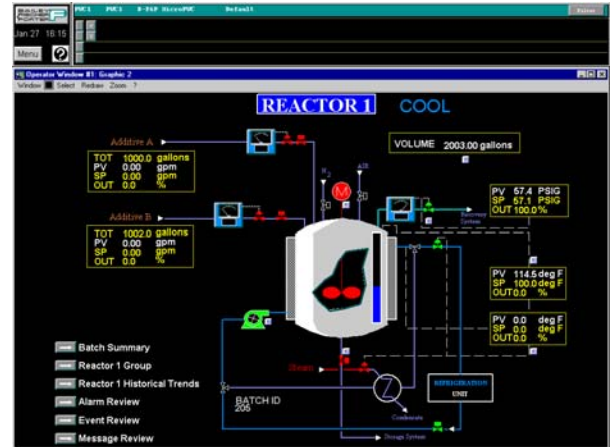


## Micro-PWC Personal Work Center PW6000

- Engineering, Operation and Information Workstation software
- Easily integrated with MicroMod control products for total plant operation
- Dynamic graphic displays with network-wide database access
- Real-time, historical and archive trend displays with zoom and time compression
- OPC Client functionality to integrate third party devices
- Multiple workstation network with Global Database Access



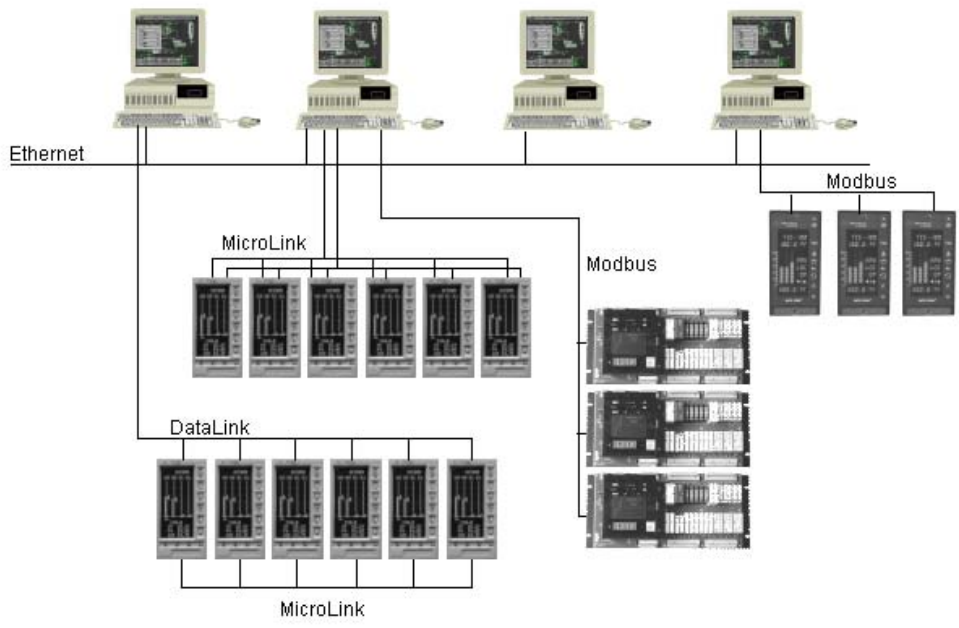
*PW6000 Micro-PWC*

## MICRO-PWC

The Micro-PWC (Personal Work Center) PW6000 is a personal computer based human-machine interface (HMI) package designed for process monitoring and control within the MicroMod Automation network architecture. The PW6000 is a complete application software package with standard imbedded functionality modules and optional add-on features. Process operators can monitor and control all analog loops and discrete devices linked to the process network. The process engineer can configure displays, change process control strategies, format reports, and assign security access levels to other users. Maintenance personnel can monitor the operating status of any system component on the network and diagnose component failures.

The PW6000 includes a library of preconfigured dynamic display templates specifically designed for analog and discrete I/O monitoring, regulatory control, alarm management, and trending. A standard display hierarchy is included to simplify the assignment of tags to Summary, Group and Single point displays.

Each package includes an ISA library of object oriented dynamic symbols. Users can modify any of the standard templates and symbols for specific applications. Also included is the built-in capability to configure displays, graphics, and process instrumentation. A comprehensive alarm management package enables users to easily sort, acknowledge, and take corrective action to process upset conditions. The software includes OPC Client functionality, allowing integration with most third-part devices using OPC servers, and DDE capability for easy data exchange between its global database and other Windows® applications running on the same platform or across the network. Custom reports can be created using EXCEL® spreadsheet and linked to the Micro-PWC's global database. The PW6000 application runs on an industry-standard Pentium™ PC platform under the Windows 2000 / XP Professional operating systems. Ethernet TCP/IP network communications with other Micro-PWC's is a standard feature.



## Features:

- **Innovative Window Displays** - Each Micro-PWC provides four full-function, freely assignable operator windows - selected, altered, or rearranged using simple point-and-click action. Each screen also includes dedicated mini-alarm and configuration windows. The pre-configured display hierarchy allows users to easily assign over 24,000 tags to Summary, Group and Single Point displays.
- **Comprehensive Alarm Management** - Manage up to 64 definable plant areas in real time. Sort alarms by area, priority, or time. Inhibit alarms or route them to networked printers or disk.
- **Event Management** - Monitor events and nonprocess related alarms such as user login, controller power-up and operator acknowledgment. Display events by message type or chronologically.
- **On-Line HELP** - The HELP feature instantly provides on-line access to operating manuals and configuration guides, displayed on the Micro-PWC screen. User configurable displays can provide site-specific instructions for operating procedures, batch preparation instructions, emergency shutdown procedures, etc.
- **System Security** - Provides multiple levels of access for operating, engineering and supervisory personnel. Each security level permits access to certain assignable functions such as configuration, control, node access, and manual data entry.
- **Quick Keys** - A pop-up 64 key video keypad saves time in calling up frequently viewed displays to any operator window. Quick keys can be personalized, sized, and relocated to suit each user.
- **CRT Context Keys** - Bypass key strokes needed to open multiple operator windows; quickly call up as many as four display windows at-a-time related to a specific operation or area. Context keys can also be personalized for each user.
- **Network Synchronization** - Automatic database and display configuration synchronization between networked Micro-PWCs.
- **DDE** - Dynamic Data Exchange (DDE) connectivity allows connection of the Micro-PWC global database to other DDE aware Windows® applications.
- **Historical/Block Database** - Collect and store historical data at configurable collection rates or triggered by events for analysis, reports and trending.
- **Redundant Communications** - Available redundant PCI bus based Ethernet Communications card for secure process data highway communications.

## Overview

The Micro-PWC Personal Work Center provides the Process Operator, Process Engineer, Instrument Engineer and Maintenance personnel with global access to all process and system parameters required by each to perform their required tasks. The Micro-PWC provides the **Process Operator** with a global window to the process for monitoring and control of all analog loops and discrete devices interfaced to the network. Using interactive process graphics and hierarchical displays the operator can perform monitoring and control functions such as: setpoint changes, sequential operation, starting of new charges and control loop tuning. In addition reporting and historical data retrieval functions are handled easily with assistance of pop up windows and intuitive menus.

The Micro-PWC enables the **Engineer** to configure Graphic and Hierarchical Displays, database I/O, make changes to process control instrumentation functions and sequences, format reports and assign security access levels to operating personnel. These changes are immediate, on-line and global, requiring no compilation time before downloading and therefore no process interruption.

The Micro-PWC enables **Maintenance Personnel** to globally monitor the operating status of any system component on the network and diagnose component failures from any Micro-PWC workstation.



## Application Architecture

The MicroMod system is composed of a scalable, multi-level Application Architecture, which permits a building block approach. This allows the user to purchase only the level of hardware and software sophistication needed. Starting at the plant floor, MicroMod offers solutions at the Unit Operations Level, the Process Management Level, on up to the Plant-wide/Enterprise Management level. The PW6000 application runs within a Microsoft Windows™ 2000 or XP workstation node. Each PW6000 Workstation communicates with the Micro-DCI or

MOD controllers over one or more serial communication networks.

MicroMod Process Control Instrumentation such as 53MC5000 Process Control Station, 53SL6000 Micro-Mite™, MOD 30ML Multiloop Controller and MODCELL Multiloop Processor provide I/O interface and the control functions required at the Unit Operations Level including data acquisition, sequential and regulatory loop control, and alarming.

