

Users Manual



PQM300 Program QoS Monitor 071-0576-02

This document applies to firmware version 2.0
and above.

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Ground the Product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Use Proper Fuse. Use only the fuse type and rating specified for this product.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Symbols and Terms

Terms in this Manual. These terms may appear in this manual:



WARNING Warning statements identify conditions or practices that could result in injury or loss of life.



CAUTION. Caution statements identify conditions or practices that could result in damage to this product or other property.

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. The following symbols may appear on the product:



CAUTION
Refer to Manual



Protective Ground
(Earth) Terminal



Not suitable for
connection to
the public telecom-
munications network

Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

Do Not Service Alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect Power. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

Use Care When Servicing With Power On. Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Preface

This manual contains operating information for the PQM300 Program QoS Monitor. The manual content is divided into the following topics:

- *Getting Started* provides a product description, installation procedures, connection information, and information on getting the program monitor ready for use.
- *Operating Basics* provides basic information about using the program monitor after it is installed and operating in a network.
- *Reference* contains an overview of monitor displays and history viewing. This is followed by a tutorial on performing selected user tasks.

The appendices contain information not needed during normal operation of the PQM300 Program QoS Monitor, but may be needed in special circumstances.

- *Appendix A: Specifications* lists the environmental, physical, and electrical properties of the instrument.
- *Appendix B: User Service* provides user service information including general care, preventive maintenance, and troubleshooting.
- *Appendix C: Software Installation* describes how to format a hard drive and reinstall the operating system software and associated hardware drivers.
- *Appendix D: SNMP Networking* describes the management information base needed to control the program monitor from a remote operating position using Simple Network Management Protocol Version 2 (SNMPv2).
- *Appendix E: Options* describes the options available at the time of printing of this manual.

Related Documentation

In addition to this user manual, the following documentation is available for your program monitor.

- The on-line help provides information about using the program monitor. To view online help, select Help in the tool bar or click on a Help button in a configuration screen. Select other help topics from the Contents or Index of the PQM300 application Help menu. Use the Windows NT help to obtain help on the Windows NT operating system.
- The optional *PQM300 Program QoS Monitor Service Manual* provides module-level service and parts replacement information.

Contacting Tektronix

Phone	1-800-833-9200*
Address	Tektronix, Inc. Department or name (if known) 14200 SW Karl Braun Drive P.O. Box 500 Beaverton, OR 97077 USA
Web site	www.tektronix.com
Sales support	1-800-833-9200, select option 1*
Service support	1-800-833-9200, select option 2*
Technical support	Email: support@tektronix.com 1-800-833-9200, select option 3* 1-503-627-2400 6:00 a.m. – 5:00 p.m. Pacific time

* This phone number is toll free in North America. After office hours, please leave a voice mail message.
Outside North America, contact a Tektronix sales office or distributor; see the Tektronix web site for a list of offices.



Getting Started

Getting Started

Getting Started provides a description of the PQM300 Program QoS Monitor and explains installation and first-time operation to set up the monitor for operation in a network. If you are using this manual to learn how to use a program monitor that is already installed and operating, the next chapter, *Operating Basics*, describes how to operate the program monitor.

Product Description

The PQM300 Program QoS Monitor is implemented on a platform based on Microsoft's Windows NT operating system. The PQM300 application is configured to begin automatically after the power switch is set to On. It does not go through the Windows NT log-on process. The standard configuration program monitor is operated without a display or front panel controls in a networked system.

An SVGA monitor, a keyboard, and a mouse can be connected for local display and control of the program monitor. For the standard configuration PQM300 program monitor without a display, you must provide the external control and display items to configure the program monitor for installation into a network. After configuration and installation in a network, the program monitor can be controlled and monitored over the network.

You can purchase the PQM300 program monitor with a local control front panel installed, or the local control front panel can be added after purchase with the PQM3FLC upgrade kit. The local control option provides a flat panel color display with touch screen and a front panel keypad. A keyboard and a mouse come with this option.

You can also purchase an alarm relay option, PQM3FRB, factory installed or add the alarm relay boards after purchase. This option is a PCI plug-in module that occupies two of the PCI slots in the card bay of the program monitor. The board has 16 contacts that can be assigned to the alarm condition on any program monitor on the network.

The PQM300 program monitor provides video program service quality assessments of real-time video signals. Quality of Service (QoS) monitoring provides the following assessments and capabilities:

MPEG Defects

- Real-time MPEG defect (Discrete Cosine Transform based blockiness artifacts) monitoring and reporting when a signal is present. The PDI level (Picture Defect Indicator) provides immediate and continuous indication of the video image quality.

- Fixed (manual) setting of blockiness period for a given pixel block size for the MPEG defects measurement.
- Adaptive settings to automatically determine blockiness periods used for the MPEG defects measurement.
- Period selection to monitor the detected blockiness period. This is a tool to find the correct period for the fixed period setting and to monitor the incoming video for blockiness period changes.

Frozen Frame, Repeated Frames, Loss of Service

- Reports situations where the video content is constant
- Repeated frame found in a moving sequence
- Absence of a serial digital video signal
- Absence of video content on the input

Uncorrelated Noise

- Indicates the amount of white Gaussian noise in the video signal (such as that injected by analog video circuits)

Alarm Level Monitoring

- Individual alarm settings for all measurements (including blockiness period)
- Level thresholds for amplitude of error
- Time thresholds in number of fields for duration of error condition
- Percentage thresholds for an amount of error within a defined time threshold

Remote Control and Networking

- Web Browser control and monitoring of any program monitor accessible over a TCP/IP network. Access is through the Netscape (4.5 or higher) or the Internet Explorer (4.0 or higher) Web browser. An applet provides a remote user interface to make all the configuration setups and display the measurement results.
- SNMP agent (Simple Network Management Protocol) and MIB (management information base) for integration into an existing SNMP infrastructure to monitor picture quality from a central control point. Click on the SNMP icon on the desktop to launch the SNMP agent. The agent must be running to connect with the SNMP network.

- Multi-machine networking. A networked Windows NT PC or a PQM300 program monitor with local display, keyboard, and mouse, can be used to control and monitor all PQM300 program monitors accessible over the network.

Continuous Measurements

Measurements run continuously to monitor program quality in real-time. An operator at a central control station can control the operation of the program monitor installed in a system network.

Standard Accessories

The standard accessories are shipped with the standard and the option 01 (composite decoder) products.

Table 1-1: Standard accessories

Description	Part number
<i>PQM300 Program QoS Monitor User Manual</i>	071-0576-XX
PQM300 Program QoS Monitor Application Software on CD-ROM	063-3243-XX
Windows NT 4.0 Software Kit	119-5514-01
Emergency repair disk (use this disk as described in the Windows NT System Guide)	063-2971-00
Standard North American power cable	161-0066-00
Rackmount kit w/ instructions	016-1691-XX

Options and Optional Accessories

In Table 1-2, the part numbers given for the mouse and keyboard are replacement parts from vendors. The exact replacement manufacturer's part numbers for the mouse and keyboard are provided in the *Replaceable Parts List* of the *PQM300 Program QoS Monitor Service Manual*.

Table 1-2: Optional accessories

Description	Part number
Option 1S <i>PQM300 Program QoS Monitor Service Manual</i>	071-0577-XX
Option RB Alarm Relay board	PQM3FRB

Table 1–2: Optional accessories (Cont.)

Description	Part number
Option LC Local Control with LCD flat panel display, touch screen, and keypad	PQM3FLC
Analog composite decoder module	PQM3F01
Additional PQM300 program monitor module	PQM3F03
Power cord options	
Opt. A1 Universal Euro 220 V	161-0066-09
Opt. A2 United Kingdom, 240V	161-0066-10
Opt. A3 Australian 240 V	161-0066-11
Opt. A5 Swiss 220 V	161-0154-00
Opt. A6 Japan 100V	161-0066-00 WITH 013-0310-00 ADAPTER

Installation

Read this section before attempting any installation procedures. This section describes site considerations, power requirements, and ground connections for your instrument. The input and output signal connections for program monitoring are described beginning on page 1–7.

Check the Shipping List

Verify that you have received all of the parts of your program monitor. Use the shipping lists that came with your instrument to compare against the actual contents of your order. You should also do the following:

- Verify that you have the correct power cord for your geographical area.
- Verify that you have the computer discs that contain backup copies of all the installed software. Store the backup software in a safe location where you can retrieve the software for maintenance purposes.
- Verify that you have a PQM300 Windows NT Emergency Startup disk in case you need to reformat the hard drive or repair damaged operating system files or drivers.
- Verify that you have all the other standard and optional accessories that you ordered.

Software Installation

All software is installed at the factory. If you ever need to reinstall it, refer to *Appendix C: Software Installation*.

Hardware Installation

This section deals with hardware installation.

The instrument comes standard with a rack-mount kit. For proper cooling, at least two inches (5.1 cm) of clearance is recommended on the rear and sides of the mainframe. Use the instructions provided with the rack-mount kit to install the rack-mount cradle in a standard rack and to install the PQM300 program monitor in the cradle.



CAUTION. For rack mounting, the product must be installed in its specified rack cradle as listed in Table 1-1. For proper cooling, the air temperature at all air intake vents (inside of the rack) must not exceed 40° C.

Before you can operate the product, you must connect the provided power cord. Refer to Figure 1-1 (see page 1-6) and connect the power cord to the instrument. Refer to Table 1-3 for the supply voltage rating and connect the other end of the power cord to the proper source. Do not connect to any power sources other than those for which the instrument is rated.



CAUTION. Keep the bottom of the instrument clear of obstructions to ensure proper cooling.

Operating Requirements

Table 1-3 lists the operating requirements. Refer to *Appendix A: Specifications* for a complete specification list.

Table 1-3: Operating requirements

Requirement	Specification
Source voltage	100–240 VAC _{RMS} , 47–63 Hz
Steady State input current	6 A _{RMS} maximum, 1.25 A _{RMS} typical
Maximum power consumption	330 Watts max, 145 Watts typical
Temperature	5°C to +40°C (32°F to 104°F), 30°C/hr max gradient, non-condensing (derated 1°C per 1,000 ft. above 5,000 ft. altitude)
Humidity	20% to 80% relative humidity, non-condensing. Max wet bulb temperature: +29.4°C or 84.9°F (derates relative humidity to ~46% at 40°C or 104°F).
Altitude	To 10,000 ft. (3,040m), (derated 1°C per 1,000 ft. above 5,000 ft. altitude).

Interface Connections

The interface connectors on the rear and side of the program monitor, shown in Figure 1–1 and Figure 1–2, provide the interconnection ports for peripheral devices and networking.

Keyboard and Mouse Connections

Connect a keyboard and mouse either to the rear panel connectors as shown in Figure 1–1 or to the left-hand side of the instrument as shown in Figure 1–2. Do not connect to both. The keyboard and mouse can be plugged in and unplugged while the program monitor is in operation.

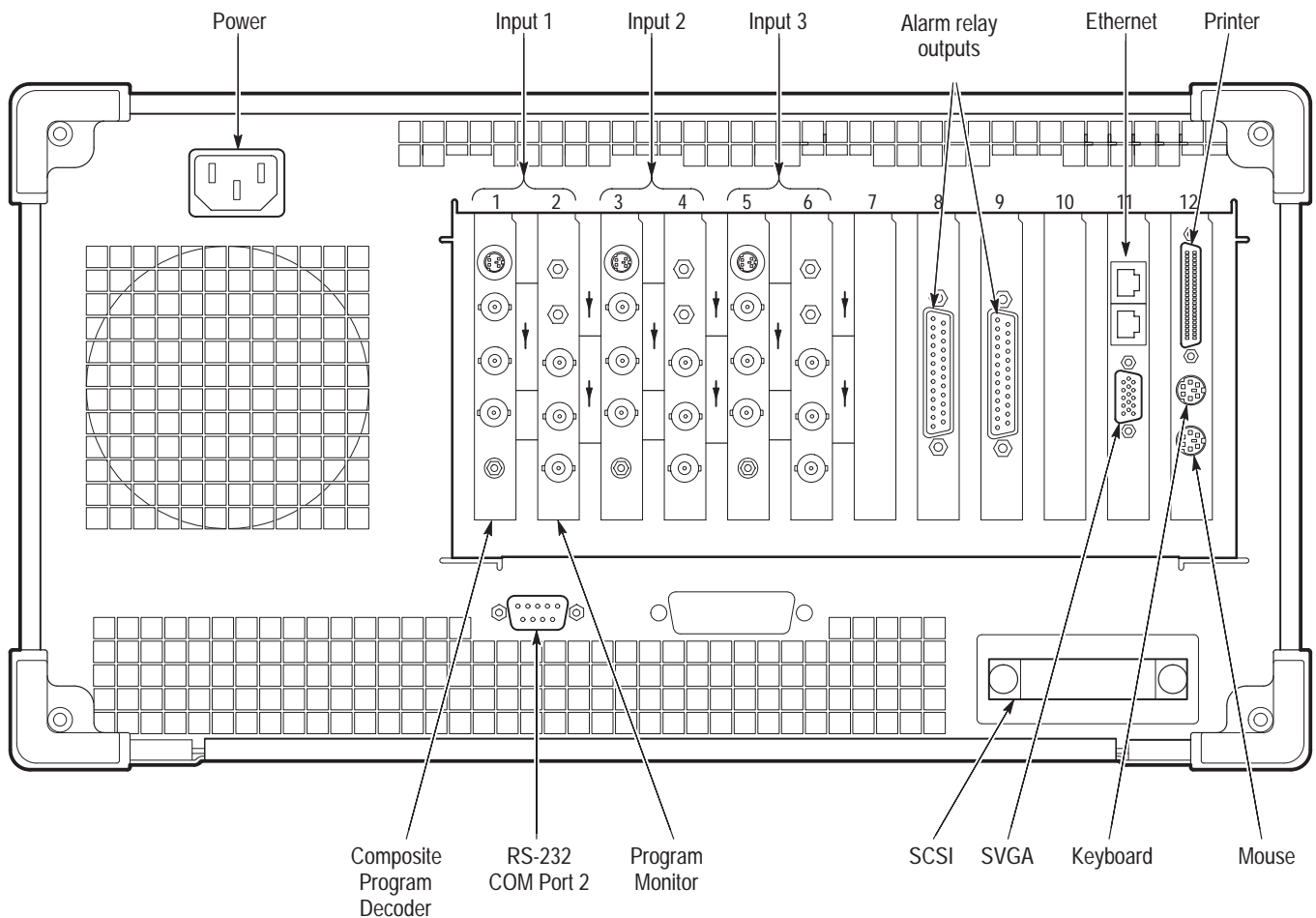


Figure 1–1: Rear panel of PQM300 program monitor with three composite video channels and alarm relay option

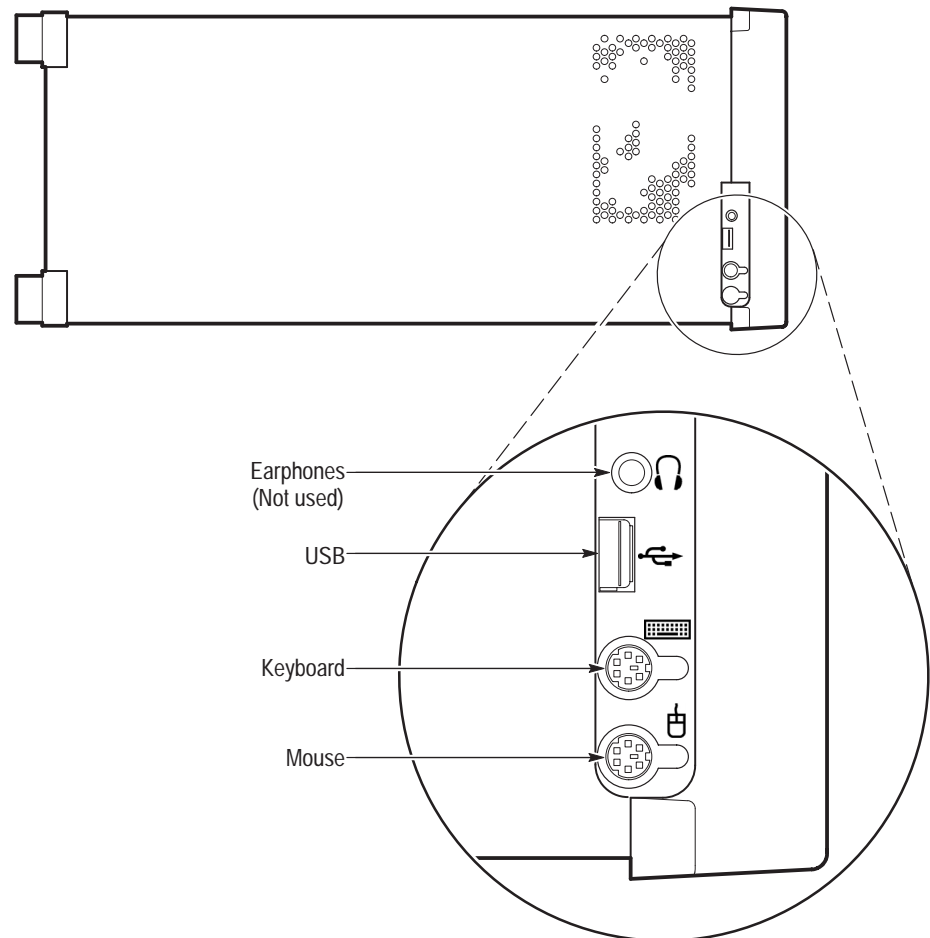


Figure 1-2: Left side keyboard and mouse connections

Input/Output Capabilities

NOTE. Do not make any cable connections to the SMB connectors on the Program Monitor modules. These ports are not presently used in the program monitor. Connecting cables can cause increased EMI (electromagnetic interference) due to radiated emissions from and to the unused SMB connectors.

Program Inputs and Outputs

The program monitor module input and output channels comply with ITU-R BT.601, BT.656, SMPTE 259M, 272M, and RP165.

A Program Monitor module has the following connectors:

- Channel A Loop In – 270 MB/s serial digital video component input, 75 Ω BNC
- Channel A Loop Out – 270 MB/s serial digital video component active loop through, 75 Ω BNC
- Channel B Loop In – 270 MB/s serial component input 75 Ω SMB (not used in the PQM300 application)
- Channel B Loop Out – 270 MB/s serial component active loop through, 75 Ω SMB (not used in the PQM300 application)
- 601 Auxiliary OUT – 270 MB/s 601 serial digital component output, 75 Ω BNC (not used in the PQM300 application)

Program Channels

One channel of program monitoring is provided for each installed program monitor module in a PQM300. Two Rec. 601 serial digital video monitor channels are included with the standard configuration. Up to six additional program monitor modules can be installed for a total of eight digital video channels. Composite video programming can be monitored using a composite decoder to provide 601 digital video to the program monitor modules. Use either your own high quality decoder or install the Tektronix PQM3F01 composite decoder modules in the PQM300 to handle the composite decoding task. You can choose to install one or more composite decoder modules to provide monitor channels for composite video. Up to four composite decoder/program monitor pairs can be installed in each machine when using the Tektronix composite decoder modules.

Program Monitor Connections

Before you start the PQM300 application, connect the 601 serial digital video program material (either 525 or 625 video standard) to be monitored to the Program Monitor CHANNEL A IN BNC connector as shown in Figure 1–3. The applied signal is either direct 601 serial video program material or it can be a 601 serial video signal obtained from a composite video decoder. When the measurements on a monitored channel start, the video standard connected to the program monitor module input is automatically recognized. The composite decoder does not recognize the applied video standard and must be preset to the correct standard. If you use the composite decoder, select the video standard of the composite video using the decoder initialization dialog box prior to starting the measurements (see Composite Decoder Configuration on page 3–22).

NOTE. Do not change the video standard applied to a Program Monitor module input while the PQM300 measurements are running.

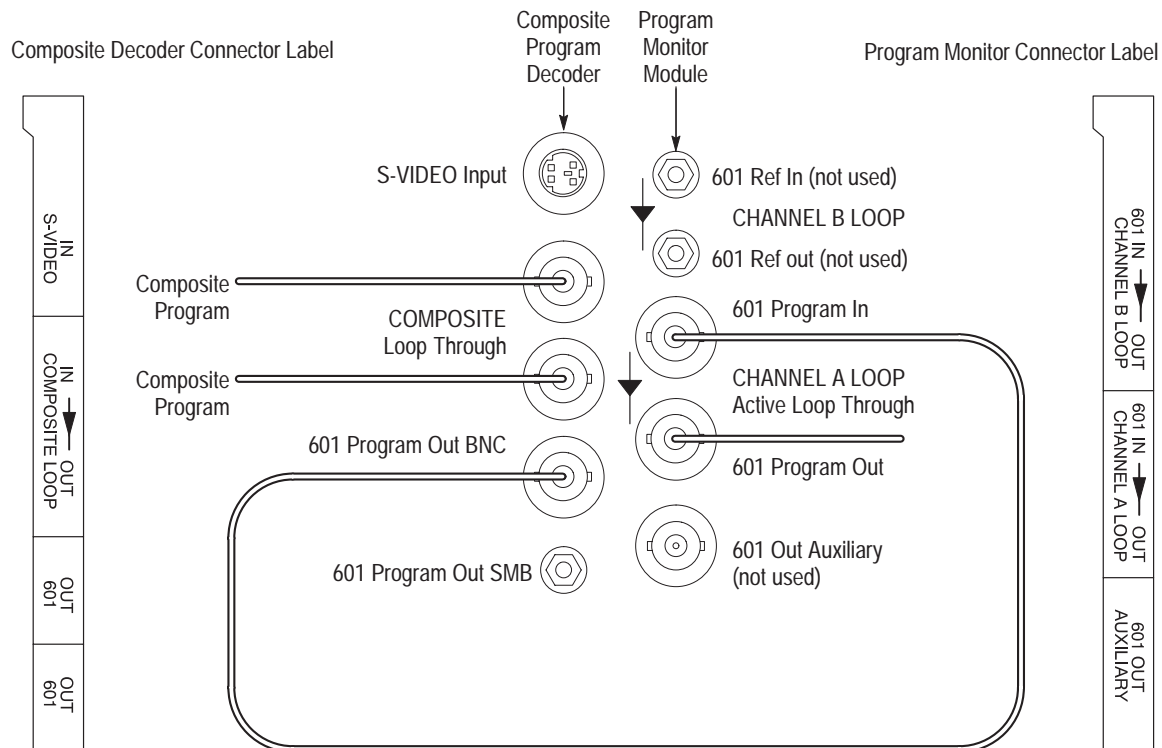


Figure 1–3: Program monitor connections for composite decoder/program monitor pairs

A simplified block diagram of the program monitor module is shown in Figure 1–4. Use the CHANNEL A OUT loop-through connector to continue the video signal path to other 601 serial video devices in the system such as a digital video monitor. The 601 Program Out connector of the active loop-through need not be terminated if it is unused. The loop-through signal output can be applied to a serial digital monitor for viewing the program material. The Channel B Loop Ref In and Ref Out SMB connectors and the 601 Out Auxiliary BNC connector are not used for the PQM300 program monitor application.

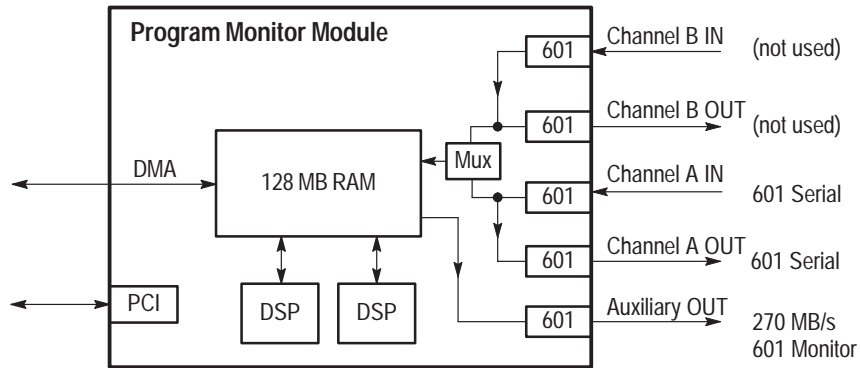


Figure 1-4: Program monitor module simplified block diagram

Composite Decoder Connections

The Tektronix PQM3F01 composite decoder module accepts NTSC, NTSC No Setup, or PAL I video in either composite video or S-Video format. A simplified diagram of the decoder connections is shown in Figure 1-5. The composite video input is output on the loop-through connector. The output of the loop-through must be either terminated by a 75 Ω BNC termination or continued on to a 75 Ω system for proper operation of the decoder. The analog input signal is converted to 601 serial video for application to the Program Monitor module. The 601 serial video is available on both an SMB connector and a BNC connector.

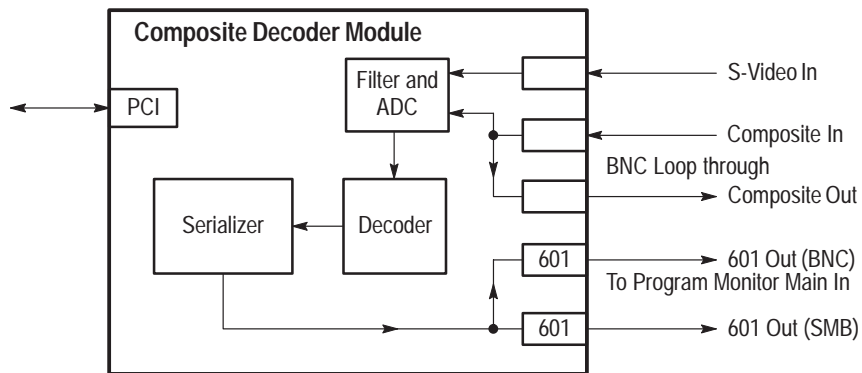


Figure 1-5: Composite decoder module simplified block diagram

The decoder module requires the standard 0 to 1 V input. That input is mapped into decimal 16 to 235 output levels (8-bit mode). Signals with lower amplitude will caused reduced decoder accuracy.

The Decoder module connectors are the following:

- S-VIDEO IN – Standard S-Video input connector, NTSC or PAL

NOTE. To ensure electromagnetic compliance for S-Video applications, use high quality S-Video cables with two clamp-on EMI suppression ferrites attached at the cable end connected to the Tektronix PQM3F01 composite decoder module S-Video input connector. See Table A-11 Electromagnetic Compatibility in Appendix A, Specifications, for suggested Tektronix part numbers.

- COMPOSITE – Composite video NTSC/PAL passive loop-through, two BNC connectors. The output BNC (the one not used for input) must be terminated in 75 Ω to operate the decoder. Connect the 75 Ω BNC terminator provided with the option if the loop-through output is not used.
- 601 OUT – Serial digital 601 output, 75 Ω BNC
- 601 OUT – Serial digital 601 output, 75 Ω SMB

Optional Alarm Relay Board

The Tektronix PQM3FRB alarm relay board option uses two 25-pin sub-D male connectors to the relay contacts. The PQM300 program monitor can be ordered with the alarm relay board installed or the board can be added later as an upgrade.

The alarm relay connector pins described in Table 1-4 are two contacts (one normally open and the other normally closed) and the center (common) connector of each relay. The relay closes during each error recorded by the program monitor channel that is assigned to the relay. More than one channel can be assigned to the same alarm relay, and it also possible to assign the same channel to multiple relays. See Table 1-4 for the pin assignments for the relay board. See the *Alarm Relay Board Option* information on page 2-40 for information on how to make the channel assignments to the relay contacts.

NOTE. Use the provided alarm board cable, Tektronix part number 174-3562-00 on the alarm board connectors and twist them together to meet the demonstrated EMI performance given in the Specification section of this manual.

Table 1-4: Alarm relay board connectors

Relay number	Relay contact pin out		
	Normally closed	Common	Normally open
1	16	3	15
2	5	17	4
3	19	6	18
4	8	20	7
5	22	9	21
6	14	23	10

Table 1–4: Alarm relay board connectors (cont.)

Slot 8	Normally closed	Common	Normally open
7	1	24	11
8	2	25	12
Slot 9	Normally closed	Common	Normally open
9	16	3	15
10	5	17	4
11	19	6	18
12	8	20	7
13	22	9	21
14	14	23	10
15	1	24	11
16	2	25	12

First Time Operation

This section contains the procedure for powering on the instrument for the first time. After the initial setup to install the program monitor in a network, it is ready to operate. The program monitor can also act as a stand-alone monitoring instrument when configured for local operation as described in the following paragraphs.

Local Operation

For the initial setup, access the controls of the standard configuration PQM300 without a front panel display locally by connecting an SVGA monitor and a keyboard and mouse for entering commands and operating the controls. The mouse cursor and buttons are used to select and activate the on-screen menu selections. Use the keyboard to enter parameter changes, file names, and edit any other user configurations choices that permit keyboard entries. The SVGA monitor connection is on the rear panel as one of the connections from the mainframe controller (see Figure 1–1 on page 1–6). The hot-pluggable mouse and keyboard may be connected either to the left front side connectors on the side of the bezel or to the mouse and keyboard connectors on the rear panel.

If your program monitor was ordered with the local control option, you can use the LCD flat panel display and touch screen on the instrument for the display. Use the keyboard and mouse that are provided with the option to aid in making the data entries and selections needed for the initial setup for operation. Refer to *Option LC Front Panel Controls* on page 2–44 for operating instruction for the keypad and touch screen.

First Time Power On Power on the program monitor for the first time as follows:

1. Connect an SVGA monitor for a display and a keyboard and mouse for user command inputs. See Figure 1–1 and Figure 1–2 for the connector locations. If you have the local control flat panel display installed, use the local display. You do not have to connect an external SVGA monitor. You can connect the keyboard and mouse either to the rear panel connectors or to the left side connectors.
2. Press the On/Stby switch to power on the instrument (see Figure 1–6 for the switch location).

Whenever you power on the program monitor, it initializes and starts the PQM300 application without the need to enter a user name and password as normally required for a Windows NT operating system.

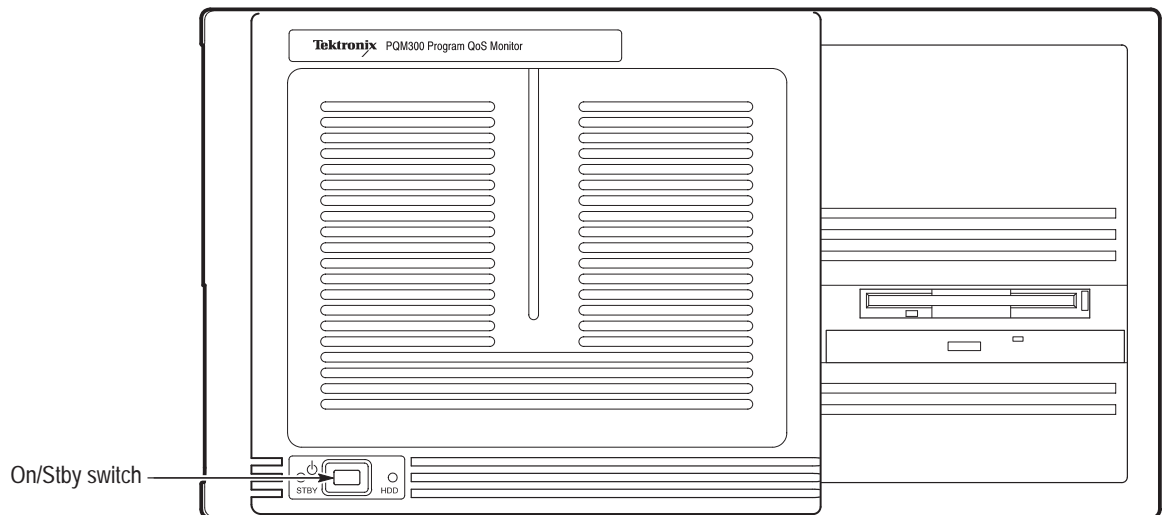


Figure 1–6: On/Stby switch

3. When the PQM300 application has started, click on the X in the upper right corner of the PQM300 application window to stop the PQM300 user interface.
4. In the task bar at the bottom of the display, click on the jre.exe task to display it and click on the X in the upper right corner of the jre task window to quit the task.
5. In the task bar at the bottom of the display, click on the PQM_core task to display the task window. Type **exit** at the prompt and press **enter** on the keyboard to exit the PQM_core application. This procedure saves some files and exits the core task in an orderly manner.

NOTE. The PQM300 program monitor uses automatic login, with the user name of **TEKMONITOR** and the password of **TEKMONITOR**. The **TEKMONITOR** user has administrative privileges on the Windows NT operating system built into the PQM300 application. You can load software, change passwords, assign users, and make the Windows NT system setups for the network from the **TEKMONITOR** log in.

No other user can log in while the autologin property of the application is enabled. If necessary to disable the automatic login, you must run the *Regedit* (registration edit) program and set the HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon\AutoAdminLogon value to 0. It must be reset to 1 to enable automatic login. See *Configure for Auto Boot Up* in Appendix C.

6. If autologin is disabled as described in the preceding note, use the key sequence CTRL + ALT + Delete to display the log-in dialog box. Login as **TEKMONITOR** and use **TEKMONITOR** as the password.
7. Check and set the program monitor clock to the correct system time.

NOTE. Do not set the program monitor clock back while the application is running. The time stamps for the files are obtained from the picture monitor clock. If conflicting times are found on the files, an error can occur. If you must reset the time, either set the time ahead, if needed, or wait until the new time setting is later than previous time setting to begin the PQM300 application again.

Configure the Network Properties

The PQM300 program monitor can be used as a stand-alone instrument, but it will seldom be used that way except initially to get the networking configured. To install the program monitor in a network, it must be configured for the network and provided with a network IP address. Specific items that need to be configured in the networking properties can vary depending on the local network requirements.

NOTE. You will need certain information to correctly install the PQM300 program monitor in a network. Ask your network administrator to do the installation, or provide you with the following information:

Computer Name for use on the network (often called Host name)
IP Address
Subnet Mask
DNS address
Default Gateway
Domain Name or Workgroup Name, as applicable

The typical steps to configure for the network are as follows:

1. Click on the Start icon in the bottom task bar, select Settings, and open the Control Panel.
2. Double-click on the Network icon to open the Network dialog box.
3. Click on Computer name, and then click Change.
4. In the Identification Changes window, enter the Computer (Host) name assigned by the network administrator for the computer you are installing.
5. Enter either the Work Group or the Domain as directed by your network administrator.
6. Click OK to apply the changes.
7. Click on the Protocols tab.
8. Select TCP/IP Protocol if there is more than one choice listed.
9. Click on TCP/IP Properties and click on the IP Address tab.
10. Click on Specify an IP Address.

Typically, the PQM300 program monitor is to participate on a network with a fixed IP address. Check with the system administrator to see if you need to select Obtain an Address from DHCP Server.

11. Enter the IP address, the subnet mask, and the default gateway addresses you obtained from the network administrator.
12. Click on the DNS tab, and then click on Add to enter a new address in the DNS service Search Order list.
13. Enter the DNS address provided by the network administrator in the edit box, and click on Add to enter the new number in the list.
14. Verify that the Host Name and Domain name are correct. Enter the correct names if necessary.
15. Click on the WINS Address tab.
16. Check that Enable DNS for Windows Resolution is selected.

17. Click on OK. You can ignore the WINS Address setting error message and select Yes to continue.
18. Click on Close to apply the changes.
19. On the prompt to restart the computer, select Yes to restart it.

NOTE. *If you change the name of the computer from the factory default, you must also change the name in file used to locate the computer through the Web.*

20. Use the explorer to navigate to the **C:\InetPub\wwwroot** folder and open the folder.
21. Use note pad, or other suitable text editor, to open the **default.htm** file.
22. Find the line that contains the address value: <PARAM NAME= "Address" VALUE="met63">
23. Edit the value inside the quote marks to the new computer (host) name used in step 4.
24. Save and close the file.

Networking the PQM300

The PQM300 program monitor must be installed in a network system if it is to be controlled and accessed using remote control features. The IP address, or the computer name assigned to the IP address, identifies the machine location for proper operation within the managed network. Refer to *Configure the Network Properties* on the preceding page.

NOTE. *Limit the total number of connections (Web browser, SNMP Network, and ethernet) to a PQM300 program monitor to no more than three for best performance. With additional connections the response of the program monitor server slows down. There is a imposed limit of three Web browser connections to a program monitor.*

System Security

The system administrator can set the administrator password and set the user security to monitor only or monitor and configuration access with an access code. When first started, access to the PQM300 application is unlocked.



The application access security is independent of the Windows NT security and any Windows NT password that is setup for system logon of the program

monitor As shipped from the factory, the Windows NT login screen requiring a password is bypassed, and the PQM300 application starts automatically after the power-up initialization has completed.

Click on the Configure selection to show the Configure menu selections as shown in Figure 1-7. Then, select the Access Code choice to display the Change Access Control dialog box as shown in Figure 1-8. You can set or change the Administrator's password and the User Access password. Click on the one you want to set. For a new password setting, enter the new password in two places to set and confirm the password. If you are changing the password, enter the old password, and then enter the new password in two places to set and confirm the change.

NOTE. In the event that the either password (administrator or users) is forgotten, the administrator can restore the factory defaults settings using the Restore Factory Defaults icon. The factory default setting for the passwords is to have the System Access unlocked. New passwords can then be set for the administrator and the users.



Figure 1-7: Configure menu selections



Figure 1-8: Change Access Control dialog

Web Browser Remote Control

A good choice of a PC for the control and monitor task is one with Pentium processor of 200 MHz or better, 64 Mbytes or more of RAM memory, and with either a direct network connection or a fast modem. Computers with less capability may be used with good results, but expect slower update rates. You can control and monitor the quality of service measurements of any networked PQM300 program monitor through the virtual front panel (UI) using a Web Browser.

Web Browser Requirements. You can use Netscape version 4.5 or higher, or Internet Explorer, version 4.01 with SP2 (Service Pack 2) or higher. To be able to use the Internet Explorer browser, the JVM (Java Virtual Machine) version 5.0 must also be installed.

Web Browser Access. Access any networked program monitor that is on the internet by starting the Web browser on your PC and entering either the network computer name or IP address for the PQM300 you want to access in the URL Location block. For example, if the host name for the machine on the network is PQM1 and its network address is PQM1.tek.com, enter `http://PQM1.tek.com`. If its IP address is known, enter that number (for example, `http://128.181.39.60`). The program monitor must be properly configured in your network. The virtual user interface displayed by the applet provides an interactive window for operating the accessed PQM300 program monitors.

SNMP Remote Control

A second networking approach is to control the program monitor in a networked system using SNMP (Simple Network Management Protocol). Refer to *Appendix D, SNMP Networking* for information on configuring and installing the program monitor in an SNMP network. You can use third party software for SNMP network control for the management application. If you have an SNMP network manager installed to control your networked devices, the PQM300 MIB and SNMP agent supplied with the application software can be added to the system. Refer to *Installing and Using SNMP Services* on page C–10 in *Appendix C* for important file configuration requirements. Refer to your third party SNMP software instructions for the information needed to install the PQM300 program monitor MIB in your networked system.

SNMP Agent. An SNMP agent is a processing entity that conveys the management information between the agent and the management station. The necessary agent software is provided as part of the PQM300 application software, but it does not start automatically. An SNMP shortcut icon is provided on the desktop. Double-click the icon to launch the SNMP agent that enables SNMP network connections.

MIB. The PQM300 management information base (MIB) provides the information needed to control the operation, configure the measurements, and monitor the activity of the program monitor from a management station. The management information base for the program monitor is shown in *Appendix D SNMP Networking*.

Network Remote Control

A third network operating choice is multi-machine networking. Access any PQM300 program monitor on the network from a controlling PC or PQM300 program monitor with a local display, keyboard, and mouse connected using the Windows NT networking facilities. Each PQM300 program monitor that is connected through a network to another PQM300 program monitor can be controlled, configured, and monitored by the control PC. Your system administrator must provide the IP addressing and configuration settings needed to properly network PQM300 program monitors in your local network.

DNS Table. To locate the PQM300 program monitors on a local network, a DNS (dynamic name server) table must be created. If the DNS server is maintained by a centralized administration, that service has to make the appropriate entries to enter the program monitors on the network. For a local network without a centralized administration, the appropriate information must be available on the program monitors in the network. The name server looks at the Host file to find the IP addresses and assigned net names to identify a machine on the network. The Host file, shown in Figure 1–9, is in the `C:\WINNT\system32\drivers\etc` directory.

NOTE. *The local machine is listed twice in the Host file; once as the localhost and again with its net name.*

Use Notepad to open the file and edit the file to add the machine ip addresses and net names for the PQM300 program monitors on the local net.

```
# Copyright (c) 1993-1995 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows NT.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com       # source server
#       38.25.63.10      x.acme.com           # x client host

128.181.39.68      localhost
128.181.39.66      met66           # control room 1
128.181.39.67      met67           # control room 2
128.181.39.68      met68           # video booth
```

Figure 1-9: Host file for DNS name server

PQM300 Remote Application Program

The PQM300 remote application can be downloaded to a PC from any of the networked PQM300 program monitors using the Web Browser. Once you download the remote application, you can run it on a PC that does not have the PQM300 modules installed. You can use this method of accessing the PQM300 program monitors when the PC is dedicated to monitor and control of the networked program monitors, but it is especially beneficial when you use the PC primarily for other tasks or you monitor through a dial-up modem.

After connecting to the PQM300 program monitor, click on the line “Download PQM300 Remote Application (Self Extracting 7Mb)” to download the application.

You can also load the PQM300 Remote Application executable directly from the application CD provided with the program monitor with the following procedure:

1. Place the CD in the CD drive of the PC you want the program loaded on.
2. Cancel the installation process that starts automatically.
3. Open the directory of the CD and locate the PQM300 Remote.exe file.
4. Select the file in the directory and drag it to the desktop of the PC.
5. Double-click on the PQM300 Remote application icon to start the installation. The PQM300 Remote application is self extracting and automatically loads to the PC.

After the program is installed, either from the Web download or copied from the CD, double-click on the PQM300 icon that is now on your PC desktop to start the application. Operation through the application installed on your PC is the same as operation using the interface that is displayed by the applet, however, the user interface does not have to reload each time you connect to a networked PQM300 program monitor. Simply start the PQM300 application and connect to any PQM300 that is known on the network. Refer to *Making Program Monitor Connections* on page 2–26 for the procedure.

Incoming Inspection

Incoming inspection consists of verifying basic operation of the PQM300 program monitor. The Power-on diagnostics check basic functionality. These diagnostics run every time you power on the program monitor. If a failure is detected, the Power-on diagnostics dialog box opens with the failed test indicated. A functional check of the MPEG Defect measurement is provided in the *User Service* found in *Appendix B* beginning on page B–3.

Diagnostics

The PQM300 program monitor has built-in self diagnostics to act as the first level of failure location and to act as part of the functional verification check. The program monitor performs power-on diagnostic testing. This testing consists of running the Windows NT power-on tests for checking the server and the boot-up testing of the program monitor modules. Additional diagnostic tests are performed on all installed Tektronix modules (such as the composite decoder or alarm relay board modules) to determine if they are operational.

Create an Emergency Repair Disk

A disk titled PQM300 Windows NT Emergency Repair Disk is shipped with the instrument. Use this disk to restore system settings for your program monitor in case of a major hardware or software failure. Use the following directions to

create a repair disk when software is either added or when software is deleted from the PQM300 program monitor.

1. Mark a High Density 3.5-inch disk clearly as the emergency repair disk for program monitor serial number Bnnnnnn (the serial number of your program monitor), and then continue with step 2.

NOTE. *The emergency repair disk is program monitor-specific. Make sure that the emergency repair disk is clearly marked with its program monitor serial number. The serial number of your PQM300 Program QoS Monitor appears on the original emergency repair disk and on the server rear panel, near the power input connector.*

2. Choose Run from the Windows NT Start menu.
3. Type rdisk in the Run dialog box. The Repair Disk Utility dialog box, as shown in Figure 1–10, opens.

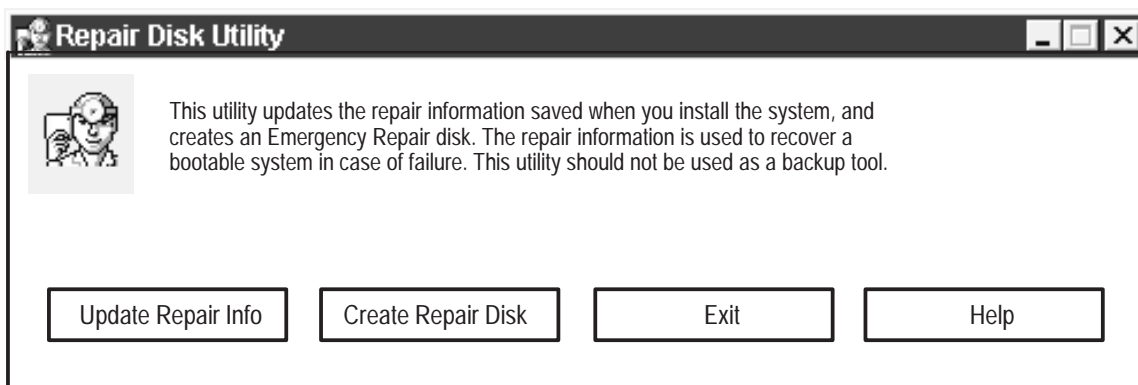


Figure 1–10: The Repair Disk dialog box

4. Click Update Repair Info to save your current configuration. A message appears to remind you that earlier repair information is overwritten. Click Yes to continue.
5. When the process is complete, a message appears to ask if you wish to create an Emergency Repair Disk. Click Yes. The message shown in Figure 1–11 appears.

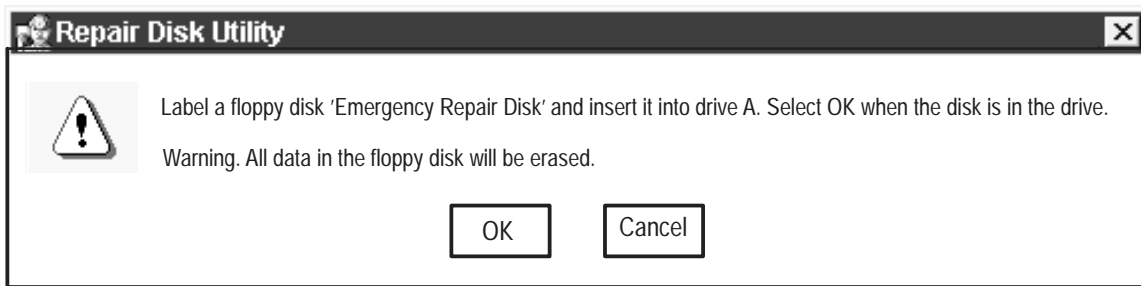


Figure 1-11: All data on the disk will be erased

6. Insert a 3.5-inch disk in drive A and click OK. Rdisk formats the disk and copies the configuration files onto it.
7. When the operation is complete, click Exit in the Repair Disk Utility dialog box. Remove the disk from drive A and keep it in a safe place.

Powering Off the Program Monitor

The normal shut-down procedure for the rack-mounted program monitor without a local user interface or display is done with the front panel On/Stby switch. When the program monitor is operating, press and release the On/Stby switch to begin the soft shutdown of the program monitor. Any open processes are closed and files are saved before the operating system shuts down.

If you are operating the PQM300 program monitor with a local UI (monitor or Option LC flat panel display, keyboard, and mouse connected), you can also use the normal Windows NT shutdown procedure (**Start** ➔ **Shutdown**) to turn off the operating system. Use the On/Stby switch to restart the program monitor. The PQM300 application restarts automatically. Disconnect the AC power cord at the rear panel to remove power from the instrument.

Emergency Shutdown. In an emergency or other priority situation, you can turn off the program monitor by holding the On/Stby button in for about 3 or 4 seconds. This method is a hard shutdown that can corrupt open files or lose unsaved files. When the program monitor is turned on again after a hard shutdown, the program monitor does an abnormal shutdown error check.

Shutting Down the PQM300 Application

There are three steps in an orderly shutdown of the PQM300 application. These steps shut down the user interface, the PQM core program, and the server. The best practice is to use the orderly shutdown procedure so that the appropriate

data for the application is saved and all the PQM300 processes are stopped. You must be able to control the program monitor operating system either locally (refer to *Local Operation* on page 1–12) or through an appropriate network to shut down the PQM300 application using the following steps:

1. In the PQM300 display, click on File in the display task bar and select Exit to shut down the user interface.
2. Click on the PQM_Core.exe task in the lower task bar to display the task DOS window. At the prompt, type in **exit** and press the **enter** key.
3. Right click on the jre.exe task in the lower task bar and select close from the list that is displayed.

To restart the PQM300 application, simply double-click on the PQM300 icon. All the PQM300 processes are automatically started, and the user interface is reloaded.

To restart the SNMP service, double-click on the PQM300 SNMP agent icon.

Field Service

If the PQM300 Program QoS Monitor needs repair or adjustment, you may either service it yourself or make arrangements for Tektronix service. Refer to *In Case of Problems* on page B–18 in the Appendices for some troubleshooting aids that may help isolate a problem area.

If you have the ability to diagnose and repair module level defects, the optional service manual will aid you in module-level trouble isolation. See *Options and Optional Accessories* on page 1–3 for the manual part number. Once a problem module is identified, you can order an exchange replacement module. You will then have to install the module, configure the mainframe, and calibrate the program monitor as necessary.

If you prefer to have Tektronix or a Tektronix authorized service center diagnose and repair the PQM300 Program QoS Monitor, contact your local Tektronix representative to arrange for either local service or shipment to Customer Service.

A field service or factory service technician performing the repairs will replace the defective module, verify instrument functionality, and ship it back to the customer. Defective modules are returned to a central repair facility for component-level repair where the boards are repaired, tested, and recalibrated to support the exchange repair program. Refer to *Contacting Tektronix* on page xiv in the *Preface* of this manual for information on obtaining additional customer support.



Operating Basics

Operating Basics

Operating Basics provides operating instructions for the PQM300 Program QoS Monitor control. Use of the controls, menus, and how to make the configuration settings for the quality of service measurements are described.

Starting the Application

You do not need a local control interface to start the application from a power-off to power-on state. The PQM300 application starts automatically at power on after the Windows NT operating system is initialized.

If the application has been stopped, and you have local control with either an external display monitor or the local control front-panel display, double-click on the PQM300 icon on the desktop to restart the application. The local control display has a touch screen for making control inputs. You can either double-touch or touch to select and press enter on the front panel keypad to make a selection.

Remote Operation

The PQM300 Program QoS Monitor has versatile networking capabilities to permit remote configuration and monitoring of the installed program monitor. Your access to the PQM300 program monitor depends on the provisions that were made for putting it into a network.

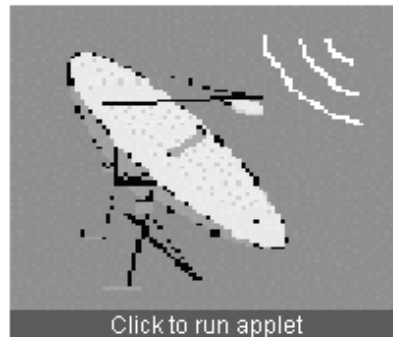
NOTE. For best performance, limit the total number of connections (Web browser, SNMP Network, and ethernet) to a PQM300 program monitor to no more than three. You can permit more connections to be made, but the response of the program monitor server slows down. There is an imposed limit of three Web browser connections to a program monitor.

Web Browser

Start the browser on your PC. In the URL Location window of the browser, enter either the network IP address or the network machine name of a program monitor you want to access. The JAVA applet screen (shown in Figure 2-1 on page 2-2) downloads to the browser window. Use this screen to start the monitor operation or to download the defects log or the measurement results files. Click on the Java applet to start the the display screens of the PQM300 program monitor.

