SYSCON · PlantStar
Technology to put you in control

System User's Guide

Version 4.3x

SYSCON - PlantStar

System User's Guide

SYSCON International, Inc.
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For your reference, our contact information is:

SYSCON - PlantStar
1108 South High Street
South Bend, IN 46601
USA

Phone - (574) 232-3900
FAX - (574) 287-5916

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SYSCON - PlantStar System
User's Guide

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1 Welcome to PlantStar

SYSCON-PlantStar produces four levels of shop floor data collection systems. These systems are sized and targeted to meet customer's needs. For additional information about these levels see on line help.

The goal of your PlantStar system is to provide you with a data collection and monitoring apparatus that enables you to make informed decisions on the factory floor in Real-Time. It defines the shop floor, schedules jobs on the floor, and monitors those jobs.

There are a number of PlantStar applications within your system:

- **Shop Floor Configuration** - The Shop Floor Configuration program enables you to define the physical descriptions of machines on the shop floor in terms of down reasons, reject reasons, assist reasons, display groups, and data collection modules (DCMs). Once defined, these shop floor characteristics provide the foundation upon which jobs are scheduled. The Shop Configuration program also lets you define users, their privileges and passwords.
- **Shop Floor Monitor** - The Shop Floor Monitor program provides information on current shop floor activity. Within Monitor, real-time monitoring is presented as a "moving window" of recent events. Information on the current shift, the current job, or the most recent machine cycle is presented in a variety of windows. A scheduling component, accessible through the SCHEDULE menu, utilizes the Shop Configuration program's definitions in order to facilitate planning activities. These planning activities take the form of job scheduling. Jobs, their priorities and placement in a job queue, provide the work schedule for the shop floor.
- **Browser Interface** - All the shop-floor information is available throughout the plant (and even the world, if so configured) through any computer with a Firefox browser and a network connection. This functionality gives end users the ability to monitor specific machines from remote locations. It also enables machine operators to access multiple machines from a single location.
- **Label Printing** - A PlantStar system (option for Snapshot and above) configured with the print option can be used to create and print labels at the production machine.
- **Voice Output** - A PlantStar system (option for Snapshot and above) configured with the Voice Output Option is able to broadcast messages relating to currently monitored exception conditions such as Down, Idle, Fast, Slow, and Production Exception. These messages can be heard on speakers or public address systems.
- **Family Molding** - A PlantStar system (option for Snapshot and above) configured with the Family Molding software can add to your ability to track multiple cavity jobs or other parallel processes.
- **Process Journal** - A PlantStar system (option for Snapshot and above) configured with the Process Journal software can track any changes made to the system on the shop floor. Supports 21CFR1 1 data recording.
- **View and Print** - The View and Print program provides up-to-date shift and job history information in the form of on-line and paper-generated reports. Your system

provides a variety of pre-existing reports from which to choose.

· **Design Manager** - The Design Manager program is an add-on feature for your system that enables you to create your own reports. The Custom Reports Manager program transfers custom reports designed in Crystal Reports into PlantStar. It provides editing capabilities for these reports, deletion capabilities, and provides for the selection of report search criteria.

1.1 Getting Started

The goal of your PlantStar system is to provide you with a data collection and monitoring apparatus that enables you to make informed decisions on the factory floor in Real-Time. It defines the shop floor, schedules jobs on the floor, and monitors those jobs.

What do you want to know about?

- System Overview
- Logging into your PlantStar system
- Setting up your System
- Shop Floor Configuration
- Shift Scheduling Concepts
- Job Scheduling Concepts
- Monitoring Concepts
- Material Lot Tracking Concepts
- Technical Support
- FAQ

1.2 PlantStar Products

SYSCON-PlantStar produces four levels of shop floor data collection systems. Two of these systems support plant floor production information and two support both production and process information. These systems are sized and targeted to meet customer's needs.

QUICKSHOT – a basic system that supports 12 to 48 production machines; used by manufacturers interested in basic shop-floor metrics; twenty pre-configured reject and down reasons; very limited upgrade capability.

SNAPSHOT - an upgradeable, mid-entry level system for shop-floor production information commonly used as a starting point by many manufacturers interested in basic shop floor data metrics.

PORTRAIT - our medium-sized company product; an expansion to the SnapShot environment that incorporates many new functions not available in SnapShot such as SPC data collection.

PANORAMA - our enterprise level product that is commonly used to integrate multi-site, multi-process environments; used by manufacturers to organize all of their world wide manufacturing assets under one system.

Our contact information is:

SYSCON-PlantStar
1108 South High Street
South Bend, IN 46601 USA

Phone - 574-232-3900
FAX - 574-287-5916
For more information visit us on the web at www.plantstar.org.

1.3 System Overview

The goal of your PlantStar system is to provide you with a data collection and monitoring apparatus that enables you to make informed decisions on the factory floor in Real-Time. It defines the shop floor, schedules jobs on the floor, and monitors those jobs.

PlantStar Applications

There are five primary PlantStar applications within your system:

- **Shop Floor Configuration** - The *Shop Floor Configuration* program enables you to define the physical descriptions of machines in terms of down reasons, reject reasons, assist reasons, boot sets, display groups, DCMs, and communications processors. Once defined, these shop floor characteristics provide the foundation upon which jobs are scheduled. The *Shop Floor Configuration* program also lets you define users, their privileges and passwords.

- **Shop Floor Monitor** - The *Shop Floor Monitor* program provides information on current shop floor activity. Within *Monitor*, real-time monitoring is presented as a "moving window" of recent events. Information on the current shift, the current job, or the most recent machine cycle is presented in a variety of windows. A scheduling component, accessible through the *Schedule* menu, utilizes the *Shop Floor Configuration* program's definitions in order to facilitate planning activities. These planning activities take the form of job scheduling. Jobs, their priorities and placement in a job queue, provide the work schedule for the shop floor.

- **Voice Output -** A PlantStar system configured with the *Voice Output* option is able to broadcast messages relating to currently monitored exception conditions such as *Down*, *Idle*, *Fast*, *Slow*, and *Production Exception*. These messages can be heard on speakers or public address systems.

- **Print and View Reports -** The *Print and View Reports* program provides up-to-date shift and job history information in the form of on-line and paper-generated reports. Your system provides a variety of pre-existing reports from which to choose.

- **Design Manager -** The *Design Manager* program is an add-on feature for your system, which enables you to create your own reports. The *Custom Reports Manager* program transfers custom reports designed in Crystal Reports into PlantStar. It provides editing capabilities, deletion capabilities, and provides for the selection of report search criteria.

Each of these components includes numerous windows that display and manipulate

shop floor information.

1.4 System Features

There are many features included within your system. Some systems have optional features configured at the time of purchase. Most of these options can be added to any of our process-level products: Portrait or Panorama. The descriptions that follow are brief summaries. Within the operational sections of this document, you'll find more detail on how the specifics of the optional feature works in your system.

High Speed Profile - HSPO
This option allows collection and display of high speed process variable profiles. These profiles are displayed in line graph format. Up to four profiles can be displayed simultaneously. This allows analysis of interdependent process phenomena and analysis of potential to optimize the process.

Statistical Process Control - SPC
A simple to use analytical tool is available in this option. It allows process variable summary display (average, last, low values), process variable history display (table, graph, X bar & R bar charts), averages and exceptions. A more advanced third party SPC package is an available option.

Sound Track Automated Public Address - VOO
Sound Track alarms and events to be announced automatically over the plant public address system. Messages are custom recorded by the system owner and can be tailored to the operations and terminology used in the plant. Voice PC not included.

Single Material Lot Tracking - MATL-LOT/S
Single Material Lot Tracking allows tracking of consumption of one material per machine using the operator input at a touch screen DCM. The lot number identifies the material. Consumption tracking, is supported and forecasting is enabled as well.

Multiple Material Tracking - MULT-MTL
Multiple materials (up to four) can be tracked with this option. Use of each material can be tracked and forecasting of material demand is supported to improve operations and control.

Multiple Material/Multiple Lot Tracking - MAT-LOT/M
Up to four component materials and four lot numbers can be tracked with this option. Use of each material and lot can be tracked and forecasting of material demand is supported to improve operations and control.

Labor Tracking - LBR-TRKG
Labor tracking is designed to forecast, collect, and report labor hours by machine, job, shift or employee. Labor is collected and tracked by personnel logging in and out at a DCM. Login/logout can be; RFID, barcode, or manual touch screen entry. The same person or people may be logged onto one or many machines at the same time depending on the work being done. For these reasons, it is not a time and attendance system. It will provide a window to where and how labor is used on the shop floor. It can also report time spent at the machine by support personnel. As a job history is developed the job history labor reports can be used to forecast staffing requirements on a shift or weekly basis.

Process Journals - PRO-JOURN

This feature adds to our already extensive web browser interface to allow operators and shop floor people to record problems and corrective actions. This feature is used in conjunction with our labor tracking option. The data is time-stamped and associated with an individual job, shift and employee. It also has an all browser based user interface so anyone on your network will be able to view the data.

Machine Control Data Interface - (MODL)-I/F
This option provides a special data interface between a machine equipped with a data port from the control system to the DCM. The DCM, depending on the capabilities of the machine's control system to generate the data, can collect temperatures and other process parameters. Additional sensors are not required for monitoring purposes for the parameters delivered by the machine's serial data port. Currently, SYSCON-PlantStar has interfaces for Allen Bradley PLC5, Advantech DL06, Arburg Selogica, Cincinnati Camac VLC/VEL, Cincinnati Camac VSX Century Controller/486/ XLT, Cincinnati Camac XTA, Cincinnati Milacron Roboshot (SPI or OPC), Cincinnati Milacron Xtreem/Mosaic , Van Dorn CRT-C, Engel CC-80/CC-90/EC-88/CC-100, HPM CMD-III/CMD-90, Husky OI TCP/IP, JSWuPACS-3000/uPACS-5000, Maco 4000, 6000, Maco 8000, Netstal Sylink (Sijaard card), Nissei NC9300T, OPC Clients, SPI interface, Van Dorn Pathfinder (Siemens 1 15u), RKC F900/F400, Square D Powerlogic Series 2000 SY/Max 802.3 Protocol, TI 545, Toshiba Injectvisor 5 series/10 series, Toshiba V10.V21/V30, Toyo PLCS Part-6, Battenfeld Unilog 9000 B, Kawaguchi B & B2, Hekuma, and more are added regularly.

Gauge Interface - GAGE-I/F
Currently, SYSCON-PlantStar has interfaces for A&D Companies EK-G or EW-G series scales, AC 9000, Beta Tech MiniMUX, Branson, Kaman Kuda, Ohaua Trooper, Peet Brothers Ultimeter 2100, Sartorius QC series The DCM can be equipped with serial communications compatible with a wide variety of digital gage equipment. Measurements can be made with the gauge and tabulated by the system allowing reports and analysis of dimensional data along with process variable measurements.

Printer Interface –
Currently, SYSCON-PlantStar has interfaces for Zebra tote label printers, HP laser printers, and all printers supported by T-Former software.

Scale Interface - SCALE-I/F
The DCM can be equipped with serial communications compatible with a wide variety of digital weigh scale equipment. Measurements can be made with the weigh scale and tabulated by the system allowing reports and analysis of part weight data along with process variable measurements.

Other Interface
Interfaces to moisture meters, humidity sensors, etc. also have been written.

Set-Up Sheet Software - SET-UP
Hard copy set up sheets can be replaced by this software option. The option allows set-up instructions to be typed into the system and displayed at a touch screen DCM for each job to be run at a specific machine. Questions about how to set up specific jobs will be put to an end.

Bar Code Interface - BAR-COD
The interface between the DCM and bar code printer is enabled by this option. Labels can be printed out by the system according to a variety of requirements. Integration of the

TFORMer runtime package allows for rapid development of customized labels. Separate purchase of the Windows- based TFORMer Designer package gives the user the ability to create label templates for use with PlantStar, and to print labels independently. A Bar Code printer may be connected to the DCM by either a serial or USB port. Bar Code Printer not included.

Interface to DataStream MP2 Software - MP2 I/F
Interface enabling data exchange between the system and DataStream MRP2 production planning software. A fully integrated system that enables both production monitoring and production planning is ensured with this option and the emplacement of the DataStream software.

Remote Modem and Set-Up Service - REMOTE-ACC
To provide remote data access or remote log-on, this option can be selected. It consists of two modems and set-up service from SYSCON-PlantStar. Minimum personal computer configuration requirements apply and the customer must provide direct telephone line access to the modem at the plant site.

Shot Tracker - SHOT-TRACK-2
Shot by shot archiving of all data collected for every shot. This feature does not provide tools to sort or analyze the data collected. The user must use a database tool such as ACCESS to analyze the collected data.

Host E-mail capabilities –
We have added a new feature to our host that allows the system to send e-mails from most programs running on the PlantStar server. We can configure this program to send information to any e-mail address in your domain. The e-mails that can be sent include success/failure of any automated tasks like backups, imports, and exports. We can, if requested, have an e-mail address created so these messages can be forwarded to PlantStar customer support. Our support department can use this information about your server status to provide you more timely and proactive system support.

Backup
The system is normal backed up by FTP transferring of files to a customer supplied file server. Optionally a CD or CDRW drive can be supplied with the PlantStar host for backup purposes.

1.5 Features Summary

Features

Features	QuickShot	SnapShot	Portrait	Panorama
Cycle Time	X	X	X	X
Cycle Time Graph/SPC	X	X	X	X
Up Time	X	X	X	X
Down Time — 20 Reasons	X	X	X	X
Reject Tracking — 20 Reasons	X	X	X	X
Assist Calls — 20 Reasons	X	X	X	X
Enhanced Down & Reject Reasons — 160 Reasons		O	O	O
Machine Performance	X	X	X	X
Machine Utilization	X	X	X	X
Overall Equipment Effectiveness "OEE %"	X	X	X	X
Drag & Drop GANNT Chart Job Scheduling	X	X	X	X
Job Summary	X	X	X	X
Tool Change Scheduling	X	X	X	X
Single Material Usage/Forecast	X	X	X	X
Multi Material Usage/Forecast		O	O	O
Concurrent Users 4	X	X	X	X
Concurrent Users 8		O	O	O
Concurrent Users 12			O	O
Concurrent Users 12+				O
Single Material Lot Tracking		O	O	O
Multi Material Lot Tracking		O	O	O
Voice Paging		O	O	O
Digital Paging/Emails		O	O	O
Pareto/Pie Charts	X	X	X	X
Process Monitoring — 20 pvars			O	O
Process Monitoring — 50 pvars				O
Profile Graphs (up to 4 total)			O	O
User Defined Area Under Curve			O	O
SPC Sampling/Correlation Analysis			O	O
Family Molding Software		O	O	O
Web-Based Setup Sheets for Document Control	O	O	O	O
Labor Scheduling/Tracking/Forecasting		O	O	O
Process Journals		O	O	O
Shot Tracker			O	O
Enhanced SPC Evaluation Tools			O	O
Machine Capacity of 12	X	X	X	X
Machine Capacity of 13-48	O	X	X	X
Machine License Capacity of 48-70			X	X
Machine License Capacity of 71+				X
Base Product Customization				O
Browser Operator Screens	X	X	X	X
Custom Browser Screens				O
Multi Lingual	O	O	O	O
MRP Integration		O	O	O
Bar Code Printing		O	O	O
Tote Tracking		O	O	O
User-Defined Web Pages Using Microsoft	X	X	X	X
Just-In-Time Tool Selection	O	O	O	O

X = Standard

O = Optional

1.6 What's new in PlantStar 4.20

PlantStar 4.20 has incorporated many new features including:

- **Process Journaling -** This feature adds to our already extensive web browser interface to allow operators and shop floor people to record problems and corrective actions. This feature is used in conjunction with our labor tracking option. The data is time-stamped and associated with an individual job, shift and employee. It also has a totally browser-based user interface. So anyone on your network will be able to view the data.

- **RTLDCM Flash Drives** - The RTL based data collection modules now come in a diskless version. This feature uses flash memory cards instead of a hard drive. Hard drives are susceptible to mechanical failure and we have eliminated the problem of hard drive failure by removing the hard drive. The flash drive allows for thousands of read/writes before needing replacement. In addition, replacement flash cards can be made for a fraction of the cost of a hard drive.

- **Journaling File System** - The structure of the data contained on the flash/hard drive has, in the past, been prone to data corruption. We have found that in almost all cases the corruption can be traced to a power failure or inappropriate shutdown of the data collection module. We have converted from the Linux based EXT2 file system to the newer Reiser journal file system. This new file system will automatically restore itself to its previous state in the event of an uncontrolled shutdown.

- **Host E-mail capabilities** - We have added a new feature to our host that allows us to send e-mails from most programs running on the PlantStar server. We can configure this program to send information to any e-mail address in your domain. The e-mails that can be sent include success/failure of any automated tasks like backups, imports, and exports. We can, if requested, have an e-mail address created to forward these messages to PlantStar customer support. Our support department can use this information about your server status to provide you more timely and proactive system support.

- **Import/Export Options** - PlantStar has extended its options for importing and exporting data to ERP systems. We now provide multiple machine specific standards to be imported in any one import file. Our *end-of-shift* export utility can now notify you of any machines that have failed to report the *end-of-shift* event. This is usually a sign of network problems between the host and the data collection module. In conjunction with the previous feature, we can export only data for late reporting machines. So once the initial communications problem has been resolved, the data that was missed in the first *end-of-shift* will be exported. Our export utility can now be set to perform an incremental export. That is, instead of one export per shift, it can now do an export on a set interval. This will allow your ERP system to more accurately reflect the current production status of your shop floor.

- **Automated Archiving** - The archiver program can now be automated to perform an archive at set interval. For instance you can maintain a six-month record active in the PlantStar database by setting the archiver to run once a month. The archiver program will store the archived data on the PlantStar server or FTP it to a location of your choice. Eliminating the delay associated with archiving multiple months worth of data after a performance decrease has been noted.

- **Labor Required Displayed on the Schedule Board** - If you have purchased the labor tracking option, the total labor hours required for a given shift can be displayed on the

Job Schedule Board. This option can be enabled from the *User Preferences* screen in the *Monitor* program.

- **Maco 6000 Host Interface** - PlantStar has expanded its already extensive collection of machine interfaces by providing support for the Maco 6000 host interface. The protocol uses 485 based serial communications to collect process data direct from the machine's controller.

- **International Support** - The date, currency, and decimal numeric fields used for input and display in all PlantStar monitor screens and reports now use the locale settings that have been configured in Windows control panel.

- **Crystal Reports v11.0** - All PlantStar reports have been updated to the latest version of Crystal Reports. This makes integrating your own custom reports even easier.

- **Voice Program** - PlantStar's voice program has been modified to eliminate delays in making announcements. Now when any event occurs that requires a voice announcement, the response will be immediate.

1.7 What's new in PlantStar 4.10

PlantStar 4.10 has many new and exciting features, including:

- **Family Tooling** - *Family Tooling* is designed to allow the collection and tracking of data by child job. Management will receive a much more detailed picture of production, rejects, history, and pieces made for each family job. *Family Tooling* allows up to twelve child jobs running, at one time, on a machine.

- **Labor Tracking** - *Labor Tracking* is designed to forecast, collect, and report labor hours by machine, job, shift, or employee. Labor is collected and tracked by personnel logging in and out at a DCM. The same person or people can be logged onto one or many machines at the same time depending on the work being done. For this reason, it is not a time and attendance system. It will provide a window to where and how labor is used on the shop floor. It can also report time spent at the machine support personnel. As a job history is developed the job history labor reports can be used to forecast staffing requirements on a shift or weekly basis.

- **Shot Tracker** - PlantStar is pleased to introduce *Shot Tracker*. This new tracking feature timestamps and logs information for each cycle of the machine.

- **OPC Client -** PlantStar has joined the OPC era with the introduction of an OPC client. This client will connect to any OPC certified server to deliver data to the PlantStar system.

- **Increased Performance** - Because of PlantStar improved capabilities; retrieval of job data is more robust than previous versions. The most noticeable areas are the loading of the *Job Schedule Board* and retrieval of *Product Standards*.

- **Improved Job Editing Capabilities** - All job editing screens (*Job Schedule Board*, *Current/Queue Jobs*, *Work Orders*, and *Product Standards*) have been recreated. The result has given a more powerful job editor. A partial list of features includes: enhanced field editing, pop up date calendars, integrated job list, and family tooling capabilities.

- **Column Resizing** - Most PlantStar screens now allow you to resize the columns the

way that you see fit.

- **Column Sorting** - Some of the *Shop Floor Monitor* screens now allow the sorting of the columns of data. This can be achieved by clicking the column heading you wish to sort. The following screens have column sorting capabilities:

  - *Material Lot Tracking*
  - *Material Lot Detail*
  - *Labor Status*
  - *Labor Forecasting*

- **Job Queue Editing** - Queue jobs can now be edited from the *Current/Queue Job* window, as well as the *Job Schedule Board*. Previous versions only allowed editing, of queue jobs, from the *Job Schedule Board*.

- **Case Insensitive Search** - Searches no longer require the search criteria to match the case of the expected result. This is most noticeable in the *Job Schedule Board*, *Product Standards*, and the *Material Lot Tracking* screens.

- **Job Schedule Board Search** - The search capabilities within the *Job Schedule Board* have been expanded to search on more fields. Now all the available fields from the filtering function are included in the search function.

- **HTML Help** - Previous versions of PlantStar used Win Help.

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II
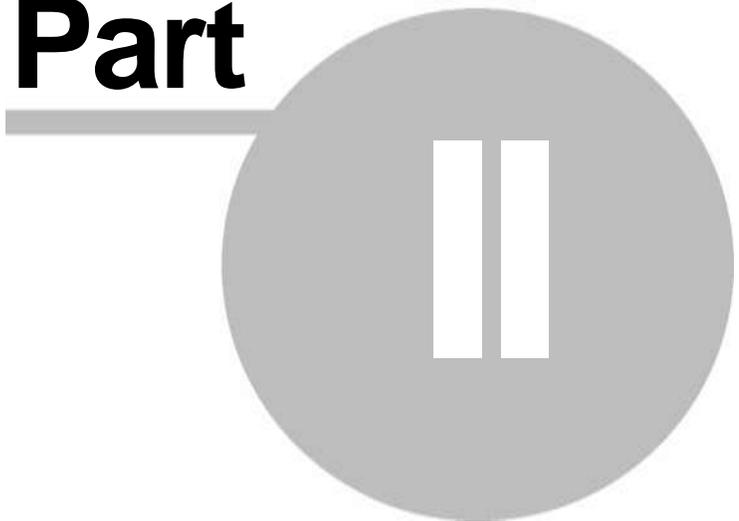
2 Shop Floor Configuration

There are numerous steps to setting up and defining a shop floor. Each step entails providing specific information. The information on one element of the shop floor directly relates to and is associated with a second element. **Communication Processor** information, for example, needs boot set information. Machine definitions need **Communications Processor** and **Data Collection Module** (DCM) information. Changes to some shop floor definitions force a re-initialization of a DCM. This, in turn, affects the currently running job.

The following sections discuss some basic relationships between specific shop floor components. These relationships are presented here to facilitate the entering of information.

What do you want to know about?

- User Defined Labels
- Reason Sets
- Work Centers
- Display Groups
- Labor Categories
- Communications Processors DCMs
- Machines
- Process Variables

2.1 File Menu
2.1.1 Save Session

Defining and updating your shop floor definitions is an extremely important part of PlantStar. When shop floor definitions change, the new information is loaded down to a DCM and the database.

Many shop floor characteristics are inter-related. **Communications Processor** information needs boot set information. **Machine** definitions need **Communications Processor** and DCM information. Since changes that you make to shop floor definitions are so inter-related and immediate, PlantStar provides a feature to edit multiple shop floor characteristics before you send them down, all at once, to the shop floor.

The **Save Session** menu command under the *File* menu lets you decide when new or updated shop floor definitions should be sent to a DCM. You can edit any number of setup windows. No action is taken with regard to actually sending information to the shop floor until you click the **Save Session** menu item.

2.1.2 Restore Session

The **Restore Session** command button restores any changes that have been made on the following windows to the way it was before you started editing. These windows include:
- **Assist Reason Sets**
- **Down Reason Sets**
- **Reject Reason Sets**
- **Boot Sets**

- ***Work Center Setup***
- ***Display Group Setup***
- ***Labor Setup***
- ***Comm Processor Setup***
- ***DCM Setup***
- ***Machine Setup***
- ***REU Setup***

To restore your information, click on the **Restore Session** command under the *File* menu.

2.1.3 User Preferences

The **User Preference** window enables you to customize the PlantStar environment in terms of:
- Font Size -- Changing Text Sizes sets the font size for all PlantStar windows.
- Job Primary Label -- The label to use for all jobs displayed on the **Job Schedule Board** window can be selected. The job label field lists all jobs on the Gantt chart by job name. The product label shows all jobs by product name.
- Default When Moving a Job - You can select what will happen by default when moving

work orders or jobs from one machine to another on the ***Job Schedule*** window.

- Screen Load Behavior - This option enables the quick loading of screens. When the quick load option is enabled, a screen is loaded without retrieving the data for the selection criteria. Data is loaded after window is opened and selection is made.
- Search Criteria - The search method used on the ***Job Schedule Board*** window can be selected. There are three search methods: left, embedded, and exact. Left matching searches for records that start with a specified text. Embedded matching finds all occurrences of a text wherever it is located. Exact matching finds exact matches only. (Specific examples are provided under each method's field help topics.)
- Show labor Hours – This displays the total number of man-hours required for each shift.
- Language - This allows the users to select their language preference.

These preferences are saved from session to session and will not change until the next modification.

Where can you find it?

- · Choose the *File* menu on the ***Monitor*** window.
- · Choose the ***User Preference*** option.

What do you want to know about?

- Changing Preferences
- Saving Your Changes
- Undoing Your Changes
- Closing the Window

2.1.4 Logout

The Logout menu option closes all the current opened PlantStar windows and returns you to the main Login window.

2.1.5 Exit

To exit the program, choose one of the following methods:

- · Select the *Exit* option under the *File* menu
- · Click your mouse button while it is positioned over the 'x' in the upper right hand corner of the window.

NOTE: You must have the "Exit Panorama" privilege to exit the ***Monitor*** program.

2.2 User Menu

2.2.1 User Accounts
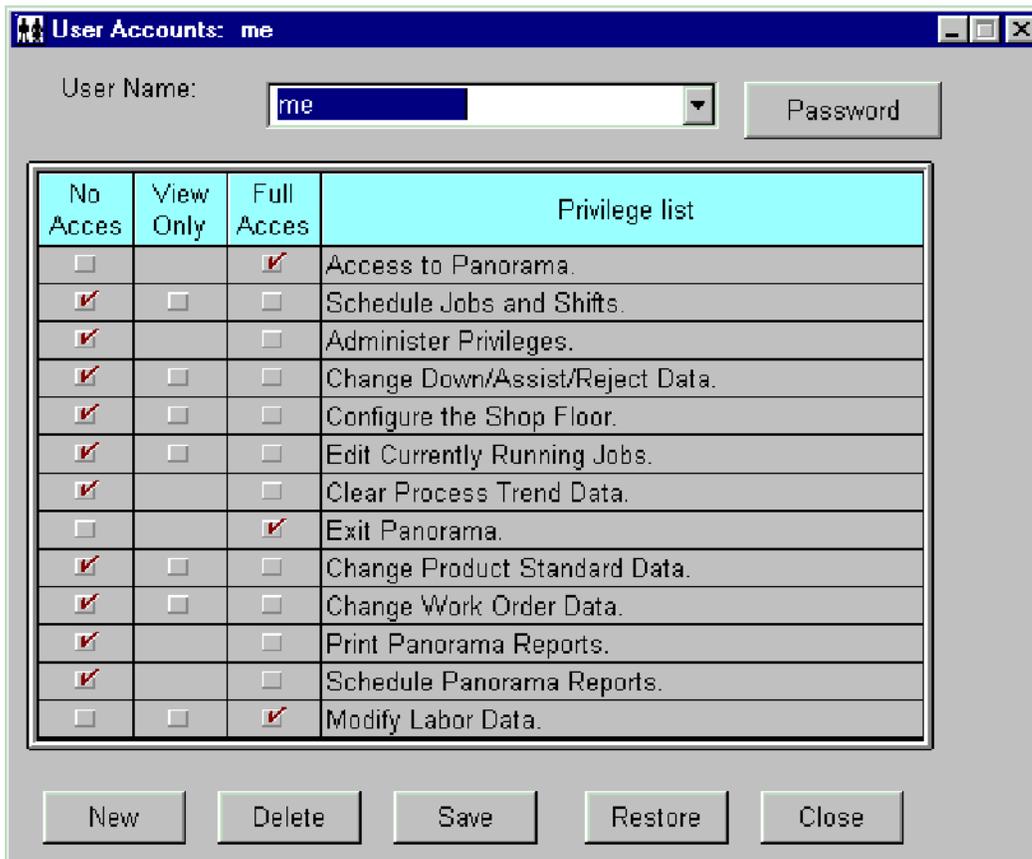
The **User Accounts** window lets you add, change or delete users and their privileges. This window is one of the primary security features within PlantStar. There are three levels of privileges which can be granted to users: no access, view only, or full access.

- No Access - Does not allow the user to open the specified window.
- View Only - Allows a user to view any PlantStar window associated with the granted privilege
- Full Access - Enables the user to add, delete and edit all information associated with the granted privilege.

All known PlantStar users are displayed upon the opening of this window. If you want to change a user's information, place your mouse pointer over the user's name or the relevant field.

NOTE: If you do not have administrator privileges, then only your name appears in the user name list. You cannot view other people's privileges. You can change your password but not your assigned privileges.

Where can you find it?

- Choose the *User* menu on the main **Shop Configuration** window.
- Choose the *User Accounts* option.

What do you want to know about?

- Selecting Users
- Adding Users
- Updating Users
- Deleting Users
- Changing Passwords
- Saving your Changes
- Undoing your Changes
- Closing the Window

2.2.2 User Defined Labels

The **User Defined Labels** window lets you customize the title of a free text field. Up to four free text fields appear on the **Product Standard**, **Work Order**, **Current/Queued Jobs**, and **Material Lot Tracking** windows within the **Monitor** program and related reports. These fields can be used as customized searching keys or site-specific pieces of information.

The top field on this window displays the free text field selected. Below it is the title currently displaying on the above-mentioned windows. This second field is editable.

Where can you find it?

- Choose the User menu on the main Shop Configuration window.
- Choose the User Defined Labels option.

What do you want to know about?

- Selecting a Free Text Field
- Changing User-Defined Labels
- Setting User-Defined Labels to Default
- Saving your Changes

- Undoing your Changes
- Closing the Window

2.3 Sets Menu

2.3.1 Down Reason Sets

Down Reason Set: Default

| Down Set Name: | Default |
| Comment: | |

Reason Index	Force Down	Ignore Cycle	Auto Clear	Force scrap	Reason List
1	No	Yes	Yes	No	Unauth
2	Yes	No	No	2	Down
3	Yes	No	No	No	Far Down
4	No	No	No	No	Way Down
5	No	No	No	No	Below Down

| New | Delete | Restore | Update | Close |

The **Down Reason Sets** window lets you add, change or delete a down reason set. Defining down reason sets enables PlantStar to report a machine's down time and down frequency by a defined reason. Down time statistics are collected using shift-to-date data for a current job or historical job. Down reason sets are associated with a machine from the **Machine Setup** window.

You can define up to twenty (20) down reasons for each down set. Down reason number one and two are pre-defined by PlantStar in terms of what they do and mean.

NOTE: An extended down and reject reason option can be purchased from PlantStar. This will extended the down/reject limit to one hundred and sixty (160) down/reject reasons for each set.

Down Reason One: The first reason is the default down reason. Time is accrued to this reason when a machine is down and the operator has not selected a specific reason. A post-down delay period can be set, though, from the **Machine Setup** window that delays the accruing of "unspecified" down time to *Down Reason #1*.

Down Reason Two: The second down reason clocks actual setup time. PlantStar compares this time with a job's standard setup time.

NOTE: A machine is considered down under the following conditions:
· The machine is cycling so slowly that the actual cycle time is longer than the down time threshold specified in the current job.

· The operator has selected a down reason that 'forces' the machine into a down state.

Where can you find it?

- Choose the Sets menu on the main Shop Configuration window.
- Choose the Down Reason Sets option.

What do you want to know about?

- Selecting Reason Sets
- Creating Reason Sets
- Renaming a Reason Set
- Deleting Reason Sets
- Saving Reason Sets
- Undoing Your Changes
- Setting Down Reason Flags

2.3.2 Assist Reason Sets
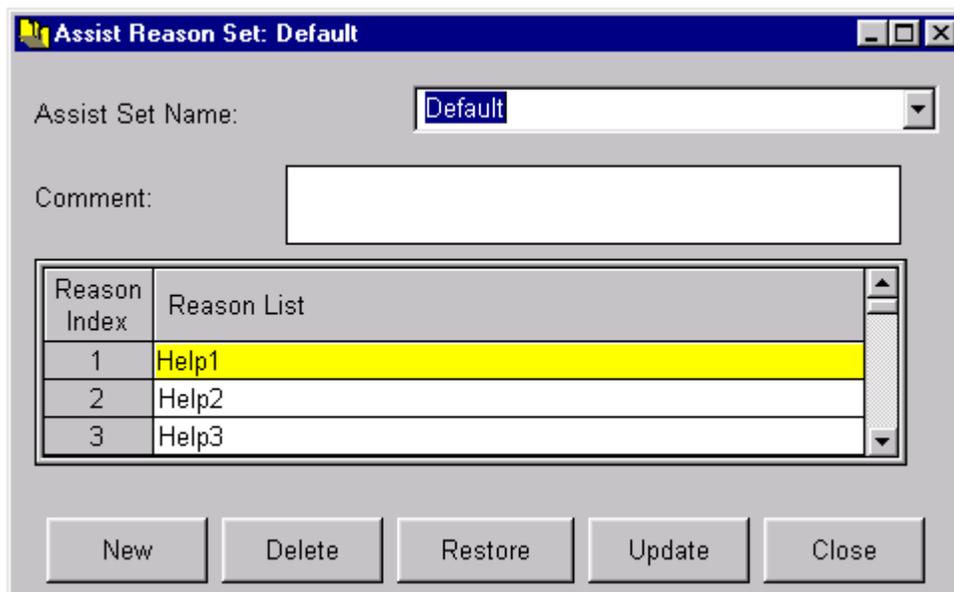
The *Assist Reason Sets* window lets you add, change or delete an assist reason set. Defining assist reasons enables PlantStar to report a machine's assist time and assist frequency by each defined reason. Assist time statistics are collected using shift-to-date data for a current jobs or historical jobs.

A list of defined assist reason sets is displayed upon the opening of this window. The first defined reason set and its reason definitions are visible initially. You can define up to twenty (20) assist reasons for each set. Reason sets are assigned to a machine from the *Machine Setup* window.

Where can you find it?

- Choose the Sets menu on the main Shop Configuration window.
- Choose the Assist Reason Sets option.

What do you want to know about?

- Selecting Reason Sets
- Creating Reason Sets
- Renaming a Reason Set
- Deleting Reason Sets
- Saving Reason Sets
- Undoing Your Changes

2.3.3 Reject Reason Sets
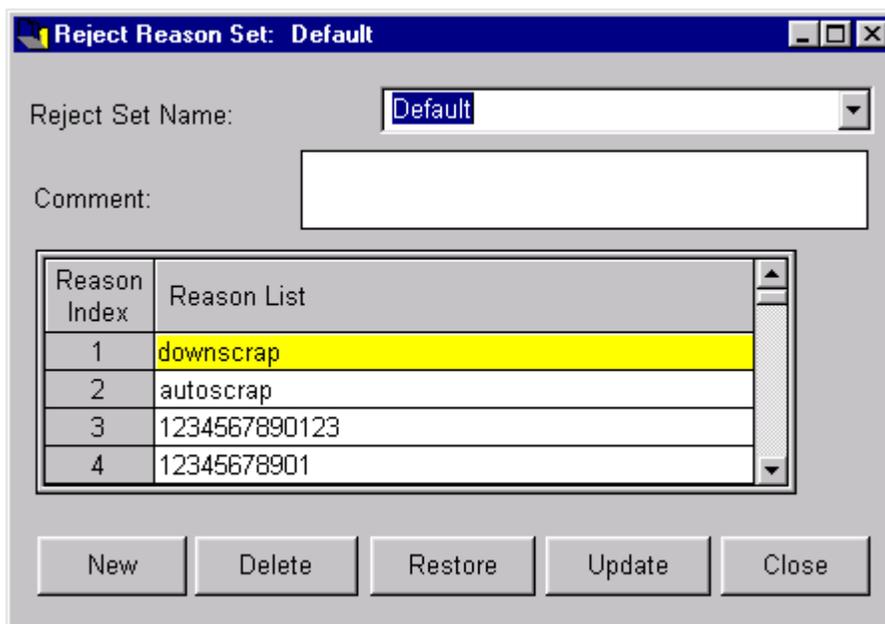
The ***Reject Reason Sets*** window lets you add, change or delete a reject reason set. Defining reject reason sets enable PlantStar to report on the number of rejects for a machine. It also is able to calculate reject percentages for each defined reject reason. Reject counts are collected using shift-to-date data of a current job or historical job.

You can define up to twenty (20) reject reasons for each reason set. The first defined reason set and its reason definitions are visible initially. Reason sets are attached to a machine from the ***Machine Setup*** window.

NOTE: An extended down and reject reason option can be purchased from PlantStar. This will extend the down/reject limit to one hundred and sixty (160) down/reject reasons for each set.

NOTE: Reject Reason number two has a special meaning attached to it. PlantStar uses the second reject reason to accumulate the difference between gross and net pieces when *Net Parts Counting* is in effect.

Where can you find it?

- Choose the Sets menu on the main Shop Configuration window.
- Choose the Reject Reason Sets option.

What do you want to know about?

- Selecting Reason Sets
- Creating Reason Sets
- Renaming a Reason Set
- Deleting Reason Sets
- Undoing Your Changes

2.3.4 Boot Sets
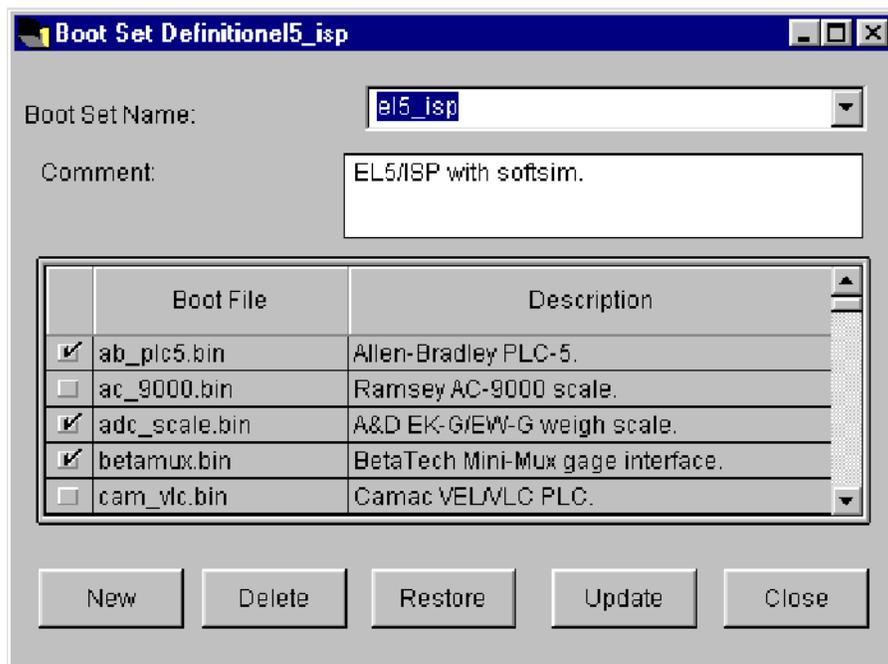
The **Boot Sets** window lets you add, change or delete a boot set. Defining boot sets enables PlantStar to start-up and load information into a communications processor or a DCM.

Defining boot sets for **Communications Processors** and DCMs are mandatory. A boot set lists the files that are downloaded to a **Communications Processor** or DCM. These files are required for communication and data collection. The boot set must correspond to your hardware configuration. A boot set is assigned to a **Communications Processor** or a DCM from the **Comm Processors Setup** or the **DCM Setup** windows.

A list of defined boot sets is displayed upon the opening of this window. The boot files included in each boot set are marked by a check box to the left of their file name. You may use the default boot sets provided or create your own boot sets.

Where can you find it?

- Choose the Sets menu on the main Shop Configuration window.
- Choose the Boot Sets option.

What do you want to know about?

- Selecting Reason Sets
- Creating Reason Sets
- Renaming a Reason Set
- Deleting Reason Sets
- Saving Reason Sets
- Undoing Your Changes
- Including Boot Files from a Boot Set

2.4 Groups Menu

2.4.1 Work Center Setup
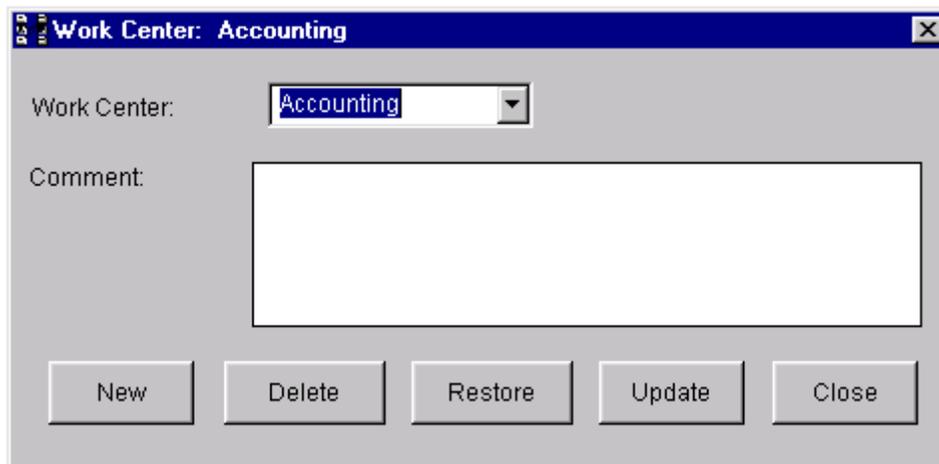
The ***Work Center Setup*** window lets you add, change or delete a work center. Defining work centers is optional although this parameter offers you a way to group your machines into logical work groups.
It is important to note that shift schedules are created for and assigned to individual work centers.

All defined work centers are displayed upon the opening of this window. If there is no work center defined, the window appears with the default 'All' work center. This work center includes all defined machines.

Machines are assigned to a work center from the ***Machine Setup*** window. A machine can belong to one and only one work center.

Where can you find it?

- Choose the Groups menu on the main Shop Configuration window.
- Choose the Work Center Setup option.

What do you want to know about?

- Changing Work Centers
- Creating Work Centers
- Deleting Work Centers
- Changing An Existing Work Center's Name
- Saving your Changes
- Undoing your Changes
- Closing the Window

2.4.2 Display Group Setup
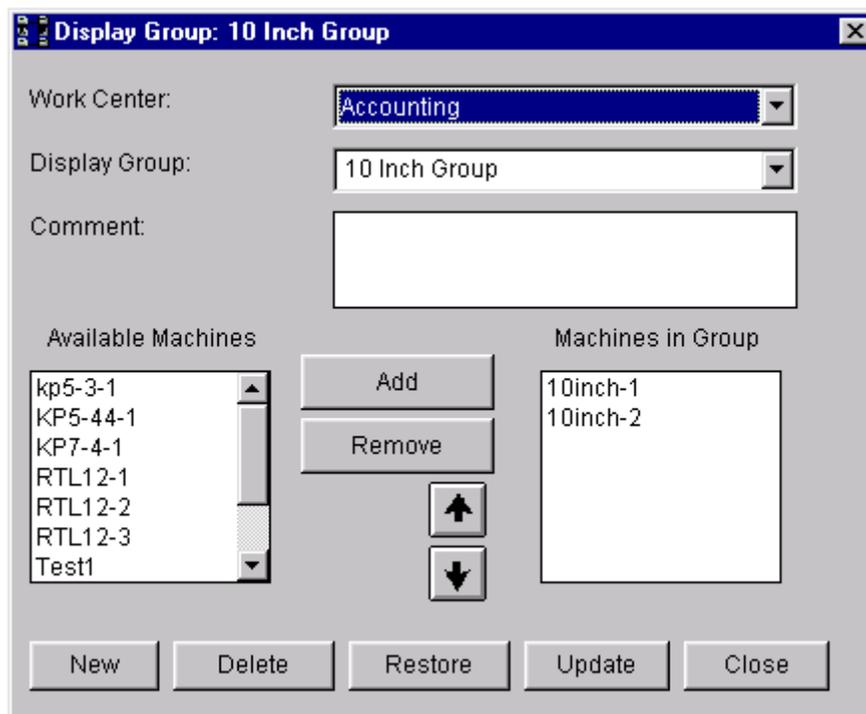
The *Display Group Setup* window lets you add, change or delete display groups. Defining display groups is optional although this parameter offers you a way to group your machines into logical work groups for later monitoring and selection on multi-machine windows within PlantStar *Monitor* (for example, the *Exception Summary* window).

Display groups are defined by work centers. Work centers define the shift schedule that a machine follows. Therefore, each machine within a display group has the same shift schedule.

Existing display groups are displayed upon the opening of this window. On the right-hand side

is a list of machines currently assigned to the "group" visible in the **Display Group** field. On the left-hand side of the window is a list of existing machines within the selected work center. Any of the machines in this list can be added to the current display group. The up and down arrows on the window move a highlighted machine up or down the list, changing the order in which machines are displayed on all multi-machine windows.

NOTE: A machine can exist in multiple display groups in any one work center.

Where can you find it?

- Choose the Groups menu on the main Shop Configuration window.
- Choose the Display Group Setup option.

What do you want to know about?

- Changing Display Groups
- Creating Display Groups
- Deleting Display Groups
- Adding Machines to a Display Group
- Removing Machines from a Display Group
- Ordering Machines in the List
- Saving your Changes
- Undoing your Changes
- Closing the Window

2.5 Labor Menu

2.5.1 Labor Setup

The **Labor Setup** window lets you add, change or delete **Labor Categories** and **Employees** for a given work center. Defining **Labor Categories** is optional although this parameter offers you a way to group labor requirements for **Labor Forecasting**.

Defining an **Employee** is necessary before that employee can be logged in and out.

Where can you find it?

- Choose the Labor menu on the main Shop Configuration window.
- Choose the Labor Setup option.

What do you want to know about?

- Changing Work Centers
- Editing Labor Categories
- Editing Employee Records
- Saving Your Changes
- Undoing Your Changes
- Closing the Window

2.6 Shop Floor Menu

2.6.1 Comm Processor Setup
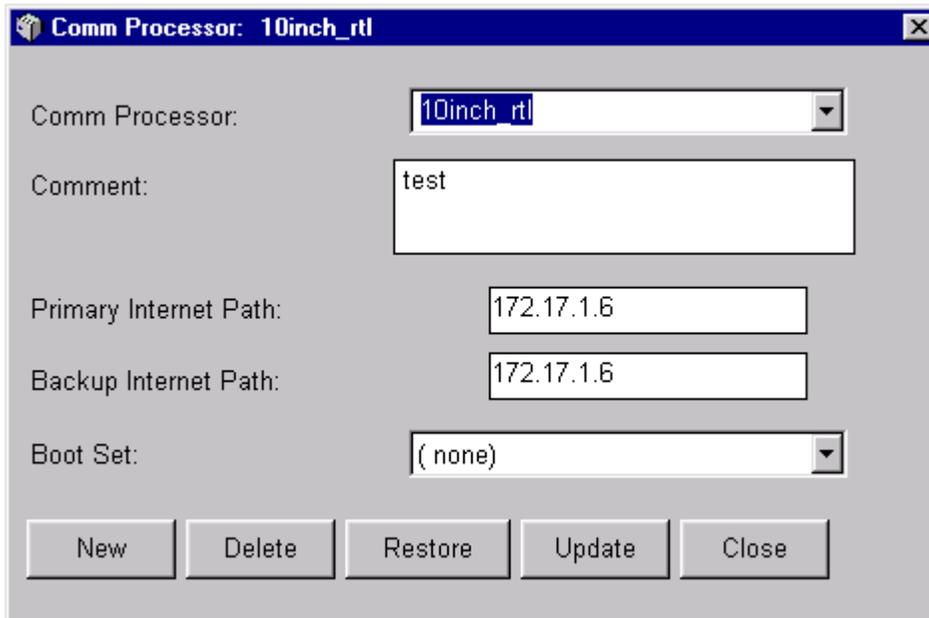
The **Comm Processor Setup** window lets you add, change or delete a **Communications Processor** (**Comm Processor**) definition. The **Comm Processor** is the link between a DCM on the production floor and the PlantStar host computer. At least one **Comm Processor** must be defined.

It is recommended that the shop floor be configured in the following sequence:

- Set up the Comm Processor.
- Set up DCMs.
- Set up Down, Reject or Assist reasons.
- Set up Work Centers.
- Set up Machines.

Each DCM must be associated with a **Comm Processor**. This is done from the **DCM Setup** and **Machine Setup** windows.

Where can you find it?

- Choose the Shop Floor menu on the main Shop Configuration window.
- Choose the Comm Processor Setup option.

What do you want to know about?

- Selecting a Comm Processor
- Creating a Comm Processor
- Deleting a Comm Processor
- Updating a Comm Processor
- Changing a Comm Processor's Name

- Saving your Changes
- Undoing Your Changes
- Closing the Window

2.6.2 DCM Setup

The **DCM Setup** window lets you add, change or delete DCM information. This window configures a DCM to suit the shop floor environment. The software configuration must match the physical components within the unit. For instance, a DCM can only be configured for 16 analog channels if the optional analog board was purchased and installed. This window also allocates the on-board memory (RAM Size).

At least one DCM must be defined for your plant. All defined DCMs are displayed upon the opening of this window. If no DCMs have been defined, then the window appears blank.

NOTE: **Machines** are assigned to DCMs from the **Machine Setup** window.

Where can you find it?

- Choose the Shop Floor menu on the main Shop Configuration window.
- Choose the DCM Setup option.

What do you want to know about?

2.6.3 Machine Setup

The *Machine Setup* window lets you add, change or delete a machine definition. It is

used to configure a machine to match a unique monitoring environment. Down reason sets, assist reason sets, and reject reason sets are assigned, along with analog inputs and digital inputs.

Monitoring machines in *Real-Time* is the primary goal of PlantStar. Machines are the main data collection point. In order to create work orders and scheduled jobs, at least one machine must be already defined and its information downloaded to the shop floor.

A list of defined machines is displayed upon the opening of this window. If no machines have been defined, the window appears blank. If machines have been defined, they can be selected for viewing from the machine field in the upper left corner. Once selected, a machine's general parameters, as well as its process variables and profiles appear. The process variables and profiles are located on the bottom portion of the window.

Where can you find it?

- Choose the **Shop Floor** menu on the main **Shop Configuration** window.
- Choose the **Machine Setup** option.

What do you want to know about?

- Changing a Machine's Name
- Creating Machines
- Deleting Machines
- Updating Machines

- Editing Process Variables
- Creating Process Variables
- Deleting Process Variables
- Changing Process Variables Name
- Saving Process Variables

- Editing Profile Variables
- Creating Profile Variables
- Deleting Profile Variables
- Changing Profile Variables Name
- Saving Profile Variables

- Saving your Changes
- Undoing Your Changes
- Closing the Window
- Undoing your Changes

2.6.4 REU Setup

NOTE: REU's are not supported in the current release of PlantStar. This window is only available for the deletion of REU's.

Upon the opening of this window, a list of existing REU's is displayed -- along with its list of corresponding machines.

Where can you find it?

- Choose the Shop Floor menu on the main Shop Configuration window.
- Choose the REU Setup option.

What do you want to know about?

- Selecting a REU
- Deleting REU's
- Saving your Changes
- Undoing Your Changes
- Closing the Window

2.7 Window Menu

2.7.1 Arrange Icons

To arrange the iconized windows into straight rows or columns, select the *Window* menu on the main menu bar. Choose the *Arrange Icons* option.

2.7.2 Arrange Windows

The windows can be arranged in three ways

Cascading:

Vertical Tiles:

Horizontal Tiles:
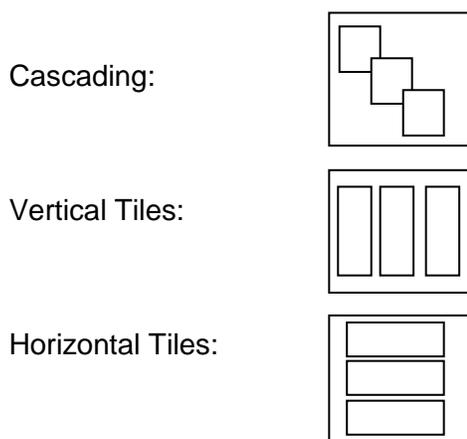
To choose one of these styles, select the *Window* menu from the main system window. Select one of the options displayed

2.8 Help Menu

2.8.1 Help Contents

General content help provides a table of contents for virtually all topics within this application. The *Contents* window can be used to jump to topics that explain various windows or how to get quick access to key reference topics. This help is available by selecting the *Contents* on the *Help* menu item.

Use the scroll bar to the right side of the *Help* window to view the next page of the *Table of Contents*.

2.8.2 Help Index

The *Index* list is directly accessible from the *Index* on the *Help* menu item or from the *Index* tab within the on-line help utility. *Index* terms consist of:

- Definitions
- Formulas, if applicable
- Recommended values, if applicable.

To access an item from the *Index* list:

- Use the scroll bar on the right hand side to scroll the window to the desired item.
- Point to the term or phase desired.
- Double-click on the highlighted word to open.

-Or-

- Use the keyword field to search for the desired item.
- Once found, double-click on the highlighted word to open.

2.8.3 Help Search

Another method to find a particular topic in *Help* is to use the *Search* option. To display the *Search* window, either choose *Search* from the *Help* menu on the application window or click the *Search* tab on the *Help* topic screen.

Select a topic by:
- Use the keyword field to search for the desired item.
- Click on the *List Topics* button to search on the keyword entered
- A list of related topics then appears on the screen.
- Once found, double-click on the highlighted topic to open.

2.8.4 Help Active Window

Window level help provides information on the display that currently has focus. Information for each window includes:

- Purpose of the window
- Specific field descriptions
- Window button explanations

This type of help is available by selecting and opening a desired window. Once opened, select the *Help-Active Window* menu on the application window or press the F1 key.

NOTE: If there are currently no PlantStar windows open, this menu item will not display any help.

2.8.5 About PlantStar

For up-to-date resource information, the application provides a window with the following information:

- PlantStar Software Version
- PlantStar Copyright Date
- Microsoft Windows Version
- Amount of free memory

To see this information:

- Select the *Help* menu on the main menu.
- Choose the *About PlantStar* menu item.

SYSCON - PlantStar System
User's Guide

Part

III
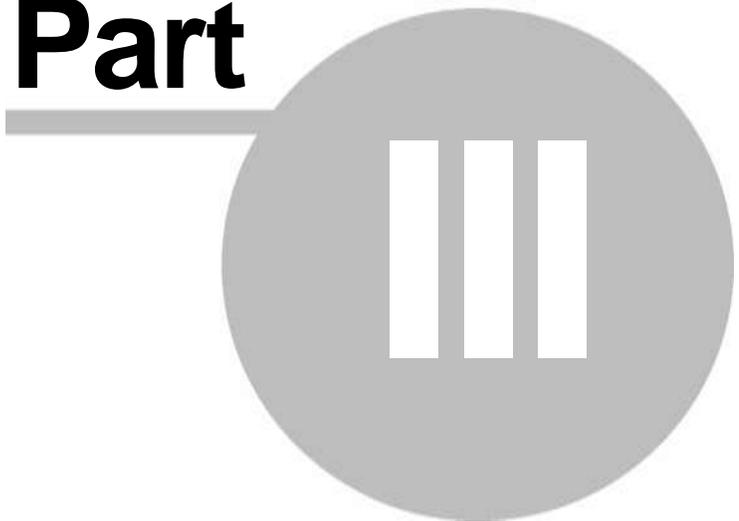
3 Shop Floor Monitor

PlantStar's goal is to provide you with a data collection and monitoring apparatus that enables you to make informed decisions on the factory floor in real-time. It defines the shop floor, schedules jobs on the floor, and monitors those jobs.

The Monitor program provides information on current shop floor activity. Within Monitor, real-time monitoring is presented as a "moving window" of recent events. Information on the current shift, the current job, or the most recent machine cycle is presented in a variety of windows. A scheduling component, accessible through the Schedule menu, utilizes the Shop floor Configuration program's definitions in order to facilitate planning activities. These planning activities take the form of job scheduling. Jobs, their priorities and placement in a job queue, provide the work schedule for the shop floor.

What do you want to know about?

- Machine States
- Shift Scheduling
- Creating Work Orders
- Creating Work Orders from a Standard Job Scheduling
- Process and Production Monitoring Displaying SPC Statistics
- Material Lot Tracking

3.1 File Menu

3.1.1 User Preference

The ***User Preference*** window enables you to customize the PlantStar environment in terms of:

- Font Size - ***Changing Text Sizes*** sets the font size for all PlantStar windows.
- Job Primary Label - The label to use for all jobs displayed on the ***Job Schedule Board*** window can be selected. The job label field lists all jobs on the Gantt chart by job name. The product label shows all jobs by product name.
- Default When Moving a Job - You can select what will happen by default when moving work orders or jobs from one machine to another on the ***Job Schedule*** window.
- Screen Load Behavior - This option enables the quick loading of screens. When the quick load option is enabled, a screen is loaded without retrieving the data for the selection criteria. Data is loaded after window is opened and selection is made.
- Search Criteria - The search method used on the ***Job Schedule Board*** window can be selected. There are three search methods: left, embedded, and exact. Left

matching searches for records that start with a specified text. Embedded matching finds all occurrences of a text wherever it is located. Exact matching finds exact matches only. (Specific examples are provided under each method's field help topics.)

- Show labor hours displays the total number of man hours required for each shift.
- Language - This allows the users to select their language preference.

These preferences are saved from session to session and will not change until the next modification.

Where can you find it?

- Choose the *File* menu on the **Monitor** window.
- Choose the **User Preference** option.

What do you want to know about?

- Changing Preferences
- Saving Your Changes
- Undoing Your Changes
- Closing the Window

3.1.2 Logout

The Logout menu option closes all the current opened PlantStar windows and returns you to the main Login window.

3.1.3 Exit

To exit the program, choose one of the following methods:

- Select the Exit option under the File menu
- Click your mouse button while it is positioned over the 'x' in the upper right hand corner of the window.

NOTE: You must have the *Exit Panorama* privilege to exit the **Monitor** program.

3.2 Monitor Menu

3.2.1 Display Group Status
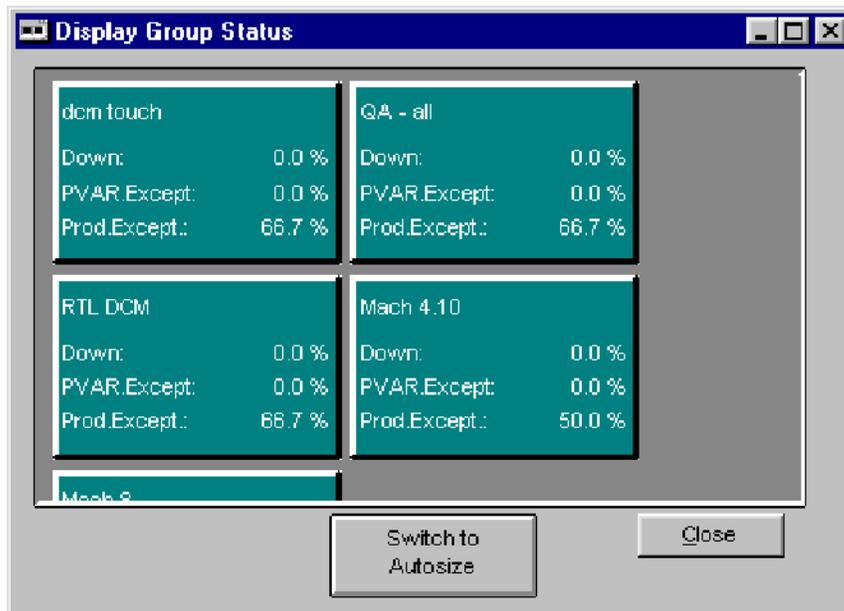
The **Display Group Status** window contains a rectangle for each defined display group. For each display group, the percent of machines in a down state, percent of machines in process exception, and the percent of machines in a production exception are calculated. Your system computes these percent values using current shift or job-to-date data or data collected during recent shifts. The color of the box reflects the display group's machine state. The machine with the highest priority state is reflected for the display group. See the **Machine State Colors** on-help section for further information.

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Display Group Status option.

What do you want to know about?

- Toggling Auto Size and Normal Size
- Viewing Machine Status
- Closing the Window

3.2.2 Machine Status
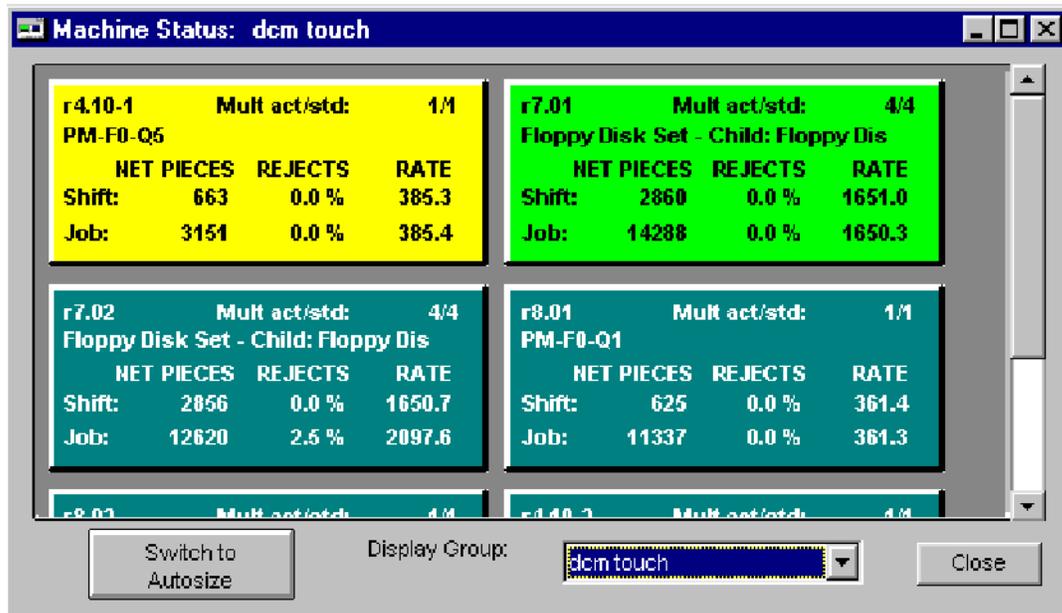
The **Machine Status** window contains a rectangle for each machine in a selected display group. If you have not selected a display group, the initial default group 'All' is displayed. The machine name appears in the upper left hand corner of the rectangle. Below the machine is the product being produced. The standard multiplier and actual multiplier for the current job are located in the upper right corner. The number of net pieces, reject percent, and actual rate for each job on a machine is calculated using current shift or job-to-date data or data collected during recent shifts.

The color of the box reflects the machine's state. See the **Machine State Colors** on-help section for further information.

NOTE: If the machine displayed is running a family job, the data displayed is one of the child jobs running. The child job displayed rotates to the next child job after each machine cycle.

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Machine Status option.

What do you want to know about?

- Viewing Machine Detail
- Toggling Auto Size and Normal Size
- Changing Display Group
- Closing the Window

3.2.3 Labor Status

The **Labor Status** window allows the viewing of any employee's labor record for the current shift or any historical shift for the selected work center. It is also possible for employees to login or logout from this window.

NOTE: You must have the proper privileges in order to view this window. See your System Administrator if you do not have the Labor viewing privilege.

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Labor Status option.

What do you want to know about?

- Changing Work Centers
- Changing Shifts
- Logging in an Employee
- Logging out an Employee
- Exporting Data
- Refreshing the display
- Sorting Columns
- Resizing Columns
- Closing the Window

3.2.4 Exception Summary

The *Exception Summary* window highlights machines that are experiencing performance problems. These are machines that are in an exception state for the selected display group. There is one line of information for each machine within a display group. The color of the line reflects the machine's running state. See the *Machine State Colors* on-line help section for further information.

If a machine is in exception, the applicable column information is displayed. For example, if a machine is in process exception, the process variable column displays the variable in violation. If a machine is in assist state, the assist reason displays in the *Assist Reason* column.

NOTE: More than one type of exception can be displayed at one time. The "Machine" and "Exception Since" columns both display the highest priority machine running state.

Highlighted exception states are:

- Down state
- Idle state
- Off-line state
- Process exception
- Production exception
- Assist state

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Exception Summary option.

What do you want to know about?

- Changing Display Groups
- Changing View Options
- Viewing Machine Exceptions
- Closing the Window

3.2.5 Production Summary

The ***Production Summary*** window provides information on the selected display group's current production on each machine. Production information is described in terms of machine performance and progress toward completion of any current jobs. There is one line of information for each job running on each machine within the display group. If there are multiple jobs running on a machine (i.e. family job), there will be multiple lines displayed for each child job.

The color of the line reflects the machine's running state. See the ***Machine State Colors*** on-line help section for further information. PlantStar computes all statistics using shift-to-date data for all current jobs.

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Production Summary option.

What do you want to know about?

- Changing Display Groups
- Changing View Options
- Exporting Data
- Closing the Window

3.2.6 Job Summary

The *Job Summary* window displays current shift and historical shift information for a selected job running on a machine.

The first row of the table provides shift-to-date information for the current shift and job. The middle rows display shift data for up to four completed shifts, depending upon how long a job has been running. The next row provides shift totals for the last four shifts available. Job-to-date totals for all columns are then calculated in the last row of the table. The color of the window background reflects the machine's running state. See the *Machine State Colors* on-line help section for further information.

NOTE: If the job is a non-family job, the child job selection will display "No Family Jobs Defined" and the child job selection would be disabled. If the machine selected is running a family job, the child job selection will be enabled and the user can select from one of the child jobs running.

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Job Summary option.

What do you want to know about?

- Changing Display Groups
- Changing Machines

- Changing Jobs
- Changing Child Jobs
- Changing Number of Shifts
- Exporting Data
- Closing the Window

3.2.7 Material Usage

The **Material Usage** window provides a summary of the amount of material used, excess material, and material requirements for each material component of a job. All calculations are based upon the current job. Material usage statistics are primarily based upon net pieces or gross pieces, part weight, and a job's standard multiplier. The handling of reject parts, whether runners are re-fed, determines whether usage and excess material calculations must take shot size into consideration.

