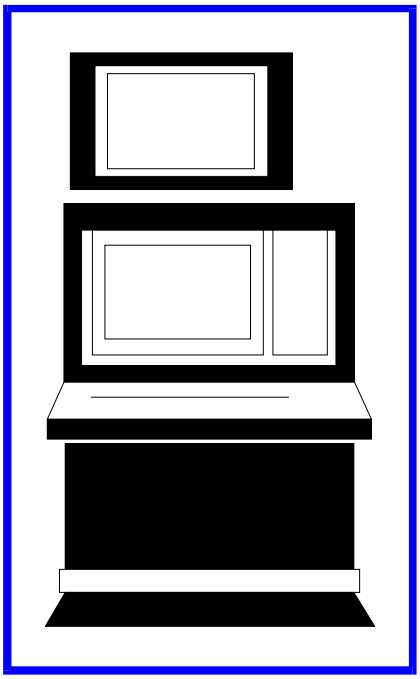
Bailey infi 90

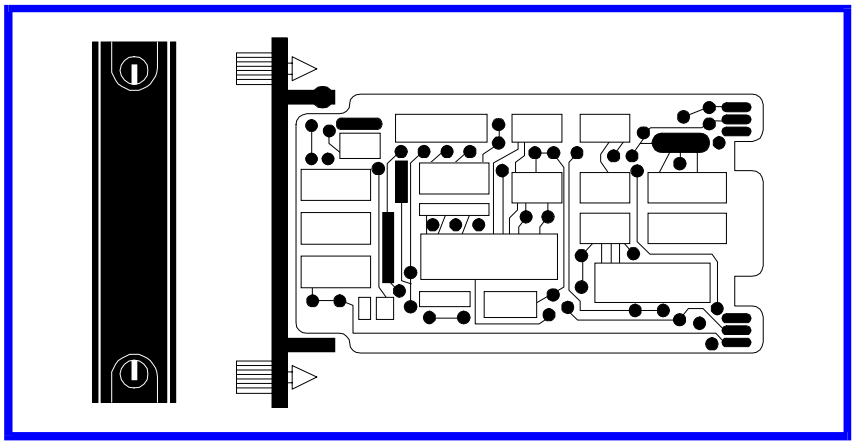
E97-811-2.2

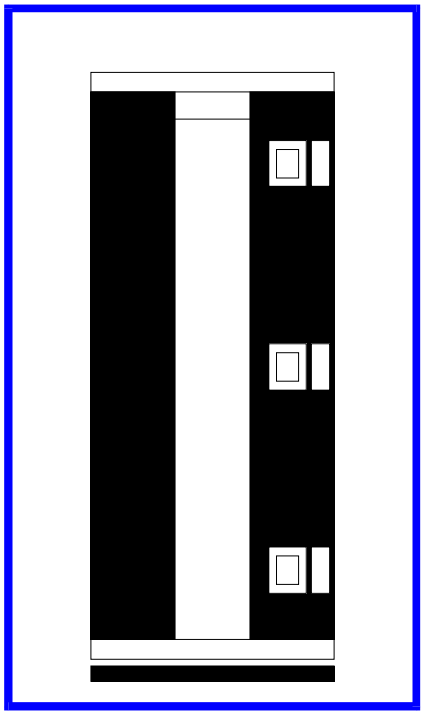
Instruction

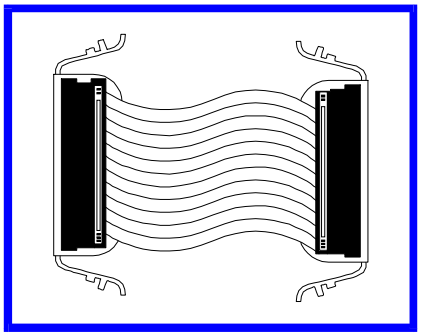
LAN-90® Process Control View (PCV®) Operation

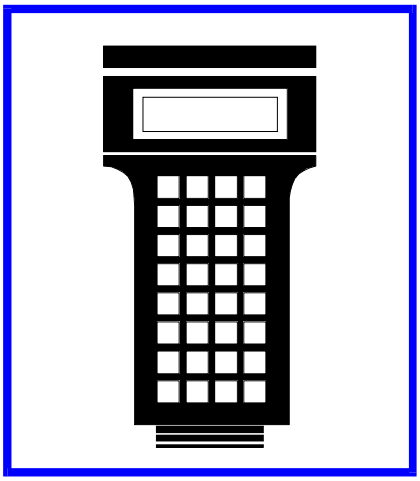
(Software Release 5.2)

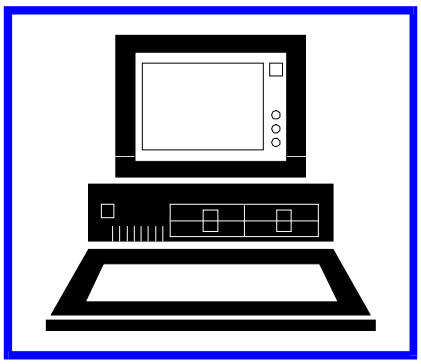












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Preface

This manual applies to LAN-90 PCV Release 5.2.This manual provides general information and specific instructions on:

- Configuring base system package and for its intended application. This manual, together with the LAN-90 PCV Installation manual (I-E97-811-1) and LAN-90 PCV Configuration manual (I-E97-811-2.1) provides a complete description of the LAN 90 PCV base system package.

This manual can be used as:

- A reference guide for system engineers and technicians responsible for operating the LAN-90 PCV console.

- An operation guide for process control operators using the LAN-90 PCV console.

This manual assumes the reader has a general knowledge of CRT-based process control systems.

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Safety Summary

SPECIFIC WARNINGS	You are advised that restarting the LAN-90 PCV Executive manually can change the permissions and ownerships of files and programs, and thus prevent proper execution of LAN-90 PCV. Instead you should shutdown LAN-90 PCV and reboot. However, if it is essential to restart the Executive type pcvExec &. Note the ampersand "&". (p.3-18)

SPECIFIC CAUTIONS	DO NOT reboot the computer if LAN-90 PCV is already running. Use the Exit & Shutdown command first or you may corrupt files and lose important information on your hard disk. (p. 2-9) The QNX4 Operating System provides two text editors, vedit and qed. DO NOT USE vedit. While vedit is running the intermediate files are not properly time stamped. Thus mirror will overwrite them and cause file corruption of the file under edit. (p. 2-14) You should NOT simply turn off or reboot a computer; this could lead to corrupted files or a loss of trend and logging data. (p. 2-16) After restoring a configuration, it is necessary to recompile all periodic logs. (p. 19-19) Inactive (unnamed) logs that contain export values are processed when demand with imports is requested. To stop processing, you must comment out the exports and recompile. (p. 20-8)

SECTION 1 - INTRODUCTION

KEY FEATURES OF LAN-90 PCV

LAN-90 PCV supports a wide range of standard hardware in a variety of configurations:

- Connects to the INFI 90 OPEN DCS via a standard serial port or a high-speed intelligent serial card
- Connects to standalone process control units
- Runs on stand-alone computers or on networked systems
- Networked systems can have multiple connections to the INFI 90 OPEN system.
- Stores data on a variety of media: hard disks, floppy disks, and rewritable optical disks
- Accepts command and text input from regular keyboards, Bailey operator keyboards, Bailey annunciator/display panels, and mouse/trackball.
- Installable support for PLCs

OPERATION IS EASY AND SECURE:

- Functions are grouped together logically in menus and organized in a tree-structured hierarchy that branches out from a single Main Menu.
- Context-sensitive help screens are provided at every application.
- Access to different functions may be restricted by assigning various access privileges to a variety of operation, configuration and control functions. Based upon their assigned configuration abilities, users may modify their abilities as required.

A COMPREHENSIVE SET OF CONSOLE CONFIGURATION FUNCTIONS ARE AVAILABLE ON-LINE:

- The tag database, which defines the INFI 90 OPEN points to be monitored or controlled, can be defined on-line.
- Trends are defined on-line. Tag values are collected on a regular basis and written to disk.
- All configurable text (e.g. alarm code descriptions) can be edited on-line and substituted for some standard LAN-90 PCV text.

- Alarm tones, alarm inhibiting, and broadcasting of alarm acknowledgements to other consoles on the INFI 90 OPEN system are configured on-line.

- Graphic displays can be configured on-line to include display and control of any faceplate type.

The use of the Elsag Bailey Engineering Workstations (EWS) system allows you to create graphic displays and develop the tag database for LAN-90 PCV on an off-line system.

A complete set of process monitoring and control functions make LAN-90 PCV a powerful operator console:

- Color graphic displays allow you to monitor process values as numbers and symbols and take various control actions.

- Faceplate displays also allow you to monitor and control tags.

- Process alarms are easily managed with the advanced alarm capabilities of alarm groups, alarm priorities, alarm indicators, alarm summaries, operator alarm inhibiting, and general and individual alarm acknowledgement.

- System status displays allow you to diagnose and troubleshoot your INFI 90 OPEN system.

- Tuning and block detail displays allow you to modify INFI 90 OPEN modules to optimize your process performance.

UTILITIES PROVIDE FILE, DATA, AND SYSTEM SUPPORT FUNCTIONS:

- Tag summaries let you query the database for configuration and live value information.

- System Event logs collect information about alarms, process events, and operator actions.

- File and disk utilities let you copy files to and from all supported media (hard disks, floppy disks, and rewritable optical disks). With the file/disk utilities you can format the different media, back up and restore files between media, and translate data files to common file formats such as ASCII text and DIF.

- System diagnostic screens report the status of CIU/ICI communication, trend collection, system activity and status, and system messages.

- Printer utilities let you control the general functions of the system printer, or various network printers, for spooling of data or alarm information.

OPTIONAL SOFTWARE APPLICATIONS

Optional Applications can be added to your LAN-90 PCV package to further enhance its power:

Logging Package

The Logging package collects historical information in report form for printing and saving on disk. There are six types of logs in the logging packages:

- Periodic logs collect tag information based upon a fixed time period (hourly, daily, weekly, etc.). Data is sent to a customized spreadsheet for archiving and printing.
- Trigger logs collect tag information between various process events, like periodic logs. Trigger logs use customized spreadsheets to display the process information.
- Trend logs print out collected trend data.
- Trip logs collect tag information before and after a process event.
- Expanded System Events Log Functions: Archiving, Retrieval and Backup.
- Sequence of Events Log: 1 millisecond resolution event recording.

Periodic and Trigger logs are configured using a spreadsheet which gives you complete control over the appearance of the log, and you can use formulas to calculate new information not available directly from process tags (e.g., costs). The other log types have a relatively fixed format and report the information collected based upon a set of given parameters.

Quality Analysis & Control

The Quality Analysis & Control (QAC) package provides both Statistical Process Control (SPC) charts and Time Series Analysis (TSA) charts. SPC charts (Shewhart, CUSUM, or EWMA) monitor the historical and current trend values for a set process variable. When the tag value is out of configured specification, the chart is highlighted and alarms can be generated. Variation in tag values can be minimized by using TSA charts to analyze trend data pinpointing interrelationships between variables and the variation source.

Lab Data Entry

The Lab Data Entry packages allow you to input manually gathered data and send these values out to the INFI 90 OPEN system. The values may be time stamped and configured to be displayed with the live process values for comparison or control abilities.

Custom Application Toolkit

The Custom applications Toolkit (CAT) gives you a set of C programming library routines for accessing tag information. You can program your own applications for collecting, displaying or manipulating tag values as they are gathered from the Elsag Bailey INFI 90 OPEN system.

classCONNECT/DDE and TCP Link

The classCONNECT/DDE and TCP Link package provides network connectivity between the LAN-90 PCV consoles and the DOS world using TCP/IP protocol communication. The classCONNECT/DDE package includes the necessary software for both the LAN-90 PCV console and the MS-Windows based computer to communicate over the ethernet using TCP/IP protocol.

FOR FURTHER INFORMATION AND SPECIFICATIONS ON THESE OPTIONAL APPLICATIONS, PLEASE CONTACT:

Information Systems Marketing Dept.
Elsag Bailey (Canada) Inc.
860 Harrington Court
Burlington, Ontario L7N 3N4

Telephone: (905) 639-8840 Fax: (905) 639-8639

CONVENTIONS USED IN THIS MANUAL

You will find the following conventions used throughout this manual:

NOTE: Used to highlight important or additional information.

CAUTION	Used to highlight information that, if ignored, could result in property or information damage.

WARNING	Used to highlight information that, if ignored, could result in personal injury.

bold Used for anything you must type exactly as shown. For example, you could be told to press **y** or type **ls /dev/hd0t77** (QNX4 example).

italic Used for information you must provide. For example, if you are told to enter a *filename*, you type the actual name of the file instead of the italicized word. Also used to show information displayed by the computer.

Initial Capitals Used for menu and screen titles.

`small text` Used to show the contents of text files.

<Key> Used for the names of special keys (non-alphabetic, non-numeric, non-punctuational) that can be found on the regular QWERTY keyboard or can be found on both the Bailey operator and regular keyboards. Some of the key names used are:

<Enter>	the enter key
<Num+>	the plus key on the numeric keypad
<Space>	the space bar
<PgUp>	the page up key
<Left>	the left cursor key

{Key} Used for the names of keys found only on the Bailey operator keyboards. Some of the Bailey operator keyboard key names are {Silence} and {DoubleUp}.

<Key Key> When two or more keys are to be pressed together, the key names appear together within the brackets or braces. For example, to reboot the computer, you can press <Ctrl Alt Shift Del>; that is, press the Ctrl, Shift, Alt, and Del keys in that order without releasing any one until you have pressed them all.

"name" Used for filenames, directory names, and device names.

SECTION 2 - BASICS

TURNING ON THE COMPUTER

When you turn on the computer, LAN-90 PCV software will start automatically once it is installed.

Before You Turn On the Computer

Before you turn on the computer, there are a couple of things you should check.

1. If you have an MKM or EMKI operator keyboard attached to your computer, turn it on before you turn on the computer.

2. If you have an optical disk drive attached to your computer, turn it on and insert a disk in the drive before you turn on the computer.

In general, any peripheral devices (e.g., printers) connected to your computer should be turned on before you turn on the computer.

Peripheral devices should be turned on first because the computer, on startup, tries to establish communications and initialize the software and hardware of the peripheral devices.

Overview of the INFI 90 OPEN System

The INFI 90 OPEN system is a distributed process management system. A network of control units is connected by a Plant Communication Loop (INFI 90 OPEN Communication Loop) so the control units can share information.

Control units, called Process Control Units (PCUs), collect information from field sensors and use the information for manipulation of field equipment. For example, if a sensor indicated a tank was full, the PCU through a designed logical sequence could turn off the valve that fed the tank. PCUs know what action to take because they are programmed by an engineer with a control scheme for the process. There can be up to 250 PCUs connected to the INFI 90 OPEN Communication Loop.

Generally an operator would not control the level of fluid in a tank by turning pumps and valves on or off. Instead an operator would control a setpoint, say 2,000 gallons and the PCU, through its program logic would control the valves or motors as necessary to maintain the setpoint level.

Operator consoles, such as LAN-90 PCV, display process data and facilitate control of the process. LAN-90 PCV communicates with the Process Control Units through an interface (CIU or ICI) to the INFI 90 OPEN Communication Loop.

Any information gathered by a PCU (e.g., flow rate, temperature, level, and pressure) can be displayed. By using keyed in controls on the console, operators can send signals to the PCUs, making changes to the way the process is run. An operator could change setpoints, turn equipment on and off, or change constants used by programmed schemes.

The Process Control Unit (PCU)

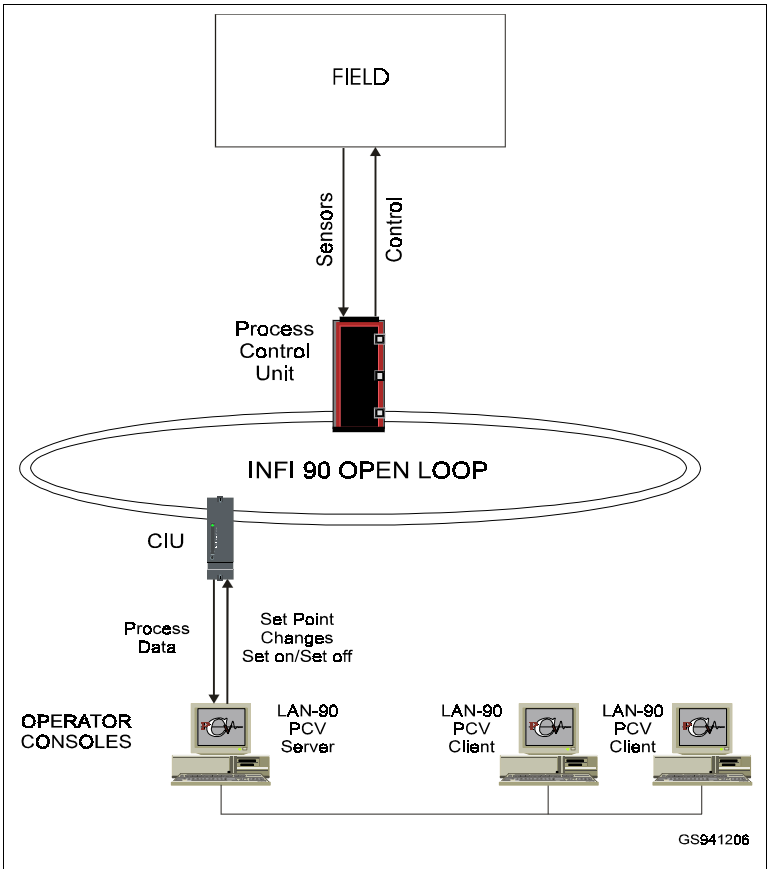


Figure 2-1. Process Control Overview

The Process Control Unit (PCU) is the primary control unit of an INFI 90 OPEN system. A PCU connects directly to field sensors and equipment. Each PCU is made up of a variety of INFI 90 OPEN control modules, which are small plug-in, rack-mounted computers specialized for manipulating process data and implementing process control schemes. The PCU is connected to the Plant Communication Loop so that the information in the modules can be shared with other process control units.

The Computer Interface Unit (CIU)/INFINET Computer Interface (ICI)

The Computer Interface (CIU) or Infinet Computer Interface (ICI) is used to connect computers, other than the PCU modules, to the INFI 90 OPEN Communication Loop.

A LAN-90 PCV Server connects to a CIU/ICI and gathers process information, shows the information on the display screen, and sends your control instructions to the PCUs.

THE CONSOLE

LAN-90 PCV consists of a set of programs that run on a standard IBM compatible computer. The computer is equipped with a Super VGA graphics monitor, a QWERTY or mylar keyboard, a mouse or trackball and possibly a printer. A serial communication board in the computer connects the console to the CIU/ICI.

The monitor displays high resolution, Windows-based full colour interactive process displays on a Super VGA compatible monitor screen. The screen is your primary source of information. You use a variety of displays to perform many different functions.

The keyboard can be either a QWERTY-style keyboard with push-button keys or a mylar membrane-covered keyboard with flat keys. The alphabetic, numeric, and specialized function keys on the keyboards are used to move between displays, control the process, and run all functions.

It is by the use of the keyboard, that you will be able to manipulate the console's software to view or control the functional operation of your process.

The mouse or trackball device will provide a means of moving a pointer/arrow indicator over the screen display. Movement of the mouse or rotation of the trackball causes a relational movement of the pointer over the screen area. Both the left and right hand buttons on the mouse or trackball are used for specific functions by the LAN-90 PCV console.

Left Button Pressing the left button while on a menu or icon button will activate the menu or icon button function.

Right Button Pressing the right button while on a menu or icon button will cause a sub-menu to be displayed, if it exists.

The use of the mouse enables you to reduce keystroke operations and group various functions into a pictorial format.

A printer can be used to print alarm occurrences, log reports, and graphic displays.

USING THE CONSOLE

Tags

The tag list defines the interaction between the console and the Process Control modules.

Process Control modules contain and process more information than is useful to an operator. For example, the voltage drop across a thermistor is of no value until it has been converted into temperature in degrees. Your console would display temperature by configuring an analog tag to read the temperature in degrees. You would not configure any tags to display the voltage drop nor display any of the steps in the conversion.

The console uses a tag list to identify which data points in the modules are of interest for operator control. Data in the modules is contained in function blocks. These function blocks exist in a variety of forms and thus a variety of LAN-90 PCV tag types exist to exchange data with the modules.

The information from the tags is presented via operator displays that present the information in a useful form. Graphic displays can be custom configured to visually represent your process and there are also many standard display formats available. Tags report when they enter and leave alarm conditions. These alarms can be grouped and prioritized to enable operator interaction. Operators can call up displays and control faceplates in order to adjust setpoints and otherwise control the process.

Monitoring and Controlling a Process

You can monitor and control overall plant operation using the LAN-90 PCV console.

Tag values and alarm states travel via the plant communication loop. The data is received and displayed on the monitor screen.

Tags may be assigned to more than one display. The value or state of a tag can be displayed in several different ways. Tags may also be set up on the displays for control. By using the keyboard, you can use the display elements to send messages to the PCU modules and control your system process.

Graphic Displays are the primary method for displaying tag information and controlling the tag's function.

Tag values can also be collected and stored on the computer's hard disk. This collected information is used for trend displays and log reports.

Any of the tags can be selected for historical data collection . The collected data is displayed on trend displays, which are grid or graph plots of the data over time. You can scroll back in time through the data, or compress or expand the time span viewed to get wider or narrower views of the data.

Logs show historical data in report form. There are many different kinds of logging. One kind, called Periodic logging, prints reports of collected data to the printer or computer disk at regular intervals (such as, every hour, every day, or every week). Your system may or may not have logging installed. See for instructions on operating logs.

Alarm Reporting

LAN-90 PCV can maintain up to 99 alarm groups. While on-line, it monitors the alarm status of all tags, regardless of which display is currently on the monitor. The Executive Bar on each monitor lists the alarm groups that currently have tags in an alarm state. A list of the most recent alarms is maintained in order of occurrence.

When an alarm first occurs, it is unacknowledged (indicated by the presence of a flashing alarm group number). After you acknowledge the alarm, the flashing stops. If you acknowledge alarms as they occur, you can easily recognize new alarms, because they are flashing.

Alarm information can include bad quality. A tag has bad quality when the value of a tag goes out of range or when the tag cannot be accessed because communication with the module or field sensor is broken.

Alarms are printed on the printer as they occur, if a printer is attached. You can turn alarm printing on or off without interruption to the flow of data or monitoring of the system.

For more information refer to Section 4.

Troubleshooting the INFI 90 OPEN System

Tags can be set up to reflect the current state of modules connected to the INFI 90 OPEN system. Using these tags, status displays can show the operational status of all INFI 90 OPEN equipment connected to the plant communication loop. These status displays show you if PCUs and CIU/ICIs are working. They also show the current state of modules within a functioning PCU.

There are three levels of status displays:

- The System Status display lists all nodes connected to the plant communication loop, and whether the nodes are in error or not.
- The Node Status display lists all modules within a particular node (such as a PCU), and the current mode and status of each module.
- The Module Status display gives a detailed list of all problems in a particular module.

Viewing and Tuning Module Configurations

There are various types of displays that allow you to view the module settings for a tag:

- Block details graphic
- Tuning displays graphics
- Editing of a database tag
- Tag operating parameters
- The Configuration Loading System (CLS) application

Depending on your permissions, you can modify or tune some or all of the module settings for a tag.

The module setting information can always be viewed without modification by any user.

Overview of Your System Hardware

The console has the following components:

- Computer
- Monitor
- Keyboard
- Mouse/trackball
- Optional peripheral devices

The computer is the heart of the console. It runs the programs which communicate with the INFI 90 OPEN system, displays process information, and allows you to configure the console. Programs run in the computer's memory or RAM. Information is stored on the hard disk. You can copy information from the hard disk to floppy disks in the floppy disk drives.

The computer displays information on the monitor, which is also known as a CRT (Cathode Ray Tube).

The keyboard and mouse/trackball allow you to communicate with the console software and INFI 90 OPEN modules.

System Security

User permissions control access to the various console functions. Each user can be configured under a general group assignment for limiting access to specific console functions. Likewise, specific user assignments may be configured on an individual basis.

In general, if you have been configured to have no access to a specific type of console function then the menu item is displayed in a shadowed or dimmed text format. If you have access the text is displayed in black.

For more information on User Permits refer to Section 11 of the ***Configuration*** manual.

Networked Systems

The LAN-90 PCV Console software can run on computers that have been connected together to form a network. This allows the computers to share information.

Network Terminology

Each computer on the network is called a node, and each node has a unique node number which identifies the computer to the rest of the network.

Types of Nodes

Each computer plays a certain role in providing information to the rest of the network:

- Server node
- Client node
- Redundant server node

Server nodes connect directly to the INFI 90 OPEN system via an ICI or CIU. These nodes exchange information with the INFI 90 OPEN system and serve the information to other nodes on the network. Often there is only one server node on the network at a time, however, additional server nodes can be added.

Client nodes do not connect directly to the INFI 90 OPEN system; they get all their process information from a server node.

Redundancy

A redundant network has two server nodes (two computers that are directly connected to the INFI 90 OPEN system via their own ICI or CIU). However, only one server node is being addressed by other nodes on the network. The redundant server node is obtaining the identical information from the same INFI 90 OPEN system. It contains the same hardware and software configuration as the server node.

The live server node is the computer currently acting as the single connection to the INFI 90 OPEN system. The redundant server node gets its process information from the live server

node (just like a client node), but it is ready to take over as the connection to the INFI 90 OPEN system if the current live server cannot communicate with the INFI 90 OPEN system or with the rest of the network. Usually, the live server node is simply called the server node, and the redundant server node is called the redundant node.

Networked Computers

If you are running on a network, you should start the server node(s) first. You can then start the rest of the nodes in any order. The server node(s) should be started first, so they will have the needed information accessible to the remaining nodes of the network.

Node Names

Each node is given a distinct node name, the default is "BCI.*nodenumber*", where the *"nodenumber"* is the numerical node number that is assigned to the node when the LAN-90 PCV software was loaded. For example: node # 1's node name is "BCI.1".

The node names can be modified via the menu system to reflect the area of the plant for which it is responsible.

In the case of server nodes, a distinct server name is assigned, the default is "PCV.nodenumber", where the "nodenumber" is the numerical node number that is assigned to the node when the LAN-90 PCV software was loaded. For example: node # 2 is a server node, its node name is "PCV.2".

The Startup Sequence

After you turn on the computer, you will see various messages displayed on the screen by the system startup file as different programs are started.

During startup, the screen changes the size of text being used. This is a normal operation and is simply a means of initializing the console for the windows application. As programs are started, a *[success]* message signifying proper startup of each program module is displayed.

Once the programs have successfully started up, the console automatically goes into the windows system and displays a prompt to have you login (Figure 2-2).

> **NOTE:** Prior to starting the windows system, you have a few seconds to press <Ctrl Break> to avoid starting windows and performing some other operation from the QNX4 system prompt.

Booting DOS

Normally, a computer that starts up the LAN-90 PCV software can also boot into DOS. These computers have their hard disk

divided into two sections or partitions: one for the QNX4 operating system and one for the DOS operating system.

If you want to start up DOS instead of QNX, you need to know the DOS partition number, typically partition 4, then:

1. Shut down. This is done by selecting the **Exit** Menu option from the Main Menu and then selecting the **Exit & Shutdown** button from the prompt. You require Exit-System permission to perform this operation.

2. Reboot the computer by pressing <Ctrl Alt Shift Del>.

3. When you see the message:

   QNX Loader
   Boot Partition ___

press the DOS partition number (usually 4). You have about one second to press the DOS partition number before QNX4 starts. If you don't press the DOS partition number in time, and QNX starts to boot, follow steps 1 to 3 above and make another attempt.

CAUTION	**DO NOT reboot the computer if LAN-90 PCV is already running. Use the *Exit & Shutdown* command first or you may corrupt files and lose important information on your hard disk.**

LOGGING IN/SIGNING IN

By default, when the system starts up, the display shows the Executive Bar across the top of the screen and the sign-in dialog prompt box waiting for your login entry.

The Executive Bar includes the current user logged into the system and current server name to which the client software is connected. This information is shown immediately to the left of the date/time display (Figure 2-2).

In order to perform configuration of the system or control of the process you are required to be logged in as a user that has permission to perform the required functions. If you have logged in with limited access, menu items are displayed in a shadowed text and these options cannot be selected.

However, some applications you are allowed to select but have only the ability to view, not change the data. These applications display a *[View Only]* message on the window control select region or on the lower region of a text screen application.

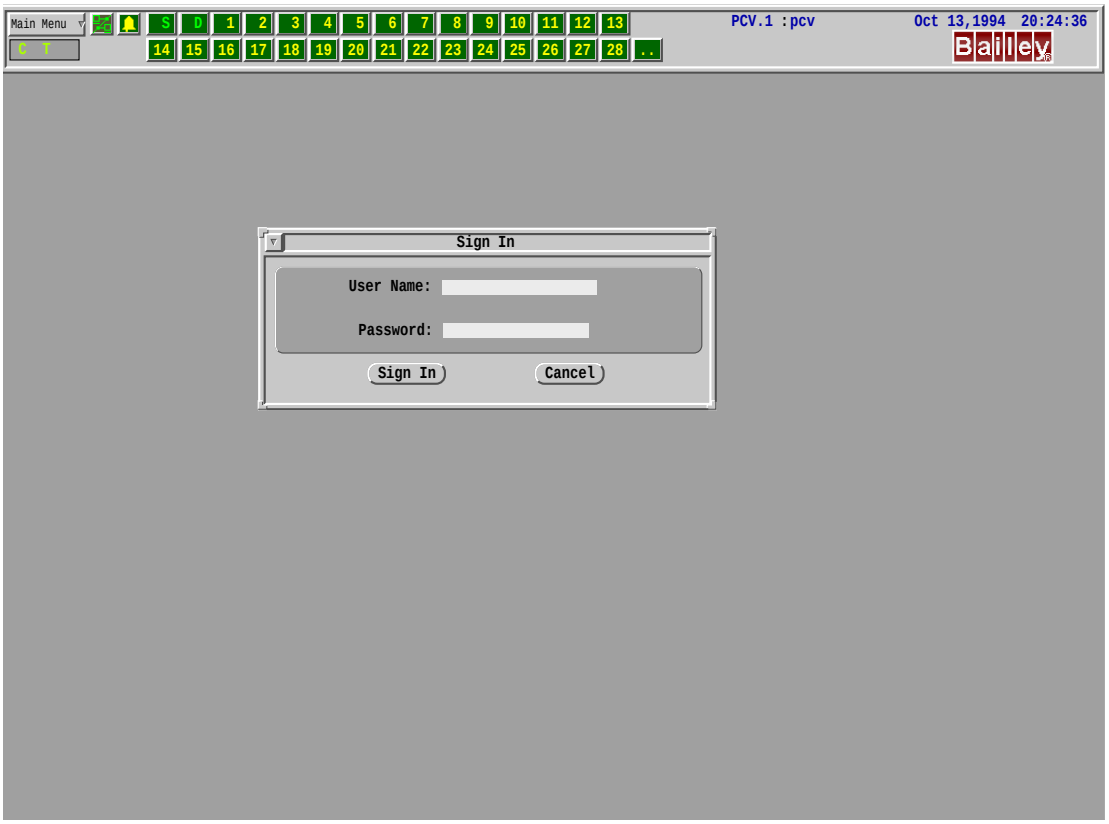


Figure 2-2. The Executive Bar

You can sign in a different user when you need a particular group of permits. From the Main Menu select the **Sign In/Out** item. Then select the ***Sign In*** Menu item from the sub-menu. You are presented with the Sign In Window. Enter a valid user name and password. If an error was made on entry, you are warned and returned to the login window.

Once you have entered your User Name, press <Tab> to move to the password entry field. You may also move the mouse to point and click on the **Password** entry field to edit the entry. When your entries are complete click on the **Sign In** control key or press <Enter> to process your login.

The Sign In window may be cancelled in one of two ways:

- Use the mouse to click on the **Cancel** control key.
- Press <Esc>

NOTE: You may directly call up the Sign In window by moving the pointer to the current user name and pressing the left button.

The user ID and password are case-sensitive. For example, "operator" and "opErator" are two distinct words. Be sure to use the required case for both entries.

If you enter your user ID and password correctly, the default opening graphic will be displayed. If you have made a mistake, you will have to re-enter them.

COLORS USED

On menus and displays, the same type of information is displayed in the same color. This lets you quickly recognize different information by its color.

Table 2-1 shows the standard color scheme for text screen applications.

Table 2-1. Standard Application Color Usage

Color	Information
Cyan	Field titles and menu titles
Green	Editable or selectable fields
White	Selected text
Yellow	Alarms
Red	Control select keys, Menu function keys
Blue	Menu outlines, Border on inactive controls
Light Green	Current node serving as primary on a redundant network
Dark Green	Current node serving as redundant node on a redundant network
Black	Background

NOTE: This color usage applies only to standard menus and displays; for text menu application screens; your graphic process displays may use colors differently.

The color scheme for any of the window applications can be modified to suit your tasks and needs. Table 2-2 shows the standard color scheme for window applications.

Table 2-2. Color Scheme For Screen Applications

Color	Description
Dark Cyan	Dialog background
Medium Cyan	Dialog highlighted area
Cyan	Non-editable text foreground Editable text background
Light Grey	Button background
Light Yellow	Title text foreground
White	Current text foreground
Black	Button and editable text foreground

KEYS USED IN DATA ENTRY FIELDS

You can edit data entry fields using the keys listed in Table 2-3.

Table 2-3. Editing Keys

Function	Type Of Keyboard	
	OIS/INFI 90	QWERTY
Move between fields:		
Move to first field	<Home>	<Home>
Move to last field	n/a	<End>
Move to next edit field	<Tab>	<Tab>
Move to previous edit field	{TabBack}	<Shift Tab>
Move to field on right	<Right>	<Right>
Move to field on left	<Left>	<Left>
Move to field above	<Up>	<Up>
Move to field below	<Down>	<Down>
Move within a field:		
Move one character right	{DoubleRight}	<Ctrl Right>
Move one character left	{DoubleLeft}	<Ctrl Left>
Move to previous item in list	{DoubleUp}	<Ctrl Up>
Move to next item in list	{DoubleDown}	<Ctrl Down>
Move to last item in list		<Ctrl End>
Move to first item in list		<Ctrl Home>
Insert and delete characters:		
Toggle insert mode	n/a	<Ins>
Delete character at cursor	n/a	<Del>
Delete character to left of cursor	n/a	<Backspace>
Clear the field and reedit	<Clear>	n/a
End entry:edit field		
Accept current field entry	<Enter>	<Enter>
Recall field's original entry, abandoning any changes	<Esc>	<Esc>

n/a = not applicable

PRINTING SCREEN DISPLAYS/WINDOWS

You can print sections of your console screen to a graphics printer. These printing features are available to all users. Refer to "Printer and Time/Data Utilities" in the ***Configuration*** manual for details on configuring your system for printing graphics.

To view the three printing options:

- Press <Alt-X> on the standard keyboard, the right mouse button on the **Main Menu** button in the Executive Bar or {GENL FCTNS MENU} on the mylar keyboard.

- Press **L** or move the mouse pointer and click the right mouse button on the **Print** Menu item to show the Print sub-menu.

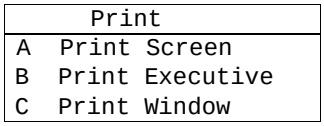


Figure 2-3. Printing Options Menu

The Print sub-menu shown in Figure 2-3 lists the options; Print Screen, Print Executive, and Print Window. Press the letter beside one of the menu items or move the mouse pointer and click the left mouse button on the menu item you want to select.

> **NOTE:** If you have a mylar keyboard with Keyboard switching, printing is limited to the currently active screen.

Print Screen

The Print Screen option captures the entire contents of the screen and sends it to the graphics printer.

Print Executive

The Print Executive option captures the contents of the Executive Bar at the top of the screen and sends it to the graphics printer.

> **NOTE:** Even if your mouse pointer is located within the Executive Bar, it is not included in your print out.

Print Window

When selected, the Print Window option pops up a list of the windows opened from the Main Menu which are currently shown on the screen. Each menu item consists of an item select letter followed by the title which appears at the top of each opened window.

Figure 2-4 shows an example of this pop-up window listing the window titles. In this example, one of three windows can be printed. The remaining menu items (D-H) are dimmed and cannot be selected.

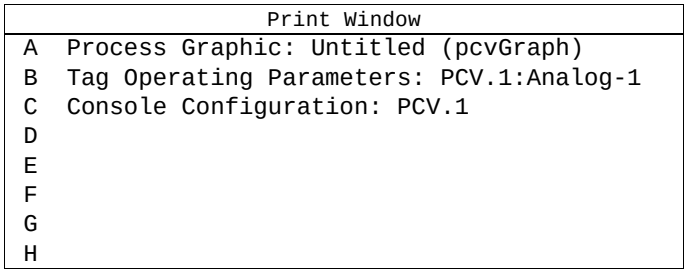


Figure 2-4. The Pop-Up For Listing Windows To Print

From the standard or mylar keyboard, enter the letter beside the title of the window you want to print. Using the mouse, simply move the mouse pointer over the title and click the left mouse button. In both cases, when a title is selected the pop-up window is closed and the contents of the window are sent to the graphics printer.

To abort printing a window, on the standard or mylar keyboard press <Esc> or using the mouse, click any mouse button outside of the Pop-Up Window.

GETTING TO THE QNX PROMPT

You do not need to use the QNX4 operating system directly. Utilities have been designed and implemented to allow you to perform a variety of the common functions from the Windows Interface Menus.

If you need to access QNX4 operating system or specific programs or utilities from the operating system's prompt, you can obtain the QNX4 prompt:

With the correct access you can press the right mouse button with the pointer on the grey screen background (also called the desktop) behind the windows. This will display the QNX4 Workspace Menu. Point and click on the **Programs Menu** item to display the Programs sub-menu. Point and click on the **Shell Menu** item and a user window (also called a W term) will be displayed with the QNX4 prompt.

CAUTION	**The QNX4 Operating System provides two text editors, vedit and qed. DO NOT USE vedit.** **While vedit is running the intermediate files are not properly time stamped. Thus mirror will overwrite them and cause file corruption of the file under edit.**

To exit from the Shell window, type **logout, exit** or <Ctrl D> at the prompt to close the shell.

WORKING WITH FILES

LAN-90 PCV runs under the QNX4 operating system. File names under QNX4 are case-sensitive; uppercase and lowercase letters are recognized as distinct characters. For example, "TestFile" is not the same file name as "testfile". When you copy a file from DOS to QNX4, the file name uses all lowercase letters.

Do NOT rely on case differences to distinguish between different graphic display file names.

Valid file name characters for files used in QNX4 are:

- All letters of the alphabet (case sensitive)
- Numbers 0 through 9
- Period (.), underscore (_), and dash (-)
- Hexadecimal characters 80 through AF (foreign characters e.g. â)

NOTE: Spaces cannot be used in file names.

Unlike DOS, the period (.) is not used as an extension separator by QNX4 and is a valid file name character. Files used in QNX4 can have names up to 48 characters long (any combination of valid characters).

Files to be used with the Engineering Work Station (EWS) or other DOS-based programs, require a DOS file name format. This format is the file name (eight characters maximum) followed by an extension separator period (.) then a three character extension (e.g., "filename.ext"). Because of this restriction, graphic display file names are limited to eight characters.

Refer to your QNX4 and DOS manuals for further explanation of valid characters and naming files.

RUNNING OTHER APPLICATIONS

The Applications Menu is a configurable menu that allows you to run other applications or utility programs that have not been included in the standard menu system.

To display the Applications Menu (Figure 2-5) press **J** from the Main Menu or move the mouse pointer to highlight the Application Menu item and press the left mouse button.

The Application Menu is shipped with only one item configured, the QNX4 on-screen calculator. Additional Menu items can be added and will be listed below this first entry.

To run a menu item, make sure the item is displayed in black text. If it is displayed in shadowed text then you do not have access.

Move the mouse pointer to the menu item and press the left mouse button on the highlighted application name, or select the letter beside the name to run it.

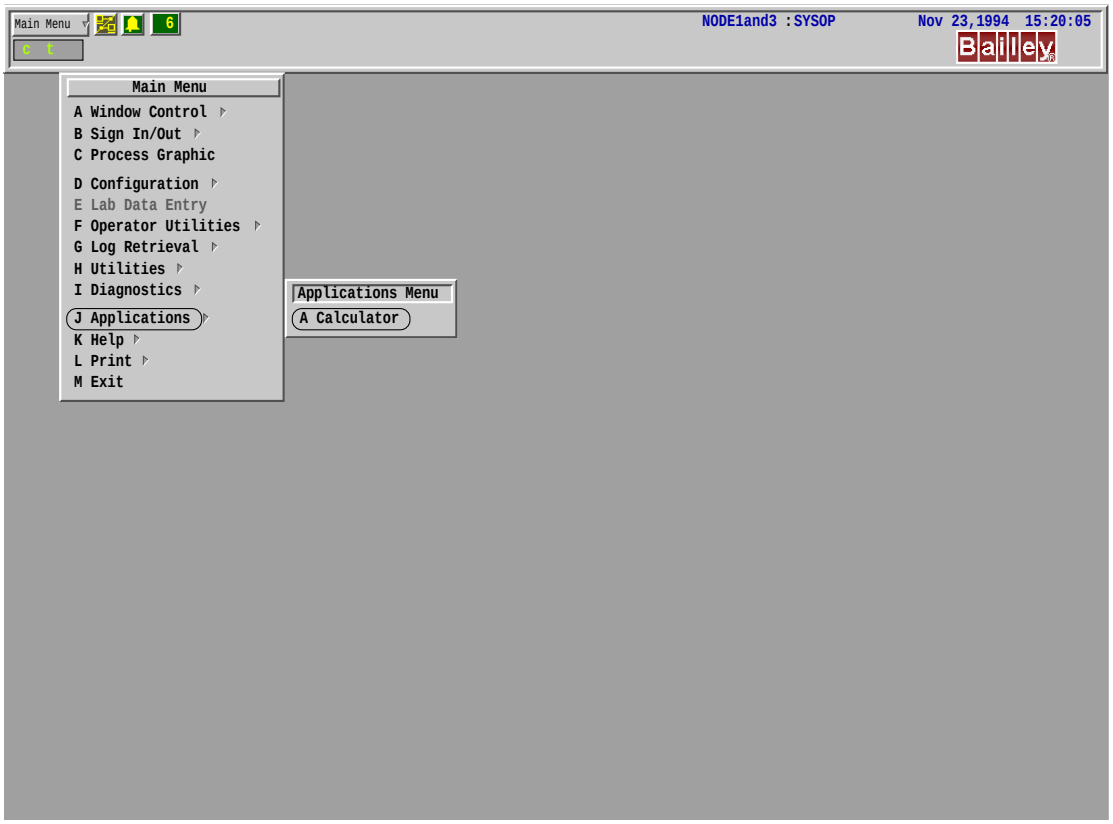


Figure 2-5. User Application Menu

LOGGING OFF/SIGNING OUT

If you have logged into the console with permits that allow the configuration or tuning of any part of the LAN-90 PCV console or INFI 90 OPEN system, be sure to logout before you leave the console. This will prevent unauthorized users from gaining access to the system.

TURNING OFF OR RESTARTING THE COMPUTER

Sometimes you will have to turn off or restart a LAN-90 PCV computer.

CAUTION	**You should NOT simply turn off or reboot a computer; this could lead to corrupted files or a loss of trend and logging data.**

Networked Computers

You can shut down a client node without losing data. When you shut down a server node, data collection stops and there is no connection to the plant communication loop. However, if you have a redundant system, shutting down the live server node will start a failover to the redundant server, so data collection and plant communication loop connection remain

intact. Shutting down the redundant server node has no effect, except that redundancy is lost until the redundant server is restarted.

The Shutdown Command

Before turning the computer off or rebooting, the running system will have be properly stopped.

From the Main Menu select the **Exit** option. You will be presented with a prompt to confirm your initial selection. Click with the mouse pointer on the **Exit & Shutdown** button.

This will shut down the software in an orderly fashion. Any trend or logging data currently stored in memory is written to the disk, and all background programs are stopped. You can view the progress of the shutdown on the displayed message window.

Once the stopping of the programs has finished (it may take several minutes depending on the amount of data your system is configured to retain), you will be returned to the QNX4 windows environment.

Once the software has stopped running on a server node, trend and log data are not being collected and your process interface is removed.

You may reboot by pressing <Ctrl Alt Shift Del> or **Exit** to QNX Text Mode through the QNX windows menus.

Exit, is used ONLY for special maintenance, will stop the Client software and place you in QNX windows with the Server software still running.

If you wish to turn the computer off, when the shudown box is displayed, simply turn the computer off after turning any peripheral devices off as well.

> **NOTE:** If the computer has an optical disk drive attached to it, make sure the optical drive isn't being used when you turn off or reboot the computer.

SECTION 3 - USING WINDOW MENUS

OVERVIEW

The console software is organized in a hierarchy of menu screens. Each menu has items that call up other menus, or run various applications. Related functions are grouped together in the same menu.

This menu hierarchy is setup for the general configuration screens. Once the system is installed and your own system configurations have been implemented then accessing of various operating functions can be performed in the same hierarchical manner or through mouse selections.

This section describes the types of windows and menu systems that the console software uses, including the following:

- QNX Window Control
- Window Types
- Executive Bar
- Console Menus
- Console Main Menu
- Window Control
- Process Graphic Window

Refer to the ***QNX Windows User's Guide***, Section 2 - Base Windows, for a complete description of QNX's Window structure and controls.

Based upon your system's configuration of various options, you may have additional menus and displays available.

QNX WINDOW CONTROL

These menus can be displayed by moving the pointer to the Window Control Button (located at the top left corner of the window) or the Window Title Bar and pressing the right mouse button (Figure 3-1).

The Windows Control Menu displays a list of options that are performed on the currently selected window. These options can only be selected by the use of the mouse. Move the pointer to highlight your desired function and press either the left or right Menu button.

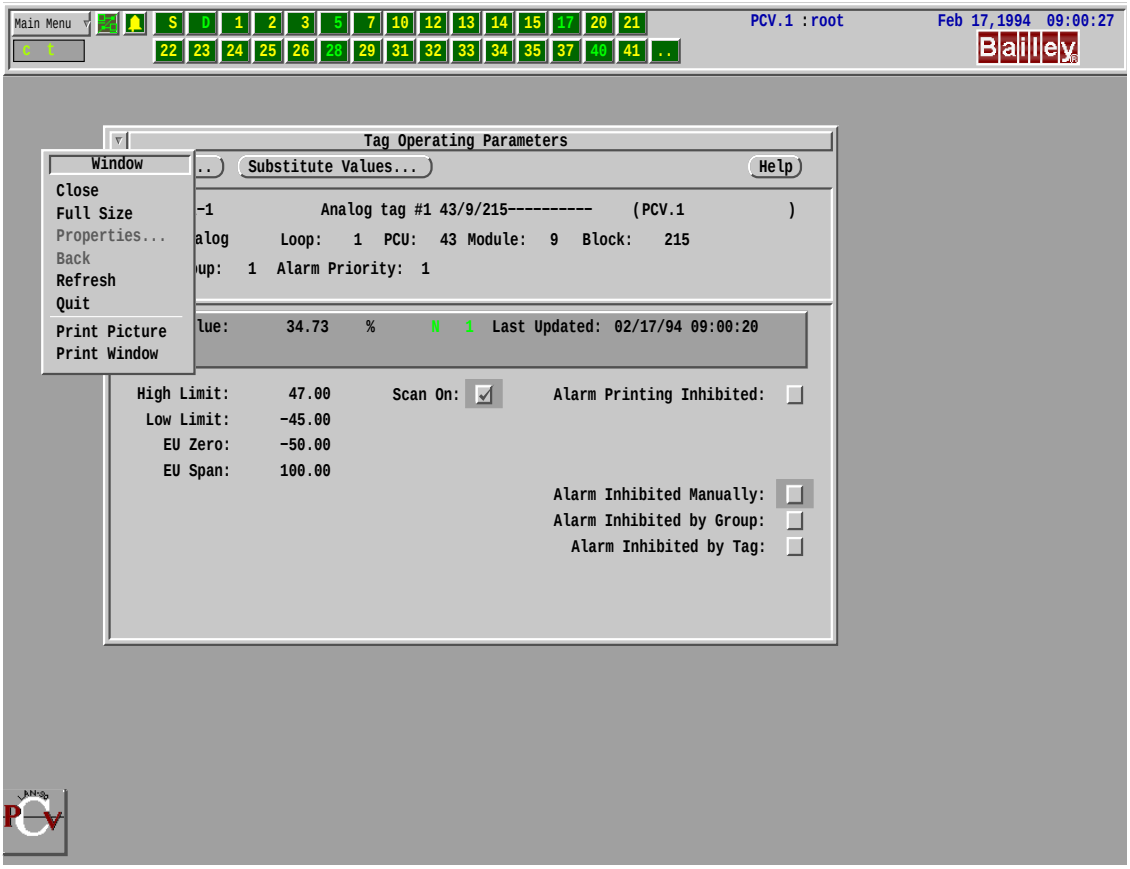


Figure 3-1. Window Control Menu

Close Turn the current window into an icon representing this window. Some applications have special icon symbols to give easier recognition of the window function. All icons have a specific name written along the bottom of the icon box.

Full Size This will expand the window to take up all of the display screen area. Some applications cannot be expanded to the full size of the screen.

> **NOTE:** The Executive Bar cannot be overwritten as this information is an important link to the functions and monitoring of your process.

Properties Selection of this option will display the current window settings. Changing of these settings is not recommended.

Back If there are many windows displayed on the screen at one time then some windows may over lap others. Selection of the Back option will put this window (into the background) behind all other windows allowing other windows it previously covered to be displayed (over top of this window).

Refresh This will update the information displayed in the window. This function generally is never used as the applications running in the window will update the information.

Quit Closes the window and causes the application running in the window to be terminated. This is not a recommended way to exit your running application. It is better to end the application in the window before quitting the window.

Print Picture This will display a prompt to enter the name of the PostScript printing device to send the current picture to. Enter the name of the printer if your system does not use the default "/dev/spool/pictps" device (any valid print task may be used to obtain a printout of the picture). Click on the **Print** button to perform the print operation or select the **Cancel** button to halt the print task and remove the prompt.

Print Window The same function is performed for Print Window as was described in Print Picture except the current window frame is printed as well.

A display can be made into an icon symbol in one of two ways. The first way is to select the **Close** Window Control Menu item. The second and easiest way is to move the pointer to the **Window Control** Button (located at the top left corner of the window) and press the left button of the mouse. Making windows into icons will reduce display screen clutter and give easy access to important information not required to remain on the display screen all the time.

Moving the pointer to one of the icon symbols and pressing the left mouse button twice in quick succession will restore the iconized window to its previous window size. The application that was in the window pane will be restored as well with the current information as per the function of the application.

Moving the pointer to a selected icon and pressing the right button of the mouse will display the icon version of the window control Menu. You will see the same functions displayed except the first option will be labelled *Open* and not *Close*.

Open Selecting this menu item will cause the window associated with the icon to be redisplayed to its previous state and location on the display screen. The icon will be removed. The window may be reopened by a double left click on the icon.

> **NOTE:** Windows and icons may be repositioned on the screen by dragging of the object.

To reposition an icon:

a. Move the pointer to the desired icon.

b. Press and hold the left mouse button. You will see a box outline form in the size of the icon.

c. Move the box outline to the destination position on the screen. Keep holding the left mouse button.

d. Once the new position is reached release the mouse button. The icon will be removed from the previous location and put at the new location.

To reposition a window

a. Move the pointer to the title bar or to an area of the window border.

b. Press and hold the left mouse button. You will see a window outline form in the size of the window.

c. Move the window outline to the destination position on the screen. Keep holding the left mouse button.

d. Once the new window position is reached release the mouse button. The window will be removed from its previous display location to the new location.

Window panes may be moved off the bottom and right side of the display area. Your window will simply be cut off but there will be no loss of information being retained or processed in the undisplayed section of the window.

Windows may be resized to a new display area by two methods. As described earlier, the window properties may be changed to a different number of rows and columns. Another way to change the window size is to drag a corner resize 'handle' of the window.

If the window is allowed to be resized it will have corner resize 'handles'. Move the pointer to a corner, press and hold the left mouse button. You will see the window box outline as with dragging the window displayed again. While holding the left button move the pointer. You will see the window outline being stretched like a rubber band. Once the new window dimensions are formed, release the mouse button and the window will be removed and redisplayed with the new dimensions.

WINDOW TYPES

The displays fall under three categories:

1. The Executive Bar displayed across the top of the screen.

2. A control window.

3. An application displayed in a window pane.

The third display type can be further broken down into two application types:

1. A windows application.

2. A text application.

THE EXECUTIVE BAR

The Executive Bar remains on the screen at all times. It provides access to the console's menu hierarchy and important information regarding the status of both the console and INFI 90 OPEN system.

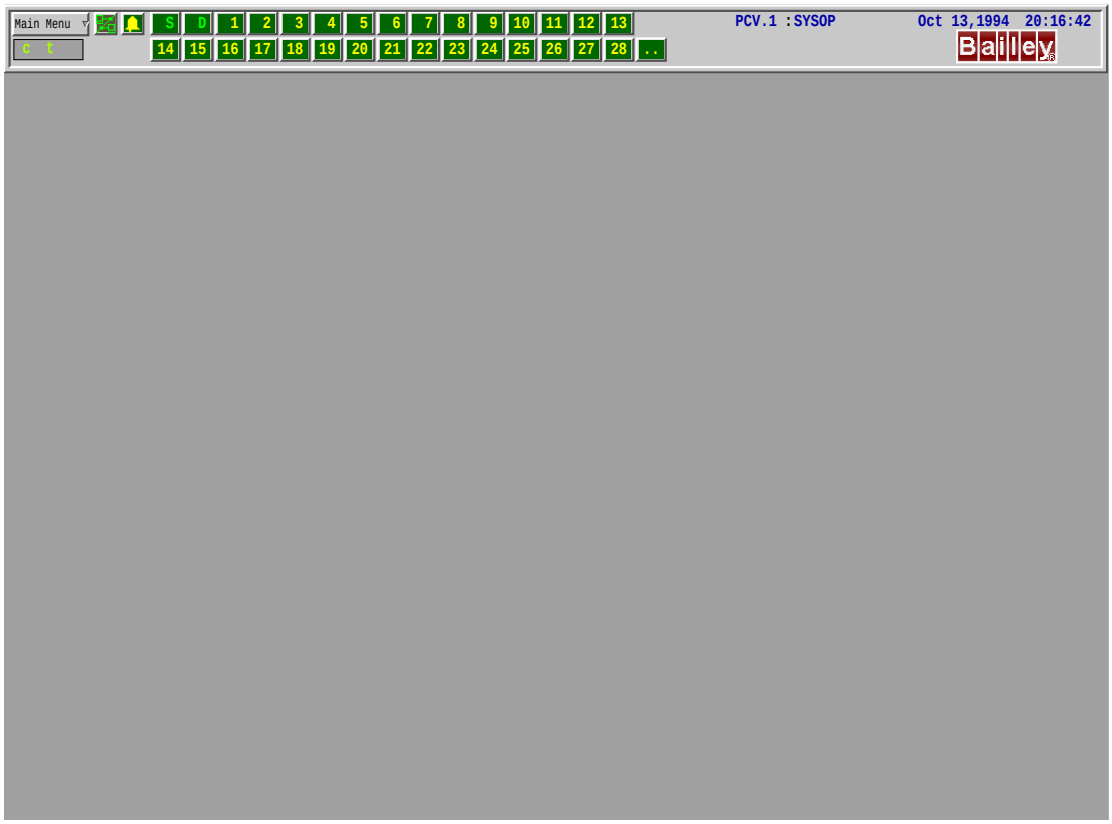


Figure 3-2. Executive Bar Menu

Main Menu Window Button

The Main Menu button is located in the upper left hand corner of the Executive Bar. Moving the pointer to this button and pressing the right button of the mouse will display the Main Menu. The Main Menu may also be displayed by pressing <Alt X> from the standard keyboard or by selecting the {GENL FCTNS MENU} key from the mylar keyboard.

Mylar Keyboard Status Display

The Mylar Keyboard Status Display is a box located beneath the Main Menu button. This box shows the current status of the attached mylar keyboard. If the keyboard is active and properly communicating the display will show the three characters of *c, t* and *s*. These characters, in lower case, signify that the operation is not locked. These characters, in upper case, signify that the operation is locked. The *C* shows the mylar keyboard configuration key in the locked position or not. The T shows the mylar keyboard tune key in the locked position or not. The *S* shows whether the mylar keyboard {Shiftlock} is on or not.

If no mylar keyboard is attached the mylar keyboard status display will always show a lowercase *c* and lowercase *t* and no *s*.

If the communication to the mylar keyboard has been broken due to power failure or poor communication, the mylar keyboard status display will display *UNAVAIL* in cyan.

Network Status Button

The Network Status Button is located to the right of the Main Menu button. The condition of the network will be reflected in the color of the network symbol on the button (Table 3-1).

Table 3-1. Network Status Table

Color	Information
Green	System functioning without error
Yellow	Communication problems exist
White	Problems occur with one or more nodes in the assigned server group; (refer to the textual description for more detail)
Red	Major problem or system failure

Moving the pointer to the Network Status button and pressing the left button will display the Server Status menu (Figure 3-3). The Server Status menu displays the Server name and current state of every Server in the LAN-90 PCV console network, or in the case of redundant Servers it will display the Server group name and status of the two Servers.

The left hand column of the Server Status window identifies the Servers and redundant Servers by name. The right hand column shows the current status of each Server using a combination of text (Table 3-2) and color (Table 3-1).

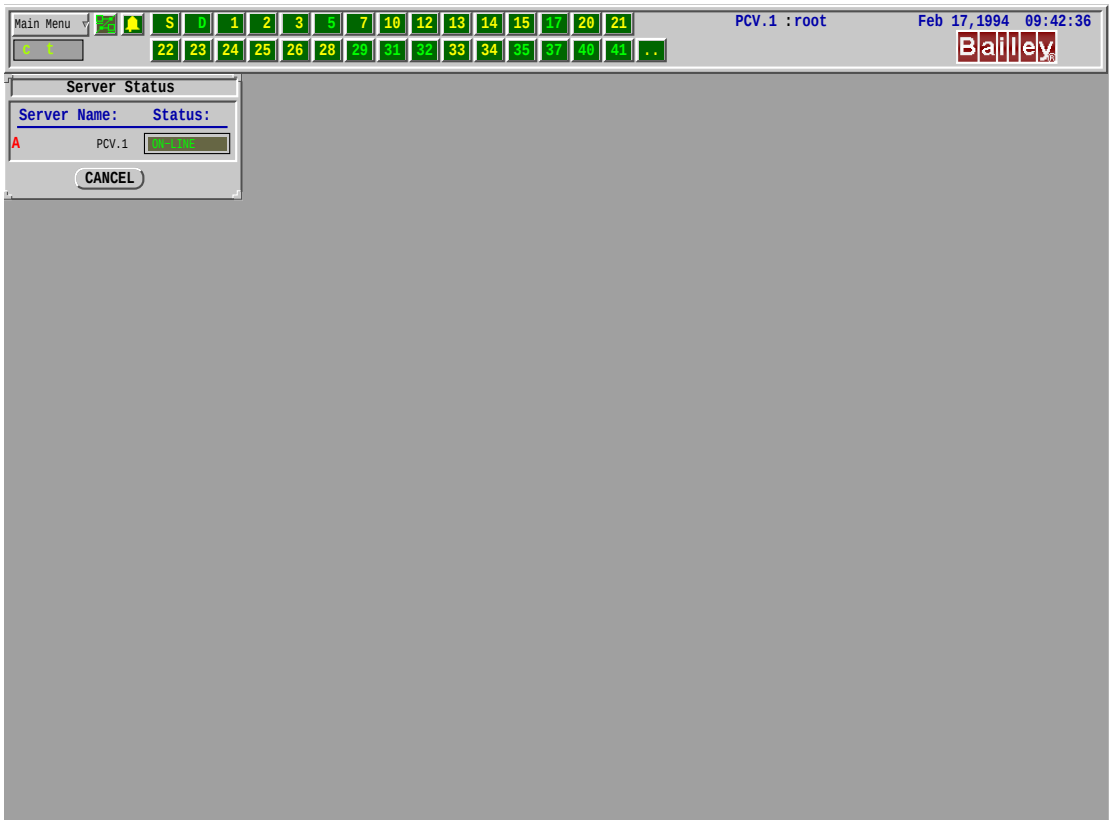


Figure 3-3. Server Status Window Display

Table 3-2. Server Status Window

States	Information
ON-LINE	System is functioning.
OFF-LINE	System was functioning and now cannot communicate to the plant communication loop or this node cannot communicate to that node.
UNAVAILABLE	This node has been configured but initial communication has never been established.

The current state of a Server is displayed on a button. If name in the Server name column is actually the Server "Group" name then selecting this button with the left mouse button will display the Group Server Status menu. The left column of the Group Server Status menu identifies the two Servers that make up the redundant group. A Server name displayed in the color cyan indicates that it is the primary (active) Server of the pair. A Server name displayed in the color white indicates that it is the redundant (inactive) Server of the pair. The Group Server Status will be displayed over top of the Server Status menu and must be dragged away from the Server Status menu in order to see both menus at the same time.

Selecting the letter from the left column of the keyboard or pressing the right button of the mouse with the pointer over the status button will call up a menu to select various diagnostics. These diagnostics give more details of the selected server.

The Server Status Window can be called up and controlled from the keyboard as follows (Figure 3-4):

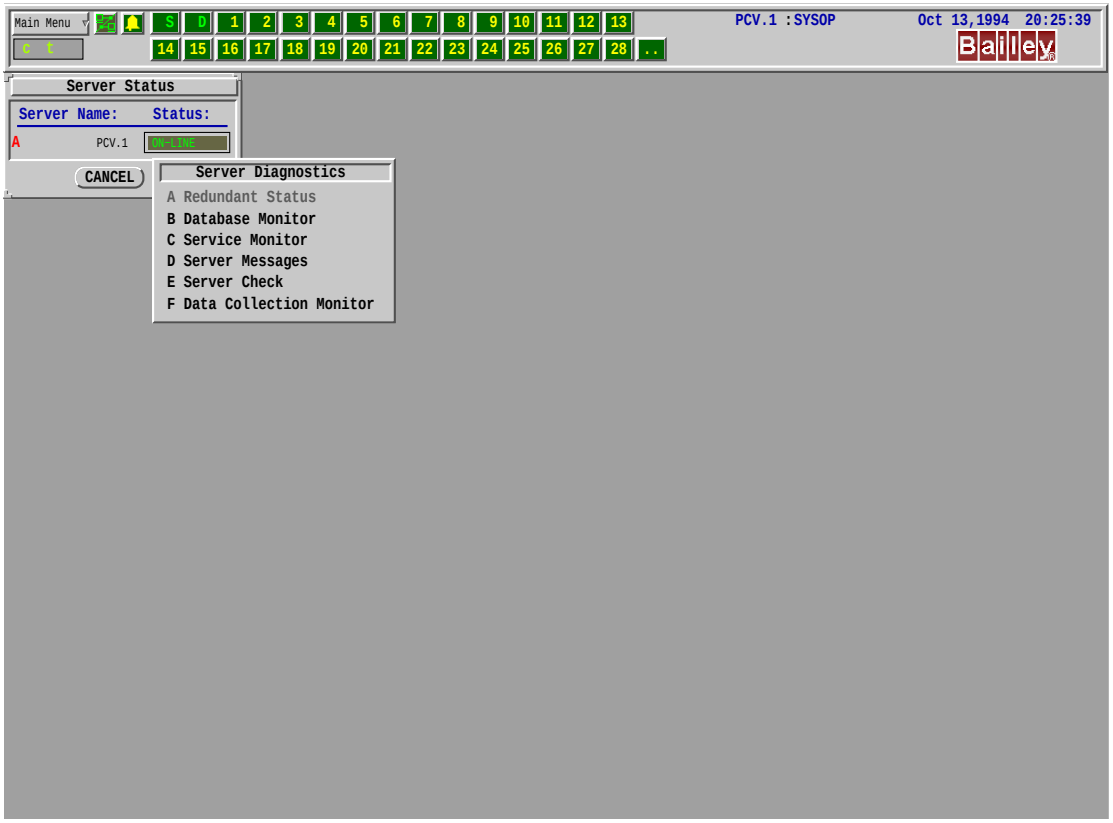


Figure 3-4. Server Status Diagnostics Display

a. Press <Alt X> or {GEN FUN} to display the Main Menu window.

b. Select **A** to display the Window Control Menu.

c. Select **F** to display the Status Window Menu.

d. Select **C** to display the Server Status window.