NOTE. If the browser has a problem and the display stops updating, close the PQM300 application window and reload the JAVA applet in the browser window. Click on the Java applet again to restart the display updates.

PQM300-Monitoring Station #1



- [Download PQM300 Remote Application \(Self Extracting 10Mb\)](#)
- [Download PQM300 Defects Log](#)
- [Download PQM300 Results](#)

Figure 2-1: Web browser screen for connection to a PQM300 Program QoS Monitor

The Status Log Monitor screen may be displayed for a brief time to show the connection activity. Once the connection is made, the program monitor screen is downloaded. The initial screen downloaded for display depends on the operating state of the program monitor to which you connect. Control the accessed program monitor and send and receive data information to it through the display screens.

SNMP Network

If you have an SNMP (simple network management protocol) network, you can use the SNMP network controls to access a networked PQM300. Refer to the instructions provided with the SNMP network software for information on its operation. The PQM300 SNMP agent and management information base (MIB) must be incorporated in a controlling SNMP system to recognize and control the program monitor. An SNMP agent icon appears on the desktop of the program monitor with Version 2.0 or higher software installed. Start the SNMP server either by clicking on the icon and pressing enter or by double-clicking on the icon.

Local Area Network

Use Windows NT networking to access a PQM300 program monitor installed on the local area network. Refer to Windows NT documentation for information on Windows NT networking. Refer to the *Network Remote Control* information on page 1–19 for information on setting up a PQM300 program monitor local area network.

PQM300 Remote Application. You can download the PQM300 Remote Application to run on a PC that is used to control and monitor the networked PQM300 program monitors. See the *PQM300 Remote Application Program* information on page 1–20 for information on loading the program either from the Web Browser download line or from the PQM300 application CD provided with the program monitor.

Quality of Service Monitor

Quality of Service measurements monitor the incoming video for MPEG blockiness defects, accompanying noise, and frozen or repeated frames. You can select any one or all three of the measurements for monitoring in any connected program monitor channel. You can set measurement thresholds to indicate program quality alarm conditions.

Alarm Monitor

Use the Icon-based Alarm View to monitor for alarm conditions. There are two possible view choices for the Alarm Monitor: View by Connection and View All Channels. Make the selection under the View menu choices under the Alarm View Mode menu choice. See *View* on page 2–7 for a complete description of the View choices.

View By Connection. This alarm view displays the connected channels of the selected PQM300 program monitor separately with a thumbnail video of the program content. When more than one program monitor is connected, more than one monitor-selection tab is available. Click on a selection tab to view the channels of that program monitor.

View All Channels. This alarm view displays all the channels of all the connected program monitors. If there are more channels connected than can be displayed in one screen, a scroll bar is provided to view all the channel icons. This alarm view does not provide a thumbnail video of the program content, but it allows you to quickly view all the monitored channels for an alarm state.

Alarm State Indication. The alarm states of the connected program monitors are indicated in a row of small tabs with the program monitor IDs across the top of the screen. If a connected program monitor does not have an alarm condition on any of its channels, the tab indicator is green. An amber-colored indicator shows

that an alarm condition existed, but is not now present. A red indicator in the tab shows an alarm condition is present on the program monitor. A gray indicator dot means there are no measurements configured for the program monitor associated with that tab. The background color of the channel icons follows the same color coding as the alarm state of the individual channels.

Stack Chart Monitor

Switch to the Stack Chart Monitor view by clicking on the thumbnail video in the View By Connection icon or the Chart button in the Monitor All icon. The Stack Chart Monitor displays a moving graph display of the channel measurements on the selected program monitor channel. Each enabled measurement for the channel is displayed in a separate line graph. If an alarm condition exists or occurred while the channel was being monitored, you can quickly discover the cause of the alarm and the time the alarm occurred by viewing the program channel history. The history time of the displayed measurement results is selectable from 10 seconds (the maximum resolution) to 1 week.

Overlay Chart Monitor

Use the Overlay Chart Monitor to view the results of multiple program monitor channel measurements. You have two possible view choices for the Overlay Chart: Line Chart, a line graph display of the selected measurements and channels, and Bar Chart, a bar graph display of the selected measurements and channels. Make the selection under the View menu choices under the Overlay View Mode menu choice. See *Overlay Chart Monitor* on page 2–13 for a complete description of the Overlay Chart View choices.

You can select measurement traces to view from any of the PQM300 channels connected. You can view up to eight measurement result traces at the same time. The history time of the displayed measurement results in the Overlay Chart Monitor is also selectable from 10 seconds to 1 week.

PQM300 windows can be resized just as any other window. Place the mouse cursor on an edge or corner of the window to get a double arrow display. Then hold down the button and drag the window edge to resize the window. Within limits, the PQM300 displays in the window are resized to adjust to the new window size. Set the window size to allow correct viewing of the PQM300 displays.

Operating Controls

Across the top of the views there are user task choices. These choices are File, View, Configure, and Help. Click on the task name to display the drop-down menu with a list of the choices. Click on a choice in the menu to make a task selection.

Icon Toolbar








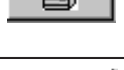
A toolbar, shown in Figure 2–2, provides icon shortcuts to switch between views and select some common operator tasks. Turn the toolbar display on or off by

clicking on the Toolbar selection in the View menu. A check mark shows that the toolbar display is enabled. Move the the mouse cursor over an icon in the toolbar to display the tool-tip help for the icon. Look in Table 2–1 for a longer description of the task done by the icon shortcut. Click on the task icon to start its associated task.



Figure 2–2: Toolbar shortcut icons

Table 2–1: Task shortcut icons

Task icon	Shortcut task
	Switches to Alarm Monitor view, View by Connection
	Switches to Alarm Monitor view, View all Channels
	Switches to the Overlay Monitor Chart, line graph display
	Switches to the Overlay Monitor Chart, bar graph display
	Switches to the Defect Log Monitor
	Indicates the system access is either locked or unlocked. Click on the icon to toggle between system access locked and system access unlocked. When the system access is locked, a user can view the program monitor, but cannot make configuration changes without an access code. If the access is not locked, all users have viewing and configuration change privileges.
	Screen captures a bit-mapped image of the current display and prepares to send it to a selected network or connected printer. The printer setup dialog box is displayed for making the printer selection.
	Accesses the online help system for the PQM300 application.

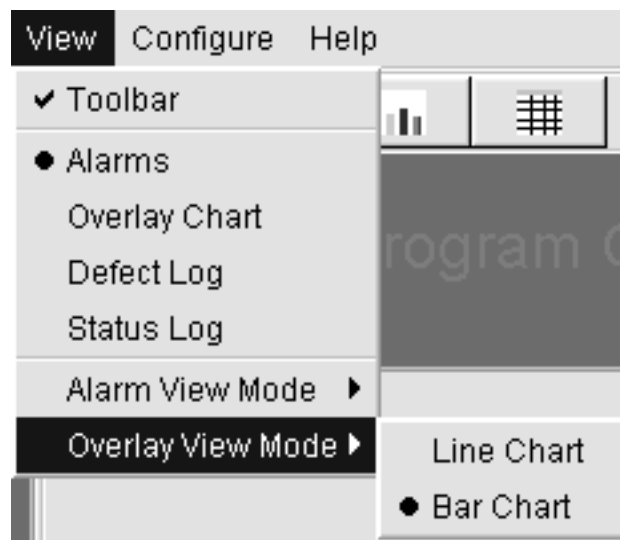
File The File menu choices are as shown below.



- **Export Defect Log:** Sends the Defect Log to the DefectLog.txt file for archiving or printing. Each new export of the Defect Log is written to the DefectLog.txt file. The previous DefectLog.txt file is renamed with a date and time added to the beginning of the file name. The DefectLog.txt file is downloaded to the controlling PC when you click on **Download the PQM300 Defect Log** in the Web browser start-up screen.
- **Export Results:** Sends the measurement data of all the displayed traces to a Results.txt file for archiving or printing. You can export the Results.txt file to a spread-sheet program for more analysis. The measurement results are exported with a time stamp and machine name for record purposes. Each time the Results data is exported, the previous file is renamed with a date and time added to beginning of the file name. The Results.txt file is downloaded to the controlling PC when you click on **Download PQM300 Results Data** in the Web browser start-up screen.
- **Clear Alarms:** Clears the current alarm states. Red and amber backgrounds turn green when the alarm is reset; but if the alarm state is still present, the background turns red again as soon as an out-of-limit measurement is made. You can also clear the alarms by clicking on the Clear Alarms button in either of the alarm views or in the Overlay Chart bar graph view.
- **Clear Log:** Clears the Defects Log to begin a new accumulation of defects. To save the current Defect Log data for your records, export the Defect Log for archiving before clearing the current log.
- **Clear Defects Statistics:** Clears the accumulated error column of the defects log. The accumulated errors column in the defects log table shows the total error time seen for a measurement since the last time the column was cleared.

- **Print:** Captures a bit-mapped image of the screen and prepares to send it to a printer. A printer setup dialog box is displayed to configure the printer and make the printer selection.
- **Exit:** On a program monitor under local control, Exit stops the PQM300 application. It has the same effect as clicking on the × in the upper right corner of the application window. You cannot start or exit the PQM300 application from a remote machine using a Web Browser or SNMP networking. The application must be started or stopped at the local machine.

View Click on View to select a different view. The menu choices are as shown below.

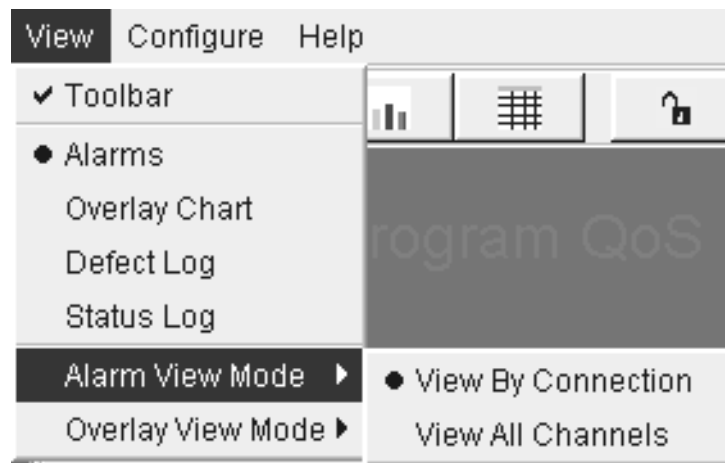


- **Toolbar:** Click on Toolbar choice to toggle the toolbar on or off.
- **Alarms:** Selects the Alarm View window showing the alarm state of the connected program monitors in a small machine-name tab across the top of the display and the program channels of a selected program monitor (machine) in a series of icons in the view display area. Use this view to monitor the alarm state of all connected program monitors.
- **Overlay Chart:** This view is the live graph overlay display of the selected measurements on selected program monitor channels.
- **Defect Log:** This view shows the log for alarm conditions on all monitored program channels for up to the last 1000 defects logged. Use the defect log or the archived DefectsLog.txt files in the D:\PQM300\Defects directory to locate any area of monitored program quality on any channel. Use the Overlay view to select program channels to view history when you want to view the traces (up to one week of trace history is maintained).

- **Status Log:** The operating status of the PQM300 application is recorded in the status log. The information recorded in this log may be helpful for troubleshooting an operation problem, but would not normally require viewing.
- **Alarm View Mode and Overlay View Mode:** Use these two choices to select the type of view you want to see for the Alarm Monitor View and the Overlay Chart View.

Alarm Monitor View

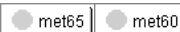
The Alarm view provides a quick visual check on the alarm status of all the connected program monitors and the program channel alarm status of a selected monitor. There are two alarm view choices available: view by connection and view all channels as shown below. Across the top of the view by connection display, each connected monitor has a tab with the machine name and a small indicator to show its alarm state.



The color of the indicator spot in the tab is green until an alarm occurs on any channel of the program monitor. When there is an alarm on any of the channels, the program monitor tab indicator is red. If an alarm has occurred in the past history, but is not present currently, the tab indicator is amber. The indicator color is gray if no measurements are being made on any channels of the program monitor.

View By Connection

This selection provides an alarm view of the connected channels of a selected program monitor.

Select a machine tab  to display the alarm icons of the channels for that program monitor. Alarm icons for all the channels of the selected program monitor are displayed. A thumbnail view of the video program content on that channel provides a means to see that a channel has video applied and to

identify the program content. The video image displayed in the icon is updated about once per second on a local machine. If connected through the internet, the apparent video update rate is slower and depends on the speed of the internet connection.

The program channel icons line up across the display in the order of the slot that the monitor board occupies in the program monitor card cage. The program channel ID is displayed across the bottom of the icon. You can change that name to the name of the monitored program source as an identification aid.

The background color of the program channel icon is red when an alarm condition exists and the alarm condition (MPEG Defect, FrozenFrame, or Noise) is displayed at the bottom of the icon. If an alarm has occurred in the past history, but is not present currently, the icon background is amber. The background color is gray if no measurements are being made on the program channel.

Alarm State Indicator. The background color of the large program channel icons in the alarm view screen shows the alarm state of each channel of the selected program monitor. The same green/amber/red color scheme as described for the program monitor tabs is used. If a connected program monitor does not have an alarm condition, the background color is green. An amber-colored background shows that an alarm condition existed, but is not now present. A red background in the icon shows that an alarm condition is present on the program monitor. If no measurements are configured for a program channel, the background color is gray. The program channel ID and nature of the alarm, if one exists, are also indicated in the program channel icons.

A rectangular button with a black border and the text "Clear Alarms" in a bold, sans-serif font.

Click on the Clear Alarms button to reset the present alarm state. Red and amber backgrounds turn green when the alarm is reset, but if the alarm state is still present, the background turns red again as soon as an out-of-limit measurement is made.

Click on the thumbnail video portion of the program channel icon to display the measurement traces for that channel in the Stack Chart Monitor view.

If there are no measurements configured for the program channel, an error message "Measures Not Configured" is displayed when you click on the program channel icon. A possible reason for not having measurements configured is that there is no signal applied to that program monitor module. A second reason is that there are no measurements turned on for that monitor.



Figure 2-3: Alarm monitor by connection view

View All Channels

A program channel alarm icon for all channels from all the connected program monitors is displayed as shown in Figure 2-4. This view does not provide a thumbnail of the video program content. If there are more channels connected than can be displayed in one screen, a vertical scroll bar is provided to view the complete list.

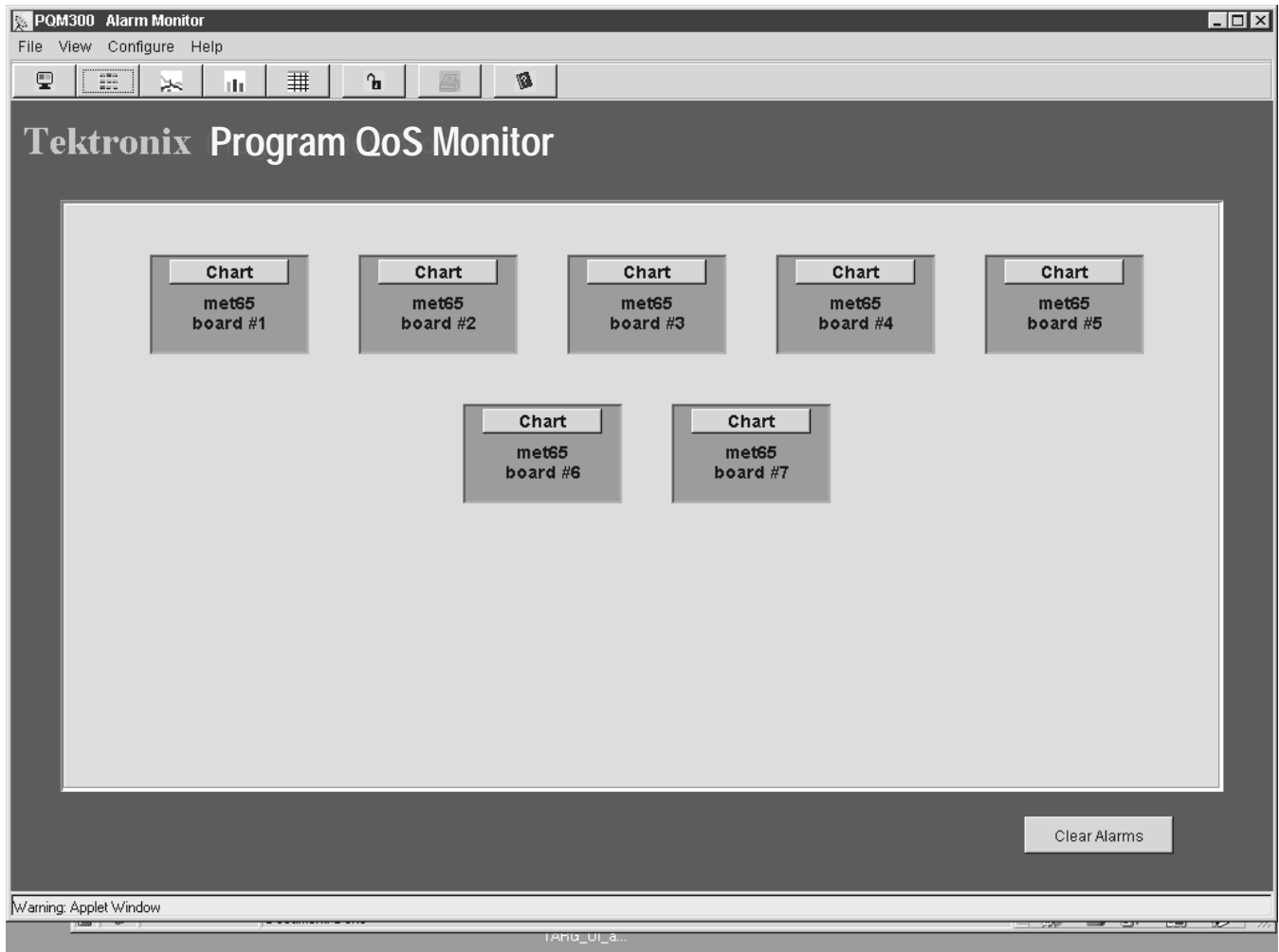


Figure 2–4: Alarm monitor all channel view

Chart Click on the Chart button in a View All Channels channel icon to switch to a Stack Chart Monitor graph view for that channel.

If there are no measurements configured for the program channel, an error message “Measures Not Configured” is displayed when you click on the program channel icon. A possible reason for not having measurements configured is that there is no signal applied to that program monitor module. A second reason is that there are no measurements turned on for that monitor.

Stack Chart Monitor

The Stack Chart Monitor is a graph of each enabled measurement on the channel as shown in Figure 2–5. Each measurement trace is in a separate graph, stacked

vertically, for easy identification. The program monitor and channel are indicated in the upper left corner of the display. An alarm condition is indicated in the trace display by a red bar line across the bottom of a graph when an alarm threshold for that measurement is crossed.

Use the Stack Chart Monitor to quickly switch to a connected program channel to check its alarm condition, program quality, and history. Refer to *History* on page 2–20 for a description of using the history selections.

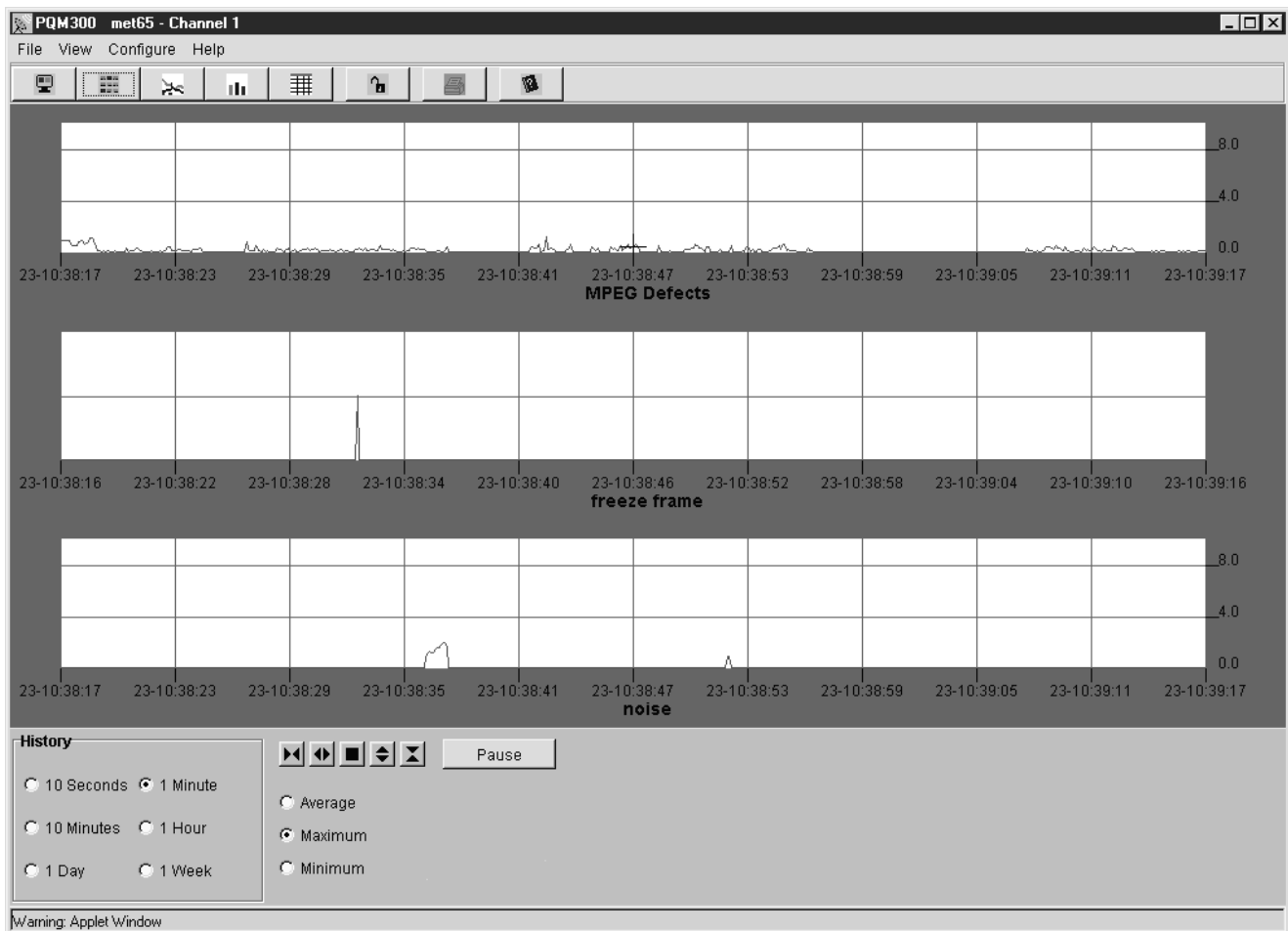
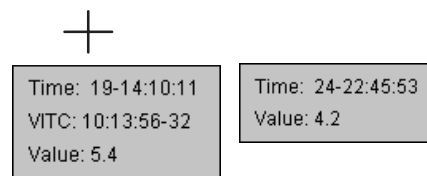


Figure 2–5: Stack Chart Monitor view with measurement traces on one monitored channel



Trace Expansion and Pause. Use the trace controls at the bottom of the graphs to expand the horizontal time or vertical PDI value axis scale of the graphs. The traces can be paused and expanded individually. Click on a trace you want to pause before clicking on the pause button.

To hold the trace stable while making measurements, pause the trace. The trace expansion controls work on the paused trace. The other traces continue to update. When you click Resume, the paused trace is realigned to the live traces.

Click on a point of interest in time to select an expansion point in the graph. You will get a time and value readout of the selected graph point while the mouse button is held down. Time is the number of seconds back from the time of origin of the graph; value is the PDI number of the data point selected by the mouse cursor. If the program material contains a VITC (vertical interval time code), that time also appears in the cursor readout. The VITC provides the hour, minute, second, and frame number of the point you select. Program material provided from a tape player usually has the time code. Original program material that is obtained after MPEG compression does not have a time code as the MPEG compressor strips it from the signal.



A small cursor remains displayed to indicate the expansion point selected after you release the mouse button. Refer to *Trace Expand/Contract* on page 2–22 for further details about the trace expansion controls.

To return to the Alarm view screen from either the Stack Chart Monitor or the Overlay Chart Monitor, select Alarm View in the View selections or, if the icon task bar is displayed, click on either the view by connection icon  or the view all channels icon. .

Overlay Chart Monitor View

Use the overlay chart monitor view to display a live graph of the measurement results. You can select up to eight measurements to view from the connected program monitor channels. You can view the measurements in a line graph as shown in Figure 2–6 or in a bar chart display as shown in Figure 2–7. Use the View menu selection of Overlay View Mode to select the display type.

Line Graph

Line graph is an X-Y graph of the measurement results. Traces are superimposed over one another for ease of comparison between like measurement traces. Trace comparison is useful if you want to compare the same program content coming from separate sources to determine if there is a quality of service difference or to correlate errors on the monitored channels.

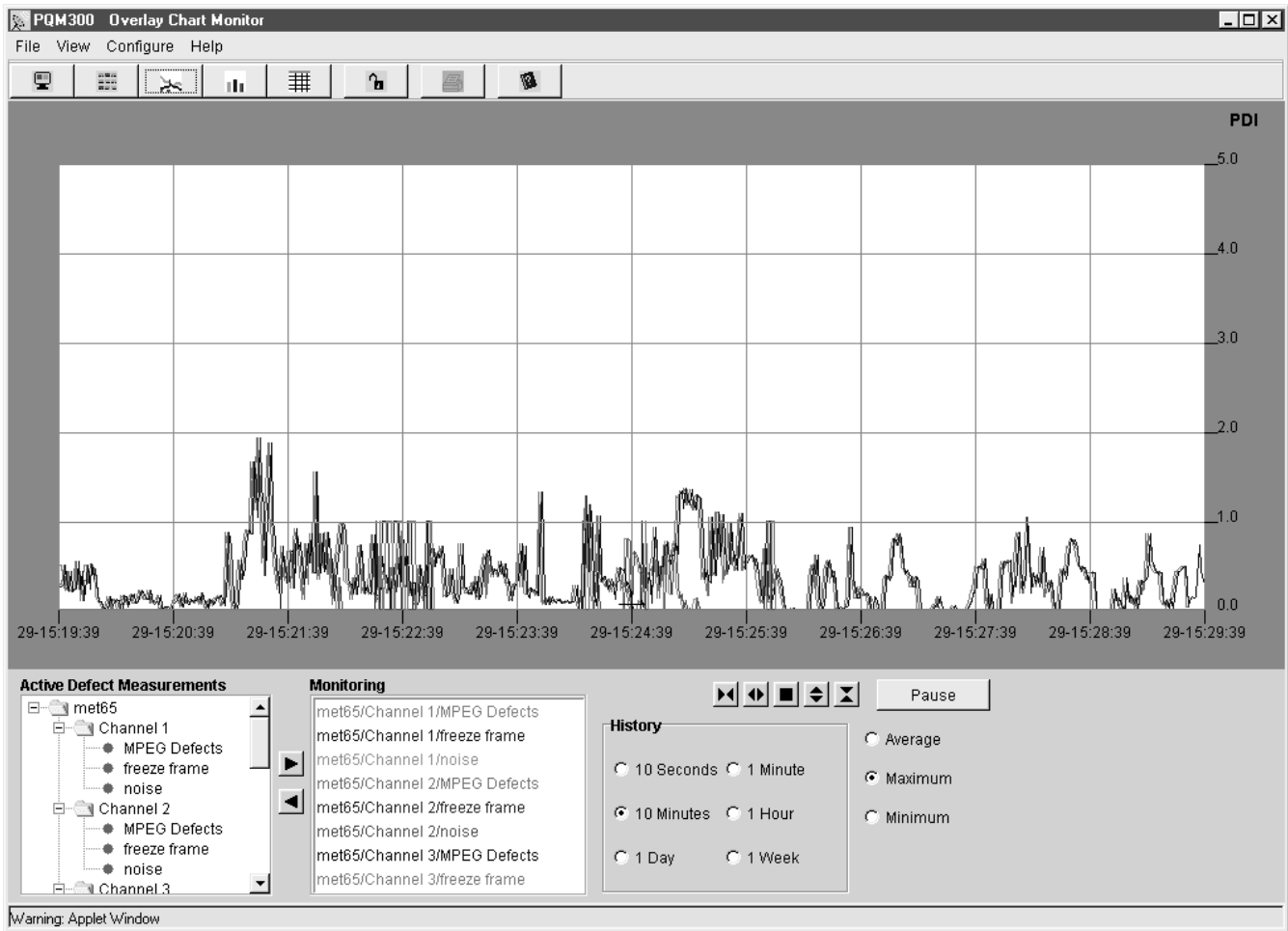
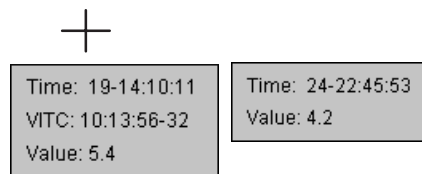


Figure 2-6: Chart Monitor with Line Graph View of selected channel measurements

Click on a point of interest in the graph to get a time and value readout of the selected point while the mouse button is held down. Time is the number of seconds back from the time of origin of the graph; value is the PDI number of the data point selected by the mouse cursor. If only one measurement trace is displayed, you will also see a VITC time, if the program material has a vertical interval time code. If more than one trace is displayed, only the time is displayed.



NOTE. The time scale on the graph is determined from the time of the local program monitor clock. The time of the signal from a remote site is read and used to adjust the data to line up the graph time of the traces to that of the local trace. The trace for the remote data can have a gap at the beginning of its plot that corresponds to the time difference between the local time clock and the remote time clock. Measurement traces viewed from different PQM300 program monitors can be from different time zones, but the clocks in each must be close in the number of seconds.

Check and set program monitor clocks against GMT (UTC) for the best accuracy. Do not set the program monitor clock back while the application is running. The time stamps for the history files and defects logs are obtained from the picture monitor clock. If conflicting times are found on the files, an error can occur. If you must reset the time, either set the time ahead, if needed, or wait until the new time setting is later than previous time setting to begin the PQM300 application again.

If the processor is heavily loaded, especially if running other tasks, the measurements can occasionally skip a few fields to catch up to real time. This skip is evidenced by short interruptions in the trace data.

Bar Chart

The measurements you select (up to eight) are displayed with the alarm state, the minimum reading, the instantaneous reading, and the maximum reading as shown in Figure 2–7.

Bar graphs are displayed in the order, from left to right, that you add them to the monitoring list.

NOTE. When you display a bar graph or line graph that has already been set up, the graphs are displayed in board number order, from the lowest to the highest.

The color of the bars (not the alarm/threshold indicator) matches the color of the measurement in the monitoring list for identification. See Figure 2–8 for an explanation of the bar chart.

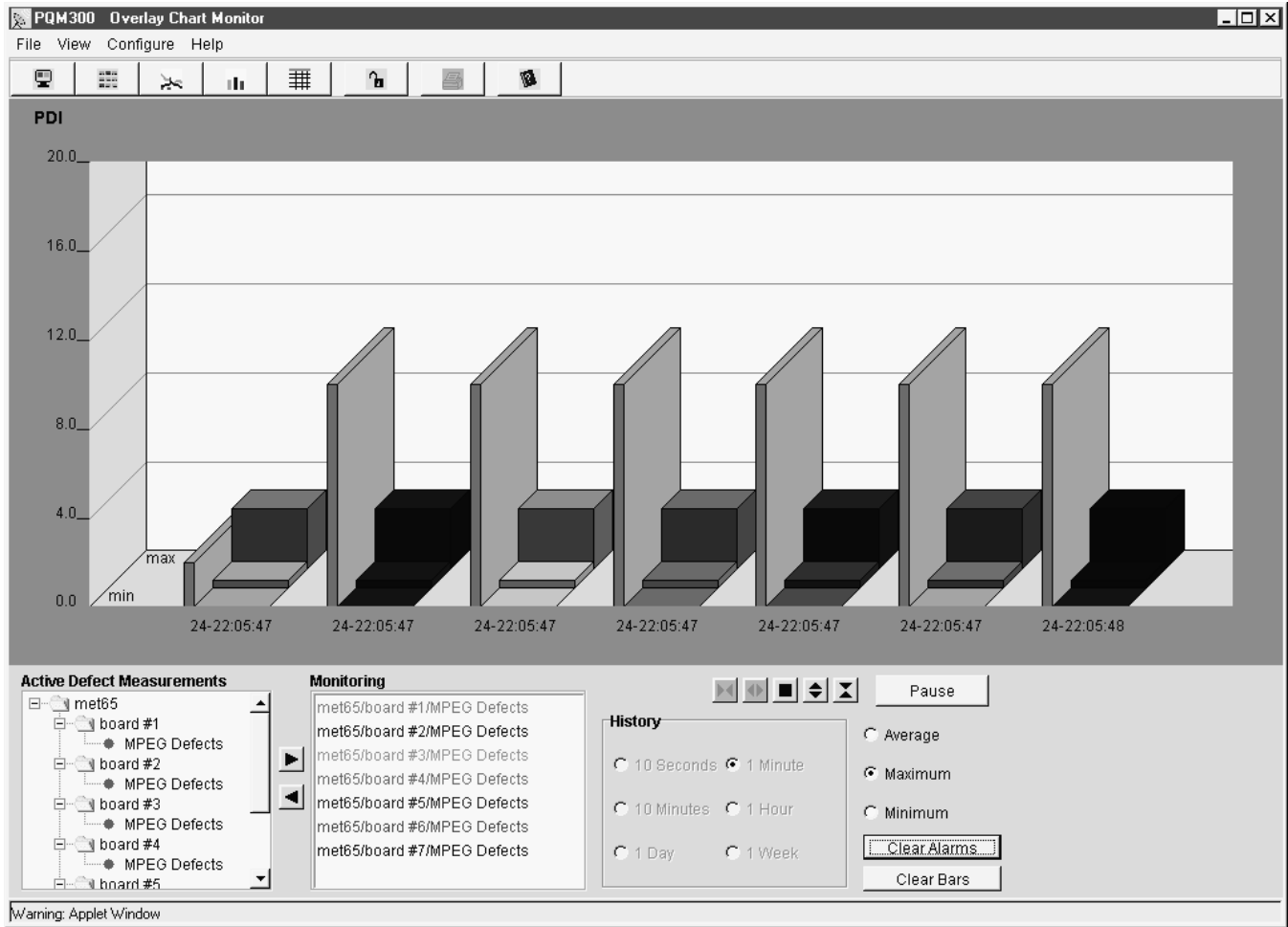


Figure 2-7: Overlay Chart monitor with Bar Graph View display of the selected measurements

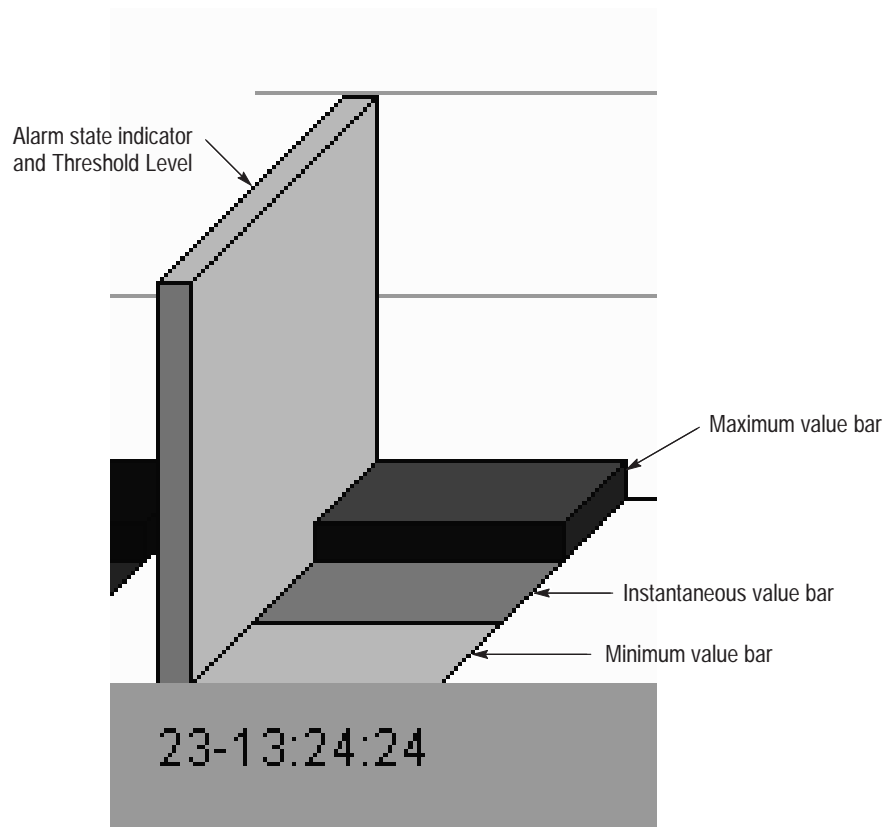


Figure 2-8: Bar graph indications

In a typical display, the most active indication of measurement activity is the changing amplitude of the instantaneous reading of the middle bar. The middle bar graph value is controlled by the selection of Maximum, Average, or Minimum in the lower right corner of the Overlay Chart Monitor screen. The Maximum selection shows the most activity as it follows the peak PDI values found in the program content.

The minimum and maximum value bars are latched to show the highest maximum and lowest minimum PDI values measured. To reset them to begin a new search for maximum and minimum values, click on the **Clear Bars** button at the bottom of the screen.

The color of the alarm state indicator bar is green unless an alarm occurred. In the alarm state, the alarm state bar has a red background. If an alarm has occurred in the past history, but is not present currently, the alarm state bar is amber.

Chart Scale You can select either a numerical PDI vertical scale (picture defect indicator) or a word description of the picture quality rating for the graphs view. The 5-Point picture quality rating has two choices for the descriptive wording labels: Quality and Impairment, as shown in Figure 2–9. You can change the default range step values shown in the Chart Scale dialog box in Figure 2–10 to values that correspond to levels that match your quality requirements. Click in the edit box and edit the number to a new value. The PDI values for the quality ranges are shown next to the edit boxes. The new range values are listed after you apply a change.

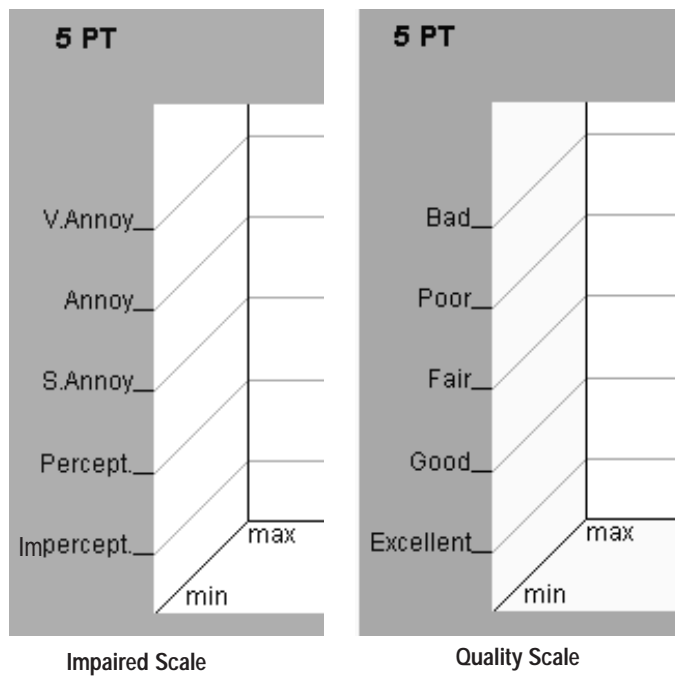


Figure 2–9: 5 Point vertical scale for picture quality

5 Pt. Scale	Top Limit	Range (PDI)
Excellent	3.0	0 to 3.0
Good	6.0	>3.0 to 6.0
Fair	9.0	>6.0 to 9.0
Poor	12.0	>9.0 to 12.0
Bad	16.0	>12.0 to 16.0

Figure 2-10: Chart scale dialog box

Selecting Active Defect Measurements

Add or delete measurement traces to/from the Overlay Monitor graph using the Active Defect Measurements selections and the Monitoring list on the lower left side of the Overlay Chart Monitor view (see Figure 2-11). Add a measurement to the monitoring list by selecting it in the measurements list and clicking the right pointing arrow. Up to eight measurements can be added to the monitoring list. Remove a measurement from the monitoring list by selecting it and clicking the left-pointing arrow. Removing a trace from the display does not stop the accumulation of channel measurement data, but it permits other traces to be added to the graph for monitoring program quality.

Only those measurements you have enabled for a program monitor appear in the Active Defect Measurement list. If a program monitor board does not have any measurements configured (turned on), none will appear in the list when you click on the machine icon radio button for that board. Use the scroll bar arrows to move up and down the measurements list when it is too long to fit in the Active Defect Measurements window.

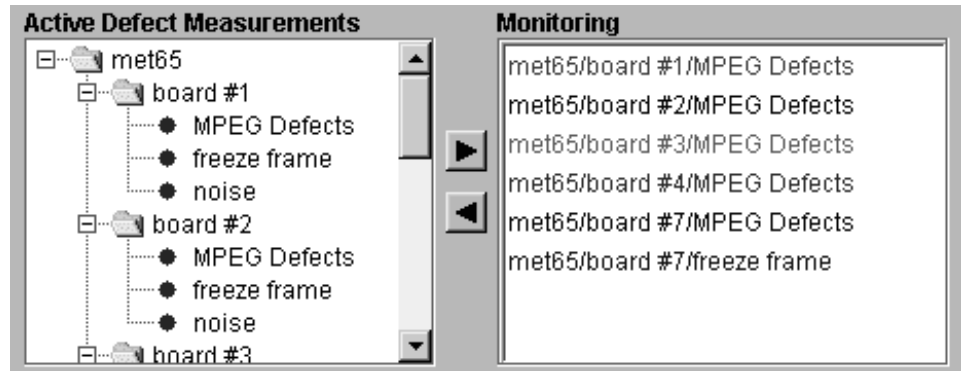


Figure 2–11: Measurement trace selection dialog box

Traces are added to the bottom of the monitoring list. Traces in the line graph or bars in the bar chart are color coded to match the color displayed in the Monitoring window to identify them in the overlay chart monitor display. You can customize the color of the traces using the selections in the Properties Configuration window (refer to *Setting Display Properties* on page 2–36).

History

The measurement and trace for the 10-second time interval have a resolution of one data point per pixel across the screen. The display data points are decimated to permit longer history periods to be shown in the graph. You can view history in either the Overlay Chart Monitor or in the Stack Chart Monitor; the history and trace controls are exactly the same.

- If you are viewing the Overlay Chart Monitor, select a program channel of interest to display using the Active Defect Measurements window. Refer to *Viewing History* beginning on page 3–13 for instructions on selecting program channels to check for history.
- If you want to check history in the Stack Chart Monitor, select the correct program monitor in the Alarm View and click on the icon for the channel you are interested in viewing. That displays the Stack Chart Monitor view for that channel. Only the measurements being made on a selected channel have a graph in the Stack Chart Monitor view.
- Select one of the longer periods in the history selection area to view the quality of service history farther back in time (see Figure 2–12). Up to one week of data for every measurement enabled for every channel monitored is maintained for defect analysis and proof of service quality over time.

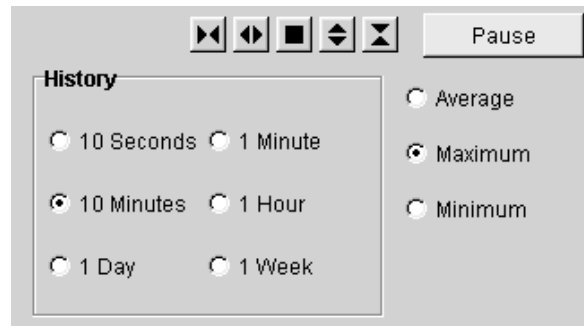


Figure 2–12: History interval and decimation mode dialog area

- Pause the update of the trace and click the mouse cursor on a point of interest in a history waveform to select a portion of the history to expand. Hold the mouse button down to display a time and value readout for the point chosen. When you release the mouse button, a small crosshair cursor remains at the selected point.
- Note the time reading of the point you selected to view in greater detail. The VITC time also appears in the cursor readout if the program has a vertical time interval code. You can use that information to identify the problem frame or frames of a time-coded video source.
- Select a shorter history period to view the data with higher resolution. The displayed history traces expand around the selected point in time. Use the time you noted from the cursor readout to help you locate the point of time in the graph using the time scale across the bottom of the graph.
- You can export the displayed trace data of the selected trace to a file using the Export Results selection in the File choices.

Display Data Decimation. The PQM300 application decimates the data in intervals of time to fit in the display when a time longer than 10 seconds is chosen. For example, with a 1-minute history window selected, six fields of data are represented by one pixel on the display. The choices of Average, Maximum, or Minimum come into action for the longer history trace displays. Select Average to show the average value (average of the quality of service) for a decimated time interval, Maximum (the default selection) to show the maximum value (worst quality) of the data, or Minimum to show a lowest (or best quality) value for the data. The decimation selection affects only the display of the traces; it does not affect the action of the alarm threshold settings or the actual measurements made.

The Minimum/Average/Minimum selection also determines the value that is indicated by the instantaneous value bar (the middle bar) in the bar graph display. When the bar graph is displayed, the maximum and minimum bars latch to show the highest maximum and lowest minimum PDI value measured. To reset the maximum and minimum bars to start a new search for maximum and minimum values, click on the Clear Bars button at the bottom of the screen.

Deleting History Data

To start a new history accumulation, you can delete the stored history results. You must be able to control the program monitor operating system either locally or through a network connection to use the procedure that follows:

NOTE. You cannot clear the defects log while the application is running. If you run the batch file while the application is running, the PQM300 application stops.

1. Shut down the PQM300 application completely, but leave the Windows NT system up. Refer to *Shutting Down the PQM300 Application* on page 1–23 for instructions if you are not familiar with the shut-down procedure.
2. Open a DOS Command Prompt window (Start, Programs, Command Prompt).
3. Change to the D:\PQM300\Support directory, and type in the batch file name “removeResults.bat” to run the cleanup routine. Alternately, you can open Explore (right click on Start and select Explore) and find the batch file in the D:\PQM300\Support directory. Then, double-click on the batch file name to start it. The stored results are deleted, and the history will be as if no measurements have been made. The cleared history cannot be recovered.
4. Double-click on the PQM300 icon in the Windows NT desktop to restart the PQM300 application.

Trace Expand/Contract

Expand the trace scale vertically or horizontally using the trace controls located just below the graph window (see Figure 2–13). The vertical scale expansion setting is maintained between views and is remembered at startup.

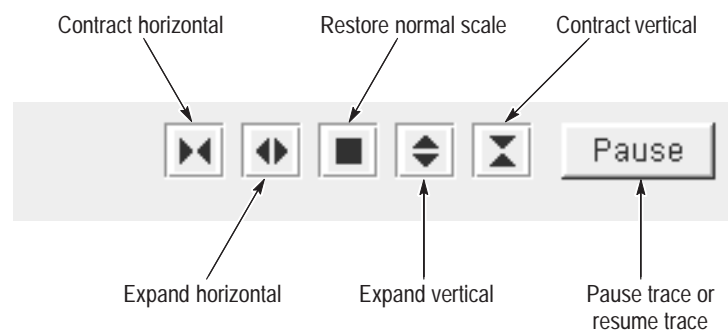


Figure 2–13: Graph trace expansion controls

- Use the Pause control to stop the movement of the traces in the graph. Measurements do not stop, but the data stops updating to the display until Resume is pressed.

- Click the cursor on a point of interest to select the expansion point in the graph. The point you select remains visible as a crosshair in the display when the mouse button is released.
- Click the Expand and Contract buttons as needed to expand or contract the trace around the selected point.
- Revert to the normal vertical and horizontal trace scales in the view by clicking on the square button.

To view a history trace with more resolution than can be obtained by expanding a trace, revert to a shorter interval history period (refer to the preceding *History* topic on page 2–20).

Viewing the Defect Log

Use the defect log view to check how many times an alarm condition occurred on a connected program monitor channel. The defects log stores the alarm record of every monitored channel.

The last 1000 defects are stored in the log. When that number is reached, the defects are written (auto exported) to a new time-stamped file in the **D:\PQM300\Defects** directory, and new defects begin to accumulate in the Defects Log. The newest 100 defects are maintained in the log for viewing.

The Defect Log Monitor shown in Figure 2–14 identifies entries by a machine address, time stamp, channel name, type of defect, duration of the defect in fields, and accumulated error time for that defect. Only data relevant to the measurement reporting the alarm appear in the defect log display. Use the vertical and horizontal scroll bars to view the entire log. If the video content has a vertical time interval code (VITC), the time code of the error frame or frames is included in the VITC column. The measurement type and alarm parameters are also maintained. The alarm parameters are displayed once at the top of the table, and again if they change.

NOTE. Do not set the program monitor clock back while the application is running. The time stamps for the history files and defects logs are obtained from the picture monitor clock. If conflicting times are found on the files, an error can occur. If you must reset the time, either set the time ahead, if needed, or wait until the new time setting is later than previous time setting to begin the PQM300 application again.

Clear Accumulated Errors. The accumulated errors column is a summation of the error time since the last time the errors column was cleared. Use the Clear

Defects Statistics choice in the File menu to clear the accumulated error column to begin a new error time accumulation.

	Machine Address	Time Stamp	VTC	Channel	Defect Name	Duration(Fields)	Accum Error(mm:ss)	Alarm Paramet...	Level	Interval	Percent	Video Standard
15	met65	Fri Jul 21 22:23:24 PDT 2000						MPEG Defects	10	10	100	NTSC
16	met65	Fri Jul 21 22:23:25 PDT 2000						MPEG Defects	10	10	100	NTSC
17	met65	Fri Jul 21 22:23:25 PDT 2000						MPEG Defects	10	10	100	NTSC
18	met65	Fri Jul 21 22:23:25 PDT 2000						MPEG Defects	10	10	100	NTSC
19	met65	Fri Jul 21 22:23:25 PDT 2000						MPEG Defects	10	10	100	NTSC
20	met65	Fri Jul 21 22:23:25 PDT 2000						MPEG Defects	10	10	100	NTSC
21	met65	Fri Jul 21 22:23:25 PDT 2000						MPEG Defects	10	10	100	NTSC
22	met65	Fri Jul 21 22:23:25 PDT 2000						MPEG Defects	10	10	100	NTSC
23	met65	Fri Jul 21 22:23:25 PDT 2000						MPEG Defects	10	10	100	NTSC
24	met65	Fri Jul 21 22:23:26 PDT 2000						MPEG Defects	10	10	100	NTSC
25	met65	Fri Jul 21 22:23:26 PDT 2000						MPEG Defects	10	10	100	NTSC
26	met65	Fri Jul 21 22:23:26 PDT 2000						MPEG Defects	10	10	100	NTSC
27	met65	Fri Jul 21 22:23:26 PDT 2000						MPEG Defects	10	10	100	NTSC
28	met65	Fri Jul 21 22:26:02 PDT 2000						MPEG Defects	2	10	100	NTSC
29	met65	Fri Jul 21 22:26:02 PDT 2000						MPEG Defects	2	10	100	NTSC

Figure 2–14: Defect Log monitor

Defect Log Files. The defects are stored in the **DefectLog.txt** file as tab separated data fields. A sample of the text from the July 10, 2000 16_48_14DefectLog file is shown below. Columns that do not contain data are empty, but each column is represented by a tab space in the file as shown below:

```
met65      July 10, 2000 14:25:18      MPEG Defects      25
met65      July 10, 2000 14:25:18      MPEG Defects      9
met65      July 10, 2000 14:25:18      MPEG Defects      15
met65      July 10, 2000 14:25:19      MPEG Defects      2
met65      July 10, 2000 14:25:19      MPEG Defects      7
met65      July 10, 2000 14:25:19      MPEG Defects      3
met65      July 10, 2000 14:25:20      MPEG Defects      7
met65      July 10, 2000 14:25:20      MPEG Defects      3
met65      July 10, 2000 14:25:20      MPEG Defects      3
met65      July 10, 2000 14:25:20      MPEG Defects      3
met65      July 10, 2000 14:25:20      MPEG Defects      3
met65      July 10, 2000 14:25:21      MPEG Defects      3
```

The Duration (Fields) column shown in the defect log is an indication of how long a condition that exceeds the threshold exists. The duration time in number of fields is the total time the threshold was exceeded and includes the time it takes for an alarm to be indicated as illustrated in Figure 2–15.