### PW6000 Personal Work Center Design features:

- *Application Software designed in accordance with ISO-9001*
- *Runs on Industry standard, 32 Bit Pentium™ processor*
- *High Resolution CRT display (1024 x 768 pixels)*
- *Microsoft Windows™ 2000 / XP Display Technology*
- *Ethernet communications network*
- *TCP/IP communications protocol*
- *Global Database Access communications*
- *ISA S5.5 Graphical Object Library*

### PW6000 Personal Work Center Functionality features:

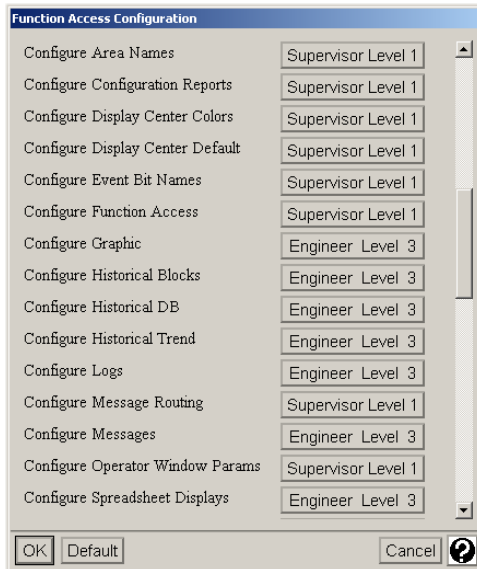
- *Intuitive system hierarchy displays*
- *128 Summary Displays each with 24 groups*
- *3072 Group Displays each with 4, 6 or 8 points*
- *Over 24,000 single point displays available*
- *Quick Keys and CRT Context Keys direct Display access “buttons”*
- *Up to four dynamic process display windows per CRT display*
- *Up to 1024 network wide graphic displays*
- *Operator capture/restore of up to 10 previous window displays*
- *On-line documentation (operation and configuration information)*
- *System and user help menus with each display window*
- *Flexible nine level system security with assignable functions*
- *Individual User login accounts*
- *Up to 1024 network-wide 8-trace Historical/Archival Trend Display pages including zoom and time compression.*
- *64 Definable Alarm areas*
- *16 Alarm priorities*
- *Built-in Alarm and Event Historian*
- *Built-in Global Data Historian*
- *Data Archive Facility*
- *Flexible Alarm Management System with alarm sorting capability*
- *Flexible Message Routing System*
- *Operator Message Broadcast capability*
- *Real-time database interface to Excel® Spreadsheet*
- *Historical Database and Historical Block Database*

## OPERATIONAL CAPABILITIES

### Operational and System Security

The Micro-PWC provides the user with nine unique levels of access for operating, engineering and supervisory personnel. Functions associated with each level are user configurable. The Micro-PWC security system provides network wide accounts

using passwords (up to 7 characters in length) with an associated user login name. There is no fixed limit as to the number of user names that can be configured. The following are examples of the assignable functions for each user level .



- Security Activation/Deactivation
- Password Accounts
- Operator/Engineer/Supervisor Access Level
- Micro-PWC Functions
- Process Control Functions
- Area Access/Alarm assignment
- Priority Access
- Node Access
- Initial Displays on login setup for each user
- Message Class
- 64 Quick Key Assignments (Single Window Display)
- 16 CRT Context Key Assignments (Multi-Window Displays)
- Configuration
- Manual Data Entry Access
- Historical Database Maintenance Access
- Network Device Assignment Access

### Display Hierarchy

Basic process displays and functions are accessed by both the fixed function keys and by clicking on the *SELECT* item on the Operator Window Menu Bar using the cursor-positioning device. These include:

- Graphic Displays
- Summary Displays
- Group Displays
- Point Displays
- Trend Displays
- Quick Keys
- System Status Display
- Alarm Review
- Event Review
- Message Review
- Event Historian
- Printer Review

Hierarchical displays are a set of pre-configured graphical representations emulating traditional instrument displays and batch control symbols. A three-tiered hierarchy of displays exists to provide the user with information about the process. This hierarchy consists of Summary, Group and Point displays. An additional 1024 Graphic Displays are completely configurable by the user.

**Plant Summary Display:** provides an overview of 24 groups arranged in a 4x6 Matrix (Figure 1). Each Summary display includes a legend of up to 48 characters. Each of the 24 groups on the Matrix is identified by a configurable group name and provides an instant color-coded status condition with a text description.

There are 128 Summary Displays available. Clicking on one of the 24 boxes associated with each Summary, opens the "Group Info" Window (Figure 2) that provides the user with an overview of each point in the group, listing the tagname and status of each point. From this window, it is possible to go directly to any one of the following displays:

- Group Display
- Point Display for any point within the group
- Graphic Display assigned to the group
- Trend Display assigned to the group
- NEXT or PREVIOUS Group Info Window

Clicking one of the Summary Boxes with the center mouse button bypasses the Group Info Window and opens the desired Group Display (Figures 2 and 3).

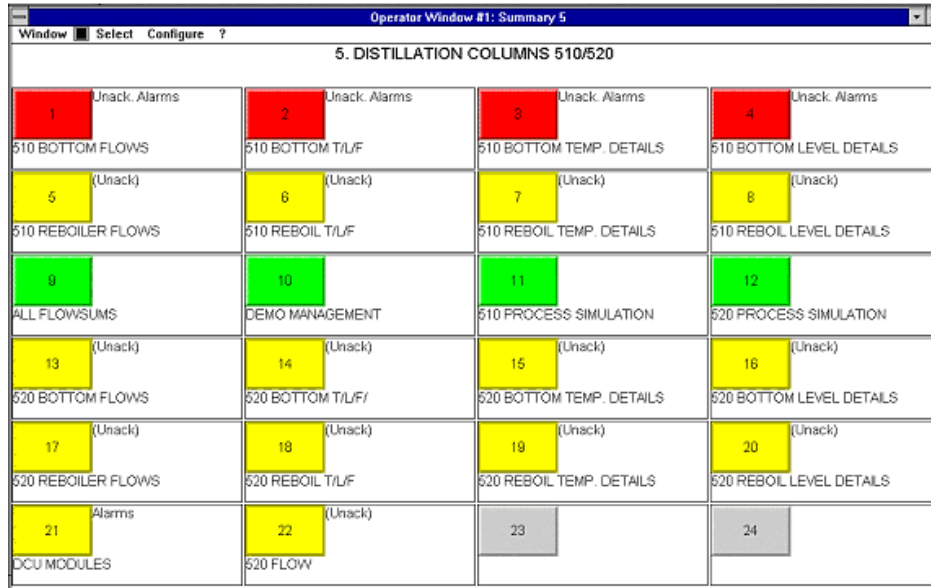


Figure 1. Summary Display

**GROUP DISPLAY:** provides an operational overview of 4, 6 or 8 points simultaneously (Figures 3 and 4). This may be a subdivision of a specific unit operations area or data related to a specific process line or piece of production equipment. The group includes a 10-character tag name for each point within the group. All process control actions (AUTO, MANUAL, REMOTE, LOCAL, Setpoint Changes, etc) and alarm acknowledgement for points within a Group, can be performed from the Group display on a point-by-point basis. From the Group display, the operator may go directly to the corresponding Point Display, the related Summary display, or to the Next or Previous Group display.

From the Group display, the operator may go directly to the corresponding Point Display for each Group position, the related Summary display, or to the Next or Previous Group display.

There are over 3000 Group Displays available for point assignment. All *system wide process modules, with tagnames*, are available for display within a group. The Micro-PWC application provides standard built-in display templates for each type of process module. This reduces the engineering time typically required for building the display hierarchy.