The Server Status window can be closed by pressing <Esc> from the keyboard or clicking on the Cancel button.

The Server Diagnostics menu provides the means to check the status of any server on the network. Refer to Section 9 of the ***Configuration*** manual for further details.

Redundant Status — Displays the status of the two Server nodes that make up the Redundant Server pair.

Database Monitor — Displays the Diagnostic menu.

Service Monitor — Displays the Status of the main tasks.

Server Messages — Displays the System Status menu.

Server Check — Check if all server system tasks which are supposed to be running are indeed running.

Data Collection Monitor — Displays the Data Collection Monitor.

Alarm Button

The Alarm button is located to the right of the Network Status button. Moving the pointer to this button and pressing the left button of the mouse will display the General Alarm Summary (Figure 3-5).

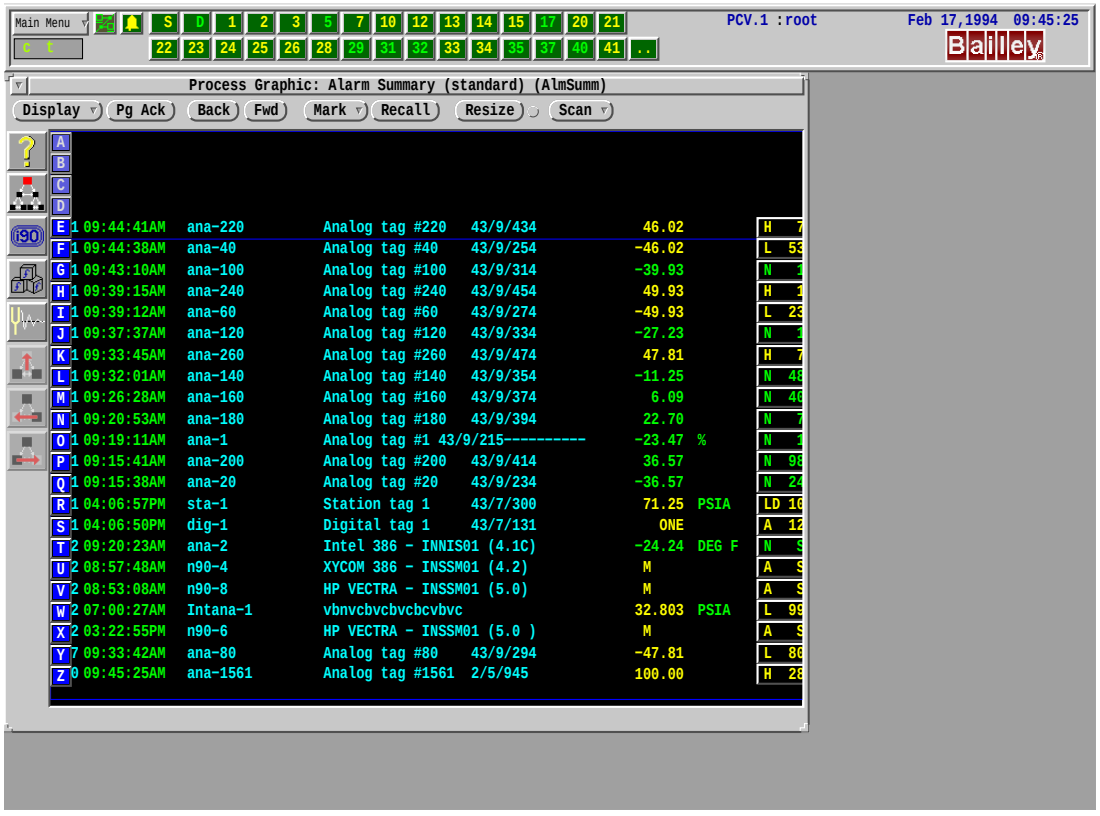


Figure 3-5. General Alarm Summary

Pressing the right mouse button on the alarm icon button will display the Alarm Management Menu. Selecting option **A** will

display the general alarm summary. Selecting option **B** will display the Alarm Group Panel that shows the alarm status of the 99 alarm groups plus the status alarm group ("S") and device alarm group ("D") (Figure 3-6).

Selecting option **C** of the Alarm Management Menu will display the ADS Panel or window (Figure 3-6).

The Alarm Group Panel can also be displayed by the following key sequence.

a. Press <Alt X> or {GENL FNCTN} menu key to display the Main Menu.

b. Select **A** for the Window Control Menu.

c. Select **F** for the Status Windows Menu.

d. Select **A** for the Alarm Group Panel.

Likewise, selecting **B** from the Status Windows Menu will display the ADS Panel.

Refer to Section 4 for more information on the Alarm Group Panel and the ADS Panel.

Alarm Tone Button

The Alarm Tone button is located directly below the Alarm Bell button. This button will only be displayed when an alarm occurs and sounds a tone either through the computer's speaker or through the mylar keyboard speaker. If there are no tones being sounded then the button is not displayed.

Using the mouse to click on this button will silence the alarm tone, but it will not acknowledge the alarm condition. Acknowledgement of the alarm is done from the alarm summaries or specially designed graphic.

This icon button acts the same as the {SILENCE} button of the mylar keyboard or <F11> on the QWERTY keyboard. It gives a visual description of the alarm tones.

Alarm Group Buttons

The Alarm Group Buttons are located to the right of the Alarm Button. Each of these buttons, if selected, will cause the alarm summary for the selected alarm group to be displayed.

There is a display limit of 31 alarm groups. If there are more alarm groups to be displayed then the **[..]** key will be displayed in the 31st position when the 32nd alarm group button is to be displayed.

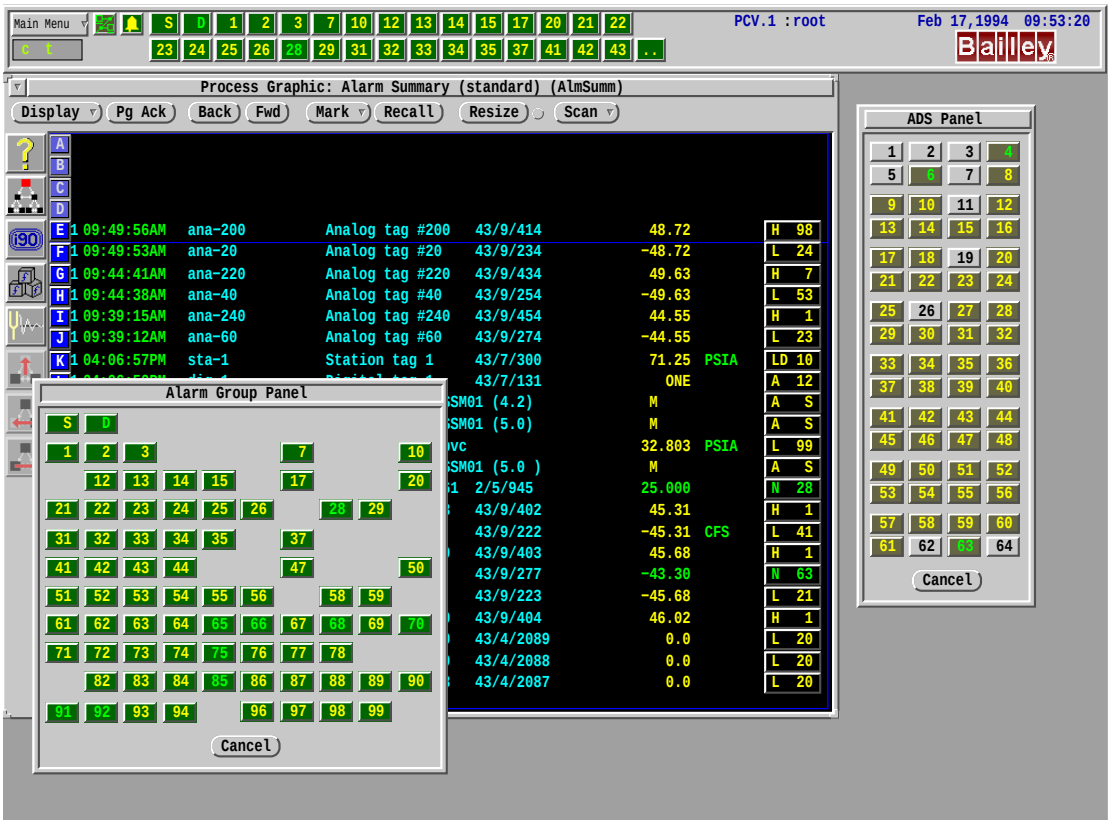


Figure 3-6. Alarm Group Panel

The buttons are arranged in the priority order of status alarms (S), device alarms (D), the numerical alarm groups in ascending order.

The alarm colors for each of the alarm group buttons is the same throughout all of the console software (Table 3-3).

Table 3-3. Alarm Colors

Text Color		Background Color		Alarm Condition
Yellow	Flash	Not Black	Flash	Unacknowledged Alarms
			Solid	Unacknowledged Alarms
		Black	Flash	Unacknowledged Alarms and Normals
			Solid	Unacknowledged Alarms
	Solid	Not Black	Flash	Acknowledged Alarms
			Solid	Acknowledged Alarms
		Black	Flash	Acknowledged Alarms
			Solid	Acknowledged Alarms
Green	Flash	Not Black	Flash	Unacknowledged Normals
			Solid	Unacknowledged Normals
		Black	Flash	Unacknowledged Normals
			Solid	Unacknowledged Normals
	Solid	Not Black	Flash	N/A
			Solid	N/A
		Black	Flash	N/A
			Solid	N/A

Current Server Name

The Current Server Name is displayed on the top line to the right of the Alarm Group button. For example: In Figure 3-6, the Current Server Name is "PCV.1"

This is the name of the server node to which your node is currently attached.

Moving the pointer to the server name and pressing the left mouse button will display a Menu listing the current valid server names. Selecting one name in the list will cause your node to detach itself from its current server and attach to the database of the selected server.

Pressing the right mouse button with the pointer on the server name will display the Sign In/Out Control Menu. This menu can be displayed by selecting the following keys:

a. <Alt X> to display the Main Menu

b. Select **B** to display the Sign In/Out Control Menu

This menu allows the user to sign in (different user accounts may have different permissions to access system resources), to sign out, to change the user's password, to select a different default server to supply data, and to show the user's resource access permission status.

Current User Name

The Current User Name is located to the right of the Current Server Name, separated by a colon (:).

This is the name of the current user logged onto your node. For example: In Figure 3-6, the Current User Name is "root".

Moving the pointer to the user name and pressing the left mouse button will display the Sign In window to login as a different user. Refer to ***LOGGING IN/SIGNING IN*** in Section 2 for more information.

Pressing the right mouse button will call up the same menu as clicking with the right mouse button on the server name.

Current Date/Time

The current date and time is displayed on the top right corner of the Executive Bar. You must have both the Configure System and Access System Utilities permits enabled, in order to modify the current date and time. The time can be modified by moving the pointer to the date or time text and clicking either the left or right mouse button to display the Set Time and Date window.

If you do not want to change the date click on the **Cancel** button.

Once your changes have been made, click on the **Apply** button. The time and date display will change and the computer's internal clock will be reset.

If you have had the Set Time and Date window on the screen for a period of time and want to update its displayed values to reflect the current time and date displayed on the executive bar, click on the Reset button. The values for the current date and time will be displayed on the Set Time and Date window.

The time and date may also be changed by using the keyboard in the following manner:

a. Select <Alt X> to display the Main Menu.

b. Select **H** to display the Utilities Menu.

c. Select **H** to display the Set Time and Date.

d. Enter the desired values. Movement between the fields can be done by pressing the <Tab> and <Tab-Back>.

e. Press <Ctrl Enter> to get cursor control. Then move the cursor to the required button **(Cancel, Apply, Reset)** and press <Ctrl Enter> again to perform the function.

THE CONSOLE MENUS

Menu screens give you access to all the functions based upon your access permissions. A menu screen can come in one of three formats:

- A dialog window that give a list of functions or applications you have access to.
- Application Menu screens displaying a set of function key assignments that are specific to the application operation.
- Window Menu control bar selections for control or operation of the task displayed within the window pane.

Because of the flexibility of the system many of the menu functions can be performed with the selection of different key strokes or mouse selections.

The Dialog Menu Window

This is the most widely used format for menu item selections. Each of the menu items are displayed in a dialog window giving the menu options in a column or listing. The current dialog menu window that is active will be displayed with the menu title bar having a dark grey background. Menu options may be selected from the keyboard by pressing the corresponding letter key displayed to the left side of the menu options.

Menu Options that have sub-menus assigned will display a small triangle pointing to the right. Selecting these menu items will display the sub-menu giving more options elaborating upon the selected menu options.

If you do not have the required access permit to perform the system function, the menu item will be displayed in a shadowed text format. These options will not be selectable.

Selection can be done with the use of the mouse as follows:

1. Move the pointer over the list of menu items.

   NOTE: The current item pointed at will be highlighted by "circling" the text within the menu.

2. Press the right button on the mouse if the menu item has a sub-menu arrow symbol on the right side of the menu box, or

Press the left button on the mouse to run the application associated with the menu item if no arrow is displayed.

The Application Menu Screen

This screen follows the format of previous software releases. The screens are in a text format with a blue border and up to ten menu items listed at the bottom of the window pane. By pressing the function key, whose name is displayed in red and its function description beside the name, you can display another application menu or use the actual application.

All of these menus use <F9> to display a text (Help Screen) description of the current menu items listed. This help text describes the function of the current application and/or the assigned function keys displayed. Likewise, all of these menus use <F10> to return to the previous menu. The <F10> menu item is usually labelled "F0".

NOTE: The mouse cannot be used for these key selections.

Window Menu Selection

These menus are part of the function, use and control of the window screens themselves. Generally, they function as part of the application.

These menu items are not displayed in a standard hierarchical format, but appear as a series of icon buttons or labelled buttons. These buttons appear as part of the window border and are specific to the window application.

Main Menu

When the computer starts up, the Executive Bar is the first window to be displayed. Then a graphic screen with the default logo graphic will be displayed in one window.

On the Main Menu (Figure 3-7), the listed items let you access various functions of the system. If you have the required system permit for the menu items, then they will be displayed in black text. If you do not have the system permit, the items will be displayed as shadowed text. Likewise, if the software is not

functional then the text will be shadowed. These shadowed menu items cannot be accessed. The following functions can be accessed from the Main Menu:

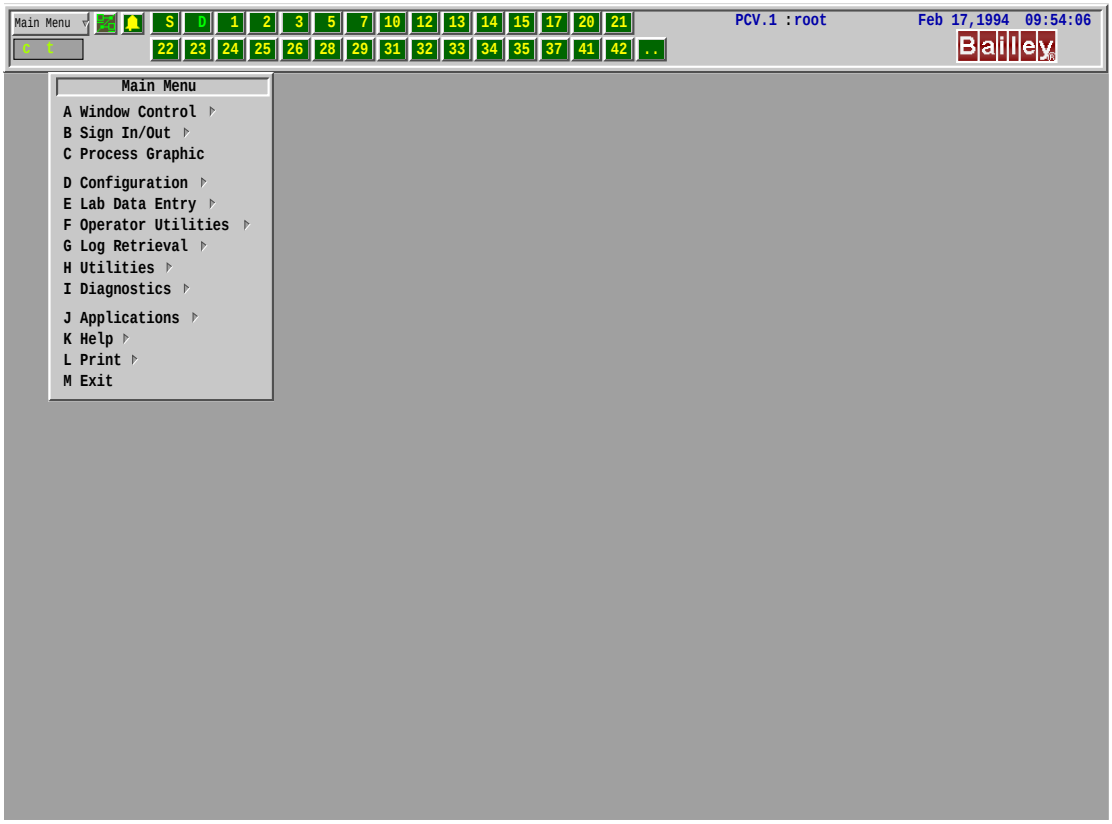


Figure 3-7. Main Menu

A Window Control — Displays the Window Control Menu. These functions will allow you to perform various screen display manipulations and user environment operations.

B Sign In/Out — Displays the Sign In/Out Control Menu. This menu will allow you to log in as a different user or to attach to a different server node when in a networked environment.

C Process Graphic — Displays a graphic window. From this window various displays may be called to control or monitor your process.

D Configuration — Displays the Configuration Menu. Various functions are provided to configure your console, including Tag Database and Graphic Displays.

E Lab Data Entry — Displays the Lab Data Entry Applications Menu. Data screens can be configured and entry of manual data may be performed from the entry screens.

F Operator Utilities — Displays the Operator Utilities Menu. Various tasks can be selected to aid in the control and monitoring of your process.

G Log Retrieval — Displays the Log Retrieval Menu. The retained log data for the periodic, trip, trigger, trend, SOE, operator action and system event logs.

H Utilities — Operations to perform on your system configuration may be performed from this menu. Backup and extraction functions, initializing media, modifying the INFI 90 OPEN module configurations, and setting the system date and time can be selected.

I Diagnostics — Displays the System Diagnostic Menu, which allows you to display various utilities to monitor system performance.

J Applications — Displays the User Application Menu. Menu items are configured by you and this menu allows for quick and easy access to your applications.

K Help — Displays the Help Menu, which allows access to the online help utility.

L Print — Displays the Print Menu which allows for printing of displayed objects to your configured PostScript printer.

M Exit — Selection of this option will display the exit prompt to get out of the graphical user interface. Move the pointer to **Cancel** and press either the right or left mouse button to remove the prompt and return to the process interface. Click/select **Exit & Shutdown** to shutdown the entire software and exit the graphical user interface.

Clicking **Exit** will exit the LAN-90 PCV user interface but will leave the server software running. To shut down the server software, action click on the icon in the upper left corner. This will put you in QNX. Type **pcv -q**, wait until the disk syncronization is complete, and then reboot via <Ctrl-Alt-Shift-Del>.

WARNING — **You are advised that restarting the LAN-90 PCV Executive manually can change the permissions and ownerships of files and programs, and thus prevent proper execution of LAN-90 PCV. Instead you should shutdown LAN-90 PCV and reboot. However, if it is essential to restart the Executive type pcvExec &. Note the ampersand "&".**

NOTES:

1. The Main Menu may be called up by selecting the {Gen Func} key or <Alt X> keys from the respective keyboards. Menu options can be selected by pressing the assigned letter to the left of the menu option description. Some applications may block the use of the <Alt X> keys, while the applications are being used.

2. If you have made a mistake in selecting a menu or application then pressing <Esc> or {Esc} will remove the current object and return to the previously selected object.

WINDOW CONTROL

A window is a rectangular region of the screen in which you run an application as though it had its own screen. Windows can be minimized into smaller icon symbols. These icons generally get displayed across the bottom area of the display screen.

Each of the icons and windows displayed may be moved about the display area individually or as a group. Individual window control has been described previously at the beginning of this section. The display may be manipulated on a group basis from the Window Control Menu.

From the Main Menu, select the Window Control Menu item by moving the pointer to highlight the option and pressing the right button of the mouse. This menu may also be displayed by selecting **A** from the Main Menu.

From the Window Control Menu you can select by using the mouse or the letter selection. This menu allows you to access the following functions:

A Bring Forward Displays a list of currently opened displays and allows you to choose which display is to be put into the foreground. If the selected window has been iconized then the icon will be displayed in the foreground but the window will have to be opened to enable control.

B Remove Displays a list of currently opened displays and allows you to choose which display to remove from the screen. Selecting the display name will remove the opened window or the associated icon from the display screen.

C Tile Selecting this menu item, resizes all opened windows to fit proportionally onto the screen equally. Some applications do not allow the window to be resized. These windows will be relocated into the mosaic but not resized. Icons will be tiled to fit sequentially across the bottom of the screen, as well.

D Restore to Sign In As each user signs into the system, they can be assigned a specific display configuration upon entry into the system. Selecting this menu item will remove your current set of windows and icons from the display and restore your display configuration as if you had just logged into the system.

E Restore To Temporary This option functions the same as the previous option except the specific display configuration is restored from a previously saved temporary configuration. This is useful for temporary interruptions that require the displays to be restored back

once the interruption is complete. For example, your co-worker has various displays set up on the screen and you want to interrupt to take a quick peek at some other information not currently displayed. The current display configuration could be saved to the temporary user, you perform your own operations and once done restore the previous display setup. In effect, your co-worker sees no interruption.

F Status Windows

Selecting this menu item will display the Status Windows Menu. This menu groups together various displays that give a general status of the process as a whole. From this Status Windows Menu the following applications may be performed:

A Alarm Group Panel

B ADS Panel

C Server Status

D Error Log

These can all be called from the Executive Bar through the use of the mouse. These options allow for easier selection of these functions using the keyboard. The fourth menu item, Error Log, displays a text window with the list of current diagnostics from the running software.

G Environment

Selection of this menu item will display the Environment Control Menu. The environment is the display setup. The menu items available are:

A Save As Sign In

Making this selection will save the current display configuration for the current user shown on the Executive Bar. The display configuration includes the graphic windows currently active and the Server to which you are currently attached. The next time you log into the system with this username, the displays will be restored to the saved display configuration.

B Save As Temporary

The same operation as Save As Sign In except the display layout is saved as a temporary display configuration.

C Remove Sign In

Selecting this option will remove any previous display configuration that you have set up to display upon your login. This will be replaced with the default display configuration as seen when first logged into the system.

D Color Setup

This option will display the System Color Selection Menu. You have a choice of setting the environment color to A - Standard Color (green) or B - OPENLOOK Color (light Grey). This will change only the general background colors for the window environment applications. It does not effect the color palette for your display configuration.

PROCESS GRAPHIC WINDOW

There are a number of control access functions available along the top and down the left side of your graphic window, refer to the Process Graphic: Alarm Summary, shown in Figure 3-5.

Top Buttons

These buttons are described in order, from left to right across the graphic window.

Display

By pressing the left mouse button it allows the operator to input the filename of a configured graphic (without extension - .dw assumed).

Pressing the right mouse button brings up a menu that allows the operator to select a graphic display.

Pressing <Esc> on the keyboard will cancel the requested menu selection.

There are five selections in this menu:

A Display by Name You can input the filename (without extension) of the graphic to display. Pressing <Esc> on the keyboard will cancel the requested menu selection.

B Browse by Name You can browse through a list of graphic file names for the selection of a graphic to display. Any subdirectories created are listed before the graphic files and are identified with a plus sign (+) preceeding the directory name. Since graphic file names can start with numbers, upper and lower case characters, the sorting places the file names starting with numbers first, upper case letters second and lower case letters last.

C Display by Title You can input the title of a graphic to display. Pressing <Esc> on the keyboard will cancel the requested menu selection.

D Browse by Title You can browse through a list of graphic file title names (sorted alphabetically) for the selection of a graphic to display. Any subdirectories created are listed before the graphic files and are identified with a plus sign (+) preceeding the directory

name. Since graphic file titles can start with numbers, upper and lower case characters, the sorting places the file titles starting with numbers first, upper case letters second and lower case letters last.

E Display by Tag You can enter or select a tag (by use of a pop-up menu) and display the primary graphic configured for the tag.

Back

The system displays the previously displayed graphic (the displayed graphics are kept in a list in computer memory).

Forward

This selects the next graphic to be displayed from the list in memory.

Mark

This marks the current graphic for manual or automatic selection at a later time.

Recall

Allows the operator to select and display a previously marked graphic.

Resize

Resizes the window to the size of the graphic.

o (Auto Resize)

This button automatically resizes the window each time a new graphic is displayed.

Scan

This button selects all graphics that are marked and displays them in sequence on a configurable time interval.

Left Side Icons

These icons are described in order from the top down.

? This brings a system help screen up and by other selections within this screen the complete system is explained.

Triangle of Squares Brings up your Display Summary screen. From this screen you will be able to step through a complete set of control graphics defined for your system process.

I90 This is a user defined INFI 90 OPEN system status screen.

Three Building Blocks Calls a Block Details graphic screen allowing you to tune tunable parameters.

Tuning Fork Allows you to select a tag for special control. A trend display, block details and faceplate are presented in a single window.

The next three graphic icons are used for displays with embedded escape codes.

Display Up Replaces the ESC key function in your displays.

Display Previous Displays the previous page graphic display as configured in your graphic.

Display Next Displays the next page graphic display as configured in your graphic.

SECTION 4 - HANDLING ALARMS

OVERVIEW

When control schemes are configured, alarm conditions can be defined for process values. For analog values, high and low alarm limits are defined; for digital values, alarm states are defined. If a process value exceeds its alarm limits or changes to its alarm state, it is in alarm.

Alarms themselves have two states: unacknowledged and acknowledged. When an alarm first occurs it is unacknowledged. Alarms remain unacknowledged until an operator interacts with the console to acknowledge the alarm.

There are three main ways you are informed of alarms:

- The individual alarm indicators that appear on various faceplate and graphic displays
- The alarm group indicator that appears on the Executive Bar
- The alarm summaries

NOTE: Your plant manager or process engineer instructs you on any corrective action you need to take when process alarms occur.

If you have an ADP (Annunciator/Display select Panel), the lamps on the panel may also indicate alarms.

When an alarm is not providing useful infomation, such as during partial plant shutdown, it can be inhibited.

There are six methods that can be used to inhibit alarm reporting. These will be discussed later in this chapter.

ALARM INDICATOR

In a process graphic display, the alarm indicator shows the alarm status, the alarm inhibit status, and the alarm group number of a tag that is in alarm (e.g., Hi 23).

When a tag is in alarm, its alarm indicator is yellow. When the tag returns to normal values or states, the alarm indicator is green.

Table 4-1. Alarm Indicator Colors

Alarm Type	Display Methods
Unacknowledged alarms	Blinking number on black background
Acknowledged alarms	Solid number on black background

Alarm indicators are displayed as soon as the tag goes into alarm, and remain displayed until the tag has been acknowledged and returns to normal values or states.

A character that indicates the type of inhibit is displayed beside the alarm status:

- ***m*** means the tag has been manually inhibited using the Tag Inhibit screen (see Section 8 for more information)
- ***g*** means the tag is inhibited by its alarm group
- ***i*** means the tag is inhibited by its inhibit tag

ALARM GROUP INDICATOR

To facilitate rapid access to alarms, each tag can be assigned to an alarm group. When a tag goes into alarm, its group is also set to alarm. The alarm group button for that group will now appear on the Executive Bar.

There is a display limit of 31 alarm groups. If there are more alarm groups to be displayed than can fit onto the alarm group area, then the **[..]** key will be displayed in the 31st position when the 32nd alarm group button is to be displayed.

The buttons are arranged in the order of status alarms (S), device alarms (D), the numerical alarm groups in ascending order.

All alarm group buttons use the same color set (see Table 3-3).

If any of the alarms in an alarm group are unacknowledged, the alarm group number is shown as unacknowledged.

If all alarms in an alarm group are acknowledged, the alarm group number is displayed as acknowledged.

If all alarms in an alarm group return to normal, and they have been acknowledged, the alarm group number is removed from the displayed list.

There are up to 99 alarm group numbers for process alarms, plus the letter S for INFI 90 OPEN system status alarms, and the letter D for console device alarms. The alarm bell represents the sum of all groups.

Clicking on an alarm group indicator will call up an alarm summary for that alarm group.

ALARM SUMMARY

The Alarm Summary lists all tags that have gone into alarm. The alarm summary can list all alarms or only alarms in one alarm group. To display one group only, mouse click on the alarm group indicator for that group. Action clicking on the alarm bell will call the alarm summary for all alarm groups except group zero.

For each alarm, the Alarm Summary lists (from left to right):

- The primary display call-up letter
- The alarm priority
- The time the alarm occurred
- The name of the tag in alarm
- The tag's description
- The tag's value and engineering units, or state
- The alarm status of the tag
- The alarm group the tag belongs to

The alarms are listed in order of priority. Priority 1 alarms are the highest, and priority 7 alarms are the lowest (each priority level may be displayed in different colors, depending on your system configuration). Any alarms with a priority level of 0 always appear at the end of the summary. Within each priority level, the alarms are listed in the order they occur; the most recent alarms are at the top, the oldest are at the bottom.

The Alarm Summary can list more alarms than can fit on a single screen. To view more alarms, press {NextPage} or <PgDn>, {PrevPage} or <PgUp>, <Home>, and <End>.

You can display alarm comments by pressing <Tab>. The comments are shown beneath each alarm description. (Because each alarm takes up two lines when comments are displayed, only half the number of alarms can be shown on the screen at a time.)

To acknowledge the alarms that are currently displayed on the Alarm Summary, press {Page Ack} or <Num+>. Alarms that have been acknowledged and have returned to their normal state are automatically removed from the Alarm Summary.

The letter that appears to the left of every alarm is used to call up the graphic display for that tag (if one has been specified). By pressing the letter, you can go from the Alarm Summary directly to a process graphic display that shows the tag. The primary display field in the tag definition specifies the display to call.

To leave the Alarm Summary simply choose another display or close the window. To choose another display:

- Press {Genl Fnctns Menu} or <Alt X> to return to the Main Menu.
- If you came to the Alarm Summary from a graphic display, you can press <Ctrl PgUp> or {Prev Page} to return to the previous graphic display.
- Press a letter displayed on the left side of the Alarm Summary to call the tag's graphic.
- Press {Disp Summ} or <Num5> to display the display summary.
- Press {Alarm Summ} or <Alt Num5> to display the graphical alarm summary.
- Press {I90Status} or <Ctrl Num5> to display the System Status display.

Time Stamp

The default time stamp used on the alarm summary is of a one second resolution. This time stamp is applied by the console upon receipt of any exception. Module time stamping provides a millisecond time stamp which is applied at the module when it generates the exception. See Section 2 of the ***Configuration*** manual for details on using these higher resolution time stamps on the alarm summary displays.

Exception reports arriving before the CIU receives its initial time synchronization do not have meaningful time stamps. Also, time stamps that are more than 30 minutes "out of sync" with the console time are considered meaningless. These exceptions will display a ".x" in place of the higher resolution.

> **NOTE:** Alarm displays using module time stamp will show a ".x" when the module time stamp is meaningless.

The time stamps on the alarm printout show tenths of a second resolution if module time stamping is enabled.

ADP LAMPS

The ADP (Annunciator Display select Panel) is a 32 or 64 button auxiliary keypad. Each button can be configured to call up a specific display. Each button contains a lamp that can be lit to indicate an alarm. This mylar panel attaches to a mylar keyboard.

Whether or not you have a physical ADP, you can display a graphical version of the ADP on your screen and thus obtain the same benefits.

Just as tags can be assigned to alarm groups they can also be assigned to ADP lamps. Use the Tag Database Editor - set ADS panel to 1 (on) and set the lamp number. A tag configured for alarm group 0 will not be reported to the graphic displays including the ADP.

There are 99 alarm groups possible but only 64 ADP lamps. Since each is separately configured, the relation between the ADP alarm lamp number and the Alarm Group number is site specific (Figure 4-1).

The 32 button ADP panel contains 32 pushbuttons and 64 lamps (LED's) in a mylar enclosure. Each pushbutton has a red and yellow LED mounted above the right hand corner of the pushbutton.

The pushbuttons and red LED's are numbered from 1 to 32 starting in the upper left hand corner of the panel and counting from left to right across the panel.

The yellow LED's are numbered from 33 to 64 starting in the lower right corner of the panel and counting from right to left across the panel.

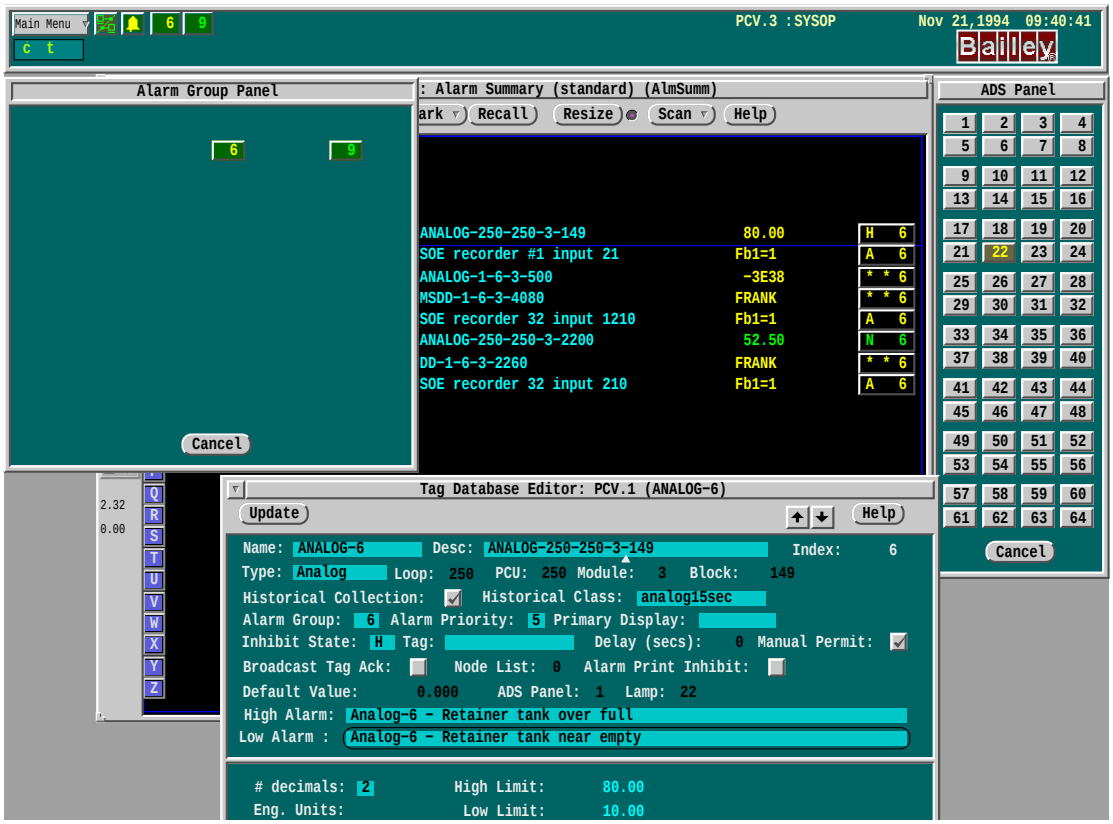
- A flashing lamp means there are unacknowledged alarms.
- A steady lamp means there are alarms but all have been acknowledged.
- An unlit lamp means there are no alarms.

Since the lamps are only one color, they cannot represent tags that have alarmed and returned to normal. Unacknowledged normals show as flashing green in the alarm displays. A tag that alarmed and returned to normal is not shown on the ADP. The graphical ADP acts identically to the actual ADP.

Your site may choose to use only 64 alarm groups in order to have a correspondence to the ADP lamps. You may configure only high priority alarms to the ADP or you may configure a single tag to each lamp and have one ADP for each section of your process.

The display you configure to each button depends on your usage.

To call up the graphical ADP, select the **Main Menu, Window Control, Status Windows, Ads Panel** or menu click on the alarm bell symbol on the Executive Bar and select ADS panel.



This analog is configured for alarm group 6 and ADP lamp 22

Figure 4-1. Alarm Group Versus ADS Panel

To configure the graphic display assigned to each ADP lamp, select **Main Menu, Configuration, Alarm Configuration, Edit ADP Displays.** Enter the graphic display name next to the button number and save.

The ADP is configured at the server level as it is directly tied to the tag database.

Consider this: You are logged into server A. Your permits are set to monitor alarms globally. There is a tag configured on server B to light lamp 22 when it goes into alarm. When the tag alarms the ADP on both A and B will light. If you want to have unique ADP configurations on each server you will need to carefully set your permits and inhibits.

INHIBITING ALARMS

Alarms can be controlled at six levels:

- Function block definition
- Tag definition
- Manual inhibit

- Tag inhibit
- Alarm group inhibit
- Console/Server permits

Function Block Definition

In the Elsag Bailey INFI 90 OPEN module, when the function block is defined, the alarm conditions are set. The block can be configured such that it never alarms. Which blocks alarm is determined during configuration. Any tag that might need to be tracked should be configured for alarming unless the volume of unnecessary alarms is impacting on system performance.

Tag Definition

In LAN-90 PCV, the tag definition determines where an alarm will be displayed. If the alarm group is set to zero then LAN-90 PCV will inhibit reporting the alarm to the graphic displays. (although it will be prepared to report should you assign the tag to an alarm group) Use this to remove generally unwanted alarm points.

Manual Inhibit

The tag can be inhibited by calling Operator Utilities, then Operating parameters (also called tag status) and clicking on the Manual Inhibit box. The tag definition must have manual permit enabled. This is used to temporarily inhibit a single tag. Changing the alarm group in the tag definition risks losing the alarm group information and thus the possibility exists of resetting the tag to the wrong group.

Tag Inhibit

A single tag can be used to inhibit a group of other tags. This is useful where shutting down one part of a process causes multiple alarms in the downstream tags. You may configure a tag for this purpose or simply use the alarm of the upstream tag as the inhibit. Each tag to be controlled must be configured. In the tag definition enter the tag name in the inhibit tag field, the inhibit state and the inhibit delay.

The tag inhibit is also called auto inhibit when it is part of the control scheme and in the tag summaries utility.

Alarm Group Inhibit

Each alarm group can be inhibited by selecting the **Main Menu, Configuration, Alarm Configuration, Edit Group Inhibits.** Select the group to inhibit, press <space> to toggle the state and save.

Console/Server Permits

The permits are used to permit/inhibit monitoring alarms on the basis of a "user in this permit group is on this console and using this server". Permits are set by choosing the **Main Menu, Configuration, System Options, User/Group Configuration.**

- Edit Permit Groups - press <F2>
- Select the permit group
- Edit the permit group - press <F1>
- Go straight to the overview - press <F2>

Read the overview by looking to the side titles first (Node name or console) and then reading the top titles (Server Name) while asking this question. "When a user of this permit group is on (console) should they see alarms from (server)?"

Move your cursor to the intersection of (console) and (server). If there is an "a" visible on the permits line then they can see those alarms.

- To change the permit, press <Enter>. You will be returned to the Edit Group Permissions screen with your cursor over Monitor Alarms.
- Press <Space> to toggle the permission.
- Save it <F1>.
- Press <F2> to recall the overview.
- Examine that console on other servers.
- Examine other consoles permits on each server.
- Repeat for other permit groups if necessary.

Refer to Section 11 in the ***Configuration*** manual for further details.

IDENTIFYING/ACKNOWLEDGING ALARMS

You should acknowledge alarms as they occur. This makes it easier to recognize new alarms, because they are unacknowledged.

To acknowledge an alarm, you call up any display that shows the tag in alarm; this includes faceplate displays, graphic displays, and the Alarm Summary. Alarms in alarm group S are INFI 90 OPEN system errors and can be found on the System Status displays or the Alarm Summary.

Once you have the tag displayed, press {Page Ack} or <Num+> to acknowledge all the alarms displayed.

You can acknowledge individual alarms instead of all the alarms on group displays and graphic displays by first pressing {AckAlarm} or <Ctrl Num+>, then pressing the <Tab> key until the alarm you want is selected (a white rectangular box appears around the selected alarm value). Once you have selected the alarm, press {AckAlarm} or <Ctrl Num+> to acknowledge it.

If your system has been set up to generate alarm horns or tones when alarms occur, you can silence the alarm horn by pressing {Silence} or <F11>.

SECTION 5 - USING TREND CHARTS

USING A TREND DISPLAY

A trend chart plots a tag's collected values on a grid. Time is shown along the horizontal axis (oldest to newest reading left to right), and the value is shown along the vertical axis. A vertical time-bar is displayed in the plot area.

To the right of the plot, boxes display information about each tag plotted on the chart (Figure 5-1). There can be up to 5 tags per chart.

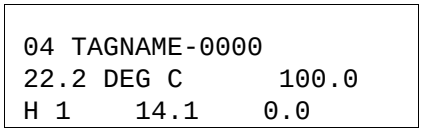


Figure 5-1. Trend Box

At the top center of each box is the tag name (Full-height trends also show the tag descriptor under the tag name). Below the tag name is the live value of the tag and its engineering units. Indicators are displayed in the lower left corner showing the tags alarm status, quality and alarm group number. The indicator is displayed when the tag is in alarm or has a non-normal status.

The value of the plotted sample at the time-bar position is displayed in the bottom center of the tag's box. This value is sometimes replaced with a text message such as *Waiting* or *No Serv.* These text messages are listed below:

Waiting The trend is waiting for the EDCS to provide the value to be plotted.

No Serv The Client has lost communication with the Server's EDCS. This can happen due to the Server being shutdown, network communication errors or in the case of a redundant Server pair the primary Server going off-line and the redundant Server taking over. In this last case, you must request the trend display again, in order to re-establish the communication with the redundant Server's EDCS.

No Data Either the Server's CIU is off-line or no historical data exists for the tag at the selected time, this will be displayed only when going back in time.

The upper and lower display limits of the chart for the tag are displayed on the right hand side of the tag's box.

The displayed time-bar value will be calculated based upon the sample rate and the time span. The actual value stored for the trend tag is the value of the process variable at the configured sample rate defined for the trend.

The letters or numbers at the upper left corner of the trend box are the trend select key(s). To be able to take control of the trend display, you must first select these keys, by using either the keyboard (Table 5-1) or pointing and clicking the mouse buttons (Table 5-2). If the selection indicator is only a single digit or letter, you must press that key and <Enter> to select the trend. The color of the trend select number indicates the color of the plotted point.

Once you have selected a trend chart, you can scroll through the retained data. Tables 5-1 and 5-2 describe how you can view the trend data.

NOTE: There is a special form of trend chart called the X-Y Plot where one process variable is plotted versus another process variable (instead of time).

Table 5-1. Using a Trend Display

Request	Press	To Obtain
Select a trend chart	The trend select key(s) of any trend tag on the chart. Select key(s) are generally displayed in the upper left corner of the trend box.	Control of the trend display options.
Move the time-bar within the displayed time span.	<Left> or {Left}	Move the time-bar to the left one displayed trend plot unit.
	<Alt Left> or {Double Left}	Move the time-bar to the left ten displayed trend plot units.
	<Right> or {Right}	Move the time-bar to the right one displayed trend plot unit.
	<Alt Right> or {Double Right}	Move the time-bar to the right ten displayed trend plot units.
	<Home> or {Home}	Move the time-bar to the rightmost displayed trend plot unit of the current trend plot region. Pressing <Home> or {Home} will cause the plot area to be updated to the current trended data with the time-bar placed at and remain at the newest data to plot.
	<End>	Move the time-bar to the leftmost displayed trend plot unit of the current trend plot region.
Move to an older time span than the currently displayed span (pan backward).	<Ctrl Left> or {Double Left}	Using the current zoom factor (or time span) move back in time to view trend data over the immediately previous time span.

Table 5-1. Using a Trend Display (continued)

Request	Press	To Obtain
Move to a newer time span than the currently displayed span (pan forward).	<Ctrl Right> or {Double Right}	Using the current zoom factor (or time span) move forward in time to view the trend data over the next immediate time span.
Move directly to a specified time span.	<Num -> or {Pan}	Displays the New Pan Date prompt to enter the desired date/time for the trend display plot area. The format for the entries are: - Day in (1-31); - Month in (Jan - Dec); - Year in (1994 - 9999); - Hour in (00 - 23); - Minute in (00 - 59); - Second in (00 - 59). Press <Alt Enter> or the right mouse button on the month field to select from the list of month names. Enter the values for each field, moving between the fields by pressing the <Tab> or {Tab} keys. Pressing the <Enter> or {Enter} key will accept your entries and update the trend plot area accordingly. Pressing <ESC> or {ESC} will exit the New Pan Date prompt window without changing the trend plot area.
Double the length of the time span displayed (zoom out).	<Ctrl Up> or {Double Up}	Double the length of the trend display area's time span. Displayed points are averaged to fit based upon the trend point sample rate. The time span is doubled moving back in time.
Halve the length of the time span displayed (zoom in).	<Ctrl Dn> or {Double Dn}	Results are the inverse of zooming out. If the trend point's sample rate is greater than the display area's time scale the plotted points will be repeated until a new sample is received, hence, flatlining of the trend plot(s).
Double or halve the length of the time span displayed more than once at a time.	<Num *> or {Zoom}	At the prompt enter a numeric value and press <Enter> or {Enter}. A negative whole number will cause the trend to zoom in (see above). A positive whole number will cause the trend to zoom out (see above). Maximum is 10, minimum is -10.
Change the upper and/or lower trend display limits for a specific trend tag plot.	The trend select key(s) of a specific trend tag on the chart. Select key(s) are generally displayed in the upper left corner of the trend box.	The edit cursor will automatically be placed at the upper limit field for the selected tag. Enter the new plot display limit and press <Enter> or {Enter}. Use the <Up/Down> or {Up}/{Down} keys to move to other limits to change. Moving off the edit field after a change has been made is equal to pressing <Enter> or {Enter}. Once editing is complete press <ESC> or {ESC} to return to control of the trend. The resultant change will be reflected in compressing or expanding the plot's amplitude based upon the limits entered.

Table 5-1. Using a Trend Display (continued)

Request	Press	To Obtain
Toggle the display of the background grid.	<Ctrl G>	Turns the display of the plot area grid lines on/off. This function may only be performed from the QWERTY keyboard.
Unselect of a trend chart control.	<ESC> or {ESC}	Unhighlights the trend faceplate and allows control of other graphic elements on the display. **NOTE:** If you select control of another graphic element on the same graphic while in control of the trend display, the control ability will be moved to the new element and trend control will be canceled with any current display settings remaining.

Any changes made to the trend display while in control of the trend will remain while the trend remains on the display screen. If the same display is called up into another window or recalled into the same window, any settings performed will be lost. If you wish to make the settings permanent for the initial displaying of the trend graphic, the settings will have to be configured into the graphic display itself. Refer to the "Trend Display" subsection of Section 6 in the ***Configuration*** manual for more information on configuring trend displays.

Table 5-2. Controlling a Trend Display Using the Mouse

Request	Press	To Obtain
Select a trend chart.	Press the left mouse button with the pointer on the trend plot area; or Press the right mouse button with the pointer on the trend plot area, then select/click the **Control** Menu item from the Trend Menu.	Control of the trend display options. The Tools dialog window will be displayed for manipulation of the trend display.

Table 5-2. Controlling a Trend Display Using the Mouse (continued)

Request	Press	To Obtain
Move the time bar within the displayed time span	Move the pointer to the time-bar press and hold the left mouse button. Move the highlight box and release the mouse button.	Update the time-bar time location and the calculated values in the trend boxes.
	Select/click the **left** arrow button from the Tools Menu.	Move the time-bar one display unit to the left.
	Select/click the **right** arrow button from the Tools Menu.	Move the time-bar one display unit to the right.
	Select/click the augmented **left** arrow button from the Tools Menu.	Move the time-bar ten display units to the left.
	Select/click the augmented **right** arrow button from the Tools Menu.	Move the time-bar ten display units to the right.
	Select/click the **HOME** button from the Tools Menu.	Move the time-bar to the rightmost displayed trend plot unit of the current trend plot region. Selecting/clicking HOME again will cause the plot area to be updated to the current trended data with the time-bar placed at and remain at the newest data to plot.
	Select/click the **END** button from the Tools Menu.	Move the time-bar to the leftmost displayed trend plot unit of the current trend plot region.
Move to an older time span than the currently displayed span (pan backward).	Select/click the **double left** arrow button from the Tools Menu.	Using the current zoom factor (or time span) move back in time to view trend data over the immediately previous time span. Each press updates the display by 1/2 a screen.
Move to a newer time span than the currently displayed span (pan forward).	Select/click the **double right** arrow button from the Tools Menu.	Using the current zoom factor (or time span) move forward in time to view the trend data over the next immediate time span.

Table 5-2. Controlling a Trend Display Using the Mouse (continued)

Request	Press	To Obtain
Move directly to a specified time span.	Select/click the **PAN** button from the Tools Menu; or Press the right mouse button with the pointer on the trend plot area. From the Trend Menu, point and click on the Pan Menu item.	Display a prompt to enter the desired date/time for the trend display plot area. The format for the entries are: - Day in (1-31); - Month in (Jan - Dec), clicking the right mouse button on this field will display a list of month descriptors. Select/click the desired descriptor with the left mouse button; - Year in (1994 - 9999); - Hour in (00 - 23); - Minute in (00 - 59); - Second in (00 - 59). Select/click the field to edit by moving the pointer to the desired field and pressing the left mouse button. Once all entries have been entered select/click on the **Apply** button to update the trend display plot region. Select/click on the **Cancel** button to remove the New Pan Date popup window. Selecting/clicking on the push-pin in the upper left window corner will cause the popup prompt to remain on the screen once the Apply button has been selected. Selecting/clicking on the push-pin a second time will close the window and ignore any requests for a new pan time.
Double the length of the time span displayed (zoom out).	Select/click the **double up arrow** from the Tools Menu.	Double the length of the trend display area time span. Displayed points are averaged to fit based upon the trend point sample rate. The time span is doubled moving back in time.
Halve the length of the time span displayed (zoom in).	Select/click the **double down arrow** from the Tools Menu.	Results are the inverse of zooming out. If the trend point sample rate is greater than the display area time scale the plotted points will be repeated until a new sample is received, hence, flatlining of the trend plot(s).
Double or halve the length of the time span more than once at a time.	Select/click the **ZOOM** button from the Tools Menu. or Press the right mouse button with the pointer on the trend plot area. From the Trend Menu point and select/click on the Zoom Menu item.	Displays the Zoom dialog window prompt to enter the zoom factor. Using the left mouse button the value can be incremented/decremented with the up/down buttons displayed to the right hand side of the zoom factor value. Once the desired zoom factor is displayed select/click on the Apply button. The trend will update to zoom in or out accordingly. Selecting/clicking on the Cancel button will remove the Zoom popup window. Selecting/clicking on the push-pin in the upper left window corner will cause the dialog to remain on the screen once the Apply button has been selected. Selecting/clicking on the push-pin a second time will close the dialog window.
Change the trend plot display resolution.	Press the right mouse button with the pointer on the trend plot area. From the Trend Menu point and click on the Props Menu item.	Enter the new Display Resolution to change the time period of the trend plot. Select/click on the **up/down arrow** buttons to incrementally change the display resolution. This value can range from 1 to 950400 (11 days).

Table 5-2. Controlling a Trend Display Using the Mouse (continued)

Request	Press	To Obtain
Change the upper and/or lower trend display limits for a trend plot.	Move the pointer to the upper or lower limit value to change and press the left mouse button.	The selected value will be highlighted for editing. Enter the new value from the keyboard and press <Enter> or {Enter}. The resultant change will be reflected in compressing or expanding the plot's amplitude based upon the entered limits.
Toggle the display of the background grid.	Press the right mouse button with the pointer on the trend plot area. From the Trend Menu point and click on the Props Menu item.	In the Properties dialog window select/click on the **grid checkbox** to toggle the checkmark within the box. Select/click on the **Apply** button to change the grid display option. ✓ = grid lines ON; no ✓ = grid lines OFF.
Enter a note onto the trend and associate it with the trend plot.	Move the time-bar to the location of the note to associate with the trend and then press the right mouse button with the point on the plot area. From the Trend Menu, point and click on the ***Note Menu*** item.	Enter the note you want to assign to the trend sample. You can also enter an optional reason code index to the trend sample. Click the left mouse button on the Up and Down symbols to increment or decrement the reason code index. Select/Click on the **Apply** button to assign the note to the sample. Select/click on the **Cancel** button to ignore any changes you have made. A musical note symbo♪) will appear blinking at the bottom of the trend plot where the sample appears.
Unselect of a trend chart control.	Click on any element outside of the trend faceplate; or Select/click the **Cancel** button of the currently displayed dialog window.	Unhighlights the trend faceplate and allows control of other graphic elements on the display. **NOTE:** If you select control of another graphic element on the same graphic while in control of the trend display, the control ability will be moved to the new element and trend control will be canceled with any current display settings remaining.
Increase number of samples on display (a multiple of 128 samples).	Press right mouse button with pointer on trend plot area. From the Trend Menu, point and click on the **Props** Menu item.	Enter a new value in the Scale Factor field. You can also click the left mouse button on the Up and Down arrow symbols to increment or decrement the Scale Factor. You can enter a value up to 8.
Toggle the display of notes on the trend plot.	Press the right mouse button with the pointer on the trend plot area. From the Trend Menu point and click on the Props Menu item.	In the Properties dialog window select/click on the **notes checkbox** to toggle the checkmark within the box. Select/click on the **Apply** button to change the notes display option. ✓= notes ON; no ✓= notes OFF.
Remove a note. View a note.	Click left mouse button on a blinking note symbol at the bottom of the trend plot.	To remove a note click the left mouse button on the delete button. This operation will delete the blinking musical symbol (♪) immediately from the trend plot display.

SECTION 6 - USING TUNING DISPLAYS

OVERVIEW

You can view the specifications for a block in an INFI 90 OPEN module from graphic displays. If you have permission to Tune Modules, you can change tunable parameters for the block.

There are two displays that you can use to view and tune block configurations:

- Block details chart, which display the specifications for a single block. Any module configured block can be called up and manipulated.

- Tuning access displays, which display station values on a trend chart while you make changes to the station via a block details chart or a station control faceplate.

Monitoring and manipulation is performed from the same display. Tuning access displays are only for station type points.

BLOCK DETAILS CHART

Block Detail charts let you view the specifications of INFI 90 OPEN blockware from graphic displays. If you have permission to Tune Modules, you can use the block details chart to change the tunable specifications.

There are three ways to display a Block Details chart:

- If graphic displays have been set up with Block Details charts, you can simply display one of the graphic displays then type the control select keys to select the Block Details chart.

- The Block Details chart for any tag or INFI 90 OPEN block can be displayed by pressing {Details}, <Alt D> or clicking the left mouse button on the icon showing three building blocks on the left border of the graphic windows.

- Select **Main Menu**, then **Operator Utilities**, then **Block Details**.

When you display a Block Details chart you can specify which tag or block to display in one of the following ways:

- If you have a tag selected for control on the current graphic display, then the block details for that tag will be displayed.

- If you have no tag selected on the current graphic display, the Block Details display will be blank and the Tuning Tag List will appear. From this dialog, you may specify the hardware address of the block you want to view, you may also choose to select a tag to view from a list. To get this list, click the left mouse button on the **Select Tag** button, once the address of the desired block appears in the Properties dialog click the **Apply** button.

- Whether or not a tag is selected, calling Block Details through the Main Menu will always present the Properties Dialog.

Once you have selected the block details chart, it is displayed with its border highlighted (Figure 6-1).

BLOCK DETAILS

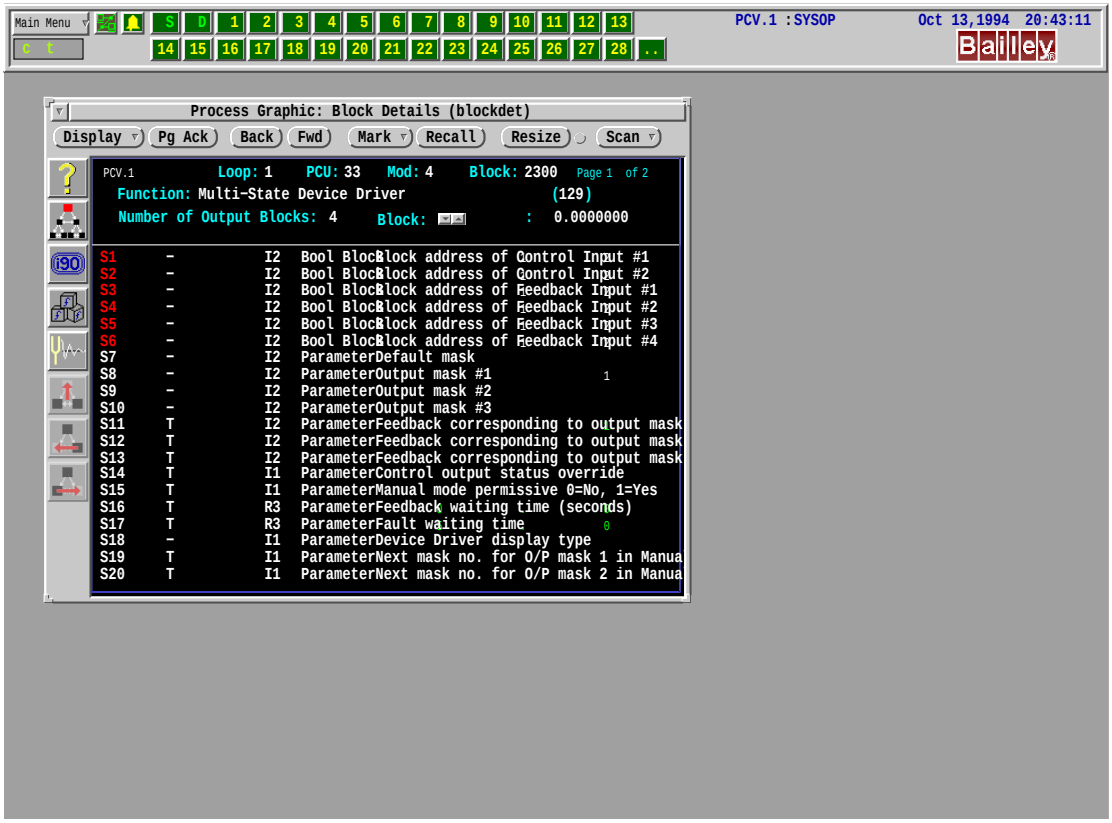


Figure 6-1. Block Details Chart

There are two sections in a Block Details chart: the header section identifies the block you are viewing, and the lower section lists all the specifications for the block. There may be more parameters for a block than can fit on a single display. The header section tells you how many pages of specifications there are for the block.

You can view other Function Blocks by recalling the Properties Dialog. Move the mouse pointer to anywhere in the block detail window and press the right mouse button. The Block Details Menu will be presented. Select the **Properties** entry. This will re-open the Properties Dialog, from which you can specify a new tag or address.

To view a different output value of the block, simply click on the **Output Block Number** field on the block detail element, and enter the new block number. You may also click on the <Up>/<Down> buttons adjacent to the output block number to move to the next and previous output blocks. The output of any block, not just outputs of the current block, can be displayed. Thus, you can examine the value of inputs or the effect of outputs.

Table 6-1. Block Details Chart Header Fields

Field	Description
Server	Displays the name of the LAN-90 PCV server through which this block is currently being accessed.
Loop	Displays the loop number of the block currently displayed. If you want to view a block on another loop, change the loop number by entering a new number in the properties dialog.
PCU	Displays the node number of the block currently displayed. If you want to view a block in another node, change the node number by entering a new number in the properties dialog.
Module	Displays the module number of the block currently displayed. If you want to view a block in another module, change the module number by entering a new number in the properties dialog.
Block	Displays the block number of the block currently displayed. If you want to view another block, enter a new block number or click the left mouse button on the <Up>/<Down> symbols to increment and decrement the block number.
Function	Displays the function code number and description of the block currently displayed.
Number of Output Blocks	Displays the number of outputs supported by the block.
Output Block Number	Displays the value and block index of the first output block. Click the left mouse button on the <Up>/<Down> arrow symbols to move to the next or previous output block index. Enter a value in the output block to move to a specific output block.

You can display the block details of any input block very easily. Function Block specifications are either values or references to other Function Blocks. The specifications that reference other module blocks have their specification numbers shown in red. If you wish to view the blocks associated with these specifica-

tions, you click the left mouse button on the **Red** specification number.

To return to the previously viewed block, recall the Block Details Menu (see above) and select the **Control** option. This will call up the Control dialog, which contains a set of control buttons. These buttons allow you to:

Home Go to the first specification page of this block.

End Go to the last specification page of this block.

Next Find the next configured block on this module and show its details.

Back Go back to the previously displayed block.

Cancel Quit the Control dialog.

If you have permission to Tune Modules, you will also be able to edit the tunable specifications for the block (tunable specifications are indicated by a *T* in the second column). You can move between the tunable specifications by pressing <Tab> and <Shift Tab>. If you change any of the tunable specifications, you must press <Enter> within the data entry field to download the changes to the module.

TUNING ACCESS DISPLAY

Tuning access displays let you tune station controllers while monitoring process changes. Tuning displays are really three graphic displays in one: a trend chart, a block details chart, and a station control faceplate. As you make set point and tuning changes, you see the changes on the trend display.

To display a tuning display, press {Tune}, <Alt T> or click the left mouse button on the Tuning Fork icon on the left border of the graphic window. If you have a station selected for control on the current graphic display, then the tuning display for that station will be displayed. If you do not have a station selected on the current graphic display, you are prompted for the tag name you want to use. You can select the tag you want to use from the tag list. Calling a tuning display from Operator Utilities on the Main Menu always brings up a Tag list.

Figure 6-2 shows the layout of a tuning access display

.