Check History Traces. You can view the history of a channel (up to one week) to examine errors reported in the defect log. Connect to the identified channel, and use the History and trace controls in either the Line Graph view of the Overlay Chart Monitor or the Stack Chart Monitor to select the time frame of history to view. Refer to Viewing History on page 3–13 for a tutorial on how to view history traces.

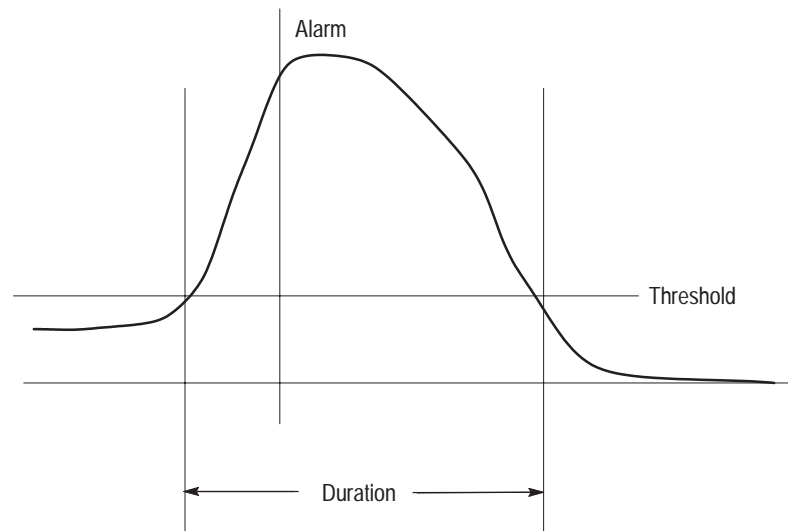


Figure 2-15: Error duration time

Configure Menu

The configure choices provide the controls shown below:



Configure Summary. The short summary of the configure selections below is supplemented by more detailed explanations following this summary.

- **Connections:** Make program monitor channel connections on all the networked machines you want to monitor from your control point. When the system access is locked, use this screen to enter your access code to make configuration changes.

- **Channels:** Assign program source names to the connected channels for easy identification. The names you assign to the channels are displayed on the channel icons in the alarm monitor views.
- **Measures:** Select measurements and set measurement parameters for each connected program monitor channel.
- **Chart Scale:** Set the vertical scale of the line graph or the bar chart to display the picture quality either in numerical values (PDI) or in words (5 PT). The descriptive words in the 5 PT selections relate to perceived program quality. There are two choices of scale wording available: Very Annoying (high PDI) to Imperceptible (low PDI) and Bad to Excellent. Refer to *Chart Scale* on page 2–18 for information on the chart scale selections.
- **Properties:** Customize the Overlay Chart Monitor and Stack Chart Monitor graph displays for color of the traces in the graph, origin of the traces on the left or right side of the graph, and graph grid on or off. You can also set the audio alarm on or off.
- **Decoder:** Set up the Composite Decoder configuration choices if a Tektronix PQM3F01 composite decoder module is present in the program monitor. If a composite decoder module is not installed, the Decoder selection is grayed out in the menu. Refer to *Configuring the Composite Decoder* on page 3–22 for information on the decoder control menus.
- **Relays:** Assign the alarm relay contacts of the optional alarm relay board to a channel. It is not necessary for the alarm relay board to be installed in the the assigning PQM300 program monitor. The relays close for an alarm condition on the assigned program monitor channel. Refer to *Alarm Relay Board Option* on page 2–40 for information on making and monitoring the relay contact assignments.
- **Access Code:** Set up or change administrator and user access codes. The default access on a new system is unlocked. Refer to *System Security* on page 1–16. When the access to a system is locked, the user must enter an assigned Access Code in the Connections dialog box to make changes to the configuration. Refer to *Making Program Monitor Connections* that follows.

Making Program Monitor Connections

You can connect as many PQM300 program monitors as there are in the installed system. If you access a program monitor either using a Web Browser or running the PQM300 remote application on your PC, you can connect to any other program monitor on the network.

Check with your local system administrator for IP addresses and/or system machine names of the installed PQM300 program monitors. In the task bar, select Configure and then Connections to display the Connections Configuration dialog box (shown in Figure 2–16). Enter either the IP address or the assigned

network machine name of the program monitor in the Connection box. Click the Apply button to make the connection. When the connections are made, click on OK to exit the Connections dialog box.

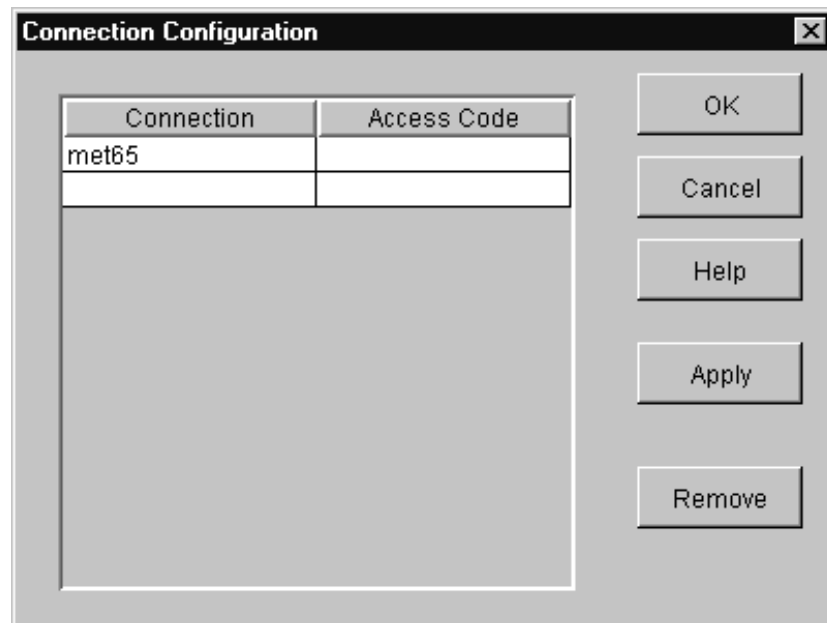


Figure 2–16: Connection Configuration dialog box

If access to a program monitor is locked, you can make the connection and view the operation of the connected program monitors. You must enter the assigned Access Code to make any configuration changes after the connection is made. The PQM administrator assigns access codes for the networked program monitors (refer to *System Security* on page 1–16).

Disconnecting a Program Monitor

Select the machine name in the Connection list and click the Remove button to disconnect a machine. If you are viewing a local display, the local machine name is always displayed as a default and cannot be deleted.

Naming Program Channels

Use the Channels dialog box shown in Figure 2–17 to name the channels of a connected program monitor for easier identification while monitoring.

1. Use the Connection drop-down menu to select a connected program monitor.
2. Click in a channel slot to be renamed in the Channel ID column and edit the name to what you want it to be.

The number of channels shown indicate the number of program monitor modules (channels) installed in a connected machine. For the selected

program monitor, select a slot that has a monitor module installed. Unnamed slots with program monitor modules installed have default Channel ID names (such as board #1 for the program monitor module in slot 1 of the indicated machine). Empty slots are either empty or contain an optional composite decoder module or alarm relay board; they cannot be renamed.

3. Click in the next box to be edited or use the Tab key to go to the next slot.
4. When you finish assigning names to the installed program monitor modules, click OK to accept the changes and exit the window. Click cancel if you do not want to accept any name changes you made.

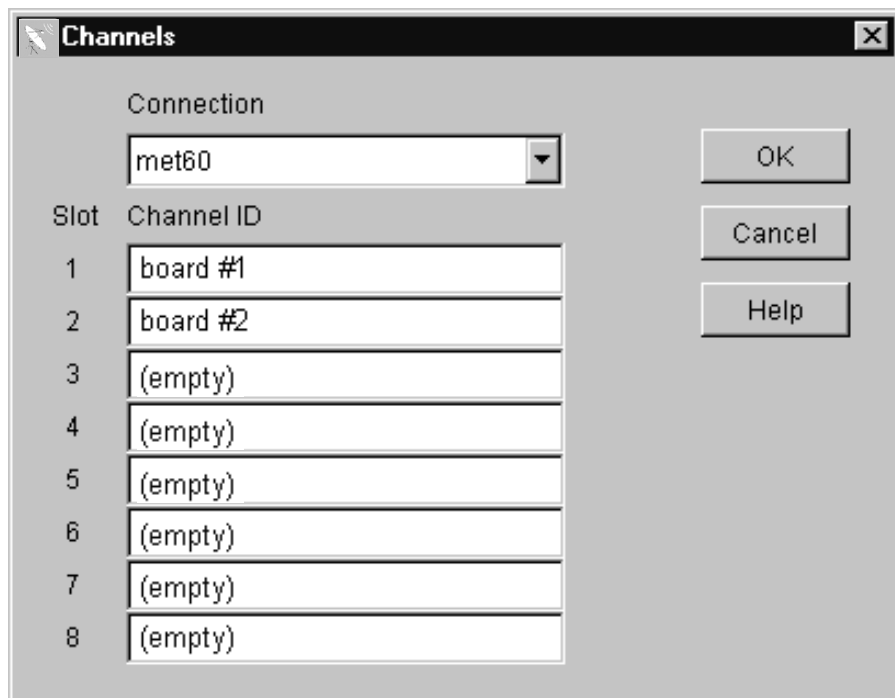


Figure 2-17: Channel naming dialog box

Setting Measurement Parameters

Set the parameters for the measurements made on connected channels. The connected program monitors are shown in the Connections box along the left side of the window (see Figure 2-18), and the measurement parameter selections are shown beneath the Measures box.

The measurement parameters on every connected channel can be controlled through the Measures window. You can set the alarm limits individually for each channel or set them for all channels or a selected set of channels at the same time.

1. In the Connections window, click on a machine icon button or double-click on the icon itself to expand or contract the channel hierarchy for the machine as shown in Figure 2–18.
2. Select a program monitor and channel to check the parameter settings, turn the measurement on or off for a selected channel, or adjust the measurement parameters. Program channels are labeled board #n until they are renamed.

NOTE. Channel selection tip. You can select all the channels or a subset of the channel enable measurements or to apply parameter choices. Use the standard Windows NT file selection methods (shift-click for multiple selections or control-click for single selections) to choose the channels to apply the parameter selections.

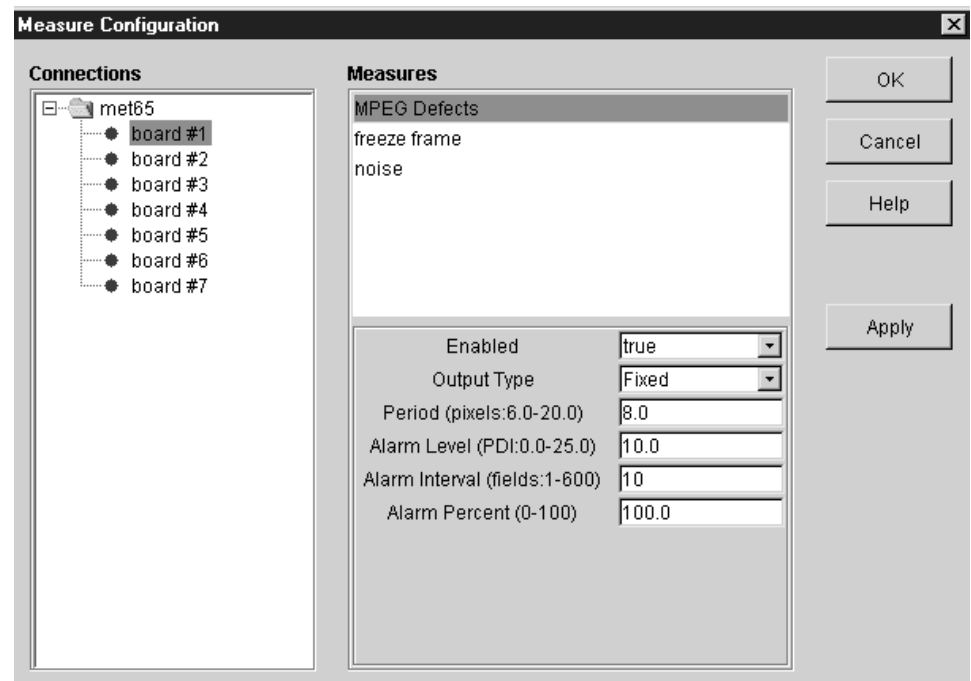


Figure 2–18: Measure Configuration dialog box

Setting MPEG Defects Measurement Parameters. MPEG defects parameters are shown in Figure 2–18. Use the edit boxes in the MPEG Defects Measurement Parameters window to turn the measurement of a selected channel on or off, set the block period size, select adaptive block size detection, and set the alarm thresholds. Suggested ranges for the parameters are shown in parenthesis following the parameter name.

1. Turn the MPEG Defects measurement on by setting the Enabled selection to True. Turn it off by setting the Enabled selection to False.
2. Click on the down arrow in the Output Type box to select the Output Type. Enable adaptive blockiness period by setting the Output Type to Adaptive. Enable the Fixed blockiness period setting by setting Output Type to Fixed. Either of these choice output a graph of the MPEG Defects measured in the incoming program video.
 - **Fixed Output Type:** Use the Fixed Output Type when the blockiness period of the incoming program video is known or you have determined the correct blockiness value using either the Adaptive Output Type or the Period Output Type.
 - **Adaptive Output Type:** Use the adaptive blockiness setting for incoming video with unknown or changing blockiness period. The adaptive choice causes the program monitor to attempt to find the period of the blockiness present in the signal. Starting with the blockiness period set in the period field, the PQM300 program monitor continually analyzes the incoming video stream on each channel individually and attempts to determine a blockiness period for the channel program content. If a different blockiness period is found, subsequent MPEG Defects measurements are made based on the found block size. Refer to *Manual and Adaptive Setting of Blockiness Period* on page 3–19 for a further discussion on blockiness period. If you view the MPEG Defect graph in the Stack Chart Monitor view, the adaptive period is reported in the graph label. There is no period reported when the Output Type is set to either Fixed or Period.
 - **Period Output Type:** Use the Period Output Type as a tool to determine blockiness period (shown in Figure 2–19) or track blockiness period changes (shown in Figure 2–20) in the incoming program video. Natural content of an incoming signal can sometimes exhibit characteristics similar to MPEG defects. Some graphic patterns present in the video can mimic a varying blockiness period during the duration of the graphic pattern display in a scene. Such a condition interferes with signal analysis of quality of service if the program monitor is adaptively finding the blockiness period.

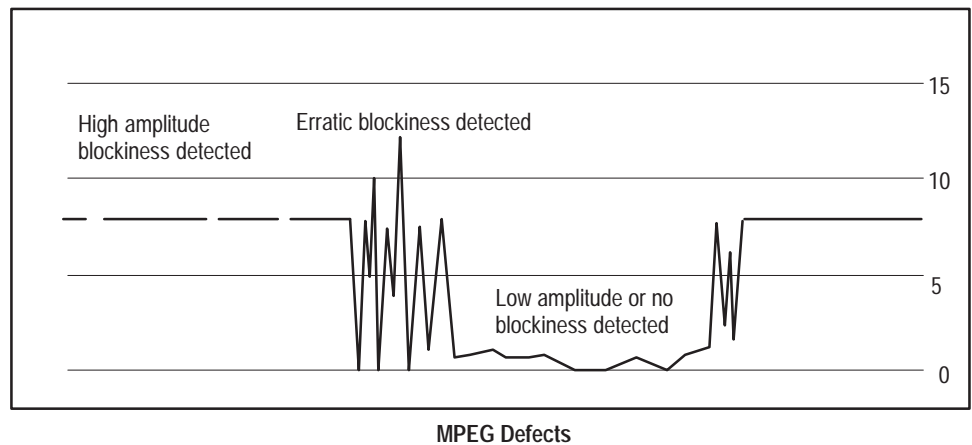


Figure 2-19: Period Output Type display with a detected period of 8 and varying blockiness

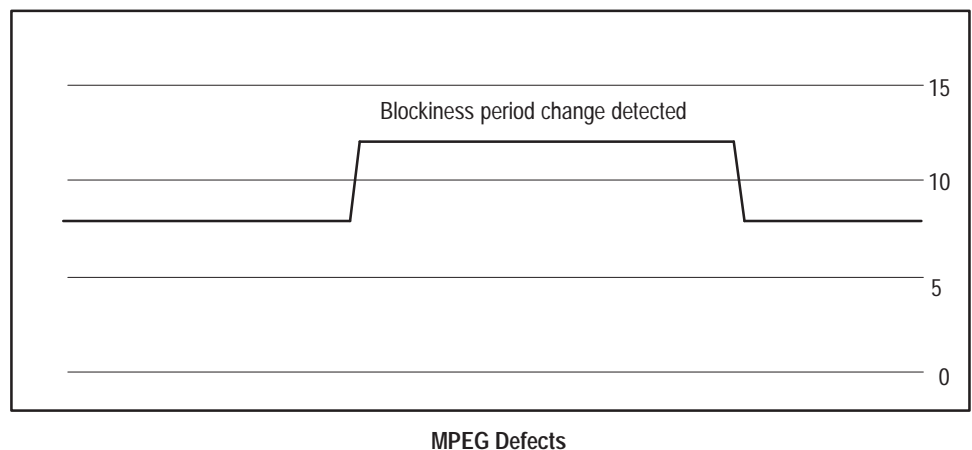


Figure 2-20: Period Output Type with blockiness period change

To determine the detected blockiness period of the incoming video, watch the detected blockiness values over time to find the true signal blockiness. Once you find the blockiness period, set the Output Type to Fixed, and set the period manually to monitor for MPEG defects in the incoming program.

3. Use the Period box to manually set the blockiness period. The Fixed Output Type measurements uses the value set in the Period box for the MPEG Defects measurement. The Adaptive Output Type uses that value as the starting point for the measurement. The value set in the Period box has no effect when Period Output Type is selected.

The value you enter can be found either adaptively or by observing the detected period, as described above. Otherwise, a good starting value is a

period of 8.0 (most MPEG codecs use this period). However, some MPEG encoders attempt to conserve transmission bit-rate by sub-sampling the original video, and then expanding it during the decoding process. The result is that the block period is enlarged. Often seen are blockiness periods of 10.667, 12, and 16 pixels. (Some decoders can slightly expand the scan, so non-integer blockiness sizes can be encountered.)

4. Set the Alarm thresholds. Three alarm limits let you determine the criteria for an alarm condition. The three limits work together as follows: if the alarm level is exceeded during a set number of fields for a set percentage of the field interval selected, an alarm condition exists. Suggested range limits for the alarm parameters are shown in parenthesis.
 - **Alarm Level** – This is the measured PDI level of a monitored defect that is the threshold for an alarm condition. Based on the settings for alarm interval and alarm percent, an excursion beyond the alarm level threshold may or may not initiate an alarm state.
 - **Alarm Interval** – This is the number of fields in which if the alarm threshold is crossed for more than the Alarm Percent setting, an alarm condition is indicated. For example, if the alarm interval is set for 10 fields, and the measured level only crosses the threshold for three fields in 10 (30%) with an Alarm Percent setting of 50%, an alarm is not indicated.
 - **Alarm Percent** – This is the percent of the Alarm Interval that the measured level must exceed the Alarm Threshold before an alarm condition is indicated. For example, even if the level does not cross the threshold continuously during the number of fields set for the Alarm Interval, if the PDI level exceeds the Alarm Level threshold for a percentage of the Alarm Interval greater than the Alarm Percent, an alarm is indicated.
5. After making your selections for a measurement's parameters, do one or more of the following actions as needed:
 - Click Apply to activate the changes you made before you select another measurement. Settings for a measurement are not made until you click Apply.

NOTE. Changes are accepted only if the program channel has a signal applied. Connect a video signal to the channel before you configure the measurements for the channel.

- Click Cancel to revert to the settings in effect before to the last apply.
- Click OK to exit the window.

Setting Freeze Frame Measurement Parameters. Select the freeze frame measurement in the Measurement Parameters window to display the parameter settings for freeze frame on the selected channel as shown in Figure 2–21.

1. Set Enabled to true to turn on the freeze frame measurement or false to turn off the measurement for the selected channel or channels.

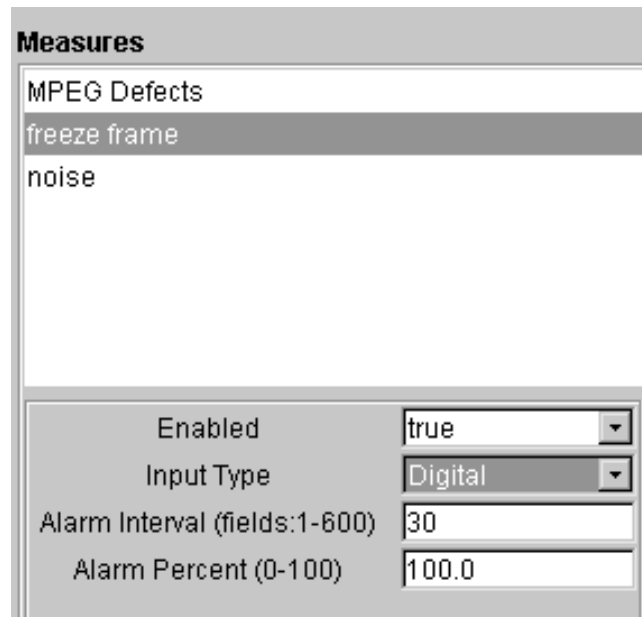


Figure 2–21: Freeze frame parameter settings

2. Choose an Input Type: Digital or Analog. Digital source material has the same content from field to field if it is frozen. Analog source material has changing color field data from field to field. The color fields are checked for the same pixels in the appropriate fields to determine if the content is frozen.

If you are not sure of the source content, the safest selection is Analog. Digital freeze frames will still be detected if they exceed the Alarm Interval setting, and Analog freeze frames will not be missed because of the color phase differences from field to field.

3. Choose an Alarm Interval setting and Alarm Percent setting to determine the percentage of frozen fields in the time interval that constitutes a freeze frame alarm condition. The suggested limits for the alarm parameters are shown in parenthesis next to the parameter to be set. There is no Alarm Level setting for FreezeFrame. A frame is either frozen or it is not, and there is no PDI scale on the graph of the freeze frame trace.

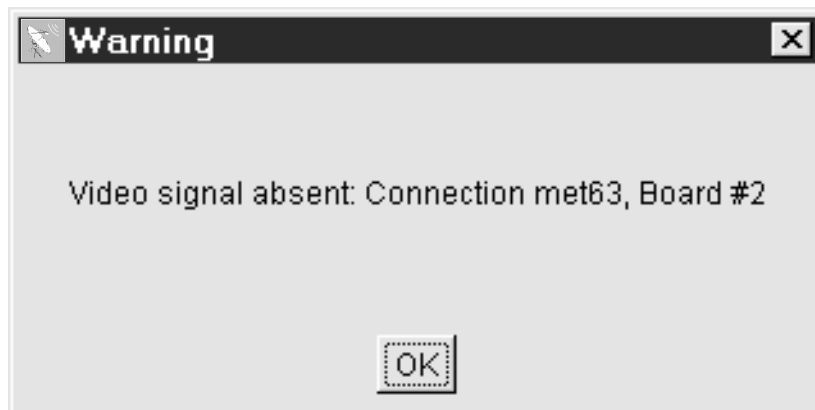
NOTE. *The minimum Alarm Interval setting changes depending on the Input Type you select. For Digital, the minimum interval is 1 field. For Analog, the minimum is 8 fields. With Analog Input Type selected, the interval number automatically rounds up to the next 8-field boundary.*

A detected freeze-frame condition during monitor operation may indicate loss of service. However, a constant image on the screen, such as still graphic content, can be mistaken for frozen video. A good practice might be to set the alarm interval to be long (large unbroken fields, for example 60) with a high alarm percent, so that only a prolonged still image triggers an alarm. Permitted ranges for the alarm limits are enclosed in parenthesis next to the parameter to be set.

Setting the Alarm Percent to a lower value means that you want fewer frozen frames in the Alarm Interval to trigger an alarm condition. If you want to set the frozen frame alarm to trigger for a set number of frozen frames in succession, set the Alarm Interval to the number of frames and the Alarm Percent to 100%.

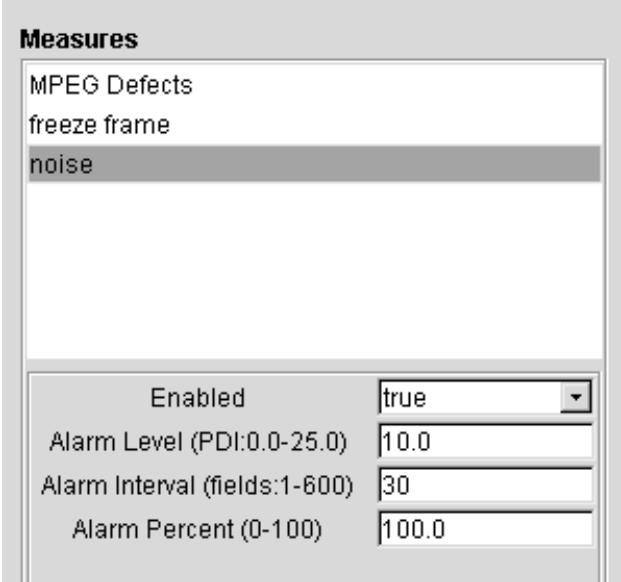
4. Click Apply to make any selection you made or changed effective. Changes are accepted only if the channel has a video signal connected. The changes you make are not accepted until you click Apply. Click Apply before selecting another measurement or board or the changes are not accepted.

An error message is displayed if there is a complete loss of signal. The program monitor name and channel are given in the error message display. A lost signal error is also noted in the Status Log and in the Defects Log.



Setting Noise Measurement Parameters. Select the noise measurement in the Measurement Parameters window to display the parameter settings for noise measurement on the selected channel as shown in Figure 2–22.

1. Set Enabled to true to turn on the noise measurement or false to turn off the measurement for the selected channel or channels.
2. Set an Alarm Level for the threshold value of the noise measurement.
3. Set the Alarm Interval for a specified number of fields during which a continuous threshold violation constitutes an alarm.
4. Set the percentage of the time during the specified number of fields that a threshold violation is considered an alarm. Suggested range limits for the alarm parameters are shown in parenthesis next to the parameter to be set.
5. Click Apply to make any selection you made or changed effective.



The screenshot shows a window titled "Measures" with a list of measurement types. "noise" is selected. Below the list are four configuration fields:

Enabled	true
Alarm Level (PDI:0.0-25.0)	10.0
Alarm Interval (fields:1-600)	30
Alarm Percent (0-100)	100.0

Figure 2–22: Noise measurement parameter settings

Audio Alarms. In the Properties configuration window shown in Figure 2–23, the first selection box is for enabling the sounding of an audio alarm. When enabled, the alarm sounds on the controlling PC (the one used to set the alarm) if there is an alarm condition on any connected program monitor. The audio alarm sounds only while the alarm state indicator in the icon of a connected program monitor is showing red. The audio alarm is turned off either when the alarm condition passes (the icon alarm indicator turns amber) or when you clear the alarm state (the icon alarm indicator turns green).

Setting Display Properties

Use the Properties Configuration dialog box shown in Figure 2–23 to select a color change target and change the color of the selected item in the Stack Chart Monitor and Overlay Chart Monitor displays. You can select one of the standard colors from the Swatches color grid or mix a custom color in RGB (red, green, blue) or HSB (hue, saturation, brightness) color mapping.

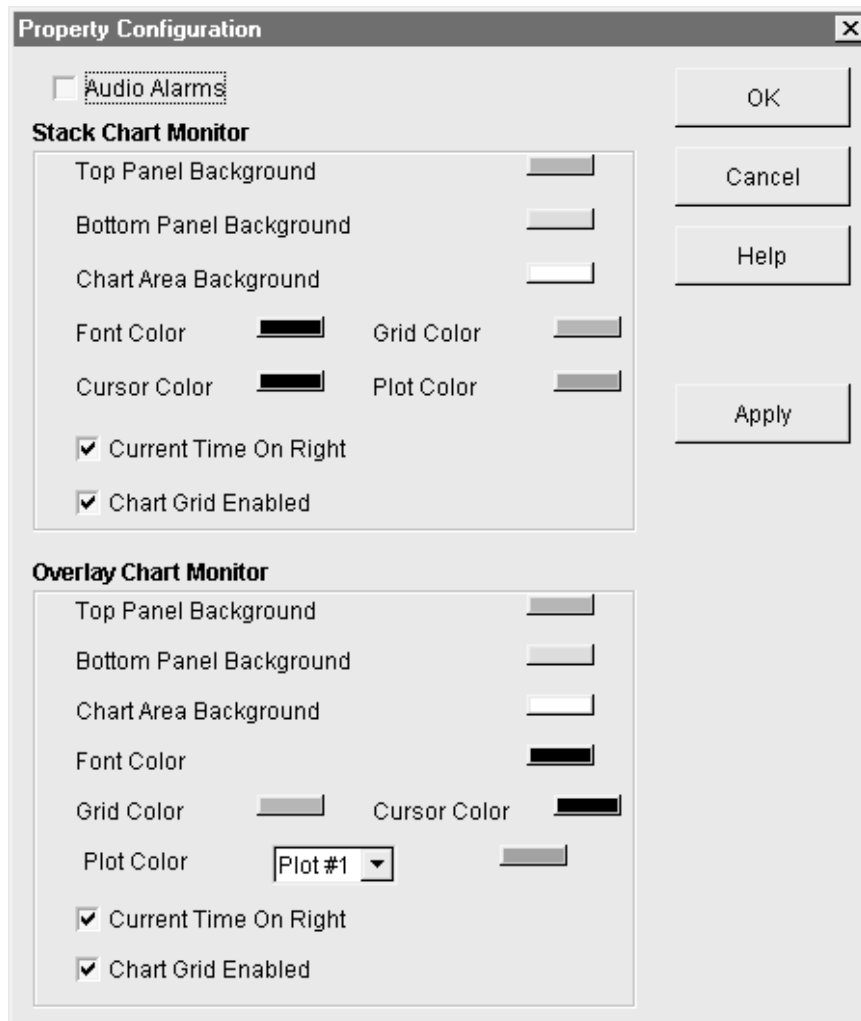


Figure 2–23: Display Properties dialog screen

1. Click on the button next to a display color you want to change to get the color selection dialog box shown in Figure 2–24.

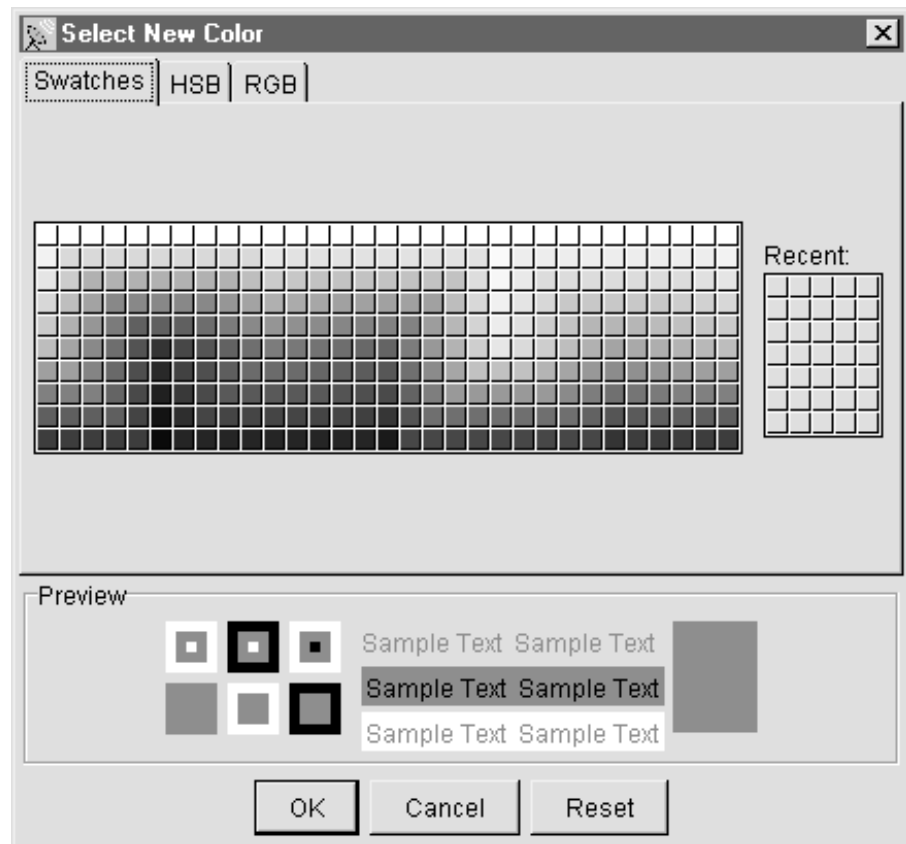



Figure 2-24: Color palette screen

2. In the Swatches color selection grid, select a color for the component. The color change shows in the Preview area of the dialog box. Click Reset to restore to the last applied color. Click OK to apply your color selection.
3. If you want a custom color, select either RGB or HSB color mapping. Adjust the color slides in the color mapping screen or enter color numbers to adjust the amount of red, green, or blue for the RGB selection. Use the HSB selection to adjust hue, saturation, and brightness for a custom color.
4. Change the plot direction of the trace in either graph display to start at the left or the right side of the graph. Click on Current Time on Right to have the new data appear on the right side of the graph and scroll off to the left. The default is to scroll the data to the right.
5. Turn the graph grid on or off using the Chart Grid Enabled selection. Grid enabled is the default setting.

Configuring the Decoder

Decoder configuration provides the choices used to set up the optional Tektronix composite decoder for the video program to monitor. The decoder is usually configured for the video standard (NTSC or PAL) at the beginning of monitor operation and never changed. If the video standard is changed, the composite decoder must be reconfigured before beginning to monitor the new video standard program. Refer to *Configuring the Composite Decoder* on page 3–22 for the Decoder configuration steps.

Using Online Help

The PQM300 Program QoS Monitor has HTML-based help. To view the top level help contents, either click Online Help in the Help menu list (shown in Figure 2–25) or click the help icon  in the icon task bar. The help browser with its controls is displayed with the help screens.

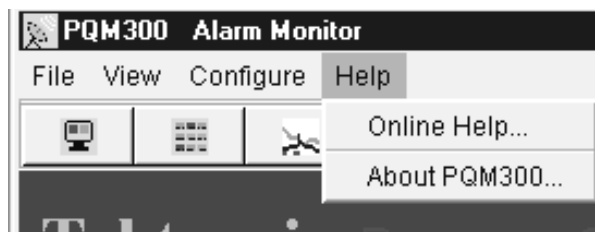


Figure 2–25: Online help menu

- To view help on a displayed window that has a Help button in the window, click on the Help button to display the help topic page for that window.
- Click on a hot link in a help page to jump to a referenced topic.
- Use the Contents and Index selections to navigate through the help files for additional information.

NOTE. *If the help page you expect does not appear after you click on a new help page selection, especially the contents or index page, click on the browser Reload button to get the new page loaded correctly.*

- In the Contents page, use the mouse to select a content area and click to open a help topic you want to read about.
- Click Index to do a search by topic alphabetically. Each index item in the list is a hot link to the topic page containing or pertaining to the indexed word or subject.

Help Browser Controls

The help html browser has controls to help you navigate through the pages you are viewing and customize some of the browser features (see Figure 2–26).



Figure 2–26: Help browser controls

- Use the browser Back and Forward buttons to go to a previously displayed help page.
- Click the browser Scroll button to switch between fast or slow scrolling when using the scroll bars on the help screen. The vertical and horizontal scroll bars also return to their beginning positions when you click the Scroll button.
- Click the Font button to display the browser Font Chooser dialog box. The default settings for the browser font are present each time the Font Chooser dialog box is displayed. A preview of the selection you make is displayed in the dialog box.
 - Select a font name from the choices displayed by the down arrow in the Name box.
 - Select a font style from the choices displayed by the down arrow in the Style box.
 - Slide the slider in the Font Size control to select a larger or smaller font size. The present selection for size is in parentheses following the Font Size label.
 - Click OK to apply the changes to the help text.
 - Click Cancel to exit the dialog box without making a change.
- Click the Stop button to halt a download to the help screen from the remote program monitor.
- Click the Reload button to reload the current help screen from the remote program monitor. You may need to use the Reload button to clear up a poorly displayed help screen.

About PQM300

This selection provides information about the application version number.

Alarm Relay Board Option

The relay board option fills one slot of the PCI board positions and uses two rear panel openings for the connectors. The board has 16 relays that can be assigned to the alarm condition on any PQM300 program monitor on the network. Multiple channels can be assigned to the same relay or the same channel can be assigned to multiple contacts of the relay board.

The alarm relay board outputs alarm signals through two 25-pin sub-D male connectors on the rear panel in slots 8 and 9. Threshold violations on a watched program monitor channel close a selected contact of the alarm relay board. Both normally open and normally closed contacts are available on the board. The pin-outs for the alarm relay are provided in *Appendix A: Specifications*.

Alarm Relay Board Configuration

The alarm relay board option can be configured to monitor alarm conditions in any program monitor accessible on the local PQM300 network through the Ethernet connection. The program monitor with the relay board hardware can be accessed from either another PQM300 program monitor or a computer running the downloaded PQM300 application. The program monitor with the relay board can also have the local control option installed or have a monitor, mouse, and keyboard connected to access to the relay board configuration dialog. The relay board cannot be configured through a SNMP network.

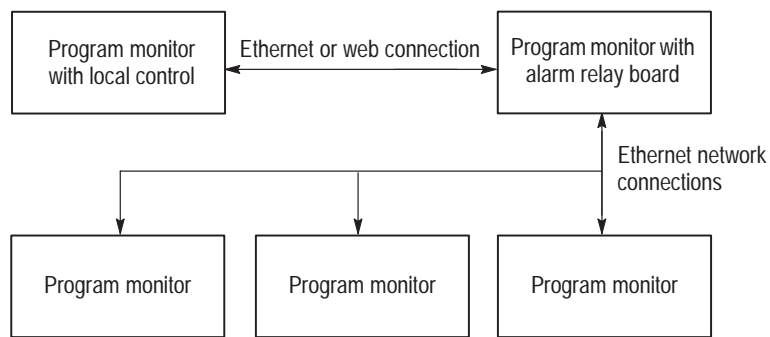


Figure 2-27: Alarm relay control connections

1. Connect to a program monitor with an alarm relay board installed. Use the Connection Configuration dialog box (see Figure 2-28) to make the connection.

If you are making the configuration from the PQM300 program monitor that has the alarm relay board installed, the local machine is connected by default.

If you are making the connection through the network, enter the network name of the program monitor that has the alarm relay board installed, and click on apply to make the connection.

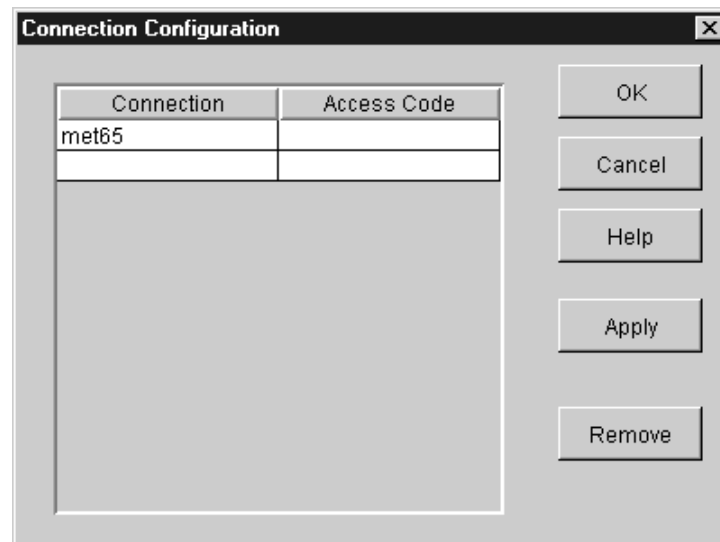


Figure 2–28: Connection Configuration dialog box

2. In the Configure choices, select **Relays . . .** to display the Relay Configuration dialog box shown in Figure 2–29.



Figure 2–29: Relay Configuration dialog box

3. Select a program monitor with an alarm relay board to configure from the choices in the **PQM300 w/Relay To Configure** box.
4. Click on the arrow in the **Alarms From PQM300** box to display the drop down list of all the connected program monitors.
5. Select a program monitor to assign relay connections. The channel identifications of the selected program monitor are displayed in the **Slot** listings.
6. Click on the arrow in the **Relay Number** box next to the channel name or board number to select a relay from 1 to 16 for that channel.
7. Slide the adjustment bar on the **Relay Time Out** to set the amount of time (from 1 to 20 seconds) that the relays are to remain activated after an alarm state has passed.
 - a. Slide the bar all the way to the left to deactivate the relays on the selected PQM300 program monitor. Then, alarms from that program monitor will not activate the relays.
 - b. Slide the bar all the way to the right to latch the relays on an alarm. Latched alarms are cleared when the **Clear Alarms** button is clicked. The **Reset** button turns off (opens) the relays and is useful in the Latched relay mode to help catch transient alarms.
8. Click on **Apply** to activate the relay assignments.

Checking Relay Assignments. Click on the Relay Map button in the Relays dialog box to display the Relay board channel assignment map as shown in Figure 2–30. The PQM300 program monitor with the relay board is listed first, followed by the machine name of a program monitor and relay assignments for the boards in that program monitor. Eight slot assignment positions are shown even if there are only two board slots filled. Empty slots or unassigned slots will be labeled None. Click OK to exit the Relay Associations box.

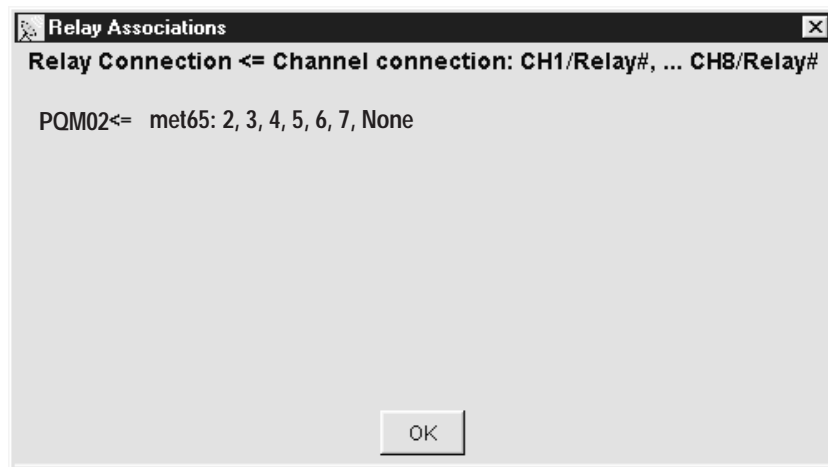


Figure 2–30: Relay board channel map

Local Control Option Front Panel Controls

The standard front panel configuration is blank with the exception of the On/Stby button and the 3-1/4 inch floppy disk and CD-ROM drives. If you have the Local Control front panel option installed, the front panel will look similar to Figure 2–31.

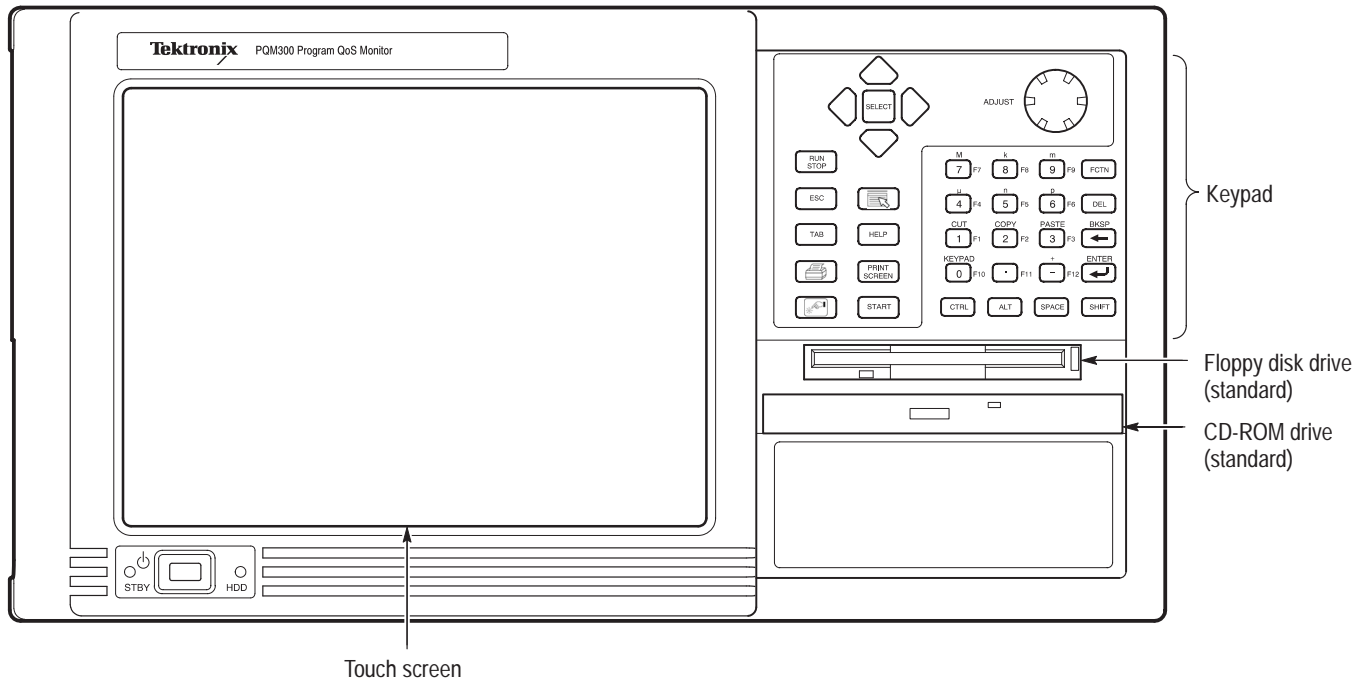


Figure 2–31: Local Control front-panel elements

This section shows how to use the touch screen features. Table 2–2 describes the keypad controls and Table 2–3 lists touch screen techniques for working with the program monitor application.



CAUTION. Do not touch the touch screen with sharp or abrasive objects. Using sharp or abrasive objects can damage the LCD display.

Included as a standard accessory with all Option LC program monitors is a stylus that gives you more precise control over the items you touch on the touch screen.

Table 2-2: Front panel-key controls

Control name	Mechanism	Description
Up Arrow	Button	Use to navigate and change focus from one window function to another.
Left Arrow	Button	
Right Arrow	Button	
Down Arrow	Button	
Select	Button	Same as the space key.
Adjust Knob	Knob (Rotary encoder)	Not enabled.
Run/Stop	Button	Not enabled.
Esc	Button	Standard Escape key.
Tab	Button	Standard Tab key.
Print	Button	Prints the current display.
Touch	Button (w/hand icon)	Toggle function not enabled. The touch screen is always on.
Menu (Application key)	Button (w/pointer icon)	Displays shortcut menus for selected items.
Help	Button	Opens the Help contents. Standard F1 key
Print Screen	Button (w/printer icon)	Copies the screen to the clipboard. Alt plus Print Screen copies the active window.
START Key	Button (w/Windows logo)	Opens the Windows Start menu.
Numbers 0 to 9, . (period), and - (minus)	Buttons	Standard number keys, most have second (Shift) and third (Function) functions.
Fctn	Button with LED	Modifier for numeral keys to create keys F1 through F12. LED indicates when active.
Del	Button	Deletes selected text or object.
←	Button	Backspace key.
↵	Button	Enter key.
Ctrl	Button with LED	Control key. LED indicates when keypad is in control mode.
Alt	Button with LED	Alternate key. LED indicates when keypad is in alternate mode.
Space	Button	Use it like a keyboard space bar or use it as mouse button 1.
Shift	Button with LED	Shift key. LED indicates when keypad is in shift mode. Locked mode key feature.

NOTE. You need an external keyboard and mouse for some of the functions of the operating system.

Table 2–3: Touch screen techniques

Task	Action
Highlighting an item	Touch the item.
Selecting an item	
Making a menu selection	Touch the menu name, and then touch the menu item.
Moving a window	Touch and drag the title bar of the window without lifting the stylus from the touch screen.
Displaying shortcut menus	Touch an icon that has a shortcut menu associated with it (for instance, a multiplex or service icon) and press the Menu button from the keypad.
Checking or clearing option boxes	Touch the option name or check box.
Entering values in text boxes	Touch the text box until a cursor appears in the text box, and then enter values using the keypad. (Only numeric values and the letters <i>M</i> , <i>k</i> , <i>m</i> , <i>u</i> , <i>n</i> , and <i>p</i> can be entered from the keypad.)
Scrolling through a list	Touch the scrolling list until a cursor appears in the list, and then press the Down Arrow button from the keypad.
Scrolling a window	Touch and drag a scroll bar without lifting the stylus from the touch screen.
Resizing windows	Touch and drag the lower right corner of the window to the desired size without lifting the stylus from the touch screen.
Following links in the online help	Touch the link text.
Expanding or collapsing a hierarchy	Double-tap the touch screen item at the point you want to expand or collapse a hierarchical display, or touch the Expand/Collapse control next to the item name.
Copying text or other values	Touch and drag over the area you want to copy, and then press the Shift button followed by the Copy button on the keypad.
Pasting text or other values	Touch the area into which you want to paste the contents of the clipboard, and then press the Shift button followed by the Paste button on the keypad.

Touch Screen Control Program

Select **Start** → **Programs** → **Touch** → **TouchScreen Control** to display the Touch Screen Control Program. The touch screen controls provide customization settings for the touch screen. Refer to the Help in the Touch Screen Control Program for information on any of the control settings for the touch screen.

Touch Screen Calibration

The touch screen is calibrated on installation. From time to time it may need to be recalibrated. Use the following steps to perform the calibration.

1. From **Start** menu, select **Programs**→**Touch**→**TouchScreen Control**.
2. In the Touch Screen Control Program screen, click the **Calibrate** button.
3. Follow the on-screen instruction to calibrate the touch screen. Use one of the styluses provided with this kit to touch the screen at the calibration points.
4. Click on the **OK** box using the mouse.
5. Select **Exit** to leave the Touch Screen Control Program.



Reference

Reference

Reference provides a condensed description of the operating features of the various monitor views. The Reference information is followed by a short Tutorial. The *Tutorial*, beginning on page 3–13, provides step-by-step instructions that require the user to operate most of the configuration controls for use as a learning tool.