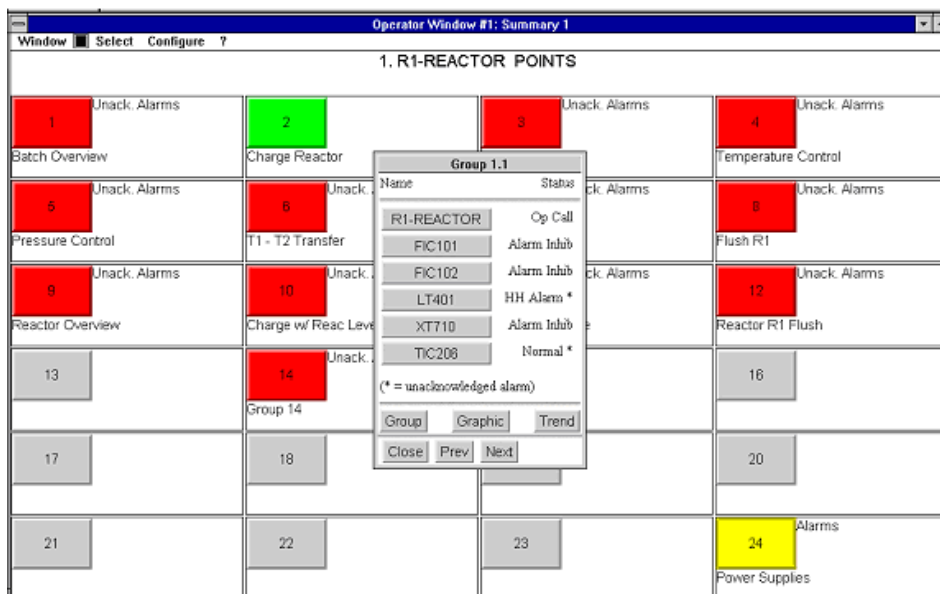


Figure 2. Group Info Window

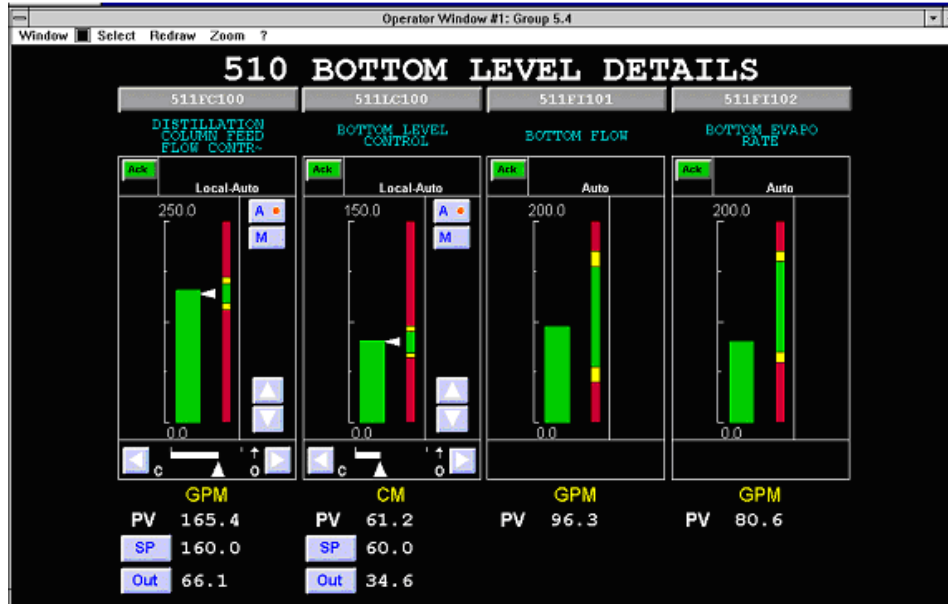


Figure 3. Group Display Showing Process Data

**POINT DISPLAY:** provides the most detailed information and most operational functions of any hierarchical display (Figures No. 4 and No. 5). Using the Point display the operator can observe a Trend display to tune a control loop, or monitor the detailed

operation of a batch sequence. Also at this level the operator can perform regulatory changes to parameters (Figure 5) including controller tuning constants, ratio constants, alarm limits, etc.

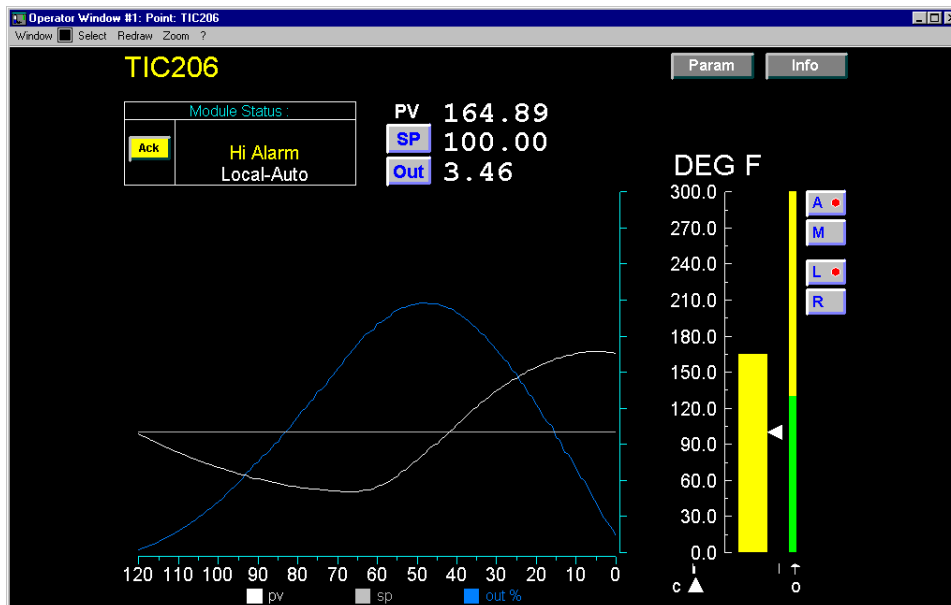


Figure 4. Single Point Display Showing Controller PV, Setpoint and Output Trends



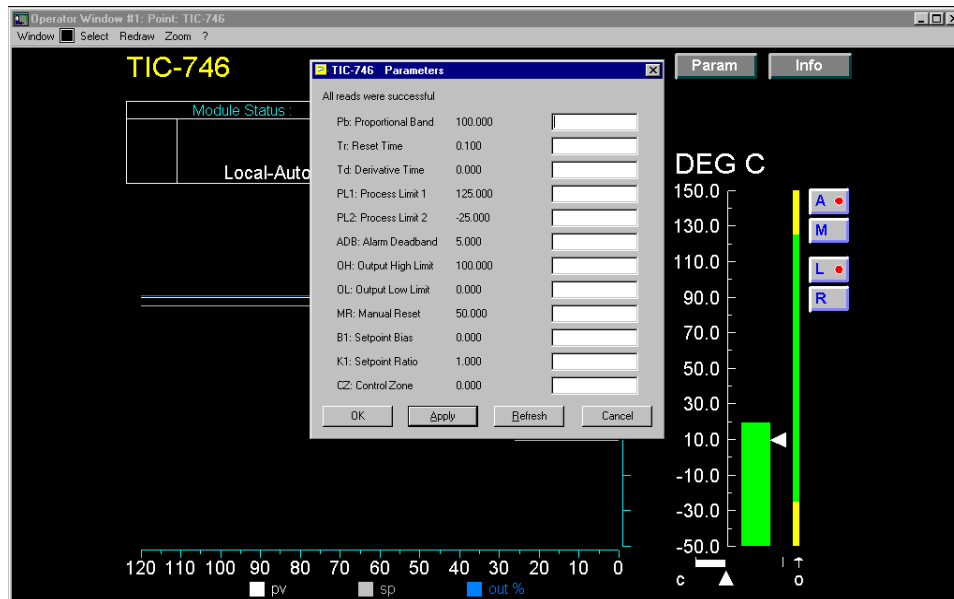


Figure 5. Single Point Display Showing Controller Tuning Parameters

**HISTORICAL DATABASE:** The Micro-PWC collects information from each process instruments and stores it for use by various applications such as Logging, Trending, and Data Archiving.

This collected data is stored in the Historical or Block Database of the Micro-PWC computer platform. Figure 6 shows the Historical Tag Configuration screen.