There is one line of information for each material component attached to the current running job on a machine. The window's information can be filtered by display group, machine state, and material component. The color of each line reflects machine states. See the **Machine State Colors** on-line help section for color-coding.

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Material Usage option.

What do you want to know about?

- Changing Display Groups
- Changing View Options

- Changing Material Components
- Closing the Window

3.2.8 Pareto/Pie Charts

3.2.8.1 Down Pareto / Pie
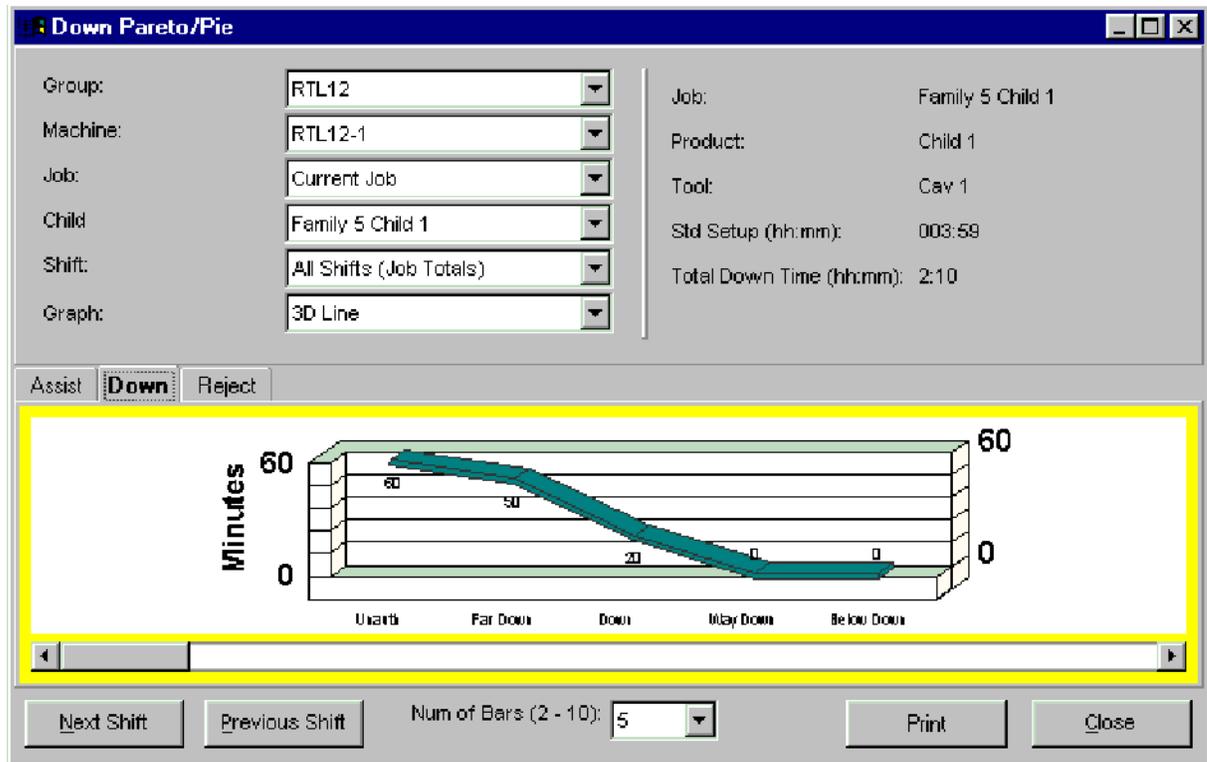
The **Down Pareto/Pie** window displays an ordered histogram of the down time for a selected shift, job, and child job. There is one vertical bar per down reason. Bar height represents the down time displayed. Bars are displayed from left to right in descending order, in effect highlighting the main causes of any down time. The Y-axis represents down time in terms of hours or minutes. The X-axis lists the down reasons as previously stated.

Where can you find it?

- Choose either the Monitor or History menu items on the main system window.
- Chose the Pareto/Pie Charts option.
- Choose the Down Pareto/Pie option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Changing Jobs
- Changing Child Jobs
- Changing Shifts

- Changing Graph Types
- Changing Number of Reasons Displayed
- Scrolling the view
- Viewing Next Shift
- Viewing Previous Shift
- Closing the Window

3.2.8.2 Assist Pareto / Pie

The **Assist Pareto/Pie** window displays an ordered histogram of the assist time for the selected shift, job, and child job. The X-axis lists the assist reasons as defined for a machine. There is one vertical bar per assist reason. Bar height represents the assist time displayed. Bars are displayed from left to right in descending order, in effect highlighting the main causes of any assist time. The Y-axis represents the amount of assist time in hours and minutes.

The color of the bars reflects the current machine state of the selected machine. See the **Machine State Colors** on-help section for further information.

Where can you find it?

- Choose either the Monitor or History menu items on the main system window.
- Chose the Pareto/Pie Charts option.
- Choose the Assist Pareto/Pie option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Changing Jobs
- Changing Child Jobs
- Changing Shifts
- Changing Graph Types
- Changing Number of Reasons Displayed
- Scrolling the view
- Viewing Next Shift
- Viewing Previous Shift
- Closing the Window

3.2.8.3 Reject Pareto / Pie

The *Reject Pareto/Pie* window displays an ordered histogram of the reject counts for the selected shift, job, and child job. The X-axis lists the reject reasons as defined for a machine. There is one vertical bar per reject reason. Bar height represents the number of rejected parts. Bars are displayed from left to right in descending order, in effect highlighting the main causes of rejects. The Y-axis represents the number of rejects. The color of the bars reflects the current machine state of the job running on a selected machine. See the *Machine State Colors* on-help section for further information.

The window's scroll bars shift the view of the Pareto chart, allowing you to see all reject reasons defined for a machine. Click on the scroll bar to view reasons not immediately visible.

NOTE: If the job selected is a non-family job, the child job selection will display "No Family Jobs Defined" and the child job selection would be disabled. If the machine selected is running a family job, the child job selection will be enabled and the user can select from one of the child jobs running.

Where can you find it?

- Choose either the Monitor or History menu items on the main system window.
- Chose the Pareto/Pie Charts option.
- Choose the Reject Pareto/Pie option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Changing Jobs
- Changing Child Jobs
- Changing Shifts
- Changing Graph Types
- Changing Number of Reasons Displayed
- Scrolling the View
- Viewing Next Shift
- Viewing Previous Shift
- Closing the Window

3.2.9 Machine Performance

The *Machine Performance* window provides a summary of a selected display group's performance over time as it pertains to currently running jobs. There is one line of information for each machine within the display group. The color of the line reflects the machine's running state. See the *Machine State Colors* on-line help section for further information.

Where can you find it?

- Choose the Monitor menu on the main PlantStar window.
- Choose the Machine Performance option.

What do you want to know about?

- Changing Display Groups
- Changing View Options
- Closing the Window

3.2.10 Machine Exception
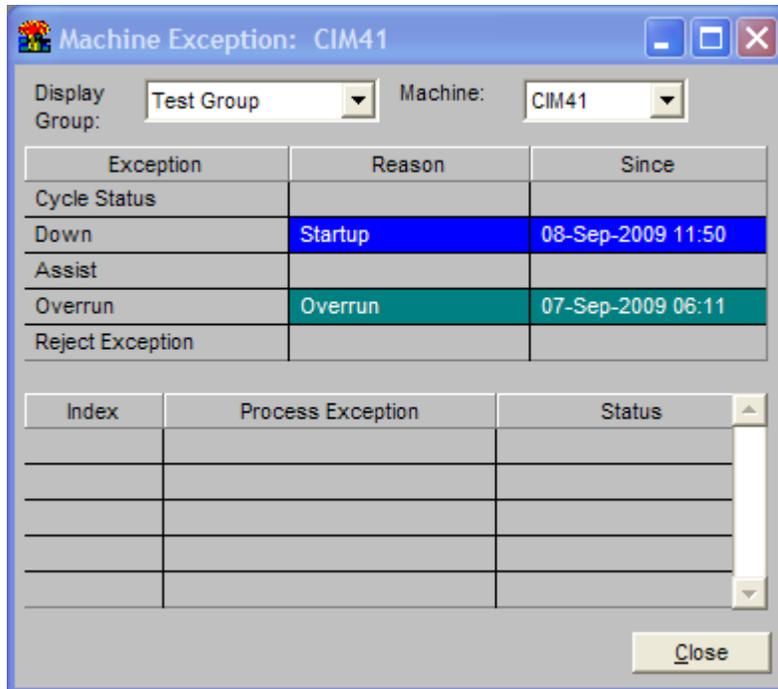
The ***Machine Exception*** window provides a greater detailed description of a selected machine's running state than the ***Exception Summary*** window. Any running state of the machine is displayed along with an exception time. If a process variable is in exception, this window shows whether it is a result of a higher limit or lower limit violation. Also, this window is color-coded according to your system ***Machine State Colors***.

NOTE: The ***Machine Exception*** window can also be accessed from the ***Exception Summary*** window. While on the ***Exception Summary*** window, click on a machine's row of information. Exception information for the selected machine appears.

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Machine Exception option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Closing the Window

3.2.11 Machine Usage

The **_Machine Usage_** window displays the machine usage and scheduled machine usage over a selected time period.

Also, the **_Machine Usage_** window provides a detailed description of the selected machine's running state. Any running state that the machine is in is displayed along with an exception time. If a process variable is in exception, this window shows whether it is a result of a higher limit or lower limit violation. Also, this window is color-coded according to the system **_Machine State Colors_**.

NOTE: For job-to-date calculations the current shift totals are also included.

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Machine Usage option.

What do you want to know about?

- Changing Start Date
- Changing End Date
- Rebuilding the Display
- Printing
- Changing Display Groups
- Changing View Options
- Closing the Window

3.2.12 Machine Log

The *Machine Log* window displays a list of the most recent 1000 events relating to a selected machine. These events are recorded at the DCM. Event types include:

- Job Related Events - start/end of a job or a job change;
- Shift Related Events - start of a new shift or a shift idle period;
- Down Events - start and end of down time periods;
- Assist Events - start and end of assist time periods;
- Process Alarm Events - time of a process exception, the actual "exception" value, and the limit it violated. Process exceptions are only logged, though, if the machine is not in a down state. If a process exception begins while a machine is down, the exception events are not logged for the machine.
- Labor Events - login and logout of users on the selected machine
- Material Events - material changes on the selected machine

For process alarms, the specific process variables that display on this window depend upon how a machine is defined. The process log field on the *Machine Setup* window controls which variables are included. There are three process log options:

- All - Include all process variables for a machine
- None - do not include any process variables
- Critical - Include critical process variables only.

NOTE: The *Machine Log* window only updates if the scroll box is at the very bottom of the scroll bar. Events are updated every 60 seconds.

Where can you find it?

- Choose the Monitor menu on the main your system window.
- Choose the Machine Log option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Changing Event Types
- Exporting Data
- Closing the Window

3.2.13 Overlay Profile
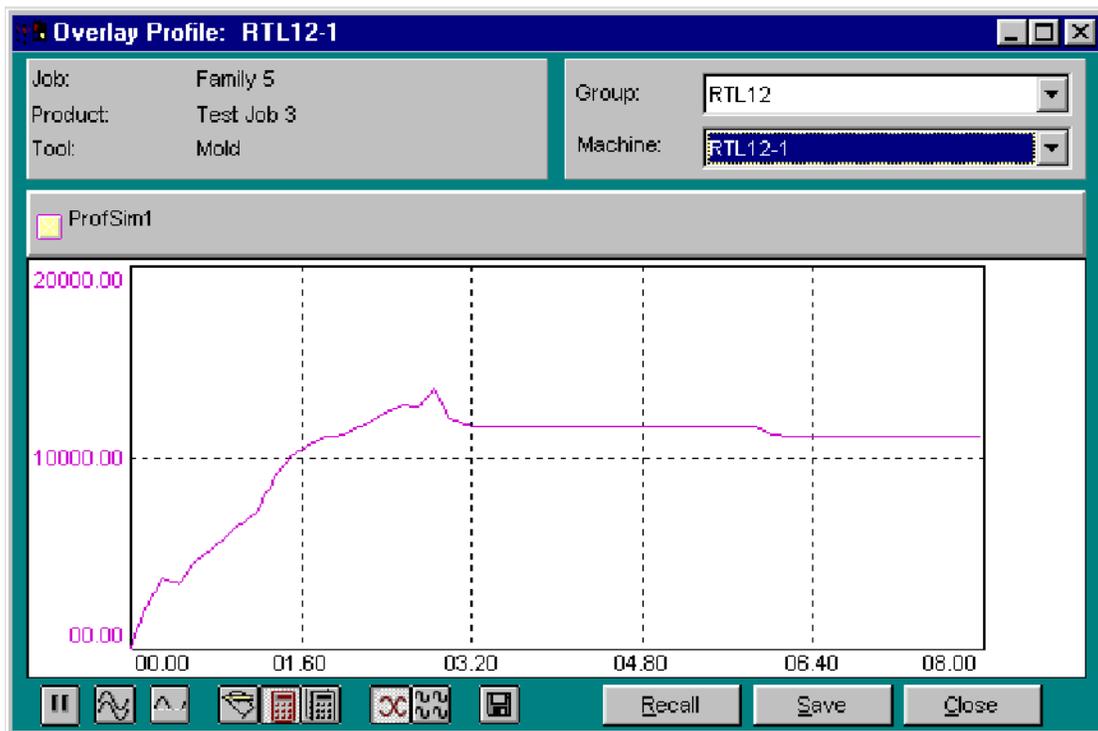
Profiles must be setup in the machine configuration before this graft is available.

The *Overlay Profile* window displays the current behavior of a profile for a selected machine, overlays that profile on top of another profile or cross plots the profile with another profile. It also allows you to zoom in on sections of a profile.

The window's graph area is blank until a profile is selected. Each profile is a collection of points. Each point represents a value that was collected during a machine cycle. Up to 500 points may be shown. Actual values are plotted against the Y-axis. The X-axis represents the time when the actual values were taken relative to the start time. The start time is always zero, which is the point at which the collection of the profile began.

NOTE: Each profile consumes a considerable amount of system resources. For that reason, only ten profiles may be displayed on the system at a given time.

Special graph controls are available for manipulating and tailoring the profiles:

II Freeze the profile

Store the profile

Clip the profile

Manual scaling option

Auto scale once option

Auto scale every cycle option

Overlay selected profiles

Cross plot selected profiles

The color of the window background reflects the machine's running state. See the **_Machine State Colors_** in the on-line help section for further information. All profiles are plotted using the color code designated by the colored box to the left of each profile's name.

Where can you find it?

- Choose the Monitor menu on the main system window.
- Choose the Overlay Profile option.

What do you want to know about?

General Functions:
- Changing Display Groups
- Changing Machines
- Selecting Profiles
- Exporting Data
- Closing the Window

Graph Functions:
- Clipping the graph
- Freezing Profiles
- Changing Profile Graph Modes
- Changing Rescaling Options
- Storing Profiles
- Viewing Actual Values
- Viewing Maximum and Minimum Values
- Zooming Selected Profiles

3.2.14 Process Trend / SPC
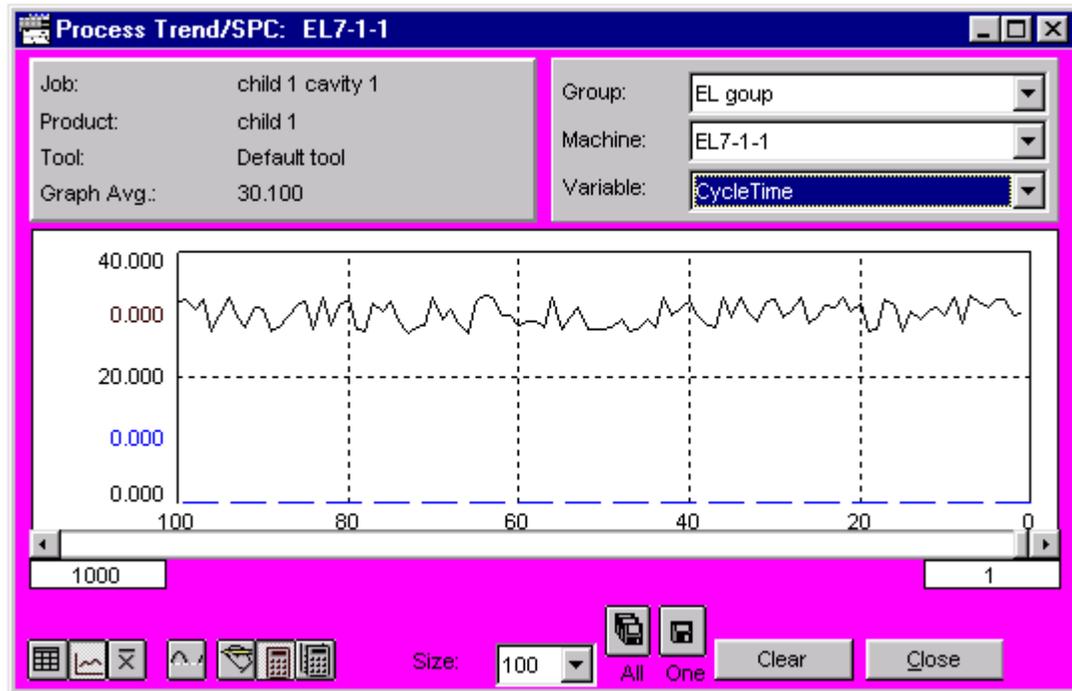
The *Process Trend/SPC* window graphically displays the behavior of any defined process variable for a machine. The selected number of most recent values for a variable is plotted.

Specific points to note are:

- The X-axis is the cycle number. The most recent cycle is 1.
- The Y-axis is the actual process variable value. The rightmost point is the most recent value. For each machine cycle update, the new value enters from the right, moving the older values to the left. Undefined values show up as blank spaces in the graph.
- The dashed, colored lines represent the higher limit and lower limit for the variable. The higher limit is red and the lower limit is blue.

The color of the window background reflects the machine's running state. See the *Machine State Colors* on-help section for further information.

Where can you find it?

- Choose the *Monitor* menu on the main your system window.
- Choose the *Process Trend/SPC* option.

The *Process Trend/SPC* window can also be accessed from the *Process Summary* window. While on the *Process Summary* window, click on a process variable's row of information. A trend graph appears for the selected process variable and machine.

What do you want to know about?

General Functions:

- SPC Statistics Concepts
- Changing Display Groups
- Changing Machines
- Selecting Process Variables
- Displaying Standard SPC Statistics Exporting Data
- Closing the Window

Graph Functions:

- Clipping the Graph
- Changing the X-axis
- Clearing Process History Information
- Changing Rescaling Options
- Viewing Actual Values
- Viewing Maximum and Minimum Values

3.2.15 Process Summary

The *Process Summary* window displays the high value and low value for a machine's process variables measured during the last fifty complete machine cycles.

The **Process Summary** window provides quick access to the **Process Trend/SPC** window for a specified machine and process variable. To view a process trend graph, click on a process variable name or any place on its row of information. A trend graph appears for the selected process variable and machine.

If a process variable is above the higher limit or below the lower limit, that process variable is highlighted according to the following default color scheme:

- Red - value is above the higher limit
- Blue - value is below the lower limit

There is one line of information in the table for each process variable defined. The color of the window background reflects the machine's running state. See the **Machine State Colors** on-help section for further information.
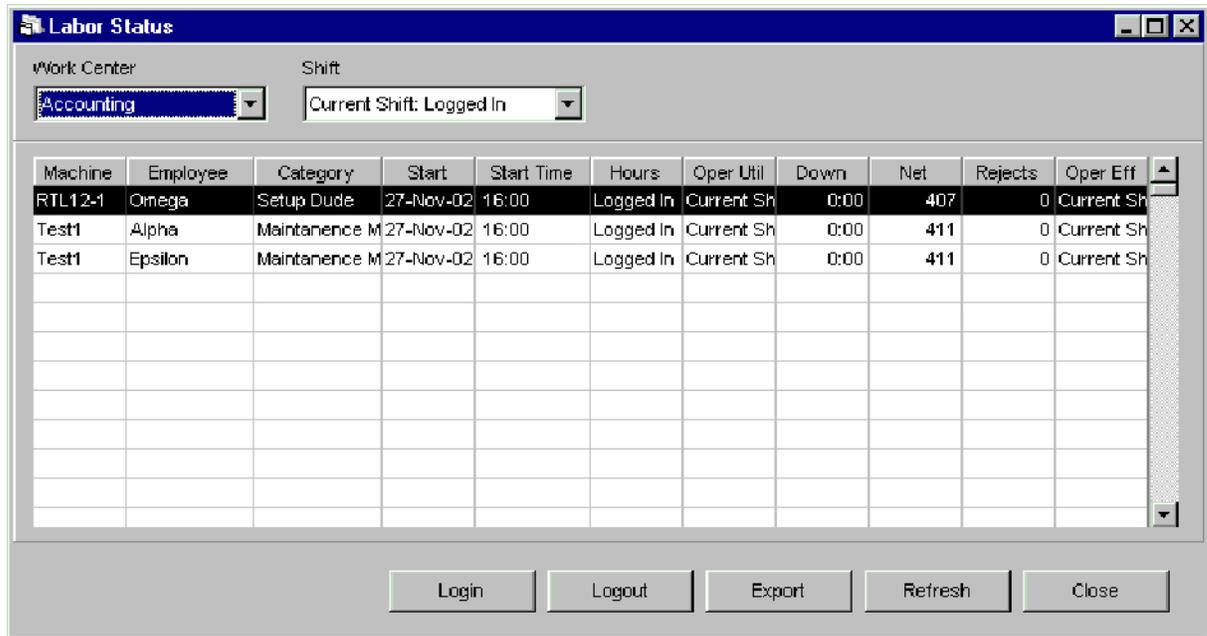
Where can you find it?

- Choose the **Monitor** menu on the main your system window.
- Choose the **Process Summary** option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Closing the Window

3.3 Schedule Menu

3.3.1 Job Schedule Board
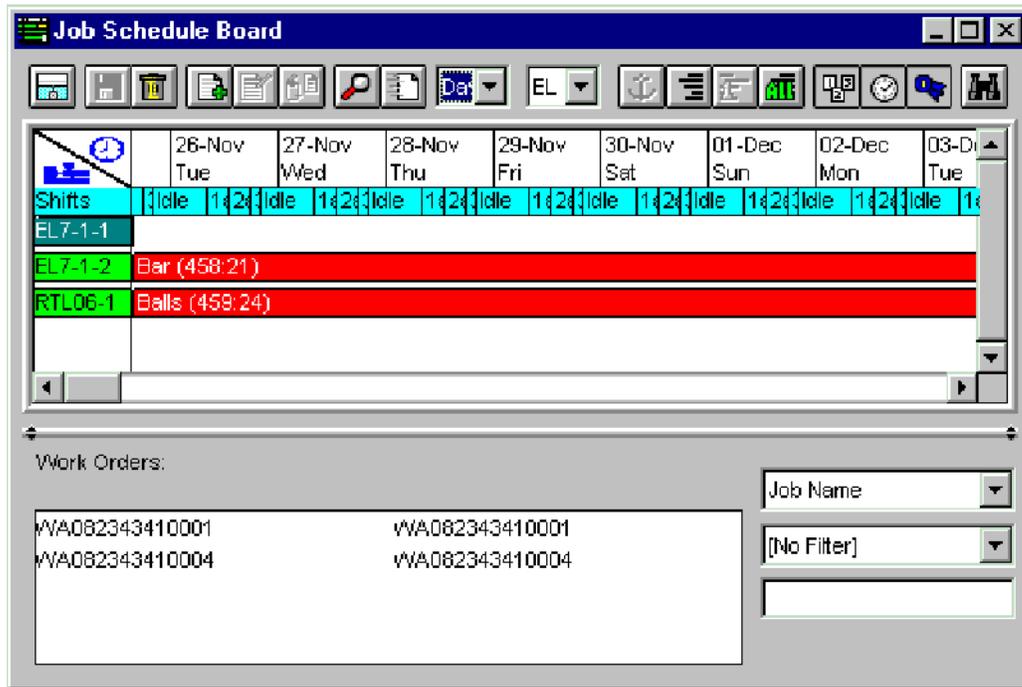
In order to collect process variables and production data for a machine, a job must be assigned on that machine. The process of scheduling or queuing jobs is handled through the *Job Schedule* window.

The *Job Schedule* window consists of a Gantt style scheduling board. Calendar time is shown on the X-axis. Machines within a selected display group are shown on the Y-axis. Each row represents a machine's job queue and each rectangular block is a scheduled job. The first rectangular block for each machine is its current job. The block length indicates the expected run time for the job. Block labels are selectable. The caption display on the block labels can be either the job or product names for the selected job.

NOTE: If the job scheduled is a family job, the block length indicates the expected run time of the longest running child job.

A job is scheduled by selecting a work order and placing it in the job queue of a given machine. By default, jobs are scheduled sequentially from left to right. There are two scheduling methods available within your system:

·   Schedule jobs by earliest start date (default)
·   Schedule jobs by required by (due date)

The default method on the *Job Schedule* window is for jobs to run immediately following the completion of previously-queued jobs. The estimated completion time of a job becomes the starting time for the next queued job. Under this method, jobs that are expected to be

completed on time are shown in green. A red rectangular block indicates that a job will not complete by its estimated completion date. The default method is active unless the second scheduling method has been activated and/or saved during a previous session.

The second method is to schedule jobs by required by due date. This method places a selected job (or jobs) on the job board at the latest possible time which allows it to be completed by its due date. Specifically, a job's required by date is used as the starting point. The length of time to run a job is then used to walk backwards through the shift schedule to estimate the start date. Using this method, gaps may occur between a job's starting time and a previous job's ending time. These "gaps" are represented on the job board by gray blocks and indicate slack time where new jobs can be scheduled. Under this method, jobs that are expected to be completed on time are shown in green. If this method causes a subsequent job to become late, the late job's rectangular block is colored orange.

The 🔻 marker, located along the top of the job board area, indicates which jobs are scheduled according to their due dates. All jobs to the left of this marker are scheduled according to the earliest possible start -- a job starts immediately upon completion of the previous job (method one). All jobs to the right of this marker are displayed on the job board according to their due dates (method two).

(For more detailed explanations refer to the field help provided on the ▤ icon.)

The **Job Schedule** window also enables you to edit a work order, current job, or queued job.

NOTE: You must have the proper privileges in order to schedule jobs. See your System Administrator if you do not have the scheduling privilege.

Where can you find it?

- Open the **Schedule** menu within **Monitor**.
- Click on the **Job Schedule** window.

What do you want to know about?

General Topics:
- Job Schedule Board Overview
- Job Scheduling Concepts
- Creating Work Orders
- Loading a Product Standard onto a Job
- Saving Jobs as a Standard

Work Order Functions:
- Creating Work Orders
- Customizing the Work Order List
- Refreshing the Work Order List

Job Functions:
- Selecting Jobs from the Schedule Board
- Editing Jobs from the Schedule Board
- Deleting Jobs from the Schedule Board
- Searching for a Job
- Viewing Job Summary Information

Scheduling Functions:

- Moving Jobs Around the Schedule Board
- Selecting a Time Scale
- Selecting Display Groups from the Schedule Board
- Scheduling Jobs by Earliest Start Date
- Scheduling Jobs by Due Date
- Viewing Production Hours
- Viewing the Shift Schedule
- Identifying Machines with Job Standards Committing a Schedule
- Discarding a Schedule

3.3.2 Current / Queue Jobs

The **Current/Queue Jobs** window provides three functions:

- Job parameters for a current job can be changed.
- Job parameters for a queued job can be changed.
- The current job and any queued jobs can be saved as product standards.

A list of existing jobs is displayed on the left side of the window and job parameters are on the right. Additionally, the process variable, profile, setup sheets, and manning factor parameters are available from the *Limits*, *Setup Sheet*, and *Labor* tabs, located in the top

portion of the window.

Where can you find it?

· Choose the **Schedule** menu on the main your system window.
· Choose the **Current/Queue Jobs** option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Selecting Current/Queue Jobs
- Editing Production Parameters
- Editing Process and Profile Limits
- Editing Setup Sheets
- Editing Labor Manning Factors
- Loading a Product Standard onto a Job
- Saving Jobs as a Standard
- Saving your Changes
- Undoing your Changes
- Closing the Window

3.3.3 Work Orders

The ***Work Order*** window lets you add, change or delete work orders. A list of work orders is displayed on the left side of the window upon opening. If no work orders have yet been defined, the work order list will be empty.

Work orders are essentially jobs that have been defined but not yet scheduled. In order to schedule jobs, you must first create a work order. A work order consists of a set of job parameters. These parameters define the job. They include such things as the number of pieces required and the standard rate at which the pieces will be produced.

A list of existing work orders is displayed on the left side of the window and job parameters are on the right. Additionally, the process variable, profile, setup sheets, and manning factor parameters are available from the *Limits*, *Setup Sheet*, and *Labor* tabs, located in the top portion of the window.

A work order may be created manually by entering the parameters or by loading in a product standard.

NOTE:
- Work orders can also be created and edited from the ***Job Schedule Board*** window.
- You must have the proper privileges to enter this menu option. (See your System Administrator if you do not have the proper privileges.).

Where can you find it?

- Choose the ***Schedule*** menu within ***Monitor***.
- Choose the ***Work Orders*** option.

What do you want to know about?

- Creating Work Orders
- Selecting Work Orders
- Changing Machines
- Editing Production Parameters
- Editing Process and Profile Limits
- Editing Setup Sheets
- Editing Labor Manning Factors
- Loading a Product Standard onto a Job
- Saving Jobs as a Standard
- Creating Unassigned Child Jobs
- Deleting Unassigned Child Jobs
- Adding Child Jobs to a Work Order
- Removing Child Jobs from a Work Order
- Assigning Child Jobs
- Deleting Work Orders
- Saving your Changes
- Undoing your Changes
- Refreshing the Lists
- Closing the Window

3.3.4 Product Standards

A job may be created manually entering all these types of parameters into a work order and then scheduling the job. The process of entering all the parameters can be time consuming. To facilitate this process, the **Product Standards** window is available. This window allows you to build up a collection of product-based standards. Job scheduling then consists of copying an existing product standard into a work order. The work order is placed into the job schedule. This library of standards also aids in the development of pre-defined standards for recurring jobs.

Every job in PlantStar consists of a set of parameters. These parameters are based upon the type of product produced and the machines on which the product will run. They, in essence, describe the job and set the standard for monitoring it. They define the line between the normal operating mode and various exception states for a machine. All monitoring is based upon these values. For instance, if the *Standard Cycle* parameter is set to 30 seconds and the *Cycle Tolerance* is set to 10 percent, a machine would be considered slow if is cycle time was currently 50 seconds. This same machine would be considered down if the down time threshold parameter was set to less than 50 seconds.

Job parameters also determine the expected run time of a job. The pieces required, standard setup time and the standard rate factor are used when computing the completion date of a job. If 10,000 pieces are required and the standard rate is 50 pieces per hour, then the runtime of a

job would be 200 hours. Add this to the standard setup time and you have the expected runtime of a job. The *schedule now* and *schedule factory* parameters also affect the calculated completion date. These fields determine if the shift schedule should be followed when computing the completion date. Specifically, the **Product Standards** window is used to add, change or delete product standards. Job parameters are separated into two types (product versus machine-specific). Machine-specific parameters are located in the bottom right corner. Machine-specific parameters generally change from machine to machine. Product-specific parameters generally do not change from machine to machine. They can, however, be changed if needed.

A list of existing product standards is displayed on the left side of the window and job parameters are on the right. Additionally, the process variable, profile, setup sheets, and manning factor parameters are available from the *Limits*, *Setup Sheet*, and *Labor* tabs, located in the top portion of the window.

NOTE: Once a product standard is saved for a machine, an asterisk appears next to the machine in the machine field. This asterisk signifies that a product standard exists for the specific machine and product.

NOTE: You must have the proper privileges to view or edit **Product Standards**. See your System Administrator if you need this privilege.

Where can you find it?

- Choose the Schedule menu within Monitor.
- Choose the Product Standards option.

What do you want to know about?

- Creating a Product Standard
- Selecting Product Standards
- Changing Machines
- Editing Production Parameters
- Editing Process and Profile Limits
- Editing Setup Sheets
- Editing Labor Manning Factors
- Adding Child Jobs to a Product Standard
- Removing Child Jobs from a Product Standard
- Copying Product Standards
- Deleting Product Standards
- Saving your Changes
- Undoing Your Changes
- Refreshing the Lists
- Closing the Window

3.3.5 Shift Schedule
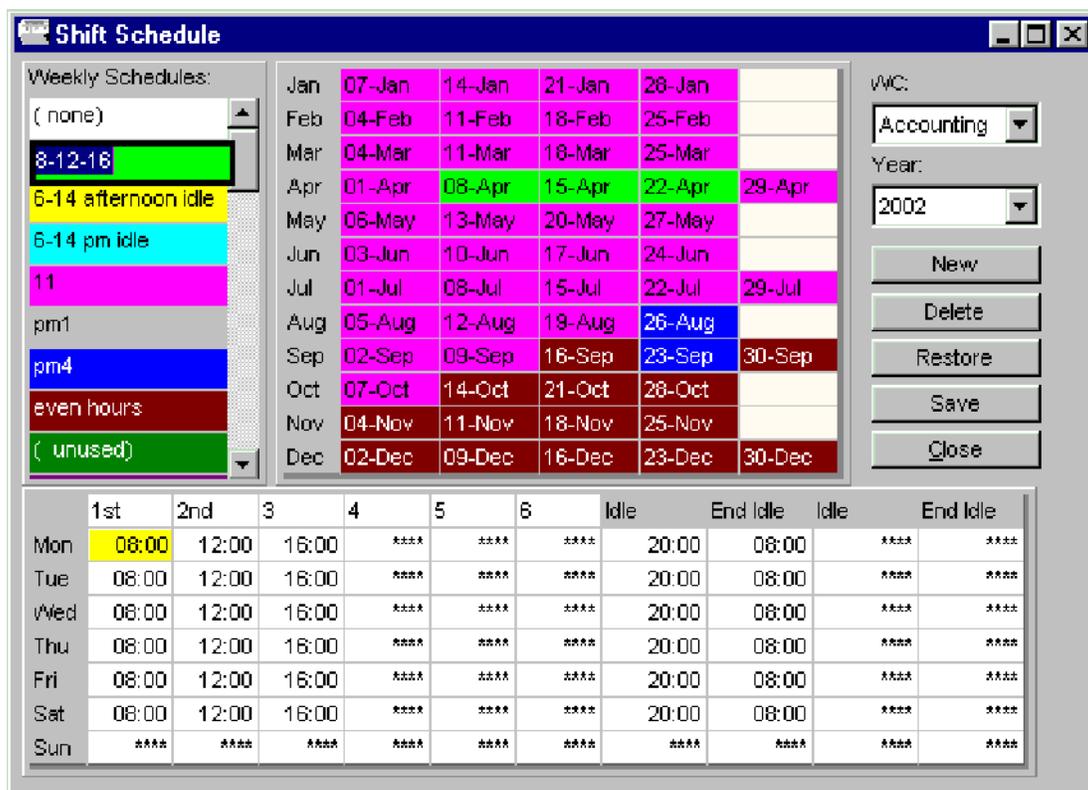
The **Shift Schedule** window is used to create, assign, delete and change work center schedules. If no schedules have been defined, the window appears blank. To create a work center's shift schedule, use the **New** button.

Shift schedules define the start time and end time for work shifts, idle times for holidays or weekends, and any other events when jobs should not be running or have special needs. Shift schedules are not required but they do provide the flexibility to control part of the job process. If shift schedules are not created, all jobs run all the time.

Shift schedules are created for a work center. Each work center has multiple schedules -- one for each year desired. Each year's schedule may have up to twelve different weekly work schedules. There must be at least one work center defined before access to the Shift Schedule window is possible.

NOTE: You must have the Scheduling privilege in order to access this window. See your System Administrator if you need this privilege.

Where can you find it?

- Choose the Schedule menu within Monitor.
- Choose the Shift Schedule option.

What do you want to know about?

General Functions:
- Shift Scheduling Concepts
- Changing Work Centers
- Selecting a Year
- Closing the Window

Weekly Schedules:
- Creating Weekly Schedules
- Assigning Weekly Schedules

Yearly Schedules:
- Creating Work Center Schedules
- Deleting Schedules
- Updating Schedules
- Saving your Changes
- Undoing your Changes

3.3.6 Material Forecast

The **Material Forecast** window provides a forecast of the amount of material required for both current jobs and queued jobs. Forecasts are based upon scheduled jobs information. Job parameters such as standard multiplier, actual multiplier, part weight, and component percents are used to calculate forecast figures. The handling of reject parts and whether

runners are re-fed determines whether material forecast figures are based upon pieces remaining or whether shot size is taken into consideration. There is one row of information in the table for each material component within a current job or queued job. The background colors reflect the current machine state of the job running on a selected machine. See the *Machine State Colors* on-help section for further information.

Queued jobs are displayed as white on dark grey and are listed after each machine's current job.

NOTE: This window does not automatically update information with each machine cycle. The ***Build*** button must be used to obtain the most current forecast figures.

Where can you find it?

- Choose the Schedule menu on the main your system window.
- Choose the Material Forecast option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Changing Material Components
- Rebuilding the Display
- Closing the Window

3.3.7 Labor Forecast

The ***Labor Forecast*** Window is used to accurately forecast, by work center and shift, the number of employees needed in a given ***Labor Category***. This forecast is based off current jobs and queued jobs scheduled.

There are two different views to Labor Forecasting:

- Grid View
- Graph View

NOTE: This window does not automatically update information with each machine cycle. The *Build* button must be used to obtain the most current forecast figures.

Where can you find it?

- Choose the Schedule menu on the main your system window.
- Choose the Labor Forecast option.

What do you want to know about?

- Changing Work Centers
- Changing Start Date
- Changing Shifts
- Changing Number of Shifts to Forecast
- Changing Forecast Views
- Changing Graph Types
- Changing Labor Categories
- Rebuilding the display
- Exporting Data
- Sorting Columns
- Resizing Columns
- Closing the Window

3.3.8 Tool Change

The **Tool Change** window provides information on upcoming tooling changes for both current jobs and queued jobs. The list of tooling changes can be filtered by *display group*, *machine*, *forecast interval* or *tool name*. The type of tooling changes displayed is selectable. The **Tool Change Only** and **All Job Changes** fields, located directly below the tool table, determine which jobs are displayed in the tool table.

If **Tool Change Only** is selected, and if each job's tool(s) are different, then current jobs and the *next* job scheduled on the same machine are displayed. If a currently-running job and upcoming queued job have the same tool, neither one is displayed. (The *next* job is color-coded in blue on dark cyan.)

If **All Jobs Only** is selected, all jobs which meet the selection filters (display group, machine, tool or forecast interval) are listed regardless of whether or not there are tooling changes. Current jobs are listed first, followed by the next queued job.

Queued jobs can be listed twice in the tooling table -- once as a "*next*" job and once as a queued job with its own "*next*" job. Queued jobs that are listed a second time are displayed as white on dark grey.

NOTE: This window does not automatically update information with each machine cycle. The Build button must be used to obtain the most current tool schedule.

Where can you find it?

- Choose the Schedule menu on the main your system window.
- Choose the Tool Change option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Changing Tools
- Toggling Tool Change View
- Selecting Forecast Intervals
- Rebuilding the Display
- Closing the Window

3.4 History Menu

3.4.1 SPC History
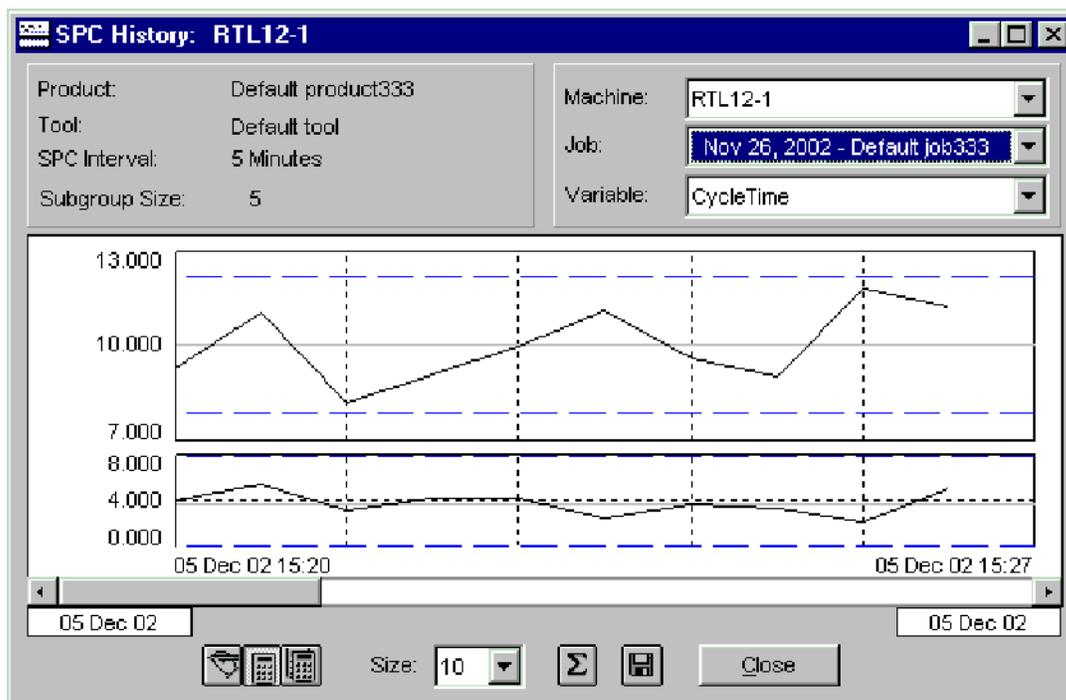
The **SPC History** window displays a line chart of the SPC values collected for a specific process variable and job. It includes two graphs. The top graph is a plot of X-bar values collected from the selected job and the bottom graph is a plot of the associated range values. The X-axis is the time at which the SPC values were recorded. The number of values graphed may be a subset of the total collected. On the top graph, the Y-axis is the X-bar value collected for the selected job and process variable. On the bottom graph, the Y-axis is the range value. The rightmost point is the most recent value for the process variable and job.

There is a scroll bar at the bottom of the graph that allows you to scroll through the SPC values. As you slide the scroll bar, you see the X-axis change. The range of the scroll bar is shown below the scroll bar. The value on the left is the time of the first SPC data (the oldest data). The value on the right is the time of the latest SPC data collected for the process variable and job. To view more data, slide the scroll bar to the left. Move the scroll bar to the right to view more current data.

The number of plotted values on both graphs is changeable using the *Size* field. If the size is set to 100, then 100 SPC samples are plotted. Changing the size does not change the value of the scroll bar. It only changes the 'depth' of the data selection.

The X-bar mean value for each graph is shown as a solid gray line. The upper and lower control limits are dashed blue lines. The upper and lower specification lines are shown on the X-Bar graph as dashed red lines.

Where can you find it?

- Choose the History menu on the main your system window.
- Choose the SPC History option.

What do you want to know about?

General Functions:
- SPC Statistics Concepts
- Changing Machines
- Changing Jobs
- Selecting Process Variables
- Displaying Standard SPC Statistics
- Exporting Data
- Closing the Window

Graph Functions:
- Changing the X-axis
- Changing Rescaling Options
- Viewing Actual Values
- Viewing Maximum and Minimum Values

3.4.2 Labor History
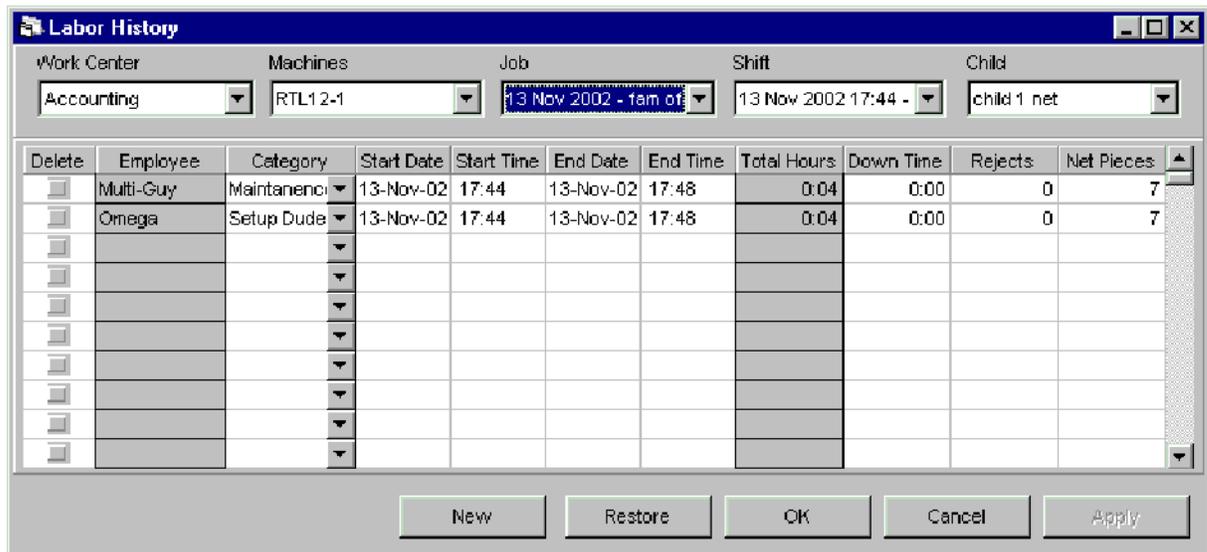
The **Labor History** window displays a table of labor records for a specific job and shift. These

records can be adjusted for historical shifts or current shifts. Labor history records include the following:

- Employee Name
- Labor Category
- Start Date
- Start Time
- End Date
- End Time
- Total Hours
- Down Time
- Total Rejects
- Net Pieces

NOTE: Adjusted totals cannot be negative.

NOTE: If the job selected is a non-family job, the child job selection will display "No Family Jobs Defined" and the child job selection would be disabled. If the machine selected is running a family job, the child job selection will be enabled and the user can select from one of the child jobs running.

NOTE: You must have the proper privileges in order to view/edit *Labor History*. See your System Administrator if you do not have this privilege.

Where can you find it?

- Click on the History menu.
- Choose the Labor History option.

What do you want to know about?

- Changing Work Centers
- Changing Machines
- Changing Jobs
- Changing Shifts
- Changing Child Jobs
- Deleting a Labor Record
- Changing Labor Categories
- Adjusting Start/End Date
- Adjusting Start/End Time
- Adjusting Down Time
- Adjusting Reject Counts
- Adjusting Gross or Net Pieces
- Adding an Employee to Labor History
- Resizing Columns
- Saving your Changes
- Undoing your Changes
- Closing the Window

3.4.3 Material Lot Tracking

The ***Material Lot Tracking*** window displays material components and the material lot IDs that have been entered at a DCM through a bar code reader or a touch screen. You can select a material lot and view its detail.

Upon entering this window, it is blank. Search keys located in the upper part of the window help find material lots quickly. If a search is initiated with search keys, all material components associated with those keys are listed at the bottom of the window. If all fields are left blank, all material lot records are listed. From this list, you can select a material lot record and view either its tote box or material lot history. See the ***Material Lot Detail*** on-help section for further information.

Where can you find it?

- Click on the History menu.
- Choose the Material Lot Tracking option.

What do you want to know about?

- Material Lot Tracking Concepts
- Searching Material Lots
- Clearing Search Fields
- Viewing Material Lot Detail
- Exporting Data
- Sorting Columns

- Resizing Columns
- Closing the Window

3.4.3.1 Material Lot Detail
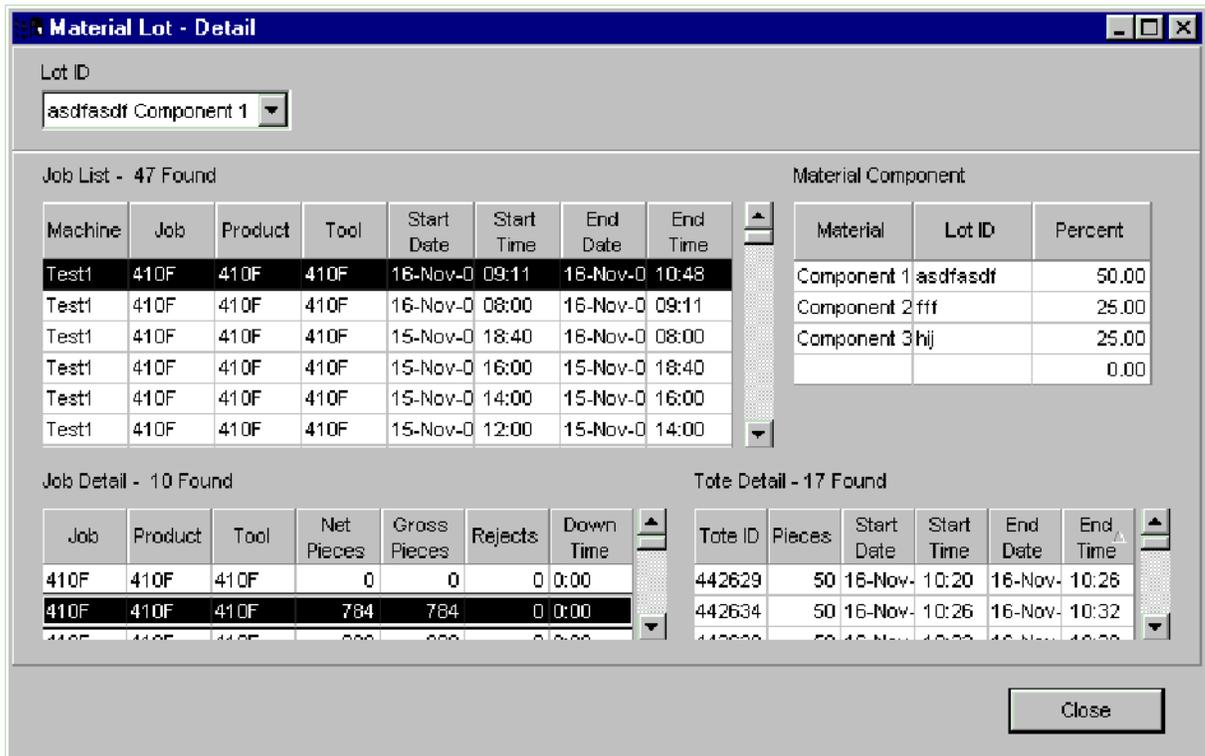
The **_Material Lot Detail_** window displays the net pieces, total rejects, gross pieces, down time, tote pieces, material components and percents for a selected material lot ID. Each historical lot record is listed in chronological order, in the Lot ID field, at the top of the window.

Where can you find it?

The **_Material Lot Detail_** window can only be opened from the **_Material Lot Tracking_** window.

What do you want to know about?

- Selecting/Viewing Job List
- Viewing Material Components
- Selecting/Viewing Job Details
- Selecting/Viewing Tote Details
- Selecting a Different Lot ID
- Sorting Columns
- Resizing Columns
- Closing the Window

3.4.4 Pareto/Pie Charts

3.4.4.1 Down_Pareto_Pie
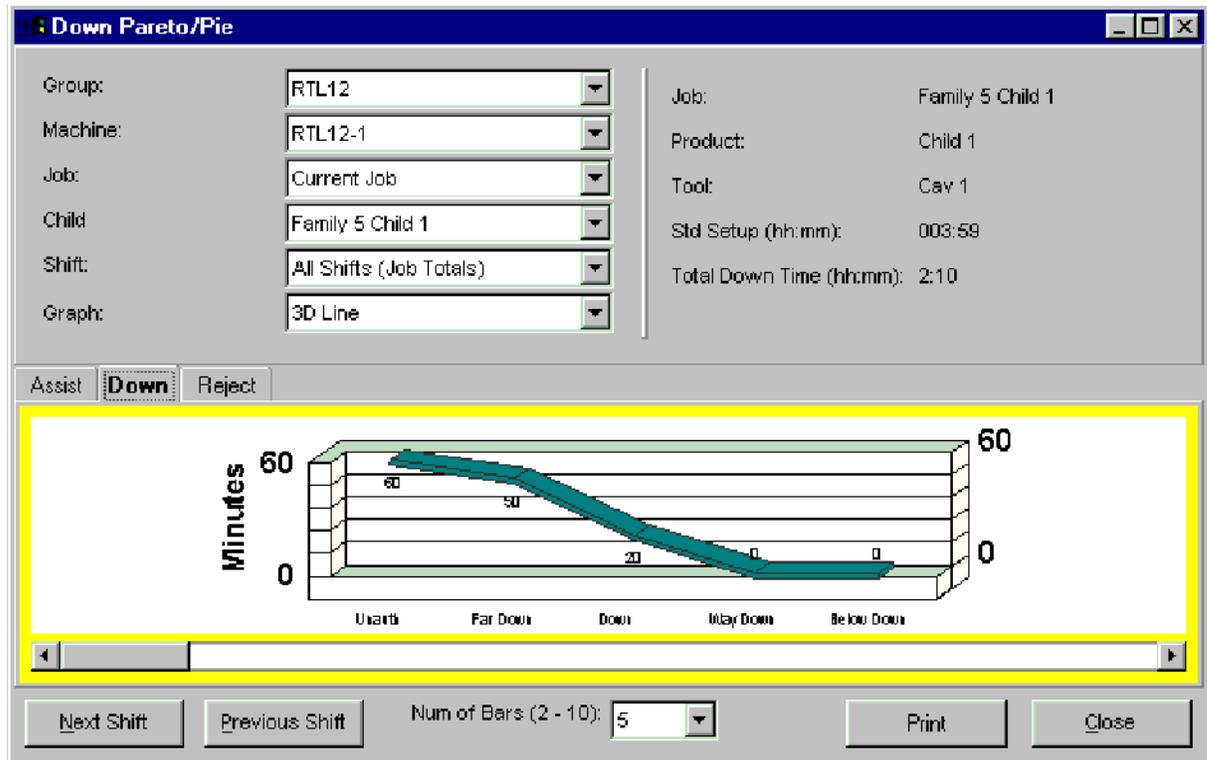
The ***Down Pareto/Pie*** window displays down time in terms of hours or minutes. The X-axis lists the down reasons as previously stated, an ordered histogram of the down time for a selected shift, job, and child job. There is one vertical bar per down reason. Bar height represents the down time. Bars are displayed from left to right in descending order, in effect highlighting the main causes of any down time. The Y-axis represents down time in terms of hours or minutes. The X-axis lists the down reasons as previously stated.

Where can you find it?

- Choose either the Monitor or History menu items on the main system window.
- Chose the Pareto/Pie Charts option.
- Choose the Down Pareto/Pie option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Changing Jobs
- Changing Child Jobs
- Changing Shifts
- Changing Graph Types
- Changing Number of Reasons Displayed

- Scrolling the view
- Viewing Next Shift
- Viewing Previous Shift
- Closing the Window

3.4.4.2 Assist_Pareto_Pie

The *Assist Pareto/Pie* window displays an ordered histogram of the assist time for the selected shift, job, and child job. The X-axis lists the assist reasons as defined for a machine. There is one vertical bar per assist reason. Bar height represents the assist time displayed. Bars are displayed from left to right in descending order, in effect highlighting the main causes of any assist time. The Y-axis represents the amount of assist time in hours and minutes.

The color of the bars reflects the current machine state of the selected machine. See the *Machine State Colors* on-help section for further information.

Where can you find it?

- Choose either the Monitor or History menu items on the main system window.
- Chose the Pareto/Pie Charts option.
- Choose the Assist Pareto/Pie option.

What do you want to know about?

- Changing Display Groups
- Changing Machines

- Changing Jobs
- Changing Child Jobs
- Changing Shifts
- Changing Graph Types
- Changing Number of Reasons Displayed
- Scrolling the view
- Viewing Next Shift
- Viewing Previous Shift
- Closing the Window

3.4.4.3 Reject_Pareto_Pie

The **Reject Pareto/Pie** window displays an ordered histogram of the reject counts for the selected shift, job, and child job. The X-axis lists the reject reasons as defined for a machine. There is one vertical bar per reject reason. Bar height represents the number of rejected parts. Bars are displayed from left to right in descending order, in effect highlighting the main causes of rejects. The Y-axis represents the number of rejects. The color of the bars reflects the current machine state of the job running on a selected machine. See the **Machine State Colors** on-help section for further information.

The window's scroll bars shift the view of the Pareto chart, allowing you to see all reject reasons defined for a machine. Click on the scroll bar to view reasons not immediately visible.

NOTE: If the job selected is a non-family job, the child job selection will display "No Family Jobs Defined" and the child job selection would be disabled. If the machine selected is

running a family job, the child job selection will be enabled and the user can select from one of the child jobs running.

Where can you find it?

- Choose either the Monitor or History menu items on the main system window.
- Chose the Pareto/Pie Charts option.
- Choose the Reject Pareto/Pie option.

What do you want to know about?

- Changing Display Groups
- Changing Machines
- Changing Jobs
- Changing Child Jobs
- Changing Shifts
- Changing Graph Types
- Changing Number of Reasons Displayed
- Scrolling the View
- Viewing Next Shift
- Viewing Previous Shift
- Closing the Window

3.4.5 Down Time Editor

The **Down Time Editor** window displays a table of down time for a specified machine, job, and shift. There is one row of information in the table per down reason. Incorrect time values for a job can be corrected in this window.

Adjustments can be made upward or downward for each defined reason. Adjusted

totals cannot, though, be negative. There is one row of information in the table for each down reason. Use the "Adjust +/-" column to make any necessary adjustments.

A machine can also be forced into a down state from the *Down Select* field on this window. When a machine enters a forced down state, its associated DCM may or may not continue to count parts and monitor process variable information. The action taken depends upon how the down reason which triggered the "force down" is defined in terms of its "*force down flag*" and "*ignore cycles flag*". These flags are set on the *Down Reason Sets* window.

Where can you find it?

- Click on the History menu.
- Choose the Down Time Editor option.

What do you want to know about?

- Changing Machines
- Changing Jobs
- Changing Shifts
- Adjusting Times
- Forcing a Machine Down
- Saving your Changes
- Undoing your Changes
- Closing the Window

3.4.6 Assist Time Editor

The *Assist Time Editor* window displays a table of assist time for a specified machine, job, and shift. There is one row of information in the table per assist reason. Incorrect time values for a job can be corrected in this window.

Adjustments can be made upward or downward for each defined reason. Adjusted totals cannot, though, be negative. There is one row of information in the table for each down reason. Use the "Adjust +/-" column to make any necessary adjustments.

Where can you find it?

- Click on the **History** menu.
- Choose the **Assist Time Editor** option.

What do you want to know about?

- Changing Machines
- Changing Jobs
- Changing Shifts
- Adjusting Times
- Saving your Changes
- Undoing your Changes
- Closing the Window

3.4.7 Parts Count Editor

Incorrect counts for a shift and job can be adjusted from the ***Parts Count Editor*** window. This window displays two tables. The top table lists reject counts by reject reason for a specified machine, job, child job, and shift. The bottom table displays gross pieces and net pieces for the same time period. Adjustments can be made upward or downward for historical shifts and current shifts.

NOTE: If the job selected is a non-family job, the child job selection will display "No Family

Jobs Defined" and the child job selection would be disabled. If the machine selected is running a family job, the child job selection will be enabled and the user can select from one of the child jobs running.

Where can you find it?

- Choose the History menu on the main your system window.
- Choose the Parts Count Editor option.

What do you want to know about?

- Changing Machines
- Changing Jobs
- Changing Child Jobs
- Changing Shifts
- Adjusting Reject Counts
- Adjusting Gross or Net Pieces
- Saving your Changes
- Undoing your Changes
- Closing the Window

3.5 Window Menu

3.5.1 Arrange Icons

To arrange the iconized windows into straight rows and columns, select the *Window* menu on the main screen of your system window. Choose the *Arrange Icons* option.

3.5.2 Arrange Windows
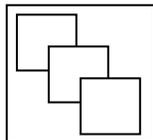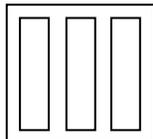
The windows can be arranged in 3 ways:

Cascading:

Vertical Tiles:

Horizontal Tiles:
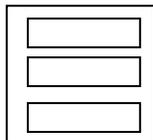
To choose one of these styles, select the *Window* menu from the main screen of your system window. Select one of the options displayed

3.6 Help Menu

3.6.1 Help Contents

General content help provides a table of contents for virtually all topics within this application. The Contents window can be used to jump to topics that explain various windows or how to get quick access to key reference topics. This help is available by selecting the *Contents* on the *Help* menu item.

Use the scroll bar to the right side of the *Help* window to view the next page of the *Table of Contents*.

3.6.2 Help Index

The *Index* list is directly accessible from the *Index* on the *Help* menu item or from the *Index* tab within the on-line help utility. *Index* terms consist of:

- definitions
- formulas, if applicable
- recommended values, if applicable.

To access an item from the Index list:

- Use the scroll bar on the right hand side to scroll the window to the desired item.
- Point to the term or phase desired.
- Double-click on the highlighted word to open.

-Or-

- Use the keyword field to search for the desired item.
- Once found, double-click on the highlighted word to open.

3.6.3 Help Search

Another method to find a particular topic in *Help* is to use the *Search* option. To display the *Search* window, either choose *Search* from the *Help* menu on the application window or click the *Search* tab on the *Help* topic screen.

Select a topic by:

- Use the keyword field to search for the desired item.
- click on the List Topics button to search on the keyword entered
- A list of related topics then appears on the screen.
- Once found, double-click on the highlighted topic to open.

3.6.4 Help Active Window

Window level help provides information on the display that currently has focus. Information for each window includes:

- purpose of the window
- specific field descriptions
- window button explanations

This type of help is available by selecting and opening a desired window. Once opened, select the **Help-Active Window** menu on the application window or press the F1 key.

NOTE: If there are currently no PlantStar windows open, this menu item will not display any help.

3.6.5 About PlantStar

For up-to-date resource information, the application provides a window with the following information:

· PlantStar Software Version
· PlantStar Copyright Date
· Microsoft Windows Version
· Amount of free memory

To see this information:

· Select the *Help* menu on the main menu.
· Choose the *About PlantStar* menu item.

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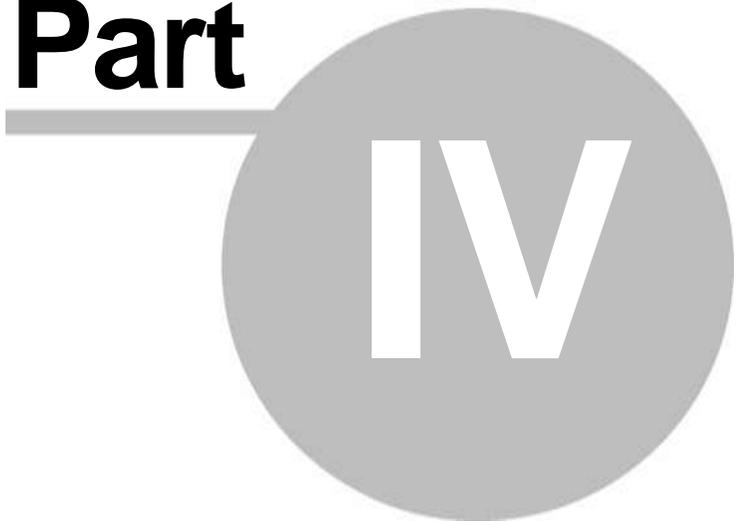
4 Voice Output

A PlantStar system configured with the *Voice Output Option* is able to broadcast messages relating to currently monitored exception conditions such as:

- Down states
- Idle states
- Fast states
- Slow states
- Assist states
- Production exceptions
- Process variable exceptions
- Reject Exceptions

These messages can be heard on speakers or public address systems. There are three primary components to the *Voice* application:

- Configuring Your Voice System
- Monitoring Exception Conditions
- Monitoring Individual Machine Status

The general procedure for setting up a *Voice* system is:

- **Define Your System Parameters** - Decide upon how often announcement messages should be broadcast. Use the *System Parameters* window under the *Configure* menu to set this schedule.

- **Define The Announcement Format** - Decide whether each exception announcement should be preceded by an attention announcement. Use the *Attention Announcement* window under the *Configure* menu to set this schedule.

- **Configure The Announcements** - Decide on which machines, machine states, process variable exceptions, assist reasons, and down reasons should be monitored for exception announcement. Setup of these conditions is done via the *Configure* windows.

4.1 File Menu

4.1.1 Exit

To exit the program, choose one of the following methods:

- Select the *Exit* option under the *File* menu
- Click your mouse button while it is positioned over the 'x' in the upper right hand corner of the window.

NOTE: You must have the *Exit Panorama* privilege to exit the *Monitor* program.

4.2 Monitor Menu

4.2.1 Exception Summary

The **Exception Summary** window highlights machines that are experiencing performance problems. These are machines that are in an exception state for the selected display group. There is one line of information for each machine within a display group. The color of the line reflects the machine's running state. See the **Machine State Colors** on-line help section for further information.

If a machine is in exception, the applicable column information is displayed. For example, if a machine is in process exception, the *Process Variable* column displays the variable in violation. If a machine is in assist state, the assist reason displays in the *Assist Reason* column.

NOTE: More than one type of exception can be displayed at one time. The "Machine" and "Exception Since" columns both display the highest priority machine running state.

Highlighted exception states are:

- down state
- idle state
- off-line state
- process exception
- production exception
- assist state

Where can you find it?

- Choose the Monitor menu on the main your system window.

- Choose the Exception Summary option.

What do you want to know about?

- Changing Display Groups
- Changing View Options
- Viewing Machine Exceptions
- Closing the Window

4.2.2 Machine Exception
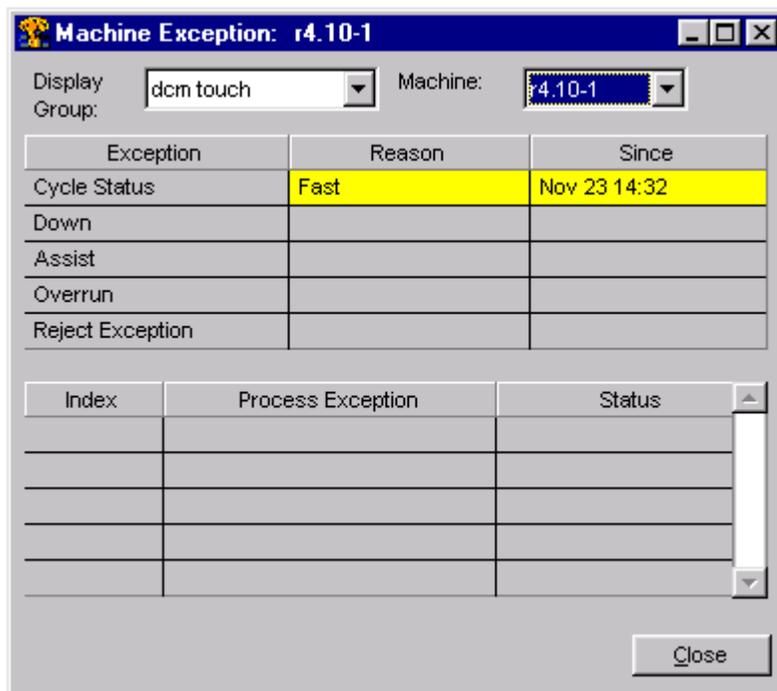
The ***Machine Exception*** window provides a greater detailed description of a selected machine's running state than the ***Exception Summary*** window. Any running state of the machine is displayed along with an exception time. If a process variable is in exception, this window shows whether it is a result of a higher limit or lower limit violation. Also, this window is color-coded according to the system ***Machine State Colors***.

