

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Astronics / EADS / Racal 456271* at our website: ***Click HERE***

USER MANUAL

1269

6 C-SIZE/3 B-SIZE
VXI/VME CHASSIS

Publication No. 980790

RACAL INSTRUMENTS

Racal Instruments, Inc.
4 Goodyear St., Irvine, CA 92618-2002
Tel: (800) RACAL-ATE, (800) 722-2528, (949) 859-8999; FAX: (949) 859-7139

Racal Instruments, Ltd.
480 Bath Road, Slough, Berkshire, SL1 6BE, United Kingdom
Tel: +44 (0) 1628 604455; FAX: +44 (0) 1628 662017

Racal Systems Electronique S.A.
18 Avenue Dutartre, 78150 LeChesnay, France
Tel: +33 (1) 3923 2222; FAX: +33 (1) 3923 2225

Racal Systems Elettronica s.r.l.
Strada 2-Palazzo C4, 20090 Milanofiori Assago, Milan, Italy
Tel: +39 (0)2 5750 1796; FAX +39 (0)2 5750 1828

Racal Elektronik System GmbH.
Technologiepark Bergisch Gladbach, Friedrich-Ebert-Strasse, D-51429 Bergisch Gladbach, Germany
Tel.: +49 2204 8442 00; FAX: +49 2204 8442 19

Racal Australia Pty. Ltd.
3 Powells Road, Brookvale, NSW 2100, Australia
Tel: +612 9936 7000, FAX: +612 9936 7036

Racal Electronics Pte. Ltd.
26 Ayer Rajah Crescent, 04-06/07 Ayer Rajah Industrial Estate, Singapore 0513.
Tel: +65 7792200, FAX: +65 7785400

Racal Instruments, Ltd.
Unit 5, 25F., Mega Trade Center, No 1, Mei Wan Road, Tsuen Wan, Hong Kong, PRC
Tel: +852 2405 5500, FAX: +852 2416 4335

http://www.racalinstruments.com



PUBLICATION DATE: October 13, 2000

Copyright 2000 by Racal Instruments, Inc. Printed in the United States of America. All rights reserved. This book or parts there of may not be reproduced in any form without written permission of the publisher.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

WARRANTY STATEMENT

Products sold by Racal Instruments, Inc. are warranted to be free from defects in workmanship or materials. Racal Instruments, Inc. will, at its option, either repair or replace any hardware products which prove to be defective during the warranty period. You are a valued customer. Our mission is to make any necessary repairs in a reliable and timely manner.

Duration of Warranty

The warranty period for this Racal Instruments, Inc. hardware is three years, except software and firmware products designed for use with Racal Instruments, Inc. Hardware are warranted not to fail to execute their programming instructions due to defect in materials or workmanship for a period of ninety (90) days from the date of delivery to the initial end user.

Return of Product

Authorization is required from Racal Instruments before you send us your product for service or calibration. Call your nearest Racal Instruments support facility. A list is located on the last page of this manual. If you are unsure where to call, contact Racal Instruments, Inc. Customer Support Department in Irvine, California, USA at 1-800-722-3262 or 1-949-859-8999 or via fax at 1-949-859-7139. We can be reached at: helpdesk@racalinstruments.com.

Limitation of Warranty

Racal Instruments, Inc. shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than authorized Racal Instruments service personnel or without the written consent of Racal Instruments.

Racal Instruments, Inc. expressly disclaims any liability to its customers, dealers and representatives and to users of its product, and to any other person or persons, for special or consequential damages of any kind and from any cause whatsoever arising out of or in any way connected with the manufacture, sale, handling, repair, maintenance, replacement or use of said products.

Representations and warranties made by any person including dealers and representatives of Racal Instruments, Inc., which are inconsistent or in conflict with the terms of this warranty (including but not limited to the limitations of the liability of Racal Instruments, Inc. as set forth above), shall not be binding upon Racal Instruments, Inc. unless reduced to writing and approved by an officer of Racal Instruments, Inc.

Except as stated above, Racal Instruments, Inc. makes no warranty, express or implied (either in fact or by operation of law), statutory or otherwise; and except to the extent stated above, Racal Instruments, Inc. shall have no liability under any warranty, express or implied (either in fact or by operation of law), statutory or otherwise.

PROPRIETARY NOTICE

This document and the technical data herein disclosed, are proprietary to Racal Instruments, and shall not, without express written permission of Racal Instruments, be used, in whole or in part to solicit quotations from a competitive source or used for manufacture by anyone other than Racal Instruments. The information herein has been developed at private expense, and may only be used for operation and maintenance reference purposes or for purposes of engineering evaluation and incorporation into technical specifications and other documents which specify procurement of products from Racal Instruments.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

FOR YOUR SAFETY

Before undertaking any troubleshooting, maintenance or exploratory procedure, read carefully the **WARNINGS** and **CAUTION** notices.

This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.

If this instrument is to be powered from the AC line (mains) through an autotransformer, ensure the common connector is connected to the neutral (earth pole) of the power supply.

Before operating the unit, ensure the conductor (green wire) is connected to the ground (earth) conductor of the power outlet. Do not use a two-conductor extension cord or a three-prong/two-prong adapter. This will defeat the protective feature of the third conductor in the power cord.

Maintenance and calibration procedures sometimes call for operation of the unit with power applied and protective covers removed. Read the procedures and heed warnings to avoid “live” circuit points.

Before operating this instrument:

1. Ensure the instrument is configured to operate on the voltage at the power source. See Installation Section.

2. Ensure the proper fuse is in place for the power source to operate.

3. Ensure all other devices connected to or in proximity to this instrument are properly grounded or connected to the protective third-wire earth ground.

If the instrument:

- fails to operate satisfactorily
- shows visible damage
- has been stored under unfavorable conditions
- has sustained stress

Do not operate until performance is checked by qualified personnel.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page was left intentionally blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table of Contents

Chapter 1
Getting Started 1-1
Product Description 1-1
Key Features 1-1
Ease of Use 1-1
Portable Bench Top Mainframe 1-2
Locations For B-Sized VXI/VME Modules 1-3
Rack Mount Configuration (5U Footprint) 1-4
Modular Mainframe Design 1-5
720 Watts Useable DC Power 1-6
High Capacity Positive Pressure Cooling System 1-7
Bench Top Cooling System 1-7
Rack Mount Cooling System 1-8
Enhanced Monitoring System (EMS) 1-9
Rack Mount Options 1-10
Backplane 1-10
Items Shipped With The 1269 1-11
Spares Ordering Information 1-11
Optional Equipment 1-12

Chapter 2
Configuring The 1269 2-1
Using This Chapter 2-1
AC Mains Power 2-1
Site Considerations 2-2
Select VXIbus Slot 0 Controller Location 2-2
Installing VXI Modules 2-2
Installation and Removal of Card Guide Covers (Airflow Directors) 2-4
Installing Blanking Panels 2-5
Installation Of Option 01, Rack Ears With Slides 2-6
Preparing Chassis for Slides 2-7

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Mounting Slide To Chassis 2-9
Installing The Slides Into The Rack 2-11
Installing The Mainframe W/Opt 01 Into The Rack 2-13
Installation of Option 04, Rack Ears 2-13
Preparing Chassis for Rack Rail Mounting 2-14
Installing The Mainframe Into The Rack 2-16
Installing Inter-Module Shield Option 52 2-16
Installing ASFP Panel Option 23 2-17
Installing Rack Mount Door Option 14 2-18
Connecting Safety Ground 2-19
Fan Speed (HI - LO) Selection 2-20
Non-EMS Units 2-20
EMS Units 2-21
Installing The Enhanced Monitoring System (EMS) 2-22
Enhanced Monitor VXI Logical Address Switch 2-22
Enhanced Monitor Configuration Switch 2-23
Connecting The RS-232 Interface 2-24
Connecting To a Computer, Data Terminal, or Modem 2-24
RS-232 Flow Control Method 2-24
Feed RS-232 Echo Back And Line Considerations 2-24
Installing The VXI*plug&play* Driver 2-27

Chapter 3
Operating The 1269 3-1
Using This Chapter 3-1
1269 Front View 3-2
1269 Rear View 3-3
Powering On The Mainframe 3-4
Using Remote Power On/Standby Switching 3-5
Monitoring Basics 3-6
Rear Panel Switch and Connector Descriptions 3-7
Backplane Connectors 3-10
Basic Functional Check 3-14

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 4

Using The Enhanced Monitoring System 4-1
Overview 4-1
Power On/Reset Defaults 4-1
What To Do Now 4-3
Measuring Power Supply Voltages 4-3
Measuring Ambient Temperature 4-3
Measuring VXI Slot Temperature 4-3
Measuring Fan Speed 4-4
Measuring Elapsed Time 4-4
Reading The Present State of VXI Signals 4-5
Monitoring The VXI Subsystem 4-5
Programming The Tolerance Limits 4-6
Programming The Power Supply Voltage Tolerance Limits 4-6
Programming The Fan Speed Tolerance Limits 4-6
Programming The Ambient Temperature Tolerance Limit 4-7
Programming The VXI Slot Temperature Rise Tolerance Limits 4-7
Programming The VXI Bus Error and IACKn Tolerance Limits 4-8
Reading The VXI Bus Error and IACKn Counters 4-9
Clearing The VXI Bus Error and IACKn Counters 4-9
Generating an Interrupt When an Alarm Condition is Detected 4-10
Clearing The Filter Service Alarm 4-18
Change of Limit for Filter Service Alarm Example 4-19
Interrupt Generation Example 4-19
Programming The Trigger Subsystem 4-20
Connecting The TRIG IN Input To a TTLTRG Line 4-21
Connecting The TRIG OUT Output To a TTLTRG Line 4-22
Programming a Trigger Delay Time 4-23
Selecting The Trigger Delay Application 4-24
Programming The Front Panel Display 4-24
Turning The Display On and Off 4-25
Writing a Message To The Display 4-25
Clearing The Message From The Display 4-26
Front Panel Message Semantics 4-26
Front Panel Status Messages 4-27

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Programming The RS-232 Interface 4-29
Programming The Baud Rate 4-29
Programming The Number of Data Bits 4-29
Programming The Parity 4-30
Programming The Number of Stop Bits 4-30
Illegal RS-232 Interface Combinations 4-30
Setting The System Time and Date 4-31
Reading Event Time Stamps 4-32
IEEE-488.2 Common Commands 4-34
*IDN? Query 4-34
*RST Command 4-34
*TST? Query 4-34
*CLS Command 4-34
*ESE Command 4-34
*ESE? Query 4-35
*ESR? Query 4-35
*SRE Command 4-36
*SRE? Query 4-37
*STB? Query 4-37
*OPC Command 4-38
*OPC? Query 4-38
*RCL Command 4-38
*SAV Command 4-39
*TRG Command 4-40
*WAI Command 4-40
Performing the Self-Test 4-40

Chapter 5
SCPI Command Reference 5-1
What's In This Chapter 5-1
Introduction To SCPI Language 5-1
Command Keyword Long Form and Short Form 5-2
Case Sensitivity 5-2
Optional Keywords 5-3
Multiple Identical Capabilities and Keyword Suffixes 5-3

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The MIN, MAX, and DEF Parameters 5-4
Querying Parameter Setting 5-4
Query Response Format 5-5
SCPI Command Terminator 5-5
IEEE-STD-488.2 Common Commands 5-5
SCPI Parameter Type 5-6
Numeric Parameters 5-6
Discrete Parameters 5-6
Boolean Parameters 5-6
SCPI Command Summary 5-6
Command Parameter Limits 5-10
Device Specific Commands 5-10

Chapter 6
Understanding The 1269 6-1
Overview 6-1
Power Supply 6-1
Power Supply Interconnection 6-1
Power Supply Protections 6-3
Backplane 6-3
Backplane Interconnections 6-4
Cooling System 6-4
Rack Mount Cooling System 6-4
Bench Top Cooling System 6-4
Cooling The Power Supply 6-5
Manual Fan Speed Switch (Non EMS Units Only) 6-5
Enhanced System Monitor (EMS) 6-5
EMS Module System Interconnection 6-7
EMS Module General Capabilities 6-7
User Limits On EMS Monitored Parameters 6-8
Timestamps on EMS Monitored Events 6-8
EMS Rear Panel Fan Speed Monitor 6-8
EMS Fan Speed Control 6-8
EMS Fan Speed Selection 6-9

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 7
Maintenance 7-1
What's In This Chapter 7-1
Service Strategy 7-1
Service Interval 7-1
Preparation 7-1
Inspection and Cleaning 7-2
Interior Cleaning 7-2
Exterior Cleaning 7-2
Cleaning The Fan Filters 7-3
Modular Component Removal and Replacement 7-4
Tools Required 7-4
Removal and Replacement of The Module Cooling Fan 7-4
Removal and Replacement of The Power Supply Assembly 7-6
Removal and Replacement of The Enhanced Monitoring System 7-7
Removal and Replacement of The AC Mains Fuse 7-9
Removing and Replacing The Card Guides 7-10
Troubleshooting The 1269 7-11
Assembly Drawings 7-14
Parts Lists 7-16
Dimensional Outline 7-18

Chapter 8
PRODUCT SUPPORT 8-1
Product Support 8-1
Reshipment Instructions 8-1
Support Offices 8-2

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

List of Figures

Figure 1-1, 1269 Portable (5U Wide) Mainframe In Bench Top Configuration..... 1-2
Figure 1-2 Locations for B-Sized VXI/VME Modules 1-3
Figure 1-3 1269 Rack Mount (5U Tall) Configuration 1-4
Figure 1-4 Modular Service Friendly Mainframe Design Features 1-5
Figure 1-5 1269 720 Watt Pluggable Power Supply 1-6
Table 1-1, 1269 Available DC Current..... 1-6
Figure 1-6, 1269 Bench Top Configuration Positive Pressure Cooling System..... 1-7
Figure 1-7, 1269 Rack Mount Configuration Positive Pressure Cooling System 1-8
Figure 1-8, 1269 System Monitor Components 1-9

Figure 2-1 Select VXIbus Slot 0 Controller Location..... 2-3
Figure 2-2 Airflow Directors..... 2-4
Figure 2-3 Blanking Panels..... 2-5
Table 2-1 Option 01 Parts List..... 2-6
Figure 2-4a Slide Rack Mounting Bottom Cover..... 2-7
Figure 2-4b Slide Rack Mounting - Top Cover 2-8
Figure 2-5 Instrument Rail Removal..... 2-9
Figure 2-6 Slide and Bracket Components 2-10
Figure 2-7 Rear End Slide Mount Rack Dimensions 2-12
Table 2-2 Option 04 Parts List..... 2-14
Figure 2-8 Fixed Rack Mounting..... 2-15
Figure 2-9 Inter-Module Shield 2-16
Figure 2-10 ASFP Panel 2-17
Figure 2-11 Installing Rack Mount Door 2-18
Figure 2-12 Connecting Safety Ground..... 2-19
Figure 2-13 Fan Speed (HI-LO) Selection - Non EMS 2-20
Figure 2-14 Fan Speed (HI-LO) Selection – EMS..... 2-21
Figure 2-15 Setting The Enhanced Monitor VXI Logical Address 2-22
Figure 2-16 Setting The Enhanced Monitoring System Configuration Switch..... 2-23
Figure 2-17 Setting Up The Enhanced Monitoring System RS-232 Interface..... 2-25
Figure 2-18 RS-232 Connections With A Computer, Data Terminal, or Modem 2-26

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figure 3-1 1269 Front View 3-2
Figure 3-2 1269 W/EMS Rear View 3-3
Figure 3-3 Powering On The Mainframe 3-4
Figure 3-4, Using Remote Power On/Standby Switching 3-5
Table 3-1, Monitoring Basics 3-6
Table 3-2, Rear Panel Switches 3-7
Table 3-3, J412 EMS RS-232 Port 3-7
Table 3-4, J413 EMS TTL Trigger Connector 3-8
Table 3-6, J415 Rear Panel Monitor/Control Connector 3-9
Table 3-7, P1 Connector Pinouts 3-11
Table 3-8, P2 Connector Pinouts For All Non-Slot 0 Locations 3-12
Table 3-9, P2 Connector Pinouts for VXIbus Slot 0 (C0 or B0) 3-13
Table 3-10, Power Supply Voltages at J415 3-14

Table 4-1, Default Limit Settings After Power On, *RST 4-2
Figure 4-1, Voltage Condition Register 4-11
Table 4-3, Temperature Condition and Event Register Bit Assignments 4-12
Table 4-4, Fan Speed Condition and Event Register Bit Assignments 4-12
Table 4-5, Time Condition and Event Register Bit Assignments 4-12
Table 4-6, VXI Condition and Event Register Bit Assignments 4-13
Figure 4-2, Event and Enable Registers and Summary Bit Generation 4-14
Table 4-7, Questionable Condition Register Bit Assignment 4-15
Figure 4-3, Status Reporting Hierarchy 4-17
Table 4-8 Front Panel Status Messages 4-28

Table 5-1, VXIbus Model 1269 EMS SCPI Commands List Summary 5-7
Table 5-2, Defaults, Minima and Maxima 5-10

Figure 6-1, Functional Block Diagram for 1269 Mainframe 6-2
Figure 6-2, Enhanced Monitoring System (EMS) Module Block 6-6

Figure 7-1, Cleaning The Fan Filters 7-3
Figure 7-2, Fan Module Assembly Detail 7-5
Figure 7-3, Removing The Power Supply 7-7

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figure 7-4, (EMS) Module Removal and Replacement 7-8
Figure 7-5, Removing and Replacing The AC Mains Fuse 7-9
Figure 7-6, Card Guide Removal and Replacement 7-11
Table 7-1, Troubleshooting 7-12
Table 7-1, Continuation Troubleshooting 7-13

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page was left intentionally blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 1
GETTING STARTED

Product Description

The Model 1269 6C/3B Slot Intelligent Mainframe is a 9-slot VXIbus Mainframe. The 1269 can accommodate up to 6 C-size VXI modules and up to 3 B-size VXI or VME modules. A plug-in Personality Module allows either the **C0 slot** or **B0 slot** to function as the mainframe **VXIbus Slot 0** location. The Model 1269 fully complies with the VXIbus Specification 1.4 requirements and is VXI*plug&play* compatible.

Key Features

Figures 1-1 through **1-8** show the key features of the 1269.

Ease of Use

Plug-in Personality Module. The orientation of the Plug-in Personality Module allows either the **C0 slot** or **B0 slot** to function as the mainframe **VXIbus Slot 0** location.

Fast Setup. The 1269 backplane uses active-automatic VME interrupt acknowledge and bus grant daisy chaining. Manual configuration of backplane switch settings or jumpers has been eliminated.

Universal AC Input. The 1269 AC input is both auto-voltage and auto-frequency ranging. The chassis does not require the configuration of a voltage selection switch.

Enhanced Monitoring. The 1269 optional micro-controller based Enhanced Monitoring System (EMS) gives you key system health status (Voltage, Airflow and Temperature). This option includes a front panel alpha-numeric display, a fully VXIbus compliant message-based interface, an auxiliary RS-232 port, and VXI*plug&play* drivers and GUI.

Plug-in Power Supply, Fans, and Monitor. The 1269 modular system design results in a virtually wireless mainframe with low MTTR and high MTBF. See **Figure 1-4.**

Variable Extension Rack Mounting. The adjustable rack mount ear provides up to 1.50 (in 0.500 inch increments) extension rack mounting capability. See **Figure 2-4a, 2-4b** for slide rack mounting and **Figure 2-8** for fixed rack mounting.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Fan Speed Control. The 1269 delivers the cooling air that your application requires. Fan speed control reduces the acoustic noise levels of the 1269 high performance cooling system.

Portable Bench Top Mainframe

The 1269 is a portable high performance 9-slot VXI mainframe that is only 5U (8.720 inches) wide when used in a bench top configuration.

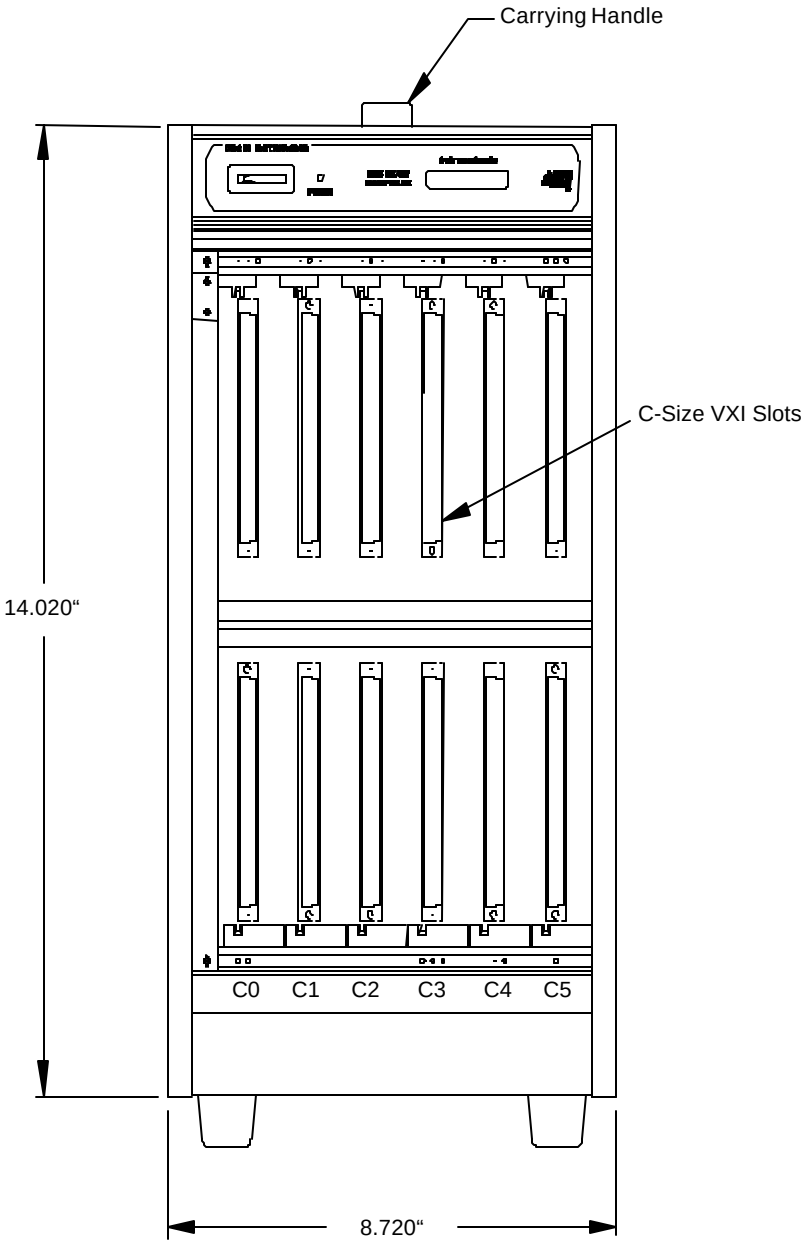
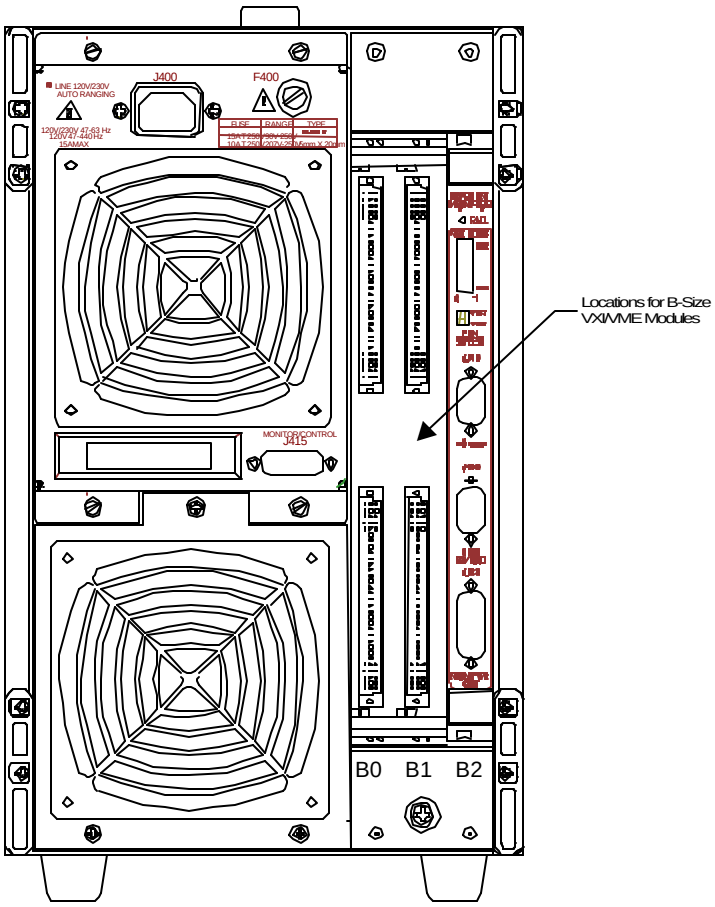


Figure 1-1, 1269 Portable (5U Wide) Mainframe In Bench Top Configuration

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Locations For B-Sized VXI/VME Modules

The 1269 backplane can accommodate up to 6 C-size VXI modules and up to 3 B-size VXI or VME modules. The plug-in Personality module allows either the **C0 slot** or **B0 slot** to function as the mainframe **VXIbus Slot 0** location.



Rear View

Figure 1-2 Locations for B-Sized VXI/VME Modules

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Rack Mount Configuration (5U Footprint)

The 1269 mainframe is designed for rack mounting in a 5U tall (8.720) footprint.

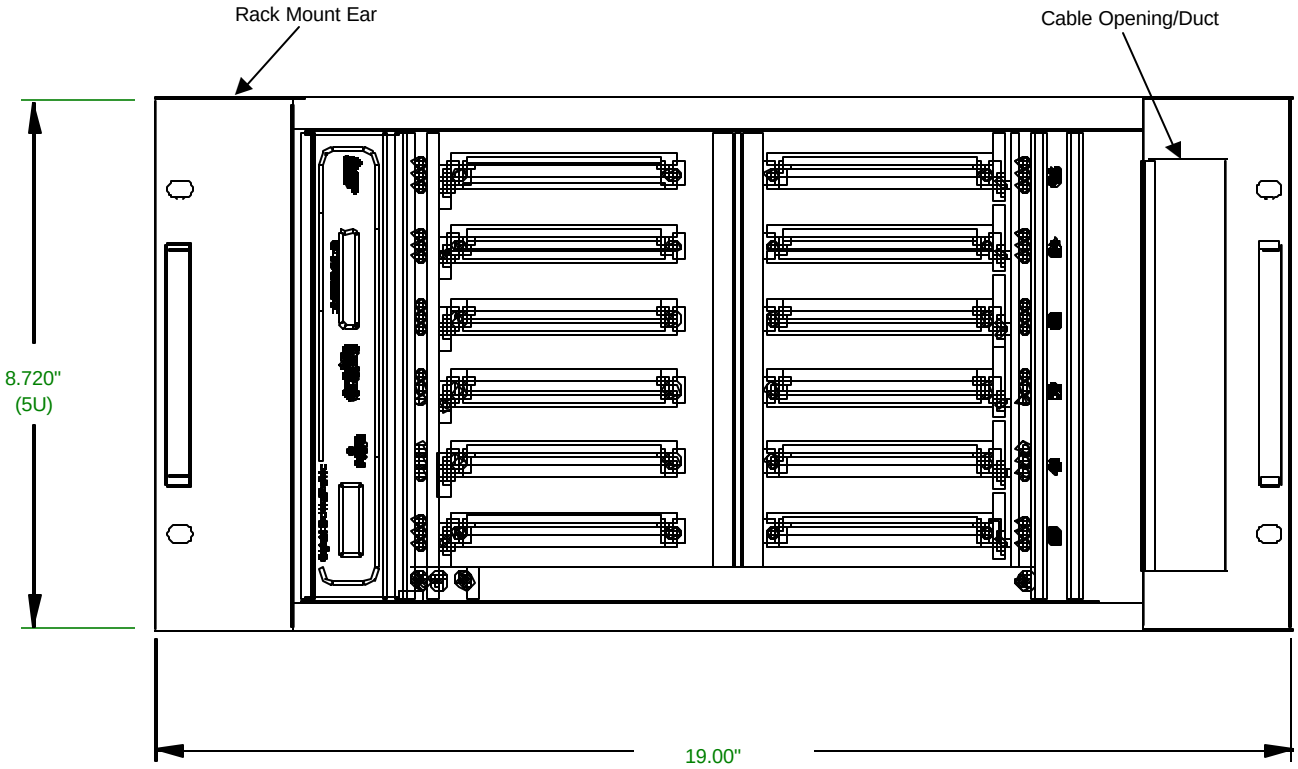


Figure 1-3 1269 Rack Mount (5U Tall) Configuration

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Modular Mainframe Design

The 1269 highly modular design is virtually wireless with low MTTR and high MTBF.

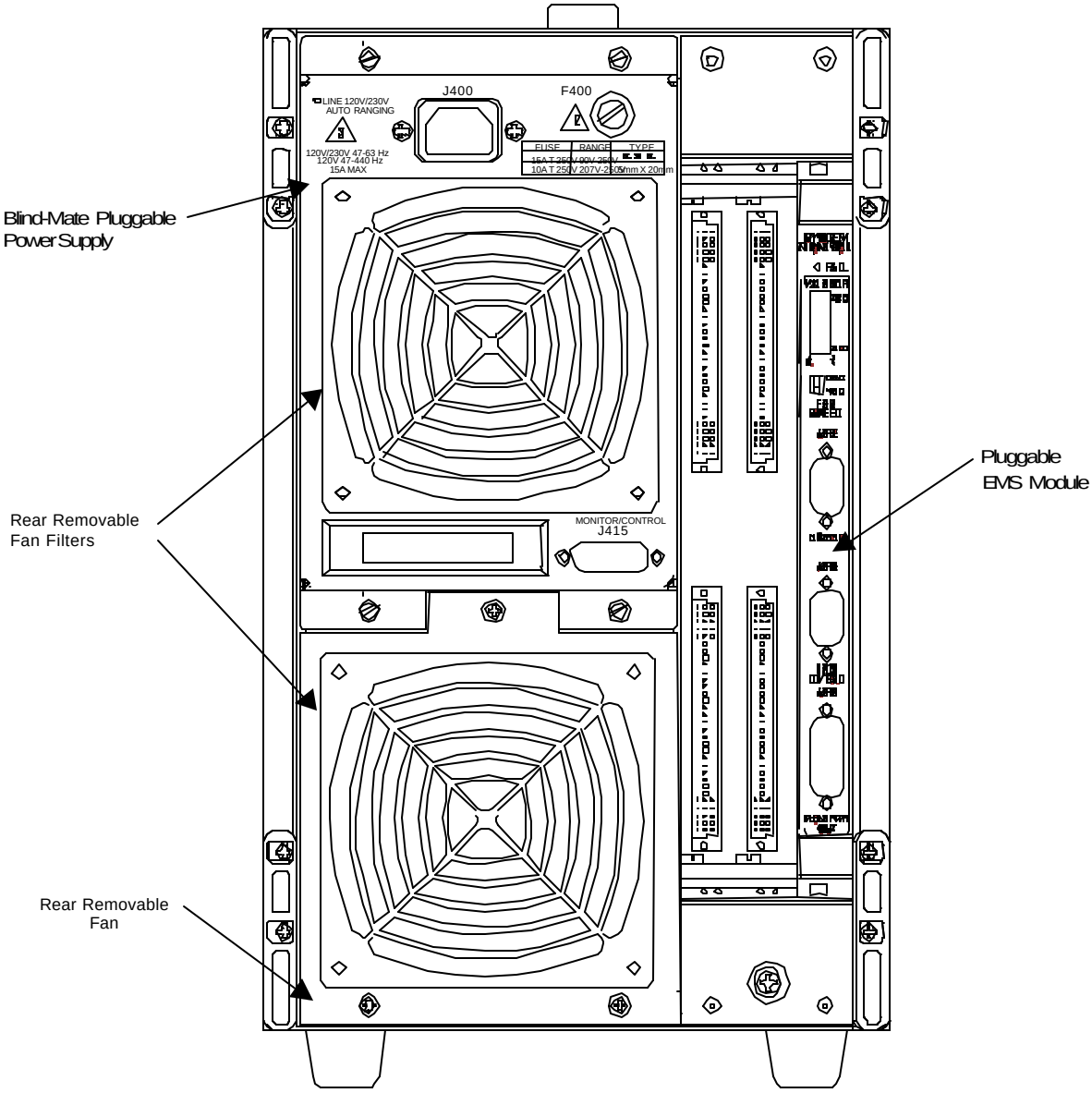


Figure 1-4 Modular Service Friendly Mainframe Design Features

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

720 Watts Useable DC Power

Figure 1-5 depicts the 1269 mainframe's 720Watt plug-in power supply. **Table 1-1** lists the available DC current for each VXI voltage.

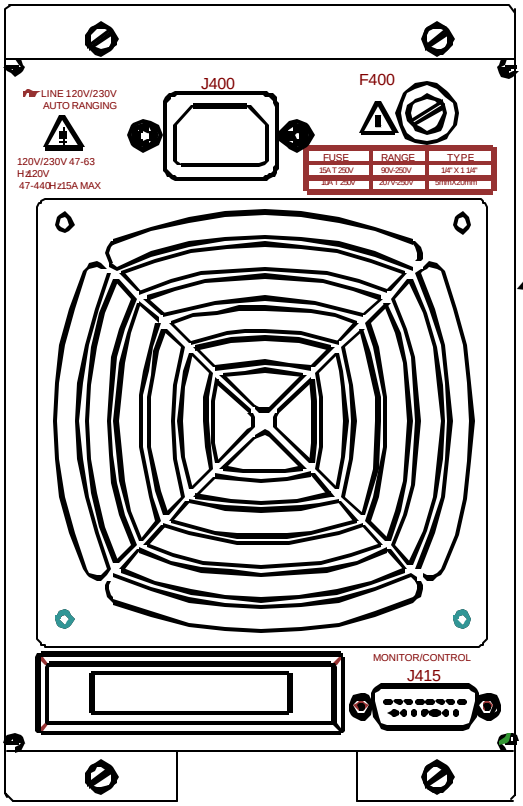


Figure 1-5 1269 720 Watt Pluggable Power Supply

VXI Voltage	Available DC Current
+5V	54 Amps
-5.2V	12 Amps
-2V	12 Amps
+12V	8 Amps
-12V	8 Amps
+24V	4 Amps
-24V	4 Amps

Table 1-1, 1269 Available DC Current

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

High Capacity Positive Pressure Cooling System

The 1269 uses forced air positive pressure cooling to direct air to the VXI modules, and VXI/VME modules.

Bench Top Cooling System

Figure 1-6 details the cooling system in the bench top configuration.

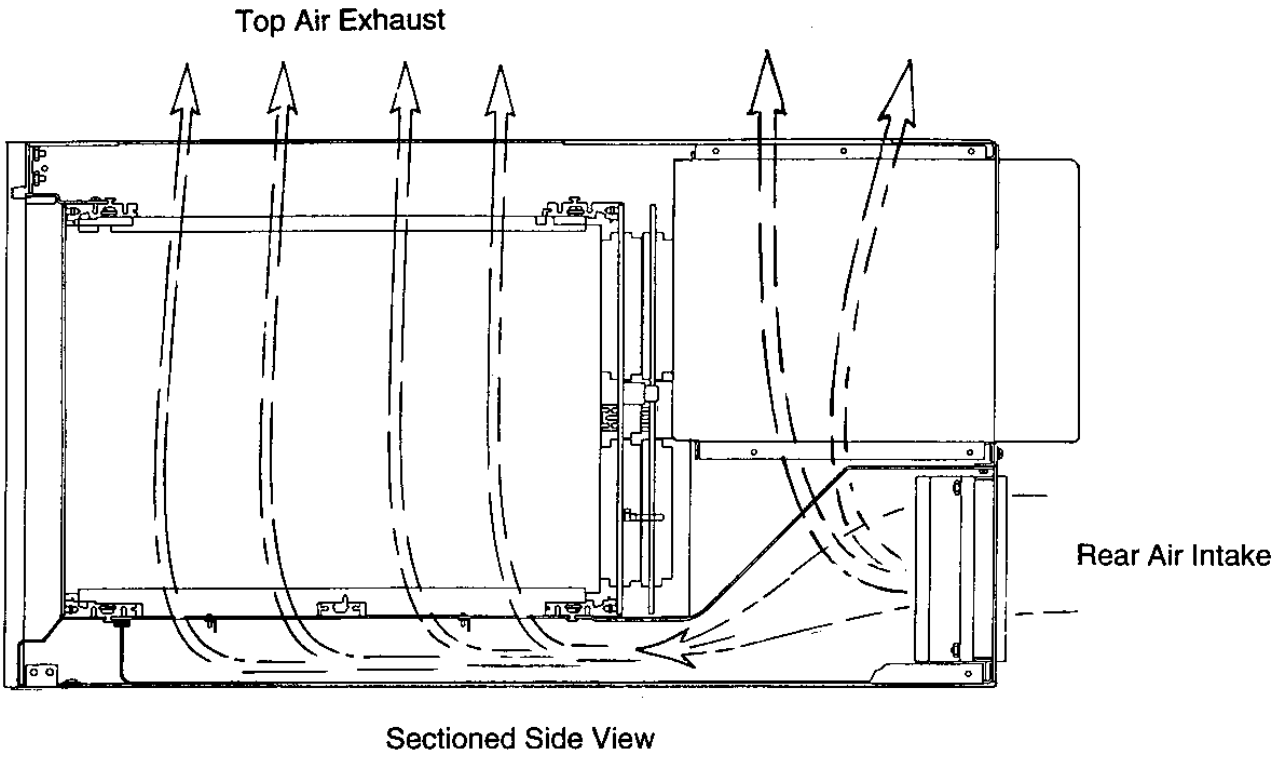


Figure 1-6, 1269 Bench Top Configuration Positive Pressure Cooling System

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Rack Mount Cooling System

Figure 1-7 details the 1269 cooling system in the rack mount configuration.

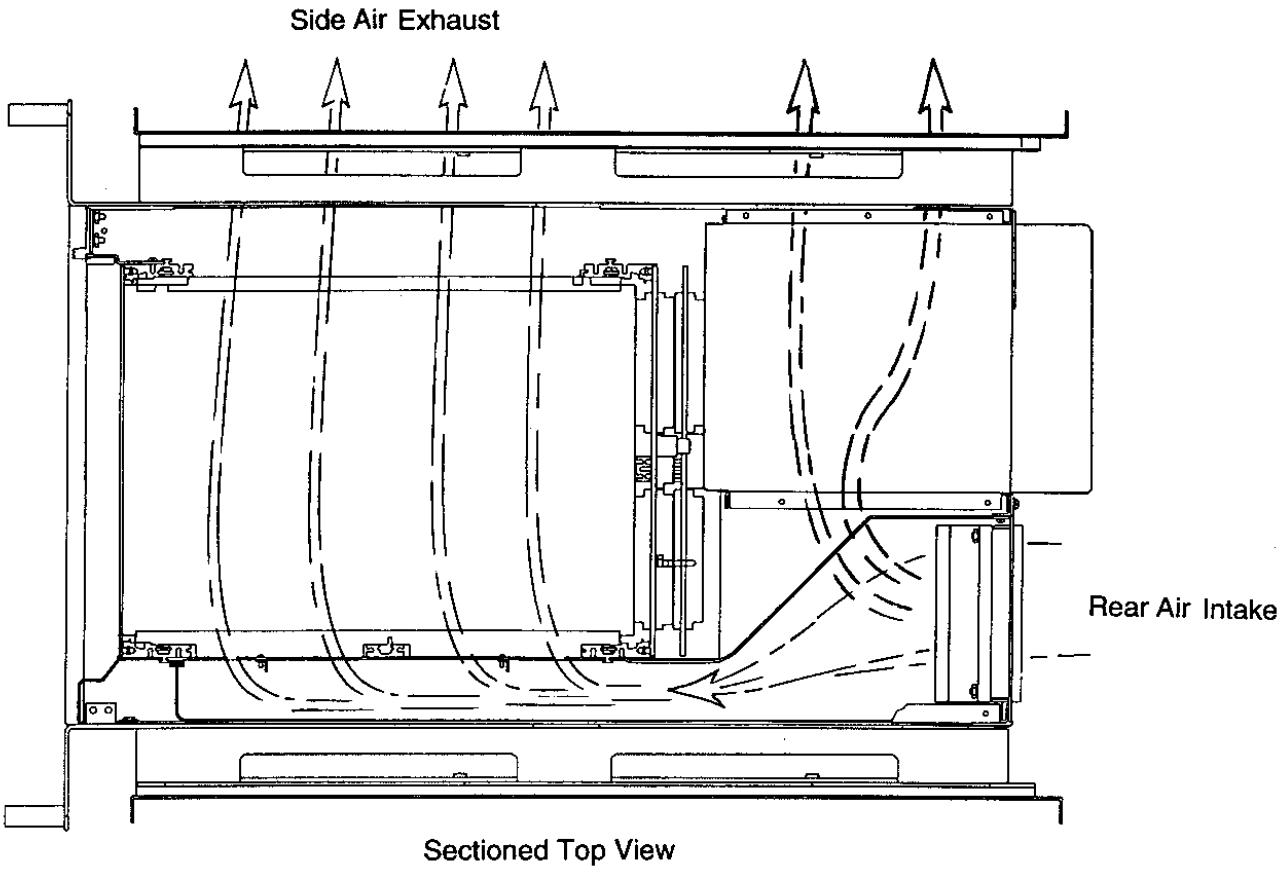


Figure 1-7, 1269 Rack Mount Configuration Positive Pressure Cooling System

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Enhanced Monitoring System (EMS)

The Enhanced Monitoring System (EMS) features include a fully VXIbus 1.4 compliant message-based interface, alpha numeric display, individual VXIbus voltage and slot temperature reading, fan speed sensing and control, TTL trigger in/outputs with programmable delay, state monitoring of key VXI backplane signals (AS*, ACFAIL*, SYSRESET*), event counting of VXI bus error (BERR*) conditions and interrupt cycles. The EMS also comes complete with VXI*plug&play* drivers. See disks at back of manual, and **Installing The VXI*Plug & Play* Drivers** in **Chapter 2**.