Program Quality of Service Monitoring

Use the PQM300 Program QoS Monitor to monitor serial digital video program material directly. Connect all program channels to be monitored before starting the PQM300 application. The program monitor modules automatically detect the video standard of the applied signal (525 or 625 Rec. 601 serial digital video) when the measurements start.



Monitor NTSC or PAL analog composite video programs by converting the material to 601 serial digital format. Use either your own high-quality analog-to-digital decoder or a Tektronix composite decoder option module installed in the PQM300. The Tektronix composite decoder must be preset for the applied video standard (NTSC or PAL) and configured for the type of decoder processing you want to use on the program material before the you start the measurements on a composite video channel.

The PQM300 Program QoS Monitor provides a continuous readout of MPEG defects. The PQM300 program monitor also checks for frozen or missing frames and absence of a video signal. The program monitor has these monitor displays:

- An alarm monitor display of all the channels on one connected machine with a thumbnail video of the program content on that channel
- An alarm monitor display of all channels of all the connected machines
- A stacked line graph display of each measurement on one channel
- An overlay line graph display showing up to eight selected measurement results from any connected program monitor
- A bar graph display of the same data represented in the overlay line graph

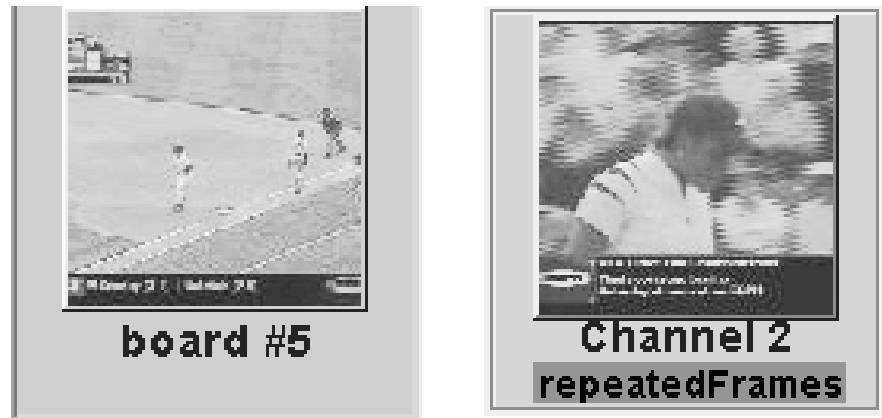
Alarm View

Use the Alarm View to provide a quick check of the alarm state of all the connected program monitors and channels.

A tab  **met65**  **met64** for each connected program monitor appears across the top of the Alarm View screen. If the small indicator in the tab is green, that program monitor does not have an alarm condition. If the indicator is red, an alarm condition is present on one or more of the channels on that program monitor. If the indicator is amber an alarm condition occurred, but has now

passed. If the indicator is gray, there are no measurements configured for that program monitor.

Click on a program monitor tab at the top of the alarm view to show the connected channels for that program monitor. The background color of the program channel icon shows the alarm state of the channel. Green means no alarm condition exists. If the icon background color is red, that channel has an alarm condition. If the indicator is amber, an alarm condition occurred, but has now passed. If no measurements are configured for a program monitor channel, the background color is gray. The board number or channel name along with the alarm condition reported is shown in the program channel icons as shown in the following illustration.



The alarm settings are key to quality of service monitoring. The level of MPEG defects, the amount of noise, and the number of missing or frozen frames allowed must be determined to set the alarm parameters for the quality of service level you determine is acceptable. Set the alarm thresholds to levels that indicate a level of program quality that provides a margin before the service becomes a customer complaint.

View By Connection

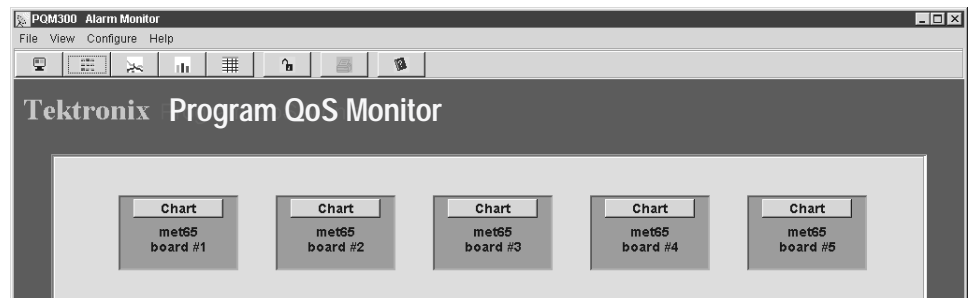
This display provides an alarm view of the channels on one connected machine. A slow update video display in the channel icon provides a means to readily identify that a channel has video applied and to identify the program content.



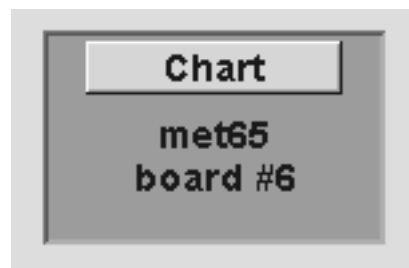
In the view by connection alarm view (shown above), click on a program channel icon to display a stacked graph view of each enabled measurement on the program monitor channel.

View All Channels

This display (shown below) provides an alarm view of all the channels on every connected machine. Every channel has an icon display. If more channels are displayed than can be shown on one screen, a vertical scroll bar appears to let you see all the channels.

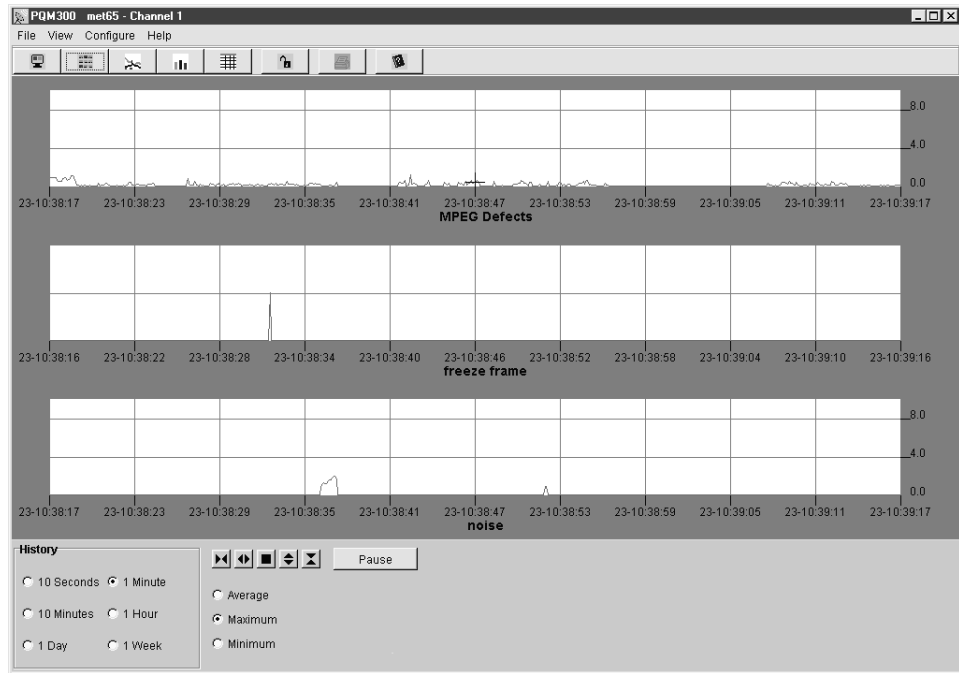


Click on the Chart button in the view by channel Alarm View icon to switch to a stacked graph view of the measurements of the selected channel.



Stack Chart Monitor View

Use the Stack Chart Monitor (shown below) to quickly switch to a connected program channel to check its alarm condition, program quality, and history.



Refer to *History* on page 2–20 for a description of using the history selections. Refer to *Viewing History* on page 3–13 for a tutorial on using the history feature.

The program monitor name and program channel name are shown at the top of the chart. Each measurement trace in the Stack Chart Monitor is in a separate graph for easy identification. Graphs are shown only for the active measurements on the channel. The alarm threshold is indicated in the trace display by a red bar line in the graph when an alarm threshold is crossed.

Use the trace controls below the graphs to expand the time-axis or value-axis scale of the graphs. Pick the expansion point in the trace by positioning the mouse cursor to the point of interest and clicking the mouse button. The cursor readout for the point is displayed while the mouse button is held down. When you release the mouse button, a small cursor remains displayed to show you the selected point.

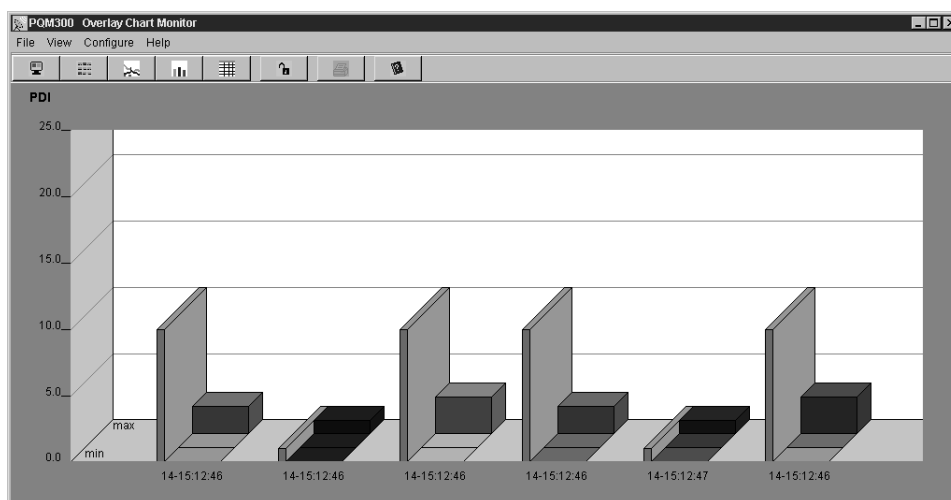
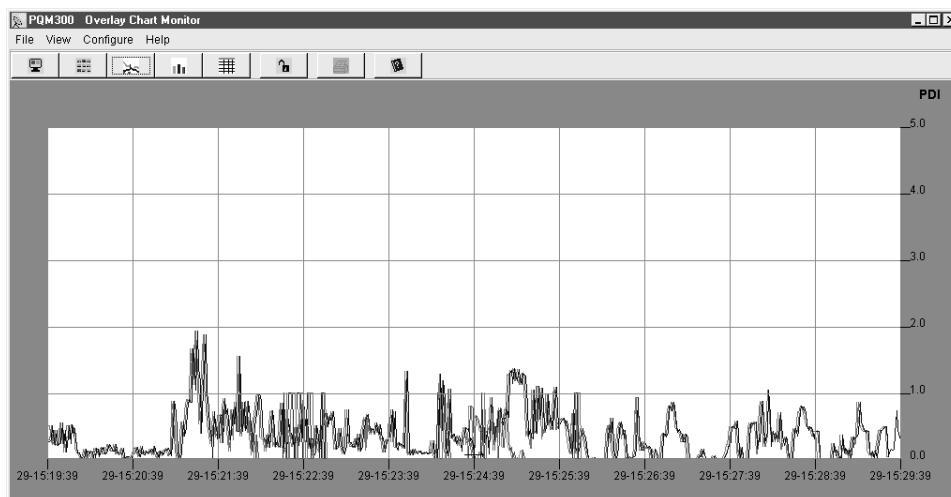
Pause the traces and expand them individually. Click on a trace you want to pause before clicking on the Pause button. The trace expansion controls work on the paused trace. The other traces continue to update.

Click Resume (the Pause button changes name) to continue the real-time update of the trace and realign the paused trace to the live traces.

Click on a point of interest in time to select an expansion point. Refer to *Trace Expand/Contract* on page 2–22 for further details the trace expansion controls.

Overlay Chart Monitor View

Use the Overlay Chart Monitor to track the measurement of selected channels on selected machines and to view the history for quality analysis and proof of program service quality. Up to eight measurement traces from any connected program monitor can be displayed at one time in either a line graph or a bar chart display.



Alarm Threshold. In the line graph, the alarm threshold is indicated in the trace display by a red bar line across the graph at the bottom of the graph when the threshold level is crossed. In the bar graph, the alarm threshold level is shown by the height of the alarm level indicator. The alarm level indicator is also color

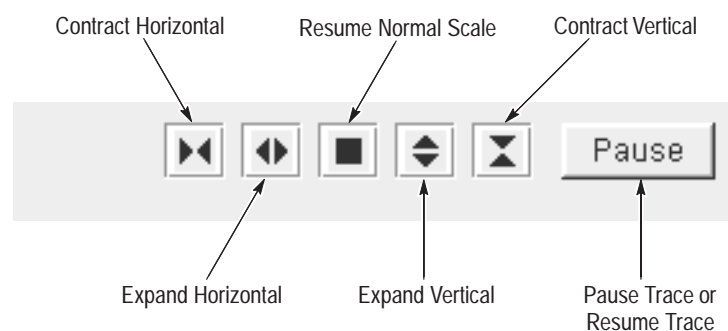
coded to show the alarm state of the monitored channel. Refer to *Overlay Chart Monitor* on page 2–13 for further information.

Alarm levels must be established in your service to determine a defect level that is to be considered an alarm condition. Set up the threshold levels with the Measurement configuration dialog box (refer to *Setting MPEG Defects Measurement Parameters* beginning on page 2–29) for information on setting alarm levels.

Chart Vertical Scale. The vertical scale axis of the graphs is a Picture Defect Indicator (PDI). The PDI scale provides an immediate and continuous indication of the video image quality. PDI is derived from the industry standard PQR (Picture Quality Rating) introduced by the Tektronix PQA200 Picture Quality Analysis System. The PDI level indicated for the quality of service approximates the experience of human viewers and is an indication of the picture quality seen by the viewer.

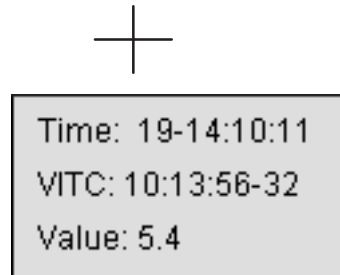
You can select either a numerical PDI vertical scale (picture defect indicator) or a verbal picture quality rating for the graphs view. The the 5-Point verbal picture quality rating has two choices for scale labels: Quality and Impairment. You can change the range step values for the 5-Point impairment scale to values that correspond to levels that match your quality requirements. Refer to *Chart Scale* on page 2–18 for further information on the scale selection choices.

Trace Controls. Use the trace controls at the bottom of the graphs to expand the time-axis or value-axis scale of the graphs. Refer to *Trace Expand/Contract* on page 2–22 for further details on the trace expansion controls.



Click on a trace at a point of interest in time to select an expansion point or to get a time and defect level readout at the selected point on the graph. If the program material contains a VITC (vertical interval time code), that time also

appears in the cursor time readout. The cursor readout with the time and PDI value is displayed at the cursor location while the mouse button is held down.

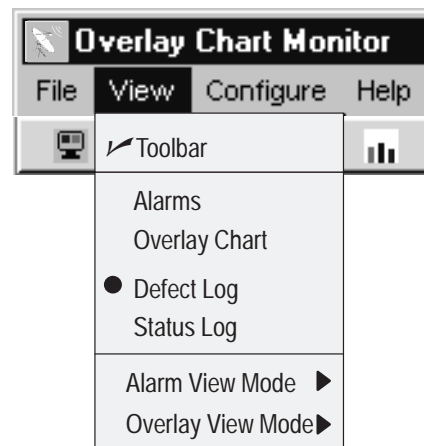


To hold the trace stable while making measurements, pause the trace.

View the program quality of the selected measurements for selected periods of time from 10 seconds to 1 week. Refer to *Viewing History* on page 3-13 for a tutorial on using the history feature.

Defect Log View

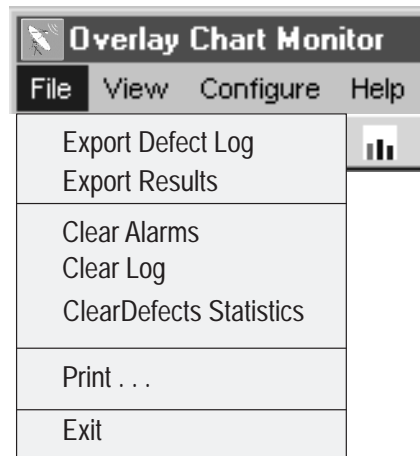
Use the Defect Log entries to view alarm state entries of connected channels. The error entries point to the machine (program monitor), channel, time and date, and the alarm conditions. Use the entries to locate specific history to look at for the analysis of quality trends.



Save the Defect Log to a file for archiving or to obtain a print out of the log. In the File selections menu shown below, select Export Defect Log to save the log to the DefectLog.txt file. Each export of the Defect Log stores the contents of the Defect Log to the DefectLog.txt file in the D:/PQM300/Defects directory.

Previous DefectsLog.txt files are renamed with a time stamp added to the file name. Only the last 1,000 defects are stored in the DefectsLog.txt file. When the

accumulated defects reach that number, the defects are written (auto exported) to a new file. The Defects Log retains the newest 100 defects for display.



NOTE. Over time the saved *DefectLog.txt* files and *Results.txt* files accumulate. To regain disk storage space, you should either archive the files, if they are needed, and delete them from the hard drive or, if they are not needed, just delete the extra ones. The *DefectLog.txt* files are in the *D:\PQM300\bin\DefecsLog* directory and the *Results.txt* files are in the *D:\PQM300\bin\journal* directory.

History Data Extraction

The measurement history is stored in journal files in the PQM300 file system in the *D:\PQM300\bin\journal* directory. The open journal file grows to a fixed size and is then written to a new file name. For example, the open journal file for board 1 of a program monitor is *00-1.dbjnl*. When the size limit of the file is reached, the file is renamed *00-2.dbjnl* and is time stamped to show the time the file was saved. You can extract the data from the journal file for analysis using a support tools provided with the PQM300 program monitor. Use the time stamps on the file names to determine the journal file that contains the measurement results you are interested in extracting.

An executable file called *histext.exe* and a batch file called *HistoryExtractor.bat* are in the *D:\PQM300\support* directory. The executable file has several argument choices to designate the data to be extracted from the journal files. The batch file is a template containing scripted text that can be used as is or modified to extract a different selection of results as you choose.

NOTE. *The extraction tool is meant for offline operation. Running the history extractor program on a program monitor that is in use is not recommended. History extraction is processor intensive, and the extracted journal files for each measurement are large. The processing time needed will cause gaps in the picture quality measurements of an active program monitor, and the local hard disk drive can run out of storage space in a period of time if history extraction is done repeatedly.*

History can be extracted from an operating program monitor and stored on a file system elsewhere. You can download the journal file or files of interest and the history extraction program to another PC to run the extraction tool, or you can run the history extraction program from a second PC over a network. To conserve hard drive space on the operating program monitor, direct the extracted output files to an external file system.

histext.exe file. The executable history extraction file is a command line executable with several required arguments and several optional arguments. Use the histext command with no argument to get the following terse help return:

```
histext [-j Journal file] [-o Output file] [-m Measure]
<-h Help> <-r Raw> <-s Summary> <-t starT time> <-p stoP
time> <-v Version>
```

The arguments in square brackets are required; the argument in angle brackets are optional as needed.

Get a detailed help screen return by using the histext command with the -h argument.

An example of a command line to obtain the summary of a journal file follows:

```
histext -j journal.dbjnl -s
```

where the file name (journal.dbjnl) is the one for the board and time you want to examine.

The return is the board name, a summary of the measurement types contained in the named file, the start time of the first measurement, and the stop time of the last measurement file.

Arguments. The list of arguments are as follows:

```
-h Detailed help
-j Journal file to extract data from
-m Measurement types to extract
-o Output file to write extracted (and calibrated) data to
-r Returns raw (uncalibrated) data
-s Extracts a summary of the file contents
```

```
-t starTtime of the data to extract  
-p stoPtime of the data to extract  
-v Version information
```

The valid measure types for use with the `-m` argument are the following:

```
noiseLevel, blockyFixed, blockyAdaptive, periodAdaptive,  
transientPeriod, and frameActivity.
```

Another example of using the extraction command line follows:

```
histext -j board00-1.dbjn1 -o output.txt -m measurement -t  
starTtime -p stoPtime
```

This command extracts data between the `-t starTtime` and `-s stoPtime` of type `-m measurement` from file `-j board00-1.dbjn1` and puts the extracted data in a tab delimited list in the `-o output.txt` file. Determine the start and stop times in a file using the summary command and select the time frame of interest in that file to extract.

HistoryExtractor.bat file. The history extractor batch file performs the commands included in the file script. An example of the batch file script follows:

```
@echo off  
  
echo PQM300 history file extractor  
  
if not exist "%1" goto usage  
  
histext.exe -j %1 -o %1_blockyFixed.xls -m blockyFixed  
.  
.  
.  
  
:usage  
echo Enter a file name to be processed.  
echo Usage: histext -j inputFile -o outputFile -m measurement  
  
:done
```

Additional command lines are included in the supplied `HistoryExtractor.bat` file. You can add command lines or delete command lines as you want and save with a different name to customize the history data you want to extract. If you do not provide a file name for the input, the usage line appears.

The batch file sends tab formatted text to a text file for importing into a data base program. The file is appended with the .xls extension to aid importing into an Excel data base program. From within the data base program, you can select a column of data or a portion of a column of data to plot using the Excel graph tools as shown in Figure 3-1.

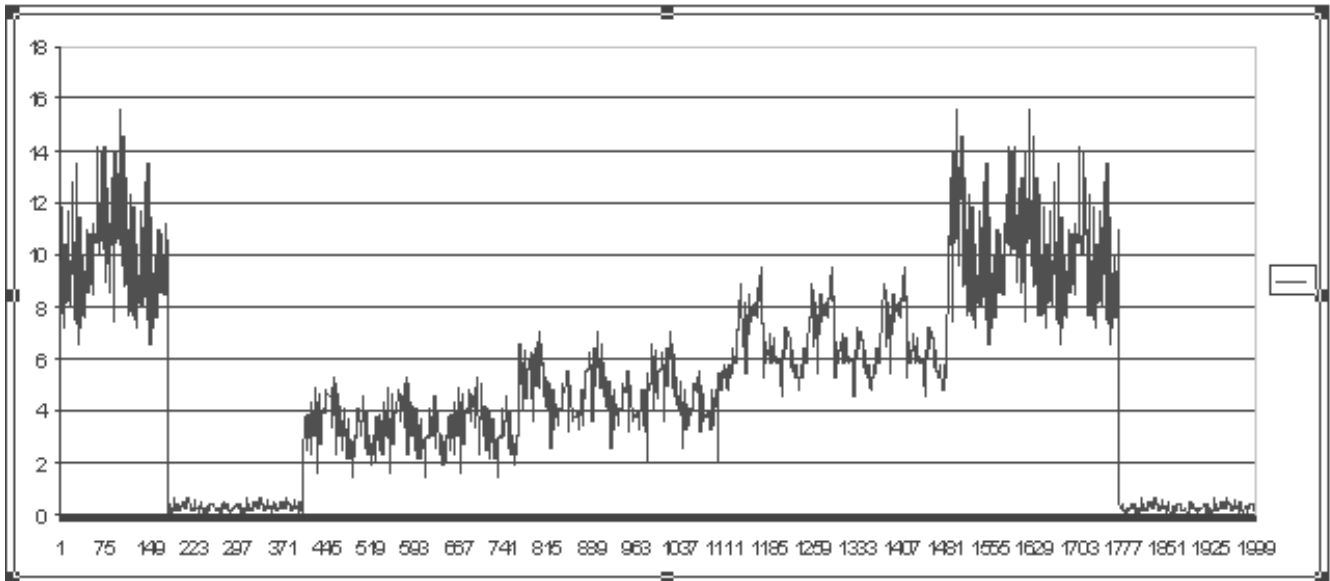


Figure 3-1: Extracted measurement data plotted using the Excel spread sheet graphing tool

Tutorial

This *Tutorial* provides step-by-step instructions for some important user tasks. Viewing History requires operating most of the configuration menus, so it can be used as a learning tool.

Viewing History

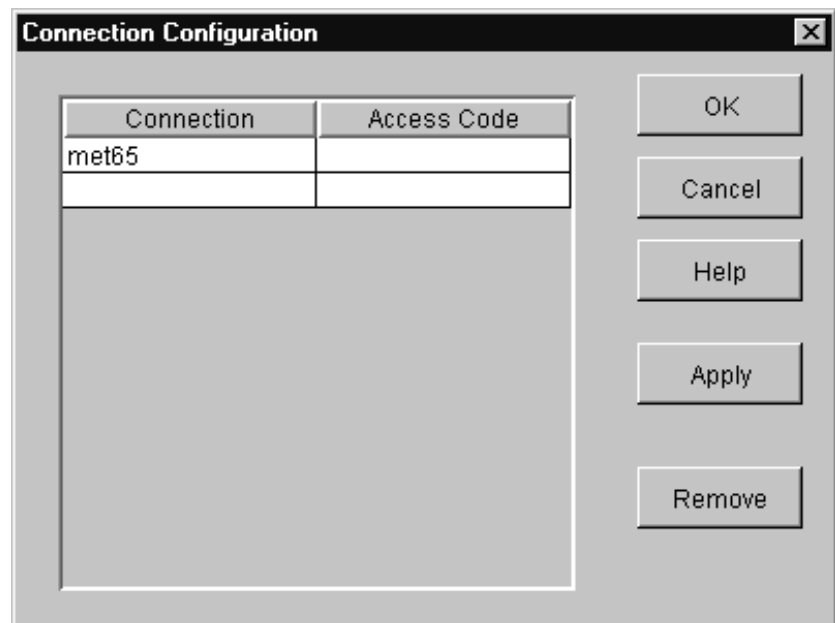
Use the Overlay Chart Monitor graph display to view up to one week of history on selected monitored program channels. The graph can display up to eight selected traces. If you are interested in the history of a particular program channel, use the following procedure to select the stored measurement results for that channel. You can also use the Stack Chart Monitor graph to quickly view all the measurement history on a selected program channel. Refer to *Stack Chart Monitor* on page 2–11 for more information on that view.

1. Determine the program monitor and channel that was monitoring the channel you want to view for history.
2. If program monitor and channel of interest are not already connected, connect them now.
 - a. In the task bar, select Configure and then Connections to display the Connections Configuration dialog box.

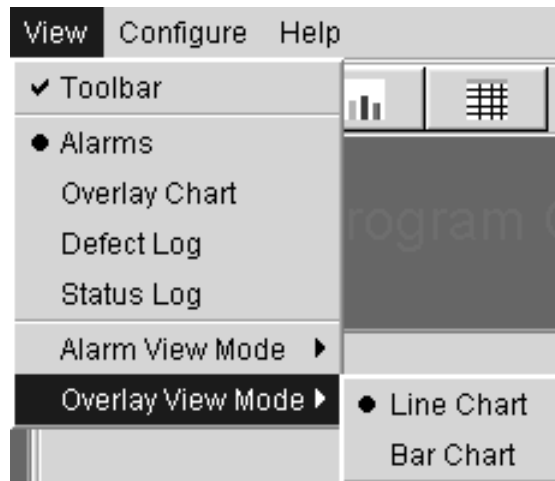


- b. Connect to a PQM300 program monitor by entering either its IP address or its assigned system machine name in the Connection Configuration box.

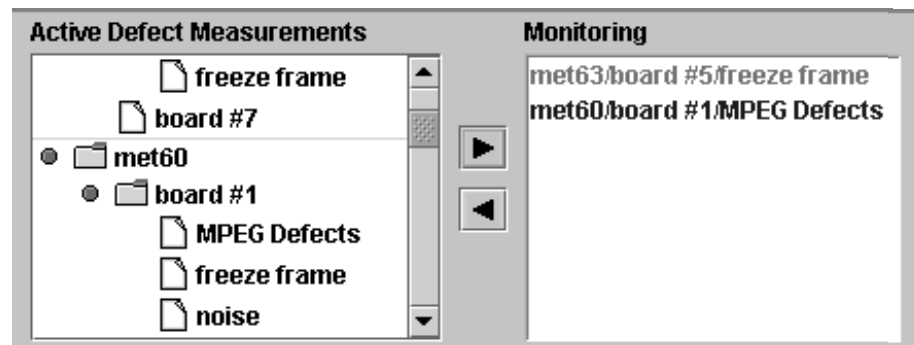
- c. If you do not know the machine name or IP address of a program monitor, check with your local system administrator for IP addresses and/or system machine names of the installed PQM300 program monitors.
- d. If access to a program monitor is locked, you can still view the operation of the connected program monitors, but you must enter the assigned Access Code to make any configuration changes.



- e. Click the Apply button to make the connection or connections.
 - f. Disconnect a machine by selecting the machine name in the Connections list and clicking the Remove button. If you are viewing a local display, the local machine name is always displayed as a default and cannot be deleted.
 - g. After you have made the connections you need and applied them, click on OK to exit the Connections dialog box.
3. Select the channel and measurement results to view.
 - a. If you are not already viewing the Overlay Chart Monitor view, click on the View choice at the top of the screen and select the Line Graph Overlay Chart. History is not available in the Bar Chart view. The Line Graph Overlay view displays a live overlay graph of the selected measurements on selected program monitor channels.

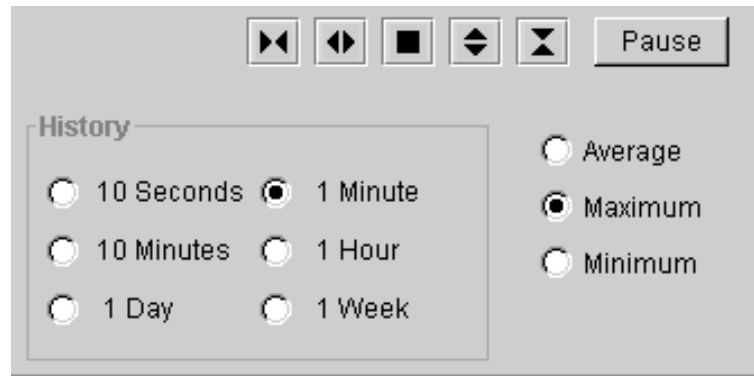


- b. In the Active Defect Measurements box of the Overlay Chart Monitor view, click on a machine icon button or double click on the icon itself to expand or contract the channel hierarchy for the machine as shown below.



- c. Select measurement traces to remove from the Overlay Chart Monitor graph, and then click on the left direction arrow to remove them. Removing a trace from the graph does not stop the accumulation of measurement data for the program channel.
- d. Select the measurement traces of the program channel you want to view for quality of service history. You can use the Defect Log to determine a time and machine name of the program monitor and channel that has the history you want to check. Refer to *Viewing the Defect Log* on page 2–23 for information on the content of the defect log.
- e. Click on the right direction arrow to add the trace or traces, if you have more than one selected, to the graph.

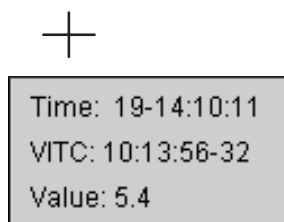
4. Select the amount of history, from the default of 10 seconds up to one week, you want to view for the channel traces. If you select a longer period of time to view than has been monitored for a selected channel, only the length of time of the stored data is displayed.



NOTE. The stored history files can be deleted if you wish to start a fresh history accumulation. You must be able to control the program monitor operating system either locally or through a network connection to run the batch file that removes the stored history data. Refer to Deleting History Data on page 2–22 for the procedure.

5. Select Average, Maximum, or Minimum for displaying the accumulated data points. The PQM300 application processes the data in the selected history time interval to fit in the display when a time longer than 10 seconds is chosen.
 - Average shows the average of the data in the processed time interval.
 - Maximum shows the highest value of the data (the worst quality) in the time interval.
 - Minimum shows the lowest (or best quality) value of the data in the time interval.
6. Get a time and amplitude readout of a graph point by placing the mouse cursor on a point of interest and holding down the left mouse button. The cursor readout is displayed for the cursor location while the mouse button is held down. Time is the number of seconds back from the time of origin of the graph; value is the PDI number of the data point selected by the mouse cursor. If the program material contains a VITC (vertical interval time code), that time also appears in the cursor time readout.

The VITC provides the hour, minute, second, and frame number of the point you select. Program material provided from a tape player usually has the time code. Original program material that is obtained after MPEG compression does not have a time code as the MPEG compressor strips it from the signal.

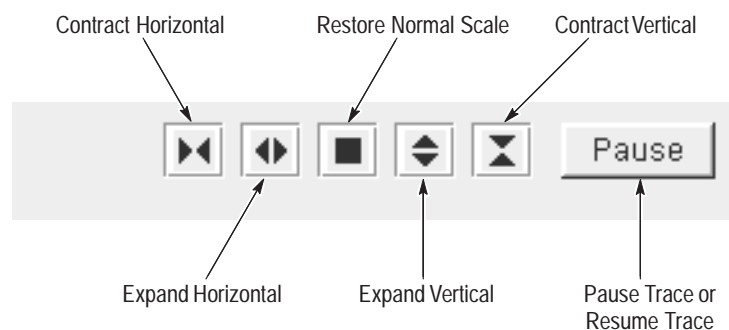


To hold the trace stable while making measurements, pause the trace.

7. Expand the trace scale vertically or horizontally using the trace controls shown below. Select a point to expand about by clicking on the point of interest as in step 6. Revert to the normal vertical and horizontal trace scales by clicking on the square button.

Use the Pause control to stop the movement of the traces in the graph. The button name changes to Resume when the trace update is paused.

Measurements are not paused at anytime, but the data stops updating to the display until Resume is pressed.



8. Select a period of history to view with higher resolution using the following procedure:
 - a. Select one of the longer periods in the history selection area to view the quality of service history farther back in time. Up to one week of data for every measurement enabled for every channel monitored is maintained.
 - b. Pause the update of the trace and click the mouse cursor on a point of interest in a history trace to select a portion of the history to expand around.

- c. Select a shorter history period to display a trace with higher resolution (a shorter time down to 10 seconds for the highest resolution) to examine the data more closely. The displayed history traces are expanded around the selected point in time.
- d. Export the displayed trace data to the Results.txt file in the D:\PQM300\Results directory using the **Export Results** selection in the File choices. You can then archive the file as necessary or import the file contents into a data base application. The output is ASCII text with a header identifying the results data followed by a results line for each data point (600) in the trace. The result lines contain a time stamp and the result value. Every measurement is exported. A sample Results.txt file follows:

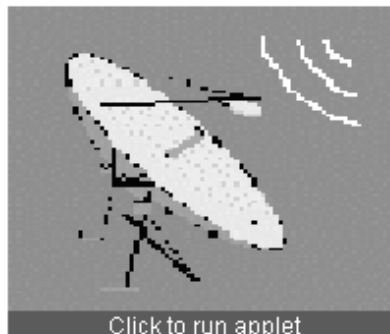
```
Machine ID   - MET60
Channel ID   - board #1
Measure Type - MPEG Defects
Decimation   - 10 Minutes maximum
Maximum PDI  - 15.14
Sept. 28, 1999 13:17:17 15.14
Sept. 28, 1999 13:17:17 12.70
Sept. 28, 1999 13:17:16 9.18
```

Web Browser Remote Operation

A centralized PC can be used to monitor any of the PQM300 program monitors installed on an accessible network. Use Netscape or Internet Explorer on your PC to display and control the PQM300 Program QoS Monitors connected to the network. Connect to a networked PQM300 program monitor as follows:

1. Start your Web Browser (either Netscape 4.5 or higher or Internet Explorer 4.0 or better).
2. Enter the IP address or computer name of one of the networked PQM300 program monitors in the Location dialog box. An example is shown in the following illustration.

PQM300-Monitoring Station #1



- [Download PQM300 Remote Application \(Self Extracting 10Mb\)](#)
- [Download PQM300 Defects Log](#)
- [Download PQM300 Results](#)

3. The applet is downloaded from the connected machine to the local PC. The display for a Netscape Web Browser is as shown above.
4. When the display is finished loading, click on the icon to run the application through the applet.

NOTE. For faster operation for future connections, you can download and install the PQM300 application to your local control PC. Click on the “Download PQM300 Remote Application” line. The program is self extracting and, once installed, can run the application without PQM300 modules installed in your PC. Downloading through a modem will take 30 minutes or more depending on the modem and data transfer rate of the ISP (internet service provider).

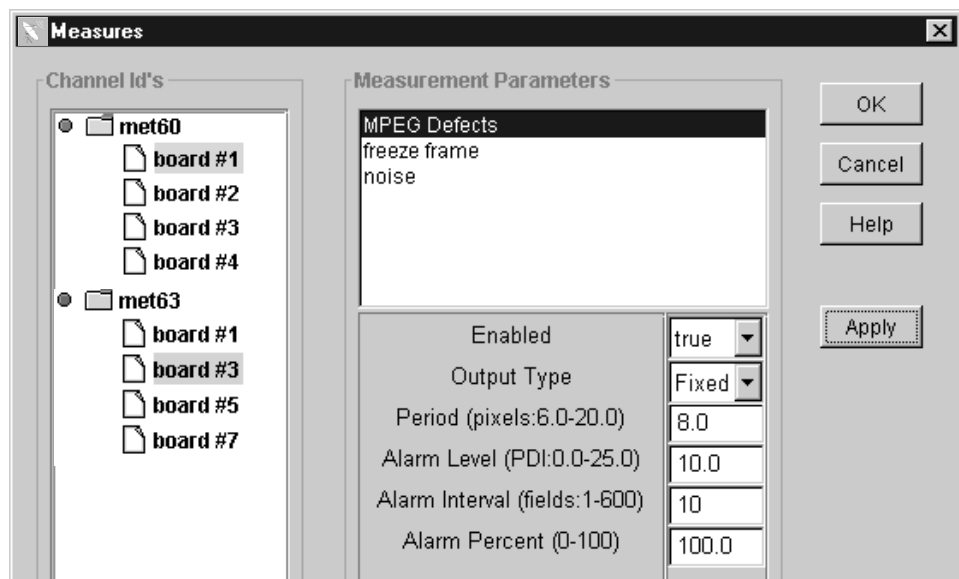
5. Use the virtual front panel display to connect to any PQM300 on the local network, make configuration changes (with access permission), display the selected measurement traces, and monitor for alarm conditions on any networked PQM300 program monitor.

Manual and Adaptive Setting of Blockiness Period

In measuring MPEG defects, the PQM300 Program QoS Monitor relies heavily on the quantity called blockiness period for its internal computations. If the blockiness period does not have correct value, the results of measuring MPEG defects will be incorrect. The blockiness period is the width of the block of picture elements used in the Discrete Cosine Transform (DCT). This transform is the basis of MPEG compression coding. The period typically equals 8 pixels, but some compression coders alter this value by shrinking the number of pixels

before sending the picture into the encoder. In spite of the loss of resolution in using this process, the picture quality can show overall improvement because there are fewer pixels to process, and the encoding task is easier for the encoder. In situations like this, when the video picture is expanded back to the original size in the decoder, the DCT block size will appear to be larger than 8.

The program monitor has two methods for setting the blockiness period parameter needed to perform the MPEG Defects measurement correctly: Fixed and Adaptive. Either of these output types has an associated MPEG Defects results trace that is displayed in the MPEG Defects graph in either the Stack Chart Monitor view or the Overlay Chart Monitor view. A third output type, Period, is a display of the detected period of the program material. Select the Output Type in the Measures Configuration window shown below.



Fixed Output Type

For the Fixed Output Type, you must know the blockiness period and enter that value manually in the period window for the MPEG Defects in the Measures configuration window. The period setting never changes in the course of the MPEG Defects measurement with the Output Type set to Fixed.

Adaptive Output Type

When Output Type is set to Adaptive, the program monitor attempts to find the blockiness period present in the video, starting with the value set in the period window. The period switches automatically if a new blockiness value is found.

The adaptive method works well in situations where MPEG artifacts of high amplitude are present (typically seen with in the MPEG transport stream at lower bit rates). When the level of MPEG artifacts are of low amplitude, the adaptive method can become unreliable. For continuous monitoring of a channel over prolonged periods of time, the best practice is to set the blockiness period

manually so that the period can not inadvertently switch to a wrong value for the measurement. Set the Output Type to Fixed and enter the correct blockiness value for the program material in the Period window.

Use the adaptive method either when connecting to program material with unknown blockiness for the first time to find out what the blockiness period is or when verifying that the blockiness period still has the same value as originally determined. The adaptive method looks at the detected blockiness values over a period of time and determines the correct blockiness period to set for the MPEG Defects measurement. The time needed to make an adaptive period change depends on the amplitude of the blockiness defects in the program material.

The adaptive period changes quickly for program material with high blockiness amplitude values. If the detected blockiness amplitude values are low, the adaptive mode takes more time to make an adaptive period change. Determine the Period setting being on a seen program channel when in adaptive period mode by viewing the MPEG Defects graph in the Stack Chart Monitor view. The MPEG Defects label at the bottom of the graph has the period reported. There is no period report after the label when the fixed period mode is selected.

Period Output Type

When the Output type is set to Period, a chart of the detected blockiness period value is shown in the MPEG Defects graph. The Period display is a good tool to use for verifying the blockiness period of the incoming program video. The detected blockiness period is clearly seen during the dynamic scenes, such as during the pan, zoom and fast movement of objects. The still scenes and scenes with a lot of graphic content that have low amplitude blockiness values, will likely yield varying blockiness values. You can observe the displayed blockiness period over time to find correct period value for the video program material. Once that value is determined, set the Output Type to Fixed and enter the period value to use for the MPEG Defects measurement in the Period window.

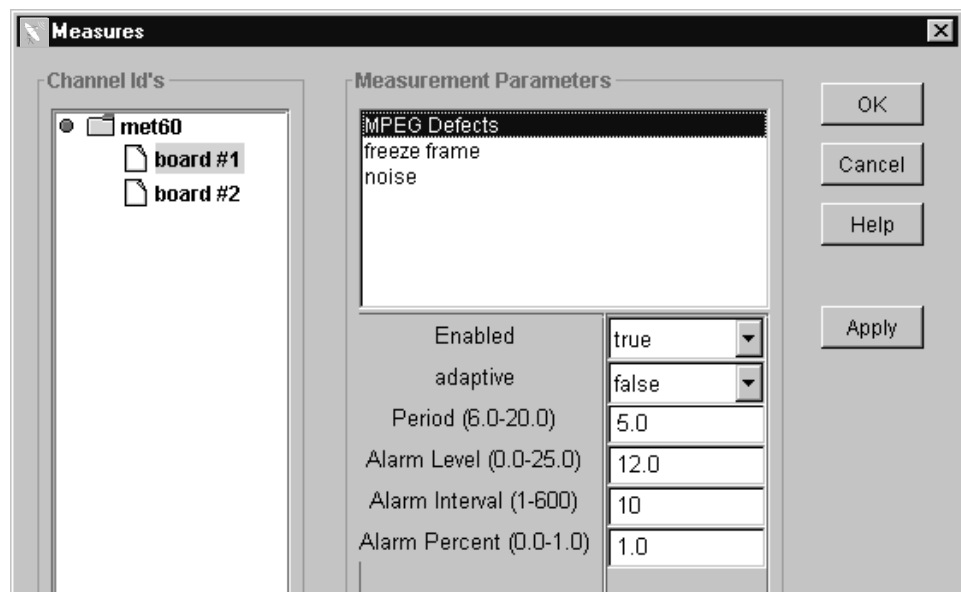
You can also use the Period Output Type to monitor the incoming program for blockiness changes that can occur when program content on a channel changes such as when the video is provided from a different source. If you want to know if the blockiness exceeds a specified value, set the Alarm Level in the Measures Configuration menu to a threshold level to catch if the changes to that value.

Configuring the Composite Decoder

The Tektronix PQM3F01 Composite Decoder module must be set for the applied video standard (NTSC or PAL) to use the correct decoding algorithm. If there is no signal connected or the incorrect video standard is applied to a decoder, error messages will appear. To avoid the error messages that will occur, do not change the video standard applied to the program monitor channel while the measurements are running. Stop all the measurements on the channel or channels that are to be changed. Set the decoder to the correct video standard before the program monitor measurements are restarted.

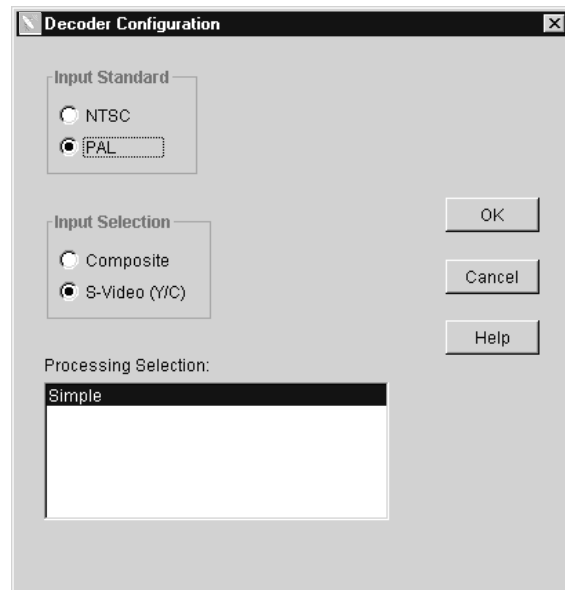
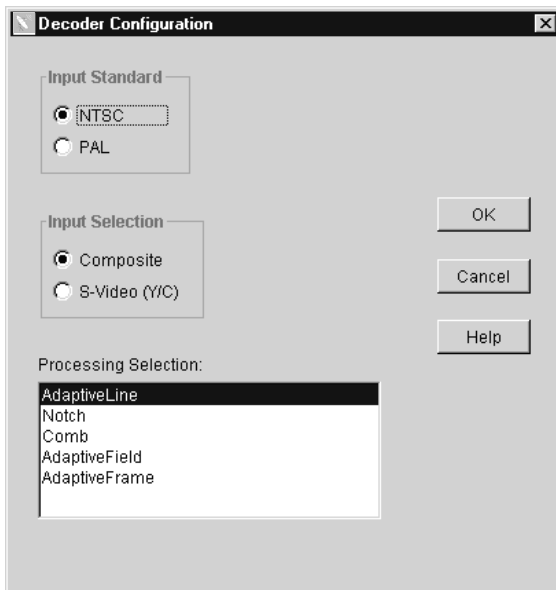
Use the following procedure to select the video standard and the signal processing for your program monitor operation. The composite decoder configuration changes you make apply to all the installed decoder modules. The decoders can not be configured either separately or for different video standards.

1. Click on the Configure task choice and select the Measures Configuration menu.



2. Select all the composite video program monitor channels.
3. Select each measurement in turn in the Measurement Parameters window. Set Enabled to false and click Apply for each one.
4. Click OK to exit the Measures Configuration menu.

5. Apply the video signal to the decoder composite input or S-Video input, as appropriate for the source, of each composite video program monitor channel. Terminate the loop-through output of the composite decoder modules using a 75 Ω BNC termination if the signal is not continued to a following 75 Ω system load.
6. Click on Configure task choice and select the Decoder Configuration menu. One of the dialog boxes shown below is displayed depending on whether NTSC or PAL and Composite or S-Video is selected for the input source.



7. Select the appropriate video standard (NTSC or PAL) for the input program material.
8. Select the appropriate input type (either composite or S-Video) for the source of the input program material. After you make that choice, the list of processing selection list shows the types available for the video standard and source selected.

Composite. Selects the Composite In connector of the decoder module as the source of input signal to convert to 601 digital video.

S-Video (Y/C). Selects the S-Video connector of the decoder module as the source of input signal to convert to 601 digital video.

9. For composite video, select the Comb filter. The Comb filter minimizes the defect filtering done by the decoder and provides the best match for composite video to 601 digital signal program material and S-Video program material with similar MPEG defect levels.

10. For S-Video, select the Simple filter.
11. Click OK to write the changes to all the composite decoder modules. This exits the Decoder Configuration menu. If any of the channels do not have a signal applied to the decoder module, one or more error messages are displayed to alert you to the missing signal.
12. Click on Configure in the task bar and reselect the Measures Configuration menu.
13. Reselect the program monitor channel or channels to re-enable the measurements you want and make any alarm changes you want for the new program content.
14. Click Apply to activate the changes for each measurement. If you do not apply the changes before selecting a new measurement to configure, the changes are not made.
15. After all the changes are made, click OK to exit the Measures Configuration menu.

Decoder Processing Information

The processing selection changes the way the decoder separates the luminance and chrominance portions of the input signal. Different processing may be better for different systems and sequences, but for the PQM300 program monitor, we want to preserve any MPEG defects in the monitored program material. The Comb filter is the best processing choice for quality of service monitoring. Information on the available decoder processing selections for general use follows:

Composite Processing Selections

Adaptive Line. This is typically the preferred selection for composite video conversion. It adapts between Comb and Notch processing to minimize the decoder artifacts.

Notch. This selection provides a simple notch filter to extract the luminance portion of the composite video and a bandpass filter to generate the chrominance. Notch can be used to emulate other notch decoders that may be part of the system under test.

Comb. This selection provides a full-time comb to separate the luminance and chrominance. In NTSC this is a 2-line comb, in PAL it is a 3-line comb. Comb can be used to emulate other comb decoders that may be part of the system under test. Comb preserves the MPEG defects in the program content for a more accurate measurement of service quality.

Adaptive Field. This selection adapts between notch and a field delay comb. Adaptive Field is useful for sequences with low motion content or to emulate similar decoders that may be part of the system under test.

Adaptive Frame. This selection adapts between a notch and a frame delay comb. Adaptive Frame is useful for sequences with low motion content or to emulate similar decoders that may be part of the system under test. This selection is not available for PAL video format.

S-Video Processing Selections

Simple. This is typically the preferred selection for S-Video. It should be used when the input luminance and chrominance are well separated. Simple processing applies the components directly to the demodulator function with minimal filtering. The Simple selection is the only processing type available for PAL video format.

Adaptive Line. This selection applies some adaptive comb filtering to the chrominance input to reduce residual luminance that may be present. Adaptive Line is needed only if the S-Video input comes from a source with poor Y/C separation.



Appendices

Appendix A: Specifications

This section lists the electrical, physical, and environmental characteristics of the PQM300 Program QoS Monitor.

Product Description

The program monitor is implemented on a platform that uses Microsoft's Windows NT operating system. Operating on a networked system, the PQM300 program monitor application is configured to begin automatically after the power-on initialization and program loading are completed.

An optional SVGA monitor can be connected for a local display and the program monitor can be controlled using a keyboard and a mouse.

The PQM300 program monitor provides program service quality assessments of live Rec. 601 digital video signals. Quality of Service (QoS) monitoring provides the following assessments and capabilities:

MPEG Defects

- Real-time MPEG defect (Discrete Cosine Transform based blockiness artifacts) monitoring and reporting when a signal is present. The PDI level (Picture Defect Indicator) provides immediate and continuous indication of the video image quality.
- Fixed (manual) setting of blockiness period for a given pixel block size for the MPEG defects measurement.
- Adaptive settings to automatically determine blockiness periods used for the MPEG defects measurement.
- Period selection to monitor the detected blockiness period. This is a tool to find the correct period for the fixed period setting and to monitor the incoming video for blockiness period changes.