Where can you find it?

- Choose the ***Monitor*** menu on the main your system window.
- Choose the ***Machine Exception*** option.

NOTE: The ***Machine Exception*** window can also be accessed from the ***Exception Summary*** window. While on the ***Exception Summary*** window, click on a machine's row of information. Exception information for the selected machine appears.

What do you want to know about?

- Changing Display Groups
- Changing Machines

- Closing the Window

4.3 Configure Menu

4.3.1 System Parameters
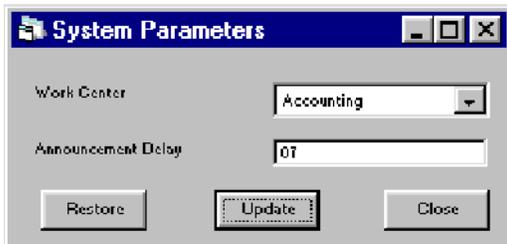
The **System Parameters** window lets you set the number of minutes between repeat announcements of the same exception condition. This time delay can be set for all machines in the specified work center. If a specific work center is selected and its announcement delay set, all **Voice** windows and announcements will refer to only those machines in the selected work center.

A list of defined work centers is displayed upon the opening of this window. Choose the desired work center and type in its required **Announcement** delay.

Where can you find it?

- Click on the Configure menu.
- Choose the System Parameters option.

What do you want to know about?

- Changing Work Centers
- Saving your Changes
- Undoing your Changes
- Closing the Window

4.3.2 Attention Announcement

The **Attention Announcement** window lets you record and plays attention announcements. This announcement is broadcast before any other exception announcement and can be turned on or off as desired from the **Play Attention** field.

Where can you find it?

- Click on the Configure menu.
- Choose the Attention Announcement option.

What do you want to know about?

- Playing an Announcement
- Recording an Announcement
- Activating an Attention Announcement
- Saving your Changes
- Closing the Window

4.3.3 State Announcement
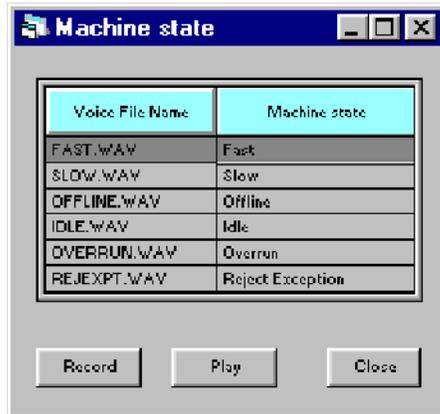
The **State Announcement** window lets you record and plays announcements for all machine running conditions except standard. Upon initially opening the window, each condition for which an announcement can be recorded is listed. Choose the desired machine state and click on the **Record** command button.

Where can you find it?

- Click on the Configure menu.
- Choose the State Announcement option.

What do you want to know about?

- Playing an Announcement
- Recording an Announcement
- Closing the Window

4.3.4 Down Announcement
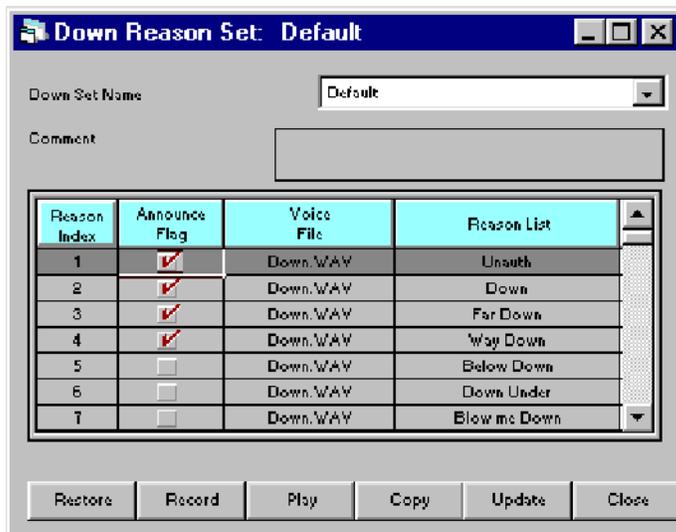
The ***Down Announcement*** window lets you record, play and copy announcement messages for whenever a machine goes into a down state. A separate announcement can be recorded for each defined down reason within a selected down set.

Note: ***Down*** does not mean the machine is no longer cycling. A machine is considered ***down*** under one of the following circumstances:

· The machine is cycling so slowly that the actual cycle time is longer than the down time threshold specified in the current job.
· The operator has selected a down reason that 'forces' the machine into a down state.

Where can you find it?

- Click on the Configure menu.
- Choose the Down Announcement option.

What do you want to know about?

- Playing an Announcement
- Copying an Announcement
- Recording an Announcement
- Saving your Changes
- Undoing your Changes
- Closing the Window

4.3.5 Assist Announcement
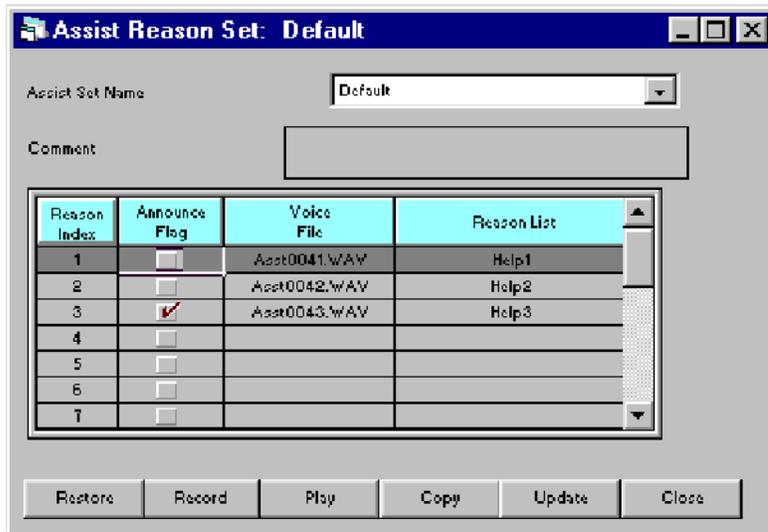
The **Assist Announcement** window lets you record, play and copy announcement messages for whenever a machine goes into an assist state. A separate announcement can be recorded for each defined assist reason within a selected assist set.

Where can you find it?

- Click on the Configure menu.
- Choose the Assist Announcement option.

What do you want to know about?

- Playing an Announcement
- Copying an Announcement
- Recording an Announcement
- Saving your Changes
- Undoing your Changes
- Closing the Window

4.3.6 Process Announcement
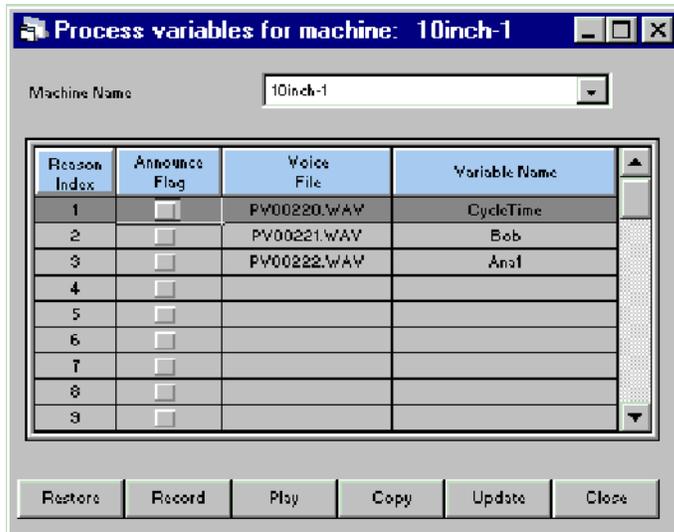
The *Process Announcement* window lets you record, play and copy announcement messages for a machine's process variables. A separate announcement can be recorded for each defined process variable for any existing machine.

Where can you find it?

- Click on the Configure menu.
- Choose the Process Announcement option.

What do you want to know about?

- Playing an Announcement
- Copying an Announcement
- Recording an Announcement
- Saving your Changes
- Undoing your Changes
- Closing the Window

4.3.7 Machine Announcement
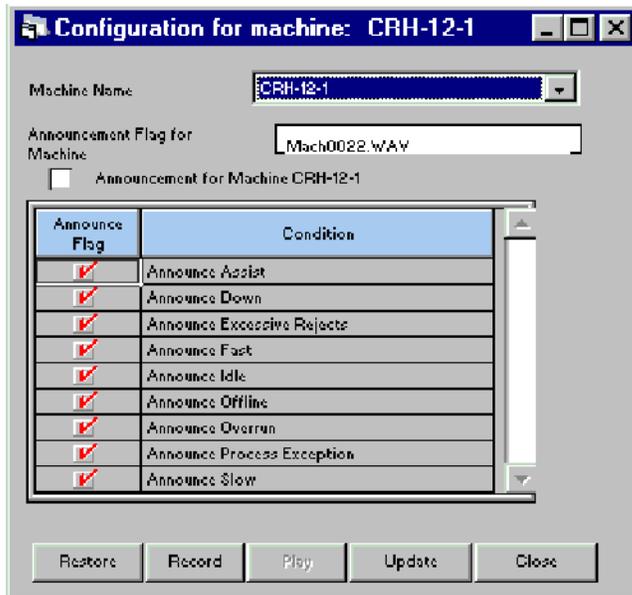
The ***Machine Announcement*** window lets you determine which exception states will be announced on a machine by machine basis. Once selected for announcement, an exception condition can have its own announcement message recorded and played back.

A list of defined machines is displayed upon the opening of this window. Select the announcement conditions for a machine by clicking the box to the right of the desired condition. Click on the ***Record*** button to record the appropriate announcement message.

Where can you find it?

- Choose the Configure menu.
- Choose the Machine Announcement option.

What do you want to know about?

- Playing an Announcement
- Recording an Announcement
- Saving your Changes
- Undoing your Changes
- Closing the Window

4.4 Options Menu

4.4.1 Silence Mode

All voice announcements can be suspended from the ***Silence Menu*** option. When announcements are suspended, existing voice messages are not deleted. They are saved for later re-activation. Upon re-activation of all voice announcements, existing messages immediately sound if an exception condition is occurring. The suspension period stays in

effect as long as a check mark appears next to this option.

- To select this mode, choose the **Options** menu on the main **Voice** window.
- Click on the **Silence** menu option. A check mark appears indicating the activation of announcement suspensions.
- To de-select this option, click on the **Silence** menu option until no check mark appears on the left- hand side.

4.4.2 Changing Text Sizes

This option sets the font size for the current PlantStar application.

Text size choices are:

- Tiny
- Small
- Medium
- Large
- Huge

4.5 Window Menu

4.5.1 Arrange Icons

To arrange the iconized windows into straight rows and columns, select the *Window* menu on the main screen of your system window. Choose the *Arrange Icons* option.

4.5.2 Arrange Windows
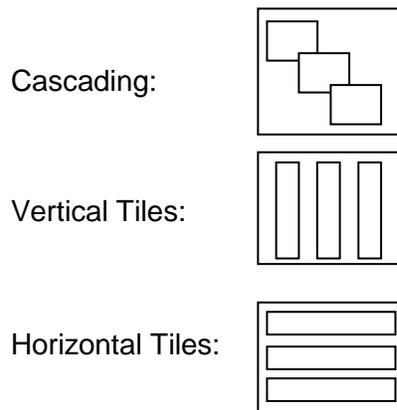
The windows can be arranged in 3 ways:

Cascading:

Vertical Tiles:

Horizontal Tiles:

To choose one of these styles, select the *Window* menu from the main screen of your system window. Select one of the options displayed.

4.6 Help Menu

4.6.1 Help Contents

General content help provides a table of contents for virtually all topics within this application. The *Contents* window can be used to jump to topics that explain various windows or how to get quick access to key reference topics. This help is available by selecting the *Contents* on the *Help* menu item.

Use the scroll bar to the right side of the *Help* window to view the next page of the Table of Contents.

4.6.2 Help Index

The *Index* list is directly accessible from the *Index* on the *Help* menu item or from the *Index* tab within the on-line help utility. Index terms consist of:

· definitions
· formulas, if applicable
· recommended values, if applicable.

To access an item from the Index list:

· Use the scroll bar on the right hand side to scroll the window to the desired item.
· Point to the term or phase desired.
· Double-click on the highlighted word to open.

-Or-

· Use the keyword field to search for the desired item.
· Once found, double-click on the highlighted word to open.

4.6.3 Help Search

Another method to find a particular topic in *Help* is to use the Search option. To display the *Search* window, either choose *Search* from the *Help* menu on the application window or click the *Search* tab on the *Help* topic screen.

Select a topic by:

· Use the keyword field to search for the desired item.
· Click on the *List Topics* button to search on the keyword entered
· A list of related topics then appears on the screen.
· Once found, double-click on the highlighted topic to open.

4.6.4 Help Active Window

Window level help provides information on the display that currently has focus. Information for each window includes:

· purpose of the window
· specific field descriptions

· window button explanations

This type of help is available by selecting and opening a desired window. Once opened, select the **_Help-Active Window_** menu on the application window or press the F1 key.

NOTE: If there are currently no PlantStar windows open, this menu item will not display any help.

4.6.5 About PlantStar

For up-to-date resource information, the application provides a window with the following information:

· PlantStar Software Version
· PlantStar Copyright Date
· Microsoft Windows Version
· Amount of free memory

To see this information:

· Select the **_Help_** menu on the main menu.
· Choose the **_About PlantStar_** menu item.

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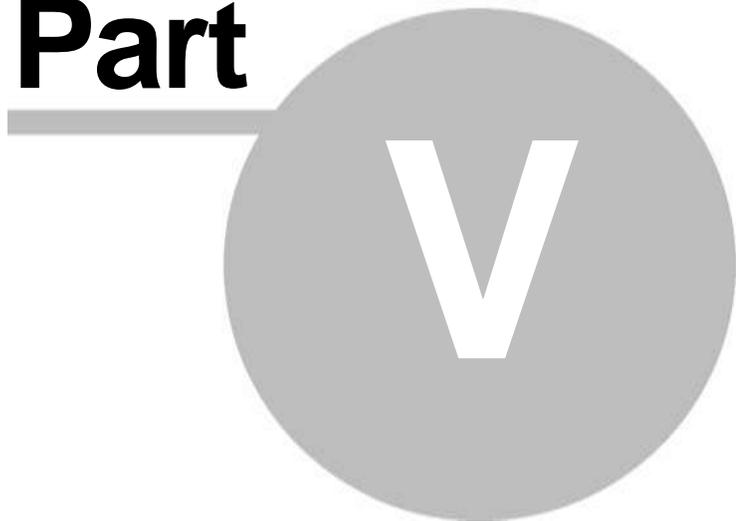
5 View and Print

The **Custom Reports Print** program provides three primary functions:

- Prints custom reports
- Schedules custom reports
- Prints scheduled reports automatically

Prints Custom Reports - Users can print custom reports on-demand. Any criterion that was defined via the **Custom Reports Manager** program is used to determine the content of any report. Both on-line and paper reports can be generated.

Schedules Custom Reports - It is possible to set up a schedule for automatic printing of custom reports. Listed below are the scheduling options available:

- Reports can be scheduled to print at a specific time
- Reports can be scheduled on a daily basis
- Reports can be scheduled on a weekly basis
- Reports can be scheduled to print at the end of a shift
- Reports can be scheduled to print at the end of each job
- Reports can be printed on any network printer or sent to an HTML file.

Prints Scheduled Reports Automatically – The **Custom Reports Print** program automatically prints any custom reports that you scheduled to your default Windows printer. Other users may schedule different custom reports on their PC. Their reports will not print out from your PC.

To print scheduled reports, this program actively monitors end-of-shift and end-of-job events to determine when reports need to be printed. If the **Print** program is minimized, your custom reports will automatically print. If the **Print** program is not running when a scheduled event occurs, no scheduled reports will be printed. The next time the **Print** program is opened, you will receive a message asking to print previously-scheduled reports.

5.1 Custom Reports

5.1.1 View

Once a custom report has been designed and defined within PlantStar, the **Print Custom Report** window provides the capability of printing those reports on-demand. A list of defined reports appears upon entry into the window. When one of these custom reports is printed, any criteria that has been defined for the report is utilized.

In terms of printing capabilities, both on-line and paper reports are available.

Where can you find it?

- Choose the Custom Reports menu on the main window.
- Choose the Print option.

What do you want to know about?

- Selecting a Report
- Selecting Criteria for a Report
- Viewing the Selected Report
- Sending a Report to the Printer
- Refreshing the Display

5.1.2 Schedule
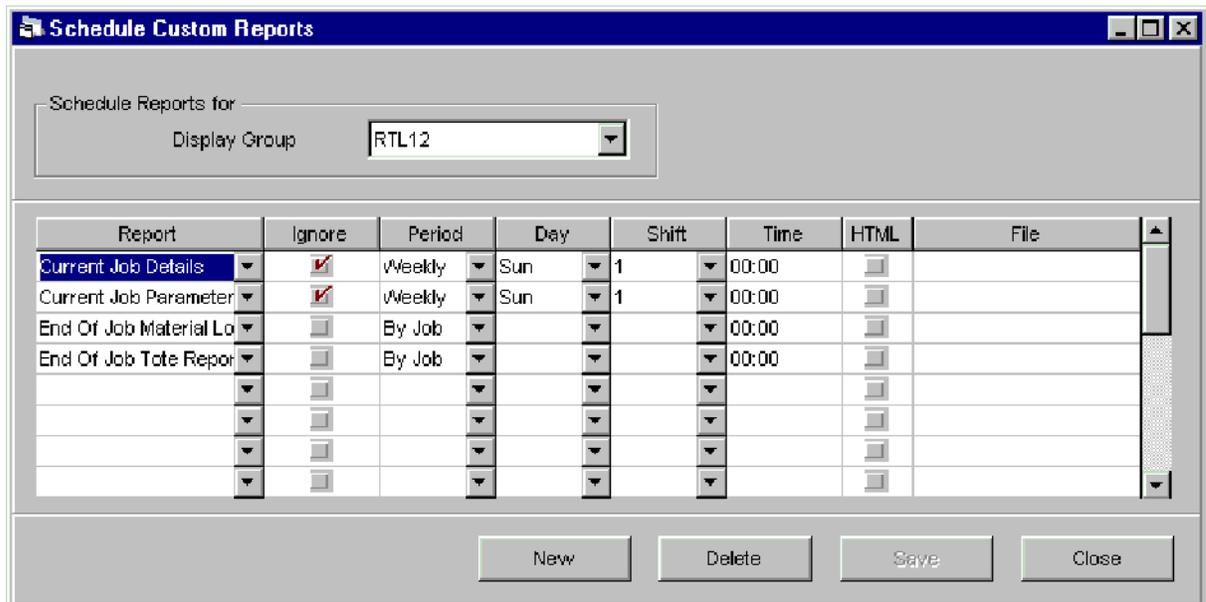
The **Schedule Custom Reports** window lets you schedule custom reports that have been defined within PlantStar for automatic printing. A variety of scheduling options are available:

- Weekly Reports
- Daily Reports
- End-of-Shift Reports
- End-of-Job Reports

Custom reports are scheduled on a PC by PC basis. For example, the **Custom Reports Print** program automatically prints any custom reports that you schedule to your default

Windows printer. Other users may schedule different custom reports on their PC. Their reports will not print out from your PC.

NOTE: For scheduled reports to print, the ***Custom Reports Print*** program must be minimized. If the ***Custom Reports Print*** program is not running when a scheduled event occurs, no scheduled reports will be printed. The next time the ***Custom Reports Print*** program is opened, you will receive a message asking to print previously-scheduled reports.

Where can you find it?

- Click on the Custom Reports menu.
- Choose the Schedule option.

What do you want to know about?

- Changing Display Groups
- Creating a New Report
- Changing a Report
- Ignore Criteria in a Report
- Selecting a Period Interval
- Set Report to Display in HTML Format
- Assigning a Report File Name
- Deleting a Scheduled Report
- Saving your Changes

5.1.3 Exit

To exit the program, choose one of the following methods:

- Select the *Exit* option under the ***Custom Reports*** menu
- Click your mouse button while it is positioned over the 'x' in the upper right hand corner of the window.

5.2 Help Menu

5.2.1 Help Contents

General content help provides a table of contents for virtually all topics within this application. The ***Contents*** window, when on-line, can be used to jump to topics that explain various windows or how to get quick access to key reference topics. This help is available by selecting the ***Contents*** on the *Help* menu item.
Use the scroll bar to the right side of the *Help* window to view the next page of the table of contents.

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- specific field descriptions
- window button explanations

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- PlantStar Copyright Date
- Microsoft Windows Version
- Amount of free memory

To see this information:

- Select the *Help* menu on the main menu.
- Choose the *About PlantStar* menu item.

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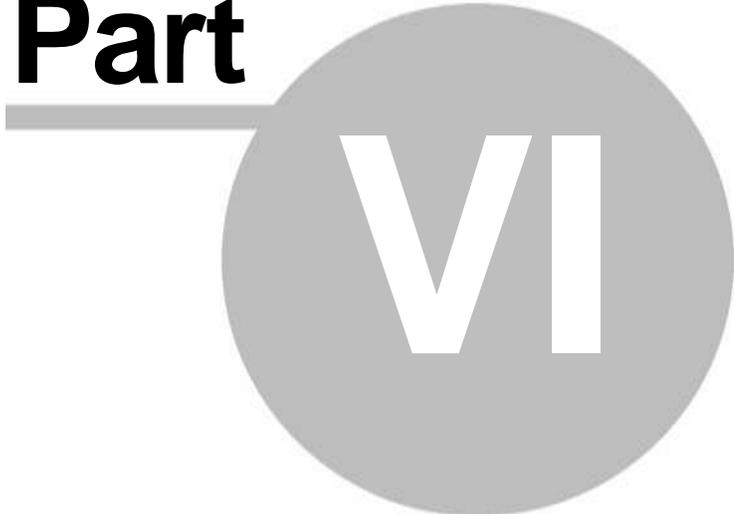
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6 Design Manager

The **Custom Reports Manager** program transfers custom reports designed in Crystal Reports into PlantStar. It provides editing capabilities for these reports, deletion capabilities, and provides for the selection of report search criteria.

Transferring Reports Into PlantStar - The first step in using custom reports within PlantStar is to design a report within the Crystal Reports program. Once a report has been designed, it can be transferred into PlantStar. The PlantStar database tables and fields must be used to create this custom report.

Editing Report Definitions - Custom reports can be edited from the **Custom Reports Manager** window. A report's name, description, definitions, and criteria are changeable.

Selecting Report Criteria - Report criteria can be set up from this window. Report criteria designate what type of information is included in a report. For example, a job history report can include all jobs for a certain product or it can be a report on a specific job. Several fields can be selected as criteria for a report or just one field.

Criteria can also be set up for a report from within the Crystal Reports program. If fields are also designated as criteria from the **Custom Reports Manager** program, then the affected report is based upon BOTH sets of criteria.

6.1 Design Manager
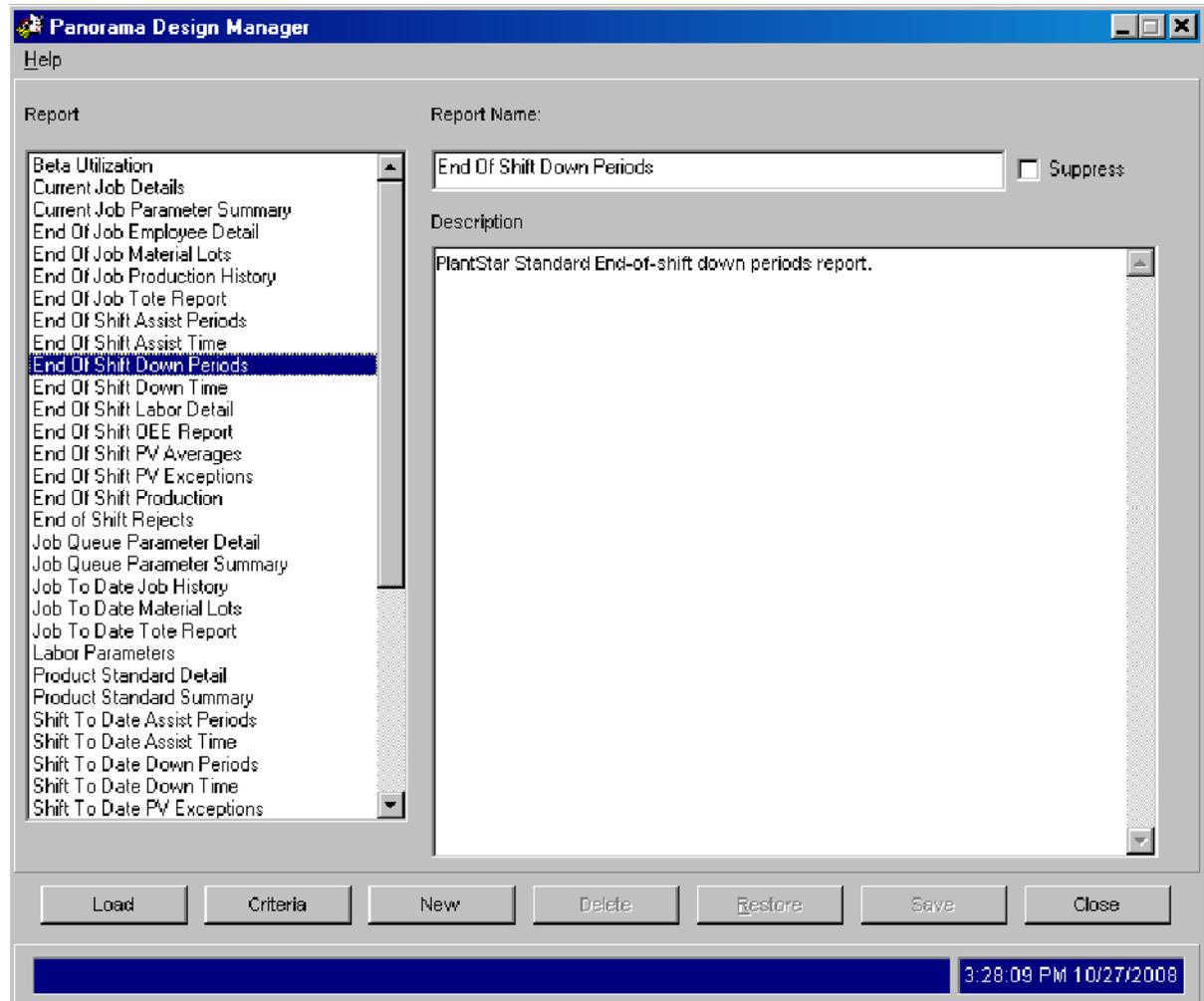
The **Custom Reports Manager** program transfers custom reports designed in Crystal Reports into PlantStar. It provides editing capabilities for these reports, deletion capabilities, and provides for the selection of report search criteria.

Transferring Reports Into PlantStar - The first step in using custom reports within PlantStar is to design a report within the Crystal Reports program. Once a report has been designed, it can be transferred into PlantStar. The PlantStar database tables and fields must be used to create this custom report. Crystal Reports 9.0 or above must be used.

Editing Report Definitions - Custom reports can be edited from the **Custom Reports Manager** window. A report's name, description, definitions, and criteria are changeable.

NOTE: Standard PlantStar reports can be edited, but must be saved as a report with a different name

Selecting Report Criteria - Report criteria can be set up from this window. Report criteria designate what type of information is included in a report. For example, a job history report

can include all jobs for a certain product or it can be a report on a specific job. Several fields can be selected as criteria for a report or just one field. Criteria can also be set up for a report from within the Crystal Reports program. If fields are also designated as criteria from the **Custom Reports Manager** program, then the affected report is based upon BOTH sets of criteria.

Where can you find it?

The **Custom Reports Manager** window is the only window within the **Design Manager** application.

What do you want to know about?

- Selecting a Report
- Transferring a Custom Report into PlantStar
- Editing Report Definitions
- Setting Report Criteria
- Deleting a Custom Report From PlantStar

6.2 Help Menu

6.2.1 About PlantStar

For up-to-date resource information, the application provides a window with the following information:

- PlantStar Software Version
- PlantStar Copyright Date
- Microsoft Windows Version
- Amount of free memory

To see this information:

- Select the *Help* menu on the main menu.
- Choose the **About PlantStar** menu item.

6.2.2 Exit

To exit the program, choose one of the following methods:

- Select the *Exit* option under the *Help* menu
- Click your mouse button while it is positioned over the 'x' in the upper right hand corner of the window.

SYSCON - PlantStar System
User's Guide

Part
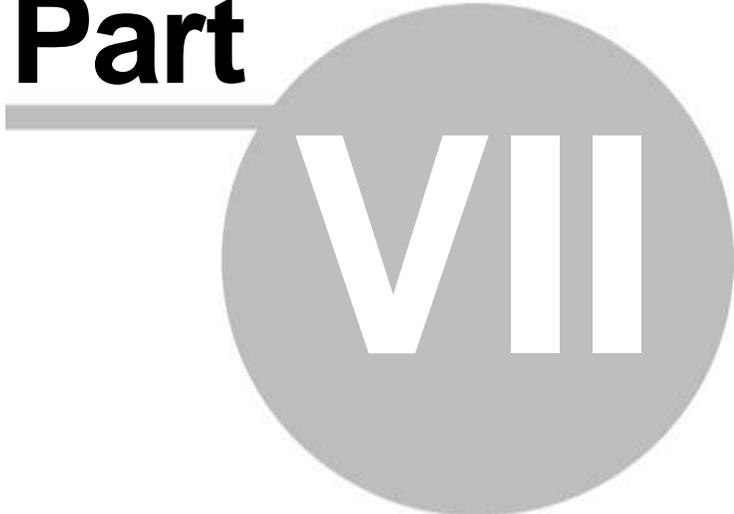
VII

7 DCM Browser Interface

The browser screens at the DCM are divided into three sections, or frames. The menu frame is located at the top of the screen and displays the machine, child, and screen which are currently being viewed. It also supplies easy navigation between machines on the same DCM, and has the capability of a user definable navigation link that can be accessed by pressing the SYSCON-PlantStar logo in the upper right corner.

The main frame occupies the central screen area and contains the screen specific data. This frame, depending on the screen being viewed, can provide summary data, detail data, and/or data entry capabilities.

Across the bottom of the screen is the lights frame which provides both status information and navigation. The various buttons, or lights, allow the user to have a quick visual summary of the status of the currently viewed machine. The colors of the buttons will change depending on the machine state and follow the color conventions used in all other SYSCON-PlantStar products.

Both the menu frame and the lights frame are shown for every screen that is being displayed in the main frame. This allows for a consistent interface regardless of the current function being utilized.

Menu Frame

Main Frame

Lights Frame

7.1 Menu Frame

The menu frame is the primary method of navigating between machines on a DCM, and the children of a particular job. In addition a clock button and the current screen name are displayed.
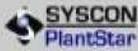
What do you want to know about?

- Changing machines
- Displaying parent or child job information
- Changing the language used
- Linking to another web page

7.1.1 Machine Navigation

These buttons allow you to scroll through the machines on a particular DCM. The machines available are those that are configured to be on the same DCM and the order follows the machine index as defined within the shop floor configuration program.
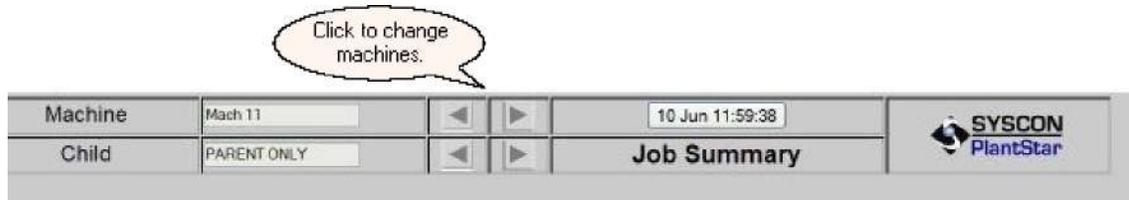
7.1.2 Child Navigation

These buttons allow you to navigate through the children of the currently running job on the selected machine. The displayed text is the same as the job field as defined when the job was created.
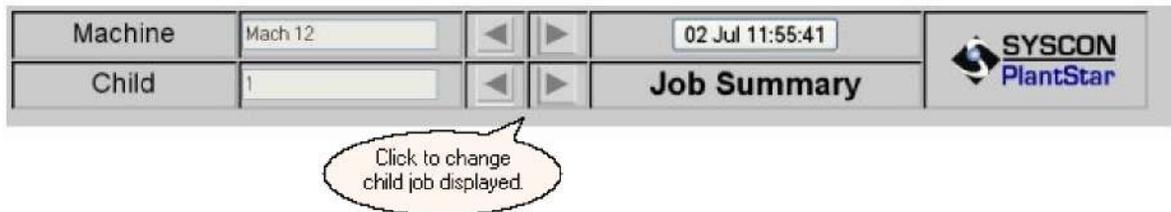
7.1.3 Menu Clock

The current date and time of the computer being used to browse to the DCM is displayed here.

This button also allows for the selection of which language is being used to describe the fields being displayed. Repeated pressing, will cycle through all available languages.

7.1.4 Logo Link

The SYSCON-PlantStar logo in the menu frame is actually an HTML hyperlink. This can be configured by the system administrator to link any other web page available on the

company's intranet.

Caution should be used when this link is selected as all three DCM frames will be replaced with the new page. This may lead to confusion and/or difficulty in returning to the DCM browser interface.

7.2 Main Frame

The **Main Frame** for the DCM browser screens occupies the center of the display. While it is possible to navigate outside of the default frames from setup sheets or through the use of the logo link, all of the PlantStar data pertaining to a specific DCM will be displayed here.

The **Lights Frame** that is displayed across the bottom of the screen is the main navigation tool for moving between the available screens. The following screens can be viewed within this frame:

Job Summary
Down Select
Assist Select
Reject Update

Process Summary
    Process Select
    Process Table
    Process Graph

    SPC Graph
    Profile Tiled
    Profile Overlay
    Profile Cross Plot
    Profile Store Graph

    SQC Sample

Production Summary
    Setup Sheets
    Job Update
    Labor Login
    Material Lot
    Machine Logs

7.2.1 Job Summary

The left half of the **Job Summary** screen displays information for a selected job running on a machine. A summary of the pieces produced and rejected is provided for the current shift and the job to date.

The *Job Summary* screen allows you to scroll through the job queue information for the selected machine which is set up via the *Job Scheduling Board* in the *Shop Floor Monitor Program*. The current job running on the machine can be changed by using the selection buttons on the right side of the screen.

Images for the current and the next scheduled job products can be displayed in the lower right area of the screen.

If a tote box is defined for a job, an additional section of information will appear on the *Job Summary* screen above the shift and job totals area. The section tracks the job progress in units based on the tote box size and if required, it allows the operator to mark an incomplete tote as finished or to reprint a tote label.

7.2.2 Down Select

The *Down Select* screen allows the operator to select the appropriate reason for why the selected machine is down. Pressing one of the down reason buttons will highlight that reason and all down time will be assigned to that reason. If another reason is selected then any additional down time will be associated with the newly selected reason.

Twenty reasons are listed on a down screen. For installations where the extended down option has been purchased, the buttons along the top of this screen will allow navigation to additional down reasons.

The down select screen displays the accumulated down time for each possible down reason of the currently running job.

Category	Time		Category	Time
Unknown	0:00:00		Aux Equip	0:00:00
Breaks	0:00:00		Color Change	0:00:46
Daily 5s	0:00:00		Machine	0:00:00
Meetings	0:00:00		Mold Change	0:00:00
Not Scheduled	0:00:00		No Comp	0:00:00
PM	0:00:00		No Material	0:00:00
	0:00:00		No Operator	0:00:00
	0:00:00		Other	0:00:00
	0:00:00		Packaging	0:00:00
	0:00:00		Press Cool	0:00:00
Down Since 14 Aug 2008 17:20:52			TOTAL	0:00:46

7.2.3 Assist Select

The **Assist Select** screen allows the shop floor staff to "call for help" by pressing the button for the appropriate assist reason. The call for help is logged in the system and the machine is put into the assist state which will be reflected in the lights frame. Once selected, time is accrued until the assist button is pressed again to turn off the assist state.

The screen displays the accumulated assist time for each possible assist reason for the currently running job.

Category	Time		Category	Time
Emergency	0:00:00			0:00:00
Material Handler	0:00:00			0:00:00
Mold Technician	0:00:00			0:00:00
Supervisor	0:00:00			0:00:00
Quality Check	0:01:00			0:00:00
Auxiliary Equipment	0:00:00			0:00:00
Inspector	0:00:00			0:00:00
Operator	0:00:00			0:00:00
	0:00:00			0:00:00
	0:00:00			0:00:00
Assist Since 14 Aug 2008 17:21:52			TOTAL	0:01:00

7.2.4 Reject Update

The **Reject Update** screen provides a summary of rejects that have been assigned to each defined reject reason for the current job. It also provides a means for the operator to add or subtract rejects for a reject reason. For a family job, the parent screen will display an accounting summary for each child.

Twenty reasons are listed on a reject screen. For installations where the extended reject option has been purchased, the buttons along the top of this screen will allow navigation to additional reject reasons.

Pressing one of the reject reason buttons will highlight that reason and a keypad will be presented. The amount of rejects to be assigned to that category can then be entered. Negative numbers can be entered to subtract rejects from a category. In addition to the actual quantity of rejects, the part weight can be used so that a given weight can be entered as rejects. This weight will be divided by the part weight so that an actual part count can be automatically rejected.

The *Reject Update* screen for a family job displays an accounting summary for each child on the parent screen. The background color of the row in the summary table reflects the machine state for the child.

This parent screen can be used to reject an entire cycle of parts as shown below. Using the menu frame to navigate to a child job allows rejects to that specific part as described above.

7.2.5 Process Summary

The *Process Summary* screens display information for a machine's process variables measured during the last fifty complete machine cycles. The table of values includes the low and high limits defined for the current job, the last value, the high value and low value, and the average value for each process variable defined. Up to twenty-five variables can be displayed per screen and navigation buttons are provided to scroll between summary screens.

The *Process Summary* screen provides quick access to the *Process Select*, *Profile*, and *SQC Sample* screens for a specified machine by using the screen navigation buttons at the left side.

When a process variable reading is collected, it is compared to the process limits which have been defined for the job. If a process variable is above the higher limit or below the lower limit, that process variable is highlighted according to the following default color scheme:

·   Red - value is above the higher limit
·   Blue - value is below the lower limit

If a process variable is outside of its defined limits for the job, the machine will be put in the process exception state for that cycle which will be reflected in the lights frame.

What do you want to know about?

- Selecting a process variable to see more detailed information
- Displaying profile information
- Taking an SQC Sample

7.2.5.1 Process Select

The **Process Select** screen allows for monitoring up to fifty process variables that may be defined for the currently running job on the selected machine.

It provides a quick visual reference to monitor the process exception state for a machine. If the last value recorded for a process variable is above the higher limit or below the lower limit defined for the job, that process variable is highlighted according to the following default color scheme:

·   Red - value is above the higher limit
·   Blue - value is below the lower limit

If a process variable exceeds its defined limits for the job, the machine will be put in the process exception state for that cycle which will be reflected by the color conventions used in the lights frame.

Pressing a process variable button will display the **Process Table** screen for the selected variable.

The **Process Select** screen also provides quick access to the *Profile*, and **SQC Sample** screens for a specified machine by using the buttons at the top left. Use the *Lights Frame* to return to the **Process Summary** screen.

What do you want to know about?

- Selecting a process variable to see the last fifty values
- Displaying profile information

- Taking an SQC Sample

7.2.5.2 Process Table

The **Process Table** screen details the history of a process variable over the last fifty machine cycles. The name, defined limits, and units of the variable are shown in the table heading. If a process variable is above the higher limit or below the lower limit defined for the job, that process variable value is highlighted in the table according to the following default color scheme:

- Red - value is above the higher limit
- Blue - value is below the lower limit

If the last value of a process variable exceeds its defined limits for the job, the machine will be put in the process exception state for that cycle which will be reflected in the lights frame.

There are three screen navigation buttons on the left to navigate among the **Process Screens**. The *Process Select* button will return you to the selection screen. The *Graph* button provides the option to display the data in graphical form on the **Process Graph** screen. If SPC data is available, a navigation button will be shown to display the SPC graph.

Use the Lights Frame to return to the Process Summary screen.

What do you want to know about?

- Displaying the values as a graph
- Displaying an SPC graph for the variable information

7.2.5.3 Process Graph

The **Process Graph** screen for a variable can be displayed by pressing the "*GRAPH*" button on the **Process Table** screen. The variable name and the units of measurement are displayed at the top of the graph. The high and low limits as defined for the job are indicated on the left side.

The x-axis is the cycle number. The y-axis is the actual process variable value. The graph can display the last fifty values with the rightmost point being the most recent value. For each machine cycle update, the new value enters from the right and moves the older values to the left. An undefined value will be a blank space in the graph.

There are three screen navigation buttons to navigate among the **Process Screens**. This screen provides the option to display the data in graphical form on the **Process Graph** screen. If SPC data is available, a navigation button will be shown to display the SPC graph as shown in the screenshot. The **Process Select** button will return you to the selection screen.

There are three screen navigation buttons on the left to navigate among the **Process Screens**. The *Process Select* button will return you to the selection screen. The *Table* button provides the option to return to the data detail on the **Process Table** screen. If SPC data is available, the *Navigation* button will be shown to display the SPC graph.
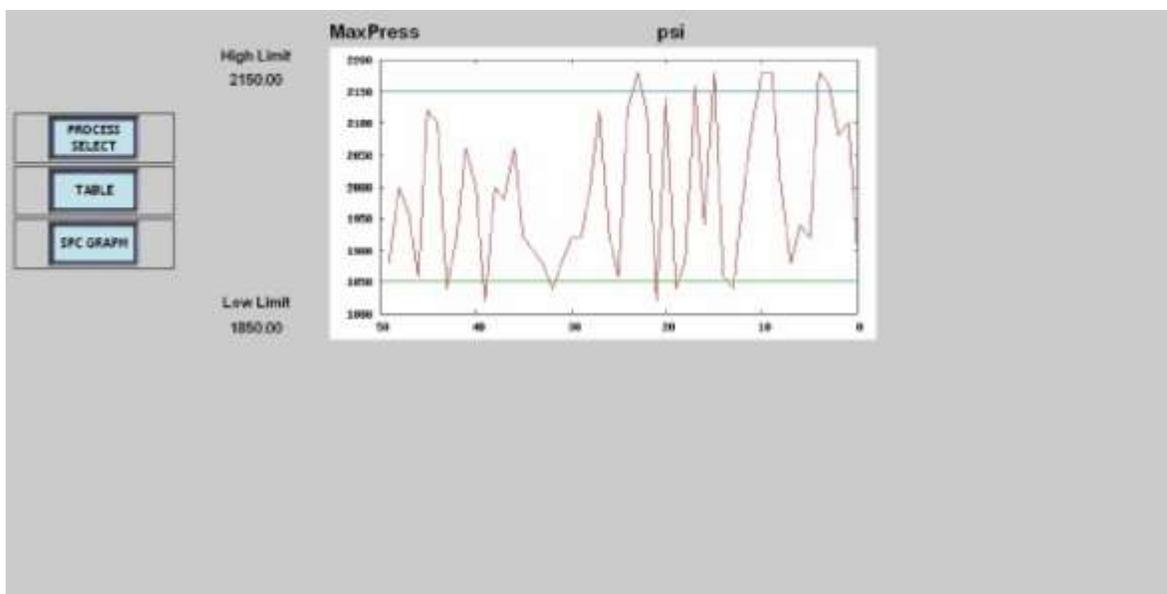
Use the Lights Frame to return to the Process Summary screen.

7.2.5.4 Process SPC

The **Process SPC** screen displays SPC data that is monitored by the DCMs. The standard SPC statistics are shown at the top of the screen. The top graph is a plot of X-bar values and the bottom is a plot of the associated range values. The X-axis is the time at which the SPC

values were recorded.

The **Process SPC** screen can only be selected from the **Process Table** screen for a process variable if SPC data is available.

There are three screen navigation buttons on the left to navigate among the Process Screens. The Process Select button will return you to the selection screen. The Table button provides the option to return to the data detail on the Process Table screen. The Graph button provides the option to display the data in graphical form on the Process Graph screen. Use the Lights Frame to return to the Process Summary screen.

Alarms are displayed to the right of the graph. The key for the alarms is as follows:

XCL   The last X-bar value was not within control limits
RCL   The last Range values was not within control limits
INC   The last 8 X-bar values were continuously increasing
DEC   The last 8 X-bar values were continuously decreasing
ABV   The last 8 X-bar values were above the mean
BLW   The last 8 X-bar values were below the mean
UTR   The last 25 X-bar values show an upward trend
DTR   The last 25 X-bar values show a downward trend
RSM   Within the last 25 X-bar values, a RUNSUM exceeded 4.

7.2.5.5 Profile Tiled

The **Profile Tiled** screen graphically displays the values of machine's profile data. A profile is a set of up to 500 readings of a rapidly changing process variable, such as pressure or position, collected during one machine cycle. Up to four profiles can be monitored and displayed for a machine.

The **Profile Tiled** screen is the default profile screen that is displayed when the "PROFILE" button is selected on either the Process Summary or the Process Select screens.

The area below the graphs provides additional option buttons for displaying profile information. One or more of the available profile variables can be selected/deselected for graphing by using the named buttons. In addition, the profile screens provide navigation buttons to display the four available graph formats:

· the profile tiled graph
· the profile overlay graph
· the profile cross plot graph
· the profile store graph
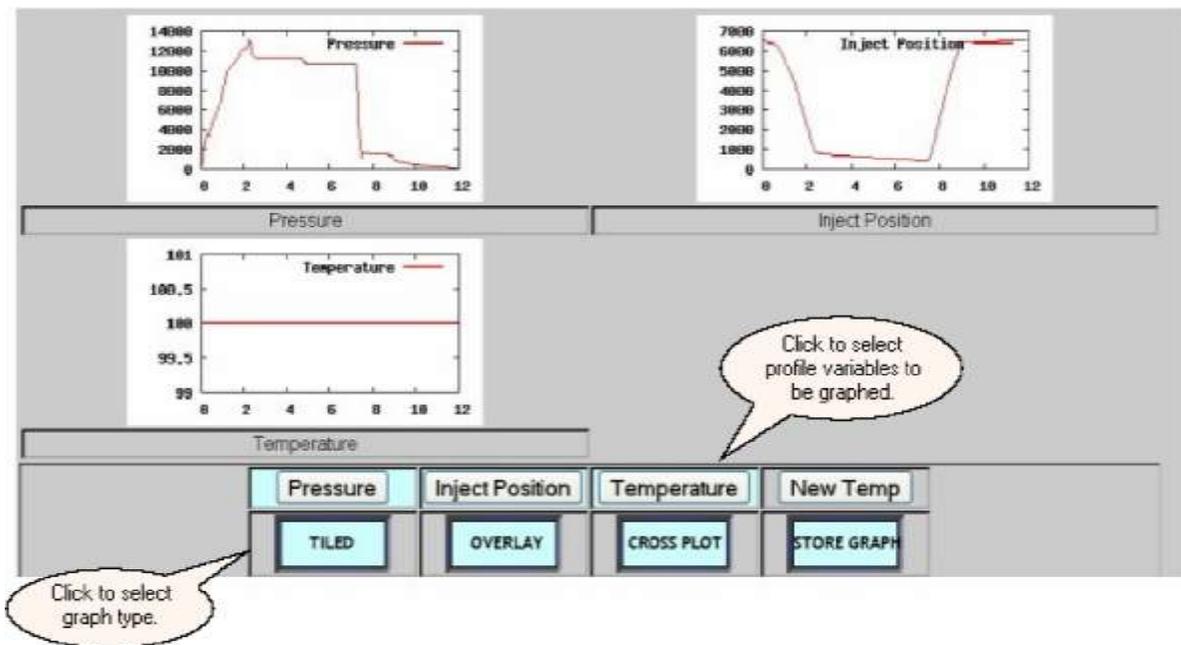
Use the Lights Frame to return to the Process Summary screen.

7.2.5.6 Profile Overlay

The **Profile Overlay** screen graphically displays the values of machine's profile data. A profile is a set of up to 500 readings of a rapidly changing process variable, such as pressure or position, collected during one machine cycle. The overlay displays up to four profiles for a machine on one graph.

The **Profile Tiled** screen is the default profile screen that is displayed when the "PROFILE" button is selected on either the **Process Summary** or the **Process Select** screens. The **Profile Overlay** screen can only be selected from another of the profile graph screens.

The area below the graphs provides additional option buttons for displaying profile information. One or more of the available profile variables can be selected or deselected for graphing by using the named buttons. In addition, the profile screens provide navigation buttons to display the four available graph formats:

- the profile tiled graph
- the profile overlay graph
- the profile cross plot graph
- the profile store graph

Use the Lights Frame to return to the **Process Summary** screen.

7.2.5.7 Profile Cross

The **Profile Cross** screen graphically displays the values of machine's profile data. A profile is a set of up to 500 readings of a rapidly changing process variable, such as pressure or position, collected during one machine cycle. The cross plot displays two selected profiles for a machine on one graph. The profiles selected must have the same delay and period defined. The first variable is the x-axis value and the second variable is the y-axis value in the cross plot.

If a valid combination of two profile variables has not been selected, the profile store screen will display the list of combinations from which to choose as shown below.

The **Profile Tiled** screen is the default profile screen that is displayed when the "PROFILE" button is selected on either the **Process Summary** or the **Process Select** screens. The **Profile Cross** screen can only be selected from another of the profile graph screens.

The area below the graphs provides additional option buttons for displaying profile information. One or more of the available profile variables can be selected or deselected for graphing by using the named buttons. In addition, the profile screens provide navigation buttons to display the four available graph formats:

- the profile tiled graph
- the profile overlay graph
- the profile cross plot graph
- the profile store graph
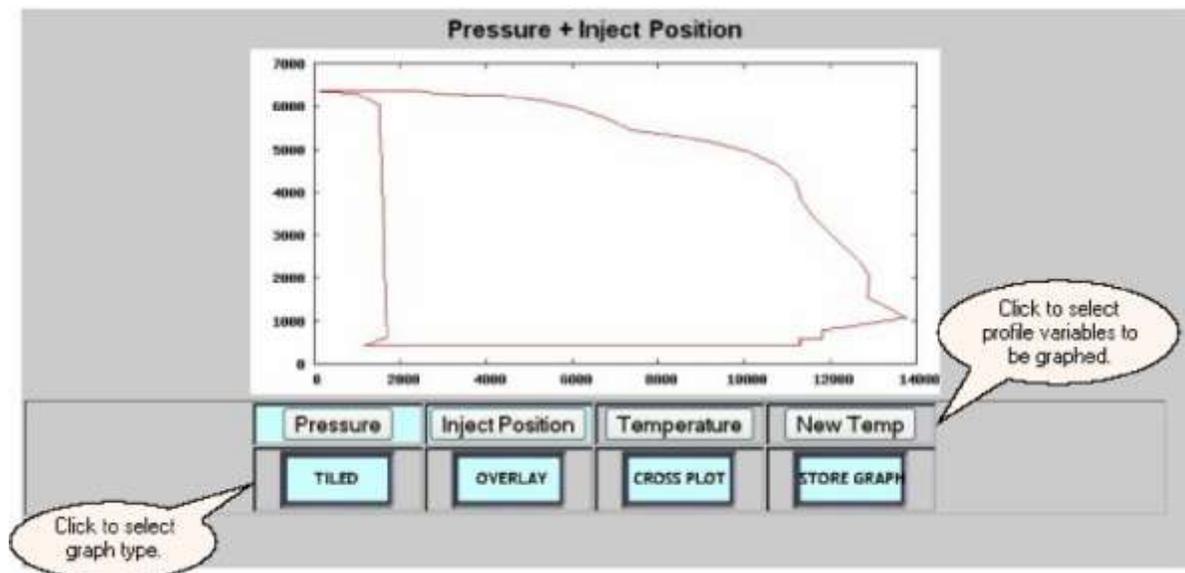
Pressure, inject position, and temperature were selected in this example. This is an error because only two profiles can be selected for the profile cross graph. The valid combinations are listed on the screen.
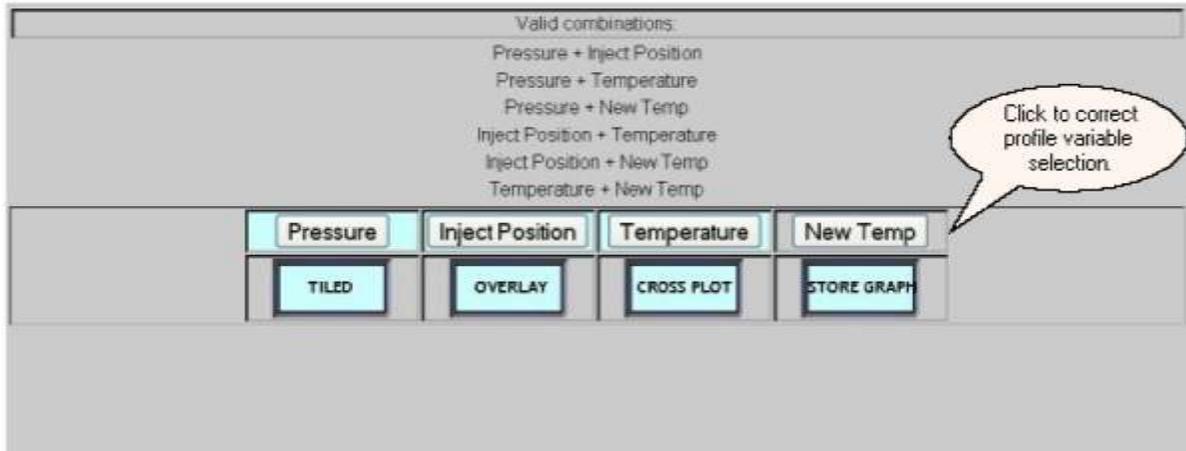
Use the Lights Frame to return to the **Process Summary** screen.

7.2.5.8 Profile Store

The **Profile Store** screen graphically displays the values of one machine profile variable over time. A profile is a set of up to 500 readings of a rapidly changing process variable, such as pressure or position, collected during one machine cycle. The profile store displays the profile data from successive machine cycles on one graph.

The **Profile Tiled** screen is the default profile screen that is displayed when the "PROFILE" button is selected on either the **Process Summary** or the **Process Select** screens. **The Profile Store** screen can only be selected from another of the profile graph screens.

The area below the graphs provides additional option buttons for displaying profile information. One or more of the available profile variables can be selected or deselected for graphing by using the named buttons. In addition, the profile screens provide navigation buttons to display the four available graph formats:

- the profile tiled graph
- the profile overlay graph
- the profile cross plot graph
- the profile store graph
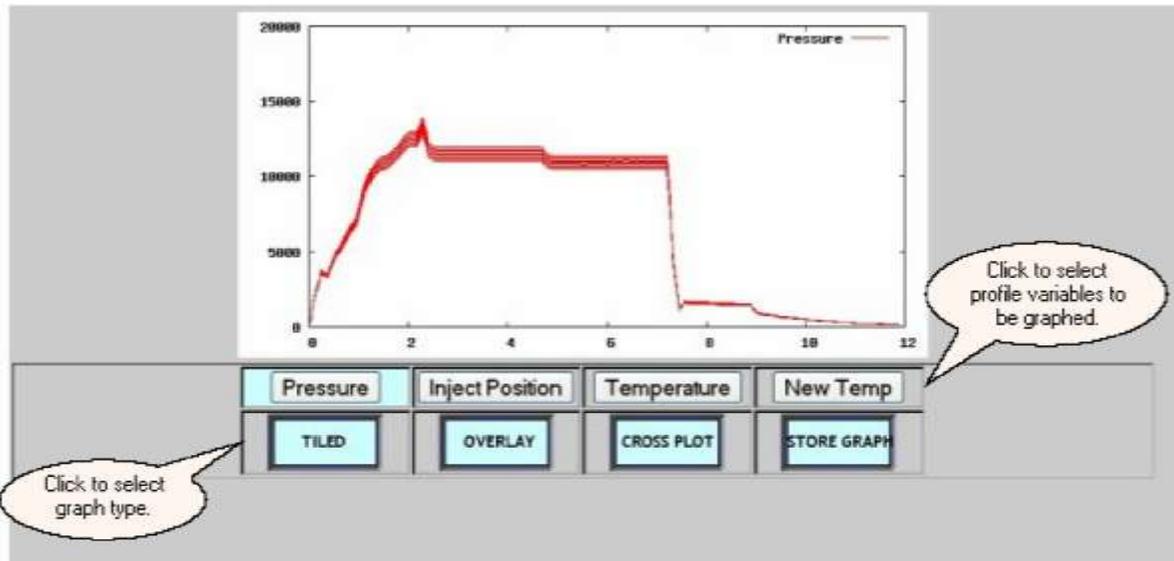
Use the Lights Frame to return to the Process Summary screen.

7.2.5.9 SQC Sample

The **SQC Sample** screen allows the operator to sample the next shot and print a sample label for quality auditing purposes with the "SAMPLE NEXT SHOT" button. The end of cycle data is written to the machine's log file.

This screen is displayed using the "SQC SAMPLE" button on either the **Process Summary** or the **Process Select** screens.

The screen displays an image of the current job product, job summary data, and the current shot ID number as well as the shot ID numbers of the samples which have been taken. The "CLEAR SHOT LIST" button will clear the screen list of sample ID numbers.

Use the Lights Frame to return to the Process Summary screen.

7.2.6 Production Summary

The **Production Summary** screen presents a snapshot of the machine's current state in terms of machine performance and progress toward completion of the current job. The background color of the line reflects the machine's state.

In addition, the **Production Summary** screen has navigation buttons to access and update further levels of production information. The *Setup Sheet* button is used to display the **Job Setup** information. The Update button allows updating of the actual multiplier, reject multiplier, and box count. The *Labor* button accesses the optional Labor Tracking feature which allows employees to log in and out of specific machines and labor categories. The *Material* button accesses the optional **Material Lot Tracking** feature. The *Logs* button displays the detail of the event log.

What do you want to know about?

- Displaying information on the setup sheets.
- Updating the reject multiplier, actual multiplier, or box count
- Logging into a machine
- Displaying the employees logged in for a machine
- Logging out of a machine
- Changing your labor category on a machine
- Displaying the material components for a job
- Changing a material component or lot ID number for a job
- Displaying the event log for a job

7.2.6.1 Job Setup

The *Job Setup* screen allows for the display of job setup instructions for the current job or any job in the job queue for a machine.

On browser based DCMs the setup sheet can contain HTML code and will be displayed as such. This allows the insertion of hyperlinks and other html objects in the setup sheet.
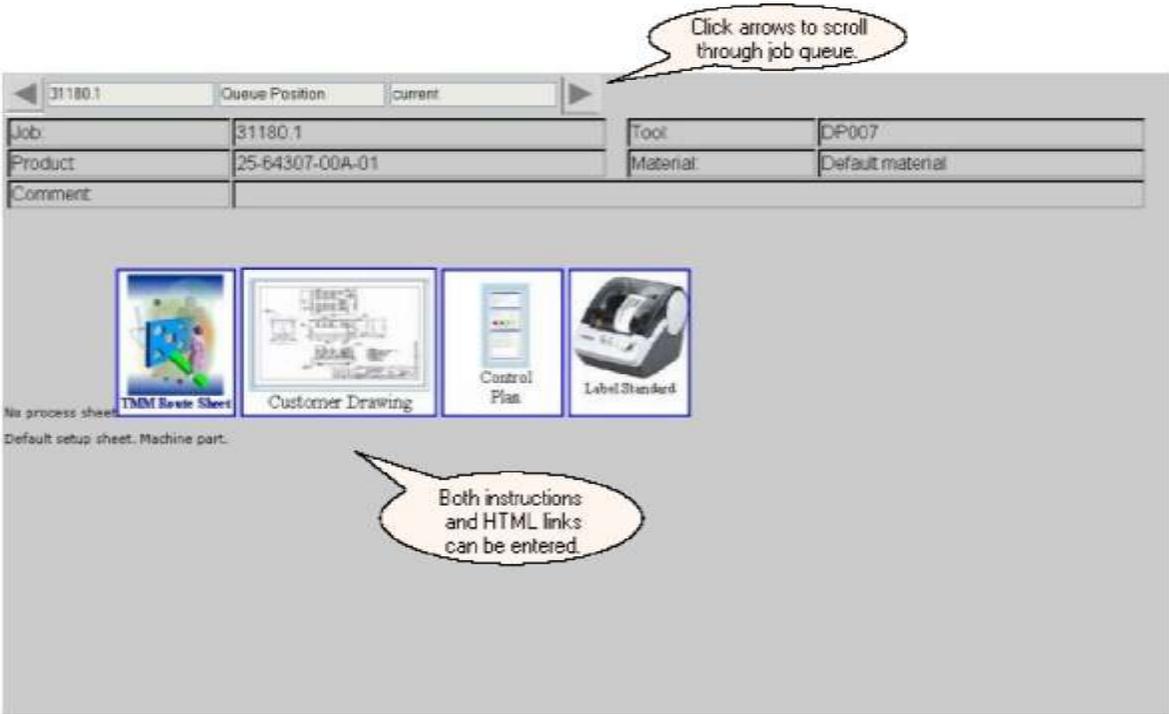
Use the Lights Frame to return to the ***Production Summary*** screen.

7.2.6.2 Job Update

The ***Job Update*** screen displays the standard multiplier for a job which is a product parameter that defines the maximum number of pieces produced per machine cycle for a job.

The actual multiplier, reject multiplier, and box count may be updated from this screen. To update a value, first press the update button to the left of the desired field. The row will be highlighted and the value that is typed on the keypad will be used to update the selected row.

Use the Lights Frame to return to the Production Summary screen.

7.2.6.3 Labor Login

If the **Labor Tracking** feature is enabled for your system and configured for a machine, the **Labor Login** screen can collect employee data to help in the tracking of operator/staff requirements and the costs of jobs being run on the shop floor.

The **Labor Login** screen allows an employee to login or logout of a specific machine. The screen lists all employees currently logged into a machine, their labor category, and their login time. The employee is prompted to enter a valid employee id with the keypad. Employee's identification numbers and valid labor categories are defined in the **Shop Floor Configuration** program. If the employee id is not valid, the user is presented with an "Invalid Employee" message.

When a valid employee id is entered with the keypad, a second screen is presented. The name of the selected employee is shown in bold in the center of the screen. The keypad can be used to change the selected employee.

The top of the screen displays up to 30 labor categories that are valid for the employee. The employee must choose a labor category and press the "log in" button to log in to the machine. The bottom of the screen lists the currently logged in employees for the selected machine.

The *Labor Login* screen also allows an employee to logout of a machine or to change their labor category on the selected machine. When the employee ID for an employee currently logged into the machine is entered, the second screen which is presented will highlight the selected employee's row in the employee list on the lower half of the screen. The logout button is used to logout the selected employee and return to the *Labor Login* screen.

The valid labor categories for the employee are presented at the top of the screen. To change labor categories, click on any valid category on the top of the screen and press the "log in" button. The employee will be logged out of their current labor category for the machine and logged in for their new category.

Use the Lights Frame to return to the Production Summary screen.

7.2.6.4 Material Lot

If the **Material Lot Tracking** feature is enabled for your system, the **Material Lot** screen provides an auditing feature to trace material lot usage. A material lot can be traced to a specific tote box. For each tote box or material lot change at the DCM, an event is recorded to form a lot history.

The **Material Lot** screen displays a list of the material components and material *Lot IDs* for the current job. The *Lot ID* can be vendor or user-defined and will create an audit trail between the lots of raw material fed into the machine and the finished products produced. Several material changes can be specified to take effect as a group.

If a different raw material lot needs to be used on a running job, the *SELECT* button to the left of the material name can be used to access a typewriter screen to enter a new material name, *Lot ID*, and delay timer. The delay timer is used to specify the amount of time in minutes that should elapse before the raw material change is to take effect on the job.

To make your required changes, click the button below the field that you wish to update. The button for the selected field will be highlighted. Type in the new value and press enter. The value will be shown in the "Next Material Component", "Next Lot ID", or "Delay" column as specified. If a delay is not specified, the default delay timer value is set to zero. After all the required changes are entered, click "RETURN" to go back to the *Material Lot List* screen.

Your changes will be recorded in the "Next Material Component", "Next Lot ID", and

"Delay" columns on the material list.

		Product:	NF Product 1 Long Name All 30!		
Job:	NF Job 1:				
Tool:	NF Tool 1:	Formula:	NF Material 1:		

	Material Component	%	Current Lot ID	Next Material Component	Next Lot ID	Delay
SELECT	Material T1	100.0%	LOT 12345	Material T22	NEW LOT 22	5
SELECT	none defined	0.0%	none defined	none defined	none defined	-1
SELECT	none defined	0.0%	none defined	none defined	none defined	-1
SELECT	none defined	0.0%	none defined	none defined	none defined	-1

CANCEL PAUSE RUN

Click these buttons to start or pause the delay timer.

At this time, additional materials can be selected from the list to specify changes that will take effect as a group.

The timer will begin counting down when the *RUN* button is pressed on the material list screen. The change goes into effect when the timer value counts down to zero. The *PAUSE* button can be used to temporarily stop the timer count down. The *CANCEL* button will discard any pending changes. When the time expires, the current materials are replaced with the new materials and the event will be recorded in the audit trail.

Use the Lights Frame to return to the Production Summary screen.

7.2.6.5 Machine Logs

The *Machine Log* screen displays a list of the most recent events relating to a selected machine. These events are recorded at the DCM.

All recorded events will be displayed by default or the events displayed can be filtered by using one of the event type buttons on the left side of the screen. The selected filter button will be highlighted. Event types include

- Job Related Events - start/end of a job or a job change;
- Shift Related Events - start of a new shift or a shift idle period;
- Down Events - start and end of down time periods;
- Assist Events - start and end of assist time periods;
- Process Alarm Events - time of a process exception, the actual "exception" value, and the limit it violated. Process exceptions are only logged, though, if the machine is not in a down state. If a process exception begins while a machine is down, the exception events are not logged for the machine.