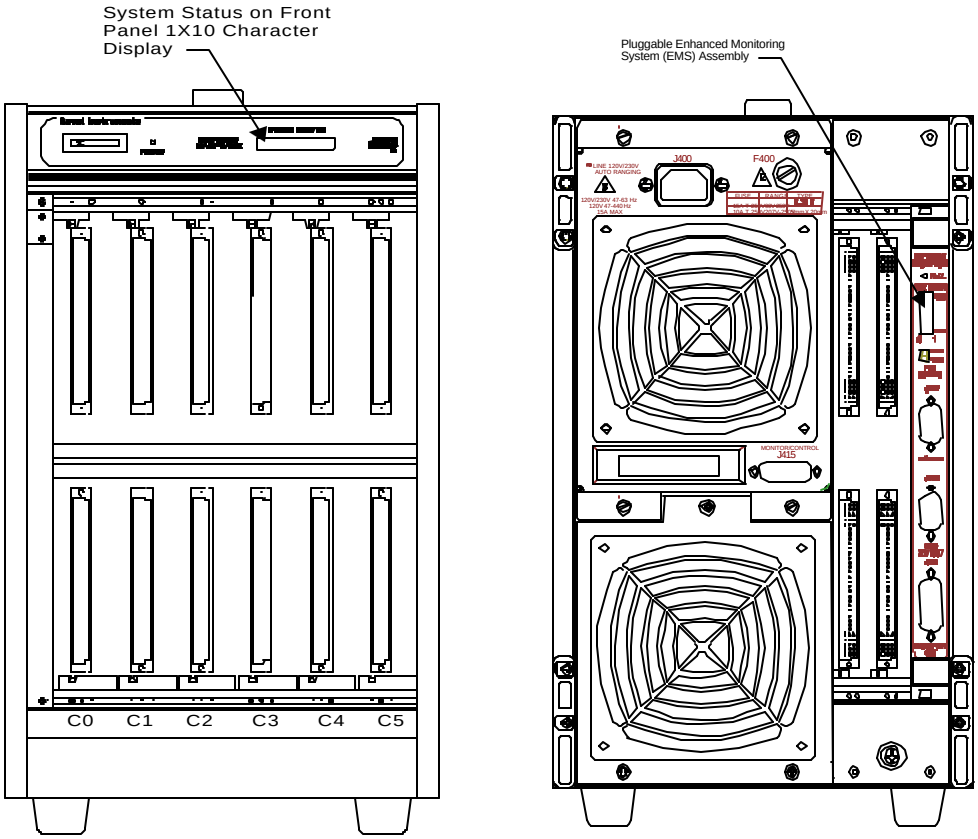


Figure 1-8, 1269 System Monitor Components

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Rack Mount Options

The 1269 is available with two rack mount options.

The adjustable rack mount ear provides variable extension rack mounting capability.

Option 01 includes rack mount ears, slide mount/cable duct adapter and slides.

Options 04 consist of rack mount ears and rack mounting adapter.

Refer to **Section 2** for details and installation.

Backplane

The 1269 backplane can accommodate up to 6 C-size VXI modules and up to 3 B-size VXI or VME modules. The plug-in Personality Module allows either the **C0 slot** or **B0 slot** to function as the mainframe **VXIbus Slot 0** location.

The 1269 has a jumperless auto-configurable backplane using active-automatic daisy chaining for the VME Interrupt acknowledge and bus grant daisy chain signal lines. This eliminates the need to manually configure the backplane.

Distribution of the CLK10 reference clock is full differential providing a low skew timing source.

Power is supplied to the backplane through a direct connection to the 1269 power supply eliminating wiring and sub-backplane interconnect boards. The result is increased reliability and improved dynamic current performance.

WARNING

Signal function on Rows A and C of the backplane P2 connector are assigned by the VXIbus specification. Verify compatibility when using VME modules in the B0, B1 and B2 slot locations.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Items Shipped With The 1269

Qty	Item	Part Number
1	Instruction Manual	980790
1	Power Cable	602262
2	Card Guide Covers (Airflow directors)	456271
1	VXI*plug&play* Win Framework Installation Disk (included with manual)	921513

Spares Ordering Information

Spares Ordering Information		
Model	**Description**	**Part Number**
1269 Power Supply	Spare Power Supply Module	407497-900
1269 Personality Card	Spare Plug-in Personality Module	415113
EMS Module	Spare EMS Module	405111
Card Guide Cover	Spare Card Guide Cover (airflow directors)	456271
Blanking Plate	Blanking Plates (to fill empty module slots)	404836
Front Door Assembly	Front Door Assembly (Opt 14)	407517

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Optional Equipment

Options		
Model	**Description**	**Part Number**
Option 01	Rack Ears with Cable Duct Adaptor and Slides	407506
Option 04	Rack Ears with Cable Duct/Rail Mount Adapters	407507
Option 14	Plexiglass Front Door	407517
Option 23	Application Specific Front Panel (AFSP)	407519
Option 51	Backplane w/Connector Shrouds Installed	407521
Option 52	Inter-Module Mainframe Shield Kit	407523
Option 71	230 Volt Fusing Option	407524

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 2

CONFIGURING THE 1269

Using This Chapter

This section includes procedures to install and configure the 1269 mainframe. Use this chapter to:

- Review installation site considerations.
- Configure the 1269 to allow the **VXIbus Slot 0 controller** to reside in either the front **C0 slot** or the rear **B0 slot**.
- Install VXI modules, card guide covers, or optional blanking plates.
- Install the 1269 rack mount options, and install the mainframe into an instrument rack.
- Connect safety ground.
- Re-configure fan speed range (HI - LO) setting.
- Configure and connect to the optional Enhanced Monitoring System (EMS) module.

AC Mains Power

The 1269 AC input is both auto-voltage and auto-frequency ranging, and requires no voltage switch selection.

When the standard 1269 is shipped, it is fused for 120 VAC operation. If Option 71 (P/N 407524) is ordered, the 1269 is fused for 230 VAC operation. Should it be necessary to replace the AC mains fuse (F400), refer to **Chapter 7**: **Removal and Replacement of The AC Mains Fuse**.

Warning

For your protection from electrical shock when operating at mains frequencies greater than 63Hz, connect the chassis safety ground terminal to permanent earth ground. See Figure 2-12.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Site Considerations

The 1269 Mainframe is designed to operate on a bench or in an instrument rack. Refer to **Figures 1-6** and **1-7** for vent locations for the 1269 when used in bench top and rack mount applications, respectively. Determine how you will use your 1269 (bench or rack mount) and follow the appropriate installation instructions.

Select VXIbus Slot 0 Controller Location

The 1269 is factory configured for operation with the **VXIbus Slot 0 controller** located in the front **C0 slot**. The 1269 may be re-configured to allow operation with the **VXIbus Slot 0 controller** located in the rear **B0 slot**, freeing one full C-sized instrument slot. Refer to **Figure 2-1** and the description below to configure the mainframe to allow operation with the **VXIbus Slot 0 controller** located in the rear **B0 slot**.

1. To remove the Personality Module (P/N 415113) grasp the Module using the “2 finger” cutout and pull gently and evenly to remove it from the J57 card edge connector located on the backplane and the retaining post located in the side panel.

2. Rotate the Personality Module 180E so that the silkscreen reads:

   $

   SLOT 0 IN REAR
   B-SIZED SLOT

   at the top.

3. Install the Personality Module into the J57 card edge connector by aligning the Personality Module with the connector and the retaining post groove and gently push towards the rear. Ensure that the retaining post groove aligns and engages with the module card. Seat firmly.

Installing VXI Modules

Install C-size modules directly into the **front** C-size slots (6) of the mainframe by first placing the module’s card edges into the front module guides (top and bottom). Slide the module to the rear of the mainframe until the module connectors mate solidly with the backplane connectors. Secure the module’s front panel to the mainframe using the module’s front panel mounting screws.

Install B-size modules directly into the **rear** B-size slots (3) of the mainframe by first placing the module’s card edges into the

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

rear module guides (top and bottom). Slide the module to the front of the mainframe until the module connectors mate solidly with the backplane connectors. Secure the module's front panel to the mainframe using the module's front panel mounting screws.

CAUTION

To avoid possible damage do *NOT* apply power to the mainframe with modules installed until you have configured the VXIbus Slot 0 controller location. Refer to the "Select VXIbus Slot 0 Controller Location" section, above, for details.

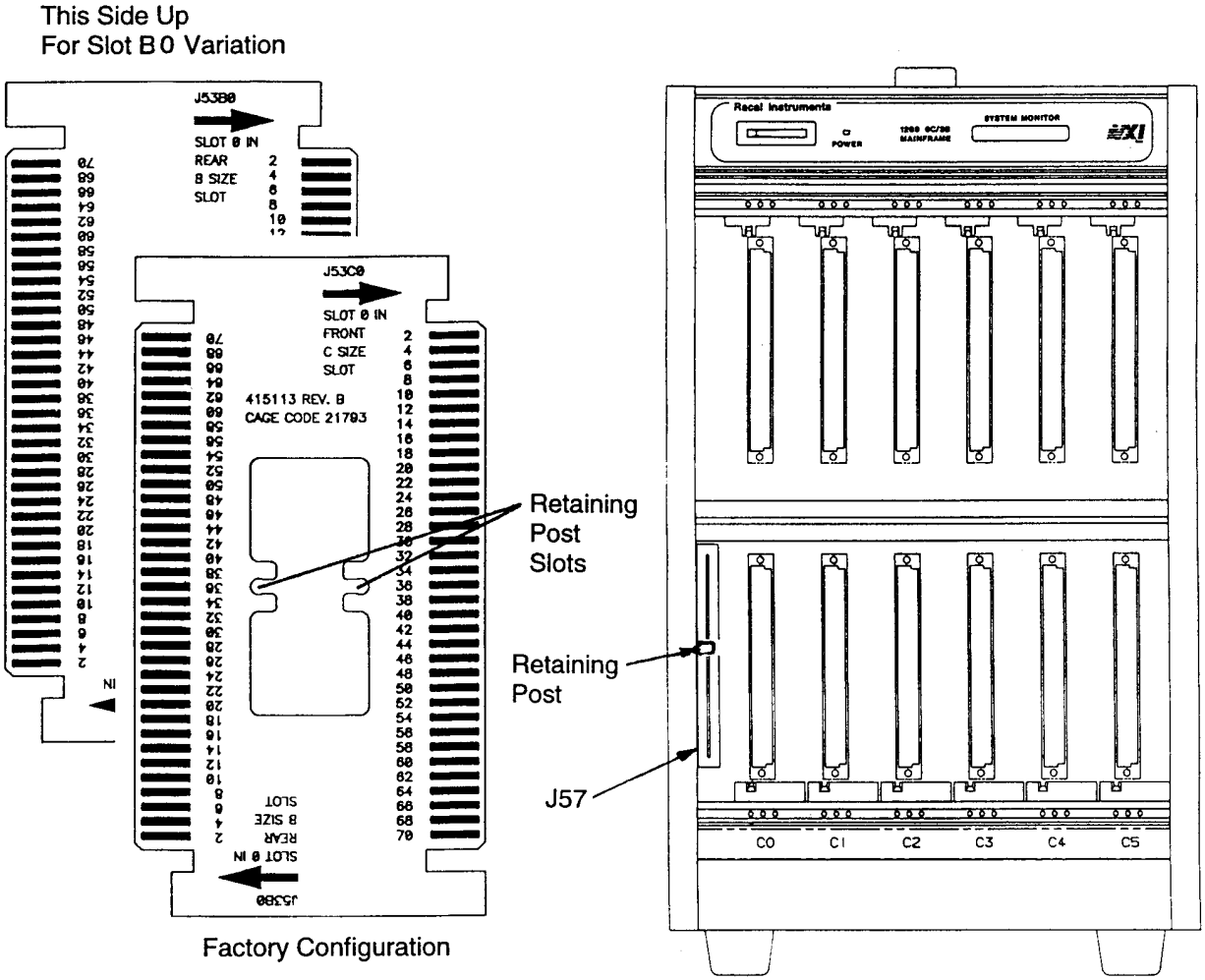


Figure 2-1 Select VXIbus Slot 0 Controller Location

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installation and Removal of Card Guide Covers (Airflow Directors)

In order to improve cooling of used slots in the VXI mainframe, a limited number of airflow directors, P/N 456271, may be installed at empty C-size slot locations to redirect otherwise wasted airflow.

CAUTION

To maintain a balanced airflow throughout the system when using airflow directors, do not cover more than three empty slots at any time. If module density is low, space airflow directors evenly across the mainframe.

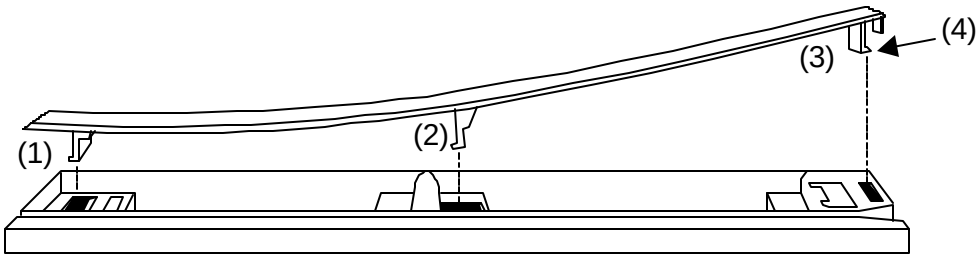


Figure 2-2 Airflow Directors

1. Facing the front of the VXI mainframe, with one hand hold the airflow director by the front end where the “Racal” logo appears.

2. Select the slot to be covered by the director, and place the hook at the rear of the director into the rectangular hole at the rear of the cardguide (1). Slight downward pressure on top of the director (with the other hand) at the rear may be required to engage the hook into the cardguide.

3. Slightly flex the director upwards at the front, maintaining pressure at the rear, and lower the center hook of the director into the center rectangular hole in the cardguide (2).

4. Press down and back to allow both center and rear hook to engage fully into the cardguide.

5. Lower the front of the director and allow the snap-in

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

hook to rest on the cardguide (3).

6. With a slotted screwdriver or similar flat-bladed tool, depress the spring hook (4) at a slight downward angle, applying light pressure at the front end. This will cause the snap-hook to firmly seat the director into place.

7. To remove the airflow director, depress the snap-in hook (4) from the front with a flat-bladed tool. This will unlatch the hook and allow removal from the cardguide at the front end.

8. Pull forward to release the fixed hooks at the center and rear.

Installing Blanking Panels

In order to optimize module cooling performance, install optional blanking panels (P/N 404836) into unused or C-size empty slots. Secure with two captive mounting screws. Refer to **Figure 2-3**.

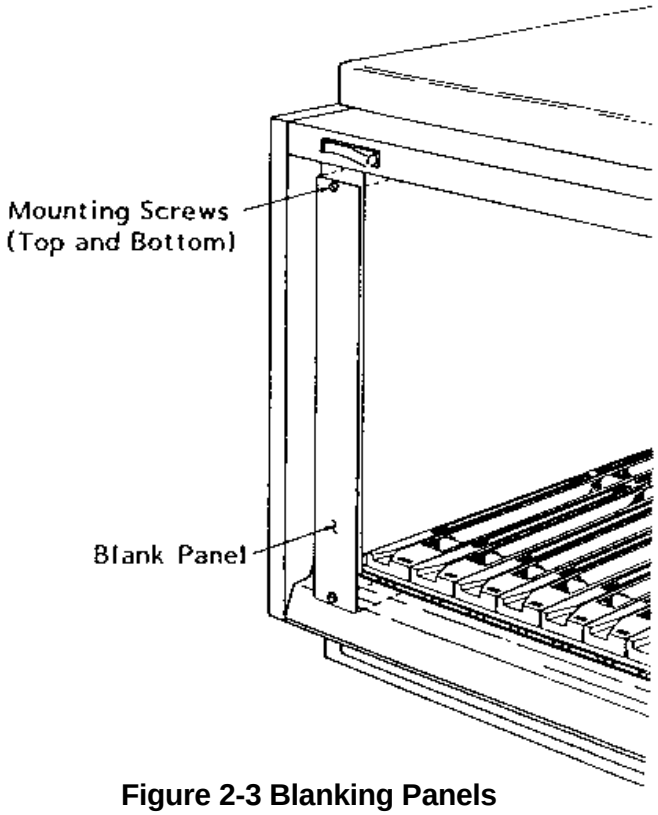


Figure 2-3 Blanking Panels

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installation Of Option 01, Rack Ears With Slides

Table 2-1 below lists the items included in this kit (P/N 407506)

Table 2-1 Option 01 Parts List

ITEM	DESCRIPTION	QTY	PART NUMBER
1	Slide Mount Adapter - Left Side	1	456527-001
3	Slide Mount Adapter - Right Side	1	456527-002
5	Rack Mount Ear - Right Side	1	456529
7	Rack Mount Ear - Left Side	1	456530
9	Retainer Nut	12	610920
11	Phillips Panhead #10-32 x .375 Screw	8	615089
13	Phillips Panhead #10-32 x .500 Screw	8	615091
15	Phillips Panhead #10-32 x .750 Screw	4	615093
17	Phillips Flathead #10-32 x .500 Screw	4	615590
19	Phillips Panhead #8-32 x .625 Sems Assy	12	616262
21	1.75" Diameter Flat Washer	8	617170
23	Rack Mount Ear Handle	2	921275
25	Slide Bracket Kit	1	921317
27	Quick Disconnect Slide, 24 Inch	2	921424
29	Instruction Sheet	1	980797

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

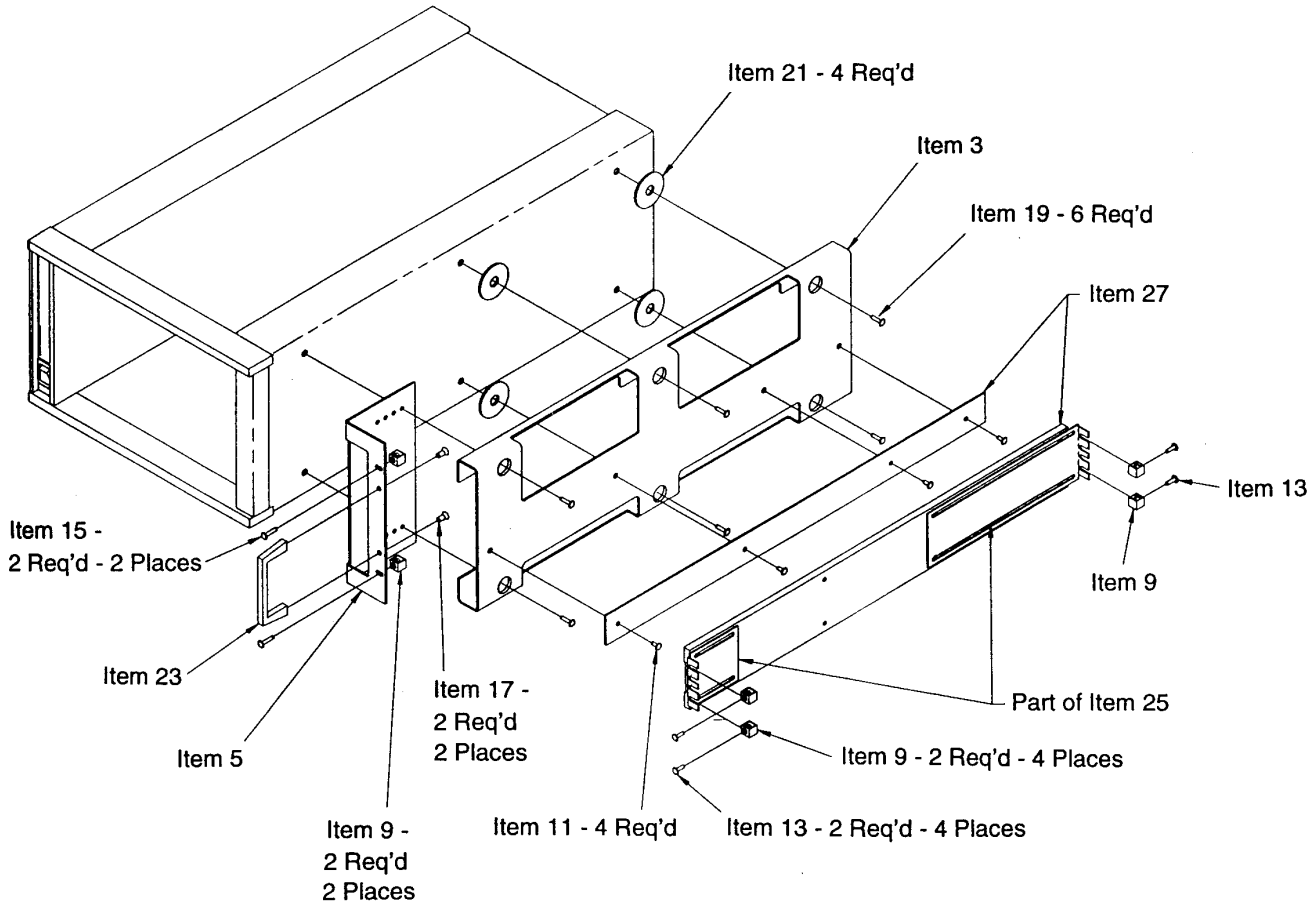


Figure 2-4a Slide Rack Mounting Bottom Cover

Preparing Chassis for Slides

(Refer to **Figure 2-4a**)

1. Remove feet and two socket button head screws from bottom cover.

2. Place four washers (Item 21) over four screw holes as shown.

3. Lay rack mount ear (Item 5) on bottom cover. Select hole that best serves your application. The one shown will make the chassis flush with the front of rack. The other holes move the chassis forward in ½ inch increments.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

4. Position adapter (Item 3) over rack mount ear (Item 5) and washers (Item 21).

5. Secure adapter and rack mount ear to bottom cover with six 8-32 x .625 Phillips screw/washer (sems) assembly (Item 19).

6. Repeat procedure for top cover with installation of adapter and rack mount ear (Item 7) (**Figure 2-4b**).

7. Attach handles (Item 23) to rack mount ears (Items 5 and 7) with two each Phillips 10-32 x .500 screws (Item 17)

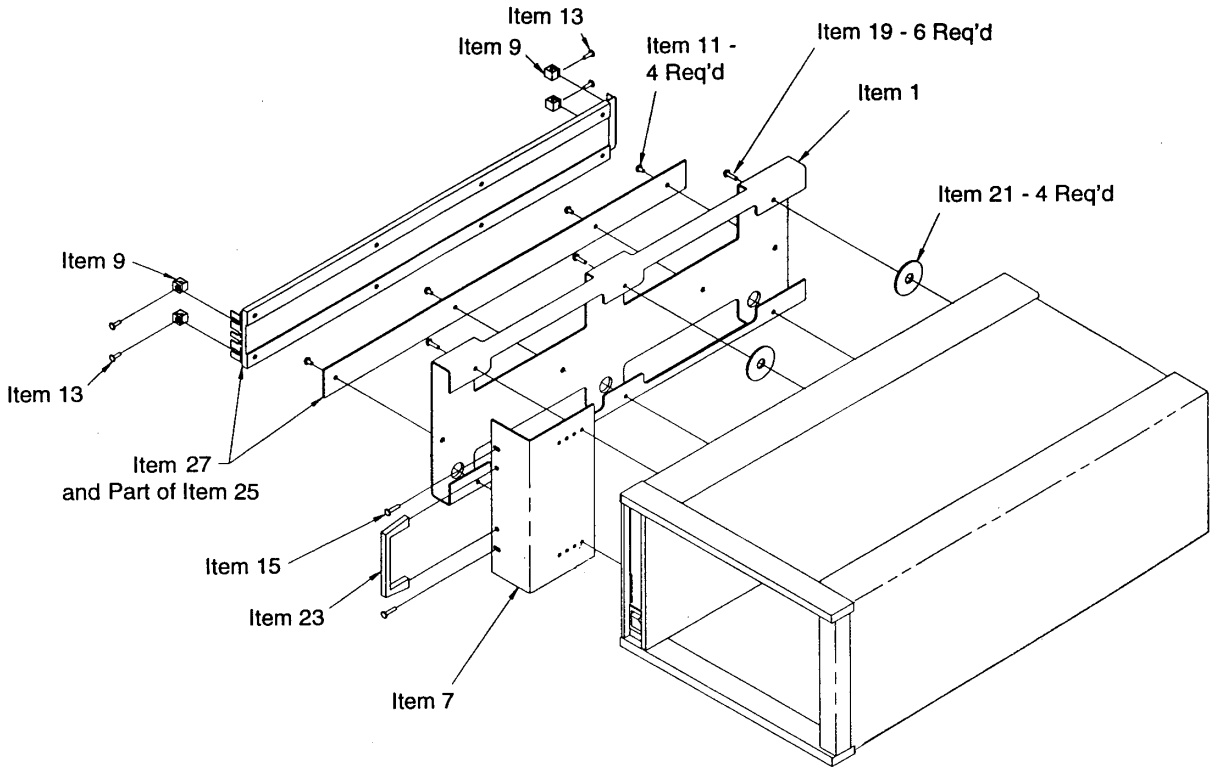


Figure 2-4b Slide Rack Mounting - Top Cover

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Mounting Slide To Chassis

1. Remove instrument (inside) rail from slides (Item 27) as shown in **Figure 2-5.**

2. Secure instrument rail to adapter plate (Item 1 and Item 3) with four each Phillips 10-32 x .375 screws (Item 11). Refer to **Figure 2-4a** and **2-4b.**

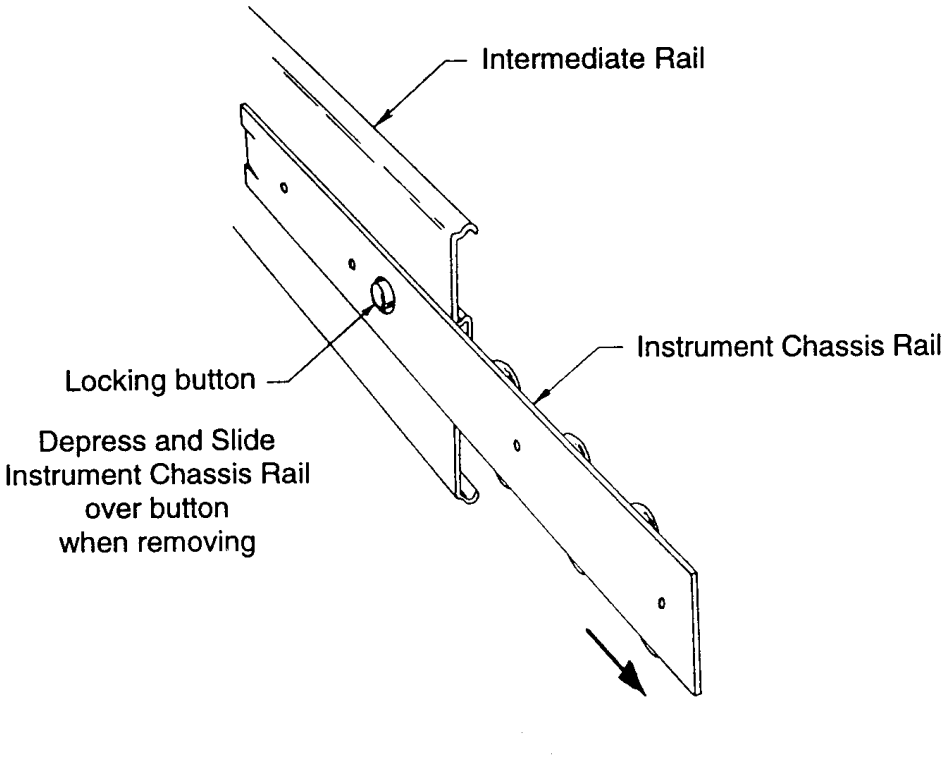


Figure 2-5 Instrument Rail Removal

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

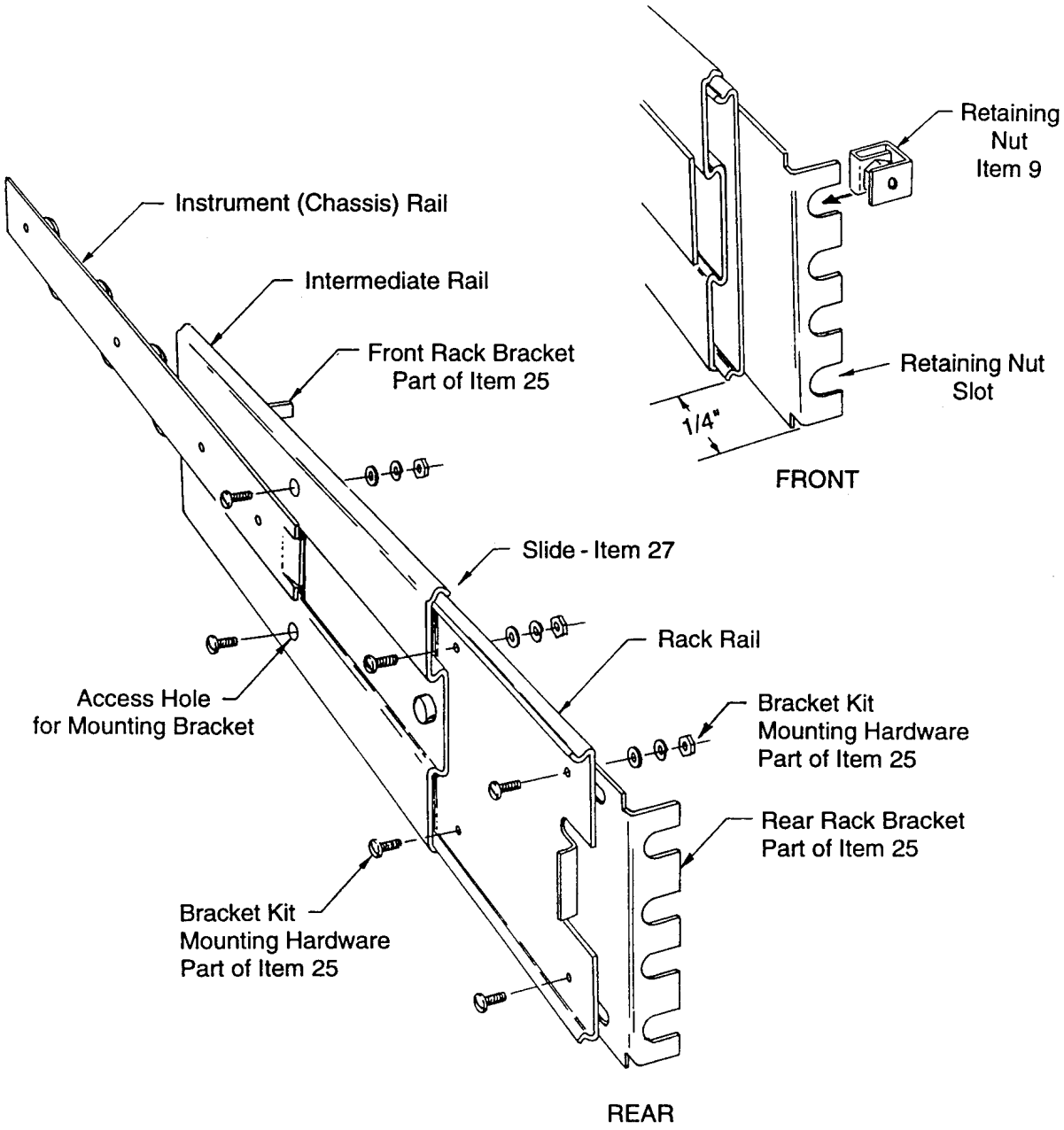


Figure 2-6 Slide and Bracket Components

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installing The Slides Into The Rack

NOTE:

Instructions below are for a typical rack mount installation. This may vary according to rack style and manufacture.

(Refer to **Figure 2-6** and **2-7**)

1. Depending on rack style (front or internal mounting rail), choose appropriate slide rack brackets (long or short) Item 25, for front and rear slide attachment. Attach brackets to slide assembly using bracket kit hardware. Leave loose for final adjustment. Install #10-32 retaining nuts (Item 9) into rack bracket slots - 8 places. (Typically the short rack mount bracket is selected for mounting to the front rack rail.).

2. For front rack rail mounting adjust front rack mounting bracket so bracket is 1/4" in front of rack mounting “slide” rail. Firmly secure bracket slide rail. (Refer to **Figure 2-6**.)

3. For inner rack rail mounting adjust rack mounting bracket D-1/4" behind front of rack mounting “slide” rail where “D” is the distance between front of front rack mounting rail and mounting surface of inner rack rail. It may be necessary to reverse the front rack mounting bracket to meet this requirement or reduce the D-1/4" dimension until access to the bracket mounting hole in the slide is possible. Firmly secure bracket to slide rail.

4. Hold the front end of the slide mount assembly behind the front rack “mounting” rail, while the second person holds the rear end of the assembly.

5. Lightly secure the front slide bracket to the front mounting rail using two Phillips Panhead #10-32 x ½ screw (Item 13).

6. Adjust the length of the rear slide bracket so it touches the inside of the rear mounting rail. Tighten the rear bracket-to-slide assembly screws making sure that the rear slide bracket is firmly seated against the mounting rail.

7. Lightly secure the rear slide bracket to the rear mounting rail using two Phillips Panhead #10-32 x ½ screws (Item 13).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

8. Install the other slide mounting assembly in the same manner.

9. Set the front dimension between the two slide mount assemblies at 16-13/16 inches (+1/16,-0) and firmly secure the front brackets to the mounting rail.

10. The distance between the two slide mount assemblies at the rear bracket should also be set at 16-13/16 inches (+1/16,-0). Should a filler-plate be required to secure the slide mount assembly to the rear rack mounting rail at 16 -13/16 inches (+1/16,-0), use the dimensions given in **Figure 2-7** to determine filler-plate size. The rear rack-bracket may require adjustment to accommodate the thickness of filler-plate.

11. Firmly secure the rear rack bracket to the rear rack mounting rail (or filler-plate) using two Phillips Panhead #10-32 x ½ screws in each bracket (Item 13).

The slides are now positioned to accept the mainframe.

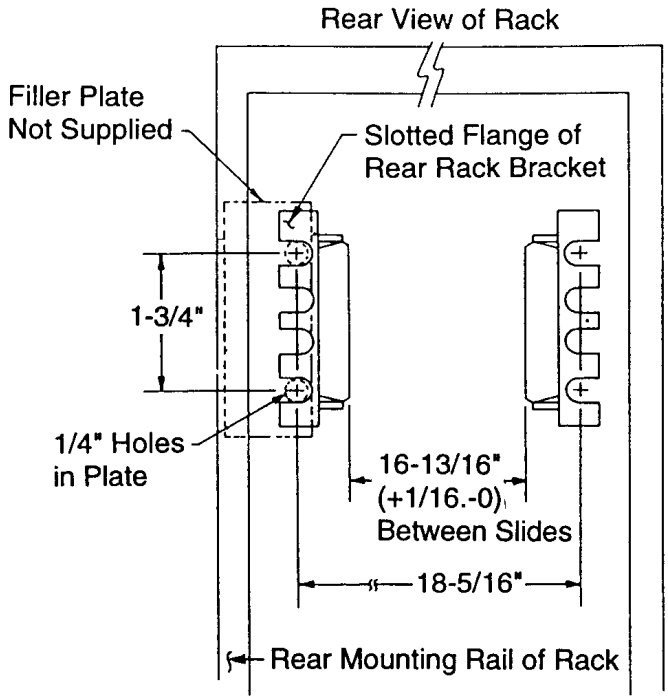


Figure 2-7 Rear End Slide Mount Rack Dimensions

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installing The Mainframe W/Opt 01 Into The Rack

Assistance of a second person will be needed to align and engage the mainframe with the slide assemblies in the rack.

1. Install the mainframe with its two attached instrument rails onto the quick disconnect slide mount assemblies (installed in the instrument rack). Be sure the mainframe is properly aligned and square with the slide assemblies. Remember to depress the locking buttons when inserting the instrument rails into the slide mount assemblies. When properly installed, the instrument should slide freely on the slide rails. If binding occurs, slide bracket-to-rack rail mounting screw should be loosened and re-adjusted to relieve binding.

2. The following assembly is required to lock the instrument into its operating position in the rack:

    a. If rack rail is not tapped, slip two self-anchoring #10-32 retaining nuts (Item 9) onto the mounting rail of the rack (each side). These nuts should be aligned with the slots in the rack mounting ears previously attached to the mainframe (Items 5 and 7).

    b. Slide the instrument fully into the rack until the rack mounting ears strike the slide screws or front rail. Secure the instrument in place using two (each side) Phillips Panhead #10-32 x 3/4 screws (Item 15).

Slide Rack mount Installation is now complete**.**

Installation of Option 04, Rack Ears

Table 2-2, below, lists the items included in this kit (P/N 407507)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 2-2 Option 04 Parts List

ITEM	DESCRIPTION	QTY	PART NUMBER
1	Rack Rail Adapter	2	456528
5	Rack Mount Ear - Right Side	1	456529
7	Rack Mount Ear - Left Side	1	456530
9	Retainer Nut	4	610920
11	Phillips Panhead #10-32 x .750	4	615093
13	Phillips Panhead #10-32 x .500	4	615590
15	Phillips Panhead #8-32 x .625 Sems Assy	8	616262
17	1.75" Diameter Flat Washer	4	617170
19	Rack Mount Ear Handle	2	921275
21	Instruction Sheet	1	980801

Preparing Chassis for Rack Rail Mounting

(Refer to **Figure 2-8**)

1. Remove feet and two socket button head screws from bottom cover.

2. Place two washers (Item 17) over screw holes as shown.

3. Lay rack mount ear (Item 5) on bottom cover, Select hole that best serves your application. The one shown will make the chassis flush with the front of rack. The other holes move the chassis forward in ½ inch increments.

4. Position rack rail adapter (Item 1) over rack mount ear (Item 5) and washers (Item 17).

5. Secure rack rail and rack mount ear to bottom cover with four 8-32 x .625 phillips screw/washer (sems) assembly (Item 15).