Frozen Frame, Repeated Frames, Loss of Service

- Video content constant (consecutive fields exactly identical)
- Repeated frame found in a moving sequence
- Absence of a serial digital video signal
- Absence of video content on the input

Uncorrelated Noise

- Indicates the amount of white Gaussian noise in the video signal (such as that injected by analog video circuits)

Alarm Level Monitoring

- Individual alarm settings for all measurements (including blockiness period)
- Level thresholds for amplitude of error
- Time thresholds in number of fields for duration of error condition
- Percentage thresholds for an amount of error within a defined time threshold

Remote Control and Networking

- Web Browser control and monitoring of any program monitor accessible over a TCP/IP network. Access is through the Netscape (4.5 or higher) or the Internet Explorer (4.0 or higher) Web browser. An applet provides a remote user interface to make all the configuration setups and display the measurement results.
- SNMP agent (Simple Network Management Protocol) and MIB (management information base) for integration into an existing SNMP infrastructure to monitor picture quality from a central control point.
- Multi-machine networking. A networked Windows NT PC or a PQM300 program monitor with local display, keyboard, and mouse, can be used to control and monitor all PQM300 program monitors accessible over the network.

NOTE. A locally attached SVGA monitor, mouse, and keyboard are used for the initial set up of the PQM300 Program QoS Monitor.

Continuous Measurements

Measurements run continuously to monitor program quality in real-time. An operator at a central control station can control the operation of the program monitor installed in a system network.

Specification Tables

The tables list the specifications for the PQM300 Program QoS Monitor. All specifications are guaranteed unless labeled typical. Typical specifications are provided for your convenience but are not guaranteed.

The following definitions describe the information you will find in the specification tables.

- **Specification.** A document or a section of a document that lists and describes characteristics and performance requirements of equipment and certain programming material.
- **Characteristic.** A property of the product.
- **Description.** A statement that describes a characteristic usually in limit form. This statement is considered to be binding on the company (seller), and can be verified by performing the appropriate portion of the Performance Verification Procedure, or by a separate and available procedure.
- **Supplemental information.** Statements that explain performance requirements or provide performance information. These are not considered to be statements of guaranteed performance and are not ordinarily supported by a performance check.

Performance Conditions

The Performance requirements are valid within the environmental limits if the instrument was adjusted at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and you allowed a minimum warm-up time of 20 minutes.

Hardware Specifications

Table A-1: Program monitor board

Characteristic	Description	Supplemental information
Input Signal Format	Receives 270 MB/s serial digital signal	Complies with ITU-R BT.601, BT.656, and SMPTE 259M
Channel 1: Main In and Main Out		Active loop-through, BNC, 75 Ω terminating
Channel 2: Ref In and Ref Out		Active loop-through SMB, 75 Ω terminating
Channel 1 to Channel 2 Isolation		30 dB to 300 MHz
Channel Synchronization		The two inputs are asynchronous

Table A-1: Program monitor board (Cont.)

Characteristic	Description	Supplemental information
Input Return Loss		At least 15 dB (1 MHz to 270 MHz), with power on.
Serial Receiver Equalization Range		Proper operation with coaxial cable up to 14.5 dB loss at 135 MHz. Typical operation; to 300 meters with Belden 8281 coaxial cable.
Active loop-through output characteristics		Meets SMPTE 259M levels and rise and fall times. No reclocking is done on loop-through output.
Loop Output Return Loss		At least 15 dB (1 MHz to 270 MHz), with power on.
Output Signal Format	270 MB/s serial digital signal	Complies with ITU-R BT.601, BT.656, and SMPTE 259M. Exception: output frequency accuracy only specified when not referenced to an external input signal.
Output impedance		75 Ω
Return Loss		At least 15 dB (1 - 270 MHz), with power on.
Output level	800 mV \pm 50 mV	
Rise/Fall		0.3 ns to 1.2 ns, measured 20% to 80%
Jitter – Internal Reference		Less than 0.2 UI, typically 0.3 ns peak-to-peak.
Jitter – External Reference		Depends on the reference input. Typically peaking at 0.05 dB. Jitter attenuation 3 dB point is typically at 650 kHz.
Frequency	270 Mbit/s	
Frequency accuracy		\pm 1.5 ppm over temperature range plus \pm 1 ppm per year drift, when using the internal oscillator.
Output connector		BNC
DSP memory		256 MB fast SDRAM

Table A-2: PQM3F01 NTSC/PAL composite decoder board

Characteristic	Performance requirement	Supplemental information
Input Channels Video Format	NTSC, NTSC No Setup, PAL (B, D, G, H, and I)	

Table A-2: PQM3F01 NTSC/PAL composite decoder board (Cont.)

Characteristic	Performance requirement	Supplemental information
Composite Input type		Passive loop-through, 75 Ω , compensated, BNC
Return loss		40 dB up to 6 MHz on composite video
Loop-through insertion loss		0.6 dB Max to 6 MHz for composite video
Input amplitude range		+5%, -20% typical
Hum range	0.5 V peak-to-peak	
Frequency range		± 20 ppm
Genlock jitter		0.5 degree on 0 dB signal, -20 dB hum, -50 dB SNR
S-Video Input type		Standard S-Video and connector. No loop-through, terminated.
Return loss		25 dB typical
601 Out (serial digital video)		
Connectors		One BNC, one SMB. Identical signals on both output connectors.
Format	270 MB/s serial video component only	Complies with ITU-R BT.601, BT.656, and SMPTE 259M.
Output level	800 mV \pm 80 mV	
Rise/Fall	0.4 ns to 1.2 ns, measured 20% to 80%	
Jitter	< 0.2UI above 10 Hz	
Output impedance		75 Ω , 15 dB return loss 5 to 270 MHz
Frequency		270 Mbit/s nominal, tracks input signal
Output mode		8 bit or 9 bit, not user selectable
Conversion Accuracy		
Gain	1 \pm 2% low frequency	
Flatness	1% to 5 MHz for luma, relative to 500 kHz	
Luma linearity		2%
Differential Gain		1%
Differential Phase		1 degree
Black Level Error		10 mV

Table A-3: PQM3FRB, Option RB, alarm relay board

Characteristic	Description
Relay contact rating	6 A at 15 V
Relay contact resistance	100 milliohms maximum
Relay life expectancy	10,000,000 actuations minimum
Alarm relay output	Two 25-pin male sub-D connectors to support alarm relay out. Pin Assignment, see Table A-4.

Table A-4: Alarm relay board connectors

Relay number	Relay contact pin out		
Slot 8	Normally closed	Common	Normally open
1	16	3	15
2	5	17	4
3	19	6	18
4	8	20	7
5	22	9	21
6	14	23	10
7	1	24	11
8	2	25	12
Slot 9	Normally closed	Common	Normally open
9	16	3	15
10	5	17	4
11	19	6	18
12	8	20	7
13	22	9	21
14	14	23	10
15	1	24	11
16	2	25	12

System Components

Table A-5: System components

Characteristic	Supplemental information
Mainframe	Tektronix manufactured, common-platform mainframe
Form Factor	Rack-mountable in standard 19-inch rack. SVGA monitor for local display and mouse and keyboard for UI control are optional.
Processor	Two 400 MHz Pentium II processors
System Memory	256 MB
Real Time Clock	Real-time clock/calendar with a resolution of 1 second or less
Retention Time: Real-time clock, CMOS setup, and PnP NVRAM	Projected battery life is typically 10 years
BIOS	Phoenix BIOS, y2k compliant, field upgradable
Bus	32-bit PCI
Expansion Slots	8 PCI slots
Graphics	1024 × 768 SVGA resolution with 32 k colors minimum
Non-volatile Storage	
Floppy Disk drive	Standard 3.5 inch PC compatible floppy disk drive; 1.44 Mbyte high-density double sided (2HD)
CD-ROM drive	PC compatible half height IDE CDROM drive, 8X
Hard Disk Drives	Standard PC compatible Small Computer Systems Interface (SCSI) HDD. Two drives of 9.1 Gbyte capacity each. Captured video sequences and other user files are striped on both hard drives.
Mainframe Interfaces	<p>One loop-through ethernet port</p> <p>One bi-directional RS-232/RS-422/RS-485 port</p> <p>One parallel port (printer)</p> <p>Two hot-pluggable keyboard ports (located on the rear panel and the left front side panel). Use either connector to connect only one keyboard.</p> <p>Two hot-pluggable mouse ports (located on the rear panel and the left front side panel). Use either connector to connect only one mouse.</p>
External Display	
SVGA Monitor	An SVGA monitor may be attached for external display of the user interface.
Digital Picture Monitor Output	An ancillary display may be attached. The output protocol is ITU-R BT.601.
Front Panel	Virtual front panel on external display monitor. Local user input is made using an optional mouse and keyboard.
Internal Display (optional local control)	LCD, 6-bit, 250 NIT, CCFL backlight, 0. 264 MM pixel

Table A-5: System components (Cont.)

Characteristic	Supplemental information
Size	10.4 IN Diagonal
Resolution	800 X 600 (SVGA)
Touch Panel	Standard 10.4 in touch panel pointing device mounted on the surface of the TFT display, connecting to the Front Panel Interface Board.

Table A-6: Rear panel interface

Characteristic	Description																										
Parallel interface port	<p>Port supports standard Centronics mode, Enhanced Parallel Port (EPP), or Microsoft high-speed mode (ECP) and utilizes a 25-pin D-sub connector.</p> <p>Compliant with IEEE P1284-C/D2 for bi-directional Parallel Peripheral Interface for Personal Computers (draft) style 1284-C.</p> <p>Pin assignments for compatible mode:</p> <table border="0"> <tr> <td>1. STROBE*</td> <td>14. AUTOLF*</td> </tr> <tr> <td>2. D0</td> <td>15. ERR*</td> </tr> <tr> <td>3. D1</td> <td>16. INIT*</td> </tr> <tr> <td>4. D2</td> <td>17. SELECTIN*</td> </tr> <tr> <td>5. D3</td> <td>18. STROBE*</td> </tr> <tr> <td>6. D4</td> <td>19. GND</td> </tr> <tr> <td>7. D5</td> <td>20. GND</td> </tr> <tr> <td>8. D6</td> <td>21. GND</td> </tr> <tr> <td>9. D7</td> <td>22. GND</td> </tr> <tr> <td>10. ACK*</td> <td>23. GND</td> </tr> <tr> <td>11. BUSY</td> <td>24. GND</td> </tr> <tr> <td>12. PaperEnd</td> <td>25. GND</td> </tr> <tr> <td>13. SELECT.</td> <td></td> </tr> </table>	1. STROBE*	14. AUTOLF*	2. D0	15. ERR*	3. D1	16. INIT*	4. D2	17. SELECTIN*	5. D3	18. STROBE*	6. D4	19. GND	7. D5	20. GND	8. D6	21. GND	9. D7	22. GND	10. ACK*	23. GND	11. BUSY	24. GND	12. PaperEnd	25. GND	13. SELECT.	
1. STROBE*	14. AUTOLF*																										
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7. D5	20. GND																										
8. D6	21. GND																										
9. D7	22. GND																										
10. ACK*	23. GND																										
11. BUSY	24. GND																										
12. PaperEnd	25. GND																										
13. SELECT.																											
Serial interface port	<p>9-pin male-D-sub connector to support RS232 serial port. Compliant to EIA/TIA 574</p> <p>Pin Assignments (RS232):</p> <table border="0"> <tr> <td>1. DCD</td> <td>6. DSR</td> </tr> <tr> <td>2. RXD</td> <td>7. RTS</td> </tr> <tr> <td>3. TXD</td> <td>8. CTS</td> </tr> <tr> <td>4. DTR</td> <td>9. RI</td> </tr> <tr> <td>5. GND</td> <td></td> </tr> </table> <p>Pin Assignments (RS485):</p> <table border="0"> <tr> <td>1. RXD-</td> <td>6. CTS-</td> </tr> <tr> <td>2. RXD+</td> <td>7. RTS+</td> </tr> <tr> <td>3. TXD+</td> <td>8. CTS+</td> </tr> <tr> <td>4. TXD-</td> <td>9. RTS-</td> </tr> <tr> <td>5. GND</td> <td></td> </tr> </table>	1. DCD	6. DSR	2. RXD	7. RTS	3. TXD	8. CTS	4. DTR	9. RI	5. GND		1. RXD-	6. CTS-	2. RXD+	7. RTS+	3. TXD+	8. CTS+	4. TXD-	9. RTS-	5. GND							
1. DCD	6. DSR																										
2. RXD	7. RTS																										
3. TXD	8. CTS																										
4. DTR	9. RI																										
5. GND																											
1. RXD-	6. CTS-																										
2. RXD+	7. RTS+																										
3. TXD+	8. CTS+																										
4. TXD-	9. RTS-																										
5. GND																											

Table A-6: Rear panel interface (Cont.)

Characteristic	Description																
SVGA Output Port	<p>15-pin female high density-D-sub SVGA connector. Compliant with EIA RS 343A. Selectable 640 X 480 (VGA), 800 X 600, and 1024 X 768 (SVGA).</p> <p>Pin assignments:</p> <table> <tr> <td>1. Red</td> <td>9. (key)</td> </tr> <tr> <td>2. Green</td> <td>10. GND</td> </tr> <tr> <td>3. Blue</td> <td>11. NC</td> </tr> <tr> <td>4. NC</td> <td>12. NC</td> </tr> <tr> <td>5. GND</td> <td>13. HSYNC</td> </tr> <tr> <td>6. AGND</td> <td>14. VSYNC</td> </tr> <tr> <td>7. AGND</td> <td>15. NC</td> </tr> <tr> <td>8. AGND</td> <td></td> </tr> </table>	1. Red	9. (key)	2. Green	10. GND	3. Blue	11. NC	4. NC	12. NC	5. GND	13. HSYNC	6. AGND	14. VSYNC	7. AGND	15. NC	8. AGND	
1. Red	9. (key)																
2. Green	10. GND																
3. Blue	11. NC																
4. NC	12. NC																
5. GND	13. HSYNC																
6. AGND	14. VSYNC																
7. AGND	15. NC																
8. AGND																	
USB Port	<p>Series A USB receptacle</p> <p>Pin assignments:</p> <table> <tr> <td>1. Vbus</td> <td>3. +Data</td> </tr> <tr> <td>2. -Data</td> <td>4. GND</td> </tr> </table>	1. Vbus	3. +Data	2. -Data	4. GND												
1. Vbus	3. +Data																
2. -Data	4. GND																
Ethernet Port	<p>10 Base-T/100 Base-T on PCI bus, RJ45 Connector, Plug & Plan compatible, Bus master mode.</p> <p>RJ45 Pin assignments:</p> <table> <tr> <td>1. TX+</td> <td>5. NC</td> </tr> <tr> <td>2. TX-</td> <td>6. RX-</td> </tr> <tr> <td>3. RX+</td> <td>7. NC</td> </tr> <tr> <td>4. NC</td> <td>8. NC</td> </tr> </table>	1. TX+	5. NC	2. TX-	6. RX-	3. RX+	7. NC	4. NC	8. NC								
1. TX+	5. NC																
2. TX-	6. RX-																
3. RX+	7. NC																
4. NC	8. NC																

Table A-7: Side panel interface characteristics

Characteristic	Description						
Mouse Port	<p>PS2 compatible mouse port utilizing a mini-DIN connector.</p> <p>Pin assignments:</p> <table> <tr> <td>1. data</td> <td>4. +5V.</td> </tr> <tr> <td>2. NC</td> <td>5. clock</td> </tr> <tr> <td>3. ground</td> <td>6. NC</td> </tr> </table>	1. data	4. +5V.	2. NC	5. clock	3. ground	6. NC
1. data	4. +5V.						
2. NC	5. clock						
3. ground	6. NC						
Keyboard Port	<p>PS2 compatible keyboard port utilizing a mini-DIN connector.</p> <p>Pin assignments:</p> <table> <tr> <td>1. data</td> <td>4. +5V.</td> </tr> <tr> <td>2. NC</td> <td>5. clock</td> </tr> <tr> <td>3. ground</td> <td>6. NC</td> </tr> </table>	1. data	4. +5V.	2. NC	5. clock	3. ground	6. NC
1. data	4. +5V.						
2. NC	5. clock						
3. ground	6. NC						

Table A-7: Side panel interface characteristics (Cont.)

Characteristic	Description
USB Port	Series A USB receptacle Pin assignments: 1. Vbus 3. +data 3. +Data 4. GND

Power Characteristics

Table A-8: AC power source characteristics

Characteristic	Description
Source Voltage	100 VAC to 240 VAC \pm 10% (90 VAC to 264 VAC RMS), 47 Hz to 63 Hz, continuous range CAT II
Fuse Rating	8 A Fast / 250 V
Maximum Power Consumption	330 Watts max, 145 Watts typical
Steady State Input Current	6 Amps max, 1.25 Amps RMS typical
Inrush Surge Current	36 Amps maximum
Power Factor Correction	Yes

Mechanical (Physical) Characteristics

Table A-9: Mechanical characteristics

Characteristic	Description
Classification	Transportable platform intended for either rackmount or bench/lab based applications.
Overall Dimensions	
Height	8.5 inches (w/o feet) (21.6 cm)
Width	17 inches (43.2 cm)
Depth	22 inches (55.9 cm)
Weight	
PQM300	42 lb (19.1 kg)
Shipping Weight	64 lb (29.1 kg)
Construction Materials	Chassis parts are constructed of aluminum alloy and aluminized steel; front panel and trim pieces are constructed of plastic; circuit boards are constructed of glass and/or ceramic-glass laminate.

Environmental Characteristics

Table A-10: Environmental characteristics

Characteristic	Description
Cooling airflow	Intake is from the front and sides of the instrument. Exhaust is to the bottom and rear of the instrument.
Required Clearance	2 in. (50 mm) air space adjacent to the bottom of the instrument is required.
Use Rating	Rated for indoor use only.
Atmospherics	
Temperature:	
Operating	5°C to 40°C (41°F to 104°F), 30°C (54°F)/hr max gradient, non-condensing (derated 1°C or 1.8 °F per 1,000 ft. or 305 m above 5,000 ft. or 1524 m altitude)
Non-operating	-20°C to 60°C (-4°F to 140°F), 30°C (54°F)/hr max gradient (without disk media installed in disk drives)
Humidity	
Operating	20% to 80% relative humidity, non-condensing. Max wet bulb temperature: 29.4°C or 84.9°F (derates relative humidity to ~46% at 40°C or 104°F)
Non-operating	8% to 80% relative humidity, non-condensing. Max wet bulb temperature: 40°C or 104°F (derates relative humidity to ~54% at 50°C or 122°F)
Altitude	
Operating	Up to 10,000 ft. (3,040m), (derated 1°C or 1.8°F per 1,000 ft. [305 m] above 5,000 ft. [1524 m] altitude).
Non-Operating	Up to 40,000 ft (12,190 m)

Certification and Compliances

Table A-11: Electromagnetic compatibility

Category	Standards or description
EC Declaration of Conformity – EMC	<p>Compliance was demonstrated per EN55103-1/2 Product Family Standard for Audio, Video, Audio-Video, and Entertainment Lighting Control Apparatus for Professional Use (Environment Class E2; rack-mount application), using the following specifications:</p> <p>Emissions:</p> <p>EN 61000-3-2 Harmonic Currents, Conducted Emissions, AC Power Port</p> <p>EN55103-1 Radiated Magnetic Field Emissions, Annex A, rack-mount, Inrush Currents, Conducted Emissions, AC Power Port, Annex B Signal and Control Ports, Conducted Emissions, Annex E</p>

Table A-11: Electromagnetic compatibility (Cont.)

Category	Standards or description
	<p>EN 55022 Class B, Radiated and Conducted Emissions.^{1 2}</p> <p>Peak Inrush Currents PQM300 main unit 36 A peak at 240 VAC/50 HZ, 15 A peak at 100 VAC/50 Hz</p> <p>Immunity:</p> <p>IEC 61000-4-2 Electrostatic Discharge Immunity, Performance Criterion "B"</p> <p>IEC 61000-4-3 RF Electromagnetic Field Immunity, Performance Criterion "A"</p> <p>IEC 61000-4-4 Electrical Fast Transient/Burst Immunity, Performance Criterion "B"</p> <p>IEC 61000-4-5 Electrical Slow Transient (Surge) Immunity, Performance Criterion "B"</p> <p>IEC 61000-4-6 Conducted Radio Frequency Immunity, Performance Criterion "A"</p> <p>IEC 61000-4-11 Voltage Short Interruption Immunity, AC Power Port, Performance Criterion "C"</p> <p>IEC 61000-4-11 Voltage Dips Immunity, AC Power Port, Performance Criterion "B" and "C"</p> <p>EN55103-2 Radiated Magnetic Field Immunity, Annex A, Rack mount, Performance Criterion "A"</p> <p>Performance Criterion A: The apparatus will continue to operate as intended, in the presence of the disturbing phenomena. The display will remain stable.</p> <p>Performance Criterion B: The apparatus will continue to operate as intended after the disturbing phenomena is removed. There will be no change of operating state or stored data.</p> <p>Performance Criterion C: Normal function of apparatus is automatically restored when the disturbing phenomena is removed or can be restored by operation of the controls. Apparatus may self-reboot.</p> <p>¹ PQM300 Option 01 (Analog Composite Video Input) compliance to EN55022 Class B Radiated emissions limits was demonstrated with S-Video cables (Tektronix part number 012-1554-00), each with two clamp-on EMI Suppression Ferrites (Tektronix part number 276-0344-00) attached on the cable at the end connected to the PQM300 Option 01 S-Video input connector.</p> <p>² Radiated emissions compliance with Option RB, the alarm relay boards, demonstrated with Tektronix part number 174-3562-00 cables attached at the alarm I/O ports, and with these cables twisted together.</p>
Australia Declaration of Conformity	<p>EMC Framework, with compliance demonstrated using the following standard:</p> <p>AS/NZS 2064, Australian EMC Emissions Standard for Industrial, Scientific, and, Medical Equipment.</p>
USA, FCC Compliance	<p>Emissions comply with FCC Code of Federal Regulations 47, Part 15, Subpart B, Class A Limits.</p>

Table A-12: Environmental limits and use classification for safety certification compliance

Category	Standards or description
Safety Certification Compliance	
Temperature, operating	+5° C to +40° C
Altitude (maximum operating)	2000 meters
Equipment Type	Test and measuring
Safety Class	Class 1 (as defined in IEC 61010-1, Annex H) – grounded product
Installation (Overvoltage) Category	Overvoltage Category II (as defined in IEC 61010-1, Annex J)
Pollution Degree	Pollution Degree 2 (as defined in IEC 61010-1). Note: Rated for indoor use only.
Supply Voltage Range	100 VAC to 240 VAC ± 10%, 50/60 Hz, single phase
Fuse Rating	Mains fuse is 8A, 250V, Fast; Not operator replaceable. Refer servicing to qualified service personnel.
Current Rating	6.0 Amps maximum
Relative Humidity (maximum operating)	80 % for temperatures up to 31° C, decreasing linearly to 50 % at 40° C
Pollution Degree Definition	<p>A measure of the contaminants that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated.</p> <p>Pollution Degree 1 No pollution or only dry, nonconductive pollution occurs. Products in this category are generally encapsulated, hermetically sealed, or located in clean rooms.</p> <p>Pollution Degree 2 Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.</p> <p>Pollution Degree 3 Conductive pollution, or dry, nonconductive pollution that becomes conductive due to condensation. These are sheltered locations where neither temperature nor humidity is controlled. The area is protected from direct sunshine, rain, or direct wind.</p>
European Union Compliance	<p>Compliance was demonstrated to the following specification as listed in the Official Journal of the European Union:</p> <p>Low Voltage Directive 73/23/EEC, amended by 93/68/EEC</p> <p>EN 61010-1/A2 Safety Requirements for Electrical Equipment for Measurement Control and Laboratory Use.</p>
Listing by a U.S. Nationally Recognized Testing Laboratory	ANSI/ISA S82.01 Safety Standard for Electrical and Electronic Test, Measuring, Controlling, and Related Equipment., 1994.
Canadian Certification	CAN/CSA C22.2 No. 1010.1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use.

Table A-12: Environmental limits and use classification for safety certification compliance (Cont.)

Category	Standards or description
Additional Compliance	<p>UL3111-1 Standard for Electrical Measuring and Test Equipment.</p> <p>IEC61010-1/A2 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use.</p>
Installation (Overvoltage) Category	<p>Terminals on this product may have different installation (overvoltage) category designations. The installation categories are:</p> <p>CAT III Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location.</p> <p>CAT II Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected.</p> <p>CAT I Secondary (signal level) or battery operated circuits of electronic equipment.</p>
Laser Classification	<p>This product contains a CD ROM drive which utilizes a Class 1 laser and complies with EN60825-1:94, as well as with the U.S. FDA regulations. The drive is marked with the laser's classification and the date of manufacture, as well as the following information: Complies with the DHHS rules 21 CFR Chapter 1, Subchapter J applicable at the date of manufacture.</p>

Appendix B: User Service

This appendix describes general care and service procedures for the PQM300 Program QoS Monitor.

Preventative Maintenance provides cleaning instructions. A *User Verification Procedure* provides testing instructions to check the operation of the PQM300 modules for expected performance. *In Case There is a Problem* provides some hints for troubleshooting some possible operational errors that can occur during the operation of the program monitor. Service troubleshooting procedures are located in the *PQM300 Program QoS Monitor Service Manual* (refer the *Preface* for a list of manuals). *Repacking for Shipment* gives instructions for packing and shipping the program monitor for reshipment to another location or return to Tektronix for service.

General Care

Protect the instrument from adverse weather conditions. The instrument is not waterproof.



CAUTION. To avoid damage to the instrument, do not expose it to sprays, liquids, or solvents.

Do not use chemical cleaning agents; they may damage the instrument. Avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Preventive Maintenance

Check the electrical performance and have the instrument accuracy certified (calibrated) once a year.

Preventive maintenance mainly consists of periodic cleaning. Periodic cleaning reduces instrument breakdown and increases reliability. You should clean the instrument as needed, based on the operating environment. Dirty conditions may require more frequent cleaning than computer room conditions.

Cleaning the Exterior

Clean the exterior surfaces of the instrument with a dry, lint-free cloth or a soft-bristle brush. If dirt remains, use a cloth or swab dampened with a 75% isopropyl alcohol solution. A swab is useful for cleaning in narrow spaces around the connectors. Do not use abrasive compounds on any part of the instrument.



CAUTION. Avoid getting moisture inside the instrument during external cleaning; and use only enough solution to dampen the cloth or swab. Use a 75% isopropyl alcohol solution as a cleanser and rinse with deionized water.

Do not wash the front-panel On/Standby switch. Cover the switch while cleaning the instrument.

Cleaning the Compact Disc Drive

The compact disc drive requires routine maintenance to operate at maximum efficiency. The compact discs can be damaged if dirt and dust accumulate on the surface. Store any discs in their protective containers to keep them from being exposed to dust or dirt.



CAUTION. Electrostatic discharge (ESD) can damage components in the CD ROM drive. Do not touch lens or exposed metallic parts on the platter, with the exception of the center hub.

Clean the face of the CD-ROM drive monthly with a cloth dampened with deionized water.



CAUTION. Do not allow moisture to enter the disc drive. When power is applied, the internal components may be damaged.

Cleaning the Optional Keyboard and Mouse

Clean the exterior surfaces of the keyboard and mouse (part of the VK Option) with a dry, lint-free cloth or a soft-bristle brush. A swab is useful for cleaning in narrow spaces around the controls and connectors. Do not use abrasive compounds on any part of the instrument.



CAUTION. Avoid getting moisture inside the keyboard and mouse during external cleaning; and use only enough solution to dampen the cloth or swab. Use a 75% isopropyl alcohol solution as a cleanser and rinse with deionized water.

Cleaning the Optional Display

Clean the face of the display screen using a soft, lint-free dampened cloth.

User Performance Verification

The user performance verification provides a few simple checks to verify the operation of the PQM300 program monitor.

Test Equipment Required

The following test equipment is needed to provide the test signals used for the performance verification steps. If the program monitor does not have a composite decoder installed, only the serial digital video check is needed to verify operation.

Table B-1: Recommended test equipment

Description	Minimum requirement	Example test equipment
Serial Digital Video Test Signal Generator	Generate 601-525 and 601-625 60% Sweep test signal	Tektronix TSG601 Serial Digital Generator
NTSC Composite Video Test Signal Generator (for Composite Decoder test)	Generate NTSC composite video convergence test pattern	Tektronix TSG130A NTSC Multiformat Generator
PAL Composite Video Test Signal Generator (for Composite Decoder test)	Generate PAL composite video convergence test pattern	Tektronix TSG131A PAL Multiformat Generator
SVGA monitor and monitor cable	Multisync SVGA monitor and connection cable with standard video cable connector	Tektronix part number 119-5696-00
Keyboard	IBM compatible keyboard, 4-pin mini DIN connector.	Tektronix part number 119-5193-00
Mouse	Microsoft compatible 3-button mouse	Tektronix part number 119-4330-02
75 Ω coaxial cable	Low-loss video cable, double shielded; BNC male to BNC male, 72 in.	Tektronix part number 012-0159-01
75 Ω coaxial cable	Coaxial cable; BNC male to BNC male, 24 in.	Tektronix part number 012-1339-00
75 Ω termination (for Composite Decoder test)	Termination impedance 75 Ω ; connector BNC male.	Tektronix part number 011-0102-01

Serial Digital Video Check

Use the following procedure to verify the operation of the serial digital video program monitor modules. If the PQM300 has composite decoder modules installed, perform the *Composite Video Decoder Check* verification procedure on page B-11 first. If that check is good, operation of the program monitor modules is verified.

1. With the power off, connect an SVGA monitor for a display and a keyboard and mouse for user command inputs. You can connect the keyboard and mouse either to the rear panel connectors (shown in Figure B-1) or to the left side connectors.

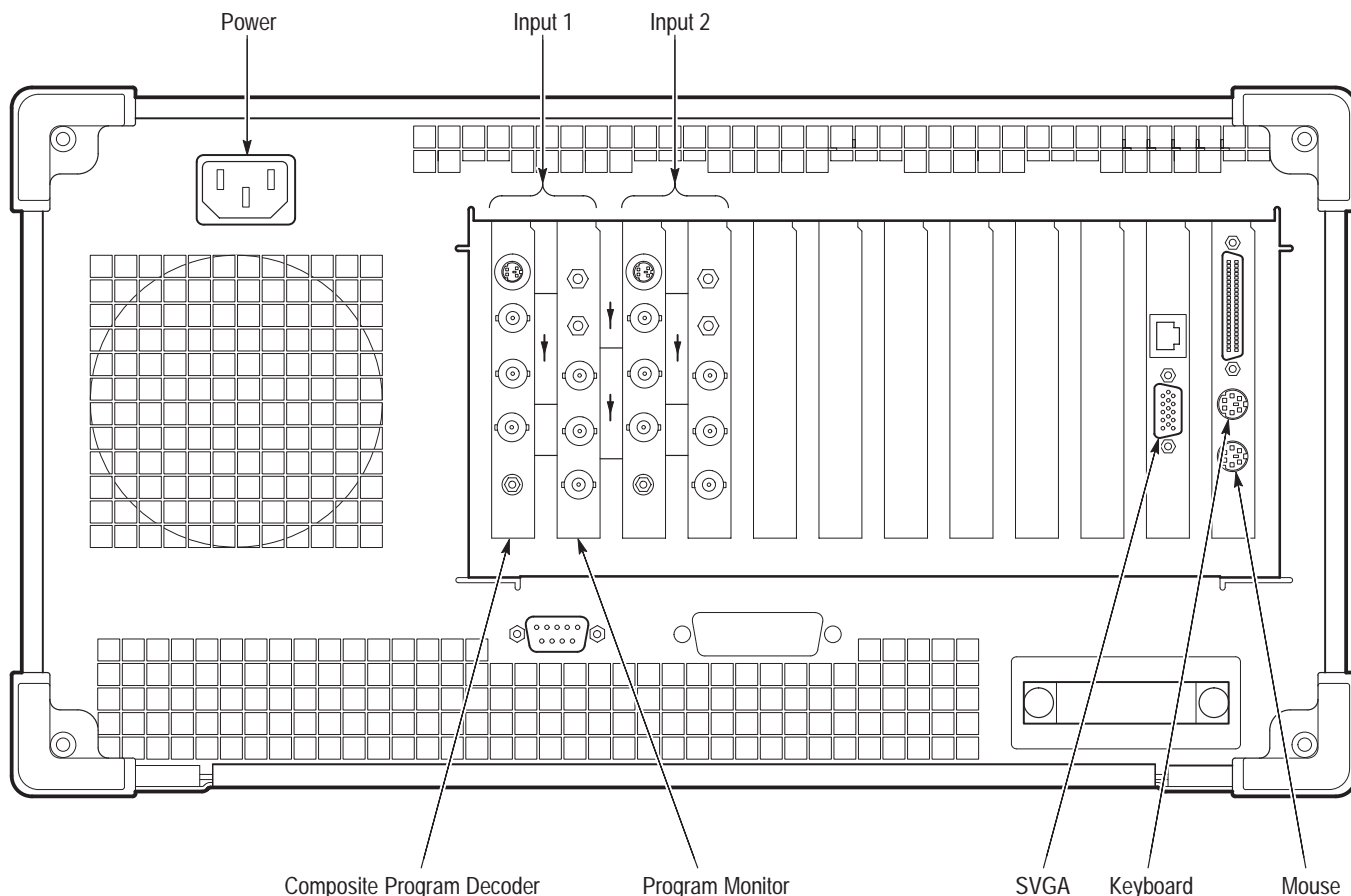


Figure B-1: Rear panel of PQM300 program monitor with composite decoder modules installed

2. Connect the SVGA monitor power cable to the ac power source.
3. Connect a Convergence (CRC off, 800 mV amplitude) 601-525 digital video test signal (NTSC) from the serial digital generator to the Channel A BNC loop-through input of the first program monitor module to be tested (see Figure B-2).
4. Connect the Channel A BNC loop-through output of the program module in slot 1 to the Channel A BNC loop-through input of the program module in slot 2 as shown in Figure B-2.

If more than two program monitor modules are installed, to save testing time you can continue to hook up the loop-through signal to the next module in line until the signal is connected to all the modules. The program monitor has an active loop-through and does not need a termination on the last output BNC.

Alternately, you can choose to apply the test signal to one program monitor module at a time without using the loop-through output for a single module test.

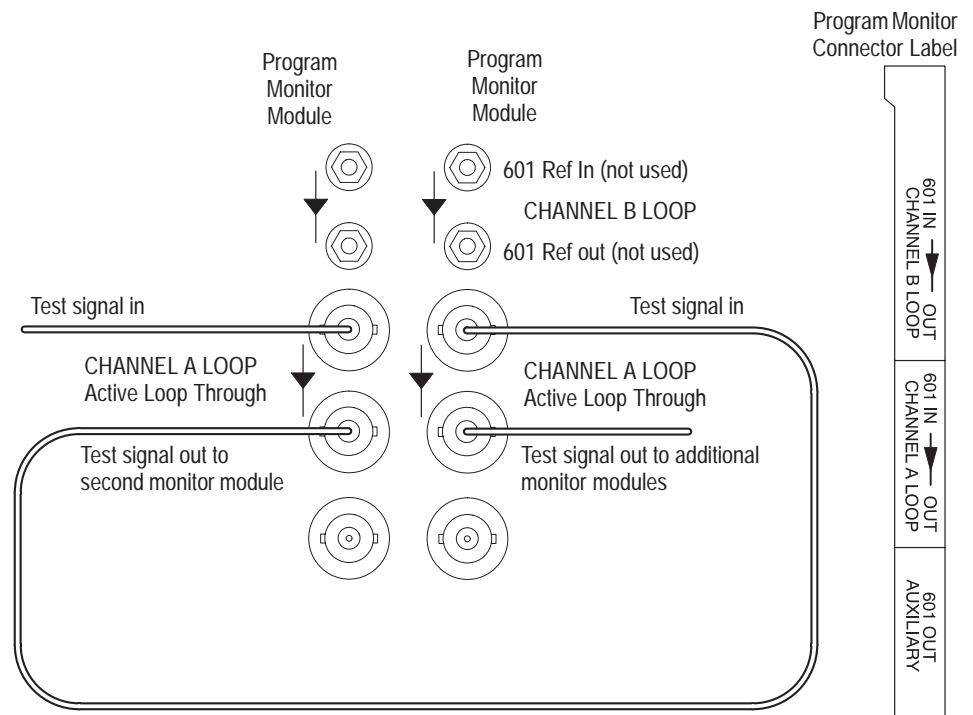


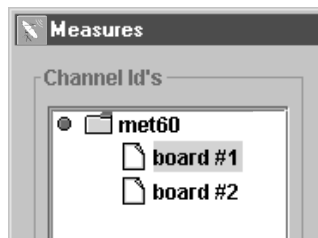
Figure B-2: Program monitor serial digital video connections

5. Press the monitor power switch to apply power to the monitor, and press the On/Standby switch to power on the PQM300 program monitor.

Whenever you power on the program monitor, it goes through the initialization and the power on diagnostics. If the diagnostics pass, the PQM300 application is loaded and starts without the need to enter a user name and password as normally required for a Windows NT operating system.

6. If the power on diagnostics fail or the PQM300 application fails to start, refer the problem to a qualified service person.
7. Select the Alarm View (click on View, select Alarm) if not already displayed.

8. Use the Configure Measures (click on Configure, select Measures) dialog box to enable all the measurements on all the installed program monitor modules. Set the measurement parameters as follows:
 - a. Click on the radio button in front of the program monitor icon to show all the monitor boards installed.
 - b. Use the mouse cursor and click to select the board number you are testing. If all the boards are connected and have the signal applied, select all the boards (shift, select each one). If only one board has a signal connected, select it alone.



- c. Select MPEG Defects to set the parameters as follows:

Enabled	true
Output Type	Fixed
Period value set	10.7

The Alarm settings can remain at the default values.

Measures

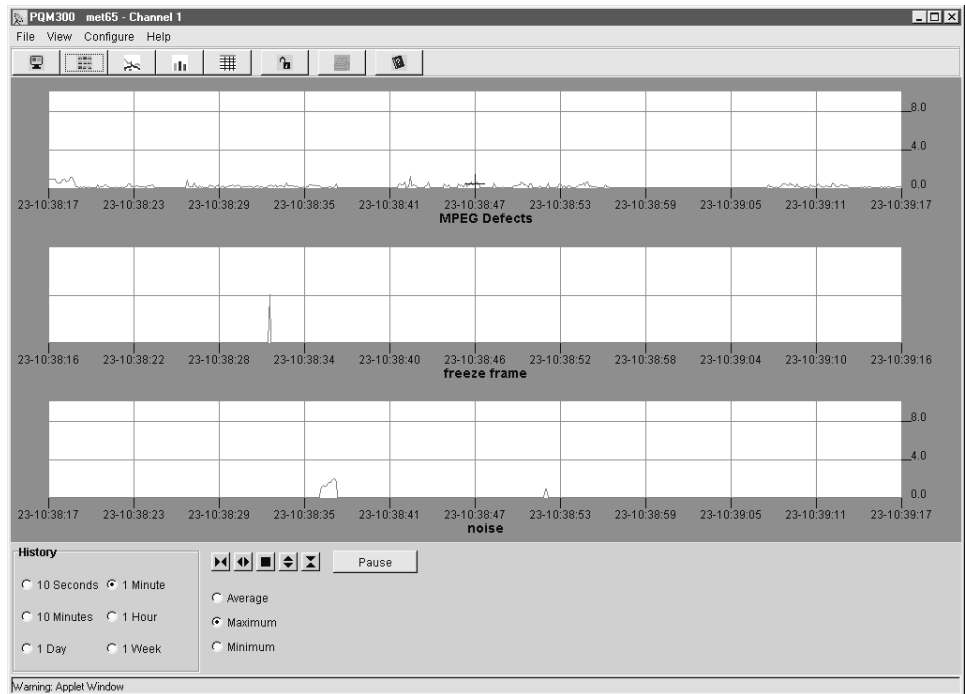
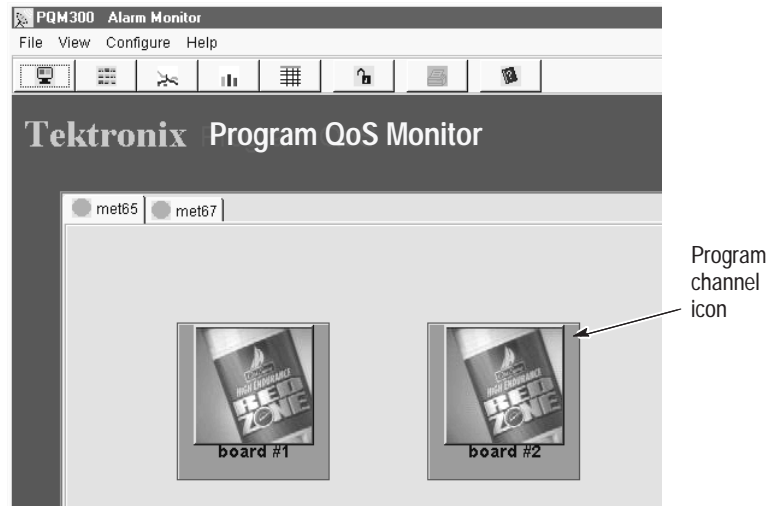
MPEG Defects

- freeze frame
- noise

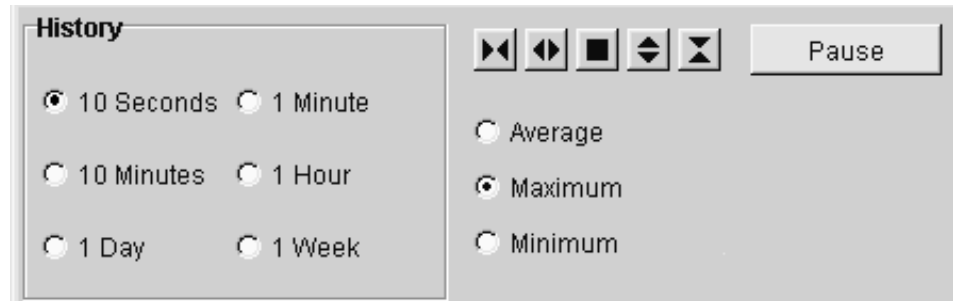
Enabled	true
Output Type	Fixed
Period (pixels:6.0-20.0)	8.0
Alarm Level (PDI:0.0-25.0)	2.0
Alarm Interval (fields:1-600)	2
Alarm Percent (0-100)	100.0

- d. Click Apply to write the changes to the PQM300 program monitor. If you do not apply the changes before you select a new measurement, the setting for the first measurement are not made.
- e. Select freeze frame and set Enabled to true. Set Input Type to Digital.
- f. Click Apply to write the change to the program monitor.
- g. Select noise and set Enabled to true.
- h. Click Apply to write the change to the program monitor.
- i. Click OK to exit the Measures dialog box.

- In the Alarm View, click on the program channel icon of the board number you are testing. The display switches to the Stack Chart Monitor View for that board.



- Select 10 seconds in the History selection box.



11. Check that a trace is being displayed in each of the three measurement graphs. The noise trace is at the bottom of the noise graph (zero), the freeze frame trace should be a heavy line across the middle of the freeze frame graph, and the MPEG Defect trace should be near the bottom of the graph.
12. Place the mouse cursor on the trace in the MPEG Defect graph box, and click on the measured results trace. Hold the mouse button (either one) down to display the measurement cursor.

Time: 28-02:33:50
Value: 3.4

13. Check the cursor readout for value of 3.4 ± 1.0 for 525 (NTSC) input video. This is the PDI value for the applied digital signal.
14. Click the Alarm View button to return to the Alarm View display.
15. If you have looped the signal to all the channels, repeat step 9 through step 14 for the program monitor channel to be tested (two channels in the standard instrument, but there can be up to eight program monitor modules installed).
16. If you are testing the modules one at a time, move the test signal input to the next module to test and repeat the setup for the measurements given in step 8, and then repeat step 9 through step 14 for the next program monitor channel to be tested.
17. Use the Configure Measures dialog to disable (set to false) all the measurements being made on all the program monitor modules. A screen is displayed telling you that no measures are configured when all the measurements are turned off.

If you are testing one module at a time, there was no signal applied to the next board to test, and Enabled is already set to false on that board. In this case, just move the test signal to the next module to test.

You will also see an error message telling you that the video signal is absent when the signal is disconnected. Click OK to clear each of the error messages after you reconnect the signal.

NOTE. *The PQM300 program monitor automatically recognizes the video standard that is applied when the measurements start, but it does not recognize a video standard change if made while the measurements are running.*

- 18.** Change the signal generator to provide a Convergence (CRC off, 800 mV) 601-625 digital video test signal (PAL). Use the following steps to change the video standard on the TSG601 signal generator:
 - a.** Turn off the signal generator.
 - b.** Hold down the Lock Out button and press the ON button to display the diagnostic menu.
 - c.** Use the up and down arrow buttons to scroll through the list of selections available to item 7=Format Select.
 - d.** Use the left and right arrow buttons to select between 525 and 625.
 - e.** Press the Test Signals button at the top of the keypad to exit the diagnostic menu and return to normal operation of the TSG601 signal generator.
 - f.** If Convergence is not the selected signal, press the L button in the keypad to directly select it.
- 19.** In the PQM300 program monitor screen, use the Configure Measures dialog box to enable all the measurements as in step 8.
- 20.** Repeat step 9 through step 14 for all the program monitor channels, and check for a PDI value of 2.2 ± 1.0 for 625 (PAL) input video.
- 21.** If there are no composite decoder modules installed, this ends the functional verification testing. Continue with step 22. If there are composite decoder modules installed, continue with the *Composite Video Decoder Check* beginning on page B-11.
- 22.** Press the On/Stby switch to start the shutdown of the PQM300 program monitor.
- 23.** When the program monitor turns off, turn off the SVGA monitor and disconnect the test equipment.

Composite Video Decoder Check

The PQM300 program monitor can also have one or more Tektronix PQM3F01 Composite Video Decoder modules (up to four) installed for four composite video program monitor channels. Use the following procedure to check the operation of any installed composite video decoder modules. Note that this procedure is actually a check of the channel modules consisting of a composite decoder module and a program monitor module. If the channel does not provide the correct PDI value for the test input signal, you can use the previous serial digital video check to verify the operation of the program monitor module for the channel pair.

1. With the power off, connect an SVGA monitor for a display and a keyboard and mouse for user command inputs. You can connect the keyboard and mouse either to the rear panel connectors or to the left side connectors.
2. Connect the SVGA monitor power cable to the ac power source.
3. Connect a multiburst PAL composite video test signal to the Composite In BNC loop-through input of the decoder module being tested as shown in Figure B-3.
4. Terminate the Composite BNC loop-through output of the decoder being tested with a 75 Ω BNC termination.
5. Connect the 601 Program Out BNC connector to the Channel A Loop 601 Program In BNC connector of the Program Monitor Module of the channel pair as shown in Figure B-3.
6. Press the monitor power switch to apply power to the monitor, and press the On/Standby switch to power on the PQM300 program monitor.
7. Wait for the initialization to complete and the PQM300 application to start.

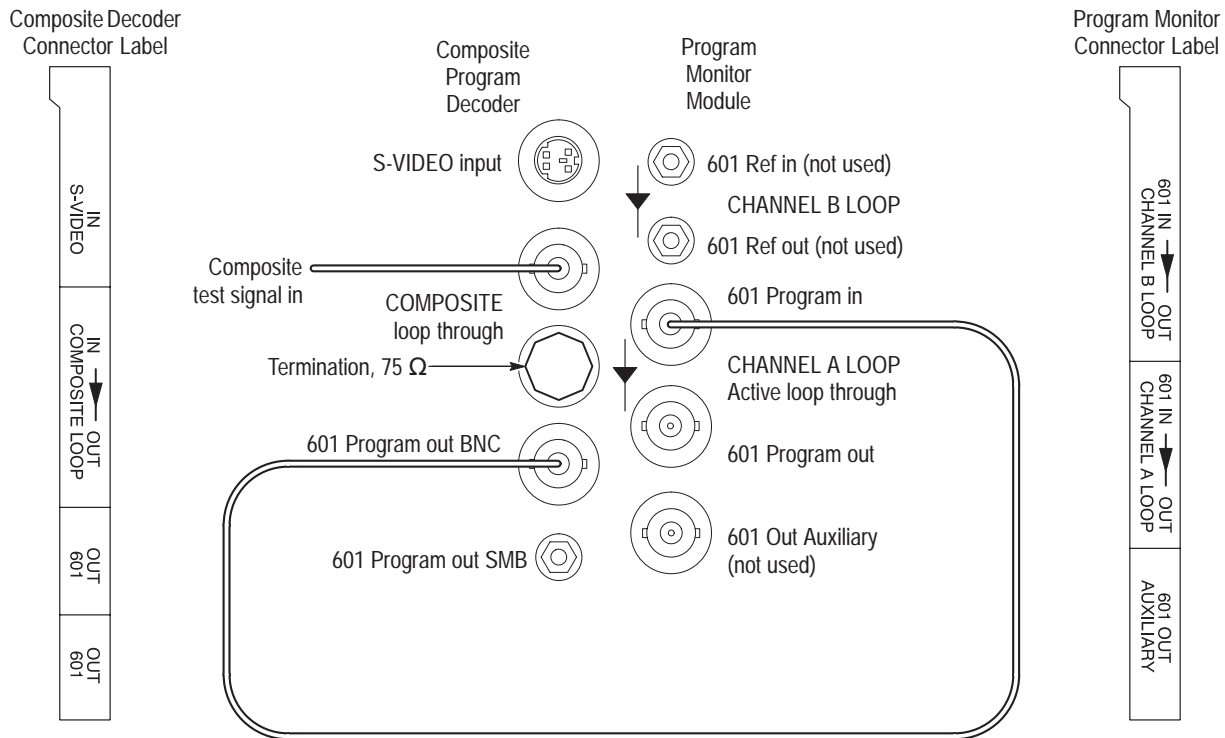
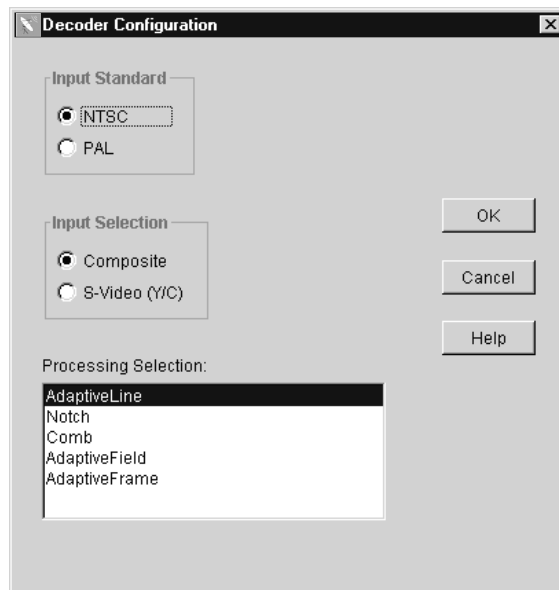


Figure B-3: Program monitor connections for composite decoder/program monitor pairs

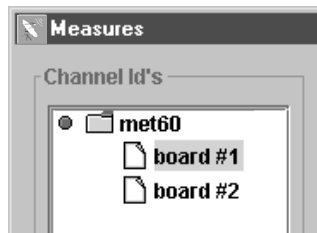
8. Click on Configure in the top task bar and select Decoder. This displays the Decoder configuration dialog box.



9. Set the Input Standard for PAL and set the Input Selection for Composite.
10. In the Processing window, select Comb filtering.
11. Click OK to apply the changes and exit the Decoder configuration box. The configuration changes apply to all the installed decoders.

NOTE. You will get error messages from any composite decoder modules that do not have a signal applied. Click on OK until all the messages are cleared. The decoder with a signal applied should not have error messages displayed.