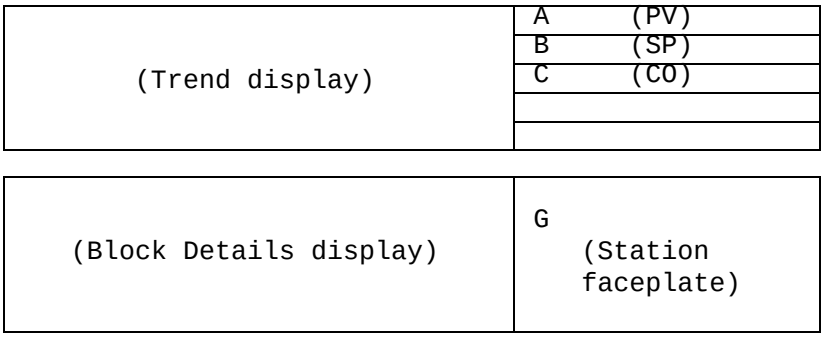


Figure 6-2. Tuning Access Display

The tuning access display has three elements:

- A trend display showing three trends: the process variable (PV), set point (SP), and control output (CO) for the station. Each trend is sampled every two seconds and up to two hours of trend data is retained.

- A block details chart for the station's control block. The tuning display assumes the control block is the block identified by specification S3 of the station block; this is the most common place to connect the control block. If this is not the correct control block for the station, call up the Properties Dialog by menu clicking anywhere inside the Block Details portion of the display.

- A station control faceplate for the station tag.

Each element of the tuning display (trend chart, block details chart, and station control faceplate) works the same way as on any other graphic display. To use one of the elements, type the control select letters displayed in the upper left corner of that element.

If the control block for the station is not the block specified by specification S3 in the station block, you can make sure the correct control block is displayed every time you call up the tuning display by following this procedure:

- Move the mouse cursor to the block detail element, and press the right mouse button.

- Select the **Save Tuning** option from the Block Details Menu. A dialog is opened showing the address of the station block and its current control block. If the information is not correct, you may edit it.

- Once the correct information is present, click on the **Apply** button and the control block address will be saved.

The trends (PV, SP, and CO) you view with a tuning display are maintained until the trend slot is released. You can quit from a tuning display and then return later without losing the collected trend data. Each trend is collected at a two second rate, and up to two hours of data for each trend is retained.

Although tuning was designed for stations only, it is useful to allow every Tag Type to be displayed via tuning. Those aspects of the display that are not appropriate should be ignored.

SECTION 7 - VIEWING SYSTEM AND NODE STATUS

OVERVIEW

The process information that is displayed on your console depends on your INFI 90 OPEN system running properly.

Three types of graphic displays provide information on the status of the INFI 90 OPEN system:

- The System Status display
- The Node Status display
- The Module Status display

Each display provides a more detailed view of INFI 90 OPEN equipment (Table 7-1).

Table 7-1. INFI 90 OPEN Status Displays

Status Display	Devices Monitored	Reports
System Status	All nodes in system	Node errors
Node Status	Each module in PCU node	Node errors, module modes, and module errors
Module Status	Single module	Detailed report of all module problems

SYSTEM STATUS DISPLAY

The System Status display shows you the status of up to 63 nodes (e.g., PCUs and CIUs) on your plant communication loop (Figure 7-1).

> **NOTE:** These are PCU nodes on the plant communication loop NOT console nodes on the LAN-90 PCV network.

Press {I90Status} or < Ctrl Num5> or <Alt 5> on the keyboard or the I90 status icon on the left border of the graphic window.

> **NOTE:** The standard System Status display shows up to 63 nodes. If your system has more nodes, your display may be slightly different from that shown.

From the System Status display, you can enter the node number or mouse click on the number to display the Node Status screen (Figure 7-2 shows an example of a Node Status screen).

To exit the System Status display, press any function key or <Ctrl PgUp> or {Double Up} to return to the previous graphics display.

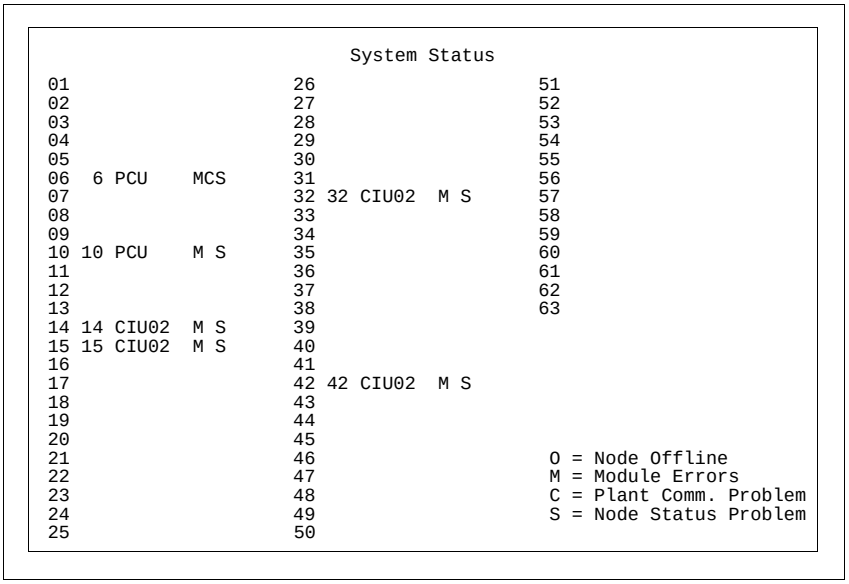


Figure 7-1. System Status Display (Example only)

NODE STATUS DISPLAY

The Node Status display shows you the status of a node, its communication system, and up to 31 modules within that node (see Figure 7-2 for an example of a Node Status display).

A Node Status display is called from the System Status display by entering the node number.

You can display a detailed Module Status report for any of the modules listed by entering the module number. See Figure 7-3 for an example of a Module Status report.

To exit the Node Status display, press any function key to switch to another graphic display or press <Ctrl PgUp> or {DoubleUp} or click on **Back** to return to the System Status Display.

MODULE STATUS DISPLAY

The Module Status display shows you the detailed status of any module in the PCU.

A Module Status display is called from the Node Status display by entering or clicking on the module number.

A Module Status display can list more errors than can fit on one screen. The number of pages in the summary is indicated in the top right hand corner of the display (Figure 7-3). To view more errors, press {NextPage} or <PgDn>, {PrevPage} or <PgUp>, <Home>, and <End>.

```
                              Status for Node 6
Node Online Module Error Communication System Error Node Status Problem


  00  LIM/BIM   Exec   ERR   16
  01                       17
  02  MFC01/02  Exec   ERR   18
  03                       19

  04                       20
  05                       21
  06                       22
  07                       23

  08                       24
  09                       25
  10                       26  MFC01/02  Exec
  11                       27

  12                       28
  13                       29
  14                       30
  15                       31
```

Figure 7-2. Node Status Display (Example Only)

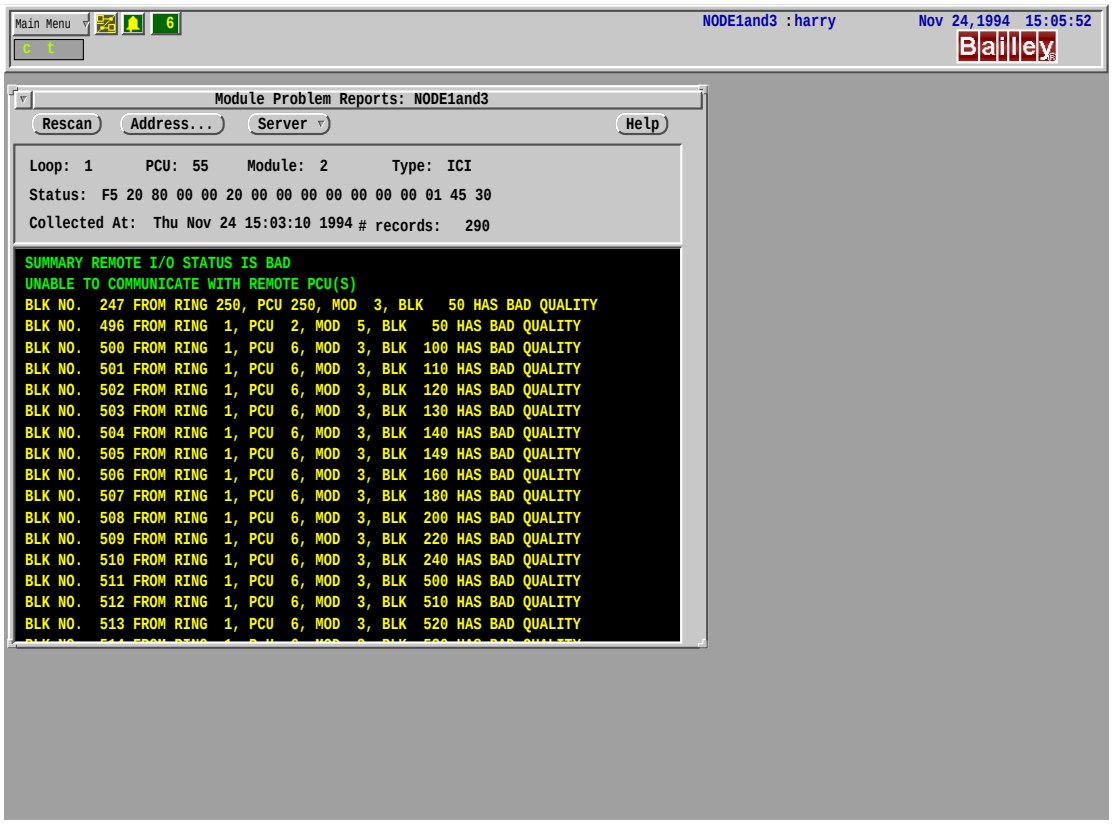


Figure 7-3. Module Status Display (Example only)

To exit the Module Status display, press <F10> or <Esc> to return to the Node Status display or any function key to switch to another graphic display or {DoubleUp} or <Ctrl PgUp> or clicking on **Back** to return to the Node Status display.

NOTE: You cannot mark and recall a module status display.

SECTION 8 - OPERATOR UTILITIES

OVERVIEW

In addition to the displays for monitoring and controlling processes, Operator Utilities provide other functions:

- Tag Operating Parameters let you change the state of a tag.
- Tag Summaries let you list tags according to different criteria.
- Operator Assignable Trends let you create a trend display.
- Block Details let you view and optionally modify the details of a function block. (see Section 6 for details of this function).
- Tuning Displays let you create a graphic display that is useful for module tuning (see Section 6 for details of this function).
- Archive monitor and status lets you monitor requests to archive files and mount archive volumes for offline optical disk devices.

These functions are provided on the Operator Utilities Menu (Figure 8-1).

To display the Operator Utilities Menu, press **F** from the Main Menu or select the **Operators Utilities** Menu item with the left mouse button.

OPERATING PARAMETERS

The Tag Operating Parameters function has four main functions:

1. Provide the capability to dynamically monitor the value, status and parameters of any tag on the system.

2. Provide the capability to enable and disable alarming for a tag, for operators with the proper permit.

3. Provide the capability to enable and disable scanning of a tag, and optionally, to substitute an alternate state or value(s) for the tag.

4. Provide the capability to add or remove a Red Tag from the database tag.

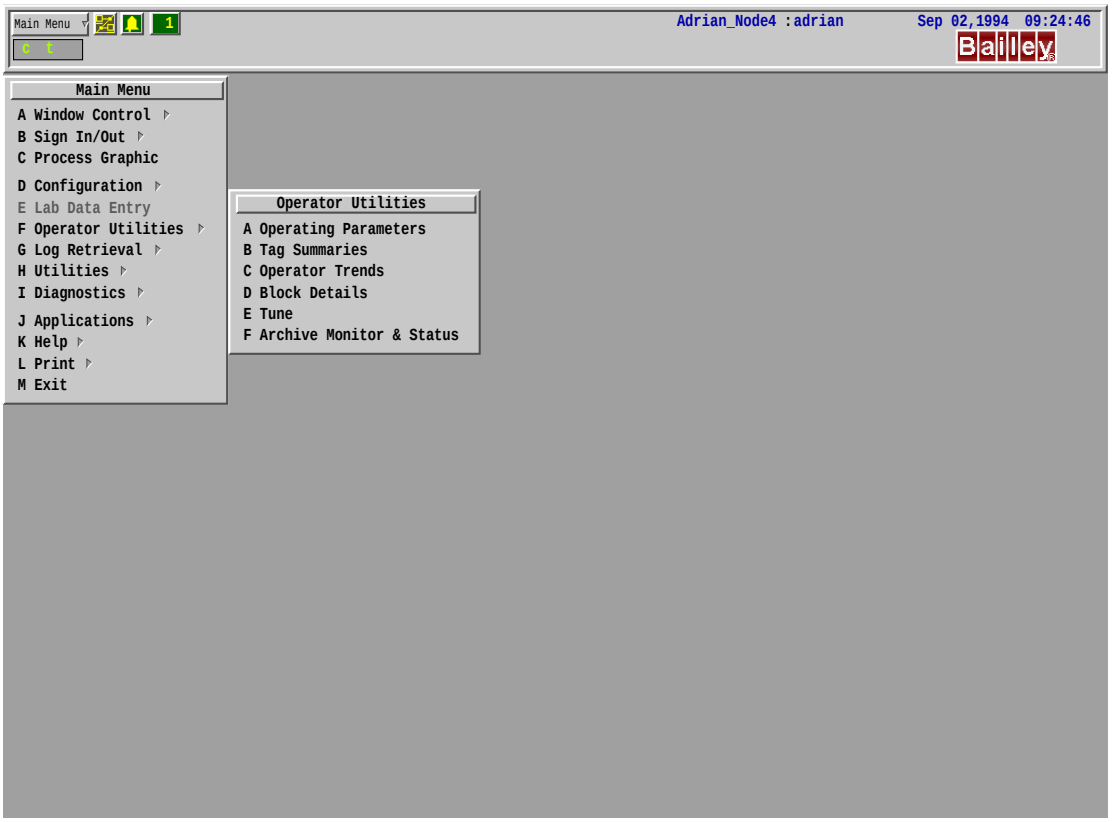


Figure 8-1. Operator Utilities Menu

The Tag Operating Parameters function may be called up in one of two ways:

1. From the Operator Utilities Menu. In this mode, you are first asked to choose a tag to monitor from a tag list (Figure 8-2).

The tag list is in a separate window from the Operating Parameters window, and shows a list of all tags configured in the current server. The list includes the name, description, and type of all the tags. You can use the mouse to select a tag by clicking on it. The <Tab>, <Back-Tab>, <Up>, <Dn>, <PgUp>, <PgDn> and <Enter> keys on the keyboard may also be used to select a tag.

You can also change the list to show tags currently configured on any other active database server. A list is presented with all the currently available database servers, from which a server may be selected (using the mouse only).

Options are also provided to allow you to search through the current tag list, either by tag name or by index. You can supply a tag name pattern so only tags whose names match the

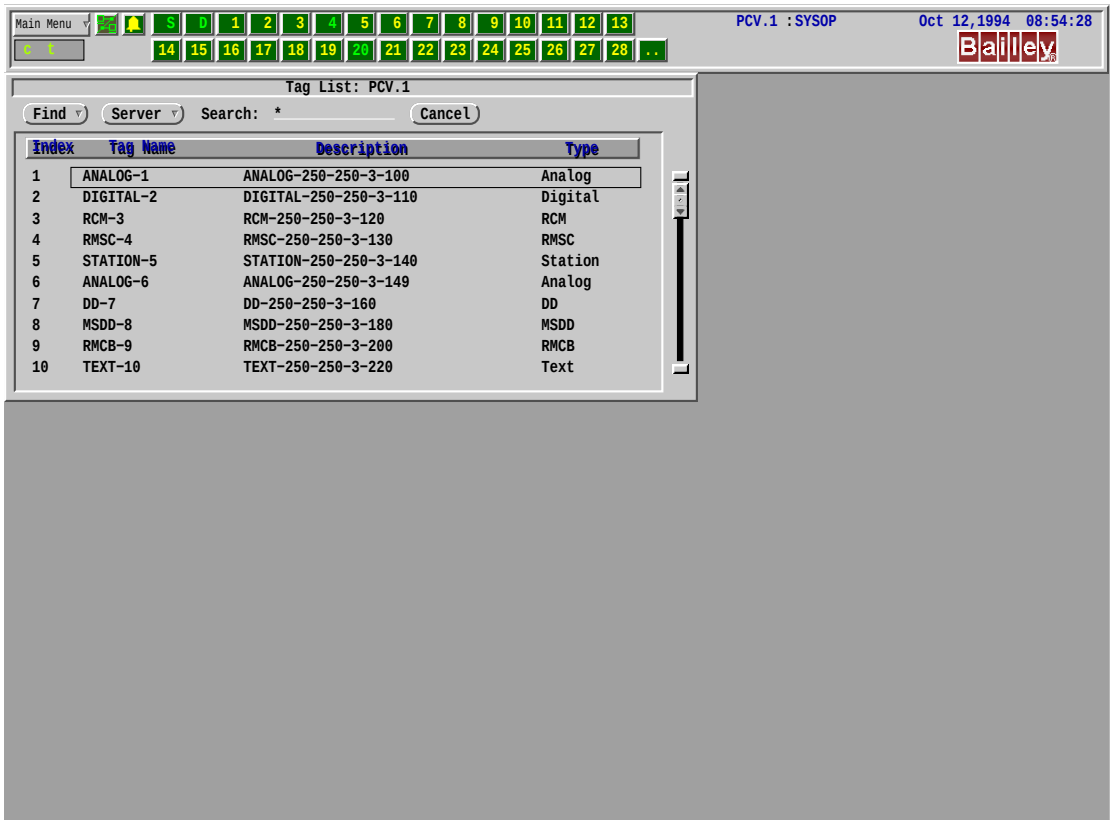


Figure 8-2. Tag List

pattern will be shown in the tag list. The default pattern will be '*' (all tags).

Once you have chosen a tag, the Operating Parameters display will be shown. The display is customized for the tag-type of the selected tag.

You may decide to monitor a different tag after one has been selected. To change tags, simply select the **New Tag** button in the Operating Parameters window, and the tag list will be presented again.

2. Menu click on a tag and select status. In this mode, no tag list is presented, and you do not have the ability to specify a different tag once the Tag Operations window has opened.

Figure 8-3 shows a sample Operating Parameters display for a Station tag.

The Tag Operating Parameters Window is divided into two sections. The top area of the window contains information fields that are common to every tag type. The bottom section contains information tailored to the particular tag type being monitored. Both sections contain dynamic information pertaining to the currently monitored tag.

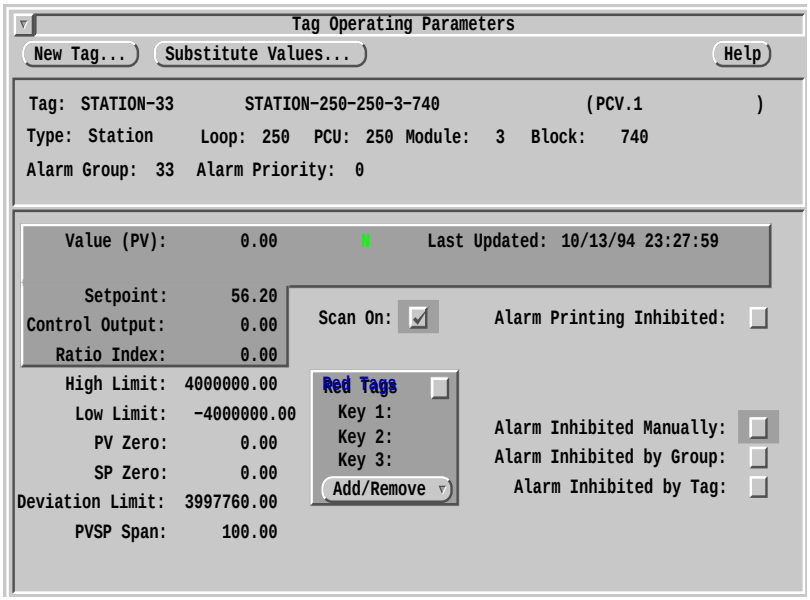


Figure 8-3. Tag Operating Parameter Window (Station Tag)

Manually Inhibiting Tags

All the tags that show the "Alarms Inhibited Manually" field provide the capability of manually inhibiting alarms for that tag simply by clicking on the field. If the user has permission and the tag is configured for manual inhibiting, the alarming for that tag will be inhibited. If the tag is not configured for manual inhibiting, an error message will be shown.

A tag is configured to allow manual inhibit when the manual permit box is checked in the tag definition.

Substituting Values

Substituted values provide the capability of manually setting the values that LAN-90 PCV uses in its displays and logs. This is useful when values from the field are not meaningful. You may have bypass logic running in the module to control the process, yet the displays are configured for the original logic.

Substituted values do not change any values in the modules. They only provide values to LAN-90 PCV. Values in the modules are controlled through logic or control faceplates.

When you apply substituted values, scanning is automatically turned off. The CIU will not gather new values from the INFI 90 OPEN system. Similarly when you turn scanning off, the current substituted values are used. Substituted values track the module values while scanning is on. They do not remain fixed at the last value you may have entered.

All the tags that show the Scan On field provide the capability of turning scanning off for that tag. When scanning is off, the CIU will no longer scan this tag for new values, alarms, etc. Clicking on **Scan On** when scanning is enabled will disable scanning, and assign the Substituted value as the current value. Clicking on **Scan On** when scanning is disabled will re-enable scanning and report the next exception report value.

If you wish to substitute a different value for the tag, click on the **Substitute** button. Substituting a value for a tag that is still on-scan will automatically place the tag off-scan, and begin showing the newly substituted value on all displays containing the tag.

When substitute is invoked, a pop-up dialog will prompt you for the new value (Figure 8-4). Different Tag Types accept different substituted values:

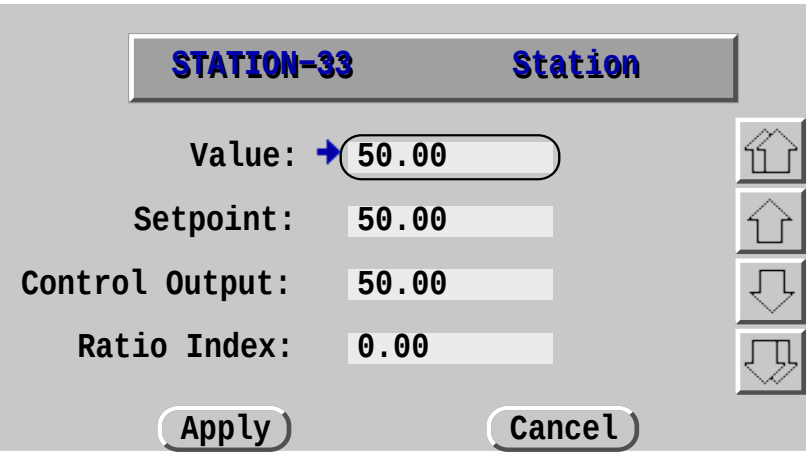


Figure 8-4. Substitute Dialog For Station Tags

Station tags allow you to substitute Value, Setpoint, Control Output and Ratio Index.

Analog, RMSC, Internal Analog, Analog Report and Daanalg tags allow you to substitute the value (in engineering units).

Digital, Internal Digital, Digital Report, RCM, RMCB and DD tags allow you to substitute the state (logic state zero or one).

MSDD tags allow you to substitute the state (logic state zero, one, two or three).

Text tags allow you to substitute the text string index, color and blink (Yes/No).

N90 Status tags do not allow substitution.

Text String tags allow the user to substitute the ASCII text string (up to 80 characters) and set the alarm state.

Red Tags

All tags that show the "Red Tags" field allow you to apply or remove Red Tags from the tag. To do this, menu-click on the **Add/Remove** button, and select **Add** or **Remove**. If Add is selected, you are prompted for a key. The key consists of a 3 character string. Valid characters are upper case letters, numbers and some punctuation. If the key is valid, the red tag is applied, otherwise an error message is generated. If Remove is selected, you are prompted to specify which of the three Red Tags is to be removed.

> **NOTE:** If any Red Tag is currently applied to a tag, a tick is shown in the Red Tag indicator.

To Add or Remove Red Tags from a tag, you must have "Add/Remove Red Tags" permission. Once a tag has been "Red Tagged" you are unable to perform any control functions on it. This control prevention may be overridden if you have "Control Red Tags" permission.

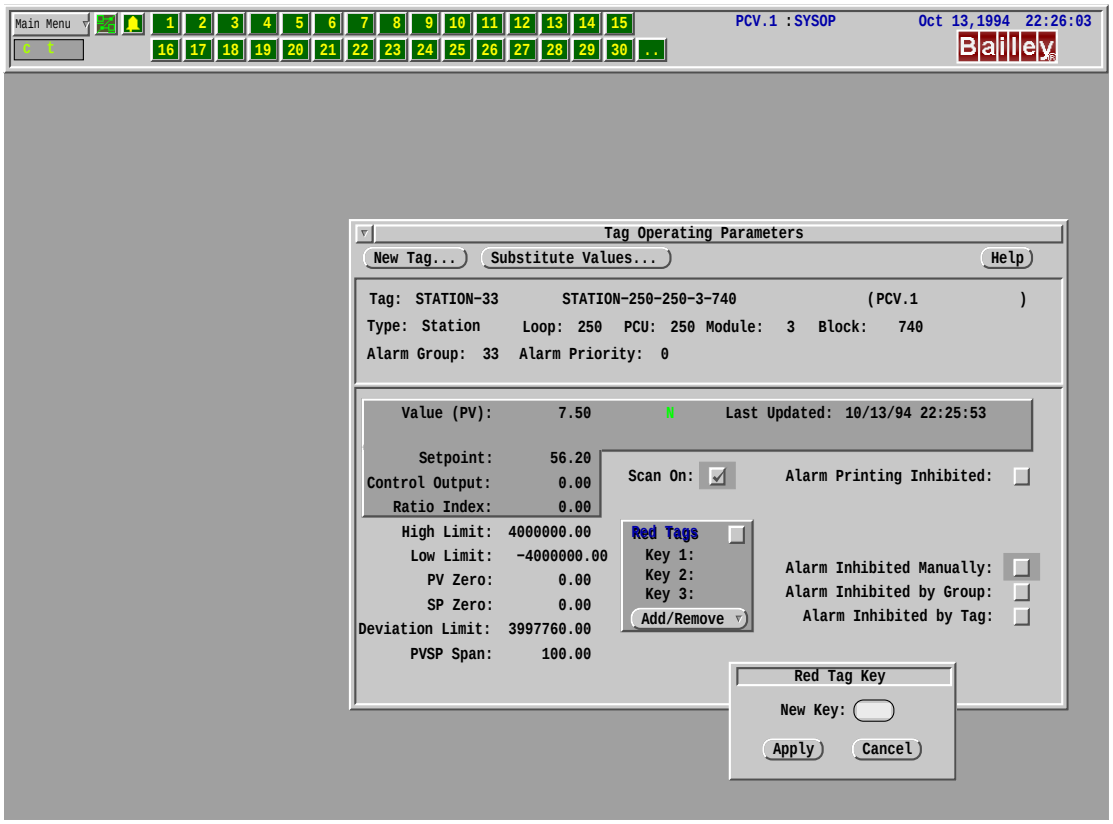


Figure 8-5. Red Tag Dialog

TAG SUMMARIES

The Tag Summaries Menu allows you to list tags according to different criteria.

To display the Tag Summaries Menu (Figure 8-6), press **B** from the Operator Utilities Menu or select the Tag Summaries Menu item with the left mouse button.

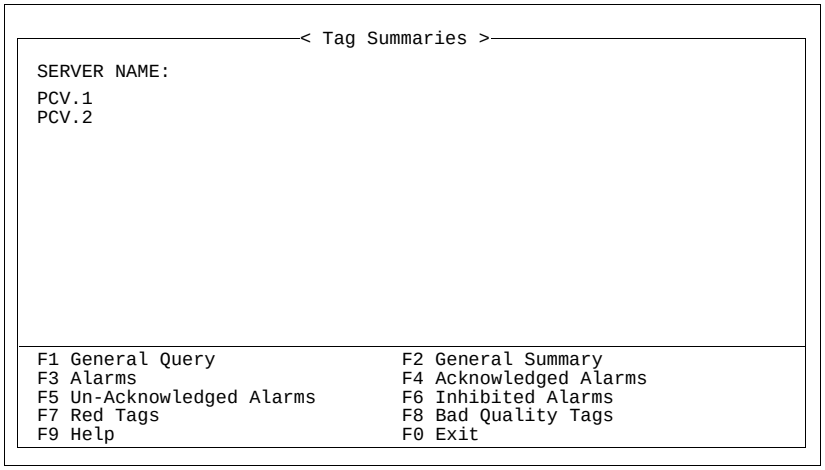


Figure 8-6. Tag Summaries Menu

To view a list of all tags in alarm, even tags in alarm group zero, whether they have been acknowledged or not, press <F3>.

To view a list of all tags with acknowledged alarms, press <F4>.

To view a list of all tags with unacknowledged alarms, press <F5>.

To view a list of all tags with inhibited alarms, press <F6>.

To view a list of all Red Tagged tags, press <F7>.

To view a list of all bad quality tags, press <F8>.

The General Query and General Summary functions on the Tag Summaries Menu list tags according to criteria you specify.

The General Query function lists tag name, tag type, loop, PCU, module, block for each tag listed (Figure 8-7).

The General Summary function lists tag name, tag type, value, status, and alarm group number for each tag listed (Figure 8-8).

Both functions display a *?* prompt where you enter the criteria by which to select tags. The criteria are specified by one or

more (up to 20) conditional statements joined by logical operators. Each conditional statement is made up of a field name compared to a value using a conditional operator.

```
Enter Query Conditions
? type = txtstr
Index Name          Description                          Type          Loop  PCV   Mod   blk
3330 txtstr1        Export of Text String 1--------1     TextStr        1     33    4     55
3350 txtstr2        Export of Text String frm bl  75     TextStr        1     33    4     75
3365 txtstr3        Export of Text String frm b1 105     TextStr        1     33    4    105

                                  -- Press any key to exit --
```

Figure 8-7. General Query

The general summary produces a display such as:

```
Enter Query Conditions
? type = txtstr
Index Name         Description                         Type      Value                    Stat  Grp
3330 txtstr1       Export of Text String 1--------1    TextStr   Beginning a new Batch     N     82
3350 txtstr2       Export of Text String frm bl  75    TextStr   Batch Lot = 10065298      N     82
3365 txtstr3       Export of Text String frm b1 105    TextStr   Ingredient B missing      A     80
```

Figure 8-8. General Summary

Query Syntax

The syntax for the query is:

field comparison value [operator field comparison value]

(eg. **TYPE=RCM and STATUS=BAD**)

where:

field	specifies the type of information you are interested in. These are either tag configuration information fields (Table 8-1) or process information fields (Table 8-2).
comparison	is a conditional operator that compares the field to the value, such as “equals” and “less than” (see Table 8-4).
value	specifies the value of the field (Tables 8-1 and 8-2).
operator	is a logical operator that links conditional statements together, such as “and” and “or” (Table 8-5).

You can enclose conditional statements and operators with brackets.

Logical operators, field names, values, and conditional operators supported are listed in Tables 8-3 through 8-5.

Table 8-1. Configuration Information Fields and Values

Field	Description	Valid Values	
index	Tag index	1 - 10000	
name	Tag name	Text (wildcards permitted, see Table 8-3)	
description	Tag description	Text (wildcards permitted)	
type	Tag type	**analog** **analog_int** **analog_rpt** **analr**pt **daang** **dd** **dig**ital **digital_int** **digital_rpt** **diglr**pt **inta**ng **intd**igl **motor_cntl** **msdd** **n90**_status **n90**status **rcm** **rmcb** **rmsc** **rmtrc**on **sta**tion **text** **textstr** **undef**ined	analog internal analog (INTANG) analog report analog report data acquisition analog device driver digital internal digital digital report digital report internal analog internal digital remote motor control block (RMCB) multi-state device driver (MSDD) N90 status N90 status remote control memory (RCM) remote motor control block (RMCB) remote manual set constant (RMSC) remote motor control block (RMCB) station text text string undefined
alarmgrp	Alarm group	0 - 99, S, D	
loop *or* **ring**	Loop address	0 - 250	
pcu *or* **node**	PCU address	0 - 250	
module	Module address	0 - 31	
block	Block address	0 - 65535	
units	Engineering Units	Any engineering units descriptor (wildcards permitted)	
szero	Zero state descriptor	Any logic state descriptor (wildcards permitted)	
sone	One state descriptor	Any logic state descriptor (wildcards permitted)	
panel	ADS panel state	0 =Disable 1=Enable Lamp	
lamp	ADS lamp number	0 - 64	

NOTE: Only the boldface letters in field names and values need to be typed.

Table 8-2. Process Information Fields and Values

Field Name	Description	Valid Values
value	Current value	Any number Text string if tag is a text str. tag

Table 8-2. Process Information Fields and Values (continued)

Field Name	Description	Valid Values	
status	Current alarm status	**alarm** **bad** **high** **high2** **high3** **high_dev** **inhibit**ed **low** **low2** **low3** **low_dev** **norm**al **out_of_serv**ice	in alarm (any state) bad quality high level alarm high level 2 alarm high level 3 alarm high deviation alarm inhibited low level alarm low level 2 alarm low level 3 alarm low deviation alarm normal (no alarm) out of service
ack	Current alarm acknowledgement state	0 1	acknowledged unacknowledged
quality	Current tag quality	**disest** **good** **qbad** **qinhibit** **subs** **suspect**	disestablished good quality bad quality inhibited substituted suspect
alminhibited	Current alarm inhibition state (tag, manual or group)	yes or **no**	
maninhibited	Current alarm inhibition state (manually inhibited)	yes or **no**	
autoinhibited	Current alarm inhibition state (automatically inhibited, tag inhibited)	yes or **no**	

NOTE: Only the boldface letters in field names and values need to be typed

Table 8-3. Wildcard Symbols

To Match:	Wildcard	Example
any sequence of characters (including none)	*	"C*" matches any word with one or more characters beginning with "C"
any single character	?	"CA?" matches any three letter word starting with "CA"
any one of a specified set of characters	[ccc]	"CA[RT]" matches "CAT" or "CAR"

NOTE: Wildcards can be used for matching tag name, tag description, and logic state or engineering unit descriptor text.

Table 8-4. Comparison Symbols

Comparison	Symbol
Equal To	EQ = ==

Table 8-4. Comparison Symbols (continued)

Comparison	Symbol
Not Equal To	NE != <> ><
Less Than	LT <
Greater Than	GT >
Less Than or Equal To	LE <=
Greater Than or Equal To	GE >=

Table 8-5. Operator Symbols

Operator	Symbol
And	AND &
Or	OR |

Example Queries

Table 8-6 lists some examples of tag queries and their query syntax.

Table 8-6. Example Queries

To List:	You Would Type:
All unacknowledged alarms in alarm group 2	**al = 2 and ack = 0**
All high alarm tags for level, flow, and temperature	**name=[LFT]AH*** (this matches any tag names that start with "LAH", "FAH", or "TAH")
All tags found in PCU 2, module 6	**pcu = 2 and mod = 6**
All RCM and DD tags	**type = rcm or type = dd**
All bad quality tags in PCU 6	**quality = bad and pcu = 6**
All digital and analog tags in alarm	**(type = dig or type = analog) and status = alarm**

OPERATOR ASSIGNABLE TRENDS

The Operator Assignable Trends function is available on Server nodes only and provides you with the ability to create 'on-the-fly' trend displays, using any tags from any of the Server tag databases. You can also select the frequency at which the trend samples are displayed.

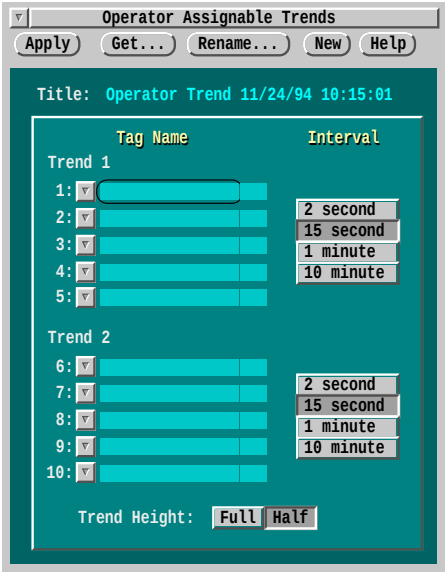


Figure 8-9. Operator Trend Dialog

To configure an operator-assignable trend, you are presented with a dialog window containing a tag list, into which may be inserted up to 10 tag names (Figure 8-9). Tag names may be entered directly, or chosen from a list of all tags, which may be popped-up on demand by clicking the mouse pointer on the button placed beside each tag name slot.

The tag's sub-type (PV, SP, CO, RI) may also be entered, in a separate area placed beside each tag name. The sub-type may also be selected from a menu, which is accessed by clicking the right mouse button when the cursor is over the sub-type field.

There are two methods of accessing the Operator Trends function. The first is via Operator Trends under 'Operator Utilities'. The second method is via the Tag Operations Menu for a particular tag. If the Tag Operations Menu is used to call up the Operator Trends dialog, then the name of the currently selected tag is automatically inserted into the first slot of the Operator Trend tag list.

Once one or more tags have been selected, you submit the list by clicking on the **Apply** button. The system will build a trend display containing either a 5 tag full-height or half-height trend, or two 5-tag half-height trends, and display it in the current graphic window.

Before Applying the Operator Trend, you can change, remove or insert additional tags into the tag list.

The following items are also contained in the Operator Trend dialog:

Trend Intervals There are two sets of push-buttons from which you can select the desired sampling intervals for each of the two possible trends. Available periods are 2 and 15 seconds, and 1 and 10 minutes. The default period is 15 seconds.

Title Normally, the title will default to "Operator Trend *date*", but you can change this title by clicking on the **Rename** button.

Trend Height You can select either a "Full" or a "Half" height trend which may be generated. If more than the first 5 trend slots are filled, the system will automatically create 2 Half-height trends, regardless of your selection.

Get This button pops up a list of previously defined operator-assigned trends on this Server. This list includes all operator-assigned trends stored, as well as all renamed operator-assigned trends. From this list, you can choose to display a previously defined operator-assigned trend, or delete previously defined operator-assigned trends. Once an operator-assigned trend is retrieved, it's tags are shown in the tag list.

Rename This button pops up a dialog, which allows you to type in a new title for the current trend. Changing the trend title makes the trend display permanently available to all operators on this Server.

New This button makes the current trend into a "new" trend, changing it's title to the standard "Operator Trend *date*" string. This function is used to create a new trend based on the contents of an older one.

Cancel This button aborts the Operator-Assignable Trend function.

Apply This button tells the Server to go ahead and build the new trend display.

Each Server maintains a list of a maximum of 20 operator-assigned trend displays. These are titled "Operator Trend *date/time*", where the console fills in the date and time. They may be called up at any time using the standard display callup button on the graphics window. Renamed operator-assigned trends are not counted in this list of 20, but may still be called up using the display callup button. Once the 21st default operator-assigned trend is defined, the system will delete the oldest one.

Each Server has a maximum limit of 100 for the number of renamed operator-assigned trends.

Displaying a trend using the operator-assignable trend function does not necessarily imply that the trended tags have their Historical Collection option enabled and a Historical Class assigned. Naturally, if one already exists when the trend is called up, all trend data currently stored for that tag is available on the trend.

If the Historical Collection option has not been enabled for the specified tag, one is created "on-the-fly". That is, a trend data for the tag is temporarily added to the system, allowing trend data to be collected starting from the time of creation. Naturally, in this scenario, no data is available for times prior to the time the trend was created, but data will be collected from this time until the temporary trend is removed. Temporary trend data for the tags is removed when no more operator-assigned trend is available, and a new operator-assigned trend is created. A tag's trend data will never be removed as long as there is a trend on-screen viewing it.

For 2-second trends, up to 2 hours of data will be stored. For slower sampling periods, more data will be kept.

ARCHIVE MONITOR AND STATUS

The Archive Management System (hereafter referred to as the Archiver) consists of one or more Archive Managers. Each Archive Manager controls the access to the optical disk(s) that are physically attached to its node. Each optical disk contains a volume (or platter) that is used to store archive data. Each volume can be in one of three possible states: Standby, Storage or Retrieval.

Any change to the state of one Archive Manager (or its drives) is broadcast to any other Archive Manager that may be running in the system. This is done to ensure that there is only one active storage device in the system and that if the storage device fills, a standby device on another node will take over properly.

Only one Archive volume in the LAN-90 PCV system can be defined as the Storage volume at any time. It receives a copy of all the archived data files until the volume is full, at this time its state changes from the Storage state to the Retrieval state. If at this time, another Archive volume (in another optical disk drive) is in the Standby state, it will automatically be changed to the Storage state.

An Archive volume is an optical disk that is initially formatted by the QNX operating system. Unique archive information is then written to the optical disk that designates it for use with the Archive system. You will need to load and initialize the optical disks from the Main Menu by clicking on **Main Menu, Operator Utilities, Archive Monitor & Status** and using the menu items

<F1> Mount Device and <F2> Initialize Device of the Archive Monitor and Status menu.

Data storage is configured through the use of historical classes, refer to the "Edit Historical Class Definition" subsection, located in Section 3 of the ***Configuration*** manual. For each historical class, archiving can be either enabled or disabled. Once an hour, data that has been flagged for archiving is written to an event file. This file is then submitted to the Archiver for storage on an optical disk. Once the file has been successfully written to an optical disk the Archiver updates its online catalog, so that the file can be located when the data it contains is requested by the user.

Archive Operational Overview

In addition to the file catalog, the Archiver also maintains a catalog of all the optical disks (or volumes) that contain archived data. A volume is initialized using the Archive Monitor, which creates a signature file in the root directory of the optical disk. This signature is used to identify the volume when it is inserted into one of the Archiver's optical drives. It is therefore important to use the Archive Monitor to re-initialize a used volume, so that it can be marked as deleted in the Archiver's catalog.

The Archive Monitor and Status menu allows you to monitor requests to archive files, mount and unmount archive volumes and define optical drives for use by the Archiver. The menu also provides a real-time display of scheduling taking place within the Archive Management System.

The Archiver handles client application requests to save or load files and schedules the actual loading and unloading of archive volumes. Scheduling is controlled by the Archiver depending on the volumes currently mounted. When saving files, the Archive Manager in charge of the current storage device informs an agent process, called an Optical Disk Agent (ODA), that does the actual work of copying the file from the hard disk to the optical disk. If the Storage volume is off-line then a request for the current Storage volume is posted on the Archive Monitor. If the Storage volume is full and there are no Standby volumes available then a request to initialize a new Storage volume is posted on the Archive Monitor. When loading or accessing files, the Archiver notifies the waiting client application when the volume containing the requested file is placed on-line. Once on-line, the files it contains can be accessed directly from the optical disk by the client application.

Archive Monitor Storage Node Shutdown

The Archive Management System consists of one or more Archive Managers that run as background processes on each

machine with an optical drive. Each Archive Manager is solely responsible for the optical drives attached to its node. Any change to the state of one Archive Manager (or its drives) is broadcast to any other Archive Manager that may be running in the system. This is done to ensure that there is only one storage device in the system and that if the storage device fills a standby device on another node will take over properly.

The current usage of an optical drive depends on the status of the volume currently mounted. Volumes can be in one of three states: Storage, Retrieval-only, or Standby. As previously stated, there can be only one Storage volume at a time in the system. This is done to prevent the scattering of event files over multiple volumes which would make retrieval inefficient.

If the Storage volume is taken off-line then any files submitted to the Archiver will be stored on the hard disk. Once the Storage volume is placed back on-line, any pending files will then be copied to the optical disk. This is true even if the device or node that the Storage volume is on fails or is shutdown. The Storage volume must be moved to an on-line device before the transfer of archived data from the hard disk to the Storage volume will continue.

The Storage volume can be used for storage or retrieval. When the Storage volume fills, its state is switched to Retrieval-only mode. Once a volume is switched to Retrieval mode it can no longer be used to store new files.

When a volume is newly initialized its state is set to Standby mode. If a Standby volume is mounted when there is no currently defined Storage volume in the system, it is automatically switched over to Storage mode. Likewise, if a Standby volume is currently mounted when the Storage volume fills it will be switched, automatically, to Storage mode. The Archive Monitor can also be used to force a Standby volume in to Storage mode. This will also force the current Storage volume into Retrieval-only mode, so it should only be used if the current Storage volume is lost or damaged.

Archive Monitor Status Reporting

Three database tags can be defined to help monitor the status of the Archiver. These are: NoStoreVolume, ArchVolume, and ArchVolumeNode. These tags when defined, should be assigned to the device (D) alarm group.

NoStoreVolume Should be defined as an internal digital, digital report, or RCM tag. Its state is set to 1 if there is no storage volume currently mounted in the system. This tag can be used to set an alarm when the storage volume fills or fails.

ArchVolumeNode Should be defined as internal analog, analog report, or RMSC points. It is used to identify the current storage device and will be set to the node number of the machine containing the current storage device.

ArchVolume Should be defined as internal analog, analog report, or RMSC tag. It is used to identify the current storage device and will contain the device number (2 = /dev/hd2) of the optical drive containing the storage volume. Once the storage volume fills these tags will be switched to the next standby volume or to zero if no standbys are available.

Archive Status Screen

The status line at the very top of the screen displays the current status of the archive manager (on-line or off-line) and the time when the last server event was generated. Server events are basically text based responses to the last function key you pressed. For example, after pressing <F1> to mount a volume, the server eventually replies with a message indicating the success or failure (the status) of mounting the volume. The screen is divided horizontally into two parts; device status and volume status.

The top half of the screen lets you monitor the real-time status of the devices maintained by the archive manager. The screen shows a list of configured devices and their current status. The device column lists the names of the devices you have configured. The current use column lists the current use of the device; storage, standby or retrieval. Note that retrieval is implied when the current use is storage. The status column lists the current status of the device; *idle, ready, off-line* or *error.* Finally, if a volume is mounted in an archive device the name assigned to the volume appears in the volume column.

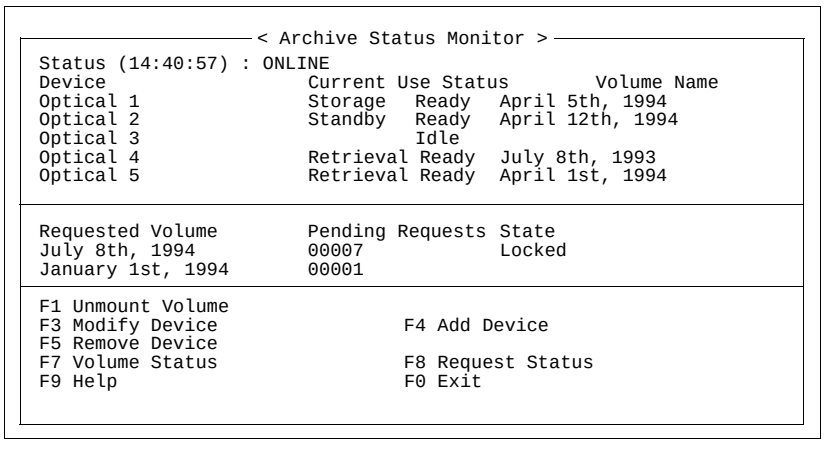


Figure 8-10. Archive Status Monitor

Press <Up>, <Down>, <PgUp>, <PgDn>, <Home> and <End> to move between the configured devices. You must have access to

configure and manipulate archive devices, otherwise function keys are not displayed in the bottom box. As you move from one device definition to another the function keys change depending on the state of the device. Pressing a function key performs the corresponding function on the highlighted device.

F1 - Unmount Device

Lets you un-mount the volume belonging to the highlighted device. This function is only available when the device is not idle. A message appears while the monitor is waiting for the archive manager to handle the request. You can cancel the request at any time, although the response is usually immediate. The response can be slow if the archive agent for this device is busy copying a file to the device. If the archive manager is no longer on-line or goes off-line during the operation, the message *Archive Manager is off-line* appears instantly.

The result of the un-mount volume request is displayed at the top of the display. The status line indicates the time and result of the last operation performed by the archive device status screen. If successful, the device status changes to idle and the current use and volume name are blanked.

F1 - Mount Device

Lets you mount the volume currently inserted into the highlighted device. This function is only available when the device is idle. A message appears while the monitor is waiting for the archive manager to handle the request. If the archive manager is no longer on-line or goes off-line during the operation, the message *Archive Manager is off-line* appears instantly. The result of the mount volume request is displayed at the top of the display. The status line indicates the time and result of the last operation performed by the archive device status screen. If successful, the device status changes to ready.

F2 - Initialize Device

Lets you initialize a volume belonging to the highlighted device. This function is only available when the device is idle. A pop-up window appears which lets you enter a volume name and force deletion if an existing volume is already loaded in the drive.

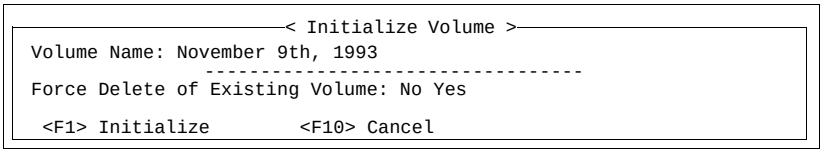


Figure 8-11. Initialize Volume

The entered name is the name to assign to the volume after it is successfully initialized. The volume name is a meaningful name that is subsequently used to refer to the volume. You should write this name on the actual media to remind yourself. By default, if the archive device contains a previously created volume, it is not initialized. In this case, the status line at the top of the screen might report *VOLUME 'October 12th, 1993'(12)*

is Used when you try to initialize the volume. To force deletion of an existing volume select the "Yes" option.

Pressing <F10> cancels the initialization request. Pressing <F1> causes a message to appear while the monitor is waiting for the archive manager to handle the request. If the archive manager is no longer on-line or goes off-line during the operation, the message *Archive Manager is off-line* appears instantly. The result of the initialize volume request is displayed at the top of the display. The status line indicates the time and result of the last operation performed by the archive device status screen. If successful, the status line displays your volume name and volume id assigned by the volume catalog manager. For example, *VOLUME 'November 9th, 1993'(13) is Initialized.*

F3 - Modify Device

Lets you modify the definition for the highlighted archive device. A pop-up window appears containing data entry fields that let you modify the archive device block I/O level path and name. The current device path and name are displayed in the data entry fields.

```
                    < Archive Device Configuration >
Device Path: //1/dev/hd2
                -------------------------------------------
Device Name: Optical Disk 1
               ---------------------------------------------------
                  <F1> Save        <F10> Cancel
```

Figure 8-12. Archive Device Configuration

The block I/O level path is used by the archive manager's device agent for initializing, mounting and un-mounting archive volumes within the main file system. The only supported devices at this time are magneto-optical disks. If any magneto-optical disks are attached to your local computer they appear in a pop-up menu for you to select. Otherwise, the message *No Devices Detected!* appears. When more than one device appears in the menu, press <Ctrl-Up> and <Ctrl-Down> to move between the devices. Press <F2> to scan for magneto-optical drives located elsewhere on the network.

The device name is a meaningful name that is subsequently used to identify this device in the main archive monitor screen.

Pressing <F10> cancels modifying the device. Pressing <F1> causes the updated device information to be sent to the archive manager. If an error occurs, a pop-up window appears containing the error. The two most frequent errors are if the device modifications match an existing device definition or the archive manager's device agent is busy. If successful, the device status is updated with the new device name.

F4 - Add Device

Lets you add a new archive device definition. A pop-up window appears containing blank data entry fields to let you enter the

archive device block I/O level path and name. The procedure to add a device is the same as Modify Device.

F5 - Remove Device Lets you remove the highlighted archive device definition permanently. First, you are queried on whether you are certain about deleting the device. By default, the "No"' option is highlighted.

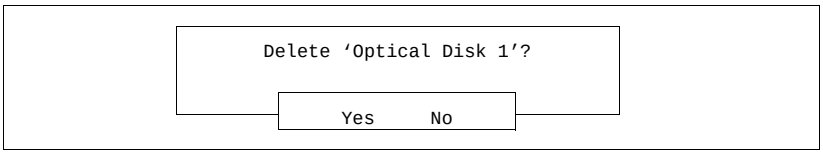


Figure 8-13. Remove Device Query

If you select "No", the delete function is canceled. Otherwise, selecting "Yes" causes a delete device request to be sent to the archive manager. If an error occurs, a pop-up window appears containing the error. The most common error to occur is the device can't be removed while the archive manager's device agent is busy using this device. If successful, the device status screen is updated with the device definition removed.

F5 - Force to Storage This option is only available when a standby device is highlighted. Selecting this command will force the selected standby volume into storage mode. The current storage volume, whether mounted or not, will be forced into retrieval-only mode. If the current storage volume is not mounted when this command is selected then it will be forced to retrieval-only mode the next time it is mounted. This command should not be used, unless the current storage volume is lost or damaged, otherwise, disk space will be wasted unnecessarily. Under normal operations the system will prompt you when it is necessary to initialize a new storage volume. New storage volumes can be pre-initialized and mounted as standby volumes and the system will automatically create a new storage volume from a standby volume when the old storage volume fills.

F6 - Take Offline Lets you take the highlighted archive device off-line. This function is only available when the device is idle. An offline device is still recognized by the archive manager, but can be used for other purposes. Basically, you don't have to tell the archive manager that the device is deleted in order to use the device for another purpose.

F6 - Bring Online Lets you bring the highlighted archive device back on-line. This function is only available when the device is off-line. The device's state is changed to idle. Press <F1> to mount the device.

The lower half of the screen lets you monitor the real-time status of the retrieval requests waiting for a volume to be placed on-line. The screen shows a list of the requested volumes, the

number of retrieval requests waiting for each volume and the locked state of each volume.

F7 - Volume Status Lets you monitor and cancel the volumes which are being requested for one or more retrieval requests from client applications.

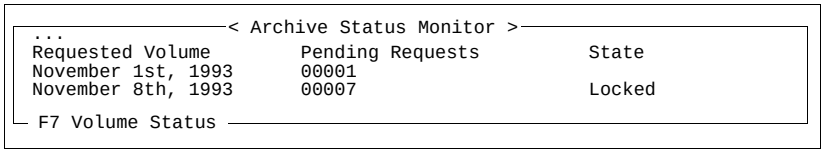


Figure 8-14. Volume Status

F8 - Request Status Lets you monitor and cancel individual storage and retrieval requests from client applications.

Archive Volume Status

The Archive Volume Status screen lets you monitor the real-time status of the retrieval requests waiting for a volume to be placed on-line. The screen shows a list of the requested volumes, the number of retrieval requests waiting for each volume and the locked state of each volume.

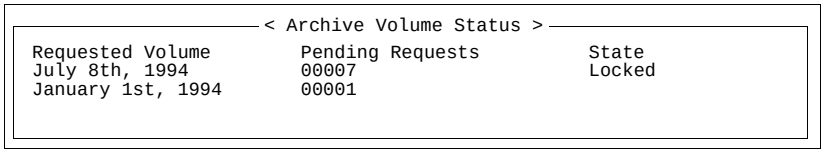


Figure 8-15. Archive Volume Status Screen

Press <Up>, <Down>, <PgUp>, <PgDn>, <Home> and <End> to move between the volumes. You must have access to cancel archive volumes, otherwise, function keys are not displayed in the bottom box. Pressing a function key performs the corresponding function on the highlighted volume. The only function supported at this time is to cancel the highlighted volume.

If there is no storage volume currently mounted then a special entry will appear in the volume request list. If there is no defined storage volume then an entry will appear requesting that a new storage volume be initialized. If there is a defined storage volume then an entry containing the storage volume's name will appear requesting that the storage volume be mounted.

F1 - Cancel Volume Lets you cancel the highlighted volume. First, you are queried on whether you are certain about canceling the volume. By default, the 'No' option is highlighted.

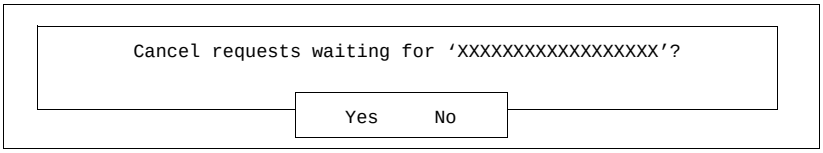


Figure 8-16. Cancel Volume

If you select "No" the cancel function is skipped. Otherwise, selecting "Yes" causes a cancel volume request to be sent to the archive manager. If successful, the volume status screen is updated with the volume removed.

You can not cancel a request for the storage volume.

Archive Request Status

The Archive Request Status screen lets you monitor the real-time status of the requests being scheduled by the archive manager. The screen shows a list of the pending requests. The request id column lists the unique identifier assigned by the archive manager to each client's request. The request volume column is blank for storage requests. For retrieval requests this column indicates the volume name for which the request is waiting. The request type column indicates whether the client's request is for storage or retrieval of a file. Finally, the file name column indicates the file name which is being requested.

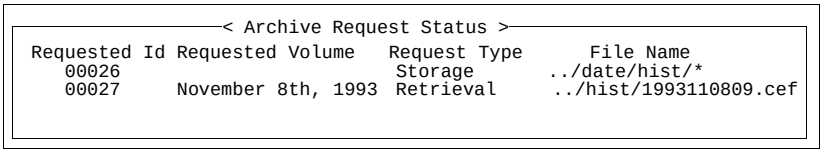


Figure 8-17. Archive Request Status Screen

Press <Up>, <Down>, <PgUp>, <PgDn>, <Home> and <End> to move between the requests. You must have access to cancel archive requests, otherwise, function keys are not displayed in the bottom box. Pressing a function key performs the corresponding function on the highlighted request. The only function supported at this time is to cancel the highlighted request.

F1 - Cancel Request Lets you cancel the highlighted request. First, you are queried on whether you are certain about canceling the request. By default, the "No" option is highlighted.

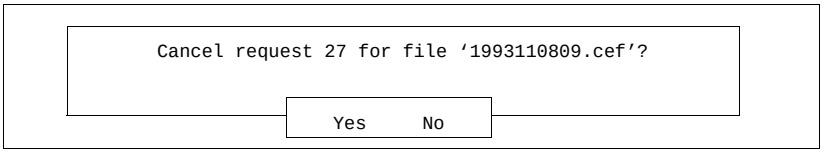


Figure 8-18. Cancel Request

If you select "No" the cancel function is skipped. Otherwise, selecting "Yes" causes a cancel request to be sent to the archive manager. If an error occurs, a pop-up window appears containing the error. The most common error to occur is if the request has just been completed by the archive manager. The archive monitor reports the error *No such file or directory*. If successful, the request status screen is updated with the request removed.

SECTION 9 - SERVER REDUNDANCY OPTION

OVERVIEW

Server Redundancy is an option that permits a continuous process link in the event of a server failure.

With this option, two servers on the network can be grouped together to form a redundant Server pair. For this redundant system to function correctly, both servers must be configured the same.

Upon failure of the Primary Server, the Redundant Server takes over the duties of the Primary Server. Deliberate fail overs can be caused by shutting down the Primary Server or disconnecting the CIU communication cable. This makes it possible to perform maintenance on the Primary Server without disrupting the rest of the network. When the failed server is placed back on-line, it assumes the Redundant Server function and allows the other server to continue as the Primary Server.

The Redundant Server will maintain current data in readiness for a fail-over. It does not maintain configuration files, since these are not changed frequently enough to justify the extra overhead of constantly checking configuration files. When you change the configuration on the Primary Server, you should follow these changes with a Redundant Server Restore. This will update these changes onto the Redundant Server.

You should use Redundant Server Restore after:

- Creating or modifying server level graphics.
- Restoring a server or system configuration.
- Restoring a node configuration to a primary server.
- Modifying the logs.

You do not need to use Redundant Server Restore after:

- Modifying individual tags definitions through the tag editor.
- Using Tag Loader.
- Restoring user configurations .
- Restoring non-redundant node configurations.

REDUNDANT SERVER RESTORE

Use Redundant Server Restore to keep the Redundant Server's configuration matching the Primary Server's configuration.

To restore files from the current Primary Server to the current Redundant Server, use the Redundant Server Restore Utility.

If you have purchased the Server Redundancy option you will have a Redundant Server Restore menu item in the Utilities menu.

To run the Redundant Server Restore utility, press **H** from the Main Menu to display the Utilities Menu. From the Utilities menu press **C** to display the Redundant Server Restore menu (Figure 9-1).

The Redundant Server Restore menu lists the redundant Server Group names (left justified) and the Server names (indented). The active (or primary) member of the redundant Server pair is displayed in cyan, while the redundant (or secondary) member of the redundant Server pair is displayed in green.

The redundant Server Group name is displayed in white.

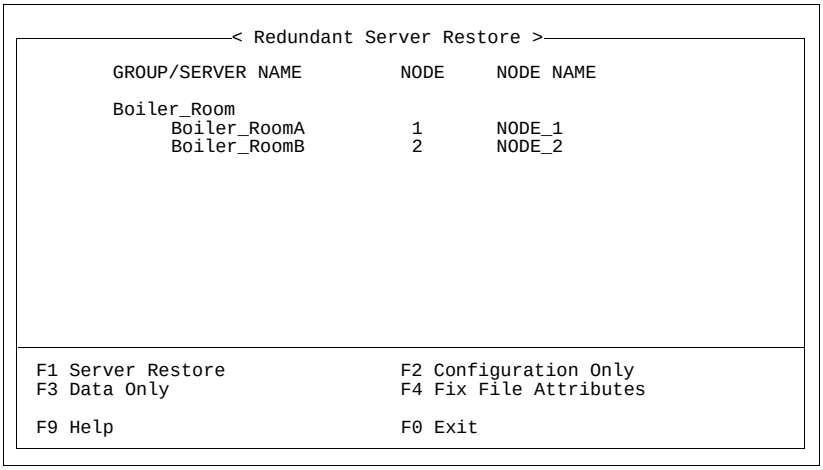


Figure 9-1. Redundant Server Restore Screen

To use this utility, both servers must be on-line. The Redundant Server being restored will be automatically shutdown.

To select a Redundant Server, use the <Up> and <Down> arrow keys to move the highlight bar over its name. All restore operations are performed on the selected server.

To fully restore the selected server press <F1>. This will cause the utility to start copying files to the selected server. As the files are copied their names are displayed on the screen.

> **NOTE:** You must reboot the Redundant Server once the restore is complete.

To only restore server configuration files press <F2>.

To only restore server data files press <F3>.

The Fix File Attributes feature is used to reset server file attributes. Normally this feature is not required unless you have manually copied server files with the operating system utilities. Files you have manually copied may not have the correct attributes and you should use this feature to correct any possible problems.

After a server has been restored it should be restarted.

NOTE: The Redundant Server Restore can be initiated from any operator station.

NOTE: The Redundant Server option should be installed on every operator station in order to enable the Redundant Server Resore menu item.

SECTION 10 - CONSOLE KEYLOCK SUPPORT - OPERATOR KEYBOARDS

OVERVIEW

In addition to the password and application security built into the software, a level of hardware security is also provided with the optional mylar keyboard. Refer to Section 11 in the ***Configuration*** manual for a summary of the console permission mentioned in this section.

HARDWARE

OIS-Style Keylock

The OIS-style keylock shown in Figure 10-1 uses a lock with three positions: TUNE, OFF, and CONFIG. There are two keys - one for TUNE access and one for CONFIGURATION access. The TUNE access is automatically locked once the key is put into the CONFIG position.

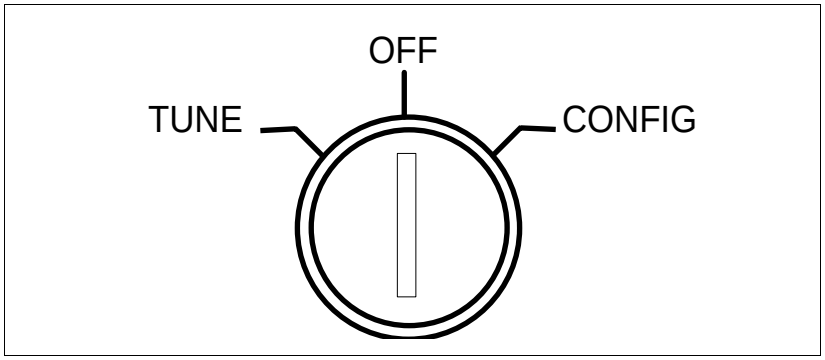


Figure 10-1. OIS-Style Keylock

INFI 90 OPEN/N90 MCS-Style Keylock

The INFI 90 OPEN MCS-style keylock shown in Figure 10-2 has two separate locks; one for CONFIGURATION access and one for TUNE access.

NOTE: If the console has problems recognizing the keylock position during start up, change both keylocks to the LOCK position, then reboot the console.

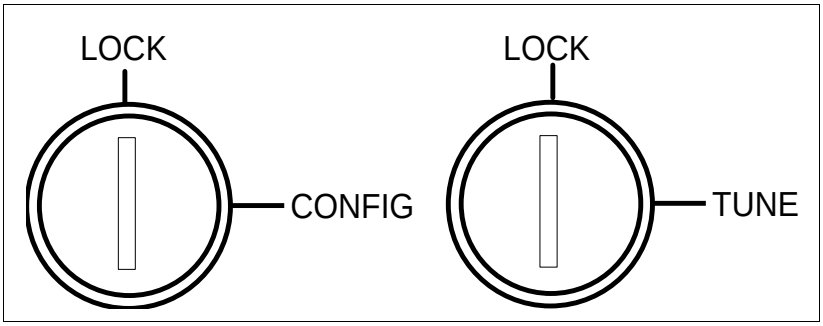


Figure 10-2. INFI 90 OPEN/N90 MCS-Style Keylock

Operation of Console Keylock Support

For both keylock styles,the following rule is used to determine whether you have CONFIG or TUNE access.

access = *console permission* AND *(override keylocks* OR *keylock position).*

where:

console permission	is either the Configure Database or Tune Modules permission
override keylocks	is only true when you have permission to Override Keylocks
keylock position	is the position of the key(s) (either CONFIG or TUNE)

For example, to have access to tune modules, you must have Tune Modules permission and either Override Keylocks permission or a key in the TUNE keylock position.

Closer scrutiny of this rule also reveals another point of view. Even though you might have permission to Tune Modules, you can only actually tune modules if you have Override Keylocks permission or a key in the TUNE keylock position.

NOTE: The Mylar Keyboard Status on the left of the Executive Bar may NOT reflect the actual keylock position if you have the Override Keylocks permission.

SECTION 11 - KEYBOARDS

USING THE KEYBOARD

Keyboards are the primary method of entering information.

Types of Keyboards

There are three types of supported keyboards:

- QWERTY keyboard
- Bailey operator keyboard
- ADP panel

The QWERTY keyboard is attached to all consoles. The QWERTY keyboard has a QWERTY typewriter layout with push-button keys.

The Bailey operator keyboards are flat, membrane-covered keyboards with dedicated process control keys. There are three versions of the operator keyboard, which differ in the layout of the keys and differ in the keys available: OIS, INFI 90 OPEN, and Network 90.

The ADP (Annunciator/Display Panel) panel is a special key panel. This is an optional panel of 32 or 64 flat, membrane-sealed keys that attaches to the MKM or EMKI operator keyboards. The keys can only be used to call graphic displays, in the currently active graphics window and LED lights on the panel are used to indicate alarms.

Keyboard Keys

There are seven general types of keys: *alphabetic, numeric, function, movement, display, control,* and *alarm.*

These keys are grouped together on the keyboards (Figures 11-1 to 11-3). All seven types of keys can be found grouped on the operator keyboards. On the QWERTY keyboard, *alphabetic*, *numeric*, and *function* keys are substituted for the *control*, *display*, and *alarm* keys.

Table 11-1. Types of Keys

Type of Key	Description of Use
Alphabetic	Selecting control elements on displays, moving between displays, selecting menu items, and entering text.
Numeric	Selecting control elements on displays, and entering numeric values.

Table 11-1. Types of Keys (continued)

Type of Key	Description of Use
Function	Selecting application functions and call up specific graphic displays.
Movement	Move the cursor on the screen, such as when selecting group displays and logs for retrieval. On trend displays, the movement keys are used to move the cursor through the historical data. The arrows also can also be used to ramp set points and control outputs in the station control mode.
Display	Call up specific graphic display and move between displays.
Control	Change modes of any station block. They also allow you to change control output and set point values manually. The control keys are also used to change the mode of remote control switches (RCMs, DDs, and MSDDs).
Alarm	Acknowledge and silence alarms. These keys do not correct alarm conditions: all corrective action is up to you, the operator.

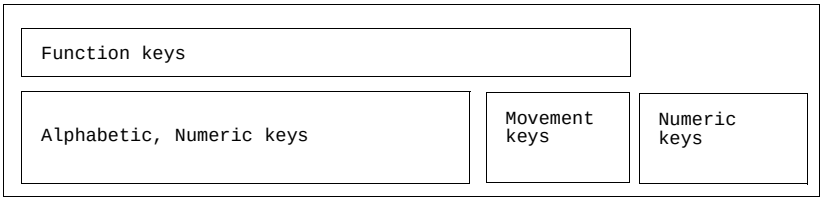


Figure 11-1. The QWERTY Keyboard Layout

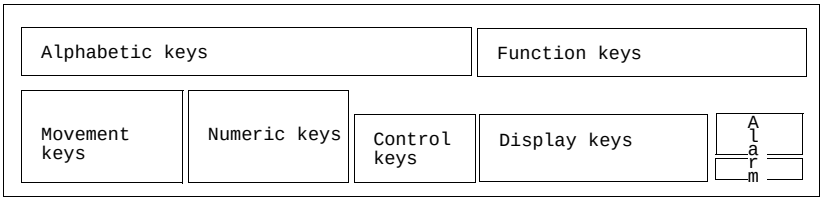


Figure 11-2. The OIS Operator Keyboard Layout

On the OIS operator keyboard, the function keys are labeled as Area keys. The {ComdLineMenu} key is used to print graphic displays.

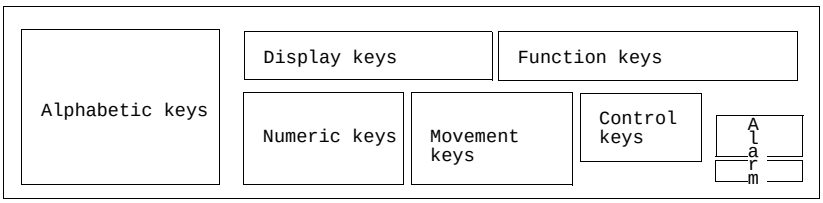


Figure 11-3. The INFI 90 OPEN Operator Keyboard Layout

The INFI 90 OPEN keyboard has an I90 key in the display key section while the NET90 keyboard shows a NET90 key. This key pulls up the display summary screen.

Keyboard Switching

If you are using an OIS or INFI 90 OPEN operator keyboard, your system may be set up to allow you to use the one keyboard to control two different CRT screens. If your system is set up this way, you can switch between either CRT you are using by pressing {SwitchCRT}.

Keys

Here is a summary of the keys used:

- Function Keys
- Movement Keys - Editing
- Movement Keys - Trend Displays
- Display Keys
- Control Keys
- Alarm Keys

Each type of keyboard has its own table in the following pages.

At the end of the tables is a list of keys that you may find on your operator keyboard that are NOT supported. Pressing these keys has no effect.

Table 11-2. Function Keys

Type of Keyboard			Function
INFI 90 OPEN	OIS	QWERTY	
F1	Area1	F1	Select menu items, display graphic, control on group displays.
F2	Area2	F2	"
F3	Area3	F3	"
F4	Area4	F4	"
F5	Area5	F5	"
F6	Area6	F6	"
F7	Area7	F7	"
F8	Area8	F8	"
F9	Area9	F9	Menu item for help/display graphic.
F10	Area10	F10	Menu item for exit/display graphic.
F11	Area11	Shift F1	Display graphic.
F12	Area12	Shift F2	"
F13	Area13	Shift F3	"
F14	Area14	Shift F4	"

Table 11-2. Function Keys (continued)

Type of Keyboard			Function
INFI 90 OPEN	OIS	QWERTY	
F15	Area15	Shift F5	"
F16	Area16	Shift F6	"
F17	Shift Area1	Shift F7	"
F18	Shift Area2	Shift F8	"
F19	Shift Area3	Shift F9	"
F20	Shift Area4	Shift F10	"
F21	Shift Area5	Ctrl F1	"
F22	Shift Area6	Ctrl F2	"
F23	Shift Area7	Ctrl F3	"
F24	Shift Area8	Ctrl F4	"
F25	Shift Area9	Ctrl F5	"
F26	Shift Area10	Ctrl F6	"
F27	Shift Area11	Ctrl F7	"
F28	Shift Area12	Ctrl F8	"
F29	Shift Area13	Ctrl F9	"
F30	Shift Area14	Ctrl F10	"

Table 11-3. Movement Keys - Editing

Type of Keyboard			Function
INFI 90 OPEN	OIS	QWERTY	
Home	Home	Home	Move the cursor to the first field on the screen. Move to first page in a multi-page display.
n/a	n/a	End	Move the cursor to the last field on the screen. Move to last page in a multi-page display.
Tab	Tab	Tab	Move one field forward.
TabBack	TabBack	Shift Tab	Move one field back.
Right	Right	Right	Move the cursor one field to the right.
Left	Left	Left	Move the cursor one field to the left.
Up	Up	Up	Move the cursor one field up.
Down	Down	Down	Move the cursor one field down.
DoubleRight	DoubleRight	Ctrl Right	Move the cursor one space to the right within the current field.
DoubleLeft	DoubleLeft	Ctrl Left	Move the cursor one space to the left within the current field.
DoubleUp	DoubleUp	Ctrl Up	Change the item selected in the current selection list field.
DoubleDn	DoubleDn	Ctrl Dn	Change the item selected in the current selection list field.
n/a	n/a	Ins	Toggle insert mode for the current field.
n/a	n/a	Del	Delete character at cursor.

Table 11-3. Movement Keys - Editing (continued)

Type of Keyboard			Function
INFI 90 OPEN	OIS	QWERTY	
n/a	n/a	Backspace	Move cursor left, deleting character.
Enter	Enter	Enter	Accept current field entry and move cursor to next field.
Esc	Esc	Esc	Recalls the field's original entry, abandoning any changes made. Exit an application prompt or menu display.
Clear	Clear	\	Starts a macro during periodic and trigger log editing.

n/a = not applicable

Table 11-4. Movement Keys - Trend Displays

Type of Keyboard			Function
INFI 90 OPEN	OIS	QWERTY	
Right	Right	Right	Moves cursor forward one sample.
Left	Left	Left	Moves cursor backward one sample.
n/a	n/a	Alt Right	Moves cursor forward ten samples.
n/a	n/a	Alt Left	Moves cursor backward ten samples.
Home	Home	Home	Moves cursor to rightmost sample of the displayed time span.
n/a	n/a	End	Moves cursor to leftmost sample of the displayed time span.
DoubleRight	DoubleRight	Ctrl Right	Pans forward in time. The displayed time span is shifted right.
DoubleLeft	DoubleLeft	Ctrl Left	Pans back in time, The displayed time span is shifted left.
Pan	Pan	Num-	Prompts for a date to move the cursor to. Format of the date is: yyyy-mon-dd hh:mm:ss
DoubleUp	DoubleUp	Ctrl Up	Zooms out; doubles the displayed time span.
DoubleDn	DoubleDn	Ctrl Dn	Zooms in; halves the displayed time span.
Zoom	Zoom	Num*	Prompts for a zoom factor to zoom in or zoom out by. The value of the factor is the same as pressing the ZOOM keys that many times. Negative factors zoom in, positive factors zoom out.
n/a	n/a	Ctrl G	Toggles the display of the background grid on and off.
Esc	Esc	Esc	Exits from trend control.

n/a = not applicable

Most display keys are functional only while viewing graphic displays. The types of display each key works for is listed under Screen Type (ScrTyp): graphic (G), text (T), or both (GT).

Table 11-5. Display Keys

Type of Keyboard			Screen Type	Function
INFI 90 OPEN	OIS	QWERTY		
Switch-CRT	Switch-CRT		GT	Switches keyboard input between two CRTs.
General-Functions	General-Functions	Alt X	GT	Return to General Functions Menu.
Display-Summary	Display-Summary	Num5	GT	Displays the Display Summary.
Alarm-Summary	Alarm-Summary	Alt Num5	GT	Displays the Alarm Summary graphic.
System Status Summary	I90Status	Ctrl Num5 or Alt 5	GT	Displays the System Status page.
Details	Details	Alt D	GT	Displays a block details chart for the currently selected tag. If no tag is selected it displays a Properties Menu. You can either enter the loop, PCU, module and block, or select from a list of configured tags.
Tune	Tune	Alt T	GT	Display a tuning access display for the currently selected tag. If no tag is selected, it displays a list of configured tags from which to select a station tag.
Help	Help	Alt H (or F9)	GT	Displays the Help screen for the current display.
Display	Display-ByName	F12	GT	Prompts for the file name of a graphic to display.
PrevPage	PrevPage	PgUp	G	Displays previous graphic.
NextPage	NextPage	PgDn	G	Displays next graphic.
Back	Back	Ctrl PgUp	G	Recalls the previously selected display. Press repeatedly to move through the last 7 displays viewed.
Forwd	Forwd	Ctrl PgDn	G	Recalls the next display in sequence after pressing BACK. Moves forward through the last 7 displays viewed.
Mark	Mark	Alt PgUp	G	Used to mark a display for later RECALL. Up to 10 (0-9) displays can be marked.
Recall	Recall	Alt PgDn	GT	Used to recall a previously MARKed display. Up to 10 (0-9) displays can be recalled.
Command-LineMenu	Print	Ctrl P	GT	Print a graphic or text display.
n/a	n/a	Ctrl Alt PrtScrn	T	Print a text display.

n/a = not applicable

Table 11-6. Control Keys

Type of Keyboard			Function
Cmptr	Cmptr	Alt P	Toggle between computer (remote) and local mode.
Ratio	Ratio	Alt R	Set ratio index.
Cascade	Cascade	Alt C	Toggle between cascade, ratio, and basic modes.
Man/Auto	Man/Auto	Alt M	Toggle manual and computer modes.
Set	Set	Alt S	Set set point.
Out	Out	Alt O	Set control output.
BoxFull	BoxFull	Alt E	Change to 1 state of RCMs, DDs, and RMCBs. Change to 3 state of MSDDs.
BoxHalf	BoxHalf	Alt W	Change to 2 state of MSDDs.
BoxEmpty	BoxEmpty	Alt Q	Change to 0 state of RCMs, DDs, and RMCBs. Change to 1 state of MSDDs.
Up	Up	Up	Ramp up numerical values (e.g., set points).
Down	Down	Down	Ramp down numerical values.
DoubleUp	DoubleUp	Ctrl Up	Fast ramp up numerical values.
DoubleDn	DoubleDn	Ctrl Dn	Fast ramp down numerical values.
Esc	Esc	Esc	Exit control.

Table 11-7. Alarm Keys

Type of Keyboard			Function
INFI 90 OPEN	OIS	QWERTY	
PageAck	PageAck	Num+	Acknowledges all alarms on the current page.
AckAlarm	AckAlarm	Ctrl Num+	Used to acknowledge individual alarms on graphic displays. (Press {AckAlarm} or <Ctrl Num+> once to highlight an alarm value; press <Tab> to highlight the alarm you want to acknowledge; then press {AckAlarm} or <Ctrl Num+> again.)
Silence	Silence	F11	Silences annunciated alarms from horn, keyboard or computer.

ADS AND ADP PANELS

An Annunciator Display Select Panel is referred to as an ADS panel or as an ADP. The terms are interchangeable. These mylar panels provide either 64 keys (type 1) or 32 keys (type 2). The panels connect to an interface (ADI) on a mylar keyboard. There is a lamp associated with each key. These lamps serve to annunciate or announce the alarming of specifically configured

tags. Pressing a key will call up the display that was selected during configuration.

When an ADP lamp lights to announce an alarm, you respond by pressing the associated key. This calls up the selected display, with which you can interact to respond to the alarm.

The ADS panel is not an alternate form of the alarm group displays. There are 101 alarm groups and only 32 or 64 ADP lamps. A tag definition contains separate fields for configuring the alarm group and the ADP lamp. There are two other main differences; the ADP does not show any tags that have returned to normal, nor is there an alarm summary listing the alarming tags that are associated with a particular ADP lamp.

The ADS panel is designed for rapid response. While alarm groups show unacknowledged alarms that returned to normal as flashing green, the ADS panel is focused on current high priority alarms. Normals would clutter your response decision. The ADP does not have nor need two color lamps.

Further, when a high priority alarm trips, the alarm groups provide no indication of the priority until the alarm summary is called. To deal with the alarm, call up the summary, then click or key the interactive letter on the left of the tag to call up the configured primary display for that tag. With the ADP, pressing the button associated with the alarm takes you directly to the display configured for that button.

The way an ADS panel is configured is site specific. The control strategy used at your site may employ the ADP in different ways. You may limit the use of alarm groups to 32 or 64 so that the ADP corresponds to the alarm groups. You may assign a particular graphic to each key just to facilitate switching displays. You may assign all tags on each display to the associated key so that you can rapidly see the display. The panel can be used only for the display select or only for announcing specific alarms.

Whether or not you have a physical ADP, you can display a graphical version of the ADP on your screen and thus obtain the same benefits. To do this open the main menu and select window control, then status windows and ADS panel. You use the mouse to click on the buttons. The graphic display of the ADP acts the same as the physical ADP. A faster method is to menu click on the alarm bell icon and choose ADS Panel.

When you select one of the ADP keys a graphic window will appear and display the graphic assigned to the key. If the current window selected is a process graphic window then the selection will cause the current display to be removed and the key-assigned graphic will be displayed. If no graphic window is

open, selecting the key will open a process graphic window and display the assigned graphic.

> **NOTE:** If all graphic windows have been made into icons, selecting an ADP key will update the graphic in the latest icon window but the icon will not be opened. Opening the icon will display the selected graphic.

See the ***Configuration*** manual for configuring the ADP.

SECTION 12 - MONITORING AND CONTROLLING A PROCESS

OVERVIEW

Live process information is displayed on graphic displays. These graphics display process information, control elements and historical charts.

You can control a process using control elements on graphic display pages.

GRAPHIC DISPLAYS

Graphic displays use a graphic window to display live process values in a variety of formats.

Monitoring plant process variables from a graphic can provide you with a comprehensive overview of the plant status and, used with the alarm system, keeps you informed of any plant upset or deviation that occurs.

To access a graphic display:

- From a process graphic menu click (right) on the display button and chose one of:

- Display By Name
- Browse By Name
- Display By Title
- Browse By Title
- Display By Tag

  Action clicking (left) on the display button automatically chooses **Display By Name**. If you know the name or title, chose the appropriate display option. If you do not know the name or title then choose the browse option. LAN-90 PCV will generate a list for you to select from. **Display By Tag** presents a dialog that allows you to enter a tag name or browse the tag list. **Display By Tag** calls the display specified in the primary display field of the tag.

- From an alarm summary, clicking or keying the boxed letter on the far left of the alarm line will call up the primary display specified for that tag.

- Menu clicking (right) on a tag name in a graphic will present a menu. Choose **Display** to call up the primary display for that tag.

- Pressing a function key will call the the display configured to that key. The graphic buttons on the left of a process graphic are also function keys on the mylar keyboard.

- Pressing a key on an ADS panel or ADS graphic will call the display configured to that key.

- Some displays also have key interactives. Generally, these are two red numbers that, when clicked or keyed, will call up a specific display.

- Other displays enable the display navigation buttons. These are the bottom three buttons on the left side of the process graphic. You may select the next, previous or higher display in this group of displays.

To print a graphic display, press {Print} or {CommandLineMenu} or <Ctrl P>. See Section 2 for more information about printing displays.

On graphic displays, you can find the following faceplate display elements:

- Station
- Remote Control Memory (RCM)
- Remote Motor Control Block (RMCB)
- Device Driver (DD)
- Multi-State Device Driver (MSDD)
- Remote Manual Set Constant (RMSC)
- Analog and Digital Values

As well as on the faceplates, process data is displayed as values or states, symbols, text, and moving bars and arrows.

Each of these controls can be displayed as faceplates and as pop-ups. Faceplates are rectangles that are always displayed on the graphic display. Pop-ups look the same as the faceplate, but they are only displayed when they are selected for control (Figure 12-1).

To activate a control on a graphic display, type the control select keys for the control. If a control only has one control select key, you have to type that key, then press <Enter> in order to gain control.

To unselect a control, press <Esc>. On graphic displays, you do not have to unselect a control before you can select another control or call up another display, unless you are currently in a numeric data entry field.

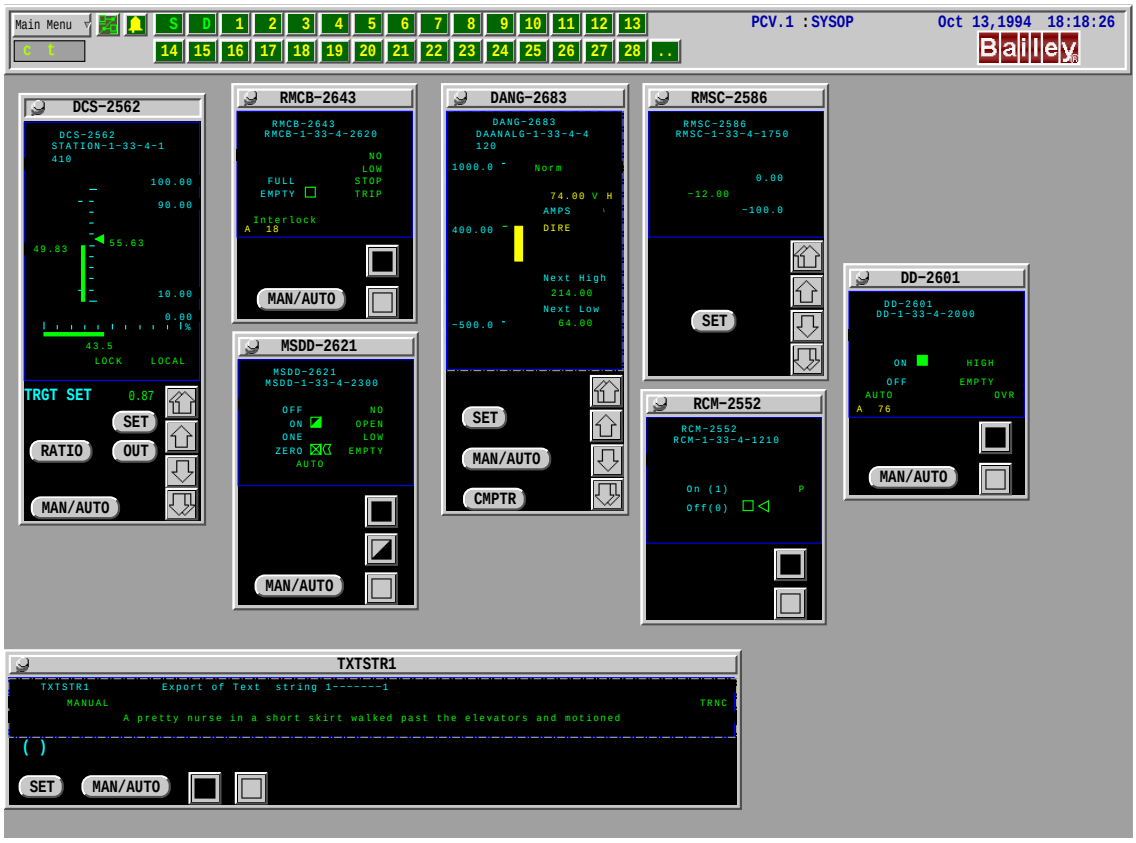


Figure 12-1. Examples of Pop-Ups

Station

A station presents a detailed on-line display of a single process loop (tag). A station can be displayed in one of two formats: half-height and full-height (Figure 12-2).

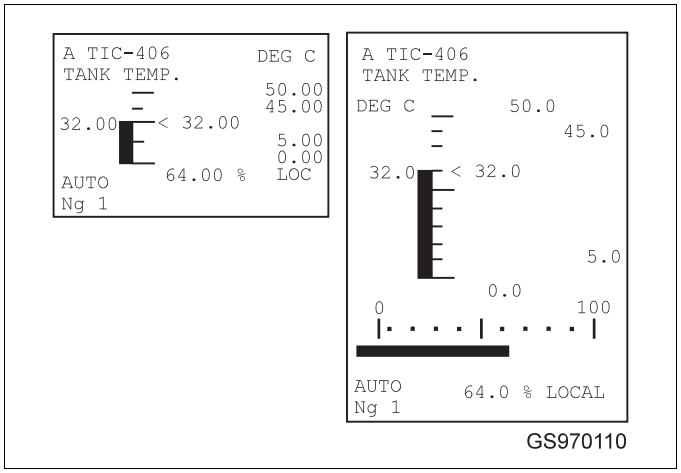


Figure 12-2. Half-Height and Full-Height Stations

Both station faceplate formats are rectangles outlined in blue.

Figure 12-3 shows the elements of a typical full-height station.

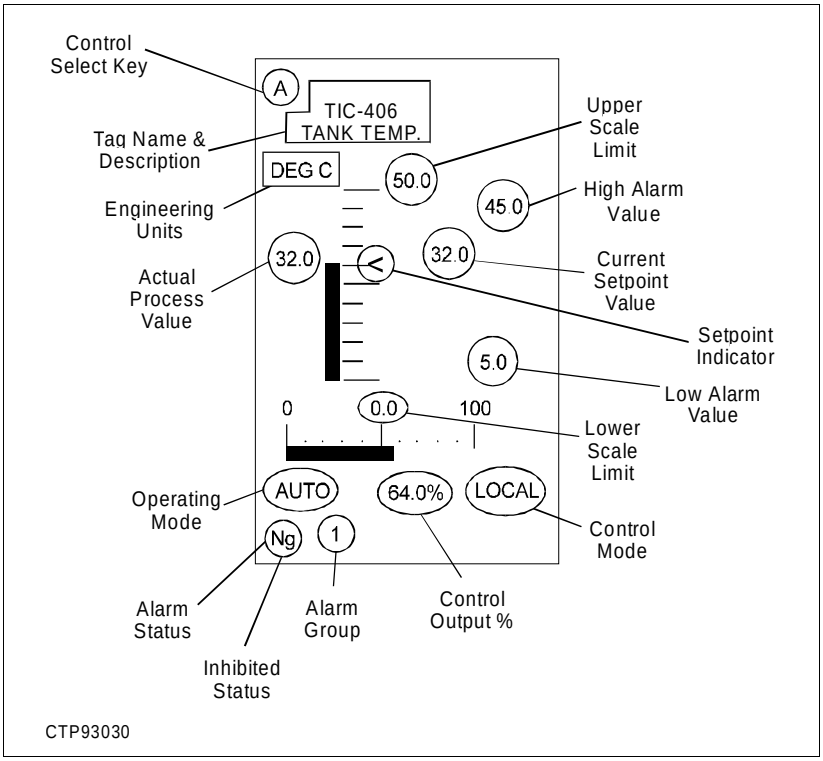


Figure 12-3. Diagram of Elements in a Full-Height Station

The control select key is shown at the top left hand corner of the station.

The tag name and description are printed at the top left of station.

The engineering units for displayed values are shown either in the top right corner (half-height), or just below the tag description (full-height).

A vertical scale, composed of a column of horizontal lines, is displayed in the center the station.

The process upper limit of the vertical scale is displayed to the right of the top of the scale.

Just below the upper limit is the station tag's high alarm value. The lower limit of the scale is displayed to the right of the bottom of the scale.

Just above the lower scale limit is the station tag's low alarm value.

A bar on the left of the scale shows the current process value. As the process value changes, the bar moves up and down.

Beside the top of the bar (to the left), the actual value of the current process value is displayed.

An arrowhead indicator on the right of the scale shows the current set point.

Beside the arrowhead (to the right) the actual value of the set point is displayed.

The distance between the top of the process value bar and the set point arrowhead shows the actual process value to set point deviation. If the percentage difference between the process value and set point exceeds the one set during configuration, a deviation alarm occurs.

Below the vertical scale, the station tag's control output percentage is displayed. On full-height stations, the control output percentage is shown on a horizontal scale, and the actual percentage is shown below the horizontal scale. On a half-height station, only the percentage of the control output is displayed below the vertical scale.

There are two control modes for stations: local or computer. The station control mode is indicated at the lower right of the station. This indicator reports whether the current PCU or another computer controls the process. *LOCAL* or *LOC* appears during PCU control, and *REMOTE* or *COM* appears during control by another computer.

There are several operating modes for stations: automatic, manual, cascade, and ratio.

The station operating mode is indicated at the lower left corner of the station. During automatic operation, the indicator displays *AUTO*; during manual operation, the indicator displays *MAN*. During automatic operation, you can change the set point value. In manual operation, you take manual control of the process and change the control output of the station. Depending on the control scheme configuration, you can also operate the station in either cascade or ratio mode.

> **NOTE:** The station operating mode (*AUTO* or *MAN*) shows the station type with an additional indicator (*/C* or */R*) following the operating mode indicator. For example, a cascade station type operating in manual mode is displayed as *MAN/C*.

The engineer sets the control output tracking mode (COTK) or set point tracking (SPTK) mode during control scheme configuration. If the operating mode goes into COTK, the control output percentage adjusts to changes in its track reference signal. If the mode goes into SPTK, the set point percentage adjusts to

changes in its track reference signal. Whenever the track reference signal goes up or down, the set point or control output value for that station changes as well.

When the system sets a station operating mode into COTK lockout or SPTK mode, the station stays locked, and you cannot change the mode. Only when the system releases the lockout (*COTK* or *SPTK* disappear from the lower left corner of the station display) can you resume control.

At the bottom left of the rectangle, an alarm indicator appears when an alarm occurs. This area is blank if there is no alarm. If an alarm group or tag is inhibited when the alarm occurs, then an inhibit indicator will be displayed between the alarm status and the alarm group.

A station can also be used for control, by changing set points or control outputs. With a station you can:

- Change the station's control mode (local or computer)
- Change the station's operating mode (automatic, manual, cascade, or ratio)
- Ramp (increase or decrease) the set point (SP), control output (CO), and ratio index (RI) values

You can toggle the station's control mode between local control (a PCU module controls the process) and computer control (a remote computer controls the process) by pressing {Cmptr} or <Alt P>. When you choose local control, the lower right corner of the station displays *LOCAL* or *LOC*, and when you choose computer control, the station displays *REMOTE* or *COM*.

> **NOTE:** In order for you to change a station's operating mode or the SP, CO, or RI, the station must be in local (LOC) control mode.

Table 12-1. Changing Station Control Modes (Graphic Display)

To Change Between:	Press:
LOCAL and COM (REMOTE)	{Cmptr} or <Alt P>

You can toggle the station's operating mode between manual and automatic by pressing {ManAuto} or <Alt M>. When the station is in automatic mode, *AUTO* is displayed in the lower left corner of the station, and when the station is in manual mode, *MAN* is displayed.

If the station is a cascade-type station (the type is set in the module configuration), you can toggle the station's operating mode between automatic and cascade by pressing {Cascade} or <Alt C>. When you choose cascade mode, *CAS* is displayed in

the lower left corner of the station, and when you choose automatic, *AUTO/C* is displayed.

If the station is a ratio-type station (the type is set in the module configuration), you can toggle the station's operating mode between automatic and ratio by pressing {Cascade} or <Alt C>. When you choose ratio mode, *RATIO* is displayed in the lower left corner of the station, and when you choose automatic, *AUTO/R* is displayed.

Under certain circumstances, you will not be able to change a station's operating mode. During control output tracking (*COTK*) and set point tracking (*SPTK*), the station is locked in manual mode (*MNLK*), and you cannot change the operating mode until the *COTK* or *SPTK* mode is released.

Table 12-2. Station Operating Modes

Operating Mode	Description	Explanation
MAN	Manual	You can modify the CO directly.
AUTO	Automatic	You can modify the SP.
CAS	Cascade	Control is determined by the PCU configuration.
RATIO	Ratio	You can modify the RI.
COTK MNLK	Control Output Tracking Lockout	CO tracks an external signal. The system locks the station in manual; you cannot change the operating mode.
SPTK MNLK	Set Point Tracking Lockout	SP tracks an external signal. The system locks the station in manual; you cannot change the operating mode.

Table 12-3. Changing Station Operating Modes (Graphic Display)

To Change Between:	Required Control Mode	Press:
AUTO and MAN	LOCAL	{ManAuto} or <Alt M>
AUTO and CAS or RATIO	LOCAL	{Cascade} or <Alt C>

To change a station's set point, the station must be in local (LOC) control mode and one of automatic (AUTO), manual (MAN), or control tracking lockout (COTK) operating modes. You cannot change the set point if the station is in cascade (CAS) or ratio (RATIO) modes. Press {Set} or <Alt S>, then either enter a new set point value and press <Enter> or ramp (increase or decrease) the current set point value slowly by pressing <Up> and <Down> or ramp the current set point value quickly by pressing {DoubleUp} or <Ctrl Up> and {DoubleDown} or <Ctrl Dn>.

To change the control output of a station, the station must be in local (*LOC*) control mode and manual (*MAN*) operating mode. Press {Out} or <Alt O>, then either enter a new control output percentage and press <Enter> or ramp the current control output percentage slowly by pressing <Up> and <Down> or ramp the current control output percentage quickly by pressing {DoubleUp} or <Ctrl Up> and {DoubleDown} or <Ctrl Dn>.

If the station is a ratio-type station, you can change the ratio index. To change the ratio index of a station, the station must be in local (*LOC*) control mode and ratio (*RATIO*) operating mode. Press {Ratio} or <Alt R>, then either enter a new ratio index and press <Enter> or ramp the current ratio index by pressing <Up>, <Down>, {DoubleUp} or <Ctrl Up>, and {DoubleDown} or <Ctrl Dn>.

Table 12-4. Controlling with a Station (Graphic Display)

To:	Required Station Mode		Press:	Then:
	Control Mode	Operating mode		
Change set point	LOCAL	AUTO, MAN, MNLK, or COTK	{Set} or <Alt S>	Enter the new value slowly and press <Enter> *or* Ramp the current value slowly by pressing <Up>, <Down>, and by quickly pressing {DoubleUp} or <Ctrl Up>, and {DoubleDown} or <Ctrl Dn>
Change control output	LOCAL	MAN	{Out} or <Alt O>	
Change ratio index	LOCAL	RATIO	{Ratio} or <Alt R>	

Remote Control Memory (RCM)

The Remote Control Memory (RCM) or Internal Digital Faceplate shows the current switch status for a particular tag (Figure 12-4).

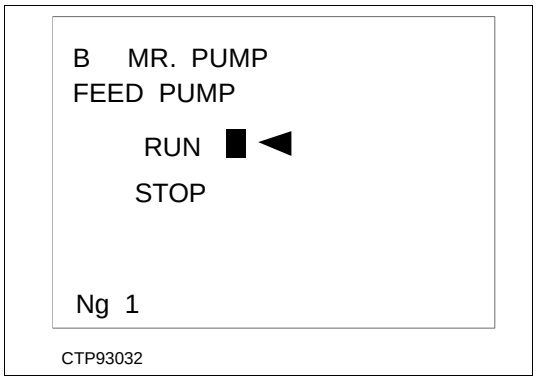


Figure 12-4. Remote Control Memory (RCM)

An RCM is a rectangular box outlined in blue. The tag name and description are printed at the top of the RCM. In the center of the rectangle are descriptions of the two states the RCM can have. To the right of the state descriptions are the status and feedback indicator symbols.

At the bottom left of the rectangle a yellow alarm indicator appears when an alarm occurs. If the alarm is inhibited then an indicator will also be displayed. This area is blank if there is no alarm. The No-Set-Permissive/Set-Permissive indicator (*NP* or *SP)* is displayed to the right of the upper switch state description. The Override indicator (*OVR)* gets displayed at the bottom center of the rectangle. The engineer selects which status indicators are to be displayed for both switch positions during control scheme configuration.

You can control with an RCM, by changing the switch position. In order to change the RCM, you must have Set Permissive (*SP*). If the RCM has No Set Permissive *(NP)* or is in Override *(Ovr)*, you will not be able to change the RCM's switch state.

Table 12-5. RCM Indicators

Indicator	Description	Explanation
P	Set Permissive	You can change the RCM switch state.
NP	No Set Permissive	You cannot change the RCM switch state.
Ovr	Override	The control scheme is overriding any choices and forcing the RCM to one of its states.

The status and feedback indicators of the RCM show the current switch position (logic state) of the RCM. To change an RCM to the 1 (set) state, press {BoxFull} or <Alt E>. To change an RCM to the 0 (reset) state, press {BoxEmpty} or <Alt Q>. As the switch state changes, the status and feedback indicators of the RCM change position.

Table 12-6. Controlling with an RCM (Graphic Display)

To:	Required Indicator	Press:
Change to 1 (set) state	P	{BoxFull} or <Alt E>
Change to 0 (reset) state	P	{BoxEmpty} or <Alt Q>

Remote Motor Control Block (RMCB)

A Remote Motor Control Block (RMCB) shows you the current switch state of a two-state switch (Figure 12-5).

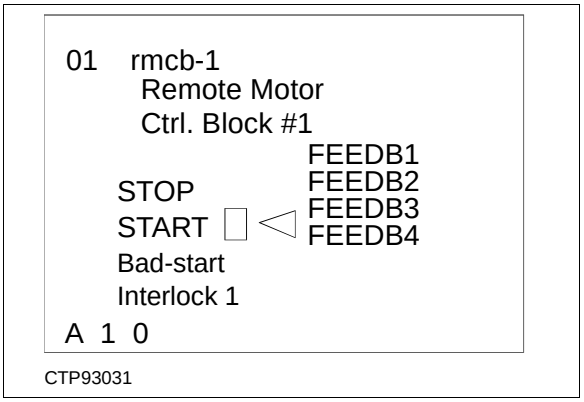


Figure 12-5. Remote Motor Control Block (RMCB)

An RMCB is a rectangular box outlined in blue. The tag name and description are printed at the top. In the center of the rectangle are descriptions of the two states the RMCB can have. To the right of the state descriptions are the status and feedback indicator symbols.

Below the state descriptions, error messages can be displayed.

At the bottom left of the rectangle, an alarm indicator appears when an alarm occurs. This area is blank if there is no alarm. If an alarm group or tag is inhibited when the alarm occurs, then an inhibit indicator will be displayed between the alarm status and the alarm group.

You can control with an RMCB, by changing the switch position. The status and feedback indicators of the RCMB show the current switch position (logic state) of the RCMB. To change an RCMB to the 1 (set) state, press {BoxFull} or <Alt E>. To change an RCMB to the 0 (reset) state, press {BoxEmpty} or <Alt Q>. As the switch state changes, the status and feedback indicators of the RCMB change position.

Table 12-7. Controlling with an RMCB

To:	Press:
Change to 1 (set) state	{BoxFull} or <Alt E>
Change to 0 (reset) state	{BoxEmpty} or <Alt Q>

Device Driver (DD)

A Device Driver (DD) shows you the current switch state and operating mode of a tag (Figure 12-6).

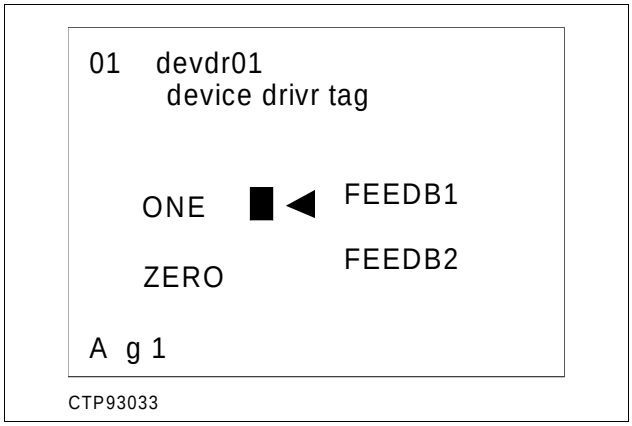


Figure 12-6. Device Driver (DD)

A DD is a rectangular box outlined in blue. The tag name and description are printed at the top. In the center of the rectangle, are descriptions of the two states the DD can have. To the right of the state descriptions are the status and feedback indicator symbols.

A DD has two operating modes: automatic and manual. The current operating mode is displayed near the bottom left corner *(AUTO* or *MAN)*.

At the bottom left corner of the rectangle, an alarm indicator appears when an alarm occurs. This area is blank if there is no alarm. If an alarm group or tag is inhibited when the alarm occurs, then an inhibit indicator will be displayed between the alarm status and the alarm group.

You can control with a DD, by changing the operating mode and switch position.You can toggle the DD's operating mode between manual and automatic by pressing {ManAuto} or <Alt M>. When the DD is in automatic mode, *AUTO* is displayed in the lower left corner of the DD, and when the DD is in manual mode, *MAN* is displayed.

NOTE: A DD must be in manual *(MAN)* mode for you to change the switch state of the DD.

Table 12-8. Changing DD Operating Modes

To Change Between:	Press:
AUTO and MAN	{ManAuto} *or* <Alt M>

The status and feedback indicators of the DD show the current switch position (logic state) of the DD. To change a DD to the 1 (set) state, press {BoxFull} or <Alt E>. To change a DD to the 0 (reset) state, press {BoxEmpty} or <Alt Q>. As the switch state changes, the status and feedback indicators of the DD change position.

Table 12-9. Controlling with a DD

To:	Required Mode	Press:
Change to 1 (set) state	MAN	{BoxFull} or <Alt E>
Change to 0 (reset) state	MAN	{BoxEmpty} or <Alt Q>

Multi-State Device Driver (MSDD)

A Multi-State Device Driver (MSDD) shows you the current switch state of a three-state switch (Figure 12-7).

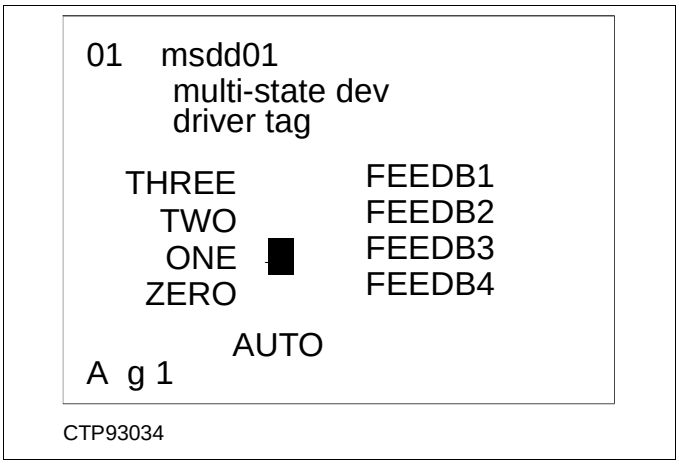


Figure 12-7. Multi-State Device Driver (MSDD)

An MSDD is a rectangular box outlined in blue. The tag name and description are printed at the top. In the center of the rectangle, are descriptions of the three states the MSDD can have. To the right of the state descriptions are the status and feedback indicators.

In the bottom left corner, a yellow alarm indicator appears when an alarm occurs. This area is blank if there is no alarm.

You can control with an MSDD, by changing the switch position. You can toggle the MSDD's operating mode between manual and automatic by pressing {ManAuto} or <Alt M>. When the MSDD is in automatic mode, *AUTO* is displayed in the lower left corner of the MSDD, and when the MSDD is in manual mode, *MAN* is displayed.

NOTE: An MSDD must be in manual *(MAN)* mode for you to change the switch state of the MSDD.

Table 12-10. Changing MSDD Operating Modes

To Change Between:	Press:
AUTO and MAN	{ManAuto} or <Alt M>

The status and feedback indicators of the MSDD show the current switch position (logic state) of the MSDD. To change an MSDD to the 3 (on) state, press {BoxFull} or <Alt E>. To change an MSDD to the 2 (mid-state) state, press {BoxHalf} or <Alt W>. To change an MSDD to the 1 (off) state, press {BoxEmpty} or <Alt Q>. As the switch state changes, the status and feedback indicators of the MSDD change position.

Table 12-11. Controlling with an MSDD

To:	Required Mode	Press:
Change to 3 (on) state	MAN	{BoxFull} or <Alt E>
Change to 2 (mid-state) state	MAN	{BoxHalf} or <Alt W>
Change to 1 (off) state	MAN	{BoxEmpty} or <Alt Q>

Remote Manual Set Constant (RMSC)

Remote Manual Set Constant (RMSC) and the internal analog faceplates show you the current value of manually-entered process constants (Figure 12-8).

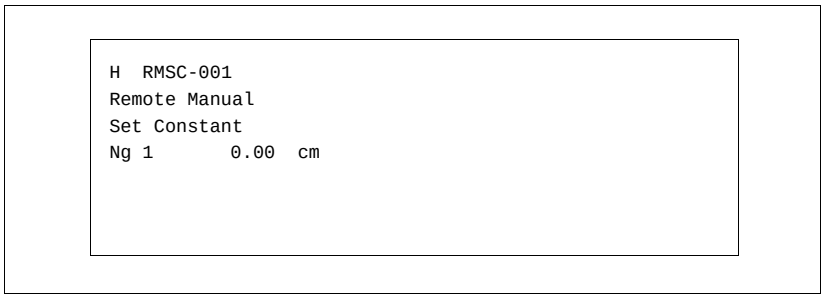


Figure 12-8. Remote Manual Set Constant (RMSC)

RMSCs are rectangles outlined in blue. The tag name and description are printed at the top of the RMSC. The current value and its engineering units are displayed at the bottom center of the rectangle. The alarm and inhibit indicators appear at the bottom left of the box.

With a Remote Manual Set Constant (RMSC), you can change the value of a constant used in the process control scheme.

To enter a new constant press {Set} or <Alt S>, then either enter a new target value and press <Enter>. You can ramp (increase or decrease) the current value slowly by pressing <Up> and <Down>, or ramp the current value quickly by pressing {Double Up} or <Ctrl Up> and {Double Down} or <Ctrl Dn>.

Analog and Digital Values

Analog and Digital display elements show you live current process values or states (Figure 12-9).

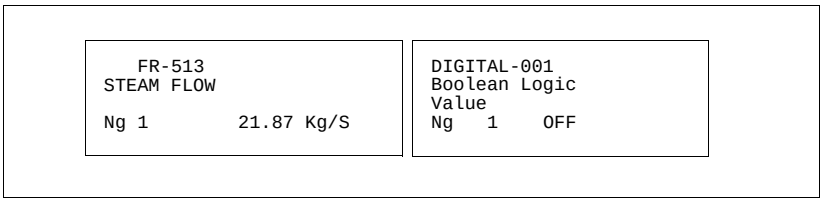


Figure 12-9. Analog and Digital Display Elements

The single point element is a rectangle outlined in blue. The tag name and description are displayed at the top.

The bottom center of the Analog element shows the current process value and its engineering units. The bottom center of the Digital element shows the current process value as a descriptive logic state (OPEN, CLOSED, ON, OFF, etc.).

If an alarm exists, a yellow alarm indicator is displayed in the lower left corner on both types of elements. If an alarm is inhibited, an indicator will also be shown.

Some digital and analog values can be changed from graphic displays (internal tags and report tags). If a digital or analog value has a control select key, you can change the value.

Analog values are changed the same as RMSC values.

Digital values are changed the same as RCM values.

SECTION 13 - LOGGING: INTRODUCTION

LOGGING

The functionality of the logging operations is outlined in the following sections. Further information regarding this software may be obtained from Elsag Bailey (Canada) Inc.

The logging system collects data that can be printed in a report format.

Data is collected by the log over a period of time. The collection period depends on the type of log: either on a regular schedule or only under certain conditions. When the log ends, the data can be printed automatically to a printer if you choose. The log data is retained on the hard disk, so you can reprint the log. Only a limited number of retained historical log data files can be kept on your computer's hard disk; as new logs are collected, the oldest are deleted. To keep log data files as permanent records, you can copy the log files to floppy disk. You can reprint log files directly from floppy disk.

Six types of logs are available: periodic, trigger, system events/ operator action, trend, trip, and SOE logs.

Periodic logs collect and print data at regular intervals or as the events occur. Periodic logs are suited for logs required on a regular schedule, such as an end-of-shift log. You can configure up to 64 periodic logs.

Trigger logs collect and print data according to trigger conditions. Using trigger tags, you can define four types of trigger conditions: collect, print, hold, and resume. Data collection begins when a collect trigger condition is detected. Data collection stops and the log printed when a print trigger condition is detected. Trigger logs are suited for batch logging where a batch can start and end at any time. You can configure up to 64 trigger logs.

Periodic and trigger logs are the most powerful and flexible logs. They are both configured using RIPCAM2, a powerful spreadsheet package. In the spreadsheet, you set up special data collection calculations to read tag data. The printed format of the log is completely flexible, there are many data collection types and options, and regular spreadsheet calculations (e.g., sums, averages) can be used to create data not available from tags directly. You can send out (export) log-calculated data to tags for use by other logs, other applications, or the INFI 90 OPEN/Network 90 system.

System Event/Operator Action logs record all tag alarms and are printed at regular intervals. You can include in the log returned-to-normal alarms and digital changes of state. You can also create a log of operator actions, such as control actions, logins, and alarm acknowledgements. The printed logs list events line by line, but you can specify the information shown on each line and on the page header. There are only the two system event logs: alarm log and operator action log.

Trend logs print out collected trend data. You can print out as much or as little of the trend data you want. Trend logs are configured to print at regular intervals. The printed format of a trend log is fixed; you only specify the trend tags to be included in each log. You can configure up to 64 trend logs.

Trip logs collect data before and after a trip. A trip occurs when values or states of tags you specify meet conditions you set (e.g., when an analog tag's value exceeds 100). You specify the tags to collect data for and the amount of data collected before and after the trip. When a trip condition occurs, a trip log containing the pre-trip and post-trip data is printed. The printed format of a trip log is fixed; you only specify the tags to include and the amount of pre-trip and post-trip data. Trip log data can also be plotted onto a graphic display. You can configure up to 20 trip logs.

SOE (Sequence of Events) logs collect data for selected critical digital points where the given situation requires that the sequence of changes of state for these points or group of points be known in the most exacting ways possible. SOE logs meet this requirement by listing all digital state transitions in time order and in one-millisecond resolution. SOE Logging is described in Section 25.

SECTION 14 - CONFIGURING GENERAL LOG DEFINITIONS

OVERVIEW

NOTE: You MUST edit the general log definitions BEFORE you can configure any logs. Editing the general definitions only needs to be done once.

The general log definitions are used by all types of logs. You define how different periods are implemented.

SETTING THE GENERAL LOG DEFINITIONS

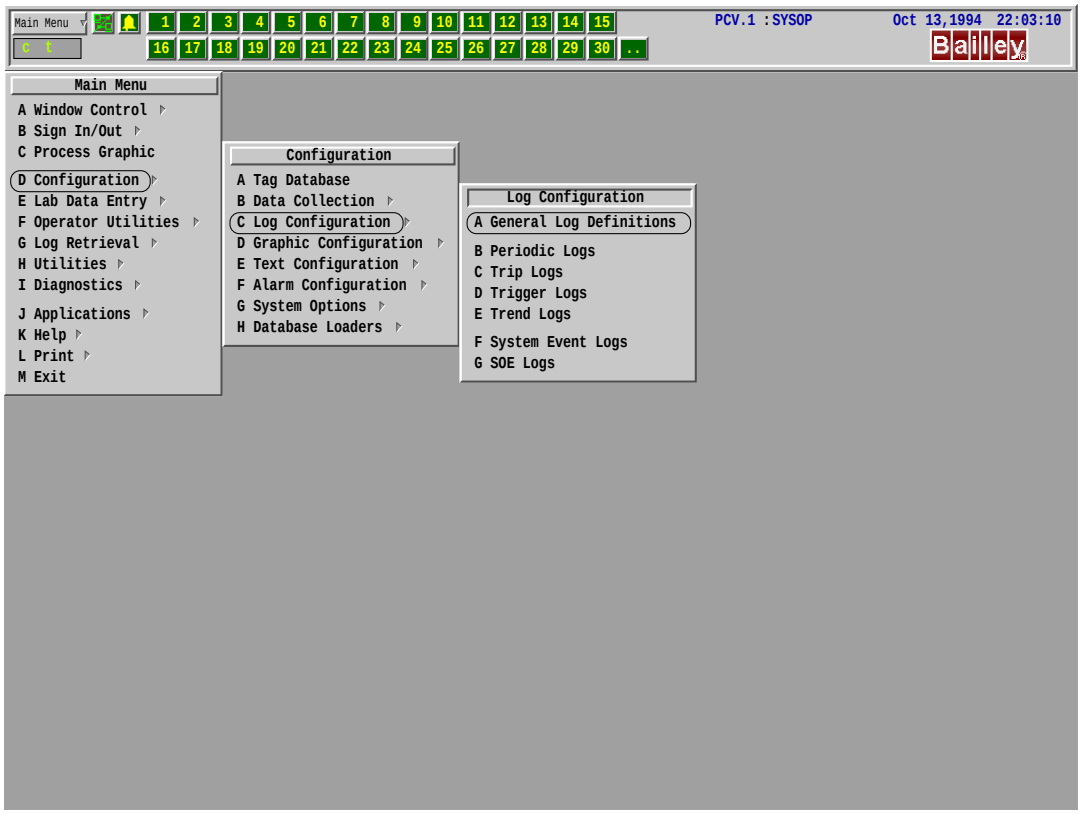


Figure 14-1. General Log Definition Menu

Press **D**, or click **Configuration** with the right mouse button on the General Functions Menu to display the Configuration Menu.

Press **C**, or click with the right mouse button, from the Configuration Menu to display the Log Configuration Menu (Figure 14-1).

Press **A**, or click with the left mouse button, from the Log Configuration Menu to display the Edit Log Definitions applications (Figure 14-2). The fields are described in Table 14-1.

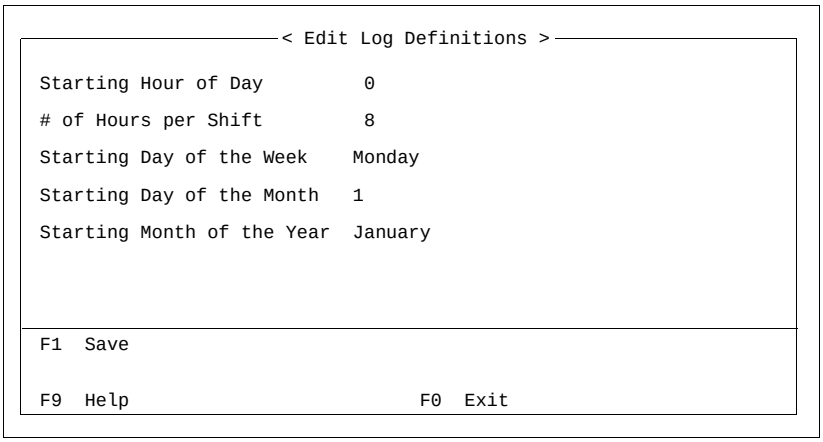


Figure 14-2. Edit Log Definitions Menu

Table 14-1. General Log Definitions

Field	Description
Starting hour of day	Enter the hour (0 - 23) that ends a day. This defines when daily logs are run, and the offset of shift logs within a day.
# Hours per Shift	Enter the number of hours in a shift. The number of hours MUST divide evenly into 24 hours.
Starting Day of the Week	Select the first day in the week. This defines when weekly logs are run. Use <Ctrl Up>/<Ctrl Dn> or {Double Up}/{Double Dn} to change the selection.
Starting Day of the Month	Select the starting day of the month. This defines when monthly logs are run. Use <Ctrl Up>/<Ctrl Dn> or {Double Up}/{Double Dn} to change the selection.
Starting Month of the Year	This defines when yearly logs are run. Use <Ctrl Up> / <Ctrl Dn> or {Double Up}/{Double Dn} to change the selection.

Example If the starting hour the day is 0 and the starting day of the week is Sunday, daily logs are printed at 0:00 AM (midnight), and weekly logs are printed at 0:00 AM on Sunday morning (midnight between Saturday and Sunday).

Example If the starting hour of the day is 4 and the starting day of the week is Friday, daily logs are printed at 4:00 AM, and weekly logs are printed at 4:00 AM on Friday morning.

Use <Ctrl Up>/<Ctrl Dn> to select in pop-up window.

Press <F1> to save your definition.

Press <F10> to exit the application.

SECTION 15 - CONFIGURING SYSTEM EVENTS & OPERATOR ACTION LOGS

OVERVIEW

System Events logs and Operator Action logs report system alarms and operator actions. The report formats are configurable, and the reports can be automatically or manually sent to a printer or viewed on the console.

The system alarms that can be logged are:

- Any tag with an alarm group other than zero that goes into alarm or returns to normal
- Change of state for digital tags that have their Save or Print flag enabled

The operator actions that can be logged are:

- Logging into or out of the system
- Configuration changes
- Unauthorized attempts at saving a configuration
- Alarm acknowledgments
- Modification of a station's setpoint, control output, or ratio index
- Changing the mode of a station, device driver (DD), multi-state device driver (MSDD), remote motor control block (RMCB), or Text String block (Text Str, function code 194).
- Changing the output of a device driver (DD), multi-state device driver (MSDD), remote motor control block (RMCB), remote control memory (RCM), or remote manual set constant (RMSC).
- Changing the output of a Text String block (Text Str) causing a Text String event.

System events can be printed as they occur or a full report can be generated at the end of a specified time period: hourly, per shift, or daily. The reports are printed, using the configured format, to the console or a printer. The printed report can contain a page header. The report viewed on the console is paged, allowing you to scan forward and backwards through the report. The printed report and the viewed report have separate formats.

SYSTEM EVENTS/OPERATOR ACTION LOG CONFIGURATION

There are two steps involved when configuring system events/ operator action logs:

1. Configure the log parameters.

2. Configure the log formats.

If you want to record digital change of states, configure the digital tags in the tag database to indicate whether a change of state event for this tag should be printed or saved.

To configure these logs, press **F** from the Log Configuration Menu to display the System Event Log Configuration Menu (Figure 15-1). This may also be selected by moving the pointer to the System Events Log Menu option and pressing the left mouse button.

Press <F1> from the System Event Configuration Menu to display the Edit System Events Log Parameters Menu (Figure 15-2).

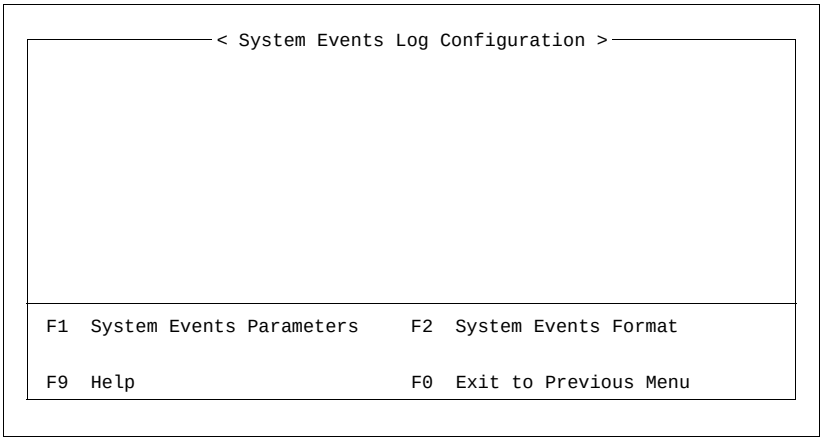


Figure 15-1. System Events Log Configuration Menu

CONFIGURING SYSTEM EVENTS/OPERATOR ACTION LOG PARAMETERS

The System Events Log parameters determine:

- Whether the events will be printed as they are received or not
- The period of time for a report
- Which printer is used for the report
- Whether the report will be printed automatically at the end of the period or if the report can only be printed manually

- Whether the events are archived or not
- The number of retained logs
- Which events will be printed

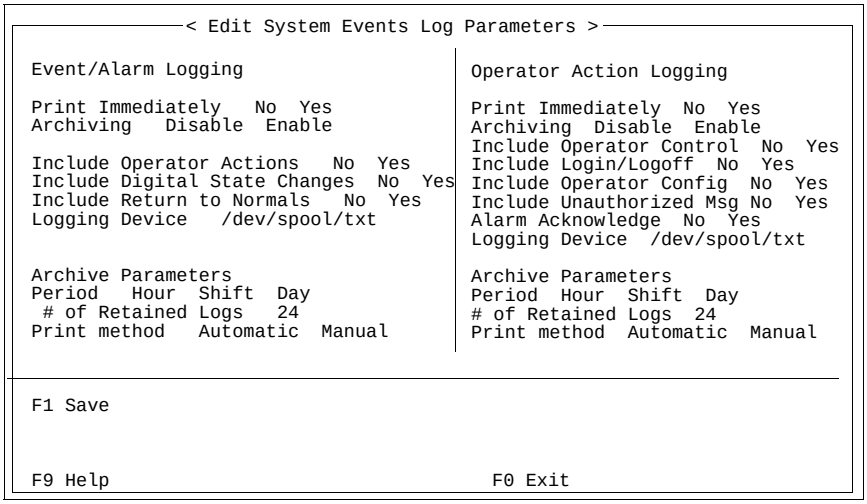


Figure 15-2. Edit System Events Log Parameters Screen

There are two columns: the left column specifies the event/alarm log parameters, the right column specifies the operator action log parameters.

Use the <Up>, <Down>, <Tab> and <Tab Back> keys to move from one field to another.

Table 15-1 describes the fields and their settings.

NOTE: Choosing **Print Immediately** will print to the alarm printer not the logging device.

Table 15-1. System Events/Operator Actions Log Parameters

Field	Log Type	Description
Print Immediately	Both	Select whether or not system events or operator actions are printed as soon as they occur by pressing <Ctrl Right> and <Ctrl Left>. This option does not affect and is not affected by retention of the information on hard disk.
Archiving	Both	Select whether or not system events or operator actions are saved in a file, regardless of whether they are printed or not by pressing <Ctrl Right> and <Ctrl Left>. This file will contain the events or action for the time span selected as the Period.
Include Operator Actions	Event/Alarm	Select whether or not operator actions will be included in the Event/Alarm logs by pressing <Ctrl Right> and <Ctrl Left>.
Include Digital State Changes	Event/Alarm	Select whether or not to save and print digital changes-of-state (dCoS) by pressing <Ctrl Right> and <Ctrl Left>. If you select Yes, any digital tag that has been configured for printing or saving of changes of state will be included in the log.

Table 15-1. System Events/Operator Actions Log Parameters (continued)

Field	Log Type	Description
Include Return to Normals	Event/Alarm	Select whether or not to include tags that have been in alarm and return to normal by pressing <Ctrl Right> and <Ctrl Left>.
Include Operator Control	Operator Action	Select whether or not to include operator control actions in the log by pressing <Ctrl Right> and <Ctrl Left>. Operator control actions are: - changing a station's setpoint, control output or ratio index - changing the mode of a station, DD, MSDD, or RMCB - changing the output of a DD, MSDD, RMCB, RCM, or RMSC
Include Login/Logoff	Operator Action	Select whether or not logging in to or out of the system will be included in the log by pressing <Ctrl Right> and <Ctrl Left>.
Include Operator Config	Operator Action	Select whether or not any configuration changes will be included in the log by pressing <Ctrl Right> and <Ctrl Left>.
Include Unauthorized Msg	Operator Action	Select whether or not to include attempts to save a configuration with the wrong access level by pressing <Ctrl Right> and <Ctrl Left>.
Alarm Acknowledge	Operator Action	Select whether or not alarm acknowledgements from anywhere in the system are included in the log by pressing <Ctrl Right> and <Ctrl Left>.
Logging Device	Both	Enter the name of the print device to send the log to. Valid names are described in the Printer Configuration section of the Configuration manual.
Archive Parameters	Both	Select the length of time that data is collected for a single log by pressing <Ctrl Right> and <Ctrl Left>. When the period is up, a new data file is created to hold the new system events or operator actions, and the old data file is optionally retained. Hour: The collection period is one hour from 0 TO 59 minutes. Shift: The shift collection period as specified in the general log definitions. Day: The collection period is one day: midnight to midnight.
# of Retained Logs	Both	Enter the number of logs that are saved for future inspection or archiving. Only the most recent logs are retained. This value ranges from 0 to 64.
Print Method	Both	Select whether or not a log is automatically printed at the end of the selected period by pressing <Ctrl Right> and <Ctrl Left>. When the period is up, and if Automatic is selected, the report will be printed on the Logging Device. If Manual is selected then a report can only be printed by using the Log Retrieval functions (see Section 16 — Retrieving Logs for details).

To save your changes, press <F1>.

To exit from the System Events Log Parameters screen, press <F10>.

Configuring the System Events/Operator Actions Log Format

The System Events/Operator Action log formats are configurable. You can specify what is included in a report and where it is placed in the columns of the report. You can also configure the format of the report title.

The format of a report only controls how and what is printed; NOT what information is saved. This means that you can produce one report that includes, for example, just the tag name and the event and another report, from the same data file, which includes the date, time, tag description, and event.

Press <F2> from the System Events Log Configuration Menu (Figure 15-1) to display the System Events Format Configuration Menu (Figure 15-3).

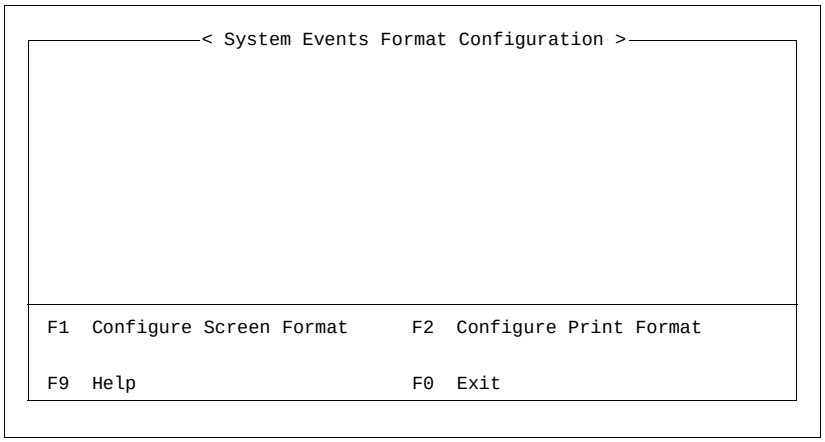


Figure 15-3. System Events Format Configuration Menu

When a report is generated, it can be either printed on a printer or viewed on the console. Because of the differences between these two output methods, each has its own format configurations. Only the printer formats will be described in this section, but the methods used to configure these two formats are the same.

Press <F2> to display the System Events Print Configuration Menu (Figure 15-4).

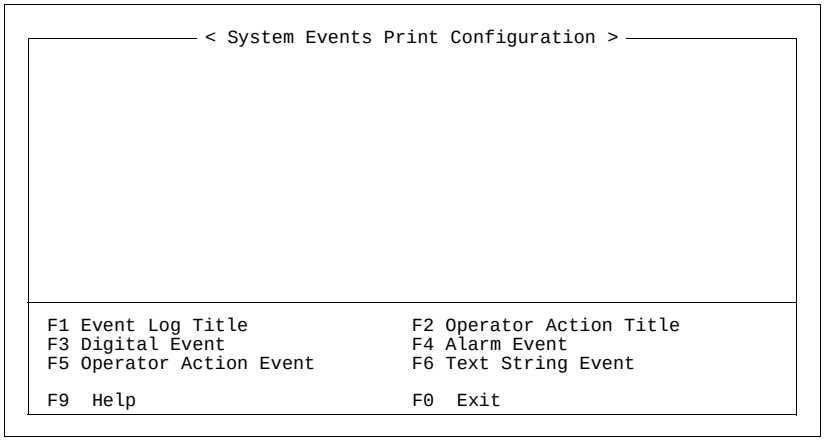


Figure 15-4. System Events/Operator Action Print Configuration Menu

This menu lists the six parts of a log that can be configured:

- Events Log Title is used for the title when an event/alarm report is printed.
- Operator Action Title is used for the title when an operator action report is printed.
- Digital Event format controls how all digital change of state events are printed.
- Alarm Event format controls how all tag alarms or return-to-normal events are printed.
- Operator Action Event format controls how all operator actions are printed, except changes to the output of Text String blocks.
- Text String event format controls how operator changes to Text String ouputs are printed.

For each title or event, you configure one to two lines, each 130 columns wide (on the configuration screen, each line is broken into two in order to fit on the 80 column application screen). These lines are marked to show the column positions.

On each line, you can type:

- Any printable character (i.e., numbers, letters, spaces, punctuation)
- Special information codes (e.g., date, tag names, event descriptions)

Each special code is made up of a percent character (%) followed by a letter (e.g., %d is used to print the date). These codes are expanded to their full representation when the log or report is generated.

Some codes are common to all formats (e.g., %d and %t for date and time), but other codes are unique (e.g., %u for user name can only be used on operator action events). The valid codes are always listed on the configuration screen.

Because the two-character codes represent a longer sequence of characters, you should leave a sufficient number of spaces after the code before adding more characters or codes to the line. The maximum width of each code when expanded is shown in brackets beside each valid code listed on the configuration screen. The code expansion starts in the column the percent character is placed in and continues until:

- The code has been fully expanded, or

- A non-space character is found on the line.

If you try to save a configuration that has truncated codes, a warning message is displayed in a pop-up window warning you that not enough space has been left for one of the codes and asking you whether you want to save the configuration as is, or return to editing the title or event format.

Blank lines (lines with no printable characters or valid codes) are not printed. If you leave one line blank in a title or event format, only one line is printed. If both lines are left blank, nothing will be printed for that title or event.

Titles on events logs and operator action logs are separated from the body of the report by two blank lines.

You can include the percent character in your report by placing the percent character in the position you want without following it by an alphabetic character. If a code is not recognized by the system when the report is generated, it will not be expanded.

Formatting the Event Log Title

To configure a title for system events logs, press <F1> from the System Events Print Configuration Menu to display the Events Log Title - Print Output screen (Figure 15-5).

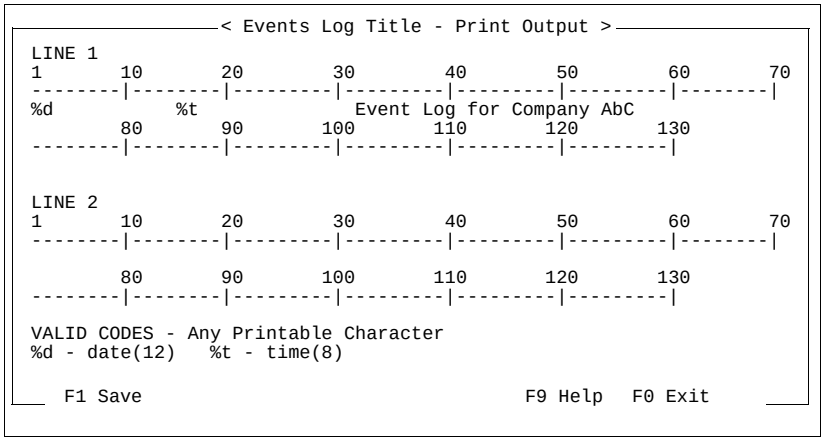


Figure 15-5. Event Log Title - Print Output Screen

Two lines can be configured; blank lines are ignored. The title will be separated from the body of the report by two lines when printed.

In addition to any printable characters, you can include the codes listed in Table 15-2.

To save your changes, press <F1>.

To exit from the configuration screen, press <F10>.

Table 15-2. Codes for System Events Log Title

Code	Width	Description
%d	12	Date the title is printed. Format: ***mmm, dd***
%t	8	Time the title is printed. Format: ***hh:mm:ss***

Example If an event log title is configured as shown in Figure 15-5, on the report it will look like

Mar 20, 1991 16:05:01 Event Log for Company AbC

Example If an event title is configured:.

```
                    < Events Log Title - Print Output >
 LINE 1
 1       10        20        30        40        50        60        70
 --------|---------|---------|---------|---------|---------|---------|
 %d      %t              Event Log for Company AbC
         80        90       100       110       120       130
 --------|---------|---------|---------|---------|---------|


 LINE 2
 1       10        20        30        40        50        60        70
 --------|---------|---------|---------|---------|---------|---------|

         80        90       100       110       120       130
 --------|---------|---------|---------|---------|---------|

 VALID CODES - Any Printable Character
 %d - date(12)   %t - time(8)

   F1 Save                                    F9 Help   F0 Exit
```

Figure 15-6. Event Log Title - Print Output Screen

On a report, it looks like:

Mar 20, 16:05:01 Event Log for Company AbC

Notice that the date has been truncated by the time.

Example If an event title is configured:

```
< Event Log Title - Print Output >
LINE 1
1       10        20        30        40        50        60        70
--------|---------|---------|---------|---------|---------|---------|
             Event Log for Company AbC                      %d
        80        90        100       110       120       130
--------|---------|---------|---------|---------|---------|


LINE 2
1       10        20        30        40        50        60        70
--------|---------|---------|---------|---------|---------|---------|
        Daily Report for Best selling Product xYz           %t
        80        90        100       110       120       130
--------|---------|---------|---------|---------|---------|

VALID CODES - Any Printable Character
%d - date(12)   %t - time(8)
```

Figure 15-7. Event Log Title - Print Output Screen

On a report, it looks like:

Event Log for Company AbC May 02, 1991
Daily Report for Best selling Product xYz 00:02:12

Formatting the Operator Action Log Title

To configure a title for the operator action log, press <F2> from the System Events Print Configuration Menu to display the Operator Action Title - Print Output screen (Figure 15-8):

```
< Operator Action Title - Screen Output >
LINE 1
1       10        20        30        40        50        60        70
--------|---------|---------|---------|---------|---------|---------|
                   Operator Action Log        %d             %t
        80        90        100       110       120       130
--------|---------|---------|---------|---------|---------|


LINE 2
1       10        20        30        40        50        60        70
--------|---------|---------|---------|---------|---------|---------|
                  ------------------------------------------------------
        80        90        100       110       120       130
--------|---------|---------|---------|---------|---------|

VALID CODES - Any Printable Character
%d - date(12)   %t - time(8)

  F1 Save                                  F9 Help   F0 Exit
```

Figure 15-8. Operator Action Title - Print Output Screen

Two lines can be configured; blank lines are ignored. The title will be separated from the body of the report by two lines when printed.

In addition to any printable characters, you can include the codes listed in Table 15-3.

To save your changes, press <F1>.

To exit from the configuration screen, press <F10>.

Table 15-3. Codes for Operator Action Log Title

Code	Width	Description
%d	12	Date the title is printed. Format: *mmm, dd, **yyyy***
%t	8	Time the title is printed. Format: ***hh:mm:ss***

The rules for configuring and displaying the title is the same as for the formatting of the event log title.

Formatting Digital Change-of-State Events

To configure the format of a digital change-of-state event, press <F3> from the System Events Print Configuration Menu to display the Digital Event - Print Output screen (Figure 15-9):

```
                    < Digital Event - Screen Output >
LINE 1
1       10        20        30        40        50        60        70
--------|---------|---------|---------|---------|---------|---------|
DC  &d          &t          %n                  %e
        80        90       100       110       120       130
--------|---------|---------|---------|---------|---------|


LINE 2
1       10        20        30        40        50        60        70
--------|---------|---------|---------|---------|---------|---------|

        80        90       100       110       120       130
--------|---------|---------|---------|---------|---------|

VALID CODES - Any Printable Character
%d-date(12)  %t-time(8)   %n-tagname(14)   %g-Tag Descriptor(32)
%e-Event Description(40)
   F1 Save                                   F9 Help   F0 Exit
```

Figure 15-9. Digital Change-Of-State Event - Print Output Screen

Two lines can be configured; blank lines are ignored.

In addition to any printable characters, you can include the codes listed in Table 15-4.

To save your changes, press <F1>.

To exit from the configuration screen, press <F10>.

NOTE: A digital tag's change of state is only printed if the tag has been configured to Print State Changes in the tag database. See the Configuration manual for details.

Table 15-4. Codes for Digital Change-of-State Event Format

Code	Width	Description
%d	12	Date the title is printed. Format: ***mmm, dd, yy***yy
%t	8	Time the title is printed. Format: ***hh:mm:ss***
%n	14	Name of the digital tag that changed state.
%g	32	Description of the digital tag that changed state.
%e	40	Description of the event. The description has the format Digital CoS ***'logic_state_descriptor_1'*** to ***'logic_state_descriptor_2'***

The rules for configuring and displaying the digital change-of-state apply as per the rules for formatting the event log title.

Example

If the digital event format is:

```
                    < Digital Event - Screen Output >
LINE 1
1       10        20        30        40        50        60        70
--------|---------|---------|---------|---------|---------|---------|
DC  &d          &t         %n                  %g
        80        90       100       110       120       130
--------|---------|---------|---------|---------|---------|


LINE 2
1       10        20        30        40        50        60        70
--------|---------|---------|---------|---------|---------|---------|
           %e
        80        90       100       110       120       130
--------|---------|---------|---------|---------|---------|

VALID CODES - Any Printable Character
%d-date(12)  %t-time(8)   %n-tagname(14)   %g-Tag Descriptor(32)
%e-Event Description(40)
   F1 Save                                    F9 Help   F0 Exit
```

Figure 15-10. Digital Event - Print Output Screen

On a report, a digital tag changing from 0 to 1 might look like:

DC Jan 29, 1991 03:12:17 DPR-0447 PRESS PRIMARY CLEANER DIFF
Digital CoS from 'LOW' to 'HIGH'.

Formatting Alarm Events

To configure the alarm event format, press <F4> from the System Events Print Configuration Menu to display the Alarm Event - Print Output screen (Figure 15-11).

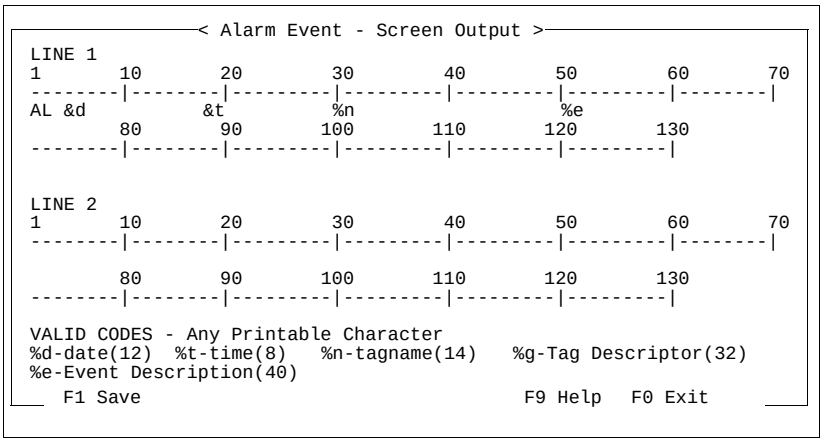


Figure 15-11. Alarm Event - Print Output Screen

Two lines can be configured; blank lines are ignored.

In addition to any printable characters, you can include the codes listed in Table 15-5.

To save your changes, press <F1>.

To exit from the configuration screen, press <F10>.

Table 15-5. Codes for Alarm Event Format

Code	Width	Description
%d	12	Date the title is printed. Format: ***Mon dd,yy***yy
%t	8	Time the title is printed. Format: ***hh:mm:ss***
%n	14	Name of the tag that went into alarm or returned to normal.
%g	32	Description of the tag that went into alarm or returned to normal.
%e	40	Description of the alarm or return-to-normal. The description has the one of the following formats. For a digital tag: ***logic_state_desc state alarm_group*** For an analog tag: ***value alarm_value*** *(if in alarm)* ***eng_units state alarm_group*** For an SPC chart: ***spc_chart alarm_value station_type alarm_type alarm_group*** For a Text String tag: ***string*** (up to 28 characters) ***state alarm_group***

The rules for configuring and displaying the alarm even apply as per the rules for formatting the event log title.

Formatting Operator Action Events

To configure the format of an operator action event, press <F5> from the System Events Print Configuration Menu to display the Operator Action - Print Output screen (Figure 15-12).:

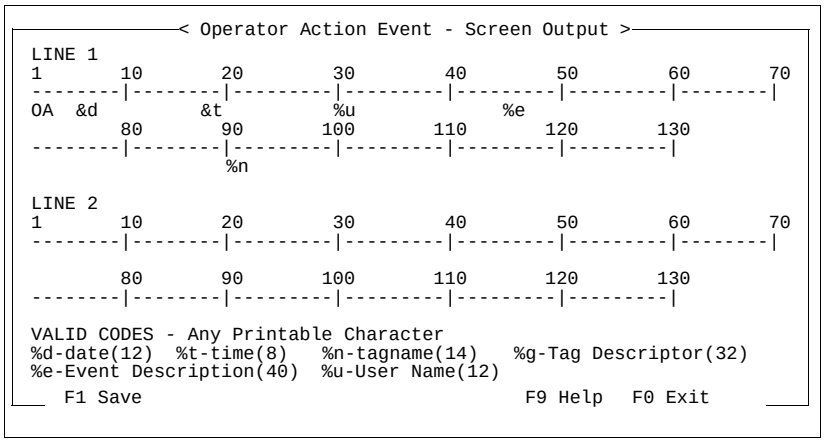


Figure 15-12. Operator Action Event- Print Output Screen

Two lines can be configured; blank lines are ignored.

In addition to any printable characters, you can include the codes listed in Table 15-6.

To save your changes, press <F1>.

To exit from the configuration screen, press <F10>.

Table 15-6. Codes for Operator Action Event Format

Code	Width	Description
%d	12	Date the title is printed. Format: ***Mon dd,yyyy***
%t	8	Time the title is printed. Format: ***hh:mm:ss***
%n	14	Name of the tag affected by the action.
%g	32	Description of the tag affected by the action.

Table 15-6. Codes for Operator Action Event Format (continued)

Code	Width	Description
%e	40	Description of the action. The description has the one of the following formats. When an operator logs in to or out: Logged onto the system Logged off the system When changing a configuration, the description reports the type of configuration. For example: Edited Logic State Descriptors When attempting to save a configuration change with insufficient access level, the description reports the type of configuration. For example: Unauth. Attempt to save LS Descriptors When acknowledging alarms: Alarm Acknowledgment When changing a station's setpoint, control output, or ratio index: Changed STAT SP ***previous_value -> new_value*** Changed STAT CO ***previous_value -> new_value*** Changed STAT RI ***previous_value -> new_value*** When changing the mode of a station, DD, MSDD, or RMCB: Changed ***tag_type*** Mode ***old_setting -> new_setting*** When changing the output of a DD, MSDD, RMCB, RCM, or RMSC: Changed ***tag_type*** Output ***old_setting -> new_setting***
%u	12	Name of the operator performing the action as per the configuration of the operator's login account.

The rules for configuring and displaying the operator action event apply as per the rules for the event log title.

Formatting Text String Events

There is a special category of operator action event-outputting a text string to an application in a process module. Text strings may be up to eighty characters long and have either normal or alarm status. If the received text string is shorter than the original string sent from the remote application, then remote truncation has occurred.

The date and time of the operator action, the name of the operator, and the name and description of the tag affected, can all be included as with other event types. In addition, the old text string as received from the process module, can be included along with the old text string's alarm status and remote trun-

cation status. Unless configured otherwise (substitutable text), remote truncation is indicated by printing "TRNC" and the absence of remote truncation by 4 blank spaces.

The new text string entered by the operator may be included and the alarm status set by the operator. At present, the operator cannot enter a string on the console which would result in causing remote truncation, however future applications may cause this truncation.

To configure the format of a text string event, press <F6> from the System Events Print Configuration menu to display the Text String Event - Print Output screen (Figure 15-13).

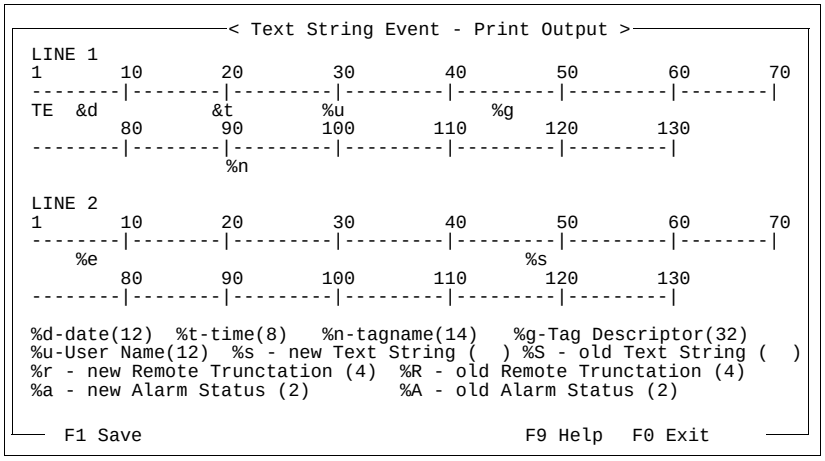


Figure 15-13. Text String Event - Print Output Screen

Two lines can be configured; blank lines are ignored.

In addition to any printable characters, you can include the codes listed in Table 15-7.

To save your changes, press <F1>.

To exit from the configuration screen, press <F10>.

Table 15-7. Codes for Text String Event Format

Code	Width	Description
%d	12	Date the title is printed. Format: ***Mon dd,yyyy***
%t	8	Time the title is printed. Format: ***hh:mm:ss***
%n	14	Name of the tag affected by the action.
%g	32	Description of the tag affected by the action.
%u	12	Name of the operator performing the action as per the configuration of the operator's login account.
%a	2	Alarm state (normal or alarm) as set by operator.
%A	2	Alarm state of original text string from process module.

Table 15-7. Codes for Text String Event Format (continued)

Code	Width	Description
%r	4	Remote truncation status of text string from operator.
%R	4	Remote truncation status of original text string from process.
%s	80	Text string entered by operator.
%S	80	Text string originally received from process module.

The rules for configuring and displaying the Text String event apply as per the rules for the event log title.

SECTION 16 - RETRIEVING LOGS

OVERVIEW

Press **G** from the Main Menu to display the Log Retrieval Menu (Figure 16-1).

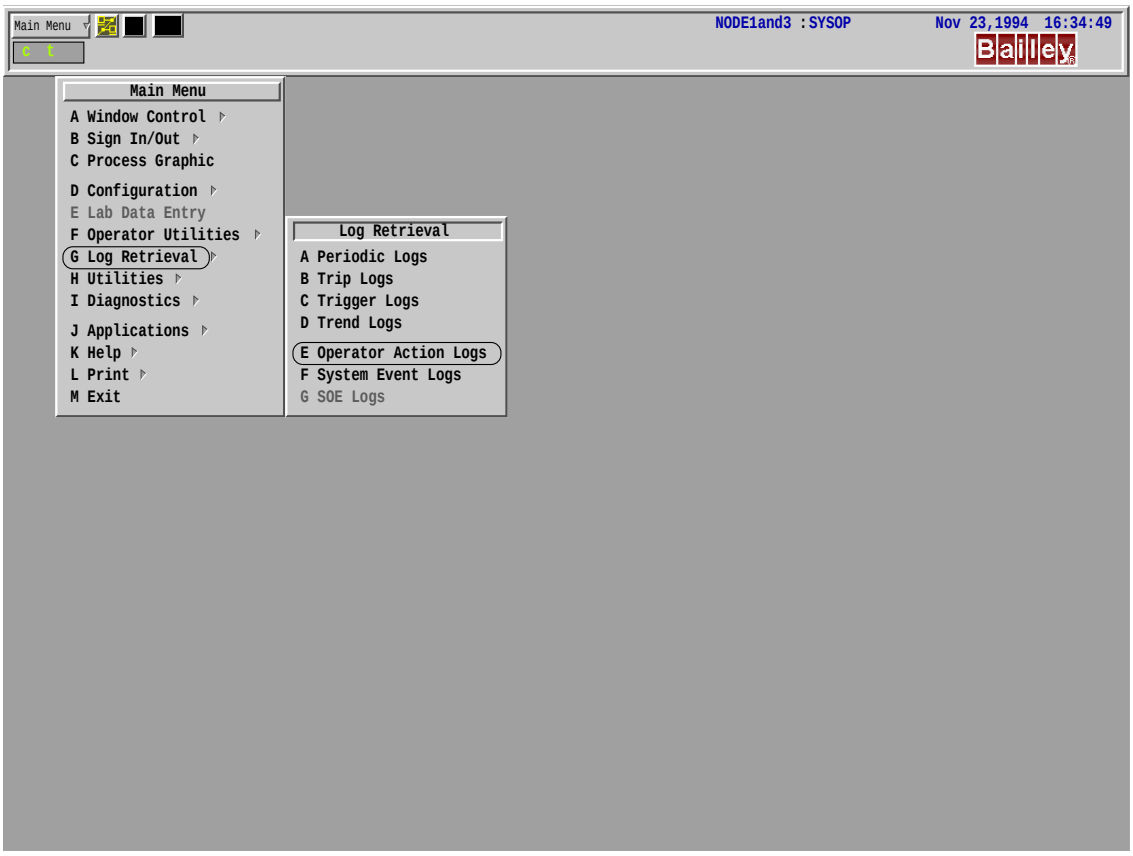


Figure 16-1. Log Retrieval Menu

RETRIEVING SYSTEM EVENTS/OPERATOR ACTION LOGS

Since System Events logs and Operator Action logs operate in an identical fashion, the following instructions refer to Operator Action logs but apply to System Events logs as well.

To view or print an Operator Action log, press **E** from the Log Retrieval Menu to display the Operator Action Logs Retrieval Menu (Figure 16-2), or press **F** to display the System Event Logs Retrieval Menu. Each of these retrieval applications can be selected with the mouse. Move the pointer to highlight the Menu option and press the left mouse button. These menus

allow you to demand the current data in a log and demand any retained or archived data logs.

> **NOTE:** This section only describes the use of log retrieval for the Operator Action Logs. The same functions and descriptions can be applied to the demanding and editing of the System Event Logs retrieval.

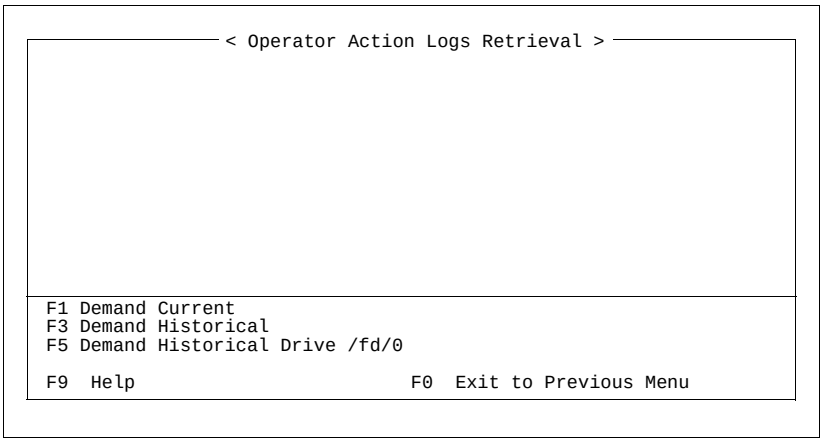


Figure 16-2. Retrieve Operator Action Logs Menu

From this menu there are three options available:

- Print the current log.
- Print or view historical logs (or the current log).
- Print or view archived logs (historical logs stored on floppy disk).

Demanding the Current Log

To demand the current log to the console press <F1> from the Operator Action Logs Retrieval Menu. If the log is large, a message will be printed asking you to wait a moment while the log is generated.

Once the report is generated, it is displayed on the console using the LAN-90 PCV "more" utility. "more" allows you to scroll forwards, backwards, left, or right through the report using the arrow keys.

Exit the "more" utility by pressing <Esc> or <x>.

A retained log named "1991 Mar 27 14:00:00" is the data collected on March 27, 1991 with the period ending at 2:00 pm.

Select the retained log to view or print by using the arrow keys to highlight the name of the file you want.

To print the log on the configured network printer, press <F1>.
To print the log on the parallel printer attached to this node, press <F3>.
To view the log on the console, press <F5>.

Demanding Archived Logs

You can view or print log files archived to floppy disk directly from the floppy disk.

To view or print an archived log, first insert the archive floppy disk in disk drive "/fd/0" then press <F5> from the Operator Action Logs Retrieval Menu. You can then print or view any of the logs listed.

Even though operator actions can be included in the system event logs, the LAN-90 PCV Module Time Stamp only affects the system events (alarms) as operator actions do not have a module time stamp.

If Module Time Stamp is enabled, the time stamp for the system event logs (current or historical) show tenths of a second resolution.

SECTION 17 - LOG TRANSLATION UTILITIES

OVERVIEW

The Log Translation Utilities provide powerful conversion utilities to translate log files to DIF or ASCII format for use in other software packages.

To use this translation utility, you must first define parameters for log translation and then, using the menu-driven utility, you can select the log or logs to translate. You can translate individual logs or use the "wild card" capability to translate a group of logs.

To access the Log Translation Utility:

From the Main Menu, press **H** to access the Utility Menu, then press **E** to access the Translation Utilities Menu (Figure 17-1). The same menus may be selected using the mouse. Move the pointer to highlight the desired menu option and press the right mouse button.

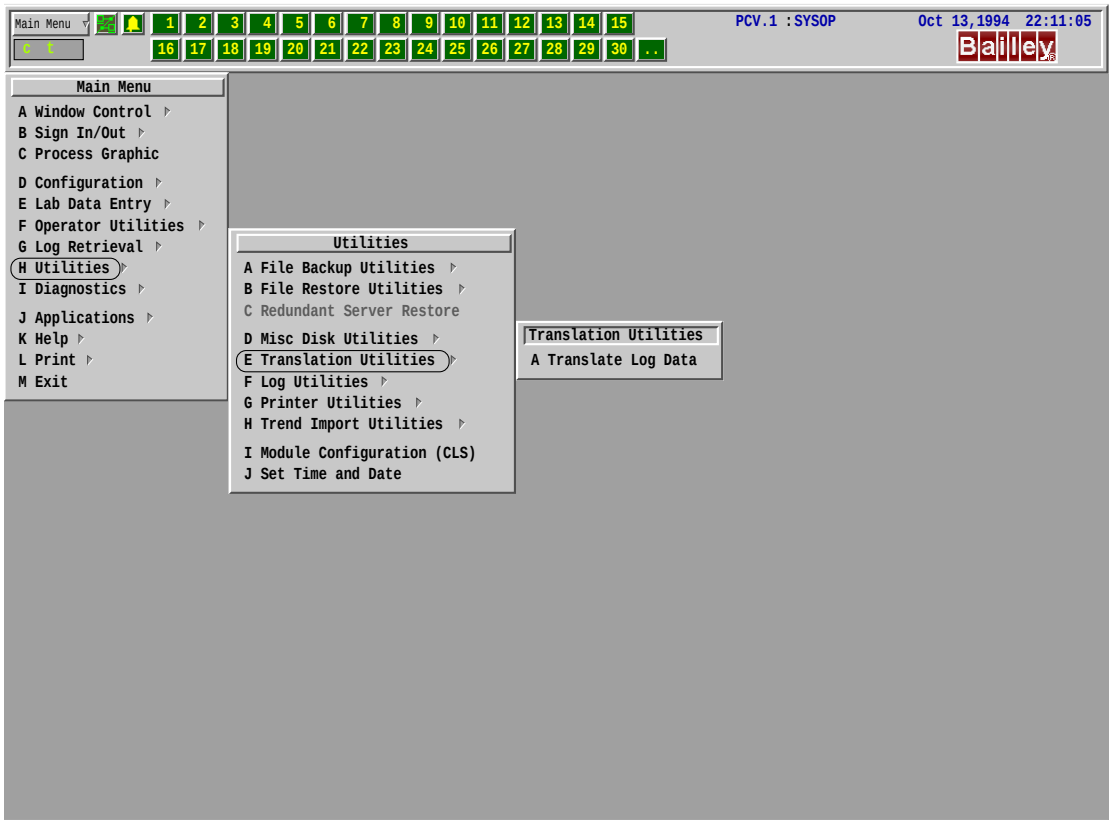


Figure 17-1. Translation Utilities Menu

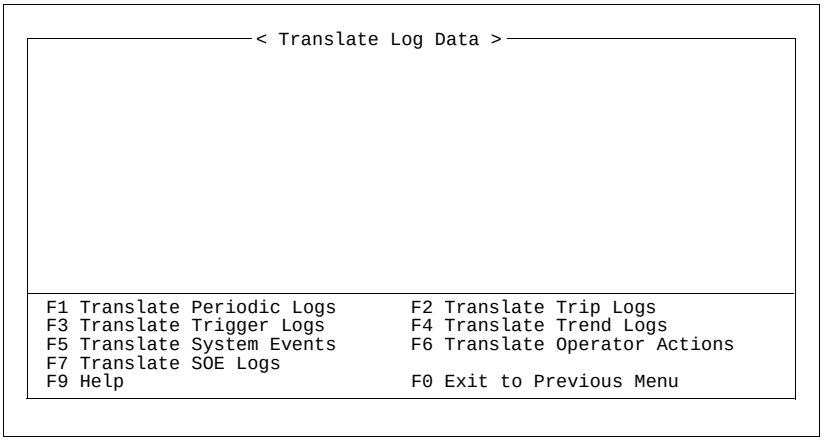


Figure 17-2. Translate Log Data Menu

TRANSLATE SYSTEM EVENTS

NOTE: You can only translate System Events files into ASCII format.

To translate System Events you must first configure the translation parameters.

From the Translate Log Data Menu, press <F5>, Translate System Events, to access the Translate System Events Menu (Figure 17-3).

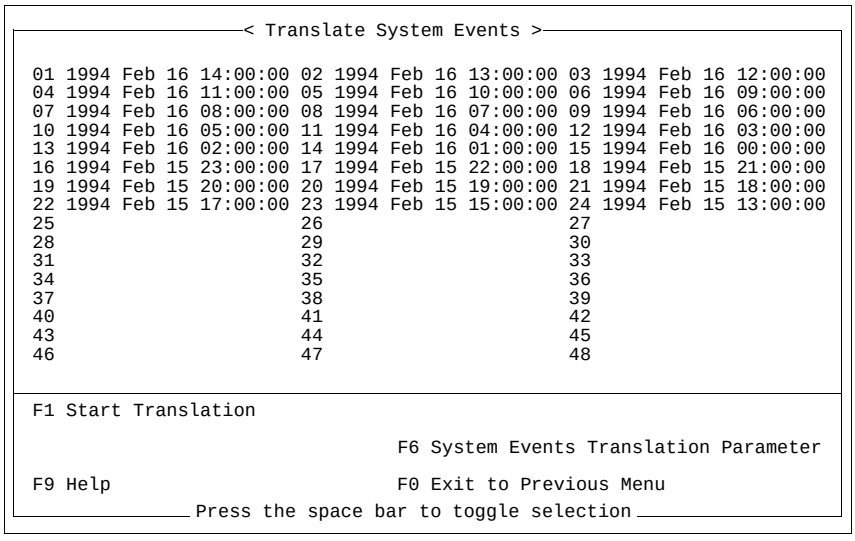


Figure 17-3. Translate System Events Menu

Configure System Events Translation Parameters

Press <F6> from this menu to display the System Events Translation Parameters Menu (Figure 17-4).

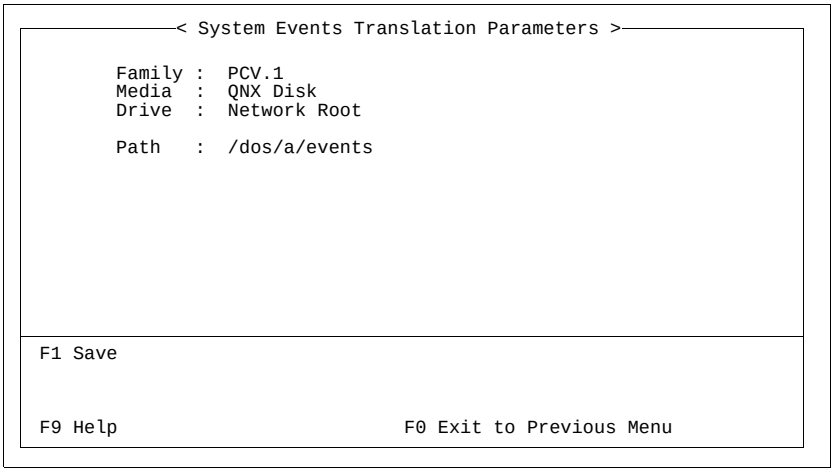


Figure 17-4. System Events Translation Parameter Menu

Table 17-1 describes the fields in this menu.

Table 17-1. Configuring System Events Translation Parameters

Field	Description
Family	Select the server on which to store data files. A window will popup. Use <Ctrl Up>/<Ctrl Dn> to select one of the currently configured file servers.
Media	Select whether the files are stored on a DOS-formatted floppy or a QNX-formatted floppy.
Drive	Enter the drive name where the files are stored. Use <Ctrl Up>/<Ctrl Dn> to select the source drive description.
Path	Enter the directory path of where the files are to be written to.

When you have configured the parameters for translation, press <F1> to save your configuration.

> **NOTE:** If your translation parameters remain constant, you need only configure them once.

Start Translation

Press <F10> to return to the Translate System Events Menu.

To select an individual event for translation use, <Up>/<Down>/<Left>/<Right> the event and then press <F1>.

To select a group of system events to translate, use <Up>/<Down>/<Left>/<Right> to cursor to each event and then press <Space> to select it. Selected events will change in color from green to gray. (To de-select a log, cursor to it and press <Space>. The color will change back to green). When you have

completed your selection process, press <F1> to translate the events.

During the translation process, the log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Logs Menu.

TRANSLATE OPERATOR ACTIONS

NOTE: You can only translate Operator Actions Files into ASCII format.

To translate Operator Actions you must first configure the translation parameters.

From the Translate Log Data Menu, press <F6>, Translate Operator Actions, to access the Translate Operator Action menu (Figure 17-5).

```
                    < Translate Operator Actions >

01 1994 Feb 16 14:00:00 02 1994 Feb 16 13:00:00 03 1994 Feb 16 12:00:00
04 1994 Feb 16 11:00:00 05 1994 Feb 16 10:00:00 06 1994 Feb 16 09:00:00
07 1994 Feb 16 08:00:00 08 1994 Feb 16 07:00:00 09 1994 Feb 16 06:00:00
10 1994 Feb 16 05:00:00 11 1994 Feb 16 04:00:00 12 1994 Feb 16 03:00:00
13 1994 Feb 16 02:00:00 14 1994 Feb 16 01:00:00 15 1994 Feb 16 00:00:00
16 1994 Feb 15 23:00:00 17 1994 Feb 15 22:00:00 18 1994 Feb 15 21:00:00
19 1994 Feb 15 20:00:00 20 1994 Feb 15 19:00:00 21 1994 Feb 15 18:00:00
22 1994 Feb 15 17:00:00 23 1994 Feb 15 15:00:00 24 1994 Feb 15 13:00:00
25                      26                      27
28                      29                      30
31                      32                      33
34                      35                      36
37                      38                      39
40                      41                      42
43                      44                      45
46                      47                      48

F1 Start Translation

                                F6 Operator Actions Translation Par

F9 Help                         F0 Exit to Previous Menu
               Press the space bar to toggle selection
```

Figure 17-5. Translate Operator Actions Menu

Configure Operator Action Translation Parameters

Press <F6> from this menu to display the Operator Actions Translation Parameters Menu (Figure 17-6).

Table 17-2 describes the fields in this menu.

When you have configured the parameters for translation, press <F1> to save your configuration.

NOTE: If your translation parameters remain constant, you need only configure them once.

Press <F10> to return to the Translate Operator Actions Menu.

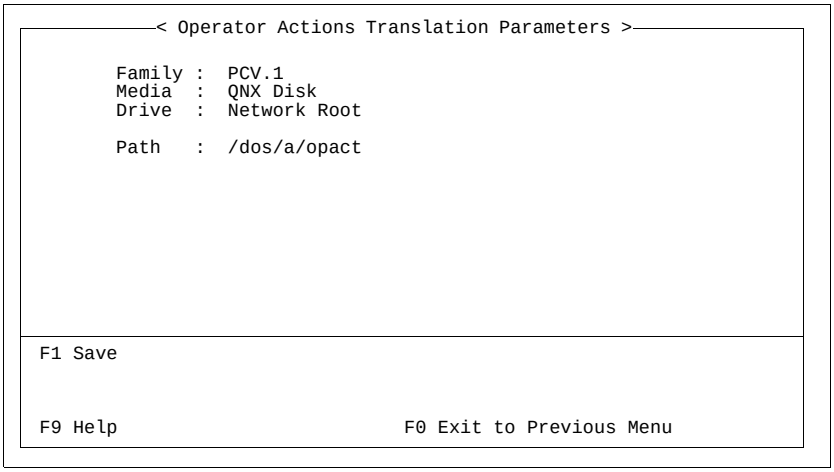


Figure 17-6. Operator Actions Translation Parameters Menu

Table 17-2. Configuring Operator Actions Translation Parameters

Field	Description
Family	Select the server on which to store data files. A window will popup. Use <Ctrl Up>/<Ctrl Dn> to select one of the currently configured file servers.
Media	Select whether the files are stored on a DOS-formatted floppy or a QNX-formatted floppy.
Drive	Enter the drive name where the files are stored. Use <Ctrl Up>/<Ctrl Dn> to select the source drive description.
Path	Enter the directory path of where the files are to be written to.

Start Translation

To select an individual operator action for translation use <Up>/<Down>/<Left>/<Right> operator action and then press <F1>.

To select a group of actions to translate, use <Up>/<Down>/<Left>/<Right> each operator action and then press <Space> to select it. Selected operator actions will change in color from green to gray. (To de-select an operator action, cursor to it and press <Space>. The color will change back to green). When you have completed your selection process, press <F1> to begin translation.

During the translation process, the log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Logs Menu.

SECTION 18 - OPTIONAL LOGGING UTILITIES

INTRODUCTION

The optional logging package consists of the following logging types:

- Periodic Logs
- Trigger Logs
- Trend Logs
- Trip Logs

System Event Logs and SOE Logs are included in the base software.

Periodic and Trigger Logs are configured using the supplied spreadsheet package RIPCAM2. These logs obtain process data from tags and can also perform calculations on this data. Periodic Logs are produced at fixed time intervals while Trigger Logs are produced in response to a trigger condition.

Trend Logs collect data from up to 20 tags and present this data in columns of up to 240 points each.

Trip Logs collect data before and after a trip condition.

SECTION 19 - CONFIGURING PERIODIC AND TRIGGER LOGS

OVERVIEW

Periodic logs collect and print data at regular intervals. Periodic logs are suited for logs required on a regular schedule, such as an end-of-shift log. You can configure up to 64 periodic logs.

Trigger logs collect and print data according to trigger conditions. Using trigger tags, you can define four types of trigger conditions: collect, print, hold, and resume. Data collection begins when a collect trigger condition is detected. Data collection stops and the log printed when a print trigger condition is detected. Trigger logs are suited for batch logging where a batch can start and end at any time. You can configure up to 64 trigger logs.

Periodic and trigger logs are the most powerful and flexible logs. They are both configured using RIPCAM2, a powerful spreadsheet package. In the spreadsheet, you set up special data collection calculations to read tag data. The printed format of the log is completely flexible, there are many data collection types and options, and regular spreadsheet calculations (e.g., sums, averages) can be used to create data not available from tags directly. You can send out (export) log-calculated data to tags for use by other logs, other software applications, or the INFI 90 OPEN/Network 90 system.

LOG SIZING AND DESIGN

Keep the following limits in mind when designing a log format:

- The maximum number of calculation definitions in a log is 100.
- The maximum size of a log is 702 columns by 10000 rows (cell A1 to cell ZZ10000).
- The maximum width of most printers is 132 characters for 8.5" x 11" paper and 200 characters for extra wide paper, using compressed fonts.
- The maximum number of cells required by calculations with TREND or MULTIPLE options is 800.
- The maximum calculation delay time and calculation collect time for trigger logs is 30000 minutes (500 hours).
- The maximum number of calculation groups is 20.

CONFIGURING PERIODIC LOGS

To set up a periodic log, you define the logging parameters of the log, such as the frequency it runs, then you define the format of the log using RIPCAM2.

Press **C** from the Configuration menu to display the Log Configuration menu (Figure 19-1).

Press **B** from the Log Configuration menu to display the Periodic Configuration menu (Figure 19-2).

These same menu selections may be performed with the mouse by moving the pointer to the desired menu item to highlight it and pressing a mouse button.

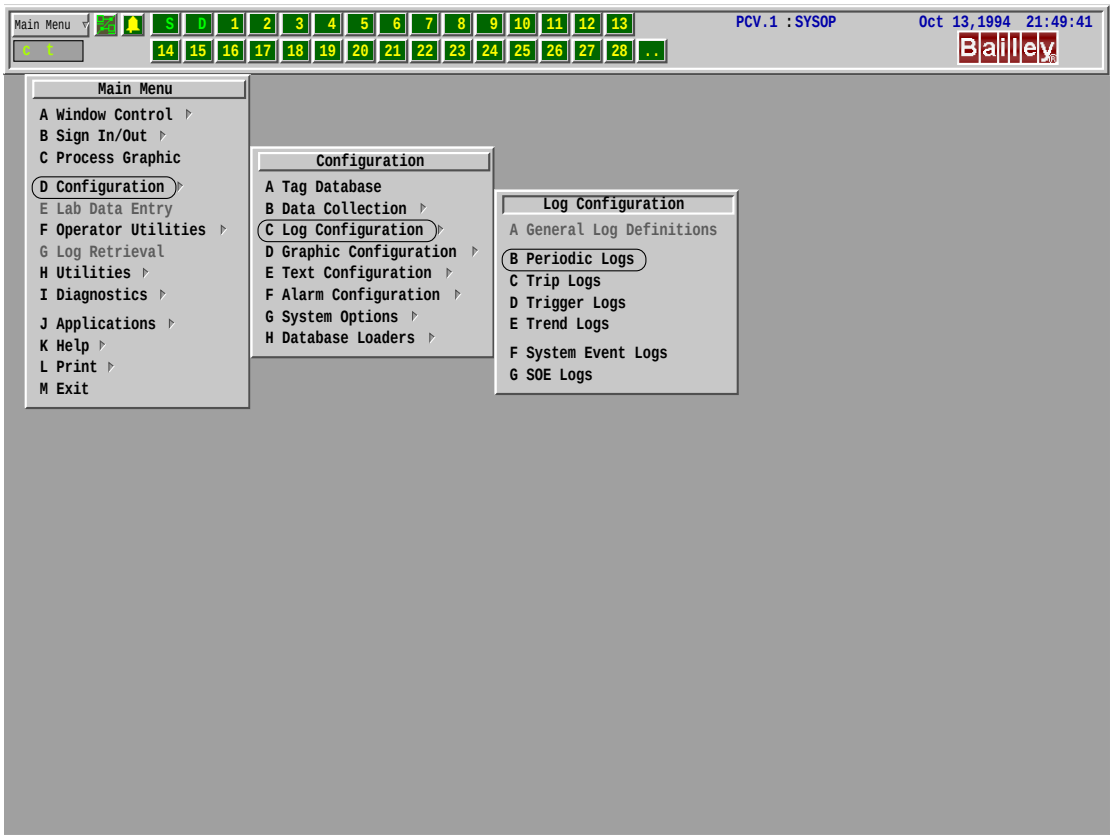


Figure 19-1. Log Configuration Menu

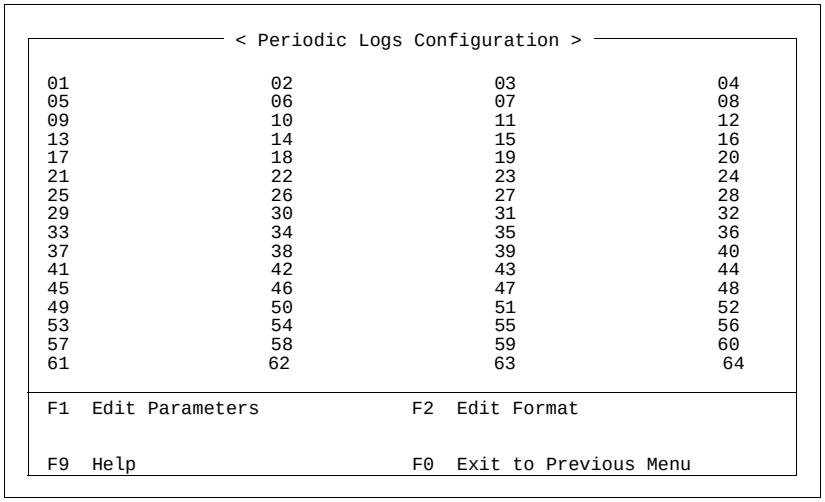


Figure 19-2. Periodic Configuration Menu

Editing Periodic Log Parameters

The periodic log parameters control the printing of each periodic log and number of retained logs.

Use the arrow keys to select the log you want to edit (or create).

<Home> moves the cursor to the first log.

<End> moves the cursor to the last log.

Press <F1> to display the Edit Log Parameters menu (Figure 19-3).

> **NOTE:** You may not have all the information you need to complete the configuration of the log parameters until you have designed the format of the log using the RIPCAM2 spreadsheet. You MUST define the log name and log period before you can edit the log format, but other information can be entered later.

Enter or select the parameters in the fields. The fields are described in Table 19-1.

Press <Enter> to accept your choices.

Remember, you MUST define the log period before you configure the log format. You can enter the other parameters after the log format is configured.

If you change the log period of an existing log, you MUST recompile the log. See ***Recompiling a Log*** for more information.

If you want to print the log, the First Cell to Log, the Last Cell to Log, and the Logging Device parameters MUST be defined. If

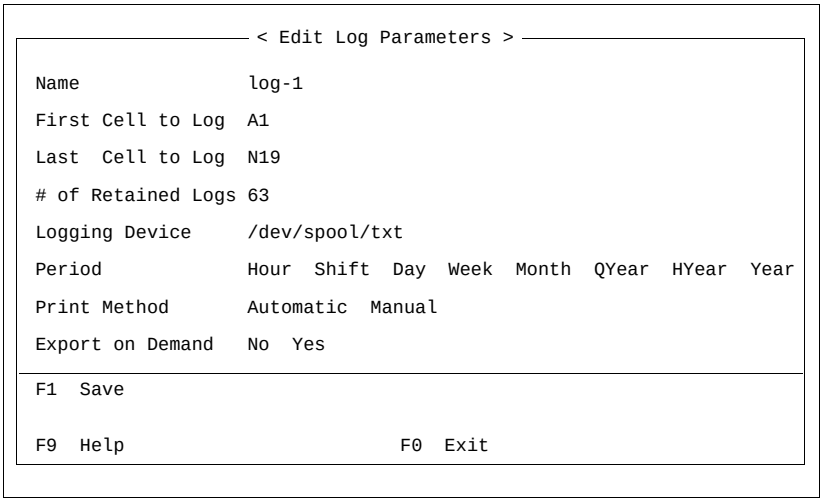


Figure 19-3. Edit Periodic Log Parameters Screen

Table 19-1. Periodic Log Parameters

Field	Description
Log Name	Enter the name of the log, up to 12 characters long. You can deactivate a log by erasing the log name.
First Cell to Log	Enter the upper left cell of the range of the log to be printed. The format is [A-ZZ][1-10000] (e.g., A1).
Last Cell to Log	Enter the lower right cell of the range of the log to be printed. The format is [A-ZZ][1-10000] (e.g., V40).
# of Retained Logs	Enter the number of historical data files that are to be retained on disk (0 to 64). For example, if you enter 3, three historical files plus the current data file would always be kept on disk. When a new data file is written to the disk, the oldest data file is deleted from disk.
Logging Device	Enter the log print device. Device names you can use are: /dev/null Logs are not printed, but historical logs are created. (Leaving the field blank is the same as entering /dev/null). /dev/spool/txt Logs are spooled and printed when the printer is free. This is the preferred device. (Depending on your printer setup, you may have other device names you can use.)
Period	Select the log period by pressing <Right> and <Left>. The log period determines how often the log is retained and printed (for Automatic print method).
Print Method	Select a print method by pressing <Right> and <Left>. If you select Automatic, the log is printed at the end of each log period on the log print device. If you select Manual, the log is not printed at the end of the log period, but the log can still be printed manually from the Log Retrieval menus. A log is ALWAYS retained and values are exported at the end of each log period, regardless of whether the Automatic or Manual print method is selected.

Table 19-1. Periodic Log Parameters (continued)

Field	Description
Export on Demand	Select whether or not the export function will modify the target tag in the tag database. If you select No, exports are NOT performed when the log is demanded. If you select Yes, exports are performed when the log is demanded. However, values are still passed to later logs. If the log does not have any exports, this parameter does NOT affect demanding a log.

these parameters are not defined, only data collection, retaining, and exports will be performed for the log.

To save the parameters, press <F1>.

Exit the menu by pressing <F10>.

Editing the Periodic Log Format

NOTE: The general log definitions and the log period parameter MUST be defined before a log format can be edited.

To edit a log format, from the Periodic Configuration menu select the log to edit using the arrow keys.

Press <F2> to edit the format of the highlighted log.

RIPCAM2 is loaded and the spreadsheet is displayed. If the log is being formatted for the first time, a blank spreadsheet is displayed. If the log has been previously formatted, the current format is displayed.

See ***Editing the Log Format*** for more information on configuring the log format.

To exit without saving your changes, press **\q**.

CONFIGURING TRIGGER LOGS

Trigger logs are based on process events; a process event starts the data collection for a log, another process event stops the collection and prints the log. Trigger logs can be used to generate "batch" style reports.

To configure a trigger log you set the general parameters of the log, such as print regions and trigger tags, then you set up the log format using RIPCAM2.

Press **D** from the Log Configuration menu (Figure 19-1) to display the Trigger Log Configuration menu (Figure 19-4).

```
< Trigger Logs Configuration >

01                  02                  03                  04
05                  06                  07                  08
09                  10                  11                  12
13                  14                  15                  16
17                  18                  19                  20
21                  22                  23                  24
25                  26                  27                  28
29                  30                  31                  32
33                  34                  35                  36
37                  38                  39                  40
41                  42                  43                  44
45                  46                  47                  48
49                  50                  51                  52
53                  54                  55                  56
57                  58                  59                  60
61                  62                  63                  64

F1  Edit Parameters             F2  Edit Format

F9  Help                        F0  Exit to Previous Menu
```

Figure 19-4. Trigger Log Configuration Menu

Editing Trigger Log Parameters

The parameters in this menu control the printing and retaining of logs and define the trigger conditions.

Use the arrow keys to highlight the log you want to edit.

Press <F1> to display the Edit Trigger Log Parameters screen (Figure 19-5).

```
< Edit Trigger Log Parameters >

                            Name  trig_log_01

First Cell to Log A1              # of Retained Logs  5
Last  Cell to Log N17             Print Method       Automatic  Manual
Logging Device    /dev/spool/txt
Batch Collection  No  Yes         Export On Demand   No  Yes

Trigger     Tag Name                   Trigger States

Collect     ana-1              N    *    H   L   HD  LD
Print       ana-1              N    *    H   L   HD  LD
Hold        rcm-3              ZERO  ONE   N   A   *
Resume      rcm-4              ZERO  ONE   N   A   *

<ctrl> <- -> move cursor in field    SPACE BAR  toggle trigger state

F1  Save

F9  Help                        F0  Exit
```

Figure 19-5. Edit Trigger Log Parameters Screen

Enter or select the log parameters. The fields are described in Table 19-2.

Press <Enter> to accept your choices.

Table 19-2. Trigger Log Parameters

Field	Description
Log Name	Enter the name of the log, up to 12 characters long. A log can be deactivated by erasing the log name. Refer to CAUTION regarding Exports.
First Cell to Log	Enter the upper left cell of the print area of the log. The format is [A-ZZ][1-10000] (e.g., A1).
Last Cell to Log	Enter the lower right cell of the print area of the log. The format is [A-ZZ][1-10000] (e.g., V40).
# of Retained Logs	Enter the number of historical data files that are to be retained on disk (0 to 64). For example if 3 were entered, 3 historical files plus the current data file would always be kept on disk. When a new data file is written to the disk, the oldest data file is deleted from disk.
Logging Device	Enter the log print device. /dev/null Logs are not printed, but historical logs are created. Leaving the field blank is the same as entering /dev/null. /dev/spool/txt Logs are spooled and printed when the printer is free. This is the preferred device. Depending on your printer setup, you may have other devices.
Print Method	Select a print method by pressing <Ctrl Right> and <Ctrl Left>. If Automatic is selected, the log is printed at the end of each log period. If Manual is selected, the log is not printed at the end of the log period. The log can be printed manually from the log retrieval menus. A log is ALWAYS retained and exporting is performed at the end of each log period, regardless of whether the automatic or manual print method is selected.
Export on Demand	Select whether or not exports are performed when a log is demanded by pressing <Ctrl Right> and <Ctrl Left>. If you select No, exports are NOT performed when the log is demanded. If you select Yes, exports are performed when the log is demanded. If the log does not have any exports, this setting has no effect.
Batch Collection	Select whether or not to use batch collection for the log by pressing <Ctrl Right> and <Ctrl Left>. Batch collection allows data to be collected for a number of batches during the data collection of the log.
Tag Name	Enter the name of the tag you want to use as a trigger. Up to four different trigger tags can be set up. If Batch Collection has been set to No, the triggers are: Collect, Print, Hold, and Resume. If Batch Collection has been set to Yes, the triggers are: Collect, Print, Start Batch, and End Batch. See ***Regular Trigger Log Triggers*** and ***Batch Trigger Log Triggers*** for more information on triggers.
Trigger States	For each trigger tag you set up, select the tags states that act as the triggers. You can select more than one state. Move between states by pressing <Ctrl Right> and <Ctrl Left>. Toggle the selection of the currently highlighted state by pressing <Space>. Analog-type tags can use any of the following trigger states: N - normal, L - low alarm, * - bad quality, HD - high deviation, H - high alarm, LD - low deviation; Digital-type tags can use any of the following trigger states: ZERO - zero logic state, A = digital alarm, ONE - one logic state, * - bad quality N - normal alarm, (Note, the logic and alarm state descriptions used for the states may differ from those shown above, depending on your configuration).

You must define the log name before you can configure a trigger log format. The other parameters can be defined after you configure the log format.

For a log to be printed, the First Cell to Log, the Last Cell to Log, and the Logging Device parameters MUST be defined. Otherwise, only data collection, retaining, and exports will be performed for the log.

Save your changes by pressing <F1>.

To exit from the Trigger Log Parameters screen, press <F10>.

Regular Trigger Log Triggers

For regular trigger logs (Batch Logging is set to No), there are four different types of trigger tags: Collect, Print, Hold, and Resume. Table 19-3 describes the four regular trigger log triggers.

Table 19-3. Trigger Types

Trigger Type	Description
Collect	The collect trigger tag defines the trigger conditions for data collection. Data collection for the log starts when any of the selected trigger states is detected for the collect trigger tag.
Print	The print trigger tag defines the trigger conditions for log printing. The log is printed when any of the selected trigger states is detected for the print trigger tag. The log does NOT have to be previously collecting data to be printed. The current data for the log is printed each time a print trigger state is detected. Data collection STOPS after a print trigger state is detected. Data collection is reset when the next collect trigger tag is detected. Data from the previous collection period is NOT carried over to the next collection period.
Hold	The hold trigger tag defines the trigger conditions for holding data collection. Data collection is suspended for the log when a hold trigger state is detected. During the hold time, the timing for the log is also suspended. Thus delay or collect times are not affected during a hold period.
Resume	The resume trigger tag defines the trigger conditions for resuming data collection. Data collection is resumed for the log when a resume trigger state is detected. Data collection resumes as if the hold time had not occurred.

At the very least, a Print trigger is required. If only a Print trigger is defined, the log is printed when the Print trigger occurs; there is no data collection.

To collect data for a trigger log, you must define BOTH a Collect trigger and a Print trigger. Data collection would continue forever if there was no print trigger to stop the collection.

To hold data collection during a log, you must define BOTH a Hold trigger and a Resume trigger. A Hold trigger is ignored if the Resume trigger is not specified.

Batch Trigger Log Triggers

Batch collection allows data to be collected for a number of batches during the data collection of the log (see ***CALCULATION TYPES AND OPTIONS*** in Section 20.

To collect batch information in a trigger log, you must set the Batch Collection field to Yes.

If you select Batch Collection, the Hold trigger becomes the Batch Start trigger and the Resume trigger becomes the Batch End trigger. The Batch Start trigger defines the conditions for signalling the start of a batch.

The Batch End trigger defines the conditions for signalling the end of a batch.

When the Collect trigger is detected, the batch count for the log is reset to 0 and data collection for the log is held until the first Batch Start trigger is detected.

When each Batch Start trigger condition is detected, the batch count is incremented and data collection is started for a new batch.

When the Batch End trigger is detected, data collection is ended for the batch.

The Collect trigger condition MUST be detected before any Batch Start trigger can be detected.

A Batch End trigger MUST be detected before a new batch can begin.

When the Print trigger is detected, any current batch data collection is ended and the log is printed.

Data collection is NOT performed in between batches.

A Start batch trigger and an End batch trigger MUST both be defined for batch data collection to occur. A Start Batch trigger or an End Batch trigger tag is ignored if both trigger tags are not specified.

Data collection hold and resume are NOT available if batch collection is selected.

Editing the Trigger Log Format

NOTE: The general log definitions and the trigger log parameters MUST be defined before a log format can be edited.

To edit a log format, display the Periodic or Trigger Logs window with the Periodic or Trigger Logs Configuration application menu. Use the arrow keys to highlight the log you want to edit, then press <F2>.

RIPCAM2 is loaded and the spreadsheet is displayed. If the log is being formatted for the first time, a blank spreadsheet is displayed. If the log has been previously formatted, the current format is displayed.

See ***USING RIPCAM2 TO EDIT LOG FORMATS*** for more information on configuring the log format.

To exit without saving any changes, press **/q** and answer **y** to the prompt.

USING RIPCAM2 TO EDIT LOG FORMATS

This section describes how to define the log formats using the RIPCAM2 spreadsheet. For complete details on the use of RIPCAM2, refer to the RIPCAM2 manual provided.

Editing the Log Format

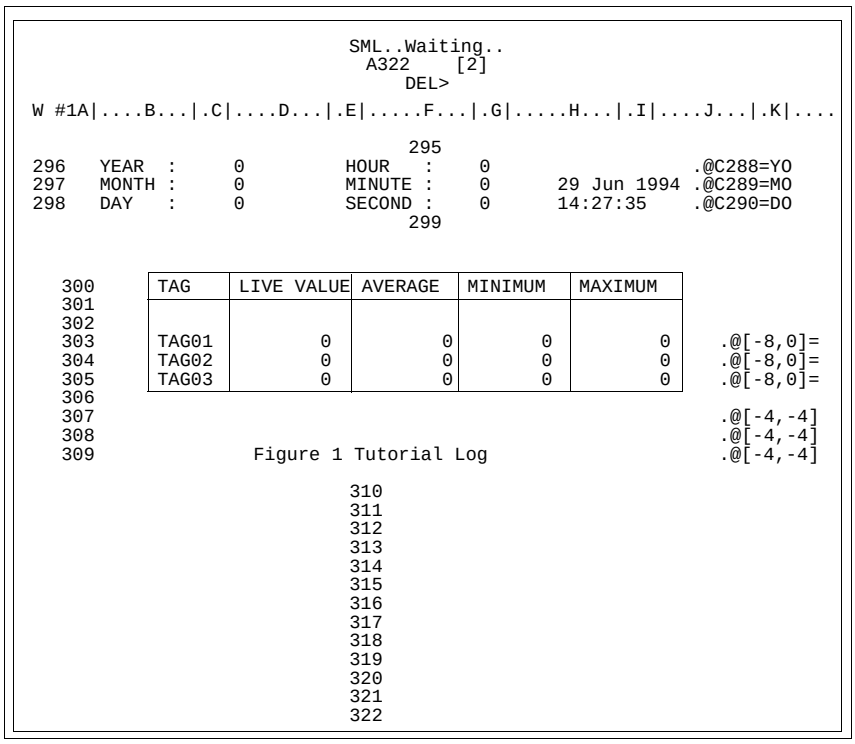
> **NOTE:** The general log definitions and the log parameters described in ***Editing Periodic Log Parameters*** and ***Editing Trigger Log Parameters*** MUST be defined before a log format can be edited.

To edit a log format, display the Periodic or Trigger Logs window with the Periodic or Trigger Logs Configuration application menu. Use the arrow keys to highlight the log you want to edit, then press <F2>.

RIPCAM2 is loaded and the spreadsheet is displayed. If the log is being formatted for the first time, a blank spreadsheet is displayed (Figure 19-6). If the log has been previously formatted, the current format is displayed (an example log format is shown in Figure 19-7).

The RIPCAM2 spreadsheet is a grid of cells where each cell is referred to by a column letter and a row number. The first cell in the spreadsheet is cell A1; the last cell in the spreadsheet is cell ZZ10000. This gives a spreadsheet of 702 columns by 10000 rows. The width of each column can be set to any size between 0 and 60.

You can move the cursor around the spreadsheet by using the arrow keys and the <PgUp> and <PgDn> keys. You can go directly to a specific cell by pressing <Tab>, then entering the cell you want at the prompt.



TAG	LIVE VALUE	AVERAGE	MINIMUM	MAXIMUM

Figure 1 Tutorial Log

Figure 19-6. Edit Log Format RIPCAM2 Spreadsheet

The first line on the screen is the system message line (SML) which is used by the menu functions to prompt for input. The first line is also used to display the available keyboard macros.

The second line displays the contents of the current working cell (CWC), the highlighted cell on the spreadsheet. The second line also displays the menu line.

You can toggle the menu line by pressing the **/** (forward slash) key. You can select menu items by pressing the first letter of the item or moving the cursor over the item and then pressing <Enter>.

The menu functions are used to edit and change the format of the spreadsheet. For example, to change the width of a cell, press **/CW**. To cancel a menu function press <Esc> or **/**.

The third line on the screen is the Data Entry Line (DEL) where you enter expressions, numerical cells and input requested by the menu functions.

A spreadsheet consists of string cells and numeric cells. String cells contain text strings and numeric cells contain numbers such as 10.0 or numeric expressions such as SUM(A1..A10).

> **NOTE:** You should design the format of a log on paper before entering RIPCAM2. For a good introduction to designing log formats, refer to Section A - Periodic Log Tutorial. After reading the following section you will be able to do the tutorial.

A log format consists of two areas: a print area and a calculation area.

The print area is the range of the spreadsheet that will be printed after each log period. You will decide how much of the spreadsheet will be printed as you design the log format. The print area is defined by the First Cell to Print and the Last Cell to Print in the Edit Log Parameters screen. In the example log (Figure 19-7) the print area lies between cells A1 and I23.

The calculation area contains the calculation definitions. The calculation area can be anywhere outside the print area. Usually it is to the right of the print area. In the example log (Figure 19-7), the calculation area starts from column J.

You must perform four main operations when formatting a log as follows:

1. Enter titles and descriptive text as string cells to create the appearance of the printed log.

2. Enter the spreadsheet constants and expressions as numeric cells.

3. Enter the calculation definitions as string cells and define the destination cells of the calculation definitions as either numeric or string cells.

4. Save the completed log format (also referred to as the model file). The model file provides the template used to print the log after each log period as defined by the log parameters.

Entering String Cells

Titles, borders, and the extended RIPCAM2 calculation definitions in a log are entered as string cells.

To enter a string, position the cursor over a cell, then press one of the following keys to begin the string and to obtain the desired appearance:

- ' (single quote) to left justify the text in the cell
- " (double quote) to right justify the text in the cell

- **^** (caret) to center justify the text in the cell

After pressing one of the above keys, type the text you want, then press <Enter>.

If you forget to press a string-justification key (', **^**, or "), any characters you type will appear on the third line of the screen instead of in the cell. To return to the spreadsheet, press <Esc>, then start again by pressing one of the string-justification keys.

To edit an existing string cell, position the cursor over the cell, then press a string-justification key (', **^**, or "). Move the cursor within the cell using <Left> and <Right>, make any changes, then press <Enter>.

Entering Numeric Cells

Numeric cells contain either a numeric constant (number) or a numeric expression, which is calculated by the spreadsheet. You enter numeric cells by positioning the cursor over a cell, then typing the number or numeric expression. The characters you type are displayed on the third line (DEL line). Numeric expressions are calculated by RIPCAM2 when the log is printed or demanded.

Entering Calculation Definitions

A calculation definition is a text string with a special format that indicates how live tag data is collected, calculated, and written to the spreadsheet, and written to the database. Unlike numeric expressions, which are calculated by RIPCAM2 in the spreadsheet, tag calculations are performed by a calculation executive task. The results of the calculations appear only in a printed or demanded log or when an historical log is edited. The types of available calculations are listed in Section 20 - Log Calculation Reference.

Calculation definitions are entered as string cells in the calculation area of the spreadsheet (usually to the right of the print area).

Calculation definition strings start with an "at" (@) character to distinguish them from regular string cells.

> **NOTE:** Calculation definitions can be entered in uppercase or lowercase. However, the tag name is case sensitive and must be entered exactly as it appears in the tag database.

The format of a calculation definition is:

*@cell = [tagname ,] calculation_type [, option]**

where:

cell The cell to store the result of the calculation definition in. This can be an absolute cell address (example: C1) or a relative cell address (example: [-2,0]).

tagname The name of the database tag to be used in the calculation. This tag MUST already be defined in the tag database. The tag name is required for all calculation types which process data from the Network 90/INFI 90 OPEN system. The tag name is case sensitive and can contain embedded blanks (e.g., STA 01) but not commas.

calculation_type The type of calculation to perform. Table 19-4 lists the available calculation types. Calculation types are described under Section 20 - Log Calculation Reference.

option Options for the calculation type are dependent on the calculation type and the log type. The available options are listed in Table 19-5. See Section 20 - Log Calculation Reference for more information. More than one option can be specified in a calculation definition. The options are separated by commas.

Table 19-4. Calculation Types

Calculation Type	Description
Average, A	Averages a tag's value over the calculation period.
Batch of Log, BOL	Records the current batch number for a trigger log.
Control by Station, CON	Calculates the percentage of the collection time that a station tag was in control (automatic mode).
Date and Time types	There are several calculation types for recording the date and time, such as day of month (DOM), and month of year (MOY).
Export, EX	Exports the value from a spreadsheet cell to a tag in the tag database at the end of the log period. The export type is used to send values to other logs or to the Network 90/INFI 90 OPEN system. (only for periodic logs).
Import, IM	Imports the value of a tag in the tag database at the end of the log period. The import type is used to obtain values from other logs. (only for periodic logs).
Integration, IN	Integrates (totals) a tag's value over the calculation period.
Length of Collection, LEN	Records the length of the collection time in minutes.
Limits (Tag Within), LIM	Calculates the percentage of time over the collection period that a tag was in a normal state (i.e., not in an alarm state or bad quality).
Live, L	Records the current value of the source point after each sample period during the calculation period.
Maximum, MA	Records the maximum value sampled over the calculation period.
Minimum, MI	Records the minimum value sampled over the calculation period.
Standard Deviation, SD	Calculates the standard deviation of a tag's values over the calculation period.

Table 19-4. Calculation Types (continued)

Calculation Type	Description
Status of Tag, ST	Records the status of the tag over the calculation period.
Text Message, TXT	Writes the text message referenced by the text tag value or a constant value. Text messages are configured in the Text Tag Message database.
Root Mean Squared, RMS	Calculates the root mean square of the station tag over the calculation period.

Table 19-5. Calculation Options

Calculation Option	Description
Batch Number, B	Specifies that the calculation is to run for a specific batch number (trigger logs only).
Collection Period, C	Specifies the number of minutes to collect data for the calculation in trigger logs.
Delay Calculation, D and PD	Specifies a delay to wait for before starting data collection for the calculation (periodic logs only). The delay is specified as a clock time (D) or an offset within the log (PD).
Delay Calculation, D	Specifies the number of minutes to delay before starting data collection for the calculation in trigger logs.
Error Mode, ER	Specifies the value to use for a tag in the event of erroneous tag values being retained.
Group Primary, GP	Specifies the primary calculation of a calculation group. All secondary calculations belonging to the same group are run at the same time the primary calculation runs.
Group Secondary, GS	Specifies a secondary calculation of a calculation group. All secondary calculations belonging to the same group are run at the same time the primary calculation runs.
Multiple Values, MU	Specifies the number of values to store in the log for Maximum and Minimum calculation types.
Number of Text, NUM	Specifies the text message index number to be used for the text calculation type.
Period for Calculation, P	Specifies the collection period of the calculation (periodic logs only).
Rate of Sampling, R	Specifies the rate of sample collection for the calculation.
Scale, S	Specifies the scale factor used in the Integration calculation type.
Trend, TR	Specifies a trend of values is to be stored in the log.
Trigger Log End Value, TE	Specifies data is to be collected for the calculation only once when the print trigger occurs (trigger logs only).
Trigger Log Start Value, TS	Specifies data is to be collected for the calculation only once when the collect trigger occurs (trigger logs only).

Columns containing calculation definitions should be widened to 20 or 30 characters using the RIPCAM2 Cell Width menu function. Calculation definitions will then fit in the cell and horizontal scrolling of the spreadsheet will be much faster.

Figure 19-7 illustrates a finished log format.

```
SML>MACROS:  \ s SAVE  e SAVE AND EXIT  q QUIT  m MACROS
A1     [1]
DEL
W# 1A|....B..|C||E||G|.....-...|I|.... J..|.....K..|.....L..|....
1     Date      0/ 0/ 0                    @C2=YOC,ER=D
2     Time      0: 0: 0   HOURLY           @E2=MOY,ER=D
3     Shift Of Day   0   LOG 001          @G2=DOM,ER=D
4     Week Of Year   0   EXAMPLE          @C3=HOD,ER=D
5     Day Of Week    0                    @E3=MOH,ER=D
6                                         @G3=SOM,ER=D
7                                         @G4=SOD,ER=D
8                                         @G5=WOY,ER=D
9   CALCULATION          VALUE            @G6=DOW,ER=D
10
11  Average                0.000         @H11=Sample_Tag,A,R=1MIN,ER=D
12  Total                  0.000         @H12=Sample_Tag,IN,R=1MIN,ER=D
13  Minimum                0.000         @H13=Sample_Tag,MI,R=1MIN,ER=D
14  Maximum                0.000         @H14=Sample_Tag,MA,R=1MIN,ER=D
15  Live                   0.000         @H15=Sample_Tag,L,R=1MIN,ER=D
16  Status                     x
17  Standard Dev            0.00         @[-3,-1]=Sample_Tag,ST,R=1MIN,ER=D
18  % in Limits             0.00%        @[-3,-1]=Sample_Tag,SD,R=1MIN,ER=D
19                                        @[-3,-1]=Sample_Tag,LIM,R=1MIN,ER=D
20  % in Control             0.0         @[-3,0]=STATION_Tag,CON,R=1MIN,ER=D
21  Text                xxxxxxxxxx        @[-3,0]=TEXT_TAG,TXT,R=1MIN,ER=D
22  Import                 $0.00         @H22=CALC_IN,IM
23  Export                 $0.00         @H23=CALC_OUT,EX
24                                        @[-3,1]=LEN,R=1MIN
25  Collection Time              0
26
```

Figure 19-7. Example Periodic Log Format

Examples in Figure 19-7:

@C2=YOC,ER=D
This calculation stores the current year of the century in cell C2.

@H11=Sample_Tag,A,R=1MIN,ER=D

This calculation stores the average value of the tag, Sample_Tag, in cell H11. The collection rate of this calculation is 1 minute, meaning the resultant value put into the spreadsheet is the average of one minute samples of Sample_Tag taken from the start of the log period.

@[-3,-1]=Sample_Tag,SD,R=1MIN,ER=D
This calculation will display the standard deviation for one minute samples of Sample_Tag. The resultant value is placed in the cell three columns to the left and one row up, cell H18.

@H22=CALC_IN,IM
The value of CALC_IN will be placed into cell H22 when the log is demanded.

@H23-CALC_OUT,EX
The value in cell H23 will be made the current value of the tag CALC_OUT when the log is demanded (if export on demand is permitted) or when the log ends and the data is retained to the hard disk.

Saving the Log Format and Exiting RIPCAM2

You save the model file and exit RIPCAM2 using keyboard macros. A keyboard macro is a preprogrammed sequence of key strokes that you run by pressing the macro key (the backslash key, \) then another key. The following keyboard macros are used to save the model file and exit from RIPCAM2:

\s Save the model file. The model file is saved to disk, and you remain in RIPCAM2.

\e Save the model file and exit from RIPCAM2. The model file is saved to disk, and you exit from RIPCAM2.

\q Exit RIPCAM2 without saving the model file. Any changes to the model file are discarded, and you exit RIPCAM2 immediately. You are NOT prompted to confirm the quit so take care when using this macro. You ARE prompted to confirm the quit when Quit is selected from the menu line.

\m Display macros on prompt line. If the prompt line has been cleared, you can redisplay the macro prompt by using this macro.

To use the above macros, press \ (the backslash key) then the letter of the macro. For example to save the model file and exit, press **\e**.

> **NOTE:** If you are using an MKM keyboard there is no backslash key available. Use the {Clear} key instead.

Keyboard macros ARE case sensitive. You MUST enter the letters in lowercase. If a macro does not appear to work, make sure that your keyboard does not have the CapsLock on.

The above macros are displayed on the first line of the spreadsheet when you first select a log format for editing. This line may disappear while you edit the log format, but you can be redisplay the prompt by pressing **\m**.

> **NOTE:** DO NOT use the File Save Model option from the menus to save the RIPCAM2 log sheet. The log model will NOT be saved to the correct file and will NOT be compiled. You MUST save the model by using the keyboard macros described above (**\s** or **\e**).

After you exit RIPCAM2, the saved model file is compiled. The compiler checks each calculation definition for proper syntax. Any cells with errors are displayed and the error is pointed out as follows:

```
                Checking model file

Error in Cell C1     :  Undefined Tag specified
                         v
                @A1=tag--1,A

Error in Cell C2     :  Undefined Tag specified
                         v
                @A2=TAG001,IN

Error in Cell C3     :  Invalid option for log type
                         v
                @3=ana-1,C=7

   Press:  r      to return to ripcam2,
           <esc>  to abort all changes,
           or any other key to continue >
```

Figure 19-8. Log Configuration Errors

After all errors have been displayed, you are given the option to return to RIPCAM2 by pressing **r**, canceling the compilation by

pressing <Esc>, or continuing the compilation by pressing any other key (Figure 19-8). If you press **r**, you return to RIPCAM2 to correct any errors in calculation definitions. If you press <Esc>, the log compile is canceled, and the original log format is restored. If you press any other key, the log compilation continues. If no errors are detected, the log compilation continues and you will not be given the above options.

> **NOTE:** The log formats you save while editing do not replace the existing log format until they have been completely compiled. If you press <Esc> to cancel a compile, ALL the changes you made since you first began to edit the format of the log will be LOST, no matter how many times you re-entered RIPCAM2 to correct errors. The original log format will be left intact.

After you have checked all calculation definitions, a number of log format files are either created (if the log format is being configured for the first time) or reformatted (if the log format is being changed). A log will still be compiled even if you do not correct the errors, unless you cancel the compile. The log compilation is finished when the *Press Any Key to Continue* message appears after all log format files have been created or reformatted. It can take more than five minutes for a large model file to compile.

Recompiling a Log

To recompile a log without making changes to the log format, select Edit Format for the log from the Periodic or Trigger Configuration menu. After the log format is displayed, press **\e**. This saves and recompiles the log model without any changes. A log MUST be recompiled if the period of the log has been changed in the log parameters. When a log is recompiled because of a format or log period change, the current data for any unchanged calculations are retained and the current data for any changed calculations are cleared.

If you have several logs to recompile the Compile All Periodic Logs function is available. Access it through Main Menu, Utilities, Compile All Periodic Logs.

CAUTION	**After restoring a configuration, it is necessary to recompile all periodic logs.**

LOG SIZING AND DESIGN

Keep the following limits in mind when designing a log format:

- The maximum number of calculation definitions in a log is 100.

- The maximum size of a log is 702 columns by 10000 rows (cell A1 to cell ZZ10000).
- The maximum width of most printers is 132 characters for 8.5" x 11" paper and 200 characters for extra wide paper, using compressed fonts.
- The maximum number of cells required by calculations with TREND or MULTIPLE options is 800.
- The maximum calculation delay time and calculation collect time for trigger logs is 30000 minutes (500 hours).
- The maximum number of calculation groups is 20.

IMPLEMENTING LONG TERM LOGS

The implementation of short term (hourly, shift, and daily) logs is simple and straightforward: all the logs fetch their data directly and calculations are performed by each individual log. All tag values in a given log are read from the INFI 90 OPEN/ Network 90 system and are either averaged, totalled, scanned for a minimum, maximum, or for a single value during the log period.

Long term logs can be configured in exactly the same way as the short term logs. For example, a yearly log would scan individual values over a period of one full year. The problem with this approach is that the log data cannot be edited before the log period is over. For instance, a mid-year field sensor problem that causes erroneous data to be logged for a few hours or days cannot be edited or adjusted until the yearly log is ready, six months later. You would then edit the historical log to correct the problem, then demand a reprint.

An alternative approach, that requires slightly more planning, but allows you to correct errors in the long-term log before it is finished, is to base the long-term logs on data gathered by short-term logs.

For example, a monthly log can obtain data from one or more daily logs. In such an arrangement, the daily log for the first day of the month sets the monthly total to zero, reads live data from the current day, adds the live data to the monthly total, and exports the new monthly total at the end of the day. The next day, the same daily log imports the monthly total from the previous day, reads live data for the current day, adds the live data to the imported total, and exports the total to the next day. This continues for each day of the month and provides month-to-date calculations. On the last day of each month, the monthly log imports the monthly total exported by the daily log on the same day. Spreadsheet logic is used to reset the monthly total to zero on the first day of the month and to

import the monthly total from previous logs on the subsequent days of the month.

To show how this allows you to correct an error before the long-term log period is finished, suppose today is January 20 and a flow sensor had broken down for 3 hours on January 15. The daily total volume for the January 15 log will be inaccurate and so will the monthly total. To correct the situation, simply edit the January 15 daily log, correcting the erroneous values. Then demand the January 15 daily log to export the corrected values, then demand the daily logs for each successive day up to the current day in order to import the corrected monthly totals, add the values for that day to the monthly totals, and export the corrected monthly totals. This carries the correction from January 15 through to the current day. At the end of the month, the monthly log will import the correct values and print a correct report. Similarly, a yearly log can be corrected by fixing the daily logs.

Note that for this approach to work, the Export on Demand parameter MUST be enabled for the short-term log, and the number of retained logs for the short-term log should be sufficient to cover the time span of the long-term log. If a daily log was used to collect values for a monthly log, the daily log must be set to export on demand, and the number of retained files should be 31.

If a tag value is exported by one log and imported by another log, the exporting log MUST have a lower log index number (as seen in the Periodic or Trigger Log Configuration) than the importing log. This is because individual logs are processed in order of their log indexes. For example, log 7 can import data from log 1 to log 6 only. If this order is not observed, then the import values will be the values exported at the end of the previous period.

Example Implementation of a Long Term Log

This example demonstrates how a monthly log can get data from a daily log so that the values can be edited at any time. The first log, the daily log, reads the current monthly total and alters its value daily, while the second log, the monthly log, reads the monthly total for report purposes. The following test tags are configured in the database:

Tag Name	Description	Loop	PCU	ModBlk	Type
TotalM	Monthly Total	0	0	0	IntAnalog
TotalD	Daily Total	x	x	x	Analog

(x represents a system dependent value.)

The daily log contains the following format configuration:

```
  |.........A.........| ......B.....| . . .| ...................Q...................|
1|             0.000                          @A1=TOTALM,IM
2|                 0                           @A2=DOM
3| IF(A2=1,0,A1)
4|             0.000                          @A4=TOTAL,A,R=2M
5|    SUM(A3..A4)                              @A5=TOTALM,EX
```

Cells A3 and A5 contain RIPCAM2 expressions (not strings).

The calculation in cell Q1 imports the value of the internal tag TOTALM in cell A1.

The calculation in cell Q2 loads the day of the month into cell A2.

Cell A3 contains the total of the month to date. If the day of the month in cell A2 is 1 the total becomes 0. This clears the total on the first day of each month.

The calculation in cell Q4 loads the average of the tag TOTALED in cell A4 every two minutes.

Cell A5 contains the monthly total plus the calculated daily total which becomes the new monthly total.

The calculation in cell Q5 exports the new monthly total to internal tag TOTALM at the end of the day when the daily log is retained.

The monthly log contains the following calculation to import the monthly total into the log:

```
  |.........A.........| ......B.....| . . .| ............Q............|
1|             0.000                        @A1=TOTALM,IM
```

The calculation in cell Q1 loads the monthly total exported by last daily log of the month into cell A1.

Now the daily log displays the running sum for each day of the month and the monthly log displays the final total at the end of each month.

> **NOTE:** The monthly log MUST have a higher log index number than the daily log because the logs are run in order of their log index. This ensures the value of TOTALM being correct for the monthly log according to the calculation performed by the daily log.

TIPS ON USING RIPCAM

Relative Addressing

Relative addressing is an alternative to absolute cell reference as a means of specifying the destination cell in a calculation definition. Relative addressing has the following syntax:

[column_offset, row_offset]

For Example. in the following calculation definition,

@[-8,0]=TAG01,MA,R=2M

[-8,0] is the relative address. If the above calculation is specified in cell L19 of the spreadsheet, the maximum value of TAG01 is stored 8 cells to the left of cell L19 in cell D19. The destination cell is determined as follows:

(L + -8)(19 + 0) = D19

In the following calculation definition,

@[-8,-1]=TAG01,MA,R=2M

[-8,-1] is the relative address. If the above calculation is specified in cell L19 of the spreadsheet, the maximum value of TAG01 is stored eight cells to the left and one cell up from cell L19 which is cell D18. The destination cell is determined as follows:

(L + -8)(19 + -1) = D18

Relative addressing allows you to move blocks of text in the log spreadsheet without having to change the destination cells in the calculation definitions as long as the relative cell locations are left intact.

For Example, the following line on line 1 in a log spreadsheet:

```
  |...A.....| ...B... | ..............C.............|
1|       0             @[-2,0]=TAG01,A
```

can be moved anywhere in the spreadsheet and the average value of TAG01 will always be written two cells to the left of the calculation.

However if the calculation were specified as follows:

```
  |...A..... | ...B... |..............C.............|
1|       0             @A1=TAG01,A
```

and the line was moved to line 2, the destination cell A1 would have to be changed to A2.

Adding Date and Time to a Log

Two RIPCAM2 functions are available to add the current date and time to a log: @TODAY() and @NOW().

@TODAY(value) Displays the current date in the cell. The **value** determines the format of the date:

@TODAY(0) or @TODAY() = YY/MM/DD

@TODAY(1) = MM/DD/YY
@TODAY(2) = DD/MM/YY
@TODAY(3) = DD Month 19YY
@TODAY(4) = DD Mon 19YY
@TODAY(5) = Month DD, 19YY

The cell should be wide enough to accommodate all of the characters for the selected date format (e.g, eight characters wide for the YY/NN/DD format).

@NOW() Displays the current time in the cell. There is only one format for the time: HH:MM:SS in twenty-four hour format. The cell should be at least eight characters wide.

These functions write the current date or time at the moment you print, demand or edit log, NOT the historical date or time of the log. If you want the historical date and time in your log, use the date calculation types (see Section 20 - Log Calculation Reference for details).

Calculating Averages

If you are calculating the average of a range of cell values, you can use the AVG() function in RIPCAM2. This function totals the values of all cells in the range then divides by the number of cells. Usually this function serves your purpose.

If, however, you wanted the average of only non-zero values in the range, the AVG() function will not work. Instead, you need to obtain a count of the number of non-zero values in the range, so that you can divide the sum of the range by the count.

To obtain count of the non-zero values in the range, set up a parallel range of IF() tests in the calculation area of the log. The IF() cell sets its value to 1 if the cell to averaged in NOT zero, otherwise it sets its value to 0 (zero).l By adding up this parallel range, you get the number of non-zero cells in the range to be averaged.

To get the average of the range, you divide the sum of the range to be averaged by the count of the non-zero values in the range. You need to check that the count of non-zero values is not zero, so that you don't perform a division by zero, but instead set the average to zero.

Example To get the average of non-zero values in cells A1 to A4, set up a parallel range of IF() test in cells X1 to X4.

```
  | .....................A ..................... | ......| ..........X.......  |
1| (value 1)                                      IF(A1!=0,1,0)
2| (value 2)                                      IF(A2!=0,1,0)
3| (value 3)                                      IF(A3!=0,1,0)
4| (value 4)                                      IF(A4!=0,1,0)
```

```
5|
6| IF(SUM(X1..X4)==0,0SUM(A1..A4)/SUM(X1..X4))
```

The average is calculated cell A6 by taking the sum of the values in cells A1 to A4 and dividing by the sum f the values in cells X1 to X4. An IF() test is used in the expression in cell A6 to prevent division by zero if all values to be averaged are zero.

Displaying Messages and Warnings

You can include messages in your logs that are only printed if they meet a true/false test by using the RIPCAM2 @SWCH function. The format of the @SWCH function is:

@SWCH(*"true string", "false string"*)

If the cell value is non-zero (true), the ***true string*** is displayed in the cell. IF the cell value is zero (false), the ***false string*** is displayed in the cell.

Example

If you want to display the message "Warning: Power consumption is unusually high" whenever a digital tag named TAG01 wan ON (a value of 1), you could configure your log as follows:

```
 | .............................A.....................................................  |
1| @SWCH("Warning: Power consumption is unusually high"," ")
2| @A1=TAG01,L
```

When the value of TAG01 is 0 the warning message is not displayed. When the value of TAG01 is 1 the warning message is displayed.

The @SWCH cell can also use the value sent to it from another cell containing a LOAD() function. The format of the LOAD() function is **LOAD*(cell, value)*** where ***cell*** is the cell of the @SWCH function and ***value*** is the test value. Refer to the RIPCAM manual for information of the LOAD() command.

You can use this technique to print an asterisk (or some other noticeable character) next to over-range or under-range values in a log to attract the reader's attention.

Printer Control in a Log

Many printers have the ability to print text in different fonts, sizes, styles, and spacings. You can use these features in your logs by including printer control codes within your log format. Printer control codes are special sequences of characters; they are not printed, instead they are interpreted by the printer as a command, such as "use bold type". Printer control codes vary from printer to printer; they are listed in your printer manual.

Usually, printer control codes included unprintable characters. To include an unprintable character in a string, precede the hexadecimal value of the character by a \ (backslash). For

example, many printers interpret the character value of OF hexadecimal (15 decimal) as the command to start compressed printing. To start compressed printing within your log, you would include the string '\OF just before the text you want compressed.

You can include more than one unprintable character in a string. Precede each hexadecimal value with a \ (backslash).

You can configure cells containing printer control codes as hidden cells so that the codes are not displayed when you edit an historical log.

If you use special printer control codes in you log, be sure to reset the printer to its default state at the end of the log. Otherwise, the next page printed might be printed with the style last used on your log.

SECTION 20 - LOG CALCULATION REFERENCE

CALCULATION TYPES AND OPTIONS

The calculation definitions used in periodic and trigger logs are specified using calculation types and options. The syntax of a calculation definition can have one of two forms:

*@cell = tagname, calculation_type [, option]**
*@cell = calculation_type [, option]**

The calculation type indicates the operation to perform for each calculation definition in the log model file. If a calculation type is not specified, the default calculation "Live" will be used. Details of the syntax of each type and examples of each type are given in the Calculation Types Descriptions section.

The calculation options specify parameters required by the calculation types. Details of the syntax of each type and examples of each type are given in the ***CALCULATION OPTIONS DESCRIPTIONS*** section.

Names of calculation types and options are not case sensitive, they can be written in either uppercase or lowercase.

Summary of Calculation Types

Tag Value Calculations (calculate or report values based on a tag's value)

- Average, A
- Integration, IN
- Live, L
- Maximum, MA
- Minimum, MI
- Standard Deviation, SD
- Text Message, TXT
- Root Mean Squared, RMS

Tag State Calculations (report the status of the tag)

- Control by Station, CON
- Limits (Tag Within), LIM
- Status of Tag, ST

Tag Export and Import Calculations (send values to and receive values from other logs) (periodic logs only)

- Export, EX
- Import, IM

Date/Time Calculations (report the date and time)

- Batch of Log, BOL
- Day of Month, DOM
- Day of Week, DOW
- Day of Year, DOY
- Hour of Day, HOD
- Length of Collection, LEN
- Minute of Hour, MOH
- Month of Year, MOY
- Shift of Day, SOD
- Second of Minute, SOM
- Week of Year, WOY
- Year of Century, YOC

Summary of Calculation Options

Sampling Options (specify how to sample a tag's value or state)

- Error Mode, ER
- Rate of Sampling, R

Special Options (options for specific calculation types)

- Multiple Values, MU
- Scale, S
- Number of Text, NUM

Periodic Log Delay Options (specify collection periods within a periodic log)

- Delay Calculation, D and PD
- Period, P

Trigger Log Delay Options (specify collection periods within a trigger log)

- Collection Period, C
- Delay Calculation, D
- Batch Number, B
- Trigger Log Start Value, TS
- Trigger Log End Value, TE

Group Calculation Options (allow a group of calculations to be run at the same time)

- Group Primary, GP
- Group Secondary, GS

Trending Options (report multiple values for a calculation type)

- Trend, TR

CALCULATION TYPE DESCRIPTIONS

The following sections describe the syntax of each calculation type in detail and provide a number of examples.

Each calculation type description starts with the title of the calculation and the type of logs it applies to.

A brief description introduces the calculation type.

The main features of the calculation are summarized in three fields:

SYNTAX Gives the syntax of calculation type.

- Required arguments are in bold and plain type, the bold letters are the minimum required spelling, plain letters are optional.
- Arguments you supply are in italic.
- Optional arguments are in square brackets.
- Arguments that can be repeated are followed by an asterisk.

@CELL Specifies the type of spreadsheet cell (numeric or string) needed for the destination cell of the calculation.

OPTIONS List all calculation options; the options that can be used with the calculation have a "y" beside them.

These are followed by a more extensive description and examples of use.

ROOT MEAN SQUARED, RMS (Periodic and Trigger Logs)

Calculates the root mean squared value of the station tag over the duration of the calculation.

SYNTAX *@cell = tagname, RMS [, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✓	Rate ✓				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

Examples

@A1=STAT01,RMS,R=30S
Stores the root mean squared value of STAT01 in cell A1 after each 30 second sample.

AVERAGE, A (Periodic and Trigger Logs)

Calculates the average value of the tag over the duration of the calculation.

SYNTAX *@cell = tagname, **a**verage [, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✓	Rate ✓				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

Examples

@A1=TAG01,A,R=30S
Stores the average value of TAG01 in cell A1 after each 30 second sample.

@A1=TAG01,AVERAGE,RATE=1M
Stores the average value of TAG01 in cell A1 after each 1 minute sample.

BATCH OF LOG, BOL (Trigger Logs)

Writes the batch number.

SYNTAX *@cell =* **BOL** *[, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✗	Rate ✗				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✗	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✗	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

This calculation is used in trigger logs that have been defined as batch logs. The batch number is incremented every time the Batch Start trigger occurs.

Examples
@A1=BOL
Stores the batch number in cell A1.

CONTROL BY STATION, CON (Periodic and Trigger Logs)

Calculates the percentage of the calculation duration that the station tag was in control (automatic mode).

SYNTAX *@cell = station_tagname,* **CON** *[, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✗	Rate ✓				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

NOTE: The specified tag MUST be a station type tag.

Examples
@A1=TAG01,CON
Stores the percentage of the collection time that station tag TAG01 was in automatic mode in cell A1.

DATE/TIME (Periodic and Trigger Logs)

The date calculation types place a date in the desired cell for the period in which the data was collected.

SYNTAX *@cell = date_calculation [, option]**

Table 20-1. Date Calculation Types

Date Calculation	Description
SOM	Second of minute (0 - 59)
MOH	Minute of hour (0 - 59)
HOD	Hour of day (0 - 23)
SOD	Shift of day (0 - 24)
DOW	Day of week (0 - 6, 0=Sunday)
DOM	Day of month (1 - 31)
DOY	Day of year (0 - 365)
WOY	Week of year (1 - 52)
MOY	Month of year (1 - 12)
YOC	Year of century (since 1900)

@CELL *numeric*

OPTIONS

Sampling:	ERror ✗	Rate ✗				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✗	Delay ✗	PDelay ✗			
Trigger Log Delay:	Collect ✗	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

Using the date calculation types, you can add the date and time to your logs in any format by arranging the destination cells in the order you want.

Examples

@G1=HOD
Stores the hour of the day in cell G1.

@a1=yoc
@c1=moy
@e1=dom

Writes the date in international format (yy/mm/dd) on the log: cell A1 stores the year, C1 stores the month, and E1 stores the day of the month (cells B1 and D1 would be string cells containing the forward slash character).

See Also ***BATCH OF LOG, BOL (Trigger Logs)***
LENGTH OF COLLECTION, LEN (Periodic and Trigger Logs)

EXPORT, EX (Periodic and Trigger Logs)

Sends a value to a tag when the log is retained.

SYNTAX *@cell = tagname,* **EX**port

@CELL *numeric*

OPTIONS

Sampling:	ERror ✕	Rate ✕				
Special:	MUltiple ✕	Scale ✕	NUMber ✕			
Periodic Log Delay:	Period ✕	Delay ✕	PDelay ✕			
Trigger Log Delay:	Collect ✕	Delay ✕	Batch ✕	TS ✕	TE ✕	
Group Calculation:	GP ✕	GS ✕				
Trending:	TRend ✕					

Exports are used to send values from one log to a subsequent log (a log with a higher index number) via database tags. The export type sends a value to the specified tag when the log is retained. The import type receives the value of the tag when the log is retained. A periodic log is retained at the end of each log period. A trigger log is retained when the print trigger condition is detected. Logs are retained in log index order, thus an exporting log must always have a log index lower than the log importing the exported values.

The tag used to transfer the value is usually an internal analog or digital tag. An internal tag does not exist on the Network 90/INFI 90 OPEN system but is internal to the database.

The import type can be used to read an instantaneous value of the specified tag when the log is retained. This is similar to a Live calculation type. However an IMPORT calculation is performed only once when the log is retained, whereas a Live calculation is performed after each sample period during the log period. A constant value entered manually into a spreadsheet cell cannot be exported.

The export type can be used to send values to the Network 90/INFI 90 OPEN system via the specified tag. In this case, the tag must exist on the Network 90/INFI 90 OPEN system as a station tag, a Remote Manual Set Constant (RMSC) tag, a Remote Control Memory (RCM) tag, or a Text String tag (with control enabled).

If the tag is a text string tag, the value exported must be a string.

If the exports for a log are to be performed each time the log is demanded, the Export on Demand parameter must be enabled for the log. If the Export on Demand parameter is not enabled, the log exports are NOT performed when the log is demanded, only when the log is retained.

Examples @A1=TAG01,EX
Exports the value in cell A1 to a tag, TAG01 at the end of the log period.

When a log containing import values is retained, the import values are added to the historical data file for the log. If an historical log is demanded or edited, the import values for the time period of the log will also be part of the log. If the import values are changed in a previous historical log, the new import values can be generated by demanding or editing the log with imports. The new import values will be obtained by regenerating all previous logs that export values. If the log is being edited, the new import values can be saved in the historical data file by saving the data for the historical log from the edit historical log spreadsheet.

For example, if an historical log 10 is demanded with imports and log 10 requires import values, all logs from 1 to 9 that export values will be regenerated (but not printed) with data from the same historical period. The import values required by log 10 will be obtained from the corresponding export values generated by logs 1 through 9.

The import values for a log which is demanded or edited with imports are available only if all import values of the log have a corresponding export value in a previous log (i.e. an export with the same tag name). Otherwise the import values will only be available in an historical log which is demanded or edited without imports.

A log can export a value to itself. For example, a daily log can keep a month-to-date total by exporting the current monthly total to the next daily log (see ***Example Implementation of a Long Term Log*** in Section 19).

Trigger logs can also be configured with exports and imports. Exporting and importing is performed for trigger logs when a log print trigger condition is detected. When a trigger log is demanded or edited with imports, the import values are obtained by regenerating all previous trigger logs from the same time frame that export values.

See Also ***IMPORT, IM (Periodic Logs)***

NOTE: To export values to an internal analog, the analog must be in scan mode.

CAUTION **Inactive (unnamed) logs that contain export values are processed when demand with imports is requested. To stop processing, you must comment out the exports and recompile.**

IMPORT, IM (Periodic Logs)

Reads a value from a tag when the log is retained.

SYNTAX *@cell = tagname,* **IM**port

@CELL *numeric*

OPTIONS

Sampling:	ERror ✕	Rate ✕				
Special:	MUltiple ✕	Scale ✕	NUMber ✕			
Periodic Log Delay:	Period ✕	Delay ✕	PDelay ✕			
Trigger Log Delay:	Collect ✕	Delay ✕	Batch ✕	TS ✕	TE ✕	
Group Calculation:	GP ✕	GS ✕				
Trending:	TRend ✕					

The import calculation reads the value of the tag when the log is retained. A periodic log is retained at the end of each log period.

Importing is often used to read in values exported by other logs.

> **NOTE:** Logs are retained in the order of their log index; an importing log must always have a higher index number than the log exporting the value.

The tag used to transfer the value is usually an internal analog or internal digital tag. An internal tag does not exist on the Network 90/INFI 90 OPEN system but is internal to the database.

If the tag is a Text Str tag, the cell must be a string cell. A string will be read from the Text Str tag, and written into the cell.

The import calculation can also be used to read the value of a tag from the Network 90/INFI 90 OPEN system when the log is retained. This is similar to a Live calculation, however an import calculation is performed only once (when the log is retained) whereas a Live calculation is performed after each sample period throughout the log period.

Examples

@A1=TAG01,IM
Imports the value of a tag, TAG01 into cell A1 at the end of the log period.

When a log containing import values is retained, the import values are added to the historical data file for the log. If an historical log is demanded or edited, the import values for the time period of the log will also be part of the log. If the import values are changed in a previous historical log, the new import values can be generated by demanding or editing the log with imports. The new import values will be obtained by regenerating all previous logs that export values. If the log is being edited, the new

import values can be saved in the historical data file by saving the data for the historical log from the edit historical log spreadsheet.

For example, if an historical log 10 is demanded with imports and log 10 requires import values, all logs from 1 to 9 that export values will be regenerated (but not printed) with data from the same historical period. The import values required by log 10 will be obtained from the corresponding export values generated by logs 1 through 9.

The import values for a log which is demanded or edited with imports are available only if all import values of the log have a corresponding export value in a previous log (i.e., an export with the same tag name). Otherwise the import values will only be available in an historical log which is demanded or edited without imports.

A log can export a value to itself. For example, a daily log can keep a month-to-date total by exporting the current monthly total to the next daily log (see ***Example Implementation of a Long Term Log*** in Section 19).

Trigger logs can also be configured with exports and imports. Exporting and importing is performed for trigger logs when a log print trigger condition is detected. When a trigger log is demanded or edited with imports, the import values are obtained by regenerating all previous trigger logs from the same time frame that export values.

See Also ***EXPORT, EX (Periodic and Trigger Logs)***

INTEGRATION, IN (Periodic and Trigger Logs)

Integrates (totals) the value of the tag over the duration of the calculation.

SYNTAX *@cell = tagname,* **IN**tegration *[,* **S***=scale] [, option]**

where: **S***=scale*
is the scale factor which is multiplied by the integrated value to obtain the value written to the destination cell. The scale can be any floating point value.

@CELL *numeric*

OPTIONS

Sampling:	ERror ✓	Rate ✓				
Special:	MUltiple ✗	Scale ✓	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

Examples

@A1=TAG01,IN,R=30S
Stores the total of all the 30 second values read for TAG01 in cell A1.

@A1=TAG01,IN,RATE=1M,S=0.01666
Stores the total of all the 1 minute values of TAG01 multiplied by 0.01666 in cell A1. If for example, TAG01 was an instantaneous power quantity in KW (kilowatts), the resulting integrated value of the above calculation would have units of KWh (kilowatt-hours).

LENGTH OF COLLECTION, LEN (Periodic and Trigger Logs)

Measures the duration of the calculation in minutes.

SYNTAX *@cell =* **LEN** *[, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✗	Rate ✗				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✗	Delay ✗	PDelay ✗			
Trigger Log Delay:	Collect ✗	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

This calculation is useful in trigger logs for recording the length of the log or batches within a log.

Examples

@A1=LEN
Stores the collection time in cell A1.

LIMITS (TAG WITHIN), LIM (Periodic and Trigger Logs)

Calculates the percentage of the calculation's duration that the tag was in a normal state (within limits) (i.e., not in alarm state or bad quality).

SYNTAX *@cell = tagname,* **LIM** *[, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✗	Rate ✓				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

Examples

@A1=TAG01,LIM
Stores the percentage of the collection time that tag TAG01 was in a normal state in cell A1.

LIVE, L (Periodic and Trigger Logs)

Reads the current (live) value of the tag at the end of the calculation duration.

SYNTAX *@cell = tagname* [, **L**ive] *[, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✓	Rate ✓				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

If no calculation type is specified, the calculation is treated as a Live calculation.

Examples

@A1=TAG01,L,R=30S
Stores the live value of TAG01 in cell A1 every 30 seconds.

@A1=TAG01,LIVE,RATE=1M
Stores the live value of TAG01 in cell A1 every minute.

MAXIMUM, MA (Periodic and Trigger Logs)

Keeps track of the maximum value of the tag over the duration of the calculation.

SYNTAX *@cell = tagname,* **MA**ximum *[, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✓	Rate ✓				
Special:	MUltiple ✓	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

Examples

@A1=TAG01,MA,R=30S
Stores the maximum value of TAG01 in cell A1 after each 30 second sample.

@A1=TAG01,MAXIMUM,RATE=1M
Stores the maximum value of TAG01 in cell A1 after each 1 minute sample.

MINIMUM, MI (Periodic and Trigger Logs)

Keeps track of the minimum value of the tag over the duration of the calculation.

SYNTAX *@cell = tagname,* **MI***nimum [, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✓	Rate ✓				
Special:	MUltiple ✓	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

Examples

@A1=TAG01,MI,R=30S
Stores the minimum value of TAG01 in cell A1 after each 30 second sample.

@A1=TAG01,MINIMUM,RATE=1M
Stores the minimum value of TAG01 in cell A1 after each 1 minute sample.

STANDARD DEVIATION, SD (Periodic and Trigger Logs)

Calculates the standard deviation of the values of the tag over the duration of the calculation.

SYNTAX *@cell = tagname,* **SD** *[, option]**

@CELL *numeric*

OPTIONS

Sampling:	ERror ✓	Rate ✓				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

Examples

@A1=TAG01,SD
Stores the standard deviation of TAG01 in cell A1.

STATUS OF TAG, ST (Periodic and Trigger Logs)

Writes the alarm status the tag has for a majority of the calculation's duration.

SYNTAX *@cell = tagname,* **ST** *[, option]**

@CELL *string*

OPTIONS

Sampling:	ERror ✗	Rate ✓				
Special:	MUltiple ✗	Scale ✗	NUMber ✗			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

If the tag has one alarm state for more than 50% of the duration of the calculation, that alarm status code (e.g., "H", "L") is written to the destination cell. If the tag is in a normal state, a blank string is written to the destination cell. If no state occurs for more than 50% of the time, "U" is written to the destination cell to indicate that the tag's state was undetermined.

The destination cell MUST be configured as a string cell, otherwise the status cannot be written to the cell. You can enter any string in the destination cell (e.g., a single space).

Examples

@A1=TAG01,ST
Stores the overall status of tag TAG01 in string cell A1.

TEXT, TXT (Periodic and Trigger Logs)

Writes the text message indicated by a text tag's value at the end of the calculation duration, or writes the text message for a given text message index.

SYNTAX *@cell = tagname,* **TXT** *[, option]**
@cell = **TXT** , **NUM**ber*=text_num [, option]**

where: *text_num*
is the index of the text message to be written to the cell (0-9999)

@CELL *string*

OPTIONS

Sampling:	ERror ✓	Rate ✓				
Special:	MUltiple ✗	Scale ✗	NUMber ✓			
Periodic Log Delay:	Period ✓	Delay ✓	PDelay ✓			
Trigger Log Delay:	Collect ✓	Delay ✓	Batch ✓	TS ✓	TE ✓	
Group Calculation:	GP ✓	GS ✓				
Trending:	TRend ✓					

NOTE: If you use the tag name version of TXT, the tag MUST be a text tag.

There are two versions of the TXT calculation: with or without a tag name. If a tag name is specified, the text message whose index is the same as the value of the text tag is written to the cell. If a tag name is not used the text message whose index is specified by the "NUM=" option is written to the cell.

If the tag is a Text String tag, the text message is obtained directly from the tag, every sample period.

Text messages are configured from the Text Configuration Menu under the System Configuration Menu. The range of text numbers is 0 to 9999.

The destination cell MUST be defined as a string cell, otherwise the text message cannot be written to the cell. You can enter any string in the destination cell (e.g., a single space).

You can edit all text in text calculation destination cells when you edit historical logs.

Examples

@A1=TXT,NUM=0
Writes text tag message 0 to string cell A1.

@A1=TEXT_TAG,TXT
Writes the text tag message referenced by the value of text tag TEXT_TAG to string cell A1.

CALCULATION OPTIONS DESCRIPTIONS

The following sections describe the syntax of each calculation option in detail and provide a number of examples.

Each calculation option description begins with the title of the option and the type of logs it applies to.

A brief description introduces the calculation option.

SYNTAX

- Summarizes the syntax of calculation options.
- Required arguments are in bold and plain type, the bold letters are the minimum required spelling, plain letters are optional.
- Arguments you supply are in italic.
- Optional arguments are in square brackets.
- Arguments that can be repeated are followed by an asterisk.

This is followed by a more extensive description and examples of use.

BATCH NUMBER, B (Trigger Logs)

This option specifies the number of the batch to collect data for during the data collection of a trigger log.

SYNTAX **B**atch *= batch_num*

where: *batch_num*
is the batch number (0 - 30000)

This option allows data collection for more than one batch in a single log. The Batch Collection parameter must be enabled in the trigger log parameters. Batch counting begins after the collect trigger condition is detected for the log. Data collection begins for a batch when the batch start trigger condition is detected. During a specific batch, all calculations specified with the current batch number or with no batch number are performed. Data collection ends for the batch when the batch end trigger condition is detected. The batch count is incremented after each batch. Data collection is NOT performed for the log in between batches.

Examples

@A1=TAG01,A,B=2
Stores the average value of TAG01 during the second batch of the log.

@A1=TAG01,A,B=0
Stores the average value of TAG01 during all batches of the log.

@A1=HOD,TS,B=0
Stores the hour of the day when the collect trigger is detected.

@A1=HOD,TS,B=1
Stores the hour of the day when the start batch trigger is detected for batch 1.

@A1=HOD,TE,B=1
Stores the hour of the day when the end batch trigger is detected for batch 1.

@A1=HOD,TE,B=0
Stores the hour of the day when the print trigger is detected.

COLLECTION PERIOD, C (Trigger Logs)

This option specifies the number of minutes to collect data after the data collection has started for the log and after any specified delay has elapsed. If a collection time is not specified, collection continues until the log is printed.

SYNTAX

Collect = *collect_time*

where: *collect_time*
is the number of minutes to collect for (0 - 30000)

Examples

@A1=TAG01,A,C=2
Data for TAG01 would be collected for two minutes after data collection has started for the log,

@A1=TAG01,A,D=1,C=2
Data for TAG01 would be collected for two minutes after a one minute delay from the start of data collection for the log.

DELAY CALCULATION, D AND PD (Periodic Logs)

This option specifies the number of the collection periods to delay before data collection begins for the calculation. Period delays can be based on the log period or on the current time.

SYNTAX

PDelay = *delay* Delay is based on the log period.
Delay = *delay* Delay is based on the current time.

where: *delay*
is a valid delay (See Table 20-2)

VALID DELAYS

Table 20-2. Valid Delays

Log Period	Calculation Period	Valid Delays
Hourly	15min 30min	0 - 3 0 - 1
Shift	15min 30min Hourly	0 - 95 0 - 47 0 - 23
Daily	15min 30min Hourly Shift	0 - 95 0 - 47 0 - 23 0 - 23
Weekly	Shift Daily	0 - 167 0 - 6
Monthly	Shift Daily	0 - 743 0 - 30
QYearly	Weekly Monthly	0 - 12 0 - 2

Table 20-2. Valid Delays (continued)

Log Period	Calculation Period	Valid Delays
HYearly	Weekly Monthly QYearly	0 - 25 0 - 5 0 - 1
Yearly	Daily Weekly Monthly QYearly HYearly	0 - 364 0 - 51 0 - 11 0 - 3 0 - 1

Examples

@A1=TAG01,A,P=H,PD=0
Stores the average value of the samples of TAG01 collected over the first hour of the log period.

@A1=TAG01,A,P=H,PD=7
Stores the average value of the samples of TAG01 collected over the 8th hour of the log period.

@A1=TAG01,A,P=H,D=0
Stores the average value of the samples of TAG01 collected over the first hour of the day.

@A1=TAG01,A,P=H,D=23
Stores the average value of the samples of TAG01 collected over the 24th hour of the day.

Delays based on the current time should only be used if a calculation is to be performed at a specific time, for example at a particular hour of the day. Otherwise most calculations requiring delays will use the period delay (PD) option.

This option is used to provide calculations such as daily totals on a weekly log or monthly totals on a yearly log. See the Section 21 - Configuring Trend Logs for creating a series of values based on calculation periods and period delays.

See Also ***DELAY CALCULATION, D (Trigger Logs)***

DELAY CALCULATION, D (Trigger Logs)

This option specifies the number of minutes to delay from the collection start time for the trigger log before starting data collection. The default delay time is 0 minutes.

SYNTAX **D**elay = *delay*

where: *delay*
is the number of minutes to delay (0 - 30000)

Examples

@A1=TAG01,A,D=2
The above calculation would be delayed two minutes after the collection start time of the log before data was collected for tag TAG01.

See Also *DELAY CALCULATION, D AND PD (Periodic Logs)*

ERROR MODE, ER (Periodic and Trigger Logs)

This option specifies the value to be used in a calculation if the tag value is of bad quality or cannot be obtained.

SYNTAX

ERror = *error_mode*

where: *error_mode*
is a valid error mode (see Table 20-3)

VALID MODES

Table 20-3. Error Modes

Error Mode	Description
Ignore	Do not collect samples when the tag is in bad quality.
Default	Use the default value of the tag when the tag is in bad quality. The default value is set in the tag database.
Error	Use a large number as a sample value to show that the tag was bad quality.

If an error mode is not specified in a calculation, the default error mode is Ignore.

Examples

@A1=TAG01,A,ER=E
Stores the average value of TAG01 in cell A1. If a bad quality value was read during the log period, the value will be the error value
(a very large value: 1.67×10^{308})

@A1=TAG01,A,ER=D
Stores the average value of TAG01 in cell A1. If a bad quality value was read during the log period, the default value of TAG01 will be used in the calculation.

@A1=TAG01,A
Stores the average value of TAG01 in cell A1. Since no error mode is specified, the error mode is Ignore and bad quality values will not be used in the calculation.

GROUP CALCULATIONS, GP AND GS (Periodic and Trigger Logs)

This option allows calculations to be grouped to timestamp calculations or compare two calculations. A primary calculation in the log must be specified. Any number of secondary calculations can be specified with the same group number as the primary calculation. If the primary calculation is performed during a sample time for the log, all secondary calculations in the same group are performed. If the primary calculation is not performed, all secondary calculations in the group are not performed.

SYNTAX **GP** = *grp_num* (for primary calculation)
GS = *grp_num* (for secondary calculation)

where: *grp_num*
is a group number (1 - 20)

Examples
```
@F1=TAG01,MA,GP=1
@G1=TAG02,L,GS=1
@A1=HOD,GS=1
@C1=MOH,GS=1
@E1=SOM,GS=1
```

Stores the maximum value of TAG01 during the log period in cell F1. The live value of TAG02 at the time of the maximum value of TAG01 is stored in cell G1. The time of the maximum value of TAG01 is stored in cells A1, C1, and E1.

A primary calculation MUST be specified for each group with secondary calculations specified. Only one primary calculation per group can be specified. The secondary calculations receives ALL options specified for the primary calculation. Any options specified for a secondary calculation are ignored. Thus only the tag name, calculation type, and secondary group option are required for a secondary calculation group.

This option can be used in conjunction with the Multiple Values option but CANNOT be used in conjunction with the Trend option.

MULTIPLE VALUES, MU (Periodic and Trigger Logs)

This option is specified along with the Maximum or Minimum calculation types and specifies the number of maximum or minimum tag values to collect during the log period. The values are written to the log starting in the destination cell and continuing in each cell after the destination cell in the same column.

SYNTAX **MU**ltiple = *num*

where: *num*
is the number of values to write (2 - 800)

This option only applies to the Maximum or Minimum calculation types and will be ignored for any other calculation type. This calculation option can be used in conjunction with the calculation group option to compare a series of maximum or minimum values for a tag with the corresponding set of values for another tag. This option CANNOT be used in conjunction with the Trend option.

Examples

@A1=TAG01,MA,MU=6
Stores the six maximum values of TAG01 (highest to lowest) obtained during the period in cells A1 to A6.

@A1=TAG01,MI,MU=2
Stores the two minimum values of TAG01 obtained during the log period in cells A1 and A2.

NUMBER OF TEXT, NUM (Periodic and Trigger Logs)

This option is specified along with the Text calculation type and specifies the number of text tag message index number to print.

SYNTAX **NUM**ber = *index*

where: *index*
is the text tag message index number to write
(0 - 9999)

This option only applies to the Text calculation type and will be ignored for any other calculation type. See the ***CALCULATION TYPE DESCRIPTIONS*** for more information on the Number of Text option.

Examples

@A1=TXT,NUM=50
Writes text tag message index 50 to cell A1.

PERIOD FOR CALCULATION, P (Periodic Logs)

This option specifies the length of the collection period for the calculation. Data for the calculation is collected for the specified calculation period and the accumulated calculation value is reset at the end of each calculation period.

SYNTAX **P**eriod = *period*

where: *period*
is a valid period

VALID PERIODS
15min
30min
Hourly
Shift
Daily
Weekly
Monthly
QYearly (Quarter Yearly)
HYearly (Half Yearly)
Yearly
None

If the calculation period is not specified, the log period is used as the calculation period.

Example
@A1=TAG01,A,P=H
Stores the average value of TAG01 over the last hour in cell A1.

The calculation period can be shorter or longer than the log period. If the calculation period is longer than the log period, the calculation is carried over to subsequent log periods. This allows logs to contain year-to-date values or motor run times to date. Calculation periods that are shorter than the log period are usually used in conjunction with period delays as shown in the Calculation Period Delay option.

RATE OF SAMPLING, R (Periodic and Trigger Logs)

This option specifies the rate at which samples are collected for the calculation.

SYNTAX ***R**ate = rate*

where: *rate*
is a valid rate (see below)

VALID RATES
5Seconds
10Seconds
30Seconds
1Minute
2Minutes
10Minutes
15Minutes

30Minutes
1Hour
None

If the sample rate is not specified, a default sample rate is used which depends on the log period as shown in Table 20-4.

Table 20-4. Default Sample Rate for Different Log Periods

Log Period	Default Sample Rate
Hourly	30 seconds
Shift	1 minute
Daily	2 minutes
Weekly	10 minutes
Monthly	30 minutes
QYearly	1 hour
HYearly	1 hour
Yearly	1 hour
Trigger	30 seconds

Examples

@A1=TAG01,A,R=30S
Collects samples of TAG01 every 30 seconds and stores the average of these samples in cell A1.

@A1=TAG01,A,R=1H
Collects samples of TAG01 every hour and stores the average of these samples in cell A1.

SCALE, S (Periodic and Trigger Logs)

This option is specified along with the Integration calculation type and specifies the factor to multiply the integrated value by before writing it to the destination cell.

SYNTAX **S** = *value*

where: *value*
is any floating point value

This option only applies to the Integration calculation type and will be ignored for any other calculation type. See the Integration calculation type description for more information on the Scale option.

TREND, TR (Periodic and Trigger Logs)

This option specifies that a trend of values is to be created in the log. This starts writing values at the specified destination cell then writes each new sample to a cell further down the column.

SYNTAX **TR**end [**,R=***rate]* [**,P=***period]* (Periodic Logs)
TRend [**,R=***rate]* **,C=***collection_time* (Trigger Logs)
TRend [**,R=***rate]* **,B=***number_of_batches* (Trigger Logs)

The trend of values starts from the destination cell and continues in each subsequent cell in the same column as the destination cell. If a calculation period is specified, a value is obtained for each calculation period during the log period by sampling at the specified rate. A new value is written to the next cell in the column at the end of each calculation period. If a collection time is specified, a new value is written to the next cell in the column after each sample period. If a number of batches is specified, a new value is written to the next cell in the column after the end of each batch until the specified number of batches is reached. Batches that occur after the number of batches has been reached are ignored. Batches are signalled by the Start Batch and End Batch triggers.

For trigger logs, a non-zero collection time or number of batches MUST be specified along with the Trend option in order for space to be reserved in the data file for the trend.

The number of values in the trend cannot exceed 800 in either periodic or trigger logs. If the trend requires more values, an error message is displayed when the log is compiled and the Trend option is ignored if the number of cells required is not reduced. For periodic logs, the number of cells required can be reduced by increasing the calculation period or sample rate. For trigger logs, the number of cells required can be reduced by increasing the sample rate or reducing the collection time.

Examples

@A1=TAG01,L,TREND,P=H
Writes a trend of live value of TAG01 to the cells in column A starting at cell A1 after each hour of the log period. Cell A1 would contain the live value of the tag after the first hour of the log period. Cell A2 would contain the live value of the tag after the second hour of the log period.

@A1=TAG01,L,TREND,R=15MIN
Writes a trend of live values of TAG01 to the cells in column A starting at cell A1 after every 15 minutes of the log period. Cell A1 would contain the live value of the tag after the fifteen minutes into the log period. Cell A2 would contain the live value of the tag 30 minutes into the log period.

@A1=TAG01,L,TREND,R=15MIN,C=3600
Writes a trend of live values of TAG01 to the cells in column A starting at cell A1 every 15 minutes after the start of the trigger log and continues for an hour of collection time.

@A1=TAG01,A,TREND,R=1MIN,B=50
Writes a trend of average values of TAG01 to the cells in column A starting at cell A1 after each batch for up to 50 batches. The value for the first batch is written to cell A1. The value for the second batch is written to cell A2. The value for the 50th batch is written to cell A50.

@A1=TAG01,L,P=HOUR,TREND
Creates a trend of values in a periodic log identical to the following group of calculations:

@A1=TAG01,L,P=HOUR,PD=0
@A2=TAG01,L,P=HOUR,PD=1
@A3=TAG01,L,P=HOUR,PD=2
@A4=TAG01,L,P=HOUR,PD=3
@A5=TAG01,L,P=HOUR,PD=4
@A6=TAG01,L,P=HOUR,PD=5
@A7=TAG01,L,P=HOUR,PD=6
@A8=TAG01,L,P=HOUR,PD=7

Thus the Trend option can be used to replace a series of calculations specified with individual period delays in periodic logs.

TRIGGER LOG END VALUE, TE (Trigger Logs)

This option specifies that data is to be collected only once when the print trigger condition is detected.

SYNTAX **TE**

Examples

@A1=TAG01,L,TE
Stores the value of TAG01 in cell A1 when the print trigger condition is detected.

@A1=LEN,TE
Stores the length of the collection time in cell A1.

See Also ***TRIGGER LOG START VALUE, TS (Trigger Logs)***

TRIGGER LOG START VALUE, TS (Trigger Logs)

This option specifies that data is to be collected only once when the collect trigger condition is detected.

SYNTAX **TS**

Example

@A1=TAG01,L,TS
Stores the value of TAG01 in cell A1 when the collect trigger condition is detected.

See Also ***TRIGGER LOG END VALUE, TE (Trigger Logs)***

SECTION 21 - CONFIGURING TREND LOGS

OVERVIEW

Trend logs present trend data in columns. The source for the trend log data is the actual trend data file. The resolution is independent of the actual trend sample. Trend graphic displays and trend logs show the same data because both sample the trend data file in the same manner.

Up to 64 trend logs can be configured, and each can have one of four periods: hour, shift, day, and week.

Up to 20 trend tag names can be configured on a single log, and up to 240 values can be reported for each trend index. Up to 99 historical data logs can be retained if there is enough space on your hard disk. Trend logs can also be configured to print automatically or manually (on demand).

Figure 21-1 shows an example of the printed trend log format.

```
Mar 31 1990  14:26:33    Trend One Title _____________    Trend Group 01

                         Collection end time:  Mar 31 1990  00:00:00

   Column     Tag Name   Tag Descriptor             Tag Type    Subtype
   ------     --------   ----------------------     ---------   -------

    (01)      Tag1       Descriptor for tag 1       Station         PV
    (02)      Tag2       Descriptor for tag 2       Digital
    (03)      Tag3       Descriptor for tag 3       Analog
    (04)      Tag4       Descriptor for tag 4       Station         CO
    (05)      Tag5       Descriptor for tag 5       Station         SP
    (06)      Tag6       Descriptor for tag 6       Analog
    (07)      Tag7       Descriptor for tag 7       Station
    (08)      Tag8       Descriptor for tag 8       Analog
    (09)      Tag9       Descriptor for tag 9       Station         CO
    (10)      Tag10      Descriptor for tag 10      Station         SP
    (11)      Tag11      Descriptor for tag 11      Analog
    (12)      Tag12      Descriptor for tag 12      Station         CO
    (13)      Tag13      Descriptor for tag 13      Analog
    (14)      Tag14      Descriptor for tag 14      Station         PV
    (15)      Tag15      Descriptor for tag 15      Analog
    (16)      Tag16      Descriptor for tag 16      Station         CO
    (17)      Tag17      Descriptor for tag 17      Station         SP
    (18)      Tag18      Descriptor for tag 18      Station         SP
    (19)      Tag19      Descriptor for tag 19      Analog
    (20)      Tag20      Descriptor for tag 20      Station         CO

                         (02)         (03)          "          (20)
   Time       EU 1__                  EU 3__        "          EU 20__
    -----      --------   --------     --------                  --------
Mar 24 1990
    00:00:00   -9999.99   LDESC1         *BAD*       "         -999.999
    01:00:00   -9999.99   LDESC1         *BAD*       "         -999.999
    02:00:00   -9999.99   LDESC2       -99999.9      "         -999.999
      "          "          "            "          "           "
    23:00:00   -9999.99   LDESC1       -99999.9      "         -999.999

Mar 25 1990
    00:00:00   -9999.99    *BAD*       -99999.9      "         -999.999
    01:00:00   -9999.99   LDESC1       -99999.9      "         -999.999
    02:00:00   -9999.99   LDESC2       -99999.9      "         -999.999
      "          "          "            "          "           "
    23:00:00   -9999.99   LDESC1       -99999.9      "         -999.999
```

Figure 21-1. Example Trend Log

Each trend log page header lists the date and time of printing, and the trend log description and group number.

After the header, the trend tag appearing in each column is identified by tag name, tag descriptor, tag type, and tag sub-type (if applicable).

The actual data is listed in columns at the bottom of the print-out. The Time column shows the date and time for each sample.

The engineering units for analog-type tag data is printed at the top of the column under the column identifier. Numbers are printed with the number of decimal places defined in the tag database. Any number falling outside of the column width of eight characters is printed in exponential format. Bad quality data values are printed as *BAD*.

For digital or RCM tags, the output state is printed using the logic state descriptor.

TREND LOG CONFIGURATION

Press **E**, or click on the Trend Logs Menu item at the Log Configuration Menu to display the Trend Log Configuration Menu (Figure 21-2).

```
                    < Trend Log Configuration >
 01                  02                  03                  04
 05                  06                  07                  08
 09                  10                  11                  12
 13                  14                  15                  16
 17                  18                  19                  20
 21                  22                  23                  24
 25                  26                  27                  28
 29                  30                  31                  32
 33                  34                  35                  36
 37                  38                  39                  40
 41                  42                  43                  44
 45                  46                  47                  48
 49                  50                  51                  52
 53                  54                  55                  56
 57                  58                  59                  60
 61                  62                  63                  64
F1 Edit Parameters              F2 Edit Format


F9  Help                        F0  Exit to Previous Menu
```

Figure 21-2. Trend Log Configuration Menu

Edit Trend Log Parameters

To edit the parameters for a trend log, select a log from the Trend Log Configuration Menu using the arrow keys, then press <F1> to display the Edit Trend Log Parameters Menu (Figure 21-3).

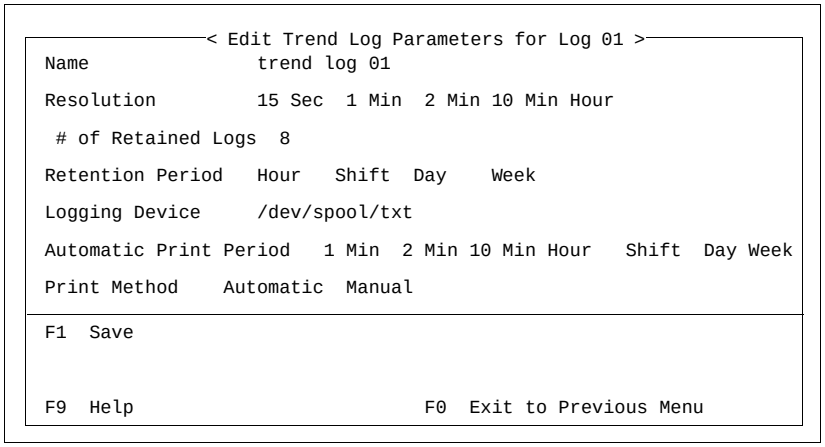


Figure 21-3. Edit Trend Log Parameters Menu

Use <Up>/<Down> to move around the fields and <Left>/<Right> to select the settings for each field. The fields are described in Table 21-1.

Table 21-1. Trend Log Parameters

Field	Description
Name	Enter the name of the log (1-12 characters). A blank name field disables the log: no data is collected or retained. To remove a log, delete the log name press <Del>. If you disable a log, the log format is not erased.
Resolution	Select how often a sample is taken during the retention period by pressing <Right> and <Left>. There are five choices: 15 seconds, 1 minute, 2 minutes, 10 minutes, or 1 hour.
# of Retained Logs	Enter the number of historical logs to be retained on disk; as a new log is created, the oldest log is deleted.
Retention Period	Select the time period the log covers by pressing <Right> and <Left>. There are seven choices: 1 minute, 2 minute, 10 minute, Hour, Shift, Day, and Week.
Logging Device #	Enter the printer device the log is printed on. Valid printer device names are described in Printer Setup of the ***Configuration*** manual (I-E97-811-2.1).
Automatic Print Method	Select the automatic print period by pressing <Right> and <Left>. This determines how often the log prints automatically.
Print Method	Select whether a log prints automatically or on demand (manually) by pressing <Right> and <Left>. Demanded logs can have manual values entered before printing.

Editing the Trend Log Format

To edit the format of a trend log, from the Trend Log Configuration Menu (Figure 21-2), select the log using the cursor keys then press <F2>. This displays the Edit Trend Log Format Menu (Figure 21-4).

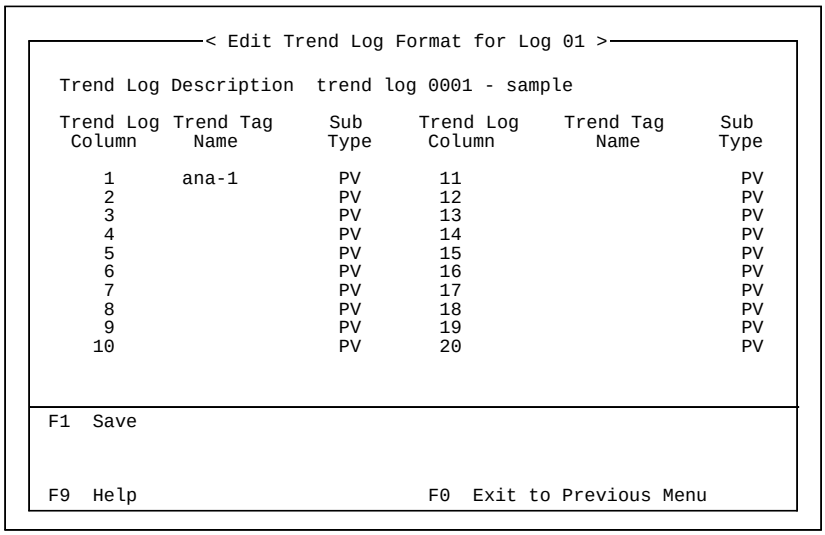


Figure 21-4. Edit Trend Log Format

Enter a title for the trend log in the Trend Log Description field.

You have 20 columns to display trend data in. Enter the trend tag name for any trended tag you want to include in this log. Leaving the tag name blank will omit the column from being printed.

To save your changes, press <F1>.

To exit from the menu, press <F10>.

SECTION 22 - CONFIGURING TRIP LOGS

OVERVIEW

Trip logs collect data before and after a trip. A trip occurs when values or states of tags you specify meet conditions you set (e.g., when an analog tag's value exceeds the configured trip value of 100). You specify the tags to collect data for and the amount of data collected before and after the trip and the data is printed. The printed format of a trip log is fixed; you only specify the tags to include. You can configure up to 20 trip logs.

CONFIGURING TRIP LOGS

To configure trip logs, press **C** or click on the Trip Logs Menu option at the Log Configuration Menu to display the Trip Logs Configuration Menu (Figure 22-1).

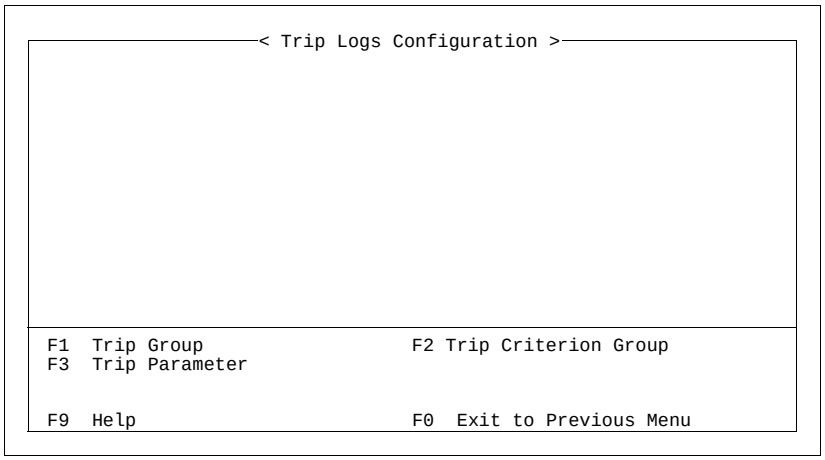


Figure 22-1. Trip Logs Configuration Menu

To configure a trip log:

1. List a group of tag names that appear on one log.
2. Define the conditions under which a trip log is run.
3. Define the amount of data to collect for the trip.

You use the Trip Group Menu item to define the tags whose values will be collected during a trip. Up to 20 trip groups can be defined. You use the Trip Criterion Group Menu item to define the tags for each group that start trip logging sequences. You use the Trip Parameter Menu item to define the amount of pre-trip and post-trip data that will be collected.

Configuring a Trip Group

A trip group is a group of tags that data is collected for during a trip.

Press <F1> at the Trip Configuration Menu to display the Trip Group Configuration Menu (Figure 22-2).

```
                    < Trip Group Configuration >

01 trip log 01      02                  03                  04
05                  06                  07                  08
09                  10                  11                  12
13                  14                  15
17                  18                  19                  20









F1  Configure Selected Group


F9  Help                            F0  Exit to Previous Menu
```

Figure 22-2. Trip Group Configuration Menu

Use arrow keys to select a group to edit, then press <F1> to display the Edit Trip Group Parameters Menu (Figure 22-3).

```
                  < Edit Trip Group Parameters >

 Trip Title trip log 01                          Trip Group # 1

ANALOG TAG
1. ana-1            5. ana-10           9.                  13.
2. ana-2            6.                  10.                 14.
3. ana-3            7.                  11.                 15.
4. ana-4            8.                  12.
DIGITAL TAG
1.                  9.                  17.                 25.
2. dig-2            10.                 18.                 26.
3. dig-3            11.                 19.                 27.
4.                  12.                 20.                 28.
5. dig-10           13.                 21.                 29.
6. dig-11           14.                 22.                 30.
7.                  15.                 23.
8.                  .                   24.


F1  Save Group Configuration



F9  Help                            F0  Exit to Prev Menu
```

Figure 22-3. Edit Trip Group Parameters Menu

To define a trip group:

1. Enter a name for the group in the Trip Title field.

2. Under *Analog Tags*, enter the tag names of the analog tags to be included in this group.

3. Under *Digital Tags*, enter the tag names of any digital tags to be included in this group.

To save the trip group configuration, press <F1>.

To exit from the menu, press <F10>.

Configuring the Trip Criteria

For each trip group, you need to define the conditions that initiate a trip log. These criteria are defined by trip tags: tags that start the trip log when their state or value meet some pre-defined conditions. Up to 20 trip tags can be entered for a group. Trip tags do not have to be included in the trip group. When any condition is met, the trip log is generated. This results in a printed trip log.

To enter the criteria for a group, press <F2> at the Trip Logs Configuration Menu to display the Trip Criterion Group Configuration Menu (Figure 22-4). Use the arrow keys to select a trip group, then press <F1> to display the Edit Trip Group Criterion screen (Figure 22-5).

```
                    < Trip Criterion Group Configuration >

01 trip log 01      02                  03                  04
05                  06                  07                  08
09                  10                  11                  12
13                  14                  15
17                  18                  19                  20

F1  Configure Selected Criterion

F9  Help                                F0  Exit to Previous Menu
```

Figure 22-4. Trip Criterion Group Configuration Menu

Enter the name of an analog-type or digital-type tag in the Tag Name column.

An operator and a value must follow each tag name. They represent the condition of the tag that generates a trip log.

Valid operators for analog tags are:

- equal (=)
- greater than (>)

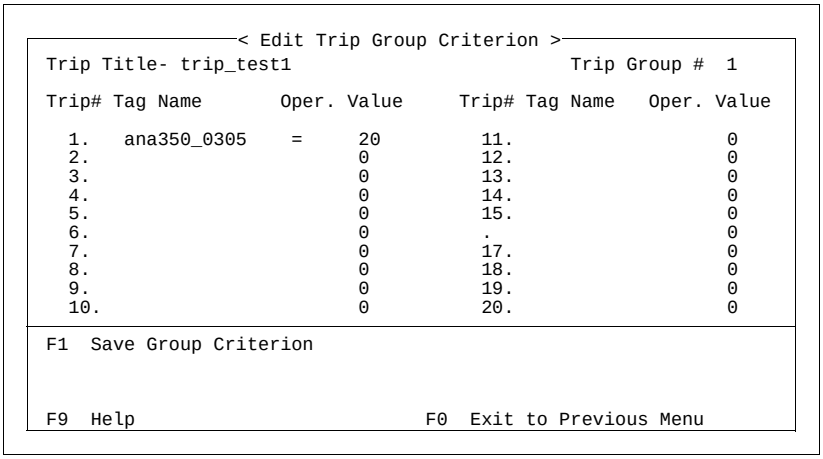


Figure 22-5. Edit Trip Group Criterion Menu

- less than (<)
- greater than or equal to (>=)
- less than or equal to (<=)
- high (H)
- low (L)

Valid operators for digital tags are:

- equal (=)
- alarm (A)

To save your changes, press <F1>.

To exit the screen, press <F10>.

Configuring the Data Collection Parameters

Trip parameters define the amount of data to collect at the trip. You can define a general set of data collection parameters that any trip log can use, and you can define data collection parameters for each group individually. For each trip group, you choose whether it uses the general definitions or the individual group data collection parameters.

To set up the data collection parameters:

1. Define the general data collection parameters that are used by all trip logs by default.

2. If you want to use a different set of parameters for a particular trip group, set up data collection parameters for that group.

3. Select whether the general or group data collection parameters are to be used for each group.

Press <F3> at the Trip Logs Configuration Menu (Figure 22-1) to display the Trip Parameter Configuration Menu (Figure 22-6).

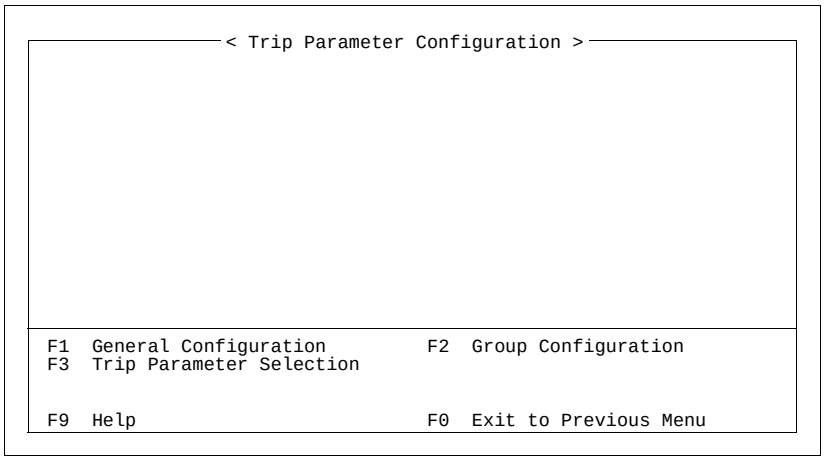


Figure 22-6. Trip Parameter Configuration Menu

Defining a General Set of Data Collection Parameters

The general parameters define the default trip data collection that can be used by any trip group.

Press <F1> at the Trip Parameter Configuration Menu to display the Edit General Trip Parameters Menu (Figure 22-7). General data collection parameters must be defined before group parameters.

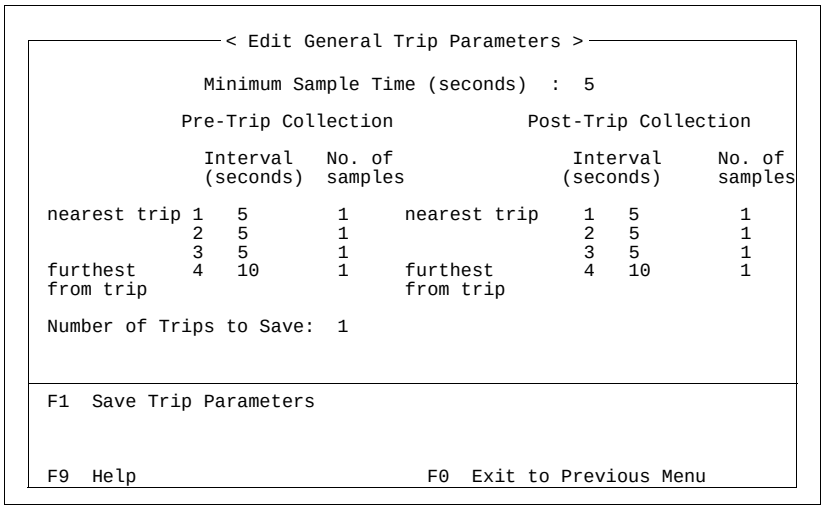


Figure 22-7. Edit General Trip Parameters Menu

To configure general data collection parameters:

1. Enter a value (in seconds) in the Minimum Sample Time field to define how frequently all trip group tags are sampled. The shortest sampling frequency is 5 seconds.

2. Enter up to four pre-trip and four post-trip time intervals. Each interval consists of a sampling frequency for the interval and the number of samples to collect. Each interval must include a sample time in the Interval field and a number of samples. The sampling times for each interval must be a multiple of the minimum sample time. For example, if the minimum sample time is 5 seconds, sample times for intervals may be 5, 10, 15, etc. seconds. This allows you to select the amount of data that will print at predetermined times before and after a trip occurs. There must be at least 1 pre-trip interval and 1 post-trip interval defined.

3. Enter the number of trip log files to save. This value is used for all trip groups.

To save your changes, press <F1>.

To exit from the menu, press <F10>.

Defining Data Collection Parameters For Individual Groups

If you want to use a different set of data collection parameters than the general parameters for a particular group, you can set up data collection parameters for that group.

Press <F2> at the Trip Parameter Configuration Menu (Figure 22-6) to configure trip group data collection parameters (Figure 22-8).

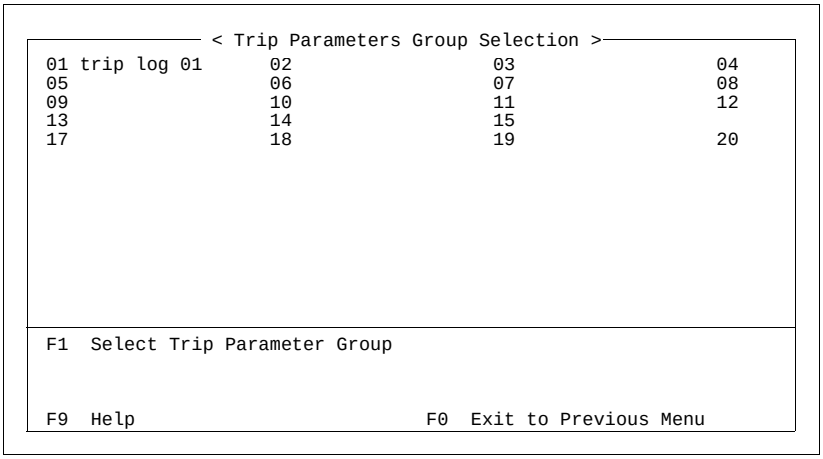


Figure 22-8. Trip Parameters Group Selection Menu

Use arrow keys to highlight the desired trip group, then press <F1> to display the Edit Trip Parameters for Group Menu (see Figure 22-9).

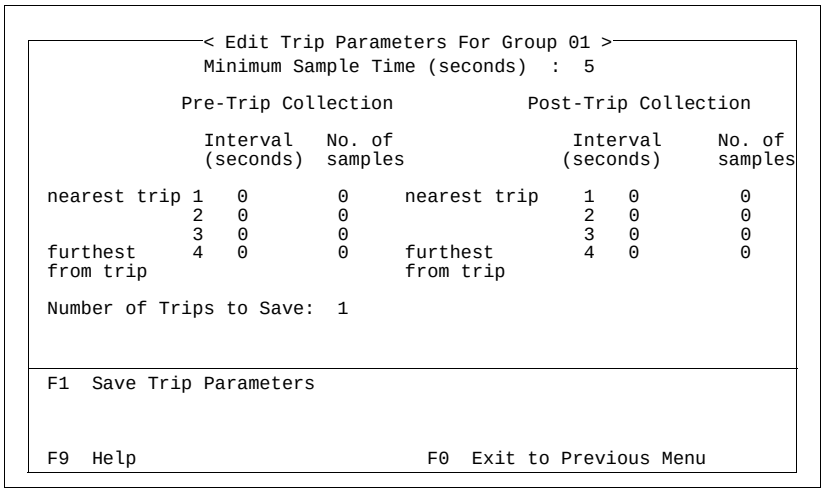


Figure 22-9. Edit Parameters for Trip Group Menu

The Minimum Sample Time and Number of Trips to Save fields cannot be modified. These values are set in the Edit General Trip Parameters Menu (Figure 22-7).

Make any changes to the data collection intervals for the group.

To save your changes, press <F1>.

To return to the previous menu, press <F10>.

Selecting the Data Collection Parameters to Use

Once general and group data collection parameters are defined, you select whether a particular group uses the general parameters or the parameters entered for that group.

Press <F3> at the Trip Parameter Configuration Menu to display the Edit Parameter Indicators screen (Figure 22-10).

Select a trip group using the arrow keys, then enter **y** if you want the group to use the trip parameters defined for the group, or enter **n** if you want to use the set of general parameters.

To save your changes, press <F1>.

To exit from the screen, press <F10>.

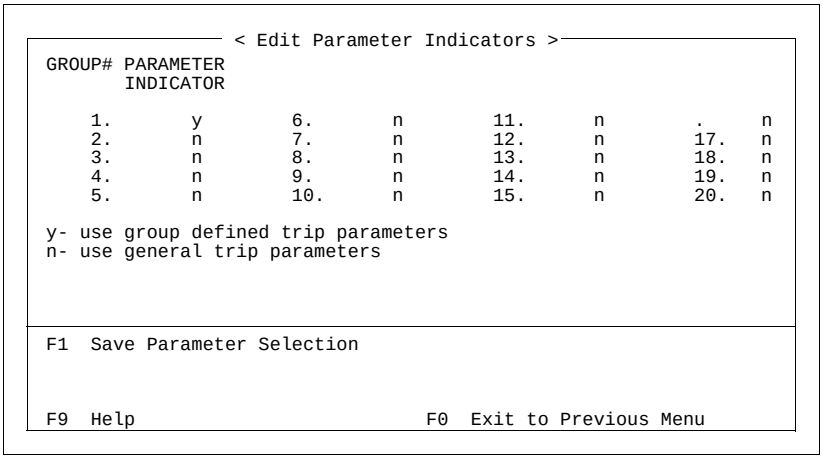


Figure 22-10. Edit Parameter Indicators

SECTION 23 - RETRIEVING LOGS

OVERVIEW

Press **G** from the Main Menu to display the Log Retrieval Menu (Figure 23-1).

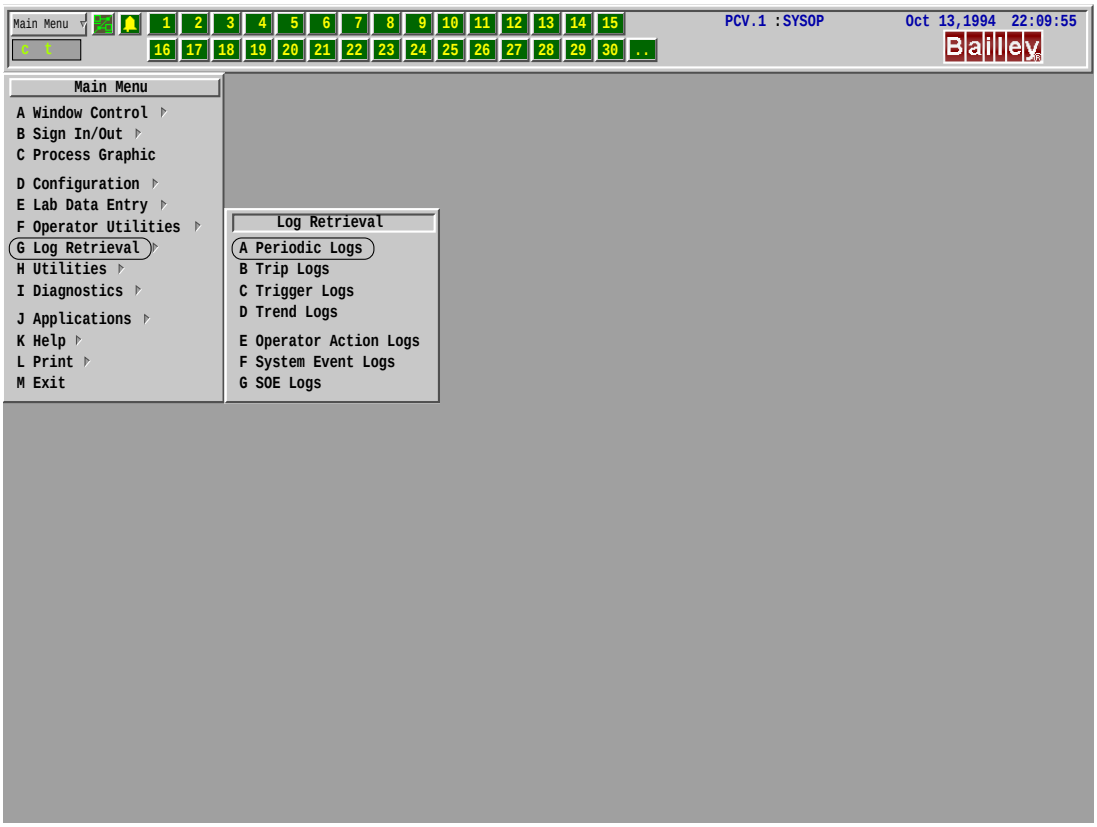


Figure 23-1. Log Retrieval Menu

RETRIEVING PERIODIC AND TRIGGER LOGS

At the end of each log period or after each print trigger, the data for a log is retained to a log data file and the log is printed to the print device. The number of log data files retained is specified by the Number of Retained Logs in the log parameters. A retained log file can be demanded (printed) or edited at any time, as long as it has not been deleted from disk to make room for newer retained log files. Log data files on floppy disk can also be demanded or edited.

From the Log Retrieval Menu, press **A** for Periodic Retrieval (Figure 23-2), or press **C** for Trigger Retrieval. Each of these retrieval applications can be selected with the mouse. Move

the pointer to highlight the Menu option and press the left mouse button. These menus allow you to monitor the current data in a log, demand a log with current or historical data, and edit the data in historical log files.

NOTE: This section only describes the use of log retrieval for periodic logs. The same functions and descriptions can be applied to the demanding and editing of trigger log retrieval.

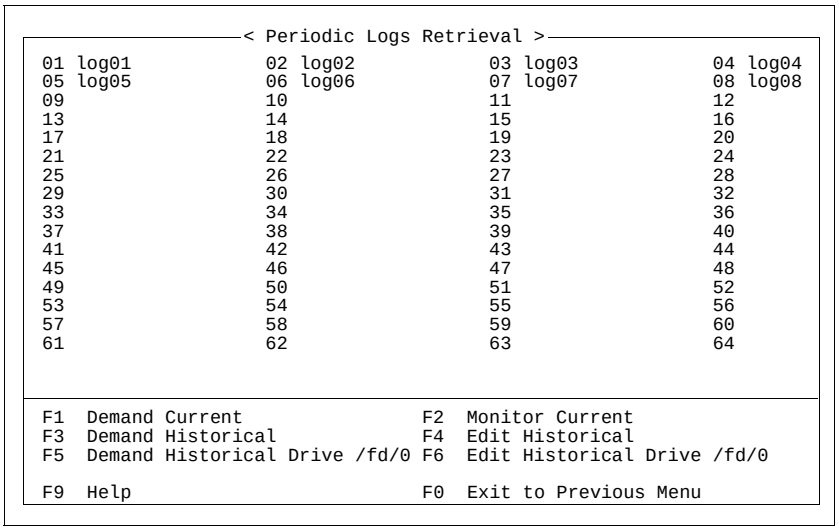


Figure 23-2. Periodic Retrieval Menu

The file names of historical logs are timestamps of the time the files were created. For periodic logs, the names of the historical log files have the following format:

yyyy mmm dd hh:mm:ss

where:
yyyy is the year
mmm is the month (Jan-Dec)
dd is the day (01-31)
hh is the hour (00-23)
mm is the minute (00-59)
ss is the second (00-59)

For trigger logs, the names of the historical log files have the following format:

yyyy mmm dd hh:mm:ss

where:
yyyy is the year (since 1900)
mmm is the month (Jan-Dec)
dd is the day (01-31)
hh is the hour (00-23)
mm is the minute (00-59)
ss is the second (00-59)

Demanding and Monitoring the Current Log

The current log is the log which is currently being collected.

Demanding the Current Log

To demand the current log, highlight the name of the log you want with the arrow keys, then press <F1>. The log is printed to the print device specified in the log parameters with the current data.

If the log requires import values, all previous logs exporting values used by the log are regenerated (but not printed) to obtain the import values.

Monitoring the Current Log

Monitoring the current log displays the log with its current values on-screen, and updates the values as new information is collected.

To monitor the current log, highlight the name of the log you want by using the arrow keys, then press <F2>. RIPCAM2 is started, and the log format is displayed with current data. You can move the cursor around the spreadsheet, but you CANNOT edit the log format or data. Imports and exports are NOT performed.

To exit from RIPCAM2, press **\q** (backslash q).

Demanding Historical Logs

From the Periodic Retrieval Menu, select the log using the arrow keys and then press:

<F3> To demand an historical log from the hard drive. The Historical Log Selection Menu (Figure 23-3) is displayed with the historical log files for the selected log.

<F5> To demand an archived log from drive 1 (make sure you have a disk in the drive containing the requested log). The Archived Log Selection Menu (Figure 23-4) is displayed with the historical log files for the selected log on drive 1.

> **NOTE:** For the <F5> selection, insert the floppy disk containing the historical log files for the selected log into drive "/fd/0" BEFORE pressing <F5>.

```
                        < Historical Log Selection >

 01 current              02 1994 Feb 15 16:00:00 03 1994 Feb 15 15:00:00
 04 1994 Feb 15 14:00:00 05 1994 Feb 15 13:00:00 06 1994 Feb 15 12:00:00
 07 1994 Feb 15 11:00:00 08 1994 Feb 15 10:00:00 09 1994 Feb 15 09:00:00
 10 1994 Feb 15 08:00:00 11 1994 Feb 15 07:00:00 12 1994 Feb 15 06:00:00
 13 1994 Feb 15 05:00:00 14 1994 Feb 15 04:00:00 15 1994 Feb 15 03:00:00
 16 1994 Feb 15 02:00:00 17 1994 Feb 15 01:00:00 18 1994 Feb 15 00:00:00
 19 1994 Feb 14 23:00:00 20 1994 Feb 14 22:00:00 21 1994 Feb 14 21:00:00
 22 1994 Feb 14 20:00:00 23 1994 Feb 14 19:00:00 24 1994 Feb 14 18:00:00
 25 1994 Feb 14 17:00:00 26 1994 Feb 14 16:00:00 27
 28                      29                      30
 31                      32                      33
 34                      35                      36
 37                      38                      39
 40                      41                      42
 43                      44                      45
 46                      47                      48


 F1  Demand Log on System Printer F2  Demand on System Printer(Imports)
 F3  Demand Log on Local Printer  F4  Demand on Local Printer(Imports)
 F5  Demand Log on Console        F6  Demand on Console (Imports)

 F9  Help                         F0  Exit to Previous Menu
```

Figure 23-3. Historical Log Selection Menu

```
                        < Archived Log Selection >

 01 1994 Jan 23 13:00:00 02 1994 Jan 23 12:00:00 03 1994 Jan 13 00:00:00
 04 1994 Jan 12 05:00:00 05 1994 Jan 12 04:00:00 06 1994 Jan 11 22:00:00
 07 1994 Jan 11 21:00:00 08 1994 Jan 11 20:00:00 09 1994 Jan 11 19:00:00
 10 1994 Jan 11 18:00:00 11 1994 Jan 11 17:00:00 12 1994 Jan 11 16:00:00
 13                      14                      15
 16                      17                      18
 19                      20                      21
 22                      23                      24
 25                      26                      27
 28                      29                      30
 31                      32                      33
 34                      35                      36
 37                      38                      39
 40                      41                      42
 43                      44                      45
 46                      47                      48



 F1  Demand Log on System Printer  F2  Demand on System Printer(Imports)
 F3  Demand Log on Local Printer   F4  Demand on Local Printer(Imports)
 F5  Demand Log on Console         F6  Demand on Console (Imports)

 F9  Help                             F0  Exit to Previous Menu
```

Figure 23-4. Archived Log Selection Menu

Select the historical log you want, then press a function key to specify where you want to demand the log to:

<F1> To demand the printout of the selected log to the log device defined in the log parameters.

<F3> To demand a printout of the selected log to the parallel printer attached to this node.

<F5> To demand the selected log to the current window pane.

The log is displayed using the QNX4 "more" utility.

This screen can be scrolled up or down or to the left or right using the arrow keys.

Exit the "more" utility by scrolling off the end of the viewed file or press **:q** (colon q). Further information on the "more" utility is available in the "QNX Operating System" manual.

The current log can also be selected from this menu by selecting the "current" log file.

For periodic logs you have the choice of demanding a log without imports (<F1>, <F3> or <F5>) or with imports (<F2>, <F4>, or <F6>).

Import values are stored in historical data files but NOT in the current data file.

<F2> Regenerates the imports for the selected log, and demands the printout of the log to the log device defined in the log parameters (periodic logs only).

<F4> Regenerates the imports for the selected log, and demands the printout of the log to the parallel printer attached to this node. (periodic logs only).

<F6> Regenerates the imports for the selected log, and demands the log to the console (periodic logs only).

When a log is demanded, the exports for the log are performed if Export on Demand has been set to Yes in the log parameters.

Demanding a log does not affect the automatic printing, retention, or exporting of the log. If a log is normally printed at the end of each shift, but the current log was demanded in the middle of the shift, the log would show the current values up to that moment in the shift.

For example, any integration values would have the current accumulated value. The integration values at the end of the shift have the accumulated values for the entire shift.

Demanding a current log during a log period obtains a snapshot of the log at that moment in the log period.

RETRIEVING TRIP LOGS

When a trip occurs, the collected information is stored in a file with a name based on the time and date of the trip, and the trip log is printed on the network printer.

The names of the historical trip log files have the following format:

yyyy mmm dd hh:mm:ss

where:

yyyy is the year
mmm is the month (Jan-Dec)
dd is the day (01-31)
hh is the hour (00-23)
mm is the minute (00-59)
ss is the seconds (00-59)

The number of historical trip log files kept on disk is set by the general data collection parameters.

The Trip Retrieval Menu will allow you to demand logs and plots for a particular trip group. Press **B**, or highlight the Trip Log Menu item and press the left mouse button from the Log Retrieval Menu to display the Trip Logs Retrieval Menu (Figure 23-5).

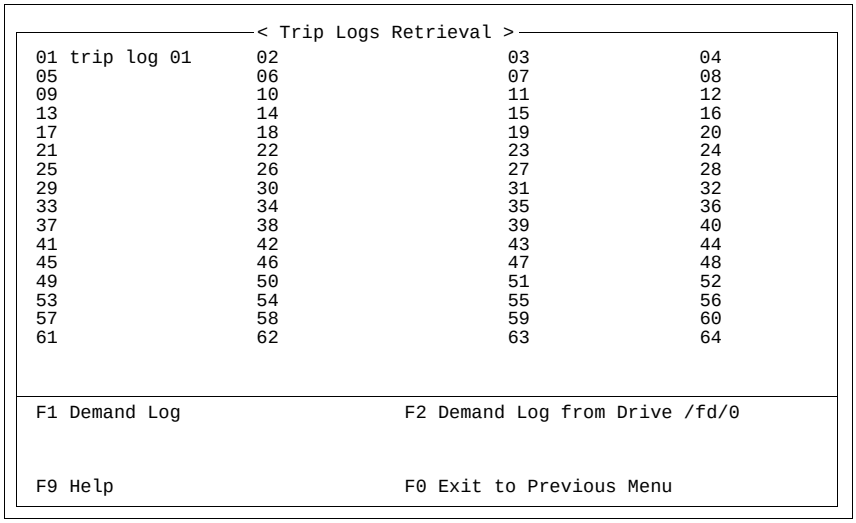


Figure 23-5. Trip Logs Retrieval Menu

Demanding a Trip Log

You can print the trip log for any historical trip data file on the hard disk or on a floppy disk.

On the Trip Logs Retrieval Menu (Figure 23-5), highlight the trip group you want, then press <F1> to display the historical trip data files. You can print trip logs from historical trip data files stored on floppy disk by inserting the disk into drive "/fd/0", then pressing <F2> from the Trip Logs Retrieval Menu.

Select the historical data file you want, then press <F1> to print the log on the network printer.

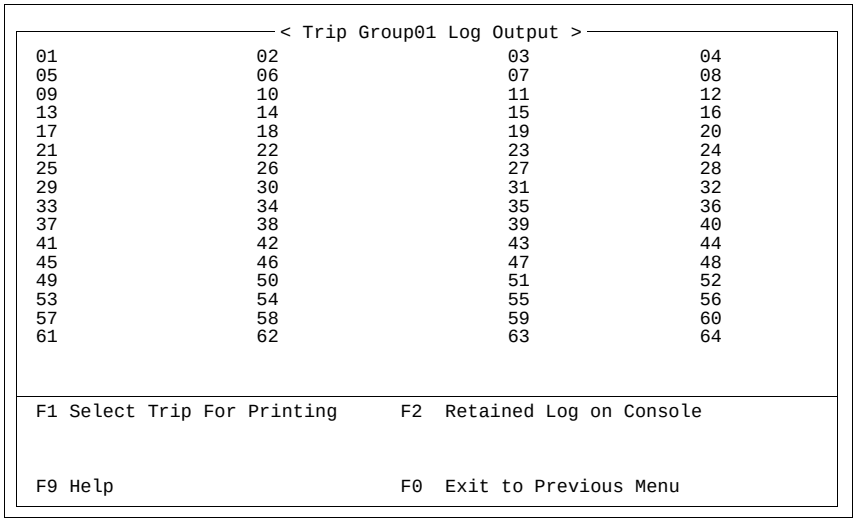


Figure 23-6. Selecting a Trip Log

Editing Historical Logs

From the Periodic Logs Retrieval or the Trigger Logs Retrieval Menu, press:

<F4> To edit an historical log. The Historical Data Selection Menu (Figure 23-7) is displayed with the historical log files for the selected log.

<F6> To edit an historical log on drive "/fd/0". The Historical Data Selection Menu (Figure 23-7) is displayed with the historical log files for the selected log on drive 1.

> **NOTE:** For the <F6> selection, insert the floppy disk containing the historical log files for the selected `log into drive "/fd/0" BEFORE pressing <F6>.

By editing an historical log, you can change any collected data values reported on a log. This allows you to correct data that was not collected accurately during the log period. For example, the average tank level couldn't be read during a log because the transmitter had failed, but you had taken measurements manually. After the log period was over, you could edit the historical log file and enter the average tank level you measured.

You use RIPCAM2 to edit historical data in the log format. However, you can edit numeric and text data cells only. You cannot create new cells, change the format, or use menu functions.

To edit historical data for a log, select the log name in the Periodic or Trigger Logs Retrieval Menu, then press <F4>. To edit

an historical log on a floppy disk, insert the floppy disk containing the historical logs for the log into drive "/fd/0", then press <F6> from the Periodic Logs Retrieval Menu. The Historical Data Selection Menu (Figure 23-7) is displayed with all historical data files currently on the hard disk (or floppy disk).

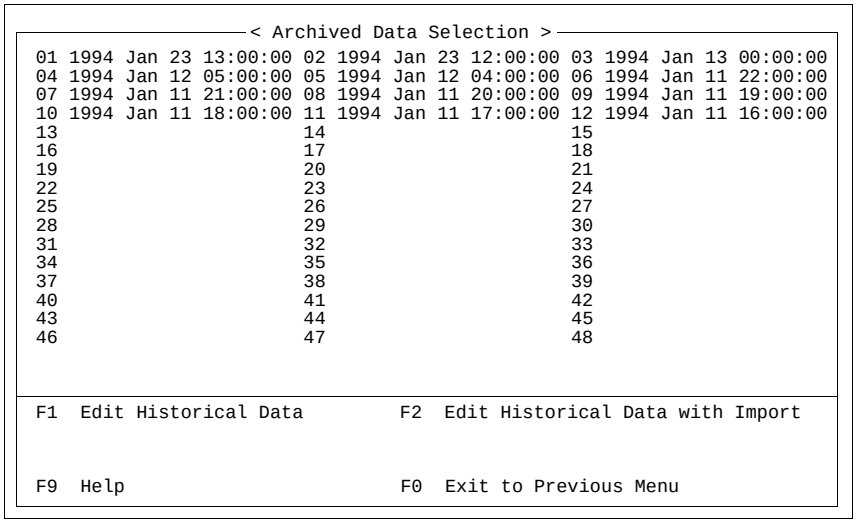


Figure 23-7. Historical Data Selection

Select the data file to edit by highlighting the file name with the cursor, then press <F1>.

For periodic logs only if the log contains import values and the import values have been changed, the new import values can be regenerated by pressing <F2> instead of <F1>. When the data is saved, the new import values will be stored in the historical data file for the log and the import values will not have to be regenerated the next time the historical log is edited or demanded.

If the log does not contain any import values, the historical data file can be edited by pressing either <F1> or <F2>.

> **NOTE:** Only historical data can be edited. The current data for a log CANNOT be edited.

When an historical data file is selected for edit, RIPCAM2 is run and displays the log format with the selected data file.

In the Edit Historical Data spreadsheet, only numeric data cells and text data cells can be modified and saved. You CANNOT use any menu functions. You use macros to save the edited historical data and exit from RIPCAM2. The following keyboard macros are available:

\s Save the data file. The data file is saved to disk, and you remain in RIPCAM2.

\t Save the text cells. The text cells are saved to disk, and you remain in RIPCAM2.

\e Save the data file and text cells and exit from RIPCAM2. The data file and text cells are saved to disk, and you exit from RIPCAM2.

\q Exit RIPCAM2 without saving. Any changes to the data or text are discarded, and exit from RIPCAM2 immediately.

\m Display macros on prompt line. If the prompt line has been cleared, the macro prompt can be redisplayed by typing this macro.

To use the above macros, press the backslash key (\), then the letter of the macro (in lowercase).

Demanding or Editing Historical Logs with Imports (Periodic Logs Only)

To demand or edit historical logs with imports:

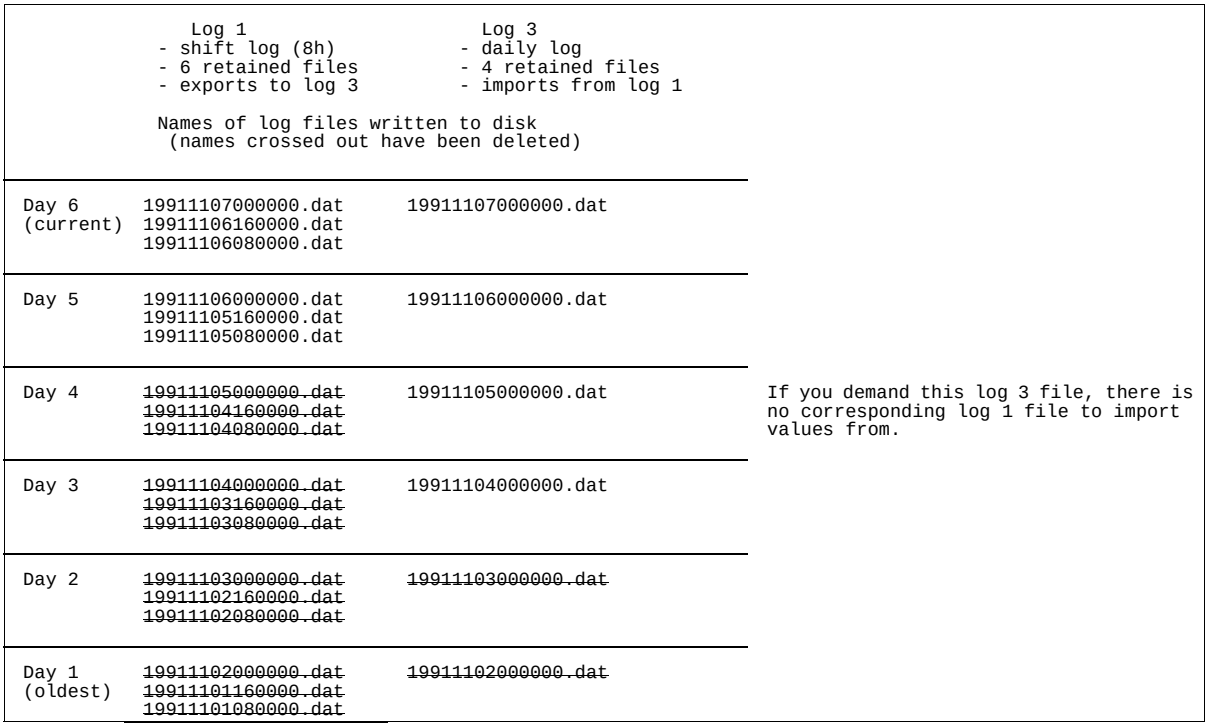
From the Historical Data Selection Menu (Figure 23-7) press <F2>.

When an historical log containing imports is edited or demanded with imports, the import values have to be regenerated. To regenerate import values, historical data files for the same time span are regenerated for all logs with a lower log index number that contain export values. If a data file is not available for a one of these logs, the following warning message is displayed:

Unable to regenerate file /bci/pcv/data/log/periodic/log ##/yyyy mmm dd hh mm ss.dat

You are asked if you want to continue. Press **y** to continue the regeneration of import values, or press any other key to cancel the log edit or demand.

An historical data file for another log may be unavailable because its number of retained logs do not extend far back enough in time to match the log data file you are demanding or editing. Figure 23-8 shows how two logs, log 1 and log 3 are saved to disk, and how a required historical data file could be missing.



	Log 1 - shift log (8h) - 6 retained files - exports to log 3 Names of log files written to disk (names crossed out have been deleted)	Log 3 - daily log - 4 retained files - imports from log 1	
Day 6 (current)	19911107000000.dat 19911106160000.dat 19911106080000.dat	19911107000000.dat	
Day 5	19911106000000.dat 19911105160000.dat 19911105080000.dat	19911106000000.dat	
Day 4	~~19911105000000.dat~~ ~~19911104160000.dat~~ ~~19911104080000.dat~~	19911105000000.dat	If you demand this log 3 file, there is no corresponding log 1 file to import values from.
Day 3	~~19911104000000.dat~~ ~~19911103160000.dat~~ ~~19911103080000.dat~~	19911104000000.dat	
Day 2	~~19911103000000.dat~~ ~~19911102160000.dat~~ ~~19911102080000.dat~~	~~19911103000000.dat~~	
Day 1 (oldest)	~~19911102000000.dat~~ ~~19911101160000.dat~~ ~~19911101080000.dat~~	~~19911102000000.dat~~	

Figure 23-8. Demanding Historical Logs with Imports

Log 1 is configured as an eight hour shift log: a log file is saved to disk at the end of each shift. Log 1 is configured to save 6 historical logs on disk. In Figure 23-8, "19911107000000.dat" is the file name of the newest historical log, and "19911105080000.dat" is the file name of the oldest historical log saved on disk. All older files have been deleted, keeping the number of retained logs at 6. Log 1 exports data to log 3.

Log 3 is configured as a daily log: a log file is saved to disk at the end of each day. Log 3 is configured to retain 4 historical logs on disk. In Figure 23-8, "19911107000000.dat" is the file name of the most recent historical log and "19911104000000.dat" is the file name of the oldest historical log saved on disk. All older files have been deleted, keeping the number of retained logs at 4. Log 3 imports data from log 1.

The "19911107000000.dat" log for log 3 receives imports from the "19911107000000.dat" log of log 1.
The "19911106000000.dat" log of log 3 receives imports from the "19911106000000.dat" log of log 1.
If the "19911107000000.dat" log of log 3 was demanded or edited, the required imports would come from the "19911107000000.dat" log of log 1.
If the "19911105000000.dat" were demanded or edited, the required imports would come from the "19911105000000.dat" log of log 1. However, the "19911105000000.dat" of log 1 has been deleted, so the log 3 log would not be able to receive the required import values and a warning that

"19911105000000.dat" of log 1 could not be regenerated would be displayed. The log "19911105000000.dat" of log 3 can still be demanded or edited, but without the import values.

Imports and exports allow previous logs to send values to subsequent logs for processing during the current log period. The export values in the previous logs can be edited historically and carried through to subsequent logs.

RETRIEVING SYSTEM EVENTS/OPERATOR ACTION LOGS

Refer to Section 16.

Retrieving Trend Logs

At the end of each trend log period, the data for a log is saved to an historical log file, and the log is printed at the print device. The number of historical log files kept on disk is specified by the Number of Retained Logs parameter in the log parameters. An historical trend log file can be demanded (printed) at any time as long as the historical log file has not been deleted from disk to make room for newer historical log files.

The names of the historical log files contain timestamps of the time the files were created. The names of the historical trend log files have the following format:

yyyy mmm dd hh:mm:ss

where:
yyyy is the year
mmm is the month (Jan-Dec)
dd is the day (01-31)
hh is the hour (00-23)
mm is the minutes (00-59)
ss is the seconds (00-59)

Demanding a Log

Press **D** from the Log Retrieval Menu to display the Trend Retrieval Menu. This Menu may also be selected by highlighting with the printer the Trend Logs Menu item from the Log Retrieval Menu and pressing the mouse button.

To demand the current log, select a trend log from the Trend Retrieval Menu using the arrow keys, then:

- Press <F1> to print the current log on the printer configured as the Logging Device.

- Press <F3> to print the current log on the parallel printer attached to this node.

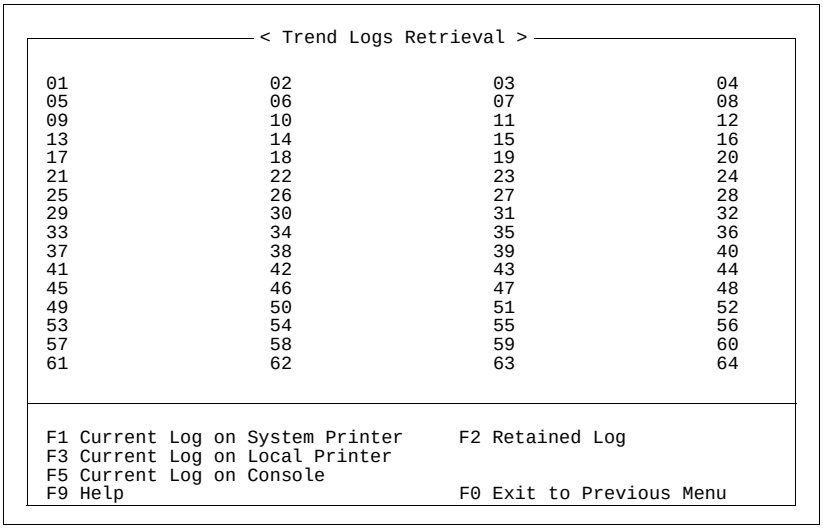


Figure 23-9. Trend Retrieval Menu

- Press <F5> to print the log on the screen.

To demand an historical log, press <F2> from the Trend Retrieval Menu to display the Retained Log Selection Menu.

Select an historical trend log file using the arrow keys, then:

- Press <F1> to print the current log on the printer configured as the Logging Device.
- Press <F3> to print the current log on the parallel attached to this node.
- Press <F5> to print the log on the screen.

SECTION 24 - LOG TRANSLATION UTILITIES

OVERVIEW

The Log Translation Utilities provide powerful conversion utilities to translate log files to DIF or ASCII format for use in other software packages.

To use this translation utility, you must first define parameters for log translation and then, using the menu-driven utility, you can select the log or logs to translate. You can translate individual logs or use the "wild card" capability to translate a group of logs.

To access the Log Translation Utility:

From the Main Menu, press **H** to access the Utility Menu, and then press **E** to access the Translation Utilities Menu (Figure 24-1). The same menus may be selected using the mouse. Move the pointer to highlight the desired menu option and press the right mouse button.

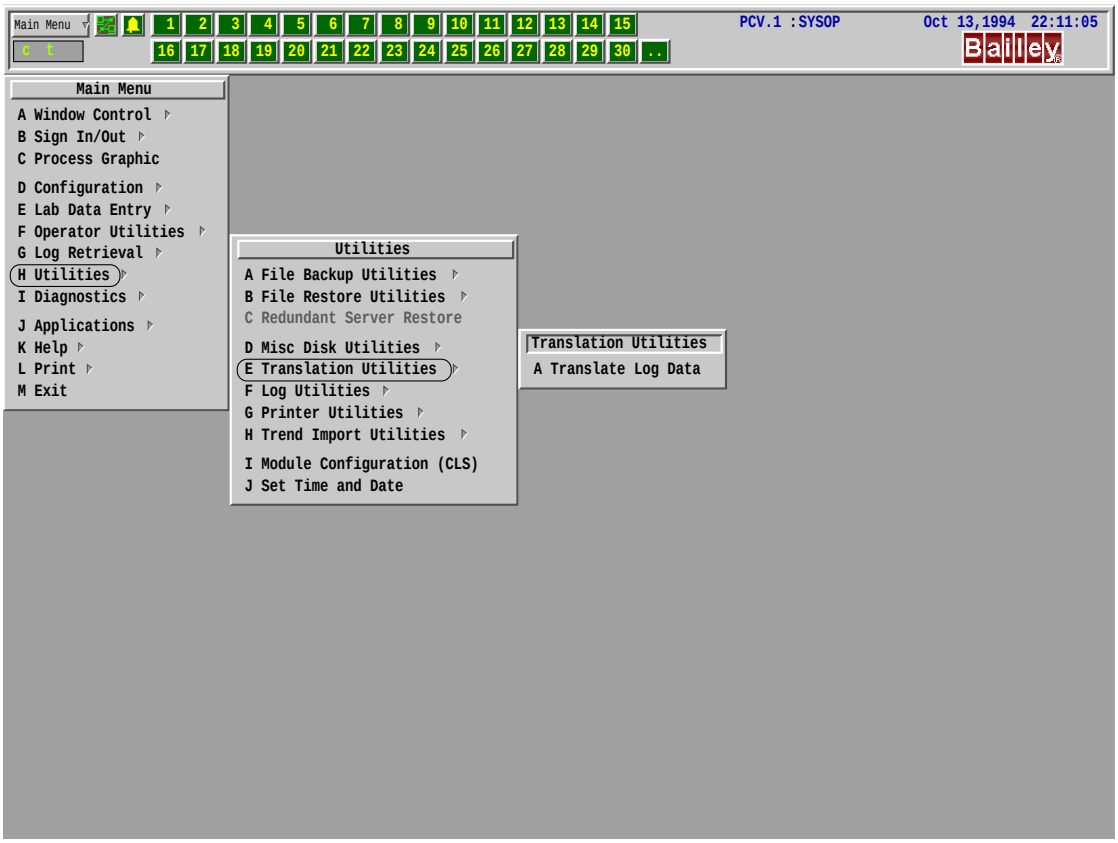


Figure 24-1. Translation Utilities Menu

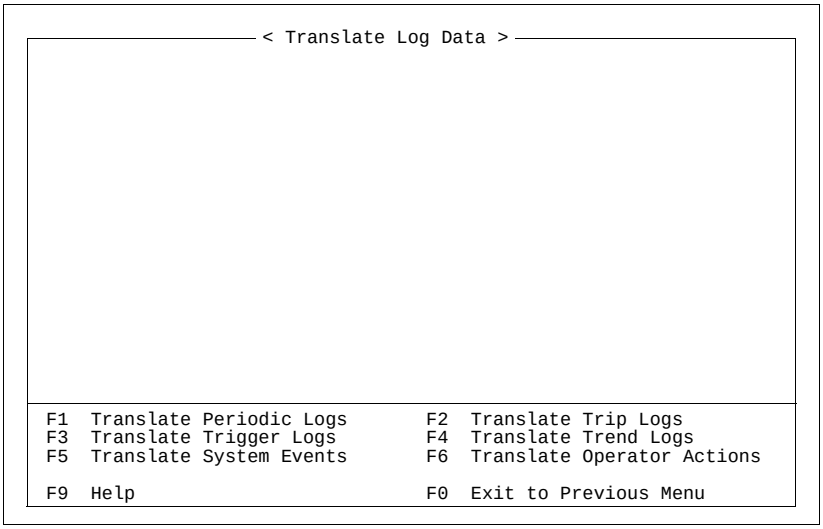


Figure 24-2. Translate Log Data Menu

TRANSLATE PERIODIC LOGS

To translate Periodic Logs you must first configure the translation parameters.

From the Translate Log Data Menu, press <F1> (Translate Periodic Logs), to access the Translate Periodic Logs Menu (Figure 24-3).

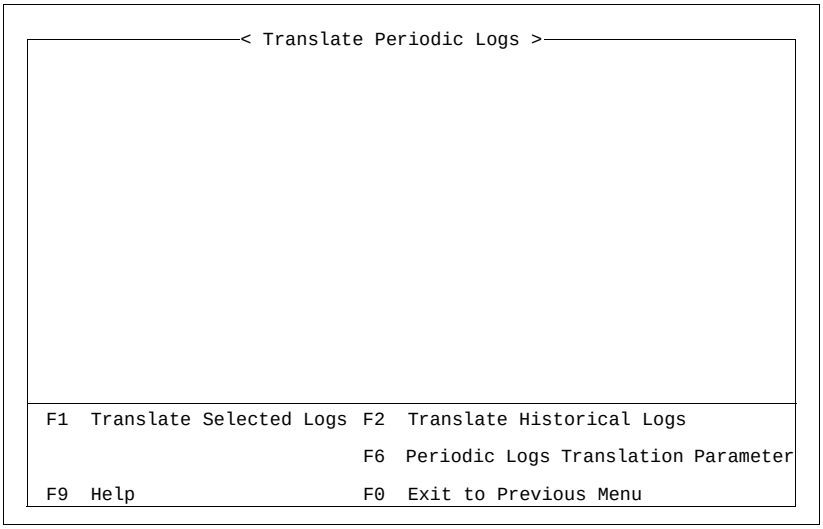


Figure 24-3. Translate Periodic Logs

Configuring Periodic Logs Translation Parameters

Press <F6> from this menu to display the Periodic Logs Translation Parameters Menu (Figure 24-4).

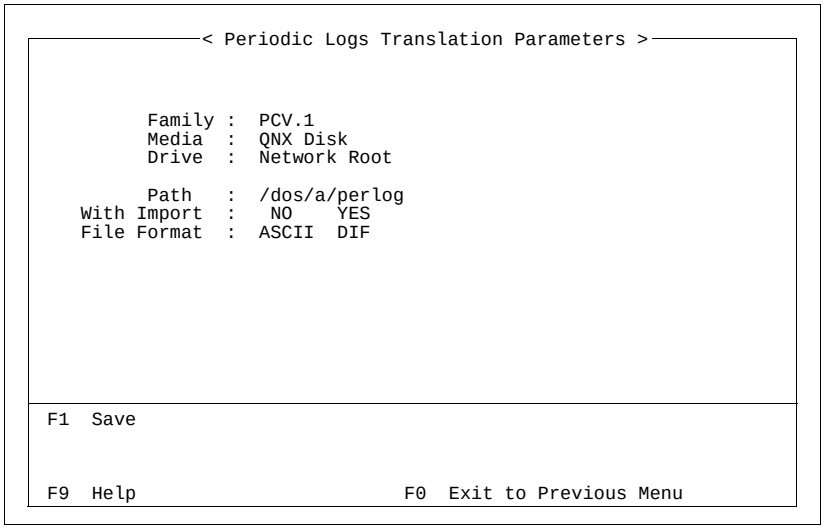


Figure 24-4. Periodic Log Translation Parameters Menu

Table 24-1 describes the fields in this menu.

Table 24-1. Configuring Periodic Log Translation Parameters

Field	Description
Family	Select the server on which to store data files. A window will popup. Use <Ctrl Up>/<Ctrl Dn> to select one of the currently configured file servers.
Media	Select whether the files are stored on a DOS-formatted floppy or a QNX-formatted floppy. A window will pop up. Use <Ctrl Up>/<Ctrl Dn> to select either QNX or DOS format.
Drive	Select the drive name where the files are stored. Use <Ctrl Up>/<Ctrl Dn> to select the source drive description.
Path	Enter the directory path of where the files are to be written to.
With Import	Select whether or not you want Import values by using <Ctrl Right>/<Ctrl Left>. (See Section 5 for information on Import values in logs.)
File Format	Select ASCII or DIF format .

When you have configured the parameters for translation, press <F1> to save your configuration.

> **NOTE:** If your log translation parameters remain constant, you need only configure them once.

Press <F10> to return to the Translate Periodic Logs Menu.

Translate Selected Periodic Logs

To translate Selected Periodic Logs, press <F1> from this Menu to display the Translate Selected Periodic Logs Menu, (Figure 24-5).

```
                    < Translate Selected Periodic >
 01 log01            02 log02            03 log03            04 log04
 05 log05            06 log06            07 log07            08 log08
 09                  10                  11                  12
 13                  14                  15                  16
 17                  18                  19                  20
 21                  22                  23                  24
 25                  26                  27                  28
 29                  30                  31                  32
 33                  34                  35                  36
 37                  38                  39                  40
 41                  42                  43                  44
 45                  46                  47                  48
 49                  50                  51                  52
 53                  54                  55                  56
 57                  58                  59                  60
 61                  62                  63                  64

 F1  Start Translation


 F9  Help                          F0  Exit to Previous Menu
          Press the space bar to toggle selection
```

Figure 24-5. Translate Selected Periodic Logs Menu

To select an individual log for translation use <Up>/<Down>/<Left>/<Right> to select the log and press <F1>.

To select a group of logs to translate,use <Up>/<Down>/<Left>/<Right> to cursor to each log and then press <Space> to select it.

Selected logs will change in color from green to gray. (To de-select a log, cursor to it and press <Space>. The color will change back to green.) When you have completed your selection process press <F1> to translate the logs.

During the translation processthe log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Periodic Menu.

Translate Historical Logs

To translate Historical logs, press <F2> from the Translate Periodic Logs Menu (Figure 24-3) to display the Translate Selected Historical Periodic Menu (Figure 24-6).

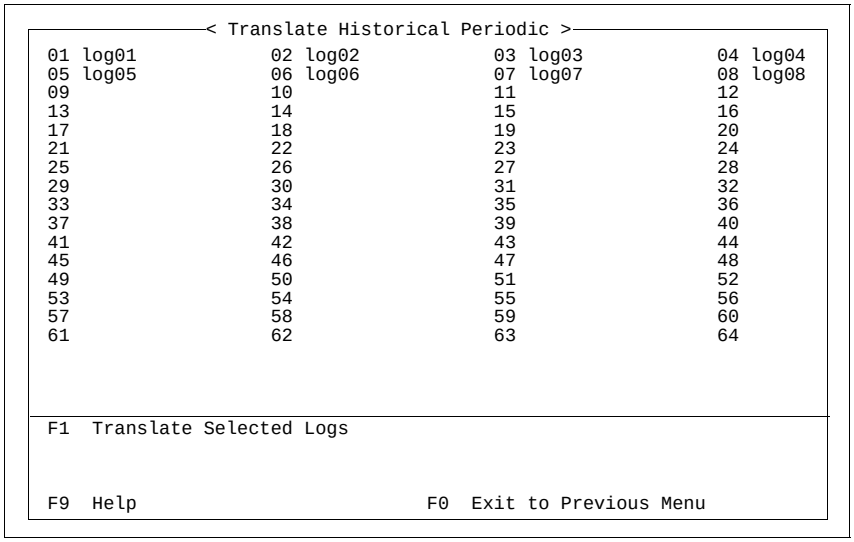


Figure 24-6. Translate Selected Historical (Periodic) Menu

Select a log to translate by using <Up>/<Down>/<Left>/<Right> and press <F1> to display the Translate Selected Historical (Periodic) Logs Menu (Figure 24-7).

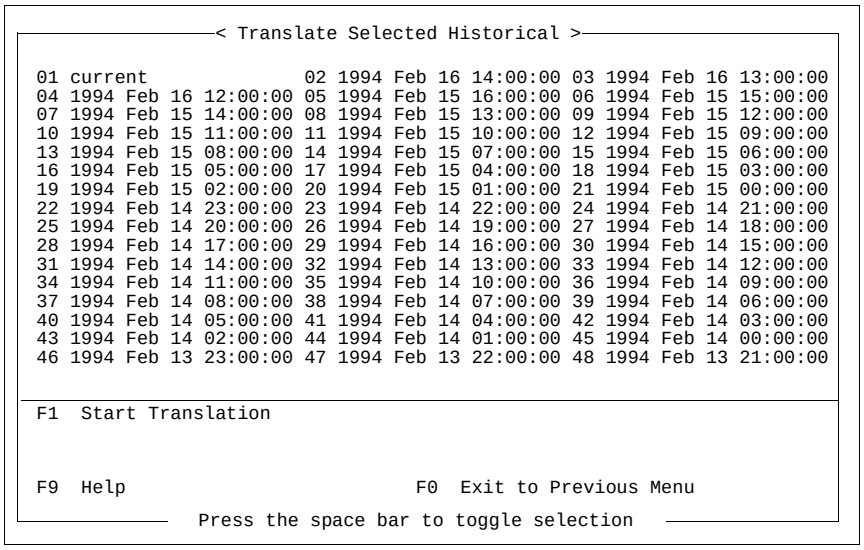


Figure 24-7. Translate Selected Historical (Periodic) Logs Menu

To select an individual log for translation use <Up>/<Down>/<Left>/<Right> to highlight the log and then press <F1>.

To select a group of logs to translate, use <Up>/<Down>/<Left>/<Right> to cursor to each log and then press <Space> to select it. Selected logs will change in color from green to gray. To de-select a log, cursor to it and press <Space>. The color will change back to green). When you have completed your selection process, press <F1> to translate the logs.

During the translation process, the log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Logs Menu.

TRANSLATE TRIP LOGS

NOTE: You can only translate Trip Log files into ASCII format.

To translate Trip Logs you must first configure the translation parameters.

From the Translate Log Data Menu (Figure 24-2), press <F2>, Translate Trip Logs, to access the Translate Trip Logs Menu (Figure 24-8).

```
                    < Translate Trip Logs >

F1  Translate Selected Logs     F2  Translate Historical Logs
                                F6  Trip Logs Translation Parameter
F9  Help                        F0  Exit to Previous Menu
```

Figure 24-8. Translate Trip Logs Menu

Configure Trip Logs Translation Parameters

Press <F6> from this menu to display the Trip Logs Translation Parameters Menu (Figure 24-9).

```
              < Trip Logs Translation Parameters >

         Family :  PCV.1
         Media  :  QNX Disk
         Drive  :  Network Root

         Path   :  /dos/a/triplogs
   With Import  :
   File Format  :

F1  Save


F9  Help                        F0  Exit to Previous Menu
```

Figure 24-9. Trip Log Translation Parameters Menu

Table 24-2 describes the fields in this menu.

Table 24-2. Configuring Trip Log Translation Parameters

Field	Description
Family	Select the server on which to store data files. A window will popup. Use <Ctrl Up>/<Ctrl Dn> to select one of the currently configured file servers.
Media	Select whether the files are stored on a DOS-formatted floppy or a QNX-formatted floppy. A window will pop up. Use <Ctrl Up>/<Ctrl Dn> to select either QNX or DOS format.
Drive	Enter the drive name where the files are stored. Use <Ctrl Up>/<Ctrl Dn> to select the source drive description.
Path	Enter the directory path of where the files are to be written to.

When you have configured the parameters for translation, press <F1> to save your configuration.

> **NOTE:** If your log translation parameters remain constant, you need only configure them once.

Press <F10> to return to the Translate Trip Logs Menu.

Translate Selected Trip Logs

To translate selected trip logs, from the Translate Trip Logs Menu (Figure 24-8), press <F1> to display the Translate Selected Trip Menu, (Figure 24-10).

```
                    < Translate Selected Trip >

 01 trip log 01      02                  03                  04
 05                  06                  07                  08
 09                  10                  11                  12
 13                  14                  15                  16
 17                  18                  19                  20
 21                  22                  23                  24
 25                  26                  27                  28
 29                  30                  31                  32
 33                  34                  35                  36
 37                  38                  39                  40
 41                  42                  43                  44
 45                  46                  47                  48
 49                  50                  51                  52
 53                  54                  55                  56
 57                  58                  59                  60
 61                  62                  63                  64

 F1  Start Translation


 F9  Help                                F0  Exit to Previous Menu

            Press the space bar to toggle selection
```

Figure 24-10. Translate Selected Trip Logs Menu

To select an individual log for translation use <Up>/<Down>/<Left>/Right> to highlight the log and then press <F1>.

To select a group of logs to translate, use <Up>/<Down>/<Left>/<Right> to cursor to each log and then press <Space> to select it. Selected logs will change in color from green to gray. When you have completed your selection process, press <F1> to translate the logs.

During the translation process, the log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Logs Menu.

Translate Historical Trip Logs

To translate Historical Trip logs, press <F2> from the Translate Trip Logs Menu (Figure 24-8).

Select a log to translate by using <Up>/<Down><Left>/Right> and press <F1> to display the Translated Selected Historical (Trip) Menu (Figure 24-11).

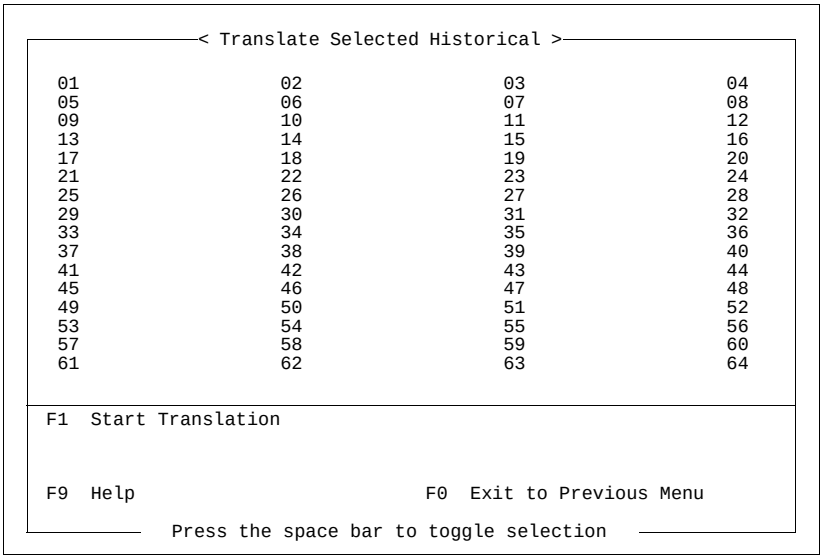


Figure 24-11. Translate Selected Historical (Trip) Logs Menu

To select an individual log for translation use <Up>/<Down>/<Left>/<Right> to highlight the log and then press <F1>.

To select a group of logs to translate, use <Up>/<Down>/<Left>/<Right> to cursor to each log and then press <Space> to select it. Selected logs will change in color from green to gray. (To de-select a log, cursor to it and press <Space>. The color will change back to green). When you have completed your selection process, press <F1> to translate the logs.

During the translation process, the log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Logs Menu.

TRANSLATE TRIGGER LOGS

To translate Trigger Logs you must first configure the translation parameters.

From the Translate Log Data Menu, press <F3>, Translate Trigger Logs, to access the Translate Trigger Logs Menu (Figure 24-12).

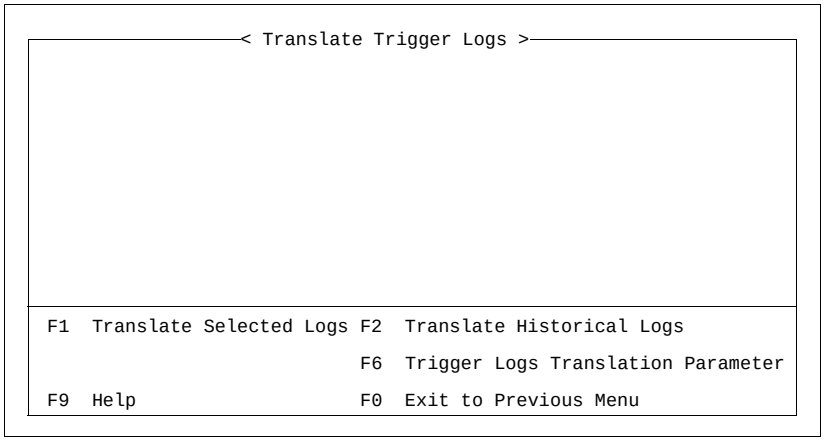


Figure 24-12. Translate Trigger Logs Menu

Configure Trigger Logs Translation Parameters

Press <F6> from this menu to display the Trigger Logs Translation Parameters Menu (Figure 24-13).

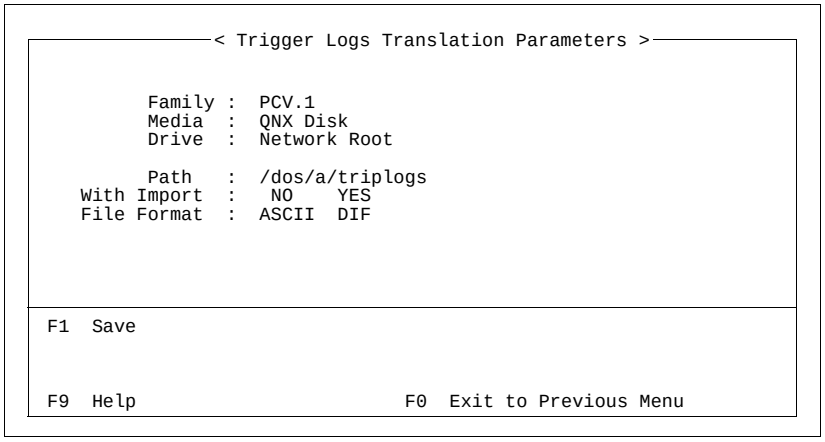


Figure 24-13. Trigger Log Translation Parameters Menu

Table 24-3 describes the fields in this menu.

Table 24-3. Configuring Trigger Log Translation Parameters

Field	Description
Family	Select the server on which to store data files. A window will popup. Use <Ctrl Up>/<Ctrl Dn> to select one of the currently configured file servers.
Media	Select whether the files are stored on a DOS-formatted floppy or a QNX-formatted floppy. A window will pop up. Use <Ctrl Up>/<Ctrl Dn> to select either QNX or DOS format.
Drive	Select the drive name where the files are stored. Use <Ctrl Up>/<Ctrl Dn> to select the source drive description.
Path	Enter the directory path of where the files are to be written to.
With Import	Not applicable to trigger logs.
File Format	Select ASCII or DIF format .

When you have configured the parameters for translation, press <F1> to save your configuration.

NOTE: If your log translation parameters remain constant, you need only configure them once.

Translate Selected Trigger Logs

Press <F10> to return to the Translate Trigger Logs Menu.

From the Translate Trigger Logs Menu (Figure 24-12), press <F1> to display the Translate Selected Trigger Menu, (Figure 24-14).

```
                    < Translate Selected Trigger >

01 trip_log_01      02                  03                  04
05                  06                  07                  08
09                  10                  11                  12
13                  14                  15                  16
17                  18                  19                  20
21                  22                  23                  24
25                  26                  27                  28
29                  30                  31                  32
33                  34                  35                  36
37                  38                  39                  40
41                  42                  43                  44
45                  46                  47                  48
49                  50                  51                  52
53                  54                  55                  56
57                  58                  59                  60
61                  62                  63                  64

F1  Start Translation


F9  Help                              F0  Exit to Previous Menu

          Press the space bar to toggle selection
```

Figure 24-14. Translate Selected Trigger Logs Menu

To select an individual log for translation use <Up>/<Down>/ <Left>/ <Right> to highlight the log and then press <F1>.

To select a group of logs to translate, use <Up>/<Down>/ <Left>/<Right> to cursor to each log and then press <Space> to select it. Selected logs will change in color from green to gray. (To de-select a log, cursor to it and press <Space>. The color will change back to green). When you have completed your selection process, press <F1> to translate the logs.

During the translation process, the log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Logs Menu.

Translate Historical Trigger Logs

From the Translate Trigger Logs Menu (Figure 24-12), press<F2> to display the Translate Historical Trigger Menu (Figure 24-15).

```
                    < Translate Historical Trigger >

01 trip_log_01      02                  03                  04
05                  06                  07                  08
09                  10                  11                  12
13                  14                  15                  16
17                  18                  19                  20
21                  22                  23                  24
25                  26                  27                  28
29                  30                  31                  32
33                  34                  35                  36
37                  38                  39                  40
41                  42                  43                  44
45                  46                  47                  48
49                  50                  51                  52
53                  54                  55                  56
57                  58                  59                  60
61                  62                  63                  64

F1  Start Translate Selected Logs


F9  Help                              F0  Exit to Previous Menu
```

Figure 24-15. Translate Selected Historical (Trigger) Menu

Select a log to translate by using <Up>/<Down>/ <Left>/<Right> and press <F1> to display the Translate Selected Historical (Trigger) Menu (Figure 24-16).

To select an individual log for translation use <Up>/<Down>/ <Left>/<Right> to highlight the log and then press <F1>.

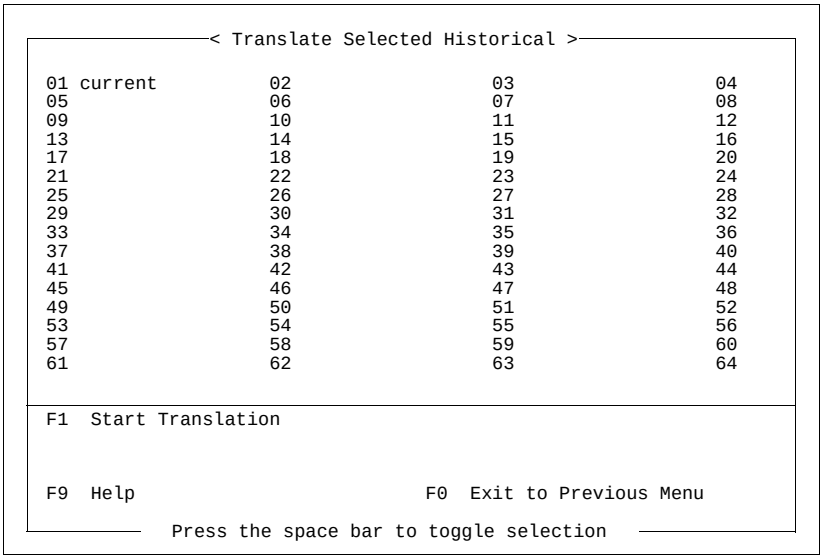


Figure 24-16. Translate Selected Historical (Trigger) Logs Menu

To select a group of logs to translate, use <Up>/<Down>/<Left>/<Right> to cursor to each log and then press <Space> to select it. Selected logs will change in color from green to gray. (To de-select a log, cursor to it and press <Space>. The color will change back to green). When you have completed your selection process, press <F1> to translate the logs.

During the translation process, the log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Logs Menu.

TRANSLATE TREND LOGS

NOTE: You can only translate Trend Log files into ASCII format.

To translate Trend Logs you must first configure the translation parameters.

From the Translate Log Data Menu, press <F4>, Translate Trend Logs, to access the Translate Trend Logs Menu (Figure 24-17).

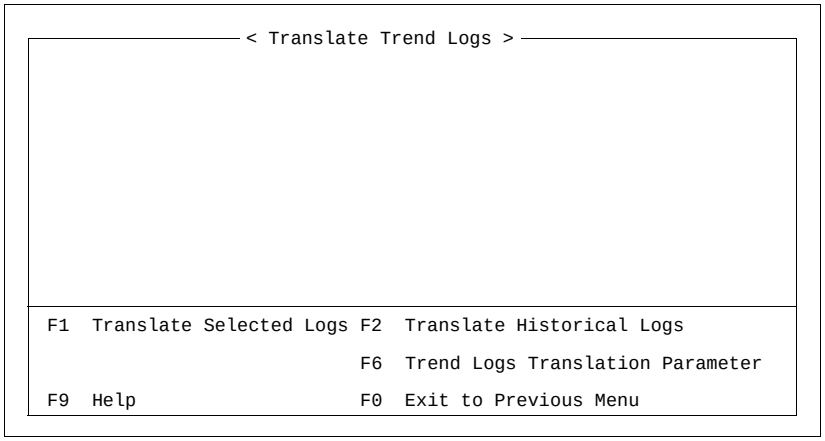


Figure 24-17. Translate Trend Logs Menu

Configure Trend Logs Translation Parameters

Press <F6> from this menu to display the Trend Logs Translation Parameters Menu (Figure 24-18).

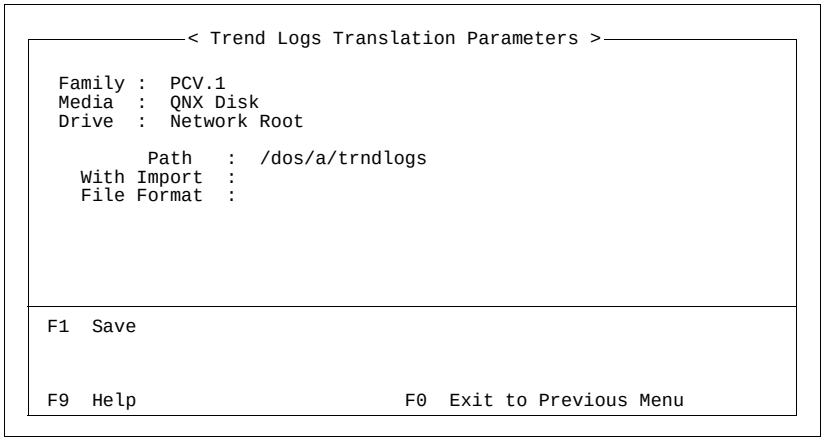


Figure 24-18. Trend Log Translation Parameters Menu

Table 24-4 describes the fields in this menu.

Table 24-4. Configuring Trend Log Translation Parameters

Field	Description
Family	Select the server on which to store data files. A window will popup. Use <Ctrl Up>/<Ctrl Dn> to select one of the currently configured file servers.
Media	Select whether the files are stored on a DOS-formatted floppy or a QNX-formatted floppy. A window will pop up. Use <Ctrl Up>/<Ctrl Dn> to select either QNX or DOS format.
Drive	Select the drive name where the files are stored. Use <Ctrl Up>/<Ctrl Dn> to select the source drive description.
Path	Enter the directory path of where the files are to be written to.

When you have configured the parameters for translation, press <F1> to save your configuration.

> **NOTE:** If your log translation parameters remain constant, you need only configure them once.

Press <F10> to return to the Translate Trend Logs Menu.

Translate Selected Trend Logs

To translate Selected Trend Logs, press <F1> from this menu to display the Translate Selected Trend Logs Menu, (Figure 24-19).

To select an individual log for translation use <Up>/<Down> to highlight the log and then press <F1>.

To select a group of logs to translate, use <Up>/<Down>/<Left>/<Right> to cursor to each log and then press <Space> to select it.

Selected logs will change in color from green to gray. (To de-select a log, cursor to it and press <Space>. The color will change back to green). When you have completed your selection process, press <F1> to translate the logs.

During the translation process, the log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Logs Menu.

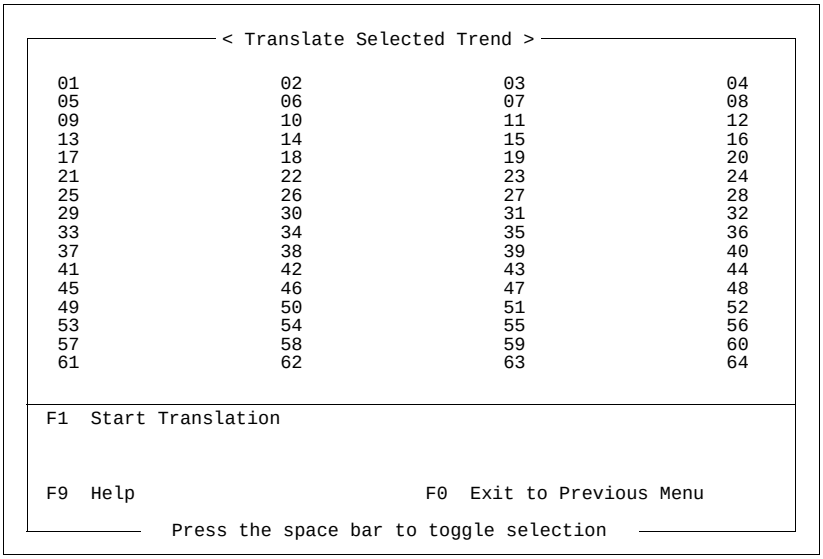


Figure 24-19. Translate Selected Trend Logs Menu

Translate Historical Trend Logs

To translate Historical Trend logs, press <F2> from the Translate Trend Logs Menu (Figure 24-17).

```
                    < Translate Historical Trend >

01                  02                  03                  04
05                  06                  07                  08
09                  10                  11                  12
13                  14                  15                  16
17                  18                  19                  20
21                  22                  23                  24
25                  26                  27                  28
29                  30                  31                  32
33                  34                  35                  36
37                  38                  39                  40
41                  42                  43                  44
45                  46                  47                  48
49                  50                  51                  52
53                  54                  55                  56
57                  58                  59                  60
61                  62                  63                  64


F1  Start Translate Selected Logs


F9  Help                            F0  Exit to Previous Menu
```

Figure 24-20. Translate Selected Historical (Trend) Menu

Select a log to translate by using <Up>/<Down>/ <Left>/<Right> and press <F1> to display the Translate Selected (Trend) Menu (Figure 24-21).

```
                  < Translate Selected Historical >

01                  02                  03                  04
05                  06                  07                  08
09                  10                  11                  12
13                  14                  15                  16
17                  18                  19                  20
21                  22                  23                  24
25                  26                  27                  28
29                  30                  31                  32
33                  34                  35                  36
37                  38                  39                  40
41                  42                  43                  44
45                  46                  47                  48
49                  50                  51                  52
53                  54                  55                  56
57                  58                  59                  60
61                  62                  63                  64


F1  Start Translation


F9  Help                            F0  Exit to Previous Menu

          Press the space bar to toggle selection
```

Figure 24-21. Translate Selected (Trend) Historical Logs Menu

To select an individual log for translation use, <Up>/<Down>/ <Left>/<Right> to highlight the log and then press <F1>.

To select a group of logs to translate, use <Up>/<Down>/<Left>/<Right> to cursor to each log and then press <Space> to select it. Selected logs will change in color from green to gray. (To de-select a log, cursor to it and press <Space>. The color will change back to green.) When you have completed your selection process, press <F1> to translate the logs.

During the translation process, the log currently being translated is displayed on the screen. Once all logs have been translated, press any key to return to the Translate Selected Logs Menu.

SECTION 25 - SOE LOGGING

OVERVIEW

The LAN-90 PCV SOE Logging package is intended for use by end-user job-site personnel to closely and rigorously monitor critical digital points where the given situation requires that the sequence of changes of state for these points or groups of points be known in the most exacting ways possible. SOE Logging meets this requirement by listing all digital state transitions in time order and in one-millisecond resolution.

For more information on SOE Logs and their configuration see the ***Configuration*** manual.

SUPPORTED FUNCTIONS

The SOE Logging system provides the following functions:

1. Allow configuration and definition of the trigger tags, aging time, report types, report parameters, log definition, printer selection, and other information necessary for a complete implementation of features provided by Function Codes 99 and 210, and by Elsag Bailey INFI 90 OPEN Distributed SOE.

2. Wait for notification that one-millisecond-resolution SOE data has arrived within Function Code 99 or 210 by monitoring the trigger tags for the defined reports in Multi-Function Processors (MFPs) and then collect them.

3. For Distributed SOE, wait for notification that one-millisecond-resolution SOE data has arrived within Sequence of Events Master (SEM) fixed blocks 5000 and 5001 by monitoring the trigger tags and then collect them.

4. Build SOE report files from the data that it has gathered through communications with the ICI task, using pre-configured report formats.

5. Automatically print the collected SOE reports on the configured printer.

6. Print or Display any retained SOE Log in the retention storage system on demand.

7. Allow archival storage and retrieval of SOE Logs in the standard LAN-90 PCV manner.

8. Optionally allow the storage and retrieval of SOE Logs using the LAN-90 PCV Archive Manager.

9. Allow each Server Node on the LAN-90 PCV Network to possess its own SOE Log database.

RUN-TIME OPERATION OF SOE LOGS

Initialization at LAN-90 PCV Start-up

At initialization, the LAN-90 PCV SOE Logging system reads a number of configuration files. One of these is the SOE General Parameters file, called "soeparam.cf", which contains various specifications and parameters to be used throughout the real-time execution of the SOE Logging system. Also, there are up to thirty-two (32) Recorder Definition Files ("serdefNN.cf"; one for each recorder), and one SOE Report Definition file ("soereprt.cf").

Next, the SOE System fetches from the LAN-90 PCV Tag Database the TAG NAME, TAG DESCRIPTOR and LOGIC STATE DESCRIPTORS of each Tag defined for each point within each SER definition file. These appear on the SOE reports themselves.

The SOE collection task then connects for exception reports from the RCM Trigger Tag for each of the defined SOE Reports. It continually monitors these tags as part of the process of collecting and reporting SOE data for each SOE Log definition. It uses these Trigger Tags to coordinate its communication with Function Code 99/210 for the remote MFPs, or, in the case of Distributed SOE architecture, with SEM fixed blocks 5000 and 5001.

Upon success of these operations, for each defined SOE Report 'RRR', a binary collection file, called "current.RRR", is designated and opened for the accumulation of SOE Logs freshly arrived from each of the defined SER recorders whenever the corresponding trigger tag changes from 0 state to 1 state.

Background Data Collection/Reporting

Real-Time SOE Collection Flow Control

The function of the SOE Collection phase is to continuously collect and report incoming SOE Logs by monitoring each defined trigger block, through its RCM Trigger Tag, saving these in "current.RRR" (assuming current SOE Report 'RRR'), with automatic printout at the end of the WAIT TIME specified in the SOE Report Generator for this SOE Report Index.

The Trigger Tag enables the MFP or SEM to notify LAN-90 PCV that a report is available for collection. When the SOE collection task is notified of the presence of new report data, it begins to poll the MFP or SEM for that data. This polling begins

immediately for Summary, Pre-Fault, and Snapshot reports. For Standard and Post-Fault reports, LAN-90 PCV waits for the specified wait time before it begins to poll for the data. In any case, collection of data continues until all stored data is received. Any new events stored in the MFP are polled for by LAN-90 PCV. Collection of data ends when the trigger tag changes to zero.

> **NOTE:** Unlike the FC210 Standard trigger block and the FC99 Standard and Post-Fault trigger blocks, the SEM Standard trigger block 5000 has a delay between the time of the first (or triggering) SOE change of state and when the trigger block itself changes state from 0 to 1. This delay is 20 seconds or the time specified in Specification S5 of SEM Function Code 243, whichever is longest.

At this point, each SOE Log Entry is added to "current.RRR", which is closed and sent to the LAN-90 PCV Printing Device for automatic printout. After printout, this file is renamed as a Log Retention File in the following format based on the current date and time of the LAN-90 PCV System, plus the SOE Report Index number:

YYMMDDHHmmSS.RRR

where *YY* is the current year, *MM* is the current month, *DD* is the current day, *HH* is the current hour, mm is the current minute, *SS* is the current second, and *RRR* is the SOE Report Index.

Only one report is printed at a time. Even if several SOE front end processors trip at once, LAN-90 PCV will finish printing one report before beginning another. There is a delay of an aging time configured in the MFP from the time the LAN-90 PCV is notified of the presence of data at the MFP and the time the report is queued to print. If the printer is busy, there is an additional delay before the report begins to print.

The oldest Retention File in the SOE directory (as per the NUMBER OF RETENTIONS entered in the SOE Report Generator for this SOE Report Index) is then sent to the LAN-90 PCV Archive Manager for permanent storage if and only if both the Archive Manager is running on this Server Node and the Archive option is set to yes in the Report Definition. Regardless of whether or not this file is archived, it is then deleted from the hard disk. At this point, a new "current.RRR" file is be started, and the cycle will begin again. This process repeats itself on a continuous, real-time basis.

Log, Display and Printout Contents

Each SOE Log contains the following data:

1. SER index [1-1536]

2. Point Alarming Status [0=NORMAL, 1=ALARMING]

3. Deletion flag [0=NORMAL, 1=DELETED FROM SCAN]

4. Log type [STANDARD,SUMMARY,PRE-FAULT, POST-FAULT , SNAPSHOT]

5. Point value [0=LOW, 1=HIGH]

6. Time stamp

At the top of each page of the screen display or printout from this file, the Log Title, Trigger Date, and Log Header appear thus:

```
REPT TYPE      SOE REPORT   RRR      LOG REPORT TITLE            PAGE 1
TRIGGERED ON  hh:mm:ss DD-MMM-YY
    Event Time     State  AID   Tag Name    Tag Description   SER Index
-------------------------------------------------------------------------
```

where:

REPT TYPE	is one of the five possible Report Types: Standard, Summary, Snapshot, Pre-fault or Post-Fault
RRR	is the LAN-90 PCV SOE Report Index Number [1-160],
hh	is the current hour (when the report is triggered) [0-23],
mm	is the current minute [0-59],
ss	is the current second [0-59],
DD	is the current day,
MMM	is the current month
YY	is the current year

All SOE Log Events are formatted thus:

```
TTT HH:MM:SS.mmm   LLLLLL   S    NNNNNNNNNNNNN   DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD  IIII
```

where:

TTT	is the trigger time indicator, where three (3) arrow symbols (>>>) indicate the SOE event which triggered this SOE Log in the first place. This field is blank otherwise
HH	is the hour of this SOE's time-stamp [0-23]
MM	is the minute of this SOE's time-stamp [0-59]
SS	is the second of this SOE's time-stamp [0-59]
mmm	is the millisecond of this SOE's time-stamp [000-999]
LLLLLL	is the Logic State Descriptor for the corresponding LAN-90 PCV Tag

S is the current AID Status of this tag; "A" indicates that the point is in alarm, "I" indicates that the point is inactive, "D" indicates that the point is deleted

NNNNNNNNNNNNNN is the LAN-90 PCV Tag Name

DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD is the LAN-90 PCV Tag Descriptor

IIII is the SER Index (not the LAN-90 PCV Tag Index) [1-1536]

NOTE: If the time-stamp of an SOE is invalid it is indicated as "**:**:**.***".

NOTE: If a Tag is not specified for a particular point in the SER Definition table, then asterisks (*) will appear in the Tag Name and Description fields for the corresponding point, and the default LAN-90 PCV Logic State Descriptors will appear.

NOTE: The trigger-event arrow (>>>) appears only if the trigger tag for this report is Distributed SOE SEM fixed block 5000.

Figure 25-1 below depicts a typical example of an SOE Report:

```
STANDARD        SOE REPORT    55     TURBINE START ROUTINE        PAGE 1
TRIGGERED ON 11:22:16  12-FEB-95
   Event Time    State  AID   Tag Name     Tag Description     SER Index
-------------------------------------------------------------------------
   11:21:06.437     ON  A    TURB01PB       START PB PUSHED            1
   11:22:06.773    OFF       TURB01SPEED    SPEED EXCEEDS 48%         17
   11:22:08.618    OFF       TURB01MOTOR01  STARTER MOTOR OFF          8
>>>11:22:16.389    OFF       TURB01SPEED    SPEED EXCEEDS 80%         18
   11:22:17.818    OFF       OILPMP02       AUX LUBE OIL PUMP OFF      2
   **:**:**.***     ON  A    OILPRS03       LUBE OIL PRESS LOW         5
   11:22:18.801     ON  A    TURBINE_TRIP01 TURBINE TRIP              67
   11:22:18.817   ZERO       ************** ************************  262
   11:22:18.822     ON  A    TURB_RESTART   START UNSUCCESSFUL         24
```

Figure 25-1. Pre-Fault Report Example

Collection Task Error Reporting

Error conditions are noted in the printed report, in the I90 Status display, and in the LAN-90 PCV Error Device Window.

There are two types of errors printed in the SOE report:

1. SOE data polling error

2. Exception Report type:
   Possible loss of SOE Data.

This message will appear if the MFP aging time is too short compared to the LAN-90 PCV Report wait time, causing data to be aged out of the MFP before LAN-90 PCV can collect it. It will also appear if an overflow occurs at the MFP, when too much data arrives at the MFP for it to hold, causing the MFP to fill before it can age the data.

SOE OPERATION UTILITIES

Retrieving SOE Log Data on Demand

Demanding SOE Logs entails the selection of one of the Log Retention Files currently in the SOE directory (for a particular SOE Report) for printing on demand. A reverse-video cursor is placed over the name of the selected file, then the desired menu key is selected. Upon selection of this file, it is then submitted to the LAN-90 PCV Print Device, or displayed on the screen.

To retrieve SOE Logs, first select **G** Log Retrieval from the LAN-90 PCV Main Menu, then, from the Log Retrieval menu, select **G** SOE Logs, invoking the SOE Logs menu, which is shown in Figure 25-2 below.

```
                          < Demand SOE Logs >

 01 log001          02 log002          03 log003          04 log004
 05 log005          06 log006          07 log007          08 log008
 09 log009          10 log010          11 log011          12 log012
 13 log013          14 log014          15 log015          16 log016
 17 log017


 F1  Demand SOE Logs for Report


 F9  Help                             F0  Exit to Previous Menu
```

Figure 25-2. SOE Log Retrieval Selection Menu and Display

Use the cursor keys to select the Index Number of the SOE Report for which SOEs are to be demanded. With the reverse-video BLACK-ON-GREEN cursor over your selection, press <F1> Demand SOE Logs for Report to bring up the Demand SOE Logs menu for the selected SOE Report Number, shown in Figure 25-3 below.

```
                  < Demand SOE Logs for Report #055 >

 01 941012094959   02 941012095143   03 941012095206   04 941012095322
 05 941012095637   06 941012095849   07 941012100014   08 941012100712
 09 941012101235


 F1  Display Selected SOE Log File   F2  Print Selected SOE Log File


 F9  Help                            F0  Exit to Previous Menu
```

Figure 25-3. SOE Log Demand Selection Menu and Display

The selection cursor is initially over file number 1. Use the cursor keys to move to the desired SOE Log file, as shown.

Select <F1> Display Selected SOE Log File to display the file currently under the cursor. Here, you can cursor, and page up and down, but you cannot edit the SOE Log.

Select <F2> Print Selected SOE Log File to send the file currently under the cursor to the LAN-90 PCV Print Device to be printed in its entirety.

SOE Log File/Disk Utilities

LAN-90 PCV SOE Logging is also supported by the following LAN-90 PCV Utilities: File Backup, Auto-File-Backup, File Restoration, Alternate Paths, and File Translation. These operations are accessible from the **H** Utilities pull-down selection from the Main Menu.

Please refer to Section 7 of the ***Configuration*** manual for instructions as to how to use the LAN-90-PCV File/Disk Utilities Backup, Auto-backup, Restore, and Alternate-Path.

In the case of SOE Logs, you would select the file catagory Log Data: SOE, and each report number for which a retention file directory exists appears in the Index row. Below each Index (report number) are the SOE Log retention files, as well as any translated ASCII log files the given SOE report directory possesses.

SOE Log File Translation

Translating SOE Logs involves the simple conversion of retained binary SOE Log files into ASCII SOE Log files, which, in turn, could be put to various practical uses, such as inclusion in documents, porting to and displaying on other computer systems, etc.

The translation of SOE Logs is performed by the program "pcvSoe.demand", the same program used for demanding SOE Log retention files to be displayed or printed, except, here, the SOE Log Translation menuing system passes a '-t' option to it so that for each binary SOE Log file.

YYMMDDHHmmSS.RRR (see above for explanation of file name format) a translated ASCII text file is formed, containing the fully-parsed SOEs (in exactly the same format as described above), and whose name follows the format:

tYYMMDDHHmmSS.RRR

where ***t*** at the start of this file's name denotes that this SOE Log file is a translated ASCII file.

> **NOTE:** SOE Logs cannot be translated into ".dif" format; only ASCII translated files are supported by LAN-90 PCV SOE Logging.

To reach the SOE Log file translation menu hierarchy, select the **H** Utilities menu as above. Next, select **D** Translation Utilities, then **B** Translate Log Data, then <F7> Translate SOE Logs. This invokes the SOE Log Translation menu, shown in Figure 25-4:

```
                    < SOE Log Translation >
 01 log001         02 log002         03 log003         04 log004
 05 log005         06 log006         07 log007         08 log008
 09 log009         10 log010         11 log011         12 log012
 13 log013         14 log014         15 log015         16 log016
 17 log017

 F1  Translate SOE Logs for Report  F2  Translate All Logs For Report


 F9  Help                           F0  Exit to Previous Menu
```

Figure 25-4. SOE Log Translation Selection Menu and Display

Use the cursor keys to move the BLACK-ON-GREEN reverse-video selection cursor to the Index Number of that SOE Report for which SOE Logs are to translated.

Select <F1> Translate SOE Logs for Report to bring up the SOE Log Translation for Report menu shown in Figure 25-5.

Select <F2> Translate All Logs for Report translate all retained files for this report into ASCII-text SOE Log files .

```
              < SOE Log Translation for Report #055 >
 01 941012094959   02 941012095143   03 941012095206   04 941012095322
 05 941012095637   06 941012095849   07 941012100014   08 941012100712
 09 941012101235

 F1  Translate Selected Retained Log


 F9  Help                           F0  Exit to Previous Menu
```

Figure 25-5. SOE Log Translation-for-Report Menu and Display

The functionality of the SOE Log Translation-for-Report menu ia similar to that of the Demand-SOE-Log menu; use the cursor keys to select that particular SOE Log retention file to be translated.

Select <F1> Translate Selected Retained Log to translate the selected SOE Log file into an ASCII-text SOE Log file.

SECTION 26 - HARMONY 90

OVERVIEW

The basic LAN-90 PCV communicates with a CIU (computer interface unit) to access the Elsag Bailey process control modules. HARMONY 90™ provides LAN-90 PCV with an interface to external (non-Bailey) devices such as PLCs. With the HARMONY 90 External Device Interface activated, LAN-90 PCV can communicate with process controllers, not on the Elsag Bailey NET 90/INFINET system, such as the Bailey-Fischer & Porter MICRO-DCI's and Modicon Modbus PLC's.

The data collected from external devices by HARMONY 90 should for the most part look the same as data collected from the Bailey system. As an operator, you deal with your system via process displays and the source of the tags should generally not be of concern.

HOW HARMONY 90 WORKS

The HARMONY 90 external device interface is a component part of LAN-90 PCV. Before it can be configured to communicate with any external device, it is necessary to obtain a Protocol Specific Driver (PSD) for the specific external device.

The HARMONY 90 External Device Interface emulates internal LAN-90 PCV to CIU interactions. Installable drivers isolate the control system from the Protocol Specific requirements of external devices. HARMONY 90 configuration screens provide the user with the means of mapping the data from external devices into tag structures which are based on the CIU messages. The data received from the external device is placed in appropriate tag structures and is passed to the LAN-90 PCV system. Requests from the operator console are converted into device appropriate messages and are passed to the devices.

This transparent integration of external device data provides the same LAN-90 PCV look and feel for all data. The HARMONY 90 External Device Interface gives LAN-90 PCV the capability to act as a console to multiple system environments for process monitoring and control while maintaining the LAN-90 PCV operator environment.

The interface between the HARMONY 90 executive and the Protocol Specific Driver is an open published specification which allows third party or in-house developers to create PSDs for new or specialized equipment.

Limited, customer specific, solutions have been engineered by Elsag Bailey for interfacing to Modular RTUs, GE Fanuc Series

5, Series 6 and 9070 PLCs and Allen-Bradley PLC5s. PSDs can be prepared for other PLC, SCADA and RTU systems.

Internally, LAN-90 PCV stores its tag configuration data in a large tag database. With the HARMONY 90 External Device Interface, a portion, at the upper end, of this database is reserved for external device HARMONY 90 tags while the remainder of the database still serves the standard tags associated with data from the Elsag Bailey modules. When you call up a Harmony tag definition you should notice an "Edit Harmony" button on the title bar of the edit window. This provides access to the Harmony mapping screen where the PLC addresses were entered by the design engineer. These addresses should only need to be changed when the PLC programming is changed. For information on changing the configuration refer to the HARMONY 90 section in the ***Configuration*** manual.

Once configured, HARMONY 90 tags can be utilized in much the same way as CIU tags.

The installation of the Protocol Specific Drivers requires editing of the startup file used by the driver. This file contains the necessary communication parameters. The file must be edited to reflect the requirements of your installation. Configuration screens are provided for enabling the driver, setting device addresses and defining read groups. Full details are provided in the Configuration manual.

TAG DIFFERENCES

Block Details are inappropriate for HARMONY 90 tags as the external devices do not support Elsag Bailey function blocks. An error message will be displayed should you request details on a HARMONY 90 tag.

Operator Tuning displays contain block details displays and as described above, are not appropriate for HARMONY 90 tags.

HARMONY 90 tags and CIU tags are independant of each other. Loss of communication with either network will not affect the other network.

ERROR LOG MESSAGES

HARMONY 90 will write status and error reports into the system messages log. You can view this file via **Main Menu — Diagnostics — System Messages.** You can also enable a window to watch error messages as they are written via **Main Menu — Window Control — Status Windows — Error Log.** The error log can be a significant drain of resources when an upset causes many error messages to be logged.

Error messages from HARMONY 90 will be prefixed with "pcv-HarmonyExec". Those errors from a specific driver will show the driver name in quotes such as "modbus".

Found in this log will be:

- Status messages such as
  pcvHarmonyExec> "modbus" - Successfully started.
- Configuration-related error messages such as
  Unable to scan groups as configured
  which indicates that Harmony has been unable to read one or more groups from the PLC at the specified scan rate. This may require changes to the existing configuration.
- Communication failure messages, which include information on which port or device is having problems, will require checking the hardware and connections to determine the cause of the problem.

These errors may be covered in either the HARMONY 90 section of the ***Configuration*** manual or the PSD manual for the named driver.

HARMONY 90 ERROR MESSAGES

HARMONY 90 may generate the following error messages. The %d, %s and @e codes will be replaced with current information before the message is printed.

Under normal operations, none of these error messages should appear in the error log.

Serious Errors

In the event that you should notice any of the following error messages, please contact tech support.

"Can't allocate memory for EGROUPS.GRPLOOKUP : @e"

*"Can't allocate memory for UPDATE * : @e"*

*"Can't allocate memory for GROUPLOOKUP * : @e"*

"Can't allocate memory for TAGS : @e"

*"Can't allocate memory for TAGS ** : @e"*

"Can't create LEA : @e"

"Unable to find pcvDBase task : @e"

"Can't find database server class : @e"

"Can't register event class : @e"

"Can't register name '%s': @e"

"Can't qnx_segment_alloc: %s"

"Can't get database segments from database server : @e"

"Can't attach 1/2 second proxy : @e"

"Can't allocate memory for errmsg[%d] : @e"

"Can't allocate memory for errmsg[%d][%d] : @e"

"Unable to attach timer : @e"

"Can't find alarm server class : @e"

"Can't find alarm manager: @e"

"Can't write to alarm manager: @e"

"Can't put shared segment: %s"

"Can't allocate memory for READ_QUEUE : @e"

"Can't set new process group ID: @e"

"Unable to set scheduling policy: @e"

"Error number out of aligment on the file %s, set %d to %d"

"Unable to start up task %s: @e"

"Can't allocate memory for READ_QUEUE : @e"

"Can't allocate memory for CHGRP_QUEUE : @e"

"Can't allocate memory for PTLOC_QUEUE : @e"

"Can't allocate memory for GEN_QUEUE : @e"

"Can't allocate memory for DEV_QUEUE : @e"

"Can't allocate memory for TIMESYNC_QUEUE : @e"

"Can't allocate memory for DEVTYPE_QUEUE : @e"

"Can't allocate memory for CIU_QUEUE : @e"

"Can't allocate memory for WRITE_QUEUE : @e"

"Receive Scanner Task Terminated signal. Restart driver"

"Receive Scanner Task Terminated signal"

"Receive PSD Driver (%d-%s) Terminated signal. Restart driver"

"Receive PSD Driver (%d-%s) Terminated signal"

Programmer Messages

The following messages can be safely ignored. They are used by programming staff.

"Found Alarm Manager"

"HARMONY EXECUTIVE HOLDING"

"HARMONY EXECUTIVE RELEASED"

"DEBUG level = %d, set by task %u"

"DEBUGGING ON"

"DEBUGGING OFF"

"Invalid Command %d from Task %u."

"Driver %s doesn't support command %d"

Operator Action Log Messages

The following messages will be entered into the Operator action logs if logging is enabled.

"Edited Harmony Driver %d Parameter"

"Edited Harmony Device %d Parameter"

"Edited Harmony Group %d Parameter"

"Edited Harmony Tag %d Parameter"

APPENDIX A - PERIODIC LOG TUTORIAL

OVERVIEW

This tutorial demonstrates how to configure a periodic log using RIPCAM2, a powerful, realtime spreadsheet with many editing functions.

Before starting this tutorial, review the RIPCAM2 manual; it explains all the RIPCAM2 functions. You can skip the List, Name, Window, and Communications sections; they do not apply to LAN-90 PCV log configuration.

Read this tutorial through before attempting to configure the example log.

USING RIPCAM2

To start the tutorial, go to the Periodic Log Configuration Menu, select log 60, then press <F2> RIPCAM2 starts up, and the tutorial spreadsheet is displayed.

The first line on the screen is the system message line (labeled *SML)*, and it displays the keyboard macros available (keyboard macros are explained later). The second line displays the contents of the cell at the cursor and also displays the menu line. The third line is a command line (labeled *DEL*, for Data Entry Line) for entering expressions in numeric cells and for entering input requested by the menu functions.

Moving Around the Spreadsheet

You can move the cursor around the spreadsheet by pressing the arrow keys, <PgUp>, and <PgDn>. The cell under the cursor is highlighted and the contents of the cell are displayed on the second line of the screen.

You can go to a specific cell by pressing <Tab>, then entering the cell name on the third line of the screen. To move directly to cell B23, press <Tab>, type **B23**, then press <Enter>.

Entering Numeric Values

To enter a number in a cell, move the cursor to the cell you want, type the number, then press <Enter>.

Entering Text Strings

To have RIPCAM2 recognize that you are entering text, and not a number or formula, you have to press one of the text-justify-

ing characters, ' (single quote), " (double quote), or ^ (caret), BEFORE you start typing the text.

To left justify text in the cell, press ' (single quote) before typing the text. To right justify text, press " (double quote) before entering the text. To center justify text, press ^ (caret) before entering the text.

If you forget to press one of the text-justifying keys before entering text, the characters you type will be displayed on the third line of the screen instead of directly in the cell. If this happens, press <Esc> to return the cursor to the spreadsheet.

Practice entering text strings in cells. Go to the following cells (by pressing the arrow keys or by pressing <Tab>), press ' (single quote), then enter the information asked for.

- Go to cell L54, press ', type your name, then press <Enter>.
- Go to cell L55, press ', type your address, then press <Enter>.
- Go to cell L56, press ', type your plant's name, then press <Enter>.
- Go to cell L57, press ', type your plant location, then press <Enter>.

You can change the justification of existing text by placing the cursor over the text, pressing the key for the justification you want, then pressing <Enter>. To center justify the text in cell L54, go to cell L54, press ^ (caret), then press <Enter>.

To edit text already in a cell, use the arrow keys to highlight the cell you want to edit. The text will be displayed on the second line along with the cell number, the cell width, and the justification (', ^, or "). To start editing the text, press the key for the justification you want (', ^, or "), and the cursor will appear on the first character in the cell. Use the arrow keys to move through the text string. Press <Ins> to toggle insert mode on and off. Press <Del> to delete characters from the string. When you have finished editing the string, press <Enter>; the cursor returns to the spreadsheet. If you have any problems with any of the keys, consult the RIPCAM2 manual.

A text string that spans more than one cell is stored in the first cell of the span. To edit the text, place the cursor over the first cell of the string. For example, the lines in the tutorial spreadsheet span cells from columns B to L but are stored in the cells under column B. To edit the text on line 93, place the cursor on cell B93, press ' (single quote), edit the text, then press <Enter>.

Try entering and editing a few more text cells until you feel comfortable with the RIPCAM2 editing functions.

Using Macros

Macros are pre-programmed keystroke sequences that perform a number of RIPCAM2 functions as if they were typed from the keyboard. You can run a macro any time, EXCEPT when you are editing a cell or using the menus.

You run a macro by pressing two keys: **** (backslash) and the letter assigned to the macro. Macros ARE case sensitive. The macros explained below MUST be entered in lower case. If a macro does not seem to work, make sure you haven't called up the menu line, that you aren't editing a cell, and the <CapsLock> light on the keyboard is off.

When RIPCAM2 is loaded, the first line on the screen displays the lowercase letters to press to run the macro. This prompt line will be overwritten by messages while you configure the log. Redisplay the macro prompt by pressing **\m**. The macro prompt line does NOT have to be displayed in order to run a macro; the prompt only serves as a reminder of the macros available.

Three other macros are included:

- To save the log format, press **\s**. RIPCAM2 will save the log and return to the spreadsheet.
- To quit RIPCAM2 without saving the log, press **\q**. Be sure to save changes to your log format (by pressing **\s**) before you quit RIPCAM2 with **\q**.
- To save the log format and exit RIPCAM2 at the same time, press **\e**.

It is a good idea to save frequently while configuring the log to prevent the loss of your work due to a power failure or other problems.

Using Menu Functions

Pressing **/** (forward slash) toggles the menu line. The menu functions allow you to configure and edit the layout of the spreadsheet. A menu function is selected by highlighting the function on the menu line using the arrow keys, then pressing <Enter>. A menu function can also be selected by pressing the first letter of the menu function (in uppercase or lowercase). To leave the menu line, press <Esc> or **/**.

Practice using the menus by calling up the RIPCAM2 help screens. Press **/** (forward slash). Move the cursor over the *Help* function and press <Enter>, or press **H**. The main help screen will be displayed. You can display each help screen by highlighting each item in the upper left box and pressing <Enter>.

Quick help can be obtained by pressing the numbers in the lower left box. Press <Esc> or <F10> to exit from the current help screen. You can exit the *Help* function or any other RIPCAM2 function at any time by pressing <Esc>; the cursor returns to the current cell in the spreadsheet.

Try some of the functions under the Cell_Format menu and the Edit_Model Menu, such as changing cell widths, moving blocks of cells, and copying blocks of cells. All menu functions are explained in the RIPCAM2 manual.

When you are familiar with the RIPCAM2 functions, try configuring the log in Figure A-1.

CONFIGURING A PERIODIC LOG

If you would like to configure the log in Figure A-1 from scratch, go to cell A288, then press **/ E E**. The *Area* option in the Edit_Model Erase Menu will be highlighted. Press <Enter> twice, then go to cell M301. Press <Enter> again, and all cells from A288 to M301 will be erased. If you make a mistake, press <Esc>, go to cell A288, and start again. If you would like to restore the log to its original form, quit RIPCAM2 without saving the log by pressing **\q**, then reselect the log from the Periodic Configuration Menu.

> **NOTE:** The log in Figure A-1 is already set up in cells A288 to M301. If you want to use the log that is already set up there, you will have to remove the "." (period) from the start of the calculation definitions in columns L and M by editing the string.

This tutorial sets up a periodic log using three analog tags named TAG01, TAG02, and TAG03. Before configuring the tutorial log, either set up three Internal Analog tags with these names in your LAN-90 PCV database, or substitute your own analog tag names for TAG01, TAG02, and TAG03 in the tutorial log.

You should also set up the log parameters for the tutorial log before you configure the log format. Set the log to print from cells A288 to K301. Set the number of retained logs to 1. Set the logging device as "/dev/spool/txt". Leave the period as hourly. Set the print method to manual.

The calculation area of the log (cells L288 to M301) appears to the right of the log area (cells A288 to J301). The print area does not include the calculation area.

The calculations in cells L288 to M290 use an absolute cell address to specify the destination cell. The calculations in cells L295 to M301 use a relative cell address to specify the destination cell.

```
    |.A|....B....|.C|....D....|.E|....F....|.G|....H....|.I|....J....|.K|
286
287
288     YEAR  :     0             HOUR   :    0
289     MONTH :     0             MINUTE :    0             24 Jan 1992
290     DAY   :     0             SECOND :    0             10:15:05
291
292
293       TAG      LIVE VALUE     AVERAGE     MINIMUM     MAXIMUM
294
295      TAG01              0           0           0           0
296      TAG02              0           0           0           0
297      TAG03              0           0           0           0
298
299
300
301
302

    |...............L...............|...............M...............|
286
287
288  @C288=YOC                        @G288=HOD
289  @C289=MOY                        @G289=MOH
290  @C290=DOM                        @G290=SOM
291
292
293
294
295 @[-8,0]=TAG01,L,ER=D            @[-7,0]=TAG01,A,R=30SEC,ER=D
296 @[-8,0]=TAG02,L,ER=E            @[-7,0]=TAG02,A,R=1MIN,ER=E
297 @[-8,0]=TAG03,L,ER=I            @[-7,0]=TAG03,A,R=2MIN,ER=I
298
299 @[-4,-4]=TAG01,MI,R=30SEC,ER=D  @[-3,-4]=TAG01,MA,R=30SEC,ER=D
300 @[-4,-4]=TAG02,MI,R=1MIN,ER=E   @[-3,-4]=TAG02,MA,R=1MIN,ER=E
301 @[-4,-4]=TAG03,MI,R=2MIN,ER=I   @[-3,-4]=TAG03,MA,R=2MIN,ER=I
302
```

Figure A-1. Example Periodic Log

To configure the example log:

Step 1 Set the width of columns B through J to 10 characters wide.

- Go to cell B288.
- Press **/ c w**. The *Cell_Format Width* Menu is displayed on the second line.
- Press <Enter>.
- Move to cell J288, then press <Enter>.
- Type **10**, then press <Enter>.

All cells in columns B to J will now be 10 characters wide.

Step 2 Set the width of columns A, C, E, G, I, and K to 3 characters wide.

- Go to cell A288.
- Press **/ c w**. The *Cell_Format Width* Menu is displayed on the second line.
- Press <Enter> twice.
- Type **3**, then press <Enter>.

Repeat the steps above after moving the cursor to cells C288, E288, G288, I288, and K288.

Step 3 Change the width of columns L and M to 32 characters wide.

- Go to cell L288.
- Press **/ c w**. The Cell_Format Width Menu is displayed on the second line.
- Press <Enter>.
- Move to cell M288, then press <Enter>.
- Type **32**, then press <Enter>.

Step 4 Enter the RIPCAM2 time and date functions.

- Go to cell J289, press ', type **@TODAY(4)**, then press <Enter>. This shows the current date.
- Go to cell J290, press ', type **@NOW()**, then press <Enter>. This shows the current time.

Step 5 Set up the titles for the date and time values. Remember to press ' (single quote) before typing the text.

- Go to B288, press ', type **YEAR:**, then press <Enter>.
- Go to B289, press ', type **MONTH:**, then press <Enter>.
- Go to B291, press ', type **DAY:**, then press <Enter>.
- Go to F288, press ', type **HOUR:**, then press <Enter>.
- Go to F289, press ', type **MINUTE:**, then press <Enter>.
- Go to F290, press ', type **SECOND:**, then press <Enter>.

Step 6 Define the cells that will hold the date and time values as numeric.

- Go to C288, type **0**, then press <Enter>.
- Go to C289, type **0**, then press <Enter>.
- Go to C290, type **0**, then press <Enter>.
- Go to G288, type **0**, then press <Enter>.
- Go to G289, type **0**, then press <Enter>.
- Go to G290, type **0**, then press <Enter>.

Step 7 Enter the calculation definitions to record the date and time for the log. The calculation definitions are text strings, so remember to press ' (single quote) before typing the calculation.

- Go to L288, press ', type @**C288=YOC**, then press <Enter>.
- Go to L289, press ', type @**C289=MOY**, then press <Enter>.
- Go to L290, press ', type @**C290=DOM**, then press <Enter>.
- Go to M288, press ', type @**G288=HOD**, then press <Enter>.
- Go to M289, press ', type @**G289=MOH**, then press <Enter>.
- Go to M290, press ', type @**G290=SOM**, then press <Enter>.

Step 8 Enter the column and row titles for the log printout.

- Go to B293, press **^**, type **TAG**, then press <Enter>.
- Go to B295, press **^**, type **TAG01**, then press <Enter>.
- Go to B296, press **^**, type **TAG02** then press <Enter>.
- Go to B297, press **^**, type **TAG03**, then press <Enter>.
- Go to D293, press ", type **LIVE VALUE**, then press <Enter>.
- Go to F293, press ", type **AVERAGE**, then press <Enter>.
- Go to H293, press ", type **MINIMUM**, then press <Enter>.
- Go to J293, press ", type **MAXIMUM**, then press <Enter>.

Step 9 If you want, you can draw the lines for the table. To type the line drawing characters, you press the string justification character you want (', ", or **^**), then press <Alt> (and release it, don't hold it), then type the hexadecimal code for the line drawing character you want. To draw the horizontal lines, you only need to enter one horizontal character if you precede the character with a / (forward slash).

Examples: Draw the upper left corner in cell A292 by typing
" <Alt > **d a.**

Draw a horizontal line in cell B292 by typing **' /** <Alt> **c 4**.

Step 10 Define the cells that will hold the calculated values as numeric cells.

- Go to D295, type **0**, then press <Enter>.
- Go to D296, type **0**, then press <Enter>.

- Go to D297, type **0**, then press <Enter>.
- Go to F295, type **0**, then press <Enter>.
- Go to F296, type **0**, then press <Enter>.
- Go to F297, type **0**, then press <Enter>.
- Go to H295, type **0**, then press <Enter>.
- Go to H296, type **0**, then press <Enter>.
- Go to H297, type **0**, then press <Enter>.
- Go to J295, type **0**, then press <Enter>.
- Go to J296, type **0**, then press <Enter>.
- Go to J297, type **0**, then press <Enter>.

Step 11 Enter the calculation definitions that will collect the live value of the tags.

- Go to L295, press ', type **@[-8,0]=TAG01,L,ER=D,** then press <Enter>.
- Go to L296, press ', type **@[-8,0]=TAG02,L,ER=E,** then press <Enter>.
- Go to L297, press ', type **@[-8,0]=TAG03,L,ER=I,** then press <Enter>.

This calculation tells LAN-90 PCV to store the live values of the tags 8 columns to the left of the calculation column (L), which is column D. These calculations include an E= parameter, which specifies an error mode. The error mode tells LAN-90 PCV how to record the value of the tag if the tag value cannot be read. ER=D tells LAN-90 PCV to use the default value of tag (which is set up in the LAN-90 PCV tag database). ER=E tells LAN-90 PCV to write an error value to the cell, and ER=I tells LAN-90 PCV to ignore the tag value for that sample.

Step 12 Enter the calculation definitions that will collect the average value of the tags over the log period.

- Go to M295, press ', type **@[-7,0]=TAG01,A,R=30SEC,ER=D,** then press <Enter>.
- Go to M296, press ', type **@[-7,0]=TAG02,A,R=1MIN,ER=E,** then press <Enter>.
- Go to M297, press ', type **@[-7,0]=TAG03,A,R=2MIN,ER=I,** then press <Enter>.

This calculation tells LAN-90 PCV to store the average value of the tags 7 columns to the left of the calculation column (M), which is column F. The R= parameter specifies how often the tag's value should be sampled when calculating the average. If a sample rate was not specified, a default sample rate, which depends on the log period, would be used.

Step 13 Enter the calculation definitions that will collect the minimum value of the tags over the log period.

- Go to L299, press ', type **@[-4,-4]=TAG01,MI,R=30SEC,ER=D,** then press <Enter>.
- Go to L300, press ', type **@[-4,-4]=TAG02,MI,R=1MIN,ER=E,** then press <Enter>.
- Go to L301, press ', type **@[-4,-4]=TAG03,MI,R=2MIN,ER=I,** then press <Enter>.

Step 14 Enter the calculation definitions that will collect the maximum value of the tags over the log period.

- Go to M299, press ', type **@[-3,-4]=TAG01,MA,R=30SEC,ER=D,** then press <Enter>.
- Go to M300, press ', type **@[-3,-4]=TAG02,MA,R=1MIN,ER=E,** then press <Enter>.
- Go to M301, press ', type **@[-3,-4]=TAG03,MA,R=2MIN,ER=I,** then press <Enter>.

Step 15 Save the log and exit RIPCAM2 by using keyboard macros.

- If you want to see the macro prompt, press **\m**.
- Save the log by pressing **\s**. RIPCAM2 will save the log and return to the spreadsheet.
- Quit RIPCAM2 by pressing **\q**.

You can save the log format and quit RIPCAM2 with one keystroke by pressing ***\e***.

After you save the log and exit RIPCAM2, LAN-90 PCV compiles the log. LAN-90 PCV checks the syntax of each calculation cell in the log. If any errors are found, they are displayed, and you can press **r** to return to RIPCAM2 and correct the errors. If all calculations are correct, a diagnostic table is displayed, listing the quantity of each type of calculation.

The log is now configured, and it is collecting values.

You can demand the current values for the log, even though the log period is not finished. Display the Periodic Retrieval

Menu, select log 60, then press <F1>. The log will be printed on the "/dev/spool/txt".

You should now be familiar with the basics of using RIPCAM2 and configuring LAN-90 PCV periodic logs. You are now ready to configure your own periodic logs. Before configuring any log, sketch out the layout of the log on paper, so that you know where to enter your text, numbers, and calculations.

If you have any problems, consult the RIPCAM2 manual.

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AMERICAS
29801 Euclid Avenue
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Telephone 1-216-585-8500
Telefax 1-216-585-8756

ASIA/PACIFIC
152 Beach Road
Gateway East #20-04
Singapore 189721
Telephone 65-391-0800
Telefax 65-292-9011

EUROPE, AFRICA, MIDDLE EAST
Via Puccini 2
16154 Genoa, Italy
Telephone 39-10-6582-943
Telefax 39-10-6582-941

GERMANY
Graefstrasse 97
D-60487 Frankfurt Main
Germany
Telephone 49-69-799-0
Telefax 49-69-799-2406

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