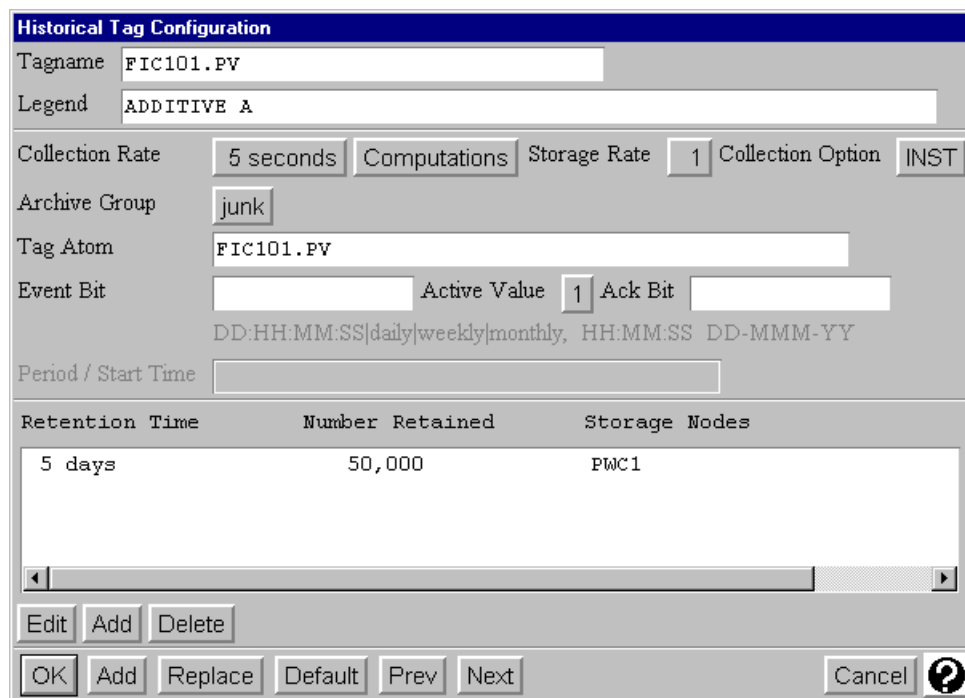


Figure 6. Historical Tag Configuration

**TREND DISPLAYS:** supplement the hierarchical operating displays by presenting the history of process variables in a trace format. Three types of trend recording are available on the Micro-PWC:

- Current Trending
- Historical Trending
- Archival Trending

Current Trends are automatically displayed on every analog oriented point display. This high-speed trend, when used in conjunction with the Single Point Parameter display window, provides an ideal means for functions such as loop tuning.

The historical and archival trending functions display the values of one or more points in an analog trend format similar to that presented by a conventional strip chart recorder. Up to eight process variables can be displayed on a single Trend display (Figure No. 9). Each trace on the graph is plotted in a different color. Trend Time Base and Sample Rate are user configurable parameters.

Historical Trends plot data collected in the Historical database. Up to 1024 network-wide Historical Trend displays are available on the Micro-PWC. The configuration of these trends can be performed on any Micro-PWC and is then automatically distributed to all other Micro-PWC's and Application Servers on the network.

Archival Trending plots data in the Archival database. Historical Data can be transferred to removable media (e.g. a DAT tape), creating a permanent record that can be retrieved and displayed at a later date as the Archival Database. The Archival Data format is identical to that of the Historical Database.

Features of the Trend Display Window include the ability to view trended data as Minimum, Maximum, Average or Instantaneous values. This method of plotting trends permits greater flexibility in trend configuration. For example, points with different collection rates can be plotted on the same trend graph, and non-periodic data can also be trended.

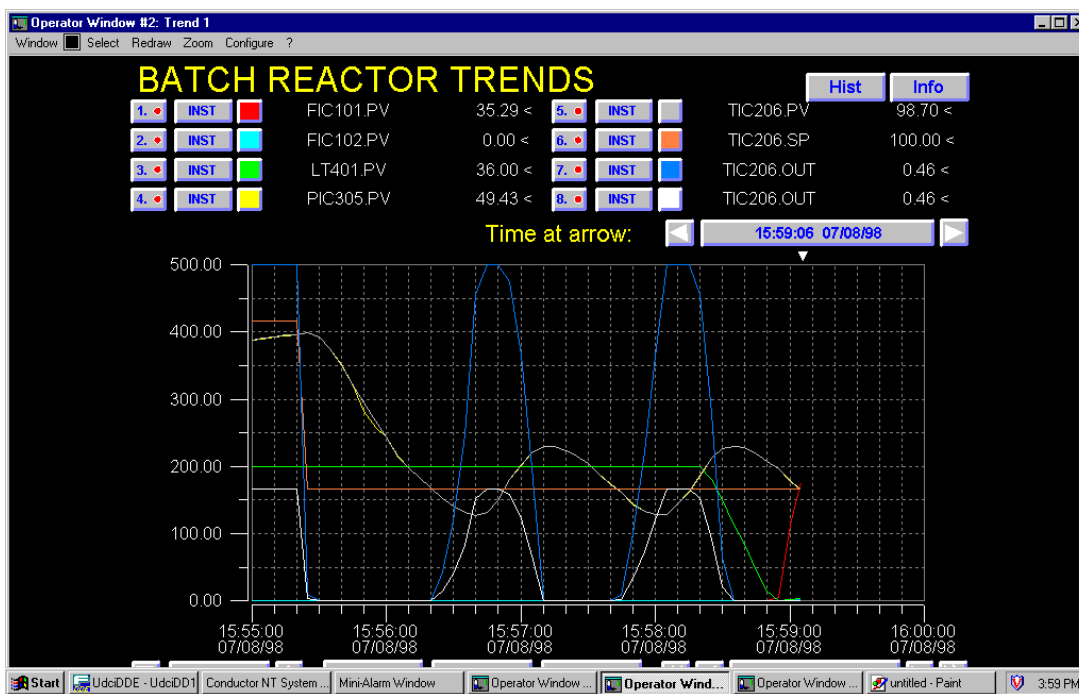


Figure 9. Multipoint Historical Trend Display

Buttons on the display provide flexible viewing options online and in real time, allowing the operator to:

- Pinpoint and view the collection time and value of any point on a trend
- Turn traces "on" and "off" for easier viewing (does not affect actual data collection)
- Display data collection parameters for each point (e.g. tag, range, timestamps, where collected)
- List an index of all configured trends and search by index number or Trend Title
- Zoom/Unzoom any portion of the graph
- Pause or Resume screen updates for reading and analysis (does not affect actual data collection)
- Vary the Compression Ratio (e.g. 1:1.00, one point to one second)

**GRAPHIC DISPLAYS:** provide the user with the capability to create animated interactive process schematics, trends, text displays etc. (Figure No. 10). Because the Graphics are user-definable they can be based on practices and standards unique to the user's plant operations. Graphic Displays can contain any combination of graphical and text information as well as dynamic data. Graphics can be linked to other displays within the system to form an intuitive operating environment. The use of an object oriented graphic modeling system and Windows display technology provides a user-friendly pop-up window display format for interactive control-through-graphics functions.

The use of the Interactive-Control-Through-Graphics feature allows the operator to control the process from the graphic display by selecting configured "Control Points". Selection of a control point will "pop-up" a window such as a Controller Template which is the same Controller Display used in the Group Display, thus providing the same control functions. The Controller window appears within the graphic display.

Typical controller functions such as Process Variable (PV) indication, Set point adjustment, Auto/Manual Selection, Remote/Local Selection and alarm status are displayed.

Using the "point and click" features of the cursor positioning device with the three dimensional function buttons on the controller template, the operator can manipulate the controller functions as if they were on a typical panel board mounted instrument.

Up to 1024 network-wide graphic displays can be configured using the Micro-PWC. Because they are network-wide, a graphic display can be configured on any Micro-PWC Workstation and automatically distributed to all Micro-PWCs on the Network. The Graphic configuration editor uses an object-oriented "CAD" style creation process. Included is a standard ISA S5.5 symbol library and a MicroMod symbol library which includes controller templates and other dynamic displays used in the display hierarchy. The user can also create a custom symbol library. Tools such as copying, cutting, pasting and moving symbols to/from libraries or between multiple graphic displays are standard features. Menus provide access to windows that allow the user to proceed intuitively through the graphic creation process.

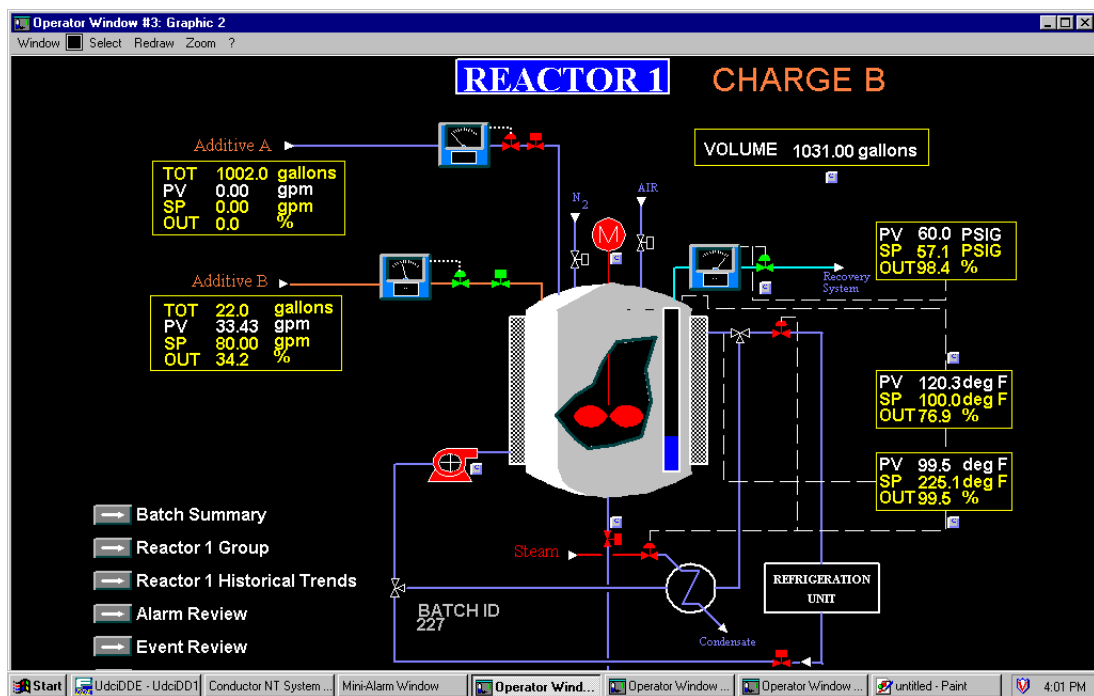


Figure 10. Interactive Graphic Display

**HELP DISPLAYS:** The Micro-PWC HELP utility provides information about the Workstation in a context-sensitive manner. A HELP icon can be found on the System Window, Mini-Alarm Window and on the pop-up windows. The HELP utility includes a menu item that provides immediate access to controller Operating Manuals, and Configuration Guides electronically displayed on the Workstation for quick reference.

Each display window on the Micro-PWC includes a configurable USER HELP Display to provide assistance to operating personnel. These displays can be site-specific instructions related to the specific Micro-PWC display or process, standard operating procedures, emergency shutdown procedures, Batch preparation instructions etc. For example, each Trend Display, Group Display and Graphic Display can have its own individual USER HELP display.

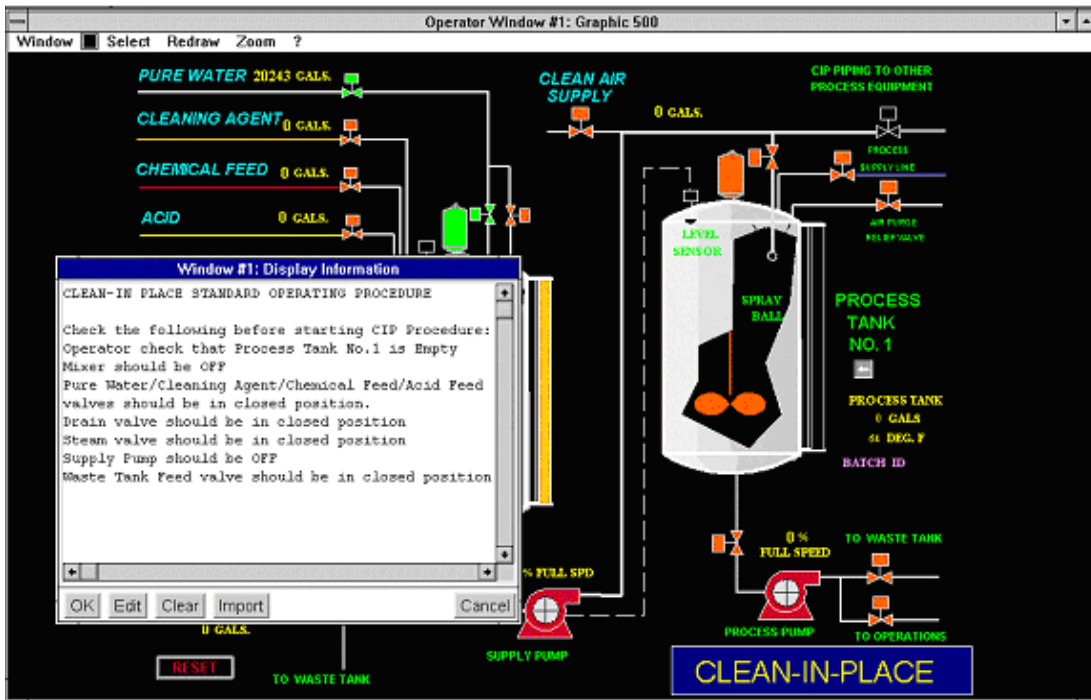


Figure 11. HELP Display Window

**SYSTEM STATUS DISPLAY:** depicts each node on the global data highway network as an icon (Figure 12). A node can be a process instrumentation communication server, or another Micro-

PWC Workstation. Access to the status of each individual node can be obtained clicking on the respective icon.

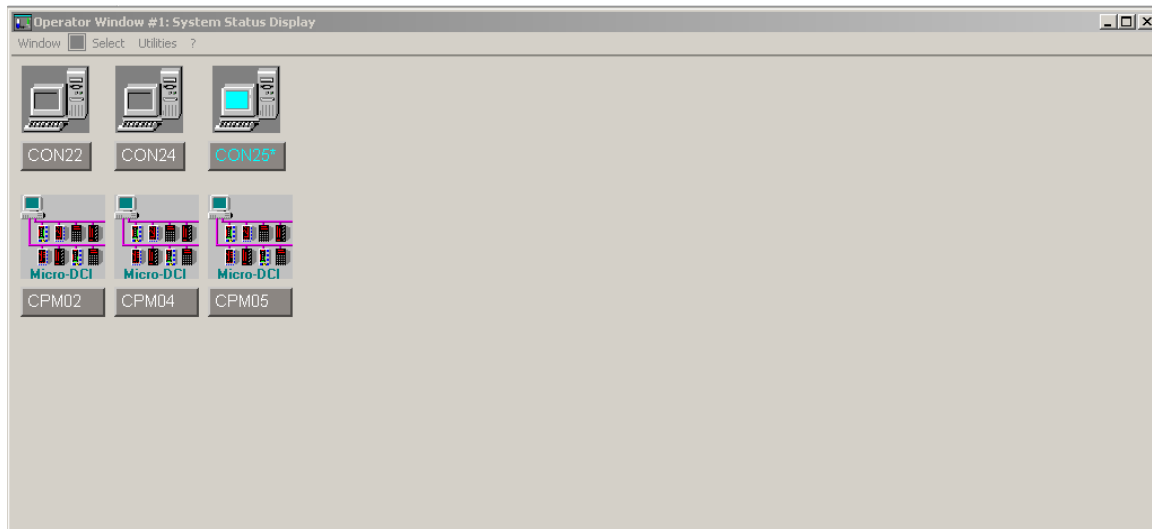


Figure 12. System Status Display

**EVENT REVIEW:** The Event Review display provides a list of non-process related alarms within the system, such as process instrument failure, User Log-in, process instrument power up, Operator acknowledgement, etc. The Event Review is an Operator Window Menu Bar selectable display. Event Review can be accessed by selecting it from the Operator Window SELECT menu. Each line of the Event Review displays the time, date and Event description. Event displays can also be color-coded.

Event Review information can be filtered by System Event Message Types for presentation of data to be displayed to the user. Event Messages can also be sorted by Oldest, Newest. As the Operator Acknowledges events, they are removed from the Event Review Display. System Event Messages are classified into the following message types:

- Process Instrument Events
- Micro-PWC Events
- Network Events
- Return to Normal
- Event Acknowledged

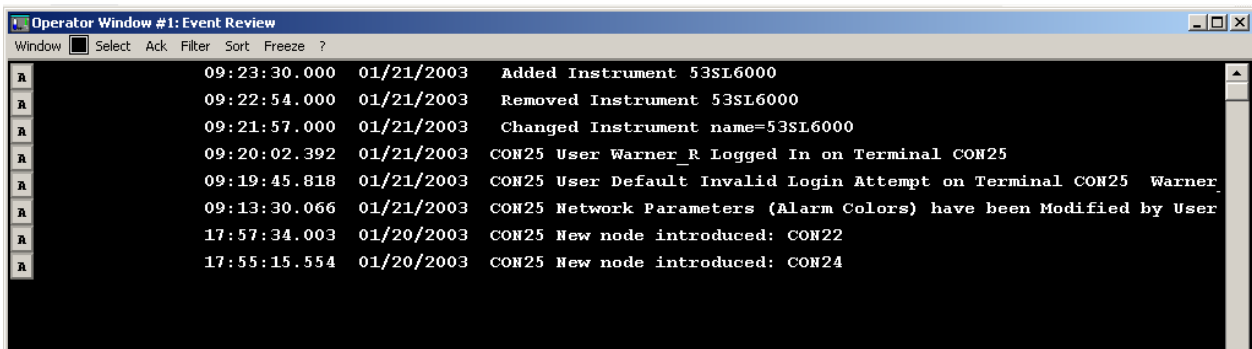


Figure 13. Event Review Display

**MESSAGE REVIEW:** The Message Review display provides a list of Operator messages or Process Instrument generated messages sent to the Micro-PWC. The Message Review is an Operator Window Menu Bar selectable display. Message Review can be accessed by selecting it from the Operator Window SELECT menu. Message displays include Priority, Area, Time, Date and Message text.

The Message Review provides sorting and filtering of messages by Oldest, Newest, Type, Priority, Area,. Messages displayed on the Message Review include a color-coded acknowledgement box assigned according to priority. As messages are acknowledged, they are removed from the Message Review Display.

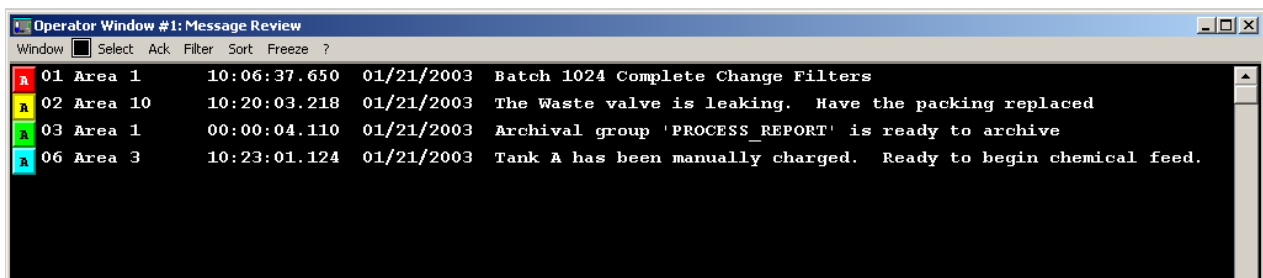


Figure 14. Message Review Display

**EVENT HISTORIAN:** The Event Historian (Figure No. 15) display provides the same list of Non-Process related alarms/events within the system as the Event Review display. In addition, the Event Historian maintains an historical record of all events including acknowledged events (which were removed from the Event Review Display). Events are presented in chronological order with the newest event at the top of the list. Events are maintained in a circular buffer with a storage capacity of 10,000 events.

After 10,000 Events have been logged, the newest event overwrites the oldest event. The Event Historian includes an Historian log function that can be configured to print an Event log on demand or on a scheduled time basis. The starting and ending time periods for the recording of events as well as the device assignment for the log printout is also configurable. The Event Historian provides the same filtering and sorting facilities as the Event Review.

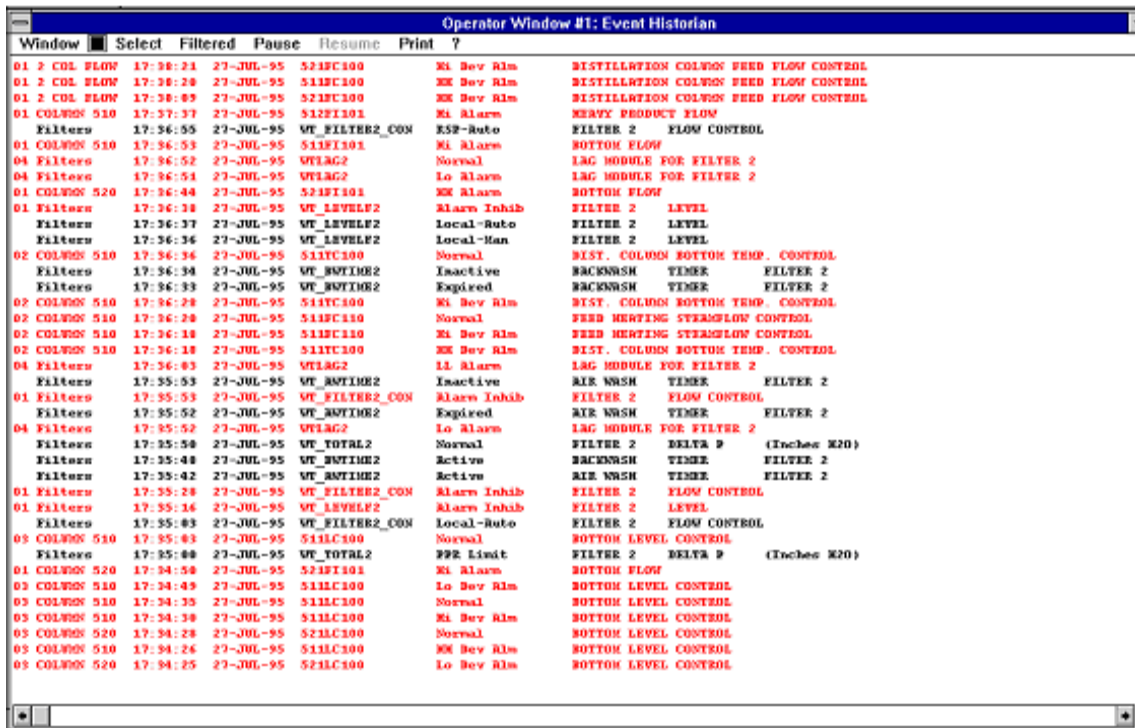


Figure 15. Event Historian Display

**ALARM MANAGEMENT**

The Micro-PWC provides for detection, organization, display and acknowledgement of both process and system alarms. Alarms can be organized by area, priority and time. Alarm Review displays provide the means to organize and sort alarms. Process alarms are alarm conditions that are detected within the process instrumentation based on user specified process limits and/or status conditions. The operator is notified of alarm conditions that may result in a process upset caused by an abnormal condition in the process or failure of process equipment.

Process alarms are displayed on the top two lines of the Micro-PWC display in the Mini-Alarm Window (Figure No. 16).

System alarms are alarms generated by problems within a Process Instrument, Micro-PWC itself, as opposed to problems associated with the process being monitored. System alarms are displayed on the third line of the Mini-Alarm Window.

CON25 Micro-PWC Warner_R						Filter	
A	V	1	Area 1	17:51:54	01/20/200	FIC-111	Lo Dev Alm
A	V	1	Area 1	17:50:23	01/20/200	FIC-110	Lo Alarm
A				09:23:30	01/21/2003	Added Instrument 53SL6000	
A		06	Area 3	10:23:01	01/21/2003	Tank A has been manually charged. Ready to begin chemical f	

Figure 16. Mini-Alarm Window

**Process Alarm Detection:** Process alarm conditions are detected in the Process Instrument modules and are reported at the Micro-PWC.

Alarm conditions can also be detected and reported on process graphics, with graphic configurations permitting such action as changing color or symbol shapes as a function of alarm conditions.

Process alarms are assigned a priority that can be configured to display in a different color for rapid identification of the importance of the alarm. Each point can also be assigned to any of up to 64 plant areas. If desired, the alarm feature can be inhibited through configuration. The Micro-PWC provides a means to filter messages by *message classes* and *message routing*. This pre-sorting feature allows an operator to quickly view, access and take corrective action on the process alarms under his/her specific area of responsibility.

*Message classes* enable the system to distinguish between different kinds of messages and allows efficient message sorting. Messages within each class are further distinguished by separation into *Message Types*. Definition of types enables the Micro-PWC to quickly process and/or sort messages within a class.

**Message Classes** on the Micro-PWC include:

- Process Alarms
- System Events
- Operator Messages
- Device Failures
- Operating Status Messages
- Diagnostics
- Status Changes
- Operating Errors

Process Alarms, System Events and Operator Messages provide information that must be immediately available to the operator; messages from these three classes are displayed in the Mini-Alarm Window on the Micro-PWC. The remaining Message Classes reflect status changes in the system rather than alarm conditions; messages belonging to these classes are not displayed in the Mini-Alarm Window. Logging of messages is configurable by the user.