6. Repeat procedure for top cover with installation of rack rail adapter and rack mount ear (Item 7).

7. 7. Attach handles (Item 19) to rack mount ears (Items 5 and 7) with two each Phillips 10-32 x .500 screws (Item 13).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

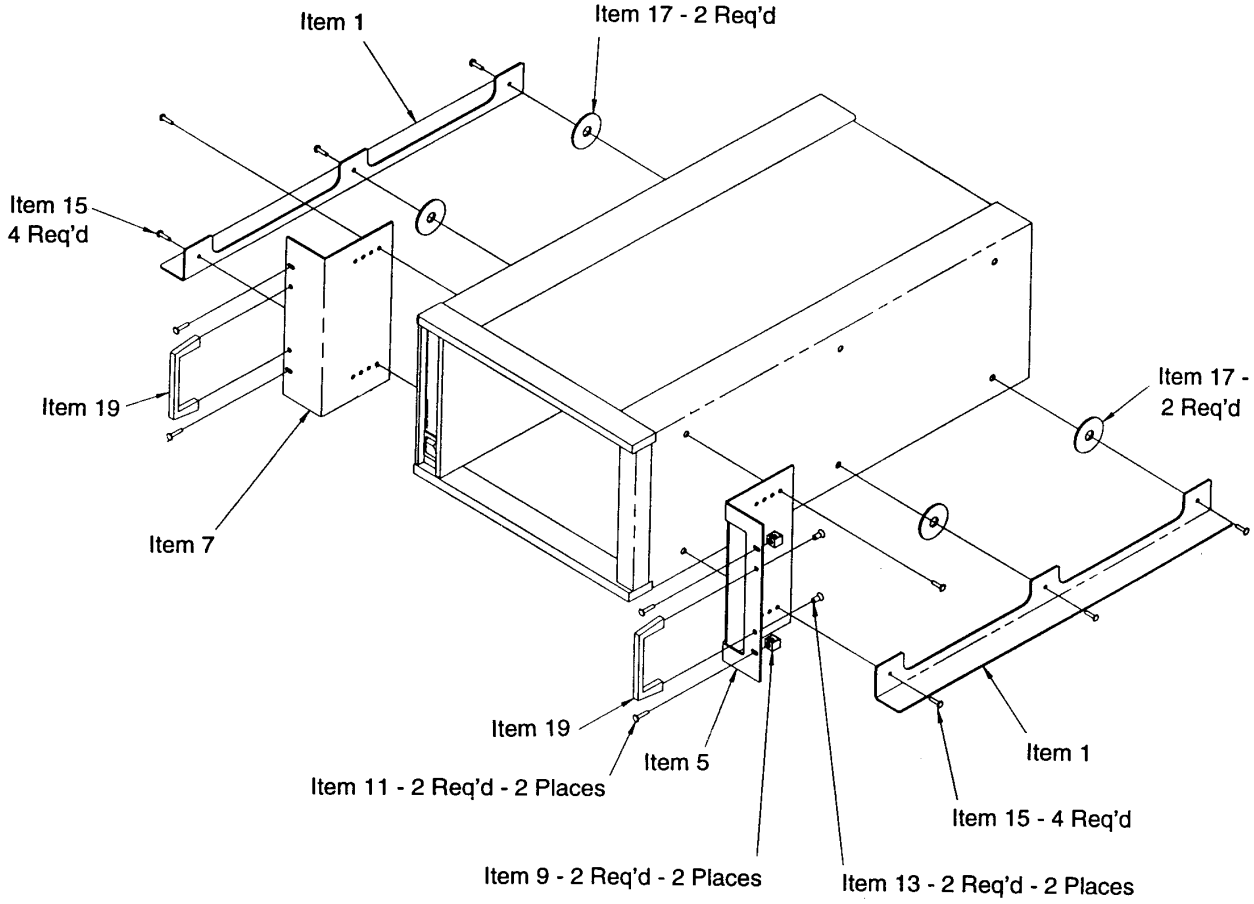


Figure 2-8 Fixed Rack Mounting

NOTE

When slides are not used to mount the mainframe in the rack, right angle runners or a base plate MUST be used to support the mainframe. Runners or plate must be used in conjunction with OPT 04.

CAUTION

DO NOT attempt to support the mainframe in the rack with the rack mount ears only.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installing The Mainframe Into The Rack

1 The following assembly is required to secure the instrument into its operating position in the rack:

a. If rack rail is not tapped, slip two self-anchoring #10-32 retaining nuts (Item 9) onto the mounting rail of the rack (each side). These nuts should be aligned with the slots in the rack mounting ears previously attached to the mainframe (Items 5 and 7)

b. Slide the instrument fully into the rack on previously installed right angle runners or a base plate, until the rack mounting ears strike the front rail. Secure the instrument in place using two (each side) Phillips Panhead #10-32 x 3/4 screws (Item 11)

Fixed Rack Mount installation is now complete.

Installing Inter-Module Shield Option 52

Instruction for installing Option 52 Inter-Module Shield (P/N 407523) into the 1269 are included in the kit that is shipped with the option.

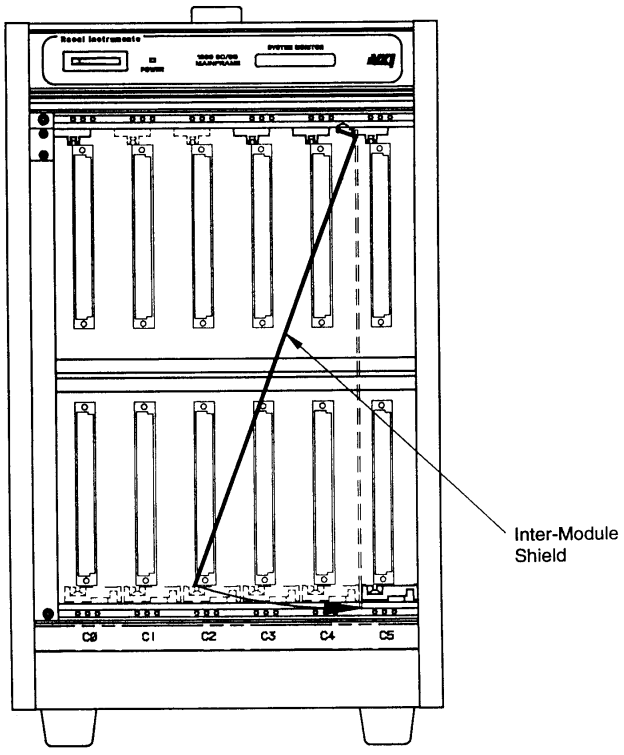


Figure 2-9 Inter-Module Shield

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installing ASFP Panel Option 23

Instructions for installing Option 23 ASFP Panel (P/N 407519) into the 1269 are included in the kit that is shipped with the option.

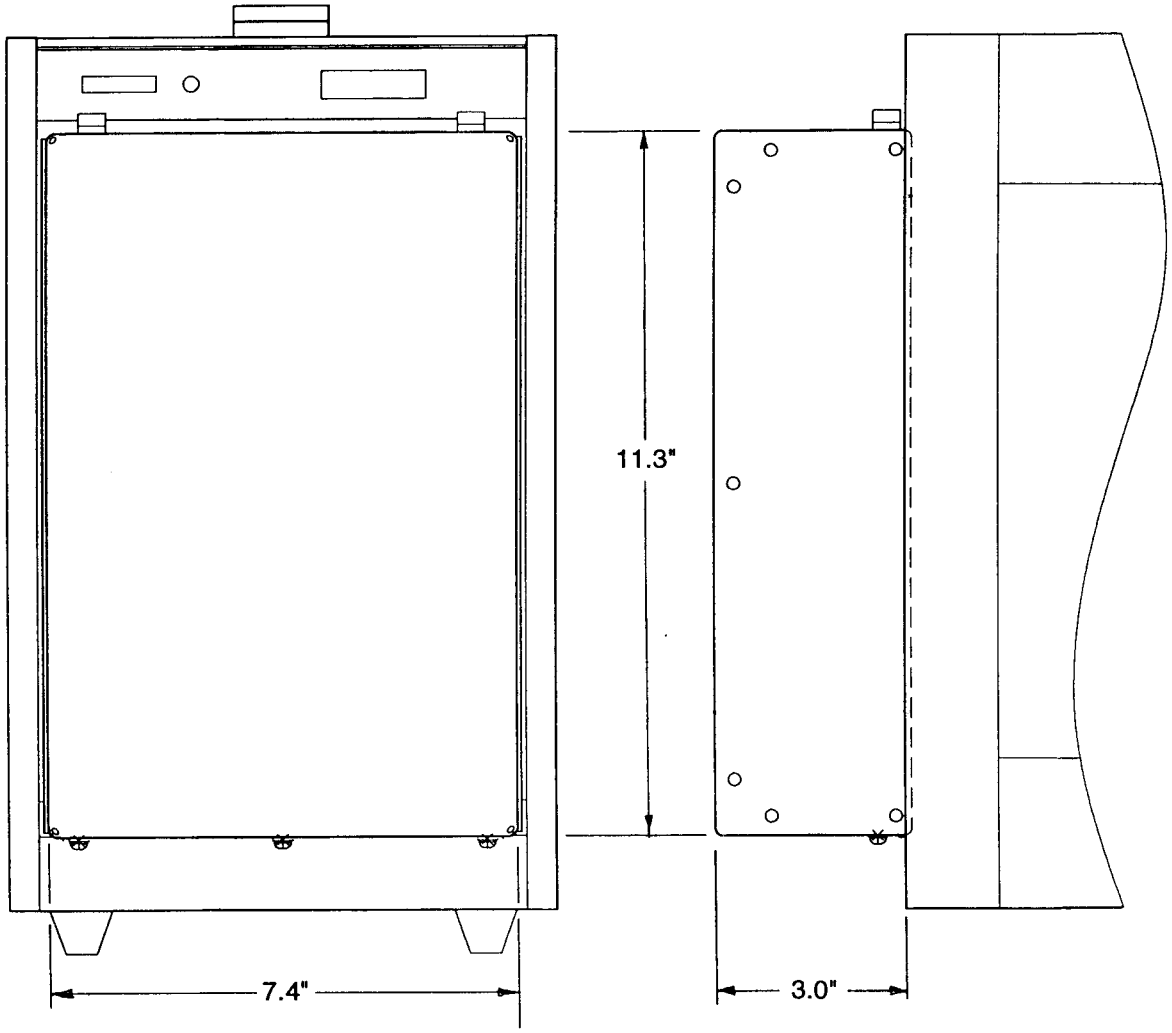


Figure 2-10 ASFP Panel

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installing Rack Mount Door Option 14

Instructions for installing Option 14 Rack Mount Door (P/N 407517) are indicated below.

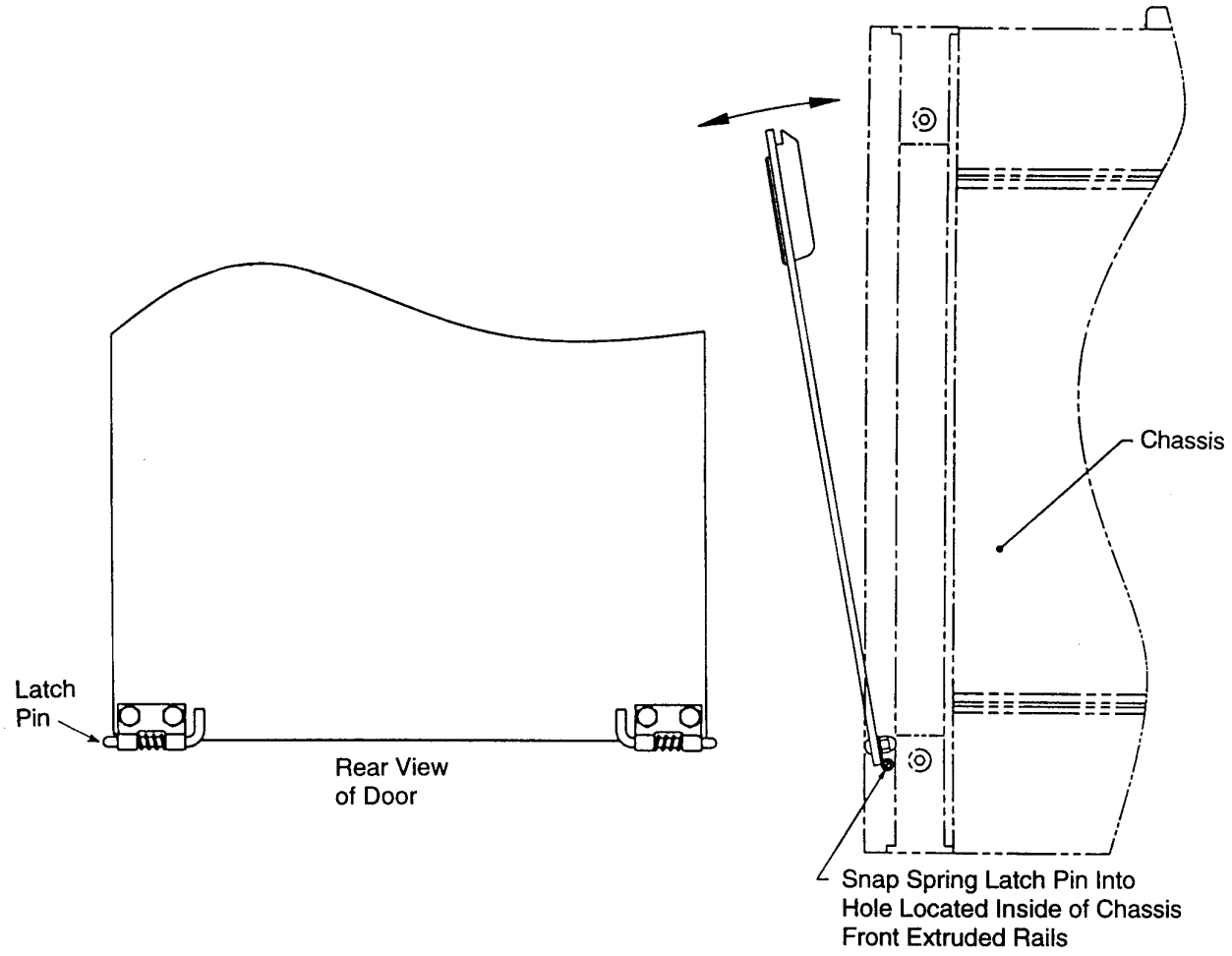


Figure 2-11 Installing Rack Mount Door

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Connecting Safety Ground

It is not necessary to perform this procedure if you do not intend to operate the 1269 at frequencies greater than 63Hz. When operating the 1269 at mains frequencies between 47 Hz and 63 Hz, use the Chassis (Safety) Ground connection to connect the grounds of one or more instruments to the mainframe. This ensures a common ground connection between instruments.

WARNING

For your protection from electrical shock when operating at mains frequencies greater than 63Hz, connect the chassis safety ground terminal to permanent earth ground. See Figure 2-12.

1. Connect a 16 AWG (1.3mm² or larger) wire to the 8-32 chassis (safety) grounding screw using a toothed grounding lug. The wire insulation must be green with a yellow stripe or non-insulated (bare).

2. Attach the opposite end of the wire to permanent earth ground using toothed washers or a toothed lug.

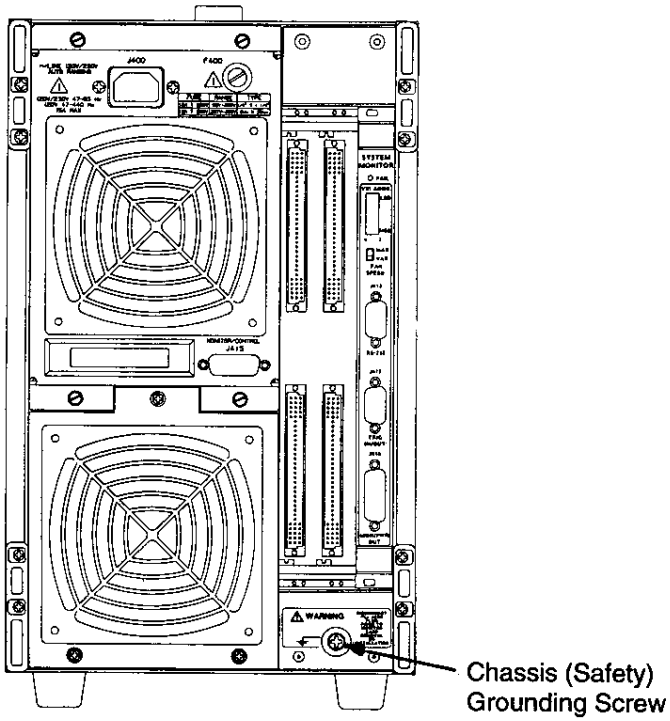


Figure 2-12 Connecting Safety Ground

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Fan Speed (HI - LO) Selection

Non-EMS Units

On 1269 mainframes not equipped with the EMS option the user may manually select between full or reduced fan speed by adjusting the position of the manual fan speed switch. Refer to **Figure 2-13.**

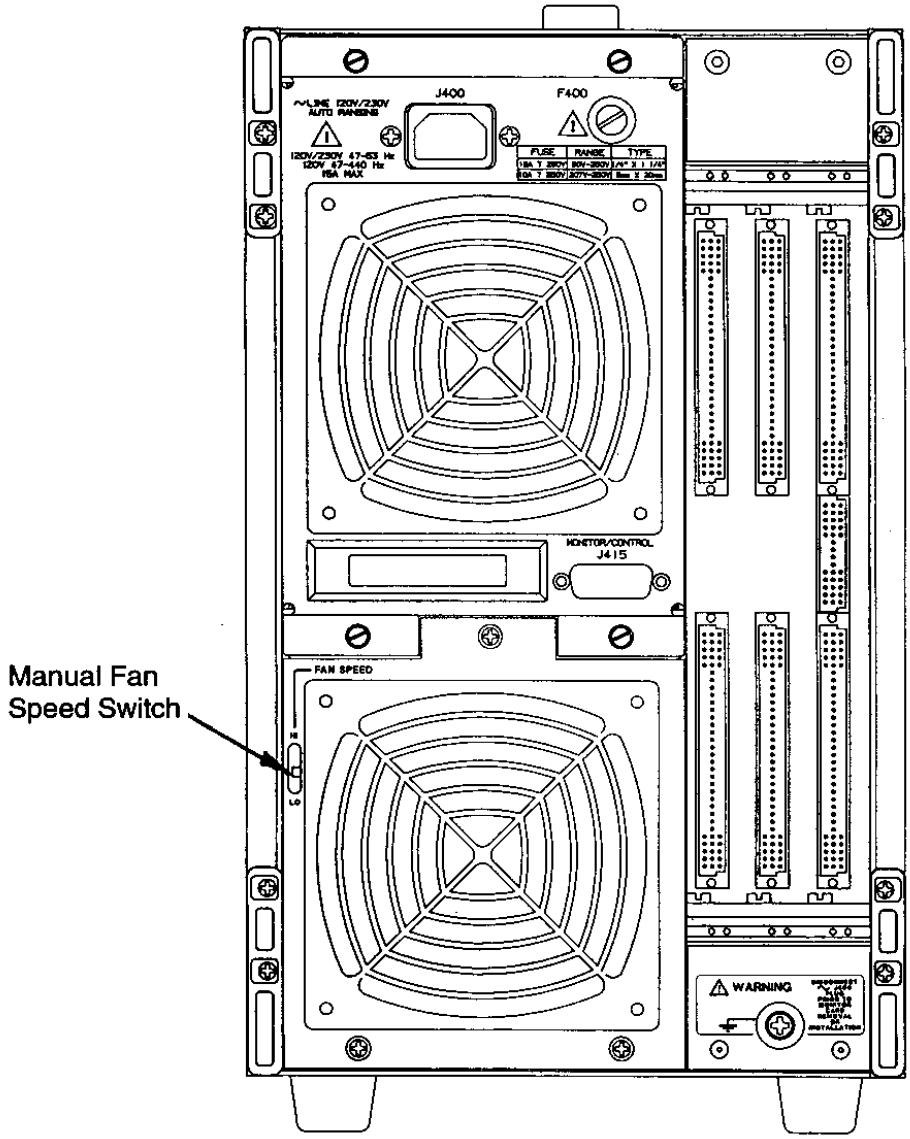


Figure 2-13 Fan Speed (HI-LO) Selection - Non EMS

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

EMS Units

The 1269 mainframes equipped with the EMS monitoring option have no manual fan switch. The fan speed is controlled by the EMS module. However the user may select the fan speed range (HI or LO). The 1269 is shipped with the fan speed range configured to the **HI** setting for rack mount configurations, and to the **LO** setting for bench top configurations. If your application requires more cooling or lower acoustic noise levels you may re-configure the fan speed range as described below, and in **Figure 2-14 Fan Speed (HI -LO) Selection- EMS.**

WARNING

Ensure that J400 AC Input is disconnected before removing or replacing the System Monitoring (EMS) module. Possible damage to the module could result.

1. Remove EMS module. See Removal and Replacement in **Chapter 7**.

2. Position the jumper at J14 between pins 1-2 for the **LO** setting, or between pins 2-3 for the **HI** setting.

3. Replace the EMS module. See Removal and Replacement in **Chapter 7**.

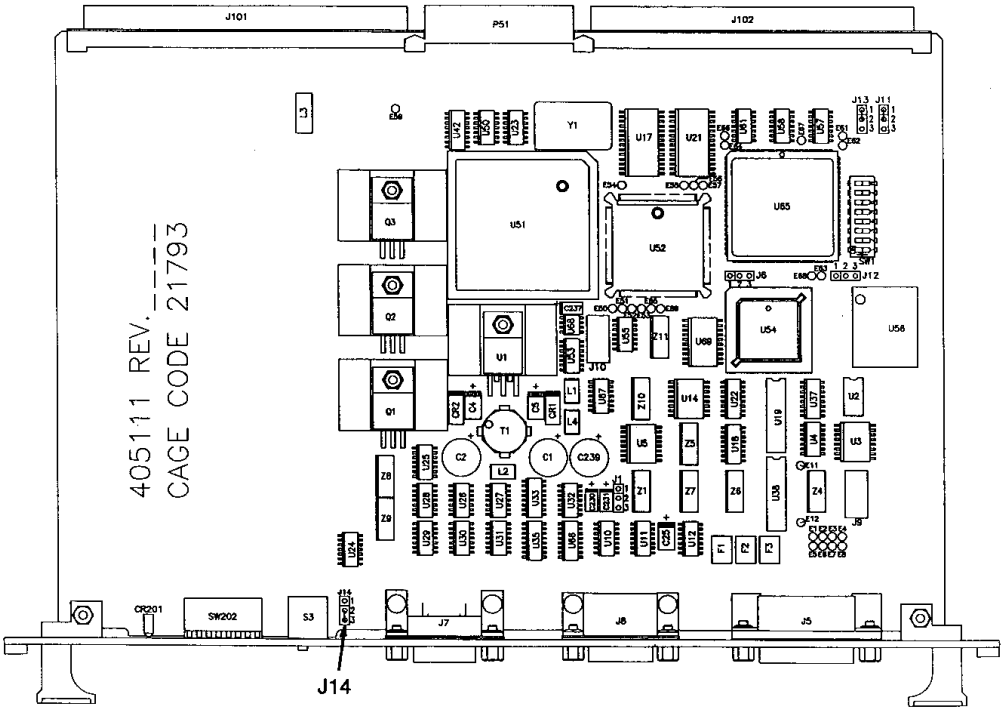


Figure 2-14 Fan Speed (HI-LO) Selection – EMS

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installing The Enhanced Monitoring System (EMS)

Omit the following procedures if your mainframe is not equipped with the Enhanced Monitoring System (EMS).

Enhanced Monitor VXI Logical Address Switch

The EMS module is a statically configurable (SC) device as described in VXIbus Specification 1.4, Sections C.2.1.1.1 and F.1. When the 1269 is shipped with the EMS, the VXI Logical Address is set to address 13 decimal. Refer to **Figure 2-15** to change the logical address of the EMS module.

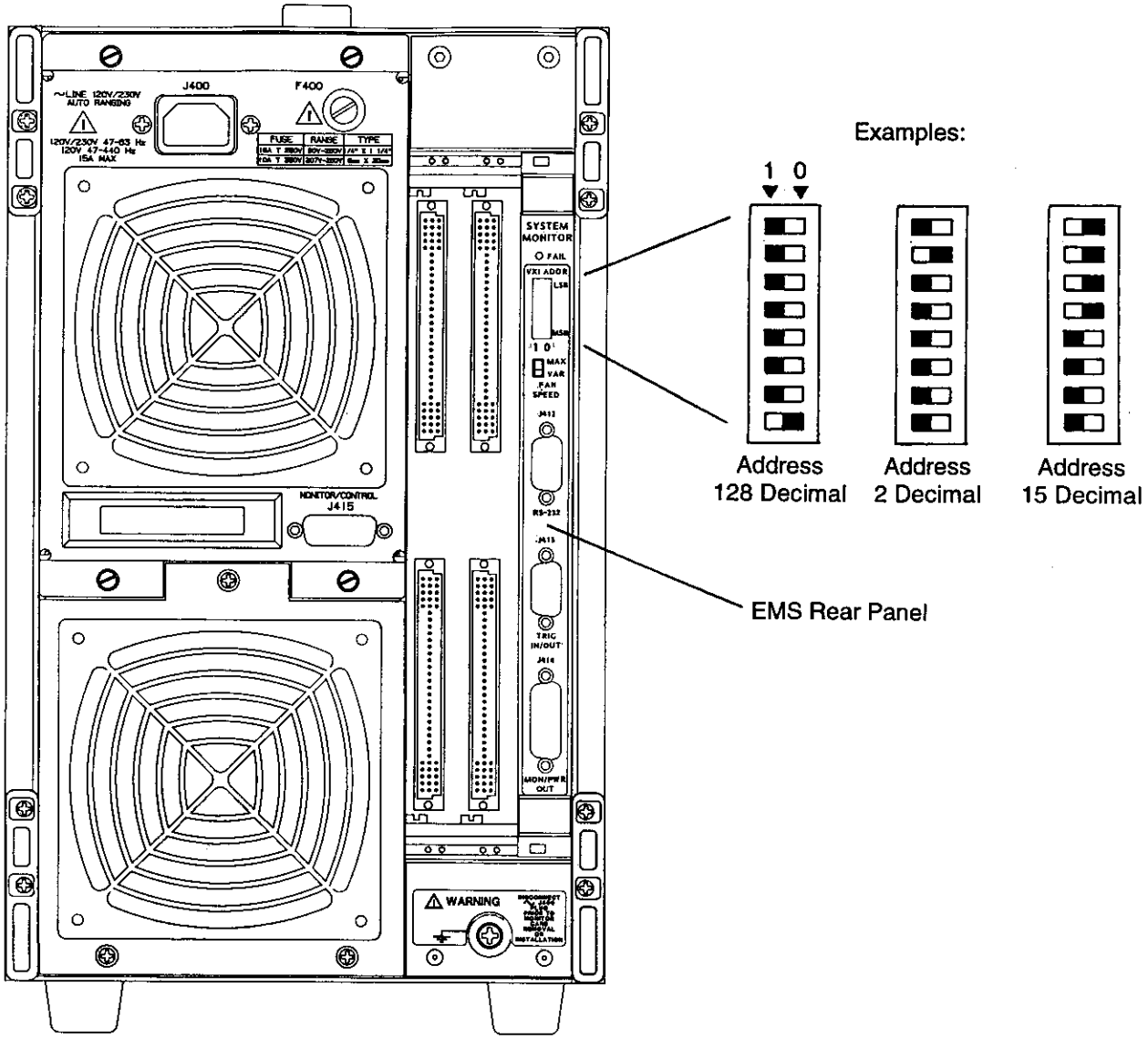


Figure 2-15 Setting The Enhanced Monitor VXI Logical Address

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Enhanced Monitor Configuration Switch

Omit this procedure if your mainframe is not equipped with the Enhanced Monitoring System (EMS).

NOTE

Perform this procedure only if factory default setting is incompatible with your application See Figure 2-16 for default setting.

WARNING

Ensure that J400 AC Input is disconnected before removing or replacing the Enhanced Monitoring System (EMS) module. Possible damage to the module could result.

1. Remove the EMS module. See Removal and Replacement in **Chapter 7.**
2. Configure SW1 located on the component side of the EMS module.
3. Replace the EMS module. See Removal and Replacement in **Chapter 7.**

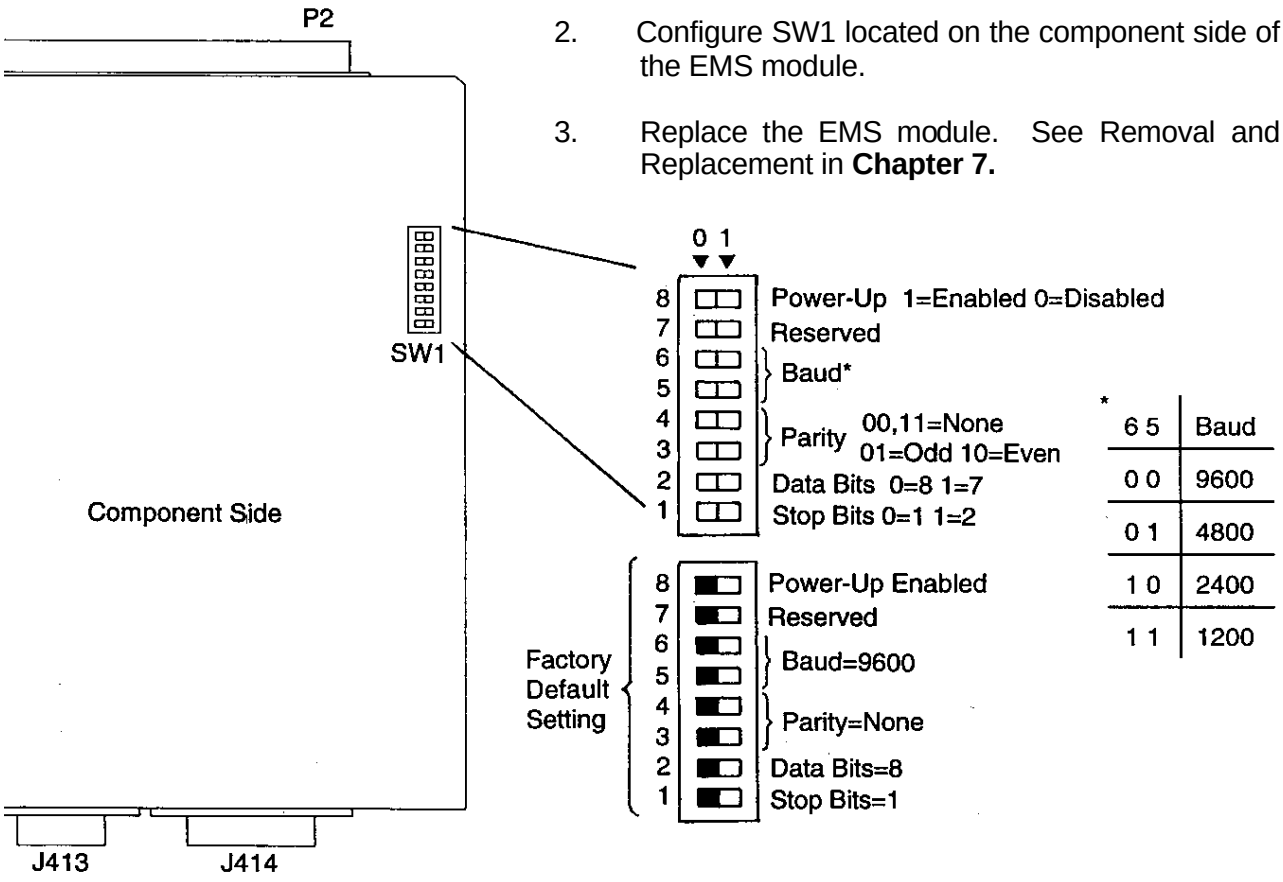


Figure 2-16 Setting The Enhanced Monitoring System Configuration Switch

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Connecting The RS-232 Interface

Omit this procedure if your mainframe is not equipped with the Enhanced Monitoring System (EMS).

The 1269 EMS RS-232 port may be connected to a computer, data terminal, or modem. Note that the RS-232 connector on the 1269 is a female, DB-09. If you do not intend to use the RS-232 port, omit this procedure.

Connecting To a Computer, Data Terminal, or Modem

Use an RS-232 cable to connect J412 (9-pin female RS-232 connector) on the EMS rear panel to the RS-232 serial port on the host controller. Refer to **Figure 2-17 Setting Up the Enhanced Monitoring System (EMS) RS-232 Interface,** and to **Figure 2-18 RS-232 Cable Connections With a Computer, Data Terminal, or modem.**

RS-232 Flow Control Method

Flow control is a means by which the host computer (or other controller) may pace the flow of data coming from the 1269 EMS Monitor so that the host controller has time to properly receive the data. It also allows the 1269 EMS Monitor to pace commands coming from the host computer so that the 1269 EMS Monitor has sufficient time to execute the commands as they arrive.

The 1269 EMS RS-232 interface uses only “Software” flow control or “XON/XOFF”. The host controller RS-232 flow control must be set for “Software” or “XON/XOFF”.

With software flow control, as implemented in the 1269 EMS Monitor, an RS-232 device that is receiving data may send an XOFF character (ASCII 19_{10}) to the sending device, commanding the sending device to suspend data output. Later, when the receiving device is ready for more data, it may send an XON character (ASCII 17_{10}) to the sending device, indicating that data transmission may be resumed.

If your controller does not support flow control, it will not send or respond to XON or XOFF characters and flow control will thus be non-existent. Note that operating without flow control may necessitate a slower baud rate in order to avoid data overrun problems.

Feed RS-232 Echo Back And Line Considerations

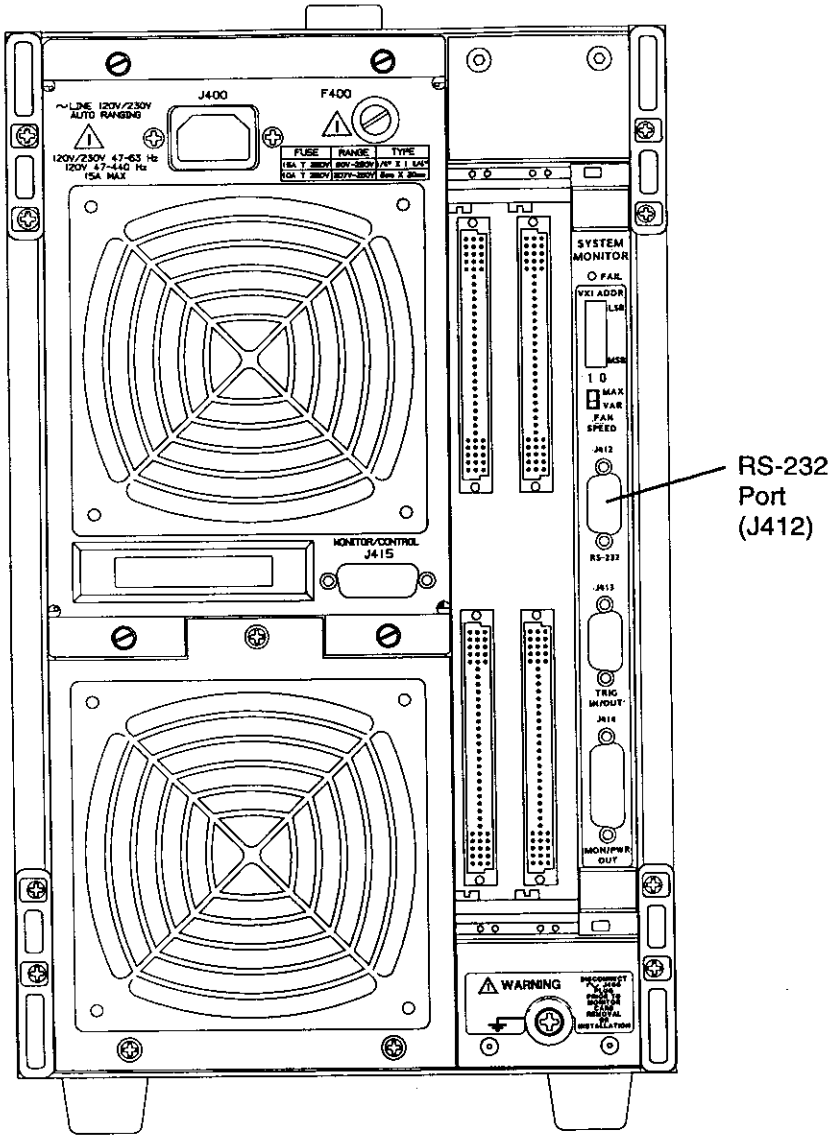
The 1269 EMS Monitor will not echo back characters it receives from the terminal. If you wish to see characters on your terminal as you type them, set your terminal for “Local Echo”.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The 1269 EMS requires a “Line Feed” character terminating each input string. Set your terminal to terminate outgoing strings with a “Line Feed”.

J412 Pin Connections

Pin	Name
3	Received Data
2	Transmitted Data
8	Request to Send



1. If factory default RS-232 setting is incompatible with your computer, (data terminal, or modem), perform the procedure described in **Figure 2-17 Setting Enhanced Monitoring System RS-232 Configuration Switch**.

The factory default setting is:

1. Stop bit, 8 data bits, No Parity, 9600 Baud, and RS-232 enabled at power on.

2. Connect host computer to RS-232 port. See **Figure 2-18 RS-232 Connections With A Computer, Data Terminal, or Modem.**

Figure 2-17 Setting Up The Enhanced Monitoring System RS-232 Interface

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

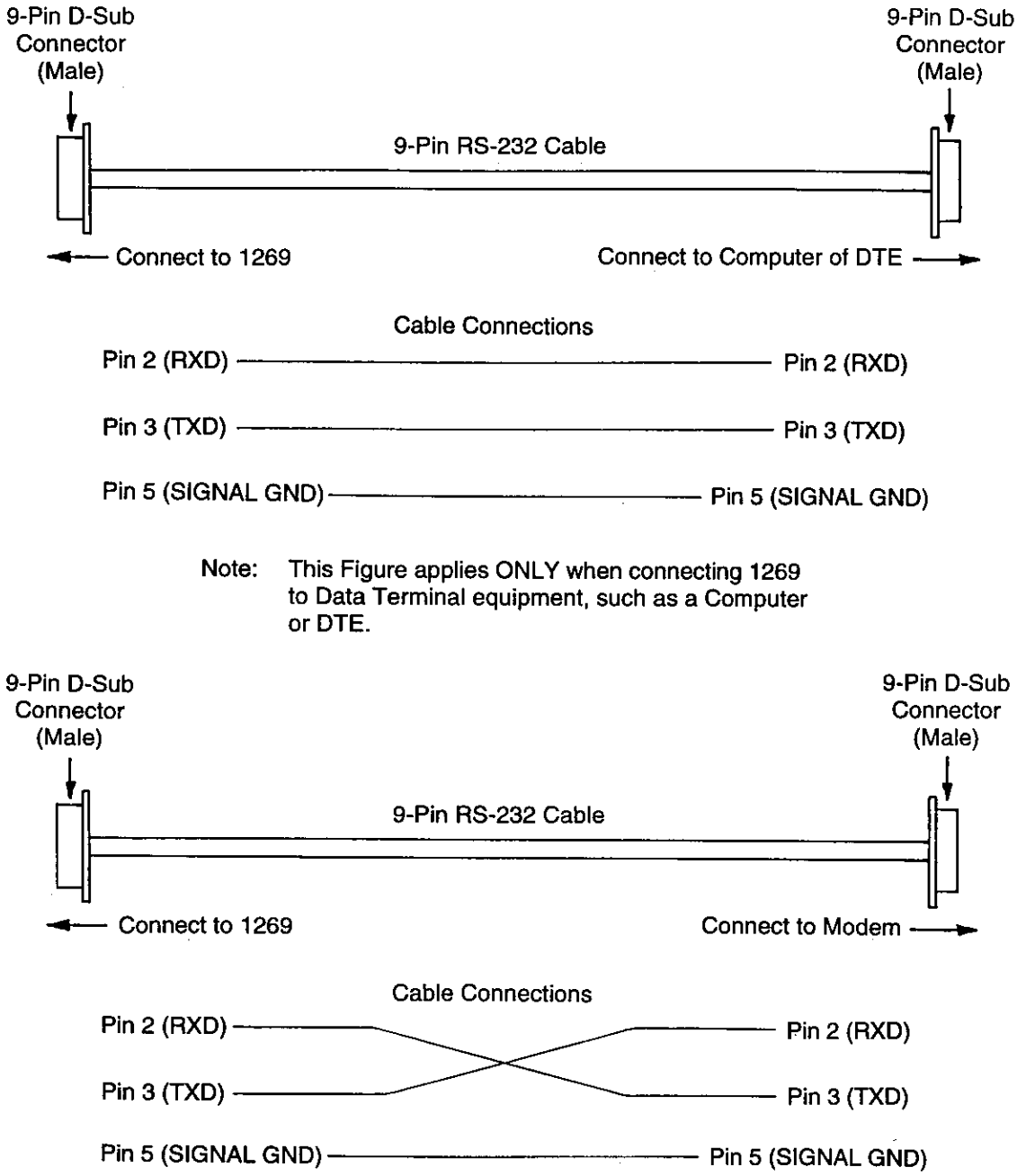


Figure 2-18 RS-232 Connections With A Computer, Data Terminal, or Modem

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installing The VXI*plug&play* Driver

After the EMS has been installed into the 1269 mainframe, the VXI*plug&play* software may be used to communicate with the EMS. To install the software, first connect the host computer power on the mainframe (see **Powering On The Mainframe** in **Chapter 3**), then perform the following operations:

1. Start Windows (3.1 or 3.11) on your computer if it is not already running.

2. Insert the VXI*plug&play* installation disk #1 into the 3-1/2" floppy disk drive.

3. Run the SETUP program on the installation disk.

4. Follow the instructions presented by the SETUP program

After the SETUP program has completed, the executable Soft Front Panel program may be run. To run the Soft Front Panel, ensure that the following conditions are met:

1. The computer is connected to the 1269 VXI mainframe via a MXI/VXI interface, a GPIB/VXI interface, or the computer is an embedded VXI computer.

2. VISA is loaded onto your system. VISA is a library of functions which provide communication between a computer and instruments (GPIB and VXI). VISA may be obtained from the manufacturer of the MXI/VXI, GPIB/VXI, or embedded computer.