12. Click on Configure again and select Measures.
13. Use the Configure Measures dialog box to enable all the measurements on the program monitor channel you are testing as follows:
 - a. In the Measures Configuration window, click on the radio button in front of the machine name icon to show all the installed program monitor channels. (The slots with composite video decoders installed do not show an installed module. Only the serial digital program monitor boards are displayed.)
 - b. Select the board number for the composite channel you are testing. (If you try to set up measurements on a board that does not have a signal applied, the measurements for that board will not be enabled.)



- c. Select MPEG Defects to set the parameters as follows:

Enabled	true
Output Type	Fixed
Period value set	6.7

The Alarm settings can remain at the default values.

Measures

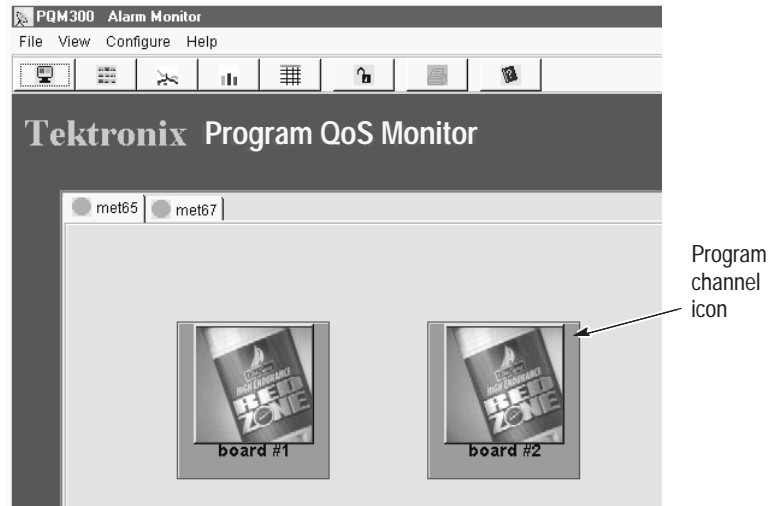
MPEG Defects

freeze frame

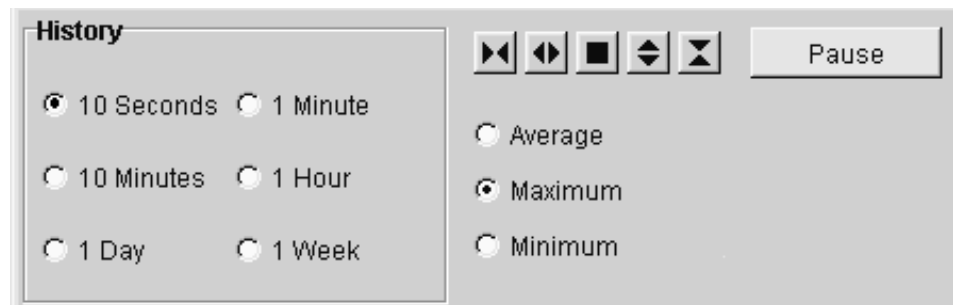
noise

Enabled	true
Output Type	Fixed
Period (pixels:6.0-20.0)	6.7
Alarm Level (PDI:0.0-25.0)	10.0
Alarm Interval (fields:1-600)	10
Alarm Percent (0-100)	80

- d. Click Apply to write the changes to the PQM300 program monitor. If you do not apply the changes before you select a new measurement, the setting for the first measurement are not made.
 - e. Select freeze frame and set Enabled to true.
 - f. Click Apply to write the change to the program monitor.
 - g. Select noise and set Enabled to true.
 - h. Click Apply to write the change to the program monitor.
 - i. Click OK to exit the Measures dialog box.
- 14.** If the Alarm View is not displayed, switch to the Alarm View now.
- 15.** In the Alarm View display, click on the program channel icon that you are testing. The Stack Chart Monitor view for that channel is displayed.



16. Select 10 seconds in the History selection box.



17. Check that a waveform is being updated in each of the three measurement graphs.
18. Check for a frozen frame indication (a solid red line across the middle of the freeze frame graph).
19. In the MPEG Defect chart, place the mouse cursor on the trace and click and hold down the mouse button. (If you want to stop the trace while you are making the check, click on the Pause button.)
20. Check the cursor readout for a PDI level of 3.0 ± 2.0 for 625 (PAL) input video.
21. Disconnect the signal applied to the first decoder and reconnect it to the second decoder to test. Move the 75Ω termination to the loop-through output of the second decoder to test.
22. Click on the Configure task in the task bar and select Measures.

23. Enable the measurements and make the MPEG Defects parameters settings as in step 13.
24. Repeat step 15 through step 23 for the second composite decoder module. If more than two composite decoder modules are installed, move the test signal and repeat step 15 through step 23 for each one.
25. Click on Configuration and select Measures.
26. Use the Measures configuration dialog box to disable any measurements that are set to true.
27. Connect a multiburst NTSC composite video test signal to the Composite In BNC loop-through input of the decoder module being tested as shown in Figure B-3.
28. Click on Configure in the top task bar and select Decoder.
29. Set the Input Standard for NTSC and set the Input Selection for Composite.
30. In the Processing window, select Comb filtering.
31. Click OK to apply the changes and exit the Decoder configure window. The configuration changes apply to all the installed decoders. You will get error messages from the decoders that do not have a signal connected. Click OK to clear each of the error messages.
32. Click on Configure again and select Measures.
33. Use the Measures Configuration window to enable all the measurements on the program channel (board#) that is being tested. Verify that the MPEG Defects Period is set for 6.7 and the Freeze Frame Input Type is set to Analog.
34. In the Alarm view, click on the Program channel icon you are testing to bring up the Stack Chart Monitor view for that channel.
35. Check that a waveform is being updated in each of the three measurement graphs.
36. Check for frozen frame indication (the same video is being generated in each frame).
37. In the MPEG Defect chart, place the mouse cursor on the trace and click and hold down the mouse button. (If you want to stop the trace while you are making the check, click on the Pause button.)
38. Check the cursor readout for a PDI level of 2.0 ± 1.0 for 525 (NTSC) input video.

- 39.** Disable the measurements on the channel being tested and disconnect the test signal from the decoder module and the program monitor module. Also disconnect the BNC termination.
- 40.** Connect the test signal cables and termination to the next composite channel pair to test as in Figure B-3.
- 41.** Repeat step 32 through step 40 for each installed composite decoder module.
- 42.** This completes the functional verification of the PQM300 program monitor.
- 43.** Press the On/Stby switch to start the shutdown of the PQM300 program monitor.
- 44.** When the program monitor turns off, turn off the SVGA monitor and disconnect the test equipment.

In Case of Problems

This section addresses problems that you may encounter while using the program monitor. This section does not identify specific problems related to performance verification or adjustments. The simplified performance verification procedure for the PQM300 program monitor modules provided in this section of the user manual can help you isolate problems to a specific module. For information on the indepth performance verification procedure or adjustment procedure, refer to the *PQM300 Program QoS Monitor Service Manual*, available as an optional accessory.

Diagnostics

Power-on diagnostics run when you first power on the instrument to start the program monitor application. These diagnostics check the operating system and hardware for correct operation. If error messages occur during the power-on diagnostics, there may be a system error that prevents the PQM300 application from starting. If no errors are detected, the PQM300 application starts automatically after the initialization and loading of the drivers and the PQM300 program.

Resetting Factory Defaults

Some operating problems can develop over time. The application just does not run correctly. This can be due to corrupted defect files or some operating condition that causes the application to lose track of what it is suppose to be doing. The cure for this nondescript problem is to restore the factory defaults using the following procedure:

NOTE. Check and set picture monitor clocks against GMT (UTC) for the best accuracy. Do not set the picture monitor clock back while the application is running. The time stamps for the files are obtained from the picture monitor clock. If conflicting times are found on the files, an error can occur. If you must reset the time, either set the time ahead, if needed, or wait until the new time setting is later than previous time setting to begin the PQM300 application again.

1. Shut down the PQM300 application using the orderly shutdown procedure.
 - a. In the PQM300 display, click on File in the display task bar and select Exit to shut down the user interface.
 - b. Click on the PQM_Core.exe task in the lower task bar to display the task DOS window. At the prompt, type in exit and press the enter (return) key.
 - c. Right click on the jre.exe task in the lower task bar and select close from the list that is displayed.
2. If the normal process does not shutdown the application or one of the other tasks, use control-alt-delete to display the Windows NT security box.

- a. Select Task Manager to display the list of running applications.
- b. Select the running PQM300 application or exe file and click End Task.
3. When the PQM300 application is completely shutdown, locate the PQM300 Reset Factory Defaults shortcut icon on the desktop and double-click on the shortcut icon.
4. Answer yes to the question about wanting to delete all the Defects files.
5. If you are using SNMP services for networking, double click on the SNMP Agent icon to restart the SNMP services.
6. Restart the PQM300 application by double clicking on the PQM300 application icon. The channel icons will appear with a gray background, as no measurements are configured.
7. Reconfigure any measurements you want on the channels that are connected.

Software Problems

Your PQM300 Program QoS Monitor comes with software already installed. For any suspected software problems, try to isolate the problem to the program monitor application software or to other installed software.

Many software problems can be due to corrupted or missing software files. In most cases the easiest way to solve software problems is to reinstall the software and follow the on-screen instructions. Refer to *Appendix C: Software Installation* for instructions on reinstalling software.

Refer to Table B–2 for a list of software and hardware troubleshooting information and recommended action.

If you suspect problems with the software, contact your local Tektronix representative or refer to *Contacting Tektronix* on page xiv in the Preface of this manual.

Hardware Problems

Hardware problems can have several causes. The first step to identifying a problem is to review the installation instructions in this manual to verify that you have properly installed the instrument. The second step is to determine if the problem is in the mainframe or the program monitor's modules.

If you are certain that you have installed the instrument correctly, run the extended diagnostics (located under the tools menu) to identify any problems with the individual modules.

Table B–2 lists some of the symptoms of hardware problems and possible solutions.

Table B-2: Troubleshooting

Symptom	Possible causes and recommended actions
Instrument does not power on	<p>Verify that the power cord is connected to the instrument and to the power source.</p> <p>Check that the instrument receives power when you press the On/Standby switch; check that fans start.</p> <p>Check that power is available at the power source.</p> <p>Instrument failure; contact your local Tektronix service center.</p>
Instrument powers on but does not complete the power-on sequence	<p>Check for and remove any disk in the floppy disk drive; make sure instrument boots from the hard disk drive.</p> <p>Possible software failure or corrupted hard disk. Refer to <i>Software Problems</i> at the beginning of this chapter.</p>
Power-on diagnostics fail	Isolate problem to faulty platform or to faulty module. Contact your local Tektronix service center.
Instrument does not recognize accessories such as monitor, printer, or keyboard	Check that accessories are properly connected or installed. Contact your local Tektronix service center.
Windows NT comes up but the program monitor application does not start	<p>Instrument not set up to start the program monitor application at power on; start application from the desktop by double clicking on the PQM300 icon. Reconfigure the system to auto start the PQM300 application.</p> <p>Faulty or corrupt software, refer to <i>Software Problems</i> at the beginning of this chapter.</p>
Instrument will not power off with On/Standby switch	If the PQM300 has a monitor, keyboard, and mouse connected, try powering off the instrument using the Windows NT shutdown procedure. If the instrument still does not power off, use the task manager to close down tasks. Finally, try the priority shutdown procedure; push and hold the On/Standby switch for five seconds to power off the instrument.

Error Messages During Operation

The PQM300 operating system displays error messages to report an error in configuration or when an expected signal is missing or is incorrect in some detectable manner. A configuration error message occurs if you select the Stack Chart Monitor view for a program monitor board that has no measurements enabled for that channel. If you try to enable measurements on a channel that has no signal applied, when you click OK, you will get an error message that no signal is applied. These errors are corrected by making sure there is a valid video signal applied to the channel, and then enabling one or more measurements for the channel.

Composite Decoder Board Error Messages

Composite decoder errors occur when an expected condition is not met. Some of those errors may be corrected by making a correction to input signals, such as making sure the amplitude is correct, that there is burst on the composite video or S-Video signal, or that you have the correct format signal applied.

Some error messages indicate a fatal error that prevents acquisition. Other errors indicate an out-of-range condition, but do not cause the PQA200 system to become inoperative. If the error persists after the corrective action has been tried, refer the problem to a qualified service person.

Table B-3: Decoder error messages

Error messages	Meaning	Action to take
Blanking	Indicates that the internal digital blanking circuit is making many corrections in one direction and none in the other. This is a normal condition when the circuit is stabilizing, but should not happen for more than a few seconds.	Check that the applied video is within normal range, try connecting a known good signal to test.
Burst Lock	Indicates that the internal timing circuit is not in the slow speed, low jitter mode. Burst Lock is not a fatal error, but a warning. This allows capture and measurement of a slightly jittery signal.	Check that the correct input standard signal is applied. The input signal may not have burst or it may have excessive noise. Apply a known good signal to test.
Burst Present	Indicates that the amplitude of the burst on the input is not sufficient to allow proper timing extraction.	Check the burst on the input signal or apply a known good signal to test.
Input Video Over Range – Check for Proper Termination	This message appears when signal clipping is indicated. This normally occurs if the input is more than about 125% of normal.	Check the input signal amplitude. Check that the loop-through is properly terminated, either into a 75 Ω system or with a 75 Ω termination on the unused loop-through connector.
Master Lock	Indicates a combination of sync present, burst present, serial lock, and several more internal timing errors from the board horizontal counters, the vertical counters and color frame decision circuits. The master lock flag is held high until everything is stable and ready to measure. Master lock is considered a fatal error if it persists.	Check that video format is correct (NTSC or PAL). The error will also occur if the input is non-standard video such as from a VCR that has not been time-base-corrected. Apply a known good signal to test.
Serial Lock	Indicates that the output serializer is not locked. The message means that the 601 output from the decoder module is probably not working.	Check all the input and signal interconnections.
Sync Present	Indicates that no sync pulses are being detected on the input. The error happens when there is no signal connected or it is very low in amplitude. It can also happen when the signal source is incorrectly selected, such as asking for a S-Video signal when the input is really a composite signal and visa-versa.	Check that the decoder is correct set for the type of signal applied. Apply a known good signal to test.

Repacking for Shipment

If a instrument is to be shipped to a Tektronix field office for repair, attach a tag to the instrument showing the following:

- Owner's name and address
- Serial number
- Description of the problem(s) encountered and/or service required.

The PQM300 Program QoS Monitor is shipped in cartons designed to provide it with the maximum protection. If you ship the instrument subsequently, you will need to use these cartons, the spacer pads, the protective bag, and the instrument support inserts to provide adequate protection.

NOTE. *The PQM300 Program QoS Monitor shipping carton in good condition must be used to return the instrument to Tektronix service centers. We cannot honor the warranties if the measurement set is not shipped in its original carton or in a replacement carton and its supporting packaging material purchased from Tektronix. Contact your Tektronix representative to obtain new packaging.*

Replacement Packaging

New packaging material is available from Tektronix. The part numbers are in Table B-4 and in the *Replaceable Mechanical Parts List* in the service manual. Packaging components are shown in Figure B-4. Each component has an index number, which also appears in Table B-4. To obtain these items contact your nearest Tektronix office or representative.

Table B-4: Packaging material

Item	Tektronix part number	Index number
Accessory tray	004-4851-00	
Accessory tray	004-4852-01	
Spacer pad (makes two pads for inner shipping box)	004-4925-01	
Protective bag	006-8164-00	
Top tray (cardboard insert)	004-4912-00	1
Instrument support inserts; top and bottom	004-4913-00	2
Inner shipping box	004-4926-00	3
Shipping box	004-4914-01	4

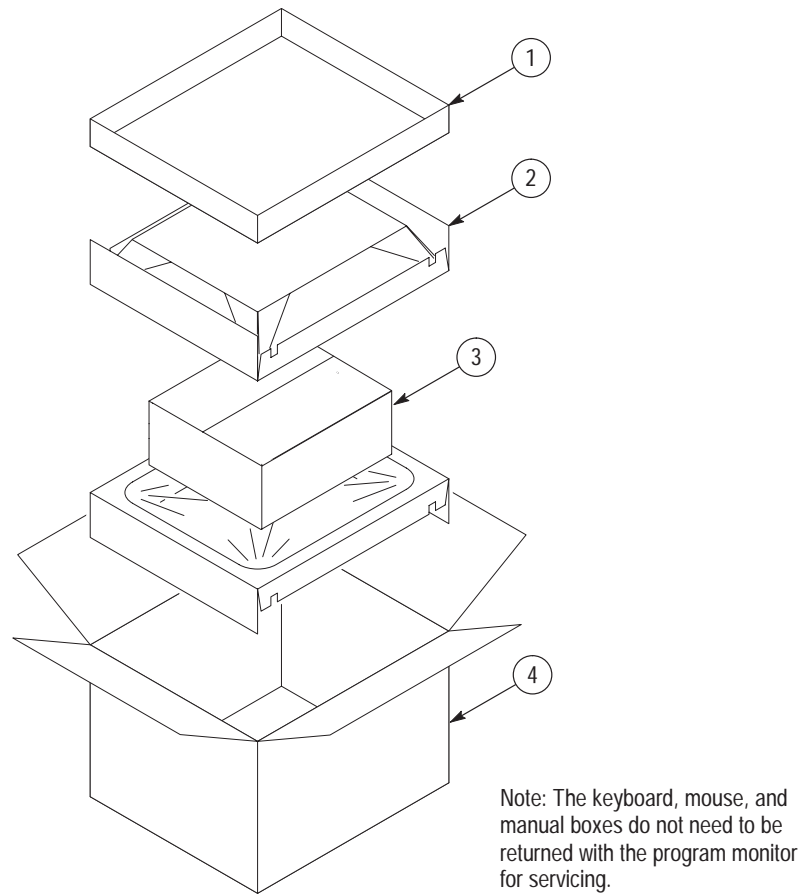


Figure B-4: Repackaging the program monitor

Repackaging Instructions

When the PQM300 is shipped, it is important to provide it with the maximum protection. Figure B-4 shows how to repack the measurement set for shipment. As the figure shows, it is not necessary to have the accessories received with the PQM300 in the package for reshipment to repair. If you are shipping to another site for reinstallation, the accessories are packed last in accessory trays at the top of the box.

The inner shipping box, pads, and protective bag provide the necessary protection to allow the shipping materials of the outer shipping box to correctly support the product for shipment. Pack the inner shipping box as follows:

1. If you have the original packaging material, start by placing one of the spacer pads in the bottom of the inner box. Position the side of the pad with the smaller, square holes against the side of the box as shown in Figure B-5.

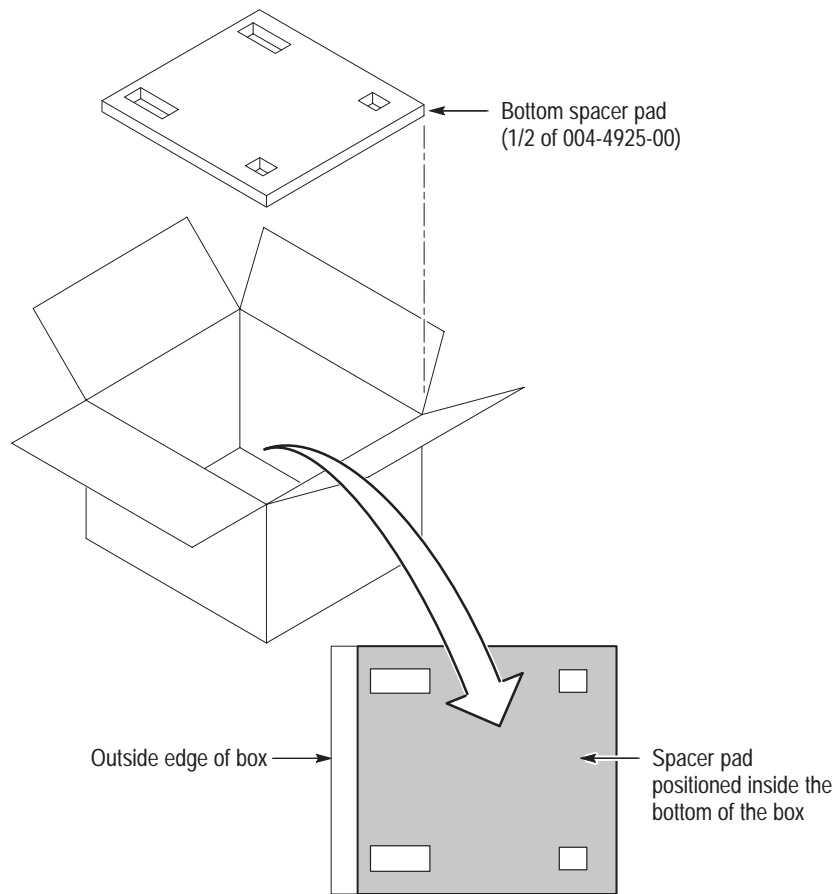


Figure B-5: Placement of bottom spacer pad in inner shipping box

2. Place the protective front cover on the front of the program monitor.
3. Place the PQM300 in the protective bag. The bag prevents dust, moisture, or other small packaging debris from entering the cabinet.
4. Fold the top of the bag neatly over the top of the PQM300 to make it as flat as possible and seal with packing tape.
5. Place the bagged PQM300 in the inner shipping box. The small feet on the bottom of the cabinet go in the square holes in the spacing pad and the larger feet near the front of the PQM300 go in the larger rectangular holes. The bezel end of the cabinet fits over the edge of the spacer pad.
6. Place the other spacer pad on top of the PQM300. Again, place the side with the small square holes against the side of the box. The protective front cover on the bezel of the PQM300 is not covered by the top spacer pad.
7. Close and tape the inner shipping box.

8. Place one of the support inserts in the bottom of the outer shipping box, film side up as shown in Figure B-4.
9. Place the sealed inner shipping box in the center of the bottom support insert in the outer shipping box.
10. Put the second support insert over the inner shipping box, film side down.

NOTE. *If you are using new packing material purchased from Tektronix, pre-stretch the film in the support inserts by pushing down firmly several times on the top support insert.*

11. Place the top tray in the box. If you are not shipping accessories with the measurement set, close and tape the outer shipping box.
12. When shipping the accessories, place the two accessory trays in the top tray, arrange the accessories in the trays, and then close and tape the outer shipping box.
13. Attach the appropriate shipping documents needed to ship the measurement set to its destination (either to Tektronix for repair or to another location).

Appendix C: Software Installation

There may be an occasion when a portion the software needs to be reinstalled to replace a deleted or corrupted application or driver. The PQM300 application software and the special driver applications can be restored using the PQM300 application CD provided using the installation procedure for that software. Use the applicable installation instructions for any partial installation that may be needed. A hard disk drive reformat or replacement requires a complete reloading of software.

The procedures in this section explain to the service person how to prepare the hard disk drives and reinstall all the software. The complete installation of software should only be done by someone with experience in loading all the drivers and services and configuring for networking. Contact your local Tektronix representative for service if required.

NOTE. *If you are reinstalling after replacing the hard disk drive with one you ordered as a replacement from Tektronix, follow the instructions provided with the hard disk drive replacement. If you are restoring software after reformatting the hard drive, perform the reloading steps in this section in sequence.*

The process of installing software on an PQM300 hard disk consists of the following major steps:

- Installing Windows NT on the hard disk
- Partitioning the hard disk drive
- Configuring for Auto Boot Start Up and Soft Shutdown
- Setting the display properties
- Installing the SNMP and Peer Web Services
- Installing the PQM300 application and drivers

The following list is the software components that get installed:

- Microsoft Windows NT 4.0
- Custom Display Driver
- Touch Screen Driver (for use with the local display option)
- Sound Driver
- Custom Ethernet Driver

- SNMP Services
- Peer WEB Services
- Soft Shutdown Driver
- Auto Boot of Start Up
- Windows NT Service Pack 4
- JAVA environment
- Internet Explorer Upgrade
- Tektronix PQM300 application software and drivers

This procedure assumes that you have the following:

- A CD-ROM disc titled PQM300 Program QoS Monitor Application Software
- Two SCSI hard drives, 9 Gigabytes each
- Windows NT 4.0 and Windows NT Service Pack 4 installation software

NOTE. *You will need certain information to correctly install the PQM300 program monitor in a network. Ask your network administrator to do the installation, or provide you with the following information:*

Computer Name for use on the network (often called Host name)

IP Address

Subnet Mask

DNS address

Default Gateway

Domain Name or Workgroup Name, as applicable

Reinstalling Software

The following procedures load the Windows NT operating system, partition the hard drives, and install the custom drivers required for the PQM300 program monitor application.



CAUTION. *Electrostatic discharge (ESD) can damage components in the CD-ROM disc drive. Do not touch the lens or exposed metallic parts on the platter, with the exception of the center hub when inserting or removing the CD-ROM disc.*

Install the Windows NT Operating System

Start the setup procedure with the Windows NT Setup floppy disk 1.

1. With the instrument off, connect the SVGA monitor, keyboard, and mouse to the PQM300 program monitor. The SVGA monitor must be connected to the rear panel display connector; the keyboard and mouse can be connected to either the rear panel or the left side front keyboard and mouse connectors.
2. Insert the **Windows NT Setup Disk #1** in the floppy disk drive.
3. Turn on the PQM300 program monitor.

NOTE. *NOTE: During the boot process, two SCSI hard disk drives must be reported on the screen. If not, check that the SCSI terminator is installed and tight, that the SCSI cable to the hard disk drives is connected and tight, and that the SCSI drives receive power. Jumpers on the SCSI drives must be set to designate the drives as SCSI 0 and SCSI 1.*

4. Follow the setup directions shown on screen. Refer to the Windows NT User documentation for additional information on installing the Windows NT operating system.
5. When prompted to do so, insert the **Windows NT Workstation CD-ROM** disc into the compact-disc drive and proceed with installation.
6. Use all the default settings and continue to press Enter as prompted to finish the Windows NT installation.
7. Set up a FAT partition of 1004 MB in C drive as follows:
 - a. In the Windows NT WorkStation Setup screen, if any partitions are present, delete them.
 - b. If the C drive partition is already set for 1004 MB FAT, use it. Otherwise, create a C drive partition of 1004 MB, formatted in FAT.
8. Install Windows NT in the C drive partition in the \WINNT directory. The directory will be created if not already present. If Windows NT was previously installed, overwrite it.
9. Choose the typical installation selection.

NOTE. The PQM300 program monitor uses automatic login, with the user name of **TEKMONITOR** and the password of **TEKMONITOR**. The **TEKMONITOR** user has administrative privileges on the Windows NT operating system built into the PQM300 application. You can load software, change passwords, assign users, and make the Windows NT system setups for the network from the **TEKMONITOR** log in.

No other user can log in while the autologin property of the application is enabled. If necessary to disable the automatic login for reloading the operating system software, you must run the **Regedit** (registration edit) program and set the HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\Current-Version\ Winlogon\AutoAdminLog value to 0. It must be reset to 1 to enable automatic login. See Configure for Auto Boot Up on page C-9.

10. If autologin is disabled as described in the preceding note, use the key sequence **CTRL + ALT + Delete** to display the log-in dialog box.
11. Login as **Administrator** and use **PQM300** as the password.
12. Install the Windows NT components. Use the default components selections.
13. Select **This computer will participate on a network**.
14. Check **Wired to network**.
15. In the Network Adapter, select **Start Search**. The search should find the INTEL 82557 Basic 1-/100 Ethernet PCI Adapter.
16. Select **NO** for DHCP (you may ask the network administrator to verify this choice).
17. Select **TCP/IP**.
18. Click on **TCP/IP Properties**.
19. Enter the IP address, the subnet mask, and the default gateway addresses you obtained from the network administrator.
20. Click on **ADD DNS Service**.
21. Type in the DNS address.
22. Enter the Domain name and click on **Apply**.
23. Click **Next** to start the Network service.
24. Enter a Workgroup name, if applicable (obtained from network administrator).

25. Do not select to make an emergency repair disk in the Startup Disk dialog box and click **Next** to continue. Making an emergency repair disk will be done after all the files are loaded and the registry has been modified.
26. Set the **Date and Time** zone as appropriate for your locale.
27. At the end of the installation, you should be prompted to restart the computer. Select to restart later and remove the CD from the drive.

Install Windows NT Service Pack 4.0

1. Insert the **Windows NT Service Pack 4.0** CD in the CD drive. An HTML install screen, Install Service Pack 4, is displayed.
2. Accept the license agreement and Install.
3. Select **No** when prompted to replace the driver files.
4. At the prompt to restart the computer, remove the CD, and restart the PQM300 program monitor.

Install D Drive

1. Click **Start->Programs->Administrative Tools** and start the **Disk Administrator**. You will see Disk 0 as a C partition in FAT disk format approximately 1 GB in size.
2. Click on the **Disk 0 Free Space**.
3. Hold down the control key and click on the **Disk 1 Free Space** to select both.
4. In Partition, select **Create Stripe Set**.
5. Stripe Set total size will be approximately 15 GB. Click **OK**.
6. In Partition, select **Commit changes now** and **Save**. The final hard drive space allocation is as shown in Figure C-1.
7. If prompted, restart the computer now. You may not see a prompt to restart now depending on the setup conditions present.
8. Click on **Start->Programs->Administrative Tools** and start the **Disk Administrator**.
9. Click on **Partition D-Drive** to select it.
10. Click on **Tool** in the task bar and select **Format**.

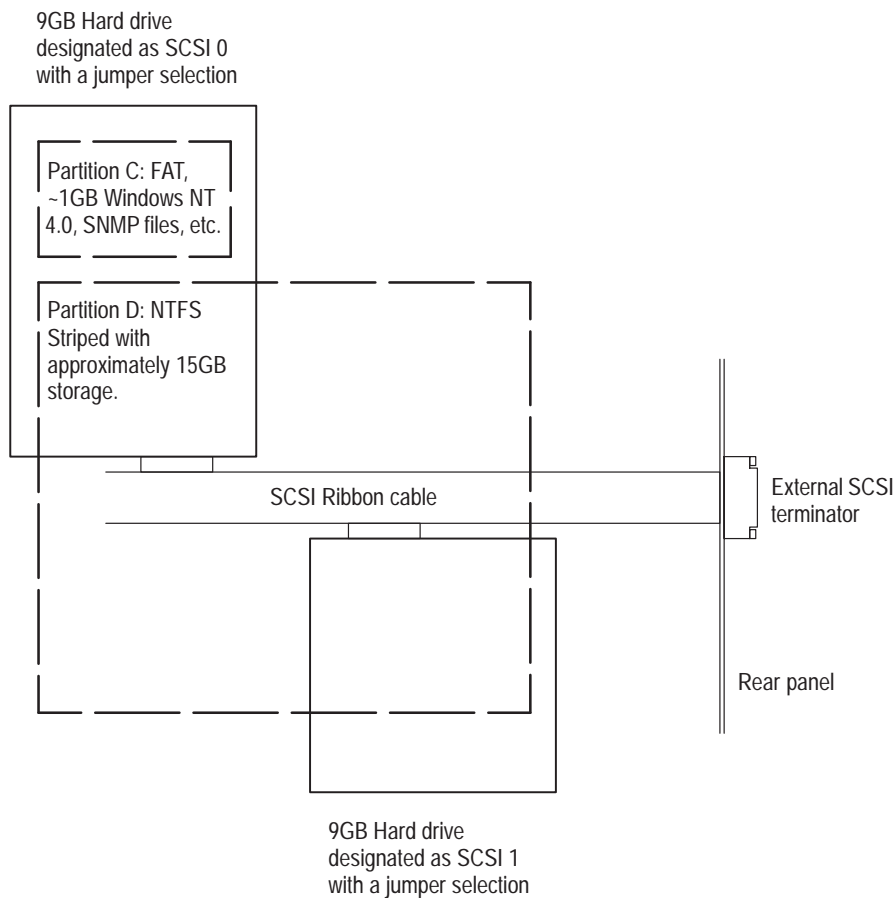


Figure C-1: Hard drive partitions

11. Select either **Quick** or **Standard Format**. Standard Format is recommended for the initial installation. A Standard Format takes a long time to complete, because the hard drive media is scanned for defects and mapped.
12. After formatting, close the **Disk Administrator**.
13. Install a paging file on drive D.
 - a. Click **Start**→**Settings**→**Control Panel**.
 - b. Open the **System** icon and click on the **Performance** tab.
14. Select **Virtual Memory** and click **Change**.
15. Select drive C.
16. Set the **Initial** size to **40 MB**, and set the **Maximum** size to **40 MB**.
17. Click **Set**.

18. Select drive **D**.
19. Set the **Initial** size to **400 MB**, and set the **Maximum** size to **400 MB**.
20. Click **OK** and **Close**.
21. At the prompt, restart the program monitor.

Upgrade the Internet Explorer

The upgrade for the Microsoft Internet Explorer is on the PQM300 application CD.

1. Hold down the shift key and insert the PQM300 application CD in the CD drive.
2. Click **Start**→**Programs** and start the **Windows NT Explorer** application.
3. Explore to select **Drive e**, the CD drive.
4. Open the **PQMRebuild** directory and select the **ie4_2** directory.
5. Start the **ie4setup.exe** program.

***NOTE.** Note: Set the View Options to not hide the file extensions if you need to see them to select the executable file.*

6. The INTERNET EXPLORER 4.01 SP2 screen is displayed. Select **Next**.
7. Accept the license agreement and click **Next**.
8. Accept all the defaults (file location) and click **Next**.
9. After the setup installation has finished loading, disconnect from the internet as prompted if the program monitor is connected to the LAN.
10. Click **OK** for the installation program to finish the setup process.
11. At the prompt, restart the program monitor.
12. Reconnect the LAN connection if the program monitor is installed in a networked system.

Install JAVA Virtual Machine Upgrade

1. Hold down the shift key and insert the PQM300 application CD in the CD drive.
2. Start the Windows NT Explorer.
3. Select **Drive e**, the CD Drive.
4. Open the **PQMRebuild** directory, then open the **javavm** directory.
5. Double click on **msjavx86.exe** to start the installation program.

6. Select **Yes** to install, accept the defaults, and **Finish** to install.
7. When the install has completed, do not reboot.

Install Peer Web Services

1. Click **Start**, select **Settings**, and open the **Control Panel**.
2. Select **Network** and click on the **Services** tab.
3. Click **Add**; select **Microsoft Peer Web Services**.
4. Click **OK**.
5. Hold down the Shift key and insert the **Windows NT 4.0 CD** into the CD drive.
6. Select **e:\i386.exe** to start the Microsoft Peer Web Services setup.
7. Check that all the options are selected and click **OK** to install the service.
8. Remove the Windows NT 4.0 CD.

Install the Custom Ethernet Driver

1. Hold down the shift key and insert the PQM300 application CD in the drive.
2. Insert a blank, formatted floppy disk in the floppy disk drive. Label it Ethernet Drives.
3. Click on the **Start** icon and select **Settings**→**Control Panel**.
4. Copy the contents of e:\PQMRebuild\EthernetDrivers to the root directory on the A drive.
5. Double click on the **Network** icon to open the Network dialog box.
6. Click on the **Adapters** tab.
7. Remove the existing network adapter (INTEL 82557 Basic 1-/100 Ethernet PCI Adapter).
8. Click on **ADD**. The default source is A:\. Type A:\ into the path dialog box if it is not already there.
9. The Intel EtherExpress PRO Adapter should be found on the A drive floppy disk and installed.

Install the Custom Display Driver

1. Click **Start**, select **Settings** → **Control Panel**.
2. Open **Display Properties**, and select the **Settings** tab.
3. For Display Type, select **Change**. Click Have Disk and OK.
4. Browse to PQM300 CD in e (the CD drive).

5. Open the PQMRebuild/Video Drivers/WinnNT 4.0 directory.
6. Select **Setup** and **Open**.
7. Select **OK**.
8. Click **Video Accelerator**. Select **Yes** to install the 3rd party driver.
9. At the prompt to reboot after installation, select **No, I will restart my computer later**, and then click **OK**.

Install the Soft Shut Down Driver

1. Use Windows NT Explorer to drag a copy of the Softpower directory from **e:\PQMRebuild\Softpower** directory to **C:\WINNT\System32\drivers**.
2. In the Softpower directory, locate the readme file. Use Notepad to read the file.

```
regini jamsrv.ini
copy jamsrv.exe \winnt\system32
regini jamshut.ini
copy jamshut.sys \winnt\system32\drivers
```

3. Open CMP (a DOS window) and enter the commands as shown in the readme file.
4. The soft shutdown service will start the next time the computer is rebooted.

Configure for Auto Boot Up

1. Click the **Start** icon and select **Programs**.
2. Open **Administrative Tools** and click on **User Manager**.
3. Create **New User TEKMONITOR**.
4. Enter **TEKMONITOR** as the password.
5. Click **Password never expires**.
6. Close the **User Manager** box.
7. Start **Shutdown** and select **Close all programs and log on as a different user**.
8. When prompted to login, change to **TEKMONITOR** and enter **TEKMONITOR** as the password.
9. After you are logged in, click on **Start**, and then select **Run**.
10. Enter **REGEDIT** in the Run edit box and click **OK** to run the program.
11. Select **HKEY Local Machine/Software/Microsoft Windows NT/Current Version/Winlogon**.

12. You should see **TEKMONITOR** as the **Default User Name**.
13. Select **Edit New String Value** and type in **AutoAdminLogon**.
14. **Edit/Modify** this **String Value** and enter **1** in the edit box.
15. Select **Edit New String Value** and type **DefaultPassword**.
16. **Edit/Modify** the **DefaultPassword** and enter **TEKMONITOR** in the edit box.
17. Close the registry editor.
18. Select **Start**→**Settings**→**Control Panel** and open the **System** icon.
19. Select **Startup/Shutdown** and set **Show List** to **0** seconds and click **Apply**.
20. Reboot the program monitor to start the new drivers. The program monitor should auto start without a Windows NT login.

Installing and Using SNMP Services

If your system is going to use the SNMP capability to network the PQM300 program monitor the Microsoft SNMP service must be installed from the Microsoft Windows NT CD-ROM. Installing the SNMP service also installs the SNMP TRAP service that is used by the AceComm NP_TRAPS utility to receive and send traps.

NOTE. *The NetPlus Auto*Manage network manager from AceComm is a third-party SNMP program used as an example of a low-cost SNMP manager. It is not provided by Tektronix.*

1. Install the Microsoft SNMP service.
2. Install the SNMP TRAP service from AceComm if the AceComm Manager is used.
3. Copy the **srconf** directory to the **c:\etc** directory. The **c:\etc** directory is required to configure the master agent so that it can recognize the trap/notification message destination systems.
4. After copying the **srconf** folder to the **c:\etc** folder, create two system environment variables from the Control Panel/system/Environment/system variables. These variables are:

SR_AGT_CONF_DIR which is set to the value **c:\etc\srconf\agt**
SR_MGR_CONF_DIR which is set to the value **c:\etc\srconf\mgr**.
5. Modify the **c:\etc\srconf\agt\snmpd.cnf** file using the following steps:

- a. From the dos prompt issue the command **net stop snmp** to stop the Microsoft SNMP service.
- b. Make the SNMP service port assignment as follows:
Open the file **C:\WINNT\system32\drivers\etc\Services**.
Change the snmp services port to **8162** instead of **162**.
Save the file.
- c. From the dos prompt issue the command **snmpdm –stop** to stop SNMP Research Master Agent.
- d. From the dos prompt issue the command **msnsaagt –stop** to stop SNMP Research Master Agent Adapter.
- e. Undo the Read Only properties of **c:\etc\srconf\agt\snmpdm.cnf** file so that you can modify it.
- f. Open the **snmpdm.cnf** file and edit the sections labeled:

```
#Entry type: snmpNotifyEntry
#Entry type: snmpTargetAddrEntry
```

Add as many **snmpNotifyEntry** and **snmpTargetAddrEntry** lines as your notify/trap destinations.

Make sure the **snmpNotifyTags** are unique integers for each line.

Follow the same syntax as the previous lines in the file.

Typically, the file changes just made are all that are needed for the SNMP manager to send and receive traps.

For MIB browsing, the only entry that may need to be modified is the **sysName**. That needs to be assigned the same name as the system that it is residing on. For example, the machine name is **MET63**, and that is its network name.

- g. Save the **snmpdm.cnf** file. Change its properties back to Read Only.
- h. From the dos prompt issue the command **net start snmp** to start the Microsoft SNMP service.
- i. From the dos prompt issue the command **snmpdm –start** to start SNMP Research Master Agent.

Make sure that the path includes the directory:

```
c:\snmp\emanate\sadk\w32.bin
```

- j. From the dos prompt issue the command **msnsaagt –start** to start SNMP Research Master Agent Adapter.

Make sure that the path includes the directory:

c:\snmp\emanate\sadk\w32.bin

NOTE. Steps 6 and 7 are to be followed if you want to use the third-party software, NetPlus Auto*Manage SNMP manager from AceComm, for demonstrating SNMP network management. You may choose not to use the NetPlus Auto*Manage manager if you have another SNMP manager.

6. Install the **NetPlus Auto*Manage** manager from AceComm by running **c:\snmp\winsnmp\Automanage99.exe**.

The Setup program prompts you for all necessary information and preferences, and copies all the necessary files to your destination disk.

The **NetPlus Auto*Manage** installation routine does not make changes to any of your system's configuration files (CONFIG.SYS, AUTOEXEC.BAT, WIN.INI, PROTOCOL.INI, SYSTEM.INI).

For a description of the files installed refer to the NetPlus Auto*Manage Help file under Installation Notes.

7. Make sure that the MIB you want to browse using the AceComm manager is in a known location. The PQM300 MIB is located at c:\Mib and is named WD_V2.mib

For Windows NT users only:

The **snmptrap.exe** provided here is a plug-in replacement for the one Microsoft provides.

NOTE. To remove and install the services: **snmpdm** and **msnsaagt**, use the following commands:

```
> snmpdm –remove  
> snmpfm –install  
> msnsaagt –remove  
> msnsaagt –install
```

If you do not already have the SNMPTRAP service installed, then it will auto-install as part of the setup process. You must be logged on as the administrator in order for the service to be installed.

If you install Auto*Manage as a user other than Administrator, you can install the SNMPTRAP service by logging on as Administrator and then running the NP_TRAPS application.

Also note that the SNMP Research utility called **traprcv** needs the SNMP TRAP service to be stopped before it is invoked. The AceComm NP_TRAPS utility needs the SNMP TRAP service be started for its proper usage. When NP_TRAPS is invoked, it automatically makes sure that SNMP TRAP service is installed and started.

Using the AceComm NetPlus Manager

If you install the AceComm NetPlus Manager, use the following procedure to configure the manager for demonstrating the SNMP manager and SNMP networking. The AceCoMM NetPlus SNPM manager is not supported by Tektronix.

1. Run the application **NP_MIB** for MIB compilation. Make sure not to overwrite any RFC***.ini or RFC***.dxt files that **NP_MIB** shows on the output file edit boxes. Just save the files with **WD.ini** and **WD.dxt** names or any other suitable file names.
2. If MIB compiles okay, launch the **NP_BROWZ** application for getting and setting the MIB variables. Make sure you are inquiring to the right context or IP address where the SNMP agent is running.
3. Run **NP_WALK** to do the MIB tree walk and demonstrate the MibII compatibility.

***NOTE.** For further information, refer to the NetPlus Auto*Manage Help file that is included with the NetPlus Auto*Manage software. You can get help by selecting Auto*Manage Help from the NetPlus AutoManage Program Group or by selecting the Help/Contents menu option of any of the NetPlus Auto*Manage applications.*

Set Display Properties

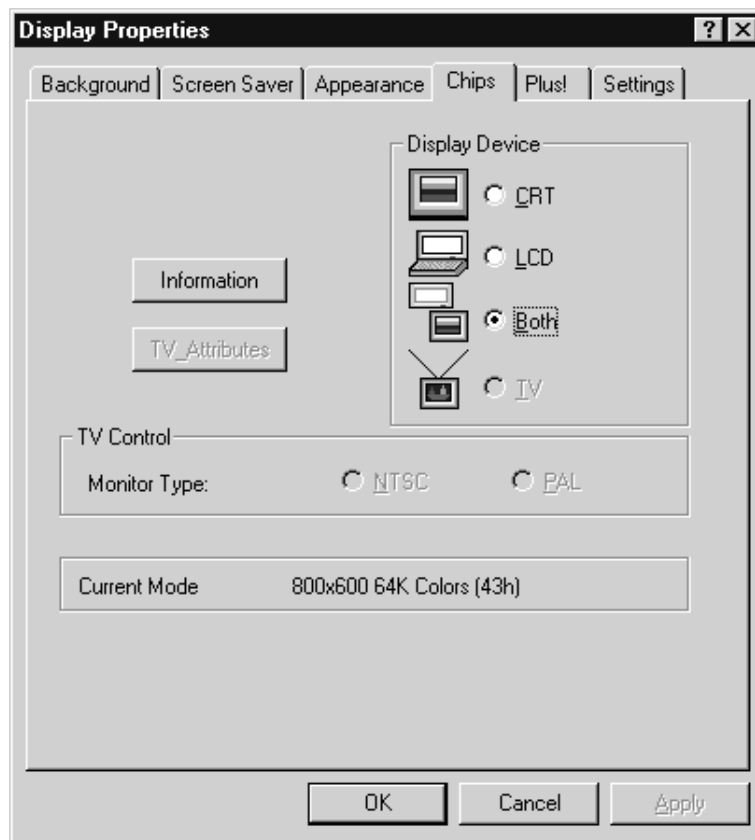
1. Click on **Start**→**Settings**→**Control Panel** and open the **Display** icon.
2. Select the **Settings** tab.
3. Set the **Desktop Area** size for **1024 by 768** pixels for external VGA operation only. If the PQM3FLC local control front panel display is installed, set the display size for **800 by 600** pixels.
4. Set the Color Palette to **65536** colors.
5. Set **Font Size** to **Large** fonts.
6. Hold down the shift key and insert the **Windows NT** CD when prompted.
7. After the CD has been read, remove the **Windows NT** CD from the CD drive.

8. Click **Apply** and **Yes** to restart the program monitor.

Setup for Flat Panel Display Boot Up

If you have a local flat panel display installed, the display settings must be selected to boot up in a mode that permits the flat panel display to operate. Use the following steps to make the setup.

1. Select **Start**→**Settings**→**Control Panel**, and then open **Display**.
2. In the **Display** screen, select the **Chips** tab, and then select **Both** (both VGA and LCD).



3. Click **Apply** to make the changes, and then click **OK**. This exits the **Display** control panel.
4. Open the **Display** controls again and select the **Settings** tab.
5. Click the **Desktop Area** slider to select **800 by 600** pixel format.
6. Select **65536** in the Color Palette.

7. Click **Apply** to make the change. The computer warns you that the settings have not been tested yet. Click **OK** to accept the changes anyway.
8. Click **OK** again to exit the Display Properties control panel.
9. Select **Start**→**Shutdown**, and then select to restart the computer.
10. Select **Yes** to shutdown the computer for a restart.
11. While the PQM300 is rebooting, press the **F2** key to enter the bios setup screen.
12. When the setup screen is displayed, press the **F6** key to select **Peripherals**.
13. Use the down arrow key to select the **VGA Boot Display** line.
14. Use the left or right arrow key to select **Simultaneous** (for both the VGA and the LCD flat panel display at boot up).
15. Press **ESC** to go to the main menu.
16. Press **F10** to go to Exit menu.
17. Select the **Exit Saving Changes** entry.
18. Select **Yes** to confirm saving configuration.

COM Port Setting

COM3 and COM4 may not be detected by Windows NT, so they need to be added manually.

1. Select **Start**→**Settings**→**Control Panel**, and then open **Ports**.
2. Click the **Add** button to add COM port.
3. Install two communication ports.
4. Configure COM1 as follows:

Input/Output Range:	3F8–03FF
Interrupt Request	10
Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

5. Configure COM2 as follows:

Input/Output Range:	2F8–02FF
Interrupt Request	03
Bits per second	9600
Data bits	8

Parity	None
Stop bits	1
Flow control	None

6. Configure COM3 as follows:

Input/Output Range:	03E8–03EF
Interrupt Request	04
Bits per second	2400
Data bits	8
Parity	None
Stop bits	1
Flow control	None

7. Configure COM4 as follows:

Input/Output Range:	02E8–02EF
Interrupt Request	03
Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

**Install the Touch-Base
SC3 Touch Screen Driver**

1. Insert the PQM300 Application CD into the CD drive.
2. From **Start** menu, run **D:\touchscreen\tnsetup.exe**. Note that if the D drive partition is installed, the files on the CD are in drive e.
3. Select touch screen type:
DynaPro – Serial, SC3
4. Click **Next** to continue.
5. Ensure that the COM3 port settings are as given in step 6 of the previous *Com Port Settings* procedure.
6. Reboot the system. If the PQM300 has a flat panel display with touch screen installed, continue with the following steps:
7. From **Start** menu, select **Programs→Touch→TouchScreen Control**.
8. In the Touch Screen Control Program screen, click the **Calibrate** button.
9. Follow the on-screen instruction to calibrate the touch screen. Use one of the styluses provided with this kit to touch the screen at the calibration points.
10. Click on the **OK** box using the mouse.
11. Select **Exit** to leave the Touch Screen Control Program.

Install the Alarm Relay Board Driver

The relay board driver and the relay user-interface software are loaded as part of the Version 2.0 software. The user interface software is loaded from the PQM300 application disc when the PQM300 application is loaded. The relay driver is provided by a third party and must be loaded with that suppliers installation software. That installation is provided on the PQM300 application CD.

1. Hold down the shift key and insert the PQM300 application CD in the CD drive.
2. From **Start** menu, select **Run** and type:

E:\RelayBoard\Setup.exe.

3. When asked if you want to install the Universal Library, select **Yes** and follow the instructions provided.
4. Accept the defaults for the loading instructions with the following exception: install the driver in the **D** drive rather than the default **C** drive.
5. At the prompt to restart the computer, do not restart if you are going to load the PQM300 Application files next.

Install PQM300 Application Files

1. Open and close the CD drive door to start the PQM300 Auto Install routine.
2. Click Next, Next, etc. to load program files. The PQM300 executable files are loaded in the **D:\PQM300\bin** directory.
3. When the files have finished loading, remove the CD from the drive and reboot the computer.

Assign a Community Name to the Program Monitor

If you are going to monitor PQM300 program monitors operating in different locations, it is important that a unique community name be given to each PQM300 program monitor so that they can be readily identified. Set up a community name plan so that you can identify the monitor site and the PQM300 when making connections and channel measurement configurations. Assign the PQM300 program monitor a community name as follows:

1. Use the explorer to navigate to the **D:\PQM300** directory.

NOTE. The following file is generated after the **SNMP** service is first started.

2. Open the pqm300Snmp.dbsnap file with Notepad and modify the value= line to change the community name from the factory default.

```
names={
  Snmp={
    CommunityName
  }
},
```

```

values={
  Snmp.CommunityName={
    perm= RWRW,
    DbString={
      value="PQM2"
    }
  }
}

```

3. Save and close the file.

Create an Emergency Repair Disk

To create an emergency repair disk, mark a high density, 3.5-inch disk clearly as the emergency repair disk for program monitor serial number B01nnnn (the serial number of your program monitor), and then perform the following steps.

NOTE. The emergency repair disk is program monitor-specific. Make sure that the emergency repair disk is clearly marked with its program monitor serial number. The serial number of your PQM300 Program QoS Monitor appears on the original emergency repair disk and on the server rear panel, near the power input connector.

1. Choose **Run** from the Windows NT Start menu.
2. Type `rdisk` in the Run dialog box. The Repair Disk Utility dialog box, as shown in Figure C-2, opens.

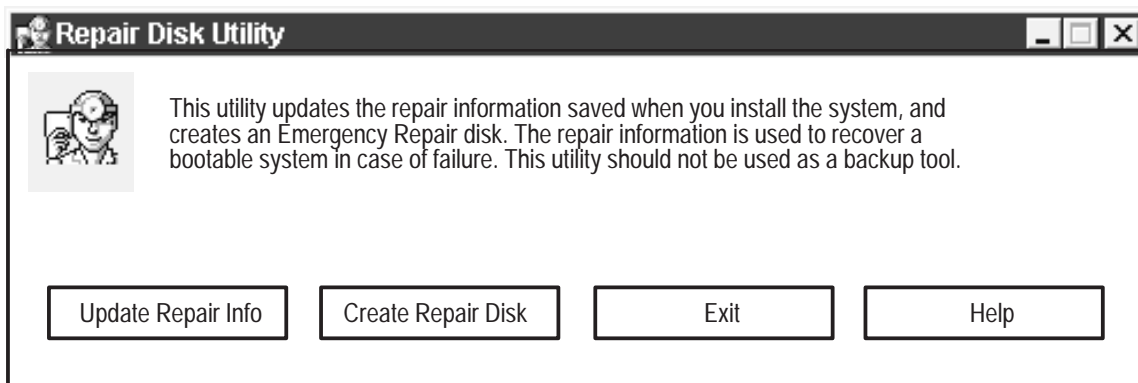


Figure C-2: The Repair Disk dialog box

3. Click **Update Repair Info** to save your current configuration. A message appears to remind you that earlier repair information is overwritten. Click **Yes** to continue.

4. When the process is complete, a message appears to ask if you wish to create an Emergency Repair Disk. Click **Yes**. The message shown in Figure C-3 appears.

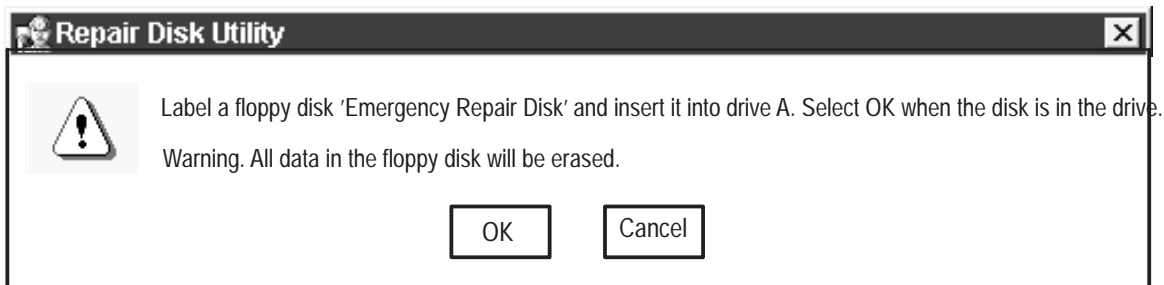


Figure C-3: Repair disk preparation

5. Insert a 3.5-inch disk in drive A and click **OK**. Rdisk formats the disk and copies the configuration files onto it.
6. When the operation is complete, click **Exit** in the Repair Disk Utility dialog box. Remove the disk from drive A and keep it in a safe place.

Using the Emergency Repair Disk

Always refer to the Windows NT documentation if you need more information.

1. Verify that you have a source of setup information available (the Windows NT back-up software package).
2. Insert the Windows NT Setup disk.
3. Restart the program monitor.
4. When the Windows NT Setup Screen appears, press R (repair).
5. When prompted, insert the emergency repair disk.
6. The emergency repair disk performs the following:
 - Runs CHKDSK.EXE on the WINNT and SYSTEM partitions.
 - Verifies each file in the installation and replaces any that are missing or corrupt.
 - Replaces the System, Security, and Security Accounts Manager hives in the registry.
 - Reinstalls the Boot Loader (the boot sector, BOOT.INI, etc.).

Appendix D: SNMP Networking

You can use third party software for SNMP network control for the management application. If you have an SNMP network manager installed to control your networked devices, the PQM300 MIB and SNMP agent supplied with the application software can be added to the system. An SNMP networking icon appears on the desktop of the program monitor with Version 2.0 software installed. Start the SNMP server by clicking on the icon and pressing enter.

SNMP Installation

The PQM300 Program QoS Monitor comes preconfigured for SNPM networking. However, certain of the files have to be modified for the system in which it is installed. Use the following steps to made the file modifications needed if not already done as part of the installation process (refer to *Installing and Using SNMP Services* on page C-10 in *Appendix C*.

1. Use the explorer to navigate to the “c:\etc\srconf” directory. Open and modify the file “c:\etc\srconf\agt\snmpdm.cnf” as follows:
 - a. From the dos prompt issue the command “net stop snmp” to stop the Microsoft SNMP service.
 - b. From the dos prompt issue the command “snmpdm –stop” to stop SNMP Research Master Agent.
 - c. From the dos prompt issue the command “msnsaagt –stop” to stop SNMP Research Master Agent Adapter.
 - d. Undo the Read Only properties of the “c:\etc\srconf\agt\snmpdm.cnf” file so that you can modify it.
 - e. Edit the sections “#Entry type: snmpNotifyEntry” and “#Entry type: snmpTargetAddrEntry” to add as many snmpNotifyEntry and snmpTargetAddrEntry lines as your notify/trap destinations.

Make sure the snmpNotifyTags are unique integers for each line. Follow the same syntax as the previous lines.

This is basically all that is needed to be modified for manager to send and receive traps. For MIB browsing, the only entry that you may need to modify is the “sysName.” It needs to be assigned the same name as the system which it is residing on. For example, the machine name is “MET63” which is its network name.

- f. Save the “snmpdm.cnf” file. Change its properties back to Read Only.

- g. From the dos prompt issue the command “net start snmp” to start the Microsoft SNMP service.
 - h. From the dos prompt issue the command “snmpdm –start” to start SNMP Research Master Agent.
 - i. From the dos prompt issue the command “msnsaaagt –start” to start SNMP Research Master Agent Adapter.
2. If you as going to monitor PQM300 program monitors operating in different locations, it is important that a unique community name be given to the PQM300 so that it can be readily identified. Set up a community name plan so that you can identify the monitor site and the PQM300 when making connections and channel measurement configurations. Assign the PQM300 program monitor a community name as follows:
- a. Use the explorer to navigate to the D:\PQM300 directory. Open the pqm300Snmp.dbsnap file and modify the value= line to change the community name from the factory default.

```
names={
  Snmp={
    CommunityName
  }
},
values={
  Snmp.CommunityName={
    perm=_RWRW,
    DbString={
      value="PQM2"
    }
  }
}
```

- b. Save and close the file.

NOTE. *If you change the name of the computer from the factory default, you should also change the name in file used to locate the computer through the Web and through the WindowsNT network. See Configure the Network Properties on page 1–14 for that procedure.*

Summary of SNMP Terms

SNMP uses many terms to name its elements. These terms are defined in detail throughout the rfc source documents. Definitions of some terms excerpted from the source documents are included in the *Glossary* section of this manual.

SNMP Agent An SNMP agent is a processing entity that conveys the management information between the agent and the management station.

MIB The PQM300 management information base (MIB) provides the information needed to control the operation, configure the measurements, and monitor the activity of the program monitor from a management station.

***NOTE.** The MIB file shipped with the PQM300 application contains the dual-channel measurements that are not yet supported in the product. Those terms are omitted from the manual MIB tables and from the on-line help MIB tables.*

Management information is viewed as a collection of managed objects. Collections of related objects are defined in MIB modules that comply with the protocols for SNMPv2.

The PQM300 MIB uses the following SNMPv2 documents:

- Structure of Management Information – SNMPv2 – SMI (rfc1902)
- Textual Conventions – SNMPv2 – TC (rfc1903)
- Conformance Statements – SNMPv2 – CONF (rfc1904)

You can access the reference documents through the Internet at the following URLs:

- <http://www.cis.ohio-state.edu/htbin/rfc/rfc1902.html>
- <http://www.cis.ohio-state.edu/htbin/rfc/rfc1903.html>
- <http://www.cis.ohio-state.edu/htbin/rfc/rfc1904.html>

The index page for these documents and the other rfc documents of the *Network Working Group* is at the following URL:

- <http://www.cis.ohio-state.edu/htbin/rfc/INDEX.rfc.html>

PQM300 MIB Definitions The following imports are included:

- Module-Identity, Object-Type, Notification-Type, Integer 32, enterprises from SNMPv2-SMI

Textual-Conventions, RowStatus, DisplayString from SNMPv2-TC

Module-Compliance, Object Groups from SNMPv2-Conf

Object Descriptions. Descriptions for Group and Table are as follows:

```

tek          OBJECT IDENTIFIER ::= { enterprises 128 }
tvf         OBJECT IDENTIFIER ::= { tek 5 }
tvf products OBJECT IDENTIFIER ::= { tvf 1 }
tvfmibs     OBJECT IDENTIFIER ::= { tvf 2 }
pqm300     OBJECT IDENTIFIER ::= { tvfproducts 5 }
    
```

MIB Tables. The MIB module tables describe the control statements for the program monitor. The management information base tables begin with the PQM300 Textual Conventions.

Table D-1: PQM Objects textual conventions

Object identifier	Description	Syntax
PqmString	Pqm 65 kb Octet String	OCTET STRING (SIZE(0 . . . 63535))
PqmFloatString	Type to represent floating point values. The value is express as the ASCII representation of the floating point value in the format sD.DDDDEsDD where 's' is a plus or minus sign, 'D' is a digit, 'E' is a letter E. For example, -3.17234E+10 and +5.00005E-02.	DisplayString(SIZE(12))
PqmStopType	Pqm Start/Stop Status	INTEGER { undefined (-1) stop (1) }
PqmMeasureStartType	Pqm measure Start command	INTEGER { undefined (-1) start (1) }
PqmMeasureStopType	Pqm measure Stop command	INTEGER { undefined (-1) stop (1) }

Table D-1: PQM Objects textual conventions (Cont.)

Object identifier	Description	Syntax
PqmBoardType	Number of boards in the PQM system	INTEGER { undefined (-1) boardOne (1) boardTwo (2) boardThree (3) boardFour (4) boardFive (5) boardSix (6) boardSeven (7) boardEight (8) }
PqmMeasureActiveType	Whether a particular measurement is Active or Not	INTEGER { undefined (-1) notActive (0) active (1) }
PqmSlotType	Number of slots in the PQM system	INTEGER { undefined (-1) slotOne (1) slotTwo (2) slotThree (3) slotFour (4) slotFive (5) slotSix (6) slotSeven (7) slotEight (8) }
PqmInputChannelsType	Number of Input Channels per board	INTEGER { undefined (-1) one (1) two (2) }
PqmOutputChannelsType	Number of Output Channels per board	INTEGER { undefined (-1) one (1) two (2) }
PqmMeasureType	Type of Measurement – single channel or dual channel	INTEGER { undefined (-1) single (1) dual (2) }
PqmMeasureAutoManual	Measurement – Automatic or Manual	INTEGER { undefined (-1) auto (0) manual (1) }

Table D-1: PQM Objects textual conventions (Cont.)

Object identifier	Description	Syntax
PqmSingleChanneMeasurements	Measurement algorithms for single-channel measurements	INTEGER { undefined (-1) blockiness (0) freezeFrame (1) noise (2) videoAbsent (3) }
PqmVideoStandardType	Video standards supported by the PQM	INTEGER { undefined (-1) standardUnspecified (0) standardNone (1) standardNTSC (2) standardPAL (3) }
PqmFileType	Directory types for PQM files – regular, directory, special	INTEGER { unspecified (-1) regular (0) directory (1) special (2) }
PqmFileAccessType	Directory access types for PQM files – readable, writable, read-writable	INTEGER { unspecified (0) readable (1) writable (2) readWritable (3) }
PqmAlarmType	PQM300 alarms	INTEGER { undefined (-1) alarmOff (0) alarmOn (1) }
PqmSubsystemStatus	PQM300 core layer ready / notReady	INTEGER { undefined (-1) notReady (0) ready (1) }
PqmVideoType	PQM300 Video type analog / digital	INTEGER { undefined (-1) analog (0) digital (1) }

Table D-2: PQM general information group

Object identifier	Object type
pqmGenInofGroup OBJECT IDENTIFIER ::= { pqm300Objects 1 }	
pqmIndexTrap SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmGenInfoGroup 1 }	Unsigned32 read-only "Trap Group Index"
pqmCommunityName SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmGenInfoGroup 2 }	PqmString read-only "Pqm Community Name" The Community Name can be assigned as part of the installation of the PQM300 onto a network. The name is passed from a file that you can edit to assign a name other than the default name assigned at the factory (refer to <i>SNMP Installation</i> on page D-1).
pqmStopSystem SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmGenInfoGroup 3 }	PqmStopType read-write "Pqm300 Stop only, for future implementation." Pqm300 start is measurement dependent so there is NO global start. System starts measurements on invocation of system logon."
pqmLastDataErr SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmGenInfoGroup 4 }	DateAndTime read-only "Last Date and Time Error"
pqmMachineName SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmGenInfoGroup 5 }	PqmString accessible-for-notify "The machine name or network name of the PQM300 from where the SNMP client or the Java server or the pqmCore is running."

Table D-2: PQM general information group (Cont.)

Object identifier	Object type
<p>pqmChannelName</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmGenInfoGroup 6 }</p>	<p>PqmString</p> <p>accessible-for-notify</p> <p>"The channel name (logical board name) of the PQM300 on which the SNMP trap occurs (for example CBS, ABC, CSPAN, etc.)"</p>
<p>pqmListSlots</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmGenInfoGroup 7 }</p>	<p>PqmString</p> <p>accessible-for-notify</p> <p>"The Slot Number string containing slot numbers of the PQM300 boards. For example, boards 1, 2, and 3 are in slots 1, 5, 7."</p>
<p>pqmNumBoards</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmGenInfoGroup 8 }</p>	<p>INTEGER (1 . . . 8)</p> <p>accessible-for-notify</p> <p>"The Total number of channels or boards on the PQM300. One to one correspondence currently."</p>

Table D-3: PQM state group

Object identifier	Object type
<p>pqmStateInofGroup OBJECT IDENTIFIER ::= { pqm300Objects 2 }</p>	
<p>pqmCoreReady</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmStateInfoGroup 1 }</p>	<p>PqmSubsystemsStatus</p> <p>read-only</p> <p>"Check if PQM300 database subsystem is up and running."</p>

Table D-3: PQM state group (Cont.)

Object identifier	Object type
<p>pqmlpReady</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmStateInfoGroup 2 }</p>	<p>PqmSubsystemsStatus</p> <p>read-only</p> <p>"Check if PQM300 IP subsystem is up and running."</p>
<p>pqmSnmpReady</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmStateInfoGroup 3 }</p>	<p>PqmSubsystemsStatus</p> <p>read-only</p> <p>"Check if PQM300 SNMP subsystem is up and running."</p>

Blockiness Measurement Configuration Table. The next table characterizes the Blockiness measurements of the PQM300 program monitor. For a given board number and the input channel number, all the blockiness measurement parameters for measurement configuration, status, and output (measurement results) can be described. Similar tables are defined for all measurement algorithms. When you make measurement configurations in SNMP, it is recommended that you configure only one measurement per board at a time.

Table D-4: PQM Blockiness configuration table

Object identifier	Object type
<p>pqmBlockinessConfigTable</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmObjects 3 }</p>	<p>Sequence of PqmBlockinessConfigEntry</p> <p>not accessible</p> <p>"This read-create table describes all the blockiness measurements possible per board and input channel. The manager creates the blockiness measurement entry given two resources – the board and the input channel. A stream entity is created through a row creation process, governed by the RowStatus object. Refer to RFC1093 for details. Currently this row status is not implemented"</p>
<p>pqmBlockinessConfigEntry</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>INDEX</p> <p>::= { pqmBlockinessConfigTable 1 }</p>	<p>PqmBlockinessConfigEntry</p> <p>not accessible</p> <p>"This entry defines double indexing based on the number of boards, from 1 to 8, and the number of channels, 1 or 2 per board. Each board and input channel combination will have all the configurations defined for the combination. The list of configurations is defined in the PqmBlockinessConfigEntry section."</p> <p>{ pqmBlockinessBoardNum, pqmBlockinessInputChan }</p>

Table D-4: PQM Blockiness configuration table (Cont.)

Object identifier	Object type
DESCRIPTION ::= { pqmBlockinessConfigEntry 4 }	"Start the Blockiness measurement – start (1). This is a transient trigger type command. On reading, the value returned is always 0."
pqmBlockinessStop SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmBlockinessConfigEntry 5 }	PqmMeasureStopType read-write "Stop the Blockiness measurement – stop (1). This is a transient trigger type command. On reading, the value returned is always 0."
pqmBlockinessVideoStdOnInput SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmBlockinessConfigEntry 6 }	PqmVideoStandardType read-only "Video standard for the incoming video on the input channel."
pqmBlockinessPeriod SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmBlockinessConfigEntry 7 }	Ineger32 read-write "Block period that describes the block width in pixels."
pqmBlockinessAdaptive SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmBlockinessConfigEntry 8 }	INTEGER (0 . . 1) read-write "Block period is adaptive – on or off."
pqmBlockinessAlarmLevel SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmBlockinessConfigEntry 9 }	Integer32 read-write "The Alarm Level value is the value of the amount of blockiness above which an alarm is generated."

Table D-4: PQM Blockiness configuration table (Cont.)

Object identifier	Object type
pqmBlockinessAlarmInterval SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmBlockinessConfigEntry 10 }	Integer32 read-write "When the number of successive frames with a blockiness value above the Alarm Level exceeds the Alarm Interval number, report an alarm."
pqmBlockinessAlarmPercent SYNTAX MAX-ACCESS DESCRIPTION ::= { pqmBlockinessConfigEntry 11 }	Integer32 read-write "When the peak blockiness value reported exceeds the Alarm Level a certain number of times per unit of time (#exceed/time), report an alarm."

Noise Configuration Table. The Noise Configuration table characterizes the Noise measurement on the PQM300 system. For a given board number, and the input channel number, all the Noise measurement parameters for measurement configuration, status, and output (measurement results) can be described throughout the PQM300 system. When you make measurement configurations in SNMP, it is recommended that you configure only one measurement per board at a time.

Table D-5: PQM Noise configuration table

Object identifier	Object type
pqmNoiseConfigTable SYNTAX MAX-ACCESS DESCRIPTION ::= { pqm300Objects 4 }	Sequence of PqmNoiseConfigEntry not-accessible "This read-create table describes all the noise measurements possible per board and input channel. The manager creates the noise measurement entry given two resources – the board and the input channel. A stream entity is created through a row creation process, governed by the RowStatus object. Refer to RFC1093 for details. Currently, this RowStatus is not implemented"

Table D-5: PQM Noise configuration table (Cont.)

Object identifier	Object type
<p>pqmNoiseConfigEntry</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>INDEX</p> <p>::= { pqmNoiseConfigTable 1 }</p>	<p>PqmNoiseConfigEntry</p> <p>not-accessible</p> <p>"This defines double indexing based on the number of boards – from 1 to 8 and the number of inputs channels – either 1 or 2 per board. Each board and input channel combination will have all the configurations defined for it. The list configurations are defined in the PqmNoiseConfigEntry section."</p> <p>{ pqmNoiseBoardNum, pqmNoiseInputChan }</p>
<p>pqmNoiseConfigEntry ::=</p> <p>SEQUENCE {</p> <p> pqmNoiseBoardNum</p> <p> pqmNoiseInputChan</p> <p> pqmNoiseMeasureStatus</p> <p> pqmNoiseStart</p> <p> pqmNoiseStop</p> <p> pqmNoiseVideoStdOnInput</p> <p> pqmNoiseAlarmLevel</p> <p> pqmNoiseAlarmInterval</p> <p> pqmNoiseAlarmPercent</p> <p>}</p>	<p>INTEGER (1 . . . 8)</p> <p>PqmInputChannelsType</p> <p>PqmMeasureActiveType</p> <p>PqmMeasureStartType</p> <p>PqmMeasureStopType</p> <p>PqmVideoStandardType</p> <p>Integer32</p> <p>Integer32</p> <p>Integer32</p>
<p>pqmNoiseBoardNum</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmNoiseConfigEntry 1 }</p>	<p>INTEGER (1 . . . 8)</p> <p>read-only</p> <p>"The board index number – BoardOne (1) to BoardEight (8)."</p>
<p>pqmNoiseInputChan</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmNoiseConfigEntry 2 }</p>	<p>PqmInputChannelsType</p> <p>read-only</p> <p>"Board input channel designation – One (1) or Two (2)"</p>

Table D-5: PQM Noise configuration table (Cont.)

Object identifier	Object type
<p>pqmNoiseMeasureStatus</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmNoiseConfigEntry 3 }</p>	<p>PqmMeasureActiveType</p> <p>read-only</p> <p>"Indicates whether the Noise measurement is active or not active for the given board and input channel combination. It is assumed that the board and the input channel uniquely identify all the measurement types."</p>
<p>pqmNoiseStart</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmNoiseConfigEntry 4 }</p>	<p>PqmMeasureStartType</p> <p>read-write</p> <p>"Start the Noise measurement – start (1). Start is a transient trigger type command. On reading, the value returned is always 0."</p>
<p>pqmNoiseStop</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmNoiseConfigEntry 5 }</p>	<p>PqmMeasureStopType</p> <p>read-write</p> <p>"Stop the Noise measurement – stop (1). Stop is a transient trigger type command. On reading, the value returned is always 0."</p>
<p>pqmNoiseVideoStdOnInput</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmNoiseConfigEntry 6 }</p>	<p>PqmVideoStandardType</p> <p>read-only</p> <p>"Video standard for the incoming video on the input channel."</p>
<p>pqmNoiseAlarmLevel</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmNoiseConfigEntry 7 }</p>	<p>Integer32</p> <p>read-write</p> <p>"Threshold value is the amount of noise above which an alarm is generated."</p>

Table D-5: PQM Noise configuration table (Cont.)

Object identifier	Object type
<p>pqmNoiseAlarmInterval</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmNoiseConfigEntry 8 }</p>	<p>Integer32</p> <p>read-write</p> <p>"When a number of frames with a noise value above the alarm level threshold exceed the percent setting of the alarm interval number, report an alarm."</p>
<p>pqmNoiseAlarmPercent</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmNoiseConfigEntry 9 }</p>	<p>Integer32</p> <p>read-write</p> <p>"When the peak noise value reported exceeds the alarm level threshold for a certain number of times per unit of time (#exceed/time), report an alarm."</p>

Freeze Frame Configuration Table. The Freeze Frame Configuration table characterizes the Freeze Frame measurement on the PQM300 system. For a given board number, and the input channel number, all the repeated frame measurement parameters for measurement configuration, status, and output (measurement results) can be described throughout the PQM300 system.

Freeze Frame Alarm Interval indicates an integer number of frames that need to be repeated to generate an Alarm condition. Freeze Frame Alarm Percent indicates how many times per unit time these Alarm Level number of frames are repeated. Freeze Frame Video Type is used to indicate if the program source is digital or analog.

When you make measurement configurations in SNMP, it is recommended that you configure only one measurement per board at a time.

Table D-6: PQM Freeze Frame configuration table

Object identifier	Object type
<p>pqmFreezeFrameConfigTable</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmObjects 5 }</p>	<p>Sequence of PqmFreezeFrameConfigEntry</p> <p>not-accessible</p> <p>"This read-create table describes all the Freeze Frame measurements possible per board and input channel. The manager creates the Freeze Frame measurement entry given two resources – the board and the input channel. A stream entity is created through a row creation process, governed by the RowStatus object. Refer to RFC1093 for details. Currently, this RowStatus is not implemented."</p>
<p>pqmFreezeFrameConfigEntry</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>INDEX</p> <p>::= { pqmFreezeFrameConfig Table 1 }</p>	<p>PqmFreezeFrameConfigEntry</p> <p>not-accessible</p> <p>"This defines double indexing based on the number of boards – from 1 to 8 and the number of inputs channels – either 1 or 2 per board. Each board and input channel combination will have all the configurations defined for it. The list of configurations are defined in the PqmFreezeFrameConfigEntry."</p> <p>{ pqmFreezeFrameBoardNum, pqmFreezeFrameInputChan }</p>
<p>pqmFreezeFrameConfigEntry ::= SEQUENCE {</p> <p>pqmFreezeFrameBoardNum</p> <p>pqmFreezeFrameInputChan</p> <p>pqmFreezeFrameMeasureStatus</p> <p>pqmFreezeFrameStart</p> <p>pqmFreezeFrameStop</p> <p>pqmFreezeFrameVideoStd</p> <p>OnInput</p> <p>pqmFreezeFrameAlarmInterval</p> <p>pqmFreezeFrameAlarmPercent</p> <p>pqmFreezeFrameVideoInputType</p> <p>}</p>	<p>INTEGER (1 . . . 8)</p> <p>PqmInputChannelsType</p> <p>PqmMeasureActiveType</p> <p>PqmMeasureStartType</p> <p>PqmMeasureStopType</p> <p>PqmVideoStandardType</p> <p>Integer32</p> <p>Integer32</p> <p>PQMVideoType</p>

Table D-6: PQM Freeze Frame configuration table (Cont.)

Object identifier	Object type
<p>pqmFreezeFrameBoardNum</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmFreezeFrameConfig Entry 1 }</p>	<p>INTEGER (1 . . . 8)</p> <p>read-only</p> <p>"The board index number – BoardOne (1) to BoardEight (8)."</p>
<p>pqmFreezeFrameInputChan</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmFreezeFrameConfig Entry 2 }</p>	<p>PqmInputChannelsType</p> <p>read-only</p> <p>"Board input channel designation – One (1) or Two (2)"</p>
<p>pqmFreezeFrameMeasureStatus</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmFreezeFrameConfig Entry 3 }</p>	<p>PqmMeasureActiveType</p> <p>read-only</p> <p>"Indicates whether the Freeze Frame measurement is active or not active for the given board and input channel combination. It is assumed that the board number and the input channel uniquely identify all the measurement types."</p>
<p>pqmFreezeFrameStart</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmFreezeFrameConfig Entry 4 }</p>	<p>PqmMeasureStartType</p> <p>read-write</p> <p>"Start the Freeze Frame measurement – start (1). This is a transient trigger type. On reading, the value returned is always zero (0)."</p>
<p>pqmFreezeFrameStop</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmFreezeFrameConfig Entry 5 }</p>	<p>PqmMeasureStopType</p> <p>read-write</p> <p>"Stop the Freeze Frame measurement – stop (0). This is a transient trigger type. On reading, the value returned is always zero (0)."</p>

Table D-6: PQM Freeze Frame configuration table (Cont.)

Object identifier	Object type
<p>pqmFreezeFrameVideoStdOnInput</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmFreezeFrameConfig Entry 6 }</p>	<p>PqmVideoStandardType</p> <p>read-only</p> <p>"Video standard for the incoming video on the input channel."</p>
<p>pqmFreezeFrameAlarmInterval</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmFreezeFrameConfig Entry 7 }</p>	<p>Integer32</p> <p>read-write</p> <p>"The Alarm Interval value is time interval in which, if the percentage of frozen frames is above the Alarm Percent, an alarm is generated."</p>
<p>pqmFreezeFrameAlarmPercent</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmFreezeFrameConfig Entry 8 }</p>	<p>Integer32</p> <p>read-write</p> <p>"The Alarm Percent is the amount of frozen frame time per unit of time (Alarm Interval) permitted without an alarm being generated."</p>
<p>pqmFreezeFrameVideoInputType</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmFreezeFrameConfig Entry 9 }</p>	<p>PqmVideoType</p> <p>read-write</p> <p>"Input video type for the freeze frame algorithm – analog (0) or digital (1)."</p>

Signal Absent Configuration Table. The Signal Absent Configuration table characterizes the Signal Absent indication for an input channel. For a given board number and input channel number, the video standard is checked.

Signal absent is typically not a measurement. It is an indication of whether or not a 601 digital video signal is present. If the video standard is “standardUnspecified(0)” or “standardNone(1),” the signal is absent on the input.

Table D-7: PQM Signal Absent configuration table

Object identifier	Object type
<p>pqmSignalAbsentConfigTable</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p> ::= { pqm300Objects 6 }</p>	<p>Sequence of PqmSignalAbsentConfigEntry</p> <p>not-accessible</p> <p>“This read-create table describes all the Signal Absent measurements possible per board and input channel. The manager creates the Signal Absent measurement entry given two resources – the board and the input channel. A stream entity is created through a row creation process, governed by the RowStatus object. Refer to RFC1903 for details. Currently, this RowStatus is not implemented.”</p>
<p>pqmSignalAbsentConfigEntry</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>INDEX</p> <p> ::= { pqmSignalAbsentConfigTable 1 }</p>	<p>PqmSignalAbsentConfigEntry</p> <p>not-accessible</p> <p>“This defines double indexing based on the number of boards – from 1 to 8 and the number of inputs channels – either 1 or 2 per board. Each board and input channel combination will have all the configurations defined for it. The list of configurations is defined in the PqmSignalAbsentConfigEntry.”</p> <p>{ pqmSignalAbsentBoardNum, pqmSignalAbsentInputChan }</p>
<p>pqmSignalAbsentConfigEntry ::= SEQUENCE {</p> <p>pqmSignalAbsentBoardNum</p> <p>pqmSignalAbsentInputChan</p> <p>pqmSignalAbsentVideoStd</p> <p>OnInput</p> <p>}</p>	<p>INTEGER (1 . . . 8)</p> <p>PqmInputChannelsType</p> <p>PqmVideoStandardType</p>

Table D-7: PQM Signal Absent configuration table (Cont.)

Object identifier	Object type
<p>pqmSignalAbsentBoardNum</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmSignalAbsentConfig Entry 1 }</p>	<p>INTEGER (1 . . . 8)</p> <p>read-only</p> <p>"The board index number – BoardOne (1) to BoardEight (8)."</p>
<p>pqmSignalAbsentInputChan</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmSignalAbsentConfig Entry 2 }</p>	<p>PqmInputChannelsType</p> <p>read-only</p> <p>"Board input channel designation – One (1) or Two (2)"</p>
<p>pqmSignalAbsentVideoStdOnInput</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmSignalAbsentConfig Entry 3 }</p>	<p>PqmVideoStandardType</p> <p>read-only</p> <p>"Video standard for the incoming video on the input channel."</p>

Channel Name Configuration Table. This table characterises the PQM channel naming for the input channel on a program monitor board. For a given board number, name the channel name, for example “ABC”, “NBC”, “PAX”, etc.

Table D-8: PQM Channel Name configuration table

Object identifier	Object type
<p>pqmChannelNameTable</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqm300Objects 10 }</p>	<p>Sequence of PqmChannelNameEntry</p> <p>not-accessible</p> <p>“A description of all the PQM Channel Names that can be set per board.”</p>
<p>pqmChannelNameEntry</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>INDEX</p> <p>::= { pqmChannelNameTable 1 }</p>	<p>PqmChannelNameEntry</p> <p>not-accessible</p> <p>“This defines single indexing based on the number of boards, which is fixed in the range 1 to 8. The list of configurations is defined in the PQMChannelNameEntry section.”</p> <p>(pqmBoardNum)</p>
<p>pqmChannelNameEntry ::=</p> <p>SEQUENCE {</p> <p> pqmBoardNum</p> <p> pqmInputChanName</p> <p>}</p>	<p>INTEGER (1 . . . 8)</p> <p>PqmString</p>
<p>pqmBoardNum</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmChannelNameEntry 1 }</p>	<p>INTEGER (1 . . . 8)</p> <p>read-only</p> <p>“The board index number, which goes from BoardOne (1) to BoardEight (8).”</p>
<p>pqmInputChanName</p> <p>SYNTAX</p> <p>MAX-ACCESS</p> <p>DESCRIPTION</p> <p>::= { pqmChannelNameEntry 2 }</p>	<p>PqmString</p> <p>read-write</p> <p>“Board input channel name – user enters this string.”</p>

Table D-9: Trap descriptions (Cont.)

Information traps	Notification type
pqmSignalAbsentTrap	
OBJECTS	{ pqmIndexTrap, pqmCommunityName, pqmSignalAbsentThreshold }
DESCRIPTION	"Pqm Trap generated based on the Signal Absent alarm set in the database. This alarm is set if the video standard on the input channel is standardUnspecified or standardNone."
::= { pqmTrapPrefix 6 }	

Conformance Group Descriptions

pqmConformance Object Identifier ::= { pqm300MIB 3 }
 pqmGroups Object Identifier ::= { pqmConformance 1 }
 pqmCompliances Object Identifier ::= { pqmConformance 2 }

Table D-10: Conformance group descriptions

Object identifier	Object group
pqmGenGroup	
OBJECTS	{ pqmCommunityName pqmStopSystem pqmLastDateErr pqmCoreReady pqmIpReady pqmSnmpReady pqmMachineName pqmChannelName pqmListSlots pqmNumBoards }
DESCRIPTION	"A collection of objects providing information applicable to PQM General Resources."
::= { pqmGroups 1 }	

Table D-10: Conformance group descriptions (Cont.)

Object identifier	Object group
<p>pqmBlockinessConfigGroup</p> <p>OBJECTS</p> <p>DESCRIPTION</p> <p>::= { pqmGroups 2 }</p>	<pre>{ pqmBlockinessBoardNum pqmBlockinessInputChan pqmBlockinessMeasureStatus pqmBlockinessStart pqmBlockinessStop pqmBlockinessVideoStdOnInput pqmBlockinessPeriod pqmBlockinessAdaptive pqmBlockinessAlarmLevel pqmBlockinessAlarmInterval pqmBlockinessAlarmPercent }</pre> <p>"A collection of objects providing information applicable to PQM Blockiness Measurement configuration items. Each measurement is defined in terms of hardware board and the input channel number where the incoming video is measured."</p>
<p>pqmNoiseConfigGroup</p> <p>OBJECTS</p> <p>DESCRIPTION</p> <p>::= { pqmGroups 3 }</p>	<pre>{ pqmNoiseBoardNum pqmNoiseInputChan pqmNoiseMeasureStatus pqmNoiseStart pqmNoiseStop pqmNoiseVideoStdOnInput pqmNoiseAlarmLevel pqmNoiseAlarmInterval pqmNoiseAlarmPercent }</pre> <p>"A collection of objects providing information applicable to PQM Noise Measurement configuration items. Each measurement is defined in terms of hardware board and the input channel number where the incoming video is measured."</p>

Table D-10: Conformance group descriptions (Cont.)

Object identifier	Object group
<p>pqmFreezeFrameConfigGroup</p> <p>OBJECTS</p> <p>DESCRIPTION</p> <p>::= { pqmGroups 4 }</p>	<pre>{ pqmFreezeFrameBoardNum pqmFreezeFrameInputChan pqmFreezeFrameMeasureStatus pqmFreezeFrameStart pqmFreezeFrameStop pqmFreezeFrameVideoStdOnInput pqmFreezeFrameAlarmInterval pqmFreezeFrameAlarmPercent pqmFreezeFrameVideoInputType }</pre> <p>"A collection of objects providing information applicable to PQM Freeze Frame Measurement configuration items. Each measurement is defined in terms of hardware board and the input channel number where the incoming video is measured."</p>
<p>pqmSignalAbsentConfigGroup</p> <p>OBJECTS</p> <p>DESCRIPTION</p> <p>::= { pqmGroups 5 }</p>	<pre>{ pqmSignalAbsentBoardNum pqmSignalAbsentInputChan pqmSignalAbsentVideoStdOnInput }</pre> <p>"A collection of objects providing information applicable to PQM Signal Absent measurement configuration items. Each measurement is defined in terms of hardware board and the input channel number where the incoming video is measured."</p>
<p>pqmChannelNameConfigGroup</p> <p>OBJECTS</p> <p>DESCRIPTION</p> <p>::= { pqmGroups 9 }</p>	<pre>{ pqmBoardNum pqmInputChanName }</pre> <p>"A collection of objects providing information applicable to PQM Channel Name configuration items."</p>

Conformance Trap Group

Table D-11: Conformance trap descriptions

Conformance trap	Notification group
pqmGenV2TrapGroup	
NOTIFICATIONS	{ pqmStartV2Trap pqmStopV2Trap pqmBlockinessTrap pqmNoiseTrap pqmFreezeFrameTrap pqmSignalAbsentTrap }
DESCRIPTION	"A collection of objects providing information applicable PQM Trap General Resources."
::= { pqmGroups 10 }	

Conformance Compliance

Table D-12: Compliance descriptions

Compliance identifier	Module compliance
<p>pqmBasicCompliance</p> <p>DESCRIPTION</p> <p>MODULE</p> <p>MANDATORY GROUPS</p>	<p>"The basic compliance statement for the PQM."</p> <p>-- This module</p> <pre>{ pqmGenGroup pqmGenV2TrapGroup pqmBlockinessConfigGroup pqmNoiseConfigGroup pqmFreezeFrameConfigGroup pqmSignalAbsentConfigGroup pqmChannelNameConfigGroup }</pre>
<p>::= { pqmCompliances 1 }</p>	

SNMP Support Commands

Software for the SNMP support commands is provided as part of the SNMP networking feature of the PQM300 Program QoS Monitor. The executable files are located in the D:\PQM300\snmp\SnmpMgrCmds\w32.bin directory shown in Figure D–1.



Figure D–1: W32.bin directory with SNMP commands

Get Commands	The get commands let you find out parameters settings on a connected PQM300 program monitor.
SetAny Command	The setany command lets you set PQM300 parameters on a connected program monitor.
TrapSend and TrapRcv Commands	The traprcv utility permits you to monitor SNMP trap responses on the PC screen. The trapsend utility demonstrates how to send trap messages to trap monitoring stations.

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Setany Command

The **setany** command is used to set the value of a variable on an SNMP entity. The **setany** utility performs a Set request on the variable passed to it.

***NOTE.** SetAny commands to the PQM300 program monitor are cached locally, not individually executed. The cached commands are sent to the addressed PQM300 when a measurement is started or restarted.*

Synopsis `setany [-v1|-v2c|-v2] [-ctx v2ContextName] [-ctxid v2ContextSnmpID] [-d] [-timeout secs] [-retries num] agent_addr userName| community variable_name type value [variable_name type value] ...`

Arguments The arguments to **setany** and their descriptions are given in Table D–13.

Table D-13: SetAny command arguments

setany Arguments	Description
-v1 -v2c -v2	The SNMP version to use when sending the request. If the SR_UTIL_SNMP_VERSION environment variable is set to a version argument, the user does not need to specify -v1, -v2c, or -v2 on the command line.
-ctx v2ContextName	By default, the utility sends all requests in the 'default' context. If the user wishes to send a request in a different context, the context is specified using the -ctx v2ContextName argument where v2ContextName is a printable ASCII string.
-ctxid v2ContextSnmpID	By default, the utility assumes that the response to a request should be provided by the agent residing at agent_addr. If the user wishes to send a request in a proxy context, the snmpID of the agent which should provide the response is specified using the -ctxid v2ContextSnmpID argument where v2ContextSnmpID is a printable ASCII string.
-d	The -d argument turns on message logging. When this feature is selected, the utility prints messages containing important information at milestone points of execution, and this is useful for problem diagnosis.
-timeout secs	By default, the utility will wait a total of ten(10) seconds to receive a response from an SNMP agent. If no response is received without that timeout period, the utility may try again to send the request. The -timeout secs (or -t secs) argument can be used to change the length of the timeout period where 'secs' is the time in seconds.
-retries num	By default, if the utility receives no response from the SNMP agent, it will try again five(5) more times to send the request. The -retries num (or -r num) argument can be used to change the number of times the utility will send the request where 'num' is the number of retries.

Table D-13: SetAny command arguments (Cont.)

setany Arguments	Description
agent_addr	The address of the SNMP agent.
userName community	<p>Either an SNMPv1/SNMPv2C community string or an SNMPv2 user name.</p> <p>If the SR_UTIL_COMMUNITY environment variable is set, the user does not need to specify a community string on the command line for SNMPv1 and SNMPv2C requests.</p> <p>If the SR_UTIL_USERNAME environment variable is set, the user does not need to specify a his or her user name on the command line for SNMPv2* requests.</p>
variable_name type value	<p>variable: the name of the variable to set.</p> <p>type: one of:</p> <ul style="list-style-type: none"> -i – integer, -o – octet, -d – object identifier -a – ip_addr -c – counter -g – gauge -t – time_ticks -D – Display String -N – NULL <p>value: the desired value.</p> <p>Note: type is an optional field for all but -D (Display String). The type may still be put on the command line, but it is only necessary in the case of display strings.</p> <p>Note: if type is -N (NULL), the value field is ignored but must be present. Use '0'.</p>

Examples

For **setany** to succeed, the variable's MAX-ACCESS as defined by the MIB must be read-write (or read-create), and the userName or community string must be authorized to perform a Set request on the indicated variable.

In the following example, the SNMPv1 community string 'public' is authorized to get the value of sysContact.0 but is not authorized to set the value:

```
% getone -v1 localhost public sysContact.0

sysContact.0 = SNMP Research, Inc. (423) 573-1434
% setany -v1 localhost public sysContact.0 -D
"support@snmp.com" Error code set in packet - No such
variable name. Index: 1.
```


In the following example, the SNMPv2 user, Guest, is not authorized to send Set requests to this SNMP entity but can Get the value of sysContact.0:

```
% getone -v2 localhost Guest sysContact.0
Enter Authentication password :
sysContact.0 = SNMP Research, Inc. (423) 573-1434
% setany -v2 localhost Guest sysContact.0 -D
"support@snmp.com"
Enter Authentication password :
Error code set in packet - NO_ACCESS_ERROR: 1.
```

In the following example, the variable is sysContact.0 and the SNMPv2 user is AnneXPert. This user is authorized to send Set requests to this SNMP entity, but the variable is not in the user's MIB view for Get or Set requests:

```
% getone -v2 localhost AnneXPert sysContact.0
Enter Authentication password :
Error code set in packet - AUTHORIZATION_ERROR: 1.
% setany -v2 localhost AnneXPert sysContact.0 -D
"support@snmp.com"
Enter Authentication password :
Error code set in packet - AUTHORIZATION_ERROR: 1.
```

In the following example, the SNMPv2 user is EarlERiser. This user is authorized to send Set requests to this SNMP entity, and the user's MIB view for Get and for Set requests includes both sysContact.0 and sysDescr.0. The value of sysDescr.0 can not be set because the variable's MAX-ACCESS as defined by the MIB is read-only:

```
% getone -v2 localhost EarlERiser sysContact.0 sysDescr.0
Enter Authentication password :
sysContact.0 = SNMP Research, Inc. (423) 573-1434
sysDescr.0 = SNMPv2 agent from SNMP Research, Inc.
% setany -v2 localhost EarlERiser sysContact.0 -D
"support@snmp.com"
Enter Authentication password :
sysContact.0 = support@snmp.com
% setany -v2 localhost EarlERiser sysDescr.0 -D "SNMPv2
agent"
Enter Authentication password :
Error code set in packet - NOT_WRITABLE_ERROR: 1.
```

In the following example for the PQM300 program monitor, the SNMPv2c user is ControlRoom. However, the system is not access controlled, so the user name is not required to send Set request to the PQM300 that is being monitored.

```
% setany -snmpversion ipAddress CommunityName mibVariable -i(integer)
value
```

```
% setany -v2c 128.181.39.65 PQM0 pqmFreezeFrameAlarmInterval.2.1 -i
6000
% setany -v2c 128.181.39.65 PQM0 pqmFreezeFrameAlarmPercent.2.1 -i 500
% setany -v2c 128.181.39.65 PQM0 pqmFreezeFrameStart .2.1
```

NOTE. Set the *SNMP version* and *CommunityName* environment variables to make the command lines shorter. Once these environment variables are set, you do not have to include them in the *SNMP* command line.

Environment The following environment variables affect the behavior of the **setany** command.

Table D-14: Setany environment variables

Variables	Description
SR_MGR_CONF_DIR	This variable changes the location where setany expects to find the configuration files mgr.cnf and snmpinfo.dat. Normally this location is /etc/srconf/mgr/.
SR_SNMP_TEST_PORT	This variable changes the UDP port where setany sends SNMP requests (normally 161).
SR_UTIL_SNMP_VERSION	This variable sets the default SNMP version to use for all subsequent requests. The value of this environment variable may be '-v1', '-v2c', or '-v2'. If this variable is set, the user does not need to specify -v1, -v2c, or -v2 on the command line.
SR_UTIL_COMMUNITY	This variable sets the default community string for all subsequent SNMPv1 and SNMPv2C requests. If this variable is set, the user does not need to specify a community string on the command line for SNMPv1 and SNMPv2C requests. Note: The PQM300 MIB supports three (3) community names: PQM0, PQM1, and PQM2. There is no limit to the number of PQM300 program monitors that can be included in each community.
SR_UTIL_USERNAME	This variable sets the default user name for all subsequent SNMPv2* requests. If this variable is set, the user does not need to specify a his or her user name on the command line for SNMPv2* requests.

Table D-14: Setany environment variables (Cont.)

Variables	Description
SR_UTIL_AUTH_PASSWORD	This variable sets the authentication password for all subsequent requests. If this variable is set to NULL string, the user will not be prompted for a password and a request with no authentication and no privacy will be sent; otherwise, the user will be prompted only for a privacy password.
SR_UTIL_PRIV_PASSWORD	This variable sets the privacy password for all subsequent requests. If SR_UTIL_AUTH_PASSWORD is not set, this variable is ignored.

Files /etc/srconf/mgr/mgr.cnf
/etc/srconf/mgr/snmpinfo.dat

Diagnostics Diagnostic error messages and their meaning are given in Table D-15.

Table D-15: Diagnostic messages

Error message	Description
Cannot translate MIB variable:	This message indicates that the snmpinfo.dat(5) configuration file does not contain OID translation information for the indicated MIB variable's English name.
Failure in snmpinfo.dat	This message indicates that there is a problem with the named configuration file. Check to see that there is an snmpinfo.dat(5) file located in the default directory or in the directory indicated by the environment variable SR_MGR_CONF_DIR. If the file exists, ensure that the file is readable and contains the correct information.

Getbulk Command

The getbulk command is used to retrieve scalar and table entries from an SNMPv2 entity.

Synopsis getbulk [-v1 | -v2c | -v2] [-ctx v2ContextName] [-ctxid v2ContextSnmpID] [-d] [-timeout secs] [-retries num] agent_addr userName|community non-reps max-reps variable_name ...

Description The **getbulk** utility performs bulk retrieval of information from an entity which supports SNMPv2C and/or SNMPv2.

NOTE. This utility will NOT work with SNMPv1-only entities; there is no SNMPv1 version of the GetBulk operator.

The **getbulk** utility uses the **GetBulk** operator instead of the **GetNext** operator. The more efficient **GetBulk** operator produces less traffic on the network than the **GetNext** operator.

The arguments to **getbulk** are given in Table D-16.

Table D-16: Getbulk command arguments

GetBulk arguments	Description
-v1 -v2c -v2	The SNMP version to use when sending the request. If the SR_UTIL_SNMP_VERSION environment variable is set to a version argument, the user does not need to specify -v1, -v2c, or -v2 on the command line.
-ctx v2ContextName	By default, the utility sends all requests in the 'default' context. If the user wishes to send a request in a different context, the context is specified using the -ctx v2ContextName argument where v2ContextName is a printable ASCII string.
-ctxid v2ContextSnmpID	By default, the utility assumes that the response to a request should be provided by the agent residing at agent_addr. If the user wishes to send a request in a proxy context, the snmpID of the agent which should provide the response is specified using the -ctxid v2ContextSnmpID argument where v2ContextSnmpID is a printable ASCII string.
-d	The -d argument turns on message logging. When this feature is selected, the utility prints messages containing important information at milestone points of execution, and this is useful for problem diagnosis.
-timeout secs	By default, the utility will wait a total of ten(10) seconds to receive a response from an SNMP agent. If no response is received without that timeout period, the utility may try again to send the request. The -timeout secs (or -t secs) argument can be used to change the length of the timeout period where 'secs' is the time in seconds.
-retries num	By default, if the utility receives no response from the SNMP agent, it will try again five(5) more times to send the request. The -retries num (or -r num) argument can be used to change the number of times the utility will send the request where 'num' is the number of retries.
agent_addr	The address of the SNMP agent.

Table D-16: Getbulk command arguments (Cont.)

GetBulk arguments	Description
userName community	<p>Either an SNMPv1/SNMPv2C community string or an SNMPv2* user name.</p> <p>If the SR_UTIL_COMMUNITY environment variable is set, the user does not need to specify a community string on the command line for SNMPv1 and SNMPv2C requests.</p> <p>If the SR_UTIL_USERNAME environment variable is set, the user does not need to specify a his or her user name on the command line for SNMPv2* requests.</p>
non-reps	The number of variables in the VarBind list that are to return exactly one value (non-repeaters). The value may be zero.
max-reps	The maximum number (maximum repetitions) of values to return for each of the variables remaining in the VarBind list after the non-reps list has been exhausted. The value of max-reps may be zero; if it is zero, getbulk behaves exactly like the getnext utility.
variable_name ...	One or more variables to retrieve. One "next" value is returned for each of the first non-reps number of variables, and then max-reps values are returned beginning at each of the remaining variables.

Examples The following request:

```
getbulk -v2c localhost public 1 0 ifIndex.1
or
getbulk -v2 localhost WyleUSleep 1 0 ifIndex.1
```

will return the next variable after ifEntry.

In this example, it happens to be:

```
ifIndex.2 = 2
```

The request:

```
getbulk -v2c localhost public 2 20 ifEntry system iso
or
getbulk -v2 localhost WyleUSleep 2 20 ifEntry system iso
```

will return up to 22 variable bindings with that one request:

```
ifIndex.1 = 1
sysDescr.0 = SNMPv2 agent from SNMP Research, Inc.
sysDescr.0 = SNMPv2 agent from SNMP Research, Inc.
sysObjectID.0 = 0.0
sysUpTime.0 = 613962
sysContact.0 = SNMP Research, Inc. (423) 573-1434
sysName.0 =
```

```

sysLocation.0 = Down on the farm
sysServices.0 = 72
sysORLastChange.0 = 0
ifNumber.0 = 2
ifIndex.1 = 1
ifIndex.2 = 2
ifDescr.1 = 1e0
ifDescr.2 = 1o0
ifType.1 = ethernet-csmacd(6)
ifType.2 = softwareLoopback(24)
ifMtu.1 = 1500
ifMtu.2 = 1536
ifSpeed.1 = 10000000
ifSpeed.2 = 10000000

```

Environment The following environment variables affects the behavior of **getbulk**. They are the same as those for the **setany** command.

Table D-17: Getbulk environment variables

Variables	Description
SR_MGR_CONF_DIR	This variable changes the location where getbulk expects to find the configuration files mgr.cnf and snmpinfo.dat. Normally this location is /etc/srconf/mgr/.
SR_SNMP_TEST_PORT	This variable changes the UDP port where getbulk sends SNMP requests (normally 161).
SR_UTIL_SNMP_VERSION	This variable sets the default SNMP version to use for all subsequent requests. The value of this environment variable may be '-v1', '-v2c', or '-v2'. If this variable is set, the user does not need to specify -v1, -v2c, or -v2 on the command line.
SR_UTIL_COMMUNITY	This variable sets the default community string for all subsequent SNMPv1 and SNMPv2C requests. If this variable is set, the user does not need to specify a community string on the command line for SNMPv1 and SNMPv2C requests. Note: The PQM300 MIB supports three (3) community names: PQM0, PQM1, and PQM2. There is no limit to the number of PQM300 program monitors that can be included in each community.

Table D-17: Getbulk environment variables (Cont.)

Variables	Description
SR_UTIL_USERNAME	This variable sets the default user name for all subsequent SNMPv2* requests. If this variable is set, the user does not need to specify a his or her user name on the command line for SNMPv2* requests.
SR_UTIL_AUTH_PASSWORD	This variable sets the authentication password for all subsequent requests. If this variable is set to NULL string, the user will not be prompted for a password and a request with no authentication and no privacy will be sent; otherwise, the user will be prompted only for a privacy password.
SR_UTIL_PRIV_PASSWORD	This variable sets the privacy password for all subsequent requests. If SR_UTIL_AUTH_PASSWORD is not set, this variable is ignored.

Diagnostics See the diagnostic messages in Table D-15.

Limitations The **getbulk** utility only works with SNMPv2C and/or SNMPv2 entities. There is no corresponding SNMPv1 utility.

Getid Command

Use the **getid** command to retrieve system group MIB variables from an SNMP entity.

Synopsis `getid agent_addr clustername getid [-v1 | -v2c | -v2] [-ctx v2ContextName] [-ctxid v2ContextSnmpID] [-d] [-timeout secs] [-retries num] agent_addr userName|community`

Description The primary purpose of this application is to demonstrate SNMPv2 error codes. As such, this utility is designed to fail under SNMPv1. The `getid` utility is an SNMP application to retrieve the variables `sysDescr.0`, `sysObjectID.0`, `sysUpTime.0`, `sysUpTime.2`, and `iso.2.0` from a SNMP entity. The variables `sysUpTime.2` and `iso.2.0` are included to illustrate the following SNMPv2 error codes:

`NO_SUCH_INSTANCE_EXCEPTION`
and
`NO_SUCH_OBJECT_EXCEPTION.`

Table D-18: Getid command arguments

Getid arguments	Description
-v1 -v2c -v2	The SNMP version to use when sending the request. If the SR_UTIL_SNMP_VERSION environment variable is set to a version argument, the user does not need to specify -v1, -v2c, or -v2 on the command line.
-ctx v2ContextName	By default, the utility sends all requests in the 'default' context. If the user wishes to send a request in a different context, the context is specified using the -ctx v2ContextName argument where v2ContextName is a printable ASCII string.
-ctxid v2ContextSnmpID	By default, the utility assumes that the response to a request should be provided by the agent residing at agent_addr. If the user wishes to send a request in a proxy context, the snmpID of the agent which should provide the response is specified using the -ctxid v2ContextSnmpID argument where v2ContextSnmpID is a printable ASCII string.
-d	The -d argument turns on message logging. When this feature is selected, the utility prints messages containing important information at milestone points of execution, and this is useful for problem diagnosis.
-timeout secs	By default, the utility will wait a total of ten(10) seconds to receive a response from an SNMP agent. If no response is received without that timeout period, the utility may try again to send the request. The -timeout secs (or -t secs) argument can be used to change the length of the timeout period where 'secs' is the time in seconds.
-retries num	By default, if the utility receives no response from the SNMP agent, it will try again five(5) more times to send the request. The -retries num (or -r num) argument can be used to change the number of times the utility will send the request where 'num' is the number of retries.
agent_addr	The address of the SNMP agent.
userName community	Either an SNMPv1/SNMPv2C community string or an SNMPv2* user name. If the SR_UTIL_COMMUNITY environment variable is set, the user does not need to specify a community string on the command line for SNMPv1 and SNMPv2C requests. If the SR_UTIL_USERNAME environment variable is set, the user does not need to specify a his or her user name on the command line for SNMPv2* requests.

Example This example shows the results of running **getid** with an SNMPv2C or SNMPv2* agent.

An SNMPv1 request fails on the fourth variable in the VarBind list, sysUpTime.2. This is because sysUpTime does not have an instance 2.

```
% getid -v1 localhost public
```

```
Error code set in packet - No such variable name. Index: 4.
```

An SNMPv2C request ‘succeeds’ with robust reporting of errors on the last two VarBinds.

```
% getid -v2c localhost public
```

```
sysDescr.0 = SNMPv2 agent from SNMP Research, Inc.
sysObjectID.0 = 0.0
sysUpTime.0 = 7982
sysUpTime.2 = NO_SUCH_INSTANCE_EXCEPTION
iso.2.0 = NO_SUCH_OBJECT_EXCEPTION
```

An SNMPv2* request ‘succeeds’ with robust reporting of errors on the last two VarBinds.

```
% getid -v2 localhost Guest
```

```
Enter Authentication password :
sysDescr.0 = SNMPv2 agent from SNMP Research, Inc.
sysObjectID.0 = 0.0
sysUpTime.0 = 8672
sysUpTime.2 = NO_SUCH_INSTANCE_EXCEPTION
iso.2.0 = NO_SUCH_OBJECT_EXCEPTION
```

Diagnostics Diagnostic error messages for the **getid** command and their meaning are given in Table D-19.

Table D-19: Diagnostic messages

Error message	Description
Failure in snmpinfo.dat	This message indicates that there is a problem with the named configuration file. Check to see that there is an snmpinfo.dat(5) file located in the default directory or in the directory indicated by the environment variable SR_MGR_CONF_DIR. If the file exists, ensure that the file is readable and contains the correct information.
Error code set in packet – No such variable name. Index: 4.	This message should be printed for SNMPv1 executions of getid. This message indicates that there is a problem with the fourth VarBind, sysUpTime.2. The problem is that there is no instance 2 for the variable sysUpTime. Because SNMPv1 does not have a robust error-reporting facility, the entire request fails.

Getmany Command

Use the **getmany** command to retrieve classes of variables from an SNMP entity.

Synopsis `getmany [-v1 | -v2c | -v2] [-ctx v2ContextName] [-ctxid v2ContextSnmpID] [-d] [-timeout secs] [-retries num] agent_addr userName|community variable_name...`

Arguments The arguments to **getbulk** are the same as those for the **getid** command shown in Table D-18 with one addition shown below:

Getmany arguments	Description
variable_class	MIB variable class name(s).

Example The **getmany** utility retrieves variables by sending GetNext requests to the SNMP entity. The first request contains variable_class to get the first variable in the class. To retrieve the next variable in the class, subsequent requests to the entity contain the variable name returned in the previous **Get** response.

The request

```
getmany -v1 myagent public system
or
getmany -v2 myagent Guest system
```

will traverse the network entity's system variable class. The traversing of the variable space stops when all of the classes being polled return a variable of a class different than what was requested. Note that a network entity's entire variable tree can be traversed with a call of:

```
getmany -v1 myagent public iso
or
getmany -v2 myagent Guest iso
```

Also note that

```
getmany -v1 myagent public sysDescr.0
and
getmany -v2 myagent Guest sysDescr.0
```

will retrieve nothing, because sysDescr.0 is not a variable class.

Environment The environment variables shown in Table D-17 on page D-38 also affect the behavior of **getmany** as described in that table.

Diagnostics Diagnostic error messages and their meaning are given in Table D-15 on page D-35.

Limitations If more than one variable class is requested and any one of the classes does not exist, nothing will be returned for any of the classes.

If more than one variable class is requested, odd effects may be seen. Specifically, since "The traversing of the variable space stops when all of the classes being polled return a variable of a class different than what was requested," once the first variable class completes, everything quits whether all the variables were returned or not. Another side effect of this behavior is if the first variable class is "large," the other variable classes will continue to be retrieved whether they are finished or not. This can result in "End of MIB" or other errors being displayed within the values from other requests.

Getmet Command

Use the **getmet** command to get routing information from SNMP entity.

Synopsis `getmet [-v1 | -v2c | -v2] [-ctx v2ContextName] [-ctxid v2ContextSnpID] [-d] [-timeout secs] [-retries num] agent_addr userName|community [subnet]`

Description The **getmet** utility is an SNMP application that retrieves routing information from an entity by traversing the `ipRouteDest`, `ipRouteMetric1`, `ipRouteMetric2`, `ipRouteMetric3`, and `ipRouteMetric4` variable classes for each subnet found.

Command Arguments The arguments to **getmet** are the same as those for the `getid` command shown in Table D–18 on page D–40 with one addition shown below:

Getmet arguments	Description
subnet	A partial IP address. This value is interpreted as first octet(s) of the IP address. In other words "128" will match addresses 128.xxx.xxx.xxx, but not addresses with xxx.128.xxx.xxx or xxx.xxx.128.xxx, etc. Only those portions of the routing table which match the subnet address qualifier are retrieved. If no subnet is specified, the behavior is the same as a <code>getroute()</code> .

Examples The request

```
getmet -v1 myagent public 192.244
or
getmet -v2c myagent public 192.244
or
getmet -v2 myagent EarlERiser 192.244
```

would retrieve all entries beginning with 192.244. Similarly,

```
getmet -v1 myagent public 128.139.4
or
getmet -v2c myagent public 128.139.4
or
getmet -v2 myagent EarlERiser 128.139.4
```

would retrieve all entries beginning with 128.139.4.

Finally,

```
getmet -v1 myagent public
or
getmet -v2c myagent public
or
getmet -v2 myagent EarlERiser
```

would retrieve the entire routing table (operate just like a `getroute()`).

Environment The environment variables shown in Table D–17 on page D–38 also affect the behavior of **getmet** as described in the table except for the following command which is not available for **getmet**.

SR_SNMP_TEST_PORT	This variable changes the UDP port where getbulk sends SNMP requests (normally 161).
-------------------	--

Diagnostics Failure in snmpinfo.dat.

This message indicates that there is a problem with the named configuration file. Check to see that there is an snmpinfo.dat(5) file located in the default directory or in the directory indicated by the environment variable SR_MGR_CONF_DIR. If the file exists, ensure that the file is readable and contains the correct information.

Getnext Command

Use the **getnext** command to retrieve one variable’s value from an SNMP entity.

Synopsis `getnext [-v1 | -v2c | -v2] [-ctx v2ContextName] [-ctxid v2ContextSnmpID] [-d] [-timeout secs] [-retries num] agent_addr userName|community variable_name ...`

Description The **getnext** utility is a SNMP application to retrieve the lexicographically “next” value after the specified variable from an SNMP entity using a GetNext request.

Command Arguments The arguments to **getnext** are the same as those for the **getid** command shown in Table D–18 on page D–40 with one addition shown below:

Getnext arguments	Description
variable_name	One or more variables to retrieve

Examples The request

```
getnext -v1 myagent public sysDescr snmp
or
getnext -v2 myagent Guest sysDescr snmp
```

would return the variables sysDescr.0 snmpInPkts.0, but the call

```

getnext -v1 myagent public snmpInPkts.0
or
getnext -v2 myagent Guest snmpInPkts.0

```

would return snmpOutPkts.0, the “next” variable after snmpInPkts.0.

- Environment** The environment variables shown in Table D–17 on page D–38 also affect the behavior of **getnext** as described in the table.
- Diagnostics** Diagnostic error messages and their meaning are given in Table D–15 on page D–35.
- Limitations** If any one of the variables in the list has a malformed OID, no request will be sent, and an error will be displayed.

Getone Command

Use the **getone** command to retrieve one variable’s value from an SNMP entity.

Synopsis `getone [-v1 | -v2c | -v2] [-ctx v2ContextName] [-ctxid v2ContextSnmpID] [-d] [-timeout secs] [-retries num] agent_addr userName|community variable_name ...`

Description The **getone** utility is an SNMP management application to retrieve a set of individual variables from an SNMP entity using a Get request.

Command Arguments The arguments to **getone** are the same as those for the **getid** command shown in Table D–18 on page D–40 with one addition shown below:

Getone arguments	Description
variable_name	One or more variables to retrieve

Examples Variables may be in name form, number form, or as they appear in the MIB document. It should be noted that since the function is a Get as opposed to a Getnext, the variable **MUST** be fully qualified for the request to be successful. For instance,

```

getone -v1 myagent public sysDescr.0 snmpInPkts.0
or
getone -v2 myagent Guest sysDescr.0 snmpInPkts.0

```

would return the variables sysDescr.0 and snmpInPkts.0, but the call

```
getone -v1 myagent public system
or
getone -v2 myagent Guest system
```

would return an error from the entity since it is not a fully qualified SNMP variable.

Environment	The environment variables shown in Table D–17 on page D–38 also affect the behavior of getone as described in the table.
Diagnostics	Diagnostic error messages and their meaning are given in Table D–15 on page D–35.
Limitations	If any one of the variables in the list has a malformed OID, no request will be sent, and an error will be displayed.

Getroute Command

Use the `getroute` command to extract routing information from an SNMP entity.

Synopsis

```
getroute [ -v1 | -v2c | -v2 ] [ -ctx v2ContextName ] [ -ctxid v2ContextSnmID ] [ -d ] [ -timeout secs ] [ -retries num ] agent_addr userName|community
```

Description The **getroute** utility is an SNMP application that retrieves routing information from an entity by traversing the `ipRouteDest`, `ipRouteIfIndex`, `ipRouteMetric1`, `ipRouteNextHop`, `ipRouteType`, and `ipRouteProto` variable classes for each route found.

Command Arguments The arguments to **getroute** are the same as those for the **getid** command shown in Table D–18 on page D–40 with one addition shown below:

Getroute arguments	Description
variable_name	One or more variables to retrieve

Examples The request

```
getroute -v1 myagent public
or
getroute -v2c myagent public
```

or
`getroute -v2 myagent EarlERiser`

will return

```
Route to: 0.0.0.0 via: 1.2.3.1 on if: 1 ...
Route to: 127.0.0.1 via: 127.0.0.1 on if: 2 ...
Route to: 1.2.3.0 via: 1.2.3.4 on if: 1 ...
```

Environment The environment variables shown in Table D–17 on page D–38 also affect the behavior of **getroute** as described in the table.

Diagnostics Diagnostic error messages and their meaning are given in Table D–15 on page D–35.

Getsub Command

Use the **getsub** command to extract the routing information from an SNMP entity.

Synopsis `getsub [-v1 | -v2c | -v2] [-ctx v2ContextName] [-ctxid v2ContextSnmID] [-d] [-timeout secs] [-retries num] agent_addr userName|community [subnet]`

Description The **getsub** utility is an SNMP application that retrieves routing information from an entity by traversing the `ipRoute-eDest`, `ipRouteMetric1`, `ipRouteMetric2`, `ipRouteMetric3`, and `ipRouteMetric4` variable classes for each subnet found.

Command Arguments The arguments to **getsub** are the same as those for the **getid** command shown in Table D–18 on page D–40 with one addition shown below:

Getsub arguments	Description
subnet	A partial IP address. This value is interpreted as first octet(s) of the IP address. In other words "128" will match addresses 128.xxx.xxx.xxx, but not addresses with xxx.128.xxx.xxx or xxx.xxx.128.xxx, etc. Only those portions of the routing table which match the subnet address qualifier are retrieved. If no subnet is specified, the behavior is the same as a <code>getroute</code>

Examples The request


```

getsub -v1 myagent public 192.244
or
getsub -v2c myagent public 192.244
or
getsub -v2 myagent Ear1ERiser 192.244

```

would retrieve all entries beginning with 192.244. Similarly,

```

getsub -v1 myagent public 128.139.4
or
getsub -v2c myagent public 128.139.4
or
getsub -v2 myagent Ear1ERiser 128.139.4

```

would retrieve all entries beginning with 128.139.4.

Finally,

```

getsub -v1 myagent public
or
getsub -v2c myagent public
or
getsub -v2 myagent Ear1ERiser

```

would retrieve the entire routing table (operate just like a `getroute(1)`).

Environment	The environment variables shown in Table D–17 on page D–38 also affect the behavior of getroute as described in the table.
Diagnostics	Diagnostic error messages and their meaning are given in Table D–15 on page D–35.

Gettab Command

The **gettab** command is a utility for table retrieval from an SNMP entity.

Synopsis

```

gettab [ -v1 | -v2c | -v2 ] [ -ctx v2ContextName ] [-ctxid
v2ContextSnmID ] [ -d ] [ -timeout secs ] [-retries num ]
agent_addr userName|community table_name

```

Description

The **gettab** utility is an SNMP application that retrieves an entire table and prints the values of the MIB variables by row. For SNMPv1, this is accomplished using the GetNext operator. For SNMPv2C and SNMPv2*, this is accomplished using the GetBulk operator. The **gettab** utility retrieves chunks of the table with each request and uses part of the response to form the request.

Command Arguments The arguments to **gettab** are the same as those for the **getid** command shown in Table D–18 on page D–40 with one addition shown below:

Gettab arguments	Description																										
table name	<p>The name of the table to retrieve.</p> <p>Some valid SNMPv1/SNMPv2C table names are:</p> <table> <tr> <td>ifTable</td> <td>ipNetToMediaTable</td> </tr> <tr> <td>atTable</td> <td>tcpConnTable</td> </tr> <tr> <td>ipAddrTable</td> <td>udpTable</td> </tr> <tr> <td>ipRouteTable</td> <td>egpNeighTable</td> </tr> </table> <p>Some valid SNMPv2* table names are:</p> <table> <tr> <td>ifTable</td> <td>communityTable</td> </tr> <tr> <td>atTable</td> <td>v2ContextTable</td> </tr> <tr> <td>ipAddrTable</td> <td>viewTreeTable</td> </tr> <tr> <td>ipRouteTable</td> <td>acTable</td> </tr> <tr> <td>ipNetToMediaTable</td> <td>transportTable</td> </tr> <tr> <td>tcpConnTable</td> <td>notifyTable</td> </tr> <tr> <td>udpTable</td> <td>notifyInformParametersTable</td> </tr> <tr> <td>egpNeighTable</td> <td>proxyForwardingTable</td> </tr> <tr> <td>snmpTrapTable</td> <td>userNameTable</td> </tr> </table>	ifTable	ipNetToMediaTable	atTable	tcpConnTable	ipAddrTable	udpTable	ipRouteTable	egpNeighTable	ifTable	communityTable	atTable	v2ContextTable	ipAddrTable	viewTreeTable	ipRouteTable	acTable	ipNetToMediaTable	transportTable	tcpConnTable	notifyTable	udpTable	notifyInformParametersTable	egpNeighTable	proxyForwardingTable	snmpTrapTable	userNameTable
ifTable	ipNetToMediaTable																										
atTable	tcpConnTable																										
ipAddrTable	udpTable																										
ipRouteTable	egpNeighTable																										
ifTable	communityTable																										
atTable	v2ContextTable																										
ipAddrTable	viewTreeTable																										
ipRouteTable	acTable																										
ipNetToMediaTable	transportTable																										
tcpConnTable	notifyTable																										
udpTable	notifyInformParametersTable																										
egpNeighTable	proxyForwardingTable																										
snmpTrapTable	userNameTable																										

Examples The following example is based on MIB–II (RFC 1907). The request:

```
gettab -v1 myagent public ifTable
or
gettab -v2c myagent public ifTable
or
gettab -v2 myagent EarlERiser ifTable
```

would retrieve the interfaces table.

The following example is based on an SNMP Research example MIB called the VCR–MIB. The request:

```
gettab -v1 myagent public vcrProgramTable
or
gettab -v2c myagent public vcrProgramTable
or
gettab -v2 myagent Guest vcrProgramTable
```

would retrieve the vcr program table.

Environment The environment variables shown in Table D–17 on page D–38 also affect the behavior of **gettab** as described in the table.

- Diagnostics** Diagnostic error messages and their meaning are given in Table D–15 on page D–35.
- Limitations** The **gettab** program is intended only as an example and not as a production utility. The **gettab** utility is designed to traverse tables and present the information by rows in a generic way. It does this by sending a single VarBind in each request (the utility does not know how many rows each table has). This process is very inefficient.
- Presenting information from a table by rows is much more efficient when the management utility knows the names of the variables which make up the columns of the table. By sending requests containing all of the column variables in the VarBind list, the network traffic can be reduced for both **getnext** and **getbulk** requests.
- For example, it is much more efficient to traverse the vcr program table by repeating the command
- ```
% getnext -v2c myagent public vcrProgramChannel.n \
vcrProgramStartTime.n vcrProgramStopTime.n \
vcrProgramSpeed.n vcrProgramStatus.n
```
- (incrementing ‘n’ until “End of MIB” is returned) than to use the command:
- ```
% gettab -v2c myagent public vcrProgramTable
```

Traprcv Command

TrapRcv is a utility that receives traps from remote SNMP trap-generating entities.

Synopsis traprcv [-d]

Description The **traprcv** utility is a program that receives traps from remote SNMP trap-generating entities. It binds to the SNMP trap port 162 (UDP) to listen for the traps, and thus must be run as root. It prints to standard output messages about the traps it has received. The primary purpose of this program is to demonstrate how traps are parsed using the SNMP library.

Command Arguments There is only one option to `trapcv`:

trapcvArguments	Description
-d	The -d argument turns on message logging. When this feature is selected, the utility prints messages containing important information at milestone points of execution, and this is useful for problem diagnosis.

Environment The following environment variables affects the behavior of **trapcv**.

Table D-20: Trapcv environment variables

Variables	Description
SR_MGR_CONF_DIR	This variable changes the location where trapcv expects to find the configuration file snmpinfo.dat. Normally this location is /etc/srconf/mgr/.
SR_SNMP_TEST_PORT	This variable changes the UDP port where other SNMP Research utilities send SNMP requests (normally 161). This variable also affects the UDP port where trapcv receives SNMP traps (normally 162). When this environment variable is set, the default trap port number is one greater than the value of this environment variable.
SR_TRAP_TEST_PORT	This variable changes the UDP port where trapcv receives SNMP traps (normally 162). This variable takes precedence over SR_SNMP_TEST_PORT.

Limitations Only works on UNIX machines. Must be run as root.

Trapsend Command

Use the **trapsend** command to send SNMP traps to a monitoring station.

SNMPv1 Synopsis `trapsend -v1 [-d] agent_addr community gen-trap [spec-trap] enterprise [sysUpTime [variable_name type value] ...]`

SNMPv2C Synopsis `trapsend -v2c [-d] agent_addr community snmpTrapOID.0 [sysUpTime [variable_name type value] ...]`

SNMPv2* Synopsis `trapsend -v2 [-d] agent_addr userName snmpTrapOID.0 [sysUpTime [variable_name type value] ...]`

Description The **trapsend** utility demonstrates how to send trap messages to trap monitoring stations. This utility can send SNMPv1 and SNMPv2 traps and only works on UNIX machines. The arguments to **trapsend** are:

Table D-21: Trapsend command arguments

Trapsend arguments	Description
-v1 -v2c -v2	The SNMP version to use when sending the request. If the SR_UTIL_SNMP_VERSION environment variable is set to a version argument, the user does not need to specify -v1, -v2c, or -v2 on the command line.
-d	The -d argument turns on message logging. When this feature is selected, the utility prints messages containing important information at milestone points of execution, and this is useful for problem diagnosis.
agent_addr	The destination address of the trap.
community	An SNMPv1/SNMPv2C community string. If the SR_UTIL_COMMUNITY environment variable is set, the user does not need to specify a community string on the command line for SNMPv1 and SNMPv2C requests.
userName	An SNMPv2* user name. If the SR_UTIL_USERNAME environment variable is set, the user does not need to specify a his or her user name on the command line for SNMPv2* requests.
variable_name ...	One or more variables to retrieve.
gen-trap	The generic trap number (SNMPv1 only).
spec-trap	The specific trap number (SNMPv1 only). enterprise The enterprise (SNMPv1 only).
sysUpTime	The value of the variable sysUpTime.

Table D-21: Trapsend command arguments (Cont.)

Trapsend arguments	Description
snmpTrapOID.0	The OID which uniquely identifies this trap. Name forms such as 'coldstart' or 'myWonderfulEntTrap' are permitted.
variable_name type value	<p>variable: the name of a variable in the trap's VarBind list.</p> <p>type: one of:</p> <ul style="list-style-type: none"> -i – integer, -o – octet, -d – object identifier -a – ip_addr -c – counter -g – gauge -t – time_ticks -D – Display String -N – NULL <p>value: the value of the variable.</p> <p>Note: type is an optional field for all but -D (Display String). The type may still be put on the command line, but it is only necessary in the case of display strings.</p> <p>Note: if type is -N (NULL), the value field is ignored but must be present. Use '0'.</p>

Examples Generic traps:

To send an SNMPv1 cold-start trap to the machine mymgr:

```
trapsend -v1 mymgr public 0
```

To send an SNMPv2c warm-start trap to the machine mymgr:

```
trapsend -v2c mymgr public snmpTraps.2
```

To send an SNMPv2* linkUp trap to the machine mymgr:

```
trapsend -v2 mymgr CharliedChief linkUp
```

Enterprise-specific traps:

The following examples are based on an SNMP Research example MIB called the SURGE-PROTECTOR-MIB. This is an SNMPv2 MIB, so to obtain the values for enterprise and spec-trap, run mostly(1) with the -1 argument.

To send an SNMPv1 enterprise-specific trap with enterprise of 'surgeProtector', spec-trap of 5, sysUpTime of 4974123, and the appropriate variable in the VarBind list:

```
trapsend -v1 localhost public 6 5 surgeProtector \
4974123 surgeBreakerStatus -i closed
```

To send an SNMPv2c enterprise-specific trap, surgeBreakerAlarm, with sysUpTime of 4974123 and the appropriate variable in the VarBind list:

```
trapsend -v2c localhost public surgeBreakerAlarm \
4974123 surgeBreakerStatus -i open
```

To send an SNMPv2* enterprise-specific trap, surgeBreakerAlarm, with sysUpTime of 4974123 and the appropriate variable in the VarBind list:

```
trapsend -v2 localhost CharliedChief surgeBreakerAlarm \
4974123 surgeBreakerStatus -i unknown
```

Environment The following environment variables affects the behavior of **trapsend**.

Table D-22: Trapsend environment variables

Variables	Description
SR_MGR_CONF_DIR	This variable changes the location where trapsend expects to find the configuration files mgr.cnf and snmpinfo.dat. Normally this location is /etc/srconf/mgr/.
SR_SNMP_TEST_PORT	This variable changes the UDP port where other SNMP Research utilities send SNMP requests (normally 161). This variable also affects the UDP port where trapsend sends SNMP traps (normally 162). When this environment variable is set, the default trap port number is one greater than the value of this environment variable.
SR_TRAP_TEST_PORT	This variable changes the UDP port where trapsend sends SNMP traps (normally 162). This variable takes precedence over SR_SNMP_TEST_PORT.
SR_UTIL_SNMP_VERSION	This variable sets the default SNMP version to use for all subsequent requests. The value of this environment variable may be '-v1', '-v2c', or '-v2'. If this variable is set, the user does not need to specify -v1, -v2c, or -v2 on the command line.
SR_UTIL_COMMUNITY	This variable sets the default community string for all subsequent SNMPv1 and SNMPv2C requests. If this variable is set, the user does not need to specify a community string on the command line for SNMPv1 and SNMPv2C requests. Note: The PQM300 MIB supports three (3) community names: PQM0, PQM1, and PQM2. There is no limit to the number of PQM300 program monitors that can be included in each community.

Table D-22: Trapsend environment variables (Cont.)

Variables	Description
SR_UTIL_USERNAME	This variable sets the default user name for all subsequent SNMPv2* requests. If this variable is set, the user does not need to specify a his or her user name on the command line for SNMPv2* requests.
SR_UTIL_AUTH_PASSWORD	This variable sets the authentication password for all subsequent requests. If this variable is set to NULL string, the user will not be prompted for a password and a request with no authentication and no privacy will be sent; otherwise, the user will be prompted only for a privacy password.
SR_UTIL_PRIV_PASSWORD	This variable sets the privacy password for all subsequent requests. If SR_UTIL_AUTH_PASSWORD is not set, this variable is ignored.

Diagnostics Diagnostic error messages for the **trapsend** command and their meaning are given in Table D-23.

Table D-23: Diagnostic messages

Error message	Description
Cannot translate MIB variable	This message indicates that the snmpinfo.dat(5) configuration file does not contain OID translation information for the indicated MIB variable's English name.
Failure in snmpinfo.dat	This message indicates that there is a problem with the named configuration file. Check to see that there is an snmpinfo.dat(5) file located in the default directory or in the directory indicated by the environment variable SR_MGR_CONF_DIR. If the file exists, ensure that the file is readable and contains the correct information.

Limitations Only works on UNIX machines.

Inform Command

Use **inform** to send InformRequest PDUs to an SNMP entity.

Synopsis `inform [-v2c | -v2] [-ctx v2ContextName]
[-ctxid v2ContextSnmpID] [-d] [-timeout secs]
[-retries num] dst_addr userName|community informName
informValue [variable_name type value] ...`

Description The **inform** utility program illustrates how to send InformRequest PDUs. It is only meant as an example and does not actually use the Manager-to-Manager MIB. This example sends the InformRequest PDU and then waits for a response. If it receives a response, the response is printed out and the program exits. Otherwise, the program tries to resend the PDU until either it gets a response or the maximum number of retries is reached.

Command Arguments The arguments for **inform** are shown in Table D–24.

Table D–24: Inform command arguments

Inform arguments	Description
<code>-v2c -v2</code>	The SNMP version to use when sending the request. If the <code>SR_UTIL_SNMP_VERSION</code> environment variable is set to a version argument, the user does not need to specify <code>-v1</code> , <code>-v2c</code> , or <code>-v2</code> on the command line.
<code>-ctx v2ContextName</code>	By default, the utility sends all requests in the 'default' context. If the user wishes to send a request in a different context, the context is specified using the <code>-ctx v2ContextName</code> argument where <code>v2ContextName</code> is a printable ASCII string.
<code>-ctxid v2ContextSnmpID</code>	By default, the utility assumes that the response to a request should be provided by the agent residing at <code>agent_addr</code> . If the user wishes to send a request in a proxy context, the <code>snmpID</code> of the agent which should provide the response is specified using the <code>-ctxid v2ContextSnmpID</code> argument where <code>v2ContextSnmpID</code> is a printable ASCII string.
<code>-d</code>	The <code>-d</code> argument turns on message logging. When this feature is selected, the utility prints messages containing important information at milestone points of execution, and this is useful for problem diagnosis.
<code>-retries num</code>	By default, if the utility receives no response from the SNMP agent, it will try again five(5) more times to send the request. The <code>-retries num</code> (or <code>-r num</code>) argument can be used to change the number of times the utility will send the request where 'num' is the number of retries.

Table D-24: Inform command arguments (Cont.)

Inform arguments	Description
-timeout secs	By default, the utility will wait a total of ten(10) seconds to receive a response from an SNMP agent. If no response is received without that timeout period, the utility may try again to send the request. The -timeout secs (or -t secs) argument can be used to change the length of the timeout period where 'secs' is the time in seconds.
dst_addr	The destination of the inform.
userName community	Either an SNMPv1/SNMPv2C community string or an SNMPv2* user name. If the SR_UTIL_COMMUNITY environment variable is set, the user does not need to specify a community string on the command line for SNMPv1 and SNMPv2C requests. If the SR_UTIL_USERNAME environment variable is set, the user does not need to specify a his or her user name on the command line for SNMPv2* requests.
informName	The event's ID, an instance-level object identifier.
informValue	The event's value, an object identifier.
variable_name type value	variable: the name of a variable in the inform's VarBind list. type: one of: -i - integer, -o - octet, -d - object identifier -a - ip_addr -c - counter -g - gauge -t - time_ticks -D - Display String -N - NULL Note: type is an optional field for all but -D (Display String). The type may still be put on the command line, but it is only necessary in the case of display strings. Note: if type is -N (NULL), the value field is ignored but must be present. Use '0'.

Examples

The request:

```
% inform -v2c -retries 4 -timeout 1 localhost public \
surgeBreakerAlarm 0.0 surgeBreakerStatus.0 -i unknown
```

will send an InformRequest and wait for the receiver to send back an acknowledgment (ACK). After waiting a certain amount of time (or timeout), the PDU

will be sent again. This cycle will repeat until either an ACK is received or the maximum number of retries is reached (in this case 4).

Environment The following environment variables affect the behavior of **inform**.

Table D–25: Inform environment variables

Variables	Description
SR_MGR_CONF_DIR	This variable changes the location where inform expects to find the configuration files mgr.cnf and snmpinfo.dat. Normally this location is /etc/srconf/mgr/.
SR_SNMP_TEST_PORT	This variable changes the UDP port where inform sends SNMP requests (normally 161).
SR_UTIL_SNMP_VERSION	This variable sets the default SNMP version to use for all subsequent requests. The value of this environment variable may be '-v1', '-v2c', or '-v2'. If this variable is set, the user does not need to specify -v1, -v2c, or -v2 on the command line.
SR_UTIL_COMMUNITY	This variable sets the default community string for all subsequent SNMPv1 and SNMPv2C requests. If this variable is set, the user does not need to specify a community string on the command line for SNMPv1 and SNMPv2C requests. Note: The PQM300 MIB supports three (3) community names: PQM0, PQM1, and PQM2. There is no limit to the number of PQM300 program monitors that can be included in each community.
SR_UTIL_USERNAME	This variable sets the default user name for all subsequent SNMPv2* requests. If this variable is set, the user does not need to specify a his or her user name on the command line for SNMPv2* requests.
SR_UTIL_AUTH_PASSWORD	This variable sets the authentication password for all subsequent requests. If this variable is set to NULL string, the user will not be prompted for a password and a request with no authentication and no privacy will be sent; otherwise, the user will be prompted only for a privacy password.
SR_UTIL_PRIV_PASSWORD	This variable sets the privacy password for all subsequent requests. If SR_UTIL_AUTH_PASSWORD is not set, this variable is ignored.

Diagnostics	Diagnostic error messages for the inform command and their meaning are given in Table D–23.
Limitations	This utility only works with SNMPv2C/SNMPv2*. There is no corresponding SNMPv1 utility.

Snmpdm

This is the EMANATE master SNMP agent daemon.

Synopsis	<code>snmpdm [-apall] [-aperror] [-aptrace] [-apwarn] [-d] [-daemonize] [-pr] [-proxy_trap_bind]</code>
HP/UX Synopsis	<code>snmpdm [-a] [-apall] [-aperror] [-aptrace] [-apwarn] [-authfail] [-C contact] [-Contact contact] [-h] [-help] [-L location] [-Location location] [-l logfile] [-logfile logfile] [-m val] [-mask val] [-n] [-nodaemonize] [-sys description] [-sysDescr description]</code> <code>snmpdm [-apall] [-aperror] [-aptrace] [-apwarn] [-c] [-configure] [-h] [-help] [-k] [-kill] [-M val] [-Mask val]</code>
pSOS Synopsis	<code>osboot 20008 mode high restart go</code>
VRTX Synopsis	<code>source kernel.xsh source snmpdm.xsh source vrtx_net.xsh</code>
VXWorks Synopsis	<code>ld < snmpdm sp snmpdm_main [,"-apall"] [,"-aperror"] [,"-aptrace"] [,"-apwarn"] [,"-d"] [,"-daemonize"] [,"-pr"] [,"-proxy_trap_bind"]</code>
Description	The <code>snmpdm</code> program is an SNMP application which listens for and responds to network management queries and commands from logically remote network management stations. The <code>snmpdm</code> program accesses the supported variables in the instrumentation of the protocol layers and the kernel. These parameters are

made accessible via the Simple Network Management Protocol (SNMP). The command `snmpdm` starts the daemon that handles SNMP requests.

Subagents are MIB extensions to `snmpdm`. Subagents can be executable programs or shared libraries (on systems that support shared libraries).

Options The following options are available on all operating systems (specific exceptions are noted).

Table D–26: Snmpdm options

Options	Description
<code>-apall</code>	Log all error messages, warning messages, and trace message. This option forces <code>snmpdm</code> to run in the foreground (except on HP/UX).
<code>-aperror</code>	Log all error messages. This option may be used in conjunction with <code>-aptrace</code> and <code>-apwarn</code> .
<code>-aptrace</code>	Log all trace messages. This option may be used in conjunction with <code>-aperror</code> and <code>-apwarn</code> .
<code>-apwarn</code>	Log all warning messages. This option may be used in conjunction with <code>-aperror</code> and <code>-aptrace</code> .
<code>-daemonize</code> <code>-d</code>	Normally <code>snmpdm</code> puts itself into the background as a daemon or system service. This option inhibits that behavior (NOTE: This option has no meaning on embedded systems. On HP/UX, this option is replaced with <code>-nodaemonize</code> .)
<code>-proxy_trap_bind</code> <code>-pr</code>	If the Master Agent has been compiled with the Proxy Agent Option, this causes <code>snmpdm</code> to bind to UDP port 162 so that the agent can act as a proxy for traps and informs. If the option is not used, <code>snmpdm</code> will only proxy for Get, Set, GetNext, and GetBulk requests. If this option is used when <code>snmpdm</code> is started, then a manager application running on the same system cannot bind to port 162 and receive traps.
The following options are available only on HP/UX.	
<code>-authfail</code> <code>-a</code>	Suppress sending authenticationFailure traps.

Table D-26: Snmpdm options (Cont.)

Options	Description
-configure -c	Send a special SNMP message to the running snmpdm which causes it to reconfigure itself (force the running snmpdm to re-read /etc/SnmpAgent.d/snmpd.conf). This does not reset the Subagents. To reset a Subagent you must stop the Subagent and then restart it. This option should not be used when starting up the Master Agent. Attempting to start snmpdm with this option will generate an error message since there is no agent running to receive the message.
-Contact contact -C contact	Specify the contact person responsible for the network management agent. This option overrides the contact person specified in the Master Agent configuration file /etc/SnmpAgent.d/snmpd.conf. It does not alter the value in /etc/SnmpAgent.d/snmpd.conf. By default, the agent's contact is a blank string. To configure the agent's contact, add the contact to /etc/SnmpAgent.d/snmpd.conf or use the -C option.
-help -h	Display command line options and log mask values.
-kill -k	Send a special SNMP message to the running snmpdm which causes it to terminate. This will also terminate all shared library Subagents which have connected to the Master Agent. The subsequent behavior of separate process Subagents is Subagent dependent. This option should not be used when starting up the Master Agent. Attempting to start snmpdm with this option will generate an error message since there is no agent running to receive the message.
-Location location -L location	Specify the location of the agent. This option overrides the location specified in /etc/SnmpAgent.d/snmpd.conf. It does not alter the value in /etc/SnmpAgent.d/snmpd.conf. By default, the agent's location is a blank string. To configure the agent's location, add the location to /etc/SnmpAgent.d/snmpd.conf or use the -L option.
-logfile logfile -l logfile	Use logfile for logging rather than the default logfile, /usr/sbin/subagt. A value of - will direct logging to stdout.

Table D-26: Snmpdm options (Cont.)

Options	Description
-Mask val -M val	<p>Send a message to the currently running snmpdm to change its logging mask to val. Valid values for val are 0x00000000 (no messages), 0x00800000 (trace messages), 0x10000000 (warning messages), 0x20000000 (error messages), and the logical OR of these values for combinations of messages. To set the snmpdm logging mask at startup, see option -m. This option should not be used when starting up the Master Agent. Attempting to start snmpdm with this option will generate an error message since there is no agent running to receive the message.</p> <p>This command line option only changes the logging mask within the Master Agent. Subagents typically read the Master Agent's logging mask when they connect to the Master Agent. Whether a particular Subagent subsequently re-reads the Master Agent's logging mask is Subagent dependent.</p>
-mask val -m val	<p>Sets the initial logging mask to val. Valid values for val are 0x00000000 (no messages), 0x00800000 (trace messages), 0x10000000 (warning messages), 0x20000000 (error messages), and the logical OR of these values for combinations of messages. This argument only takes effect as you are starting the agent. To change the mask of an agent that is already running use option -M.</p>
-nodaemonize -n	<p>Normally snmpdm puts itself into the background as if the command was terminated with an ampersand. This option inhibits that behavior.</p>
-sysDescr description -sys description	<p>Allows the user to specify the value for the system.sysDescr MIB object. The format is a text string enclosed in quotes. This option overrides the sysDescr specified in /etc/SnmpAgent.d/snmpd.conf.</p>

Environment The following environment variables affect the behavior of the Master Agent.

Table D-27: Snmp master agent environment variables

Variables	Description										
SR_MGR_CONF_DIR	This variable changes the location where snmpdm expects to find the configuration file snmpd.cnf (snmpd.conf on HP/UX). Normally this location is: <table> <tr> <td>/etc/srconf/agt/</td> <td>Most UNIX Systems</td> </tr> <tr> <td>/etc/SnmpAgent.d/</td> <td>HP/UX</td> </tr> <tr> <td>/etc/snmp/agt</td> <td>Siemens-Nixdorf delivered systems</td> </tr> <tr> <td>/home/vxworks/snmp-dev/config/agt/</td> <td>VxWorks</td> </tr> <tr> <td>\ETC\SRCONFVAGT\ (current drive)</td> <td>MS-DOS</td> </tr> </table>	/etc/srconf/agt/	Most UNIX Systems	/etc/SnmpAgent.d/	HP/UX	/etc/snmp/agt	Siemens-Nixdorf delivered systems	/home/vxworks/snmp-dev/config/agt/	VxWorks	\ETC\SRCONFVAGT\ (current drive)	MS-DOS
/etc/srconf/agt/	Most UNIX Systems										
/etc/SnmpAgent.d/	HP/UX										
/etc/snmp/agt	Siemens-Nixdorf delivered systems										
/home/vxworks/snmp-dev/config/agt/	VxWorks										
\ETC\SRCONFVAGT\ (current drive)	MS-DOS										
SR_SNMP_TEST_PORT	This variable changes the UDP port where snmpdm listens for SNMP requests (normally 161). This variable also changes the UDP port where snmpdm sends SNMP traps (normally 162). The trap port number is one greater than the value of this environment variable.										
SR_TRAP_TEST_PORT	This variable changes the UDP port where snmpdm sends SNMP traps (normally 162). This variable takes precedence over SR_SNMP_TEST_PORT.										
SR_LOG_DIR	This variable changes the location where snmpdm creates the snmpd.log file. Normally this location is: <table> <tr> <td>/tmp/</td> <td>Most UNIX Systems</td> </tr> <tr> <td>/var/adm/</td> <td>HP/UX</td> </tr> </table> <p>Note: On Microsoft Windows 3.1, there is no snmpd.log file, because log message are printed to the agent's window instead.</p>	/tmp/	Most UNIX Systems	/var/adm/	HP/UX						
/tmp/	Most UNIX Systems										
/var/adm/	HP/UX										

Files /etc/srconf/agt/snmpd.cnf
 /tmp/snmpd.log
 mib2agt
 shlib_mib2.so

HP/UX only

/usr/sbin/snmpd
 /usr/sbin/snmpdm
 /usr/lib/libSaMib2.sl
 /usr/lib/libSaHpunix.sl
 /usr/sbin/subagt_ld
 /usr/sbin/subagt_unld
 /etc/SnmpAgent.d/snmpd.conf
 /var/adm/snmpd.log

/opt/OV/snmp_mibs/
/sbin/SnmpAgtStart.d/

pSOS only

ram.x

VRTX only

kernel.xsh
snmpdm.xsh
vrtx_net.xsh

VXWORKS only

/home/vxworks/snmp-dev/config/agt/snmpd.cnf lmib2agt

Appendix E: Options

Optional Configurations

- PQM300 PQ Monitor (two serial digital program monitor channels standard)
- PQM3F01 Adds one Composite Analog Decoder to standard configuration (up to four can be added, along with two more program monitor modules, for a total of four composite video program monitor channels)
- PQM3F03 Adds one PQM300 Program Monitor module to standard configuration (up to six can be added for a total of eight serial digital program monitor channels)
- PQM3FLC Adds flat panel display with touchscreen, keypad, keyboard, and mouse.
- PQM3FRB Adds an alarm relay board with 16 relay contacts.

Optional Accessories

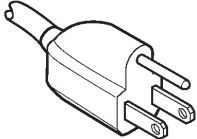
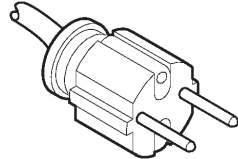
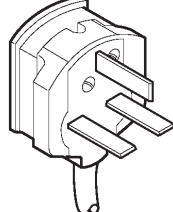
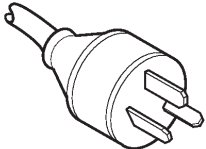
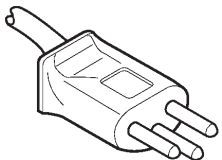
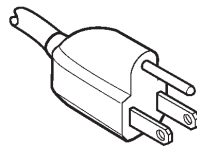
Table E-1: Optional accessories

Description	Part number
Option 1S: PQM300 Program QoS Monitor Service Manual	071-0577-XX
Power cord options	
Option A1 Universal Euro 220 V	161-0066-09
Option A2 United Kingdom, 240V	161-0066-10
Option A3 Australian 240 V	161-0066-11
Option A5 Swiss 220 V	161-0154-00
Option A6 Japan 100V	161-0066-00 WITH 013-0310-00 ADAPTER

Optional Power Cords

The power cord options shown in Table E-2 are available for the PQM300 Program QoS Monitor.

Table E-2: Power cord options

Plug configuration	Normal usage	Option number
	North America 115 V	Standard
	Europe 230 V	A1
	United Kingdom 230 V	A2
	Australia 230 V	A3
	Switzerland 230 V	A5
	Japan 100V with Adapter	A6



Glossary

Glossary

Algorithm

A well-defined set of rules for processing data to arrive at a result in a finite number of steps. The final result may be only a good approximation of the exact result that can be obtained using a more rigorous and lengthy mathematical method that either cannot be duplicated exactly by a computer or would take excessive time to solve for an exact solution.

Analog to Digital Conversion

The process of sampling an analog signal and converting the samples to discrete digital values that represent the analog signal.

Artifact

A term used to describe a change from the original or a defect that results from processing a video signal.

ASN.1

Abstract Syntax Notation One

Block Distortion

Distortion of the received image characterized by the appearance of an underlying block encoding structure.

Blockiness

The level of block distortion in a video program.

Capability Statements

Information modules that make use of the AGENT-CAPABILITIES macros for agent implementations.

CCIR 601

International Radio Consultative Committee (CCIR) Recommendation 601.

This is a standards recommendation for the formatting of digital video signals. The CCIR 601 recommendation is now ITU-R BT 601.

Chroma (chrominance)

The color information used to create the colors seen in the display. The RGB (red, green, and blue) color information is mathematically mixed with the luminance (Y) information to produce the R-Y and B-Y signals sent along with the Y signal in a video signal.

Compliance Statements

Information modules that make use of MODULE-COMPLIANCE and OBJECT-GROUP macros.

Component Video Signal

A method of separating the video color (R, G, B) and luminance (Y) information into separate channels for transmission.

Composite Coding

The composite (complete) video signal is digitized and coded into a digital signal format.

Composite Video Signal

A video signal that has the chrominance (R, G, B) and luminance (Y) of a video image combined with the horizontal and vertical synchronization to provide the complete picture information in a single channel. On a waveform monitor, a standard amplitude composite video signal in NTSC or PAL format measures from -40 IRE to +100 IRE units sync tip to reference white level.

Compression Artifacts

Changes or defects to a video signal that are introduced by transformation, quantization, and transmission compression. The common defects are loss of resolution, block errors, and quantization noise.

Distortion

Undesired change in the signal waveform while passing through a transmission system or path.

Digital to Analog Conversion

Changing the digital values representing an analog signal back into discrete analog amplitudes (either current or voltage values). These analog values are further processed by filtering techniques to restore the beginning analog signal as accurately as possible.

Enterprise-Specific Information Module

Information modules developed to describe the controls and capabilities of a networking subsystem so that it may be added to the managed system.

FAT

A file allocation table (FAT) is a file that the operating system maintains on a hard disk drive. The file provides a map of the drive clusters (the basic logical storage unit) that a file has been stored in. Files may be stored across many clusters, not necessarily next to each other. The FAT stores the location and order that the clusters are to be read to assemble the file.

Frame

All the information required for a complete picture. For interlaced scan systems, there are two fields in a frame.

Gaussian Noise

Noise that has a frequency distribution which follows the Gaussian curve (a bell-shaped curve corresponding to a population that has a normal distribution).

Information Module

An ASN.1 module that defines information related to network management.

ITU

International Telecommunications Union. A specialized agency of the United Nations for Telecommunications whose goal is cooperation to improve the rational use of telecommunications. Members of the organization include governments, private companies, scientific and industrial institutions.

ITU-R BT.601

International Telecommunications Union Recommendation BT.601. Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios. ITU-R BT.601 replaced CCIR 601.

Limits

As used in this context, the acceptable range of difference from a standard or reference value.

Management Station

A control point that executes management applications which monitor and control managed elements. A managed element can be any device on the network that can be monitored and controlled using its management information.

Management System

A network of nodes, each with a processing entity (an agent) that has access to management instrumentation; at least one management station; and a management protocol that is used to convey management information between the agents and the management stations.

MIB Modules

Information modules that contain definitions of inter-related managed objects. The modules make use of OBJECT-TYPE and NOTIFICATION-TYPE macros.

MIB

Management Information Base. The management information is views as a collection of managed objects that reside in a virtual information store. This store is termed the Management Information Base. Collections of related objects are defined in MIB Modules.

Module Definitions

Information module descriptions. An ASN.1 macro, MODULE-IDENTITY, is used to concisely convey the semantics of a managed object.

Motion-Related Artifacts

Distortion of moving video images that may be seen by a viewer. Sometimes the distortion increases with more rapid motion in the video scene. The distortion may be seen as smearing, block distortion, jerkiness, or other defect.

Notification Definitions

Describe unsolicited transmissions of management information. An ASN.1 macro, NOTIFICATION-TYPE is used to concisely convey the syntax (how it is stated) and semantics (what it means or interpreted to mean) of a notification.

Object Definitions

Describe managed objects. An ASN.1 macro, OBJECT-TYPE, is used to concisely convey the syntax and semantics of a managed object.

Object Identifier

An ordered list of non-negative numbers. Each number in the list is referred to as a sub-identifier.

PDI (Picture Defects Indicator)

The vertical axis scale indicator for the MPEG Defects graph in the PQM300 Program QoS Monitor. The PDI scale provides an immediate and continuous indication of the video image quality. The PDI scale is derived from the industry standard Picture Quality Rating (PQR) scale introduced by the Tektronix PQA200 Picture Quality Analysis System. The PDI level indicated for the quality of service approximates the experience of human viewers and is an indicator of the picture quality seen by the viewer.

Quantizing

The sampling process done to an analog signal to obtain discrete analog values to convert to digital value representing the analog signal.

Quantizing Error/Noise

Digital values obtained from an A-to-D converter that do not accurately reflect the analog signal values applied to the input of the converter.

Rec. 601

An International Telecommunications Union recommendation for the standardization of formatting of a digital video signal. See ITU-R BT.601.

RFCxxxx

Request for Comment. A document of the Network Working Group that specifies an Internet standards track protocol for the Internet community. Requests for discussion and suggestions for change or improvements are encouraged.

SMI

Structure of Management Information. The SMI describes how to use a subset of ASN.1 to define an information module. The SMI is divided into three parts: module definitions, object definitions, and notification definitions.

SNMP Agent

An SNMP agent is a processing entity that conveys the management information between the agent and the network management station.

SNMP

Simple Network Management Protocol.

S-Video

Separate video, also called Y/C. The luminance (Y) and the chrominance (C) signals are sent separately to decrease the chance of crosstalk between the two signals that is possible when they are sent as a composite signal. It also eliminates the need to separate the Y and C signals later for the separate processing circuitry.

Termination

The impedance that ends a signal path through a transmission line. To accurately send a signal through a transmission line, there must be an impedance at the end that matches the impedance of the source and of the line itself. Amplitude errors and reflections will otherwise result. Video is a 75Ω system, so a 75Ω terminator is required at the end of the signal path.

Threshold

A level or point that divides one condition of operation or position from another and perceptually different condition of operation or position. For example, the black threshold is the level that divides those objects that are above the threshold and visible in a display from those that are below the threshold and are not visible.



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