- Material Events - material changes on the selected machine
- Labor Events - login and logout of users on the selected machine

Use the Lights Frame to return to the **Production Summary** screen.

7.2.7 Journals

The PlantStar **Process Journal** program is a web-based program designed to provide the shop floor personnel with a method to record changes made to a process being monitored by the PlantStar system.

An overview of the **Process Journal** program and instructions for how to view and create **Process Journal** tickets can be found in Application Notes 2007-03 and 2007-04.

7.3 Lights Frame

The **Lights Frame,** at-a-glance, gives the user the current machine state of the selected machine. The colors of the buttons will change depending on the machine state and follow the color conventions used in all SYSCON-PlantStar products.

This frame also serves as the primary navigation method for changing the screen that is displayed within the main frame.

SYSCON - PlantStar System
User's Guide

Part

VIII

8 System Administration

8.1 Configuring the Host

This section outlines the installation for **first-time setup** of the host computer and describes the installation results. For QuickShot systems, host configuration changes require attachment of a monitor and keyboard, not supplied with the system.

Hardware Overview

The host computer and support equipment is, in virtually all cases, directly purchased from SYSCON-PlantStar. The standard hardware package includes

- Server with external modem
- Uninterruptible power supply (UPS)
- Keyboard

Optional equipment, such as additional disk drives, printers, Modems and CDRW drives can be purchased depending upon site configuration.

On QuickShot Systems, the host and DCM are both contained in one NEMA box.

Disk Space

The system database stores historical production and SPC information. How much it can store on disk is dependent upon available disk space. Typically a year or more can be stored on the supplied disks. The speed at which disk space is used is dependent upon the number of machines defined and the number of monitored process variables. The host automatically monitors its free space and alerts the administrator, via console messages, when space is getting low.

Printers

Printers for generating paper copies of reports and screen captures can be connected to the host computer directly or by Ethernet. Production reports are printed via client workstations using their default or user-specified printer.

8.1.1 Software Configuration

Software Configuration

This section describes the steps necessary for **first-time** configuration of the host computer. Another Chapter, Administering the Host Computer, provides information for general maintenance on an on-going basis.

There are two utilities that set up the host computer – **configure.f2k** and **netconfig**. The **configure.f2k** utility is used to define the host computer's time zone, your company name, host name, and authorization key. It is also used to start and stop information routing processes that run on the host. The **netconfig** utility is used to define and change the host's Ethernet/internet and Slip addresses.

Configure.f2k Utility

1. Log into the host computer as *root*. The initial password is *pstar*.

2. Check to make sure that the shop floor processes are running. Two processes automatically startup upon booting. Type in **psg sfd** and then **psg pcd**.

3. The following should appear. The highlighted entries indicate that the Panorama processes are running.

   psg sfd

   ```
   (A)   00:00:00 sh -c (sfd -s 60; CODE=$?7; DIFF…
   (B)   00:00:00 sfd -s 60
   ```

   psg sfd

   ```
   (A)   00:00:00 sh -c (pcd ;CODE=$?7; DIFF=`dc >…
   (B)   00:00:00 pcd
   ```

   NOTE: More lines than shown above may appear.

4. At the shell prompt, type in **configure.f2k** and press the <**ENTER**> key. This command starts up a utility to facilitate setting up your system. The following menu appears:

   ```
                --Focus2000 Configuration--
       Select Configuration Option

       --------------------------------------------------
            1.       Set Time zone
            2.       Set System Time
            3.       Set Authorization Key
            4.       Set Company Name
            5.       Set Host name
            6.       Enable / disable startup
            7.       Start MySQL / Panorama
            8.       Stop MySQL / Panorama
            9.       Configure Email Server
            10.      Configure CD Burner
            0.       Exit
       --------------------------------------------------
                    < OK >              <Cancel>
       --------------------------------------------------
   ```

5. Menu items 1 and 4 must be done for a first time software configuration. Each menu item asks a series of questions. Be careful when answering these questions. The **configure.f2k** program does not always have verification prompts

6. To set the time zone, type in **1**, tab to **<ok>**, and press **<ENTER>**. The following displays on the screen.

```
    The MySQL RDBMS and Panorama will now be stopped.


After the time zone is set MySQL and PlantStar will be restarted.
        ---------------------------------------------------------
              < Yes >                 < No >
        ---------------------------------------------------------
```

7. The first question is a warning message. Tab to **<yes>** and press the **<ENTER>** key to continue. After Panorama and MySQL are stopped, the following will appear.

```
          --HARDWARE CLOCK SET TO UTC--

    Is  the  hardware  clock  set  to  Coordinated  Universal  Time
    (UTC/GMT)? If it is, select YES here. If the hardware clock
    is set to the current local time (this is how most PCs are
    set up), then say NO here. If you are not sure what this is,
    you should answer NO here.

        ---------------------------------------------------------
        NO          Hardware clock is set to local time
        YES         Hardware clock is set to UTC
        ---------------------------------------------------------
              < OK >                  <Cancel>
        ---------------------------------------------------------
```

8. Type **n** (or **y),** tab to **<ok>**, and press the **<ENTER>** key to continue. The time zone options will appear.

```
            --TIMEZONE CONFIGURATION--
        Please select one of the following time
            zones for your machine:
    ---------------------------------------------------------
    US/Alaska
    US/Aleutian
    US/Arizona
    US/Central
    US/East-Indiana
    US/Eastern
    US/Hawaii
    US/Indiana-Starke
    US/Michigan
    US/Mountain
    US/Pacific
    US/Samoa
    Africa/Abidjan…
    ---------------------------------------------------------
          < OK >                  <Cancel>
    ---------------------------------------------------------
```

9. Scroll to select the desired time zone, tab to **<ok>**, and press **<ENTER>**. Panorama will restart and the configuration menu will return.

10. The second option on the configuration menu is to set the system time. Select **2**, or scroll to the entry, tab to **<ok>**, and press **<ENTER>**. A warning prompt will appear.

```
------------------------------------------------------------
Panorama will now be stopped.
After the time is set Panorama will be restarted.
------------------------------------------------------------
       < Yes >                    < No >
------------------------------------------------------------
```

11. Respond with "yes", again, with tab to **<yes>** and press the **<ENTER>** key. After Panorama is halted, a "Set Date" panel will be presented.

```
                    --Set Date--
    Move between boxes with the Tab key.
    Use the arrow keys to change values.
                        ?
    Month                   Year
    ------------------------------------
    March                   2008
    ------------------------------------
    ------------------------------------

    Sun Mon  Tue Wed Thu   Fri  Sa
                                 t
                                 .
    2     3   4   5    6    7    8
    9    10  11  12   13   14    15
    16   17  18  19   20   21    22
    23   24  25  26   27   28    29
    30   31
    v(+)
    ------------------------------------
       < OK >           <Cancel>
    ------------------------------------
```

12. Tab to the Month, Year, and Day fields and use the scroll keys to select the appropriate values. Then tab to **<ok>** and press **<ENTER>**. The "Set system Time" panel will appear.

```
              --Set System Time--
       Move between boxes with the Tab key.
       Use the arrow keys to change values.

              10 : 55 : 55

       --------------------------------------
          < OK >      <Cancel>
       --------------------------------------
```

13. Move between the hours, minutes, and seconds, and then use arrow keys to scroll to the desired values. Note the 24 hour clock vs. a.m. and p.m. When ready, select **<ok>** and **<ENTER>**, as before. The time and date will be reset, Panorama will be restarted, and the configuration menu will return.

14. Setting the authorization key, item 3, will be done by SYSCON-PlantStar personnel.

15. Select item **4** as previously-described to set the company name. This task does not

reboot the computer. A screen similar to the following appears.

```
            --Company Name--
    Your company name is currently:
                      ?
    SYSCON International, Inc.
                      ?
 Select Yes to change the name or No to abort.
     ---------------------------------------
          < Yes >            < No >
     ---------------------------------------
```

16. Select **<Yes>** and press the <**ENTER**> key to change your company name. Edit your company name in the subsequent panel.

```
            --Company Name Update--
    Please enter your new company name (up to 50
    characters)
    ------------------------------------------------------
                My Company Name
    ------------------------------------------------------
          < OK >          <Cancel>
    ------------------------------------------------------
```

17. After updating your company name, select **<ok>** and **<ENTER>**. The system responds with:

```
    ---------------------------------------------
    Company name update completed.
    ---------------------------------------------
              < OK >
    ---------------------------------------------
```

18. Select **<ok>** and return to the configuration menu. Once finished with running all four menu items, exit the **configure.f2k** program by selection option **0** (zero) and **<ENTER>**

19. Verify that the network environment is working. On a previously-configured workstation, PING to the host computer.

Typical Installation Results

A successful host computer installation performs the following operations:

- ·   Sets up the host computer hardware: console terminal, modem, and tape drive
- ·   Sets the computer's time zone
- ·   Sets the computer's company name
- ·   Sets the computer's Ethernet/internet address
- ·   Enables workstations to ping to the host computer

On the host computer, all system files are located in the directory, **/focus2000**. This directory has four sub-directories. A brief description of each follows:

Directory	Purpose
DBextended	Stores auxillary data files
installed	Stores binary executable files and environment scripts
log	Stores log files for all processes;
tmp	Used for sorting and other miscellaneous tasks

8.2 Administering the Host

Administering the Host Computer

System monitoring of the host computer may need to be done periodically. Several LINUX commands are described below to help in this monitoring activity. Your system provides additional commands for viewing the status of the shop floor routing processes, identifying current system users, and viewing your authorization string.

System Monitoring Commands

cat <filename>
Displays contents of a file. This command is useful for looking at the contents of log files, etc. If a file is large, the **tail** command may be more efficient. Combine the **cat** command with the **more** command to view files page by page:

cat sfd.log | more
Note: you must be in the **/focus2000/log** directory in order for this command to find the **sfd.log** file.

df -l
Displays the amounts of free disk space and the percentage used. One line of information appears for each defined file system. This command is useful for determining when to archive system job information. It is recommended that one-third of the available space always remain free.

Sample Output:

```
Filesystem          1K-blocks      Used Available Use% Mounted on
/dev/md1             1003932     535244    468688  54% /
/dev/md3           132267060    9596352 122670708   8% /var
/dev/md4             2007932      82876   1925056   5% /tmp
/dev/md5            10008072    5805064   4203008  59% /home
/dev/md6             9992008    5094440   4897568  51% /usr
```

f2kdown <Level> <Time>
This utility will signal an orderly shutdown or startup to all active workstations. Usage: f2kdown [Level] [Time]
      Level - Shutdown level -1 =shutdown, 0=startup
      Time - Minutes to wait before shutdown, 0 to 99

f2kulog -l
Displays a list of users currently logged into your system. This command can also be used to delete any user processes that no longer respond from the workstation.

Sample Output:

LOG SEQ	LOGIN TIME	USER INET ADDRESS NAME (station)	PCC PID
10047	06/16/1994 08:46:42	pstar 128.1.11 .2(engtest2)	16075

Several other options are available for this command:

-d *SEQ*   Deletes the F2K user login where LOG_SEQ = SEQ

-d *all*   Deletes all existing F2K user logins.

-k *SEQ*   Deletes the F2K user login where LOG_SEQ = SEQ **and** kills the associated f2kpcc process. This option is used when the workstation has become unresponsive.

ls
Displays a list of files for a directory in alphabetic order. If the **-l** option is used with the ls command the mode, number of links, owner, group, size (in bytes), and time of last modification for each file displays. If the file is a special file, the size field contains the major and minor device numbers. If the file is a symbolic link, the path name of the linked-to file is printed preceded by a **->**. The attributes of the symbolic link are displayed.

more
Paginates displayed information; can be used with almost any Linux command.
For example:

    set | more   = displays current environment variables page by page.
    cat sfd.log | more   = displays the sfd.log file page by page for ease of reading.

Use the space bar to scroll to the next page of information;
Use the <**ENTER**> key to scroll one line;
Press the **Q** key to stop viewing the information in question.

ps -ef
Displays active processes in terms of time started, process IDs, and other general information. List has headings for each column of information provided.

Sample Output:

USER	PID	TTY	STAT	TIME	COMMAND
root	29501	tty3	Ss+	0:00	-bash REMOTEHOST=…
root	1647	tty6	Ss+	0:00	/sbin/agetty 38400 tty6…

read_auth
Displays the host computer's current authorization string as well as all authorized system features. A **Y**es or **N**o appears after each available feature.

Example Output:

```
Authorization Utility for Panorama, Version 4.30

Authorization String: PIBPHFCE IBKFFLBH GHEKGOLM QHEHFIQH DIKIKEBE

         ********** Authorized Features ************
 1(10)Max Users    | 2(Y)PVAR          | 3(N)Camac XTA     | 4(Y)Maco 8000
 5(N)Moog          | 6 (N) GageTalk    | 7 (N)Mitutoyo     | 8(N)Mettler
 9(Y)Engel         |10(N)Precisa       |11(Y)Camac 486,VSX |12(N)Camac VLC
13(Y)Roboshot,ACT  |14(N)CRT-C         |15(Y)Pathfinder    |16(N)Accudata
17(N)BetaMUX       |18(N)HPM CMD       |19(N)Unilog 9000B  |20(Y)Toyo
21(N) NetStal      |22(Y)L Type TC     |23(N)Extended SPC  |24(Y)Husky
25(N)JSW uPac      |26(Y)Mat Lot Track |27(Y)Multiple Mat  |28(Y)Profile
29(N)RKC F900      |30(Y)Toshiba       |31(Y)Tote Label    |32(Y)Voice
33(N)Maco 4000     |34(Y)Setup Sheets  |35(N)Square D      |36(N)A-B PLC5/E
37(Y)A&D Scale     |38(N)TI-545 PLC    |39(Y)Ext Down/Rej  |40(N)Kawaguchi
41(N)Hekuma        |42(Y)Delta         |43(Y)Panorama      |44(N)Portrait
45(Y)Family Mold   |46(N)KuDA          |47(N)AC-9000       |48(Y)Design Mangr
49(Y)Labor Track   |50(N)French        |51(Y)German        |52(Y)Spanish
53(Y)Dutch         |54(N)Chinese       |55(N)Language 6    |56(N)Language 7
57(N)Language 8    |58(N)Language 9    |59(N)Language 10   |60(N)Language 11
61(N)Language 12   |62(N)Language 13   |63(N)Language 14   |64(N)Language 15
65(N)Language 16   |82 (200)Max Machines
Use -x option to print additional
features. bash$ read_auth -x


Authorization Utility for Panorama, Version 4.30

Authorization String: PIBPHFCE IBKFFLBH GHEKGOLM QHEHFIQH DIKIKEBE

         ***********Extra Features**********
66(Y)Sartorius     |67(Y)Asset Manage |68(Y)Nissei        |69(N)Ext. MatLot
70(Y)OPC_plc       |71(Y)SPI_plc      |72(Y)Labor Auth    |73(Y)Tech Connect
74(N)Cycle Log     |75(N)Rate Based   |76(Y)Arburg        |77(Y)Ohaus
78(Y)Indusoft Dryer|79(Y)Sequencing   |80 (N)Extreem      |81 (Y)Maco 6000
83(N)AB DF1        |84(Y)Branson      |85(N)Peet Bros
```

set
Displays current environment variables.

sfdctrl -stats
Reports the current status of the shop floor routing process.

Sample Output:

```
Panorama shop floor daemon control program, version 4.30

Requesting status from sfd.
localhost:sfd is online and active.
Debug level logging is disabled.
Trace level logging is disabled.
Shop floor daemon statistics. Accumulation interval = 60 minutes.
Overall stats:
  Avg service time = 0.000, Max = 0.000, Count      = 1
  Avg idle time  = 1739.000, Max = 2.000
Datagram stats:
```

```
    Received = 1, Unknown type = 0, Bad size = 0
  End-of-cycle stats:
       Service     SF-comm     DB-update
   Count              0
   Avg time    0.000        0.000       0.000
   Max time    0.000        0.000       0.000
  Shop floor update stats:
   Avg service time = 0.000, Max =0.000, Count = 0
```

su - <user name>
Changes a user's privileges and authorizations to those of the specified user. If no user name is provided, the current user's privileges will be changed to those of the **Root** user id.

tail <number of lines> <filename>
Displays the end of a file. This command is useful when a file is large like the log file for the shop floor routing process.

An example valid command is:

tail -40 sfd.log   displays the last 40 lines of the **sfd.log** file
tail -f sfd.log   displays the end of the **sfd.log** to the terminal
                         monitor and continues to display new output until **<Delete>**
                         is typed.

Startup and Shutdown Procedures
Your system is designed to run continuously. It is extremely rare that the host computer will need to be powered down or rebooted. It is also rare that any process will need to be manually stopped or started. Step-by-step instructions on startup and shutdown procedures are included, though, in the case of known power outages and extreme error conditions. It is recommended that you contact **SYSCON-Intl Customer Support** before attempting to manually start and stop processes.

Starting System Processes
The shop floor message and routing processes (shop floor daemon) are configured to automatically start up upon booting the host computer. Use the **ps** command to verify that they are running.

If the shop floor processes have been stopped and need to be re-started, use the **configure.f2k** utility. This utility starts up all system processes without the need for rebooting the host computer.

1. At the system prompt, type in **configure.f2k** and press the <**ENTER**> key.
2. The following screen appears.

```
        --Focus2000 Configuration—
      Select Configuration Option
   ------------------------------------------------------
      1        Set Time zone
      2        Set System Time
      3        Set Authorization Key
      4        Set Company Name
      5        Set Host name
```

```
      6         Enable / disable startup
      7         Start Mysql / Panorama
      8         Stop MySQL / Panorama
      9         Configure Email Server
     10         Configure CD Burner
      0         Exit
  ------------------------------------------------------------
  ------------------------------------------------------------
      < OK >              <Cancel>
  ------------------------------------------------------------
```

3. To start up system processes, select menu item 7. This menu item does not reboot the host computer.
4. This process takes a few minutes. When complete the **Configuration** menu returns.
5. Type in **0** (zero) to exit **configure.f2k**.
6. Wait about 5 minutes for all system processes to start.

Stopping System Processes

If an error situation is occurring that necessitates stopping all system processes, use the **configure.f2k** utility.

1. At the system prompt, type in **configure.f2k**.
2. The following screen appears.

```
          --Focus2000 Configuration—

          Select Configuration Option
   ------------------------------------------------------------
   1              Set Time zone
   2              Set System Time
   3              Set Authorization Key
   4              Set Company Name
   5              Set Host name
   6              Enable / disable startup
   7              Start MySQL / Panorama
   8              Stop MySQL / Panorama
   9              Configure Email Server
  10              Configure CD Burner
   0              Exit
    ----------------------------------------------------------
    ----------------------------------------------------------
      < OK >              <Cancel>
    ----------------------------------------------------------
```

3. To stop all system processes, select menu item **8**. This menu item does not reboot the host computer.
4. Upon completion, the **Configuration** menu returns.
5. Type in **0** (zero) to exit **configure.f2k.**

Rebooting The Host Computer

If an error situation occurs that necessitates rebooting the host computer, follow these instructions.

1. At the system prompt, type in **shutdown –r now**. Note that this command is case-sensitive.
2. The system shuts down all active processes and then reboots. At times the process appears to pause. This is normal behavior.
3. All system processes are automatically started upon boot up. They do not have to be manually started.
4. Log back in.
5. Wait about 5 minutes for all system applications to start.
6. If desired, check the shop floor processes to ensure that they are running. Type in **ps -ef**:

PID	TTY	STAT	TIME	COMMAND
29501	pts/1	Ss+	0:00	-bash REMOTEHOST=…
1647	tty6	Ss+	0:00	/sbin/agetty 38400 tty6…

!!!Caution !!!
Do not press the **RESET** button on the host computer to reboot. This action can result in serious complications.

Powering Down The Host Computer
There are times when the host computer needs to be powered down -- either for power outages or maintenance. If any of these situations arise, follow these instructions:

1. At the system prompt, type in **shutdown –h now**. Note that this command is case-sensitive.
2. A message appears stating the shutdown program has begun. At times the process appears to pause. This is normal behavior.
3. Once shutdown has been invoked, it must be allowed to run to completion.

!!!Caution !!!
Do not just turn the power switch off. This action can result in serious complications.

8.3 Archiving Data

Archiving Data
Your system collects and stores large amounts of historical information. After a period of time, the host computer's disk space becomes full. To free up disk space, your system provides an archiving utility. This utility, **archive.f2k**, saves completed job information to a file, CD or CDRW and then removes it from the database. The file can be FTP'd to a backup file system. On the QuickShot System the file must be ftp'd to another computer; CD or CDRW backup is not provided. It is recommended that you contact **PlantStar Customer Support** before archiving. This topic is covered in Application Note 2004-06.

Archiving should be done before the host computer's disk space is used up. Checking the host computer's disk space is done via the **df** command. The amount of disk space displayed, in combination with plant guidelines, determines the timing of the archive process. Note that the **archive.f2k** utility **does not** save all Portrait information. For a complete back up of your system, refer to the next section on Backing Up the System.

NOTE: We recommend archiving no more than three months worth of data at a time.

Once job information is stored on a file, CD or CDRW, it can be restored for system users. The **unarchive.f2k** utility provides this function.

To obtain a list of completed jobs available for archiving before a specific date:

1. Log onto the host computer.
2. At the system prompt, type in **archive.f2k –l –e YYMMDD** and press the **<ENTER>** key.
3. A listing similar to the following should appear:

```
f2karc    -l          -e 060101
Panorama History Archive V4.30

preparing job list by DATE
.
preparing shift list
.
preparing material list
.
The list of jobs finished before 2006-01-01 23:59:59:


  1. job=Idle, family _seq=-150381, family _count 1
      1 ss records, 0 spc records, 0 ls records,
      1 jts records, 1 mls records, 0 ts records

  2. job=, family _seq=0, family_count 0
     0 ss records, 0 spc records, 0 ls records,
     0 jts records, 0 mls records, 11 ts records
```

To archive and remove jobs completed before a specific cutoff date:

1. Log onto the host computer.
2. Select the media you wish to use and put it into the host. The archive utility will check CD or CDRW for usability automatically.
3. Decide on a cutoff date for completed jobs. The archive process generally takes at least 30 minutes to run for an average number of jobs. The more SPC information that is collected per machine, the longer the archiving process takes.
4. At the system prompt, type in **archive.f2k -e *YYMMDD* -r -y –m <media>** where *YYMMDD* is a desired cutoff date and **<media>** is the media you are archiving to. The **-r** option removes all archived jobs from the database after writing them to the media. The **-y** option will not prompt for individual confirmation of each job to be archived. If you wish to individually confirm each job, do not add the **-y** option.
5. A message prompting for media appears. Press the **<ENTER>** key.
6. The archiving process begins.

Several other options are available for the archive command. All options and their

descriptions are provided below:

archive.f2k [-cdlnqrtyz] [+f] -m media [-e YYMMDD] [-j JOB_NAME] [-A num_months]

-A NUM_MONTHS   Automatic archive jobs finishing before NUM_MONTHS.

-c   Counts jobs and records only.

-d   Enables debug level message log.

-e   YYMMDD Cut-off date (in YYMMDD format), archive
only those jobs that finished before the given cut-off
date.

-j JOB NAME   Archive those jobs that match the given job name.

-l   Lists jobs only, no archive

-m <media>   Write Archive to media type <media>. (No
Default) Valid values are: file, cdr, cdrw, and
ftp. Files are originally written to
/focus2000/tmp/archive
cdr, cdrw, options remove files after the disk is verified
ftp removes files after ftp is verified.
file leaves files in directory until manually
removed. Copies of files are kept in
/focus2000/tmp labeled as **f2karc.dat** and
archive.dat until manually removed or
overwritten by next archive.

-n   Prevents archiving. This option is intended for use with
the **-r** option to allow the permanent removal of
unwanted job histories.

-q   Run all queries, but don't archive.

-r   Remove the jobs from the database after archived.

-t   Enables trace level message log.

-y   Don't prompt for confirmation for individual jobs when archived and
removed.

-z <file> Specify <file> path/name to use with media file type. File
automatically has .dat extension added.
All data files are automatically zipped (.gz added)
The archive.dat file is copied as archive-<file>
Note: the default file (**f2karc.dat** and **archive.dat**) remain
In the **/focus2000/tmp** directory until removed or overwritten.

NOTE: Either the -j or -e option must be used, not both.

To obtain a list of archived jobs on CD or CDRW:

1.   Select the archived media and put it into the host.
2.   Log onto the host computer.
3.   At the system prompt, type in **unarchive.f2k –l –z** and press the **<ENTER>** key.
4.   A listing similar to the following appears:

Options: f2kunarc program -z -l "" ""
mount: block device /dev/cdrom is write-protected, mounting read-only
found opt file: f2karc-060101.dat.gz
looking for archive-060101 .dat

Historical Job Data of Panorama 0.
Date of Archive: 2008-04-14 10:53:01

The list of jobs found in the archive:
1.   job=Idle, family_seq=-1 50381, family_count 1
      1 ss records, 0 spc records, 0 ls records,
      1 jts records, 1 mls records, 0 ts records

2.   job=, family_seq=0, family_count 0
      0 ss records, 0 spc records, 0 ls records,
      0 jts records, 0 mls records, 0 ts records

8.4 Backing Up the System

Backing Up The System

SYSCON-PlantStar provides automatic back up capabilities of all system information. The timing and frequency of backups is configurable. When determining a backup schedule, keep in mind the following:

- The length of time between backups determines the amount of risk you are willing to take on the potential loss of data. If, for some reason, the system database becomes corrupted, backups are used to restore all information. The database is restored to the *point in time* when the backup was done. SYSCON-PlantStar recommends at least a weekly backup schedule.
- The system application is available during the backup process. Users are able to log in. shop floor information is still collected during this down time.
- The CD or CDRW disc must be large enough to store the system database. The backup utility does not write to multiple CDs. If multiple CDs are necessary, contact **SYSCON Customer Service**.
- The backup process can take up to an hour for large databases.
- PlantStar's backup utility incorporates database maintenance and clean up commands which affect the performance of system applications.

Backup schedules are implemented by SYSCON-PlantStar personnel upon request. When backup needs are ascertained, contact **SYSCON-PlantStar Customer Service**. Once the backup schedule is set up, it is the System Administrator's responsibility to maintain the backup schedule:

1.   Select a media and place it in the drive at the designated backup schedule time. You can put the media in ahead of time. Once the backup is complete, change media on the morning after the scheduled backup and leave it in until the next scheduled time.

2. To check the backup logs, type in **cd /focus2000/log** to change directories.
3. Review the backup.log file. Type in **cat backup.log | more**. Any errors that occur during the backup process are written to this file.

Note: **backup.f2k** MUST be run with specific command line switches. You should review your current settings before attempting to backup independent of a scheduled backup. It is always wise to contact **Customer Support** prior to issuing a **backup.f2k** command.

For informational purposes only, the command line argument explanation follows:

Backup script for Panorama 4.30 started Tue Apr 15 14:36:52 CDT 2003
Usage: /focus2000/installed/bin/backup.f2k [-ik] [-s <media>] [-w <device>] [-d <tmp_dir>] [-t <type> | - [cmou]]

Option descriptions:

-d <dir>	Use directory <dir> for temp space. Default is F2K_DIR/tmp/backup for one-disk systems, and /Database/backup for two-disk systems.
-s <media>	Write backup to media type <media>.Valid values are hd, cdr, and cdrw. The default is cdr.
-t <bckup_type>	Perform <bckup_type> type backup. Valid values are checkpoint, online, maintenance, unload.
-c	Perform checkpoint backup.
-m	Perform maintenance backup.
-o	Perform online backup.
-u	Perform unload backup.
-i	Use semaphore to synchronize access to tape device.
-k	Remove old checkpoint files from disk (online backups only.)
-w <dev>	Specify backup device location. Defaults are /dev/nrct0 for tape; /dev/rcd0:5,0 for CDR and CDRW; and the current directory for hard drive.

Running **backup.f2k** with no arguments will perform a checkpoint backup to CDR.

4. The following is a sample backup log file with no errors:

System shutdown.
System snapshot daemon control program
Sending shutdown request to sfd.
Waiting for confirmation from
sfd. Shutdown confirmed.
PC daemon control program, version 2.0
Sending shutdown request to f2kpcd.
Waiting for confirmation from f2kpcd.
Shutdown confirmed.
Terminating qaspcd; pid = 10725
System shutdown complete.

.

```
.
beginning checkpoint to tape /dev/rmt0. 1 of 1 locations
Sun May 8 00:10:25 1994 CPP: Starting checkpoint of location: focus2000 to tape:
path = '/dev/rmt0. 1',
file = 'c0003001.ckp'.
mount CDR and press return
tar: /dev/rmt0. 1
a ./focus2000/install/up2.scr 61 blocks
a ./focus2000/install/up3.scr 60 blocks
a ./focus2000/install/up4.scr 40 blocks
a ./focus2000/bin/f2krep 61 blocks
.
.
.
f2kdbmod - Compress table structures in database focus2000
rows)
Continue
* * * Executing ...
rows)
Continue
* * * Executing
.
.
.
System startup complete.
```

Backups can be run on-demand:

1. Select a media and place it in the drive.
2. Log in as **root** to the host computer.
3. At the system prompt, type in **backup.f2k, (options).** The backup utility writes all necessary files to the media, **or** runs some database maintenance programs.
4. All status and output information appears on the screen for this utility.

8.5 Host Log Files

Host Log Files

Host computer log files are located in the **/focus2000/log** directory.

Log File Name Contents

backup.log	Log file containing status messages from the last Portrait backup
eoj.log	Log file containing status messages from the last time end-of-job reports were generated
eos.log	Log file containing status messages from the last time end-of-shift reports were generated
f2karc.log	Log file containing status messages from the last Portrait archive task
f2kunarc.log	Log file containing status messages from the last Portrait unarchive task
f2kpcd.log	Log file containing status messages about the PC connection to the host

computer

sfd.log   Log file containing status messages about the shop floor message and routing process

8.6 Software Upgrades

Software Upgrades
Special maintenance updates for the host computer are done via the **update.f2k** utility. During an update, users do not have access to system applications.

If an update is received, follow these instructions:

1. Log onto the host computer as **root**.
2. Ensure that all system users are off the system.
3. Go to the following directory:

   cd /focus2000/installed/install

4. At the system prompt, type in **update.f2k**.
5. The update utility checks user privileges, shuts down all system processes, backs up production data, and then installs the update. At certain points, the procedure asks whether to proceed or abort the update process. Answer **y** to continue, **n** to stop.

   Sample Output of update.f2k utility

System update script.

***** **WARNING** *****

This script is intended for updating the system host software from a PlantStar supplied distribution media.

Shutting down system services.

***** **WARNING** *****

This update script must have **EXCLUSIVE** access to the system database. Failure to comply with this requirement may cause the update to fail and/or the system database to be corrupted.

This script will now pause until it has exclusive access to the system database. If you are unable to close all open sessions, press **<CTRL-C>** to abort this script.

Proceeding with update.

Please insert the media labeled "Final Backup Before Update" which came with the update kit. Proceed with final backup **-> y**

Compressing the database...
Checkpointing database to media...

Please remove the media. Turn the write protect indicator to **SAFE**.
Store the media in a safe place.
Proceed with final backup **-> y**

Please insert the media labeled "*Host Distribution*" which came with the update kit. Proceed with update **-> y**

Pausing for any manual adjustments before proceeding with the version specific portion of this update.

Press **<Enter>** to proceed, **<Ctrl>-C** to abort ->

5. Once the distribution media is read, the update procedure prompts for continuation.
6. When finished, the system prompt appears.

If an update requires on-site support, advance notification is provided.

8.7 Product Standards Import

Product Standards can be imported from other systems or databases via a transfer of records and fields in ASCII format. The layout of the data can be configured to meet the customer's needs. The application used on the system host to accomplish this task has several parameters as shown below:

primp

Focus-2000 product standards import program, version 4.10

Usage: primp PS_ASCII_FILE [-a] [-d] [-f] [-n N _MAX] [-s FMT_SEQ]

-a   Update all machines for a matching product if a particular machine is not specified.

-d   Enable debug level logging.

-f   Use default product standard to update missing fields if there is no matching product standard.

-n N_MAX   Import only first **N_MAX** product standards from ASCII product standards file into database. If **-n** option is not used, all product standards in the file will be imported.

-s FMT_SEQ   Sequence number of the file/field format used for converting product standards file into database. If **-s** option is not used, the first format in the database will be used.

Additionally, this import can be used on a recurring basis for those companies that make engineering changes regularly to Product Standards. Our Customer Support staff will create the initial upload for you, as well as configure a recurring upload if needed.

8.8 Work Orders Import

Some customers wish to integrate their scheduling efforts with other systems. This is made possible by the import of new Work Orders from another system. Our system host utility allows customers the flexibility to import a list of jobs to be scheduled, or if desired, an entirely configured "master schedule". Our Customer Support staff will configure the import capability with your data file. It can be run on command or on a recurring basis.

woimp

Usage: woimp WO_ASCI I_FI LE [-a][-C][-d][-f][-n N_MAX][-p S_PORT][-s FMT_SEQ]

-a   Import-**ADD** mode. Bring in only non-existing orders.

-C   Clear-and-replace mode. This option will clear all current job queues and then place those imported work orders that have machine name and queue position specified into job queues accordingly.

-d   Enable debug level logging

-f   Use default job standard if there is no matching job standard.

-h   Do *not* check history for duplicate work orders.

-n N_MAX   Import only first **N_MAX** work orders from ASCII work order file into database. If **-n** option is not used, all work orders in the file will be imported.

-o   Only look for duplicates in the work order list

-p S_PORT   Service port of shop floor daemon for datagram. The default is "**f2k-sfd**".

-r   Remove mode. This option will remove current work orders before import begins.

-s FMT_SEQ   Sequence number of the file/field format used for converting work order file into database. If **-s** option is not used, the first format in the database will be used.

-u   Stop and replace the current running job. This option will stop and replace the current running job on the DCM for an imported work order with its queue position set to zero.

8.9 Production and/or Process Data Export

Your system collects various types of valuable information that could be used by other systems. One of the utilities we provide for this purpose is the Product/Process Data Export Utility. Our Customer Support staff will, with your assistance, select the desired fields of data that can be used in other company information systems. This export can be configured to run on a recurring basis or on demand, and can also be configured to transfer the created data files to the appropriate server that will use the data.

f2kexp

Panorama Production/SPC/Labor/Material Lot export program, version 4.31

Usage: f2kexp [-e] [-d] [-r] [-j JOB_NAME] [-J JOB_SEQ] [-p [PROD_FILE]]
          [-s EOS_SEQ] [-f FMT_SEQ] [-x [SPC_FILE]]

-e   Exclude idle jobs from job and shift production exports. Idle
        jobs are defined as those having zero pieces required.

-d   Enable debug mode.

-r   Right justify all number fields, left justify all text
        This option is used primarily for any system that
        requires a fixed decimal point (such as an AS/400).

-j JOB_NAME   Export production and/or spc data for the
        job with the given JOB_**NAME**. This option cannot be
        used with the **-J** or **-s** option.

-J JOB_SEQ   Export production and/or spc data for the
        job with the given **JOB_SEQ**. This option cannot be
        used with the **-j** or **-s** option

-p PROD_FILE   Export production data for a job (with **-j**
        option) or a shift (with **-s** option) to the ASCII file
        PROD_FILE. If **PROD_FILE** is not specified, default
        name **prod.exp** is used.

-l LABOR_FILE   Export labor data for a shift with -l options to
        ASCII file **LABOR_FILE**. If **LABOR_FILE** is not specified,
        default name **labor.exp** is used.

-s EOS_SEQ   Export production and/or spc data for the
        shift with given **EOS_SEQ**. This option cannot be used
        with the **-j** or **-J** option

-f FMT_SEQ   Sequence number of the file/field format
        used for writing data to the work order file. The **-f** option
        must be used.

-x SPC_FILE   Export SPC data for a job (with -j option) or
        a shift (with -s option) to the ASCII file SPC_FILE. If
        SPC_FILE is not specified, default name spc.exp is used.

Exactly one of the **-j**, **-s**, or **-J** options must be used.
At least one of the **-p**, **-x** or **-l** options must be used.
The format sequence number must be specified (via the **-f** option.)

8.10 Job Schedule Data Export

Some customers prefer to use our ***Job Schedule Board*** to create the final actual machine
loading of their shop floor, but need to send that information to other information systems.
Our ***Job Queue Export Utility*** will generate a data file that can be used (imported) by those
other systems. As with other utilities we provide, it is flexible, can be run on demand, and can
be run on a recurring basis

f2kjqexp

Panorama Job/Work Order program, version 4.10

Usage: f2kjqexp [-d] [-r] [-e EVENT_TYPE] [-f FMT_SEQ] [-o OUT_FILE] [-m MACH_SEQ] [-w]

-d   Enable debug mode.

-r   Right justify all number fields, left justify all text
      This option is used primarily for any system that
      requires a fixed decimal point (such as an AS/400).

-e EVENT_TYPE   Export data for only the specified event.
      This flag is only valid for a machine log export template.

-f FMT_SEQ   Sequence number of the file/field
      format used for writing data to the export file. The **-f**
      option must be used.

-j   Export current and queued job data.

-o OUT_FILE   Export data to the ASCII file **OUT_FILE**. If
      OUT_FILE is not specified, default name **data.exp** is used.

-m MACH_SEQ   Export data for only the specified machine
      sequence number.

-w   Export work order data.

8.11 Material Lot Data Export

Customers that have purchased the Material Lot Tracking option almost always have the
need to export the data collected by their system to another information system that is
tracking inventory quantities, ISO Lot information or both. Our utility is flexible and can be
configured to run recurrently or on demand as the customer's need dictates.

\# f2kmatexp

Panorama Material Lot export program, version 4.10

Usage: f2kmatexp [-d] [-r] [-J JOB_SEQ] [-m [PROD_FILE]]
           [-s EOS_SEQ] [-f FMT_SEQ] [-C] [-L]

-d   Enable debug mode.

-r   Right justify all number fields, left justify all text. This option is
      used primarily for any system that requires a fixed decimal point
      (such as an AS/400).

-j JOB_NAME   Export production and/or SPC data for the job with
      the given **JOB_NAME**. This option cannot be used with the **-J** or **-s**
      option.

-J JOB_SEQ   Export material history data for the job with the
      given **JOB_SEQ**. This option cannot be used with the **-j** or **-s**
      option

-m MATERIAL_FILE   Export material data for a shift with **-m**
      option to ASCII file **MATERIAL_FILE**. If **MATERIAL_FILE** is not
      specified, default name **material.exp** is used.

-s EOS_SEQ   Export material data for the shift with given
      EOS_SEQ. This option cannot be used with the **-j** or **-J** option

-f FMT_SEQ   Sequence number of the file/field format used for

writing data to the work order file. The **-f** option must be used.

-C   Summary by material component.

-L   Summary by material lot id.

Exactly one of the **-s**, and **-J** options must be used.
The format sequence number must be specified (via the **-f** option.)
Only one of the **-C** and **-L** options may be used.

SYSCON - PlantStar System
User's Guide

Part

IX

9   Knowledge Base

9.1 Application Notes

Application Notes

The following list of **Application Notes** is available to all customers via FAX or email. Simply review the list and call **Customer Support** and request the document by the **App Note Number**.

App Note	Topic
91-004	PLC Serial Interface Handbook
92-001	SACK Code Listing/Explanations
92-002	High Speed Data Acquisition / Inj. Molding
92-004	Sensor Selection: Injection Molding Machines
92-005	Non-Normal Data Analysis in QA/S
92-008	Paralleling Existing Sensors
92-009	Configuring a CP3-32, CP3-32S, CP3-64
92-018	Printer Setups to Allow Labels to Work.
93-005	Net Parts Counting
93-006	Calculating Tonnage
93-007	Siemens/Pathfinder Up/Download Instructions
96-004	Checking Statistics at a Communications Processor
96-006	Power Conditioning
96-011	Identifying M-CIM hardware (CPU revision, memory)
96-015	Material Lot Tracking description.
97-010	HP Network Printer Setup for Portrait
97-012	Material Lot Tracking at DCM
98-006	PlantStar-Hekuma Communications Link
98-007	TI-545 PLC
98-008	PlantStar-Nissei Interface
98-009	Toshiba InjectVisor S10/V10
98-010	Toshiba InjectVisor S10/V10v Parameter List for PlantStar Process Variables
99-005	Adding a Permanent Route on Host (SCO and AIX)
99-007	Using *crontab* Feature
99-009	How to Troubleshoot the Custom Reports Ingres/Net Client
99-010	Disaster Recovery: Identifying a Failed Hard Disk or Partition
99-011	Disaster Recovery: Failed Second Hard Disk
99-015	New Boolean Equation Type JEQ_CYC2 in Panorama v2.40
99-016	CPU7.0 Board Information and Ethernet DCM16 Info. (DIP switches, etc.)
99-018	Changing the System Host Name When "**configure.f2k**" is not Available
99-021	Configure HP Network Printers Updated.
99-026	Implementing and Troubleshooting Import-Export Templates and Scripts
99-027	Checkpoint Backup Restoration Procedures
99-029	PowerChute Password Instructions and Procedures.
2001-001	Installing Lexmark Printer Drivers for SCO UNIX.
2001-002	Running Multiple Logins for **Shop Floor Monitor**.

2001-004   Installing Engel Serial Interface on RTLDCM's
2001-005   Linking the RTLDCM Browser Interface to Support Documents
2002-002   Creating Browser Links from **Setup Sheets**
2002-003   CIM/RTL Setup and Operation for Production
2002-004   Configuring IP Address on Linux Web-Pad
2002-005   Tips for Crystal Report Conversion for Family Molding
2002-006   Command Line Options for Multiple Vnode Printing
2002-007   Procedure to Change an Ethernet el7 to an rs485 el7
2002-008   Resetting APC Smart-UPS after Battery Change
2002-009   Nissei Interface
2002-010   RTL-Boot Disks
2002.11   Customer Host Upgrade Instructions X.10
2003.1   Database Transfer Host to Host
2004.1   Installation of Windows 2003 Server on a Host
2004.2   Toshiba Serial Cable Diagram
2004.3   Configuring the PlantStar Server as a Gateway
2004.4   Setting Up WINXP for dial-up slip
2004.5   Using **f2karc**
2004.6   Using **archive.f2k**
2004.7   PlantStar OEE Definitions
2004.8   Compaq Workstation Linux Slackware Install
2005.1   Excel Spreadsheet Problems and PlantStar
2005.2   Reiser Image Installation Guide
2005.3   **Pstar_setup** Instruction Guide
2005.4
2005.5   PlantStar Software Patch Installation
2005.6   **View & Print** User Privileges
2005.7   Touch 8 Set-Up Instructions
2006.3   **Process Journals** User Manual
2006.4
2006.5   Machine Removal Instructions
2006.6   PM Asset Import from External Source
2006.7   Using Excel or Access with PlantStar
2006-08   Using Microsoft Excel or Access with PlantStar
2006-09   Linux Serial and USB Device Management Using *usbconf*
2006-10   RTL Screen Saver Setup
2007-01   DNS Mail Server Setup
2007-02   Apache Web Server Daemon Change
2007-03   **Process Journal** User Manual
2007-04   **Process Journal** Administrator's Manual
2007-05   Understanding and Developing Digital Equations
2007-06   Passing Parameters in a Link
2007-07   Creating Browser Links from Setup Sheets **(Replaces 2002-01)**
2007-08   Configuring Remote System Logging
2008-01   Scheduled MySQL Backup
2008-02   Cincinnati Milacron Mosaic Control Instructions to Change Sequencer IP
                Address
2008-03   Linux Server Build Instructions
2008-04   OPC Client Application User's Guide
2008-05   APC UPS Configuration in Linux
2008-06   Ingres to MySQL Database Conversion
2008-07   Script & Directory Changes for Version 4.30

9.2 Arranging Windows and Icons

9.2.1 Arange Icons

To arrange the iconized windows into straight rows and columns, select the

Window menu on the main screen of you your system window.

Choose the **Arrange Icons** option.

9.2.2 Arrange Windows
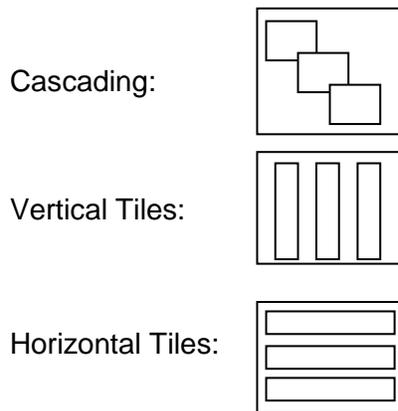
The windows can be arranged in 3 ways:

Cascading:

Vertical Tiles:

Horizontal Tiles:

To choose one of these styles, select the **Window** menu from the main screen of your system window. Select one of the options displayed.

9.3 Changing View Options

The *View* button opens the **View Options** window. This window filters the list of machines that appear on a **Monitor** window. The filtering is done by machine state or a selected machine list. Click on one of the circles to the left of the desired machine state. The **Monitor** window immediately changes its list of machines to those that are currently in the selected machine state.

Where can you find it?

> The **View Options** window is accessible from the **Material Usage**, **Production Summary**, **Exception Summary**, and **Machine Performance** windows.

What do you want to know about?

- Selecting a Machine State
- Selecting Specific Machines
- Selecting All Machines in a Display Group
- Clearing Machines
- Closing the Window

9.4 Colors

This image represents the possible machine states and their associated colors.

State	Color
Off-line	Black on white
Idle	Black on gray
Down	White on blue
Process Exception	White on magenta
Production Exception	White on dark cyan
Assist	Red on yellow
Slow	White on red
Fast	Black on yellow
Running	Black on green

9.5 Creating Work Orders

Work Orders are essentially jobs that have been defined but not yet scheduled. In order to schedule jobs, you must first create a work order. A work order consists of a set of job parameters. These parameters define the job. They include such things as the number of pieces required and the standard rate at which the pieces will be produced.

A work order may be created manually by entering the parameters or by loading in a product standard. Work Orders can be created from the Work Orders or Job Schedule Board windows.

From the **Work Orders** window:

- Click on the *New* button.
- Select a machine from the machine field.
- Move the cursor to the *Value* column for each desired parameter. Directly type in parameter values. If default information is displayed, edit it as desired by typing over it.
- Click on the *Apply* button to save the new work order after all relevant job parameters have been entered. Once a work order is saved for a machine, an asterisk appears next to the machine in the machine field. This asterisk signifies that a work order exists for the specific machine and product combination.

From the **Job Schedule** window:

- Click on ⬜ the button. The **Edit Job Parameters** window appears which looks similar to the **Work Orders** window.

- Move the cursor to the *Value* column for each desired parameter. Directly type in parameter values. If default information is displayed, edit it as desired by typing over it.

- Click on the *Commit* button 🔲 on the **Job Schedule** window to save the changes to the **Job Schedule Board**. If this step is not done, the changes will not be permanent or sent down to the shop floor.

9.6 FAQ - Frequently Asked Questions

Following are the most common questions asked about your system. Scan this list before you call **Customer Service**. Each question is followed by the answer.

Question 1:

What do I do when a message appears stating that system resources are too low to open a window?

Answer:

System resource limitations restrict the number of windows which can be open at one time. If you are running **your system** and several other programs, close one or more of the other programs. If you are only running **your system** and receive this message, close some of your open windows. To see how much free resources are available, select the ***About...*** menu item under the ***Help*** menu within **your system**.

Question 2:

Why did your system stop updating the ***Real-Time*** windows within ***Monitor***?

Answer:

If window information is not being updated, make sure all host computer programs are running. Specifically, the System Administrator should check and ensure that the shop floor routing process is running. Use the **sfdctrl -stats** command on the host computer to obtain the current status of the shop floor routing process.

Question 3:

Automatic reports are not printing. Why?

Answer:

If automatically scheduled reports are not running

- Open the ***Schedule Reports*** window under the ***REPORTS*** menu within the ***Monitor*** program. Ensure that the reports are correctly set up for the scheduled time. Make sure that there is a shift schedule for the _current_ year. (At year end, shift schedules do not roll over.)
- Check the printer to ensure it is ready and on-line.
- Use another program to try to print something to the printer.

Question 4:

Why does your system report that a machine is down (appears blue) when the machine is actually running.

Answer:

- The down threshold may be set too low. Open the ***Edit Current Job*** window in the ***Monitor*** program and make sure that the down threshold setting is larger than the current cycle time of the machine.
- The machine's DCM may not be receiving a contact closure from the machine. Check the wiring from the machine's relay to the DCM. Check the relay inside the machine cabinet. It should open and close each time the machine cycles. Make sure that all ribbon cables are seated securely at both ends.

Question 5:

Why would all machines show as off-line (appear white in the ***Monitor*** windows)?

Answer

- Make sure that there is power to the DCM.
- Check all wiring. Using a volt meter, measure the RS-232 voltages inside the DCM. Go to the COMM 1 section of the terminal board and measure the voltage across RXD and

GND. The voltage should be between -8.0 VDC and -11.0 VDC. If this voltage is not present, the wiring is faulty.

Question 6:
How can I find out the version number from a system distribution tape?

Answer
The system version number is documented within the **install.f2k** and **update2.sh** installation files.

·   Untar the first tar set on the distribution tape into a temporary (for example, **tmp**) directory.
·   Two files -- **update2.sh** and **install.f2k** -- now exist after the untar procedure.
·   View either file. Look for the **F2K_VERSION** variable within either file. This variable displays the version number for the distribution tape.

9.7 Getting A Screen Capture

Windows within your system can be printed using the standard *Print Screen Key* function and any windows application that will accept a Windows *Clipboard Paste*. This utility provides an easy way to capture and print either an active window or the entire screen. The screen picture can be resized and pasted into any Windows program which handles graphics such as Microsoft Word or Paint Brush.

9.8 JIT - Product Standard Matching

JIT scheduling is an authorized feature that allows customers to switch product standards by selecting from a drop-down list of products on the work order edit screen. For instance, the customer knows he needs to make "Cooties", but his ERP system does not know which of six tools will be used. Each tool defines a unique product standard. Work order import requires the import of a unique "Cooties" standard. Once this is completed, the user can go to the *Job Edit* screen and select from a drop-down list of **unique** tools (in this example) and over-write the work order with selected information from the selected product standard associated with that tool.

The implementation of this feature requires a custom import template to be written. Please contact **Customer Support** for information regarding this template.

9.9 Job Schedule Board Overview

In order to collect process variables and production data for a machine, a job must be assigned on that machine. The process of scheduling or queuing jobs is handled through the *Job Schedule* window.

The *Job Schedule* window consists of a Gantt style scheduling board. Calendar time is shown on the horizontal axis. Machines within a selected display group are shown on the vertical axis. Each row represents a machine's job queue and each rectangular block is a scheduled job. The first rectangular block for each machine is its current job. The block length indicates the expected run time for the job. Block labels are selectable. They can be either job or product names.

A job is scheduled by selecting a work order and placing it in the job queue of a given machine. By default, jobs are scheduled sequentially from left to right. There are two scheduling methods available within Panorama:

- Schedule jobs by earliest start date (default)
- Schedule jobs by due date

The default method on the *Job Schedule* window is for jobs to run immediately following the completion of previously-queued jobs. The estimated completion time of a job becomes the starting time for the next queued job. Under this method, jobs that are expected to be completed on time are shown in green. A red rectangular block indicates that a job will not complete by its estimated completion date. The default method is active unless the second scheduling method has been activated and/or saved during a previous session.

The second method is to schedule jobs by due date. This method places a selected job (or jobs) on the job board at the latest possible time which allows it to be completed by its due date. Specifically, a job's required by date is used as the starting point. The length of time to run a job is then used to walk backwards through the shift schedule to estimate the start date. Using this method, gaps may occur between a job's starting time and a previous job's ending time. These "gaps" are represented on the job board by gray blocks and indicate slack time where new jobs can be scheduled. Under this method, jobs that are expected to be completed on time are shown in green. If this method causes a subsequent job to become late, the late job's rectangular block is colored orange.

The marker, located along the top of the job board area, indicates which jobs are scheduled according to their due dates. All jobs to the left of this marker are scheduled according to the earliest possible start -- a job starts immediately upon completion of the previous job (method one). All jobs to the right of this marker are displayed on the job board according to their due dates (method two). (For more detailed explanations refer to the field help provided on the icon.)

NOTE: You must have the proper privileges in order to schedule jobs. See your System Administrator if you do not have the *Scheduling* privilege.

9.10 Job Scheduling Concepts

Once the shop floor is defined, its work schedule can be created. There are numerous steps for creating the shop floor work schedule. The first step in understanding how to schedule jobs centers around the *Work Center*. Work centers define how jobs are scheduled and when they run.

The following sections discuss some basic relationships about scheduling jobs. These relationships are presented here to facilitate the use of the *SCHEDULE* windows. Once understood, job scheduling within your system is straightforward.

Shifts

A machine follows one shift schedule -- the one belonging to its work center. It is important to design your work centers with this in mind. Each work center has a set of annual shift schedules. Annual shift schedules are divided into 52 weeks. Weeks start on Monday and end on Sunday.

Schedules for each week of the year can be set from one of twelve weekly schedules. Each weekly schedule defines the day-to-day shift changes for up to six different day shifts. Two idle periods per day are available for times when the machines should not be in operation. During an idle period, the machine's DCM ignores all inputs. Only idle time is accumulated. If no shift schedule is assigned to a machine, the machine is considered to be up 24 hours a day.

These shift schedules are important because they are used by your system to create historical production records. The production records are the raw data for the monitoring windows. A new historical production record is created for each machine at each shift or job change.

Jobs

A job is the basic unit which defines production monitoring on a machine. Every monitored machine in the system must have a job assigned to it. Scheduling a job is a two step process. Every job within your system starts as a work order, which is step one. A work order is a job which has not yet been scheduled on a machine. It consists of parameters which define how to monitor a job's performance and progress. These parameters are based upon the type of product produced and the machines on which the product will run. They, in essence, describe the job and set the standard for monitoring it. They define the line between the normal operating mode and various exception states for a machine. All monitoring is based upon these values. Examples of job parameters are job name, product, material, tool, standard cycle, pieces required, required date, and process limits. Care should be taken when defining job parameters. For instance, if the **Standard Cycle** parameter is set to 30 seconds and the **Cycle Tolerance** is set to 10 percent, a machine would be considered slow if its cycle time was currently 33 seconds. This same machine would be considered down if the down time threshold parameter was set to less than 33 seconds.

Job parameters also determine the expected run time of a job. The pieces required, standard setup and the standard rate factor are used when computing the completion date of a job. If 10,000 pieces are required and the standard rate is 50 pieces/hour, then the runtime of a job would be 200 hours. Add this to the standard setup time and you have the expected runtime of a job. The **Schedule Now** and **Schedule Factory** parameters also affect the calculated completion date. These fields determine if the shift schedule should be followed when computing the completion date.

Once a work order is created, it can be scheduled as a job -- the second step in job scheduling. Each machine has a currently-running job and a queue of jobs waiting to run. The scheduling person must know which jobs can be run on which machines. The main objective is to arrange the job queues so that as many jobs as possible complete on or before their required completion date.

Once started, a job cannot be removed or stopped. It can only be replaced by another job. If a current job is not complete when it is replaced with a new job, it can be suspended. A new work order is created. The **Pieces Required** parameter on this work order is set to equal the pieces remaining to complete the job. The comment parameter will indicate that this work order was created from a suspended job. The work order can then be scheduled on a new or the same machine at a future date.

A job is considered completed when the pieces required for a job is equal to the net pieces produced. When a job is completed, it may be set to an idle state if there is no new job in the

machine's queue. This "job idle state" is exactly the same as a shift idle period for a single machine. The machine's DCM ignores all inputs from the machine. To put a job in the idle state, set the job parameters "Schedule Now" and "Schedule Factory" both to No.

Additional Considerations:

Estimated completion dates for a job are only as accurate as the job's parameters and shift schedule. The parameters **Standard Rate** and **Standard Setup Time**: are especially important for accurate estimates.

To facilitate the creation of a work order, a **Product Standard** can be created. **Product Standards** are templates which contain the same parameters as a work order. A library of standards can be created and maintained within your system. When a work order needs to be created, a **Product Standard** can be loaded in and used as a base for the work order. **Pieces Required** and **Required Completion Date** are the most common parameters which are set when using a standard to define a new job.

A maintenance (non-production) job can be created within your system. This is accomplished by setting the job parameters **Pieces Required** and **Standard Rate** both equal to zero. The **Standard Setup** parameter can then be used to define the duration of the maintenance job.

9.11 Loading a Product Standard onto a Job

Any job can be updated by loading (copying) a product standard from the **Load Product Standard** window.

Where can you find it?

- The Load Product Standard window can be accessed from the Current/Queue Job, Work Orders, and Job Schedule Board windows.
- Click on the Load Std button.
- The Select Product Standard window appears. Select a product standard. Once selected, the Work Order window reappears with the job parameters of the desired standard.

9.12 Logging into your PlantStar system
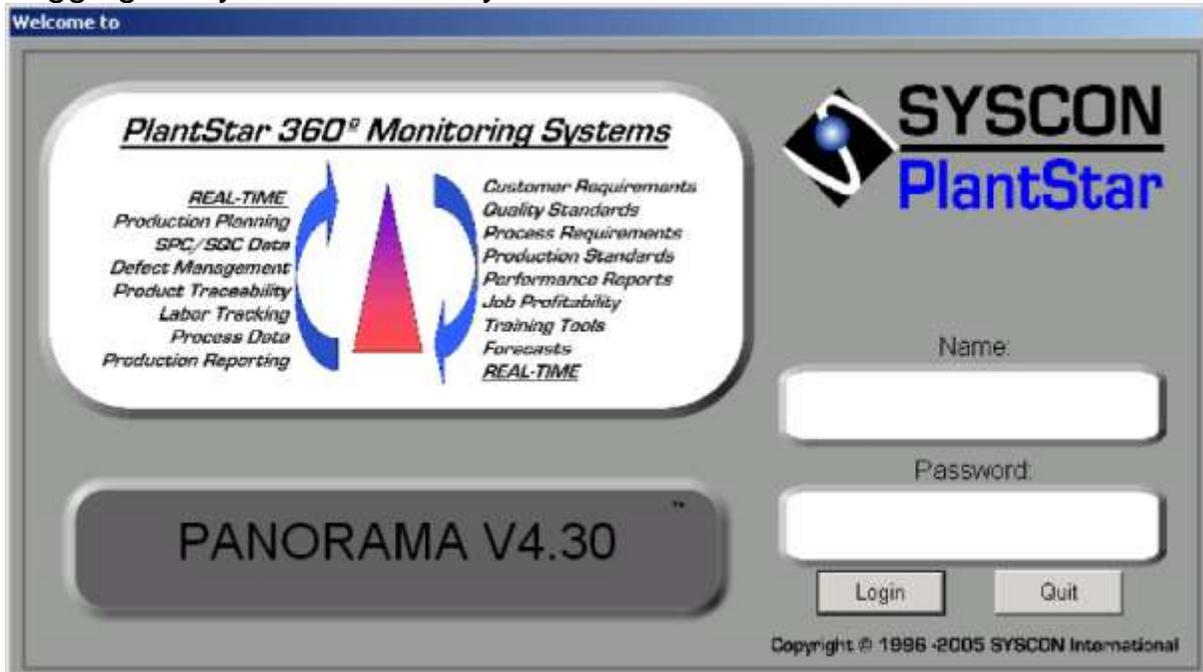
The login window provides security for all programs within your system. Only users that have permission to access the application are allowed. Only ONE Monitor session is allowed per workstation.

To access:

- Install the application into your Windows software.
- If the **Monitor** icon is highlighted, then double-click on the icon. If it is not highlighted, move the mouse pointer to the icon and then double-click on it.
- The main login window appears which asks for a user name and password. Both of these can be obtained from the System Administrator.
- Use the **<TAB>** key to go from field to field. After your name and password are entered, click on the *Login* button or press the **<ENTER>** key.

NOTE: If your password does not seem to work, first try to re-enter your password. If it still does not work, contact your System Administrator.

9.13 Material Lot Tracking Concepts

Every monitored machine has a job assigned to it. The job has a defined material formula. This formula can consist of up to four raw materials. Once a job is running on a machine, its associated DCM enables the entering of *Material Lot IDs* for each of the raw materials.

Lot IDs can be vendor or user-defined. *Lot IDs* create an audit trail between the lots of raw material fed into a machine and the tote boxes of finished products which come out of the machine. If a different raw material lot needs to be used on a running job, the new *Lot ID* and material name can be entered at the DCM.

A delay timer is available for specifying the amount of time to elapse before a new material lot is used on the current job. When the time expires, the current material lot is replaced with the new material lot. The current material lot then becomes part of the historical audit trail.

Material Lot Tracking is an auditing feature that traces material lot usage. A material lot can be traced to a specific tote box. Each time a tote box becomes full, an operator presses the *tote change* button on a DCM, or a material lot changes for a job, the event is recorded. These events form a lot history.

9.14 O.E.E.

OEE is a tool to measure the performance of individual equipment or an entire process.

OEE can be used to measure losses caused by poor quality, equipment problems or non-optimal run rates. The calculation for OEE is:

%OEE = (% availability)*(% productivity)*(% quality)

This equation can be applied to a single machine or an entire process. It should be tracked over time to see the impact of changes in equipment, training, and maintenance, purchased materials and management direction.

OEE will help identify the areas requiring improvement, the potential revenue from an improvement and serve as a benchmark against competition. One of many ways of expressing OEE is (Operating Time/Total Time)*(Std Cycle/Std Mult)

Typical items measured by OEE will be actual downtime vs. planned, slower production rates than standard, defects, and minor but important problems. The Emerson Company offers the following guidelines for OEE. Other references can be found on the web by searching on OEE.

Process	Worst	Quartile 3rd	2nd	Top
Continuous	<78%	78-84%	85-91%	>91%
Batch	<72%	72-80%	8 1-90%	>90%
Chem.,	<85%	85-90%	91-95%	>95%
Paper	<83%	83-86%	87-94%	>94%

The elements of OEE are Availability, Productivity and Quality.

Availability takes into account Down Time or stoppages, time the machine is not running as scheduled.

% Availability is defined as Actual Production time/Planned production time, or Operating Time/ planned production time, or the percentage the equipment is available for production. It can be affected by changes in process variables, preventive maintenance, and machine failure detection.

$$Avail = \frac{Uptime}{(Uptime + Downtime)}$$

PlantStar defines availability as
Idle time is not a part of this calculation. I.e. A machine is not available when idle for

whatever reason. Idle time can be scheduled or non-scheduled.

Productivity or Performance takes into account Speed Loss.

% Productivity is defined as Actual Production/Optimum Capacity or (Minutes/part)/(Total parts/Operating time), or Ideal cycle Time/(operating time/Total parts), or (Total parts/Operating time)/Ideal run rate, or parts per time to produce. Material availability, operator training, equipment breakdowns and machine speeds affect it. If production was planned for a machine and it is down, the productivity clock is still running.

PlantStar defines productivity as (gross parts produced/up time)*(std cycle/std mult). Or (gross parts/up time)*((seconds/cycle)/pieces/cycle).

Productivity is a unit less quantity, a number. Expanding just a little:

$$\text{Productivity} = \frac{\text{Gross Parts}}{\text{Scheduled Pieces}} = \frac{\text{Gross Parts}}{\text{Time to make a part}} \times \frac{\text{Time to make a part}}{\text{Scheduled Pieces}}$$

$$\text{Productivity} = \frac{\text{Gross Parts}}{\text{Time to make a part}} \times \frac{\text{Time to make a part}}{\text{Std Mult} \times \text{Num of Cycles}}$$

$$\text{Productivity} = \frac{\text{Gross Parts}}{(\text{up time})/\text{Std Cycle}} \times \frac{\text{Time to make a part}}{\text{Std Mult} \times \text{Num of Cycles}}$$

$$\text{Productivity} = \frac{\text{Gross Parts}}{\text{up time}} \times \frac{(\text{Time to make a part} \times \text{Std Cycle})}{(\text{Std Mult} \times \text{Num of Cycles})}$$

where Std rate = Std Mult/Std Cycle

$$\text{Productivity} = \frac{\text{Gross Parts}}{\text{up time}} \times \frac{1}{\text{std rate}}$$

Quality takes into account bad parts or wastage.

% Quality is defined as (Product produced – (rejects))/Product produced, or Good parts/total parts. It is affected by changes in process variables, material quality, and equipment performance.

PlantStar defines Quality as (net pieces/gross pieces).

The total calculation can be expressed as:

(up time/(up time + down time))(net parts produced/(up time + down time))(std cycle/std mult)

For Example:
Shift Time = 8 hrs
Breaks = 30 minutes
Lunch = 1 hr
Down time = 35 minutes

Ideal Run Rate = 10 seconds
Gross parts = 2200
Rejects = 37

Availability = Operating time/Planned production time = (480–30-60-35)/(480-30-60) = 0.91
Availability = Up Time/(Up Time + down time) = 355/390 = 0.91

Productivity = Gross Parts/Scheduled Parts = 2200/(60*390)/10 = 2200/2340 = 0.94
Productivity = Gross Parts/operating time/run rate = 2200/390*60/10 = 0.94

Quality = Good Parts/(good parts + rejects)= 2163/2200 = 0.98

OEE = Availability * Productivity * Quality = 0.91 * 0.94 * 0.98 = 0.838

9.15 OSI Model

Networks are a series of computers and devices tied together by the Open System Interconnect (OSI) model. The OSI model provides a way of describing the way a computer connects a running program to the network. Within a computer there are many layers of things going on both at the hardware and software level. There is the CPU connected to several buses, in turn connected to memory, drives, ports etc. There is a software operation system, software modules running the connected devices, and one or more application programs. As a user we see all this as a computer not as all its parts. This is called looking at the computer as a whole as a level of abstraction. The OSI model provides a level of abstraction to view the connection between a network and the running program.

There are seven layers in the OSI model:

1.   Application
2.   Presentation
3.   Session
4.   Transport
5.   Network
6.   Data Link
7.   Physical

The Application layer provides services to the running program. It handles such matters as screen size and fonts. The Presentation layer converts the information flow to a network standard. Different computers define character sets, escape characters etc. in a different way. The Presentation layer converts these to a network standard. The Session layer handles the bookkeeping required. It knows to whom it is talking and can re-establish communication if contact is lost or part of a file transfer must be repeated. The Transport layer handles the end to end communication. It must cut up a message into packets that match the ability of the network to handle. If a file transfer was done in one packet of a million bytes and one present of the packet was lost on each transfer, the file would never complete. If the file was sent as one thousand packets of one thousands bytes each, only a small percent would have to be re-transmitted to cover the lost packet. The Network layer handles the routing. It keeps track of the route over which a packet must travel. The Data Link layer provides error control, re-assemblies packets of data that may have been scrambled in transmission and puts packets back in order. It does the handshaking between connections. It requests a re-transmission of a lost packet and throws out duplicate packets that might arrive. The media access control or MAC is located in the Data Link layer and contains the device address. The Physical layer provides the connection to the network. It deals in ones

and zeros and the time between them.