3. The 1269 mainframe has power applied and the power switch has been turned ON.

4. For the MXI/VXI and embedded computers, the resource manager program has been run since the 1269 mainframe power was last turned ON.

To run the Soft Front Panel, “double-click” on the 1269 EMS Front Panel” icon in the “VXIPNP” Windows Group.

If the four conditions above are met, the Soft Front Panel program will automatically locate the EMS in the 1269 Mainframe. The Soft Front Panel program will display the VXI logical address of the EMS, and the “Active” LED on the Soft Front Panel will be green.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page was left intentionally blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 3
OPERATING THE 1269

Using This Chapter

Use this Chapter to:

- Review front and rear panel controls and indicators.
- Power the mainframe on/off using the front panel switch
- Power the mainframe on/off using the remote inhibit rear panel input.
- Review **Monitoring Basics** guide to front panel visual system health status
- Perform basic functional check of the mainframe VXI voltages.
- Review Rear Panel Switch and Connector Reference for pinouts and descriptions of all rear panel connectors.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1269 Front View

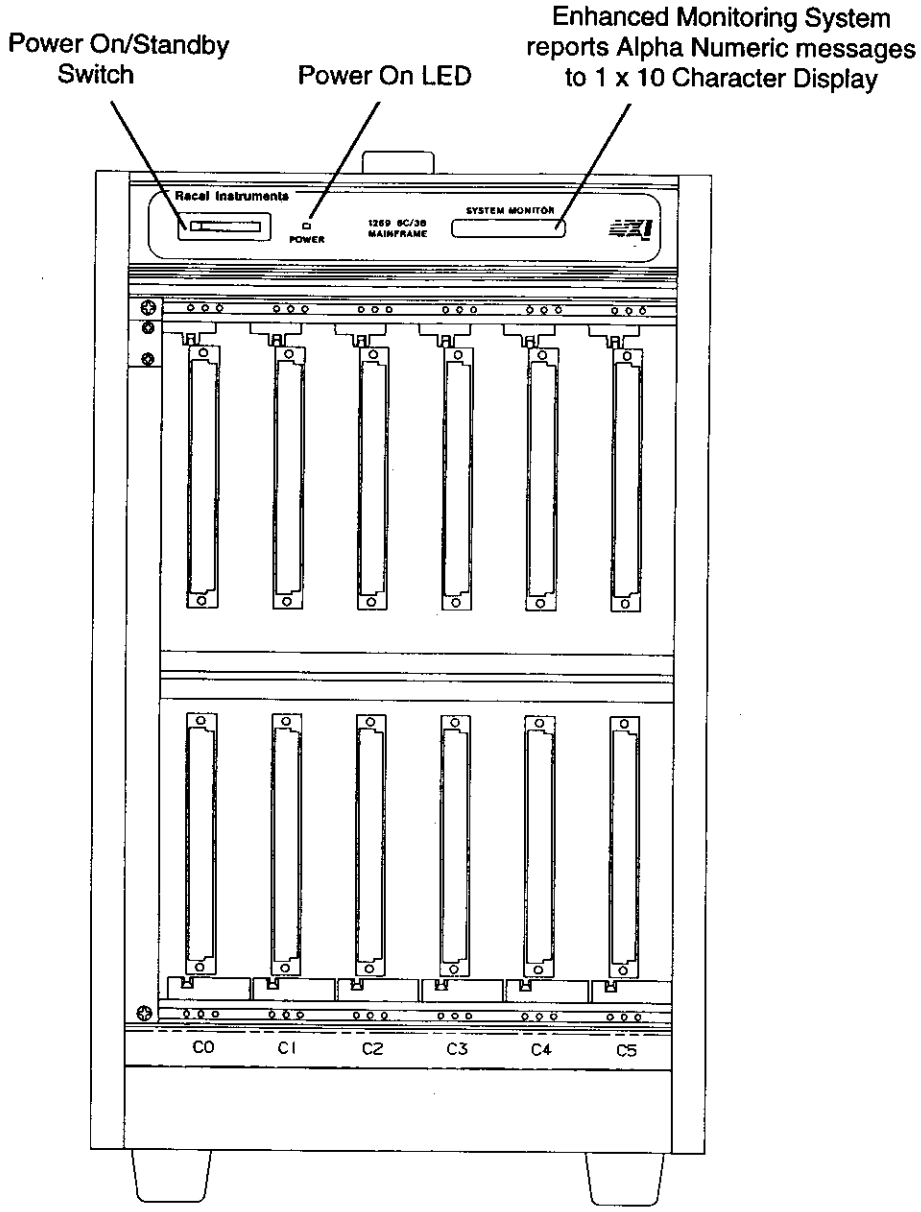


Figure 3-1 1269 Front View

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1269 Rear View

See **Rear Panel Switch and Connector Descriptions** (later in this Chapter) for information on rear panel features.

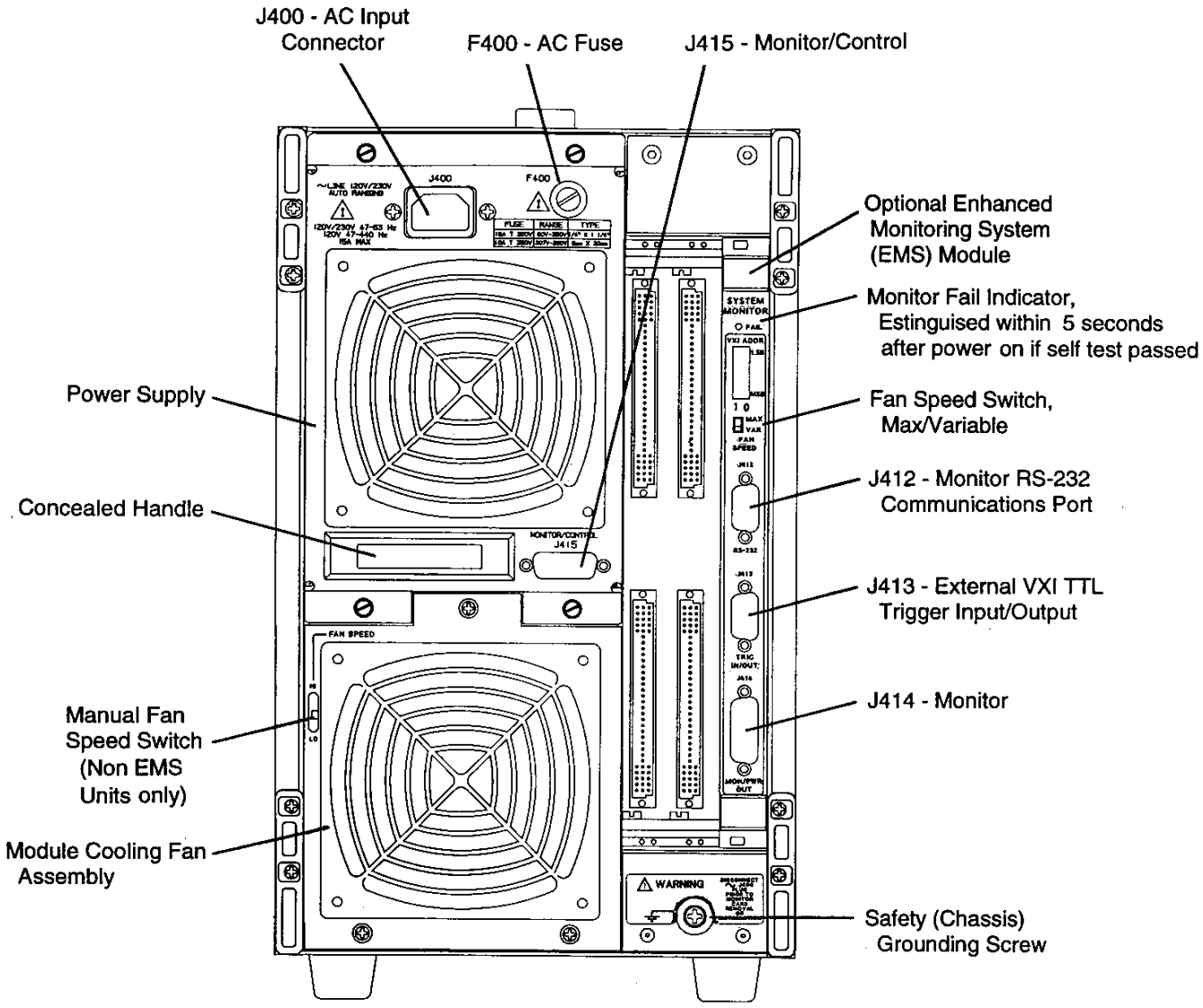


Figure 3-2 1269 W/EMS Rear View

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Powering On The Mainframe

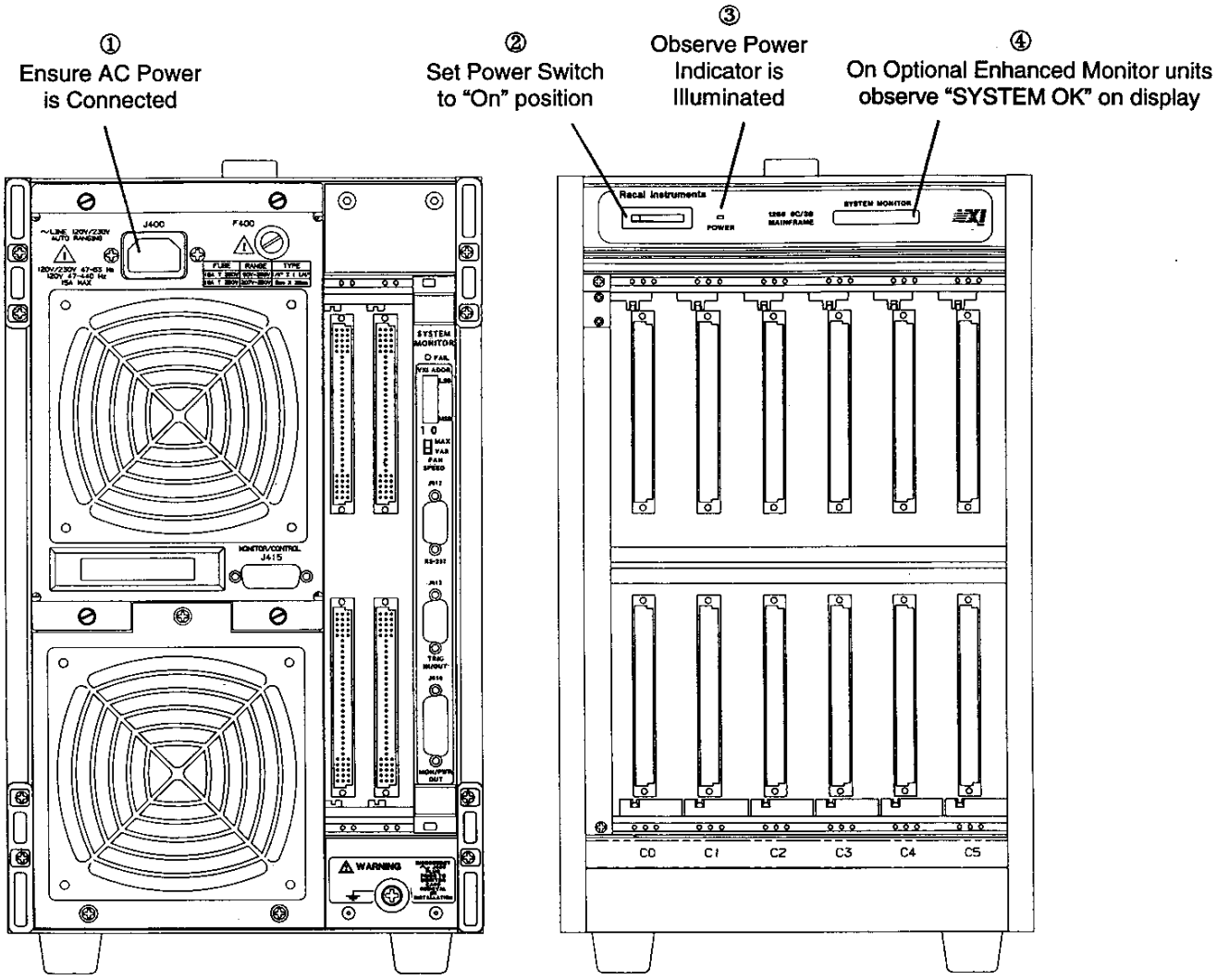
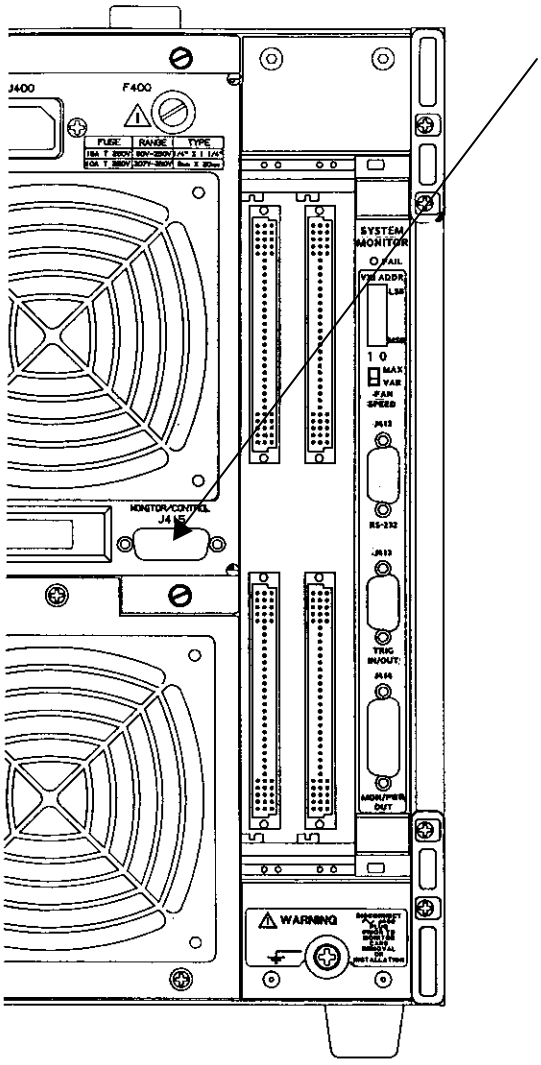


Figure 3-3 Powering On The Mainframe

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Using Remote Power On/Standby Switching



Pin	Function
15	Remote INHIBIT*
7,11	Logic Ground (GND)

1. Connect a user supplied cable (or equivalent) between J415 (female 15 DSUB) and a remote switch, or open collector driver. The switch (or driver) should connect to J415 pin 15 (INHIBIT*) and to one of the GND pins.

2. Complete Steps in **Figure 3-3 Powering On The Mainframe.**

3. Place in **Standby**, DC power to mainframe **off**, by closing remote switch shorting pin J415-15 to Logic Ground (INHIBIT* to GND) or by driving J415-15 to a TTL low with an open collector driver which can sink 5mA of current. The OC voltage at J415-15 is # 30 VDC.

4. Opening the remote switch (or deasserting the open collector driver) re-applies DC power to the mainframe (**Power On**) provided the front power switch is in the **on** position.

Figure 3-4, Using Remote Power On/Standby Switching

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Monitoring Basics

Refer to **Figures 3-1 and 3-2** while using **Table 3-1** to interpret system monitor information. This section applies to basic features of Enhanced (EMS) Monitoring System. See **Section 4 Using The Enhanced Monitor** for additional EMS capabilities. Refer to **Section 7 Troubleshooting** if a display message in the **"What You See On The Front Panel"** column is other than the message "System OK".

Table 3-1, Monitoring Basics

WHAT YOU SEE ON THE FRONT PANEL	WHAT IT MEANS	WHERE TO VERIFY
"System OK"	• VXI Voltages are within acceptable limits +4.56V # **+5V Rail** # +5.50V +10.95V # **+12V Rail** # +13.20V +21.90V # **+24V Rail** # +26.40V -2.20V # **-2V Rail** # -1.83V -5.72V # **-5.2V Rail** # -4.75V -13.20V # **-12V Rail** # -10.95V -26.40V # **-24V Rail** # -21.90V	• At rear panel connector J415 J415 Pin 3 J415 Pin 2 J415 Pin 9 J415 Pin 12 J415 Pin 4 J415 Pin 10 J415 Pin 1 Use J415 Pin 7,11 as Ground reference.
"System OK"	• Maximum slot temperature # 75EC • Maximum slot temperature rise # 20EC	• J414 Pin 4 100mV per EC, 0EC corresponds to 0 V • J414 Pin 5 100mV per EC, 0EC corresponds to 0 V Use J414 Pin 9 or 10 as ground reference.
"System OK"	• Module cooling fan is operating above acceptable limit Fan Speed $ 2000 RPM (EMS units)	• J414 Pin 6 2 Pulses per Revolution, TTL Pulse Train Use J414 Pin 9 or 10 as ground reference

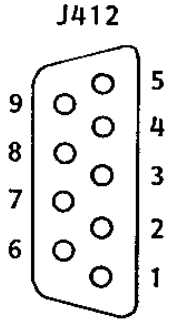
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Rear Panel Switch and Connector Descriptions

Table 3-2, Rear Panel Switches

Switch Reference	Description
FAN FULL/3-QUARTER SPEED (NON EMS UNITS ONLY)	This switch allows fans to run at 3/4 speed on units not equipped with the EMS option. Refer to **Chapter 2, Fan Speed (HI-LO) Selection.**
FAN SPEED CONTROL ENABLE (EMS ONLY)	Fan Speed Control. This switch enables fan speed control when set to the **VAR** (Variable) position. Set this switch to **MAX** to run the fan at full speed regardless of HI or LO jumper setting on EMS See **Fan Speed (HI-LO) Selection - EMS Figure 2-14.** In the **VAR** position the monitoring system automatically controls the speed of the fans depending on the air temperature and the amount of cooling required by the modules.
LOGICAL ADDRESS (EMS ONLY)	VXI Logical Address Switch. Refer to **Chapter 2 Enhanced Monitor VXI Logical Address Switch.**

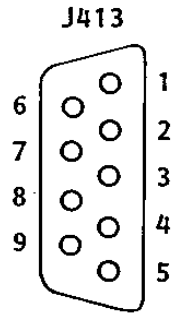
Table 3-3, J412 EMS RS-232 Port



Pin	Signal	Description
2	TXDA	Transmit Data
3	RXDA	Received Data
5	GND	Logic Ground
1,4,6,7,8,9	RSV	Reserved

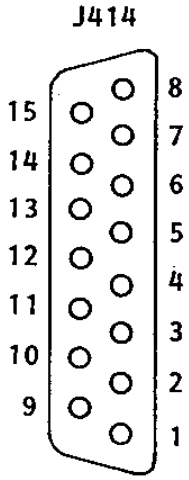
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 3-4, J413 EMS TTL Trigger Connector



Pin	Signal	Description
1	TRIG IN	TTL level input signal which is routed to any one of the eight TTLTRIG lines on the VXI backplane, with or without a programmable delay applied.
2	TRIG OUT	TTL output signal which is routed from any one of the eight TTLTRIG lines on the VXI backplane, with or without a programmable delay applied.
6,7,8	GND	Logic Ground
3-5,9	RSV	Reserved

Table 3-5, J414 EMS Rear Panel Monitor



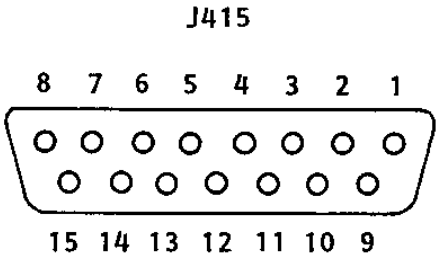
Pin	Signal	Description
1	+5V	+5V for powering external user circuitry, etc. (1 A max.)
2	+12V	+12V for powering external user circuitry, etc. (1 A max.)
3	+24V	+24V for powering external user circuitry etc. (1 A max.)
4	T_{max}	Output signal proportional to the maximum absolute temperature of the 13 modules (100 mV/^{o}C, 0 V corresponds to 0^{o}C)
5	^{a}T	Output signal proportional to the maximum absolute temperature rise (w/ respect to internal ambient sensor) of the 13 modules (100 mV^{o}C, 0 V corresponds to 0^{o}C)
6	TACH1	TTL output proportional to the speed of Fan 1 (2 pulses/ revolution)
7	RSV	Reserved
8	RSV	Reserved
9-11	GND	Logic Ground
12-15	RSV	Reserved

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 3-6, J415 Rear Panel Monitor/Control Connector

Pin	Signal	Description
1	-24 VMON	VXIbus Voltage Monitor Output
2	+12 VMON	VXIbus Voltage Monitor Output
3	+5 VMON	VXIbus Voltage Monitor Output
4	-5.2 VMON	VXIbus Voltage Monitor Output
5	+5 STANDBY	VXIbus +5V Standby Input
6	ACFAIL*	VXIbus ACFAIL* Input or Monitor Output (see note)
7	GND	Logic Ground
8	RSV	Reserved
9	+24 VMON	VXIbus Voltage Monitor Output
10	-12 VMON	VXIbus Voltage Monitor Output
11	GND	Logic Ground
12	-2V MON	VXIbus Voltage Monitor Output
13	+24VHS	+24V House Keeping Supply Voltage Monitor Output
14	SYSRESET*	VXIbus SYSRESET* Input or Monitor Output (see note)
15	R INHIBIT*	Power Supply Remote Inhibit Input

Note: Refer to VXIbus and VMEbus specifications for details on using the ACFAIL* and SYSRESET* signals. If you use these signals, do not violate VXIbus or VMEbus electrical specification.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Backplane Connectors

Table 3-7 shows the P1 connector pinouts for all slots in the 1269. **Table 3-8** shows the P2 connector pinouts for all non-slot 0 slots. **Table 3-9** shows the P2 connector pinouts for the VXIbus slot 0 located in either slot C0 or Slot B0 depending on personality module orientation (see **Select VXIbus Slot 0 Controller Location** in **Chapter 2.**)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 3-7, P1 Connector Pinouts

Pin	Row A	Row B	Row C
1	D00	BBSY*	D08
2	D01	BCLR*	D09
3	D02	ACFAIL*	D10
4	D03	BG0IN*	D11
5	D04	BG0OUT*	D12
6	D05	BG1IN*	D13
7	D06	BG1OUT*	D14
8	D07	BG2IN*	D15
9	GND	BG2OUT*	GND
10	SYSCLK	BG3IN*	SYSFAIL*
11	GND	BG3OUT*	BERR*
12	DS1*	BR0*	SYSRESET*
13	DS0*	BR1*	LWORD*
14	WRITE*	BR2*	AM5
15	GND	BR3*	A23
16	DTACK*	AM0	A22
17	GND	AM1	A21
18	AS*	AM2	A20
19	GND	AM3	A19
20	IACK*	GND	A18
21	IACKIN*	SERCLK	A17
22	IACKOUT*	SERDAT*	A16
23	AM4	GND	A15
24	A07	IRQ7*	A14
25	A06	IRQ6*	A13
26	A05	IRQ5*	A12
27	A04	IRQ4*	A11
28	A03	IRQ3*	A10
29	A02	IRQ2*	A09
30	A01	IRQ1*	A08
31	-12V	+5V STDBY	+12V
32	+5V	+5V	+5V

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 3-8, P2 Connector Pinouts For All Non-Slot 0 Locations

Pin	Row A	Row B	Row C
1	ECLTRGO	+5V	CLK10+
2	-2V	GND	CLK10-
3	ECLTRG1	RSV1	GND
4	GND	A24	-5.2V
5	LBUSA00	A25	LBUSC00
6	LBUSA01	A26	LBUSC01
7	-5.2V	A27	GND
8	LBUSA02	A28	LBUSC02
9	LBUSA03	A29	LBUSC03
10	GND	A30	GND
11	LBUSA04	A31	LBUSC04
12	LBUSA05	GND	LBUSC05
13	-5.2V	+5V	-2V
14	LBUSA06	D16	LBUSC06
15	LBUSA07	D17	LBUSC07
16	GND	D18	GND
17	LBUSA08	D19	LBUSC08
18	LBUSA09	D20	LBUSC09
19	-5.2V	D21	-5.2V
20	LBUSA10	D22	LBUSC10
21	LBUSA11	D23	LBUSC11
22	GND	GND	GND
23	TTLTRG0*	D24	TTLTRG1*
24	TTLTRG2*	D25	TTLTRG3*
25	+5V	D26	GND
26	TTLTRG4*	D27	TTLTRG5*
27	TTLTRG6*	D28	TTLTRG7*
28	GND	D29	GND
29	RSV2	D30	RSV3
30	MODID	D31	GND
31	GND	GND	+24V
32	SUMBUS	+5V	-24V

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 3-9, P2 Connector Pinouts for VXIbus Slot 0 (C0 or B0)

Pin	Row A	Row B	Row C
1	ECLTRG0	+5V	CLK10+
2	-2V	GND	CLK10-
3	ECLTRG1	RSV1	GND
4	GND	A24	-5.2V
5	MODID12	A25	LBUSC00
6	MODID11	A26	LBUSC01
7	-5.2V	A27	GND
8	MODID10	A28	LBUSC02
9	MODID09	A29	LBUSC03
10	GND	A30	GND
11	MODID08	A31	LBUSC04
12	MODID07	GND	LBUSC05
13	-5.2V	+5V	-2V
14	MODID06	D16	LBUSC06
15	MODID05	D17	LBUSC07
16	GND	D18	GND
17	MODID04	D19	LBUSC08
18	MODID03	D20	LBUSC09
19	-5.2V	D21	-5,2V
20	MODID02	D22	LBUSC10
21	MODID01	D23	LBUSC11
22	GND	GND	GND
23	TTLTRGO*	D24	TTLTRG1*
24	TTLTRG2*	D25	TTLTRG3*
25	+5V	D26	GND
26	TTLTRG4*	D27	TTLTRG5*
27	TTLTRG6*	D28	TTLTRG7*
28	GND	D29	GND
29	RSV2	D30	RSV3
30	MODID00	D31	GND
31	GND	GND	+24V
32	SUMBUS	+5V	-24V

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Basic Functional Check

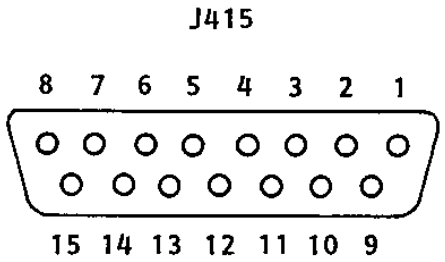
The functional check consists of checking the 1269 power supply voltages to the VXIbus limits at rear panel connector J415 using a digital voltmeter.

Referring to **Table 3-10** connect one lead of the voltmeter to a supply pin at J415. Connect the reference lead of the voltmeter to one of the ground pins. Compare each voltage reading to the values listed in **Tables 3-10.**

Table 3-10, Power Supply Voltages at J415

J415 Pin	Supply	VXI Acceptable Voltage Range
3	+5V	4.875V to 5.25V
10	-12V	-12.6 to 11.64V
1	-24V	-25.2V to -23.28V
12	-2V	-2.1V to -1.9V
2	+12V	11.64V to 12.6V
9	+24V	23.28V to 25.2V
4	-5.2V	-5.46V to -5.044V
7,11	Logic Ground	

If the voltages are within the specified ranges, the mainframe complies with VXI voltage limit specifications.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 4

USING THE ENHANCED MONITORING SYSTEM

Overview

This chapter contains information about how to operate the Model 1269 Enhanced Monitoring System (EMS). The instrument can be programmed using a set of SCPI commands. A list of SCPI commands, implemented by the Model 1269 EMS, is given in **Table 5-1.** The following paragraphs describe the various modes of operation and give examples on how to program the Model 1269 EMS.

Power On/Reset Defaults

After executing a software reset, the EMS defaults to the conditions shown in **Table 4-1.** A complete list of all parameters and their default values is given in **Chapter 5.**

Upon power-on, the EMS state will be reset to the power-on state described in **Table 4-1**. If DIP switch SW1-8 is set to the “1" position, the instrument state will be recalled from nonvolatile memory location 0. As shipped from the factory, nonvolatile location 0 holds the instrument state as described in **Table 4-1.** The power-on state of the EMS can be changed by overwriting the contents of nonvolatile location 0 by using the command:

```
*SAV 0
```

The command below may be used to place the instrument in its default state as described in **Table 4-1** on the following page.

```
*RST
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 4-1, Default Limit Settings After Power On, *RST

Power Supply Voltage Limits:		
Power Supply (PS)	**Maximum**	**Minimum**
+5V	5.50 V	4.56 V
-5.2V	-4.75 V	-5.72 V
-2V	-1.83 V	-2.20 V
+24V	26.40 V	21.90 V
-24V	-21.90 V	-26.40 V
+12V	13.20 V	10.95 V
-12V	-10.95 V	-13.20 V

Fan Speed Limit:	2000 RPM Minimum 4999 RPM Maximum
Ambient Temperature Limit:	70°C Maximum
Slot Temperature Rise Limit:	20.0°C Maximum
Number of VXI Bus Errors/IACKs:	0 (disabled)
Power On Time Limit:	1 year
Cumulative Power-On Time Limit:	5 years
Filter Service Time Limit:	720 hours of power-on time (30 days)
Trigger In/Trigger Out Delay:	0.0 Seconds
TRIG IN Input:	Disconnected
TRIG OUT Output:	Disconnected
Front Panel Display State:	On
Front Panel User Message:	None
RS-232 Baud Rate:	9600 (set by DIP switch SW1)
RS-232 Parity:	None (set by DIP switch SW1)
RS-232 Data Bits:	8 (set by DIP switch SW1)
RS-232 Stop Bits:	1 (set by DIP switch SW1)
Rack Mount Display Option:	Disabled (set by DIP switch SW1-7

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

What To Do Now

When writing commands to operate the Model 1269 EMS, follow the instructions in this chapter to understand the meaning and response that each command generates. Examples contained in the following paragraphs show basic techniques on how to program output waveforms.

Measuring Power Supply Voltages

The "MEAS:VOLT" command is used to measure the voltage presently being output by one of the seven VXI power supplies. The following commands may be used:

```
MEAS:VOLT1?      -- measure +5V PS Voltage
MEAS:VOLT2?      -- measure -5.2V PS Voltage
MEAS:VOLT3?      -- measure -2V PS Voltage
MEAS:VOLT4?      -- measure +24V PS Voltage
MEAS:VOLT5?      -- measure -24V PS Voltage
MEAS:VOLT6?      -- measure +12V PS Voltage
MEAS:VOLT7?      -- measure -12V PS Voltage
```

Each of these causes the 1269 EMS to reply with a value formatted as a real number. The number is rounded to the nearest 0.01 VDC.

Measuring Ambient Temperature

The "MEAS:TEMP14" command is used to measure the ambient temperature.

```
MEAS:TEMP14?     -- measure ambient temperature
```

This command causes the 1269 EMS to reply with a value formatted as a real number. The number is rounded to the nearest 1 degree Celsius.

Measuring VXI Slot Temperature

Each VXI slot temperature may be read individually. The following commands may be used to read the specified VXI slot temperature:

```
MEAS:TEMP1?      -- read slot C0 temperature
MEAS:TEMP2?      -- read slot C1 temperature
MEAS:TEMP3?      -- read slot C2 temperature
MEAS:TEMP4?      -- read slot C3 temperature
MEAS:TEMP5?      -- read slot C4 temperature
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
MEAS:TEMP6?          -- read slot C5 temperature
MEAS:TEMP7?          -- read slot B0 temperature
MEAS:TEMP8?          -- read slot B1 temperature
MEAS:TEMP9?          -- read slot B2 temperature
```

Each of these queries causes the 1269 EMS to reply with a value formatted as a real number. The number is rounded to the nearest 0.1 degree Celsius.

Note that the temperature rise of any slot may be computed by the difference between the ambient temperature and the slot's temperature ((MEAS:TEMPX?) - (MEAS:TEMP14?).

Measuring Fan Speed

The following commands may be used to read the fan speed:

```
MEAS:FREQ1?          -- read Fan speed
```

This query causes the 1269 EMS to reply with an integer value. The fan speed is rounded to the nearest whole number. The unit of measure is RPM (revolutions per minute).

Measuring Elapsed Time

The 1269 EMS monitors three elapsed time attributes. These are as follows:

- Power-on Time

The number of seconds since the power switch was switched from the OFF state to the ON state.

- Cumulative Power-on Time

The total number of seconds which the power switch has been in the ON state from the time the EMS was installed.

Filter Service Time

The total number of seconds which the power switch has been in the ON state since the filter was last serviced (and the "SENSE:TIME3:CLEAR" command was executed).

The following commands may be used to read the elapsed time attributes:

```
MEAS:TIME1?          -- read power-on time

MEAS:TIME2?          -- read cumulative power-on time

MEAS:TIME3?          -- read power-on time since last
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

filter service

Each of these queries causes the 1269 EMS to reply with an integer value. The unit of measure is seconds.

Reading The Present State of VXI Signals

The 1269 EMS has the capability to read the present state of the VXI SYSFAIL*, ACFAIL*, and AS* (address strobe) lines. The following commands may be used to read the present state of each of these lines:

```
MEAS:VXI:ACFAIL?        -- read ACFAIL* line

MEAS:VXI:SYSFAIL?       -- read SYSFAIL* line

MEAS:VXI:ASTROBE?       -- read AS* line
```

Each of these queries causes the 1269 EMS to reply with a 1 if the line is high, or a 0 if the line is low. Note that since each of these lines is asserted when low, the normal reply should be "1".

Monitoring The VXI Subsystem

The 1269 EMS has the ability to monitor the VXI power supplies' voltage, VXI slot temperatures, fan speeds, and select VXI signals. When one of these is outside the user-specified limits, an interrupt can be generated. This allows the system controller (computer) to effectively monitor the VXI subsystem without having to continually poll the 1269 EMS.

Each attribute is checked once per second, at a minimum, by the EMS. If the attribute value is outside the programmed limits, an "alarm" condition is assumed to exist. If the EMS has been told to generate an interrupt when the alarm condition exists, an interrupt will be sent to the system controller (by asserting one of the VXI interrupt lines IRQ1 to IRQ7).

When the system controller detects the interrupt, it can read status registers on the EMS to determine which attribute is at fault. It can then query the EMS to determine the present value of the attribute. It can also query the EMS to determine the time and date of the alarm condition.

Programming the EMS to perform this monitoring is done as a two-step process:

1) Program the tolerance limits for the attribute

2) Program the status registers to generate an interrupt when the attribute is outside its

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

tolerance limits.

Programming The Tolerance Limits

The various SENSE commands are used to set the programmable tolerance limits for the various attributes monitored by the 1269 EMS. The following paragraphs describe how to set each attribute's tolerance limit or limits. Refer to **Table 5-2** for a description of the range of values accepted for each command.

Programming The Power Supply Voltage Tolerance Limits

The power supply voltages are monitored to ensure that they are between an upper and a lower limit. The lower voltage tolerance limit is always the most negative, and the upper voltage tolerance limit is always the most positive. The following commands may be used to set the power supply voltage tolerance limits:

```
SENSE:VOLT1:RANGE:UPPER 5.2   -- +5V  upper limit
SENSE:VOLT1:RANGE:LOWER 4.8   -- +5V  lower limit
SENSE:VOLT2:RANGE:UPPER -5.0  -- -5.2V upper limit
SENSE:VOLT2:RANGE:LOWER -5.4  -- -5.2V lower limit
SENSE:VOLT3:RANGE:UPPER -1.8  -- -2V upper limit
SENSE:VOLT3:RANGE:LOWER -2.2  -- -2V lower limit
SENSE:VOLT4:RANGE:UPPER 25.9  -- +24V upper limit
SENSE:VOLT4:RANGE:LOWER 23.1  -- +24V lower limit
SENSE:VOLT5:RANGE:UPPER -23.1 -- -24V upper limit
SENSE:VOLT5:RANGE:LOWER -25.9 -- -24V lower limit
SENSE:VOLT6:RANGE:UPPER 12.9  -- +12V upper limit
SENSE:VOLT1:RANGE:LOWER 11.1  -- +12V lower limit
SENSE:VOLT7:RANGE:UPPER -11.1 -- -12V upper limit
SENSE:VOLT7:RANGE:LOWER -12.9 -- -12V lower limit
```

Each of these commands has an associated query. For example, the query:

```
SENSE:VOLT5:RANGE:LOWER?
```

reads the lower voltage tolerance limit for the -24V Power Supply. Refer to **Table 5-2** for a description of a range of values accepted for this command.

Programming The Fan

The fan speed is monitored to ensure that it is between the

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Speed Tolerance Limits

upper and lower limits. The following commands may be used to set the fan speed tolerance limits.

```
SENSE:FREQ1:RANGE:UPPER 6500   -- fan, upper limit

SENSE:FREQ1:RANGE:LOWER 2000   -- fan, lower limit
```

Each of these commands has an associated query. For example, the query:

```
SENSE:FREQ1:RANGE:LOWER?
```

reads the lower fan speed tolerance limit. Refer to **Table 5-2** for a description of a range of values accepted for this command.

Programming The Ambient Temperature Tolerance Limit

The ambient temperature is monitored to ensure that it does not exceed an upper limit. The following command may be used to set the ambient temperature limit.

```
SENSE:TEMP14:RANGE:UPPER  63.0
```

This example sets the upper limit of the ambient temperature to 63 degrees Celsius. The present upper limit for the ambient temperature may be read with the query:

```
SENSE:TEMP14:RANGE:UPPER?
```

Refer to **Table 5-2** for a description of a range of values accepted for this command.

Programming The VXI Slot Temperature Rise Tolerance Limits

Each VXI slot is individually monitored to ensure that the **temperature rise above ambient** does not exceed its programmable limit. Each VXI slot temperature rise may be programmed individually. The following commands may be used to establish the slot's upper limit for temperature rise above the measured ambient temperature.

```
SENSE:TEMP1:RANGE:UPPER 11.0     -- Slot C0 temp rise
SENSE:TEMP2:RANGE:UPPER 12.0     -- Slot C1 temp rise
SENSE:TEMP3:RANGE:UPPER 13.0     -- Slot C2 temp rise
SENSE:TEMP4:RANGE:UPPER 15.0     -- Slot C3 temp rise
SENSE:TEMP5:RANGE:UPPER 9.0      -- Slot C4 temp rise
SENSE:TEMP6:RANGE:UPPER 11.0     -- Slot C5 temp rise
SENSE:TEMP7:RANGE:UPPER 22.0     -- Slot B0 temp rise
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
SENSE:TEMP8:RANGE:UPPER 16.0      -- Slot B1 temp rise
SENSE:TEMP9:RANGE:UPPER 14.0      -- Slot B2 temp rise
```

Each of the commands has an associated query which may be used to read the present upper limit for the VXI slot temperature rise. For example, the command:

```
SENSE:TEMP9:RANGE:UPPER?
```

reads the presently programmed upper limit for the temperature rise in VXI slot B2. Refer to **Table 5-2** for a description of a range of values accepted for this command.

Programming The VXI Bus Error and IACKn Tolerance Limits

The EMS provides monitoring of the VXI Bus Error or IACKn events. Only one of the following events may be monitored at one time:

Bus Error (BERR*)

IACK1, IACK2, IACK3, ..., IACK7

Programming an upper limit for any of these events results in all other events being ignored by the EMS. The following commands may be used to set the upper limit for either the Bus Error or IACK events:

```
SENSE:VXI:BERR:LIMIT 255     -- set BERR limit
SENSE:VXI:IACK1:LIMIT 128    -- set IACK1 limit
SENSE:VXI:IACK2:LIMIT 233    -- set IACK2 limit
SENSE:VXI:IACK3:LIMIT 1      -- set IACK3 limit
SENSE:VXI:IACK4:LIMIT 2      -- set IACK4 limit
SENSE:VXI:IACK5:LIMIT 3      -- set IACK5 limit
SENSE:VXI:IACK6:LIMIT 44     -- set IACK6 limit
SENSE:VXI:IACK7:LIMIT 113    -- set IACK7 limit
```

Each limit may be set to an integer value between 0 and 255. Setting the limit to 0 disables the monitoring of the BERR and all IACK lines.

Each of the commands has an associated query which may be used to read the present limit for the BERR or IACK line. For example, the query:

```
SENSE:VXI:IACK5:LIMIT?
```

reads the presently programmed limit for the IACK5 line. Refer to **Table 5-2** for a description of a range of values

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

accepted for this command.

Reading The VXI Bus Error and IACKn Counters

The present count of Bus Error (BERR) or Interrupt Acknowledge cycles (IACKn) may be read back from the EMS. Only the presently monitored event will return a non-zero count value; all others will return a count of 0. For example, if the "SENSE:VXI:IACK3:LIMIT 7" command is received, then the BERR, IACK1, IACK2, and IACK4 through IACK7 count values will be returned as zero.