In addition to *Message Classes*, *Message Routing* also allows filtering of messages based on the following parameters:

- Priority
- Area
- Server or Micro-PWC

**Message Routing** enables messages of any Message Class to be separately routed to any device that has been configured through the Printer Assignment. Message Routing also allows filtering out messages that are not important for a specific application or operating area.

**Mini-Alarm Display:** A Mini Alarm window (Figure 16) occupies the top of each Micro-PWC display screen. The Mini-Alarm Window is used to display messages regarding process conditions that are in alarm, event messages and operator messages. Alarms will appear on the top 2 lines and are visible at all times, regardless of other displays that may be on the display screen. The top alarm line can be configured to display either the newest or oldest alarm that has the highest priority. Furthermore, the display may be configured to behave differently, depending on whether or not unacknowledged alarms exist. The information provided by the Mini-Alarm Window includes:

- A title bar
- A process alarm display area (2 lines)
- A system event display area (1 line)
- An operator message display area (1 line)
- Alarm Acknowledge buttons to acknowledge alarms and events
- Vector button allows immediate display of the point in alarm
- A *Filter Button* and *More Alarms* indicator

The system event display area appears below the alarm display area. Event messages report the occurrence of system events (as opposed to process events) such as database loading and Process Instrument status.

If one or more additional alarms occur before the operator has acknowledged the first two, they will be queued. The *More Alarms* indicator appears when more process alarms exist than can be shown in the Mini-Alarm display area. When the first alarm is acknowledged, the next unacknowledged alarm moves into the Mini-Alarm area. Alarms of higher priority replace those of lower priority in the queue. The operator can therefore review and acknowledge each of the new alarms without changing the CRT display.

The *Filter Button* is a video push button activated with the cursor-positioning device. Clicking on the button causes a pop-up window containing a user interface to appear. This display contains options that can be used to filter process alarms by Priority, Area, Server or Micro-PWC.

**Alarm Review Display:** This display presents a list of all process alarms generated on the system (Figure No. 17). The order in which process alarms are listed on the Alarm Review Display is the same as that used in the Mini-Alarm Window. The user can elect to display either the Newest or Oldest High Priority Alarm. The user also has the option to sort the Alarm Review and display alarms by time of occurrence, priority or area. Each line of the Alarm

Review provides the priority, area, time of occurrence, tagname, alarm limit, and value. If more than one page of process alarms exist, use either the cursor positioning device or the fixed function Operator keys to PAGE UP and PAGE DOWN to view the additional alarms. By using the cursor positioning device and “pointing and clicking” on any point on the Alarm Review, the operator can go directly to that Point display to take corrective action.

Window	Select	Ack	Filtered	Sort	Freeze	Search ?
R	V					01 Reac 01 10:33:35 27-JUL-95 FI-R1 HH Alarm R1 Pressure
R	V					01 Reac 01 10:33:15 27-JUL-95 FI102 Normal Flow from T2 into R1
R	V					01 Reac 01 10:31:32 27-JUL-95 LI401 HH Alarm REACTOR VOLUME
R	V					01 Reac 01 10:31:18 27-JUL-95 LI-R1 HH Alarm R1 reactor level
R	V					01 Reac 01 10:31:05 27-JUL-95 FI101 Normal Flow from T1 into R1
R	V					01 Reac 01 10:30:35 27-JUL-95 real30 LL Alarm
R	V					01 Reac 01 10:28:23 27-JUL-95 REACTOR-R2 Lo Alarm VOLUME R2
R	V					01 Reac 01 10:19:50 27-JUL-95 LI412 Normal T2 VOLUME
R	V					01 Reac 01 10:01:34 27-JUL-95 LI-T2 HH Alarm Material Tank-2 Level
R	V					01 Reac 01 10:01:23 27-JUL-95 LI410 Normal T1 VOLUME
R	V					01 Reac 01 10:01:21 27-JUL-95 FI540 LL Alarm FLOW TO OFFSITE
R	V					01 Reac 01 00:00:00 LEVEL Lo Alarm
R	V					01 Reac 01 00:00:00 real27 LL Alarm
R	V					01 Reac 01 00:00:00 FI-R21 LL Alarm Flow from T1 into R1
R	V					01 BATCH PLNT 00:00:00 320TC100 Lo Dev Alm REACTOR 201 TEMPERATURE CONTROL
G	V					03 COLUMN 510 17:47:46 27-JUL-95 5111C100 Normal BOTTOM LEVEL CONTROL
R	V					02 COLUMN 510 17:45:08 27-JUL-95 5111C100 Normal DIST. COLUMN BOTTOM TEMP. CONTROL
R	V					01 COLUMN 510 17:43:46 27-JUL-95 512FI102 Normal REBOIL FLOW
R	V					02 COLUMN 510 17:43:02 27-JUL-95 511FC110 Normal FEED HEATING STEAMFLOW CONTROL
R	V					01 COLUMN 510 17:38:33 27-JUL-95 511FI101 Normal BOTTOM FLOW
R	V					01 COLUMN 510 17:38:27 27-JUL-95 512FI101 Normal HEAVY PRODUCT FLOW
R	V					01 COLUMN 510 00:00:00 512FC110 Normal REBOIL STEAM FLOW CONTROL
R	V					01 COLUMN 510 00:00:00 511FI102 Normal BOTTOM EVAPORATE
R	V					01 COLUMN 510 00:00:00 512TC100 Normal REBOILER TEMPERATURE
R	V					01 COLUMN 510 00:00:00 5121C100 Normal REBOILER LEVEL CONTROL

Figure 17. Alarm Review by Priority and Area

**Alarm Annunciation:** An audio output speaker within the Personal Computer can be used to produce a single tone when triggered by an alarm within the Micro-PWC application.

As indicated previously, each Summary display includes a color-coded status indication of each group within the summary displays. Any point in alarm within the group will cause the status color of the group block to turn to red. Pointing and clicking on the group block provides quick access to the point in alarm for operator action.

**Alarm Acknowledgement:** The Micro-PWC provides several ways to acknowledge alarms. Process Alarms can be acknowledged directly from the Mini-Alarm Window using the cursor positioning device and selecting an “Acknowledge” box next to each alarm line.

If the Alarm Review display is on screen, the operator has the option of acknowledging each individual alarm using the point and click method similar to the Mini-Alarm window or of acknowledging all alarms on the Alarm Review simultaneously. The single point display also provides the capability to acknowledge alarms for individual points from the Operator’s keyboard.

**Alarm Printouts:** System alarms, process alarms and other recorded events can be printed on an Alarm/Event printer. The device assignment feature of the Micro-PWC allows plant personnel to direct specific types of alarms and messages to be printed automatically at selected printers in a multiple printer system. Use of the optional printer provides a permanent record of process alarms and acknowledgement. Printouts can be inhibited by configuration or sent to hard disk for storage and printout at a later time. The alarm printout format is



**LOGGING & MESSAGE FUNCTIONS:**

Available as hard copy with the installation of an optional printer, the Micro-PWC provides the following functions:

- Printer Message Routing
- Process Alarm and Acknowledgement Messages
- CRT Copy
- Printer Message Review
- User Format Logs/Reports

**Printer Message Routing:** (Refer to Message Classes discussed earlier under Alarm Management functions.) Message Routing enables messages of any Message Class to be separately routed to any device that has been configured through the *Printer Assignment* Menu selection. Messages for each particular Message Class are color coded and indented when sent to a file or a color printer. Message Routing permits multiplexing any Micro-PWC Message Class to any of the available logical devices on the network, printers, disk files etc.

**Process Alarm and Acknowledgement Messages:**

The alarm message record consists of: time, point tagname, point legend, type of alarm, process variable value, and alarm setpoint. The final two items apply to analog process variables only. The printing of pre-selected alarms can be inhibited by Micro-PWC configuration.

**CRT Copy:** Using a color PostScript™ printer, the CRT Copy function will copy the contents of the CRT Screen display to a separate storage buffer. The Micro-PWC display and keyboard continue normal operation. After a few seconds, during which time a graphics compatible image is prepared, the printer starts reproducing the color Micro-PWC display image (screen or individual window). The time to produce the copy is a function of the printing speed and display complexity.

**Printer Message Review:** This function accesses a circular file of the previous printer messages. All printer output except CRT copy is stored. Its primary use is to back up the printer in the event of printer failure (exhausted paper supply, etc.). Selected pages can be printed from the circular file.

**REPORT GENERATION FUNCTIONS:**

The Micro-PWC supports a number of report types, and these can be used in any combination to produce a total reporting package, as process needs dictate. Capabilities range from printing a simple process alarm log to fully user-designed, free format multi-page reports. A log is used to collect and format data for use in reports and spreadsheet calculations. Two types of standard logs are available on the Micro-PWC; these include:

- Event Logs
- Spreadsheet Logs

**Event Logs** are used to examine the Micro-PWC Historical Database and create lists of all events that occurred within a specific time span. The events contained in an Event Log can be limited or filtered by Message Class and Message Type similar to the Alarm Management and Event Review Functions discussed previously. The following are available Message Classes for sorting Historical Database points into Event Logs:

- Process Alarms
- System Events (Process Instruments, Micro-PWC and Network)
- Operator Messages
- Device Failures
- Operating Status Messages
- Module Diagnostics
- Status Changes
- Operator Actions
- Operator Errors
- Area (64 available areas)
- Process Instruments
- Micro-PWCs (10 available)

Event Logs can be printed based on an Event trigger or scheduled to print on a regular time basis such as hourly, daily, weekly and monthly.

**Spreadsheet Logs** are used to obtain data from, change, and put data into the Global database, and to load the data into spreadsheets, allowing the user to format, store, and perform calculations using live process data. The Micro-PWC application provides an optional real-time database Application Program Interface (API) to a user supplied *Microsoft EXCEL*®

Spreadsheet package for the Windows 2000 or XP Professional environments. Custom report configuration is performed using the integrated Spreadsheet. Spreadsheet Logs can be scheduled to print on a regular time basis, in the same manner as Summary and Event Logs.

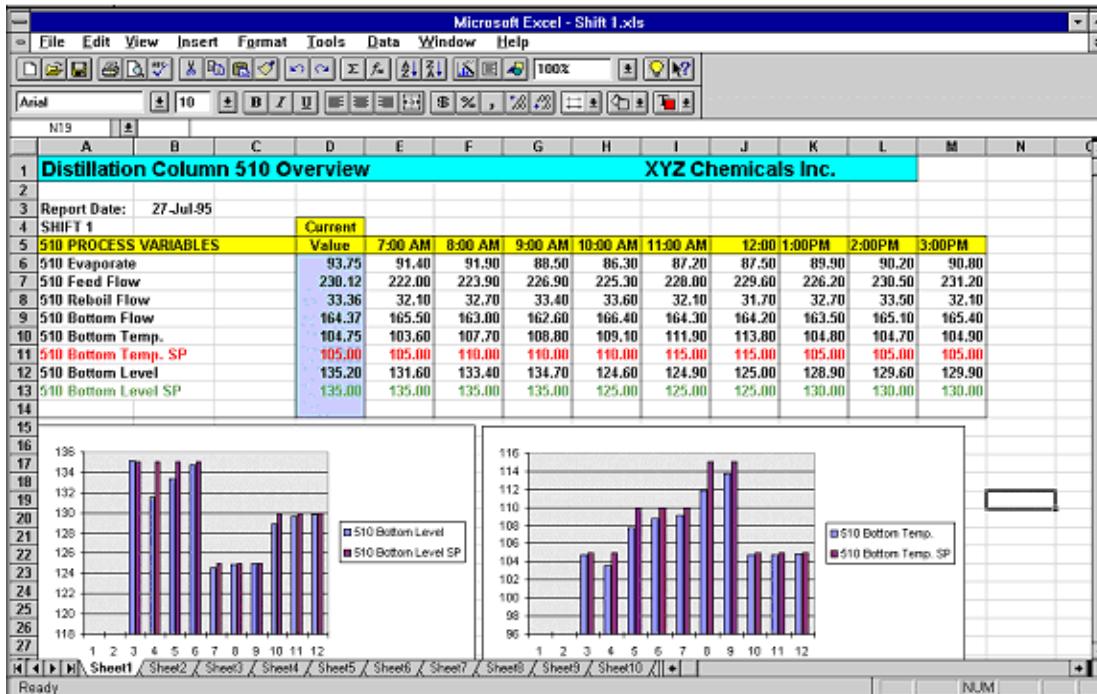


Figure 18. EXCEL® Spreadsheet Display

**Configuration Tools:**

The Micro-PWC application provides the Process Engineer with a complete set of user-friendly configuration/development tools supporting both Micro-PWC. Depending on password access level, the Engineer can create or modify any PWC database within the global process data highway network. A separate Engineer’s keyboard is not required to perform configuration functions. Configuration is accomplished by accessing Configuration Menu Windows using the cursor positioning device and typing in the command shown next to each item on the menu. Menu commands and alphanumeric text such as tagname are entered from the QWERTY portion of the standard PC keyboard. Configuration of Hierarchical displays, Graphical displays and Process Instrument control logic performed at any Micro-PWC can be backed-up and restored via the network to any Micro-PWC.

The Windows driven menus and prompts lead the user through intuitive fill-in-the-blank video display forms simplifying the setup and data entry tasks.

A built-in HELP utility assists the user with on-line Configuration instructions, eliminating the need to continually page through reference manuals during the configuration process.

The following engineering functions can be performed from any Micro-PWC with the proper security access level:

- Setup of User security levels and passwords
- Setup of User Quick Keys and CRT Context keys
- Configure Alarm point parameters
- Printer Assignments and Message Routing
- Message and Alarm filtering
- Configuration of Hierarchical Display windows
- Configuration of Historical Database
- Creation of object-oriented Interactive Graphic displays
- Assignment of Historical/Archival Trend points
- Creation of free-format spreadsheet reports
- Network device assignment
- Configuration of USER HELP displays

**MODEL NUMBER BREAKDOWN**

	Model Code	<b>PW60</b> 01 - 04	<b>0</b> 05	— 06	<b>A</b> 07	— 08
<b>MicroPWC</b> <i>for Windows 2000 Professional or Windows XP Professional</i>		PW60				
<b>Fixed Digit</b>			0			
<b>MicroDCI Communications Services</b>						
Client Station (Note 1)				0		
75 Tags				3		
150 Tags				4		
300 Tags				5		
600 Tags				6		
900 Tags				7		
Unlimited Tags				U		
<b>Design Level</b>					A	
<b>Security Key Type</b>						
None <i>(for adding to systems with existing Security Device/copy protection key)</i>						X
Parallel Port						0
USB Port						1

*Historian and Logging/Report functions are now included as standard with the base MicroPWC package.*

**IMPORTANT INFORMATION:**

The Micro-PWC product functionality is controlled by a software license manager using a hardware security device (which plugs into the parallel port or universal serial bus (USB) port of the PC) and one or more 20 digit software license keys to match the hardware key. The host computer must have either a working parallel port with a standard 25 pin female "D" connector or a working USB port. The parallel port hardware security device is a pass-thru device permitting its parallel port to be used for driving a second parallel device, such as a printer.

Only one Hardware Security Device is required when Micro-PWC, Micro-DCI Communications Services, LoopMaster and Micro-Tools products are installed on the same host computer.

The customer is required to sign one of more Software License agreement which legally restricts the usage of some Micro-DCI Software elements.

**Minimum System Requirements**

**Desktop or Tower Mount Case including:**

- Intel-based, Microsoft Windows 2000 Professional - compatible personal computer (PC) with a Pentium™ Microprocessor and minimum speed of 500 MHz: (1.0 GHz or higher recommended)
- 512 MB (or more) for optimum performance
- 500 MB of available Hard Disk space minimum. This can be a SCSI or IDE drive, but must be compatible with Windows. A larger disk is recommended.
- A single Ethernet communication channel
- A parallel port or universal serial bus port for printing and hardware security key installation.
- One full size ISA bus slot is required for each installed Supervisor card (if required)
- One or more RS232 (or RS485) serial communication ports

**Operating System**

- Microsoft Windows 2000 or XP Professional

**Removable Media**

- A CD-ROM drive. (The Micro-PWC system software is distributed on CD-ROM)
- Removable Media - DAT, QIC Tape etc. for archiving data and configuration files)
- A 3.5 inch floppy disk drive for small capacity removable storage

**Keyboard and Monitor**

- An IBM AT-compatible 101 key keyboard
- A cursor positioning device. This can be a two or three button mouse, trackball or other Windows-compatible cursor-positioning device.
- Video board and monitor, which support 256 colors (8-bit mode) at 1024 x 768 pixel resolution. Video board and monitor, that supports 65K colors (16-bit mode), are recommended.

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Printed in USA (May 2006)

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