A Domain is a feature that allows the Internet to map from a language description (English usually) to an Internet address. For example mordred.cs.purdue.edu is the English name for a computer at Purdue. Its domain is purdue.edu. It is in the computer science department and its name is mordred.

The domain for PlantStar is Syscon-intl.com. The domain most of you will be working on will be mycompany.com All Internet addresses are actually what are known as a dotted quad. This is four numbers between 0 and 255 each separated by a period or dot. An example is 192.17.10.11 which is the address of a Syscon computer. When you type a name into your computer, it goes up the chain of servers on the net until it finds one that knows the correct dotted quad address equivalent to the name you typed. That address is returned to your box and the connection is then made. The new address is saved in a routing table in your computer so the next time that name is typed in, your computer will already know where to find the requested address. As an FYI, the world is running out of numbers and the dotted quad will change to a dotted sextet sometime soon. This will provide a unique number for every square meter on earth

A PlantStar host has two network cards. One handles communication with the DCMs and the other handles communication with the PCs.

Local Area Networks:

This section will discuss local area network (LAN) as used by the PlantStar System. A LAN is a network where multiple devices (stations) use the same media access technology and exist within the same broadcast domain. That is, each device can send and receive information without the need for routing. PlantStar is usually set up as a single LAN and all devices see the traffic at the data link layer. If a message is not for a given computer it stops at the data link layer. If a large area or more than one building is covered then a router or a bridge can be used for connecting devices. If a bridge is used to connect devices within a LAN it is known as an Extended LAN. A router can be used to connect multiple LANs at the network layer. Each LAN would have its own broadcast domain and the router would be used when a device in one domain talked to a device in another domain. The collection is known as a wide area network (WAN).

A computer can broadcast to ALL devices in its domain by sending the first three numbers in its dotted quad and making the last number 255. As an example at Syscon, the address would be 172.17.10.255. A broadcast is used by a host to ask all the computers in its domain to tell it their addresses.
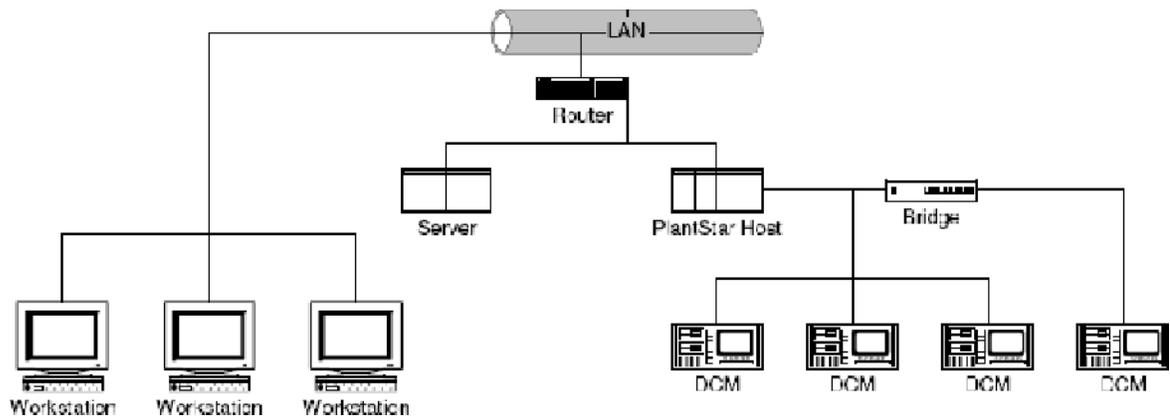
There are a number of types of networks and the standards that define them. PlantStar is an Ethernet network defined by IEEE standard 802.3. Each DCM has a unique address, which can be assigned during setup. This standard allows all stations to try to talk at any time. Collisions are detected and stations back off a variable amount of time and try again. This technique is known as CSMA/CD, which stands for Carrier Sense Multiple Access/Collision Detection. In a PlantStar only network (no other devices on the local net) Collisions are not a problem. PlantStar is a talker/listener system. The host goes from station to station and requests information. It listens for a response and then goes to the next station. There are never two units trying to talk at the same time.

Workstations may have a fixed address or have one assigned to them when they power up using Dynamic Host Communication Protocol (DHCP). Which approach is used in your shop is based on a decision made by your IT person.

Ethernet comes in several speeds. Older networks run at 1 0Mbyes/sec half duplex (talk in only one direction at once). Today's standard is 100 Mbytes/sec full duplex. One Gbyte/sec is available and plans are underway for a 10 Gbyte/sec system. Other LAN types are Token Ring and FDDI (Fiber Distributed Data Interface. A special bridge can be used to connect a Token Ring or a FDDI ring to a standard Ethernet but that technology is outside this discussion.

PlantStar uses the Transmission Control Protocol/Internet Protocol (TCP/IP) (standard) to talk to devices on the network. Many other protocols exist and are often used on wide area networks and the Web. Again these other protocols will not be covered during this class.

Network Topology:

PlantStar uses a distributed star topology. In a small system the host computer is connected to each of the DCMs with a network cable. As the system gets larger, routers and bridges are used to reduce the length of cable runs and to isolate sections of the network. It is possible to connect individual DCMs and the PlantStar host to a plant bus as it passes the devices. However, PlantStar prefers to run a local bus for the PlantStar system and join the PlantStar system and the plant bus together at the host using two network cards in the host to separate the networks. This provides a high degree of isolation between systems and makes maintenance and troubleshooting much easier. If all devices are on one plant network, an on-site technician may be required to keep the systems up and running.

Networks can be hard wired or wireless. Wireless is usually cheaper today but comes with its own set of problems. The specification is numbered 802.11 and comes in several flavors,

b and **g** being the ones that are interesting for a PlantStar system. The **b** version talks at up to 11mbytes/sec and the **g** version up to 54 mbytes/sec. Both offer 11 channels to talk on but these channels overlap so that there are really only three usable in a plant 1, 6, and 11. Each DCM will need a bridge and depending on the distance up to eight bridges might talk to one access point. Cable is usually run from the access point to the host. One combination would be to run a group of machines say eight on channel 1 to the first access point, the second eight machines to the second access point on channel 6 and the third set of eight machines to another access point on channel 11. Repeat until done.

Another approach might be to alternate channels 1 and 11 throughout the shop and use channel 6 to bring the signals back to the host. A key to making this work is that each access point can be told what addresses it can and can not talk to, which prevents two access points trying to talk to the same machine and causing problems with the host.

Cabling:

Computers can be connected with copper wire, fiber optic cable, coaxial cable or even wirelessly. Copper wire is the media used in almost all installations today. UTP5e is the designation. It describes Unshielded Twisted Pair cable and the capacitance between wires. A shielded version (STP5e) is also available but used only in very noisy installations. Some UTP3 is in place in older systems, it will support a 10Mbytes/sec Ethernet connection up to 100 meters. UTP5e will support 100Mbytes/sec. Because of increased usage, there is little difference in cost and all new installations should be run with 5e. The connector used with this cable is known as RJ45, an eight-wire connector that started life in the telephone industry. In your house it may be a different story. If you have cable, it will be run with coax. Coax cable can support broadband while UTP is always baseband. Baseband is when the ones and zeros appear directly on the cable as a plus and minus voltages. The cable pair can support only one bit of information at a time. With broadband, the data is used to modulate a frequency carrier and thousands of signals, each at a different frequency can co-exist on the wire. This technique is expensive and used on the Internet backbone where a large amount of data is carried. The frequencies can extend to the range of light and fiber optic cable can be used.

Bridges, Hubs, Switches, Routers, Gateways:

Bridges are used to connect two or more subnets or LAN with the same domain. A standard bridge contains just the data link and physical layers of the OSI. They can determine if a data packet needs to be passed from one LAN to another by checking the destination address in the packet. A translation bridge is capable of translating data packets from one type of network to another. This also reduces total traffic on the extended LAN.

A hub typically connects 8, 16 or 24 devices. A hub can be used to reduce the amount of wiring required in a plant. A hub can concentrate a number of devices in one area into one line connecting to the rest of the plant. Smarter hubs can be accessed over the network to check their operation and change some parameters.

Another step up is a switch. A bridge provides a "one to one" connection, a hub provides a "one to many" connection, a switch provides a "many to many" connection. A switch can be used to connect multiple networks without the use of a backbone or to reduce the traffic on a backbone. A backbone is the highest level the signal must traverse to get to and from its goal. In a plant the backbone would be the wire connecting accounting, the shop floor, the front office, etc. In a multi-plant operation, it would be the wiring connecting the plants. On

the Internet it is the grid connecting major cities all over the world.

A router works with more than just the data and physical layers. Adding network and transport layers allows routers to handle traffic between different types of networks. A gateway is a smart router. It stands at the entry to a domain and looks at all traffic into and out of a domain. It can be set to reject a single internet address (Whitehouse.com), addresses that are mostly personal (JUNO.net), a list from the anti-porn league, or what have you. The reject list is maintained by the IT group.

Virtual Private Networks (VPN):

A VPN is a way to connect a remote device to a network with a reasonable level of security. Just adding a modem to a system allows the remote device the same access that any other device on the LAN to which it is connected. If the modem is connected to a LAN segment that is in turn connected to the main LAN, it may be possible for a remote connection to access sensitive information. If the modem is connected through a level three switch, the switch can be told to match software and hardware address from the remote device. This will restrict unauthorized users from getting into the system; furthermore, if the switch and modem are properly located, the external device will only be allowed to access the LAN to which the modem is connected. If the PlantStar system is set up as a separate LAN, then the switch can be set up so the PlantStar system can be contacted by Syscon for service but Syscon would be blocked from access to anything else.

9.16 Process and Production Monitoring

There are two primary types of monitoring windows within your system -- process and production. Production information is available for a specific machine or a group of machines. Process information is available for a specific machine. Both types of windows are accessible through the *MONITOR* menu.

How a job is set up directly relates to the monitoring information available. The job parameter *Schedule Now*, for example, determines whether to monitor a job without reference to its machine's defined shift schedule. If this job parameter is set to "yes", the machine is monitored and job data is generated regardless of any idle periods in the shift. If this parameter is set to "no", the state of the *Schedule Factory* parameter determines when the machine is monitored.

The *Schedule Factory* job parameter indicates whether to use the factory shift schedule for the job. If this parameter is "yes", the job follows the defined shift schedule. If this parameter is set to "no", the job is considered to be idle and the associated machine is not monitored. If the *Schedule Now* parameter is "yes", this parameter is ignored.

Thus, these two job parameters affect how and when a job is monitored. How a machine is defined also affects the monitoring component of your system. Process variables and profile variables, if defined, have numerous windows devoted to reporting their behavior.

The following sections discuss some other job parameters and basic concepts that influence how information is monitored and presented within your system. A few of the more important types are discussed individually.

Production Monitoring

For production monitoring, there are two fundamental pieces of data -- pieces and time. Virtually all monitoring information involves or uses these two pieces of data to report on the progress and performance of a job.

Pieces

The first fundamental production monitoring quantity is pieces. Gross pieces are accumulated by counting closures of the primary contact. The standard multiplier is a parameter entered in the job's work order. It defines the maximum number of pieces produced per machine cycle for a job. The actual multiplier reports the number of pieces currently produced per machine cycle.

Reject pieces

Reject pieces are counted within your system to keep track of the number of good pieces. Rejects can be entered in one of three ways:

·   by an operator at a keypad or EL/TS DCM,
·   by a user at a work station,
·   by automated equipment using contact inputs to the DCM.

Rejected pieces are used in the calculation of net pieces. The number of rejected pieces is subtracted from gross pieces to obtain net pieces.

Net parts counting is an alternate method of monitoring good parts. Using this method, finished boxes of good parts are counted instead of counting rejected parts. Any difference between the good parts counted and the gross pieces produced by the machine is automatically accumulated in the machine's designated reject reason. (The designated reason is defined from the **Force Scrap** flag on the **Down Reason Sets** window.) The number of good parts to be counted each time the net parts input contact is closed is tracked by the job parameter, net parts multiplier.

Time

The second fundamental production monitoring quantity is time. Production time is divided up into up time, down time and idle time. Down time is accumulated based upon cycle time exceeding the down time threshold. Pieces, possibly good pieces, can be produced while down time is accumulating. This depends upon how the down threshold and standard cycle time parameters are defined for a job. Down time quantities may be adjusted by a user at a work station.

Assist time is accumulated in parallel with production time. No assist time accumulates while a job is idle. Operators may call for assistance at any time by selecting one of the available assist reasons. This does not affect the production monitoring of the machine.

Process Monitoring

Process Variables

If defined for a machine, up to 50 process variables can be monitored. Most process variables are collected once per machine cycle. These types of process variables are used to monitor characteristics which are repeated with every machine cycle. Examples are

pressure, temperature or time duration process variables.

Some process variables are collected only when new readings are provided by the operator. These types of process variables are used to monitor something which is sampled at irregular intervals. Examples are measurements of sampled parts such as weight or dimensions.

Whenever a reading is collected, it is compared to the process limits which have been defined for a job. If the reading is out of bounds, a process violation is flagged. This violation is displayed on the monitoring windows as a process exception.

Profiles

Up to 4 profiles can be monitored for each machine. Their behavior can be graphically displayed on any work station or at the relevant EL/TS DCM. A profile is a set of up to 500 readings of a single process input channel collected during one machine cycle. The input channel can be sampled as fast as once every 10 mS. Limits may be set for the minimum and maximum values (similar to process limits) to flag a process violation. Again, any violations are displayed on the monitoring windows.

Various values can be collected from a profile. These values can be read as process variables (called pseudo variables) for further tracking and limit checking.

SPC Data

DCMs calculate and monitor a variety of SPC parameters. X-bar and Range graphs display SPC alarms for defined process variables. On an EL/TS, the alarms are displayed to the right of the graph. The key for the alarms is as follows:

XCL   The last X-bar value was not within control limits
RCL   The last Range values was not within control limits
INC   The last 8 X-bar values were continuously increasing
DEC   The last 8 X-bar values were continuously decreasing
ABV   The last 8 X-bar values were above the mean
BLW   The last 8 X-bar values were below the mean
UTR   The last 25 X-bar values show an upward trend
DTR   The last 25 X-bar values show a downward trend
RSM   Within the last 25 X-bar values, a RUNSUM exceeded 4.

If any of these parameters fall outside of accepted norms, an SPC violation is flagged on an EL/TS DCM. SPC subgroups can be collected for each process variable on a job-by-job basis. Monitor X-bar and Range charts are then provided in the monitoring windows for all current jobs. Historical X-Bar/Range charts can be displayed for completed jobs. Undefined and down cycle process readings are never included in SPC subgroups. SPC data can be transferred to the Extended SPC database for more advanced analysis.

9.17 Saving Jobs as a Product Standard

Any job can be saved as a product standard from the **Save as Product Standard** window.

Where can you find it?

- The Load Product Standard window can be accessed from the Current/Queue Job, Work Orders, and Job Schedule Board windows.
- Select an existing job or work order from the list on the left-hand side of the window
- Click on the Save Std button.
- The Save as Product Standard window appears.
- To save a job as a new standard, click on the New button.
- To update an existing standard, click on the Update button. (See the Save As Product Standard window on-line help topic for further information.) The Update button replaces the existing job standard's parameters with the job parameters from the previous window.
- Once changes are complete, the Save As Product Standard window immediately returns you to the previous window.

9.18 Setting up your System

The general operating procedure for setting up your system is:

- **Define your Shop Floor Characteristics** - Describe your machines, process variables, DCMs, profiles, reason sets and all other relevant information from the Shopfloor Configuration program.
- **Schedule Jobs To Run** - Schedule jobs from the Monitor program. There are four basic steps to scheduling jobs -- creating shift schedules, creating product standards, creating work orders, and assigning work orders to machines to run as jobs.

  1. Creating shift schedules is done from the Shift Schedule window. Shift schedules are created for a work center. Each work center has multiple schedules -- one for each year desired. Each week within a year may have a different work schedule.
  2. Creating product standards is optional. Product Standards facilitate the creation of work orders (step three).
  3. Work orders are not optional. You must create work orders to schedule jobs. Work Orders can be created from the Job Schedule Board or the Work Orders windows
  4. Assigning work orders to machines to run as jobs through the Job Schedule Board window.

- **Monitor the Shop Floor -** After machines have been defined, summary, production process and material lot tracking information can be monitored using a variety of windows within the Monitor program.
- **Print and/or View Reports** - Your system offers several types of reports. You can decide what reports should be printed automatically at the end of a shift or end of a job. You can also select certain reports for immediate printing.
- **Generate Quality Assurance Information (optional) -** X-bar and Range graphs are available for a machine's process history within the Monitor program. There is also a statistical process control package which interfaces with your system for further SPC analysis.

There are a number of optional capabilities available within your system that you may or may not have purchased. These options can be added to your system at any time. All of the options require not only additional software licensing, but some may require additional hardware be purchased.

9.19 Shift Scheduling

Shift schedules define the start and end times for work shifts, idle times for holidays or weekends, and any other events when jobs should not be running or have special needs. Shift schedules are not required but they do provide the flexibility to control part of the job process. If shift schedules are not created, all jobs run all the time.

Shift schedules are created for a work center. Each work center has multiple schedules -- one for each year desired. Each year schedule may have up to 12 different weekly work schedules. There must, therefore, be at least one work center defined before access to the *Shift Schedule* window is possible. The *Scheduling* privilege is also needed in order to access this window.

The *Shift Schedule* window is used to create, assign, delete and change work center

schedules. If no schedules have been defined, the window appears blank. To create a work center schedule, use the *NEW* button.

What do you want to know about?

- Selecting a Work Center Schedule
- Creating a Work Center Schedule
- Changing a Work Center Schedule
- Creating a Weekly Schedule
- Assigning a Weekly Schedule to an Annual Schedule
- Deleting a Work Center Schedule

Selecting a Work Center Schedule

- Once on the *Shift Schedule* window, position the cursor on the arrow to the right of the WC field.
- Choose the new work center by sliding the pointer down the selection list to the appropriate work center and click.
- Upon selection, a new list of year schedules assigned to the selected work center appears in the Year field.
- The *Calendar and Weekly Schedules* list reflects the annual schedule for the visible work center and year.

Every work center schedule has multiple annual schedules. To select a specific year's schedule and its work schedule assignments:

- Once on the *Shift Schedule* window, position the cursor on the arrow to the right of the Year field.
- Choose the new year by sliding the pointer down the selection list to the appropriate line and click.
- Upon selection, the *Calendar and Weekly Schedules List* reflects the work schedule assignments for the visible work center and year.

An annual schedule may have up to 12 weekly schedules defined and associated with it. A 'none' weekly schedule always appears at the top of the Weekly Schedules List. It is used for clearing out or 'unassigning' a weekly schedule previously assigned to a yearly schedule.

Creating a Work Center Schedule

A work center schedule is created from the *Shift Schedule* window. A work center schedule consists of one or more annual schedules and one or more weekly work schedules.

- Go to the *Shift Schedule* window.
- If there is no work center schedule for the current year, click on the *NEW* button to create a current year work center schedule. Each time the *NEW* button is selected, it checks to see what the latest, existing year schedule for the selected work center is. The *NEW* button increments the year by one each time it is pressed.
- Move the cursor to the *Weekly Schedules List* field. If a work center schedule existed for a previous year, the *Weekly Schedules List* contains the previous year's weekly schedules. Define any new weekly schedules for the new year or change any existing weekly schedules.

· Assign weekly schedules to all or some of the week blocks on the *Calendar*.
· Click on the *Save* button when all weekly schedules are assigned to the new year schedule.
· A new work center schedule is created.

Changing a Work Center Schedule

Many different types of changes can be made to a work center schedule from the ***Shift Schedule*** window. Possible changes are:

· Assign a different weekly schedule to a specific week on the ***Calendar***;
· Change a start, idle, or end idle time in a weekly schedule;
· Un-assign a weekly schedule for a specific week on the ***Calendar***;
· Change the name of a weekly schedule.

To make a change:

· Go to the ***Shift Schedule*** window.
· Move the cursor to the *WC* field. Choose the work center desired.
· Move the cursor to the *Year* field. Choose the year schedule desire.
· The weekly schedules associated with the selected yearly schedule appear in the ***Weekly Schedules List***.
· Make any necessary changes by referring to the appropriate on-line help section listed below:

   A. Assign a different weekly schedule to a specific week ***Calendar*** week; Refer to the ***Assigning Weekly Schedules For A Year*** help topic.
   B. Change a start, idle, or end idle time in a weekly schedule; Refer to the ***Creating Weekly Schedules*** help topic.
   C. Un-assign a work schedule for a specific week block on the ***Calendar***; Refer to the ***Assigning Weekly Schedules To The Calendar Board*** help topic.
   D. Change the name of a weekly schedule; to change a schedule name, simply type over the existing schedule name in the ***Weekly Schedules List*** field.

· Click on the *Save* button.
· The work center schedule is updated.

Creating a Weekly Schedule

· Go to the ***Shift Schedule*** window.
· Move the cursor to the *WC* field. Choose the work center desired.
· Move the cursor to the *Year* field. Choose the annual schedule desired. Any defined weekly schedules for the selected work center and year appear in the ***Weekly Schedules List***, located in the upper left corner.
· Move the cursor to the ***Weekly Schedules List*** field.
· If you want to edit an existing work schedule, click on it. The ***Work Schedule Chart***, located below the ***Schedules*** list displays running and idle periods for the selected weekly schedule.
· To change a shift time, move the cursor to the appropriate field, click, and type over any existing time.
· If you want to create a new work schedule, click on a row in the ***Weekly Schedules List*** that is 'unused'. Click again to set the insertion point. Enter a new name over the unused title. Use the **<DELETE>** key to erase any unwanted characters.
· Move the cursor to the shift name fields. These names default to 1, 2, 3, 4, 5, 6,

Idle, and End Idle. You can change the shift names, which can be up to 4 characters long.

· Move the cursor to the desired time fields on the **Weekly Schedule Chart** and click. Type in new times.
· Click on the *Save* button.

NOTE: A change made to a weekly schedule affects all weeks using the same schedule in that calendar year.

Assigning a Weekly Schedule to an Annual Schedule

The **Shift Schedule** window lets you assign one weekly schedule to each week within an annual schedule. An annual schedule can have a mixture of different weekly schedules or no weekly schedule. Assignments are done using the **Calendar Board** and a 'drag and drop' method.

To assign weekly schedules to an annual schedule:

1. Go to the **Shift Schedule** window.
2. Choose a work center with the *WC* field.
3. Choose a year with the *Year* field.
4. Move the cursor to the **Weekly Schedules List** field. Click on the desired weekly schedule. Holding down the mouse button, drag the rectangle that appears to the desired week block on the **Calendar**. If you want to un-assign' a work schedule from a specific week, click on the *NONE* option in the **Weekly Schedules List** (always located at the top of the **Weekly Schedule List**). Holding down the mouse button, drag the rectangle that appears to the desired week block on the **Calendar**.
5. Release the mouse button. The week block color changes to match the color of the weekly schedule in the **Weekly Schedules List**.
6. Repeat steps 4 and 5 as many times as needed.
7. Click on the Save button.

Deleting a Work Center Schedule

Existing shift schedules may be deleted from the **Shift Schedule** window. Deleting a yearly schedule deletes not only the selected year schedule but all the year's weekly schedules as well.

To delete a work center schedule:

· Go to the **Shift Schedule** window.
· Move the cursor to the *WC* field. Choose the work center desired.
· Move the cursor to the *Year* field. Choose the year schedule targeted for deletion.
· The weekly schedules associated with the selected year schedule appear.
· Click on the *Delete* button.
· The work center schedule is deleted.

9.20 Shop Floor Configuration

There are numerous steps to setting up and defining a shop floor. Each step entails providing specific information. The information on one element of the shop floor directly relates and is associated with a second element. communication processor information, for example, needs

boot set information. Machine definitions need communications processor and Data Collection Module (DCM) information. Changes to some shop floor definitions force a re-initialization of a DCM. This, in turn, affects the currently running job.

The following sections discuss some basic relationships between specific shop floor components. These relationships are presented here to facilitate the entering of information.

What do you want to know about?

- User Defined Labels
- Reason Sets
- Work Centers
- Display Groups
- Labor Categories
- Communications Processors DCMs
- Machines
- Process Variables

9.21 SPC Statistics Concepts

Standard SPC statistics can be viewed on the *Process Trend/SPC* and *SPC History* windows. Standard SPC statistics are defined as:

- X-Bar Upper Control Limit
- X-Bar Lower Control Limit
- Range Upper Control Limit
- Range Lower Control Limit
- X-Bar Mean
- Range Mean
- Upper Specification
- Lower Specification

These values can be viewed by pressing the Σ icon. To close the popup window, click on this icon Σ again.

What do you want to know about?

- SPC Graph Area
- Graph Area
- Viewing Actual Values on a Graph
- Viewing Maximum and Minimum Graph Values
- Size Field
- Changing The X-Axis
- Graph Scaling Options
- Manually Scaling Graphs
- Autoscaling Graphs
- Auto Scale Every Cycle
- Cycle

- Cycle Value

SPC Graph Area

The window displays a line chart of the SPC values collected for a specific process variable. It includes two graphs. The top graph is a plot of X-bar values and the bottom is a plot of the associated range values. The X-axis is the time at which the SPC values were recorded. The number of values graphed may be a subset of the total collected.

To view the maximum value for a graph, click anywhere on the far right-hand side of the window, outside of the graph borders but within the top and bottom lines of the desired graph. To view the minimum value of a graph, click anywhere on the far left-hand side of the graph, outside of the graph borders. To view actual values, click in the middle of the graph area.

Graph Area

The graph area displays a plot of the most recent process variable values. Clicking anywhere within the graph area displays a new window with exact x, y coordinate values. A vertical line marker also appears -- designating the data point selected.

To view the maximum value for a graph, click anywhere on the far right-hand side of the window, outside of the graph borders but within the top and bottom lines of the desired graph. To view the minimum value of a graph, click anywhere on the far left-hand side of the graph, outside of the graph borders. To view actual values, click in the middle of the graph area.

Viewing Actual Values on a Graph

There are two ways to view the exact values of the last 'n' cycles on a graphical window:

- Click anywhere within the borders of the graph. A vertical line marker appears -- designating the data point selected. A new window also appears displaying the exact x, y coordinates. The data point selected by the mouse placement is highlighted on the new window.

- Or -

- Click on the ⊞ icon for a table format of a **Trend** graph.
- For each machine cycle update, the new value appears in the Cycle 1 Value cell, moving older values down sequentially.

Viewing Maximum and Minimum Graph Values

To view the maximum value on any graph window:

- Click anywhere on the far right-hand side of the window, outside of the graph borders but within the top and bottom lines of the desired graph.

To view the minimum value:

- Click anywhere on the far left-hand side of the window, outside of the graph borders, but within the top and bottom lines of the desired graph.

Size Field

Changes the number of plotted values on the graph.

Changing The X-Axis

The x-axis may be changed from the *Size* field. The *Size* field represents the displayable history size for the process history graph or the SPC History size for the X-Bar and Range chart.

To change the x-axis:

- Click on the *Size* field.
- Move the cursor down the selection list to the desired x-axis range.
- Release the mouse button.

Graph Scaling Options

There are three primary scaling options:

- **Manual Scale** - This option allows you to manually enter the maximum and minimum values for the Y-axis. The *Manual Scales* window appears when this button is pressed.

  1. Click on the ⬦ icon.
  2. Type in the values you wish to change.
  3. To make the changes effective, select the **OK** button.
  4. To cancel any changes made, select the **Cancel** button.

- **Auto scale Once** - This option automatically scales the graph when the ⊞ button is pressed. The maximum and minimum values for the Y-axis are calculated using the selected data, the high limit, and the low limit. Once these values are calculated, they are retained until this button is clicked again or another scale option is chosen.

- **Auto scale every machine cycle** - Each window update forces a rescale when the ⊞ button is chosen. The graph is always scaled according to the displayed data. The maximum and minimum values for the Y-axis are calculated using the selected data, the high limit, and the low limit.

Manually Scaling Graphs

Allows you to manually enter the maximum and minimum values for the Y-axis. A new window appears when this button is pressed.

Auto Scaling Graphs

Automatically scales the graph when the above button is pressed. The maximum and minimum values for the Y-axis are calculated using the selected data, the high limit and the low limit. Once these values are calculated, they are retained until this button is clicked again or another scale option is chosen.

Auto Scale Every Cycle

Forces a rescale when chosen. The graph is always scaled according to the displayed data. The maximum and minimum values for the Y-axis are calculated using the selected data, the high limit, and the low limit.

Cycle

The actual machine cycle number.

Cycle Value

The actual machine cycle value.

9.22 System Architecture

All of the systems we supply run on your existing Local Area Network. We may employ a subnet to optimize performance, or include wireless components for mobility, or we may even link multiple plants together in a Wide Area Network. In any of these cases, we employ system components that come together as in the following examples of system architecture:
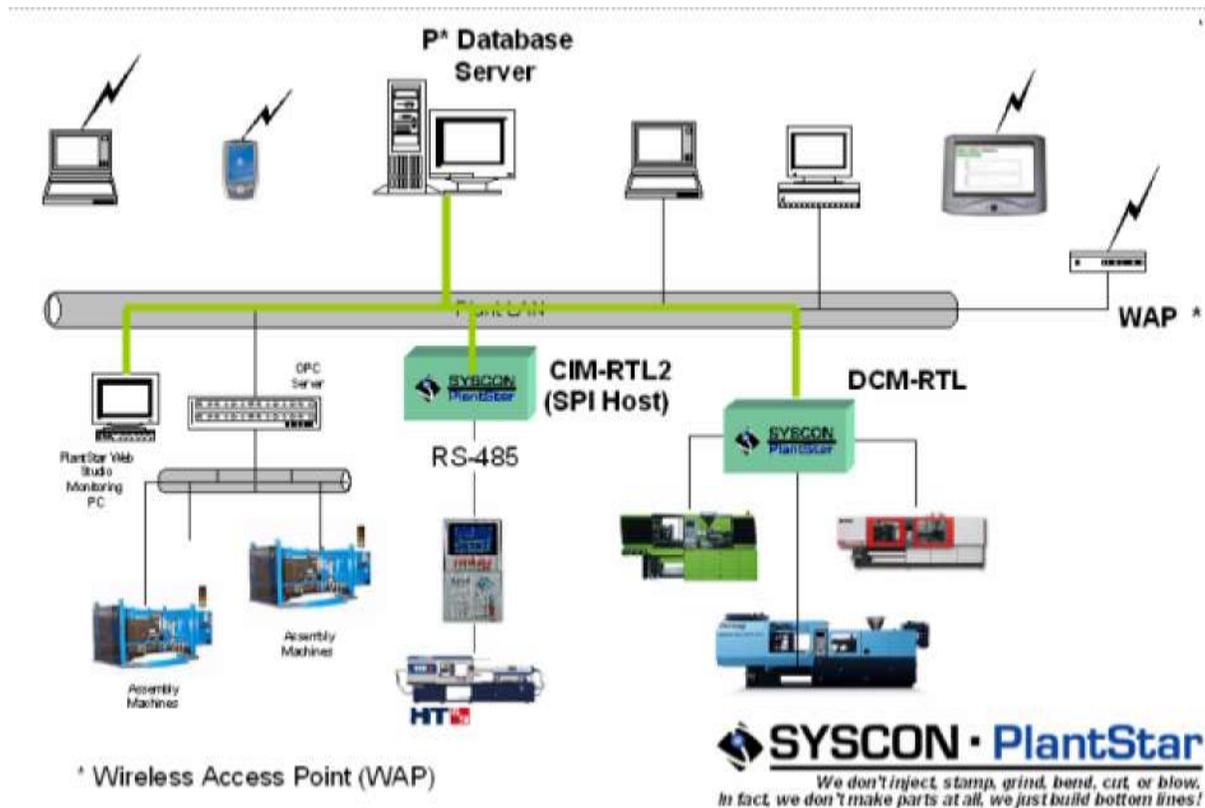
9.23 Understanding Machine States

All monitoring windows display the state of a machine by color. On machine-specific windows, the background color of the window represents the machine state. Monitoring windows which list multiple machines display the machine state from each machine name's

background color. On DCMs, the colored lights represent the machine states.

A machine's state is determined by a set of exception flags. Each flag indicates one possible exception condition. The following table lists each machine state and its associated color. The highest priority state determines the color displayed. The states are listed below in order of priority, with the highest of importance listed first.

State	Color
Off-line	Black on white
Idle	Black on gray
Down	White on blue
Process Exception	White on magenta
Production Exception	White on dark cyan
Assist	Red on yellow
Slow	White on red
Fast	Black on yellow
Running	Black on green

A machine can be in one or more states at a time. It can have a process or production exception and be in the assist state. Process and production exception states can also co-exist on the same machine at the same time. The following list provides a general overview of machine states and their relationships to each other.

- The off-line state is mutually exclusive from all other machine states.
- If a machine is idle, all other states, except off-line, are excluded.
- If a machine is down, it can still be in assist or have a process and/or production exception.
- A machine can be fast, slow, standard, or down.

Other combinations not specifically mentioned above are possible.

There are many ways that machines can enter or exit a certain state. Selection of an assist reason by an operator at a DCM triggers the respective state for the selected machine. Process exceptions occur when a process variable measurement is outside of an assigned limit, either high or low. A machine can go in or out of a process exception state with each new cycle value.

Production exceptions occur when a machine's pieces to go is negative (too many pieces have been made) or when its job-to-date percent rejects is greater than its reject threshold for the current job. Once these two relationships are no longer true, a machine exits the production exception state.

There are two ways a machine can enter an idle state. A machine becomes idle if it is following a shift schedule that has an idle period defined. For the duration of the idle period, the machine is classified as idle. The second way a machine can become idle is by suspending its job. To suspend a job, set the job parameters **Schedule Now** and **Schedule Factory** both to No. The idle state stays in effect until these job parameters are changed.

The down state is entered when the average cycle time exceeds the down threshold. The

down state ends when the average cycle time is once again less than the down threshold. The down state can also be entered if the operator selects a down reason which is configured to force a machine down.

The fast, slow, and standard machine states are basic indicators of machine performance. For each machine cycle, the cycle tolerance is monitored. The tolerance is the percent deviation of a job from its normal standard cycle time. An average cycle is computed and a comparison is made using the cycle tolerance and standard cycle values. If the average cycle is greater than the resultant value, the machine is considered to be running slow. If the average cycle is less than the resultant value, the machine is considered fast.

Moving Average Cycle

The moving average cycle is compared to the standard cycle to determine the fast state/slow state of a machine.

The machine is slow if:

(Average Cycle) > (Standard Cycle) + ((Cycle Tolerance) * (Standard Cycle) /1 00)

The machine is fast if:

(Average Cycle) < (Standard Cycle) - ((Cycle Tolerance) * (Standard Cycle) /1 00)

The "Your System" Icon

When your system is iconized, the icon displays on the bottom of the workstation monitor. The top three circles signal exception states for any machine listed on an open window. For example, if you open the *Machine Performance* window and then iconize your system, the icon blinks if one of the machines displayed on the window goes into exception. Exceptions displayed from the icon are down, assist, production exception, and process exception.

9.24 User Preferences

The *User Preference* window enables you to customize the PlantStar environment in terms of:

- Font Size -- Changing Text Sizes sets the font size for all PlantStar windows.
- Job Primary Label -- The label to use for all jobs displayed on the *Job Schedule Board* window can be selected. The job label field lists all jobs on the Gantt chart by job name. The product label shows all jobs by product name.
- Default When Moving a Job - You can select what will happen by default when moving work orders or jobs from one machine to another on the *Job Schedule* window.
- Screen Load Behavior - This option enables the quick loading of screens. When the quick load option is enabled, a screen is loaded without retrieving the data for the selection criteria. Data is loaded after the window is opened and selection

is made.

- Search Criteria - The search method used on the **Job Schedule Board** window can be selected. There are three search methods: left, embedded, and exact. Left matching searches for records that start with a specified text. Embedded matching finds all occurrences of a text wherever it is located. Exact matching finds exact matches only. (Specific examples are provided under each method's field help topics.)
- Show labor hours displays the total number of man hours required for each shift.
- Language - This allows the users to select their language preference.

These preferences are saved from session to session and will not change until the next modification.

Where can you find it?

- Choose the *File* menu on the **Monitor** window.
- Choose the *User Preference* option.

What do you want to know about?

- Changing Preferences
- Saving Your Changes
- Undoing Your Changes
- Closing the Window

9.25 Using PlantStar Help

9.25.1 About PlantStar

For up-to-date resource information, the application provides a window with the following information:

- PlantStar Software Version
- PlantStar Copyright Date
- Microsoft Windows Version
- Amount of free memory

To see this information:

- Select the *Help* menu on the main menu.
- Choose the *About PlantStar* menu item.

9.25.2 Help Active Window

Window level help provides information on the display that currently has focus. Information for each window includes:

- purpose of the window
- specific field descriptions
- window button explanations

This type of help is available by selecting and opening a desired window. Once opened, select the **Help-Active Window** menu on the application window or press the F1 key.

NOTE: If there are currently no PlantStar windows open, this menu item will not display any help.

9.25.3 Help Contents

General content help provides a table of contents for virtually all topics within this application. The Contents window can be used to jump to topics that explain various windows or how to get quick access to key reference topics. This help is available by selecting the **Contents** on the **Help** menu item.
Use the scroll bar to the right side of the Help window to view the next page of the Table of Contents.

9.25.4 Help Index

The Index list is directly accessible from the **Index** on the **Help** menu item or from the Index tab within the on-line help utility. Index terms consist of:

- definitions
- formulas, if applicable
- recommended values, if applicable.

To access an item from the Index list:

- Use the scroll bar on the right hand side to scroll the window to the desired item.
- Point to the term or phase desired.
- Double-click on the highlighted word to open.

-Or-

- Use the keyword field to search for the desired item.
- Once found, double-click on the highlighted word to open.

9.25.5 Help Search

Another method to find a particular topic in Help is to use the Search option. To display the Search window, either choose **Search** from the **Help** menu on the application window or click the Search tab on the Help topic screen.

Select a topic by:
- Use the keyword field to search for the desired item.
- Click on the List Topics button to search on the keyword entered
- A list of related topics then appears on the screen.
- Once found, double-click on the highlighted topic to open.

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10 Functions

10.1 Activating an attention announcement

The *Play Attention* field on the *Attention Announcement* window determines whether an attention message is played before any other exception message.

To activate an attention message:

· Click on the box to the left of the *Play Attention* field.
· An "x" appears. This "x" signifies that an attention message will be broadcast before any other message is played.
· To cancel the playing of the attention message, click on the box to the left of the *Play Attention* field until the "x" disappears (usually once).
· Click on the *Update* button.

10.2 Adding a DCM

· Click on the *New* button.
· Type in the new DCM name.
· After entering your information, click on the *Update* button to temporarily store your changes and to allow other windows access to the new DCM.
· To send the new DCM definitions to the shop floor, select the *Save Session* command under the File menu.

A window's *Delete* button deletes information from PlantStar's database. Depending upon the window, a reason set, boot set, work center, display group, communications processor, machine or DCM will be deleted.

10.3 Adding a labor category

· Click on the *Labor Categories* tab located at the top of the window.
· Scroll the list until you find an empty record. Up to 30 labor categories can be added.
· Type in the new labor category name.

10.4 Adding an employee

· Click on the *Employees* tab located at the top of the window.
· Click on the *New* button.
· Type in the new employee name.

10.5 Adding an employee to labor history

If an employee is not logged in during the shift they work, they may need to be added to the labor history at a later time. To add an employee record to history, click the *Add* button at the bottom of the screen. Once clicked, you will be presented a login dialog.

From this dialog you would enter a valid employee id. Employees are defined in the *Labor Setup* window, which is in the *Shop Floor Configuration* program. If the employee id is invalid, you will be presented with a pop up message "Invalid Employee". Once a valid employee id is entered, you will be prompted for a labor category you wish to log into.

From this dialog you can select a labor category from the drop down list. The drop down list consists only of the categories that have been assigned to the employee id entered. Employee-Labor Category definitions are defined in the Shop Floor Configuration program. Once a labor category has been selected, the login record will be added to the shifts labor history.

NOTE: Labor history records cannot be added to the current shift. Employees can be added to the current shift by logging in at the DCM or from the Labor Status window.

10.6 Adding child jobs

Up to 12 child jobs can be assigned to either a work order or a product standard.

To assign a child job to an existing product standard,

·   Select the "Add Child" button at the bottom of the screen.
·   This will add a child job to the product standard using the parent information as a base.

To assign a child job to an existing work order:

·   Use the mouse and **right** click over the work order list or the child parameter grid.
·   Select "Add Child" from the pop up menu.
- or -
·   Use the mouse and select "Edit" from the main PlantStar window.
·   Select "Add Child" from the menu.

NOTE: Child Jobs cannot be added or removed from current jobs or queued jobs. In other words, the number of child jobs assigned to a job cannot be changed once the job has been scheduled.

10.7 Adding machines to a display group

The Add button enables you to include new machines into an existing display group.

- Select a machine from the Available Machines list by clicking on the desired machine in the list.
- To select several machines next to each other, keep the mouse button pressed down and move the mouse up or down. Then let go.
- To select several machines that are not next to each other in the list, press the CTRL button, in combination with the mouse button, over each desired machine.
- Click on the Add button.
- Click on the Update button.
- Select the Save Session command under the File menu.

10.8 Adding machines to an REU list

The Add button enables you to include new machines and make them accessible from an REU.

- Select a machine from the Available Machines list by clicking on it. To select several machines next to each other, keep the mouse button pressed down and move the mouse up or down. Then let go. To select several machines that are not next to each other in the list, press the CTRL button, in combination with the mouse button, over each desired machine.
- Click on the Add button.
- Click on the Update button.
- Click on the Save Session button under the File menu to transfer the new machines for the REU to the shop floor.

10.9 Adding users

The New button on the User Accounts window clears the window and enables you to type in a new user's information. To add a user:

- Go to the User Accounts window
- Click on the New button. Type in the new user name. The name may contain letters and/or numbers and be up to 20 characters in length.
- Set up the user's password by clicking on the Password button.
- Set the user privileges by clicking on the appropriate check boxes next to each privilege.
- Click on the Save button to add the new user to the system.
- If a user already exists with that name, a warning message will be displayed. Type in a different user name and select the Save button again.
- To permanently save the new user, click on the Save Session command under the File menu.

10.10 Adding/editing multiple materials

Material Component	Percent
Default material	50
new material	50
Total	100

If you have the multiple materials feature, a pop up window appears when clicking the material button on the job editor screen.

To add one material, enter the name in the material field. To add multiple materials:
· Enter the material formula in the material field.
· Click or tab out of the material field. Another window appears.
· Enter the name of a material component. Up to four components can be entered.
· Enter a component percent for each material listed.
· Click or tab out of the component fields to close the window.

10.11 Adjusting gross or net pieces

Incorrect piece counts can be adjusted. Adjustments can be made upward or downward. To adjust gross pieces or net pieces:

· Move the cursor and select the reject cell to update
· Type in the adjustment value.

10.12 Adjusting reject counts

Incorrect reject counts can be adjusted. Adjustments can be made upward or downward. To adjust reject counts:

· Move the cursor and select the reject cell to update
· Type in the new reject value.

10.13 Adjusting start/end date

· Move the cursor and select the cell to update
· Type in the new date value. Format is Day/Month/Year (dd/mm/yy).

10.14 Adjusting start/end time

· Move the cursor and select the cell to update
· Type in the new time value. Format is Hours: Minutes (hh:mm).

10.15 Adjusting times

Incorrect time values can be adjusted. Adjustments can be made upward or downward for each defined reason.

To adjust times:

· Move the cursor and select the cell to update
· Type in the new time. Format is Minutes:Seconds (mm:ss).
· If you wish to subtract time you can press the plus button on the screen.
· To change to positive values click the minus button on the screen.
· Using the plus and minus keys on the keyboard functions in the same manner.

10.16 Anchoring selected job

Anchoring job in the Job Schedule Board allows you to move the selected job anywhere within its position of the job queue. This gives you the ability to schedule the job at a more precise date and time than the other job scheduling methods.

First, you must first choose one of the two scheduling methods:

- Schedule jobs by earliest start date (default)
- Schedule jobs by due date

The default method on the Job Schedule window is the first method; which will schedule the next job to run immediately following the completion of previously-queued jobs.

To anchor a selected job:
- Choose one of the two scheduling methods desribed above. This determines the anchor point of the selected job.
- Click on the Anchor button.   This will display an anchor icon on the selected bar.
- If the job schedule by earliest start date is selected, the icon will appear on the left side of the selected job. If the job schedule by due date is selected, the icon will appear on the right side of the selected job.
- Once anchored, you can move the selected job anywhere within its position of the job queue. This allows you to specify the exact time a job will run.
- Click on the Commit ⬛ button.

NOTE: If the job is anchored at its earliest start date, the anchor on the bar will appear red in color. If scheduled at any other time, the bar anchor will appear blue.

10.17 Assigning a report file name

- Move the cursor down the report list to the desired choice
- Type in the directory name and file name of the file you wish to export the report.

10.18 Assigning an employee to a labor category

Labor cateogories are user-definable categories which one or more can be assigned to an employee. When an employee attempts to login, they are presented with a list which consist only of the labor categories to which they have been assigned. Employee-Labor Category definitions are also defined in the Labor Setup window.

To assign an employee to a labor category:
- Select the employee record to update.
- Select the column that corresponds to the labor category you wish to assign.
- Using the mouse or cursor, check the check box in the labor category column.

10.19 Assigning child jobs

To assign child jobs, there must be existing unassigned child jobs to assign to a child job. Unassigned child jobs would appear in the "Available Child Jobs" list, which is directly under the work order list.

To assign a child job to an existing child job:
- Use the mouse and **right** click over the work order list or the child parameter grid.

- Select "Load Child" from the pop up menu. You will be presented with a list of available child jobs.
- From this screen, you can search or scroll through the list of child jobs.
- Once a child has been selected, click the "OK" to load the child job onto the child job selected.
- Alternatively, you can use the default product standard by clicking the "Default" button and selecting "OK".

NOTE: You can only assign child jobs to existing child jobs. See Adding Child Jobs for further details.

10.20 Assigning weekly schedules

The Shift Schedule window lets you assign one weekly schedule to each week within an annual schedule. An annual schedule can have a mixture of different weekly schedules or no weekly schedule. Assignments are done using the Calendar Board and a 'drag and drop' method.

To assign weekly schedules to an annual schedule:

1. Choose a work center with the Work Center field.
2. Choose a year with the Year field.
3. Move the cursor to the Weekly Schedules List field. Click on the desired weekly schedule. Holding down the mouse button, drag the rectangle that appears to the desired week block on the Calendar. If you want to 'unassign' a work schedule from a specific week, click on the *None* option in the Weekly Schedules List (always located at the top of the Weekly Schedule list). Holding down the mouse button, drag the rectangle that appears to the desired week block on the Calendar.
4. Release the mouse button. The week block color changes to match the color of the weekly schedule in the Weekly Schedules List.
5. Repeat steps 4 and 5 as many times as needed.
6. Click on the Save button.

10.21 Changing a comm processor's name

- Type over the existing Comm Processor's name.
- Click on the Update button.
- Select the Save Session command under the File menu to immediately transfer any changes to the shop floor.

10.22 Changing a machine's name

- Type over the existing machine name.
- Click on the Update button.
- To send your changes to the shop floor, select the Save Session command under the File menu.

10.23 Changing a report

There may be times when a scheduled report needs to be changed. Shift changes, period changes, day of the week and even the type of report can be changed. To make changes:

- Move the cursor down the report list to the desired choice
- Click on the arrow to the right of the report field.
- Choose the report you want by sliding the pointer down the selection list to the

appropriate line

10.24 Changing an existing work center's name

To change a work center's name

·   Type over the existing work center name.
·   Click on the Update button.
·   Select the Save Session command under the File menu.

10.25 Changing child jobs

To change the Child Job that you are viewing:

·   Position the mouse pointer over the arrow to the right of the Child Job field and click.
·   Choose the new Child Job you want by sliding the pointer down the selection list to the appropriate line. Click again.

10.26 Changing com port settings

General	COM Ports	Contact Inputs	RIO	
Port	**Source**	**Baud**	**Bits**	
1	RIO	57600	8- none-1	
2	(none)	0	0- none-0	
3	(none)	0	0- none-0	
4	RESERVED	RESERVED	RESERVED	
5				
6				
7				
8				
9				
10				
11				
12				

The com ports tab allows the user to set the serial port communications.

To change the Com Ports settings, click on the Com Ports tab located in the middle of the screen.

These are used to pass messages to and from printers, barcode scanners, and machine specific PLCs. In order to use these devices the correct communication protocols for the device need to be specified here.

10.27 Changing contact input settings

Contact Number	Debounce (10ms/Tick)	Simulated Open Time (10ms/Tick)	Simulated Close Time (10ms/Tick)	Random Variance (% of Close)
1	0	0	0	0
2	0	500	500	10
3	0	400	400	20
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0

(Tabs: General | COM Ports | **Contact Inputs** | RIO)

The *Contact Inputs* tab allows the user to set up simulated contact inputs.
To change the Contact Inputs settings, click on the Contact Inputs tab located in the middle of the screen.

This is useful for diagnostic purposes. The first input is always Cycle Time. The open and close ticks are defined as being 10 milliseconds per tick, so to have the contact open for 5 seconds the setting should be 500. In order for the DCM to operate correctly these must be reset to zero when testing is completed.

10.28 Changing display groups

To change the display group that you are viewing:

· Position the mouse pointer over the arrow to the right of the Display Group field and click.
· Choose the new display group you want by sliding the pointer down the selection list to the appropriate line. Click again.

10.29 Changing down, assist and reject data

This privilege gives users the ability to update historical down, assist, reject, gross or net pieces information. These updates are done via three windows within the Monitor program:

· Down Time Editor
· Assist Time Editor
· Parts Count Editor

10.30 Changing end date

·   Move the cursor to the end date field
·   Type in the date value. Format is Day/Month/Year (dd/mm/yy).

10.31 Changing forecast start date

The start date displayed is the date Labor Forecasting will start calculating manning factors for the scheduled jobs. To change the start date:

·   Move the cursor to the start date field
·   Type in the date value. Format is Day/Month/Year (dd/mm/yy).

- or -

·   Position the mouse pointer over the arrow to the right of the Start Date field. A pop up calendar will display the current date selected.
·   Choose a start date by navigating the calendar to the selected date. To select the current date, select the "Today" button at the bottom of the pop up calendar.

NOTE: Dates prior to the current date cannot be selected. Labor Forecast was designed to forecast man-hour needs for jobs currently running and scheduled to run in the future.

10.32 Changing forecast views

There are two different views to Labor Forecasting:

·   **Grid View** - The Grid View displays a table of labor manning factors for a specific shift and labor category.

·   **Graph View** - The Graph View displays an ordered histogram of the manning factors for a labor category. There is one vertical bar per shift. Bar height represents the man hour needs for the given shift. Bars are displayed from left to right in order of shift occurrence.

To select one of the views, select from the Grid View or Graph View tabs, at the top of the screen.

10.33 Changing general DCM settings

The general tab allows the user to set the appropriate physical settings for the DCM.

To change the General settings:
· Click on the General tab located in the middle of the screen.

These include Base Model type, Display Type, Memory, Job History Size, etc. If a setting is grayed out the option is currently unavailable either because of setup limitations or the option has not been authorized. The memory required field is used as a guide line to let the user know approximatley how much memory the current setup will require. These figures are estimates only, and problems may occur if the memory required is greater then the memory installed on the DCM. This is only an issue with older DCMs such as the CPU5 and the CPU7 where memory is very limited.

10.34 Changing graph types

To change the type of graph you are viewing:

· Position the mouse pointer over the Graph field.
· Choose the new graph type, by sliding the pointer down the selection list to the appropriate line.

10.35 Changing jobs

To change the Job that you are viewing:

· Position the mouse pointer over the arrow to the right of the Job field and click.
· Choose the new Job you want by sliding the pointer down the selection list to the appropriate line. Click again.

10.36 Changing labor categories

· Move the cursor and select the labor category cell to update
· Position the mouse pointer over the arrow to the right of the labor category field and click.
· Choose the new labor category you want by sliding the pointer down the selection list to the appropriate line.

10.37 Changing machines

To change the machine that you are viewing:

- Position the mouse pointer over the arrow to the right of the Machine field and click.
- Choose the new machine you want by sliding the pointer down the selection list to the appropriate line.

10.38 Changing material components

To change the material components that you are viewing:

- Position the mouse pointer over the arrow to the right of the material name field and click.
- Choose the new material components you want by sliding the pointer down the selection list to the appropriate line. Click again.

10.39 Changing number of plotted values

The combo box indicates the number of plotted values on the graph:

To change the number of plotted values that you are viewing:

- Position the mouse pointer over the arrow to the right of the field and click.
- Choose the new number you want by sliding the pointer down the selection list to the appropriate line.

10.40 Changing number of reasons displayed

The combo box indicates the number of reasons displayed in the Pareto chart.

To change the number of reasons that you are viewing:

- Position the mouse pointer over the arrow to the right of the field and click.
- Choose the new number you want by sliding the pointer down the selection list to the appropriate line.

10.41 Changing number of shifts

The number of shift records PlantStar should attempt to retrieve for the given selection criteria.

To change the number of shifts to display:

- Position the cursor in the "Num of Shifts" field.
- Enter the number of shifts to display.

NOTE: If the shift count exceeds the number of actual shift records, PlantStar will only return the actual shift records found.

NOTE: The Labor Forecasting window allows entries of 1-100. Job Summary window allows entries of 1-350

10.42 Changing passwords

To change your password:

·   Choose the User menu on the main Shop Floor Configuration window.
·   Choose the User Accounts window.
·   Click on the Password button on the User Account window.
·   A new window appears with 2 fields: a password field and a verification field.
·   Type in your new password and its verification.
·   Click on the OK button.
·   Click on the Save button on the User Account window.
·   To permanently save all user changes, click on the Save Session command under the File menu.

10.43 Changing preferences

·   Select a font size -- tiny, small, medium or large.
·   Select a Job Schedule Board window label.
·   Select the default job movement method for the Job Schedule window.
·   Select screen load behavior.
·   Select the search method to be used on the Job Schedule Board window for work orders and on the Job Schedule Search window.
·   Select the language preference.

10.44 Changing process graph modes

The graph mode button plots a graph of the n most recent values of a variable on a machine.

·   To change the graph mode, click the   graph mode button

10.45 Changing process variables name

You can change a process variable or profile name at any time.
·   Select the process variable or profile desired from the variable index field. Click on the arrow to the right of this field. Move your cursor down the list to the appropriate variable and click again.
·   Type in a new name for the variable in the variable name field. (Directly type over the existing name.)
·   Click on the Update button.
·   Select the Save Session button under the File menu to transfer this information to the shop floor.

10.46 Changing profile graph modes

Profiles can be viewed by themselves, overlaid on top of other profiles, or crossplotted with other profiles. If more than one profile is selected, the default viewing mode is to overlay the profiles.

To **overlay** two or more profiles:

1.   Select the desired profiles by clicking on the colored box to the left of each profile. An 'x' appears in the box. As each profile is selected, its line graph is drawn on top of the previously selected profile. To de-select a profile, click on the colored box to the left of the profile name again. The 'x' disappears.
2.   Or if you have the CROSSPLOT mode turned on, then click on the   button to display all selected profiles in overlay mode.

To **crossplot** two or more profiles:

1. Select the desired profiles by clicking on the colored box to the left of each profile. An 'x' appears in the box. As each profile is selected, its line graph is drawn on top of the previously selected profile. To de-select a profile, click on the colored box to the left of the profile name again. The 'x' disappears.
2. Click on the   button to crossplot the profiles.

10.47 Changing profile variables name

You can change a process variable or profile name at any time.

· Select the process variable or profile desired from the variable index field. Click on the arrow to the right of this field. Move your cursor down the list to the appropriate variable and click again.
· Type in a new name for the variable in the variable name field. (Directly type over the existing name.)
· Click on the Update button.
· Select the Save Session button under the File menu to transfer this information to the shop floor.

10.48 Changing rescaling options

There are three primary scaling options:

1. Manual Scale - This option allows you to manually enter the maximum and minimum values for the Y-axis. The Manual Scales window appears when this button is pressed.
· Click on the   icon.
· Type in the values you wish to change.
· To make the changes effective, select the OK button.
· To cancel any changes made, select the Cancel button.
2. Auto scale Once - This option automatically scales the graph when the   button is pressed.
 The maximum and minimum values for the Y-axis are calculated using the selected data, the higher limit, and the lower limit. Once these values are calculated, they are retained until this button is clicked again or another scale option is chosen.
3. Auto scale every machine cycle - Each window update forces a rescale when the   button is chosen. The graph is always scaled according to the displayed data. The maximum and minimum values for the Y-axis are calculated using the selected data, the higher limit, and the lower limit.

10.49 Changing RIO settings

The RIO tab is only available after an RIO has been defined in the com ports tab.

To change the RIO settings:
·   Click on the RIO tab located in the middle of the screen.

This tab allows the configuration of the Remote I/O unit. In order for a machine to be able to collect data from the RIO the check box next to the machine number must be selected. Once selected, the machine will retrieve all process variables and profile data including cycle time from the RIO unit. The other boxes allow the user to specify whether 1 RIO is connected to all machines or each machine has its own RIO, if the analog card in the RIO is isolated, or whether the shuttle type boot set should be downloaded to the RIO.

10.50 Changing shifts

To change the shifts that you are viewing:

·   Position the mouse pointer over the arrow to the right of the shifts field and click.
·   Choose the new shifts you want by sliding the pointer down the selection list to the appropriate line.

NOTE: If the All shifts menu option is available, selecting the item "All", will update the display with all available shifts.

10.51 Changing start date

·   Move the cursor to the start date field
·   Type in the date value. Format is Day/Month/Year (dd/mm/yy).

10.52 Changing the x-axis

The X-axis may be changed from the Size field. The Size field represents the displayable history size for the process history graph or the SPC History size for the X-Bar and Range chart.

To change the X-axis:

·   Click on the Size field.
·   Move the cursor down the selection list to the desired x-axis range.
·   Release the mouse button.

10.53 Changing tools

To change the tool:

·   Position the mouse pointer over the arrow to the left of the Tool field.
·   Click and slide the pointer down the selection list to the appropriate line.

10.54 Changing user-defined labels

To change user-defined field label

·   Select the field title to change from the parameter name field.
·   Type in the new label for the field in the current name field.

10.55 Changing work centers

To change the work center that you are viewing:

·   Position the mouse pointer over the arrow to the right of the work center field and click.
·   Choose the new work center you want by sliding the pointer down the selection list to the appropriate line.

10.56 Clearing machines

The Clear All button clears the existing machine selection.

10.57 Clearing process history information

The Clear button deletes all current process history information for the displayed job and machine. This button is enabled for both the graph and table modes. In order to use it, the Change SPC and PVAR History Data privilege on the User Accounts window must be granted.

10.58 Clearing search fields

The Clear All button blanks out all searching key fields and any material components found.

10.59 Clipping the graph

The Process Trend/SPC and Profile windows feature a 'clip' option for the graph. Clipping redraws the graph, displaying only the positive or zero values. The clipping feature stays into effect until canceled.

To clip the graph:
1.   Click on the   button.
2.   Once selected, this button appears 'depressed' into the background of the window.
3.   To cancel this feature, click on the icon again. It should appear not selected.

10.60 Closing the window-Close

To close the current window, choose one of the following methods:

·   Select the Close button.
- or -

· Click your mouse button while it is positioned over the 'x' in the upper right hand corner of the window.

10.61 Closing the window-OK-Cancel

To close the current window, choose one of the following methods:

· Select the OK button at the bottom of the window.
- or -

· Select the Cancel button at the bottom of the window.
- or -

· Click your mouse button while it is positioned over the 'x' in the upper right hand corner of the window.

NOTE: If the Cancel button is selected, all changes will be disregarded and you will not be prompted to save your changes.

After saving, any necessary adjustments will be sent to the DCM and other PlantStar clients.

10.62 Coldstart a DCM

Many changes made to the DCM setup require a restart of the DCM for the changes to take effect. If this check box is grayed out, it means that when you save your changes from the Save Session command under the file menu, the DCM will reboot and your changes will be implemented. You may also wish to manually check this box to force the DCM to coldstart.

10.63 Committing a schedule

The Commit button [icon] on the Job Schedule Board window sends the schedule to the shop floor.
Click on this button to transfer job queues to a DCM.

10.64 Copying a product standard

An existing product standard can be copied and then edited to create a new standard.

· Select a standard to copy.
· Click on the New button. The screen will still display the previous standards information.
· Make any necessary changes.
· Click on the Apply button. A new product standard has been created using the previous standard as a template.

10.65 Copying an announcement

Announcements or voice files can be copied from:

- one assist reason set to another
- one down reason set to another
- one assist reason to another
- one down reason to another
- one process variable to another
- one machine's process variables to another

To copy:

- Select the Process Announcement, Assist Announcement or the Down Announcement window from the Configure menu.
- Select the process variable, assist reason, or down reason, which is to be the destination for the copy.
- Click on the Copy command button. The Select File To Copy window appears.
- Select the down set, assist set, or machine from which to copy.
- Click on the down reason, assist reason or process variable to copy.
- Click on the OK button. The voice file associated with the item from the previous step is copied to the originally-selected reason or process variable.

10.66 Creating a comm processor

The New button allows the user to add a new communications processor:

- Click on the New button.
- Type in the new Communications Processor's name.
- After entering your information, click on the Update button to temporarily store your changes.
- Select the Save Session command under the File menu to transfer the new changes to the shop floor.

10.67 Creating display groups

The New button enables you to define a new display group.

- Click on the New button.
- Select a work center from the work center field. A list of available machines appears in the Available Machines field.
- Type in the new display group's name and any comments you may have.
- Select the desired machines from the Available Machines list for inclusion in the group. Highlight a machine or group of machines.
- Click on the Add Button.
- Click on the Update button.
- Select the Save Session command from the File menu.

10.68 Creating machines

The New button allows the user to add a new machine:

- Click on the New button.
- Type in the new machine's name.
- After entering your information, click on the Update button to temporarily store your changes. Other windows, such as the Display Group window, will now have access to the new machine.
- Select the Save Session command under the File menu to transfer the new machine to the shop floor.

10.69 Creating new standards

To create a new standard based upon the job or work order on the previous window, click on the **New** button.

Once the update is complete, the **Save As Product Standard** window immediately returns you to the previous window.

10.70 Creating process variables

For each machine, PlantStar lets you define 0, 20, or up to 50 process variables depending on the options purchased.

To create a new process variable:

- Choose the Shop Floor menu on the main Shop Floor Configuration window.
- Choose the Machine Setup option.
- Select a machine on the window.
- Click on the process option button, located on the left hand side of the window. A list of defined process variables displays.
- Click on the arrow to the right of the variable index field. Select a process variable index that has an empty process variable name field. If none are empty, you cannot add a new process variable.
- If one is empty, type in your new name for the process variable in the variable name field. Select a source type and complete all source type information.
- Click on the Update button to save your information.
- Select the Save Session command under the File menu to send the process variable to the shop floor.

10.71 Creating product standards

- Click on the New button.
- Select a machine from the machine field.
- Move the cursor to the Value column for each desired parameter. Directly type in parameter values. If default information is displayed, edit it as desired by typing over it.

10.72 Creating profile variables

PlantStar lets you define up to 4 profile variables if the profile option has been purchased. To create a new profile:

- Choose the Shop Floor menu on the main Shop Floor Configuration window.
- Choose the Machine Setup option.

- Select a machine on the window.
- Click on the Edit profile option button, located on the left hand side of the window. A list of defined profiles displays.
- Move the cursor to the variable index field. Click on the arrow to the right of the field and slide your cursor down the list. Select a variable index that has an empty variable name field. If none are empty, you cannot add a new profile variable.
- If one is empty, type in your new name for the profile and then fill out any other relevant information.
- Click on the Update button to save your information and then on the Save Session command under the File menu.

10.73 Creating reason sets

The New button allows the user to add a new reason set or boot set:

- Click on the New button.
- Type in the new set's name and any comments you may have.
- Enter the list of reason names for the reason set by clicking on a row in the reason table. Type over the text in the Reason List if you want to change the default names displayed.
- If editing boot sets, click on the boot file column to select or de-select a boot file.
- After entering your information, click on the Update button to temporarily store your changes.
- Click on the Save Session button under the File menu to immediately download your changes to the shop floor.

10.74 Creating REUs

The New button enables you to define a new REU. As of version 4.10 this feature is no longer supported.

- Click on the New button.
- Type in the new REU's name, its address, communications processor, boot set, and location.
- Highlight the machines which are accessible on the REU from the Available Machines list. To select several machines next to each other, keep the mouse button pressed down and move the mouse up or down. Then let go. To select several machines that are not next to each other in the list, press the CTRL button, in combination with the mouse button, over each desired machine.
- Click on the Add Button.
- Enable the REU, if desired.
- Click on the Update button.
- Click on the Save Session command under the File menu to transfer REU information to the shop floor.

10.75 Creating unassigned child jobs

Unassigned child jobs can be created to be added to work orders at a later time.

To create an unassigned child job:
- Select a work order from the work order list.
- Use the mouse and right click over the job selected in the work order list. A pop up menu will appear directly over were you clicked the mouse.

·   Select "New Child" from the pop up menu. This will create an unassigned child job based off of the work order selected.

10.76 Creating weekly schedules

An annual schedule may have up to 12 weekly shift schedules defined and associated with it. A 'none' weekly schedule always appears at the top of the Weekly Schedules List. It is used for clearing out or 'un-assigning' a weekly schedule previously assigned to a yearly schedule.

To create a weekly schedule:

·   Go to the Shift Schedule window.
·   Move the cursor to the Work Center field. Choose the work center desired.
·   Move the cursor to the Year field. Choose the annual schedule desired. Any defined weekly schedules for the selected work center and year appear in the Weekly Schedules list, located in the upper left corner.
·   Move the cursor to the Weekly Schedules list.
·   If you want to edit an existing work schedule, click on it. The Work Schedule Chart located below the Schedules list displays running and idle periods for the selected weekly schedule.
·   To change a shift time, move the cursor to the appropriate field, click, and type over any existing time.
·   If you want to create a new work schedule, click on a row in the Weekly Schedules list that is 'unused'. Click again to set the insertion point. Enter a new name over the unused title. Use the DELETE key to erase any unwanted characters.
·   Move the cursor to the shift name fields. These names default to 1,2,3,4,5,6, Idle, and End Idle. You can change the shift names, which can be up to 4 characters long.
·   Move the cursor to the desired time fields on the Weekly Schedule Chart and click. Type in new times.
·   Click on the Save button.

10.77 Creating work center schedules

Work center schedules are created from the Shift Schedule window. A work center schedule consists of one or more annual schedules and one or more weekly work schedules.

·   Go to the Shift Schedule window.
·   If there is no work center schedule for the current year, click on the New button to create a current year work center schedule. Each time the New button is selected, it checks to see what the latest, existing year schedule for the selected work center is. The New button increments the year by one each time it is pressed.
·   Move the cursor to the Weekly Schedules List field. If a work center schedule existed for a previous year, the Weekly Schedules list contains the previous year's weekly schedules. Define any new weekly schedules for the new year or change any existing weekly schedules.
·   Assign weekly schedules to all or some of the week blocks on the Calendar.
·   Click on the Save button when all weekly schedules are assigned to the new year schedule.
·   A new work center schedule is created.

10.78 Creating work centers

To create a work center:

- · Click on the New button.
- · Type in the new work center's name and any comments you wish.
- · After entering your information, click on the Update button to temporarily store your changes.
- · Click on the Save Session command under the File menu.

10.79 Creating work orders

Work Orders are essentially jobs that have been defined but not yet scheduled. In order to schedule jobs, you must first create a work order. A work order consists of a set of job parameters. These parameters define the job. They include such things as the number of pieces required and the standard rate at which the pieces will be produced.

A work order may be created manually by entering the parameters or by loading in a product standard. Work Orders can be created from the Work Orders or Job Schedule Board windows.

From the *Work Orders* window:

- · Click on the *New* button.
- · Select a machine from the machine field.
- · Move the cursor to the Value column for each desired parameter. Directly type in parameter values. If default information is displayed, edit it as desired by typing over it.
- · Click on the Apply button to save the new work order after all relevant job parameters have been entered. Once a work order is saved for a machine, an asterisk appears next to the machine in the machine field. This asterisk signifies that a work order exists for the specific machine and product combination.

From the **Job Schedule** window:

- · Click on the ⬚ button. The Edit Job Parameters window appears which looks similar to the Work Orders window.
- · Move the cursor to the Value column for each desired parameter. Directly type in parameter values. If default information is displayed, edit it as desired by typing over it.

- · Click on the Commit button ⬚ on the Job Schedule window to save the changes to the Job Schedule Board. If this step is not done, the changes will not be permanent or sent down to the shop floor.

10.80 Customizing the work order list

For ease of use, the work order list can be partially customized in two ways:

- · The work order list can be restricted to show only certain work orders.
- · The type of work order information displayed is selectable.

Selecting the Type of Information Displayed:

The work order list has two columns. The first column displays the work order name, or product name depending on the user preferences selected. The second column displays any of the following based upon your selection:

- Job Name
- Product name
- Tool name
- Material formula
- Required by date
- Free text 1,2,3 or4
- Comment

To select what to display in the second column, click on the list box to the right of the work order list. Highlight your selection by clicking with the mouse.

Customizing the Work Order List:

The work order list can be filtered, providing a way to limit what is displayed. For example, if only work orders for a specific product are desired, a filtering mechanism enables you to specify which product.

To list specific work orders:

- Click on the list box to the right of the work order list.
- Move your cursor down the selection list to the desired filter item. Click again.
- Move your cursor down to the text field located directly below the list box.
- Type in the desired search criteria. Press the ENTER key.

NOTE: How the search is performed depends upon the searching method defined on the User Preference window. Searching methods can be left matching, embedded matching, exact matching, and case sensitive. If left matching has been designated on the User Preference window, then entering the word 'poly' (if material formula was chosen as the search criteria) would find work orders that use 'polypropylene' and 'polyurethane'. If embedded matching is designated, then entering the word '285' would find work orders using 'polyurethane 285 Black' and 'Acrylic V285-100 Clear'. Exact matching means that searching for 'polypropylene' would only find work orders that are using 'polypropylene'.

10.81 Deleting a comm processor

A window's Delete button deletes information from PlantStar's database. Depending upon the window, a reason set, boot set, work center, display group, communications processor, machine or DCM will be deleted.

To delete:

- Select the reason set, boot set, or work center, etc. you wish to delete.
- Click on the Delete button.
- Click on the Save Session button under the File menu to immediately transfer your changes to the shop floor.

10.82 Deleting a custom report from PlantStar

To delete a report:

- Click on the arrow to the left of the Report field. Select a report by moving the cursor down the list to the desired item and click. The report's description and filename

appears.
·   Click on the Delete button.

10.83 Deleting a DCM

·   Select the DCM. you wish to delete.
·   Click on the Delete button.
·   Click on the Save Session button under the File menu to immediately transfer your changes to the shop floor.

10.84 Deleting a labor category

·   Click on the "Labor Categories" tab located at the top of the window.
·   Select the Labor Category you wish to delete.
·   Clear out the Labor Category name. Only Labor Categories with names will appear in Labor Category list.

10.85 Deleting a labor record

Employee records can be permanently removed from labor history.

To delete an employee's labor record:
·   Select the employee record to delete.
·   Using the mouse or cursor, check the delete check box on the left side of the employee record

NOTE: Once saved, the employee labor record will no longer exist in the Plantstar system.

NOTE: The employee record will not be deleted until you save your changes. The Delete Employee Record check box only flags the employee record for deletion.

10.86 Deleting a scheduled report

·   Select a scheduled report. Scheduled reports are listed on the right-hand side of the window.
·   To select one for deletion, move the cursor over to the list and click on the desired report.
·   Upon clicking, the selected report is highlighted.
·   Click on the Delete button.

10.87 Deleting an employee

·   Click on the "Employees" tab located at the top of the window.
·   Select the Employee you wish to delete.
·   Click on the Delete button.

10.88 Deleting display groups

The Delete button deletes a display group.

To delete a group:

·   Select the group you wish to delete from the work center and display group field. For example, select a work center from the work center list. Next, select a display group from the display group list.
·   Click on the Delete button.
·   Select the Save Session command under the File menu.

10.89 Deleting jobs from the schedule board

Queued jobs can be deleted from a machine's job queue and work orders can be deleted from the work order list.

To delete a job:
·   Position the cursor over the job you wish to delete. Click on the job to highlight it.

·   Click on the Delete   button.

·   Click on the Commit   button.

NOTE: A current job cannot be deleted, it can only be replaced.

10.90 Deleting machines

To delete a machine:

·   Go to the Machine Setup window.
·   Select the machine to delete by clicking on the arrow to the right of the Machine field. Move your cursor to the appropriate machine and click again.
·   Click on the Delete button.
·   To send your changes to the shop floor, select the Save Session command under the File menu.

NOTE: Once a machine has been deleted, the same machine can never exist again. If a new machine is created with the same name, it is not considered the same machine. Because of this rule within PlantStar, a machine with historical job records should be deleted only if it is to be permanently removed from the system. If its future is uncertain, the machine should not be deleted. It should be disabled so that it can be reactivated later.

10.91 Deleting process variables

To delete a process variable:

- Choose the Shop Floor menu on the main Shop Floor Configuration window.
- Choose the Machine Setup option.
- Select a machine on the window.
- Click on the edit process option button, located on the left hand side of the window. A list of defined process variables displays.
- Select the process variable index and name that you want to delete.
- Blank out the process variable name field.
- Move your cursor to the Source field and select the 'None' usage option for the process variable.
- Click on the Update button.
- Select the Save Session command under the File menu.

10.92 Deleting profile variables

To delete an existing profile:

- Choose the Shop Floor menu on the main Shop Floor Configuration window.
- Choose the Machine Setup option.
- Select a machine on the window.
- Click on the edit profile option button, located on the left hand side of the window. A list of defined profiles displays.
- Select the profile that you want to delete by moving your cursor to the variable index field. Click on the arrow to the right of this field and slide your cursor down the list to the desired index. Click again.
- Blank out the variable name field.
- Move your cursor to the Source field and select the 'None' usage option for the profile.
- Click on the Update button.
- Select the Save Session command from the File menu to transfer the deletion to the shop floor.

10.93 Deleting reason sets

A window's Delete button deletes information from PlantStar's database. Depending upon the window, a reason set, boot set, work center, display group, communications processor, machine or DCM will be deleted.

To delete:

- Select the reason sets you wish to delete.
- Click on the Delete button.
- Click on the Save Session button under the File menu to immediately transfer your changes to the shop floor.

10.94 Deleting REUs

The Delete button deletes an REU.

- · Select the REU you wish to delete.
- · Click on the Delete button.
- · Click on the Update button.
- · Click on the Save Session button under the File menu.

10.95 Deleting schedules

Existing shift schedules may be deleted from the Shift Schedule window. Deleting a yearly schedule deletes not only the selected year schedule but all the year's weekly schedules as well.

To delete a work center schedule:

- · Go to the Shift Schedule window.
- · Move the cursor to the Work Center field. Choose the work center desired.
- · Move the cursor to the Year field. Choose the year schedule targeted for deletion.
- · The weekly schedules associated with the selected year schedule appear.
- · Click on the Delete button.
- · The work center schedule is deleted.

10.96 Deleting unassigned child jobs

Unassigned child jobs can be removed permanently from the system.

To delete an unassigned child job:

- · Select an unassigned child job from the child list.
- · Use the mouse and **right** click over the child list.
- · Select "Delete Child" from the pop up menu. This will remove the child job from the child list.

10.97 Deleting users

The Delete button on the User Accounts window deletes an existing user. To delete a user:

- · Select the user from the User Name list box.
- · Click on the Delete button.
- · To permanently delete the user, click on the Save Session command under the File menu.

10.98 Deleting work centers

A window's Delete button deletes information from PlantStar's database. Depending upon the window, a reason set, boot set, work center, display group, communications processor, machine or DCM will be deleted.

To delete:

- · Select the work center you wish to delete.
- · Click on the Delete button.

· Click on the Save Session button under the File menu to immediately transfer your changes to the shop floor.

10.99 Deleting work orders and product standards

· Select a work order or product standard to delete from the list, on the left hand side.
· Click on the Delete button.

After answering "Yes" to the confirmation message, the work order or product standard will be deleted.

10.100 Discarding a schedule

The Discard button 🗑 on the Job Schedule Board restores the job schedule back to the last time you committed (saved). Click on this button to restore all information.

10.101 Displaying standard spc statistics

Standard SPC Statistics can be viewed by pressing the Σ icon, on the Process Trend/SPC and SPC History windows.

SPC Summary			
X-Bar Mean:	10.032	Range Mean:	3.700
X-Bar UCL:	12.167	Range UCL:	7.822
X-Bar LCL:	7.897	Range LCL:	0.000
X-Bar Max:	11.780	Range Max:	5.300
X-Bar Min:	8.180	Range Min:	2.000
Upper Spec:	****		
Lower Spec:	****		
Std Dev:	1.591	CPK:	****
CV:	15.856	Cp:	****

To close the pop up window, click on this icon Σ again. The Standard SPC statistics are:

· X-Bar Upper Control Limit
· X-Bar Lower Control Limit
· Range Upper Control Limit
· Range Lower Control Limit
· X-Bar Mean
· Range Mean
· Upper Specification
· Lower Specification

10.102 Editing child parameters

Chil...	Child 2	Child 3	Child 4			
Product	1/8 SPHERE SLICE TOP	Net Parts Multiplier	0			
Job Name	WA08234/03	Std. Multiplier	4			
Tool	3420	Actual Multiplier	4			
Part Weight	0.012000	Idle	No			
Pieces Req.	500	Free Text 1	811604			
Tote Box Size	0	Free Text 2	M60			
Reject Threshold(%)	5.0	Free Text 3	FRACTION CUBES & SPI			
Reject Multiplier	1	Free Text 4	051700			

- Use the tab key or mouse to select the child job to edit.
- Move the cursor to the desired job parameter.
- Type in a new value in the Value column for the job parameter.

NOTE: Child Jobs cannot be added or removed from a current job or queued job. They can only be added when the job is a work order. In other words, once scheduled, the number of child jobs assigned to a job cannot be changed.

10.103 Editing employee records

Labor Categories	Employees												
Employee ID	Employee Name	Main tane nce	Setu p Dud	Broo m Swe	Fork Truc k	Bob the Build	Ope rator 1	Ope rator 2	Ope rator 3	Ope rator 4	man age ment	sup port	stoc ker
42	Captain CaveMan			✔									
43	Agent 99	✔											
111	Alpha	✔							✔				
222	Beta									✔			
333	Gamma				✔		✔						
444	Delta										✔		
555	Omega		✔				✔				✔		
666	Epsilon	✔											

The *Employees* tab lets you add, change or delete Employees for a given work center. Defining an Employee is necessary before that employee can be logged in or out.

Where can you find it?

- Choose the Labor menu on the main Shop Configuration window.
- Choose the Labor Setup option.
- Choose the Employees tab

What do you want to know about?

- Adding an Employee
- Updating an Employee
- Assigning an Employee to a Labor Category
- Deleting an Employee

10.104 Editing jobs from the schedule board

- Highlight the job by selecting it on the Job Schedule Board.
- Double-click on the yellow box surrounding the desired queued job. The Edit Job Parameters window appears.

  or –

- Click on the Edit Button [icon] on the tool bar.
- Move the cursor to the desired job parameter. Type in a new value in the Value column for the parameter.
- Click on the Apply button. You will be returned to the Job Schedule Board window.
- Click on the Commit Button [icon] on the tool bar to save the changes to the Job Schedule Board. If this step is not done, the changes will not be permanent or sent down to the shop floor.

10.105 Editing labor categories

Labor Categories	Employees				
	Forecast Type	Auto Logout	Multiple Login	Cost Per Hour	
Maintanence Man	Setup	No	No	$1.00	
Setup Dude	Setup	No	No	$2.00	
Broom Sweeper	Operation	No	No	$3.00	
Fork Truck Driver	Operation	No	No	$4.00	
Bob the Builder	Operation	No	No	$5.00	
Operator 1	Operation	No	No	$6.00	
Operator 2	Operation	No	No	$7.00	
Operator 3	Operation	No	Yes	$8.00	
Operator 4	Operation	Yes	Yes	$9.00	
management	Operation	Yes	Yes	$10.00	
support	Operation	No	No	$0.00	

The Labor Category window lets you add, change or delete Labor Categories for a given work center. Defining Labor Categories is optional although this parameter offers you a way to group labor requirements for Labor Forecasting.

Where can you find it?

- Choose the Labor menu on the main Shop Configuration window.
- Choose the Labor Setup option.
- Choose the Labor Categories tab

What do you want to know about?

- Adding a Labor Category
- Updating a Labor Category
- Deleting a Labor Category

10.106 Editing labor manning factors

One primary reason for setting labor manning factors is to track and schedule labor for a job or shift. In order to track labor, you need to enter labor manning factors for the job. Editing of these parameters is, however, optional.

To edit labor manning factors:

- Click on the Labor tab located in the top of the window.
- A list of labor categories and their corresponding forecast types appears.
- Type in a new manning factor in the appropriate column.

10.107 Editing machine parameters

Machine Parameters			
Std Setup (hh:mm)	000:20	Act. Shot Weight	0.048000
Std Cycle (sec)	31.7	Refeed Runner	No
Down Threshold(sec)	63.4	Refeed Scrap	No
Std. Shot Weight	0.048000		

- Move the cursor to the machine parameters grid, which is under the child job parameters.
- Type in a new value in the Value column for the machine parameter.

10.108 Editing parent parameters

Job Parameters			
Parameter	Value	Parameter	Value
Job Name	Cooties	SPC Subgroup Size	8
Product	Cooties	SPC Interval (min)	30
Tool	Cootie Tool	Std Rate Factor(%)	0
Material	Cootie Material	Schedule Now	No
Comment	Need to make all body p	Schedule Factory	Yes
Cycle Tolerance (%)	5.0	Free Text 1	You can type
Cycle Window	1	Free Text 2	anything in these
Tote Reject	No	Free Text 3	fields as well as
Req. By (MM/dd/yyyy)	04/04/2004	Free Text 4	changing the labels

- Move the cursor to the job parameter grid, which is under the job parameters label.
- Type in a new value in the Value column for the parameter.

NOTE: SPC Subgroup Size cannot be changed for current jobs.

10.109 Editing process and profile limits

One primary reason for setting variable parameters is to track process variable exceptions for a job. In order to track exceptions, you need to enter the higher limit and lower limit for each process variable. Editing of these parameters is, however, optional.

To edit a parameter:

- Click on the Limits tab located in the top of the window.
- A list of process variables and their corresponding parameters appears in the top grid.
- A list of profiles and their corresponding parameters appears the bottom grid.
- An undefined parameter is represented by four asterisks.
- Type in any new values in the appropriate column and process variable row -- over striking the asterisks.

Primary process parameters are:

- Higher Limit - Enter a value that is higher than the normal operating range of the process variable.
- Lower Limit - Enter a value that is lower than the normal operating range of the process variable.
- Trigger Delay - This field is used to override the existing trigger delay as entered in the Machines Setup window. Leave the asterisks if you want to keep the existing delay.

Primary profile parameters are:

- Trigger Delay - This field is used to override the existing trigger delay as entered in the Machines Setup window. Leave the asterisks if you want to keep the existing

delay.

- Duration - This field is used to override the existing duration as entered in the Machine Setup window. Cycle times for different jobs may vary, requiring a longer or shorter duration. The sum of the trigger delay and the duration must be less than the cycle time. Leave the asterisks if you want to keep the existing duration.

10.110 Editing process variables
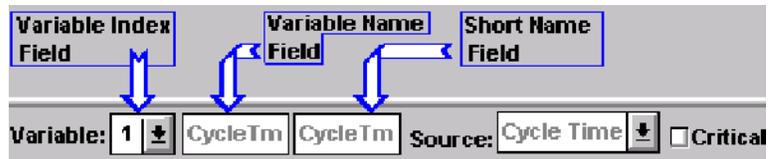
- Choose the Shop Floor menu on the main Shop Floor Configuration window.
- Choose the Machine Setup option.
- Select a machine on the window.
- Click on the Edit process option button, located on the left hand side of the window.
- Click on the arrow to the right of the Variable index field. Choose from the list by sliding the pointer down the list to the appropriate line. Release the mouse button.

10.111 Editing production parameters

| Production | Limits | Setup Sheet | Labor |

Job Parameters

Parameter	Value	Parameter	Value
Job Name	Cooties	SPC Subgroup Size	8
Product	Cooties	SPC Interval (min)	30
Tool	Cootie Tool	Std Rate Factor(%)	0
Material ▼	Cootie Material	Schedule Now	No ▼
Comment	Need to make all body p	Schedule Factory	Yes ▼
Cycle Tolerance (%)	5.0	Free Text 1	You can type
Cycle Window	1	Free Text 2	anything in these
Tote Reject	No ▼	Free Text 3	fields as well as
Req. By (MM/dd/yyyy)	04/04/2004	Free Text 4	changing the labels

| Chil... | Child 2 | Child 3 |

Job Name	Cootie Head	Net Parts Multiplier	0
Product	Cootie Head	Std. Multiplier	1
Tool	Cootie Tool Cav 1	Actual Multiplier	1
Part Weight	0.400000	Idle	No ▼
Pieces Req.	10000	Free Text 1	You can type
Tote Box Size	0	Free Text 2	anything in these
Reject Threshold(%)	5.0	Free Text 3	fields as well as
Reject Multiplier	1	Free Text 4	changing the labels

Machine Parameters

Std Setup (hh:mm)	0:10	Act. Shot Weight	5.100000
Std Cycle (sec)	12.0	Refeed Runner	No ▼
Down Threshold(sec)	33.8	Refeed Scrap	Yes ▼
Std. Shot Weight	5.100000		

The **Production** tab lets you add, change or delete production parameters for a given job.

Where can you find it?

- Production parameters can be edited from the Current/Queue Job, Work Orders, Product Standards, and Job Schedule Board windows.
- Select a job to view.
- Choose the Production tab

What do you want to know about?

- Editing Parent Parameters
- Editing Child Parameters
- Editing Machine Parameters
- Adding/Editing Multiple Materials

10.112 Editing profile variables

- Choose the Shop Floor menu on the main Shop Configuration window.
- Choose the Machine Setup option.
- Select a machine on the window.
- Click on the Edit profile option button, located on the left hand side of the window.
- Select the profile you wish to view by positioning your mouse over the arrow to the right of the variable index field, located on the left hand, bottom side of the Machine Setup window.
- Slide the cursor down the list to the desired profile and click again.

10.113 Editing report definitions

- Click on the arrow to the left of the Report field. Select a report by moving the cursor down the list to the desired item and click. The report's description and filename appears.
- If you wish to edit the report's description or its name, go to step 3. If you wish to edit a report's fields, titles, or view the report definitions, go to step 4.
- Enter the new name or description. Click on the Save button. An informational message appears stating that reports definition file cannot be found. Click the OK button. This message appears only when the name or description of a report is being changed.
- Click on the Load button. The Load button opens up the Crystal Reports application. Edit any desired report definitions and save the changes within Crystal Reports.
- Upon returning to the Custom Reports Manager program, click on the Save button.

10.114 Editing setup sheets
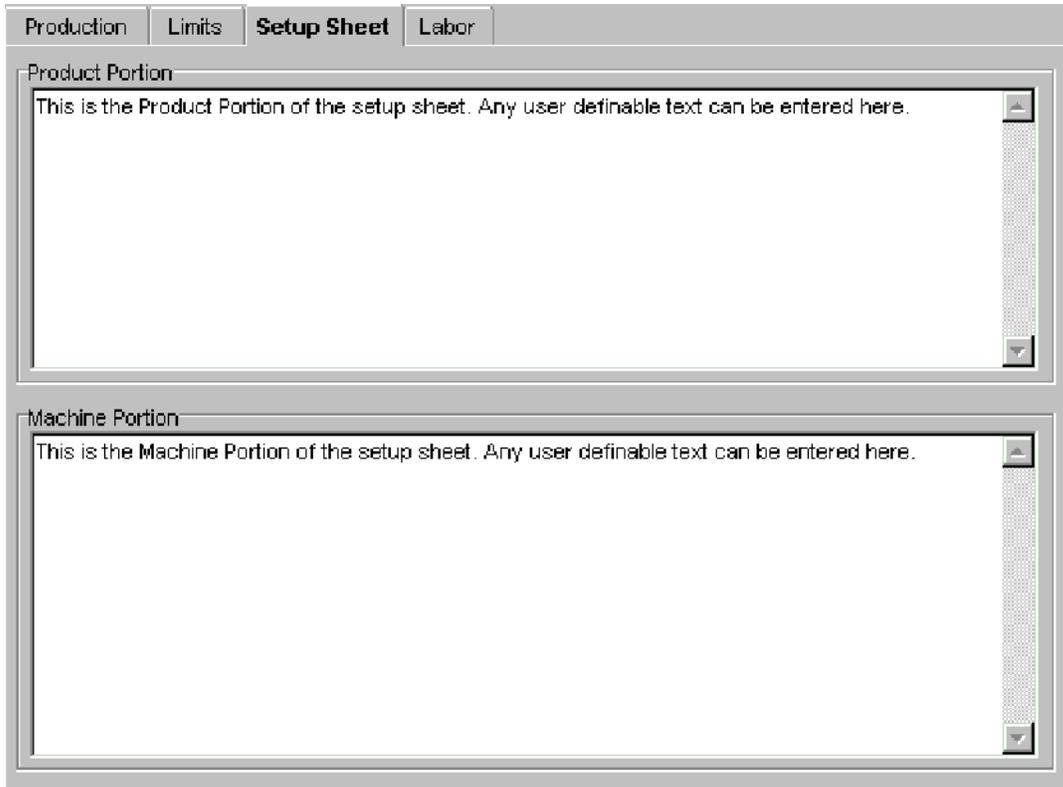
Setup Sheet information can be added to product standards, work orders or currently running jobs. There are two types of setup sheet information -- product portion and machine portion. Both types are sent to the DCM.

To add setup information:

- Click on the "Setup Sheets" tab located in the top of the window.
- The setup sheets appear, allowing the entry of setup sheet information.
- Select the setup sheet to edit, product or machine, by tabbing to the "Product Portion" or "Machine Portion" text fields.
- Type in setup sheet information directly into this field.

NOTE: When typing, the text field wraps words. The DELETE or BACKSPACE keys can be used to erase characters. A maximum of 2600 characters can be typed in. This limit is for the sum of the text in both the product and machine portions.

10.115 Enable a DCM

By clicking on the Enable Radio button you are allowing the DCM to communicate with the host. While a DCM is disabled no communication with the host occurs and no data for any machine defined for this DCM is collected. Some setup features like the number of machines require that the DCM be disabled before changing.

10.116 Enabling a RIO on a machine

In order for a machine to be able to collect data from the RIO the check box next to the machine number must be selected. Once selected, the machine will retrieve all process variables and profile data including cycle time from the RIO unit.

To enable a RIO on a machine, check the checkbox next to the selected machine.

10.117 Exporting data

Graph and table values may be written and stored in a file in the following windows:
- Labor Status
- Production Summary
- Job Summary
- Machine Log
- Overlay Profile
- Process Trend/SPC
- Process Summary
- Labor Forecasting
- SPC History
- Material Lot Tracking

To write values to a file:

- Enter the appropriate window and click on the appropriate button.
- The File Selection window appears.
- Move the cursor to the file name field. Type in the name of a file to save the graph values. The default disk drive is the one you entered PlantStar from.
- You may change the disk drive by moving the cursor to the drives field. Click on the desired drive.
- Click on the OK button when finished identifying the file name.

NOTE: Process Trend/SPC and Machine Log - These windows have two options: which writes one process variable to a file or all process variables for the machine and job.

Depending upon the window selected, the ASCII file created has several formats.

Process variable information is in the following format:
- Machine
- Job
- product
- Process Variable name (if the window allows variable selection)
- Time Stamp
- Values

The SPC History window has the following format:
- Job name
- Machine
- product
- Process Variable
- SPC Subgroup Size

- Time stamp
- X-bar Value
- Range
- SPC values -- The number of values is based upon the SPC Subgroup Size.

The Profile window has the following format:
- Machine
- Job
- Product
- Profile Name
- Time Stamp
- Number of SPC points included
- X, Y coordinate (Each coordinate is on a separate line.)

10.118 Forcing a machine down

A machine can be forced into a down state from the Down Select field. Click on the arrow to the right of this field. A list of down reasons appears. Select the desired reason by clicking on its name. The machine will go down within the next machine cycle.

When a machine enters a forced down state, its associated DCM may or may not continue to count parts and monitor process variable information. The action taken depends upon how the down reason which triggered the "forced down" is defined in terms of its force down and ignore cycles flags. These flags are set on the Down Reason Sets window.

10.119 Freezing profiles

Freezing the profile window stops data updates to the graph. The graph will not change until the 'freeze' option is canceled.

To freeze the profile:

1. Click on the **❚❚** button.
2. Once selected, this button appears 'depressed' into the background of the window.
3. To cancel this feature, click on the icon again. It should appear not selected.

10.120 Getting a voice file

To get a new voice file:

- Click on the Get File button.
- The File Selection window appears.
- Move the cursor to the file name field.
- Type in the name of a file to retrieve. The default disk drive is the one you entered PlantStar from.
- You may change the disk drive by moving the cursor to the drives field. Click on the desired drive.
- Click on the OK button when finished identifying the file name.

10.121 Identifying machines with Product Standards

For a selected job or work order, machines with matching product standards are identified with the button.

· Click on the   button.
· Select a current job or queued job on the job board by moving the cursor over the job. Click on the job. The job's rectangle will turn yellow.
· If a standard was written for the designated machine and product, a   symbol appears next to the machine name.

10.122 Ignore criteria in a report

This feature is used to schedule a report that does not include a selection criterion. For example, to schedule a "Job Queue" report at shift change, choose "Ignore Criteria", since the shift is not criteria for the "Job Queue" report.

· Move the cursor down the report list to the desired choice.
· To temporarily disable a report, check the "Ignore Criteria" field to the right of the "Report" field.

10.123 Including boot files from a boot set

Boot sets can consist of multiple boot files. PlantStar provides a list of default boot files from which to choose to make up a boot set.

To specify which boot files to include in a boot set:

· Go to the Boot Sets window.
· Position your mouse over the box to the left of the boot file you want to include in the set.
· Click on the box. An 'x' appears in the box if it is included in the boot set.
· To exclude the boot file from the set, click on the box again. The 'x' in the box disappears.
· Click on the Update button to save your changes.
· Select the Save Session command under the File menu to transfer the new information to the shop floor.

10.124 List All product standards

Retrieves all existing product standards.

10.125 Logging in an employee

Users can login an Employee from the Labor Status screen, as well as the shop floor DCM's. To login an Employee, click the Login button at the bottom of the screen. Once clicked, you will be presented the following login dialog:
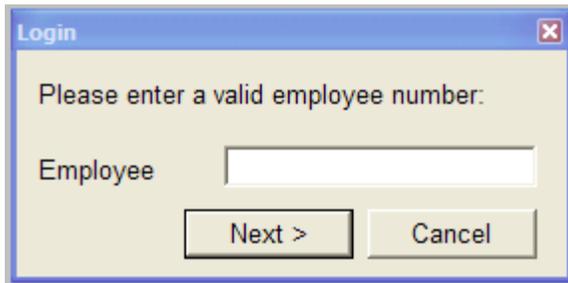
From this dialog, enter a valid employee id. Employees are defined in the Shop Floor Configuration program. If the employee id was invalid, the users would be presented with a pop up message "Invalid Employee". Once a valid employee id was entered, you will be prompted for a machine that you wish to log into.
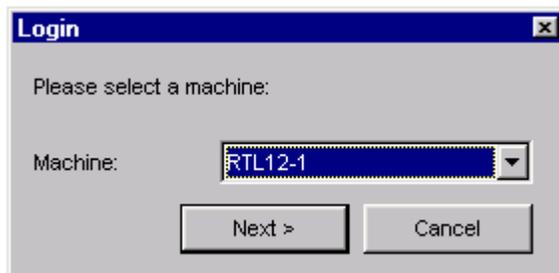
From this dialog, you can select a machine from the drop down list. The drop down list consist only of the machines which belongs to the work center an employee is assigned. Employee-*Work Center* relationships are defined at the *Labor Setup* window in the *Shop Floor Configuration* program. Once a machine is selected, you will be prompted for a labor category you wish to log into.

From this dialog you can select a labor category from the drop down list. The drop down list consists only of the categories that have been assigned to the Employee Id entered. Employee-Labor Category definitions are defined in the Shop Floor Configuration program. Once a labor category has been selected, you can click the "Finish" button which will log you

into the system.

NOTE: To Cancel out of the login process, click the "Cancel" button.

NOTE: No matter what shift is currently displayed in the shift selection, the employee will always be logged into the current shift. Employees can only be added to previous shifts from the Labor History window.

10.126 Logging out an employee

Users can logout an Employee from the Labor Status screen, as well as the shop floor DCM's.

To logout an Employee, click the record, in the grid, that contains the employee record to be logged out. Once the record is selected, the entire row will change to a black background with white text. Click the logout button, at the bottom of the screen. This will logout the selected employee.

NOTE: The Logout button is only enabled when the shift selected is "Current Shift: Logged In" and a row containing an employee record is selected. When other shifts or empty rows are selected, the logout button is disabled.

10.127 Moving jobs around the schedule board

The Job Schedule Board window lets you rearrange jobs in a machine's job queue or move queued jobs from one machine to another. A 'drag and drop' method is used for scheduling.

When moving jobs around the job board, the job movement default which is defined on the User Preference window is very important. It determines what information is moved with a job when it is re-assigned to different machines. There are two methods offered:

- Keep the standard of the original machine - When a queued job is moved from one machine to another, the machine-related job parameters defined for the queued job on the originating machine are moved to the new machine. No changes are made.
- Keep the standard of the new machine - When a queued job is moved from one machine to another, the machine-related job parameters defined for the queued job are changed to match the job parameter values defined on the original product standard created for the destination machine.

Once selected, the "default drag and drop" is activated as follows:

- Position the cursor over the job to re-schedule and click. The job rectangle becomes yellow.
- Holding down the mouse button, drag the job rectangle to the new location on the job board.
- Release the mouse button. The job automatically appears in the new location unless you have moved a queued job to a current job position. If you are scheduling a current job, a message appears if a job was previously scheduled in that position. Click on the Current button or Queue button. If Current is clicked, you must decide whether you want to suspend or end the currently running job. If you suspend a job, a work order is created. The pieces to go of the suspended job will be transferred into the Pieces Required field of the newly created work order.
- Click on the Commit button to save the new schedule.

NOTE: The non-default job movement method is activated by holding down the SHIFT key while dragging and dropping the job.

10.128 Ordering machines in the list

The up and down buttons enable you to put each machine within a display group into any desired order. This order is used on all multiple machine windows.

- Select a machine from the Machines in Group list by clicking on it.
- Click on the up or down arrow button.

10.129 Playing an announcement

All existing or newly-created announcements can be played within the Voice application.

To play an announcement:

- Open the desired configuration window under the Configure menu.
- Click on the Play command button.

10.130 Printing a report to the screen

- Select a report.
- Click on the View button.
- If any criteria windows appear, select the desired criteria fields.
- Always click on the OK button when finished selecting all desired parameters.
- A window appears displaying the selected report.
- To close the report window, click on the close button located in the upper right corner of the window.

10.131 Rebuilding the display

This window is not updated every machine cycle. To view a forecast using the latest job information, click on the Build button. Once clicked, PlantStar retrieves the most recent job and shift information. A forecast is then provided based upon the retrieved information. Re-click the Build button each time an up-to-date forecast is desired.

10.132 Recalling profiles

Recalls profiles saved from the Save Profile window. When the Recall button is clicked, a second window appears. This window enables you to select a saved profile for display. Also, when the Recall button is clicked, a new button appears -- the Clear button. The Clear button clears the recalled profile from the graph area.

10.133 Recording an announcement

.Click on the Record command button. The Record Voice File window appears.
- · Turn on your microphone.
- · Click on the Record command button. Begin speaking.
- · When finished, click on the Stop button.

10.134 Refreshing the display

Users can use the Refresh button to force an update to the window as the data is static once the window is opened.

10.135 Refreshing the lists

The work order and product standard lists are not updated automatically. At times, there may be two or more people editing work orders and product standards. Newly created work orders and product standards by one person will not necessarily be seen in another person's lists. The Refresh button updates the lists, with the most recently created work orders and product standards. Click on this button anytime you wish an updated the list.

10.136 Removing child jobs from a product standard

Child Jobs can be deleted from either work orders or product standards.

To remove a child job from a product standard, select the "Delete Child" button at the bottom of the screen. This will remove the child job from the product standard.

NOTE: Product Standards cannot be saved with only one child job. This would be considered a non- family job. To save, you will need to delete the last child job or add another child job to continue.

10.137 Removing child jobs from a work order

Child Jobs can be deleted from either work orders or product standards.

To remove a child job from a work order:
- · Use the mouse and **right** click over the work order list or the child parameter grid.
- · Select "Remove Child" from the pop up menu. This will remove the child job from the work order.

NOTE: Work Orders cannot be saved with only one child job. This would be considered

a non- family job. To save, you will need to delete the last child job or add another child job to continue.

10.138 Removing machines from a display group

The Remove button enables you to delete machines from an existing display group.

- Select a machine from the Machines in Group list by clicking on it.
- To select several machines next to each other, keep the mouse button pressed down and move the mouse up or down. Then let go.
- To select several machines that are not next to each other in the list, press the CTRL button, in combination with the mouse button, over each desired machine.
- Click on the Remove button.
- Click on the Update button.
- Select the Save Session command under the File menu.

10.139 Removing machines from a REU list

The Remove button enables you to delete machines from the list of accessible machines on an REU. A machine can always be added back later.

- Select a machine from the Selected Machines list by clicking on it. To select several machines next to each other, keep the mouse button pressed down and move the mouse up or down. Then let go. To select several machines that are not next to each other in the list, press the CTRL button, in combination with the mouse button, over each desired machine.
- Click on the Remove button.
- Click on the Update button.
- Click on the Save Session command under the File menu.

10.140 Renaming a reason set

You can change the name of a reason set by simply typing over the existing name. The name can be up to 20 characters in length.

- Click on the set name field.
- Type the new set name over the existing set name.
- Click on the Update button to save your changes temporarily.
- Click on the Save Session button under the File menu to immediately send your changes to the shop floor.

10.141 Resizing columns

Columns on this display can be adjusted to fit the desired width.

This can be done by:

- Move the mouse over the column heading to resize.
- When the mouse cursor changes to a drag bar, press and hold the mouse button. This will drag the column border.
- When the column border is in the appropriate place, release the mouse button.

10.142 Retrieve default product standard

Retrieves the existing default product standard.

NOTE: Once retrieved, the default product standard can be edited and saved again as the default product standard.

10.143 Saving process variables

To save your process variable information:

- Choose the Shop Floor menu on the main Shop Floor Configuration window.
- Choose the Machine Setup option.
- Select a machine on the window.
- Click on the process option button, located on the left hand side of the window. A list of defined process variables displays.
- Select the process variable from the variable index field.

Click on the arrow to the right of this field.
- Select the desired variable from the list by clicking again.
- Type over or change any information you desire.
- Click on the Update button to save your changes.
- Select the Save Session command under the File menu.

10.144 Saving profile variables

To update your profile variable information:

- Choose the Shop Floor menu on the main Shop Floor Configuration window.
- Choose the Machine Setup option.
- Select a machine displayed in the window.
- Click on the edit profile option button, located on the left hand side of the window. A list of defined profile variables displays.
- Select the desired variable index and variable name. To select a profile index, click on the arrow to the right of the variable index field.
- Slide the cursor down the list to the appropriate index and click again. The profile's name and related information appears on the window.
- Type over or change any information you desire.
- To send your changes to the shop floor, select the Save Session command under the File menu.

10.145 Saving reason sets

The Update button changes an existing reason set or boot set's information.

To update a set:

- Select the reason or boot set to update.
- After changing your information, click on the Update button.
- To send your changes to the shop floor immediately, click the Save Session button under the File menu.

10.146 Saving your changes-Apply

Click on the Apply button in the bottom right hand corner. Alternatively you can click the OK button and you will be prompted to save your changes. After saving, any necessary adjustments will be sent to the DCM and other PlantStar clients.

10.147 Saving your changes-Update

Click on the Update button in the bottom right hand corner.

NOTE: In the Shopfloor Configuration Program, the Update button does not send the new changes to the DCM or Communications Processor. (All changes are sent to the database and the shop floor from the Save Session command under the File menu.)

10.148 Scheduling jobs by due date

- Make sure that the due date scheduling method is active. This method is activated by clicking on the ![icon] icon.
- If a vertical line marker ![marker], appears on the top of the Job Schedule Board, then the "schedule by due date" method is active.
- The marker indicates the point in time when job scheduling by due date should begin. Jobs which are scheduled to start to the right of this marker (on the job board) are scheduled by due date. Jobs which start to the left of this marker are scheduled by the earliest possible time -- immediately upon completion of the previous job. The marker can be moved back and forth along the job board's time line. To move the marker, click on the marker and hold down the left mouse button. Drag the marker to any desired point along the time line. Release the mouse button. Upon release, all jobs to the right of the marker will be re-estimated and re-scheduled according to job due dates.
- To schedule a new work order onto the job board, move the cursor to the work orders list box, located on the bottom, left of the window.
- Click and hold down the left mouse button on the desired work order. Drag the work order rectangle to its new location on the job board.
- Release the mouse button. The work order automatically appears in the new location.
- Click on the Commit ![button] button.

10.149 Scheduling jobs by earliest start date

- Make sure that the three due date scheduling icons ![icons] are not active :
- If a marker ![marker] appears on the top of the job board, then the "schedule by due date" method is active.
- Click on the ![button] button to turn this scheduling method off.
- Move the cursor to the work orders list box, located on the bottom, left of the window.
- Click and hold down the left mouse button on the desired work order. Drag the work order rectangle to its new location on the job board.
- Release the mouse button. The work order automatically appears in the new location.

· Click on the Commit ⊞ button.
·

10.150 Scheduling selected jobs by due date

This button 🜋 changes the scheduling method of a highlighted job between the earliest possible start method or the due date method. Once a job is highlighted (clicking on the job highlights it and turns its job rectangle yellow), use this button to switch the job between the two scheduling methods.

NOTE: The right click button on the mouse may be substituted for clicking the 🜋 button (i.e. it provides the same function).

NOTE: This button only works when the ☰ button is selected at the same time. Also, in order to schedule a job by due date, the job must start to the right of the scheduling marker.

10.151 Search Product Standards

Retrieves any existing product standards using the job or product fields. If no job or product name is provided, the Search button retrieves all existing product standards.

NOTE: As of PlantStar v4.10, this search no longer requires the key fields to match the case of the expected result. In other words, the search is no longer case sensitive.

10.152 Searching for a job

The Job Schedule Search window lets you quickly locate a specific job on the Job Schedule Board window. Once the desired job is found, it is highlighted on the Job

Schedule window. This can be invoked by clicking the ⬚ button on the menu bar.

An existing job or work order may be found by:

·   Searching for a job or work order by job name
·   Searching for a job or work order by product name
·   Searching for a job or work order by material name
·   Searching for a job or work order by tool name
·   Searching for a job or work order by Due Date Before
·   Searching for a job or work order by Due Date After
·   Searching for a job or work order by Free Text
·   Searching for a job or work order by Comment
·   Searching for a job or work order by any 4 combinations of the above
·   Listing all scheduled jobs and work orders

The searching method for this window is defined by the User Preference window. Exact matching, left matching, or embedded matching schemes are available. Once a search is initiated, any matching job's location (on which machine it is scheduled), its product name and job name are displayed.

A job or work order can be found by initiating a search. Four different fields may be used in the search -- Only one field is required.

To initiate a search:
· Select a field to search on from the drop down list.
· Enter a search string.
· Click on the Search button.
· A list of jobs that match the given key(s) appears.
· Select from the list by clicking on a job.
· Click on the OK button.

How a search is performed depends upon the searching method defined on the User Preference window. Searching methods can be left matching, embedded matching, exact matching, and case sensitive. If left matching has been designated on the User Preference window, then entering the word 'poly' (if material was chosen as the search criteria) would find jobs that use 'polypropylene' and 'polyurethane'. If embedded matching is designated, then entering the word '285' would find jobs using 'polyurethane 285 Black' and 'Acrylic V285-100 Clear'. Exact matching means that searching for 'polypropylene' would only find jobs using 'polypropylene'.

10.153 Searching material lots

The Search button enables you to scan the database for specific material tracking information. Searching keys are provided for narrowing your search.

The following keys are availible for search:

· Tote ID
· Machine
· Job
· Product
· Tool
· Material
· From Date
· To Date
· Free Text 1
· Free Text 2
· Free Text 3
· Free Text 4

To search for material lot information:
· Type in the desired search criteria. If you want all information to be retrieved, leave the searching keys blank.
· Click on the Search button.
· The lower half of the window lists all material lots matching the search keys.

10.154 Selecting a machine state

Select a machine state by clicking on the circle to the left of the desired state. The Monitor window immediately displays any machines currently running in that state. The list of machines may change with each machine cycle as machines go in and out of a selected state.

NOTE: The All selection displays all machines within the selected display group, regardless of their machine state.

10.155 Selecting a period interval

A variety of scheduling options are available:

Daily Reports
·   Go to the period field. Select the Daily choice from its selection list.
·   Go to the shift field. Select a desired shift from its selection list.

Weekly Reports
·   Go to the period field. Select the Weekly choice from its selection list.
·   Go to the day of the week field. Select a desired day from its selection list.
·   Go to the shift field. Select a desired shift from its selection list.

End-of-Shift Reports
·   Go to the period field. Select the By Shift choice from its selection list.

End-of-Job Reports
·   Go to the period field. Select By Job from the selection list.

10.156 Selecting a time scale

Five different time scales are available for viewing a machine's job schedule:

·   1-Hour
·   8-Hour
·   Day
·   Week
·   Month

To select a time scale:

·   Locate the time scale field is located in the middle of the Job Schedule Board's tool bar.
·   Click on the arrow to the right of this field. Position the mouse pointer over the time scale field.
·   Choose the new time designation by sliding the pointer down the selection list to the appropriate line and clicking again.

10.157 Selecting a year

Every work center schedule has multiple annual schedules. To select a specific year's schedule and its work schedule assignments:

·   Once on the Shift Schedule window, position the cursor on the arrow to the right of the Year field.
·   Choose the new year by sliding the pointer down the selection list to the appropriate line and click.
·   Upon selection, the Calendar and Weekly Schedules List reflects the work schedule assignments for the visible work center and year.

10.158 Selecting criteria for a report

Report Criteria designate what type of information is included in a report. For example, a job history report can include all jobs for a certain product or one specific job. A custom report can be set up to include only information for a certain time period or for a certain

machine.

Criterion fields are set up from the View and Print program.

To select criteria when printing a report:

· Select a report for printing.
· Click on the Print button.
· For each field that is designated as criteria for the custom report, a window appears.
· For each window, use the mouse pointer to select from the display lists. Always click on the desired item. If more than one item is desired in a list, click on each item. Selected items are highlighted.
· Click on the OK button.

NOTE: Each selection criteria is independent. The list of choices in the second criteria window is not dependent of the first criteria of choices.

10.159 Selecting current/queue jobs

Current jobs and Queue jobs can be edited from the Edit Current\Queue Job window.

To edit a Current Job:

· Click on the first job in the job list labeled "Current Job". The job list is located on the left side of the window.

To edit a Queue Job:

· Click on the queue in the job list. This would be every job in the list, except the first job. The first job is the current job, which is labeled "Current Job". The job list is located on the left side of the window.

NOTE: These jobs can also be edited through the Job Schedule window.

10.160 Selecting display groups from the schedule board

· The display group field is located in the middle of the Job Schedule Board's tool bar.
· Click on the arrow to the right of this field.
· Slide the pointer down the selection list to the appropriate display group. Click.
· Only those machines in the display group are listed on the job board.

NOTE: If the All display group is selected, and there is more than one work center

defined with different shift schedules, then the Display Shift Schedule button is disabled.

10.161 Selecting forecast intervals

The forecast interval field restricts the number of jobs displayed on the Tool Change window to those that are estimated to be completed by the selected interval. For example, if the 1 Day interval is chosen, jobs that are estimated to be complete within 1 day from "now" are listed in the table.

10.162 Selecting jobs from the schedule board

A job may be selected, from the Job Schedule Board, in several ways:

·   Position the mouse cursor over the desired job on the job board and click. The box surrounding the job turns yellow when selected.

- or -

·   Click on the machine on which the job is running or scheduled to run. A small selection window appears. Click on the desired job name. The box surrounding the job turns yellow when selected.

NOTE: Use the job board's scroll bars to find the job if you cannot see it. A small time scale may make the queued job not initially visible. Change the time scale, if desired.

10.163 Selecting product standards

·   Load the product standard list by clicking the "Refresh" button in the bottom right hand corner. The Product Standard list is located on the left side of the window.

·   Click on the desired standard in the Product Standard list.

- or -

·   Click on the Load Std button.
·   The Select Product Standard window appears.
·   From this screen, you can search or scroll through the list of product standards.
·   Once a child has been selected, click the "OK" to select the product standard.
·   Alternatively, you can select the default product standard by clicking the "Default" button and selecting "OK".

Once selected, the Product Standard window reappears with the job parameters of the selected standard.

10.164 Selecting Report Criteria

Allows database fields to be designated as report criteria; Criteria designate what type of information is included in a report. The fields selected as criteria must be actually used on the report.

10.165 Selecting specific machines

The Selected List option enables the list of machines on the top right-hand side of the window. Choosing machines from this list makes a Monitor window change its list of machines to match your selection.

To select several machines next to each other, keep the mouse button pressed down and move the mouse up or down. Then let go. To select several machines that are not next to each other in the list, press the CTRL button, in combination with the mouse button, over each desired machine.

10.166 Selecting users

You can view all users in the PlantStar system if you have administrator privileges:

·   Select the User Accounts menu option from the User menu on the main Shop Floor Configuration window.
·   To select a user to view, position your mouse pointer over the User Name field. Click on the arrow to the right of the field. Choose the new user you want by sliding your

pointer down the selection list to the appropriate line. Click again. Upon selection, all privileges will be displayed for the selected user.

The User Name field enables you to change the user name. If you desire, just type over the name of the user that is currently selected. Click on the **Save** button to temporarily save the new name for the selected user. Click on the *Save Session* command under the File menu to permanently save all user changes.

10.167 Selecting/viewing tote details

Once a child job record has been selected in the "Job Detail" grid, the "Tote Detail" grid will contain the tote boxes that were generated for the selected child job.

10.168 Sending a report to the printer

- Select a report.
- Click on the Print button.
- If any criteria windows appear, select the desired criteria fields. Always click on the OK button when finished selecting all desired parameters.
- A window appears displaying the selected report.
- To print a report, click on the print.bmp button at the top of the window. The report is routed to your default Windows printer.

10.169 Set report to display in HTML format

A report can be set to display in HTML format:

- Move the cursor down the report list to the desired choice.
- Check the "HTML" field to the left of the "File Name" field.

10.170 Setting down reason flags

There are four flags which can be set for each down reason:

- Force Down
- Ignore Cycle
- Auto Clear
- Force Scrap

To set flags for a down reason:

- Click on a flag field for the desired down reason.
- Type in either 'Y' or 'N'.
- Click on the Update button.
- To send your changes to the shop floor, select the Save Session command under the File menu.

10.171 Setting report criteria

- Click on the arrow to the left of the Report field. Select a report by moving the cursor down the list to the desired item and click. The report's description and filename appears.
- Click on the Criteria button. This button brings up a second window which displays a list of PlantStar tables from which criterion fields can be selected.
- Clicking on a table name displays its list of possible criteria. Select as many fields as desired by clicking on the field name. Note that for each field selected, a window

appears during the report printing process. These windows provide field selection lists. For example, the job field is designated as a criterion for a report. When printing the report, a user will be asked to select which specific production jobs to print. If start date is also designated as a report criterion, a second window appears during the printing process asking for a valid start date.

·   Click on the OK button when finished selecting report criteria.
·   Upon returning to the main window, click on the Save button. An informational message appears stating that reports definition file cannot be found. Click the OK button.

Criteria can also be set up for a report from within the Crystal Reports program. If fields are also designated as criteria from the Custom Reports Manager program, then the affected report is based upon BOTH sets of criteria.

NOTE: When selecting a report's criteria, i.e. what type of information will be included in the report, the fields selected as criteria must be actually used on the report. For example, if a report is designed to print job history information, it is invalid to select field information from the shift history tables.

10.172 Sorting columns

Columns on this display can be sorted so that you can view the data displayed based on the selected column.

·   To sort the column, click once on the column heading that you wish to sort. This will sort the column in an ascending order.

 - also –

·   To sort the column in a descending order, click the same column heading again.

10.173 Storing profiles

Storing a displayed profile saves the graph snapshot onto the window. Future snapshots of data points are then overlaid onto the 'stored' profile graph.

To store the profile:

- Click on the ___ button.
- Once selected, this button appears 'depressed' into the background of the window.
- To cancel this feature, click on the icon again. It should appear not selected.

10.174 Toggling auto size and normal size

Auto Text Size forces all fields on a window to fit within the window's boundaries. If there is a long list of machines within a display group, sometimes the text on this window is not readable. The Switch to AutoSize button changes the size of the window's text -- making it more readable.

To change between normal and auto text size on a window, click on the
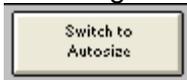
Switch To Autosize button. This button acts like a toggle. Click on it again to return to the previous text size.

10.175 Toggling Process and Profile view

Displays a machine's associated profiles and process variables. The profiles and process variables display on the bottom of the window, directly below this button.

10.176 Toggling tool change view

Tool change information can be viewed for all jobs or just those jobs where there are tooling changes from one scheduled job to the next. To view all scheduled job changes, click on the circle to the left of the All Job Changes field. This field is located directly under the table.

To select only those jobs where there are tooling changes, click on the circle to the left of the Tool Change Only field.

10.177 Undoing your changes

Click on the Restore button to undo any changes made on the window since the last save.

10.178 Updating a comm processor

The Update button saves any changes made on a window so that other shop configuration windows can access the new information. The Update button does not send the new changes to the DCM or Communications Processor. (All changes are sent to the database and the shop floor from the Save Session command under the File menu.)

- Select the Communications Processor you wish to update.
- Change all desired information.
- Click on the window's Update button. If new information has been added, other shop floor windows will reflect the change.
- To send your changes to the shop floor, select the Save Session command under the File menu.

10.179 Updating a DCM

The Update button saves any changes made on a window so that other shop configuration windows can access the new information. The Update button does not send the new changes to the DCM or Communications Processor. (All changes are sent to the database and the shop floor from the Save Session command under the File menu.)

· Select the DCM you wish to update.
· Change all desired information.
· Click on the window's Update button. If new information has been added, other shop floor windows will reflect the change.
· To send your changes to the shop floor, select the Save Session command under the File menu.

10.180 Updating default Product Standard

To update the default product standard based upon the job on the previous window, click on the Default button.

The Default button replaces the default product standard with the job parameters from the previous window. Once the update is complete, the *Save As Product Standard* window immediately returns you to the previous window.

NOTE: Altering the default product standard affects the future creation and import of work orders.

NOTE: A family job cannot be saved as the default product standard. If a family job has been selected, the Default button will be disabled.

10.181 Updating existing standards

To update an existing standard based upon the job on the previous window, click on the Update button. The steps are:

· Highlight an existing standard in the Standards list box.
· Click on the Update button.

The Update button replaces the existing standard's parameters with the job parameters from the previous window. Once the update is complete, the Save As Product Standard window immediately returns you to the previous window.

10.182 Updating machines

The Update button saves any changes made on a window so that other shop configuration windows can access the new information. The Update button does not send the new changes to the DCM or Communications Processor. (All changes are sent to the database and the shop floor from the Save Session command under the File menu.)

· Select the machine you wish to update.
· Change all desired information.
· Click on the window's Update button. If new information has been added, other shop floor windows will reflect the change.
· To send your changes to the shop floor, select the Save Session command under the File menu.

10.183 Updating schedules

Many different types of changes can be made to a work center schedule from the Shift Schedule window. Possible changes are:

· Assign a different shift schedule to a specific week on the Calendar;
· Change a start time, idle, or end idle time in a weekly schedule;
· Unassign a weekly schedule for a specific week on the Calendar;
· Change the name of a weekly schedule.

To make a change:

· Go to the Shift Schedule window.
· Move the cursor to the Work Center field. Choose the work center desired.
· Move the cursor to the Year field. Choose the year schedule desired.
· The weekly schedules, associated with the selected yearly schedule, appear in the Weekly Schedules list.
· Make any necessary changes by referring to the appropriate on-line help section listed below:
· Assign a different weekly schedule to a specific week Calendar week; Refer to the "Assigning Weekly Schedules For A Year" help topic.
· Change a start, idle, or end idle time in a weekly schedule; Refer to the "Creating Weekly Schedules" help topic.
· Unassign a work schedule for a specific week block on the Calendar; Refer to the "Assigning Weekly Schedules To The Calendar Board" help topic.
· Change the name of a weekly schedule to change a schedule name, simply type over the existing schedule name in the "Weekly Schedules List" field.
· Click on the Save button.
· The work center schedule is updated.

10.184 Updating users

The Save button changes a user's privileges.

To change a user's information:

· Go to the User Accounts window.
· Select the user from the User Name list box.
· Make your desired changes by clicking on the desired privilege boxes or change the password by clicking on the Password button.
· Click on the Save button.
· Select another user for updating, if desired. Repeat steps 3 - 4.
· To permanently save all user changes, click on the Save Session command under the File menu.

NOTE: If a user is currently logged into PlantStar when changes are made to his/her privileges, he/she must log out and then log back in for any changes to take affect.

10.185 Viewing job summary information

```
Job Summary
Job:       410F
Tool:      410F
Prod:      410F
Material:   3 parts
Est. Start Date:           Dec 09, 2002
Req. By:                   Dec 31, 1999
Est.End Date:              Dec 11, 2002    Hours:   50:35
(Estimated end date is  1076 Days  and  17 Hours  late)
Child Count:               10
Child Job:                 Pieces:
410F c3                    3
410F c4                    0
410F c5                    6979
410F c6                    0
410F c7                    25798
410F c8                    20706
410F c9                    15282
410F c10                   28405
```

Job Summary information can be viewed from the Job Schedule Board

window. Summary information includes:

- Job
- Tool
- Product
- Material
- Required by Date
- Estimated Completion Time
- Hours To Go
- Child Count
- Pieces Required for each child job
- Comment

To view the job summary:

- Move the cursor to the job board and click on a job.

- Click on the Summary button [icon] on the menu bar.
- To close the summary information window, click on the Summary button again.

Alternate Method:
If you are already viewing a list of jobs on a machine, highlight a job by clicking the mouse. Then click on the Summary button.

10.186 Viewing machine detail

Several windows are directly accessible from the Machine Status window. These are accessible by double-clicking on a machine's rectangle to open the windows. The specific window that is opened depends upon the current selected machine's running state and is outlined in the following list:

State	Window
Assist State	Assist Pareto Window
Down State	Down Pareto Window
Fast State	Job Summary Window
Idle State	Machine Exception Window
Off-line State	Machine Exception Window
Process Exception	Process Summary Window
Production Exception	Job Summary Window
Reject Exception	Reject Pareto Window
Slow State	Job Summary Window
Running State	Job Summary Window

10.187 Viewing machine exceptions

You can access the Machine Exception window from the Exception Summary window. To view detailed information about a machine's current exception states, double-click on the machine name or anywhere within a machine's row of information.

10.188 Viewing machine status

The Machine Status window is accessible from the Display Group Status window. Double-click on a display group's rectangle. The Machine Status window opens. It displays all machines within the selected display group.

10.189 Viewing min and max values

To view the minimum value:

·   Click anywhere on the far left-hand side of the window, outside of the graph borders, but within the top and bottom lines of the desired graph.

To view the maximum value on any graph window:

·   Click anywhere on the far right-hand side of the window, outside of the graph borders but within the top and bottom lines of the desired graph.

10.190 Viewing production hours

·   Production hours can be displayed on the job board by clicking on the ⌚ button, located on the window's tool bar.
·   On the job board, production hours appear in parentheses next to the job name. For jobs, production hours are calculated the same way as estimated completion time. Calculation of production hours for slack time (the gray rectangles between scheduled jobs which only appear if due date scheduling is active) are based upon the current shift schedule and any idle periods that are defined.

NOTE: This button acts like a toggle. Click on it again to hide production hours.

10.191 Viewing the shift schedule

The shift schedule for a selected display group can be viewed on the job board. Click on the button to display the shift schedule time line. The schedule appears at the top of the Job Schedule Board directly below the time scale. Click again on the button to hide the time line.

NOTE: The shift schedule time line can only be viewed if all the machines in the selected

display group belong to the same work center. Also, the shift schedule time line does not appear when the time scale for the job board is set for weeks and months.

10.192 Zooming selected profiles

A section of a profile can be exploded or "zoomed".

To zoom in:

- Select the zoom area by moving the mouse pointer to the beginning of the desired profile section.
- Click and hold down the left mouse button while dragging the pointer to the ending point of the desired zoom area. Once the ending point is reached, release the left mouse button. The area to be zoomed is highlighted in black.
- The graph area automatically changes to display the desired profile section for all displayed profiles.

To zoom out:

- Once in a "zoomed" state, click on either the or button to resume normal mode viewing.

SYSCON - PlantStar System
User's Guide

Part

XI

11 Glossary

11.1 Actual multiplier

Job parameter which defines the number of pieces currently produced per machine cycle. The range is from 0 up to the value of the standard multiplier. See also actual shot weight.

11.2 Actual rate

The actual number of net pieces (good pieces) produced per hour. The actual rate can be calculated over a single shift or an entire job.

Actual Rate = (net pieces) / (Up Time)

11.3 Actual setup time

The actual time it took to set up a job to run on a machine. Setup time is accumulated under a machine's down reason #2, which when selected at a DCM usually puts the machine into a down state. Actual setup time is displayed in terms of hours and minutes (hhh:mm). The range is 0:00 to 500:00.

11.4 Actual shot weight

Machine-based parameter which indicates the total amount of plastic currently used to fill a single shot. Generally, if the actual multiplier changes on a job, the actual shot weight also changes. This field's range is from 0.000 up to the value of the 999999.9.

11.5 ADC option

DCM parameter which configures the DCM for 0, 16, or 32 analog channels. A DCM may only be configured for analog channels if the optional analog to digital board was purchased and installed. Set this value to zero if the unit does not have an A to D card.

11.6 Administration privilege

This privilege grants users the ability to edit any user's account and privileges.

11.7 Analog filter

Digital filter setting used to reduce noise on an analog channel.

Filter Value:
0 = No Filtering
1 = Light filter, pressure transducers
2 = Moderate filter, position transducers
3 = Heavy filter
4 = Maximum filter, thermocouples

The recommended maximum value for pressure transducers is 2. The recommended maximum value for temperature is 4.

11.8 Analog inputs

Analog inputs are electrical inputs that use variable voltages to model changes in real-world conditions.

11.9 Announce flag

Flag that identifies the down reason, assist reason, machine state, or process variable which should be announced. A check mark in the flag field turns on the specified announcement. For process variables, the flag identifies which variable should be announced when it exceeds the higher or lower limit. For down reasons, assist reasons, and machine states, the flag indicates

an announcement should be made when the specified condition exists. To set this flag, click on the box associated next to the desired item.

11.10 Announce machine flag

If the announce machine flag is checked on the machine announcement window, the machine is marked for announcing.

11.11 Announcement delay

The amount of time to wait before re-announcing the same message. The range is 1 to 99 minutes.

11.12 Assist state

Selection of an assist reason by an operator at a DCM triggers the assist state for a selected machine.

11.12.1 Assist period

The number of times (frequency) a machine entered an assist state. Assist periods are recorded by specific reason.

11.12.2 Assist reason

Specific reasons available to the operator for requesting assistance. Assist time and frequency are accumulated for each assist reason. Reason names can be up to 20 characters in length.
Sets of assist reasons are a user configurable feature. On keypad DCMs, only the first 9 characters are displayed. On EL DCMs, the first 7 characters are displayed.

11.12.3 Assist state colors

This button's image will change depending upon whether the machine is in the assist state. Pressing this button, regardless of the current state, will display the Assist Select page in the main frame of the browser screen.

ASSIST

Machine is not currently in the assist state.

ASSIST

Machine is in the assist state.

11.12.4 Assist time

The total number of hours an operator waited for assistance at a machine. Assist time is recorded by specific reason. Format is hhh:mm.

11.13 Auto clear flag

Flag which determines whether the selection of a down reason automatically clears after a machine has 3 consecutive up cycles;

If a machine enters a down state by the selection of a specific down reason, and that down

reason has the auto clear flag enabled, then the down selection is automatically cleared after the machine has been up for three (3) consecutive cycles. Valid choices for this field are 'Yes' or 'No'.

11.14 Auto logout

When set to 'yes' this setting automatically logs a person out of a DCM at shift change or the start of an idle period.

11.15 Available triggers

The number of trigger events remaining. This count is based upon the types of process variables defined for the displayed machine. The maximum number of trigger events for a machine across all process variable source types is 50.

11.16 Average cycle

Average of some set of actual machine cycle times. Average cycle is computed several ways. The current incomplete cycle is never included.

Job-to-date Average Cycle (includes current, incomplete shift):

Average Cycle = (UP TIME for the job) / (UP CYCLES for the job)

Shift-to-date Average Cycle

Average Cycle = (UP TIME for the shift) / (UP CYCLES for the shift)

Moving Average Cycle:

```
If cycle window = 0, then
   Average Cycle = AVERAGE CYCLE
Else
   Average Cycle = (CYCLE TM1 +.. .+ CYCLE TMn)
   / N where N = cycle window
```

The moving average cycle is compared to the standard cycle to determine machine state. A machine is slow if the Average Cycle is:

Average Cycle > (Standard Cycle) + ((Cycle Tolerance) * (Standard Cycle) / 100)

A machine is fast if the Average Cycle is:

Average Cycle < (Standard Cycle) - ((Cycle Tol) * (Standard Cycle) / 100)

11.17 Average value

Mean value of a process variable. This value can be calculated for the current shift or historical shift.

Average Value = (Total Value) / (Total Cycles)

11.18 Backup internet path

The backup path to a communications processor if a redundant network path exists. It is

also an alternative path name for the primary internet path, if necessary. This path name can be up to 20 characters in length.

11.19 Base model

DCM parameter which refers to the model type and/or number of the hardware installed in the DCM.

11.20 Baud

This field refers to the speed at which information can be transferred through a COM (serial) port. It is used for **Engel, BetaMux, HPM CMD, JSW uPACS, Maco 4000, Maco 8000, CAMAC, Netstal, RKC F900, Square D, Unilog 9000B, A & D Scale, Toshiba** and **Toyo** source types. For **Toshiba PLCs,** the baud rate should be set to 4800. For **RKC F900** source types, the baud rate should be set to 9600. For **MACO 8000** sources, the baud rate should be set to 9600. **Unilog 9000B** sources cannot be set higher than 9600 baud.

11.21 Bias

Zero offset used to convert analog and serial inputs or any received value into engineering units. Bias and scale are used in the following formula to convert transducer output voltage to engineering units.

$$Value = (Voltage * Scale) + Bias$$

To compute bias, use the following formula:

$$Bias = (High\ Value) - (Scale * (High\ Voltage))$$

Bias is displayed to 4 decimal places and can be positive or negative. Bias should be 0.0000 for all time duration variables. For **Simulated** sources, the bias is applied to the simulated signal.

11.22 Bits

Configuration parameter which defines the serial interface being used. The bits field consists of three parts:

    Data bit - 7 or 8
    Parity - None, Odd or Even
    Stop Bit - 1 or 2

For **Toshiba PLCs,** the bits field must be set at 8-even-2. For **Engels**, the data bit should be 7 with even parity. For **RKC F900** sources, the bits field should be set at 8-None-1. For **MACO 8000** sources, the bits field should be set at 8-None-2. **Unilog 9000B** sources must be set at 8 data bits. Stop bits and parity can be selected in the control unit.

11.23 Block number

Block number for the process variable being monitored. For valid block numbers, refer to the JSW *Process Monitoring Parameters to Host Computer of uPACS-5000 & uPACS-5000D* manual.

11.24 Boolean set

This field is the name of the Boolean equation set assigned to a machine. Each machine has at least one contact input. This set defines how the system interprets these digital inputs.

11.25 Boot files

Binary files distributed with your system which contain software modules used by DCMs and communications processor. These files are not used in the RTL/CIM style DCMs.

11.26 Boot set

A group of boot files defined for a DCM or Communications Processor which are downloaded upon coldstart. For a DCM or Communications Processor to function correctly, its associated boot set must contain the appropriate boot files for all hardware and software options installed. These files are not used in the RTL/CIM style DCMs.

11.27 Calendar board

The upper, middle part of the window displays a yearly calendar for the work center and year visible in the upper right-hand corner. Each month is divided into weeks. One block represents one week of the month, with the first Monday of each week displayed. Each block is color-coded. The color represents the work schedule in effect for that week. The color code is set in the Weekly Schedules field.

11.28 CAMAC address

This field is primarily used with **CAMAC** source types. It refers to a machine address. For **VLC** controllers, this address is set at the VLC panel. For **VSX** controllers, this address is set at the VSX panel. For **XTL** controllers, this address is set at the XTL panel. For **486** controllers, this address is set at the 486 panel. For most CAMAC sources, it is usually set to 1.

11.29 Case sensitive matching

Searching methods are used on the Job Schedule and Job Schedule Search windows to quickly find jobs and work orders. The case sensitive matching distinguishes between upper and lower case when doing searches. For example, searches for the word "BATTERY' are not the same as searches for the word "battery". If case sensitive matching is not turned on, then case is ignored. The words "BATTERY" and "battery" are considered the same.

11.30 Channel

Hardware path on which a DCM receives process variable and profile data. For analog channel and thermocouple source types, the channel field refers to the analog channel where the input signal is physically connected. The channel must match the analog channel number (inside the DCM) where this input is connected. For Engels, this field refers to the valid channel number for the Engel group being used. For simulated source types, the channel field refers to the type of signal to be simulated. For BetaMux sources, the channel field refers to the channel on the Gage Multiplexer which is currently selected.

11.31 Child count

The number of child jobs that are associated with a particular job. This value may range from 1 to 12.

NOTE: A job with a child count of 1 is considered to be a non-family job.

11.32 Child job

A child job represents a sub-section of a multi-part job. This can be a particular cavity type in a multi- cavity mold, or a particular die in a multi-die press operation. The number of child jobs (child count) may range from 1 to 12.

NOTE: A one child job is not valid. When creating a work order or product standard, jobs with only one child job cannot be saved. You will be prompted to either add another child job or remove the current child job before saving.

11.33 Column number

The column number which corresponds to the process variable being monitored; Column numbers refer to the location of the process variable within a Unilog 9000B output table. Output tables can be customized so refer to your site's output file format.

11.34 Comm port

A serial port used to communicate with an exterior device.

11.35 Comm option

DCM parameter which refers to the number of communication ports available on the DCM. Set this value to 5 if the optional 4 port serial card was purchased and installed.

11.36 Comment

Parameter used for general descriptive text. The comment field can be up to 50 characters in length. In terms of job scheduling, this field is used by PlantStar to report an error if a failure occurs.

11.37 Communications processor

Communications processors create a link between DCMs on the production floor and the system's host computer. The "cp" ensures proper message routing and control between the shop floor network and the TCP/IP network. The Communications processor field is an alphanumeric that can be up to 20 characters in length. Only the first 6 characters will be sent down to the attached DCM.

At least one communications processor must, therefore, be defined for the shop floor. A communications processor can be linked to many DCMs, although a DCM must have one and only one associated communications processor. Changes made to a communications processor setup can affect each of its attached DCMs. In the case of the RTL-based DCM, each RTL-DCM will also be its own Communications Processor and therefore there will be a

Communications Processor defined for each DCM.

The Communications processor should be one of the first elements of the shop floor which is defined.

Recommended steps are:

1.) Create Boot Sets. These files are not used in the RTL/CIM style DCMs.
2.) Configure the communications processor
3.) Create Reason Sets
4.) Create Work Centers
5.) Configure DCMs
6.) Configure Machines
7.) Configure process variables on each machine if option purchased
8.) Configure profiles on each machine if option purchased
9.) Define display groups

11.38 Component percent

Product-based parameter indicating the percentage, by weight, of raw material used to produce a product on a job. The total component percent for all materials used on one job should equal 100. If there is only one material assigned for a job, then the component percent is automatically set to 100. The range is 0.0 to 200.0.

11.39 Contact duration

Contact refers to the digital equation name or the number of the contact input used to measure duration. The duration is the amount of time that this input remains closed. Up to 20 characters are available.

11.40 Contact input

A digital input used to mark the occurance of an exterior event. Contact input #1 is always the cycle event of the machine.

11.41 CONV_VEC#

This field is primarily used for CAMAC VSX source types. The CONV_VEC number refers to the location of the data to be monitored. Refer to the CAMAC Host Computer Information Manual to select the correct CONV_VEC number. Type in the number corresponding to the appropriate description.

11.42 Convert index

This field refers to the conversion index to be used for correct scaling of a monitored item. It is used with CAMAC and Netstal process variables. For Netstal source types, refer to the Netstal PLC Interface Table to select the desired index.

11.43 Cost per hour

This field associates a dollar value to a labor category. This value is then used in labor forecasting to estimate job costs.

11.44 Cp

Capability Index which indicates how well a process can do if it is centered midway between the defined specification limits. The index is the ratio of the specification range to the process capacity. In PlantStar, the CP is calculated only over the range of subgroups that are currently displayed on a window's graph.

Cp = (Upper Spec - Lower Spec) / (6 * Standard Deviation)

11.45 Cpk

Index which reflects the relative probability of making a part outside of defined specification limits -- i.e. the expected level of defects for a given part. In PlantStar, the Cpk is calculated only over the range of subgroups that are currently displayed on a window's graph. The calculation is:

$$\frac{\text{Min ((X-bar Mean - Lower Spec), (Upper Spec - X-bar Mean))}}{3* \text{ Standard Deviation}}$$

11.46 Critical process variable

When a critical process variable falls outside of its defined limits, a critical process exception is flagged. This flag can be used in digital equations to close an output contact or activate a light.

11.47 Current job

The job that is currently running on a machine. The current job is the first job listed on the job schedule for each machine.

11.48 Current shift

The shift that is currently running, as defined in the Shift Schedule window.

11.49 Currently running jobs privilege

This privilege gives users the ability to edit job parameters for currently-running jobs from the Job Schedule or Edit Current Job windows within the PlantStar Monitor program.

11.50 CV

Abbreviation for Coefficient of Variation. This statistic is a measurement of precision that does not depend upon any scale of measurement. In PlantStar, the CV is calculated only over the range of subgroups that are currently displayed on a window's graph.

11.51 Cycle time

The measured length of time between consecutive closures of the primary contact. For production data, cycle time is recorded to one tenth of a second and must be in the range of 0.5 sec to 248 days. For process data, cycle time has a selectable range and accuracy up to one hundredth of a second.

11.52 Cycle tolerance

Parameter indicating the percent deviation from standard cycle time that is normal for a job. See average cycle for a complete description. The range is 0.0 to 100.0 percent.

11.53 Cycle window

Product-based parameter defining the number of cycles used to compute average cycle time. Cycle window can be set from 0 to 50. See average cycle for a complete description.

11.54 Data number

The data number refers to the **item** to be monitored for **Toshiba** source types. Refer to the Toshiba PLC Information manual to select the item to be monitored. Type in the number corresponding to the appropriate description.

11.55 Date range scheduled usage

The Date Range Scheduled Usage is the scheduled machine usage during the given date range.

The date range is "12:00:00am" on the start date to "11:59:59pm" of the end date.

· To change the date range, type in a beginning or end date from which to search.
· Date format is in the form of "dd mmm yyyy" (i.e. "01 Jan 2003").

11.56 Date range usage

The Date Range Scheduled Usage is the machine usage during the given date range.

The date range is "12:00:00am" on the start date to "11:59:59pm" of the end date.

· To change the date range, type in a beginning or end date from which to search.
· Date format is in the form of "dd mmm yyyy" (i.e. "01 Jan 2003").

11.57 DCM

A Data Collection Module (DCM) describes the physical microprocessor-controlled unit which is attached to a machine or group of machines. The DCM collects and monitors Real-Time data such as machine state, rejected parts, and process variable values. This data is transferred to the host database for display.

The DCM also provides an interface for the machine operator through either a Keypad (KP) or Electroluminescent/Touch Screen (EL/TS) display, TouchPanel display (RTL-DCM), or browser based interface. These options enable manipulation and/or viewing of various machine operations.

DCMs are self-contained units. The DCM can operate independently of the host computer for some period of time by maintaining its own copy of job queues and historical production records in battery backed RAM. Some DCM configurations have communications processor functionality built in and do not require a physical, external communications processor. This includes all RTL-DCM type modules.

The DCM browser interface is available from any networked computer that has an appropriate web browser installed.

11.58 DCM base address

This address is the name of the base address of the DCM, which is a combination of the communications processor and the address of the DCM. This value must match the address entered at the DCM unit. Valid values are 1 through 250.

For RTL type DCM's the base address is automatically set to 1 and cannot be changed.

11.59 Debounce

Number of ticks (1 tick = 1 tenth of a second) that a signal change will be ignored so that bounce can be eliminated. This is used primarily to reduce false signals generated by line noise.

11.60 Decimals

Specifies where to put the decimal point in a sampled value prior to applying a scale factor and bias. For example, when the implied decimal position = 3, the inputs 0.4102, 0.410 and 0.41 are interpreted as 0.410. Valid decimal positions can be from 0 to 4.

For **Netstal** source types, the decimal value for the desired Parameter Number and Convert Index must be obtained from Netstal's PLC Interface Table.

Netstal PLC Interface Table

S19	4	0	1.00	1
S11	5	0	1.00	1
T11	6	3	1.00	1
T02	7	3	1.00	1
T34	8	3	1.00	1
S00	9	0	1.00	1
T21	10	3	1.00	1
TH11	11	2	1.00	0
TH12	12	2	1.00	0
TH13	13	2	1.00	0
TH15	14	2	1.00	0
TH16	15	2	1.00	0
TH17	16	2	1.00	0
TH25	17	2	1.00	0
TH26	18	2	1.00	0
P21	19	0	1.00	0
P22	20	0	1.00	0
P23	21	0	1.00	0
P24	22	0	1.00	0
N21	23	2	1.00	0
N22	24	2	1.00	0
N23	25	2	1.00	0
N24	26	2	1.00	0
V01	27	2	1.00	0
V02	28	2	1.00	0
V03	29	2	1.00	0
V04	30	2	1.00	0
V05	31	2	1.00	0
S01	32	2	1.00	1
S02	33	2	1.00	1
S03	34	2	1.00	1
S04	35	2	1.00	1
S05	36	2	1.00	1
P12	37	3	10.00	0
P13	38	3	10.00	0
P14	39	3	10.00	0
P15	40	3	10.00	0
T12	41	3	1.00	1
T13	42	3	1.00	1
T14	43	3	1.00	1
T15	44	3	1.00	1
T39	45	3	1.00	1

11.61 Delay Timer

The delay timer is used at the DCM in the Material Lot screen to specify the amount of time in minutes that should elapse before a raw material change is to take effect on a job. The default timer value is set to zero.

The timer does not begin counting down until the "RUN" button is pressed on the Material Lot screen. A material change goes into effect when the timer value counts down to zero. The "PAUSE" button can be used to temporarily stop the timer count down. When the time expires, the current materials are replaced with the new materials and the event will be recorded in the audit trail.

11.62 Derivative

Order of the derivative taken, with respect to time, of a profile channel. The first order derivative of a position channel would result in a velocity profile. The second order derivative would result in an acceleration profile. Select "none" if you do not want a derivative.

11.63 Derivative smoothing

This is the size of the smoothing window used by the derivative algorithm. Values range from 1 to 8. A value of 1 gives a simple, point-to-point difference. A value of 8 gives maximum noise damping, but also damps rapid (real) signal changes. Values of 2 or 3 are recommended.

11.64 Descriptor

The parameter descriptor of the **Maco-8000** source type;

11.65 Device address

Unique address of the unit being accessed; for **Square D** source types, the device address refers to the unique address of the target Circuit Monitor. For **RKC F900** sources, the device address must be set to the 485 physical address and must match the address set on the F900. Addresses are numeric integers.

11.66 Digital inputs

Electrical inputs that have two-states, high and low, to model changes in real-world conditions.

11.67 Display group

A user-defined group of machines used to filter monitoring information on **Monitor** windows. A machine can belong to any number of display groups. Each machine within a display group must belong to the same work center.

Display groups are used as a way to customize what machines are shown on all monitoring and historical windows. All machines that are attached to an enabled DCM are monitored. A machine may not appear on a window, though, if it is not in the selected display group. Each time a different display group is selected, the choice of machines offered by a window also changes.

A machine can belong to more than one display group. An **All** display group exists even if no display groups have ever been defined. This display group includes all defined machines. It is automatically set up by the **Shop Floor Configuration** program. It cannot be modified or deleted.

11.68 Display option

DCM parameter which refers to the type of DCM display. If an optional electro-luminescent touch screen was purchased, choose EL/TS. Choices for RTL based DCMs are 10", 12", 15" touch screens and none for a blind CIM.

11.69 Display type

The particular display type that has been installed on the DCM. The range of values varies with the particular model type of the DCM.

11.70 Down state

A machine enters a down state when its current cycle time exceeds its established down threshold. The down state ends when the current cycle time is once again less than the down threshold

The down state can also be entered if the operator selects a down reason which is configured to force a machine down.

11.70.1 Down cycles

Number of machine cycles counted while the machine is in a down state. A machine is considered down whenever its cycle time is above the down threshold.

11.70.2 Down period

The number of times a machine has entered the down state. Down Frequency is recorded by specific reason.

11.70.3 Down reason

Specific reasons available to the operator for classifying down time. Down time and down frequency are accumulated for each down reason. Reason names can be up to 20 characters in length. Sets of down reasons are a user configurable feature. On keypad DCMs, only the first 9 characters are displayed. On EL DCMs, the first 7 characters are displayed. On browser screens only the first 10 characters are displayed.

11.70.4 Down state colors

This button's image will change depending upon whether the machine is down, or if a down reason is selected. Pressing this button, regardless of the current state, will display the Down Select page in the main frame of the browser screen.

Machine is not currently down.

Machine is either down with no reason selected, or running with a reason selected.

Machine is down and a reason has been selected.

11.70.5 Down threshold

Machine-based parameter which determines when a machine is considered down. Set this to a value greater than the cycle time. When the cycle time of a machine exceeds the down threshold, the machine is classified as down. The machine continues in the down state until it completes a cycle below the down threshold. The range is 0.5 to 3276.7 seconds.

11.70.6 Down time

The total number of hours a machine has been in the down state. Down time is recorded by specific reason.

11.71 Drag and drop options

Determines what happens when a job or work order is moved from one machine to another machine on the Job Schedule window. The option selected as the default is automatically enforced. To activate the other option on the Job Schedule window, use the "drag/drop method" in conjunction with the SHIFT key.

- Keep the standard of the original machine - Each queued job or work order has its own set of product-related and machine-related job parameters. When a job or work order is re-scheduled from one machine to another, these parameters move with them. If this method is the default, then all job parameters are based upon the originating machine. They are not modified to accomodate the new machine.

- Use the standard of the new machine - When this method is used as the default for moving jobs or work orders, machine-related job parameters are verified. If the destination machine has different values for any of the machine-related parameters, they are replaced. For example, the originating machine's standard cycle is 30 seconds. The destination machine's standard cycle is 15 seconds. The standard cycle parameter for the re-scheduled job is automatically changed from 30 to 15.

11.72 Duration

The length of time in seconds that a profile will be collected. The sum of the trigger delay and the duration must be less than the cycle time. Up to 1000 samples can be taken during a collection period.

11.73 Element number

Allen Bradley data table files contain multiple elements. The element number identifies which element corresponds to the process variable being defined.

11.74 Embedded matching

Searching methods are used on the Job Schedule and Job Schedule Search windows to quickly find jobs and work orders. The embedded matching search method finds jobs or work orders that have the specified string of characters somewhere in the name. For example, if the letters "an" were entered in the product name field on the Job Schedule Search window, PlantStar would find the following:

· flange
· handle
· ankle brace
· paint can

11.75 Employee id

A unique numeric code used to identify an employee.

11.76 Employee name

A name that corresponds to a selected employee id. This field is 30 characters and may contain letters and numbers.

11.77 End date

Precise time at which the system stopped monitoring the task selected. End date is formatted as dd/mmm/yy.

11.78 End time

Precise time at which the system stopped monitoring the task selected. End time is formatted as dd/mmm/yy hh:mm.

11.79 Estimated completion time

Time estimated to finish a job. The job is complete when total net pieces for the job equals the pieces required. The estimated completion time is computed using the shift schedule and hours to go to determine the estimated date and time the job will end.

If the shift schedule does not include any idle period, the estimated completion time would be:

· Estimated Completion Time = Current Date and Time + Hours to Go

If the shift schedule does include idle periods, the estimated completion time would be:

· Estimated Completion Time = Current Time + Hours to Go + Scheduled Idle Time

11.80 Event type

The type of event to display on the window. Events types are:

- Job
- Shift
- Down state
- Assist state
- Process exception
- Employee login and logout
- Material

To select an event type, click on the arrow to the right of the Event field. Slide the mouse down to the desired event type and click again.

11.81 Exact matching

Searching methods are used on the Job Schedule Board's search windows to quickly find jobs and work orders. The exact matching search method finds jobs or work orders that exactly match the specific string of characters entered. For example, if the product name "battery" is entered as a search string, PlantStar would find jobs where the product name is "battery".

11.82 Exception state

The exception state (or alternately machine state) of a machine is determined by a set of exception flags. Each flag indicates one possible exception condition. The exception flags are prioritized as follows:

Most windows show the machine state as the highest priority exception flag which is true. Use the Machine Status window to see all exception flags for a machine.

11.83 Exception time

The time of day when an exception state was entered. The time is displayed in an hh:mm format if it happened within 24 hours. If it happened greater than 24 hours ago, the exact day is displayed.

11.84 Excess material

The amount of material wasted on a job. If runners and scrap are re-fed on a job, the amount of excess material is equal to zero. Otherwise, excess material calculations are based upon reject weight or shot size.

11.85 Exit privilege

The exit privilege lets a user leave a PlantStar program and return to the Window's desktop.

11.86 Extended down and reject reasons

An extended down and reject reason option can be purchased from PlantStar. This will extend the down and reject limit to one hundred sixty (160) reasons for each set.

11.87 Family job

A job that has two or more child jobs associated with it.

11.88 Fast state

The fast, slow, and standard machine states are basic indicators of machine performance. For each machine cycle, the cycle tolerance is monitored. The tolerance is the percent

deviation of a job from its normal standard cycle time. An average cycle is computed and a comparison is made using the cycle tolerance and standard cycle values. If the average cycle is less than the resultant value, the machine is considered fast.

11.89 File number

The identification number of the Allen Bradley data table file. Only whole numbers are acceptable.

11.90 File type

One character abbreviation which identifies the format of the data stored in an Allen Bradley data table file; Examples are **N** for integer values or **F** for floating point values.

11.91 FN code

Function Number for the Maco-4000; MACO 4000 functions are identified as follows:

    01H Sequence
    02H Temperature
    03H Hydraulic
    20H Display Handler
    25H Display Processor
    26H Cartridge
    27H Communications Processor
    28H Keyboard Processor
    30H RS-232 Communications
    38H RS-485 Communications
    40H Data Handler

11.92 Force down flag

Flag which determines if a down reason forces the machine into a down state. While in this forced down state, a machine's attached DCM continues to count parts and monitor process variables. All time is accumulated as down time. The machine appears in a down state regardless of its actual cycle time.

11.93 Force scrap flag

A down reason may be associated with a reject reason via the Force Scrap flag. Valid choices for this field are either "No" or the reason index of a reject reason (as defined on the Reject Reason Sets window). If a reject reason index is entered, parts are automatically rejected and accumulate under the associated reject category. For example, if the Force Scrap flag is set to 5 for down reason #2, then whenever down reason number 2 is selected, all parts are rejected and accumulate under reject reason #5.

11.94 Forecast interval

The forecast interval field restricts the number of jobs displayed on the Tool Change window to those that are estimated to be completed by the selected interval. For example, if the "1 day" interval is chosen, jobs that are estimated to be completed within 1 day from "now" are listed in the table.

11.95 Forecast types

Forecast types are used to determine the effect a labor category has on the job to which it was assigned. There are two forecast types: setup and production. Setup forecast types will only be used during the setup time that was assigned to the job. Production forecast types will be used only during the rest of the job, that falls outside of the jobs initial setup portion.

11.96 Free text

Parameter which contains user-designated information. The PlantStar system provides you with up to four customizable fields. The titles of the free text fields can be set up from the User Defined Labels window.

The free text fields are also available as descriptive fields for bar coded tote labels. Bar code labels are printed in conformance with the AIAG bar code standard. Each free text field can be up to 20 characters in length.

11.97 Full access privilege

If the Full Access box is checked, a user can add, delete and edit any PlantStar window and its information associated with the checked privilege (the privilege located on the same row as the Full Access box).

11.98 Gain

Multiplier used to amplify or extend the range of an analog signal. Always use the largest gain which will keep the signal within the 0 to 10V input range. For example, if a transducer generates a 0 - 30 mV signal, use a gain of 300 to amplify the input signal to 0 - 9V for digitizing. For **simulated** sources, the gain is applied to the simulated signal.

Standard gain factors are 1, 2, 3, 10, 20, 30, 100, 200, and 300.

11.99 Gross pieces

The number of total pieces produced on a job, including both net and rejected pieces.

11.100 High value

The highest value recorded for a process variable during the current shift.

11.101 Higher limit

Highest value of a process or profile variable that is normal for the current job. If a process or profile variable exceeds its high threshold, the machine will be in process exception for that cycle.

11.102 Historical job

A job which has been completed and whose data is available for analysis.

11.103 Historical shift

A shift that has been completed and whose data is available for analysis.

11.104 Hours to go

Total hours and minutes estimated to finish a job. The job is complete when total net pieces for the job equals the pieces required. Before 5% of the pieces required have been made, Hours To Go is calculated as follows:

Hours to Go = Remaining Setup Time + ((Pieces to Go) / (Standard Rate))

After 5% of the pieces required have been made, the following formula is used:

Hours to Go = (Pieces to Go) / (Actual Rate)

For maintenance jobs, Hours To Go is equal to the actual setup time remaining.

NOTE: If the job scheduled is a family job, the Hours to go will indicate the expected run time of the longest running child job.

11.105 Hours worked

The total number of hours an employee worked. This is the difference between the employee's start and end time.

11.106 HTML

Hyper-Text Markup Language – This is the language that web pages are written in. They are displayable in a web browser.

11.107 Identifier

A three character identification which is associated with a process variable; For HPM CMD sources, a list of standard identifiers is available from the **HPM CMD** manual. For **RKC F900** sources, identifiers are user-defined.

11.108 Idle period

The time when the machines are not scheduled to operate. During an idle period, the DCM ignores all inputs from the machine. Only idle time will be accumulated.

11.109 Idle state

A machine is considered idle if it is following a shift schedule that has an idle period defined or if its job is set to idle. A job is idle if its job parameters -- *schedule factory* and *schedule now* -- are both set to "NO".

11.110 Idle time

The time that is accumulated while a machine is idle. See Idle Period.

11.111 Ignore cycle flag

Flag which determines whether a DCM ignores the primary contact when in a forced down state.

If a machine is in a forced down state (as set by the Force Down flag), and the Ignore Cycle flag is set to "Yes", a machine's attached DCM stops counting parts and monitoring process variables. Monitoring is resumed only when the machine exits the down state.

11.112 Index number (JSW source type)

Index number within the block which identifies the process variable being monitored; For valid index numbers, refer to the JSW *Process Monitoring Parameters to Host Computer of uPACS-5000 & uPACS-5000D* manual.

10.113 International support
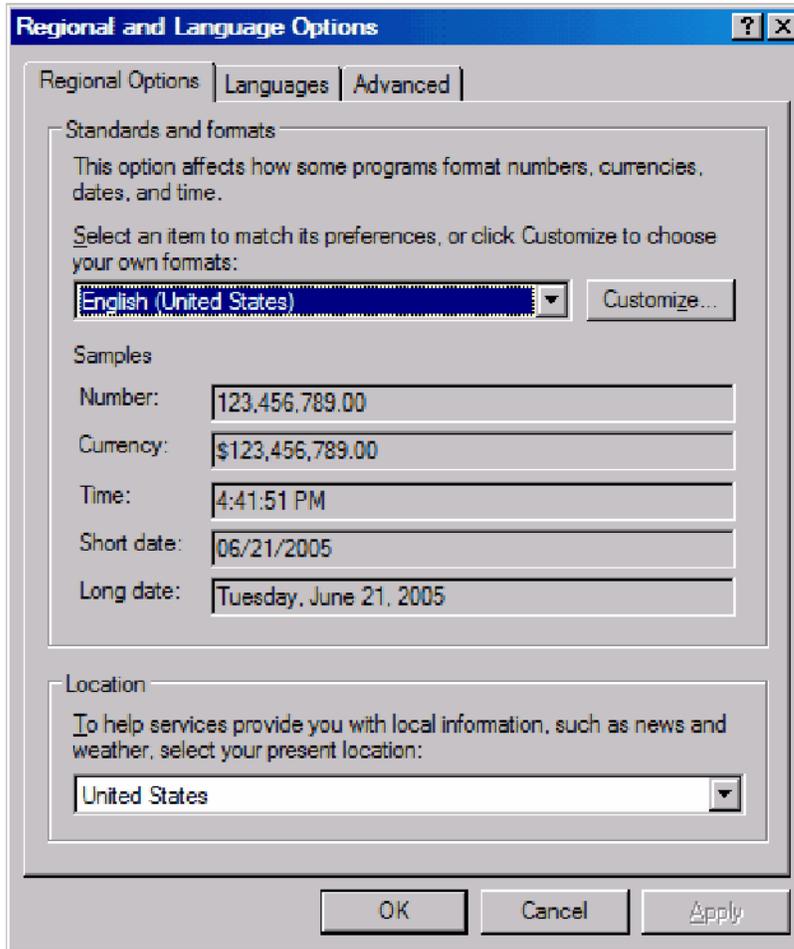
PlantStar uses the Windows regional settings to define valid input on date, currency and decimal input controls. All displays and reports will also use the regional settings of the computer they are currently running on. Please see the available settings by going to contol panel->Regional and Language Options and clicking the customize button. The screen is displayed above.

11.114 IP address

Logical ethernet/internet address -- this address can be a logical name or in dotted quad notation (192.168.100.100).

11.115 Isolated A to D

When checked the RIO's boot set will contain the files necessary for use with an isolated analog to digital converter card.

11.116 Job

A fully specified set of job parameters for monitoring the production of a specific quantity of a specific product. The general term "job" is used to describe the current job running on a machine, a queued job or a work order.

11.116.1 Job board

Displays the current job queues for all machines within a selected display group. Each row represents a machine's job queue and each rectangular block is a scheduled job. The first rectangular block on each machine is its active job. The remaining jobs form a linear list of jobs waiting to be run on the machine. The block length indicates the expected run time for the job. Green rectangular blocks indicate that a job is estimated to complete on time. Red and orange blocks indicate late completion times.

11.116.2 Job changes

Number of times a new job has been started, on the selected machine, during the given time period.

11.116.3 Job history size

DCM parameter which sets the number of job change records which should be stored locally at the DCM. All DCMs have the capability for local data storage. This capability allows the DCM to hold data while the host computer is either down or busy -- minimizing data loss. It is recommended that the history sizes be set so that three days of history be stored locally. If the DCM is in communication with the host then these histories are not used.

11.116.4 Job key

Selects existing product standards based upon the entered job name. Partial or complete searches can be done.

NOTE: As of PlantStar v4.10, this search no longer requires the key fields to match the case of the expected result. In other words, the search is no longer case sensitive.

11.116.5 Job name

A user-defined name that identifies a current job, queued job, work order, or product standard. Job name is an alphanumeric string of up to 20 characters.

11.116.6 Job parameters

Refers to a collection of parameters which define how to monitor performance and progress for a job on a specific machine. Job parameters are made up of product-specific and machine-specific information.

11.116.7 Job primary label

Determines how the Job Schedule Window displays jobs on its scheduling chart. Jobs are either identified by job name or by product name.

11.116.8 Job start time

Precise time at which the system started to monitor a job on a machine. Start time is formatted as dd/mmm/yy hh:mm.

11.116.9 Job-to-date

The data available for a current job from the time that is was started to the present time.

11.117 Job queue

A linear list of jobs that are scheduled for a machine. This list does not include the current job. The first queue position holds the next job to be run on the machine.

11.118 Job queue size

Parameter which sets the size of the DCM's local job queue. There are two "job queue size" parameters within your system. This queue size determines the number of jobs that a DCM operator can view or start at the DCM.

The second job queue size parameter is the one defined for the host computer (currently set

to 100). It is not editable.

11.119 Job Summary - graph view
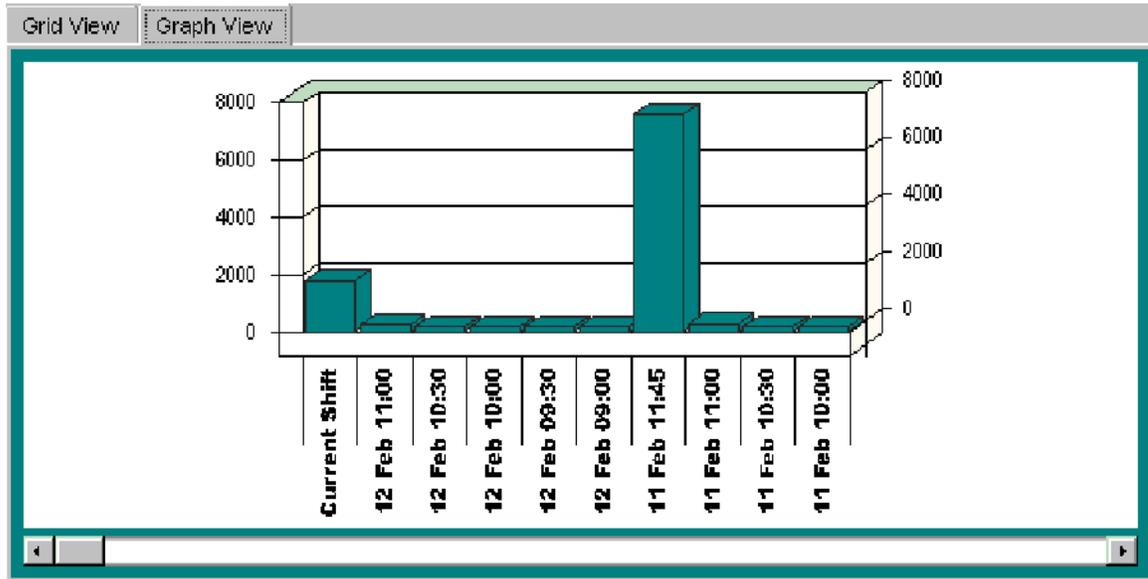
The *Graph View* displays a graph of the selected column in the grid view. There is one vertical bar per shift. Bar height represents the column selected.

11.120 Job Summary - grid view

Shift Start Time	Shift ID	Net Pieces	Parts Per Minute	Total Rejects	% Reject	Production Efficiency	Up Time (hh:mm)	Avg.Cycle
Job to Date		548753	6.08	2657	0.5	298.7	1503:27	10.0
Current Shi	6	1797	5.98	0	0.0	298.9	5:01	10.0
12 Feb 11:0	5	270	6.00	0	0.0	300.0	0:45	10.0
12 Feb 10:3	4	190	6.33	0	0.0	316.7	0:30	9.5
12 Feb 10:0	3	185	6.17	0	0.0	308.4	0:30	9.7
12 Feb 09:3	2	177	5.90	0	0.0	295.0	0:30	10.2
12 Feb 09:01		179	5.96	0	0.0	298.2	0:30	10.1
11 Feb 11:4	6	7585	5.97	0	0.0	298.4	21:11	10.1
11 Feb 11:0	5	273	6.07	0	0.0	303.3	0:45	9.9
11 Feb 10:3	4	177	5.90	0	0.0	295.0	0:30	10.2
11 Feb 10:0	3	177	5.90	0	0.0	295.0	0:30	10.2
11 Feb 09:3	2	179	5.96	0	0.0	298.2	0:30	10.1

The first row of the table provides shift-to-date information for the current shift and job. The middle rows display shift data for up to four completed shifts, depending upon how long a job

has been running. The next row provides shift totals for the last four shifts available. Job-to-date totals for all columns are then calculated in the last row of the table. The color of the window background reflects the machine's running state.

11.121 Labor category

Labor categories which one or more can be assigned to an employee.

The PlantStar system provides up to 30 of these customizable fields. The names of the labor categories can be set up from the Labor Setup window. When an employee attempts to login, they are presented with a list which consist only of the categories to which they have been assigned. Employee Labor categories are user-defined employee-Labor Category definitions are also defined in the Labor Setup window.

11.122 Labor data privilege

Allows this user to view/modify data contained in the Labor Definition Screen.

11.123 Labor Forecast - graph view
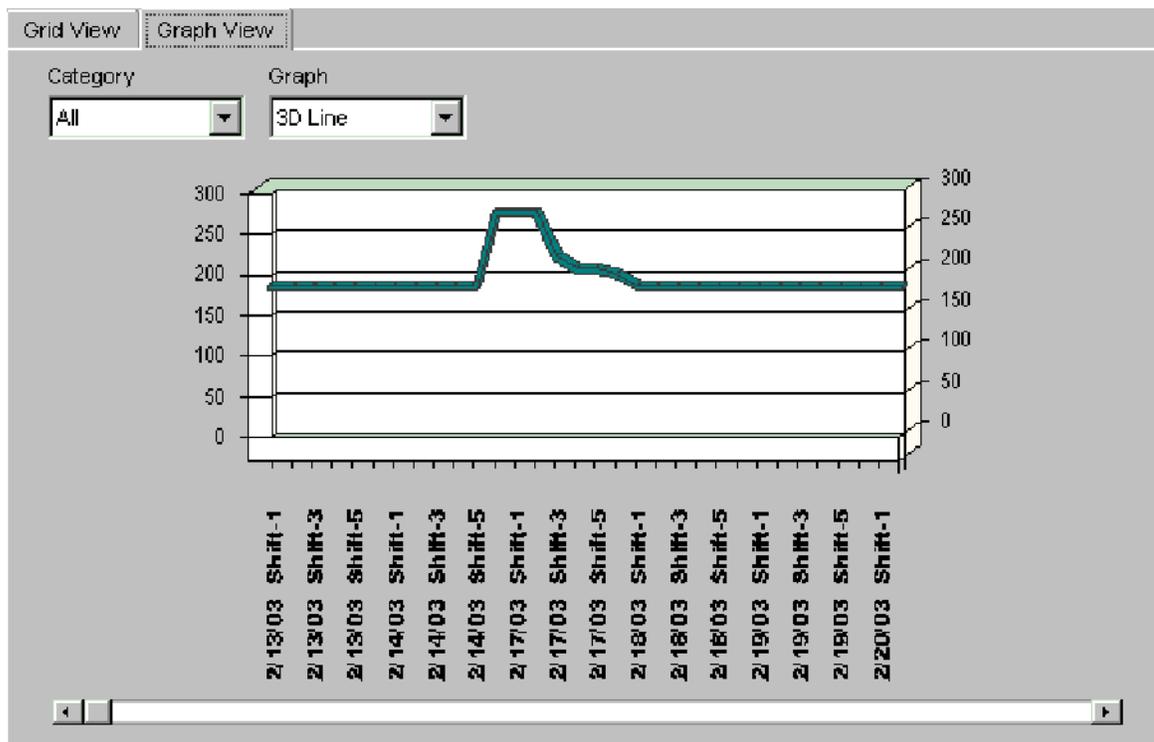
The *Labor Forecast* window is used to accurately forecast, by work center and shift, the number of employees needed in a given *Labor Category*. This forecast is based on current jobs and queued jobs scheduled.

11.124 Labor Forecast - grid view

	Maintenenc	Setup Dude	Broom	Fork Truck	Bob the	Operator 1	Opera
2/13/03 Shift-5	0.00	0.00	8.00	55.00	2.00	3.00	
2/13/03 Shift-6	0.00	0.00	8.00	55.00	2.00	3.00	
2/14/03 Shift-1	0.00	0.00	8.00	55.00	2.00	3.00	
2/14/03 Shift-2	0.00	0.00	8.00	55.00	2.00	3.00	
2/14/03 Shift-3	0.00	0.00	8.00	55.00	2.00	3.00	
2/14/03 Shift-4	0.00	0.00	8.00	55.00	2.00	3.00	
2/14/03 Shift-5	0.00	0.00	8.00	55.00	2.00	3.00	
2/14/03 Shift-6	8.00	13.00	14.00	61.00	7.00	15.00	
2/17/03 Shift-1	8.00	13.00	14.00	61.00	7.00	15.00	
2/17/03 Shift-2	8.00	13.00	14.00	61.00	7.00	15.00	
2/17/03 Shift-3	8.00	13.00	9.30	56.30	3.09	5.61	
2/17/03 Shift-4	8.00	13.00	8.00	55.00	2.00	3.00	
2/17/03 Shift-5	8.00	13.00	8.00	55.00	2.00	3.00	
2/17/03 Shift-6	0.00	0.00	13.17	55.43	4.58	4.72	
2/18/03 Shift-1	0.00	0.00	8.00	55.00	2.00	3.00	
2/18/03 Shift-2	0.00	0.00	8.00	55.00	2.00	3.00	
2/18/03 Shift-3	0.00	0.00	8.00	55.00	2.00	3.00	

The **Labor Forecast** window is used to accurately forecast, by work center and shift, the number of employees needed in a given **Labor Category**. This forecast is based on current jobs and queued jobs scheduled.

11.125 Labor history size

DCM parameter which sets the number of labor history records which should be stored locally at the DCM. All DCMs have the capability for local data storage. This capability allows the DCM to hold data while the host computer is either down or busy -- minimizing data loss. It is recommended that at least three days of history be stored locally.

11.126 Language

The language option allows the users to select their language preference.

11.127 Last value

The process variable measurement taken during the most recent completed cycle.

11.128 Left matching

Searching methods that are used on the **Job Schedule** and **Job Schedule** search windows to quickly find jobs and work orders. The left matching search method finds jobs or work orders that start with a specific string of characters. For example, if the product name "battery" is entered as a search string, PlantStar would find the following:

- battery
- battery clip
- battery housing

If the word "batter" was entered, the left searching method would also find "batteries" in addition to the matches above.

11.129 Linearization type

Indicates the type of linearization which is required to condition an analog input channel for use as a process variable. Most commonly used to linearize thermocouple inputs. However, other non-linear transducers may require a linearization type.

For pseudo variables, the linearization type may be:
- the maximum value
- time that the maximum value occurred
- the minimum value
- the time that the minimum value occurred
- the range (max - min)
- the mean value
- the average of the selected profile
- a value range.

For thermocouples, the linearization type refers to the type of thermocouple that is connected to the DCM.

If your input device is, a pressure transducer, linear potentiometer or any other linear device, select linear transducer. The Newport8005 dewpoint option is a non-linear device which is designed to monitor compressed air and plastic air drying systems.

11.130 Login privilege

This privilege gives a user access to the PlantStar Monitor, PlantStar Shop Configuration, and PlantStar Reports programs.

11.131 Lot end time

The time when an active *Material Lot ID* was either replaced with another lot ID or one of the material components changed within the material formula.

11.132 Lot start time

The time when a *Material Lot ID* was entered at the DCM through a bar code reader or a touch screen. The start time is recorded upon the expiration of the DCM-entered lot delay period.

11.133 Low value

The lowest value recorded for a process variable during the current shift.

11.134 Lower limit

If a process or profile variable is below its lower limit, the machine will be in process exception for that cycle.

11.135 Lower spec

The lower control limit assigned to a process variable. When this limit is exceeded the machine will enter a process exception state.

11.136 Machine

The machine on the shop floor that is being monitored. Each DCM may monitor one or more machines. The machine name can be up to 8 characters in length. The name can include numbers and characters.

A machine setup describes the connection of a DCM to a machine on the factory floor. Every

machine must

- · have one and only one associated DCM,
- · have a set of down reasons, assist reasons, and reject reasons,
- · be defined, if it is to be monitored,
- · belong to one and only one work center

The work center in which the machine belongs is important. A machine follows the shift schedule of its work center. Scheduling of jobs is done by work center.

There are several important points that need to be explained about creating and deleting machines. Once a machine is created, it is considered the same machine until it is deleted. Even if it undergoes a name change, it is still considered the same machine. Once a machine has been deleted, the same machine can never exist again. If a new machine is created with the same name, it is not considered the same machine. Because of this rule within PlantStar, a machine with historical production records should be deleted only if it is to be permanently removed from the system. If its future is uncertain, the machine should not be deleted. It should be disabled so that it can be reactivated later.

11.136.1 Machine cycle

The time duration between closures of the primary contact inputs. The elapsed time is measured and identified as cycle time. Window displays are normally updated at least once per machine cycle.

11.136.2 Machine index

This field is the index of the machine on a DCM. On multiple machine DCMs, this number may be as high as 16. For example, a DCM-4 has indices 1 through 4. A single machine DCM (DCM-1) has an index of 1.

11.136.3 Machine parameter

Refers to a collection of parameters which define how to monitor performance and progress for a job on a specific machine. Examples of machine parameters are *standard cycle*, *down threshold*, and *refeed runners*.

11.136.4 Machine running state

Fast, slow or standard running state.

11.136.5 Machine state

The status of how a machine is performing. See the exception state definition for more complete details.

11.136.6 Machine state colors

All monitoring windows display the state of a machine by color. On machine-specific windows, the background color of the window represents the machine state. Monitoring windows which list multiple machines displays the machine state for each machine by the color of the name's background. On DCMs, the colored lights represent the machine states.

A machine's state is determined by a set of exception flags. Each flag indicates one possible exception condition. The following table lists each machine state and its associated color. The highest priority state determines the color displayed. The states are listed below in order of priority, with the highest of importance listed first.

State	Color
Off-line	Black on white
Idle	Black on gray
Down	White on blue
Process Exception	White on magenta
Production Exception	White on dark cyan
Assist	Red on yellow
Slow	White on red
Fast	Black on yellow
Running	Black on green

A machine can be in one or more states at a time. It can have a process or production exception and be in the assist state. Process and production exception states can also co-exist on the same machine at the same time. The following list provides a general overview of machine states and their relationships to each other.

·   The off-line state is mutually exclusive from all other machine states.
·   If a machine is idle, all other states, except off-line, are excluded.
·   If a machine is down, it can still be in assist or have a process and/or production exception.
·   A machine can be fast, slow, standard, or down.

Other combinations not specifically mentioned above are possible.

There are many ways that machines can enter or exit a certain state. Selection of an assist reason by an operator at a DCM triggers the respective state for the selected machine. Process exceptions occur when a process variable measurement is outside of an assigned limit, either high or low. A machine can go in or out of a process exception state with each new cycle value.

Production exceptions occur when a machine's "pieces to go" is negative (too many pieces have been made) or when its job-to-date percent rejects is greater than its reject threshold for the current job. Once these two relationships are no longer true, a machine exits the production exception state.

There are two ways a machine can enter an idle state. A machine becomes idle if it is following a shift schedule that has an idle period defined. For the duration of the idle period, the machine is classified as idle. The second way a machine can become idle is by suspending its job. To suspend a job, set the job parameters **Schedule Now** and **Schedule Factory** both to No. The idle state stays in effect until these job parameters are changed.

The down state is entered when the average cycle time exceeds the down threshold. The down state ends when the average cycle time is once again less than the down threshold. The down state can also be entered if the operator selects a down reason which is configured to force a machine down.

The fast, slow, and standard machine states are basic indicators of machine performance. For each machine cycle, the cycle tolerance is monitored. The tolerance is the percent deviation of a job from its normal standard cycle time. An average cycle is computed and a comparison is made using the cycle tolerance and standard cycle values. If the average

cycle is greater than the resultant value, the machine is considered to be running slow. If the average cycle is less than the resultant value, the machine is considered fast.

Moving Average Cycle

The moving average cycle is compared to the standard cycle to determine the fast state/slow state of a machine.

The machine is slow if:

(Average Cycle) > (Standard Cycle) + ((Cycle Tolerance) * (Standard Cycle) /1 00)

The machine is fast if:

(Average Cycle) < (Standard Cycle) - ((Cycle Tolerance) * (Standard Cycle) /1 00)

The "Your System" Icon

When your system is iconized, the icon displays on the bottom of the workstation monitor. The top three circles signal exception states for any machine listed on an open window. For example, if you open the *Machine Performance* window and then iconize your system, the icon blinks if one of the machines displayed on the window goes into exception. Exceptions displayed from the icon are down, assist, production exception, and process exception.

11.136.7 Machine usage

A percentage indicator of how much the machine was up during the given time period. This statistic is calculated for an entire job or a single shift.

Machine Usage = (Up Time) / (Up Time + Down Time + Idle Time)

11.137 Maintenance job

A non-production job which has the job parameters with pieces required = 0 and its standard rate = 0. The standard setup time for the job is used to define the duration of the maintenance job. The "Setup" down reason (reason #2) should be selected on the DCM for the entire duration of the job so that actual setup time can be measured and compared to standard setup time.

 For maintenance jobs, estimated completion time is equal to the actual setup time remaining.

11.138 Manning factor

Manning Factors are a numeric representation of man hours required per shift, for a selected job. Manning Factors can be added to product standards, work orders, queued jobs or currently running jobs. The manning factors assigned to jobs are used in the Labor Forecasting window to generate the labor requirements, by shift, for each labor category.

11.139 Material component

Parameter which indicates the name of a raw material. All material components must be assigned a component percent. Lot IDs can be assigned to material components at the DCM. A material name can be up to 20 characters in length.

11.139.1 Material formula

The material components that make up a particular material. Material formulas may contain

from 1 to 4 components.

11.139.2 Material lot history size

DCM parameter which sets the number of material lot history records which should be stored locally at the DCM. All DCMs have the capability for local data storage. This capability allows the DCM to hold data while the host computer is either down or busy -- minimizing data loss. It is recommended that around three days of history be stored locally.

11.139.3 Material lot ID

A user or vendor-defined identification number that uniquely specifies a raw material lot. Lot IDs are entered at the DCM through a bar code reader or the touch screen. The Lot ID is an alpha-numeric string of up to 20 characters.

11.139.4 Material name

Parameter which indicates the name of a single material or a material formula. If your system's multiple material option has been purchased, up to four raw material components can be attached to a material formula. All material components must be assigned a component percent. Material names can be up to 20 characters in length.

11.139.5 Material required

The estimated weight of a material component necessary to meet the production targets for a job. There are three primary formulas for calculating the amount of material required. The formulas are dependent upon whether runners and/or scrap are being re-fed for a job.

- Whenever runners are being re-fed, then the amount of material required is based upon the number of pieces remaining.
- If scrap is being re-fed but not runners, then calculations are based upon the number of pieces remaining plus estimated rejects and the amount of excess weight per actual shot size.
- If neither runner nor scrap is being re-fed, then the amount of material required is based upon the number of shots remaining plus estimated rejects.

All calculations take into consideration actual reject percents if a job is current and more than 5% complete. There is one exception to this rule, however. If both runners and scrap are being re-fed, reject information is not applicable.

11.139.6 Material used

The amount of a material component, in weight, which has been used by the current job. If runners and scrap are re-fed on a job, the amount of material used is based upon net pieces. If only runners are re-fed on a job, then the amount of material used is based upon gross pieces. If neither is being re-fed, then shot size is taken into consideration.

11.140 Max assist time

The maximum amount of time available for a specific machine, job, shift and material lot.

Max Assist Time = Up Time + Down Time + Idle Time

11.141 Max cycle time

The Max Cycle Time field is primarily used with Duration and Cycle Time process variables. It sets the maximum time of a machine cycle. It also sets the level of accuracy for cycle time values up to one hundredth of a second. For example, 3276.5 seconds means that the

maximum time for a machine cycle can be up to 3276.5 seconds and that cycle time values should be recorded up to an accuracy of one tenth of a second.

Note: The <u>higher</u> the maximum cycle time, the <u>lower</u> the level of accuracy. A maximum time of 3276.5 seconds sets the level of accuracy to one tenth of a second. A maximum time of 327.65 sets the level of accuracy to one hundredth of a second.

11.142 Maximum family size

Specifies the maximum number of child jobs that a machine, defined for this DCM, may have for any one job.

The range is from 1 to 12 child jobs.

11.143 Memory

The amount of memory installed in the DCM. The range of values varies with the particular model type of the DCM.

11.144 Memory area

Current memory control area; For **RKC F900** sources, set the memory area to **K0.**

11.145 Memory required

Displays of the estimated memory required by the DCM with the selected options. If this value appears in yellow then the estimated memory exceeds the available memory and unpredictable results may occur. This should be used as a guideline.

11.146 Module address

The module address containing process variable data. Each module must have an address assigned to it. Addresses are assigned by jumpering of Terminals 50 through 53 on the module terminal block and by grouping the modules according to function and then assigning consecutive addresses within each function group. Refer to the *Maco-800 Module Installation and Wiring Procedures* manual for valid module addresses. The parameter type field also offers possible module address data values.

11.147 Monitor number

The monitor number refers to the "subject" to be monitored for the Toyo source type. Refer to the Toyo **Table of Monitor Data** to select the desired monitoring subject. Type in the number next to the appropriate description.

11.148 Moving average cycle

The moving average cycle is compared to the standard cycle to determine the fast state/slow state of a machine.

The machine is slow if:

(Average Cycle) > (Standard Cycle) + ((Cycle Tolerance)*(Standard Cycle) / 100)

The machine is fast if:
(Average Cycle) < (Standard Cycle) - ((Cycle Tolerance)*(Standard Cycle) / 100)

11.149 Multiple login

When set to 'yes' this setting allows an employee to login onto more than one machine at a time.

11.150 Net parts counting

An alternate method of counting parts produced on a machine. Using this method, all parts produced are considered rejects and will be placed in reject reason #2. When a quantity of parts are known to be good then a signal is sent to move the net parts multiplier quantity of parts, as defined in the job parameters, from reject reason #2 to finished parts. Note that the terms "net pieces" and "Net Parts" are used interchangeably.

11.151 Net parts multiplier

Job parameter which indicates the number of good (net) parts to be counted each time the net parts input contact is closed. If you are not using net parts counting, leave the value at zero (0). The range is 0 to 99999. If a value other than 0 is entered then all parts made will be put in reject reason #2. (See net parts counting for a full explanation)

11.152 Net pieces

The number of good pieces that have been produced on a job. *Net Pieces* is displayed in a variety of forms -- for an entire job, for a single shift, or totaled for all machines on a single shift. When *Net Pieces* is displayed for an entire job, the current, incomplete shift is included. The standard method for calculating net pieces is:

Net Pieces = (Gross Pieces) - (Total Rejects)

See net parts counting for an alternate method.

11.153 No access privilege

If the *No Access* box is checked, a user may not do whatever is listed under the *Privilege List* in that row. For example, if the no access column is checked for the *Change Work Order Data* privilege, the user will not see the *Work Orders* window under the *Schedule* menu within the Monitor program. Specifically, no access on the following privileges means

- **Schedule Jobs and Shifts** - User will not see the *Job Schedule* or *Shift Schedule* window within the *Monitor* program.
- **Change Down/Assist/Reject Data** - User will not see the *Down Time Editor*, *Assist Time Editor* and **Parts Count Editor** windows within the *Monitor* program.
- **Configure The Shop Floor** - User will not have the *Sets*, *Group*, and *Shop Floor* menus available for use within the *Shop Floor Configuration* program.
- **Clear Process Trend Data** - The *Clear* button on the *Process Trend/SPC* window is disabled within the *Monitor* program.
- **Change Product Standards Data** - User does not have the *Product Standards* window in the *Monitor* program.
- **Change Work Order Data Privilege** - User does not have the *Work Order* window within the *Monitor* program.

11.154 Non-family job

A job that has no child jobs associated with it.

11.155 Offline state

A machine is considered offline when its associated DCM is no longer in communication with the PlantStar host computer. This does not mean that data is not being collected, unless the DCM itself has lost power. It could be a result of network issues between the host and the DCM.

11.156 One RIO for all machines

When checked this DCM has one RIO configured and it will communicate with each machine. When unchecked this DCM has a single RIO configured for each machine.

11.157 Operator efficiency

A percentage indicator of how many good versus rejected parts a selected employee is producing. This statistic is calculated for a single shift.

The formula is:

(Net Pieces / Gross Pieces) * 100

For current shift calculations, the total part count for the employee is unknown, so "Current Shift" is displayed instead of a percentage.

11.158 Operator start options

Specifies what if any job in the job queue the operator may start. The settings are none, any job in the queue, idle job only, any job in the queue and idle job.

11.159 Operator utilization

A percentage indicator of how many hours a selected employee was logged into the machine versus the total number of hours for a shift. This statistic is calculated for a single shift.

The formula is:

(hours worked / shift length) * 100

For current shift calculations, the hours worked for the selected employee is unknown, so "Current Shift" is displayed instead of a percentage.

11.160 Ordered histogram

A histogram is a way of summarizing data that are measured on an interval scale (either discrete or continuous). In an Ordered Histogram, bars are displayed from left to right in descending order, in effect highlighting the main points.

11.161 Other status

Any machine state information other than down, assist, process exception or production exception. An example is a machine in an off-line state.

11.162 Overrun

A machine is in an overrun state whenever the current job's "pieces to go" is negative (i.e. net pieces are greater than pieces required).

11.163 Parameter number

This field refers to the item to be monitored; For Netstal sources, refer to the item number in the *Table of PLC Interfaces*. For MACO 8000 sources, refer to the *Host Communications Protocol* manual provided with the MACO 8000 controller documentation from Barber-Coleman.

11.164 Parameter type

The parameter type for the Maco-8000 source. The following list of data items is provided courtesy of PlantStar. There are other data values you may want. These will have to be researched in the *Host Communications Protocol* manual provided with the MACO 8000

controller documentation from Barber-Coleman:

Variable	module address	param type	descriptor	param number	decimal places
Nozzle Temp	17	0	0	0	0
Front Temp	17	0	0	1	0
Center Temp	17	0	0	2	0
Rear Temp	17	0	0	3	0
Cycle Time	01	7	0	23	2

11.165 Part weight

Job parameter defining the weight of the material required to produce 1 piece of a product. The range is 0.000 to 999999.999 units.

11.166 Parts per minute

The average number of net pieces (good pieces) produced per minute. The rate can be calculated over a single shift or an entire job.

Parts per Minute = ((Net Pieces) / (Up Time)) / 60

11.167 Percent down

Percentage of machines in a display group that are down.

11.168 Percent process exception

Percentage of machines in a display group with a process variable exception.

11.169 Percent production exception

Percentage of machines in a display group with a production exception.

11.170 Percent rejects

Percentage indicator of how many pieces have been rejected across all reasons. This value is calculated for an entire job, a single shift, or all machines on a single shift. When calculated for an entire job, the current, incomplete shift is included. The formula is:

((Total Rejects) / (Gross Pieces)) * 100

11.171 Percent slow cycles

Indicates the number of slow cycles as a percentage of total cycles. This value is calculated for the current shift as:

Percent Slow Cycles = ((Slow Cycles) / (Total Cycles)) * 100

11.172 Percent variance

Amount of random variance that is desired in a simulated signal as a percentage of the original signal value. The range is 0 to 100 percent.

11 .173 Pieces required

Job parameter which defines the total number of good pieces required to complete a job. The range is 0 to 999999999. A value of 0 would normally be used only for a maintenance job.

11.174 Pieces to go

Pieces still required for the job to meet its production target.

This value is calculated as:

Pieces To Go = (pieces required) - (net pieces)

A production exception is triggered when "pieces to go" becomes negative.

11.175 PLC

Progammable Logic Controller – This refers to the particular machine controller that the DCM will communicate with.

11.176 Polarity

The type of setpoint -- unipolar or bipolar; Unipolar values have a range from (0000H) to (FFFFH) or (0 to 65535) decimal. Bipolar values have a range from (8001 H) to (7FFFH) or (-32767 to 32767). Refer to the *MACO 4000 RS-232 Digital Communications Instruction Manual* for further information.

11.177 Port number

The DCM communications port to use for monitoring a serial process variable. For *simulated* source types, select an unused port number from the selection list. For Engels**,** it refers to the communications port (on the DCM) where the serial link is connected. For RKC F900 sources, the port number should typically be set to 1. Port 0 (Zero) only works with Ethernet DCMs.

11.178 Post-down delay

Amount of time to wait before designating unassigned down time to Down Reason #1. The delay period can be from 0-30 minutes.

When a machine enters a down state, down time is accrued under the down reason selected by an operator. At times, a machine enters a down state and no down reason is specified. If no down reason is specified and the machine exits the down state, an operator has the length of the post-down delay period to assign a reason. If the post-down delay period expires and still no down reason has been specified, all accrued down time is allocated to Down Reason #1. For example, a machine's post-down delay period is set to 5 minutes. While running a job, the machine enters a down state. No reason is given. The machine then exits the down state. An operator has 5 minutes from the time the machine started running normally to designate a down reason for the "unassigned" down time. If the delay is set to zero (0) and an operator does not select a specific reason, down time is automatically accrued under Down Reason #1.

11.179 Primary contact

The contact used to measure cycle time. A primary contact is required for each machine being monitored.

11.180 Primary internet path

This is the symbolic name (exactly as it appears in the hosts file) or the Internet address (in dot notation) of the Communications Processor or the RTL based DCM. Examples include CP3 or 128.0.1.3 This path name can be up to 20 characters in length.

11.181 Print reports privilege

This privilege grants users the ability to print shift-to-date, job-to-date, end-of-shift, end-of-job, and shop configuration reports via the PlantStar Reports program.

11.182 Process trend privilege

This privilege grants users the ability to clear historical process variable data from the **Process Trend /SPC** window within the PlantStar **Monitor** program.

11.183 Process variable

Each machine has a set of process variables and profiles. A process variable is a physically, measurable quantity or characteristic that is collected by a DCM. Most process variables are collected once during each machine cycle. Examples of cyclic process variables are temperatures, pressures, time durations, and PLC readings. Some process variables are not directly related to machine cycles. Examples of non-cyclic process variables are manually operated scales and gauges. Process variable names can be up to 20 characters in length.

There are several categories of process variables. A process variable's type is determined by the source of its input signal:

- **Cycle Time -** Obtained through the primary contact input. Cycle time is the time between consecutive closures of this input. This is always the first process variable.

- **Analog Channel -** Obtained by reading one of the analog channels within a DCM. The applied signal may originate from a pressure transducer, linear potentiometer or another linear device.

- **Duration -** Obtained through an additional contact input. A duration variable measures the length of time that a contact input was closed. One example is hold time.

- **Serial Communication -** Obtained through a serial communications link with the machine's controller. This type of process variable requires a specific software driver. An example is an Engel PLC.

- **Pseudo -** Obtained by reviewing a profile. This may be the maximum, the time that the maximum occurred, the minimum, the time that the minimum occurred, the range (max - min), or the average of the selected profile. Examples include peak pressure, peak time, stroke, and cushion.

- **Thermocouple -** Obtained by reading an analog channel where a J or K thermocouple is connected. This is used in temperature measurements.

A profile is a rapidly changing process variable, such as pressure or position. For a profile, a machine's DCM collects a set of up to 500 points per machine cycle. Profiles are mostly collected from analog transducers. Some PLC's are capable of collecting and transmitting a profile.

11 .183.1 Process exception

Indicates that a process variable measurement is outside of the assigned limits, either high or low.

11.183.2 Process exception state colors

This button's image will change to indicate that a process variable measurement is outside of the assigned limits, either high or low.

The various states are described below. Pressing this button, regardless of the current state, will display the Process Summary page in the main frame of the browser screen.

Normal: All of the machine's process variable measurements are within the assigned limits.

Process exception: At least one of the process variable measurements is outside of the assigned limits, either high or low.

11.183.3 Process index

A number used to show the number of process variables in exception. The index column has no connection with the defined index of a process variable.

11.183.4 Process log

Indicates the type of process variables to be included on the Machine Log window within the Monitor program and on DCM Log screens. Three options exist -- All, Critical or None. The All option reports all process variables for a machine. The Critical option displays only those process variables marked as critical. The None option turns off the reporting of process alarms.

11.183.5 Process variable parameter

An optional job parameter that defines the limits for a process variable. This includes the low and high limits, and a trigger delay. The trigger delay will override the default value that was entered in the Machine Setup Window.

11.184 Product

Job parameter which identifies the product to be manufactured. This parameter can be up to 30 characters in length.

11.184.1 Product parameter

Refers to a collection of parameters which define how to identify and monitor performance/ progress of a specific product. Examples of product parameters are material, part weight, standard shot weight, and standard rate factor.

11.184.2 Product key

Selects existing product standards based upon the entered product name. Partial or complete searches can be done.

NOTE: As of PlantStar v4.10, this search no longer requires the key fields to match the case of the expected result. In other words, the search is no longer case sensitive.

11.185 Product standard

A template of parameters which is copied into a work order. A product standard is made up of product-specific parameters and machine-specific parameters.

11.186 Product standard privilege

This privilege enables users to create, delete, and edit product standards.

11.187 Production data

All data collected by the PlantStar system during a particular job and/or shift.

11.188 Production efficiency

A percentage indicator of how well the machine is performing. This statistic is calculated for an entire job or a single shift.

The formula is:

$$(((Net Pieces) / (Standard Rate)) * ((Up Time) + (Down Time))) * 100$$

For job-to-date calculations the current, incomplete shift is included.

11 .189 Production exception

A machine is in the production exception state whenever one or more of the following is true:

- · Pieces to go is negative (more pieces have been made than were required);
- · Job-to-date Percent Rejects > Reject Threshold.

11.189.1 Production exception state colors

This button's image will change to indicate that a machine is in the production exception state.

The various states are described below. Pressing this button, regardless of the current state, will display the Production Summary page in the main frame of the browser screen.

Normal: The job still has pieces to make and the reject level is within the specified threshold limit.

Production Exception: A job is in production overrun when Pieces To Go is negative (more pieces have been made than required).
A job is in reject exception because Job-to-date percent rejects exceeds the reject threshold.

11.190 Production performance

Percentage indicator of how close a machine is running to its standard rate of production.

Production Performance = ((Actual Rate) / (Standard Rate)) * 100

Performance is considered standard when this value is 100%.

11.191 Production time

Total scheduled runtime that has elapsed for a job. This value is calculated for an entire job or a single shift. The formula is:

Production Time = (Up time) + (Down Time)

Format is hhhh:mm.

11.192 Profile

Rapidly changing process variable, such as pressure or position, for which the DCM collects a set of up to 500 points on each machine cycle. The profile name can be up to 20 characters in length.

11.192.1 Profile parameter

An optional job parameter that defines the limits for a profile. This includes a trigger delay and duration. The trigger delay and duration set in the job editor overrides the default values that were entered in the Machine Setup Window.

11.192.2 Pseudo end

A pseudo variable can be defined for an entire machine cycle or a segment of a cycle. The **end** field indicates the event which, after the trigger delay elapses, terminates the collection of a profile. The event can be a profile value, duration, trigger event, or the end of the profile itself (i.e. the end of the cycle).

11.192.3 Pseudo start

A pseudo variable can be defined for an entire machine cycle or a segment of a cycle. The **start** field indicates the event which, after a trigger delay elapses, starts the collection of a profile. The event can be a profile value, trigger event, or the start of the profile itself (i.e. the start of the machine cycle).

11.192.4 Pseudo variable

A process variable that draws its values from the analysis of a profile. The following pseudo variables are available:

- Max Value
- Time of Max Value
- Min Value
- Time of Min Value
- Value Range
- Average Value
- Mean Value
- Area

11.193 PVAR History

Process variable history data is data collected for a particular process variable and stored for analysis.

11.194 Queued job

The job that is scheduled but not currently running on a machine. The current job is the job that is currently running.

11.195 RAM size

DCM parameter which describes the amount of volatile memory in the DCM. The size must match the amount of RAM physically installed in the unit.

11.196 Range

The difference between the highest and lowest values within the subgroups that are currently displayed on a window's graph.

11.196.1 Range control limits

Blue dashed lines which mark the extent of range variation in the process variable displayed. The extent of variation is based upon the amount that could be expected if only common causes of variation were present. Control limits are based upon actual process variation in terms of the range of subgroups that are currently displayed on a window's graph.

11.196.2 Range max

The highest value which represents the difference between the maximum and minimum values in a sample. In your system, the Range Max is calculated over the range of subgroups that are currently displayed on a window's graph for a specific process variable.

11.196.3 Range mean

The average of all ranges over a set of subgroups. In your system, the Range Mean is calculated over the range of subgroups that are currently displayed on a window's graph.

11.196.4 Range min

The lowest value which represents the difference between the maximum and minimum values in a sample. In your system, the Range Min is calculated over the range of subgroups that are currently displayed on a window's graph for a specific process variable.

11.197 Real-time

Processing and displaying real world events in a continuous and timely fashion.

11.198 Reason set

Down reasons, assist reasons and reject reasons are attached to machines from reason sets. A reason set is a group of up to 160 down, 160 reject, or 20 assist reasons that are grouped together and assigned as a unit to a machine or to several different machines. Note that a single reason set contains only one category type of reason (down, assist or reject). Certain down and reject reasons have special meanings attached to them:

- **Down Reason One** - The first reason is the default down reason. Time is accrued to this reason when a machine is down and the operator has not selected a specific reason. A post-down delay period can be set, though, from the ***Machine Setup*** window that delays the accruing of "unspecified" down time to Down Reason #1.

- **Down Reason Two** - The second down reason clocks actual setup time. PlantStar compares this time with a job's standard setup time.

- **Reject Reason Two** - PlantStar uses the second reject reason to accumulate the difference between gross pieces and net pieces when ***Net Parts Counting*** is in effect.

The various reasons which are defined may later be selected by an operator at a DCM or by automated equipment using contact inputs to a DCM.

11.199 Re-feed runners

Machine-based parameter which indicates whether all runners produced by a job are re-ground and re- fed at the machine. "Yes" specifies that all runners are reused immediately at the machine. "No" specifies that runners produced on a job are not re-fed at the machine for a job.

11.200 Re-feed scrap

Machine-based parameter which indicates whether rejected pieces produced by a job are re-ground and re-fed at the machine. "Yes" specifies that all rejects are reused immediately at the machine. "No" specifies that rejects produced on a job are not re-fed at the machine for a current job.

11.201 Register number

The register number of a Square D source type's Circuit Monitor. Circuit Monitors (CM) have two types of registers -- Read-only registers and Write/Read registers. Read-only registers contain values calculated on raw data sampled by CMs. Write/Read registers contain user-defined parameters that are downloaded or changed from a host. Refer to the *Square D PowerLogic Circuit Monitor* manual for register numbers.

11.202 Reject reason

Specific reject reason against which the system charges operator entries. Reason names can be up to 20 characters in length. On keypad DCMs, only the first 9 characters are displayed. On EL DCMs, the first 7 characters are displayed. On browser based DCMs the first 10 characters are displayed.

11.202.1 Reject count

The number of total rejects for a shift or job.

11.202.2 Reject exception

A machine state in which the number of rejects as a percentage of total pieces exceeds the reject threshold percentage for the current job.

11.202.3 Reject multiplier

Product parameter which defines the number of pieces added to the reject count whenever a remote reject contact input is closed for a job. Remote rejects are assigned to specific reasons based upon the digital equation set. The range is 1 to 9999.

11.202.4 Reject percent

Percentage indicator of how many pieces have been rejected across all reasons. This value is calculated for an entire job, a single shift, or all machines on a single shift. When calculated for an entire job, the current, incomplete shift is included. The formula is:

((Total Rejects) / (Gross Pieces)) * 100

11.202.5 Reject threshold

Product-based parameter which sets the maximum acceptable reject percentage for a job. A production exception is triggered if job-to-date rejects exceeds this value. The range is 0.0 to 100.0 percent.

11.202.6 Reject state colors

This button's image will change depending upon whether the machine is in a production exception state due to actual rejects exceeding the reject threshold as defined in the cuurent job. Pressing this button, regardless of the current state, will display the Assist

Select page in the main frame of the browser screen.

REJECT

The machine is not currently in the Production Exception state due to an excess of rejects.

REJECT

The machine is currently in Production Exception due to an excess of rejects.

11.203 Required by

Job parameter which defines the date by which a job must meet its production target. The format is mm/dd/yy. Dates up to the year 2050 are acceptable.

11.204 REU

An REU is a remote entry unit. This is an independent device which enables the entry of reject counts, down time and assist time for up to sixteen (16) machines. As of version 4.10, this feature is no longer supported as it has been replaced by the browser based DCMs.

11 .205 RIO

Remote Input/Output device. This device is used to collect analog data from a machine.

11.206 Running state

This reflects the current state of the machine. If the last cycle of the machine is within the cycle tolerance the running state will be normal

11.206.1 Running state colors

This button's image will change depending upon the current running status of the machine. The various states are described below. Pressing this button, regardless of the current state, will display the Job Summary page in the main frame of the browser screen.

NORMAL

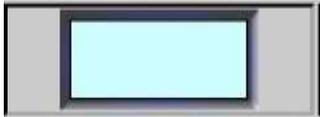Normal: The machine is cycling within the standards defined by the job.

FAST

Fast: The machine is running faster than the standards defined by the job.

Slow: The machine is running slower than the standards defined by the job.

Idle: The machine is currently set to be in the idle state.

Blank: The machine is currently in the down state and therfore has no running status.

11 .207 Scale factor

Multiplier used to convert analog and serial inputs into engineering units. Bias and scale are used in the following formula to convert transducer output voltage to engineering units:

Value = (Voltage * Scale) + Bias

To compute the scale factor, use the following formula:

Scale = (High Value - Low Value) / (High Voltage - Low Voltage)
    where voltage must be in the range of 0 to 10.

This field requires an input value significant to three decimal places. Values can be positive or negative. For Netstal source types, the scale factor for the desired Parameter Number and Convert Index must be obtained from Netstal's PLC Interface Table. For simulated sources, the scale factor is applied to the simulated signal. For Engels, the scale factor is applied to the received value.

11.208 Schedule factory

The schedule now and schedule factory parameters work in conjunction. The following table represents the possible combinations of values and the effect they have on the job when it is scheduled to run.

Schedule Now	Schedule Factory	Result
No	No	The job is set to idle.
No	Yes	The job runs according to the shift schedule.
Yes	No	The job ignores the shift schedule and 24-hour production is assumed.
Yes	Yes	The job runs according to the shift schedule. (Schedule now is ignored)

11.209 Schedule jobs and shifts privilege

This privilege grants users the ability to schedule jobs via the **Job Schedule** window and to create shift schedules via the **Shift Schedule** window.

11.210 Schedule now

The schedule now and schedule factory parameters work in conjunction. The following table represents the possible combinations of values and the effect they have on the job when it is scheduled to run.

Schedule Now	Schedule Factory	Result
No	No	The job is set to idle.
No	Yes	The job runs according to the shift schedule.
Yes	No	The job ignores the shift schedule and 24-hour production is assumed.
Yes	Yes	The job runs according to the shift schedule. (Schedule now is ignored)

11.211 Schedule reports privilege

This privilege grants users the ability to schedule end-of-shift and end-of-job reports via the **PlantStar Reports** program. If scheduled, these reports print automatically at the user-designated time.

11.212 Schedule selected job by due date

This button changes the scheduling method of a highlighted job between the earliest possible start method and the due date method. Once a job is highlighted (clicking on the job highlights it and turns its job rectangle yellow), use this button to switch the job between the two scheduling methods. The right click button on the mouse may be substituted for clicking the button (i.e. it provides the same function).

NOTE: This button only works when the [icon] button is selected at the same time. Also, in order to schedule a job by due date, the job must start to the right of the scheduling marker.

11.213 Scheduled idle time

The amount of idle time assigned within the Shift Schedule window, for a given date range.

11.214 Scheduled jobs

Work orders that have been assigned to the job queue of a specific machine. Scheduled jobs wait in the job queue until they are started by the machine operator or from the monitor job schedule board.

11.215 Scheduled machine usage

A percentage indicator of how much the machine was up during the given time period. This statistic is calculated for an entire job or a single shift.

Scheduled Machine Usage is computed much like machine usage, except it ignores the scheduled idle time during the given time period.

Scheduled Machine Usage = (Up Time) / (Scheduled Up Time)

11.216 Scheduled up time

The amount of up time assigned within the Shift Schedule window, for a given date range.

11.217 Set name

The name for the group of reasons. Up to 20 reasons can be in any given set. If the extended down and reject option is enabled then the down and reject reasons can number up to 160 with the up to 20 assist reasons. There is no limit to the number of sets.

11.218 Setup sheet

Setup sheet information can be added to product standards, work orders, queued jobs or currently running jobs. Setup sheets can be printed in reports, viewed at a workstation, or viewed at the DCM.

Setup sheets consist of two parts -- a general product portion and a specific machine portion. For all jobs, the maximum number of characters allowed for instructions is 2600 combined, as both portions are sent to a DCM as a single instruction sheet.

A free form field is used for typing in information on the Setup Sheet window. On browser based DCMs the setup sheet can contain HTML code and will be displayed as such. This allows the insertion of hyperlinks and other html objects in the setup sheet.

11.219 Setup time

The length of time required to prepare the machine to run a particular job. This time is ignored by the machine usage calculations.

Setup Time information can be added to product standards, work orders, queued jobs or currently running jobs.

11.220 Shift

Shifts define the start and end times of work periods. Shifts can be defined within the Shift Schedule window.

NOTE: Defining shifts within PlantStar is not required but it does provide the flexibility to control part of the job process. If shifts are not defined, all jobs are assumed, by PlantStar, to run 24 hours a day 7 days a week.

11.220.1 Shift count

The number of shift records PlantStar should attempt to retrieve for the given selection criteria.

NOTE: If the shift count exceeds the number of actual shift records, PlantStar will only return the actual shift records found.

11.220.2 Shift history size

DCM parameter which sets the number of shift history records which should be stored locally at the DCM. All DCMs have the capability for local data storage. This capability allows the DCM to hold data while the host computer is either down or busy -- minimizing data loss. It is recommended that at least three days of history be stored locally.

11.220.3 Shift ID

Name assigned to a daily shift. Each weekly shift schedule has 6 shifts available for scheduling each day. The shift name can be up to four characters in length.

11.220.4 Shift idle period

The time scheduled, during a shift, when the machines are not scheduled to operate. During an idle period, the DCM ignores all inputs from the machine. Only idle time will be accumulated.

11.220.5 Shift length

The length of the shift is the total working hours in the shift, as setup in the *Shift Schedule* window. Idle times scheduled during the shift, are not counted in the total working hours.

11.220.6 Shift schedule

Shift schedules define the start and end times for work shifts, idle times for holidays or weekends, and any other events when jobs should not be running or have special needs. Shift schedules are not required but they do provide the flexibility to control part of the job process. If shift schedules are not created, all jobs run all the time.

Shift schedules are created for a work center. Each work center has multiple schedules -- one for each year desired. Each year's schedule may have up to 12 different weekly work schedules.

The Shift Schedule window is used to create, assign, delete and change work center schedules.

11.220.7 Shift-to-date

The data available for a job from the time the current shift started to the present time.

11.221 Shop floor privilege

This privilege grants a user access to defining shop floor configuration parameters such as machine definitions, DCMS, work centers, and down reasons. Specifically, all windows under the *Sets*, *Groups*, and *Shop Floor* menus are affected.

11.222 Shot size

The weight of all materials used in a single cycle of the machine. This number should include both parts and runners.

11 .223 Shuttle boot set

When selected the RIO's boot set will include the files necessary for use with a shuttle type machine.

11.224 Slow state

The fast, slow, and standard machine states are basic indicators of machine performance. For each machine cycle, the cycle tolerance is monitored. The tolerance is the percent deviation of a job from its normal standard cycle time. An average cycle is computed and a comparison is made using the cycle tolerance and standard cycle values. If the average cycle is greater than the resultant value, the machine is considered slow.

11.225 Source

This field defines the source of the data or analog signal.

To set the source:

- Click on the *Edit Process* field.
- Select the number of the desired process variable/profile via the *Variable* field.
- Position your cursor on the *Source* field. Choose from the selection list by clicking the arrow to the right of the list. Slide your pointer down the list to the appropriate line. Release your mouse button.
- Click on the Update button.
- Select the *Save Session* command under the *File* menu to send process variable definitions to the shop floor.

11.226 SPC

Abbreviation for Statistical Process Control. There are two levels of SPC support. The basic SPC option supports SPC collection by DCMs, Real-Time SPC alarms, and real-time SPC X-Bar and Range Charts. The extended SPC option supports advanced SPC capability studies, including normal, non-normal, and multi-variate analysis.

11.226.1 SPC alarms

SPC Alarm abbreviations (**n** = SPC History Size):

XCL - Last X-bar value not within control limits RCL - Last Range value not within control limits

INC - Last 8 X-bar values were continuously increasing DEC - Last 8 X-bar values were continuously decreasing ABV - Last 8 X-bar values where above the mean.

BLW - Last 8 X-bar values were below the mean. UTR - Last n X-bar values show an upward trend.

DTR - Last n X-bar values show a downward trend.

RSM - Within the last n X-bar values, a RUNSUM exceeded 4.

11.226.2 SPC Graph Area

The window displays a line chart of the SPC values collected for a specific process variable. It includes two graphs. The top graph is a plot of X-bar values and the bottom is a plot of the associated range values. The X-axis is the time at which the SPC values were recorded. The number of values graphed may be a subset of the total collected.

To view the maximum value for a graph, click anywhere on the far right-hand side of the window, outside of the graph borders but within the top and bottom lines of the desired graph. To view the minimum value of a graph, click anywhere on the far left-hand side of the graph, outside of the graph borders. To view actual values, click in the middle of the graph area.

11.226.3 SPC history size

DCM parameter which defines the number of SPC samples to be stored locally at the DCM.

11.226.4 SPC interval

Job parameter which defines the minimum time between SPC samples. Individual sample intervals may be longer if enough valid process data has not been collected for a complete SPC subgroup. The range is 0 to 500 minutes. A value of 0 disables SPC collection.

11.226.5 SPC subgroup

The number of data points collected during a specified length of time. This length is defined in the SPC Interval. This value ranges from 0 to 8.

11.226.6 SPC subgroup size

Job parameter which defines the number of process data points required to make an SPC sample. Because the statistical methods used in SPC do not support variable subgroup size, this parameter cannot be changed once a job has been started. The range is 0 to 8. A value of 0 disables SPC collection for the entire job.

11.227 Specification limits

The highest and lowest values accepted by Engineering Standards. In your system, specification limits are equivalent to the high limits and lower limits for a job.

11.228 Standard completion time

The total amount of hours and minutes required to finish a job given the standard production rate. Before 5% of the job is completed, standard completion time is calculated as follows:

Standard Completion Time = Remaining Setup Time + ((Pieces To Go) / (Standard Rate))

After 5% of the pieces required have been made, the following formula is used:

Standard Completion Time = (Pieces To Go) / (Standard Rate)

For maintenance jobs, standard completion time is equal to the setup time remaining.

11.229 Standard cycle

Machine-based parameter defining the normal machine cycle time for a job. When a machine is up, your system uses cycle tolerance and standard cycle to determine whether the red (signifying slow cycles), green (signifying normal cycles), or yellow (signifying fast cycles) performance light should be on. See Average Cycle for more details. The range is 0.5 to 3276.7 seconds.

11.230 Standard deviation

A measure of the spread of individual values around the mean of a sample or the average amount of variation from one part to the next. In your system, the standard deviation is calculated over the range of subgroups that are currently displayed on a window's graph.

11.231 Standard multiplier

Product parameter defining the maximum number of pieces produced per machine cycle for a job. The value of the actual multiplier cannot exceed the value of the standard multiplier. The range is 0 to 9999.

11.232 Standard production time

Calculation indicating the expected amount of time to produce the required number

of pieces.

Standard Production Time = Pieces Required / Standard Rate

11.233 Standard rate

Calculation which defines the number of good pieces normally produced per hour. This value reflects the expected long term average rate of gross production and rejects.

Standard Rate = ((Standard Rate Factor * Standard Multiplier) / Standard Cycle) * 3600

11.234 Standard rate factor

Product parameter indicating the ratio of good pieces expected to be produced per hour as compared to the theoretical maximum for a job. The range is 0.0 to 100 percent.

11.235 Standard setup time

Machine-based parameter defining the expected time necessary for setting up a job to run on a machine. Standard setup time is compared with actual setup time for reporting purposes. This parameter is displayed as hours and minutes (hhh:mm). The range is 0:00 to 500:00.

11.236 Standard shot weight

Machine-based parameter which indicates the total amount of plastic used to fill a single shot for a job. The range is from 0.000 to 999999.9.

11.237 Start date

Precise date at which the system started monitoring the task selected. Start date is formatted as dd/mmm/yy.

11.238 Start time

Precise time at which the system started monitoring the task selected. Start time is formatted as dd/mmm/yy hh:mm.

11.239 Suspend

The current job may be suspended when another job is started. The suspended job becomes a work order and the remaining pieces to go for the job becomes the pieces required for the work order. A job that is in overrun may not be suspended as the pieces required are negative.

11.240 Switch code

To allow a BetaMux to send DCM information for more than one process variable. A selector switch must be connected to the DCM's contact inputs. The selector switch must be a binary coded switch. This type of switch will have five connections. Four of the five contacts should be marked 1, 2, 4 and 8. The fifth is a common. The following is an example of how to connect a selector switch to the contact inputs.

Selector Switch	DCM
Switch #1	IN5+
Switch #2	IN6+
Switch #4	IN7+
Switch #8	IN8+
Common	IN5-

The selector switch contacts #1, 2, 4 and 8 must connect to four consecutive contact inputs.

11.241 System icon

When the PlantStar system is minimized, the   icon displays on the bottom of the workstation monitor. The top three circles signal exception states for any machine listed on an open window. For example, if you open the **Machine Performance** window and then minimize the program, the icon blinks if one of the machines displayed on the window goes into exception. Exceptions displayed from the icon are down, assist, production exception, and process exception.

Moving from left to right, each circle represents the following when blinking:

· First Circle (Flashes Magenta) - Production Exception or Process Exception
· Second Circle (Flashes Blue) - Down State
· Third Circle (Flashes Yellow) - Assist State

11.242 Tool

Job parameter which identifies the molding tool to be used. This parameter can be up to 20 characters in length.

11.243 Total cycles

Total number of machine cycles counted by a DCM over the job or shift. This includes both up cycles and down cycles.

11.244 Total rejects

The total number of pieces rejected on a machine, regardless of reason. This value is displayed for an entire job, a single shift, or all machines on a single shift. When displayed for an entire job, the current, incomplete shift is included.

11.245 Tote box

A tote box is a set number of parts that are traceable as a unit.

11.245.1 Tote box size

Product-based parameter defining the number of pieces in a tote box. This field provides two capabilities:

· When a job's tote count is equal to the tote size, tote label printing can be generated.

· A DCM can be configured to generate a contact output each time a job's tote size number of pieces has been made. To disable this capability (i.e. disable the contact output), set the tote box size to 0.

This field's range is 0 to 99999.

11.245.2 Tote end time

The time of day when a job's tote box count became equal to its tote box size or when an operator pressed the tote change button at the DCM.

11.245.3 Tote history size

DCM parameter which sets the number of tote history records which should be stored locally at the DCM. All DCMs have the capability for local data storage. This capability allows the DCM to hold data while the host computer is either down or busy -- minimizing data loss. It is recommended that about three days of history be stored locally.

11.245.4 Tote ID

An identification number that is assigned to a tote box. Once a tote box is full, ie. a job's tote count is equal to its tote box size; a new ID is assigned for the next tote box. An operator pressing the tote change button at the DCM also triggers the creation of a new Tote ID for

the next tote box.

Tote IDs are unique to a single machine and are automatically generated by your system. They can be used for the tracking of material component lots to a specific tote box.

11.245.5 Tote pieces

The number of pieces in a tote. Each tote is identified by a unique tote id.

11.245.6 Tote reject

Product-based job parameter which indicates whether to subtract rejected pieces from a job's current tote count. Both manually and automatically rejected parts will be subtracted. Valid choices are 'Yes' or 'No'.

11.245.7 Tote start tim

The time of day when a tote box started to be filled.

11.246 Trigger delay

The amount of time to wait after the trigger event before collecting a process variable or initiating the collection of a profile. The range is 0.0 to 999.9 seconds.

11.247 Trigger event

The event which, after trigger delay elapses, starts the collection of a process variable or initiates the collection of a profile. The value can be the name of a digital equation or the number of a contact input.

For analog channels, thermocouples, and simulated process variables, this field refers to a contact which triggers the reading of a process variable. Up to 20 characters is available.

11.248 Ty-Decimal

Upper and lower type codes. These codes identify specific values, setpoints, control relays, or ASCII strings for MACO 4000 data transmission. The three left-most digits should be selected from the following list and are defined as the **Type Upper Byte:**

OxH is a value
1XH is a Setpoint
2XH is a Control
Relay 4XH is an
ASCII string

The two right-most digits of this field are associated with the **Type Lower Byte**. Refer to the *MACO 4000 RS-232 Digital Communications Instruction Manual* for valid choices.

11.249 Unassigned child jobs

A child job that has not been assigned to a family job.

Unassigned child jobs can be imported through the "Work Order Import" program or created in the Work Orders window.

NOTE: These jobs must be assigned to a work order before they can be run on a machine.

11.250 Units

Name of the engineering units to which a process variable or profile variable has been scaled. All duration variables are measured in seconds. Temperature is usually measured in degrees F (DEG F), pressure in pounds per square inch (PSI), speed in centimeters per minute (CPM), and flow in gallons per minute (GPM), to name a few examples.

11.251 Up cycles

Number of machine cycles counted while the machine is up (i.e. not down or idle).

11.252 Up time

The total number of hours a machine has been running (i.e. not down or idle).

11.253 Upper spec

The upper control limit assigned to a process variable. When this limit is exceeded the machine will enter a process exception state.

11.254 User name

The name of a user that will be used as a login name for your system. A user name can be up to 20 characters in length and can include characters or numbers.

11.255 Value

The exact point at which the collection of a pseudo variable is initiated or terminated.

11.256 Variable long name

Long text name of the process variable or profile being defined. This name can be up to 20 characters in length.

11.257 Variable short name

Short text name of the process variable or profile being defined. This name can be up to 8 characters in length. The short name is used on various graphs and on DCMs.

You can change the short name any time you wish just by typing over the current name in the field.

11.258 View only privilege

If the View Only box is checked, a user can view but not edit any PlantStar window associated with the activity of the privilege (the privilege located on the same row as the View Only box). For example, if View Only privileges are granted for the Schedule Jobs and Shifts privilege, a user may open the Job Schedule and Shift Schedule windows within the Monitor program, but they may not edit anything.

11.259 Voice file name

A standard Windows wave form message file which contains an announcement message. The file name is 8 characters in length with a .wav extension.

11.260 Weekly schedules list

The Weekly Schedules List identifies the weekly schedules that have been or can be defined for a calendar year and work center. Each year schedule can have up to 12 different weekly work schedules. Each work schedule is color-coded to identify it on the Calendar table. The 'none' work schedule is always listed first.

11.261 Weekly shift chart

When a weekly schedule is highlighted in the Weekly Schedules list, its running and idle times are displayed in this area. Up to six work shifts can be defined. Their start times are displayed in columns 1 through 6. The last four columns show two possible sets of idle periods.

Times and shift titles are changeable. Times are on a 24 hour clock. Shift names can be up to 4 characters in length.

11.262 Weight per part

Job parameter defining the weight of the material required to produce 1 piece of a product. The range is 0.000 to 999999.999 units.

11.263 Work center

User-defined groups of machines which share the same shift schedule. Since a machine can only execute one shift schedule, it can only belong to one work center. Machines in the same work center always appear together on the same End-of-Shift reports.

11.264 Work order

Work Orders are essentially jobs that have been defined but not yet scheduled. In order to schedule jobs, you must first create a work order. A work order consists of a set of job parameters. These parameters define the job. They include such things as the number of pieces required and the standard rate at which the pieces will be produced.

11.265 Work order privilege

This privilege enables users to create, delete, and edit work orders.

11.266 X-axis

The horizontal axis of a graph.

11.267 X-axis Value

The X-axis Value appears at the bottom right and left hand corner of the Process/Trend SPC window. The X-axis Value represents:

- The X-axis Value in the bottom left hand corner displays the time of the oldest process or SPC value.
- The X-axis Value in the bottom right hand corner displays the time of the most recent process or SPC value

11.268 X-bar

Blue dashed lines which mark the extent of average variation in the process variable displayed. The extent of variation is based upon the amount that could be expected if only common causes of variation were present. Control limits are based upon process variation in terms of the range of subgroups that are currently displayed on a window's graph.

11.268.1 X-bar Control Limits

Blue dashed lines which mark the extent of average variation in the process variable displayed. The extent of variation is based upon the amount that could be expected if only common causes of variation were present. Control limits are based upon process variation in terms of the range of subgroups that are currently displayed on a window's graph.

11.268.2 X-bar Max

The highest value of the mean values in a sample. In your system, the X-bar Max is calculated over the range of subgroups that are currently displayed on a window's graph for a specific process variable.

11.268.3 X-bar Mean

The average of the mean values in a sample. In your system, the mean is calculated only over the range of subgroups that are currently displayed on a window's graph.

11.268.4 X-bar Min

The lowest value of the mean values in a sample. In your system, the X-bar Min is calculated
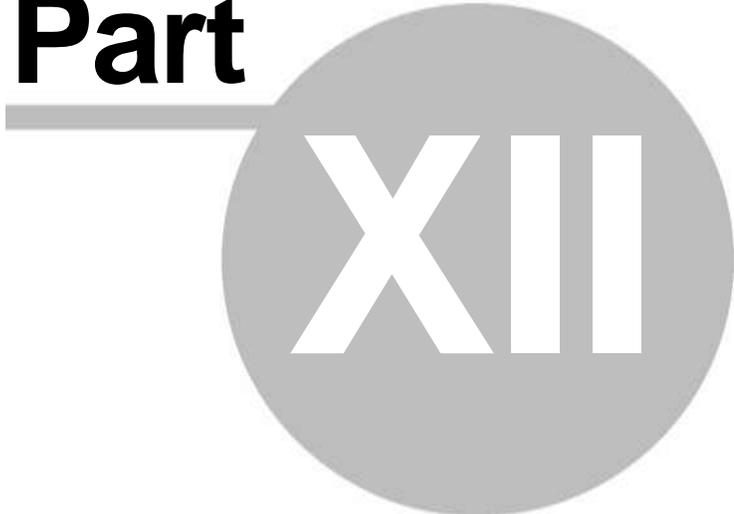
over the range of subgroups that are currently displayed on a window's graph for a specific process variable.

11.269 Y-axis

The vertical axis of a graph.

SYSCON - PlantStar System
User's Guide

Part

XII

12 Release Notes

For each major and minor release, PlantStar has release notes. These release notes include:

· new features within the current version
· bug fixes
· known problems

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         V E R S I O N 4 . 2 0
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                     V4.20 Installation

PlantStar v4.20 can be installed as a new system or as an upgrade to PlantStar v4.10 or later. Data compatibility with earlier systems requires the host computer be upgraded to PlantStar v4. 10 prior to installation of v4.20 as a maintenance release.

NOTE: For those users that have installed Windows 2000, or XP the operating system login MUST be set to have administrative privileges in order to install ANY PlantStar client programs. In addition, we have a known issue in regards to .dll registration on some systems that require the administrator account to run the client software and open all screens at least once to insure proper .dll registration. This issue is under investigation and a methodology is being prepared to eliminate this inconvenience in the future.

                     V4.20 New Features

Browser - Process Journaling

This interface allows operators and shop floor people to record problems and corrective actions.

DCM - Flash Drives

The RTL based data collection modules now come in a diskless version. This feature uses flash memory cards instead of a hard drive.

DCM - Journaling File System

This new file system will automatically restore itself to its previous state in the event of an uncontrolled shutdown.

Host - E-mail

We have added a new feature to our host that allows us to send e-mails from any program running on the server.

Host - Import/Export

We now provide multiple machine specific standards to be imported in any one import file. Our end-of-shift export utility can now notify you of any machines that have failed to report the end-of-shift event. Our export utility can now be set to perform an incremental export.

Automated Archiving -

The archiver program can be set-up to automatically store data over a given interval at a specified time.

Labor Required Displayed on the Schedule Board -

The total labor hours required for a given shift can be displayed on the job schedule board. This option can be enabled from the User Preferences screen in the Monitor program.

Maco 6000 Host Interface -

This protocol uses 485 based serial communications to collect process data direct from the Maco 6000 controller.

International Support -

The date, currency, and decimal numeric fields used for input and display in all PlantStar monitor screens and reports now use the locale settings that have been configured in Windows control panel.

Crystal Reports v11.0 -

All PlantStar reports have been updated to the latest version of Crystal Reports.

Voice Program -

PlantStar's voice program has been modified to eliminate delays in making announcements. Now when any event occurs that requires a voice announcement, the response will be immediate.

                              V4.20 Bug Fixes

No bugs have been reported since the release of 4.10r11.

                      V4.20 Features No Longer Supported

As of 4.20 PlantStar will no longer support the os9 style M-CIMs. This

includes EL/TS, keypads, and REU units. If you have these style units then
the hardware will need to be upgraded before 4.20 can be applied to your
system. Contact you sales representative for further information.


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                    V E R S I O N  4.10r11
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--------------------------------------------------------------------------------------
                    V4.10r11 Installation
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PlantStar v4.10r11 has been released as a minor revision to make feature
enhancements and bug fixes available to PlantStar customers.
The upgrade path is the same as v4.10 in that a customer must be
at v4.00 before upgrading to this version.

NOTE: For those users that have installed Windows NT, 2000, or XP the
operating system login MUST be set to have administrative privileges in
order to install ANY PlantStar client programs. In addition, we have a
known issue in regards to .dll registration on some systems that require the
administrator account to run the client software and open all screens at
least once to insure proper .dll registration. This issue is under
investigation and a methodology is being prepared to eliminate this
inconvenience in the future.


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--------------------------------------------------------------------------------------
                    V4.10r11 New Features
--------------------------------------------------------------------------------------
```

Monitor - Job Schedule Board

The job schedule board's search functionality has been expanded to search on all of the
fields contained in the filter function. This allows for greater flexibility in searching for
specific jobs with the schedule board and work order list.

Monitor - Multiple Material Formula

For users with the multiple materials option, the work order/job material formula fields will
allow up to 1 decimal place to be used.

Host - Backup

The maintenance backup will now optimize the database.

Host - Backup

The backup script will now disconnect any ODBC connections to the database before
running. This eliminates deadlock and resource conflicts associated with backing up the
PlantStar database. Any program that connects via ODBC will need to have its connection

re-established after the backup is complete. PlantStar recommends waiting at least 1 hour from the time backup starts until the ODBC program attempts to reconnect.

Host - Import

Work order import has an option added that prevents the current job from being modified. Product standard import now allows more than 2600 product standards to be imported at any one time. It now allows the importation of multiple machine specific product standards.

Host - Export

Production export now has an option to eliminate a parent record of a family job from the export if its data is not related to production.

DCM - Shot Tracker

A cycle logging option has been created that will timestamp and log information from the DCM for each cycle. This data is being placed into a .csv file to ease importation into most pc based spreadsheet and/or database programs. The logging files are located on the DCM's hard drive and named with the following convention, machine_name_day_shiftID.csv. This convention allows for the recording of data for the previous week to remain on the harddrive. Users can use an ftp client, or other related program to retrieve these files from the DCM's harddrive for importation and review.

DCM - Xtreem interface

An interface to the Cincinnati-Milacron Xtreem controller has been added to our already extensive collection of machine interfaces. This interface requires a Windows based pc to proxy the data between the machine controller and the PlantStar DCM. This was due to the fact that Cincinnati- Milacron uses a Windows based Active-X control to access its Xtreem controller.

DCM - OPC client

An OPC client has been added to collect process variables from OPC compliant machine controllers and auxiliary devices. The OPC client requires a Windows based pc to proxy the data between the OPC Server and the PlantStar DCM.

Browser - Job Update screen

In response to customer's requests the Job Update browser screen at the DCM now allows for the editing of the reject multiplier as well as the editing of the actual multiplier. This gives the user one screen to adjust the cavitation of the mold in the event of a cavity no longer being used.

Browser - Reject Screen

The reject browser screen has been modified so that weights of less than 1 can be entered when rejecting parts based on their part weight instead of by part count.

V4.10r11 Bug Fixes

Monitor - General

An error that allowed for multiple pop-up message windows to be displayed and causing a run-time error #400 to occur has been corrected.

Monitor - Tool Change / Material Forecast

An error opening the tool change or material forecast screens when more than 200 records are being displayed has been corrected.

Monitor - OEE

The down time was being used both in the availability and productivity portions of the OEE calculation resulting in a double adjustment when a machine was down. Down time has been removed from the performance factor in calculating OEE.

Monitor - Job Schedule Board

Many non-critical errors in the schedule board were being ignored by the program causing unexpected results. These errors will now be reported by a pop-up window when encountered. If this occurs, a screen capture should be taken and forwarded to PlantStar customer support so that the underlying cause can be determined and corrected.

Monitor - Work Order

An invalid default required by date has been fixed.

Host - Product Standard Import

A fix has been made to properly update or insert machine specific portions of the product standard when imported.
A problem associated with fixed length fields when parsing an import file has been corrected.

Host - Work Order Import

During import disabled, machines are no longer checked when attempting to find matching jobs in the current job or queued jobs.
A problem associated with fixed length fields when parsing an import file has been corrected.

DCM - General

A memory corruption of the job queue has been found and corrected. This bug was related to unexpected/missing rejects being displayed and as the next job on the Job Summary browser page displaying a large number of "ÿÿÿ" characters.

DCM - RIO2 Driver

The driver for the RIO2 analog card has been rewritten to correctly reload the card with the proper gain and offset settings if a communication error occurs. This was seen by users as erroneous data being captured for analog process variables and as a flattening of the profile curves. In addition, an error displaying a spike in the first reading of the profile has been corrected.

DCM - Tote Count

The tote count field is now saved so that the count can be recovered in the event of a power loss or a cold start of the DCM.

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                          V E R S I O N  4.10
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-------------------------------------------------------------------------------------------
                          V4.10 Installation
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PlantStar v4.10 can be installed as a new system or as an upgrade to PlantStar v4.00 or later. Data compatibility with earlier systems requires the host computer be upgraded to PlantStar v4.00 prior to installation of v4.10 as a maintenance release.

NOTE: For those users that have installed Windows NT, 2000, or XP the operating system login MUST be set to have administrative privileges in order for that workstation to install and run the View and Print Application.

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-------------------------------------------------------------------------------------------
                          V4.10 New Features
-------------------------------------------------------------------------------------------
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General

Although there have been a number of minor changes, the focus of V4.10 is Family Tooling and Labor Tracking.

Family Tooling is designed to allow the collection and tracking of data by child tool. Management will receive a much more detailed picture of production, reject, history, and pieces made for each family tool. Family Tooling allows up to twelve child jobs running, at one time, on a machine.

Labor tracking is designed to forecast, collect, and report labor hours by machine, job, shift, or employee. Labor is collected and tracked by personnel logging in and out at a DCM. The same person or people can be logged onto one or many machines at the same time depending on the work being done. For these reasons, it is not a time and attendance system. It will provide a window to where and how labor is used on the shop floor. Management will receive a much more detailed picture of the time spent on setup, maintenance, idle time, wait time and other assigned labor categories. It can also report time spent, at the machine, by support personnel. As a job history is developed the job history labor reports can be used to forecast staffing

requirements on a shift or weekly basis.

Monitor - Machine Status

Machine Status displays all of the child jobs on a rotating basis. The child job displayed will start at the first child job and rotate to the next child job, with each end of cycle. All data displayed, in the machine cell, would be for the current child job. If no child jobs are found, the data displayed would not rotate. It would always display the parent jobs information. The machine cell would turn cyan if the current child job was in production exception.

Monitor - Production Summary

Production summary displays one line of summary for each child job. If child jobs are not present, the data displayed is based on the parent job.

Monitor - Material Usage

The "Pieces To Go" displayed is a summary of all the child jobs. If child jobs are not present, the data displayed is based on the parent job.

Monitor - Job Summary

A drop down has been added underneath machine for selecting child jobs. Job data displayed is a summary for the child job selected. If no child job is present, the child drop down displays "No Family Data Defined" and the data displayed is based on the parent job.

Monitor - Reject Pareto-Pie

A drop down has been added underneath machine for selecting child jobs. Reject data displayed is a summary for the child job selected. If no child job is present, the child drop down displays "No Family Data Defined" and the data displayed is based on the parent job.

Monitor - Job Schedule Board

The schedule bars now represent the length of time for the child that will take the longest time to complete. If the job is a non-family job, the calculations are based on the parent job. Job Summary displays the pieces to go for each child job. A set of "Child Jobs" tabs were added to the Job Parameter Editor.
The Job Parameter Editor allows the editing of jobs opened from the Job Schedule Board. It also added the ability to assign a labor category and manning to each job. Manning factor is the number of man hours needed to complete the job for the selected labor category. These can be entered into a job by selecting the new labor button at the top of the job parameters screen.

Monitor - Edit Current Job

"Child Jobs" tabs added for the editing of child jobs. Reformatted screen for enhanced usability. Moved machine parameters onto their own grid. Now allows the editing of queue jobs as well as current jobs. Added the ability to assign a labor category and manning factors to each job. Added a new field "Idle". This is a field that allows for setting of a jobs idle state from the PC Client.

Monitor - Edit Work Order

"Child Jobs" tabs added for the editing of child jobs. Reformatted screen for enhanced usability. Moved machine parameters onto their own grid. Added the ability to assign a labor category and manning to each job. Added a new field "Idle". This is a field that allows for setting of a jobs idle state from the
PC Client.

Monitor - Edit Product Standard

"Child Jobs" tabs added for the editing of child jobs. Reformatted screen for enhanced usability. Moved machine job parameters onto their own grid. Added *Add/Delete Child* buttons for the adding/removal of child records from a product standard. NOTE: Child records can only be added or removed from a product standard. The number of child records cannot be changed once created as a Work Order, Job Queue, or Current Job. Added a product standard list that displays all of the product standards on the left hand side of the screen. This allows for easier navigation among product standards. Enhanced the search performance for product standards. Product Standard searches can now be done in a much shorter period of time. Added the ability to assign a labor category and manning to each job. Added a new field "Idle". This is a field that allows for setting of a jobs idle state from the PC Client.

Monitor - Tool Change

Pieces To Go and Estimated Completion Time are based on the child job that will take the longest time to complete. If the job is a non-family job, the calculations are based on the parent job.

Monitor - Historical Reject Pareto Pie

A drop down has been added underneath machine for selecting child jobs. Reject data displayed is a summary of the child job selected. If no child job is present, the child drop down displays "No Family Data Defined" and the data displayed is based on the parent job.

Monitor - Part Count Edit

A drop down has been added underneath machine for selecting child jobs. Part count data displayed is a summary of the child job selected. If no child job is present, the child drop down displays "No Family Data Defined" and the data displayed is based on the parent job.

Monitor - Material Lot Tracking

Material Lot Tracking has been modified to show tote part and tote totals for each child job.

Monitor - Labor Status

Labor Status is a new screen that allows the viewing of current employees logged in. Selecting a work center from the drop down, in the upper left hand corner, will fill the grid with a list of current employees logged in, for the selected work center. The grid displays the employees name, machine, labor category, login date, login time, and hours worked. An additional feature of the labor status screen is the ability to logout an employee. To logout an employee, use the mouse to select the employee from the grid and click the logout button at the bottom.

Monitor - Labor Forecast

Labor Status is a new screen that displays the calculated man-hours needed per shift. The calculations are based off the manning factors assigned to the job scheduled to run in the selected time frame. The Labor Forecasting screen is split into two views: Grid View and Graph View. The Grid View displays one cell for each shift and labor category. For a given shift and labor category the cell displays the required manning factor. The Graph View graphs the man hours required for a given labor category. There is one point on the graph for each shift in the selected date range.

Monitor - Labor History

Labor History is another new screen that allows the viewing, modification, and deletion of labor records for shifts that have already completed. Labor history records are by work center, machine, job, and shift. These are selected from drop downs at the top of the screen. Once a valid selection has been made, the grid will display the employee records for the selection. The grid displays the employee name, labor category, date/time logged in, date/time logged out, down time, reject count, and part count. All fields can be edited, except for employee name. To delete an employee record, select the delete check box, in the grid, on the desired record. Changes are not saved until the <Save> button has been selected. To disregard changes, select the <Restore> button.

Configuration - DCM Configuration

A new field was added to DCM Configuration called "Max. Family Size". This allows the modification of the maximum number of child jobs allowed running on a machine, at the same time. The range is from 1 to 12. Also, a new field was added to show memory used with current configuration. This modification will limit saving of data to data that does not exceed installed memory of the DCM. The calculations for memory use do not include bin sets. Memory overrun may still occur if the bin set used is very large.

Configuration - Labor Configuration

The Work Center screen was updated. A tabbed grid control was added to

allow for the entry of Labor category and employee information. Note clicking on the command buttons on the bottom of this screen affects the work center not the individual employees or labor categories. (i.e. New, Delete, Restore, etc.) Also, the DCM set-up screen was updated. A tabbed grid control was added to aid in the setting up of DCMs correctly. A tab for COM port setup was added as well as a tab to allow for editing contact inputs. Modifications to the DCM set-up screen were also made to enhance error correction in the configuration process.

View & Print Reports

All reports now support family tooling. Reports display totals based on both parent and child information.

New Labor Reports:

1. Labor by Job--Labor history by job. Selection by job and job ending date range
2. Labor by Shift--Labor history by shift. Selection by display group and shift starting date range.
3. Labor Definitions--Labor category and employee definitions for all work centers.

Host - Import

All import programs now support the new field "Family Name". "Family Name" should be assigned to each family set of records to distinguish them as a family. Also, the "Family Name" should be the job name of the parent record. "Family Name" must be included in import files that wish to import family jobs. Also, all import programs now support the new field "manning factor", as it applies to jobs. Added a new employee import program to import employees' definitions.

Host - Export

All import programs now support the new field "manning factor", as it applies to jobs. Job Que export will export manning factors. Labor categories, as it exports data for shift history, will also export labor history for all valid "end-of-shift". For this 115 has to be specified with -f option (as we specify 111 for exporting shift history data)

DCM - RTL

The DCM-RTL now has the ability to view and track each individual child tool production. Also, the DCM-RTL now has a popup display for entry and viewing of Labor related data (Login, Logout, etc.). The DCM-RTL can also obtain login/logout data from a barcode scanner.

DCM – EL Menu

Also, the EL DCM's now has a popup display for entry and viewing of labor related data (Login, Logout, etc.). The DCM-RTL can also

obtain login/logout data from a barcode scanner.

Browser - Job Summary screen

Defaults to showing a family view of a job. This view gives a summary
display of each child in the family with color details. Added button to
allow selection of a specific child to view its details.

Browser - Job Update

For family jobs a new button was added to select each child. When
child is displayed you can modify its actual multiplier.

Browser - Reject Update

Button was added to select individual children. When selected each child's rejected
parts can be modified. The reject numbers are now entered through two dropdown
menus instead of a keypad, works similar to the Job Update screen. This allows for
greater compatibility with various browser software.

Browser - Job Summary, Machine Summary and Job Queue

Pieces required displayed in a job summary format will display
'Family' for all family jobs.

                              V4.10 Bug Fixes

Browser – Job Summary

Job Summary was modified to show number of parts in red when job or
child in overrun. Reject percent displays in red when percent of rejects
exceeds limits.

Browser – Job Setup

Job Setup was modified to allow for more than 80 columns in a
single line. Embedded links now work correctly when a 'T' is placed
within the link.

Browser - Down, Assist, Reject

Button text was modified to improve alignment and consistency with
previous versions.

                              V4.10 Notes

Monitor - Job Summary

Job Summary does not change to previous shift automatically. For
example, if you entered reject parts into Part Count Editor, your
changes would not be displayed until you press the "Build" button at the

bottom. All changes to the current shift are updated by Job Summary automatically, without a screen rebuild.

                        V4.10 Features No Longer Supported

DCM – Keypad and EL Menu

Keypad and EL Menu's do not support family tooling jobs.

Host - Reports

Host Reports are no longer supported.

REU

REU are not supported in this release.

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                        V E R S I O N 4.05
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                        V4.05 Installation

PlantStar v4.05 can be installed as a new system or as an upgrade to PlantStar v4.02. Data compatibility with earlier systems requires the host computer be upgraded to PlantStar v4.00 prior to installation of v4.02 as a maintenance release.

This upgrade uses a method to significantly lower the impact on shop floor data collection in larger systems. The older v4.00 - v4.02 software is compatible enough with the new v4.05 system that data collection can continue on the shop floor during the upgrade. The last step of the upgrade is to reload each DCM in turn with the new software. Overall this may take several hours but it results in each DCM loosing only 5 minutes of data collection time. No backups, job schedule changes or shift schedule changes should be made during this process. The low impact method will not be available on all future upgrades but will be used whenever possible.

                        V4.05 New Features

General

Although there have been a number of minor changes the focus of V4.05 is labor tracking and management. Labor tracking is designed to forecast, collect, and report labor hours by machine, job, shift, or employee. Labor is collected and tracked by personnel logging in and out at a DCM. The same

person or people can be logged onto one or many machines at the same time depending on the work being done. For these reasons, it is not a time and attendance system. It will provide a window to where and how labor is used on the shop floor. Management will receive a much more detailed picture of the time spent on setup, maintenance, idle time, wait time and other assigned labor categories. It can also report time spent at the machine of support personnel. As a job history is developed the job history labor reports can be used to forecast staffing requirements on a shift or weekly basis.

Client - Labor Scheduling

Added the ability to assign a labor category and manning to each job. Manning factor is the number of man hours needed to complete the job for the selected labor category. These can be entered into a job by selecting the new labor button at the top of the job parameters screen.

Client - Labor Status

Labor Status is a new screen that allows the viewing of current logged in employees. Selecting a work center from the drop down, in the upper left hand corner, will fill the grid with a list of current logged in employees, for the selected work center. The grid displays the employees name, machine, labor category, login date, login time, and hours worked. An additional feature of the labor status screen is the ability to logout an employee. To logout an employee, use the mouse to select the employee from the grid and click the logout button at the bottom.

Client - Labor History

Labor History is another new screen that allows the viewing, modification, and deletion of labor records for shifts that have already completed. Labor history records are by work center, machine, job, and shift. These are selected from drop downs at the top of the screen. Once a valid selection has been made, the grid will display the employee records for the selection. The grid displays the employee name, labor category, date/time logged in, date/time logged out, down time, reject count, and part count. All fields can be edited, except for employee name.
To delete an employee record, select the delete check box, in the grid, on the desired record.
Changes are not saved until the <Save> button has been selected.
To back out changes, select the <Restore> button.

Client - Labor Configuration

The Work Center screen was updated. A tabbed grid control was added to allow for the entry of *Labor Category* and *Employee* information. Note clicking on the command buttons on the bottom of this screen affects the work center not the individual employees or labor categories. (i.e. New, Delete, Restore, etc.) Also, the DCM set-up screen was updated. A tabbed grid control was added to aid in the setting up of DCMs correctly. A tab for COM port setup was added as well as a tab to allow for editing contact

inputs. Modifications to the DCM set-up screen were also made to enhance error correction in the configuration process.

Client - View & Print Reports

New Reports:
1.   Labor by Job--Labor history by job. Selection by job and job ending date range
2.   Labor by Shift--Labor history by shift. Selection by display group and shift starting date range.
3.   Labor Definitions--Labor category and employee definitions for all work centers.

Host - Import

All import programs now support the new field "manning factor", as it applies to jobs. Added a new employee import program to import employees' definitions.

Host - Export

All import programs now support the new field "manning factor", as it applies to jobs. Job Queue Export will export manning factors and labor categories. It also will export labor history for all valid "End-of-Shift", as it exports data for shift history. For this 115 has to be specified with -f option (as we specify 111 for exporting shift history data)

Host - Reports

The labor definitions (Labor Category, Forecast Type, Auto Logout, Multiple Login, and Labor Cost) are shown for all the work centers in Host Full-Reports. The manning factor for each labor category is shown for all the jobs in the Host Full-Reports. (Manning factor is reported only when it is greater than Zero).The summary reports remain as before.

Host - Archiving

The archive utility will now support archiving to a CD-R, CD-RW, or an external file.

DCM - EL & LCD

The DCM-EL and DCM-LCD now have a display screen for entering and viewing Labor data. This screen allows login/logout and viewing the current workforce on a machine by machine basis. The DCMs also support login/logout using a barcode scanner.

DCM - RTL

The DCM-RTL is capable of serving web-pages containing its job data to any client PC running a standard browser. The data shown on the DCM-RTL is available for viewing nearly anywhere. Along with this comes the ability (on the 12" RTL-DCM)

to place links in the Job Setup Sheet that point to web-based data of any kind (Documents, pictures, video, etc). The DCM-RTL now has a popup display for entry and viewing of Labor related data (Login, Logout, etc). The DCM-RTL can also obtain login/logout data from a barcode scanner.

                                V4.05 Bug Fixes

Client - View & Print Reports

The Current Job Parameters Summary Report and the Job Queue Job Parameters Summary Report were corrected for a problem of printing multiple rows of the same data for machines defined in multiple display groups.

Host - Work Order Import

Fixed a problem with the work order import where it would occasionally create duplicate work order for records that were not in the system.

Host - Archiving

The archive utility would exit with errors when it encountered incomplete job data. The utility has been made more robust to handle missing or unexpected SPC, shift, tote, and material lot records.

DCM

Setup sheets for the current job or next job were sometimes not available for viewing at the DCM. The DCM would ignore auto-reject inputs on a "net parts" job if the rejects would cause the shrinkage category to go negative. This is now permitted to better handle the resets which occur at job and shift change.

                                V4.05 Known Problems

Archiving

The archive utility will not export labor history. Also, there is a limitation to archiving the first 2000 records for each record type (e.g. SPC, material tracking, and tote snap shots) that are associated with a job. The remaining records will not be archived and will remain in the database.

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                           V E R S I O N 4.02
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                        V4.02 Installation
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PlantStar v4.02 can be installed as a new system or as an upgrade to PlantStar v4.00 or v4.01. Data compatibility with earlier systems requires the host computer be upgraded to PlantStar v4.00 prior to installation of v4.02 as a maintenance release.

This upgrade uses a new method to significantly lower the impact on shop floor data collection in larger systems. The older v4.00/4.01 software is compatible enough with the new v4.02 system that data collection can continue on the shop floor during the upgrade. The last step of the upgrade is to reload each DCM in turn with the new software. Overall this may take several hours but it results in each DCM loosing only 5 minutes of data collection time. No backups, job schedule changes or shift schedule changes should be made during this process. The low impact method will not be available on all future upgrades but will be used whenever possible.

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                        V4.02 New Features
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General

A completely updated edition of the Spanish language translations for the client PC, DCM, and host reports has been incorporated.

Installation of the client software, including View & Print, on Windows 2000 and Windows Millennium Edition has been tested and is now supported.

The Screen Shot utility will no longer be distributed or supported. If you already have Screen Shot installed from a previous release, you may continue to use it for as long as it works in your environment. For new PC's we recommend getting one of the many shareware or commercial screen printing products. ClipTrakker (www.cliptrakker.com) is a full featured shareware program. PrintScreen32 (www.surf.to/provtech) is a bare bones screen printing program.

SnapShot (v2.02) systems have been enhanced to support licensing of up to 8 users and 50 machines. Also SnapShot now supports a wider variety of DCM hardware.

When forecasting the completion or duration of a queued job the PlantStar algorithms now use actual multiplier instead of standard multiplier to estimate the production rate. This allows scheduling personnel to account for a known condition that will prevent all cavities in a mold from being used.

Job Scheduler

The "justify all" button has been changed to toggle left and right like the "justify 1" has always done.

The four user text fields have been added to the job summary popup window.

Machine Status Display

The machine status display now uses larger fonts in the machine status blocks when showing only the machine name. This was done to make large display screens on the plant floor easier to read from a distance.

Import / Export

A special utility has been developed for sending PlantStar production data to the Data Technical Research (DTR) TMM business system. This is an optional utility which is available for a licensing fee.

A new command line option (-a) has been added to the work order import utility (woimp). When this option is used only new work orders are processed from the import file. Any existing work orders (either running, queued, or unscheduled) will not be updated. This option can be helpful when there are a lot of suspended jobs (where the pieces required gets changed to pieces remaining) and change orders to outstanding jobs are infrequent.

Another command line option (-u) has been added to the work order import utility (woimp). This option is used when importing job queues to specific machines and queue positions. When this option is used and the specified queue position for a job is zero, the current job on the associated machine will be stopped and the new imported job will be started as the current job. This option should be used with caution. In most cases the work order import is run automatically once per day. New jobs will be started at the DCM as per the import file regardless of what product is actually running at the machine. In nearly all cases it is best for the operator to do routine job changes at the machine to confirm what the machine is actually doing.

DCM

The new color touchscreen DCM-RTL has been fully integrated for production tracking into the basic operation of the system. Many additional features and improvements will be developed over the coming months.

On the DCM-RTL-10 and DCM-RTL-12 the touch screen calibration item under the "diag" menu is now available to update touchscreen calibrations.

                        V4.02 Bug Fixes

General PC Client

Some of the display screens, including Machine Utilization and Job Summary, would be cut off when maximized at certain resolutions.

In V4.01 the Pieces to Go field on some workstation screens were incorrectly changed to show 0 when the job was in overrun. These have been restored to show the amount of overrun produced as a negative number.

Server Reports

Machines were occasionally reported missing off end-of-shift production reports. This only applied to the server-generated text reports (not to View & Print reports).
The Shop Floor Reports program would exit with an error when attempting to generate a detailed product standards report.

View & Print Reports

View & Print would exit with run time error 6 when an internal sequence number got larger than was expected.

View & Print would exit with run time error 6 when automatic reports were still scheduled after a display group had been deleted.

Import/Export

European date formats were not being handled correctly on the work order import utility.

The work order import utility had several problems relating to the use of the *clear-and-replace* (-c) option. The behavior of this feature was changed enough that the original lower case option (-c) was changed to an upper case letter (-C). This was done to force all installations using *clear-and-replace* to inspect and re-evaluate how the option works in their environment.

It was discovered that the work order import utility would not always match the correct machine specific details when filling out an imported work order.

Job Scheduling

The job queue estimation program, which updates estimated completion times for export purposes, had several related problems which kept it from generating accurate and timely estimates under certain conditions.

The Job Schedule Board would sometimes not refresh itself correctly after committing changes to the schedule. All changes would have been saved correctly and upon exiting and re-entering the schedule board everything would appear normal.

In the Job Schedule Board the length of individual job bars would not always change length when the time scale was changed.

A problem was fixed which would occasionally allow a *hidden space character* to be included at the beginning of the job name. This would cause errors when the job parameters were exported to other computers at the end-of-shift.

In the various screens where job parameters could be edited there was a problem with values from one field being transferred to another field when the job was saved. This most often with the material name field where the word "Yes" would overwrite the material name or the material name would overwrite another field.

Voice

Several customers have had problems with portions of their voice announcements not playing. This problem turned out to be an incompatibility between wave file formats as PC sound has evolved from 8- to 16- and 32-bit sound cards. Wave files recorded with more recent sound card drivers cannot be merged with older files. This problem has been solved by playing each file separately in sequence rather than trying to merge them into one continuous file for playing. Newer workstations are fast enough to handle this without pause. There is one other side-effect which some customers may experience. Wave files recorded with different hardware and drivers often play back at different volumes. Some may find that portions of an announcement are too loud or too quiet compared to the rest. The only remedy for this is to re-record the entire announcement set using the same hardware and sound drivers.

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                            V4.02 Known Problems
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A last minute problem was found in the job schedule board when a large number of jobs are placed in the queue of a single machine. The normal limit is 100 jobs per machine on the job schedule board. However, a fatal exception would occur in the program before this limit was reached. As a temporary patch for v4.02 the limit has been reduced to 75 jobs per machine. This problem will be corrected and the limit restored to 100 in the next release.

Under, as yet undetermined conditions. some of the process thresholds on a job can be set to 0. This can happen to thresholds that were set for alarm as well as ones that had no limit set. The cause of this problem is still under investigation.

All events which occur at the DCM are logged and show up in the DCM machine log display as they should. But sometimes a few of them do not get transferred to the server database and hence do not show up on workstation displays. The cause of this problem is still under investigation.

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V E R S I O N 4.01

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V4.01 Installation

PlantStar v4.01 can be installed as a new system or as an upgrade to
PlantStar v4.00. Data compatibility with earlier systems requires the host
computer be upgraded to PlantStar v4.00 prior to installation as a
maintenance release.

Since the DCM cold end offset between isolated and non-isolated A/D
converter has been standardized, users with the isolated A/D cards that
upgrade from v4.00 to v4.01 will require the corresponding hardware
modification to their isolated A/D cards.

View & Print and Design Manager have been upgraded to support Crystal
Reports 7.0. Since some of the functionality has been dropped, Crystal
Reports 6.0 can not be supported. It is recommended that users of Design
Manager should upgrade all their custom report templates to avoid any
adverse affects.

V4.01 New Features

Job Scheduler

Reload button has confirmation prompt prior to discarding changes and
reloading schedule.

View & Print

Vies & Print now allows *multi-select* on criteria. Added work center
and display group criteria for selection of machines. Date criteria
dialog boxes now default to current date. Templates are reloaded
from host when a report is run to allow easier viewing of new
templates.

Report Definitions

Standard reports templates have upload options as part of PC install
program and do not require reloading of Ingres or View & Print.

DCM

When the 'Down' menu is selected the DCM automatically jumps to the group of 20 down reasons which has the current selected down reason.

                              V4.01 Bug Fixes

DCM

Blank down reasons at DCM after cold boot has been corrected.
Off-line DCM could cause a com failure on CP units. The host has been adjusted to allow for this situation.

DCM cold end offset between isolated and non-isolated A/D converter has been standardized. This upgrade coincides with a hardware change requirement to isolated A/D cards.

If a machine is down at shift change the DCM display doesn't update to show the piece counters reset to 0. This has been corrected so the display always updates at shift change.

General PC Client

Machines that are idle and down will no longer show up on displays that are filtering to view down machines.

"Version mismatch" when specifying INI file on command line has been fixed.

Saving a job as a product standard would give an invalid standard error on the first try, and then work on the second try. This has been fixed.

The **Shop Floor Monitor** program was much slower than previous versions and had noticeable hesitations when entering data. The program has been re-optimized to increase speed and reduce hesitation.

The quick load option caused a "No jobs are scheduled for any machines" error when opening the tool change screen.

The user definition window prompts to save changes on close even if the update button was pressed.

The **Shop Floor Monitor** would occasionally exit with "Run-time Error 5". The vertical scroll bar on setup sheet edit windows was missing.

Some of the real-time display screens would immediately roll up the machine or process selection list after it was dropped down, not allowing enough time to select a different item.

The CAMAC-486/VSX pvar definition was expanded to allow a Convert Index of between 0-79. Previously, its maximum value was 29. Also, some annoying text entry problems were cleaned up with that particular field.

Job Schedule Board

Job Schedule Board now displays machines in alphabetic order when selecting the "<all Machine>" option.

Job Schedule Board has been improved for error recovery and number of work orders.

Job Schedule Board shift patterns are displayed correctly after an idle period.

The *Job Schedule Board* dividing bar between work orders and machine schedule would return to its default setting after editing job parameters. Customer setting will now be remembered.

Improvements in the *Job Schedule Board* were made to handle scheduling by multiple personnel.

A 'required by date' in a prior year for which the shift schedule had been deleted caused problems in *Job Schedule Board*. It displayed an error message saying the "job will be scheduled in 1890". This has been fixed.

Resize handles were missing on the job summary popup window.

The title on the job list popup box was not showing the correct machine name.

When a work order was scheduled and then found in the job search dialog it would still be listed as a work order instead of scheduled on a machine.

Job Schedule Board did not auto-scroll or smooth scroll.

A security hole has been corrected in the *Job Schedule Board*. A user with *view-only* permission could change display groups and be prompted to commit changes.

View & Print

View & Print as well as the standard report templates have been extensively re-worked to correct multiple report problems. This includes the handling of suspended jobs and shift breaks.

View & Print will now allow database backup and maintenance to proceed without interference.

Installation

Ingres can now run in a directory other than the default (C:\OPING).

The installation program will now retain monitor's user preferences during upgrade.

The free disk space checks during PC installation did not take into account browsing to a different drive.

Voice

The voice application work center is preserved during upgrade installation.

The shortcuts created for the voice application in the *Start* menu do not have the home folder as the working path. This causes a failure when looking for the wave files. This problem has been fixed.

Backups

Communication problem on host computer after short backups have been resolved.

After a backup the host computer only ejects CD-R disks. Prior software also ejected the CD-RW disks.

Archiver

The archiver program has been fixed for date range problem and Y2K issue where every date was within the 6-month cutoff time.

The archiver program was getting fatal errors on **Material Lot** and **Tote Box History**. This problem has been fixed.

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                        V4.01 Known Problems
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Screen Shot on Windows NT systems does not function when minimized or in the background. To use with Windows NT, keep it normal size and visible on the screen.

When **View & Print** displays a report on screen, printing of the report causes the screen not to be re-painted when scrolling. This is a problem within Crystal Report. Workaround is to view the report prior to printing.

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                        V E R S I O N 4.00
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                        V4.00 New Features
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General

PlantStar is now an entirely 32-bit application, and as a consequence will no longer run under Windows 3.x. PlantStar relinquishes focus during long operations (such as logging in) and allows the user to go to other open applications and work until the process is done.

PlantStar is now multi-lingual (for the **Monitor** and **Reports** programs) and supports English, French and German. At this time the **Voice** option and the **Shop Floor Configuration** program are available only in English.

New Monitor Screen

Machine Utilization Summary

A new screen has been added under the monitor menu which displays a summary of machine utilization for both a given date range and for any shifts started within 24 hours of the start time for the last completed shift. Machine utilization is defined as *up time* divided by the sum of *up time*, *down time* and *idle time*. Scheduled utilization is a similar calculation, only *idle time* is excluded. Thus it is derived by dividing the *up time* by the sum of the *up time* and *down time*. The date range can be changed and the screen will be updated when the *Build* button is pressed. The current machine state is also displayed and updated in real time. A print button on this screen allows the summary to be printed to a Windows printer. The machines displayed can be filtered by display group, exception type, or by machine name.

Multilingual Monitor

INI file specification for language

The PlantStar **Monitor** now supports not only the English language, but French and German as well. To accomplish this, the user can go to the "Preferences" screen and choose the language that will be used by the monitor program. Simply changing the "English" value to "French" or "German" will cause the PlantStar program to reload those language definitions (if they are not already present) the next time that the program starts up. The user will have to restart the program once the language files have been loaded, as the program will be unable to use most of the strings until it gets the definitions from the database.

After the restart, the new language should be intact. A message box will pop up alerting the user of the need to restart the program after a language change.

DCMs

Idle job start from DCM

The operator is now able to start an idle job at the DCM (for such things as scheduled maintenance). To enable this option, the machine must be setup in the **Shop Floor Configuration** to allow this activity. Once enabled, the operator has only to go to the "Queues" screen and press the "Start Idle Job" button. A warning message will come up to make sure that this operation is the intended one, and then the current job will be either suspended or ended (depending on operator choice).

Utilities

Export programs now have AS/400 support
Both f2kexp and f2kjqexp now support the -r option, which will right justify all non-text fields in the output. This was designed for

customers that require fixed numerical format from within a fixed-width formatted export. This feature will not pad the numerical output with zeros, however. Also, any text field is still left-justified.

A Note on older export templates

In one of the previous 2.3x versions, a new field was added to the database to distinguish between varying types of exports. If you are using exports that were written prior to PlantStar 2.30 or Portrait 1.00, you will need to contact SYSCON Customer Service and have them update your export templates for you. If you experience any problems with your imports or exports after the upgrade, contact SYSCON Customer Service as soon as possible.

Multiple Logins

INI file specification via Command Line

PlantStar now supports running multiple copies of the *Monitor* program simultaneously. This allows users on WAN's to be logged in to multiple hosts concurrently. For multiple host login, a new INI file should be created in the WINDOWS directory for each host to be accessed remotely. Each of these INI files should have the following entry placed into the "main" section:

multi_instance=yes

The multiple instance capability is OFF by default. Each new INI file should also have its "hosts" entry set to the proper IP address or host name. To run PlantStar for a remote host, the name of the proper INI file should then be specified on the command line.

Add-On Features

New Custom Reports Option

A custom reports feature is now available within PlantStar. This new option provides the ability to create custom reports using Seagate Crystal Reports 7.0 and 6.0 formats and share those reports among PlantStar workstations. This option provides for a centralized location for all of your customized reports. This feature augments the Standard Reports program.

Delta Type Process Variable

A new type of process variable has been introduced which allows one process variable to represent the difference between two other process variables.

Monitor Quick-load Feature

Quick-load is a feature that bypasses some of the initialization for screens that take quite some time to load, such as the *Job Schedule Board* and the *Machine Utilization Screen*. If the "Enable Quick

Load" option is selected in the **Monitor's** "Preferences" screen, the following screens will load without any information selected: **Job Schedule Board**, **Machine Utilization** and **Tool Change**. To get them to calculate information, the user must select either a display group, a work center, or a valid date range. These actions will cause the respective form to reload their data.

Thermocouple Scale

A scale was added to the **Thermocouple Process Variable** configuration screen that will account for a level shift on the thermocouple.

Print & View Refresh Button

A "Refresh" button was added to the report list screen to allow the user to check for changes made via the Design Manager without logging out of Print & View and reopening the application.

DCM Screen Saver Enable/Disable

There is now a selection on the DIAGS menu of the DCM/EL that will allow the user to disable/enable the screen saver.

                    V4.00 Bug Fixes

SPC histories from ended jobs were showing 0 for the upper and lower spec limit values. They had non-zero values when the job was current, but went to 0 (not *) when the job ended. This has now been fixed, and all upper and lower limits are retained after the job is committed to history.

The date format on the **Machine Log** screen has been changed to an internationally ambiguous format, to account for overseas customers.

Editing a job by double-clicking it from the Schedule Board, after scrolling to the right one screen, causes the shift legend to recalculate incorrectly. The shift legend was that of the initial screen, not the current one. This has been fixed.

When the time changes, due to Daylight Savings Time, the REU's were not getting updated with the new time. This has now been remedied.

The **Work Order** screen now automatically refreshes after a new work order is saved, to eliminate the problem of a new work order overwriting the previously selected work order if the *Refresh* button was not pressed.

The **Process Summary** screen now clears leftover color bars that were

orphaned when viewing a machine with fewer process variables than the previously viewed machine, and that previous machine had some out-of-range values.

If a user creates a second work order by copying the previous work order, and that previous work order was created from a product standard, and the user changes the selected machine, they are asked if they would like the machine portion overwritten from the product standard. However, instead of overwriting the machine portion only, the entire work order is overwritten. This is no longer the case. Only the machine-specific portion will get overwritten.

The *backup.f2k* script now handles command line typing errors in a more robust manner. An error message is now output.

The *free_check.sh* script has been updated to properly monitor space on a 2-disk system.

The work order import and product standard imports are now fully Y2K compliant.

The archiver program now only allows the user to archive data that is older than 6 months. This was to remedy a problem that was leaving partial job records in the database, leading to inconsistent data. This also remedies a problem with the archiver purging the entire history if the "*jobs finishing prior to*" date was set to 01-01-2000.

When configuring an REU, pressing the "*New*" button clears all the fields, instead of retaining the data from the previously defined REU.

All DCM programs now have adequate stack space, and all stack-related program exits have been taken care of.

The user is now able to use the command button functionality of the main *Monitor* window in the event that the "Host is not Available". Previously, only the File->Exit option would allow the user to close the program.

The KP70 bin set now has the proper sequence number in the database.

                              V4.00 Known Problems

Currently it is possible to include SPC information for an individual job on a machine that has an SPC History Size of 0. The *Process Trend/SPC* screen will return a value of "No Data Available" and no SPC data will be returned, even though it is asked for by the job parameters.

On Windows 95/98 when using a file server login scheme that overwrites the AUTOEXEC.BAT file upon every successful login, the Ingres/Net Client will fail to operate correctly. This is due to the fact that

the Ingres/Net Client relies on path statements put in the AUTOEXEC.BAT file at installation time. A remedy can be accomplished by modifying the "main" AUTOEXEC.BAT file that gets copied to every system. For Novell-specific fixes, please contact SYSCONPlantStar Customer Service for assistance.

**SYSCON - PlantStar System
User's Guide**

Part

XIII

13 Technical Support Contact

If you have a question about your system, look through the *System Administrator's Guide* or consult on-line help. If you cannot find an answer, please contact Customer Service.

If you call, please be at your computer and have the appropriate product documentation at hand. Be prepared to give the following information:

·   The version number of your system that you are using
·   The type of hardware you are using, including network hardware
·   The exact wording of any messages that appeared on your workstation
·   What happened and what you were doing when the problem occurred
·   How you tried to solve the problem

Our Support Phone Number is: 574-232-3900 Ext. 265

For additional contact information please visit us on the web at www.syscon-intl.com

Email can be sent to:
    Information Requests - marketing@syscon-intl.com
    Support Requests - support@syscon-intl.com