The following queries may be used to read the present count of VXI Bus Error and Interrupt Acknowledge events.

```
SENSE:VXI:BERR:COUNT?   -- read BERR count
SENSE:VXI:IACK1:COUNT?  -- read IACK1 count
SENSE:VXI:IACK2:COUNT?  -- read IACK2 count
SENSE:VXI:IACK3:COUNT?  -- read IACK3 count
SENSE:VXI:IACK4:COUNT?  -- read IACK4 count
SENSE:VXI:IACK5:COUNT?  -- read IACK5 count
SENSE:VXI:IACK6:COUNT?  -- read IACK6 count
SENSE:VXI:IACK7:COUNT?  -- read IACK7 count
```

Clearing The VXI Bus Error and IACKn Counters

The present count of Bus Error (BERR) or Interrupt Acknowledge cycles (IACKn) may be cleared to zero. This is necessary since the count increases to a maximum value of 256. Once the count reaches 256, the only way to clear it is to use the command described below (or to select some other IACKn or BERR line for monitoring).

The following commands may be used to clear the BERR or IACKn counters:

```
SENSE:VXI:BERR:CLEAR   -- clear BERR counter
SENSE:VXI:IACK1:CLEAR  -- clear IACK1 counter
SENSE:VXI:IACK2:CLEAR  -- clear IACK2 counter
SENSE:VXI:IACK3:CLEAR  -- clear IACK3 counter
SENSE:VXI:IACK4:CLEAR  -- clear IACK4 counter
SENSE:VXI:IACK5:CLEAR  -- clear IACK5 counter
SENSE:VXI:IACK6:CLEAR  -- clear IACK6 counter
SENSE:VXI:IACK7:CLEAR  -- clear IACK7 counter
```

This command is meaningful only if the specified event is presently being monitored. If, for example, the IACK3 line is

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

presently being monitored (because a "SENSE:VXI:IACK3:LIMIT" command was executed), then clearing the counter for the BERR event will have no effect.

Generating an Interrupt When an Alarm Condition is Detected

The previous paragraphs have described how to program tolerance limits. When one of the attributes monitored by the EMS exceeds its tolerance limits, an alarm condition exists. The following paragraphs describe how to program the EMS to generate an interrupt when it detects an alarm condition.

The EMS uses the SCPI-defined mechanism for generating interrupts based on out-of-tolerance conditions. The EMS implements a 3-level hierarchy of status registers to provide for enabling and disabling of interrupts based upon the individual VXI attributes monitored.

At the highest level, a separate condition, event, and enable register is maintained for each of the following attributes:

- Power Supply Voltages
- Fan Speed
- VXI Slot Temperatures
- Elapsed Time
- VXI Bus Error and IACK Events

Thus, there is a "Voltage Condition Register", a "Voltage Event Register", a "Voltage Enable Register", and so on.

The "Condition Register" holds the present status of each of the individual items monitored. For example, the "Voltage Condition Register" has a total of seven meaningful bits (see **Figure 4-1**). Each bit represents the present in-tolerance/out-of-tolerance state of a single power supply voltage.

Bit 0 (the least significant bit) is set to 1 if the voltage for the +5V power supply voltage is out of the programmable tolerance limits. This bit is cleared to 0 if the +5V power supply voltage is within the tolerance limits.

Similarly, bit 1 is set if the -5.2V power supply voltage is out of tolerance, and cleared to 0 if it is in tolerance. The other bit assignments for the **"Voltage Condition Register"** are shown in **Figure 4-1**.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Bits 15 through 7 Not assigned/ Always 0	Bit 6 -12V PS	Bit 5 +12V PS	Bit 4 -24V PS	Bit 3 +24V PS	Bit 2 -2V PS	Bit 1 -5.2V PS	Bit 0 +5V PS

Figure 4-1, Voltage Condition Register

The Voltage Condition Register may be read with the query:

```
STAT:QUES:VOLT:COND?
```

This query returns an integer value in the range 0 to 127. The value is formed by adding the bit values of each of the status bits. For example, the value of 97 (64 + 32 + 1) indicates that the -12V (64), +12V (32), and +5V (1) power supplies are out of tolerance.

Each attribute monitored by the 1269 EMS has its own "Condition Register". The remaining condition registers may be read with the following queries:

```
STAT:QUES:TEMP:COND?    -- Temperature Condition
STAT:QUES:FREQ:COND?    -- Fan Condition
STAT:QUES:TIME:COND?    -- Elapsed Time Condition
STAT:QUES:VXI:COND?     -- VXI BERR/IACK Condition
```

The bit assignments for the various Condition Registers are shown in **Tables 4-1** through **Tables 4-6.**

Table 4-2 Voltage Condition and Event Register Bit Assignments

Bit	Set When
0	+5V Power Supply Voltage out of tolerance
1	-5.2V Power Supply Voltage out of tolerance
2	-2V Power Supply Voltage out of tolerance
3	+24V Power Supply Voltage out of tolerance
4	-24V Power Supply Voltage out of tolerance
5	+12V Power Supply Voltage out of tolerance
6	-12V Power Supply Voltage out of tolerance

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 4-3, Temperature Condition and Event Register Bit Assignments

Bit	Set When
0	VXI slot C0 temperature rise exceeds limit
1	VXI slot C1 temperature rise exceeds limit
2	VXI slot C2 temperature rise exceeds limit
3	VXI slot C3 temperature rise exceeds limit
4	VXI slot C4 temperature rise exceeds limit
5	VXI slot C5 temperature rise exceeds limit
6	VXI slot B0 temperature rise exceeds limit
7	VXI slot B1 temperature rise exceeds limit
8	VXI slot B2 temperature rise exceeds limit
13	Ambient temperature exceeds limit

Table 4-4, Fan Speed Condition and Event Register Bit Assignments

Bit	Set When
0	Fan is out of tolerance

Table 4-5, Time Condition and Event Register Bit Assignments

Bit	Set When
0	Present Power-On Time exceeds limit
1	Cumulative Power-On Time exceeds limit
2	Filter Service Time exceeds limit

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 4-6, VXI Condition and Event Register Bit Assignments

Bit	Set When
0	VXI Bus Error (BERR*) Count exceeds limit
1	VXI SYSFAIL* is asserted
2	VXI ACFAIL* is asserted
3	VXI IACK1 Count exceeds limit
4	VXI IACK2 Count exceeds limit
5	VXI IACK3 Count exceeds limit
6	VXI IACK4 Count exceeds limit
7	VXI IACK5 Count exceeds limit
8	VXI IACK6 Count exceeds limit
9	VXI IACK7 Count exceeds limit

The “Event Register” holds the latched status of each of the individual items monitored. Each “Event Register” has the same bit assignment as the corresponding “Condition Register”. Thus, the “Voltage Event Register” has the same bit assignment as that shown in **Figure 4-1.**

The difference between the “Condition Register” and the “Event Register” is that the “Event Register” holds **latched** status information, while the “Condition Register” holds the **present** status information. For example, if the -12V power supply voltage goes out of tolerance and then returns in tolerance, bit 6 of the “Voltage Condition Register” will be 0 while bit 6 of the “Voltage Event Register” will be 1.

The following queries may be used to read the various attributes’ Event Registers:

```
STAT:QUES:VOLT:EVENT?   -- Voltage Event Register
STAT:QUES:TEMP:EVENT?   -- Temperature Event Reg.
STAT:QUES:FREQ:EVENT?   -- Fan Speed Event Reg.
STAT:QUES:TIME:EVENT?   -- Elapsed Time Event Reg.
STAT:QUES:VXI:EVENT?    -- VXI Event Register
```

Each time the “Event Register” is read, the bits of the “Event Register” are cleared. The bits of the “Event Register” are only set on a transition from an in-tolerance state to out-of-tolerance state. This corresponds to a 0-to-1 transition of the “Condition

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Register".

The "Enable Register" determines which of the "Event Register" bits will be passed onto the next level of status reporting. The value of the "Event Register" and "Enable Register" are logically ANDed together. If any of the bits of both registers are set, the status summary bit passed onto the next level of status reporting is also set. This is shown in **Figure 4-2.**

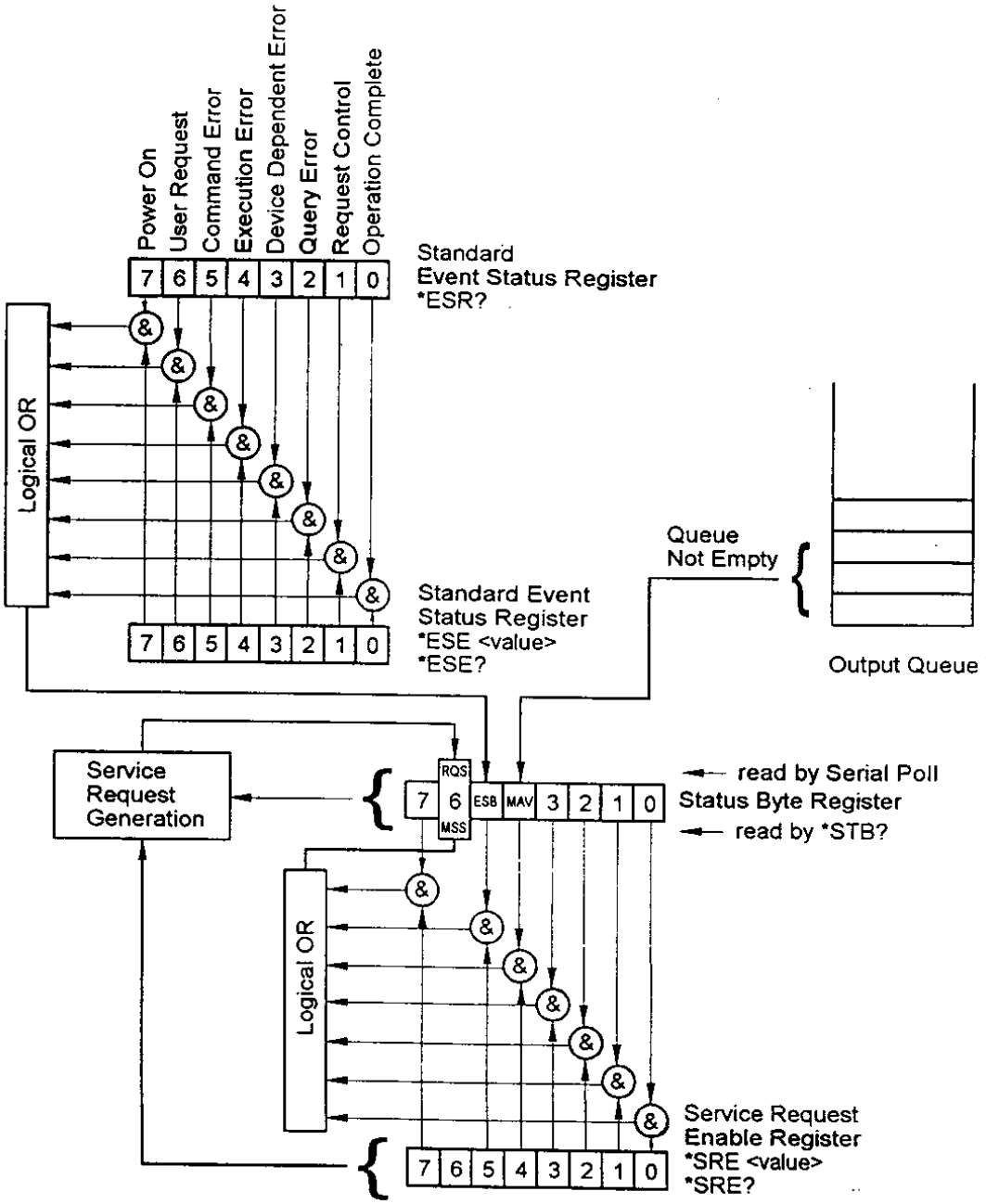


Figure 4-2, Event and Enable Registers and Summary Bit Generation

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The Enable Registers for each attribute may be set with the following commands (arbitrary register values are shown).

```
STAT:QUES:VOLT:ENAB   127 -- Voltage Enable
STAT:QUES:TEMP:ENAB     7 -- Temperature Enable
STAT:QUES:TIME:ENAB    15 -- Elapsed Time Enable
STAT:QUES:FREQ:ENAB    15 -- Fan Speed Enable
STAT:QUES:VXI:ENAB    255 -- VXI Enable
```

Each of the monitored attributes have an Event Register and an Enable Register. For each attribute, the registers are logically ANDed together, and the result is Ored to form a status summary bit. Each attribute is represented in the "Questionable Condition" register by a single summary bit. The bit assignments for the "Questionable Condition" register is shown in **Table 4-7.**

Table 4-7, Questionable Condition Register Bit Assignment

Bit	Set When
0	Voltage Event AND Enable bit or bits set
1	Not Assigned/always 0
2	Time Event AND Enable bit or bits set
3	Not Assigned/always 0
4	Temperature Event AND Enable bit or bits set
5	Fan Speed Event AND Enable bit or bits set
6	Not Assigned/always 0
7	Not Assigned, always 0
8	Not Assigned, always 0
9	VXI Event AND Enable bit or bits set
10	Not Assigned, always 0
11	Not Assigned, always 0
12	Not Assigned, always 0
13	Not Assigned, always 0
14	Not Assigned, always 0
15	Not Assigned, always 0

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The Questionable Condition Register may be read with the query

```
STATUS:QUES:COND?
```

This query returns an integer value in the range 0 to 575.

In addition to the Questionable Condition Register, the 1269 EMS implements a “Questionable Event Register” and a “Questionable Enable Register”. These act identically to the “Event Registers” and “Enable Registers” associated with each of the attributes.

The “Questionable Event Register” contains the latched status of all of the attribute summary bits. This means that a bit in the “Questionable Event Register” is set when the corresponding bit of the “Questionable Condition Register” transitions from a 0 to a 1.

The Questionable Event Register may be read with the query:

```
STATUS:QUES:EVENT?
```

The “Questionable Enable Register” enables bits in the “Questionable Event Register” to set bit 3 of the IEEE-488.2 defined Status Byte. Bit 3 of the Status Byte is the status summary for all enabled “Questionable Event Register” bits.

The Questionable Enable Register may be set with the command:

```
STATUS:QUES:ENABLE 32767
```

This example enables all of the bits of the Questionable Event Register to set bit 3 of the Status Byte.

The status reporting hierarchy is shown in **Figure 4-3.**

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

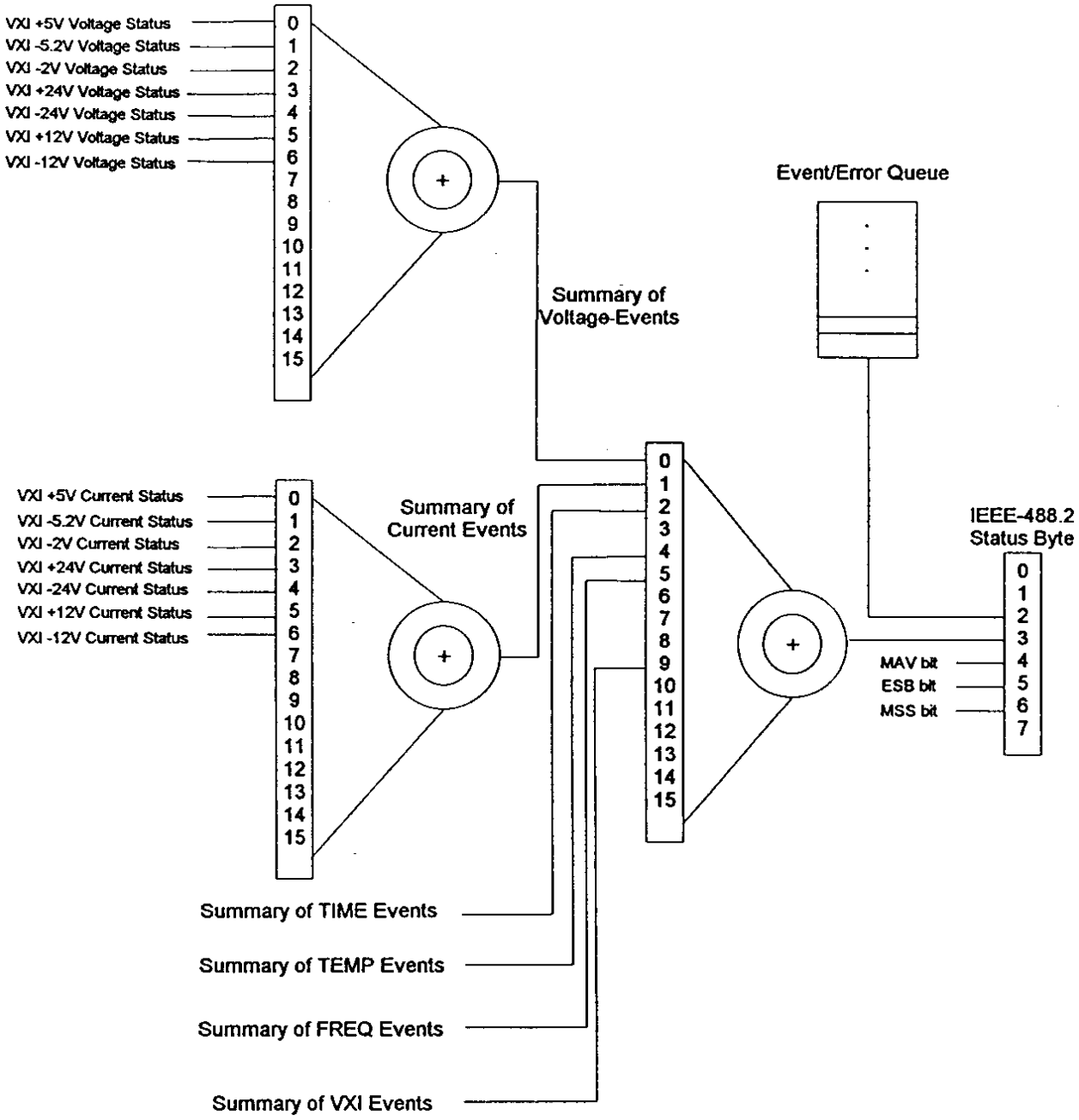


Figure 4-3, Status Reporting Hierarchy

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The final step for enabling out-of-tolerance conditions to generate an interrupt is to enable bit 3 of the Status Byte to generate an interrupt. The IEEE-488.2 "*SRE" command is used to enable bits of the Status Byte to generate an interrupt. Thus, if bit 3 of the "SRE Register" value is set, then an interrupt will be generated by the EMS when bit 3 of the Status Byte becomes set.

The following example enables bit 3 and bit 0 of the Status Byte. When either of the bits transition from a 0 to a 1, an interrupt will be generated:

```
*SRE 9
```

Clearing The Filter Service Alarm

The EMS maintains a "power-on" clock. This clock counts each second that the mainframe power switch is turned to the ON state. This clock is used to determine both the cumulative power-on time and the power-on time which has elapsed since the last time the filter was cleaned.

The time interval for cleaning the filter is set using the "SENSE:TIME3:RANGE:UPPER" command. This command sets the number of seconds which must elapse the mainframe power ON before the Filter Service Alarm is generated.

The number of seconds which has elapsed (with the mainframe power on) since the last filter service may be read using the "MEAS:TIME3?" command. This command calculates the difference between the present value of the "power-on" clock and a reference time stored in an EEPROM on the EMS.

After the "SENSE:TIME3:RANGE:UPPER" time has elapsed, the Filter Service Alarm is generated. This alarm will set bit 2 of the Questionable Time Condition and Event Registers (see **Table 4-5**). These registers may be read using the "STATUS:QUES:TIME:COND?" and "STATUS:QUES:TIME:EVENT?" queries, respectively. Bit 2 of the Questionable Time Event register will be cleared the first time "STATUS:QUES:TIME:EVENT?" query is executed. Bit 2 of the Questionable Time Condition register will remain set as long as the Filter Service Alarm is active.

The Filter Service Alarm may be cleared by executing the "SENSE:TIME3:CLEAR" command. This command stores the present value of the "power-on" clock as the reference time used to calculate the elapsed filter service time. Thus, if the "SENSE:TIME3:CLEAR" command is followed immediately by

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

a “MEAS:TIME3?” command, the “MEAS:TIME3?” command will return a value of **0**.

Therefore, the “SENSE:TIME3:CLEAR” command should be executed immediately after the filter is cleaned and mainframe power is turned on.

Change of Limit for Filter Service Alarm Example

To display a failure message after 100 days (example) of "power-on time" the following sequence may be performed:

A. Remove power cord, then remove EMS module.

B. Locate DIP switch SW1-8 on the EMS board. Move the switch to ON position. This allows the EMS to read the limits at power-up from the on-board EEPROM. The limits are read from the nonvolatile location 0. This location is stored using the command "SAV 0".

C. Using the following SCPI commands:

1. SENSE:TIME3:CLEAR

2. SENSE:TIME3:RANGE:UPPER 864E6
   864E6 is an example representing 8640000 or 100 days.

3. *SAV 0

You have just set the Filter Service Alarm to be active in 100 days of power -on.

Interrupt Generation Example

As an example, suppose an interrupt is desired only when one or more of the following conditions exist:

1) +24V Power Supply Voltage is out of tolerance
2) -12V Power Supply Voltage is out of tolerance
3) VXI Slot 7 Temperature Rise is too high
4) Fan speed is out of tolerance

No other condition should generate an interrupt.

To provide for this combination, execute the following commands:

```
-- Enable +24V and -12V Power Supply Voltage only
STAT:QUES:VOLT:ENABLE 72
-- Enable VXI Slot 7 Temperature Rise
STAT:QUES:TEMP:ENABLE 128
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
-- Enable Fan Speed
STAT:QUES:FREQ:ENABLE 1
-- Enable all bits of the Questionable Enable Register
STAT:QUES:ENABLE 32767
-- Enable bit 3 of the IEEE-488.2 Status Byte
*SRE 8
```

When an interrupt is detected by the system controller, it must check to see which condition generated the condition. To do this, it must:

1) Read the Questionable Event Register to see which attribute caused the interrupt. Recall that this register is read with the "STAT:QUES:EVENT?" query.

2) If the Voltage Summary bit (bit 0) is set, then read the Questionable Voltage Event Register to determine which supply Is out of tolerance. The Questionable Voltage Event Register may be read with the

   "STAT:QUES:VOLT:EVENT?" query.

3) If the Temperature Summary bit (bit 4) is set, it must be caused by VXI slot 7 temperature rise, since that is the only slot enabled in this example.

4) If the Frequency Summary bit (bit 5) is set, it is caused by the fan.

The example enables only a few attributes to generate an interrupt. For most users, all out-of-tolerance conditions should be investigated. Therefore, for most users, all of the Enable Registers should be set to a value of 32767 so all monitored attributes are capable of generating an interrupt.

Programming The Trigger Subsystem

The 1269 provides the following trigger capabilities:

1) Route a signal from the TRIG IN front panel input connector to one of the TTLTRG lines on the VXI backplane.

2) Route a signal from one of the TTLTRG lines on the VXI backplane to the TRIG OUT front panel output connecter.

3) Apply a programmable delay between either the

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

TRIG IN signal and the TTLTRGx line or the TTLTRGx signal and the TRIG OUT line.

4) Route the TRIG IN front panel input signal directly to the TRIG OUT front panel output (with or without a delay).

Note that by routing the TRIG IN input to the same TTLTRGx line that is connected to the TRIG OUT output, the TRIG IN signal may be connected to the TRIG OUT connector in addition to the TTLTRGx line.

Connecting The TRIG IN Input To a TTLTRG Line

The TRIG IN input may be connected to one of the TTLTRGx lines (TTLTRG0 through TTLTRG7) . The following commands may be used to connect the TRIG IN input to one of the TTLTRG lines, or to disconnect the input from all of the TTLTRG lines:

```
VXI:CONF:MONITOR:TRIG:INPUT   TTLTRG0
VXI:CONF:MONITOR:TRIG:INPUT   TTLTRG1
VXI:CONF:MONITOR:TRIG:INPUT   TTLTRG2
VXI:CONF:MONITOR:TRIG:INPUT   TTLTRG3
VXI:CONF:MONITOR:TRIG:INPUT   TTLTRG4
VXI:CONF:MONITOR:TRIG:INPUT   TTLTRG5
VXI:CONF:MONITOR:TRIG:INPUT   TTLTRG6
VXI:CONF:MONITOR:TRIG:INPUT   TTLTRG7
VXI:CONF:MONITOR:TRIG:INPUT   NONE
```

The first eight commands above connect the TRIG IN input to TTLTRG0 through TTLTRG7 respectively. The last command disconnects the TRIG IN input from all of the TTLTRG lines.

Note that by selecting one TTLTRG line, all other TTLTRG lines are implicitly disconnected.

To determine which line is presently connected, the query:

```
VXI:CONF:MONITOR:TRIG:INPUT?
```

may be used. The reply to this query will be one of the following:

```
TTLT0
TTLT1
TTLT2
TTLT3
TTLT4
TTLT5
TTLT6
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

TTLT7

NONE

The Default state for this command is “NONE”.

Connecting The TRIG OUT Output To a TTLTRG Line

The TRIG OUT output may be connected to one of the TTLTRGx lines (TTLTRG0 through TTLTRG7) . The following commands may be used to connect the TRIG OUT output to one of the TTLTRG lines, or to disconnect the input from all of the TTLTRG lines:

```
VXI:CONF:MONITOR:TRIG:OUTPUT   TTLTRG0
VXI:CONF:MONITOR:TRIG:OUTPUT   TTLTRG1
VXI:CONF:MONITOR:TRIG:OUTPUT   TTLTRG2
VXI:CONF:MONITOR:TRIG:OUTPUT   TTLTRG3
VXI:CONF:MONITOR:TRIG:OUTPUT   TTLTRG4
VXI:CONF:MONITOR:TRIG:OUTPUT   TTLTRG5
VXI:CONF:MONITOR:TRIG:OUTPUT   TTLTRG6
VXI:CONF:MONITOR:TRIG:OUTPUT   TTLTRG7
VXI:CONF:MONITOR:TRIG:OUTPUT   NONE
VXI:CONF:MONITOR:TRIG:OUTPUT   INPUT
```

The first eight commands above connect the TRIG OUT output to TTLTRG0 through TTLTRG7, respectively. The ninth command disconnects the TRIG OUT output from all of the TTLTRG lines. The last command connects the TRIG IN input to the TRIG OUT output without affecting any of the TTLTRG lines. In this case, if the TRIG IN input is already connected to a TTLTRG line, it will be disconnected prior to connecting it to the TRIG OUT output.

Note that by selecting one TTLTRG line, all other TTLTRG lines are implicitly disconnected.

To determine which line is presently connected, the query:

```
VXI:CONF:MONITOR:TRIG:OUTPUT?
```

may be used. The reply to this query will be one of the following:

TTLT0

TTLT1

TTLT2

TTLT3

TTLT4

TTLT5

TTLT6

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
TTLT7
NONE
INP
```

The Default state for this command is “NONE”.

Programming a Trigger Delay Time

A delay time may be added between:

1) The TRIG IN input and the selected TTLTRGx line, OR

2) The TTLTRGx line and the TRIG OUT output, OR

3) The TRIG IN input and the TRIG OUT output

The trigger delay time ranges from 0.0 to 1.04857596875 seconds in steps of 31.25 nanoseconds. To program a delay time, the command:

```
VXI:CONF:MONITOR:TRIG:DELAY <delay time>
```

where “<delay time>” ranges between 0.0 and 1.04857596875.

NOTE

When the trigger delay is non-zero, the trigger pulse is generated from the 1269 EMS. It is not identical to the trigger signal applied to the input (or from the TTLTRGx line). The trigger pulse is approximately 100 nanoseconds wide and is a low-going (normally high) pulse.

NOTE

The EMS trigger delay circuit adds a delay between the input and output pulses. This delay is between 31.25 ns and 62.5 ns (typical, 100 ns maximum).

The present delay time may be read back with the query:

```
VXI:CONF:MONITOR:TRIG:DELAY?
```

The reply to this query is a numeric value formatted as a real number.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Selecting The Trigger Delay Application

The trigger delay may be placed between ONE of the following:

1) TRIG IN input to selected TTLTRG line
2) Selected TTLTRG line to TRIG OUT output
3) TRIG IN input to TRIG OUT output
4) Nothing (no delay)

The following commands may be used to select the delay application:

```
VXI:CONF:MONITOR:TRIG:DELAY:STATE    INPUT
VXI:CONF:MONITOR:TRIG:DELAY:STATE    OUTPUT
VXI:CONF:MONITOR:TRIG:DELAY:STATE    NONE
```

The first command applies the delay between the TRIG IN input and the selected TTLTRG line. The second command places the delay between the selected TTLTRG line (or TRIG IN input) and the TRIG OUT output. The third command removes any trigger delay from the trigger subsystem.

The present trigger delay application may be read using the query:

```
VXI:CONF:MONITOR:TRIG:DELAY:STATE
```

The reply to this query will be one of the following:

```
INP

OUTP

NONE
```

Programming The Front Panel Display

The EMS has a 10 character LED display which is capable of displaying all printable characters. This includes both uppercase and lowercase “A” through “Z”, the comma, single quote, double quote, forward and backward slash, asterisk, dollar sign, percent sign, and so on. A space character may also be displayed.

At Power-On and after a reset command (“*RST”), the front panel display is turned on. The front panel will display the message:

```
Standby
```

if the AC line power switch is off. If the AC line power switch is

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

on, the front panel will display the message:

```
System OK
```

These two messages are displayed only when no out-of-tolerance conditions have been detected by the EMS. If an out-of-tolerance condition is detected, a status message is displayed. Consult the “Front Panel Display Status Messages” of this chapter for a description of the various status messages and their meanings

Turning The Display On and Off

At Power-On and after a reset, the front panel display is turned on. The front panel may be turned off using the command:

```
DISPLAY:TEXT:STATE OFF
```

After this command is executed, the display is turned off. The display will not display any status messages nor will it display any user-defined messages.

The front panel display may be turned on by using the command:

```
DISPLAY:TEXT:STATE ON
```

The present state of the display may be read using the query:

```
DISPLAY:TEXT:STATE?
```

The EMS will reply to this query with a “0" if the display is off, or a “1" if the display is on.

Writing a Message To The Display

The user may write a message to the display. This is done with the command:

```
DISPLAY:TEXT “Show This On The Display”
```

This text to display may be enclosed in either double quotes or in single quotes.

The text message may be from 0 to 80 characters in length. Since the LED display can accommodate only 10 characters at a time, and since the status “clock” is always shown at the right-most position, only 9 characters may be displayed at one time. The EMS will automatically “scroll” messages longer than 9 characters from left to right at the rate of 2 characters per second. Thus, if the command:

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
DISPLAY:TEXT “This is My String”
```

is executed, then the front panel will show the following characters in succession:

```
This is M
his is My
is is My
s is My S
 is My St
is My Str
s My Stri
 My Strin
My String
```

The presently programmed text string may be read using the query:

```
DISPLAY:TEXT?
```

The EMS will reply to this query with the string enclosed in double quotes. If a double quote is part of the displayed string, then two consecutive double quotes will be shown in the reply as follows:

```
“This has a double quote “” embedded in it”
```

The user string may be set to a length of 0 by sending the command:

```
DISPLAY:TEXT “”
```

If this command is executed, the display will show nothing UNLESS an out-of-tolerance condition is detected by the EMS.

Clearing The Message From The Display

The user message may be cleared entirely by executing the command:

```
DISPLAY:TEXT:CLEAR
```

After this command has been executed, the EMS will behave as if no user message has been defined. This will then return to displaying the “System OK” or out-of-tolerance message(s).

Front Panel Message Semantics

The EMS updates the front panel display as illustrated by the following pseudocode:

```
If the display state is ON then
        If there is an out-of-tolerance condition then
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
                display out-of-tolerance message
            Elsif there is a user-defined message then
                display the user-defined message
            Elsif the AC line power is switch ON then
                display “System OK”
            Else
                display “Standby”
            Endif
        Endif
```

Front Panel Status Messages

In the event that the EMS detects an out-of-tolerance condition, the front panel display will be updated with a status message. The status messages and their meanings are shown in **Table 4-8.**

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 4-8 Front Panel Status Messages

Message	Meaning
System OK	AC Power switch is ON, nothing out-of-tolerance
Standby	AC power switch is OFF, nothing out-of-tol
+5V PS OV	+5V power supply over-voltage condition
-5V PS OV	-5.2V power supply over-voltage condition
-2V PS OV	-2V power supply over-voltage condition
+24V PS OV	+24V power supply over-voltage condition
-24V PS OV	-24V power supply over-voltage condition
+12V PS OV	+12V power supply over-voltage condition
-12V PS OV	-12V power supply over-voltage condition
+5V PS UV	+5V power supply under-voltage condition
-5V PS UV	-5.2V power supply under-voltage condition
-2V PS UV	-2V power supply under-voltage condition
+24V PS UV	+24V power supply under-voltage condition
-24V PS UV	-24V power supply under-voltage condition
+12V PS UV	+12V power supply under-voltage condition
-12V PS UV	-12V power supply under-voltage condition
FAN SPEED	Fan speed is out of tolerance
AMB TEMP H	Ambient Temperature is too high
SLOT XX T	Slot XX temperature rise is too high (XX will be “C0 to C5", or “B0 to B2")
IACKX CNT	Interrupt Acknowledge Line X count reached (X will be “1" to “7")
BERR CNT	Bus Error count reached
SYSFAIL	SYSFAIL* line asserted
ACFAIL	ACFAIL* line asserted
PON TIME	Elapsed power-on time limit reached
TOT PON TM	Elapsed cumulative power-on time limit reached
FILTER	Filter service time limit reached

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Each of these messages will be flashed on the display. If more than one out-of-tolerance condition is detected, each status message will be displayed in a round-robin fashion.

Programming The RS-232 Interface

The EMS includes an RS-232 interface which may be used to send commands and receive replies. The RS-232 interface operates at one of four baud rates: 1200, 2400, 4800, or 9600. It supports 7 or 8 data bits, even, odd, or no parity, and 1 or 2 stop bits.

The default baud rate, data bits, stop bits, and parity are selected using DIP switch SW1. These settings will be used upon power on or upon reset. Consult the configuration diagram in section 2 of this manual for switch settings of SW1.

The baud rate, data bits, stop bits, and parity may be programmed using commands over the VXIbus or over the RS-232 interface.

Programming The Baud Rate

The baud rate may be programmed using the command:

```
SYSTEM:COMM:SERIAL:BAUD <baud rate>
```

where "<baud rate>" will be one of the following: 1200, 2400, 4800 or 9600. The present baud rate may be read back using the query

```
SYSTEM:COMM:SERIAL:BAUD?
```

The EMS will reply with one of the four possible values.

Programming The Number of Data Bits

The number of data bits may be programmed with the command:

```
SYSTEM:COMM:SERIAL:BITS <data bits>
```

where "<data bits>" will either be 7 or 8. The presently programmed number of data bits may be read with the query:

```
SYSTEM:COMM:SERIAL:BITS?
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Programming The Parity

The parity may be programmed using one of the following commands:

```
SYSTEM:COMM:SERIAL:PARITY EVEN
SYSTEM:COMM:SERIAL:PARITY ODD
SYSTEM:COMM:SERIAL:PARITY NONE
```

The present parity may be read using the query:

```
SYSTEM:COMM:SERIAL:PARITY?
```

The EMS will reply to this query with one of the following:

```
EVEN
ODD
NONE
```

Programming The Number of Stop Bits

The number of data bits may be programmed with the command:

```
SYSTEM:COMM:SERIAL:SBITS <stop bits>
```

where "<stop bits>" will either be 1 or 2. The presently programmed number of stop bits may be read with the query:

```
SYSTEM:COMM:SERIAL:SBITS?
```

Illegal RS-232 Interface Combinations

The following combinations of parity, data bits, and stop bits are NOT supported

No parity, 7 data bits, 1 stop bit

Even parity, 8 data bits, 2 stop bits

Odd parity, 8 data bits, 2 stop bits

If an attempt is made to program one of these combinations, the command will be ignored, and an error will be generated and placed in the instrument's "error queue". The error generated will be error number -221 ("Settings conflict"). Consult the SCPI reference section of this manual for a complete description of error messages.

As an example, suppose that the system presently has the following RS-232 configuration:

9600 baud

1 stop bit

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

no parity

8 data bits

Suppose also that the following configuration is desired:

9600 baud

1 stop bit

even parity

7 data bits

Then the parity must be programmed BEFORE the number of data bits is programmed. If an attempt is made to program the number of data bits to 7 before the parity is set to even, then an illegal combination would (temporarily) result. That is, the combination would be:

9600 baud, 1 stop bit, no parity, 7 data bits

which is NOT allowed. Thus, the commands must be sent in the following order:

```
SYSTEM:COMM:SERIAL:PARITY   EVEN
SYSTEM:COMM:SERIAL:BITS     7
```

Note that the order of programming will have to change based upon what the present configuration is and what the desired configuration is. That is, if we go from:

9600 baud, 1 stop bit, even parity, 7 data bits

to:

9600 baud, 1 stop bit, no parity, 8 data bits

Then the number of data bits must be programmed first.

Setting The System Time and Date

The EMS has an on-board battery-backed time of day clock. This clock keeps track of both time and date. The time and date are used for time stamping the alarm conditions so they may be read back by the user. They may also use this feature to obtain the date and time.

The system time may be set using the command:

```
SYSTEM:TIME <hour>,<minute>,<second>
```

where:

<hour> ranges from 0 to 23

<minute> ranges from 0 to 59

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

<second> ranges from 0 to 59

The present time may be read using the query:

```
SYSTEM:TIME?
```

The EMS will reply to this query using the format

<hour>,<minute>,<second>

The system date may be set using the command:

```
SYSTEM:DATE <year>,<month>,<day>
```

where:

<year>	ranges from 1995 to 2020
<month>	ranges from 1 to 12
<day>	ranges from 1 to 31 (may be less than 31 depending on the <month>)

The present date may be read using the query:

```
SYSTEM:DATE?
```

The EMS will reply to this query using the format

<year>,<month>,<day>

Reading Event Time Stamps

Each alarm condition has an associated time stamp. This time stamp tracks the most recent occurrence of the out-of-tolerance condition. The time stamp indicates the earliest time at which the most recent out-of-tolerance condition was detected.

In general, the time stamps may be read using a query of the form:

`<attribute>:ALARM:TIME?` -- read the time of the event

`<attribute>:ALARM:DATE?` -- read the date of the event

Where <attribute> is replaced by a keyword which indicates which attribute's out-of-tolerance time stamp is to be read. The valid queries are:

`VOLT1:ALARM:TIME?` -- +5V PS voltage alarm

`VOLT2:ALARM:TIME?` -- -5.2V PS voltage alarm

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
VOLT3:ALARM:TIME?      -- -2V PS voltage alarm
VOLT4:ALARM:TIME?      -- +24V PS voltage alarm
VOLT5:ALARM:TIME?      -- -24V PS voltage alarm
VOLT6:ALARM:TIME?      -- +12V PS voltage alarm
VOLT7:ALARM:TIME?      -- -12V PS voltage alarm

FREQ1:ALARM:TIME?      -- most recent alarm of any fan

TIME1:ALARM:TIME?      -- power on time alarm
TIME2:ALARM:TIME?      -- cumulative power on time
TIME3:ALARM:TIME?      -- filter service time alarm

TEMP1:ALARM:TIME?      -- slot C0 temp rise alarm
TEMP2:ALARM:TIME?      -- slot C1 temp rise alarm
TEMP3:ALARM:TIME?      -- slot C2 temp rise alarm
TEMP4:ALARM:TIME?      -- slot C3 temp rise alarm
TEMP5:ALARM:TIME?      -- slot C4 temp rise alarm
TEMP6:ALARM:TIME?      -- slot C5 temp rise alarm
TEMP7:ALARM:TIME?      -- slot B0 temp rise alarm
TEMP8:ALARM:TIME?      -- slot B1 temp rise alarm
TEMP14:ALARM:TIME?     -- ambient temperature alarm

VXI:SYSFAIL:ALARM:TIME?     -- VXI SYSFAIL* alarm
VXI:ACFAIL:ALARM:TIME?      -- VXI ACFAIL* alarm
VXI:IACK1:ALARM:TIME?-- VXI IACK1 alarm
VXI:IACK2:ALARM:TIME?-- VXI IACK2 alarm
VXI:IACK3:ALARM:TIME?-- VXI IACK3 alarm
VXI:IACK4:ALARM:TIME?-- VXI IACK4 alarm
VXI:IACK5:ALARM:TIME?-- VXI IACK5 alarm
VXI:IACK6:ALARM:TIME?-- VXI IACK6 alarm
VXI:IACK7:ALARM:TIME?-- VXI IACK7 alarm
VXI:BERR:ALARM:TIME?  -- VXI Bus Error alarm
```

Only the “TIME?” queries are shown above. The “DATE?” queries may be formed by substituting the keyword “DATA” for the keyword “TIME”.

The time stamps cannot be set by a command; they can only be queried. The EMS automatically records them into nonvolatile memory whenever an out-of-tolerance condition is detected.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

IEEE-488.2 Common Commands

The EMS supports all required IEEE-488.2 commands. In addition, the optional "*OPT?", "*SAV", and "*RCL" commands are all supported. The following paragraphs describe the IEEE-488.2 commands supported by the 1269 EMS.

*IDN? Query

This query requests the instrument to identify itself. The EMS responds to this query with the following reply:

Racal Instruments,1269 EMS,0,<firmware revision>

This reply indicates the manufacturer ("Racal Instruments"), the model ("1269 EMS"), the serial number (if not available, it is "0"), and the firmware revision. The firmware revision is the only field that may change in the future. The firmware revision is a numeric, floating point value. An example firmware revision is "2.1".

*RST Command

The *RST command resets the instrument to its power-on default state. These settings are shown in **Table 4-1** of this manual. This command does NOT change the value of SCPI or IEEE-488.2 status registers, event registers, condition registers, or enable registers.

*TST? Query

The *TST? query initiates an instrument self-test and returns a reply. The reply is a integer numeric value. A value of "0" indicates that the self-test has passed. A non-zero value indicates that one of the commanded self-tests has failed. Consult the "**Performing the Self-Test**" Section of this chapter for a description of the self-test failures and error codes associated.

*CLS Command

The *CLS command clears the SCPI and IEEE-488.2 defined status event registers. These include the Questionable Voltage Event Register, and so on. This also includes the Standard Event Register (see the *ESR? query description).

*ESE Command

The *ESE command sets the value of the Standard Event Status Enable Register. The value of this register is

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

logically ANDed with the contents of the Standard Event Status Register (see the *ESR? query description). If any bits of this AND operation are set, then bit 5 of the Status Byte is set. That is:

bit 5 of Status Byte = (bit 0 of ESE AND bit 0 of ESR)
OR
(bit 1 of ESE AND bit 1 of ESR)
OR
(bit 2 of ESE AND bit 2 of ESR)
OR
(bit 3 of ESE AND bit 3 of ESR)
OR
(bit 4 of ESE AND bit 4 of ESR)
OR
(bit 5 of ESE AND bit 5 of ESR)
OR
(bit 6 of ESE AND bit 6 of ESR)
OR
(bit 7 of ESE AND bit 7 of ESR)

where:

ESE is the value as set by the *ESE command

ESR is the value which may be read with *ESR? query

Bit 5 of the Status Byte is also known as the “Event Summary Bit”, or ESB. The *ESE command has the format:

```
*ESE <ESE value>
```

where the “<ESE value>” is an integer numeric value in the range 0 to 255.

*ESE? Query

This query reads the value presently programmed for the “Standard Event Status Enable Register”. This reads the value as programmed by the “*ESE” command.

*ESR? Query

This query reads the value of the “Standard Event Status Register”. Each bit of this register indicates a true/false status condition. When the bit is set, the condition is TRUE; when the bit is cleared, the condition is FALSE. The

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

bit assignments are defined by the IEEE-488.2 specification. The bit assignments are as follows:

Bit 0 - Operation Complete. This bit is set when the *OPC command is sent and has been executed.

Bit 1 - Request Control. This bit is always 0 for the 1269 EMS.

Bit 2 - Query Error. This bit is set when the EMS parser has detected a query error condition, as defined by the IEEE-488.2 specification.

Bit 3 - Device Dependent Error. This bit is set when the EMS has detected a Device Dependent error, such as an internal conflict or a self-test failure at power-on.

Bit 4 - Execution Error. This bit is set when the EMS has attempted to execute a command but the command could not be executed successfully.

Bit 5 - Command Error. This bit is set when the EMS receives a command it does not recognize.

Bit 6 - User Request. This bit is always 0 for the 1269 EMS.

Bit 7 - Power On. This bit is set when the AC line power switch is turned on

The bits of the Standard Event Status Register are cleared after this query has been executed. The reply to the *ESR? query is a numeric integer value in the range “0" to “255".

*SRE Command

The *SRE command sets the value of Service Request Enable Register. The value of this register is logically ANDed with the contents of the Status Byte (see the *STB? query description). If any bits of this AND operation are set, bit 6 of the Status Byte is set. That is:

bit 6 of Status Byte = (bit 0 of SRE AND bit 0 of STB)
OR
(bit 1 of SRE AND bit 1 of STB)
OR
(bit 2 of SRE AND bit 2 of STB)
OR

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

(bit 3 of SRE AND bit 3 of STB)
OR
(bit 4 of SRE AND bit 4 of STB)
OR
(bit 5 of SRE AND bit 5 of STB)
OR
(bit 7 of SRE AND bit 7 of STB)

where:

SRE — is the value as set by the *SRE command

STB — is the value of the Status Byte which may be read with *STB? query or by performing a serial poll (VXI read STB command).

Bit 6 of the Status Byte is also known as the "Master Status Summary" bit. When this bit transitions from a 0 to a 1, a VXI Request True interrupt is generated by the EMS. When this bit transitions from a 1 to a 0, a VXI Request False interrupt is generated by the EMS.

The command has the format:

```
*SRE <SRE value>
```

where the "<SRE value>" is an integer numeric value in the range 0 to 255. The value of bit 6 of this register is ignored, since it does not make sense to "enable an interrupt when an interrupt is generated".

*SRE? Query

This query reads the value presently programmed for the "Service Request Enable Register". This reads the value as programmed by the "*SRE" command.

*STB? Query

This query reads the value of the "Status Byte". Each bit of this register indicates a true/false status condition. When the bit is set, the condition is TRUE; when the bit is cleared, the condition is FALSE. The bit assignments are defined by the IEEE-488.2 specification. The bit assignments are as follows:

Bit 0 - Not used. Always returns 0.

Bit 1 - Not used. Always returns 0.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Bit 2 - Not used. Always returns 0.

Bit 3 - Set when the SCPI "Questionable Condition Register" ANDed with the SCPI "Questionable Condition Enable Register" is non-zero.

Bit 4 - Message Available (MAV). Set when there is a reply in the output buffer to be read.

Bit 5 - Extended Status Byte (ESB). Set when the IEEE-488.2 Standard Event Register ANDed with the IEEE-488.2 Standard Event Status Register is non-zero.

Bit 6 - Master Summary Status (MSS). Set when the value of the Status Byte ANDed with the value of the Service Request Enable Register is non-zero. When this bit transitions from a 0 to a 1, a Request True interrupt is generated. When this bit transitions from a 1 to a 0, a Request False interrupt is generated.

Bit 7 - Not used. Always returns 0.

*OPC Command

The *OPC command will cause the Operation Complete bit of the Standard Event Status Register (SESR) to be set when the command is executed. This is bit 0 of the SESR. The value of the SESR may be read using the *ESR? query.

The *OPC command has no parameters. The only valid syntax for this command is:

```
*OPC
```

*OPC? Query

The *OPC? query causes the EMS to reply with the value of "1" when the query is executed. This query may be used to ensure that all previous commands have been executed so the application program may be sure that tolerances and other attributes have been programmed before continuing.

*RCL Command

The *RCL command will recall the instrument state from nonvolatile memory. The *RCL command may specify a

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

nonvolatile memory location from which to recall the instrument state. That is, both of the following formats are accepted:

```
*RCL

*RCL <location>
```

If <location> is specified, it must be in the range 0 to 9. If <location> is not specified, it will default to 1.

The *RCL command recalls the following instrument state attributes

Upper and/or Lower Tolerances For:

- Power Supply Voltages
- Fan speed
- Ambient Temperature
- VXI Slot Temperature Rise
- VXI IACKn count limits
- VXI BERR count limit
- Elapsed time

Trigger Subsystem Configuration:

- Trigger Delay and Delay Application
- TRIG IN/TRIG OUT connections

Front Panel Display Configuration:

- Front Panel Display On/Off State
- User-Defined Display Text

RS-232 Interface Configuration:

- Baud Rate
- Parity
- Data Bits
- Stop Bits

Note that Status Registers, Condition Registers, Enable Registers, and Event Registers are NOT affected by the *RCL command.

*SAV Command

The *SAV command will store the present instrument state into nonvolatile memory. The *SAV command may specify a nonvolatile memory location into which the instrument state is saved. That is, both of the following formats are accepted:

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
*SAV

*SAV <location>
```

If <location> is specified, it must be in the range 0 to 9. If <location> is not specified, the instrument state will be saved into nonvolatile memory location 1. Note that *SAV location 0 is recalled at power-up if the DIP switch SW1-8 is set.

The *SAV command saves all of the attributes described in the *RCL command description into the specified nonvolatile memory location.

*TRG Command

The *TRG command is required by the IEEE-488.2 specification. This command is accepted but has no effect on the EMS.

*WAI Command

The *WAI command is required by the IEEE-488.2 specification. This command is accepted but has no effect on the EMS.

Performing the Self-Test

The EMS performs a series of self-tests when power is first applied. If any of the self-tests fail, the following message is displayed on the 10 character LED display on the front of the VXI mainframe:

```
Self Test Failed!
```

To determine the cause of this failure, perform one of the following 3 operations:

- Connect an RS-232 terminal to the RS-232 port of the EMS. Cycle power to the EMS by removing and reconnecting the AC power cord. Observe the error messages displayed on the terminal to determine which of the self-tests have failed.

- Connect an RS-232 terminal and keyboard to the RS-232 port of the EMS. Type the command

  ```
  SYST:ERR?
  ```

  on the keyboard. Observe the reply to determine the cause of the self-test failure. The meaning of the replies to this query are discussed later in this section.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

C Turn VXI mainframe power on. After the resource manager program has executed (MXI/VXI and embedded computer interfaces), or after a five second delay (GPIB/VXI slot 0 interface), send the following command to the EMS over the VXIbus:

```
SYST:ERR?
```

Read the reply to determine the cause of the self-test failure. The meaning of the replies to this query are discussed later in this section.

The "Self Test Failed!" message will continually be displayed until it is cleared. This message may be cleared using the following command:

```
DISP:TEXT:CLEAR
```

The self-tests may also be initiated with an ASCII command over either the RS-232 or the VXIbus interface. The command:

```
*TST?
```

initiates the self-test. The self-test will complete after approximately 3 seconds. Upon completion of the self-test, the result may be read via the VXIbus (the result will automatically be sent over the RS-232 interface if the command was received on the RS-232 interface).

The result of the self-test will be one of the following:

0 The self-test has passed

-1 The checksum of the ROM which contains the firmware does not match the checksum stored in the ROM itself.

-2 The EEPROM checksum does not match the checksum stored in the EEPROM itself; the EEPROM is possibly corrupt.

-3 One of the VXI mainframe sensors routed to the EMS's A/D converter has failed. The measured value on one of the sensors has measured extremely high, indicating that the sensor is disconnected. The sensor(s) at fault is indicated in the reply to the "SYST:ERR?" query.

-4 The EMS programmable interrupt timer has failed its self test.

-5 One section of the EEPROM has failed its

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

verification. Some data in the EEPROM may be corrupt.

-6 The real-time clock has failed its self-test. Date and Time functions will not work properly. Time stamps for alarm conditions will not be recorded properly.

If any non-zero error code is returned, a description of the failure is placed on the error queue. The cause of the error may be read using the command:

```
SYST:ERR?
```

This command may be sent over the RS-232 or the VXIbus interface. The EMS will reply with an error message with the form:

```
-330,"Self-test failed;<self-test failure description>"
```

The <self-test failure description>s, and their meanings, are described below:

```
ROM checksum failed (is XXXX, s/b YYYY)
```

This error is returned when the ROM checksum has failed (*TST? returns -1). The computed checksum is shown as four hexadecimal digits, represented by XXXX. The stored checksum is shown as four hexadecimal digits, represented by YYYY.

```
PS Voltage Sensors: +5V -5.2V -2V +24V -24V +12V -12V
```

This error is returned when the Power Supply voltage sensors for one or more of the power supplies has failed. All seven power supplies are shown in this example. Only the failing supplies will be shown when this error occurs. This message may be returned if the *TST? command returns a value of -3.

```
Fan Speed Sensor: Fan
```

This error is returned when the fan speed monitor sensor for the fan has failed. This message may be returned if the *TST? command returns a value of -3.

```
Ambient Temperature Sensor
```

This error is returned when the ambient temperature sensor has failed. The message may be returned if the *TST? command returns a value of -3.

```
Slot Temperature Sensors (Slots): 0 1 2 3 4 5 6 7 8
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This error is returned when one or more of the slot temperature sensors has failed. This example shows that the C0 - C5, and B0 - B2 slot temperature sensors has failed. Only the failing sensors will be shown when this error occurs. This message may be returned if the *TST? command returns a value of -3.

`Microcontroller P.I.T failed`

This error is returned when the EMS's Programmable Interrupt Timer test has failed. This message will be returned if the *TST? command returns a value of -4.

`EEPROM header corrupt (XXXXXXXX)`

This error is returned when the header (first 4 bytes) of the EEPROM do not match the expected fixed pattern of AAAA5555 hexadecimal. The actual value read from the EEPROM is shown as 8 hexadecimal digits enclosed in parentheses. This error may be returned if the *TST? command returns a value of -5.

`EEPROM Alarm Data Corrupt (Address XXXX)`

This error is returned when one of the alarm time-stamps in the EEPROM does not have a valid checksum. This indicates that the particular time stamp is corrupted. The address within the 8K EEPROM is shown as four hexadecimal digits. This error may be returned if the *TST? command returns a value of -5.

`EEPROM state X read fail`

This error is returned when the attempt to read the data for state X (X = 0 to 9) has failed. This indicates that the stored instrument state location MAY be corrupt. This error may be returned if the *TST? command returns a value of -5.

`EEPROM state X checksum fail`

This error is returned when the checksum stored for the instrument state does not match the computed checksum for that state. This indicates that the stored instrument state MAY be corrupt. This error may be returned if the *TST? command returns a value of -5. The X will be replaced by the state that was found to be corrupt (X = 0 to 9).

`EEPROM read failure`

This error is returned when the EEPROM indicates that it is

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

busy writing data for more than 40 milliseconds. This indicates a general EEPROM failure. This error may be returned if the *TST? command returns a value of -5.

`Time-of-day real-time clock failed`

This error is returned when the real-time clock on the EMS does not advance after a minimum of 1.2 seconds. This error may be returned if the *TST? command returns a value of -6.

`Power-on time real-time clock failed`

This error indicates that the power-on time real-time clock on the EMS does not advance after a minimum of 1.2 seconds. This error may be returned if the *TST? command returns a value of -6.

The following self-tests are NOT performed when VXI mainframe power is NOT applied:

EEPROM tests

real-time clock tests

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 5

SCPI COMMAND REFERENCE

What's In This Chapter

This chapter contains reference information for programming the Model 1269 Enhanced Monitoring System (EMS). Standard Commands For Programmable Instruments (SCPI) convention rules and syntax are explained in detail. **Table 5-1** lists all SCPI commands used for programming the EMS. The command summary for each SCPI model is also included in this chapter.

This chapter teaches you how to use SCPI commands to control functions, modes, waveforms and other aspects of the instrument. Prior understanding of SCPI programming is necessary for low level programming of the EMS.

Introduction To SCPI Language

Commands to program the instrument over the VXIbus and RS-232 interfaces are defined by the SCPI 1994.0 standard. The SCPI standard defines a common language protocol. It goes one step further than IEEE-STD-488.2 and defines a standard set of commands to control every programmable aspect of the instrument. It also defines the format of command parameters and the format of values returned by the instrument.

SCPI is an ASCII-based instrument command language designed for test and measurement instruments. SCPI commands are based on a hierarchical structure known as a tree system. In this system, associated commands are grouped together under a common mode or root, thus forming subsystems. Throughout this chapter, the following conventions are used for SCPI command syntax.

Square Brackets ([ ])	Enclose optional keywords or parameters
Braces ({ })	Enclose parameters within a command string

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Triangle Brackets (< >)	Substitute a value for the enclosed parameter
Vertical Bar (|)	Separate multiple parameter choices
Bold Typeface Letters	Designate factory default values

Part of the DISPlay subsystem is shown below to illustrate the tree system:

```
[:]DISPlay
        [:WINDow]
                :TEXT
                        :CLEar
                        [:DATA] <string>
                        :STATe          OFF|ON
```

DISPlay is the root keyword of the command, WINDow is the optional second level keyword, TEXT is the third level keyword. CLEar, DATA, and STATe are fourth level keywords. A colon (:) separates a command keyword from a lower level keyword.

Command Keyword Long Form and Short Form

Each keyword defined by SCPI has both a long form and a short form. The long form is formed by using all letters shown in the keyword. The short form is formed by using only the uppercase letters shown in the keyword.

For example, the DISPlay keyword may be specified by either of the following:

```
DISP

DISPLAY
```

No other form can be used to specify the keyword. The keyword “DISPL” may NOT be used.

Case Sensitivity

Command keywords are NOT case sensitive. Command parameters are NOT case sensitive, unless the parameter is string data enclosed in quotes.

For example, the following commands are all equivalent:

```
DISPLAY
Display
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
DiSpLaY
disPLAY
display
```

Optional Keywords

Command keywords enclosed in square brackets are optional. For example, all of the following commands are valid and equivalent:

```
DISPLAY:WINDOW:TEXT:DATA “Hello”
DISPLAY:TEXT:DATA “Hello”
DISPLAY:WINDOW:TEXT “Hello”
DISPLAY:TEXT “Hello”
```

A colon (:) is used to separate a command keyword from a lower level keyword as shown below:

```
DISP:WIND:TEXT:STATE ON
```

A semicolon (;) is used to separate commands within the same subsystem, and can also minimize typing. For example, sending the following command string:

```
DISP:TEXT “Example Text” ; STATE ON
```

is the same as sending the following two commands:

```
DISP:TEXT “Example Text”

DISP:TEXT:STATE ON
```

Use the colon and semicolon to link commands from different subsystems. For example, in the following command string, an error is generated if both the colon and the semicolon are not used.

```
DISP:TEXT:STATE ON;:SYSTEM:ERR?
```

Multiple Identical Capabilities and Keyword Suffixes

In several places in the EMS, there are nearly identical measuring capabilities across multiple instances of a monitored attribute. For example, the voltage from 7 different power supplies can be read. The base keyword used to measure the power supply voltage is shown as:

```
MEASure:VOLTage[<N>]? (N = 1 - 7)
```

This represents eight different keywords:

```
MEASure:VOLTage?        -- read +5V Power Supply
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
MEASure:VOLTage1?      -- read +5V Power Supply
MEASure:VOLTage2?      --read -5.2V Power Supply
MEASure:VOLTage3?      -- read -2V Power Supply
MEASure:VOLTage4?      --read +24V Power Supply
MEASure:VOLTage5?      -- read -24V Power Supply
MEASure:VOLTage6?      --read +12V Power Supply
MEASure:VOLTage7?      -- read -12V Power Supply
```

Each of these has a long form and a short form. Thus

```
MEAS:VOLTAGE2?
```

```
MEAS:VOLT2?
```

are equivalent.

Omitting the keyword suffix selects the same capability as specifying the suffix of 1. This means that:

```
MEAS:VOLTage?
```

```
MEAS:VOLTage1?
```

are equivalent.

The MIN, MAX, and DEF Parameters

Substitute MINimum, MAXimum, or DEFault in place of a numeric parameter for most commands. For example, the following command:

```
:VOLTAGE3:RANGE:UPPER MIN
```

sets the upper voltage range for the -2V power supply monitor to its minimum programmable value. The command:

```
:VOLTAGE3:RANGE:UPPER DEF
```

sets the upper voltage range for the -2V power supply monitor to its default, power-on value.

The MINimum, MAXimum, and DEFault keywords are accepted for all SENSE:<Attribute>:RANGE commands and the VXI:CONF:MON:TRIG:DELAY command.

Querying Parameter Setting

Query the current value of most parameters by adding a question mark (?) to the command. For example, the following command sets the trigger delay to 0.5 seconds:

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
VXI:CONF:MON:TRIG:DELAY 0.5
```

Query the trigger delay by executing:

```
VXI:CONF:MON:TRIG:DELAY?
```

Query Response Format

The response to a query depends on the command sent to the instrument to generate the query response. In general, a response to a query contains present values or settings of the EMS. Commands that set values can be queried about their present value of the setting. Commands that set modes of operation can be queried about their present mode setting.

SCPI Command Terminator

A command string sent to the EMS must be terminated with a one of the following:

1) An ASCII linefeed character: (decimal 10, hex 0A, 'C' char '\n').

2) The last character with the END bit set to 1.

3) An ASCII linefeed character with the END bit set to 1.

The END bit for a VXI instrument is analogous to the GPIB EOI line. The END bit is sent along with each character using the Word Serial Byte Available command. GPIB/VXI slot 0 controllers translate the GPIB EOI line to VXIbus protocol, which sets the END bit to identify the last character of a command.

Over the RS-232 interface, there is no EOI line. Therefore, ALL commands transmitted over the RS-232 interface must be terminated with the ASCII newline character.

IEEE-STD-488.2 Common Commands

The IEEE-STD-488.2 standard defines a set of common commands that perform functions like reset, trigger and status operations. Common commands begin with an asterisk (*), are four to five characters in length, and may include parameters. The command keyword is separated from the first parameter by a blank space. Use a semicolon (;) to separate multiple commands as shown below:

```
*RST; *STB?; *IDN?
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

SCPI Parameter Type

The SCPI language defines several different data formats to be used in program messages and response messages.

Numeric Parameters

Commands that require numeric parameters will accept all commonly used decimal representations of numbers including optional signs, decimal points, and scientific notation. Special values for numeric parameters like MINimum, MAXimum, and DEFault are also accepted.

Engineering unit suffixes with numeric parameters (e.g., mV, KV, mA, KHz) can also be sent. If only specific numeric values are accepted, the function generator will ignore values which are not accepted and will generate an error message. The following command is an example of a command that uses a numeric parameter:

```
SENSE:VOLT1:RANGE:UPPER 5.75
```

Discrete Parameters

Discrete parameters are used to program settings that have a limited number of values (e.g., trigger delay is applied to INPut or OUTput or NONE). They have short and long form command keywords. Upper and lower case letters can be mixed. Query responses always return the short form in all upper case letters. The following command uses discrete parameters:

```
:VXI:CONF:MON:DELAY:STATE {INPut|OUTput|NONE}
```

Boolean Parameters

Boolean parameters represent a single binary condition that is either true or false. The EMS accepts "OFF" or "0" for a false condition. The EMS accepts "ON" or "1" for a true condition. The instrument always returns "0" or "1" when a boolean setting is queried. The following command uses a boolean parameter:

```
:DISPLAY:TEXT:STATE { OFF | ON | 0 | 1 }
```

SCPI Command Summary

Table 5-1 summarizes the complete SCPI command tree available to program the EMS. Refer to **Section 4** in this manual for more complete details on each command.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 5-1, VXIbus Model 1269 EMS SCPI Commands List Summary

Keyword	Parameter Form (Default in Bold)	SCPI 1994.0	Notes
SYSTem		Confirmed	
:ERRor ?		Confirmed	(Query only)
:VERSion?		Confirmed	(Query only)
:COMMunicate		Confirmed	
:SERial		Confirmed	
[:RECeive]		Confirmed	
:BAUD	1200 | 2400 | 4800 | **9600**	Confirmed	Combinations ofParity/Data/StopBits
:BITS	7 | **8**	Confirmed	which are NOT allowed:
:SBITs	**1** | 2	Confirmed	NONE/7/1
:PARity		Confirmed	EVEN/8/2
[:TYPE]	EVEN | ODD | **NONE**	Confirmed	ODD/8/2
:TRANsmit		Confirmed	
:AUTO		Confirmed	Programming either the TRANSMIT
:BAUD	1200 | 2400 | 4800 | **9600**	Confirmed	or the RECEIVE direction programs
:BITS	7 | **8**	Confirmed	BOTH directions
:SBITs	**1** | 2	Confirmed	
:TIME	<hour>, <minute>, <second>	Confirmed	ranges: 0 - 23, 0 - 59, 0 - 59
:DATE	<year>, <month>, <day>	Confirmed	ranges: 1995 - 2120, 1 - 12, 1 - 31
:MEASure		Confirmed	
:VOLTage[<N>]?		Confirmed*	<N> = 1 - 7 (Query only)
:FREQuency[<N>]?		Confirmed*	<N> = 1 (Query only)
:TIME[<N>]?		Not Confirmed	<N> = 1 - 3 (Query only)
:TEMPerature[<N>}?		Confirmed*	<N> = 1 - 14 (or 1 - 27) (Query only)
:VXI		Not Confirmed	
:ACFail?		Not Confirmed	(Query only)
:ASTRobe?		Not Confirmed	(Query only)
:SYSFail?		Not Confirmed	(Query only)
STATus		Confirmed	
:PRESet		Confirmed	(Command only)
:OPERation		Confirmed	Command has no effect
[:EVENt]?		Confirmed	Command has no effect (Query only)
:CONDition?		Confirmed	Command has no effect (Query only)
:ENABle	(0;0;32767)	Confirmed	Command has no effect
:QUEStionable		Confirmed	
[:EVENt]?		Confirmed	(Query only)
:CONDition?		Confirmed	(Query only)
:ENABle	(0;0;32767)	Confirmed	
:VOLTage		Confirmed	
[:EVENt]?		Confirmed	(Query only)
:CONDition?		Confirmed	(Query only)
:ENABle	(0;0;32767)	Confirmed	Meaningful range is 0 to 127
:TEMPerature		Confirmed	
[:EVENt]?		Confirmed	(Query only)
:CONDition?		Confirmed	(Query only)
:ENABle	(0;0;32767)	Confirmed	Meaningful range is 0 to 16383
:FREQuency		Confirmed	
[:EVENt]?		Confirmed	(Query only)
:CONDition?		Confirmed	(Query only)
:ENABle	(0;0;32767)	Confirmed	Meaningful range is 0 to 15
:TIME		Confirmed	
[:EVENt]?		Confirmed	(Query only)
:CONDition?		Confirmed	(Query only)
:ENABle	(0;0;32767)	Confirmed	Meaningful range is 0 to 7
:VXI		Not Confirmed	
[:EVENt]?		Not Confirmed	(Query only)
:CONDition?		Not Confirmed	(Query only)
:ENABle	(0;0;32767)	Not Confirmed	Meaningful range is 0 to 1024

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Keyword	Parameter Form (Default in Bold)	SCPI 1994.0	Notes
[:SENSe]		Confirmed	
:VOLTage[<N>]		Confirmed	N = 1 - 7
[:DC]		Confirmed	
:RANGe		Confirmed	
[:UPPer]	<voltage as a real number>**	Confirmed	set most positive voltage monitor limit
:LOWer	<voltage as a real number>**	Confirmed	set most negative voltage monitor limit
:ALARm		Not Confirmed	
[:TIME}?		Not Confirmed	(Query only)
:DATE?		Not Confirmed	(Query only)
:FREQuency[<N>]		Confirmed	N = 1
:RANGe		Confirmed	
[:UPPer]	<frequency as a real number (RPM)>**	Confirmed	set maximum frequency limit
:LOWer	<frequency as a real number (RPM)>**	Confirmed	set minimum frequency limit
:ALARm		Not Confirmed	
[:TIME}?		Not Confirmed	(Query only)
:DATE?		Not Confirmed	(Query only)
:TIME[<N>]		Not Confirmed	N = 1 - 3
:RANGe		Not Confirmed	
[:UPPer]	<time as a real number (seconds)>**	Not Confirmed	set maximum time limit
:LOWer	<time as a real number (seconds)>**	Not Confirmed	may be specified but is ignored
:ALARm		Not Confirmed	
[:TIME}?		Not Confirmed	(Query only)
:DATE?		Not Confirmed	(Query only)
:TEMPerature[<N>]		Not Confirmed	N = 1 - 14 (or 1- 27 if option installed)
:RANGe		Not Confirmed	
[:UPPer]	<time as a real number (seconds)>**	Not Confirmed	set maximum temperature/temp rise
:LOWer	<time as a real number (seconds)>**	Not Confirmed	may be specified but is ignored
:ALARm		Not Confirmed	
[:TIME}?		Not Confirmed	(Query only)
:DATE?		Not Confirmed	(Query only)
:VXI		Not Confirmed	
:SYSFail		Not Confirmed	
:ALARm		Not Confirmed	
[:TIME}?		Not Confirmed	(Query only)
:DATE?		Not Confirmed	(Query only)
:ACFail		Not Confirmed	
:ALARm		Not Confirmed	
[:TIME}?		Not Confirmed	(Query only)
:DATE?		Not Confirmed	(Query only)
:IACK<N>		Not Confirmed	N = 1 to 7
:COUNt?		Not Confirmed	(Query only)
:LIMit	(0;0;255)	Not Confirmed	
:CLEar		Not Confirmed	(Command only)
:ALARm		Not Confirmed	
[:TIME}?		Not Confirmed	(Query only)
:DATE?		Not Confirmed	(Query only)
:BERR		Not Confirmed	
:COUNt?		Not Confirmed	(Query only)
:LIMit	(0;0;255)	Not Confirmed	
:CLEar		Not Confirmed	(Command only)
:ALARm		Not Confirmed	
[:TIME}?		Not Confirmed	(Query only)
:DATE?		Not Confirmed	(Query only)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Keyword	Parameter Form (Default in Bold)	SCPI 1994.0	Notes
VXI		Confirmed	
:CONFigure		Confirmed	
:MONitor		Not Confirmed	
[:TRIGger]		Not Confirmed	
[:INPut]	TTLTRG0 | TTLTRG1 | TTLTRG2 | TTLTRG3 | TTLTRG4 | TTLTRG5 | TTLTRG6 | TTLTRG7 | **NONE**	Not Confirmed	
:OUTput	TTLTRG0 | TTLTRG1 | TTLTRG2 | TTLTRG3 | TTLTRG4 | TTLTRG5 | TTLTRG6 | TTLTRG7 | **NONE** | INPut	Not Confirmed	
:DELay		Not Confirmed	
[:TIME]	(**0**; 0; 1.04857596875)	Not Confirmed	
:STATe	INPut | OUTput | **OFF**	Not Confirmed	
:DISPlay		Confirmed	
[:WINDow]		Confirmed	
:TEXT		Confirmed	
:CLEar		Confirmed	
[:DATA]	<string data>	Confirmed	enclose <string data> in quotes
:STATe	OFF | **ON** | 0 | 1	Confirmed	

Common Commands	Parameter Form (Default; Min; Max)	IEEE-488.2	Notes
*CLS		Confirmed	
*ESE	(**0**;0;255)	Confirmed	
*ESE?		Confirmed	
*ESR?		Confirmed	
*IDN?		Confirmed	
*OPC		Confirmed	
*OPC?		Confirmed	
*RCL	[0 | **1** | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9]	Confirmed	
*RST		Confirmed	
*SAV	[0 | **1** | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9]	Confirmed	
*SRE	(**0**;0;255)	Confirmed	
*SRE?		Confirmed	
*STB?		Confirmed	
*TRG		Confirmed	command has no effect
*TST?		Confirmed	
*WAI		Confirmed	command has no effect

Notes:

* The limits and default values depend upon which power supply is being measured. Consult **Table 5-2.**

** Although these MEASure commands are identified in SCPI version 1994.0, this implementation does NOT accept either the expected value or the resolution as a parameter. The MEASure commands accept NO parameters as implemented by the Enhanced Monitoring System.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Command Parameter Limits

The parameter limits for the numeric commands are shown in **Table 5-2.**

Table 5-2, Defaults, Minima and Maxima

Command	Default	Minimum	Maximum	Notes
SENSE:VOLT1:RANGE:UPPER	5.4	5.0	40.0	+5V PS voltage upper tolerance
SENSE:VOLT1:RANGE:LOWER	4.6	0.0	5.0	+5V PS voltage lower tolerance
SENSE:VOLT2:RANGE:UPPER	-4.8	-5.2	0.0	-5.2V PS voltage upper tolerance
SENSE:VOLT2:RANGE:LOWER	-5.6	-40.0	-5.2	-5.2V PS voltage lower tolerance
SENSE:VOLT3:RANGE:UPPER	-1.8	-2.0	0.0	-2V PS voltage upper tolerance
SENSE:VOLT3:RANGE:LOWER	-2.2	-16.0	-2.0	-2V PS voltage lower tolerance
SENSE:VOLT4:RANGE:UPPER	25.9	24.0	100.0	+24V PS voltage upper tolerance
SENSE:VOLT4:RANGE:LOWER	22.1	0.0	24.0	+24V PS voltage lower tolerance
SENSE:VOLT5:RANGE:UPPER	-22.1	-24.0	0.0	-24V PS voltage upper tolerance
SENSE:VOLT5:RANGE:LOWER	-25.9	-100.0	-24.0	-24V PS voltage lower tolerance
SENSE:VOLT6:RANGE:UPPER	12.9	12.0	100.0	+12V PS voltage upper tolerance
SENSE:VOLT6:RANGE:LOWER	11.1	0.0	12.0	+12V PS voltage lower tolerance
SENSE:VOLT7:RANGE:UPPER	-11.1	-12.0	0.0	-12V PS voltage upper tolerance
SENSE:VOLT7:RANGE:LOWER	-12.9	-100.0	-12.0	-12V PS voltage lower tolerance
SENSE:FREQ:RANGE:UPPER	5200.0	2000.0	7650.0	Fan, upper RPM tolerance
SENSE:FREQ:RANGE:LOWER	2000.0	500.0	7650.0	Fan, lower RPM tolerance
SENSE:TEMP14:RANGE:UPPER	70.0	0.0	140.0	Ambient temperature upper tol.
SENSE:TEMP<X>:RANGE:UPPER	20.0	0.0	140.0	VXI slot temp rise tol. <X> = 1 to 9
SENSE:TIME1:RANGE:UPPER	31536000 (365 days)	0.0	125 years	Power-On elapsed time limit
SENSE:TIME2:RANGE:UPPER	157680000 (5 x 365 days)	0.0	125 years	Cumulative power-on time limit
SENSE:TIME3:RANGE:UPPER	2592000 (30 days)	0.0	125 years	Filter service power-on time limit
SENSE:VXI:IACK<X>:LIMIT	0	0	255	IACKn limit (<X> = 1 to 7)
SENSE:VXI:BERR:LIMIT	0	0	255	VXI Bus Error limit
VXI:CONF:MON:TRIG:DELAY:TIME	0.0	0.0	1048575968.75 (nanoseconds)	Trigger Delay time resolution = 31.25 nanoseconds

Device Specific Commands

The 1269 EMS conforms to the 1994.0 version of the SCPI standard. Some of the commands used are not included in the 1994.0 version. However, these commands are designed with the SCPI standard in mind and they follow all of the command syntax rules defined by the standard. **Table 5-1** lists all device-specific commands that were designed specifically for the EMS as “Not Confirmed” to the 1994.0 SCPI version.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 6

UNDERSTANDING THE 1269

Overview

The 1269 Mainframe consists of the following major functional blocks.

- Power Supply
- Backplane
- Cooling System
- Monitoring System (Optional)

Figure 6-1 shows the functional block diagram of the 1269 Mainframe.

Power Supply

The power supply accepts power from the AC mains and converts it to DC to power the following:

- VXI modules installed into the backplane
- Backplane terminations and daisy chaining logic
- Module Cooling Fan
- System Monitoring Module (Optional)
- Temperature Monitor Module (Optional)
- Front Panel Display (Optional)

Power Supply Interconnection

Power is supplied to the backplane through board-to-board connector P52 eliminating any wiring and sub-backplane interconnect boards. This design reduces the path impedance between the supply and the VXI modules receiving power, which results in improved dynamic current performance. See **Appendix A** for specifications.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

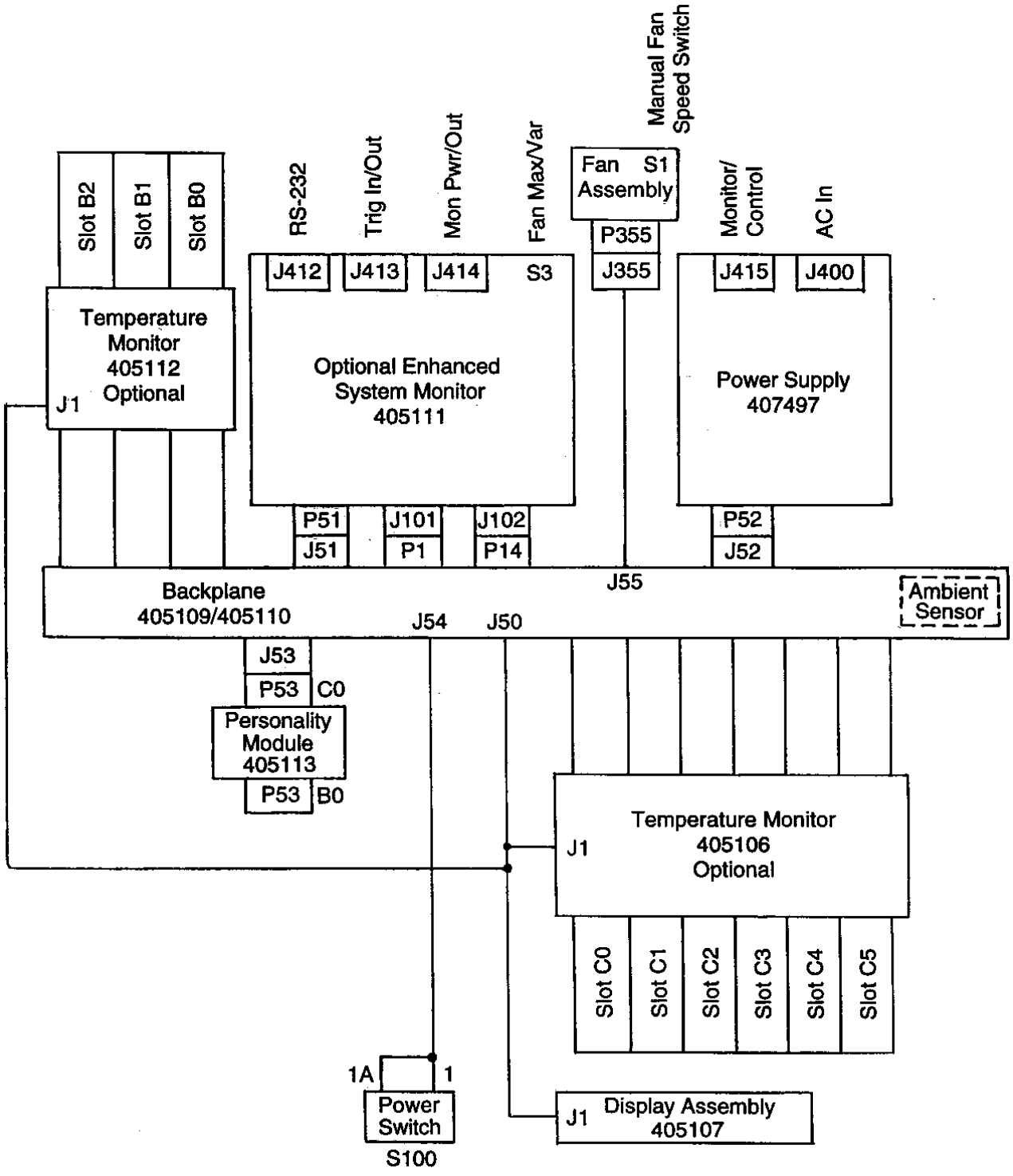


Figure 6-1, Functional Block Diagram for 1269 Mainframe

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Power Supply Protections

The seven VXIbus power supply outputs are protected for:

- Over-voltage
- Over-current and short circuit
- Over-temperature

The AC input of the power supply includes protections for:

- Input current fusing

See **Appendix A** for specification details pertaining to the above protections. If any of the above protections are active, the power supply may shutdown. This means it has, effectively, turned itself off to protect the system. The Power On/Standby switch or the Remote Inhibit input must be cycled to turn the mainframe back on. Refer to **Powering On The Mainframe** and **Using Remote Power On/Standby Switching** in **Chapter 3.**

Backplane

The Backplane serves several functions

- Accommodates up to 6 C-size VXI modules and up to 3 B-size VXI or VME modules. The plug-in Personality module allows either the **C0 slot** or **B0 slot** to function as the mainframe **VXIbus Slot 0** location.
- Rigid mechanical interface which accommodates a lifetime of insertions of VXI modules and the plug-in power supply.
- Supplies DC voltages and currents to modules.
- Connects the VME communications interface across P1 and P2 to all slots CO.
- Connects the VXI extensions across P2 rows a and c to all slots. There is no VXIbus connection between B-Sized and C-Sized slots.
- Connects the monitoring system module, temperature monitor board, display board, Power On/Standby switch, and module cooling fan with the power supply.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Backplane Interconnections

The Power On/Standby switch (S100) connects to the backplane through a polarized locking wire-to-board header at J54.

The optional front panel display module and the temperature monitor board connect to the backplane through a 24-pin ribbon cable IDC header at J50.

The module cooling fan connect to the backplane through a polarized locking wire-to-board header at J56.

The power supply mates with the backplane through board-to-board connector J52.

The monitoring system module mates with the backplane through a board-to-board connector at J51.

Cooling System

The module cooling fan is located at the bottom rear of the mainframe (bench top configuration). The speed of the fan is controlled to maintain a temperature rise of # 10EC across any module slot in the mainframe. In high ambient temperature conditions of $ 40EC, the fan shall run full speed.

Rack Mount Cooling System

Module cooling air enters at the rear of a 1269 rack mounted mainframe and is filtered as it is drawn through the fan chamber.

The incoming air is forced into a pressurized plenum on the P2 side of the VXI modules. The high pressure in the plenum forces the air through a metered plate into the P2 connector side of the VXI modules. The air passing over components in the modules absorbs heat and exits at the P1 side of the modules.

The rack mounted 1269 mainframe exhausts module cooling air at the left side of the mainframe (front view).

Bench Top Cooling System

Filtered air enters at the bottom rear of a 1269 bench top mainframe through the fan chamber.

The incoming air is forced downward into a pressurized plenum below the VXI/VME modules. The high pressure in the plenum forces the air up through a metered plate into the VXI/VME modules. The air passing over components in the

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

modules absorbs heat and exits at the top of the module.

Cooling air is exhausted through the top of the mainframe in the 1269 mainframe.

Cooling The Power Supply

The power supply assembly contains a speed controller fan for its own internal cooling. Filtered air enters through the rear of the mainframe and exits at top (bench) or side (rack) after passing through the power supply.

Manual Fan Speed Switch (Non EMS Units Only)

On 1269 mainframes not equipped with EMS option the user may manually select between full or reduced fan speed by adjusting the position of the manual fan speed switch. Refer to **Figure 2-13.**

Enhanced System Monitor (EMS)

The Enhanced Monitoring System adds a fully VXIbus 1.4 compliant message-based interface, alpha numeric display, individual VXIbus voltage and slot temperature reading, TTL trigger in/outputs with programmable delay, and monitoring of key VXI backplane signals (AS*, ACFAIL*, SYSRESET*).

Refer to **Figure 6-2 Enhanced Monitoring System (EMS) Module Block Diagram** and the description below.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

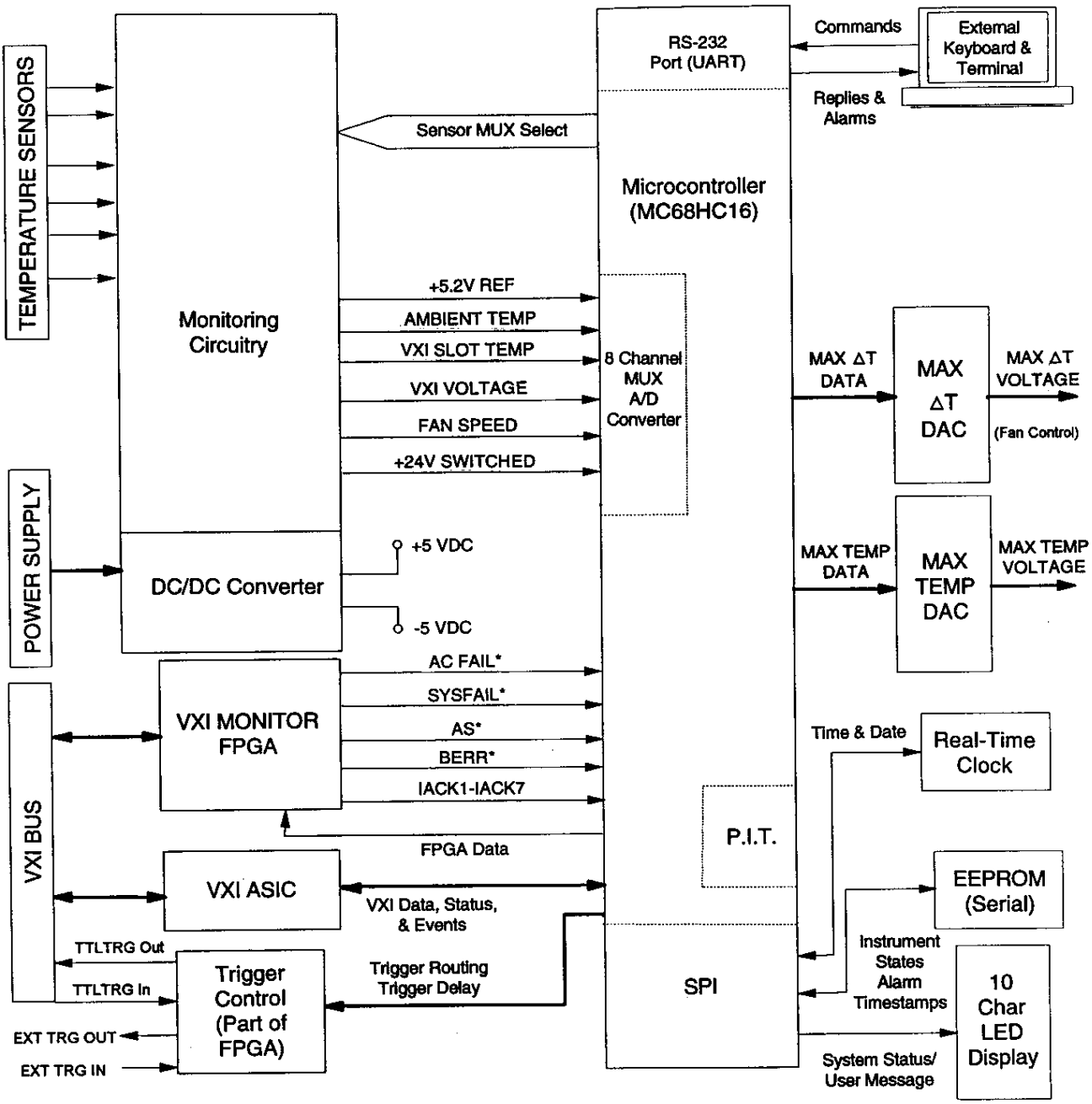


Figure 6-2, Enhanced Monitoring System (EMS) Module Block

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

EMS Module System Interconnection

The Enhanced Monitoring System module plugs directly into the slot 0 location on the rear of the 1269 backplane.

EMS Module General Capabilities

The **EMS** module general capabilities are listed below. Refer to **Section 4 Using the Enhanced Monitoring System** for complete information.

- Monitoring of the 7 voltages produced by the VXI power supply.
- Monitoring of the ambient temperature and the temperature within the each of the thirteen VXI slots
- Monitoring the speed of the module cooling fan
- Monitoring the VXI Address Strobe (AS*), Bus Error (BERR*), ACFAIL*, SYSFAIL*, and Interrupt Acknowledge (IACK) signals.
- Monitoring the elapsed time since power was turned on (power-on time, both cumulative since shipment and the present total since last power cycle)
- Recording when the last time the VXI Mainframe Filter was serviced, and notifying the user when the service period has elapsed and service is suggested
- Recording when the last time the VXI Mainframe filter was serviced, and notifying the user that filter service is due again.
- Routing a "External Trigger In" signal to one of the TTLTRG<n> lines on the VXI backplane. A programmable delay may be added to the trigger input before the TTLTRG<n> trigger output signal is asserted.
- Routing one of the TTLTRG<n> lines from the VXI backplane to an "External Trigger Out" connector. A programmable delay may be added to the trigger before it is output to the "External Trigger Out" connector.
- Calculates the maximum VXI slot temperature

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

rise relative to the ambient temperature, and outputs a voltage proportional to the maximum temperature rise at the rear panel monitor connector J414.

- Calculates the maximum VXI slot temperature and outputs a voltage proportional to the maximum slot temperature at the rear panel monitor connector J414.
- Provides an RS-232 interface(J412) over which commands may be received and replies sent by the EMS.

User Limits On EMS Monitored Parameters

Many of the monitored functions provide the capability for the user to program upper and/or lower limit values. When a limit is exceeded, the EMS will generate a VXI interrupt (if enabled to do so) which notifies the user of an alarm condition. Refer to **Chapter 4 Using the Enhanced Monitoring System** for complete information.

Timestamps on EMS Monitored Events

For many of the monitored functions, a timestamp is saved by the EMS software. This time stamp indicates the time of the most recent occurrence of an alarm condition for that monitored function. The timestamp may be queried by the user via SCPI commands. The timestamp includes both time and date information for the alarm. Refer to **Chapter 4 Using the Enhanced Monitoring System** for complete information.

EMS Rear Panel Fan Speed Monitor

A TTL pulse train at the speed (RPM) of the cooling fan is output to the EMS rear panel Monitor Connector J414. The fan outputs two pulses per revolution.

EMS Fan Speed Control

The speed of the module cooling fan is controlled by either the slot with the highest absolute temperature or the highest temperature rise.

If the absolute temperature of any slot exceeds +40EC, the module fans operate at full speed. If the temperature rise of any module slot exceeds 10EC, the module fans operate at full speed.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

EMS Fan Speed Selection

Switch S3, mounted on the EMS module rear panel, allows the user to select between **maximum** fan speed or **variable** fan speed.

When in **variable** mode the fan speed range (HI or LO) is determined by a jumper position at J14. When the jumper is positioned between J14 pins 2 and 3 the HI range is selected. When the jumper is positioned between J14 pins 1 and 2 the LO range is selected.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page was left intentionally blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 7
MAINTENANCE

What's In This Chapter

This chapter provides procedures for inspecting and cleaning the 1269, removing and replacing mainframe components, and isolating problems to the module level. Refer to **Chapter 6 Understanding The 1269** for theory of operation information.

Service Strategy

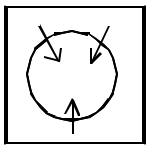
The service procedures in this manual provide removal and replacement procedures to repair the 1269 to the module level. Module level repairs are accomplished by exchanging faulty modules with known good modules or parts. No component-level repair is provided in this manual.

Service Interval

Clean the power supply filter and mainframe module fan filter at a maximum interval of six months. Depending upon the amount of usage and ambient dust levels in the operating environment, the filters may require more frequent cleaning. Clean dust from the mainframe exterior (and interior) as needed, based on the operating environment. Periodic cleaning reduces instrument breakdown and increases reliability.

Preparation

The information in this section is designed for use by qualified service personnel. Read the **For Your Safety** at the front of this manual and **Service Strategy** before attempting any procedures in this chapter. Refer to **Chapter 3 Operating The 1269** for information on the location of controls, indicators, and connectors used with the mainframe.



CAUTION

Many components within the mainframe are susceptible to static discharge damage. Service the mainframe only in a static-free environment. Observe standard handling precautions for static-sensitive devices while servicing the mainframe. Always wear a grounded wrist strap, or equivalent, while servicing the mainframe.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Inspection and Cleaning

The mainframe is inspected mechanically and electrically before shipment. It should be free of marks or scratches and should meet or exceed all electrical specifications. To confirm this, inspect the mainframe for physical damage incurred during transit. Retain the mainframe packaging if reshipment is necessary.

Cleaning procedures consist of exterior and interior cleaning of the mainframe and cleaning fan filters. Refer to your module user documentation for information on cleaning the individual VXIbus modules.

CAUTION

Always power off the mainframe and disconnect the power cord before cleaning or servicing the mainframe.

Interior Cleaning

Use a dry, low-velocity stream of air to clean the interior of the mainframe. Use a soft-bristle brush for cleaning around components. If you must use a liquid for minor interior cleaning, use a 75% isopropyl alcohol solution and rinse with deionized water.

Exterior Cleaning

Clean the exterior surfaces of the mainframe with a dry lint-free cloth or a soft-bristle brush. If any dirt remains, wipe with a cloth moistened in a mild soap solution. Remove any soap residue by wiping with a cloth moistened with clear water. Do not use abrasive compounds on any part of the mainframe.

CAUTION

Avoid getting moisture inside the mainframe during exterior cleaning - use just enough moisture to dampen the cloth.

Do not wash the front or rear panel connectors or switches. Cover these components while cleaning the mainframe.

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

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Cleaning The Fan Filters

The module cooling filter or supply filter is easily removed from the rear of the mainframe as shown in **Figure 7-1.**

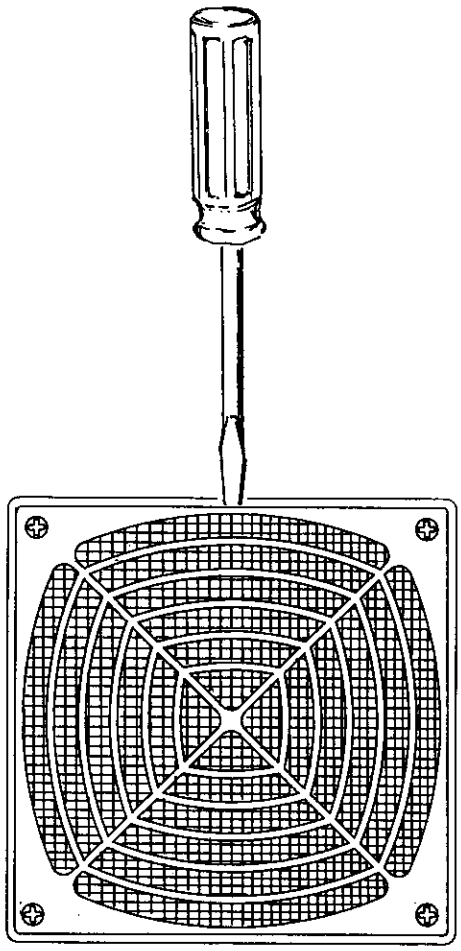


Figure 7-1, Cleaning The Fan Filters

1. Pry off the plastic grill retaining the supply fan filter. Use a flat blade screwdriver if necessary.

2. Remove the supply fan filter towards the rear.

3. Clean the supply fan filter by washing in mild soap solution, vacuuming or blowing air through the filter. Rinse the filter with water and dry before replacing it in the mainframe.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Modular Component Removal and Replacement

The following procedures describe how to remove and replace module-level components of the 1269 Mainframe. Perform these procedures only as necessary as part of installation (e.g. fuse replacement), mainframe service, or repair. Refer to the **Assembly Drawings** in this chapter for an overview of the assembly and disassembly of the mainframe. See **Troubleshooting** for assistance in fault isolation.

CAUTION

Always power off the mainframe and disconnect the power cord before cleaning or servicing the mainframe.

Tools Required

The only tools required to disassemble the 1269 chassis to the module level are a medium flat blade and Phillips screwdriver.

Removal and Replacement of The Module Cooling Fan

The plug-in module fan assembly may be removed and replaced as described in the following steps. Refer to **Figure 7-2.**

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

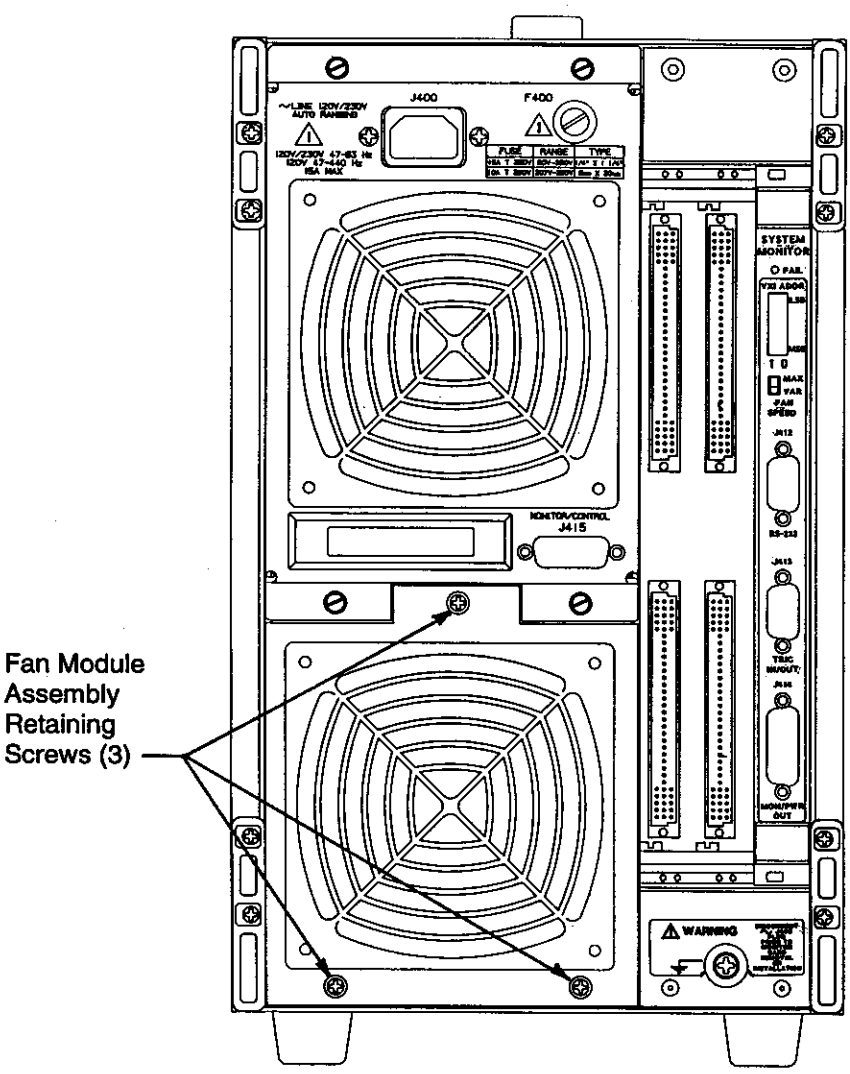


Figure 7-2, Fan Module Assembly Detail

1. Loosen the three retaining Phillips screws located on the fan filter frame. Lift it towards the rear being careful not to damage the fan wiring.

2. Disconnect the in-line connector by grasping each mating half and gently pulling apart.

3. To reinstall the module fan assembly, reverse steps 1 and 2, above.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Removal and Replacement of The Power Supply Assembly

To remove and install the power supply assembly from the mainframe. Refer to **Figure 7-3** and perform the steps below.

1. Unplug the AC power cord from the rear panel of the 1269.

2. Loosen the four captive thumbscrews which secure the power supply to the mainframe. See **Figure 7-3** for locations of these four thumbscrews. Ensure that the threads of the four thumbscrews are disengaged from the captive pem nut on the mainframe.

3. Push the base of the recessed handle to rotate and expose the mainframe handle.

4. Firmly grasp the handle and pull evenly using a slight side to side rocking motion. If the power supply is difficult to remove, recheck to make sure all the thumbscrews are disengaged.

5. To reinstall a power supply into the mainframe, first align the power supply with the cavity at the rear of the mainframe. Note that the silkscreen on the supply rear panel will read correctly when the supply is in the proper orientation. Use the alignment of the threads on the upper fasteners as a visual guide.

6. Gently guide the power supply forward until engagement of the blind-mate connector is felt.

7. Exert pressure by using the palm of hand to assist final engagement.

8. When fully seated tighten the four thumbscrews. Do not over-tighten.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

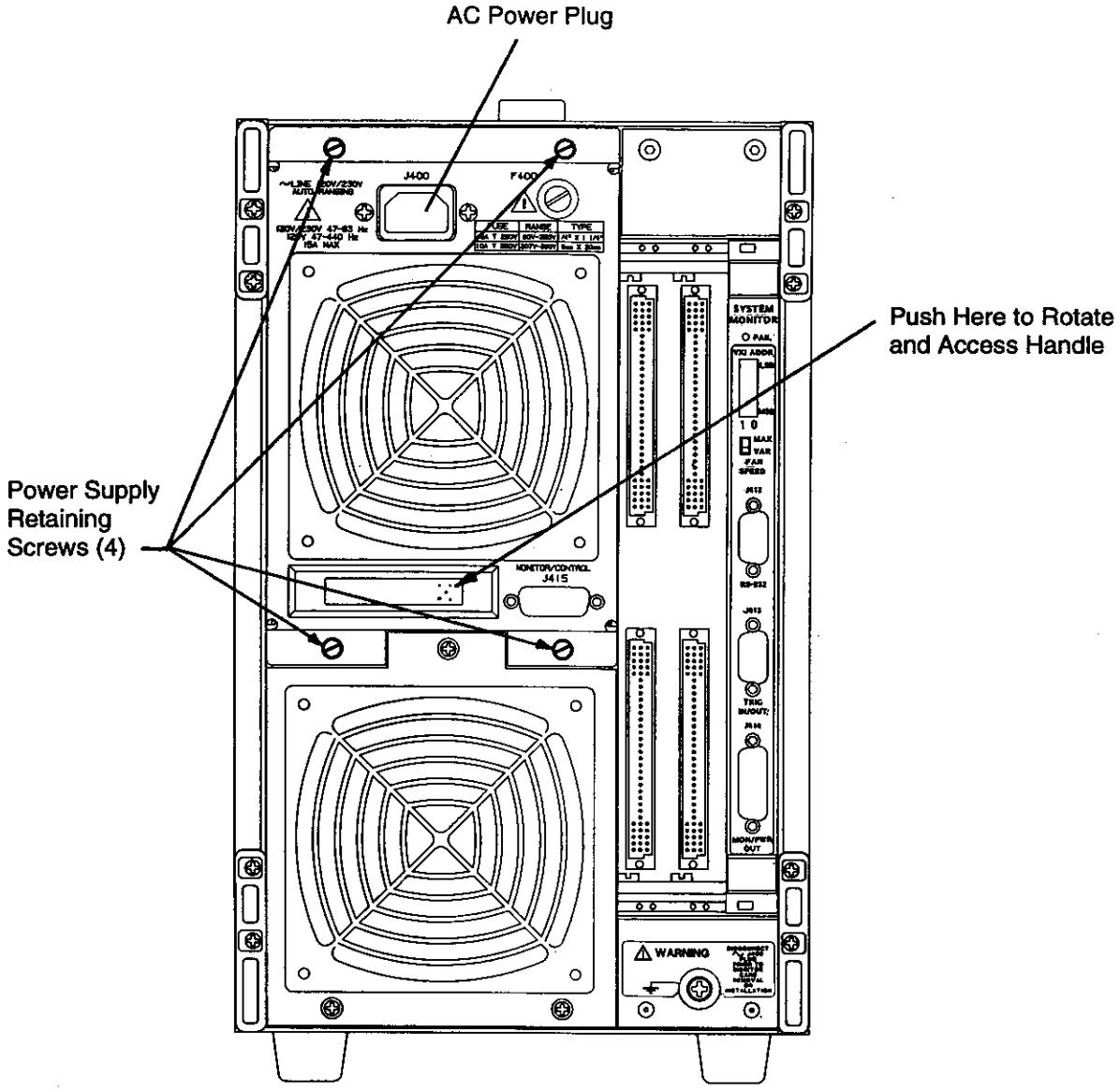


Figure 7-3, Removing The Power Supply

Removal and Replacement of The Enhanced Monitoring System

This procedure applies to the Enhanced Monitoring System (EMS) module. Refer to **Figure 7-4** while following the steps below.

WARNING

Ensure that J400 AC Input is disconnected before removing or replacing the (EMS) module. Possible damage to the module could result.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

1. Loosen the two captive screws which secure the (EMS) to the mainframe.

2. Grasp the module by the top and bottom handles.

3. Carefully pull to the rear to remove the system monitor module.

4. To reinstall the (EMS) module, align in the card guides at rear of the mainframe.

5. Gently insert the module into the mainframe ensuring proper engagement in the card guides.

6. Firmly push the module forward to seat into the backplane connectors.

7. Tighten the two captive screws securing the module.

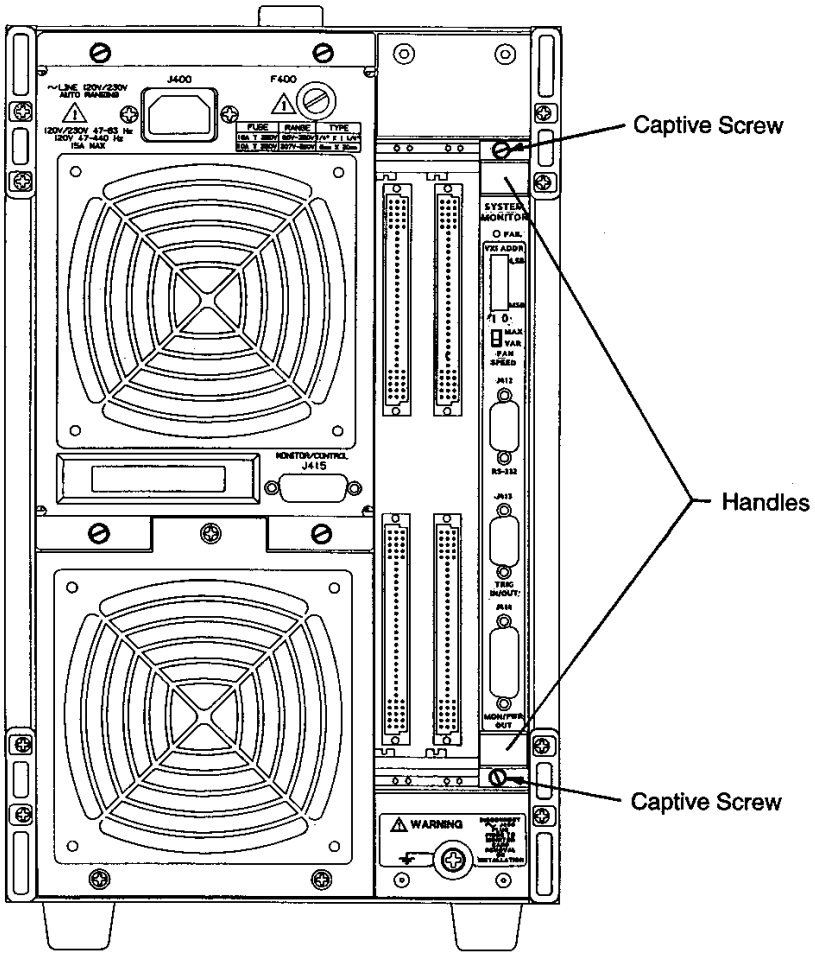


Figure 7-4, (EMS) Module Removal and Replacement

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Removal and Replacement of The AC Mains Fuse

Complete the steps below while referring to **Figure 7-5**

WARNING

To avoid electrical shock, the AC mains power input must be disconnected before replacement of the fuse.

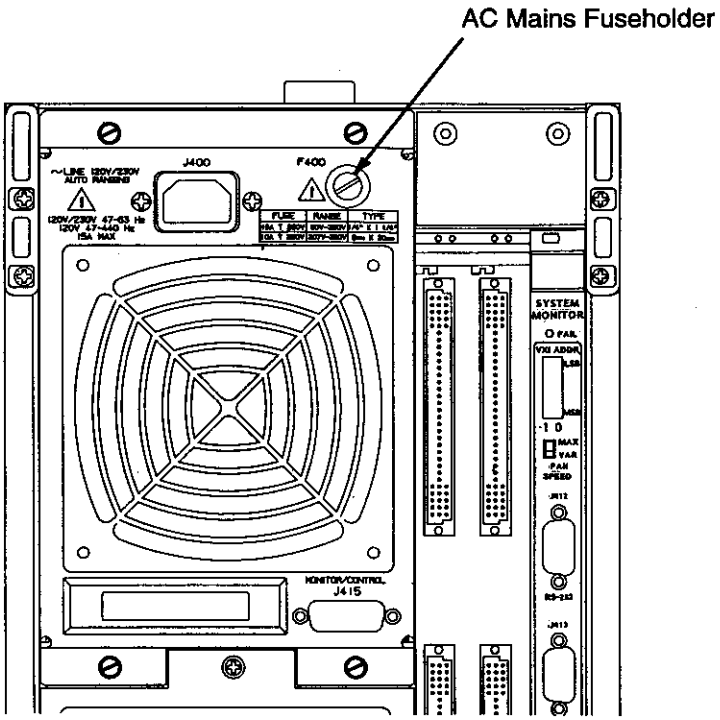


Figure 7-5, Removing and Replacing The AC Mains Fuse

1. Ensure AC mains input (J400) is disconnected.
2. Insert flat blade screwdriver into fuse carrier slot at F400 in power supply rear panel and rotate counter clockwise to remove.
3. To replace fuse, insert the fuse carrier and fuse assembly into fuse housing opening for F400 on power supply.
4. Insert flat blade screwdriver into fuse carrier and rotate clockwise to lock fuse assembly in place.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Removing and Replacing The Card Guides

Complete the steps below while referring to **Figure 7-6** to remove and replace the card guides. The procedure applies to top and bottom card guides.

1. Insert a flat blade screwdriver into the slot in front of the retaining hook.

2. Gently pry the tab of the retaining hook to the rear, and lift the card guide, releasing it at the front.

3. Gently pull the card guide forward releasing it from the center and rear retaining hooks. Bowing the card guide is required to clear the front rail.

4. To replace, align the card guide with the mainframe front ensuring that the “V” groove is at the front.

5. Gently push down and to the rear to engage the hooks at the rear and middle of the card guide. Bowing the card guide is required to clear the front rail.

6. Allow the front retaining hook to rest on the front rail.

7. Insert a flat blade screwdriver into the slot in front of the retaining hook.

8. Gently pry the tab of the retaining hook to the rear, and press down the front of the card guide to snap into position.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

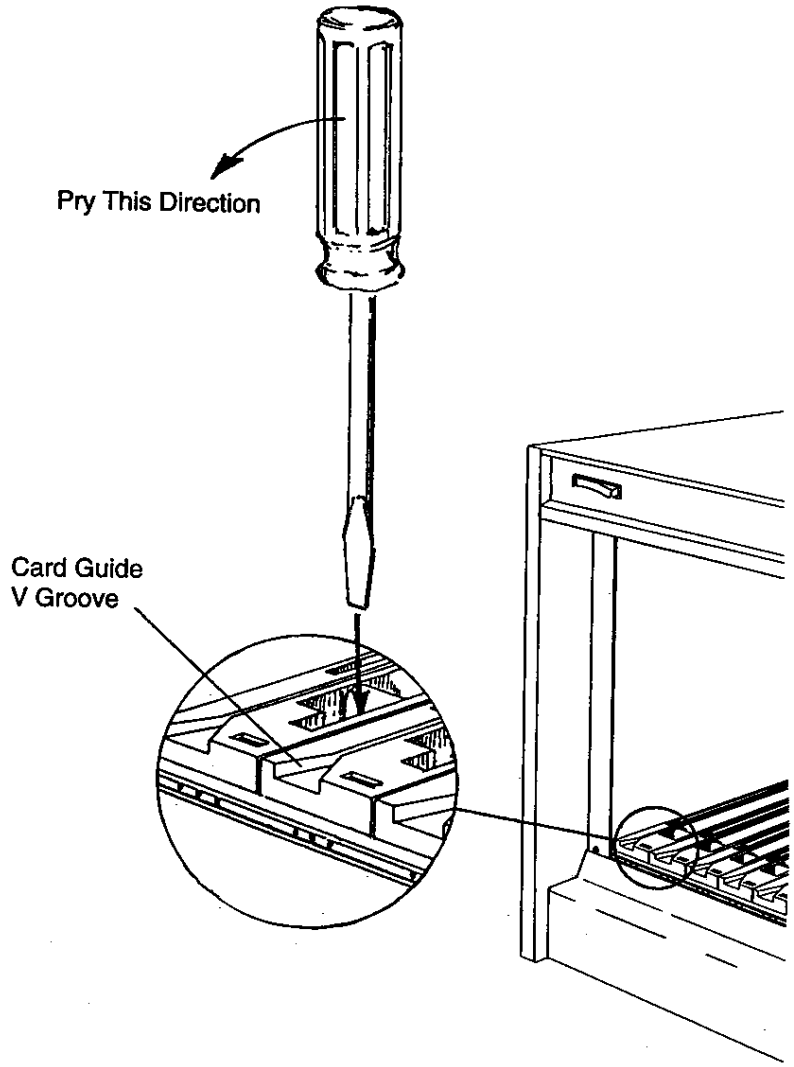


Figure 7-6, Card Guide Removal and Replacement

Troubleshooting The 1269

To troubleshoot the 1269 VXIbus mainframe to its component module level use **Table 7-1** and **Understanding the 1269** in **Chapter 6**.

"Alarm conditions" referenced in the **PROBLEM** column of **Table 7-1** occur when the monitored system status function (Voltage, Current, Temperature, or Airflow) is outside of its specified tolerance. For information on status indicators and tolerance limits refer to **Table A-8** EMS equipped mainframes, respectively.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 7-1, Troubleshooting

PROBLEM	POSSIBLE CAUSES	WHAT TO DO
"Power" annunciator does not come on	• 1269 mainframe not connected to power source.	• Make sure that the 1269 is connected to a live electrical outlet. Try operating another piece of equipment from this outlet.
	• Power/On/Standby switch not switched on.	• Set the front Power On/Standby switch to the **ON** position (See **"Powering On The Mainframe"** in **Chapter 3**).
	• Remote inhibit input on rear panel of power supply is active.	• Remove the inhibit by opening the remote switch (or deasserting the remote open collector driver). See **"Using Remote Power On/Standby Switching"** in **Chapter 3.**
	• Blown AC Mains Fuse.	• Unplug AC mains power and check the fuse. See **"Removal and Replacement of the AC Mains Fuse"** in **Chapter 7.**
	• Power supply protections are active causing the supply to be "shutdown".	• Refer to **"Power Supply Protections"** in **Chapter 6.** • Cycle power to clear fault. If fault persists remove installed VXI modules (cycle power) until fault is cleared.
	• Power supply not fully seated.	• Verify that the power supply assembly is fully seated and all four thumbscrews are fastened. See **"Removal and Replacement of the Power Supply"** in **Chapter 7**.
	• Faulty wiring to front panel Power On/Standby Switch	• Verify integrity of wiring to Power On/Standby switch. Contact customer service.

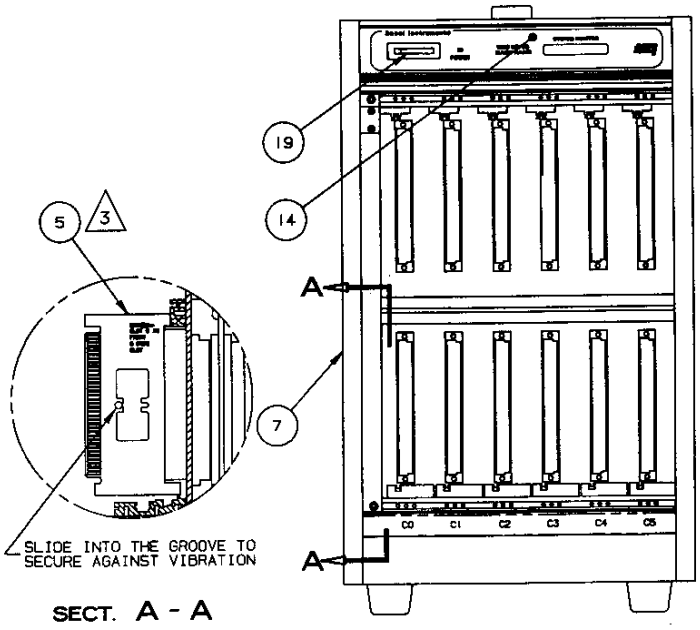
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table 7-1, Continuation Troubleshooting

PROBLEM	POSSIBLE CAUSES	WHAT TO DO
Voltage alarm condition.	• Faulty VXI module installed or voltage fault occurred	• Cycle power. • If fault persists remove installed VXI modules until fault indication is cleared.
	• VXI supply is out of tolerance	• Perform **Basic Functional Check** procedure from **Chapter 3.** • For EMS equipped mainframe check VXI supply voltage levels and that alarm limits are valid. (See **Chapter 4**)
Temperature alarm condition	• Module temperature rise or max ambient limit exceeded or Insufficient module cooling air	• Check **)T** and T_{max} outputs at rear panel (EMS option). • Check for restrictions to airflow at mainframe intake and exhaust. • Check fan **TACH** outputs at rear panel (EMS option). • Query EMS to check ambient temperature, slot temperature rise, and fan speed to verify values and limits. Refer to **Chapter 4.** • Clean mainframe module cooling fan filter.
Airflow alarm condition	• Fan speed tolerance limit exceeded	• Check fan **TACH** output at rear panel • Query EMS to check fan speed value and to verify limits. Refer to **Chapter 4.** • Check for restrictions to airflow at mainframe intake and exhaust. • Clean mainframe module cooling fan filter.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Assembly Drawings



NOTES:

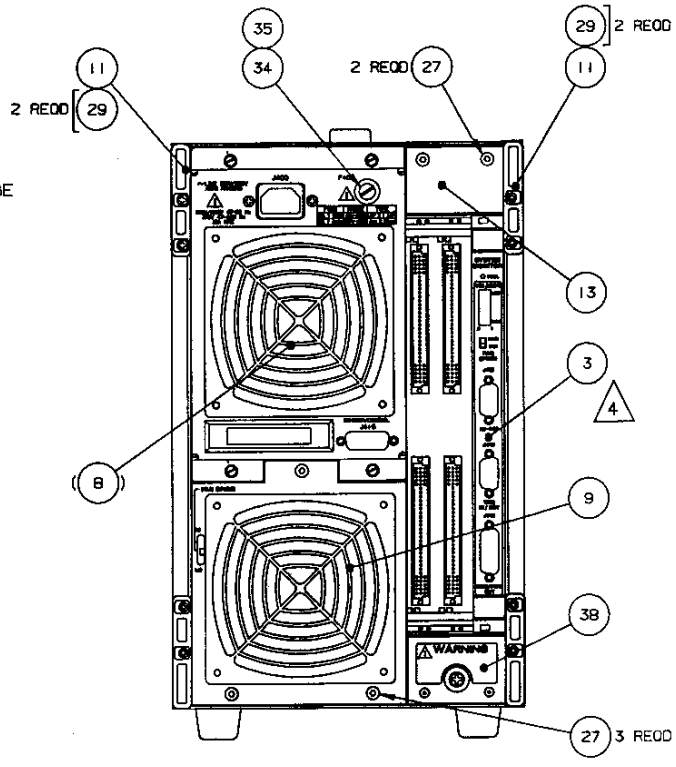
1) ASSEMBLY AND MANUFACTURING PRACTICES :
   A. FOR WIRE AND CABLE ROUTING, ANY CHOSEN PATH WHICH IS NON-INJURIOUS TO THE CONDUCTORS, CONNECTORS OR ADJACENT ASSEMBLIES IS ACCEPTABLE.
   B. CABLE CLAMP, TIE WRAP AND DOUBLE SIDED TAPE TO BE POSITIONED TO OPTIMIZE AND FACILITATE WIRE AND CABLE RETENTION AND ROUTING.
   C. EXPOSED WIRE AND CABLE CONNECTIONS TO BE PROPERLY SEALED USING APPROPRIATELY SIZED SHRINK TUBING.
   D. ACTUAL WIRE LENGTH TO BE DETERMINED, CUT AND TERMINATED AT FINAL INSTALLATION.

2 SPLIT AND TERMINATE RIBBON CABLE ITEM (16) FROM P50 TO P1, P2 AND P3 AS FOLLOWS:
   - P50-1 THRU 10 TO P1-1 THRU 10
   - P50-11 THRU 24 TO P2-1 THRU 14
   - P50-11 THRU 24 TO P3-1 THRU 14
   CABLE TO BE INSTALLED ON 407502-XXXX2 ONLY.

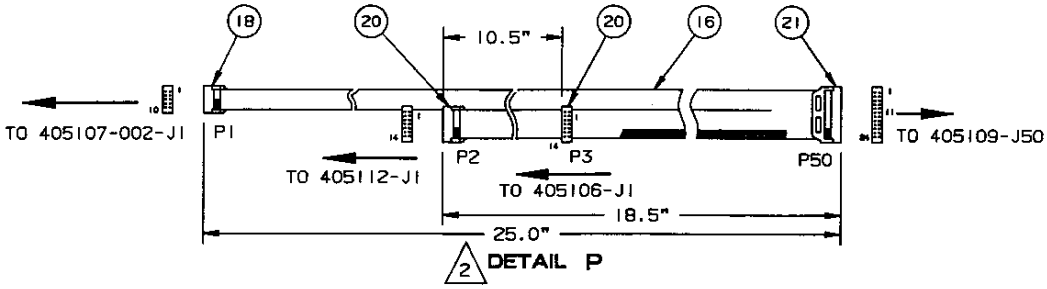
3 INSTALL ITEM (5) IN ORIENTATION "SLOT 0 IN FRONT C SIZE SLOT" AS SHOWN .

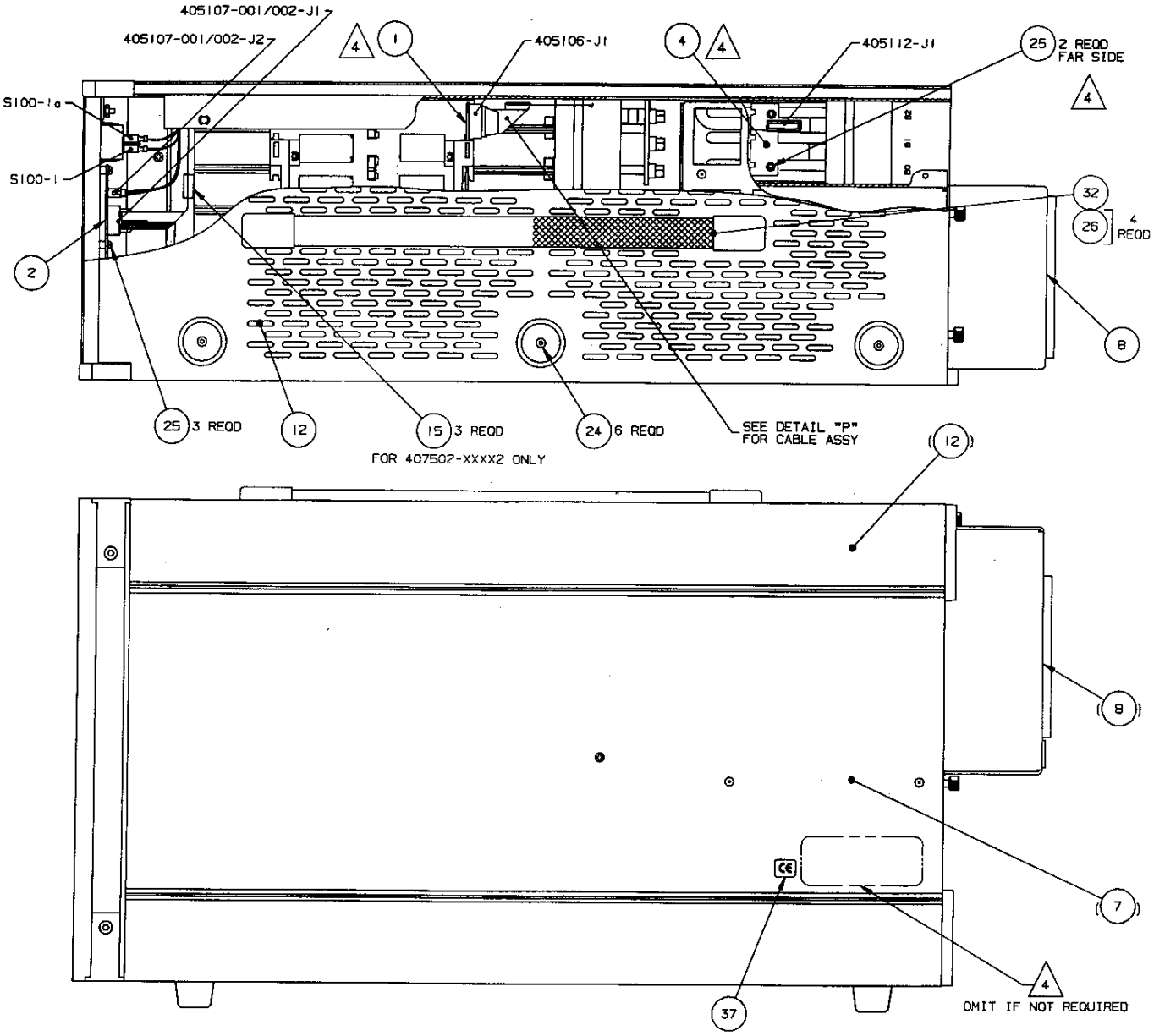
4 PRINT BAR CODE IDENTIFICATION LABEL WITH PERTINENT DATA USING BRADYCODE BAR CODE SOFTWARE P/N 800522 AND AFFIX APPROX. WHERE SHOWN.

5) BAG & TAG ITEM (10) , (23) AND (33) .



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com





Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Parts Lists

407502-11102 - FINAL ASSY, 1269 CHASSIS W/EMS

REF DESIG	RACAL INST P/N	DESCRIPTION	FSC	MANUFACTURER'S P/N
P1	602147	CONNECTOR, FLAT CABLE, IDC, 10 PIN	53387	3473-6610
P2	602240	CONNECTOR, FLAT CABLE, IDC, 14 PIN	53387	3385-6614
P3	602240	CONNECTOR, FLAT CABLE, IDC, 14 PIN	53387	3385-6614
P50	602241	CONNECTOR, FLAT CABLE, IDC, 24 PIN	53387	3626-6624
S100	602235	SWITCH, ROCKER, SNAP-IN	21793	602235
{1}1	405106	PCB ASSY, TEMP. MONITOR, 6-SLOT	21793	405106
{2}1	405107-002	PCB ASSY, DISPLAY W/EMS	21793	405107-002
{3}1	405111	PCB ASSY, EMS	21793	405111
{4}1	405112	PCB ASSY, TEMP. MONITOR	21793	405112
{5}1	405113	PCB, BACKPLANE PERSONALITY	21793	405113
{7}1	407425-001	ENCLOSURE ASSY, 6-SLOT CHASSIS	21793	407425-001
{8}1	407497	POWER SUPPLY ASSY, 750W	21793	407497
{9}1	407529	FAN ASSY W/EMS	21793	407529
{10}2	456271	COVER, CARD GUIDE	21793	456271
{11}2	456533	FOOT, REAR	21793	456533
{12}1	456486	COVER, TOP, 6-SLOT CHASSIS	21793	456486
{13}1	456503	COVER, REAR UPPER, 6-SLOT CHASSIS	21793	456503
{14}1	456531-002	OVERLAY, FRONT PANEL W/EMS	21793	456531-002
{15}3	611417	CLAMP, FLAT RIBBON CABLE	06915	CFCC-3-RT
{16}A/R	500318	CABLE, FLAT, RIBBON, 24 COND, 28 GA	53387	3355-24
{23}1	602262	CORD, POWER, 15A	MEGAE	17005-14M
{24}6	615800-803	SCREW, BUTTON HEAD, CAP, 8.32X.375	3E130	38030-98C-.375
{25}5	616251	SCREW, PPH, SEMS ASSY, 4-40X.250	78189	SEMS W/SQ CONE WA.
{26}4	611434	RIVET, POP, .25X.4	05693	CCP-44
{27}2	615800-604	SCREW,BUTTON HEAD,CAP,6-32X.375	6W060	38030-96CXX
{29}4	618112	SCREW, PPH, 6-20 X .500, TAPPING, TYPE B	-	-
{31}A/R	920962	LOCTITE, 242, MED STR.	05972	272
{32}1	921466	HANDLE, CARRYING, 14.12 INCH	51506	300007-MOD
{33}1	980790	MANUAL, 1269 USER	21793	980790
{37}1	921423	LABEL, CE-96	21793	921423
{38}1	921486	LABEL, WARNING	21793	921486

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

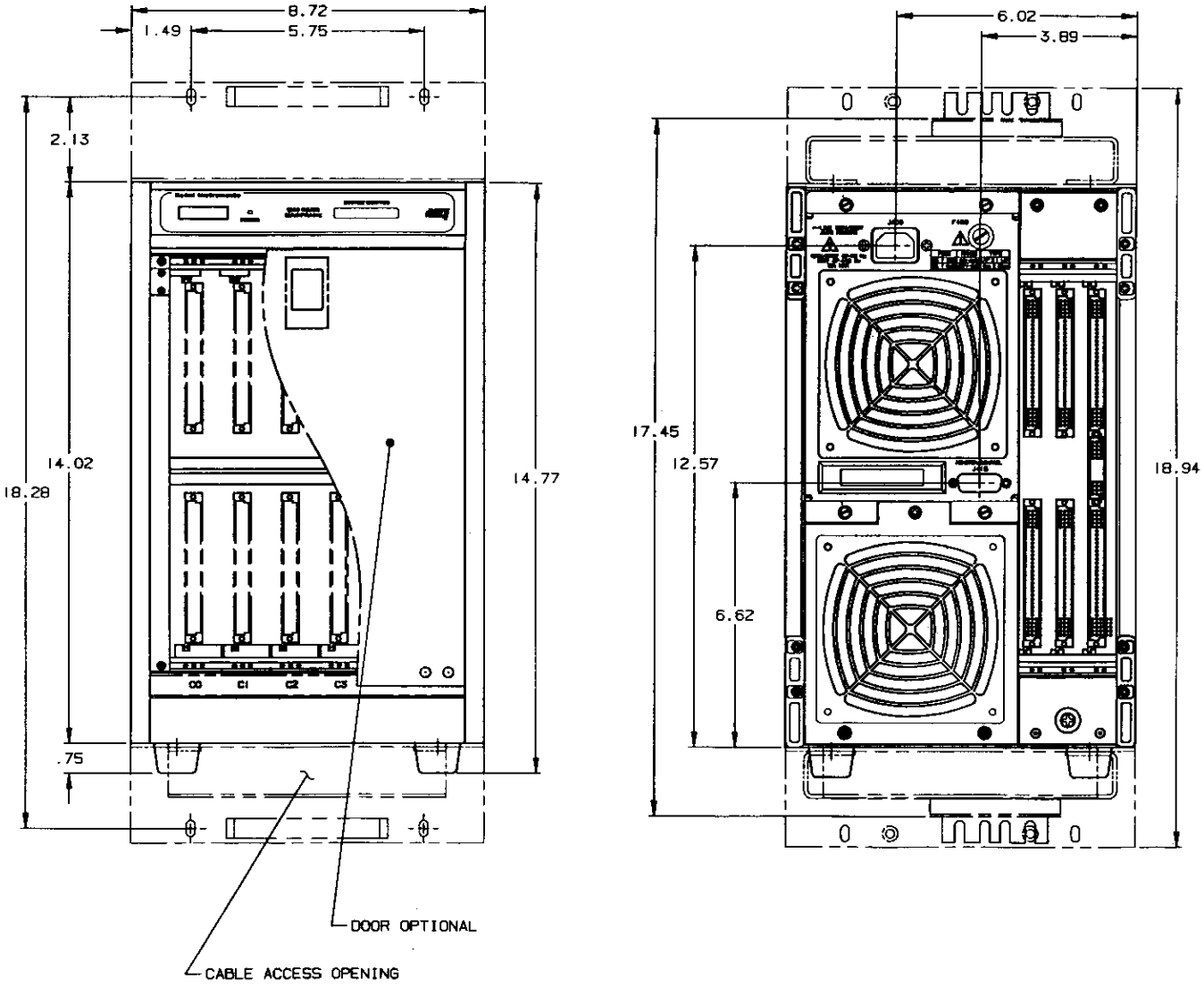
407502-11101 - FINAL ASSY, 1269 CHASSIS

REF DESIG	RACAL INST P/N	DESCRIPTION	FSC	MANUFACTURER'S P/N
S100	602235	SWITCH, ROCKER, SNAP-IN	21793	602235
{2}1	405107-001	PCB ASSY, DISPLAY	21793	405107-001
{5}1	415113	PCB, PERSONALITY MODULE	21793	415113
{7}1	407425-001	ENCLOSURE ASSY, 6-SLOT CHASSIS	21793	407425-001
{8}1	407497	POWER SUPPLY ASSY, 750W	21793	407497
{9}1	407530	FAN ASSY, 2 SPEED	21793	407530
{10}2	456271	COVER, CARD GUIDE	21793	456271
{11}2	456533	FOOT, REAR	21793	456533
{12}1	456486	COVER, TOP, 6-SLOT CHASSIS	21793	456486
{13}1	456503	COVER, REAR UPPER, 6-SLOT CHASSIS	21793	456503
{14}1	456531-001	OVERLAY, FRONT PANEL	21793	456531-001
{23}1	602262	CORD, POWER, 15A	MEGAE	17005-14M
{24}6	615800-803	SCREW, BUTTON HEAD, CAP, 8.32X.375	3E130	38030-98C-.375
{25}3	616251	SCREW, PPH, SEMS ASSY, 4-40X.250	78189	SEMS W/SQ CONE WA.
{26}4	611434	RIVET, POP, .25X.4	05693	CCP-44
{27}5	615800-604	SCREW,BUTTON HEAD,CAP,6-32X.375	6W060	38030-96CXX
{29}4	618112	SCREW, PPH, 6-20 X .500, TAPPING, TYPE B	-	-
{31}A/R	920962	LOCTITE, 242, MED STR.	05972	272
{32}1	921466	HANDLE, CARRYING, 14.12 INCH	51506	300007-MOD
{33}1	980790	MANUAL, 1269 USER	21793	980790
{37}1	921423	LABEL, CE-96	21793	921423
{38}1	921486	LABEL, WARNING	21793	921486

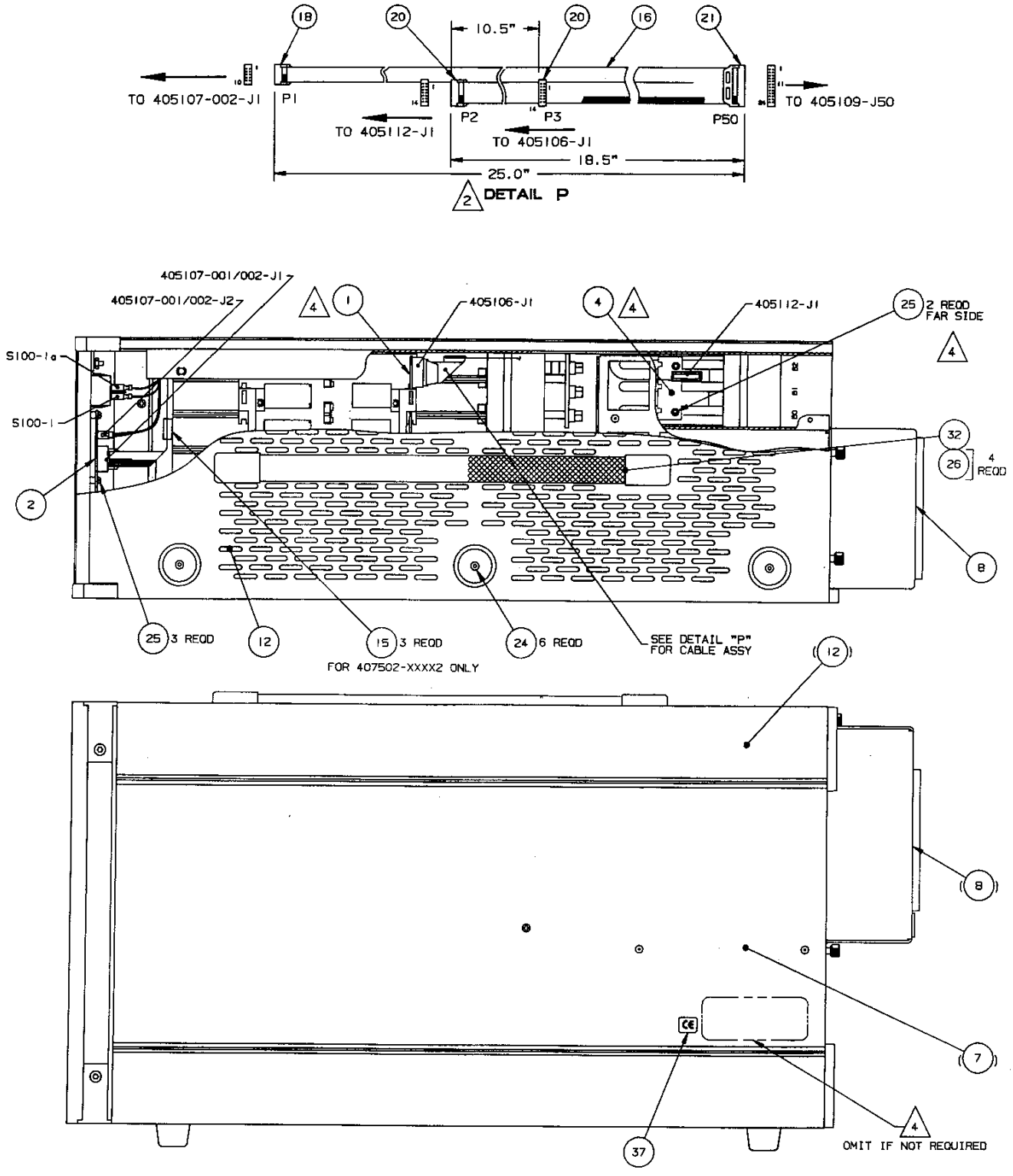
FSC	SUPPLIER
05397	UNION CARBIDE CORP. (MATERIALS SYSTEMS DIV.) CLEVELAND, OH
05972	LOCTITE CORP. HARTFORD, CT
06915	RICHCO PLASTIC CO. CHICAGO, IL
21793	RACAL INSTRUMENTS INC. IRVINE, CA
51506	ACCURATE SCREW MACHINE NUTLEY, NJ
53387	THREE M (3M) CO. ST. PAUL, MN
6W060	UNBRAKO LTD. LEICESTER, ENGLAND
78189	ILLINOIS TOOL WORKS, INC. (SHAKEPROOF DIV.) ELGIN, IL
80539	SPS TECHNOLOGIES INC. SANTA ANA, CA
MEGAE	MEGA ELECTRONICS NEW BRUNSWICK, NJ

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Dimensional Outline



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

This page was left intentionally blank.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 8
PRODUCT SUPPORT

Product Support

Racal Instruments has a complete Service and Parts Department. If you need technical assistance or should it be necessary to return your product for repair or calibration, call 1-800-722-3262. If parts are required to repair the product at your facility, call 1-949-859-8999 and ask for the Parts Department.

When sending your instrument in for repair, complete the form in the back of this manual.

For worldwide support and the office closes to your facility, refer to the Support Offices section on the following page.

Reshipment Instructions

Use the original packing material when returning the 1269 to Racal Instruments for calibration or servicing. The original shipping crate and associated packaging material will provide the necessary protection for safe reshipment.

If the original packing material is unavailable, contact Racal Instruments Customer Service for information.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Support Offices

Racal Instruments, Inc.
4 Goodyear St., Irvine, CA 92618-2002
Tel: (800) RACAL-ATE, (800) 722-2528,
(949) 859-8999; FAX: (949) 859-7139

Racal Instruments, Ltd.
480 Bath Road, Slough, Berkshire, SL1 6BE, United Kingdom
Tel: +44 (0) 1628 604455; FAX: +44 (0) 1628 662017

Racal Systems Electronique S.A.
18 Avenue Dutartre, 78150 LeChesnay, France
Tel: +33 (1) 3923 2222; FAX: +33 (1) 3923 2225

Racal Systems Elettronica s.r.l.
Strada 2-Palazzo C4, 20090 Milanofiori Assago, Milan, Italy
Tel: +39 (0)2 5750 1796; FAX +39 (0)2 5750 1828

Racal Elektronik System GmbH.
Technologiepark Bergisch Gladbach, Friedrich-Ebert-Strasse,
D-51429 Bergisch Gladbach, Germany
Tel.: +49 2204 8442 00; FAX: +49 2204 8442 19

Racal Australia Pty. Ltd.
3 Powells Road, Brookvale, NSW 2100, Australia
Tel: +612 9936 7000, FAX: +612 9936 7036

Racal Electronics Pte. Ltd.
26 Ayer Rajah Crescent, 04-06/07 Ayer Rajah Industrial Estate,
Singapore 0513.
Tel: +65 7792200, FAX: +65 7785400

Racal Instruments, Ltd.
Unit 5, 25F., Mega Trade Center, No 1, Mei Wan Road, Tsuen
Wan, Hong Kong, PRC
Tel: +852 2405 5500, FAX: +852 2416 4335

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Appendix A
SPECIFICATIONS

SPECIFICATIONS

This chapter contains the complete specifications for the 1269 Mainframe.

Table A-1, AC Input Specifications

Characteristic	Description
Input Voltage Range	90 V_{RMS} to 250 V_{RMS}
Input Frequency Range	47 Hz to 440 Hz, 120 V operation 47 Hz to 63 Hz, 230 V operation
Power Consumption	1440 W line power maximum
Fuse Rating 90 V - 250 V Operation 207 V - 250 V Operation	 0.25 in x 1.25 in, Slow Blow, 15 A, 250 V 5 mm x 20 mm, Slow Blow, 10 A, 250 V
Inrush Current	40 A maximum, cold start or after 1 minute cool down
Input current	15 A maximum at 90 V_{RMS} 8 A maximum at 207 V_{RMS}
Power Disconnect	Front Panel Power On/Standby Switch: Rear panel connection allows for remote inhibit operation. Power cord provides main power disconnect. The Power On/Standby switch must be in **Power On** position prior to use of remote inhibit.
Power Factor Correction	Over entire input voltage range, 47 Hz to 63 Hz

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table A-2, DC Output Power

Characteristic	Description
Maximum Power Available To Modules	720 W, 0°C to 45°C, Derate 10W/°C above 45°C
DC Current Capacity (I_{MP})	**Voltage** **I_{MP} (Steady-State Current)** +24V 4 A +12 V 8 A +5 V 54 A -2V 12 A -5.2 V 12 A -12 V 8 A -24 V 4 A +5 V STDBY 0 A (1 A max, user supplied)
DC Voltage Regulation	**Voltage** **Tolerance, [a] V** +24 V +1.2V, -720 mV +12 V +600 mV, -360mV +5V +250 mV, -125 mV -2V -100 mV, +100 mV -5.2 V -260 mV, +156 mV -12 V -600 mV, +360 mV -24 V -1.2 V, +720 mV
Maximum Load Ripple/Noise (per VXIbus 1.4)	**Voltage** **Ripple/Noise** +24 V 150 mV_{pp} +12 V 50 mV_{pp} +5 V 50 mV_{pp} -2 V 50 mV_{pp} -5.2 V 50 mV_{pp} -12 V 50 mV_{pp} -24 V 150 mV_{pp}
Maximum Induced Ripple/Noise	**Voltage** **Ripple/Noise** +24 V 150 mV_{pp} +12 V 50 mV_{pp} +5 V 50 mV_{pp} -2 V 50 mV_{pp} -5.2 V 50 mV_{pp} -12 V 50 mV_{pp} -24 V 150 mV_{pp}

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table A-2, DC Output Power Continued

Characteristic	Description
Dynamic Current I_{dm}	**Voltage** **I_{dm} Dynamic Current** +24 3.5 +12 2.0 +5 3.0 -2 1.6 -5.2 1.4 -12 1.6 -24 3.5
Auxiliary DC Outputs, Fused-Self Healing (EMS Option Only)	**Voltage** **Current** +5 V 1 Amp +12 V 1 Amp +24 V 1 Amp
Protections	Over voltage protection Over temperature protection Over current protection
VXI Supply Rear Panel DC Voltage Monitors (J415 Connector)	**Voltage** **Tolerance, [a] V** +24 V +1.2V, -720 mV +12 V +600 mV, -360mV +5V +250 mV, -125 mV -2V -100 mV, +100 mV -5.2 V -260 mV, +156 mV -12 V -600 mV, +360 mV -24 V -1.2 V, +720 mV

Table A-3, Cooling

Characteristic	Description
Per Slot Cooling Capacity	Typically 80 W per slot @ 0.35 mm H_20. **Figure A-1** shows the worst slot cooling curve of the mainframe.
Cooling System	Forced air circulation (positive pressurization).
Slot Airflow Direction	P2 to P1, bottom of module to the top of module
Mainframe Intake, Bench Top	Bottom rear of mainframe
Mainframe Exhaust, Bench Top	Top of mainframe.
Mainframe Intake, Rack Mount	Rear of mainframe
Mainframe Exhaust, Rack Mount	Side of mainframe
Filter Access (Power Supply and Module Fans)	Filter accessible from rear of the mainframe

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

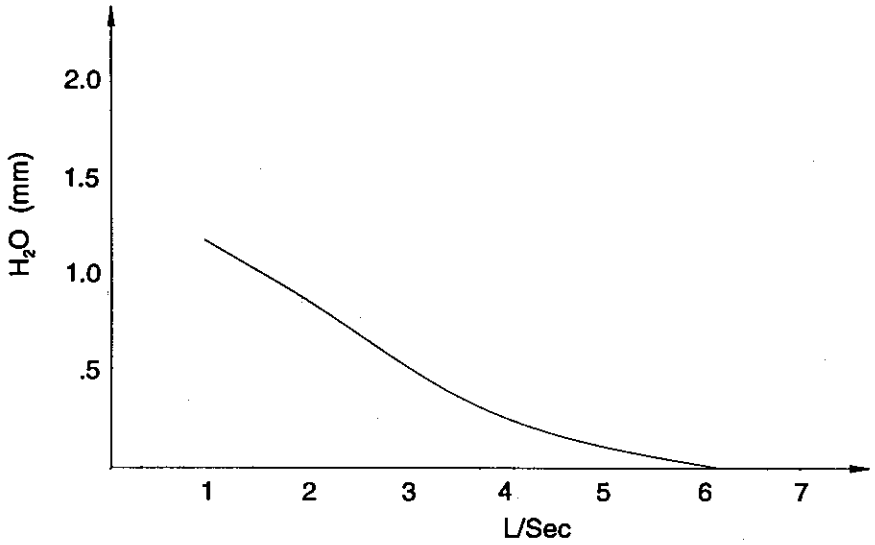


Figure A-1, Mainframe Worst Case Slot Cooling Curve

Table A-4, Safety

Characteristic	Description
Safety Characteristics	EN61010-1
IEC Characteristics	Installation Category II Pollution Degree 2 Safety Class 1

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table A-5, Environmental

Characteristic	Description
Temperature Operating Non-operating	Meets the limits stated in MIL-T-28800E for Type III, Class 5 0°C to 55°C -40°C to 75°C
Relative Humidity Operating Non-operating	 95+/-5% RH non condensing 75+/-5% RH above 30E 45+/-5% RH above 40E 95+/-5% RH at <55E
Altitude Operating Non-operating	 10,000 ft. (4570m) 15,000 ft. (12,190 m)
Vibration	0.013" double amplitude, 5-55Hz
Functional Shock Operating	 Half sine, 30 g, 11 ms duration.
Electromagnetic Compatibility (EMC) Emissions Enclosure AC Mains	Emissions shall be within the limits specified by the following requirements: EN 55011 Class A, FCC Part 15 Class A limits for radiated emissions EN 55011 Class A, FCC Part 15 Class A limits for conducted emissions
Immunity, Enclosure, Radio Frequency Electromagnetic Field	No mainframe failures when the mainframe is subjected to a 3 V/m electromagnetic field over the frequency range of 27 MHZ to 500 MHZ.
Immunity, Enclosure, Electrostatic Discharge (ESD)	Up to 8 kV with no change to control settings or impairment of normal operation.
Immunity, Fast Transients, Common Mode	Port — Peak Voltage — Tr/Th — Rep Frequency Signal&Control — 0.5 kV — 5/50 ns — 5 kHz DC Power — 0.5 kV — 5/50 ns — 5 kHz AC Power — 1.0 kV — 5/50 ns — 5 kHz
MTBF	44,554.76 Hours

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table A-6, Backplane

Characteristic	Description
Bus Grant/Interrupt Acknowledge	Solid state, auto-configuring (jumper less)
VXIbus CLK10 Distribution	Full differential

Table A-7, Mechanical

Characteristic	Description
Overall Dimensions	
Standard Mainframe (7U)	
Height	14.02 in (35.6 cm)
Width	8.72 in (22.2 cm)
Depth	28.32 in (71.9 cm)
Weight	35 lbs (15.9 kg) with no modules installed

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

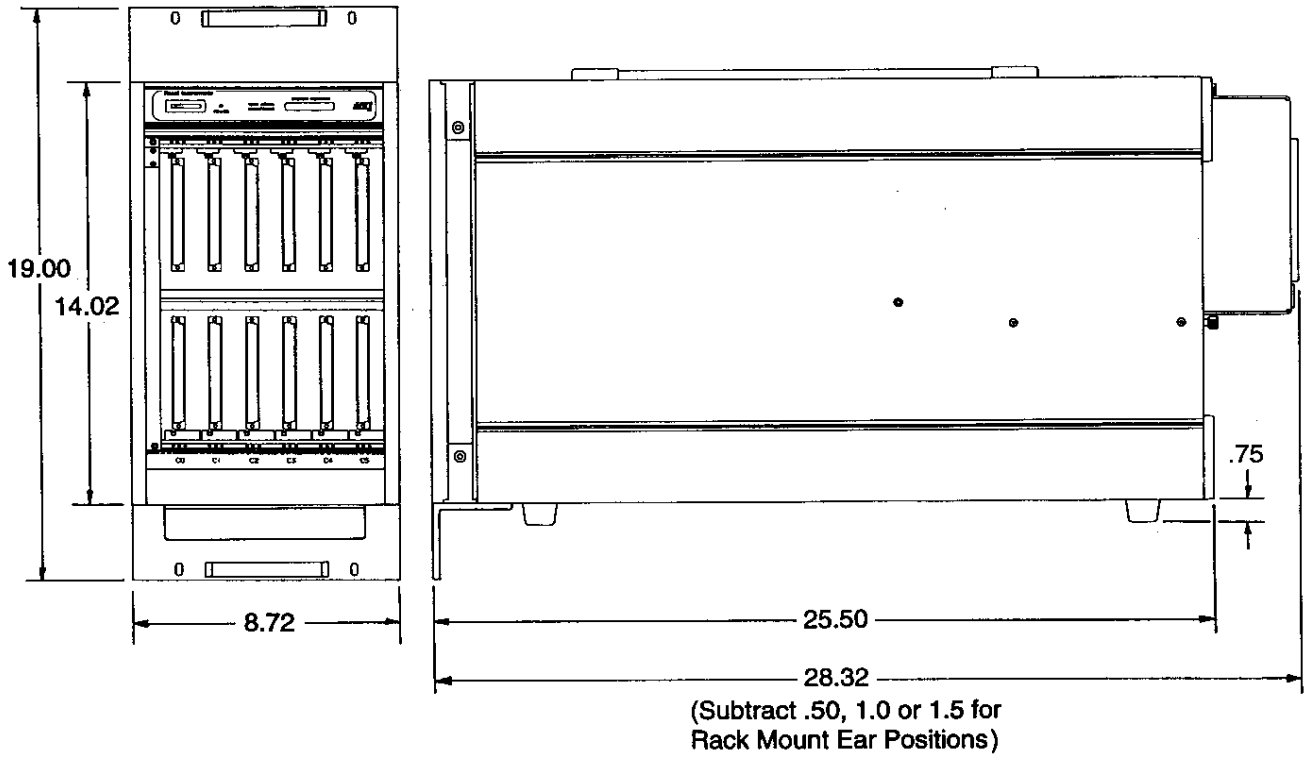


Figure A-2, Front View and Side View of 1269 With Rack Mount Option

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table A-8, EMS Monitoring System Specifications, (Typical)

Characteristics	Description
Auxiliary Rear Panel DC Voltage Outputs	**Voltage** **Current** +5 V 1 Amp maximum, (Self Healing Fuse) +12 V 1 Amp maximum, (Self Healing Fuse) +24 V 1 Amp maximum, (Self Healing Fuse)
Maximum slot temperature (**Tmax**) Rear Panel Output Voltage	100 mV per ^{o}C, 0^{o}C corresponds to 0 V output ± 1.5 ^{o}C accuracy, -5 to + 85^{o}C range
Maximum slot Temperature Rise (**) T)** Rear Panel Output Voltage	100 mV per ^{o}C, 0^{o}C corresponds to 0 V output ± 1.5 ^{o}C accuracy, -5 to + 85^{o}C range
Fan Speed **TACH** Rear Panel Output	2 Pulses/Rev, TTL level Tach output
Fan Speed Range, typical	2000 to 3400 RPM
VXI Power Supply **Voltage** Health Status Readout	Available at : Front Panel Display, VXI Message Based Interface, RS-232 interface Default Tolerance limits: V nom -8.75%, +10% 3% accuracy
VXI Power Supply **Temperature** Health Status Readout	Available at : Front Panel Display (1 x 10 Characters), VXI Message Based Interface, RS-232 interface Default Tolerance limits: **)T** > 20 ^{o}C, **Tamb** > 70 ^{o}C ± 1.5^{o}C accuracy, -5 to + 85^{o}C range
VXI Power Supply **Airflow** Health Status Readout	Available at : Front Panel Display (1 x 10 Characters), VXI Message Based Interface, RS-232 interface Tolerance limit: 2000 RPM < Fan speed < 5000 RPM ± 200 RPM accuracy

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table A-8, EMS Monitoring System Specifications, (Continued)

Characteristics	Description
Rear Panel Trigger Input	TTL level Input (5VDC max), active low Routes to any one of eight backplane TTLTRIG lines (default is unconnected). Routing delay 50 nS, typical Programmable delay range: 0 nS to > 1 Second, 31.25 nS resolution, synchronization error 31.25 nS
Rear Panel Trigger Output	TTL level Output, active low, 74F38 driver with 1K Ohm pull up to +5V Routes from any one of eight backplane TTLTRIG lines or Real Panel Trigger Input (default is unconnected). Routing delay 50 nS, typical Programmable delay range: 0 nS to > 1 Second, 31.25 nS resolution, synchronization error 31.25 nS
Elapsed Time Functions Fan Service Power-On Time Cumulative Power-On Time	 1 Second resolution 1 Second resolution 1 Second resolution
VXI IACK<N> Event Count	1 Count resolution, 0 to 255 range
VXI Bus Error Event Count	1 Count resolution, 0 to 255 range
VXI SYSFAIL*, ACFAIL*, and AS* Logic State Monitor	State Indication: 1 if the line is high, or a 0 if the line is low. (Note that since each of these lines is asserted when low, the normal reply should be “1").
Front Panel User Message	80 Characters, scrolled
VXI Interface Capabilities	VXIbus Specification Rev 1.4 compliant Message-Based Device A16 Only Servant only Static Configuration Instrument Protocol (I) IEEE-488.2 Instrument Protocol (I4) Supports the Word-Serial Trigger command Programmable Interrupter Event Generation Response Generation

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table A-8, EMS Monitoring System Specifications, (Continued)

Characteristics	Description
Software Protocols supported by VXI and RS-232 Interfaces	SCPI Compliance 1994.0 IEEE 488.2

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Appendix B
ERROR MESSAGES

Error Messages

In general, whenever the EMS receives an invalid SCPI command, it automatically generates an error. Errors are stored in a special error queue and may be retrieved from this buffer one at a time. Errors are retrieved in first-in-first-out (FIFO) order. The first error returned is the first error that was stored. When you have read all errors from the queue, the generator responds with the message:

```
0,"No error"
```

If more than 16 errors have occurred, the last error stored in the queue is replaced with:

```
-350,“Queue overflow"
```

No additional errors are stored until errors are removed from the queue as described in the following paragraphs.

The error queue is cleared when power has been shut off or after a *CLS command has been executed. The *RST command does not clear the error queue. Use the following command to read the error queue:

```
SYSTem:ERRor?
```

All errors have the following format (the error string may contain up to 80 characters):

<Error Number>, <Error String>

Where:

<Error Number> is a numeric value. This may be positive or negative

<Error String> is a descriptive error message, enclosed in double quotes.

A complete listing of the errors that can be generated by the EMS is shown in **Table B-1.**

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table B-1, Error Messages

Error Message	ESR Bit Set	Error Description
0,"No Error"	none	The error queue is empty.
-100,"Command error"	CME	The command is not recognized.
-101,"Invalid character"	CME	There is an invalid character embedded in the command.
-102,"Syntax error"	CME	An unrecognized command or data type was encountered.
-103,"Invalid separator"	CME	The parser was expecting a separator and encountered an illegal character.
-104,"Data type error"	CME	The parser encountered a parameter data type different than expected. (For example, expected numeric/received string).
-105,"GET not allowed"	CME	A Group Execute Trigger was received within a command.
-108,"Parameter not allowed"	CME	More parameters were received than were expected.
-109,"Missing parameter"	CME	Fewer parameters were received than expected.
-110,"Command header error"	CME	An error was detected in the header.
-111,"Header separator error"	CME	An illegal separator character followed the command header.
-112,"Program menmonic too long"	CME	The command keyword contains more than 12 characters.
-113,"Undefined header"	CME	Command header is syntactically correct but not recognized.
-114,"Header suffix out of range"	CME	The value of a numeric suffix makes the header invalid (VOLT8).
-120,"Numeric data error"	CME	The data appears to be numeric but is syntactically incorrect.
-121,"Invalid character in number"	CME	An invalid character for the data byte was encountered.
-123,"Exponent too large"	CME	The magnitude of the exponent was larger than 32000.
-124,"Too many digits"	CME	The mantissa of a decimal numer contains more than 255 digits.
-128,"Numeric data not allowed"	CME	A legal numeric data element was received but is not allowed.
-130,"Suffix error"	CME	The command suffix is not understood or recognized.
-131,"Invalid suffix"	CME	The suffix does not follow the syntax in IEEE-488.2, Sec 7.7.3.2.
-134,"Suffix too long"	CME	The suffix contains more than 12 characters.
-138,"Suffix not allowed"	CME	A suffix was encountered after a numeric parameter value where no suffix is allowed. (e.g." *SRE 255 MHZ").
-140,"Character data error"	CME	A character received as a command parameter is invalid.
-141,"Invalid character data"	CME	The character data element has an invalid character or the character data is not valid for the command header.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table B-1, Error Messages (Continued)

Error Message	ESR Bit Set	Error Description
-144,"Character data too long"	CME	The character data element contains more than 12 characters.
-148,"Character data not allowed"	CME	A legal character data element was received but is not allowed.
-150,"String data error"	CME	A string received as a command parameter is invalid.
-151,"Invalid string data"	CME	A string was received where expected, but contained an invalid character (e.g. was not terminated with a quote character).
-158,"String data not allowed"	CME	A string data element was encountered but is not allowed.
-200,"Execution error"	EXE	An execution error has occurred. The EMS cannot determine a more specific problem with the error (see errors -201 to -299 below).
-210,"Trigger error"	EXE	A trigger error has occurred. No more specific info is known.
-211,"Trigger ignored"	EXE	*TRG or GET received but ignored due to timing considerations.
-212,"Arm ignored"	EXE	An arming signal was received and recognized but was ignored.
-213,"Init ignored"	EXE	A request for measurement initiation was ignored since another measurement was already.
-214,"Trigger deadlock"	EXE	Trigger subsystem is deadlocked.
-215,"Arm deadlock"	EXE	Trigger arming is deadlocked.
-220,"Parameter error"	EXE	Command parameter is invalid or unrecognized.
-221,"Settings conflict"	EXE	Legal command parameter received but could not be executed because doing so would place the device in an invalid state.
-222,"Data out of range"	EXE	Command data parameter is out of range.
-223,"Too much data"	EXE	Block, expression, or string type received contained too much data.
-224,"Illegal parameter value"	EXE	The parameter value is not from list of possible values.
-240,"Hardware error"	EXE	An (unspecified) hardware error prevented proper execution of the command.
-241,"Hardware missing"	EXE	The command failed because a hardware option was not installed.
-300,"Device-specific error"	DDE	A generic device-specific error which does not match one of the SCPI-defined errors in the range -300 to -399 has occurred.
-310,"System error"	DDE	A device-defined generic system error has occurred.
-311,"Memory error"	DDE	The EMS's memory is corrupted.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table B-1, Error Messages (Continued)

Error Message	ESR Bit Set	Error Description
-314,"Save/recall memory lost"	DDE	The *SAV or *RCL command has failed due to a corrupted nonvolatile memory.
-315,"Configuration memory lost"	DDE	Configuration information has been lost due to a corrupted nonvolatile memory.
-330,"Self-test failed"	DDE	The self-test has failed. If this is set at power-up, execute the *TST? query to determine what has failed.
-350,"Queue overflow"	DDE	An attempt was made to add an error message to a full error queue. Thus, the error queue has overflowed.
-360,"Communication error"	DDE	A communication error has occurred over the RS-232 interface.
-361,"Parity error in program message"	DDE	A parity error has been detected in the command over the RS-232 interface.
-362,"Framing error in program message"	DDE	A framing error has been detected in the command over the RS-232 interface.
-363,"Input buffer overrun"	DDE	The RS-232 interface input buffer has been overrun.
-400,"Query error"	QYE	A query error has been detected.
-410,"Query INTERRUPTED"	QYE	The query has been interrupted (see IEEE-488.2, Sec. 6.3.2.3).
-420,"Query UNTERMINATED"	QYE	see IEEE-488.2, Sec 6.3.2.2 for a description.
-430,"Query DEADLOCKED"	QYE	The query has reached a deadlocked state. This happens when the input buffer is full, the output buffer is full, and a reply to a query cannot be generated.
1000,"VXI signal queue overflow"	DDE	The signal queue has overflowed. Sending VXI signals is an alternative method of generating interrupts.
1001,"VXI interrupt queue overflow"	DDE	The queue of pending interrupts to send has overflowed. The EMS maintains a queue of interrupts which should be sent. An interrupt cannot be sent until a previous interrupt has been acknowledged.
1002,"VXI bus error"	DDE	A VXIbus error has occurred when the EMS attempted to write data over the VXIbus.
1003,"VXI bus timeout"	DDE	A timeout has occurred while the EMS was waiting for control of the VXIbus.
1005 - 1999, "Internal error: xxx"	DDE	An internal firmware error has been detected. Errors of this type should be reported to Racal Instruments for correction.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP