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Instruction Manual

Tektronix

VX1410A & VX1420A IntelliFrame® VXIbus Mainframes

070-9645-01

Warning
The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to the Safety Summary prior to performing service.

CE

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General Safety Summary

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

Only qualified personnel should perform service procedures.

While using this product, you may need to access other parts of the system. Read the *General Safety Summary* in other system manuals for warnings and cautions related to operating the system.

To Avoid Fire or Personal Injury

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

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

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

The common terminal is at ground potential. Do not connect the common terminal to elevated voltages.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

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

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

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

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

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

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

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Symbols and Terms

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



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



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

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

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

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

CAUTION indicates a hazard to property including the product.

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



WARNING
High Voltage



Protective Ground
(Earth) Terminal



CAUTION
Refer to Manual



Double
Insulated

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Service Safety Summary

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

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

Disconnect Power. To avoid electric shock, disconnect the main power by means of the power cord or, if provided, the power switch.

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

To avoid electric shock, do not touch exposed connections.

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Preface

The VX1410A & VX1420A IntelliFrame Mainframe Instruction Manual provides information on using the mainframe. The manual includes the following chapters:

- *Getting Started* provides a brief description of the IntelliFrame Mainframe, a list of accessories that accompany the mainframe, installation and configuration procedures, and a functional check procedure.
- *Operating Basics* provides a functional overview of the mainframe and includes illustrations of the main components.
- *Specifications* lists all of the warranted characteristics, nominal traits, and typical characteristics of the mainframe.
- *Reference* provides reference information on the various connectors on the mainframe. It also provides details on the command set and programming information for the Enhanced Monitor option.
- *Performance Verification* includes the performance verification procedures used to verify the advertised specifications of the mainframe.
- *Theory of Operation* includes a brief overview of the theory of operation for the IntelliFrame Mainframe.
- *Adjustment* chapter describes adjustment procedures for the IntelliFrame Mainframe.
- *Maintenance* is intended for qualified service personnel who need to service the mainframe. Module-level removal and replacement procedures and troubleshooting procedures are included in this chapter.
- *Replaceable Parts* includes a list of replaceable mechanical and electrical parts for the mainframe to be used with the maintenance chapter. It also includes the exploded view diagrams of the mainframe and options.
- *Appendices* includes a power budget worksheet, a description of special configuration options and SCPI conformance information.
- *Glossary.*
- *Index.*

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Contacting Tektronix

Product Support	For application-oriented questions about a Tektronix measurement product, call toll free in North America: 1-800-TEK-WIDE (1-800-835-9433 ext. 2400) 6:00 a.m. – 5:00 p.m. Pacific time Or contact us by e-mail: tm_app_supp@tek.com For product support outside of North America, contact your local Tektronix distributor or sales office.
Service Support	Contact your local Tektronix distributor or sales office. Or visit our web site for a listing of worldwide service locations. http://www.tek.com
For other information	In North America: 1-800-TEK-WIDE (1-800-835-9433) An operator will direct your call.
To write us	Tektronix, Inc. P.O. Box 1000 Wilsonville, OR 97070-1000

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Introduction

This manual contains information needed to properly service the IntelliFrame Mainframe This manual does *not* support component-level fault isolation and replacement.

Service Offerings

Tektronix provides service to cover repair under warranty as well as other services that are designed to meet your specific service needs.

Whether providing warranty repair service or any of the other services listed below, Tektronix service technicians are well equipped to service the IntelliFrame Mainframe. Tektronix technicians train on Tektronix products; they have access to the latest information on improvements to the IntelliFrame Mainframe as well as the latest new product upgrades. *Services are provided at Tektronix Services Centers and on-site at your facility, depending on your location.*

Warranty Repair Service

Tektronix warrants this product for three years from date of purchase. (The warranty appears behind the title page in this manual.) Tektronix technicians provide warranty service at most Tektronix service locations worldwide. The Tektronix product catalog lists all service locations worldwide or you can visit us on our *Customer Services World Center* web site at http://www.tek.com/Measurement/Service. See our latest service offerings and contact us by email.

Calibration and Repair Service

In addition to warranty repair, Tektronix Service offers calibration and other services which provide cost-effective solutions to your service needs and quality-standards compliance requirements. Our instruments are supported worldwide by the leading-edge design, manufacturing, and service resources of Tektronix to provide the best possible service.

The following services can be tailored to fit your requirements for calibration and/or repair of the IntelliFrame Mainframe.

Service Options. Tektronix service options can be selected at the time you purchase your instrument. You select these options to provide the services that best meet your service needs. These service options are listed on the *Tektronix Service Options* page following the Warranty page of this manual.

Service Agreements. If service options are not added to the instrument purchase, then service agreements are available on an annual basis to provide calibration services or post-warranty repair coverage for the IntelliFrame Mainframe.

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Service agreements may be customized to meet special turn-around time and/or on-site requirements.

Service on Demand. Tektronix also offers calibration and repair services on a per incident basis that is available with standard prices for many products.

Self Service. Tektronix supports repair to the replaceable-part level by providing for circuit board exchange.

Use this service to reduce down-time for repair by exchanging circuit boards for remanufactured ones. Tektronix ships updated and tested exchange boards. Each board comes with a 90-day service warranty.

For More Information. Contact your local Tektronix service center or sales engineer for more information on any of the Calibration and Repair Services just described.

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Getting Started

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Getting Started

This chapter provides an overview of the Tektronix IntelliFrame Mainframe family. It includes installation and configuration information on user-installed options.

Product Description

The IntelliFrame Mainframes are intelligent, 13-slot, C-size, VXIbus Mainframes. They fully comply with the VXIbus Specification 1.4 requirements and are VXI*plug&play* compatible. The mainframes can be configured as standard benchtop or optional rackmount instruments. The mainframes have the following features:

- High output power supply
- Intelligent cooling for installed modules
- Super Cooler™ (VX1420A)
- High quality auto-configuration backplane
- Enhanced Monitor
- Front panel display (Optional for VX1410A)
- EMI DIN shields for superior EMI protection
- Optional adjustable rackmounts and cable trays

These features are explained in more detail in the following paragraphs.

Power Supply

The IntelliFrame Mainframe provides all VXIbus voltages at levels necessary for the most demanding ATE applications. The power supply has a volt-ampere capacity of 1783 VA with 875 watts usable by VXI instrument modules at any one time (refer to *Appendix A: Power Budget Worksheet*). The mainframe accommodates exclusively digital applications, exclusively analog applications, or combinations of both.

The power supply plugs directly into the rear of the mainframe and has no cables to disconnect. The power supply can be replaced in less than three minutes, minimizing downtime. The power supply automatically sets the ranges for the appropriate input voltage and frequency.

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Intelligent Cooling

The IntelliFrame Mainframe provides optimal cooling for all installed modules. The mainframe uses an intelligent, adaptive cooling scheme to efficiently remove heat while maintaining quiet operation. The mainframe monitors the temperature rise of the exhaust air above each module slot and automatically adjusts the fan speed to keep the temperature rise to user specified temperature rise or less for the each module. You can also manually set the fan to full speed to provide maximum cooling.

Air is exhausted at the sides of the mainframe, allowing you to stack the mainframe with other rackmount equipment. You don't have to worry about restricting airflow out of the top of the mainframe or creating a chimney effect.

Cooling is not wasted on empty slots. IntelliGuides automatically direct air to only those slots containing modules; empty slots are shut off. The mainframe directs airflow across each installed module from the bottom to the top of each slot. Baffles balance the airflow from the front to back and across occupied slots in the mainframe.

You can remove the air filter from the rear of the mainframe. The fans can be replaced without disassembling the entire mainframe.

High Cooling

The VX1420A Super Cooler has all the features of the VX1410A IntelliFrame Mainframe, but with higher cooling capacity and very quiet operation. The higher cooling fan operates at a low fan speed with equivalent airflow.

Backplane

The IntelliFrame Mainframe has an auto configuration, solid-state backplane that uses electronic jumpering of the IACK and BUS GRANT signal lines. There are no jumpers to move or install on the backplane. This results in a high quality backplane that is ideal for ATE systems that must be reconfigured frequently. The EMI DIN shields are standard to provide superior EMI protection.

Full differential distribution of the CLK10 signals provides a clean timing source for your VXIbus instruments.

Optional Rackmounts and Cable Trays

You can order the IntelliFrame Mainframe with user-installed rackmounts and cable trays. The cable trays provide a means to conveniently route cables from the front of the modules to the rear of the mainframe. Options 1U and 2U cable tray depths range from 1.75 to 6.0 inches. Install Option 1U to provide a 1.75-inch, 2.5-inch, or 4.25-inch deep cable tray. You can install Option 2U to provide a 3.5-inch, 4.25-inch, or 6.0-inch deep cable tray.

The rackmount adapters let you recess the mainframe from the front panel mounting surface at specified depths from 0.735 inches to 5.735 inches in 0.5-inch increments. Similarly, you can configure the mainframe to extend out of the front of the rack at specified depths (0.57 inches to 5.57 inches in 0.5-inch increments).

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You can install the rackmount kits along with the cable trays to provide vertical cable access to easily route cables to instruments above or below the mainframe while keeping lead lengths as short as possible.

You can also install an optional Lexan door with the rackmount kit.

NOTE. *If you choose to extend the mainframe out of the front of the rack, the mainframe cannot accept a door.*

Instructions for installing the cable trays begin on page 1–7; instructions for installing the rackmounts kits begin on page 1–12.

Enhanced Monitor

The IntelliFrame Mainframe enhanced monitor lets you monitor the power supply voltages, power supply currents, slot temperature rises, fan speeds, and other VXIbus system activity via the VXIbus or a rear RS-232 interface.

Optional Front Panel Display

The VX1410A Option 1M includes a 20-character alphanumeric display on the front panel with scroll keys for manual viewing for mainframe status. The VX1420A comes standard with this option.

Options and Upgrade Kits

Table 1–1 lists the IntelliFrame Mainframe options and upgrade kits that you can purchase and install separately. Contact your local Tektronix representative for information on the upgrade kits.

Table 1–1: IntelliFrame Mainframe options and upgrade kits

Description	Option	Upgrade or Part number
Rackmount Kit with Rack Slides	1R	020-2221-XX
Rackmount Kit with Rack Slides and Lexan Door	2R	020-2222-XX
Cable Tray Kit (1U/2U)	1U	020-2223-XX
Cable Tray Kit (1U/2U)	2U	020-2224-XX
VX1410A Front Panel Display Upgrade (Option 1M)	1M	VXF1M
VX1410A Option 1M to VX1420A Upgrade	–	VXF20A

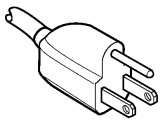
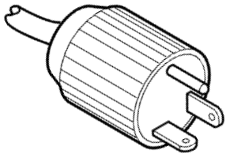
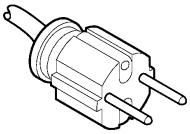
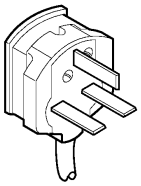
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Standard Accessories

The IntelliFrame Mainframe comes with the following standard accessories:

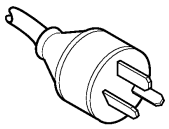
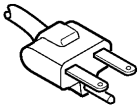
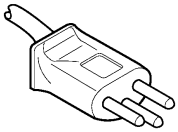
- *IntelliFrame Mainframe Instruction Manual*
- One single-slot panel filler
- Five double-slot panel fillers
- Two power cords (voltage range and plug type varies according to country, see Table 1–2)
- Fuse holder
- Line fuse, 15 A, 250 V
- Line fuse, 20 A, 250 V
- Line fuse, 6.3 A, 250 V
- VXI*plug&play* Floppy disk (See the Readme file on disk for installation information)

Table 1–2: Power cord identification

Plug configuration	Normal usage	Option number
	North America 125 V/15 A Plug NEMA 5-15P	Standard
	North America 125 V/20 A Plug NEMA 5-20P	Standard
	Europe 230 V	A1
	United Kingdom 230 V	A2

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Table 1–2: Power cord identification (Cont.)

Plug configuration	Normal usage	Option number
	Australia 230 V	A3
	North America 230 V	A4
	Switzerland 230 V	A5

Optional Accessories

The IntelliFrame Mainframe has the following optional accessories:

- RS-232C Cable, DB9 female X DB9 female, serial null modem (Tektronix part number 012-1379-XX)
- AC to DC low voltage converter supply to externally supply power to the Enhanced Monitor (Tektronix part number 119-5061-XX)
- US Power cord for the external supply (Tektronix part number 161-0213-00)
- Option A1 Power cord for the external supply (Tektronix part number 161-0209-00)
- Option A2 Power cord for the external supply (Tektronix part number 161-0210-00)
- Option A3 Power cord for the external supply (Tektronix part number 161-0211-00)
- Option A4 Power cord for the external supply (Tektronix part number 161-0208-00)
- Option A5 Power cord for the external supply (Tektronix part number 161-0212-00)
- Single-wide EMI panel fillers
- Double-wide EMI panel fillers
- EMI intermodule shields

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Selecting the Correct Power Cord and Fuse

The standard IntelliFrame Mainframe comes with two power cords and three fuses. Before installing the mainframe, you must determine the correct fuse and power cord for your application. Use the following information to determine the appropriate power cord and line fuse for either the VX1410A or the VX1420A mainframes. This information is important to avoid overloading the power distribution system and to comply with the National Electrical Code.

For mainframe loads in the nonshaded region of Figure 1–1, use the power cord with the 15 A plug (Tektronix part number 161-0213-XX) or the power cord with the 20 A plug (Tektronix part number 161-0218-XX). For high mainframe loads combined with low input line voltages (shaded region), use only the power cord with the 20 A plug.

Select the proper fuse based on the ranges shown in Figure 1–1.

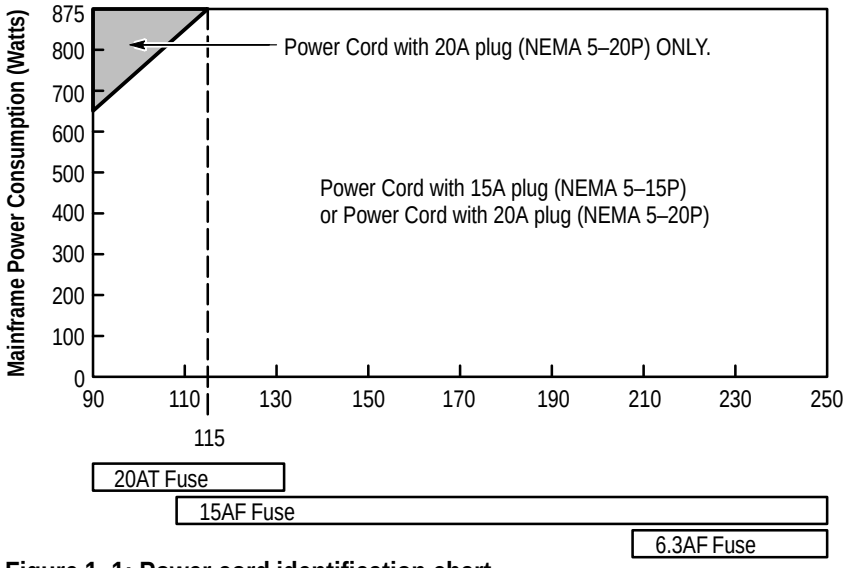


Figure 1–1: Power cord identification chart

Installation

This section describes the procedures to install your mainframe. It includes procedures for installing the mainframe with the rackmount or cable tray options.

This section does not include specific procedures for installing modules in the mainframe. Refer to your module documentation for information regarding the module installation instructions.

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Site Considerations

The IntelliFrame Mainframe is designed to operate on a bench or in a rackmount environment. For proper cooling, allow at least 2 in (5.1 cm) of clearance on the rear and sides of the mainframe. Determine how you will use your mainframe with cable trays, and then follow the appropriate installation instructions. If you ordered your mainframe with a cable tray option and rackmount option, install the cable tray before installing the rackmount.



WARNING. *To avoid personal injury, use care when lifting or moving the mainframe to avoid personal injury while performing the installation procedures.*

Cable Tray Installation

The IntelliFrame Mainframe comes a with a 0.75-inch cable access area on the bottom of the mainframe. Use the following procedure to install your cable tray option:

You will need a T-20 Torx and Phillips driver to install Options 1U or 2U.

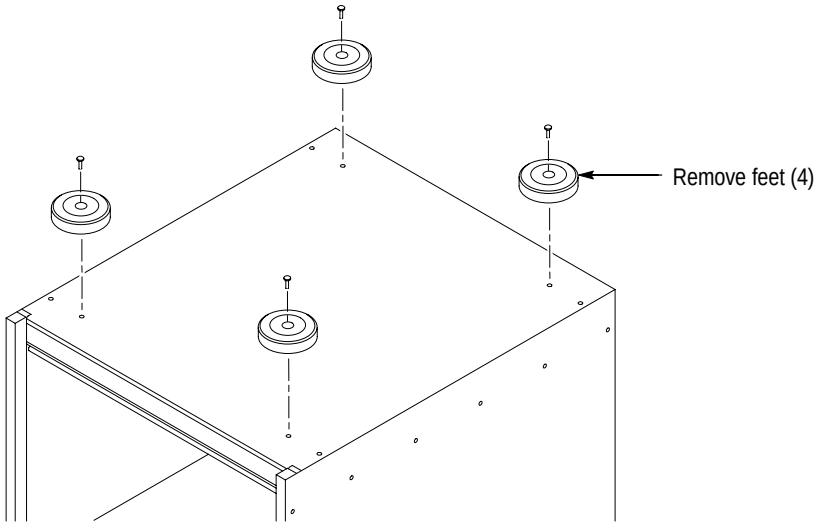
Options 1U and 2U can be installed three different ways; without rails, with rails, or with rails installed at 90°.

Figure 1–2 on page 1–8 and Figure 1–3 on page 1–9 show how to install Option 1U (without rails, with rails, rails at 90°) to provide a cable tray depth of 1.75, 2.50, or 4.25 inches.

Figure 1–4 on page 1–10 and Figure 1–5 on page 1–11 show how to install Option 2U (without rails, with rails, rails at 90°) to provide a cable tray depth of 3.50, 4.25, or 6.00 inches.

Both options come with butch plates to mount cable connectors at the rear of the cable trays. The butch plate will not fit on Option 1U when the foot rails are not used. You can modify the butch plate to accept cable connectors at the rear of the mainframe. Specific instructions for modifying the butch plate are not given since the locations, types, and size of connectors vary with each application.

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Opt 1U without rails
1.75–inch depth

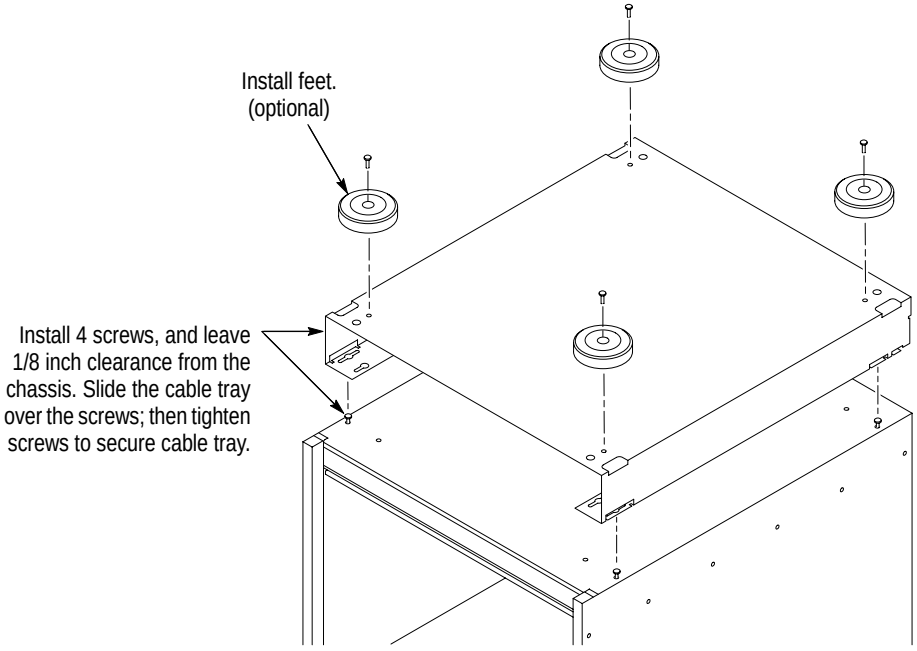


Figure 1–2: Install Option 1U cable tray

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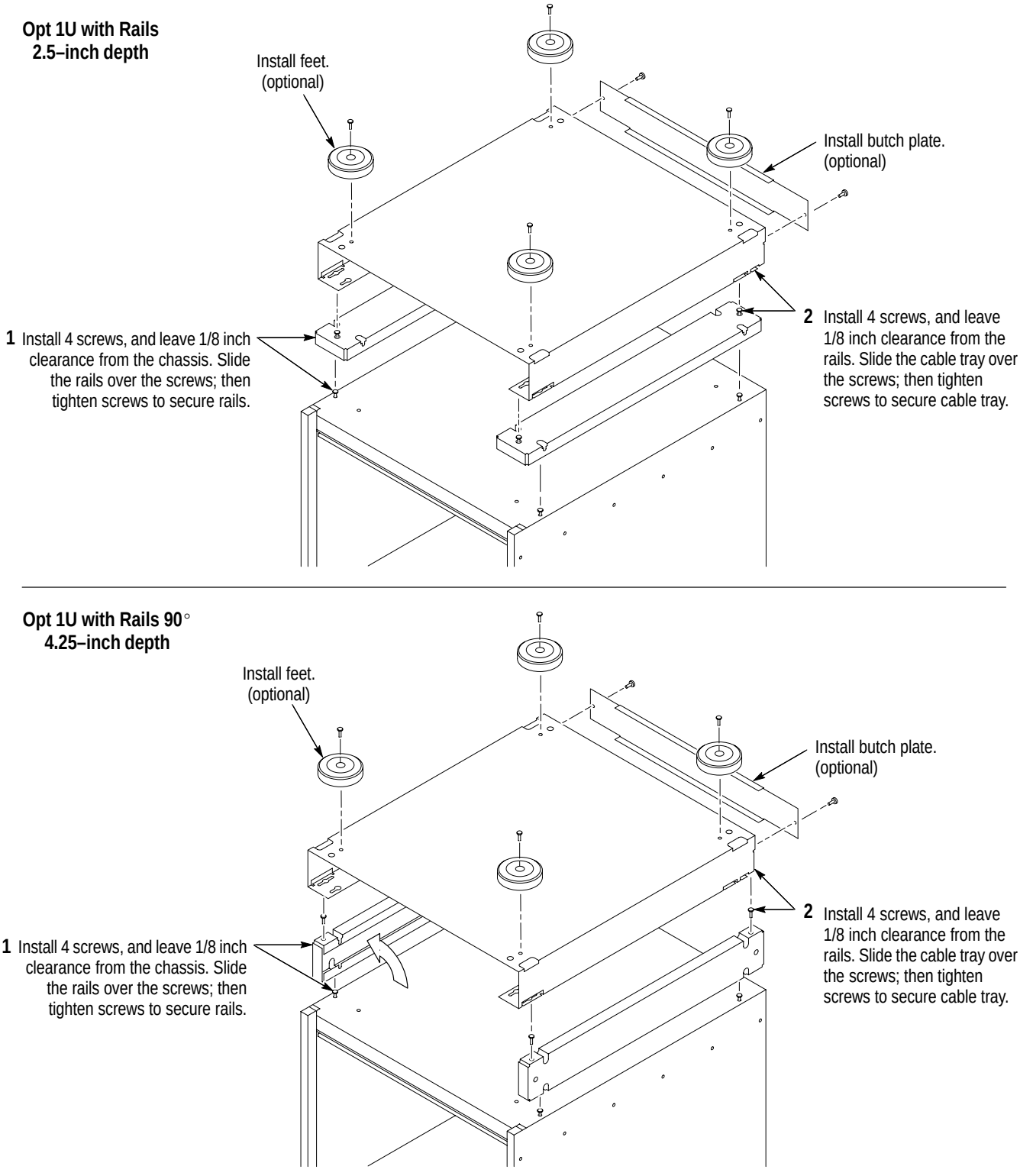
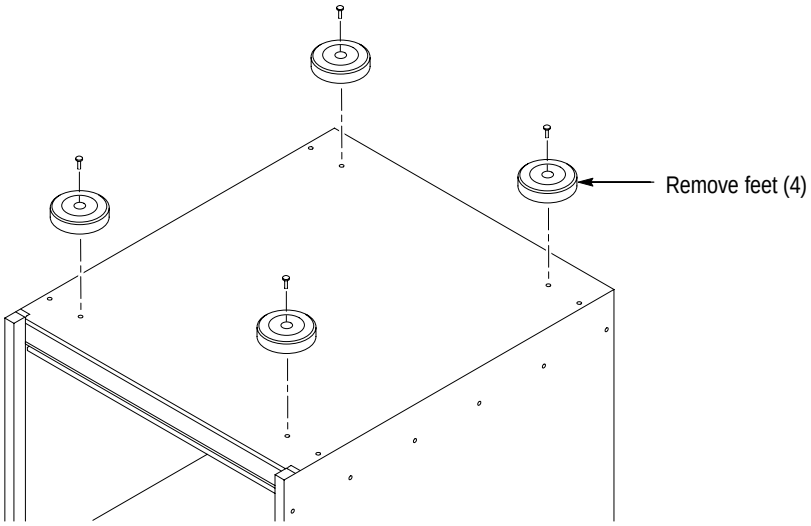


Figure 1–3: Install Option 1U cable tray

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Opt 2U without rails
3.5–inch depth

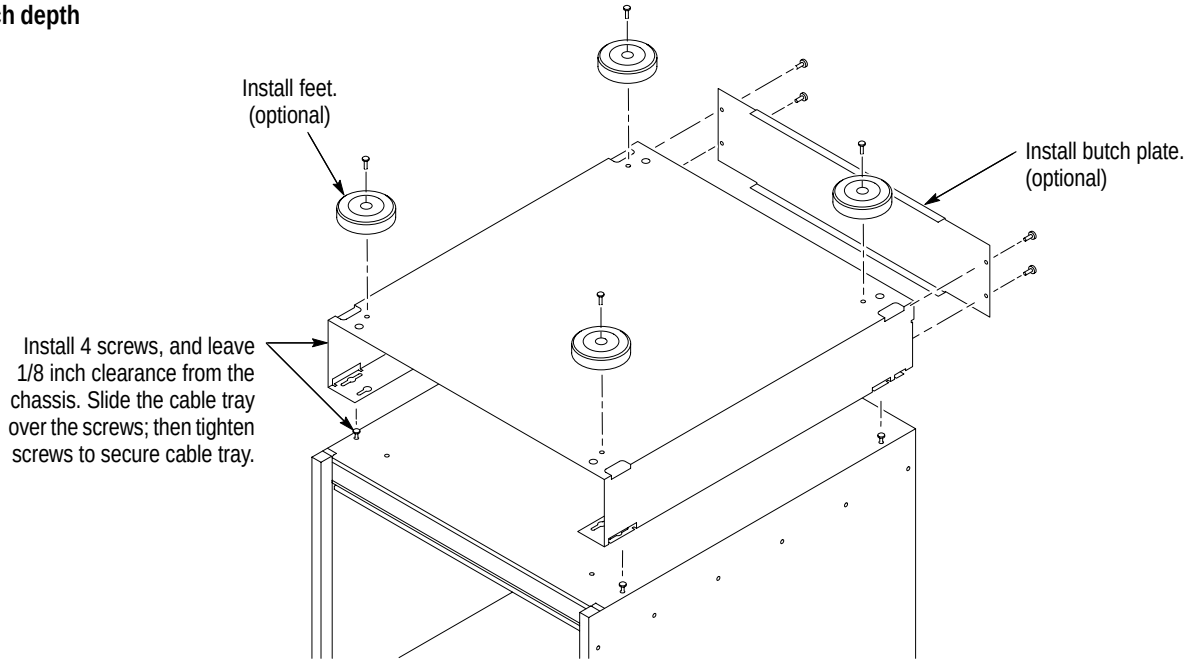


Figure 1–4: Install Option 2U cable tray

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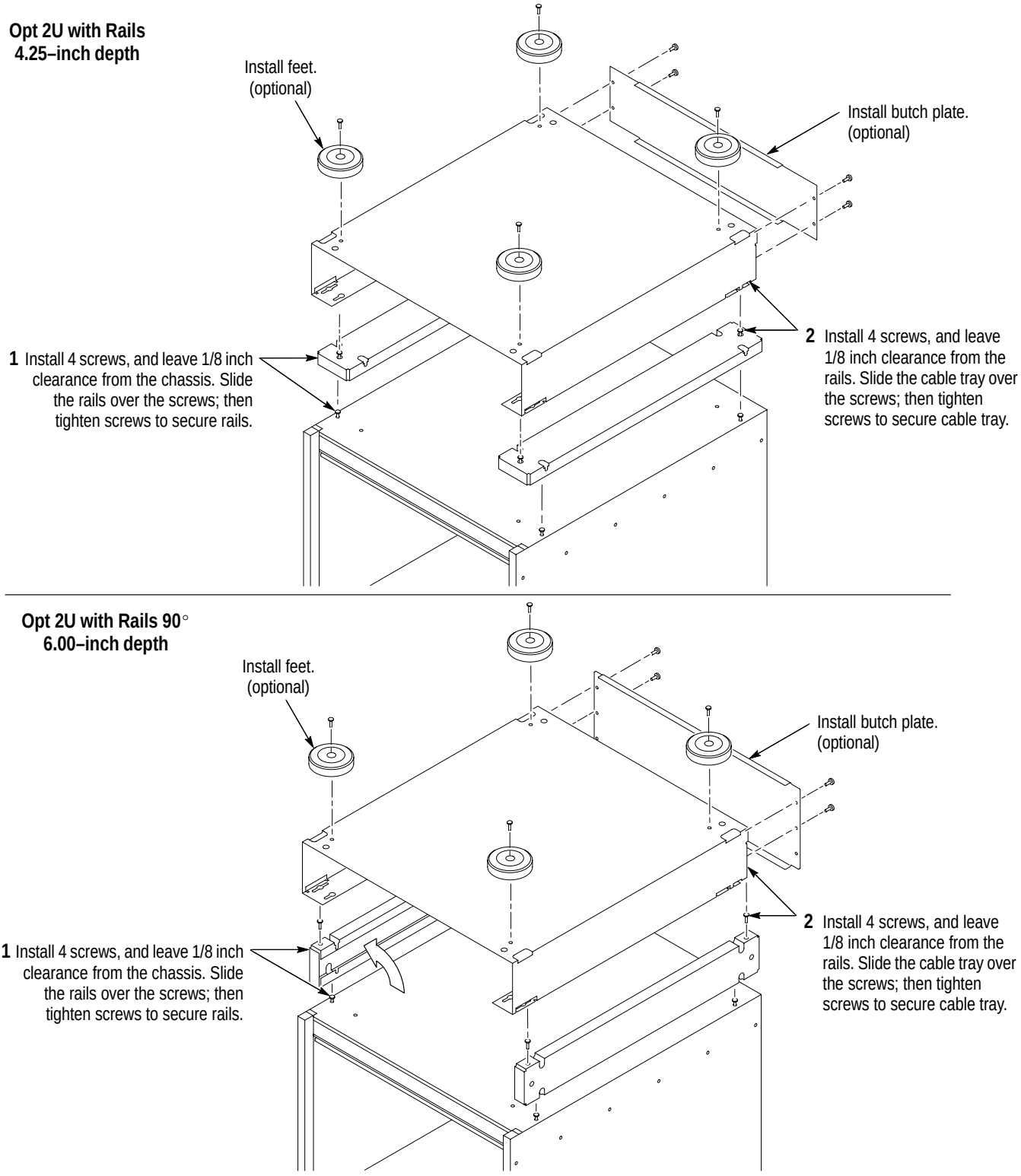


Figure 1–5: Install Option 2U cable tray

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Remote On/Standby Configuration

The IntelliFrame Mainframe allows you to power on and power off the mainframe from the rear panel (passive monitor connector) as well as the front panel On/Standby switch. Alternatively, you can disable the front panel On/Standby switch.

***NOTE**. If you decide to bypass the front panel On/Standby switch, you should configure the mainframe before installing the rackmount hardware. Refer to* Appendix B: Special Configuration Options *and then return to this section to continue the installation procedures.*

The Enhanced Monitor allows you to power off the mainframe through VXI and RS-232 commands. If you apply external power to the Enhanced Monitor, you can you can also power on and off the mainframe using RS-232 commands.

***NOTE**. Disconnecting the power cord provides the mainframe's voltage disconnect. Even when powered off by the On/Standby switch, the power supply circuits are connected to primary power.*

Front Panel SYSReset Activation

IntelliFrame Mainframe provides you the ability to generate a backplane SYSReset signal from the front panel. This feature allows you to reset the complete VXI system without having to power down the mainframe. A SYSReset activation is accomplished by pushing the right side (nonlighted side) of the On/Standby power switch.

***NOTE**. If you decide to configure the front panel to SYSReset, you should configure the mainframe before installing the rackmount hardware. Refer to* Appendix B: Special Configuration Options *for activation of this feature and then return to this section to continue the installation procedures.*

Rackmount Installation

The procedures for installing the rackmount kits are similar for the Option 1R and 2R kits. You can install Option 1R kit to either recess the mainframe inside the rack or to protrude in front of the rack. However, you can only install the door for the Option 2R kit so that the mainframe is recessed inside the rack.

The steps for installing the rackmount kits consist of installing the rackmount hardware to the mainframe, and then installing the mainframe in the rack.

You will need the following tools to install the rackmount options:

- T-15 Torx driver

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- T-20 Torx driver
- #2 Phillips screwdriver

Install the Rackmount Kit Hardware

Refer to Figure 1–6 and perform the following steps to install the rackmount kit hardware:

1. Determine where you want the mainframe positioned in the rack (recessed inside the rack or protruding in front of the rack).

   If you want the mainframe installed protruding in front of the rack, position the rackmount bracket as shown on the right side of Figure 1–6. If you want to recess the mainframe in the rack, position the rackmount bracket as shown on the left side of Figure 1–6.

2. Determine how far you want to recess or extend the IntelliFrame Mainframe and install the rackmount adapter as shown using two 8-32 screws (included with the kit). Repeat this step for the other bracket.

NOTE. *To comply with VXIplug&play mounting specifications, position the rackmount adapter at the mounting holes with the adjacent identifier keys (see Figure 1–6). This results in 3.960 in (10.06 cm) from the module panel mounting surface to the rack frame mounting surface.*

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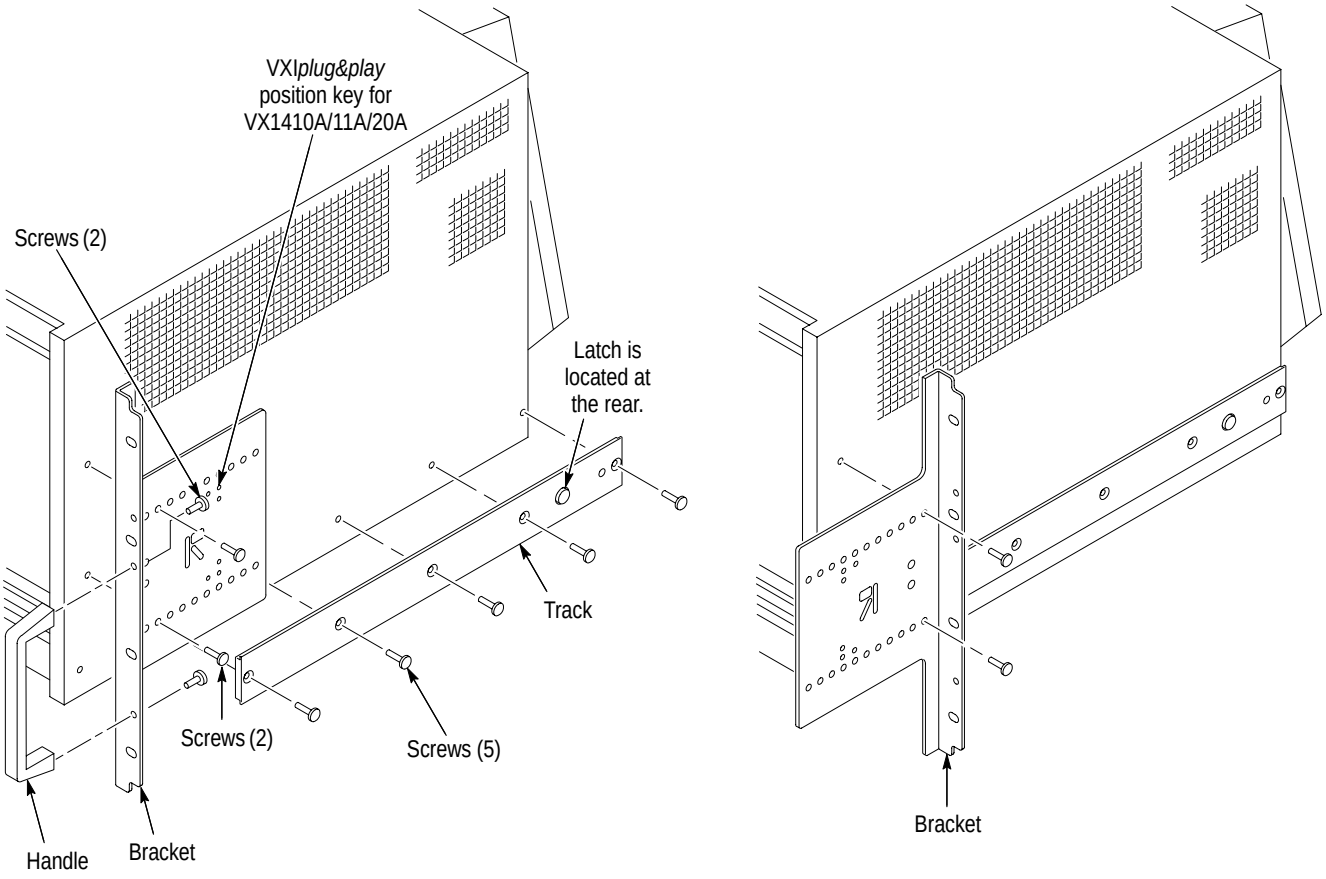


Figure 1–6: Installing the rackmount kit hardware

3. Remove the five 8-32 screws from both sides of the mainframe.
4. Attach the left and right inside tracks to the sides of the IntelliFrame Mainframe using five 8-32 flathead screws. Add a spacer plate between the left track and mainframe, refer to the *Replaceable Parts* on page 9–15. Orient the button latch so that it faces away from the mainframe and toward the rear.

Install the Mainframe in the Rack

Use the following procedure to install the IntelliFrame Mainframe in the rack:

1. Identify the right and left slide-out track assemblies: find the date code label on each assembly. The assembly to be mounted in the left side of the rack (the side nearest the left side of the mainframe when it is mounted in the rack) has a date code that ends with LH (for left hand). The right assembly has a date code ending with RH.
2. Measure the distance between the front and rear rail of the rack.

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3. Align the rear bracket to the right slide-out track as shown in Figure 1–7. Note that the rear bracket has two pairs of mount-through holes. When aligning the bracket and the track, select a pair of holes that mount the rear bracket so the flange-to-flange distance (see Figure 1–7) matches the front rail to rear rail spacing that you just measured in step 2.

NOTE. *If necessary, refer to the rackmount kit instructions for detailed installation information.*

4. Attach the rear bracket to the right slide-out track using two 10-32 screws and a bar nut as shown in Figure 1–7. Leave the screws loose so that you can adjust the overall length of the slide-out track assembly when installing the mainframe in the rack. Use the extended length brackets to comply with deeper rackmounts.

5. Repeat steps 3 and 4 to assemble the left slide-out track assembly.

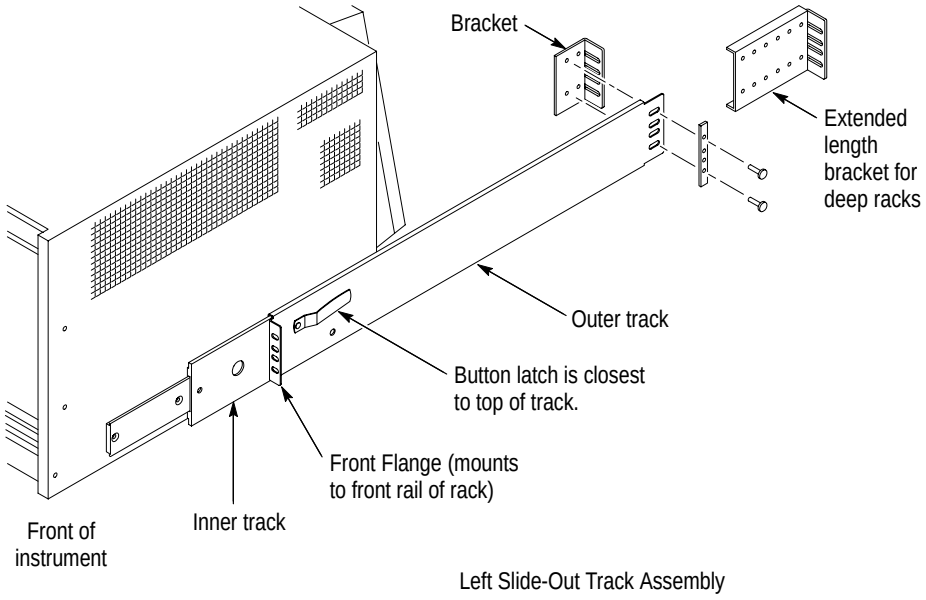


Figure 1–7: Assembling the slide-out track assemblies

6. Select the mounting position in the rack: select two 0.5-inch spaced holes in the front rail and verify that the 1.5-inch and 13.25-inch clearances exist relative to the mounting holes as shown in Figure 1–8.

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***NOTE**. The 13.25-inch vertical clearance is only valid for the mainframe without the plastic feet, rails and cable trays. Refer to Figures 4–2, 4–4, and 4–5 on pages 4–11, 4–12, and 4–13 for information on vertical clearances of the mainframe with cable tray options.*

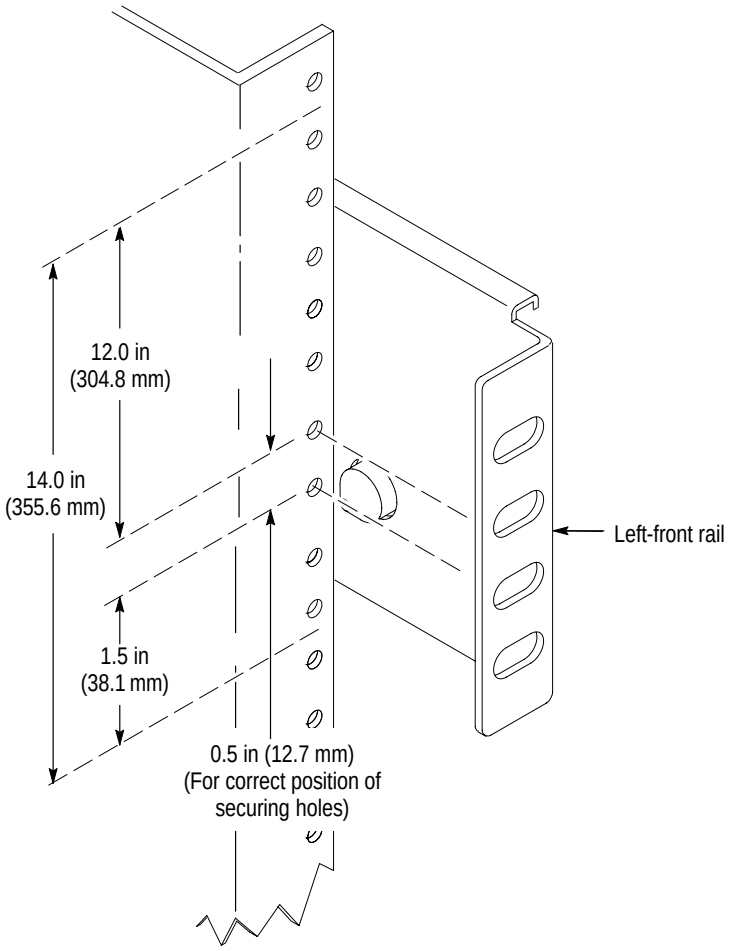


Figure 1–8: Vertical clearance for rack installation (standard mainframe)

7. Select the mounting method according to the rack type.

To mount the slide-out tracks with the front and rear flanges outside of the front and rear rails, use method A shown in Figure 1–9 when doing step 8. Add a bar nut to the installation only if the rails have untapped holes.

To mount with front and rear flanges inside of the rails, use mounting method B shown in Figure 1–9 when doing step 8. This mounting method assumes untapped holes.

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8. Using the mounting method determined from the previous step, secure the right slide-out track assembly to the front and rear rails. Seat the screws fully, but lightly, so that you can adjust the mounting later.

9. Tighten the screws left loose in step 4 to fix the front to rear flange spacing of the slide-out track assembly.

10. Repeat steps 6 through 9 to mount the left slide-out track assembly.

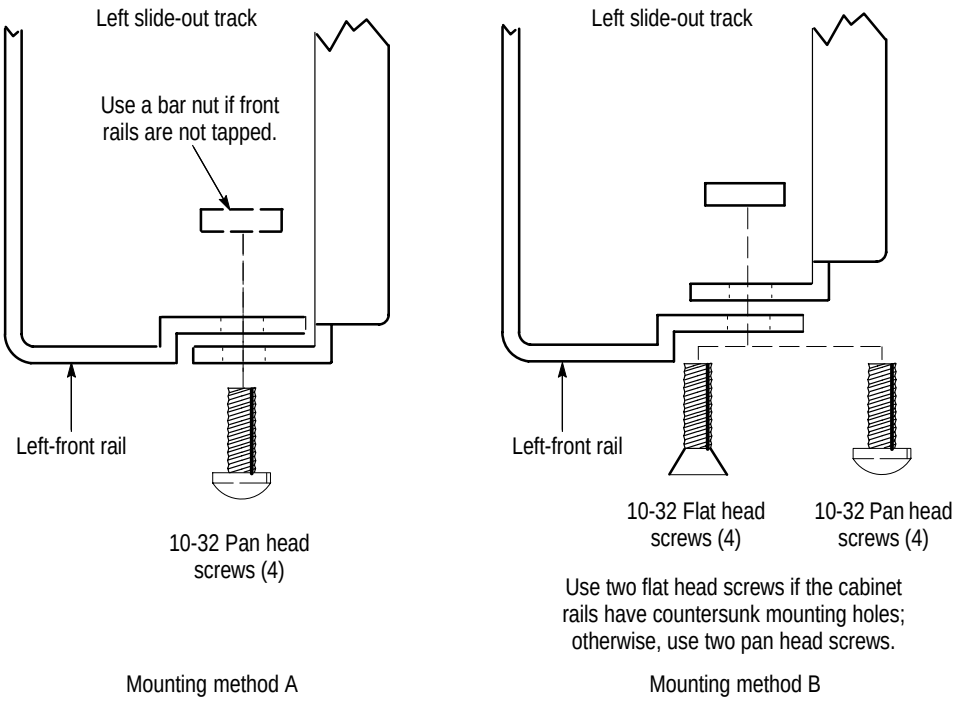


Figure 1–9: Installing the slide-out track assemblies in the rack (Top view)

WARNING. *Because of the size and weight of the mainframe, installing the mainframe alone can result in personal injury or equipment damage. Installing the IntelliFrame Mainframe in the rack requires at least two people. One person should be on the left side of the mainframe with one hand holding the left front handle and with the other hand underneath the mainframe. The other person should do likewise on the right side of the mainframe.*

11. Fully extend the inner tracks of each slide-out section out of the front of the rack until they lock.

12. Lift the mainframe and insert the left and right tracks that extend from the rear of the mainframe into the ends of the tracks that you just extended. Make sure that the tracks mounted on the mainframe slip just inside the inner tracks that you extended earlier.

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13. Slide the mainframe back until it stops.

14. Push to release the button latches, located on the outside of each track, and continue to slide the mainframe all the way back into the rack cabinet.

15. Tighten the four screws that you left loose at the rear of the rack when you performed step 8, and pull the mainframe part way out of the rack. (Tighten the 10-32 screws using 28 inch-lbs of torque.)

16. Be sure that the screws that you left loose at the front of the rack are loose enough to allow the slide-out track assemblies to seek the normal positions.

17. Tighten the screws and push the mainframe all the way into the rack. If the tracks do not slide smoothly, readjust the level using the method described in steps 15 and 16. (Tighten the 10-32 screws using 28 inch-lbs of torque.)

18. Install the proper power cord at the rear of the mainframe.

NOTE. *To ensure the mainframe is properly mounted in the rack do not tighten the screws while installing the chassis track to the rack front rails. After all the mounting screws have been installed shift the mainframe to the far right of the rack, then tighten all the mounting screws. Refer to Figure 1–10 for screw positions. Depending on the rack manufacturer it may be necessary to use an additional spacer plate, refer to the* Replaceable Parts *on page 9–15.*

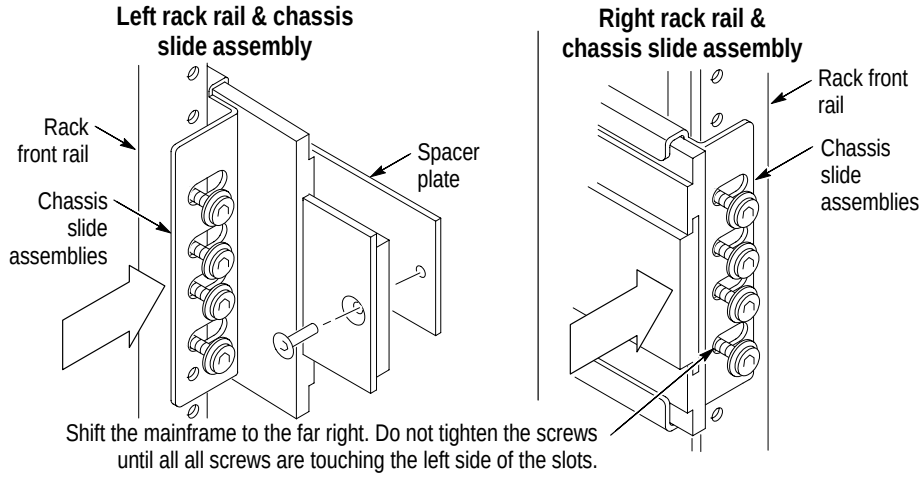


Figure 1–10: R1 or R2 rackmounting screw positions (front view).

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Install the Option 2R Rackmount Door

Refer to Figure 1–11 and perform the following steps to install the rackmount door for Option 2R:

1. Install the bottom halves of the two hinges to the left rackmount bracket as shown in Figure 1–11.
2. Install the top halves of the hinges on the door.
3. Install the catch on the right rackmount bracket.

   You can adjust the catch position forward or back to assure a flush fit between the door and the rackmount bracket.
4. Lift the rackmount door and mate the door with the hinges.

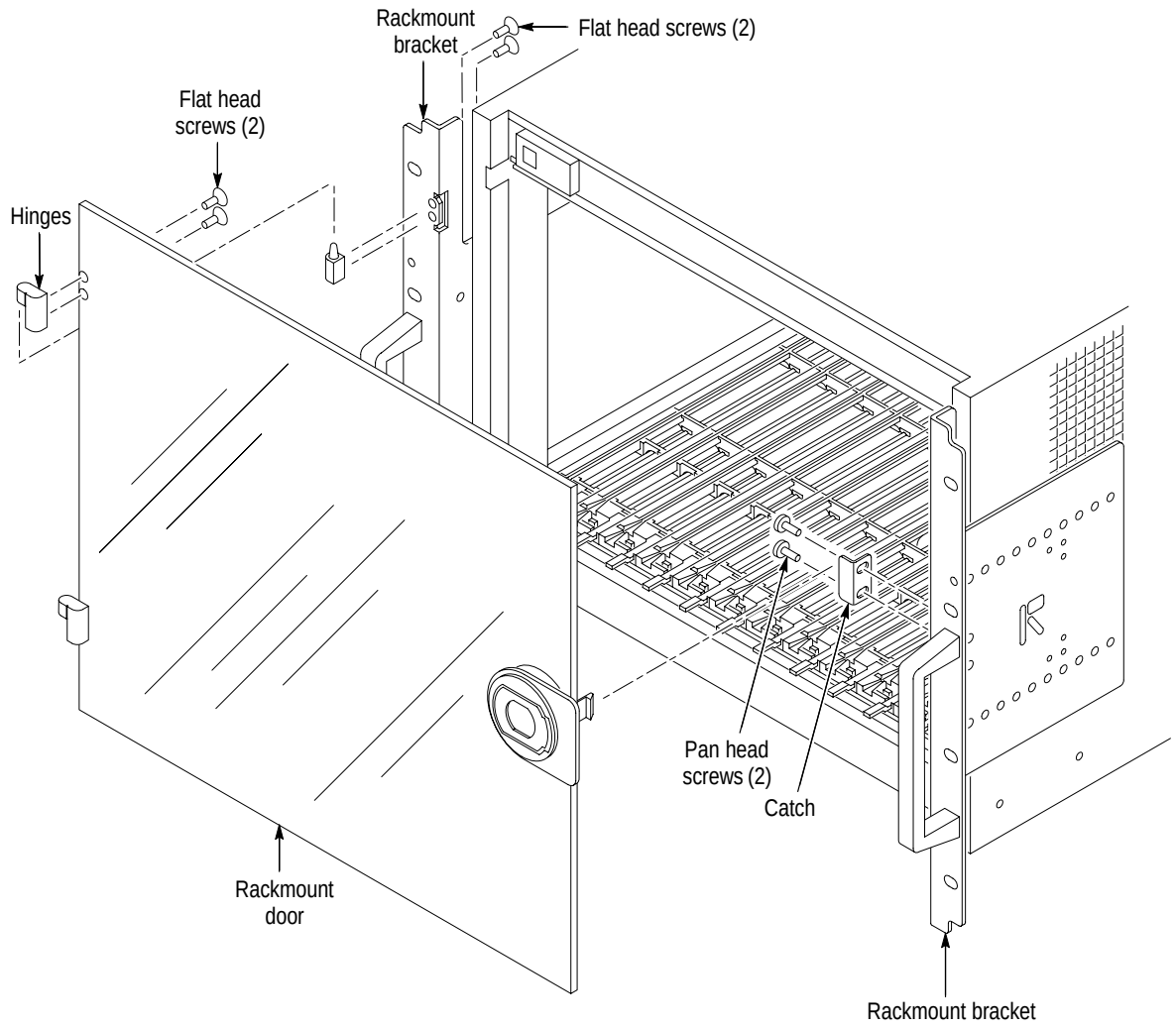


Figure 1–11: Installing the rackmount door (Option 2R)

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Configuration

After installing the mainframe, you are ready to configure it for your applications. If you have not already done so, install your VXIbus modules in the mainframe following the installation guidelines for your VXIbus module.

Module Selection and Design Guidelines

The IntelliFrame Mainframe is UL listed to UL 3111-1 and CAN/CSA C22.2 No. 1010.1 and is IEC 1010-1 compliant. You should use VXIbus modules with the mainframe that are listed or designed to limit electric shock and fire.

- Investigate the possibility of fire hazards due to the availability of power from the mainframe exceeding 150 W per slot. Use similar considerations for VXIbus Modules that externally receive power greater than 150 W per slot.
- Printed wiring boards should be flame rated UL 94V–1 or better.
- To prevent possible electrical shock, limit the voltage to the mainframe interface or chassis to less than 60 VDC, 30 V_{RMS}, or 42.4 V_{pk}.
- Ensure that measuring inputs provide a means of limiting unintended voltages that may reach the mainframe interface or chassis to less than 60 VDC, 30 V_{RMS}, or 42.4 V_{pk}.

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Install Empty Slot Panel Fillers

If you have any unused (empty) slots in your mainframe, you may install the empty slot Panel Fillers. Install either the single-wide or double-wide fillers that came with your mainframe.

Refer to Figure 1–12 for information on installing the slot fillers.

CAUTION. *To avoid damage caused by heat use only Tektronix front panels; otherwise, the shutters may activate, effectively robbing airflow from installed modules. Installing the fillers provides improved cooling for installed modules, improved EMI shielding, and more accurate air temperature sensing to control the fan speeds.*

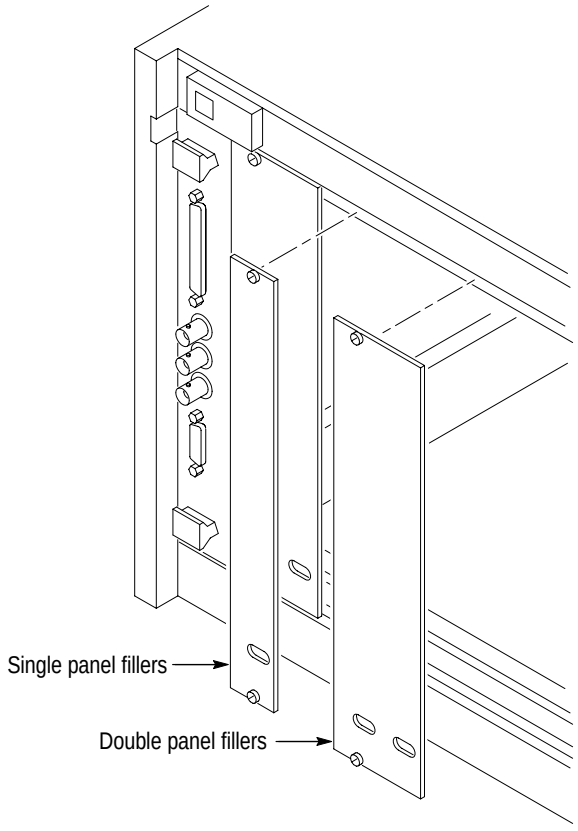


Figure 1–12: Installing the empty slot panel fillers

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Safety and Chassis Grounds

The left rear of the IntelliFrame Mainframe has a connection point for the chassis ground (see Figure 1–13).

WARNING. *To avoid personal injury the safety ground screw must always be in place to ensure the proper bonding of the power supply to the mainframe. You can use the chassis ground connection to connect the grounds of one or more instruments to the mainframe. This ensures a common ground connection between instruments.*

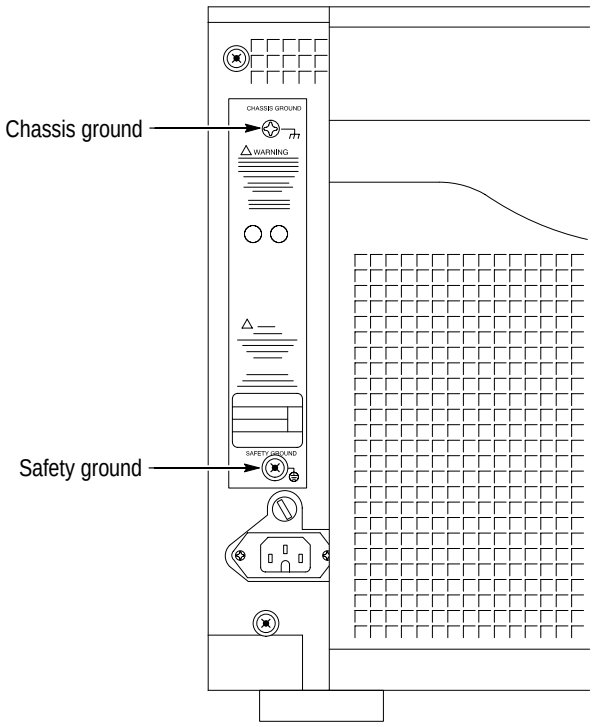


Figure 1–13: Locations of safety and chassis ground connections

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EMI Configurations

Perform the following steps if you intend to install the optional EMI Intermodule shields and/or blank EMI filler panels. Part numbers are listed under *Optional Accessories* on page 9–9:

NOTE. *It is only necessary to install the EMI intermodule shields if your VXIbus module does not have EMI shielding. Backplane EMI DIN shields are standard.*

1. Refer to Figure 1–14 and slide the EMI intermodule shields between the grooves of the card guide on one side of each installed VXIbus module. This is recommended to use with unshielded modules; the shielding may not be compatible with some shielded modules. The shield conforms with the VXI specification for intermodule shielding.
2. Install a blank EMI front panel for each empty slot, making sure that the EMI shielding is in contact with the adjacent front panel.

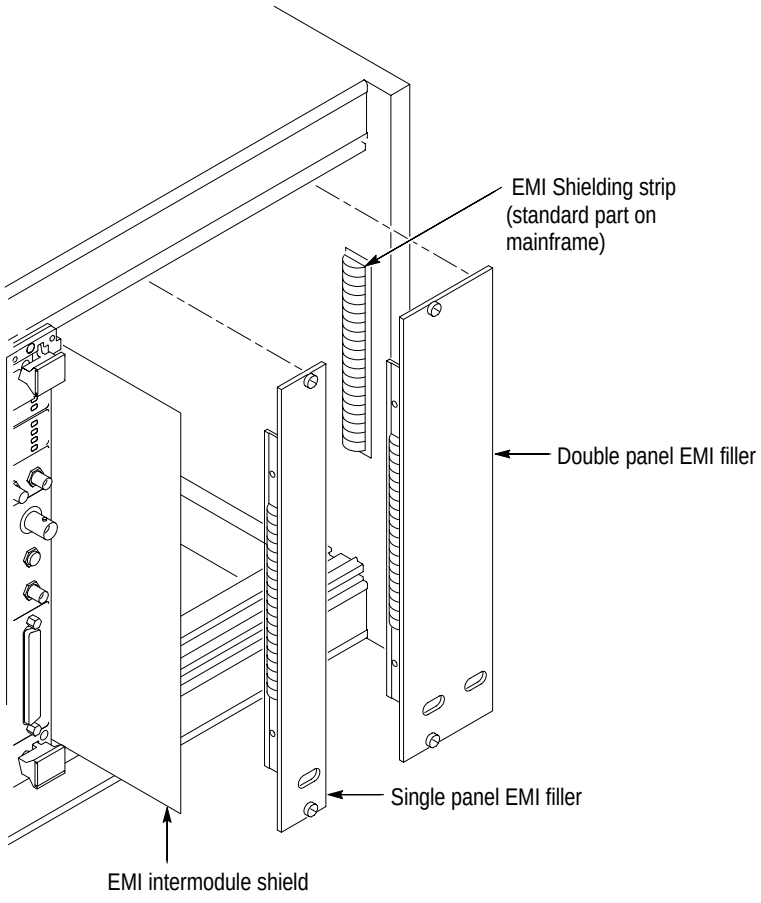


Figure 1–14: Installing the EMI intermodule shield and front panel EMI fillers

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Logical Address Switch Settings

You can set the logical address of the mainframe with the switches on the rear panel. Figure 1–15 shows the locations of the logical address switches on the rear of the Enhanced Monitor panel.

In most cases, you can leave the switches in the factory default position of FF. This allows the mainframe to dynamically configure the address. However, make sure that no other module has the same slot address as the Enhanced Monitor board. If all VXI modules in the mainframe are set to FF, the resource manager will “dynamically” configure the module’s logical address. If a VXI module is set to a logical address other than FF, you must be careful to choose a unique address. See *Enhanced Monitor Board Jumpers* on page B–4 for information on configuring the jumpers on the Enhanced Monitor board.

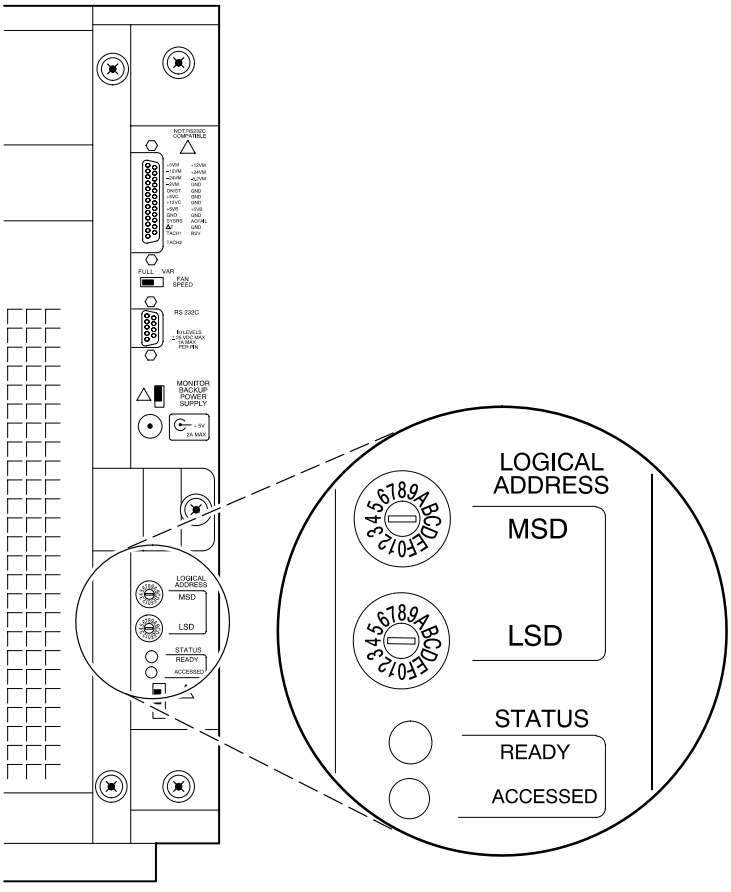


Figure 1–15: Logical address switches

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Functional Check

Use the information in this section to determine that the IntelliFrame Mainframe operates properly. The functional check consists of checking the power supply voltages at the 25-pin connector at the rear of the mainframe with a digital voltmeter.

If your VX1410A mainframe comes with the optional display (standard on the VX1420A mainframe), verify that the display shows no errors at power on. You can then verify the power supply voltages with the front-panel digital display and compare the displayed values against those in Table 1–3.

If your mainframe does not include the optional display you can measure the power supply voltages with a digital voltmeter.

Connect one lead of the voltmeter to the supply pins of the 25-pin connector on the rear panel of the mainframe. Connect the reference lead of the voltmeter to one of the ground pins. Compare each voltage reading to the values listed in Table 1–3.

Table 1–3: Power supply voltages at the 25-pin connector

Pin	Supply	Acceptable voltage range
1	+5 V	4.875 V to 5.25 V
2	–12 V	–12.6 V to –11.64 V
3	–24 V	–25.2 V to –23.28 V
4	–2 V	–2.1 V to –1.9 V
14	+12 V	11.64 V to 12.6 V
15	+24 V	23.28 V to 25.2 V
16	–5.2 V	–5.46 V to –5.044 V
9, 17, 19, 20, 22, 24	Logic Ground	

If the voltages are within the specified ranges, your mainframe is functional.

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Operating Basics

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Operating Basics

This chapter provides a brief overview of the IntelliFrame Mainframe including illustrations and descriptions of switches, indicators, and connectors.

Figure 2–1 shows the front view of the IntelliFrame Mainframe. All of the mainframe slots are labeled on the top and bottom of the mainframe. Slot 0 is reserved for the mainframe controller; all other slots are available for any VXIbus modules.

IntelliGuides on the bottom of each slot automatically open when you install a module with a front panel in the mainframe to provide cooling for the installed modules. The guides remain closed for empty slots to direct airflow only where it is needed.

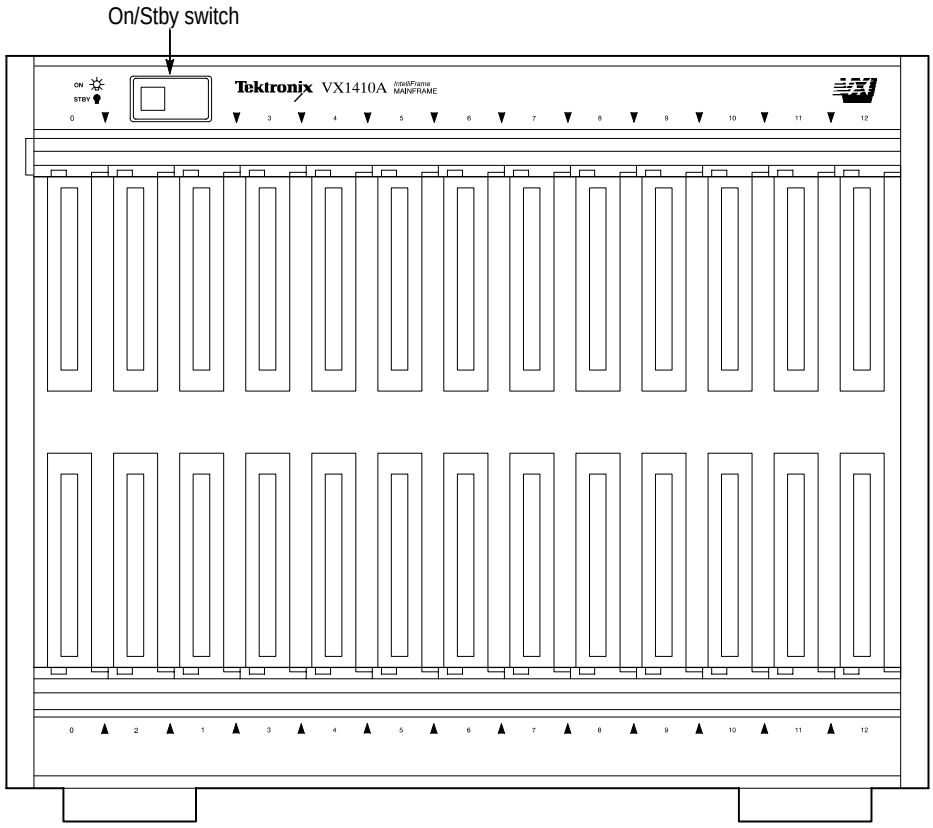


Figure 2–1: Front view of the VX1410A IntelliFrame Mainframe

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The On/Standby switch on the top-left corner of the front panel applies DC voltages to the mainframe. The switch is a momentary contact switch. The switch is lighted when DC voltages are applied to the mainframe. You can also remotely power on or power down the mainframe.

You can configure your mainframe to bypass the On/Standby switch (refer to *Remote Power Switch Configuration* in Appendix B of this manual for information on configuring the power switch). The On/Standby switch remains lighted while power is applied; however, the switch itself no longer controls the mainframe. The switch can also be configured to activate SysReset, Refer to *Front Panel SYSReset Cable Connector Configuration* in Appendix B.

If you ordered your VX1410A with Option 1M (VX1420A display is standard) or ordered field upgrade VXF1M, the mainframe includes a 20-character alphanumeric display indicating the status of the system . The NEXT and PREV push buttons, located to the right of the display, allow you to scroll through the display selections. See Figure 2–2.

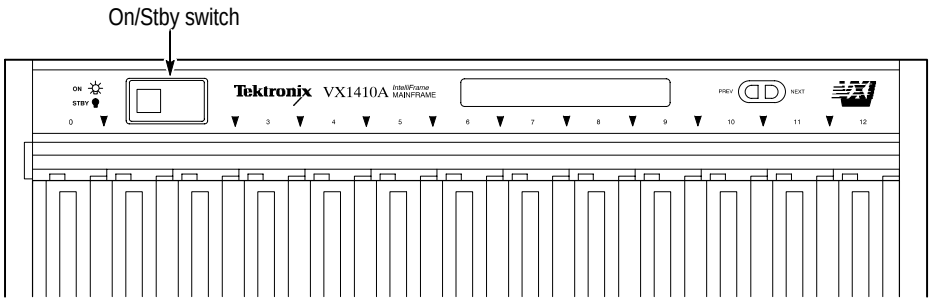


Figure 2–2: Partial front view of a VX1410A with Option 1M

The AC power connector is located on the bottom left side on the rear of the mainframe. The AC fuse holder is located just above the power connector. See Figure 2–3.

The chassis ground screw (if installed) can be used to connect multiple mainframes to a common ground point.

The fan filter is located on the back of the mainframe. The filter slides easily into the mainframe; there is no need to remove any covers to replace or clean the fan filter. Refer to the *Cleaning the Fan or Blower Filters* page 8–3.

Enhanced Monitor

The Fan Speed switch controls the speed of the system cooling fan. When the switch is set to the VAR (variable) position, the mainframe automatically controls the speed of the fan depending on the air temperature and amount of

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cooling required by the modules. When the switch is in the FULL position, the fans operate at full speed.

A DB-25-pin connector provides the ability to monitor the power supply voltages, fan speeds, and the maximum slot temperature rise of the mainframe. Refer to page 3–1 for information on the pinouts of the connector.

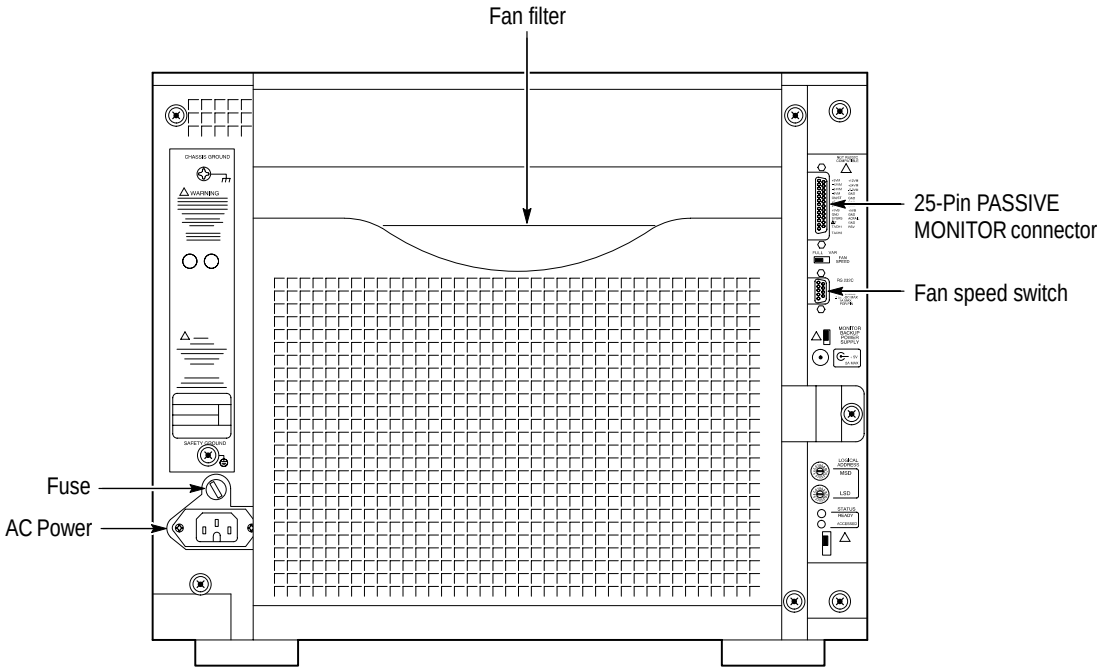


Figure 2–3: Rear view of a IntelliFrame Mainframe

WARNING. *To prevent damage to the instrument do not connect an RS-232 cable to the 25-pin connector. The connector is not an RS-232 connector. Connecting an RS-232 cable to the connector can result in damage to the equipment.*

The Enhanced Monitor, in addition to the DB25-pin connector and the fan switch, includes a 9-pin RS-232 D-connector to provide RS-232 communication, Logical Address switches, an auxiliary power connection and status lights (see Figure 2–4). For information on the pinouts of the RS-232 connector, see Table 3–2 on page 3–5.

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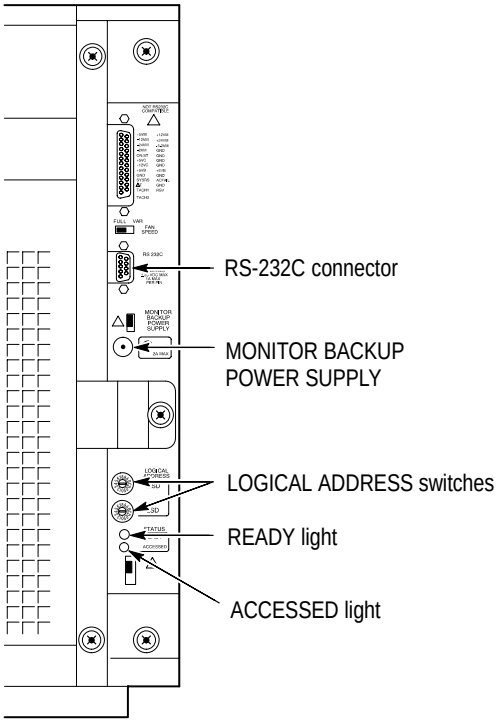


Figure 2–4: Rear view of the Enhanced Monitor

The Logical Address switches are available with the Enhanced Monitor; these switches select the logical addresses for the Enhanced Monitor. The top switch sets the most-significant digit, and the bottom switch sets the least-significant digit.

The green READY indicator lights after the power-on diagnostics are complete and there are no failures. During normal operation, the light flashes if there is a pending error message. Once all error messages have been retrieved, the READY indicator stops flashing and remains on.

The amber ACCESSED indicator lights when the MODID line is accessed by the slot 0 device. Refer to *Enhanced Monitor Board Jumpers* on page B–4 for information on the jumper MODID jumper positions.

An auxiliary power connector (MONITOR BACKUP POWER SUPPLY) allows you to apply +5 volts to the Enhanced Monitor board to provide RS-232 communication with a host computer while the mainframe is not powered on. The jumper located just above the power connector determines whether you source the +5V standby voltage from the monitor backup power supply connector or from the 25-pin connector. (Refer to *Enhanced Monitor Board Jumpers* on page B–4 for information on the jumper positions.)

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Reference

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Reference

This chapter provides reference information on the mainframe and its connectors. A description of the command set and information related to the Enhanced Monitor makes up the remainder of this chapter.

Passive Monitor Connector

The 25-pin Sub-D connector lets you monitor the power supply voltages, fan speed, and the maximum slot temperature rise within the mainframe. The connector also provides remote on and off capability and access to the SYSRESET* and ACFAIL* signals. Figure 3–1 shows the pinouts of the Passive Monitor Connector. Table 3–1 describes each of the pins and its function.

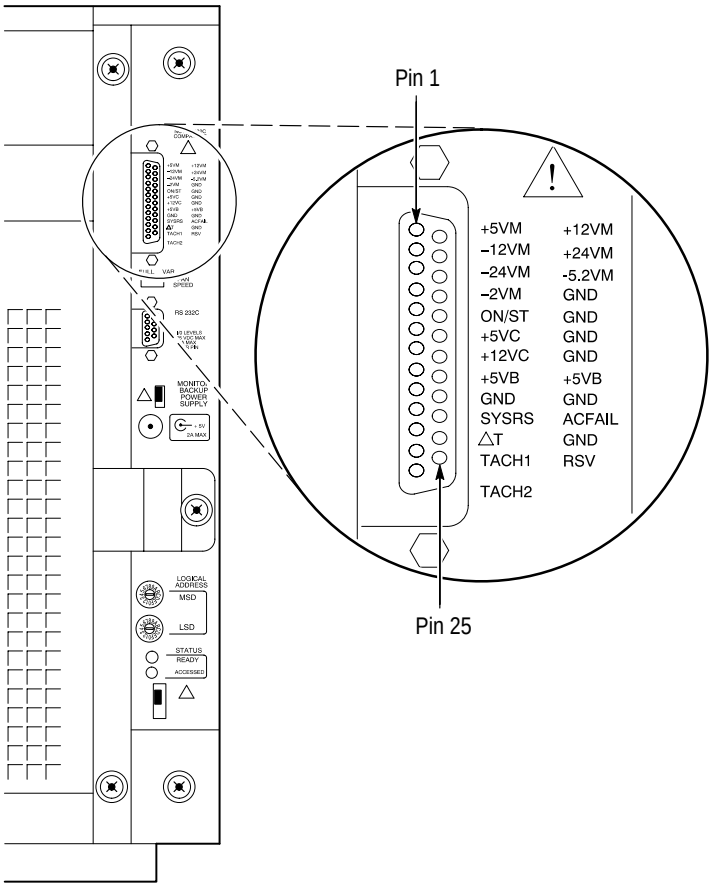


Figure 3–1: Passive monitor connector

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Table 3–1: Passive monitor connector pinouts

Pin	Function	Description
1	+5 VM	+5 V for voltage monitoring[1]
2	–12 VM	–12 V for voltage monitoring[1]
3	–24 VM	–24 V for voltage monitoring[1]
4	–2 VM	–2 V for voltage monitoring[1]
5	Rem On/Stdby	Remote On/Standby Power Switch.[2]
6	+5 VC	+5 V output for charging batteries, running external TTL circuitry, 1 A maximum
7	+12 VC	+12 V output for charging batteries, running external TTL circuitry, 1 A maximum
8	+5 VB	Input for +5 V standby voltage (for example, from an external battery). Maximum of 1 A total (pins 8 and 21 combined)[3]
9	Gnd	Logic Ground
10	SYSRESET*	Backplane SYSRESET* signal (input or output). If you use this pin, do not violate VXIbus electrical specifications (keep the extender cable as short as possible).[4]
11	ΔT	An analog output signal proportional to the maximum temperature rise of the 13 modules (100 mV/°C) 0V=0°C
12	Tach1	VX1410A: A square wave output signal proportional to the speed of Fan 1. RPM = 15 / (+Pulse Width), where (+Pulse Width) is the positive pulse width of the Tach1 fan output signal. VX1420A: RPM = 10 / (+Pulse Width)
13	Tach2	VX1410A: A square wave output signal proportional to the speed of Fan 2. RPM = 15 / (+Pulse Width), where (+Pulse Width) is the positive pulse width of the Tach2 fan output signal.
14	+12 VM	+12 V for voltage monitoring[1]
15	+24 VM	+24 V for voltage monitoring[1]
16	–5.2 VM	–5.2 V for voltage monitoring[1]
17	Gnd	Logic Ground
18	Gnd	Logic Ground
19	Gnd	Logic Ground
20	Gnd	Logic Ground
21	+5 VB	Input for +5 V standby voltage (for example, from an external battery). Maximum of 1 A total (pins 8 and 21 combined)[3]
22	Gnd	Logic Ground
23	ACFAIL*	Backplane ACFAIL* signal output. If you use this pin, do not violate the VXIbus electrical specifications (keep the extender cable as short as possible).[4]

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Table 3–1: Passive monitor connector pinouts (Cont.)

Pin	Function	Description
24	Gnd	Logic Ground
25	RSV	Request Service signal[5]

1 To monitor, only use a probe with greater than 1 MΩ impedance.

2 By momentarily grounding this line, the mainframe will toggle from on to off (or vice versa). The state changes on the falling edge of the signal. Hold the signal low for at least 500 ms before releasing. Attach only a momentary switch or an open collector device to drive this line. The line is pulled up to 1 V internally.

3 If you use pins 8 and 21 (+5 VB) to supply +5 V Standby to the backplane, make sure that the rear panel jumper is in the correct position (refer to *Enhanced Monitor Board Jumpers* on page B–4).

4 Refer to *VMEbus Specification Manual* for details on using the ACFAIL* and SYSRESET* signals.

5 The RSV signal is equivalent to the IEEE 488.1 SRQ signal. The signal is asserted (0) when an enable event is generated; the signal is unasserted(1) when the event is cleared by reading the event register. This line is an open collector output. The signal can be stand-alone or multiple mainframes can be tied together. If you tie multiple mainframes together, each mainframe must be polled to determine the source of the service request.

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Enhanced Monitor RS-232 Connector

The Enhanced Monitor includes a 9-pin RS-232 connector that allows connection to a RS-232 host. Figure 3–2 shows the pinouts of the 9-pin RS-232 connector; Table 3–2 describes the pin assignments.

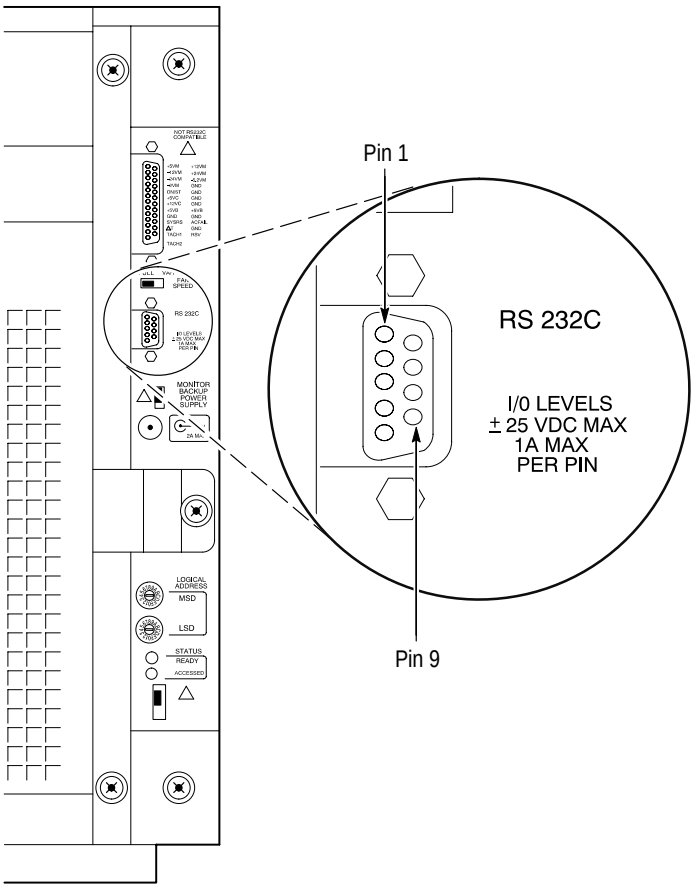


Figure 3–2: RS-232 connector pinout

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Table 3–2: RS-232 pin connector

Pin	Description
Shield	Protective Ground
1	No Connection
2	Receive Data (RxD)
3	Transmit Data (TxD)
4	Data Terminal Ready (DTR)
5	Signal Ground (GND)
6	No Connection
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	No Connection

Backplane Connectors

Table 3–3 shows the P1 connector pinouts for all slots in the IntelliFrame Mainframe. Table 3–4 shows the P2 connector pinouts for slots 1 to 12 and Table 3–5 shows the pinouts for the Slot 0 P2 connector.

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Table 3–3: 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	–12 V	+5 V STDBY	+12 V
32	+5 V	+5 V	+5 V

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Table 3–4: P2 connector pinouts for slots 1 – 12

Pin	Row A	Row B	Row C
1	ECLTRG0	+5 V	CLK10+
2	–2 V	GND	CLK10–
3	ECLTRG1	RSV1	GND
4	GND	A24	–5.2 V
5	LBUSA00	A25	LBUSC00
6	LBUSA01	A26	LBUSC01
7	–5.2 V	A27	GND
8	LBUSA02	A28	LBUSC02
9	LBUSA03	A29	LBUSC03
10	GND	A30	GND
11	LBUSA04	A31	LBUSC04
12	LBUSA05	GND	LBUSC05
13	–5.2 V	+5 V	–2 V
14	LBUSA06	D16	LBUSC06
15	LBUSA07	D17	LBUSC07
16	GND	D18	GND
17	LBUSA08	D19	LBUSC08
18	LBUSA09	D20	LBUSC09
19	–5.2 V	D21	–5.2 V
20	LBUSA10	D22	LBUSC10
21	LBUSA11	D23	LBUSC11
22	GND	GND	GND
23	TTLTRG0*	D24	TTLTRG1*
24	TTLTRG2*	D25	TTLTRG3*
25	+5 V	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	+24 V
32	SUMBUS	+5 V	–24 V

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Table 3–5: P2 connector pinouts for slot 0

Pin	Row A	Row B	Row C
1	ECLTRG0	+5 V	CLK10+
2	–2 V	GND	CLK10–
3	ECLTRG1	RSV1	GND
4	GND	A24	–5.2 V
5	MODID12	A25	LBUSC00
6	MODID11	A26	LBUSC01
7	–5.2 V	A27	GND
8	MODID10	A28	LBUSC02
9	MODID09	A29	LBUSC03
10	GND	A30	GND
11	MODID08	A31	LBUSC04
12	MODID07	GND	LBUSC05
13	–5.2 V	+5 V	–2 V
14	MODID06	D16	LBUSC06
15	MODID05	D17	LBUSC07
16	GND	D18	GND
17	MODID04	D19	LBUSC08
18	MODID03	D20	LBUSC09
19	–5.2 V	D21	–5.2 V
20	MODID02	D22	LBUSC10
21	MODID01	D23	LBUSC11
22	GND	GND	GND
23	TTLTRG0*	D24	TTLTRG1*
24	TTLTRG2*	D25	TTLTRG3*
25	+5 V	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	+24 V
32	SUMBUS	+5 V	–24 V

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Enhanced Monitor

The Enhanced Monitor provides the IntelliFrame Mainframe with the following additional capabilities via the VXIbus and the rear panel RS-232 interface:

- Power supply voltage readouts
- Power supply current readouts
- Power supply wattage readout
- Ambient (input) air temperature readout
- Exhaust temperature readout for each slot
- Fan speed readout
- User-selectable alarms
- User-selectable maximum temperature rise
- VXIbus system monitoring activities

VX1410A with Option 1M or field upgrade VXF1M (VX1420A front panel display is standard) includes a front-panel display to indicate the system status as determined by the monitoring system. Use the NEXT and PREV buttons on the side of the display to scroll through the individual messages. Table 3–6 lists some of the messages that you may see on the display. You can also display user defined messages with the DISPlay:TEXT command (see *DISplay Subsystem* beginning on page 3–27).

Table 3–6: Front panel display messages

Category	Message
Power Supply Voltage Messages	FAIL:+24V@XX.XX
	FAIL:+12V@XX.XX
	FAIL:+5V@X.XX
	FAIL:+5V STBY@XX.XX
	FAIL:+5V EXT@XX.XX
	FAIL:–2V@X.XX
	FAIL:–5.2V@X.XX
	FAIL:–12V@XX.XX
	FAIL:–24V@XX.XX
Power Supply Current Average Messages	FAIL:+24I@XX.XXA
	FAIL:+12I@XX.XXA

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Table 3–6: Front panel display messages (Cont.)

Category	Message
	FAIL:+5I@XX.XXA
	FAIL:–2I@XX.XXA
	FAIL:–5.2I@XX.XXA
	FAIL:–12I@XX.XXA
	FAIL:–24I@XX.XXA
Power Supply message	FAIL: Total W@XX.XW
Slot Temperature messages	FAIL:S0 ΔT@XX°C
	FAIL:S1 ΔT@XX°C
	FAIL:S2 ΔT@XX°C
	FAIL:S3 ΔT@XX°C
	FAIL:S4 ΔT@XX°C
	FAIL:S5 ΔT@XX°C
	FAIL:S6 ΔT@XX°C
	FAIL:S7 ΔT@XX°C
	FAIL:S8 ΔT@XX°C
	FAIL:S9 ΔT@XX°C
	FAIL:S10 ΔT@XX°C
	FAIL:S11 ΔT@XX°C
	FAIL:S12 ΔT@XX°C
	FAIL:Ambient T@XX°C
	FAIL:Fan1 XXXXRPM
	FAIL:Fan2 XXXXRPM (VX1410A only)
Warning Message	WARN:Clean Filter
Power Supply Voltage Messages	+24 Volts:XX.XXV
	+12 Volts:XX.XXV
	+5 Volts:X.XXV
	+5V Stby:X.XXV
	+5V External:X.XXV
	–2 Volts:X.XXV
	–5.2 Volts:X.XXV
	–12 Volts:XX.XXV
	–24 Volts:XX.XXV

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Table 3–6: Front panel display messages (Cont.)

Category	Message
Power Supply Current Amperage Messages	+24V Amps:XX.XXA
	+12V Amps:XX.XXA
	+5V Amps:XX.XXA
	–2V Amps:XX.XXA
	–5.2V Amps:XX.XXA
	–12V Amps:XX.XXA
	–24V Amps:XX.XXA
Power Supply Power Messages	Total Power:XXX.XW
Temperature Status Messages	Ambient T:XX°C
	ΔT S0,S1:XX,XX°C
	ΔT S2,S3:XX,XX°C
	ΔT S4,S5:XX,XX°C
	ΔT S6,S7:XX,XX°C
	ΔT S8,S9:XX,XX°C
	ΔT S10,S11:XX,XX°C
	ΔT S12:XX°C
Fan Status Messages	Fan 1 RPM: XXXX
	Fan 2 RPM: XXXX (VX1410A only)
Filter Status Message	Filter Hr Left:HHHH[1]
Miscellaneous Messages	Time On:HHHHHH:MM
	Hr of Oper:HHHHHH
Date and Time Message	Year–Mon–XX XX:XX[2]
	SYSTEM OFF
	SYSTEM OK

1 **To reset the filter cleaning interval, display the filter status message by pressing the Next or Prev scroll buttons. While the message displays, press both buttons at the same time. The Filter Cleaning Interval will reset to the current interval.**

2 **After power on a prompt will appear in the display. Press the PREV and NEXT buttons to set the date and time. Pressing the PREV or NEXT will cycle through the values, while pressing both buttons simultaneously moves the cursor to the next field.**

You can also query the individual messages and status information using the commands and queries described in the remainder of this chapter.

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The remainder of this chapter provides the following information:

- A summary of the SCPI commands and queries
- An overview of the syntax used with the commands and queries
- A detailed description of each command and query
- A list of error messages
- Brief examples of using commands and queries

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Command Groups

This section lists IntelliFrame Mainframe commands by functional groups. A question symbol surrounded by brackets [?] identifies commands that also have a query form.

Display Commands

Commands in the DISPlay subsystem display user defined messages on the front panel of VX1420A mainframes or VX1410A mainframes with option 1M (display). Note that the standard VX1410A mainframe does not include a front panel display. Detailed information on the DISPlay command and query begins on Page 3–27.

Table 3–7: Display commands

Header	Description
DISPlay	
[:WINDow]	
:TEXT	
[:DATA][?]	Sets or queries user defined messages to display on the front panel readout.
:MARQuee [?]	Sets or queries the marquee status to scroll the display

Status Commands

Commands in the STATus subsystem, along with several IEEE 488.2 Common Commands, control the status and event reporting system. Detailed information on the STATus subsystem begins on page 3–31.

Table 3–8: Status commands

Header	Description
STATus	
:OPERation?	Returns the contents of the Operation Event register as a decimal number.
:CONDition?	Returns the contents of the Operation Condition register.
:ENABle[?]	Sets or queries the contents of the Operation Event Enable register.

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Table 3–8: Status commands (Cont.)

Header	Description
:VXIInterrrupt?	Returns the contents of the VXIInterrupt event register.
:Condition?	Returns the contents of the VXIInterrrupt Condition register.
:INTerrupt	Returns the time when each interrupt occurred.
:ENABle[?]	Sets or queries the contents of the VXIInterrupt enable register.
:VXIMonitor?	Returns the contents of the VXI Monitor Event register.
:ACFail?	Returns the time when the ACFAIL signal was asserted.
:BERR?	Queries the VXI Bus Error address space.
:ENABle[?]	Sets or queries the contents of the VXI Monitor Enable register.
:SYSFail?	Returns the time when the VXI SYSFAIL signal was asserted.
:VXITrigger?	Returns the contents of the VXITrigger Event register.
:CONDition?	Returns the contents of the VXITrigger Condition register.
:TRIGger?	Returns the trigger location.
:ENABle[?]	Sets or Queries the Contents of the VXITrigger enable register.
:PRESet	Presets the SCPI enable registers, transition filters, and the Error/Event queue enable.
:QUEStionable?	Returns the contents of the Questionable Register as a decimal number.
:BLOWer?	Returns the contents of the Blower Event register.
:CONDition?	Returns the contents of the Blower Condition register.
:CURRent?	Returns the contents of the Current Event register.
:CMAXimum?	Returns the maximum current level since power on.
:CONDition?	Returns the contents of the Current Condition register.
:ENABle[?]	Sets or queries the contents of the current enable register.
:LEVel?	Returns current level.
:LIMit[?]	Sets or queries the maximum current usage allowed before generating an alarm.
:MAXimum?	Returns the maximum current level since the last factory maintenance.
:ENABle[?]	Sets or queries the contents of the Blower Enable register.

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Table 3–8: Status commands (Cont.)

Header	Description
:SPEed?	Returns the fan speed in revolutions per minute.
:CONDition?	Returns the contents of the Questionable Condition register.
:ENABle[?]	Sets or queries the contents of the Questionable Status Enable register.
:FILTer	
:TINTerval[?]	Sets or queries the filter cleaning interval time.
:TREMaining?	Returns the remaining time for the next filter cleaning cycle.
:TRESet	Resets the remaining filter cleaning time to the filter cleaning interval.
:POWer?	Returns the contents of the power event register.
:CMAXimum?	Returns the maximum power used since power up.
:CONDition?	Returns the contents of the power condition register.
:ENABle[?]	Sets or queries the contents of the power enable register.
:LEVel?	Returns the wattage used by the mainframe.
:LIMit[?]	Set or query the maximum amount of power allowed before generating an alarm.
:MAXimum?	Returns the maximum power high mark used since the last factory maintenance.
:TEMPerature?	Returns the contents of the Temperature Event register as a decimal number.
:CMAXimum?	Returns the maximum measurable temperatures in the mainframe since power on.
:CONDition?	Returns the contents of the Temperature Condition register.
:ENABle[?]	Sets or queries the contents of the Temperature Enable register.
:LEVel?	Returns the current temperatures in the mainframe.
:LIMit[?]	Sets or queries the maximum ambient and delta temperatures in each slot of the mainframe.
:MAXimum?	Returns the maximum measurable temperatures in the mainframe since the last factory maintenance.
:VOLTage?	Returns the contents of the Voltage Event register as a decimal number.
:CONDition?	Returns the contents of the Voltage Condition register.

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Table 3–8: Status commands (Cont.)

Header	Description
:ENABle[?]	Sets or queries the contents of the Voltage Enable register.
:LEVel?	Returns the current power supply output voltages.
:PTR[?]	Sets or queries the power supply positive transition filter.
:QUEue?	Returns the next message in the error queue.
[:NEXT]?	Returns the next event code and message from the Error/Event queue.
:ALL?	Returns a comma-separated list of all unread events from the Error/Event queue.
:CODE?	Returns the next event code from the Error/Event queue.
:ALL?	Returns a comma-separated list of all unread event codes from the Error/Event queue.
:COUNt?	Returns the number of unread events from the Error/Event queue.
:ENABle[?]	Sets or queries enable events to be placed in the Error/Event queue.
:ALL	Presets the Error/Event queue enable to –1999:1000.
:SCONdition?	Returns a summary condition of all monitors.
:S2CONdition?	Returns the overflow summary information of the condition registers.
:SEVent?	Returns summary information of all events in the mainframe.
:S2EVent?	Returns the overflow summary information for events in the mainframe.

System Commands

Commands in the SYSTem subsystem program utility functions provide version information about the IntelliFrame Mainframe. Detailed information on the SYSTem subsystem begins on page 3–111.

Table 3–9: System commands

Header	Description
SYSTem	
:COMMunicate	
:SERial	

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Table 3–9: System commands (Cont.)

Header	Description
:BAUD[?]	Sets or queries the baud rate of the RS-232 port.
:BITS[?]	Sets or queries the number of bits per character in the RS-232 port.
:CONTrol	
:RTS[?]	Sets or queries the operation of the RTS and CTS lines.
:ECHO[?]	Sets or queries whether incoming characters are echoed back to the RS-232 port.
:ERESponse[?]	Sets or queries whether error messages are automatically returned to the RS-232 port.
:LBUFfer[?]	Sets or queries the state of the character buffer.
:PACE[?]	Sets or queries whether software flow control (XON/XOFF) is enabled.
:PARity[?]	Sets or queries the type of parity for the RS-232 port.
:PRESet	
[:ALL]	Configures RS-232 port parameters to default values.
:RAW	Configures the RS-232 port parameters for use with a computer.
:TERMinal	Configures the RS-232 port parameters for use with a terminal.
:SBITs[?]	Sets or queries the number of stop bits sent with each character.
:DATE[?]	Sets or queries the calendar date.
:LMAintenance?	Returns the last factory maintenance date.
:ERRor?	Returns the next entry from the Error/Event queue.
:ALL?	Returns a comma separated list of all events stored in the Error/Event queue.
:CODE?	Returns the next event code stored in the Error/Event queue.
:ALL?	Returns a comma separated list of all event codes stored in Error/Event queue.
:COUNt?	Returns the number of unread events in the Error/Event queue.
:ENABle[?]	Sets or queries enable events to be placed in the Error/Event queue.
:ALL?	Presets the Error/Event queue enable to –1999:1000.
:FACTory	Sets the IntelliFrame Mainframe settings to the factory default values.

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Table 3–9: System commands (Cont.)

Header	Description
:HELP	
:SYNTax?	Returns the syntax of the specified command.
:IEMessage	Sends interface event messages between the VXI interface and the RS-232 port.
:MODel?	Returns the model number of the mainframe.
:NVRecall	Recalls device settings from nonvolatile RAM.
:NVSave	Saves device settings to nonvolatile RAM.
:OPTions	Returns the options installed in the mainframe.
:PASSword	
:CDISable[1]	Disables the CALibrate command.
:CENable[1]	Enables the CALibrate command.
:STATe?[1]	Queries if password-protected commands are enabled.
:POWer[?]	Powers the mainframe on or off. The query returns whether the power is on or off.
:CYCLe?	Queries the number of times the mainframe power has been cycled.
:SOURce?	Queries the power source of the enhanced monitor.
:SYSReset[?]	Sets or queries whether the VXI SYSRESET signal can reset the enhanced monitor.
:IMMediate	Initiates a VXI SYSRESET signal.
:TIME[?]	Sets or queries the time.
:LMAintenance?	Returns the number of hours the mainframe has been operating since the last factory maintenance.
:ON?	Returns the number of hours the mainframe has been operating since power on.
:VERSion?	Returns the SCPI version supported by the IntelliFrame Mainframe.

1 **These commands are intend to be used only by qualified service personnel while servicing the instrument.**

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Test Commands

Commands in the TEST subsystem execute the internal self-tests of the IntelliFrame Mainframe Detailed information on the TEST subsystem begins on page 3–149.

Table 3–10: Test commands

Header	Description
TEST	
[:ALL][?]	Executes all internal self tests once. The query returns the test results.
:NUMBer[?]	Executes a test. The query returns the test result.
:RESults?	Returns the failure code for the last self-test command that was executed.
:VERBose?	Returns a failure code as a string describing the last executed self-test command and the test results.

VXI Monitor Commands

Commands in the VXIMonitor subsystem control parameters that relate to the VXIbus. Detailed information on the VXIMonitor subsystem begins on page 3–155.

Table 3–11: VXI Monitor commands

Header	Description
VXIMonitor	
:REPeat[?]	Sets or queries the repeat mode of the VXI monitor.
:STATe[?]	Starts or stops the VXI monitor.
:TINTerval[?]	Sets the time interval to run the VXI monitor.

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IEEE 488.2 Commands

The IntelliFrame Mainframe supports the following IEEE 488.2 common commands. Detailed information on the command begins on page 3–161.

Table 3–12: IEEE 488.2 common commands

Header	Description
*CLS	Clears the SCPI and IEEE 488.2 event registers and the Error/Event Queue.
*ESE[?]	Sets or queries standard Event Status Enable register.
*ESR?	Returns the contents of the Standard Event Status Register.
*IDN?	Returns the identification message of the mainframe.
*OPC[?]	Synchronizes command execution with the controller.
*PSC[?]	Sets or queries the power-on status clear flag.
*RST	Resets instrument settings to a default state.
*SRE[?]	Sets or queries the Service Request Enable register.
*STB?	Returns the contents of the Status Byte Register.
*TST?	Initiates an internal self test and returns a failure code.
*WAI?	Synchronizes command execution with the system controller.

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Syntax

This section provides an overview of the commands for the IntelliFrame Mainframe and includes the following topics:

- A brief introduction to SCPI
- A description of the command syntax
- Instructions on how to enter commands

The commands for the mainframe are compatible with IEEE-488.1, IEEE-488.2, and SCPI-1995.0 standards.

SCPI

SCPI (Standard Commands for Programmable Instruments) is a standard created by an international consortium of the major manufacturers of test and measurement equipment. SCPI uses IEEE-488.2 syntax to provide common commands for the same functions of various programmable instruments.

The standard simplifies the task of programming a group of instruments that use SCPI. Instead of having to learn different commands for every instrument, the programmer may use the same commands for the same functions of each instrument.

The controller sends instructions to the instrument in the form of commands or queries. Commands modify control settings or tell the instrument to perform a specific action. Queries cause the instrument to send data or status information back to the controller. A question mark at the end of a command header identifies it as a query.

Command Syntax

Any instruction that you send to an instrument that complies with SCPI must have at least three basic elements:

- Command header
- Parameter (if required)
- Message terminator or separator

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Command Headers

The command header has a hierarchical structure that may be represented by a command tree (see Figure 3–3). An easy-to-remember word called a mnemonic designates each level of the hierarchy. A colon separates the levels.

The top level of the tree is the root level. A root node is a mnemonic at the root level. A root node and one or more lower-level nodes form a header path to the last node called the leaf node.

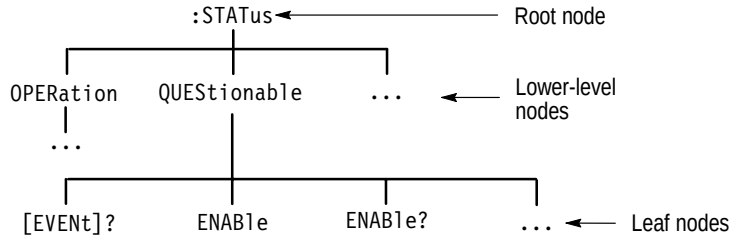


Figure 3–3: Tree hierarchy

The header path and leaf node together form the command header. Figure 3–4 shows the command header for the leaf node indicated in Figure 3–3.

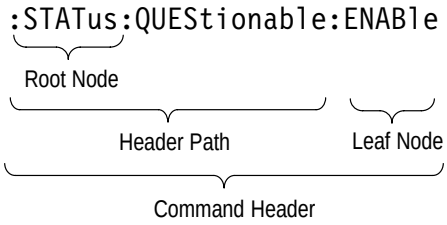


Figure 3–4: Command header

Parameter

You must include values for commands that have parameters. In this manual, the < > symbols enclose the parameter type when stating the syntax of the command. For example, the syntax of the command in Figure 3–5 includes the <NRf> parameter type.

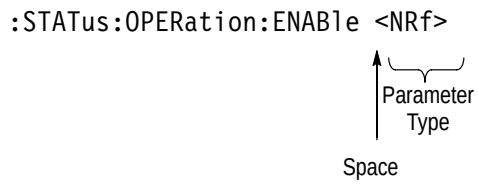


Figure 3–5: Command header with parameter

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NOTE. *Do not include the* `<, >, {, }, or |` *symbols when entering the actual value for a parameter.*

Separate multiple parameters after a command header with a comma. For example:

```
STATus:QUEStionable:TEMPerature:LIMit DELTa1,30
```

Table 3–13 defines the command and response parameter types for the Intelli-Frame Mainframe.

Table 3–13: Parameter types for syntax descriptions

Parameter type	Description	Example
Boolean	Boolean number or value (command parameter, response returns a 1 or 0)	ON or 1 OFF or 0
Block	A specified length of block-formatted data (command parameter)	#212xxxxxxxxxxx where 2 indicates that the following 2 digits (12) specify the length of the following block data (xxx...)
Nondecimal numeric	Integers in hexadecimal (#H), octal (#Q), or binary (#B) format (command parameter).	#H00FF, #B010101, #Q0753
NR1	Integers (response parameter)	0, 1, 15
NR2	Decimal numbers (response parameter)	1.2, 3.141516, 6.5
NRf	Integer, decimal, or floating point number as well as MAX and MIN for setting the largest or smallest value the instrument allows. (command parameter)	1, 3E+1, MAX, 2.6
discrete	A list of specific values (command or response parameter)	P24, P5EXT, N2, ...
String	Alphanumeric characters within quotation marks (command or response parameter)	“No error”

Parameter values that appear in this manual are often enclosed in curly braces ({}) separated by a vertical line. This vertical line means the same thing as the word “or.” For example, values for the parameter <Boolean> are

```
{0|1|OFF|ON}
```

This is the same thing as saying “0 or 1 or OFF or ON.” Any single value is a valid parameter.

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Message Terminator and Message Separator

In accordance with IEEE 488.2 and the VXIbus specification, the IntelliFrame Mainframe accepts any of the following message terminators:

- LF^END — Linefeed code (hexadecimal 0A) with the END bit in the *Byte Available* command asserted.
- LF — Linefeed code
- <dab>^END — Last data byte with the END bit in the *Byte Available* command asserted.

A semicolon separates one command from another when the commands appear on the same line. See *Entering Commands*.

Entering Commands

The standards that govern the command set for the IntelliFrame Mainframe allows for a certain amount of flexibility when you enter commands. For example, you can abbreviate many commands or combine commands into one message that you send to the mainframe. This flexibility, called “friendly listening,” saves programming time and makes the command set easier to remember and use.

Command Characters

The mainframe is not sensitive to the case of command characters. You can enter commands in either upper or lower case.

You can precede any command with white space characters. White space characters include a space or any combination of the ASCII control characters hexadecimal 00 through 1F except for the character 0A (new line). You must, however, use at least one space between the parameter and the command header.

Abbreviating Commands

Most commands have a long form and a short form. The listing for each command in this section shows the abbreviations in upper case. For example, you can enter the query `SYSTem:ERRor?` simply as `SYST:ERR?` (or `syst:err?`).

The brackets around a mnemonic indicate that the mainframe assumes this level of the command header by default. It is not necessary, therefore, for this mnemonic to appear as part of the header when you send the command. For example, you can abbreviate the command

```
STATus:OPERational[:EVENt]?
```

to

```
STAT:OPER?
```


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Because the mainframe assumes that a command at the beginning of a program message starts from the root, you have the option of beginning the initial command header with a colon (:).

Combining Commands

You can combine (concatenate) commands and queries using a semicolon (;). The mainframe executes concatenated commands in the order it receives them. When you concatenate queries, the mainframe combines the responses into a single response message. For example, querying both the standard event status register and the error/event queue in the same program message

```
STATus:OPERation?;:SYSTem:ERRor?
```

returns the response message

```
0;0,"No errors"
```

If the command that follows the semicolon has a different header path from the root level, you must use a colon to force a return to the root level:

```
SYSTem:VERSion?;:TEST:RESult?
```

If the command that follows the semicolon has the same header path, you may omit the colon and the path and state only the new leaf node. This makes it possible, for example, to shorten the concatenated query

```
SYSTem:TIME:LMAintenance?;:SYSTem:TIME:ON?
```

into

```
SYSTem:TIME:LMAintenance?;ON?
```

The 488.2 common commands that begin with an asterisk (*) may be used anywhere in a command sequence with no effect on the command header path.

```
SYSTem:VERSion?;*ESR?
```

returns

```
1995.0;16
```

You can combine commands and queries into the same message. Note, for example, the following combination which sets the temperature limit and queries to verify the setting

```
status:questionable:temperature:limit AMBient,25;limit? AMBient
```


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DISPlay Subsystem

This section describes the commands in the DISPlay Subsystem, which applies to all VX1420A mainframes or VX1410A mainframes with Option 1M or field upgrade VXF1M. Use the DISPlay subsystem to display user defined messages on the front panel. Figure 3–6 lists the DISPlay subsystem parameters.

***NOTE**. The standard VX1410A mainframe does not include a front-panel display.*

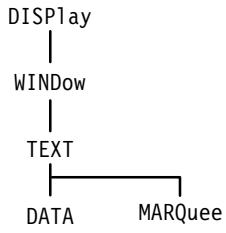


Figure 3–6: DISPlay subsystem hierarchy

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DISPlay:WINDow:TEXT:DATA
DISPlay:WINDow:TEXT:DATA?

Sets or queries the user defined message to be displayed on the front panel readout of the mainframe. You can display up to 60 characters in the message. The string "SYSTEM OK" is the default factory message. This message only displays when there are no monitor failures.

Syntax

```
DISPlay[:WINDow]:TEXT[:DATA] <String>|<Block>
DISPlay[:WINDow]:TEXT[:DATA]?
```

Parameters

Parameter	Query response
<String> <Block>	<String>

Reset Value

Not Applicable

Errors and Events

–223, "Too Much Data"
You attempted to send too much data to the display.

–220, "Parameter Error"
You attempted to send nonprinting data in the block parameter.

Dependencies

None

Examples

Command: `DISP:TEXT "SYSTEM INIT"`

Query: `DISP:TEXT?`

Response: `"SYSTEM INIT"`

Related Commands

None

NOTE. (DISPlay:WINDow:TEXT:DATA): *This command applies to all VX1420A mainframes or VX1410A mainframes with Option 1M.*

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DISPlay:TEXT:MARQuee
DISPlay:TEXT:MARQuee?

Sets or queries the state of marquee display on the front panel readout of the mainframe. Up to 20 characters can be displayed at one time. For user defined messages of greater length (60 characters maximum) the display will rotate slowly to the left. When ON is selected the user defined message will continuously rotate to the left regardless of the length.

Syntax

```
DISPlay[:WINDow]:TEXT:MARQuee <Display Control>
DISPlay[:WINDow]:TEXT:MARQuee?
```

Parameters

<Display control>	Query response
AUTO ON	AUTO ON

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to set the marquee display to an illegal value.

Dependencies

None

Examples

Command: `DISP:TEXT:MARQ AUTO`

Query: `DISP:TEXT:MARQ?`

Response: `AUTO`

Related Commands

None

NOTE. (DISPlay:WINDow:TEXT:MARQuee): *This command applies to all VX1420A mainframes or VX1410A mainframes with Option 1M.*

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STATus Subsystem

This section describes each command and query in the STATus subsystem. The STATus subsystem controls the parameters shown in Figure 3–7.

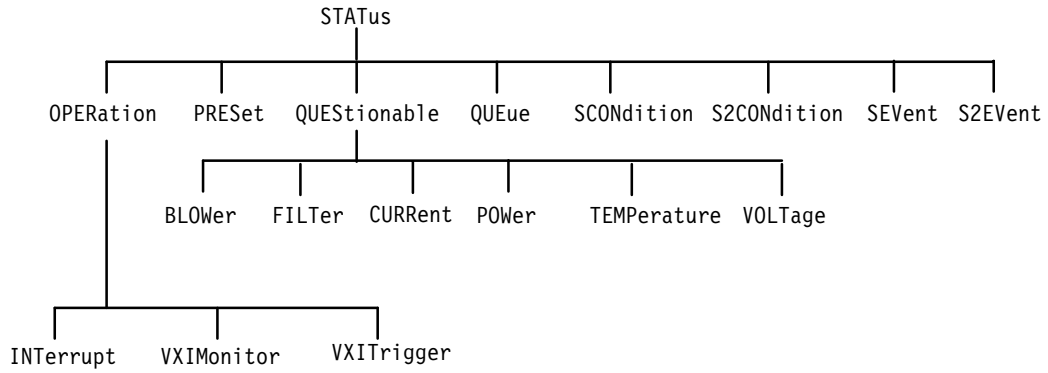


Figure 3–7: STATus subsystem hierarchy

Use the STATus subsystem to monitor the status of the voltages, currents, power, temperatures, fans, and the VXI Monitor.

The differences between the Event Registers and the Condition Register are as follows:

- Reading the Event Register is destructive. Contents are reset to zero until an event occurs. If the triggering event disappears, the corresponding event bit remains set until the register is read or *RST (IEEE command) is performed.
- Reading the Condition Register is not destructive. The Condition Register gives a real-time account of the status.

The Enable Register does not affect the related Event or Condition Registers. For example, the Enable Register for the current sense (“STAT:QUES:CURR:ENABLE?”) does not effect which bits are set in the Condition Register (“STAT:QUES:CURR:COND?”). The Enable Register does affect which bits will cause the current bit to be set in the questionable Event Register (”STAT:QUES?”) or the questionable condition register (“STAT:QUES:COND?”).

Examples:

1. Read the amperage draw used by the +5 Volt supply:
   STAT:QUES:CURR:LEV? P5
   The system response: 17.5

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2. Read the Event Register for all currents:
   STAT:QUES:CURR?
   The system response: 0

3. Read the Condition Register for all currents:
   STAT:QUES:CURR:COND?
   The system response: 0

4. Set an alarm to activate by dropping the amperage threshold for the +5 Volt supply down to 10 Amps:
   STAT:QUES:CURR:LIMIT P5, 10.0
   The system response: The front panel display should start flashing the alarm for +5V current over limits

5. Read the Condition and Event Registers. They should have bit 2 set.
   STAT:QUES:CURR?
   The system response: 4
   STAT:QUES:CURR:CONDITION:
   The system response: 4

6. Read the same registers: since the event still exists the Condition Register will display the problem with +5V current. The Event Register was cleared from the previous read operation:
   STAT:QUES:CURR?
   The system response: 0
   STAT:QUES:CURR:COND?
   The system response: 4

7. Clear all event registers and reset the alarm:
   *CLS

8. Read the Event Register that shows *CLS caused the event to be re-triggered:
   STAT:QUES:CURR?
   The system response: 4

9. Clear the event again to trigger the event, but this time eliminate the error before reading registers:
   *CLS
   STAT:QUES:CURR:LIMIT P5, MAX
   The system response: The alarm is removed
   STAT:QUES:CURR?
   The system response: 4 (Error situation removed, but still displays the event)
   STAT:QUES:CURR:COND?
   The system response: 0 (No errors exist at this time)

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STATus:OPERation?

Returns the contents of the Operation Event register. A value of one in a bit indicates the corresponding condition bit changed from false to true. Unused bits always return a value of zero. The register is cleared by the *CLS command.

There is no command associated with this query.

Syntax

```
STATus:OPERation[:EVENt]?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

Operation status word bits	Definition
D0	CALibrating
D1	Not Used
D2	Not Used
D3	Not Used
D4	Not Used
D5	VXI Triggers
D6	Not Used
D7	Not Used
D8	VXI Monitor
D9	Mainframe Power Down
D10	VXI Interrupts
D11	Not Used
D12	Not Used
D13	Not Used
D14	Not Used
D15	Not Used

Reset Value 0

Errors and Events None

Dependencies Reading the register clears it.

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Examples

Query: `STAT:OPER?`

Response: `0`

Related Commands

STATus:OPERation:CONDition?

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STATus:OPERation:CONDition?

Returns the contents of the Operation Condition register. A value of one in a bit indicates the corresponding current condition is asserted. Definition of the bits in this register can be found under the STATus:OPERation? command on page 3–33. Unused bits always return a value of 0.

Reading the Operation Condition register does not clear it.

There is no command associated with this query.

Syntax

```
STATus:OPERation:CONDition?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:OPER:COND?`

Response: 0

Related Commands

STATus:OPERation?

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STATus:OPERation:ENABle
STATus:OPERation:ENABle?

Sets or queries the contents of the Operation Event Enable register. Setting unused enable bits does not generate an error; the unused bits are ignored.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power-on, the register value will be restored from nonvolatile RAM; otherwise the register value at power-on is set to #H0000. Executing the STATus:PRESet command sets the register value to #H0000.

Syntax

```
STATus:OPERation:ENABle <Mask>
STATus:OPERation:ENABle?
```

Parameters

<Mask>	Query response
{<NRf> | <Nondecimal Numeric>} 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

0

Errors and Events

–222, “Data Out of Range”
You attempted to set the mask to an illegal value.

Dependencies

None

Examples

Command: `STAT:OPER:ENAB #H0100`

Query: `STAT:OPER:ENAB?`

Response: `256`

Related Commands

STATus:OPERation?
STATus:OPERation:CONDition
STATus:PRESet

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STATus:OPERation:VXIInterrupt?

Queries the contents of the VXI Interrupts Monitor Event Register. A value of one in a bit indicates the corresponding condition bit has transitioned from false to true. Unused bits always return a value of zero. The register is cleared by the *CLS command.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXIInterrupt[:EVENt]?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

VXI Monitor event word bits	Definition
D0	IRQ1 occurred
D1	IRQ2 occurred
D2	IRQ3 occurred
D3	IRQ4 occurred
D4	IRQ5 occurred
D5	IRQ6 occurred
D6	IRQ7 occurred
D7	Not Used
D8	Not Used
D9	Not Used
D10	Not Used
D11	Not Used
D12	Not Used
D13	Not Used
D14	Not Used
D15	Not Used

Reset Value Not Applicable

Errors and Events None

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Dependencies Reading the register clears it.

Examples Query: `STAT:OPER:VXII?`

Response: 1

Related Commands STATus:OPERation:VXIInterrupt:CONDition?
STATus:OPERation:VXIInterrupt:ENABle

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STATus:OPERation:VXIInterrupt:CONDition?

Queries the contents of the VXI Interrupt Monitor Condition register. A value of one in a bit indicates the corresponding condition bit has transitioned from false to true. Unused bits always return a value of zero. Definition of the bits in this register can be found in STATus:OPERation:VXIInterrupt command.

The enhanced monitor latches the state of the VXI IRQ lines into a hardware register. This register is cleared upon VXI Monitor initialization. This query returns the state of this register.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXIInterrupt:CONDition?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:OPER:VXII:COND?`

Response: 0

Related Commands

STATus:OPERation:VXIInterrupt?
STATus:OPERation:VXIInterrupt:ENABle

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STATus:OPERation:VXIInterrupt:INTerrupt?

Queries the time when the VXI Interrupt signal was asserted. The time is relative to the mainframe power-on time.

If there are multiple occurrences of the Interrupt signal, only the time of the first assertion is saved.

When no Interrupt is detected, the query returns a value of 0 in all fields. At power-on, or starting the VXI monitor, the values of all fields are set to 0.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXIInterrupt:INTerrupt? <interrupt>
```

Parameters

Parameter	Query response
{IRQ1 ... IRQ7}	<Hour>,<Minute>,<Second>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:OPER:VXII:INT? IRQ1`

Response: `12,3,1`

Related Commands

STATus:OPERation:VXIInterrupt:CONDition?
STATus:OPERation:VXIInterrupt:ENABle
STATus:OPERation:VXIInterrupt?

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STATus:OPERation:VXIInterrupt:ENABle
STATus:OPERation:VXIInterrupt:ENABle?

Sets or queries the contents of the VXI Interrupt Monitor Enable register. Setting unused enable bits does not generate an error; the bits are ignored.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power on, the register value will be restored from nonvolatile RAM; otherwise the register value at power on is set to #H7FFF. Executing the STATus:PRESet command sets the register value to #H7FFF.

Syntax

```
STATus:OPERation:VXIInterrupt:ENABle <Mask>
STATus:OPERation:VXIInterrupt:ENABle?
```

Parameters

<Mask>	Query response
<NRf> | <Nondecimal Numeric> 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable register to an illegal value.

Dependencies

None

Examples

Command: `STAT:OPER:VXII:ENAB #HOOO1`

Query: `STAT:OPER:VXII:ENAB?`

Response: 1

Related Commands

STATus:OPERation:VXIInterrupt?
STATus:OPERation:VXIInterrupt:CONDition?
STATus:PRESet

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STATus:OPERation:VXIMonitor?

Queries the contents of the VXI Monitor Event Register. A value of one in a bit indicates the corresponding condition bit changed from false to true. Unused bits always return a value of zero. The register is cleared by the *CLS command.

The VXI Monitor must be running (See *VXIMonitor Subsystem* on page 3–155) for these events to be recorded.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXIMonitor[:EVENt]?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

VXI Monitor event word bits	Definition
D0	BERR Occurred
D1	SYSFAIL Occurred
D2	ACFAIL Occurred
D3	AS Missing
D4	Not Used
D5	Not Used
D6	Not Used
D7	Not Used
D8	Not Used
D9	Not Used
D10	Not Used
D11	Not Used
D12	Not Used
D13	Not Used
D14	Not Used
D15	Not Used

Reset Value

0

Errors and Events

None

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Dependencies Reading the register clears it.

Examples Query: `STAT:OPER:VXIM?`

Response: `0`

Related Commands STATus:OPERation:VXIMonitor:CONDition?
STATus:OPERation:VXIMonitor:ENABle

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STATus:OPERation:VXIMonitor:ACFail?

Queries the time when the VXI ACFAIL signal was asserted. The time is relative to the mainframe power-on time.

If there are multiple occurrences of the ACFAIL signal, only the time of the first assertion is saved. Reading the time enables it to record the next ACFAIL signal assertion time.

When no ACFAIL is detected, the query returns a value of 0 in all fields. At power-on, or restarting VXIMonitor the values of all fields are set to 0.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXIMonitor:ACFail?
```

Parameters

Parameter	Query response
Not Applicable	<Hour>,<Minute>,<Second>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:OPER:VXIM:ACF?`

Response: `0,0,0`

Related Commands

STATus:OPERation:VXIMonitor:CONDition?
STATus:OPERation:VXIMonitor:ENABle
STATus:OPERation:VXIMonitor?

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STATus:OPERation:VXIMonitor:BERR?

Queries the VXI Bus Error address space.

If multiple bus errors occurred, only the first BERR address space will be saved. If there are no errors, the query returns NONE.

At power-on the value is set to NONE.

There is no command associated with this query.

Syntax `STATus:OPERation:VXIMonitor:BERR?`

Parameters

Parameter	Query response
Not Applicable	{A16 | A24 | A32 | NONE}

Reset Value 0

Errors and Events None

Dependencies None

Examples Query: `STAT:OPER:VXIM:BERR?`

Response: `A16`

Related Commands STATus:OPERation:VXIMonitor:CONDition?
STATus:OPERation:VXIMonitor:ENABle
STATus:OPERation:VXIMonitor?

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STATus:OPERation:VXIMonitor:CONDition?

Queries the contents of the VXI Monitor Condition register. A value of one in a bit indicates the corresponding condition bit has transitioned from false to true. Unused bits always return a value of zero. Definition of the bits in this register can be found in STATus:OPERation:VXIMonitor command.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXIMonitor:CONDition?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:OPER:VXIM:COND?`

Response: 0

Related Commands

STATus:OPERation:VXIMonitor?
STATus:OPERation:VXIMonitor:ENABle

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STATus:OPERation:VXIMonitor:ENABle
STATus:OPERation:VXIMonitor:ENABle?

Sets or queries the contents of the VXI Monitor Enable register. Setting unused enable bits does not generate an error; the bits are ignored.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power-on, the register value will be restored from nonvolatile RAM; otherwise the register value at power-on is set to #H7FFF. Executing the STATus:PRESet command sets the register value to #H7FFF.

Syntax

```
STATus:OPERation:VXIMonitor:ENABle <Mask>
STATus:OPERation:VXIMonitor:ENABle?
```

Parameters

<Mask>	Query response
{<NRf> | <Nondecimal Numeric>} 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

0

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable register to an illegal value.

Dependencies

None

Examples

Command: `STAT:OPER:VIXM:ENAB #HOOO1`

Query: `STAT:OPER:VXIM:ENAB?`

Response: 1

Related Commands

STATus:OPERation:VXIMonitor?
STATus:OPERation:VXIMonitor:CONDition?
STATus:PRESet

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STATus:OPERation:VXIMonitor:SYSFail?

Queries the time when the VXI SYSFAIL signal was asserted. The time is relative to the mainframe power-on time.

If there are multiple occurrences of the VXI SYSFAIL signal, only the time of the first assertion is saved. Reading the time enables it to record the next SYSFAIL signal assertion time.

When no SYSFAIL is detected, the query returns a value of 0 in all fields. At power-on, or after restarting VXIMonitor the values of all fields are set to 0.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXIMonitor:SYSFail?
```

Parameters

Parameter	Query response
Not Applicable	<Hour>,<Minute>,<Second>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:OPER:VXIM:SYSF?`

Response: `12,3,1`

Related Commands

STATus:OPERation:VXIMonitor:CONDition?
STATus:OPERation:VXIMonitor:ENABle
STATus:OPERation:VXIMonitor?

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STATus:OPERation:VXITrigger?

Queries the contents of the VXI TTL Trigger Monitor Event Register. A value of one in a bit indicates that the corresponding condition bit has transitioned from high to low. Unused bits always return a value of zero.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXITrigger[:EVENt]?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

VXI Monitor event word bits	Definition
D0	TTL0trig occurred
D1	TTL1trig occurred
D2	TTL2trig occurred
D3	TTL3trig occurred
D4	TTL4trig occurred
D5	TTL5trig occurred
D6	TTL6trig occurred
D7	TTL7trig occurred
D8	Not Used
D9	Not Used
D10	Not Used
D11	Not Used
D12	Not Used
D13	Not Used
D14	Not Used
D15	Not Used

Reset Value

Not Applicable

Errors and Events

None

Dependencies

Reading the register clears it.

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Examples

Query: `STAT:OPER:VXIT?`

Response: 1

Related Commands

STATus:OPERation:VXITrigger:CONDition?
STATus:OPERation:VXITrigger:ENABle

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STATus:OPERation:VXITrigger:CONDition?

Queries the contents of the VXI TTL Trigger Monitor Condition register. A value of one in a bit indicates the corresponding condition bit has transitioned from high to low. Unused bits always return a value of zero. The definition of the bits in this register can be found in STATus:OPERation:VXITrigger command.

The enhanced monitor latches the state of VXI TTL Trigger lines into a hardware register. This register cleared upon VXI Monitor initialization. This query returns the state of this register.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXITrigger:CONDition?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:OPER:VXIT:COND?`

Response: 0

Related Commands

STATus:OPERation:VXITrigger?
STATus:OPERation:VXITrigger:ENABle

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STATus:OPERation:VXITrigger:TRIGger?

Queries the time when the VXI TTL Trigger signal was asserted. The time is relative to the mainframe power on time.

If there are multiple occurrences of the TTL Trigger signal, only the time of the first assertion is saved.

When no Trigger is detected, the query returns a value of 0 in all fields. At power on, or after starting the VXI monitor, the values of all fields are set to 0.

There is no command associated with this query.

Syntax

```
STATus:OPERation:VXITrigger:TRIGger? <trigger>
```

Parameters

Parameter	Query response
{TTL0trig ... TTL7trig}	<Hour>,<Minute>,<Second>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:OPER:VXIT:TRIG? TTL0`

Response: `12,3,1`

Related Commands

STATus:OPERation:VXITrigger:CONDition?
STATus:OPERation:VXITrigger:ENABle
STATus:OPERation:VXITrigger?

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STATus:OPERation:VXITrigger:ENABle
STATus:OPERation:VXITrigger:ENABle?

Sets or queries the contents of the VXI TTL Trigger Monitor Enable register. Setting unused enable bits does not generate an error; the bits are ignored.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power on, the register value will be restored from nonvolatile RAM; otherwise the register value at power on is set to #H7FFF. Executing the STATus:PRESet command sets the register value to #H7FFF.

Syntax

```
STATus:OPERation:VXITrigger:ENABle <Mask>
STATus:OPERation:VXITrigger:ENABle?
```

Parameters

<Mask>	Query response
<NRf> | <Nondecimal Numeric> 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable register to an illegal value.

Dependencies

None

Examples

Command: `STAT:OPER:VXIT:ENAB #HOOO1`

Query: `STAT:OPER:VXIT:ENAB?`

Response: 1

Related Commands

STATus:OPERation:VXITrigger?
STATus:OPERation:VXITrigger:CONDition?
STATus:PRESet

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STATus:PRESet

Presets the SCPI enable registers. The Operation and Questionable Enable registers are preset to zero, disabling all events. All other enable registers are preset to all ones, enabling all events. The Error/Event Queue is preset to the default value of –499:0. The SCPI Positive Transition Filters are preset to 1.

This command does not clear the SCPI event registers or the IEEE 488.2 enable and event registers.

Syntax `STATus:PRESet`

Reset Value 0

Errors and Events None

Dependencies None.

Examples Command: `STAT:PRES`

Related Commands STATus:OPERation:ENABle
STATus:QUEue:ENABle
STATus:QUEStionable:ENABle
*CLS

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STATus:QUEStionable?

Returns the contents of the Questionable Event register. A value of one in a bit indicates the corresponding condition bit changed from false to true. Unused bits always return a value of zero. The register is cleared by the *CLS command.

There is no command associated with this query..

Syntax

```
STATus:QUEStionable[:EVENt]?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

Questionable status word bits	Definition
D0	VOLTage
D1	CURRent
D2	Not Used
D3	POWer
D4	TEMPerature
D5	Not Used
D6	Not Used
D7	Not Used
D8	CALibration
D9	BLOWer
D10	FILTer
D11	Not Used
D12	Not Used
D13	Not Used
D14	Not Used
D15	Not Used

Reset Value

0

Errors and Events

None

Dependencies

Reading the register clears it.

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Examples

Query: `STAT:QUES?`

Response: `0`

Related Commands

STATus:QUEStionable:CONDition?
STATus:QUEStionable:ENABle

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STATus:QUEStionable:BLOWer?

Queries the contents of the Blower Event register. A value of one in a bit indicates the corresponding condition bit changed from false to true and that there may be a problem with one of the fans. Unused bits always return a value of zero. The register is cleared by the *CLS command.

There is no command associated with this query.

Syntax `STATus:QUEStionable:BLOWer[:EVENt]?`

Parameters

Parameter	Query response
Not applicable	<NR1>

Blower status word bits	Definition
D0	Blower 1
D1	Blower 2
D2	Not Used
D3	Not Used
D4	Not Used
D5	Not Used
D6	Not Used
D7	Not Used
D8	Not Used
D9	Not Used
D10	Not Used
D11	Not Used
D12	Not Used
D13	Not Used
D14	Not Used
D15	Not Used

Reset Value 0

Errors and Events None

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Dependencies Reading the register clears it.

Examples Query: `STAT:QUES:BLOW?`

Response: `0`

Related Commands STATus:QUEStionable:BLOWer:CONDition?
STATus:QUEStionable:BLOWer:ENABle

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STATus:QUEStionable:BLOWer:CONDition?

Returns the contents of the Blower Condition register. A value of one in a bit indicates possible problems with one of the fans. Unused always return a value of zero. Definition of the bits in this register can be found under the STATus:QUEStionable:BLOWer command on page 3–57.

Reading this register does not clear it.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:BLOWer:CONDition?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUES:BLOW:COND?`

Response: 0

Related Commands

STATus:QUEStionable:BLOWer?
STATus:QUEStionable:BLOWer:ENABle

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STATus:QUEStionable:BLOWer:ENABle
STATus:QUEStionable:BLOWer:ENABle?

Sets or queries the contents of the Blower Enable register. Setting unused enable bits does not generate an error; the bits are ignored. Enabling bits in the register allows information from the Blower Event register to be passed on to the Questionable Event register.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power on, the register value will be restored from nonvolatile RAM; otherwise the register value at power on is set to #H7FFF. Executing the STATus:PRESet command sets the register value to #H7FFF.

Syntax

```
STATus:QUEStionable:BLOWer:ENABle <Mask>
STATus:QUEStionable:BLOWer:ENABle?
```

Parameters

<Mask>	Query response
{<NRf> | <Nondecimal Numeric>} 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

0

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable register to an illegal value.

Dependencies

None

Examples

Command: `STAT:QUES:BLOW:ENAB #H0000`

Query: `STAT:QUES:BLOW:ENAB?`

Response: `0`

Related Commands

STATus:QUEStionable:BLOWer?
STATus:QUEStionable:BLOWer:CONDition?
STATus:PRESet

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STATus:QUEStionable:BLOWer:SPEed?

Queries the current fan (blower) rotational speed in revolutions per minute (RPM). Normal values are 1200 to 3350 for the VX1410A and 650 to 2250 for the VX1420A.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:BLOWer:SPEed? <Blower>
```

Parameters

<Blower>	Query response
{BLOWer1 | BLOWer2}	<NR1>

Reset Value

0

Errors and Events

–224, “Illegal Parameter Value”
You attempted to use an invalid parameter value.

Dependencies

None

Examples

Query: `STAT:QUES:BLOW:SPE? BLOW1`

Response: `1200`

Related Commands

STATus:QUEStionable:BLOWer?
STATus:QUEStionable:BLOWer:CONDition?
STATus:QUEStionable:BLOWer:ENABle

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STATus:QUEStionable:CONDition?

Queries the contents of the Questionable Condition register. Unused bits always return a value of zero. Definition of the bits in this register can be found under the STATus:QUEStionable? command on page 3–55.

Reading the register does not clear it.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:CONDition?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUES:COND?`

Response: 0

Related Commands

STATus:QUEStionable?
STATus:QUEStionable:ENABle

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STATus:QUEStionable:CURRent?

Queries the contents of the Current Event register. A one in a bit indicates the corresponding power supply failure event has been asserted. Unused bits always return a value of zero. The register is also cleared by the *CLS command.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:CURRent[:EVENt]?
```

Parameters

<Event>	Query response
Not applicable	<NR1>

Current status word bits	Definition
D0	+24 V
D1	+12 V
D2	+5 V
D3	Not Used
D4	Not Used
D5	–2 V
D6	–5.2 V
D7	–12 V
D8	–24 V
D9	Not Used
D10	Not Used
D11	Not Used
D12	Not Used
D13	Not Used
D14	Not Used
D15	Not Used

Reset Value

Not Applicable

Errors and Events

None

Dependencies

Reading the register clears it.

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Examples

Query: `STAT:QUES:CURR?`

Response: `0`

Related Commands

STATus:QUEStionable:CURRent:CONDition?
STATus:QUEStionable:CURRent:ENABle

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STATus:QUEStionable:CURRent:CMAXimum?

Queries the current maximum measurable power supply currents within the mainframe since power on; the returned value is in amperes.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:CURRent:CMAXimum? <power supply>
```

Parameters

<Power supply>	Query response
{P24 | P12 | P5 | N2 | N5PT2 | N12 | N24}	<NR2>

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to use an illegal parameter value.

Dependencies

None

Examples

Query: `STAT:QUES:CURR:CMAX? P12`

Response: `5.1`

Related Commands

STATus:QUEStionable:CURRent:LEVel?
STATus:QUEStionable:CURRent:MAXimum?

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STATus:QUEStionable:CURRent:CONDition?

Queries the contents of the Current Condition register. A value of one in a bit indicates the corresponding power supply is currently failing. Unused bits always return a value of zero. Definition of the bits in this register can be found in STATus:QUEStionable:CURRent? command.

Reading the register does not clear it.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:CURRent:CONDition?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUES:CURR:COND?`

Response:0

Related Commands

STATus:QUEStionable:CURRent?
STATus:QUEStionable:CURRent:ENABle

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STATus:QUEStionable:CURRent:ENABle
STATus:QUEStionable:CURRent:ENABle?

Sets or queries the contents of the Current Enable register. Setting unused enable bits does not generate an error; the bits are ignored.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power on, the register value will be restored from nonvolatile RAM; otherwise, the register value at power on is set to #H7FFF. Executing the STATus:PRESet command sets the register value to #H7FFF.

Syntax

```
STATus:QUEStionable:CURRent:ENABle <Mask>
STATus:QUEStionable:CURRent:ENABle?
```

Parameters

<Mask>	Query response
<NRf> | <Nondecimal Numeric> 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable register to an illegal value.

Dependencies

None

Examples

Command: `STAT:QUES:CURR:ENAB #H3FFF`

Query: `STAT:QUES:CURR:ENAB?`

Response: `16383`

Related Commands

STATus:QUEStionable:CURRent?
STATus:QUEStionable:CURRent:CONDition?
STATus:PRESet

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STATus:QUEStionable:CURRent:LEVel?

Queries the current power supply output amperage.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:CURRent:LEVel? <Power Supply>
```

Parameters

<Power supply>	Query response
{P24 | P12 | P5 | N2 | N5PT2 | N12 | N24}	<NR2>

Code	Power supply
P24	+24V
P12	+12V
P5	+5V
N2	–2V
N5PT2	–5.2V
N12	–12V
N24	–24V

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to use an illegal parameter value.

Dependencies

None

Examples

Query: `STAT:QUES:CURR:LEV? P5`

Response: `5.11`

Related Commands

STATus:QUEStionable:CURRent?
STATus:QUEStionable:CURRent:CONDition?
STATus:QUEStionable:CURRent:ENABle

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STATus:QUEStionable:CURRent:LIMit
STATus:QUEStionable:CURRent:LIMit?

Sets or queries the maximum allowable current to be drawn from each of the power supplies.

Syntax

```
STATus:QUEStionable:CURRent:LIMit <Location>,<Limit>
STATus:QUEStionable:CURRent:LIMit? <Location>
```

<Location>	**Query response (Amperes)**
{P24 | P12 | P5 | N2 | N5 | N12 | N24}	<NR2>
<Limit>	
<NRf>	
MIN {all supplies}	0.0
MAX {each supply}	
P24	13.0
P12	13.0
P5	95.0
N2	–30.0
N5PT2	–60.0
N12	–13.0
N24	–13.0

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to set the location to an illegal value.

–222, “Data Out of Range”
You attempted to set the current limit to an illegal value.

Dependencies

None

Examples

Query: `STAT:QUES:CURR:LIM? P24`

Response: `12.0`

Related Commands

STATus:QUEStionable:CURRent?
STATus:QUEStionable:CURRent:CONDition?
STATus:QUEStionable:CURRent:ENABle
STATus:QUEStionable:CURRent:LEVel?

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STATus:QUEStionable:CURRent:MAXimum?

Queries the current maximum measurable power supply currents within the mainframe since the last factory maintenance was performed; the returned value is in amperes.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:CURRent:MAXimum? <power supply>
```

Parameters

<Power supply>	Query response (Amperes)
{P24 | P12 | P5 | N2 | N5PT2 | N12 | N24}	<NR2>

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to use an illegal parameter value.

Dependencies

None

Examples

Query: `STAT:QUES:CURR:MAX? P12`

Response: `7.1`

Related Commands

STATus:QUEStionable:CURRent:LEVel?
STATus:QUEStionable:CURRent:CMAXimum?

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STATus:QUEStionable:ENABle
STATus:QUEStionable:ENABle?

Sets or queries the contents of the Questionable Enable register. Setting unused enable bits does not generate an error; the bits are ignored.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power on, the register value will be restored from nonvolatile RAM; otherwise the register value at power on is set to #H0000. Executing the STATus:PRESet command sets the register value to #H0000.

Syntax

```
STATus:QUEStionable:ENABle <Mask>
STATus:QUEStionable:ENABle?
```

Parameters

<Mask>	Query response
{<NRf> | <Nondecimal Numeric>} 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

0

Errors and Events

–222, “Data Out of Range”
The value of the data was outside of the legal value.

Dependencies

None

Examples

Command: `STAT:QUES:ENAB #H0001`

Query: `STAT:QUES:ENAB?`

Response: 1

Related Commands

STATus:QUEStionable?
STATus:QUEStionable:CONDition?
STATus:PRESet

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STATus:QUEStionable:FILTer:TINTerval
STATus:QUEStionable:FILTer:TINTerval?

Sets or queries the filter cleaning interval in hours. The factory default setting is 4000 hours.

Syntax

```
STATus:QUEStionable:FILTer:TINTerval <Time>
STATus:QUEStionable:FILTer:TINTerval?
```

Parameters

<Time>	Query response
<NRf> 1 ≤ N ≤ 65535 MIN MAX	<NR1> 1 65535

Reset Value

0

Errors and Events

–222, “Data Out of Range”
You attempted to set the filter cleaning time interval to an illegal value.

Dependencies

None

Examples

Command: `STAT:QUES:FILT:TINT 300`

Query: `STAT:QUES:FILT:TINT?`

Response: `300`

Related Commands

STATus:QUEStionable:FILTer:TREMaining?
STATus:QUEStionable:FILTer:TRESet

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STATus:QUEStionable:FILTer:TREMaining?

Returns the time for the next filter cleaning cycle.

Syntax `STATus:QUEStionable:FILTer:TREMaining?`

Parameters

Parameter	Query response
0	<NR1>

Reset Value 0

Errors and Events 0

Dependencies None

Examples Query: `STAT:QUES:FILT:TREM?`

Response: 300

Related Commands STATus:QUEStionable:FILTer:TINTerval
STATus:QUEStionable:FILTer:TRESet

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STATus:QUEStionable:FILTer:TRESet

Resets the filter cleaning remaining time to the cleaning interval time.

You can also reset the filter cleaning time by pressing both the PREV and NEXT keys on the front panel-display when the front panel displays the filter cleaning warning message or the filter cleaning remaining time (Option 1M only).

Syntax

```
STATus:QUEStionable:FILTer:TRESet
```

Parameters

Parameter	Query response
Not Applicable	Not Applicable

Reset Value

0

Errors and Events

0

Dependencies

None

Examples

Command: `STAT:QUES:FILT:TRES`

Related Commands

STATus:QUEStionable:FILTer:TINTerval
STATus:QUEStionable:FILTer:TREMaining?

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STATus:QUEStionable:POWer?

Queries the contents of the Power Event register. A one in the corresponding bit indicates the power supply failure event has been asserted. Unused bits always return a value of zero. The register is also cleared by the *CLS command.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:POWer[:EVENt]?
```

Parameters

<Event>	Query response
Not applicable	<NR1>

Current status word bits	Definition
D0	Not Used
D1	Not Used
D2	Not Used
D3	Not Used
D4	Not Used
D5	Not Used
D6	Not Used
D7	Not Used
D8	Not Used
D9	Total Power occurred
D10	Not Used
D11	Not Used
D12	Not Used
D13	Not Used
D14	Not Used
D15	Not Used

Reset Value

Not Applicable

Errors and Events

None

Dependencies

Reading the register clears it.

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Examples

Query: `STAT:QUES:POW?`

Response: `0`

Related Commands

STATus:QUEStionable:POWer:CONDition?
STATus:QUEStionable:POWer:ENABle

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STATus:QUEStionable:POWer:CMAXimum?

Queries the current maximum measurable total power supply wattage within the mainframe since power on; the returned value is in watts.

There is no command associated with this query.

Syntax `STATus:QUEStionable:POWer:CMAXimum?`

Parameters

<Power supply>	Query response
Not Applicable	<NR2>

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Query: `STAT:QUES:POW:CMAX?`

Response: `824.5`

Related Commands STATus:QUEStionable:POWer:LEVel?
STATus:QUEStionable:POWer:MAXimum?

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STATus:QUEStionable:POWer:CONDition?

Queries the contents of the Power Condition register. A value of one in the 9 bit indicates the power supply is over limits. Unused bits always return a value of zero. Definition of the bits in this register can be found in STATus:QUEStionable:POWer? command.

Reading the register does not clear it.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:POWer:CONDition?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUES:POW:COND?`

Response:0

Related Commands

STATus:QUEStionable:POWer?
STATus:QUEStionable:POWer:ENABle

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STATus:QUEStionable:POWer:ENABle
STATus:QUEStionable:POWer:ENABle?

Sets or queries the contents of the Power Enable register. Setting unused enable bits does not generate an error; the bits are ignored.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power on, the register value will be restored from nonvolatile RAM; otherwise the register value at power on is set to #H7FFF. Executing the STATus:PRESet command sets the register value to #H7FFF.

Syntax

```
STATus:QUEStionable:POWer:ENABle <Mask>
STATus:QUEStionable:POWer:ENABle?
```

Parameters

<Mask>	Query response
<NRf> | <Nondecimal Numeric> 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable register to an illegal value.

Dependencies

None

Examples

Command: `STAT:QUES:POW:ENAB #H3FFF`

Query: `STAT:QUES:POW:ENAB?`

Response: `512`

Related Commands

STATus:QUEStionable:POWer?
STATus:QUEStionable:POWer:CONDition?
STATus:PRESet

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STATus:QUEStionable:POWer:LEVel?

Queries the total power supply output wattage.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:POWer:LEVel?
```

Parameters

<Power Supply>	Query response
Not Applicable	<NR2>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUES:POW:LEV?`

Response: `812.3`

Related Commands

STATus:QUEStionable:POWer?
STATus:QUEStionable:POWer:CONDition?
STATus:QUEStionable:POWer:ENABle

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STATus:QUEStionable:POWer:LIMit
STATus:QUEStionable:POWer:LIMit?

Sets or queries the maximum allowable power to be drawn from the entire power supply.

Syntax

```
STATus:QUEStionable:POWer:LIMit <Limit>
STATus:QUEStionable:POWer:LIMit?
```

<Limit>	Query response
<NRf> MIN MAX	<NR2> 0.0 VX1410A: 925.0 VX1420A: 1000.0

Reset Value Not Applicable

Errors and Events –222, “Data Out of Range”
You attempted to set the power limit to an illegal value.

Dependencies None

Examples Query: `STAT:QUES:POW:LIM?`

Response: `675.0`

Related Commands STATus:QUEStionable:POWer?
STATus:QUEStionable:POWer:CONDition?
STATus:QUEStionable:POWer:ENABle
STATus:QUEStionable:POWer:LEVel?

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STATus:QUEStionable:POWer:MAXimum?

Queries the current maximum measurable total power supply wattage within the mainframe since the last factory maintenance was performed; the returned value is in watts.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:POWer:MAXimum?
```

Parameters

<Power supply>	Query response
Not Applicable	<NR2>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUES:POW:MAX?`

Response: `876.3`

Related Commands

STATus:QUEStionable:POWer:LEVel?
STATus:QUEStionable:POWer:CMAXimum?

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STATus:QUEStionable:TEMPerature?

Returns the contents of the Temperature Event register. A value of one in a bit indicates the corresponding condition bit has transitioned from false to true. Unused bits always return a value of zero. The register is cleared by the *CLS command.

There is no command associated with this query.

Syntax `STATus:QUEStionable:TEMPerature[:EVENt]?`

Parameters

Parameter	Query response
Not applicable	<NR1>

Blower status word bits	Definition
D0	Slot 0 Delta Temperature
D1	Slot 1 Delta Temperature
D2	Slot 2 Delta Temperature
D3	Slot 3 Delta Temperature
D4	Slot 4 Delta Temperature
D5	Slot 5 Delta Temperature
D6	Slot 6 Delta Temperature
D7	Slot 7 Delta Temperature
D8	Slot 8 Delta Temperature
D9	Slot 9 Delta Temperature
D10	Slot 10 Delta Temperature
D11	Slot 11 Delta Temperature
D12	Slot 12 Delta Temperature
D13	Ambient Temperature
D14	Not Used
D15	Not Used

Reset Value 0

Errors and Events None

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Dependencies Reading the register clears it.

Examples Query: `STAT:QUES:TEMP?`

Response: 1

Related Commands STATus:QUEStionable:TEMPerature:CONDition?
STATus:QUEStionable:TEMPerature:ENABle

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STATus:QUEStionable:TEMPerature:CMAXimum?

Queries the current maximum measurable temperatures in the mainframe since power on. The returned value is in °C.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:TEMPerature:CMAXimum? <Location>
```

Parameters

<Location>	Query response
{AMBient | OUT0 . . . OUT12 | DELTa0 . . . DELTa12} AMBient – ambient input temperature OUT0 . . . OUT12 – output temperature of each slot DELTa0 . . . DELTa12 – output temperature minus input temperature of each slot	<NR1>

Reset Value

0

Errors and Events

–224, “Illegal Parameter Value”
You attempted to use an illegal parameter value.

Dependencies

None

Examples

Query: `STAT:QUES:TEMP:CMAX? DELTA12`

Response: `50`

Related Commands

STATus:QUEStionable:TEMPerature:LEVel?
STATus:QUEStionable:TEMPerature:MAXimum?

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STATus:QUEStionable:TEMPerature:CONDition?

Queries the contents of the Temperature Condition register. A value of one in a bit indicates the corresponding temperature condition is outside of the limits. Unused bits always return a value of zero. Definition of the bits in this register can be found under the STATus:QUEStionable:TEMPerature? command on page 3–83.

If the fan speed is already set to the maximum speed and the delta temperature is above the limit for 30 seconds, a failure will be reported.

Reading the register does not clear it.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:TEMPerature:CONDition?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUES:TEMP:COND?`

Response: `0`

Related Commands

STATus:QUEStionable:TEMPerature?
STATus:QUEStionable:TEMPerature:ENABle

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STATus:QUEStionable:TEMPerature:ENABle
STATus:QUEStionable:TEMPerature:ENABle?

Sets or queries the contents of the Temperature Enable register. Setting unused enable bits does not generate an error; the bits are ignored.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power on, the register value will be restored from nonvolatile RAM; otherwise, the register value at power on is set to #H7FFF. Executing the STATus:PRESet command sets the register value to #H7FFF.

Syntax

```
STATus:QUEStionable:TEMPerature:ENABle <Mask>
STATus:QUEStionable:TEMPerature:ENABle?
```

Parameters

<Mask>	Query response
{<NRf> | <Nondecimal Numeric>} 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

0

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable register to an illegal value.

Dependencies

None

Examples

Command: `STAT:QUES:TEMP:ENAB #H7FFF`

Query: `STAT:QUES:TEMP:ENAB?`

Response: `32767`

Related Commands

STATus:QUEStionable:TEMPerature?
STATus:QUEStionable:TEMPerature:CONDition?
STATus:PRESet

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STATus:QUEStionable:TEMPerature:LEVel?

Returns the current temperatures in the mainframe; the returned value is in °C.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:TEMPerature:LEVel? <Location>
```

Parameters

<Location>	Query response
{AMBient | OUT0 . . . OUT12 | DELTa0 . . . DELTa12} AMBient – ambient input temperature OUT0 . . . OUT12 – output temperature of each slot DELTa0 . . . DELTa12 – output temperature minus input temperature of each slot	<NR1>

Reset Value

0

Errors and Events

–224, “Illegal Parameter Value”
You attempted to use an illegal parameter value.

Dependencies

None

Examples

Query: `STAT:QUES:TEMP:LEV? OUT0`

Response: `24`

Related Commands

STATus:QUEStionable:TEMPerature?
STATus:QUEStionable:TEMPerature:CONDition?
STATus:QUEStionable:TEMPerature:ENABle

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STATus:QUEStionable:TEMPerature:LIMit
STATus:QUEStionable:TEMPerature:LIMit?

Sets or queries the maximum allowable ambient and delta temperatures in each slot. The factory default settings are 55 °C for ambient and 10 °C for each delta temperature.

Syntax

```
STATus:QUEStionable:TEMPerature:LIMit <Location>,<Limit>
STATus:QUEStionable:TEMPerature:LIMit? <Location>
```

<Location>	Query response
{AMBient | DELTa0 . . . DELTa12} AMBient - ambient input temperature DELTa0 . . . DELTa12 – output temperature minus input temperature of each slot	<NR1>
<Limit>	
<NRf> If Location is AMBient 1 ≤ Limit ≤ 75 MIN MAX If Location is DELTan 5 ≤ Limit ≤ 30 MIN MAX	 1 75 5 30

Reset Value

0

Errors and Events

–224, “Illegal Parameter Value”
You attempted to set the location to an illegal value.

–222, “Data Out of Range”
You attempted to set the temperature limit to an illegal value.

Dependencies

None

Examples

Query: `STAT:QUES:TEMP:LIM? AMB`
Response: `32`

Related Commands

STATus:QUEStionable:TEMPerature?
STATus:QUEStionable:TEMPerature:CONDition?
STATus:QUEStionable:TEMPerature:ENABle
STATus:QUEStionable:TEMPerature:LEVel?

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STATus:QUEStionable:TEMPerature:MAXimum?

Queries the maximum measurable temperatures in the mainframe since the last factory maintenance was performed; the returned value is in °C.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:TEMPerature:MAXimum? <Location>
```

Parameters

<Location>	Query response
{AMBient | OUT0 . . . OUT12 | DELTa0 . . . DELTa12} AMBient – ambient input temperature OUT0 . . . OUT12 – output temperature of each slot DELTa0 . . . DELTa12 – output temperature minus input temperature of each slot	<NR1>

Reset Value

0

Errors and Events

–224, “Illegal Parameter Value”
You attempted to use an illegal parameter value.

Dependencies

None

Examples

Query: `STAT:QUES:TEMP:MAX? AMB`

Response: `32`

Related Commands

STATus:QUEStionable:TEMPerature:LEVel?
STATus:QUEStionable:TEMPerature:CMAXimum?

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STATus:QUEStionable:VOLTage?

Returns the contents of the Voltage Event register. A value of one in a bit indicates the corresponding power supply failure event has been asserted. Unused bits always return a value of zero. The register is cleared by the *CLS command.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:VOLTage[:EVENt]?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

Voltage status word bits	Definition
D0	+24 V
D1	+12 V
D2	+5 V
D3	+5 V Standby
D4	+5 V External
D5	–2 V
D6	–5.2 V
D7	–12 V
D8	–24 V
D9	Not Used
D10	Not Used
D11	Not Used
D12	Not Used
D13	Not Used
D14	Not Used
D15	Not Used

Reset Value 0

Errors and Events None

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Dependencies Reading the register clears it.

Examples Query: `STAT:QUES:VOLT?`

Response: `0`

Related Commands STATus:QUEStionable:VOLTage:CONDition?
STATus:QUEStionable:VOLTage:ENABle

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STATus:QUEStionable:VOLTage:CONDition?

Queries the contents of the Voltage Condition register. A value of one in a bit indicates the corresponding power supply has a failure. Unused bits always return a value of zero. The definition of the bits in this register can be found in STATus:QUEStionable:VOLTage? command on page 3–91.

Reading the register does not clear it.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:VOLTage:CONDition?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

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

Response: 0

Related Commands

STATus:QUEStionable:VOLTage?
STATus:QUEStionable:VOLTage:ENABle

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STATus:QUEStionable:VOLTage:ENABle
STATus:QUEStionable:VOLTage:ENABle?

Sets or queries the contents of the Voltage Enable register. Setting unused enable bits does not generate an error; the bits are ignored.

If the power-on status clear flag is FALSE (see **PSC* command on page 3–166) at power on, the register value will be restored from nonvolatile RAM; otherwise, the register value at power on is set to #H7FFF. Executing the STATus:PRESet command sets the register value to #H7FFF.

Syntax

```
STATus:QUEStionable:VOLTage:ENABle <Mask>
STATus:QUEStionable:VOLTage:ENABle?
```

Parameters

<Mask>	Query response
{<NRf> | <Nondecimal Numeric>} 0 ≤ N ≤ #HFFFF	<NR1>

Reset Value

0

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable register to an illegal value.

Dependencies

None

Examples

Command: `STAT:QUES:VOLT:ENAB #H3FFF`

Query: `STAT:QUES:VOLT:ENAB?`

Response: `16383`

Related Commands

STATus:QUEStionable:VOLTage?
STATus:QUEStionable:VOLTage:CONDition?
STATus:PRESet

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STATus:QUEStionable:VOLTage:LEVel?

Queries the current power supply output voltage.

There is no command associated with this query.

Syntax

```
STATus:QUEStionable:VOLTage:LEVel? <Power Supply>
```

Parameters

<Power supply>	Query response
{P24 | P12 | P5 | P5STBY|P5EXT | N2 | N5PT2 | N12 | N24}	<NR2>

Code	Power supply
P24	+24 V
P12	+12 V
P5	+5 V
P5STBY	+5 V Standby
P5EXT	+5 V External
N2	–2 V
N5PT2	–5.2 V
N12	–12 V
N24	–24 V

Reset Value

0

Errors and Events

–224, “Illegal Parameter Value”
You attempted to use an illegal parameter value.

Dependencies

None

Examples

Query: `STAT:QUES:VOLT:LEV? P24`

Response: `24.01`

Related Commands

STATus:QUEStionable:VOLTage?
STATus:QUEStionable:VOLTage:CONDition?
STATus:QUEStionable:VOLTage:ENABle

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STATus:QUEStionable:VOLTage:PTR
STATus:QUEStionable:VOLTage:PTR?

Sets or queries the power supply positive transition filter.

You can only set or clear bits 3 and 4 of the transition filter. Setting a bit enables the corresponding power supply condition to propagate to the event system. Any failures will display on the front panel readout. If you disable the bits, any failure in the corresponding power supply will not be reported to the front panel readout or to the event system.

Bits 0 – 2 and bits 5 – 8 of the transition filter are always enabled. Bit 15 always returns a 0. The factory default setting is 32743. The +5 V Standby and +5 V External are not monitored.

Syntax

```
STATus:QUEStionable:VOLTage:PTR <Mask>
STATus:QUEStionable:VOLTage:PTR?
```

Parameters

<Mask>	Query response
{<NRf> | <Nondecimal Numeric>} 0 ≤ N ≤ #HFFFF	<NR1>

Voltage positive transition filter bits	Definition
D3	+5 V Standby
D4	+5 V External

Reset Value

0

Errors and Events

–222, “Data Out of Range”
You attempted to set the transition filter to an illegal value.

Dependencies

None

Examples

Command: `STAT:QUES:VOLT:PTR #H7FF7`

Query: `STAT:QUES:VOLT:PTR?`

Response: `32759`

Related Commands

STATus:QUEStionable:VOLTage:CONDition?

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STATus:QUEue?

Returns the next event code and message in the Error/Event queue.

The Error/Event queue is cleared at power on or when you send the *CLS command. This is derived from the standard SCPI command. The SYSTem:ERRor? query is an alias.

There is no command associated with this query.

Syntax

```
STATus:QUEue[:NEXT]?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>, <string>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUE?`

Response: –221, “Settings Conflict.”

Related Commands

STATus:QUEue:ENABle
SYSTem:ERRor?

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STATus:QUEue:ALL?

Returns a comma-separated list of all unread events from the Error/Event queue.

The Error/Event queue is cleared at power on or when you send the *CLS command. The SYSTem:ERRor:ALL? query is an alias.

There is no command associated with this query.

Syntax

```
STATus:QUEue:ALL?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>, <string>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query:

```
STAT:QUE:ALL?
```

Response:

```
–221, “Settings Conflict.”,-224, "Illegal Parameter Val-
ue", . . .
```

Related Commands

STATus:QUEue?
STATus:QUEue:ENABle

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STATus:QUEue:CODE?

Returns the next event code from the Error/Event queue. The SYSTem:ERRor:CODE? query is an alias.

The Error/Event queue is cleared at power on or when you send the *CLS command.

There is no command associated with this query.

Syntax `STATus:QUEue:CODE[:NEXT]?`

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value 0

Errors and Events None

Dependencies None

Examples Query: `STAT:QUE:CODE?`

Response: `-221`

Related Commands STATus:QUEue?
STATus:QUEue:ENABle

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STATus:QUEue:CODE:ALL?

Returns a comma-separated list of all unread events from the Error/Event queue. The SYSTem:ERRor:CODE:ALL? query is an alias.

The Error/Event queue is cleared at power on or when you send the *CLS command.

There is no command associated with this query.

Syntax

```
STATus:QUEue:CODE:ALL?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUE:CODE:ALL?`

Response: `-221,-224`

Related Commands

STATus:QUEue?
STATus:QUEue:CODE?

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STATus:QUEue:COUNt?

Returns the number of unread events in the Error/Event queue. The SYSTem:ERRor:COUNt? query is an alias.

The Error/Event queue is cleared at power on or when you send the *CLS command.

There is no command associated with this query.

Syntax

```
STATus:QUEue:COUNt?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:QUE:COUN?`

Response: 3

Related Commands

STATus:QUEue:ALL?

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STATus:QUEue:ENABle
STATus:QUEue:ENABle?

Sets or queries the enable events to be placed in the Error/Event queue. The SYSTem:ERRor:ENABle and SYSTem:ERRor:ENABle? commands are aliases.

Attempting to enable events that are not reported by the mainframe does not generate an error.

At power on or when you send the STATus:PRESet command the contents of the register is set to –499:0.

Syntax

```
STATus:QUEue:ENABle <Event List>
STATus:QUEue:ENABle?
```

Parameters

<Event list>	Query response
{<NRf> | numeric range[,<NRf> | numeric range]}*	{<NRf> | numeric range[,<NRf> | numeric range]}

* **numeric range is <NRf>:<NRf>**

Reset Value

0

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable list to an illegal value.

Dependencies

STATus:PRESet

Examples

Command: `STAT:QUE:ENAB (-499:200)`

Query: `STAT:QUE:ENAB?`

Response: `(-499:200)`

Related Commands

STATus:QUEue?
STATus:PRESet
SYSTem:ERRor

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STATus:QUEue:ENABle:ALL

Presets the Error/Event queue enable to the value of –1999:1000. The SYSTem:ERRor:ENABle:ALL command is an alias.

Syntax `STATus:QUEue:ENABle:ALL`

Reset Value 0

Errors and Events None

Dependencies None

Examples Command: `STAT:QUE:ENAB:ALL`

Related Commands STATus:PRESet
STATus:QUEue:ENABle
*CLS

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STATus:SCONdition?

Returns the pass/fail condition of all the monitors. A value of one in a bit indicates the corresponding current condition has failed. Unused bits always return a value of zero. The definition of the bits can be found in STATus:SEVent? command on page 3–106.

Reading the register does not clear it.

There is no command associated with this query.

Summary information for current, power, triggers and IRQ reside in the overflow register. If bit 30 is set, the overflow register should be queried for more information. See the STATus:S2CONdition? query on page 3–105.

Syntax

```
STATus:SCONdition?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:SCON?`

Response: `256`

Related Commands

STATus:SEVent?

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STATus:S2CONdition?

Overflow register for the STATus:SCONdition summary condition register. Returns the summary information on the power supply current condition, total power (wattage) condition, TTLTrigger condition and IRQ condition.

Definition of the bits can be found in STATus:S2EVent? query on page 3–108.

There is no command associated with this query.

Syntax

```
STATus:S2CONdition?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

0

Errors and Events

None

Dependencies

None

Examples

Query: `STAT:S2CON?`

Response: 8

Related Commands

STAT:QUES:CURR:COND?
STAT:QUES:POWER:COND?
STAT:OPER:VXII:COND?
STAT:OPER:VXIT:COND?
STAT:SCON?

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STATus:SEVent?

Returns the summary information on the power supply voltage events, temperature events, blower events, filter events, and VXI monitor events.

A one in a bit indicates the corresponding event has been asserted. Unused bits always return a value of zero. The query returns a value of zero at power on or when you send the *CLS command. Reading events by this command does not clear the events. Reading the specific event register will clear the corresponding bits in the register. (That is, STAT:QUES:VOLT? will clear all of the voltage bits in this register). Summary information for current, power, triggers and IRQ reside in an overflow register. If bit 30 is set, the overflow register should be queried for more information. See the STATus:S2EVent? query on page 3–108.

There is no command associated with this query.

Syntax

```
STATus:SEVent?
```

Parameters

Parameter	Query response
Not applicable	<NR1>

Event status word bits	Definition
D0	Blower 1
D1	Blower 2
D2	Filter
D3	Slot 0 Delta Temperature
D4	Slot 1 Delta Temperature
D5	Slot 2 Delta Temperature
D6	Slot 3 Delta Temperature
D7	Slot 4 Delta Temperature
D8	Slot 5 Delta Temperature
D9	Slot 6 Delta Temperature
D10	Slot 7 Delta Temperature
D11	Slot 8 Delta Temperature
D12	Slot 9 Delta Temperature
D13	Slot 10 Delta Temperature
D14	Slot 11 Delta Temperature
D15	Slot 12 Delta Temperature

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Event status word bits	Definition
D16	Ambient Temperature
D17	+24 V
D18	+12 V
D19	+5 V
D20	+5 Standby
D21	+5 V External
D22	–2 V
D23	–5.2 V
D24	–12 V
D25	–24 V
D26	BERR
D27	SYSFAIL
D28	ACFAIL
D29	AS
D30	Check overflow register
D31	Not Used

Reset Value 0

Errors and Events None

Dependencies None

Examples Query: `STAT:SEV?`

Response: `256`

Related Commands STATus:SCONdition?
STATus:S2EVent?

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STATus:S2EVent?

Overflow register for the STATus:SEVent summary event register. Returns the summary information on the power supply current events, total power (wattage) events, TTLTrigger events and IRQ events.

A one in a bit indicates the corresponding event has been asserted. Unused bits always return a value of zero. The query return a value of zero. The query returns a value of zero upon power on or when you send the *CLS command. Reading the events by this command will not clear the events.

There is no command associated with this query.

Syntax `STATus:S2EVent?`

Parameter	Query response
Not Applicable	<NR1>

Event status word bits	Definition
D0	+24 V Current
D1	+12 V Current
D2	+5 V Current
D3	Not Used
D4	Not Used
D5	–2 V Current
D6	–5PT2V Current
D7	–12V Current
D8	–24 V Current
D9	Total Power
D10	IRQ1 occurred
D11	IRQ2 occurred
D12	IRQ3 occurred
D13	IRQ4 occurred
D14	IRQ5 occurred
D15	IRQ6 occurred
D16	IRQ7 occurred
D17	TTL0trig occurred

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Event status word bits	Definition
D18	TTL1trig occurred
D19	TTL2trig occurred
D20	TTL3trig occurred
D21	TTL4trig occurred
D22	TTL5trig occurred
D23	TTL6trig occurred
D24	TTL7trig occurred
D25	Not Used
D26	Not Used
D27	Not Used
D28	Not Used
D29	Not Used
D30	Not Used
D31	Not Used

Reset Value 0

Errors and Events None

Dependencies None

Examples Query: `STAT:S2EV?`

Response: 8

Related Commands STAT:QUES:CURR?
STAT:QUES:POWER?
STAT:OPER:VXII?
STAT:OPER:VXIT?
STAT:SEV?

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SYSTem Subsystem

This section describes each command and query in the SYSTem subsystem. The SYSTem subsystem controls the parameters shown in Figure 3–8. The SYSTem subsystem collects the functions that are not related to the performance of the IntelliFrame Mainframe.

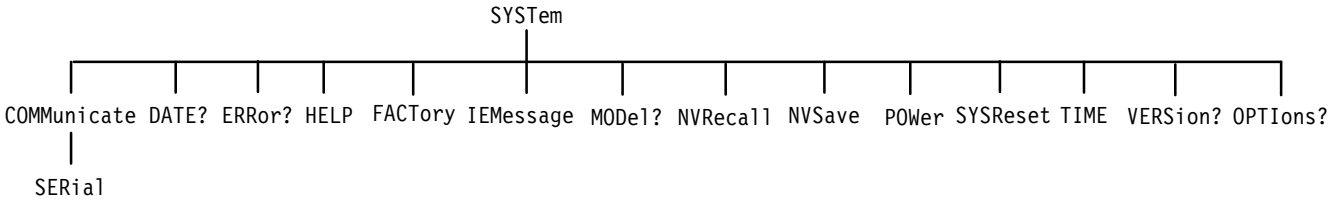


Figure 3–8: SYSTem subsystem hierarchy

Table 3–14 lists the factory default settings for the SYSTem:COMMunicate:Serial parameters in the IntelliFrame Mainframe. These default settings do not change when you issue the SYSTem:FACTory command.

Table 3–14: Default factory RS-232 communication settings

Command	Factory default setting
SYSTem:COMMunicate:SERial[:RECeive]:BAUD	9600
SYSTem:COMMunicate:SERial[:RECeive]:BITS	8
SYSTem:COMMunicate:SERial:CONTrol:RTS	ON
SYSTem:COMMunicate:SERial:ECHO	1
SYSTem:COMMunicate:SERial:ERESponse	1
SYSTem:COMMunicate:SERial:LBUFfer	1
SYSTem:COMMunicate:SERial[:RECeive]:PACE	XON
SYSTem:COMMunicate:SERial[:RECeive]:PARity[:TYPE]	NONE
SYSTem:COMMunicate:SERial[:RECeive]:SBITs	1

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SYSTem:COMMunicate:SERial:BAUD
SYSTem:COMMunicate:SERial:BAUD?

Sets or queries the baud rate of the RS-232 port. This command sets the transmit and receive baud rates.

Syntax

```
SYSTem:COMMunicate:SERial[:RECeive]:BAUD <Baud Rate>
SYSTem:COMMunicate:SERial[:RECeive]:BAUD?
```

Parameters

<Baud Rate>	Query response
<NRf>	<NR1>
300	300
600	600
1200	1200
2400	2400
4800	4800
9600	9600
19200	19200
MINimum	300
MAXimum	19200

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the baud rate to an illegal value.

Dependencies

None

Examples

Command: `SYST:COMM:SER:BAUD 4800`

Query: `SYST:COMM:SER:BAUD?`

Response: `4800`

Related Commands

All SYSTem:COMMunicate:SERial commands

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SYSTem:COMMunicate:SERial:BITS
SYSTem:COMMunicate:SERial:BITS?

Sets or queries the number of bits per character in the RS-232 port.

Syntax

```
SYSTem:COMMunicate:SERial[:RECeive]:BITS <Bits>
SYSTem:COMMunicate:SERial[:RECeive]:BITS?
```

Parameters

<Bits>	Query response
<NRf>	<NR1>
7	7
8	8
MINimum	7
MAXimum	8

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the bits per character value to an illegal value.

Dependencies

None

Examples

Command: `SYST:COMM:SER:BITS 8`

Query: `SYST:COMM:SER:BITS?`

Response: `8`

Related Commands

All SYSTem:COMMunicate:SERial commands

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SYSTem:COMMunicate:SERial:CONTrol:RTS
SYSTem:COMMunicate:SERial:CONTrol:RTS?

Sets or queries the operation of the RTS/CTS lines. A value of OFF sets the outgoing RTS line low and ignores the incoming CTS line. A value of ON sets the outgoing RTS line high and ignores the incoming CTS line. A value of IBFull or RFR specifies that the two lines are used for hardware flow control.

Syntax

```
SYSTem:COMMunicate:SERial:CONTrol:RTS <Flow Control>
SYSTem:COMMunicate:SERial:CONTrol:RTS?
```

Parameters

<Flow Control>	Query response
OFF	OFF
ON	ON
IBFull | RFR	IBF

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to use an illegal parameter value.

Dependencies

None

Examples

Command: `SYST:COMM:SER:CONT:RTS IBF`

Query: `SYST:COMM:SER:CONT:RTS?`

Response: `IBF`

Related Commands

All SYSTem:COMMunicate:SERial commands

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SYSTem:COMMunicate:SERial:ECHO
SYSTem:COMMunicate:SERial:ECHO?

Sets or queries whether the incoming characters are echoed back to the RS-232 port.

Syntax

```
SYSTem:COMMunicate:SERial:ECHO <Boolean>
SYSTem:COMMunicate:SERial:ECHO?
```

Parameters

<Boolean>	Query response
<NRf>	<NR1>
N ≠ 0	1
0	0
ON	1
OFF	0

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `SYST:COMM:SER:ECHO OFF`

Query: `SYST:COMM:SER:ECHO?`

Response: `0`

Related Commands All SYSTem:COMMunicate:SERial commands

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SYSTem:COMMunicate:SERial:ERESponse
SYSTem:COMMunicate:SERial:ERESponse?

Sets or queries if error response messages automatically return to the RS-232 port. When the mode is ON, all error and event response messages will output directly to the RS-232 port; the error and event response messages will not be placed in the Error/Event queue. When the mode is OFF, all error and event messages will be reported to the Error/Event queue and will not be output to the RS-232 port directly.

If the mode is ON, all asynchronous error messages are placed in the Error/Event queue. The event registers will not be updated by any event message.

Asynchronous event messages include “Self Test Failed” and “Configuration Memory Lost.”

Syntax

```
SYSTem:COMMunicate:SERial:ERESponse <Boolean>
SYSTem:COMMunicate:SERial:ERESponse?
```

Parameters

<Boolean>	Query response
<NRf>	<NR1>
N ≠ 0	1
0	0
ON	1
OFF	0

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to set use an illegal parameter value.

Dependencies

None

Examples

Command: `SYST:COMM:SER:ERES OFF`

Query: `SYST:COMM:SER:ERES?`

Response: `0`

Related Commands

All SYSTem:COMMunicate:SERial commands

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SYSTem:COMMunicate:SERial:LBUFfer
SYSTem:COMMunicate:SERial:LBUFfer?

Sets or queries whether the RS-232 line buffer is enabled. If the buffer is enabled, all input characters are buffered until a new line character (^J or 0x0A) is received. Then all characters are available for processing. You can use special characters to modify the input before the new line character is received. For example, for a backspace character, use ^H; for a line-delete character, use ^U.

If you enable the line buffer mode, the output character "\n" 0x0A will be converted to "\n\r" 0x0A 0x0D and the input character will be converted to "\n" 0x0A.

Syntax

```
SYSTem:COMMunicate:SERial:LBUFfer <Boolean>
SYSTem:COMMunicate:SERial:LBUFfer?
```

Parameters

<Boolean>	Query response
<NRf>	<NR1>
N ≠ 0	1
0	0
ON	1
OFF	0

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `SYST:COMM:SER:LBUF OFF`

Query: `SYST:COMM:SER:LBUF?`

Response: `0`

Related Commands All SYSTem:COMMunicate:SERial commands

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SYSTem:COMMunicate:SERial:PACE
SYSTem:COMMunicate:SERial:PACE?

Sets or queries whether software flow control (pacing) is enabled for the RS-232 port. This command sets both the transmit and receive values.

Avoid using XON pacing when transferring binary data.

Syntax

```
SYSTem:COMMunicate:SERial[:RECeive]:PACE <Flow Control>
SYSTem:COMMunicate:SERial[:RECeive]:PACE?
```

Parameters

<Flow Control>	Query response
NONE XON	NONE XON

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to set the flow control to an illegal value.

Dependencies

None

Examples

Command: `SYST:COMM:SER:PACE XON`

Query: `SYST:COMM:SER:PACE?`

Response: `XON`

Related Commands

All SYSTem:COMMunicate:SERial commands

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SYSTem:COMMunicate:SERial:PARity
SYSTem:COMMunicate:SERial:PARity?

Sets or queries the type of parity used by the RS-232 port. This command sets both the transmit and receive values.

Syntax

```
SYSTem:COMMunicate:SERial[:RECeive]:PARity[:TYPE] <Type>
SYSTem:COMMunicate:SERial[:RECeive]:PARity[:TYPE]?
```

Parameters

<Type>	Query response
EVEN	EVEN
NONE	NONE
ODD	ODD

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to set the parity to an illegal value.

Dependencies

None

Examples

Command: `SYST:COMM:SER:PAR EVEN`

Query: `SYST:COMM:SER:PAR?`

Response: `EVEN`

Related Commands

All SYSTem:COMMunicate:SERial commands

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SYSTem:COMMunicate:SERial:PRESet

Presets logical groups of RS-232 port control parameters. The default mode sets all RS-232 settings to a known state. The RAW and TERMinal modes change only a subset of the parameters. Use RAW when connected to a computer and use TERMinal when connected to a computer display terminal.

The command "T" followed by a new line character (^J) configures the RS-232 port for terminal operation when it is currently in the RAW mode.

There are no associated queries with these commands.

Table 3–15 lists the preset values for each PRESet command.

Table 3–15: Effects of :PRESet on serial port parameters

SERial port parameter	[:ALL]	:RAW	:TERMinal
BAUD	9600	NC[1]	NC[1]
BITS	8	NC[1]	NC[1]
CONTrol:RTS	ON	NC[1]	NC[1]
ECHO	OFF	OFF	ON
ERESponse	OFF	OFF	ON
LBUFfer	OFF	OFF	ON
PACE	NONE	NONE	XON
PARity	NONE	NC[1]	NC[1]
SBITs	1	NC[1]	NC[1]

[1] **The entry NC in a field means the value is not changed.**

Syntax

```
SYSTem:COMMunicate:SERial:PRESet[:ALL]
SYSTem:COMMunicate:SERial:PRESet:RAW
SYSTem:COMMunicate:SERial:PRESet:TERMINAL
```

Parameters None

Reset Value Not Applicable

Errors and Events None

Dependencies See Table 3–15.

Examples Command: `SYST:COMM:SER:PRES:TERM`

Related Commands All SYSTem:COMMunicate:SERial commands

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SYSTem:COMMunicate:SERial:SBITs
SYSTem:COMMunicate:SERial:SBITs?

Sets or queries the number of stop bits sent with each character over the RS-232 port. This command sets both the transmit and receive values.

Syntax

```
SYSTem:COMMunicate:SERial[:RECeive]:SBITs <Stop Bits>
SYSTem:COMMunicate:SERial[:RECeive]:SBITs?
```

Parameters

<Stop Bits>	Query response
<NRf>	<NR1>
1	1
2	2
MINimum	1
MAXimum	2

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set terminator to an illegal value.

Dependencies

None

Examples

Command: `SYST:COMM:SER:SBIT 2`

Query: `SYST:COMM:SER:SBIT?`

Response: `2`

Related Commands

All SYSTem:COMMunicate:SERial commands

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SYSTem:DATE
SYSTem:DATE?

Sets or queries the date displayed on the front panel.

The date setting is not mantained across power down and will be reset at power up.

Syntax

```
SYSTem:DATE <year>, <month>, <day>
SYSTem:DATE?
```

Parameters

<date>	Query response
<NRf>, <NRf>, <NRf>	<year>, <month>, <day>

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the date to an illegal value.

Dependencies

None

Examples

Query: `SYST:DATE?`

Response: `1997,2,4`

Related Commands

SYSTem:TIME?

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SYSTem:DATE:LMAintenance?

Queries for the last factory maintenance date.

There is no command associated with this query.

Syntax `SYSTem:DATE:LMAintenance?`

Parameters

Parameter	Query response
None	<year>, <month>, <day>

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Query: `SYST:DATE:LMA?`

Response: `1995,3,10`

Related Commands SYSTem:TIME:LMAintenance?

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SYSTem:ERRor?

This query returns the next entry from the Error/Event queue. This is an alias command with the STATus:QUEue[:NEXT]? command. There is no associated command for this query.

The Error/Event queue is cleared at power up, upon receipt of *CLS, and upon reading the last item from the queue.

Syntax

```
SYSTem:ERRor?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>, <string>

Reset Value

Not Applicable

Errors and Events

–350, “Queue Overflow”
The Error/Event queue overflowed due to the execution errors of other commands. The SYST:ERR? query, itself, cannot generate an error.

Dependencies

Reading the event clears the entry from the queue.

Examples

Query: `SYST:ERR?`

Response: `0, "No error"`

Related Commands

STATus:PRESet
STATus:QUEue?
STATus:QUEue:ENABle
*CLS

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SYSTem:ERRor:ALL?

Returns a comma-separated list of all unread events from the Error/Event queue. This is an alias command with the STATus:QUEue:ALL? command.

The Error/Event queue is cleared at power up, upon receipt of the *CLS command.

There is no associated command for this query.

Syntax

```
SYSTem:ERRor:ALL?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>, <string>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query:

```
SYST:ERR:ALL?
```

Response:

```
-221, "Settings Conflict.",-224, "Illegal Parameter Value"
```

Related Commands

STATus:QUEue?
STATus:QUEue:ENABle
STATus:QUEue?:ALL
*CLS

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SYSTem:ERRor:CODE?

Returns the next event code from the Error/Event queue. This is an alias command with the STATus:QUEue:CODE? command.

The Error/Event queue is cleared at power up, upon receipt of the *CLS command.

There is no associated command for this query.

Syntax

```
SYSTem:ERRor:CODE:[NEXT]?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `SYST:ERR:CODE?`

Response: `-221`

Related Commands

STATus:QUEue?
STATus:QUEue:ENABle
STATus:QUEue:CODE?

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SYSTem:ERRor:CODE:ALL?

Returns a comma-separated list of all unread event codes from the Error/Event queue. This is an alias command with the STATus:QUEue:CODE:ALL? command.

The Error/Event queue is cleared at power up, upon receipt of the *CLS command.

There is no associated command for this query.

Syntax

```
SYSTem:ERRor:CODE:ALL?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `SYST:ERR:CODE:ALL?`

Response: `-221,-224`

Related Commands

STATus:QUEue:ALL?
STATus:QUEue:CODE:ALL?

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SYSTem:ERRor:COUNt?

Returns the number of unread events in the Error/Event queue. This is an alias command with the STATus:QUEue:COUNt? command.

The Error/Event queue is cleared at power up, upon receipt of the *CLS command.

There is no associated command for this query.

Syntax

```
SYSTem:ERRor:COUNt?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `SYST:ERR:COUNt?`

Response: 3

Related Commands

STATus:QUEue:ALL?
STATus:QUEue:COUNt?

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SYSTem:ERRor:ENABle
SYSTem:ERRor:ENABle?

Sets or queries the enable events to be placed in the Error/Event queue. The STATus:QUEue:ENABle and STATus:QUEue:ENABle? commands are aliases.

Attempting to enable events that are not reported by the mainframe does not generate an error.

At power on, when the power-on status clear flag is true, or when you send the STATus:PRESet command the contents of the register is set to –499:0.

Syntax

```
SYSTem:ERRor:ENABle <Event List>
SYSTem:ERRor:ENABle?
```

Parameters

<Event List>	Query response
{<NRf> | numeric range[,<NRf> | numeric range]}*	{<NRf> | numeric range[,<NRf> | numeric range]}

* **numeric range is <NRf>:<NRf>**

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable list to an illegal value.

Dependencies

STATus:PRESet

Examples

Command: `SYST:ERR:ENAB (-499:0)`

Query: `SYST:ERR:ENAB?`

Response: `(-499:0)`

Related Commands

STATus:QUEue?
STATus:PRESet
SYSTem:ERRor
STATus:QUEue:ENABle
STATus:QUEue:ENABle?

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SYSTem:ERRor:ENABle:ALL

Presets the Error/Event queue enable to the value of –1999:1000. The STATus:QUEue:ENABle:ALL command is an alias.

Syntax `SYSTem:ERRor:ENABle:ALL`

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `SYST:ERR:ENAB:ALL`

Related Commands STATus:PRESet
STATus:QUEue:ENABle
STATus:QUEue:ENABle:ALL

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SYSTem:FACTory

This command sets the IntelliFrame Mainframe settings (except the communication settings) to the factory default values. Table 3–16 lists the impacted commands and their factory default settings.

Table 3–16: Super Cooler factory default settings

Command	Settings
DISPlay[:WINDow]:TEXT:[DATA]	"SYSTEM OK"
DISPlay[:WINDow]:TEXT:MARQuee	AUTO
STATus:OPERation:ENABle	0
STATus:OPERation:VXIInterrupt:ENABle	32767
STATus:OPERation:VXIMonitor:ENABle	32767
STATus:OPERation:VXITrigger:ENABle	32767
STATus:QUEStionable:BLOWer:ENABle	32767
STATus:QUEStionable:CURRent:ENABle	
STATus:QUEStionable:CURRent:LIMit	32767
STATus:QUEStionable:ENABle	0
STATus:QUEStionable:FILTer:TINTerval	4000
STATus:QUEStionable:POWer:ENABle	32767
STATus:QUEStionable:POWer:LIMit	VX1410A: 925.0 VX1420A: 1000.0
STATus:QUEStionable:TEMPerature:ENABle	32767
STATus:QUEStionable:TEMPerature:LIMit	AMBient: 55 DELTaN: 10
STATus:QUEStionable:VOLTage:ENABle	32767
STATus:QUEStionable:VOLTage:PTR	32743
STATus:QUEue:ENABle	(–1999:1000)
SYSTem:ERRor:ENABle	(–1999:1000)
SYSTem:SYSReset	0
VXIMonitor:REPeat	0
VXIMonitor:TINTerval	10
*ESE	0
*PSC	0
*SRE	0

Syntax `SYSTem:FACTory`

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Parameters

Parameter	Query response
Not Applicable	Not Applicable

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `SYST:FACT`

Related Commands None

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SYSTem:HELP:SYNTax?

Returns a string containing the syntax specification of the specified command. There is no command associated with this query.

Syntax

```
SYSTem:HELP:SYNTax?
```

Parameters

<Command Header>	Query response
<string>	<string>

Reset Value

Not Applicable

Errors and Events

The query returns a null string ("") if the <Command Header> is not a valid command header being recognized by the IntelliFrame Mainframe.

Dependencies

None

Examples

Query: `SYST:HELP:SYNTax? "DISP:TEXT"`

Response: `"DISPlay[:WINDow]:TEXT[:DATA] <string>|<block>"`

Related Commands

None

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SYSTem:IEMessage

Sends an interface event message from the VXI interface to the RS-232 interface or vice versa. You can use a maximum of 32 data bytes in the message. There is no query associated with this command.

When you send the command from the RS-232 interface, the interface event message is placed in the VXI Error/Event queue as part of an event message. When you send the command from the VXI interface, the interface event message is placed in the RS-232 Error/Event queue as part of an event message.

The message in the Error/Event queue looks similar to the following message:

```
100,"System Message; Your Message Here"
```

Event number 100 has to be enabled by the SYSTem:ERRor:QUEue:ENABle command to place an event into the event queue.

Syntax

```
SYSTem:IEMessage <Message>
```

Parameters

<Parameter>	Query response
<string>	Not Applicable

Reset Value

Not Applicable

Errors and Events

–223, “Too Much Data”
You attempted to send too much data in the string.

Dependencies

None

Examples

Command: `SYST:IEM "System Init"`

Related Commands

None

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SYSTem:MODel?

This query retrieves the model number of the mainframe. This model number is determined upon power up based on the configuration of the Enhanced Monitor board.

Syntax `SYSTem:MODel?`

Parameters

<Parameter>	Query response
Not applicable	VX1410A VX1411A VX1420A

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Query: `SYST:MOD?`

Response: `VX1410A`

Related Commands *IDN

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SYSTem:NVRecall

Recalls device settings from nonvolatile RAM.

Table 3–17 lists the device settings that will be restored from nonvolatile RAM:

Table 3–17: NVRecall device settings

Device settings	
DISPlay[:WINDow]:TEXT[:DATA]	STATus:QUEStionable:TEMPerature:LIMit
DISPlay[:WINDow]:TEXT:MARQuee	STATus:QUEStionable:POWer:ENABle
STATus:OPERation:ENABle	STATus:QUEStionable:POWer:LIMit
STATus:OPERation:VXIInterrupt:ENABle	STATus:QUEStionable:VOLTage:ENABle
STATus:OPERation:VXIMonitor:ENABle	STATus:QUEStionable:VOLTage:PTR
STATus:OPERation:VXITrigger:ENABle	SYSTem:SYSReset
STATus:QUEStionable:BLOWer:ENABle	VXIMonitor:TINTerval
STATus:QUEStionable:CURRent:ENABle	VXIMonitor:REPeat
STATus:QUEStionable:CURRent:LIMit	*ESE
STATus:QUEStionable:ENABle	*PSC
STATus:QUEStionable:FILTer:TINTerval	*SRE
STATus:QUEStionable:TEMPerature:ENABle	

Syntax

```
SYSTem:NVRecall
```

Parameters

<Parameter>	Query response
Not Applicable	Not Applicable

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `SYST:NVR`

Related Commands SYSTem:NVSave

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SYSTem:NVSave

Saves device settings to nonvolatile RAM. The settings will be restored at power on.

Table 3–17 lists the device settings that will be saved to nonvolatile RAM:

Table 3–18: NVSave device settings

Device settings	
DISPlay[:WINDow]:TEXT[:DATA]	STATus:QUEStionable:VOLTage:PTR
DISPlay[:WINDow]:TEXT:MARQuee	SYSTem:COMMunicate:SERial:BAUD
STATus:OPERation:ENABle	SYSTem:COMMunicate:SERial:BITS
STATus:OPERation:VXIInterrupt:ENABle	SYSTem:COMMunicate:SERial:CONTrol:RTS
STATus:OPERation:VXIMonitor:ENABle	SYSTem:COMMunicate:SERial:ECHO
STATus:OPERation:VXITrigger:ENABle	SYSTem:COMMunicate:SERial:ERESponse
STATus:QUEStionable:BLOWer:ENABle	SYSTem:COMMunicate:SERial:LBUFfer
STATus:QUEStionable:CURRent:ENABle	SYSTem:COMMunicate:SERial:PACE
STATus:QUEStionable:CURRent:LIMit	SYSTem:COMMunicate:SERial:PARity
STATus:QUEStionable:ENABle	SYSTem:COMMunicate:SERial:SBITs
STATus:QUEStionable:FILTer:TINTerval	SYSTem:SYSReset
STATus:QUEStionable:POWer:ENABle	VXIMonitor:TINTerval
STATus:QUEStionable:POWer:LIMit	VXIMonitor:REPeat
STATus:QUEStionable:TEMPerature:ENABle	*ESE
STATus:QUEStionable:TEMPerature:LIMit	*PSC
STATus:QUEStionable:VOLTage:ENABle	*SRE

Syntax

```
SYSTem:NVSave
```

Parameters

<Parameter>	Query response
Not Applicable	Not Applicable

Reset Value Not Applicable

Errors and Events None

Dependencies None

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Examples Command: `SYST:NVS`

Related Commands SYSTem:NVRecall

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SYSTem:POWer
SYSTem:POWer?

Powers the mainframe on or off. Use the query to determine if the mainframe is powered on or off.

Syntax

```
SYSTem:POWer[:STATe] <Boolean>
SYSTem:POWer[:STATe]?
```

Parameters

<Boolean>	Query response
<NRf>	<NR1>
N ≠ 0	1
0	0
ON	1
OFF	0

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to set the parameter to an illegal value.

Dependencies

External +5V power to operate the enhanced monitor when the mainframe is powered off.

Examples

Command: `SYST:POW ON`

Query: `SYST:POW?`

Response: `1`

Related Commands

None

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SYSTem:OPTions?

Queries the monitor to report which options are currently installed. One Option is available for the Super Cooler: “S” Supercooler (Blower) fan option. This option appears for all VX1420A mainframes and for the VX1411A or VX1410A mainframes that have been upgraded to the Super Cooler (field upgrade kit VXF20A)

Parameters

<Parameter>	Query response
Not applicable	“NOOPT” “S”

Reset Value Not Applicable

Errors and Events None

Dependencies Fan jumpers correctly installed on enhanced monitor board.

Examples Query: `NOOPT`

Response: `None`

Related Commands None

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SYSTem:POWer:CYCLe?

Returns the number of times the mainframe power has been cycled since the mainframe was manufactured.

Syntax

```
SYSTem:POWer:CYCLe?
```

Parameters

Parameter	Query response
Not Applicable	<NR1>

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Query: `SYST:POW:CYCL?`

Response: `50`

Related Commands None

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SYSTem:POWer:SOURce?

Queries whether the power source of the Enhanced Monitor is from the mainframe power supply or from an external power supply.

Syntax

```
SYSTem:POWer:SOURce?
```

Parameters

Parameter	Query response
Not Applicable	MAIN EXTERNAL

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `SYST:POW:SOUR?`

Response: `MAIN`

Related Commands

None

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SYSTem:SYSReset
SYSTem:SYSReset?

Sets or queries whether the VXI SYSRESET signal can reset the Enhanced Monitor.

When SYSRESET is enabled, asserting the VXI SYSRESET signal will reset the Enhanced Monitor. When disabled, asserting the VXI SYSRESET signal only initializes the Enhanced Monitor VXI Interface; all other Enhanced Monitor functions are not affected.

The factory default setting is disabled (0).

***NOTE**. If SYSRESET is enabled and the mainframe is powered down, communication through the RS-232 port is not possible even if an external +5 V is supplied to the enhanced monitor card. The display will not show the current status and the scroll buttons will be inoperative. Consequently the enhanced monitor is inoperative.*

Syntax

```
SYSTem:SYSReset <Boolean>
SYSTem:SYSReset?
```

Parameters

<Boolean>	Query response
<NRf>	<NR1>
N ≠ 0	1
0	0
ON	1
OFF	0

Reset Value Not Applicable

Errors and Events –224, “Illegal Parameter Value”
You attempted to set the parameter to an illegal value.

Dependencies None

Examples Command: `SYST:SYSR ON`

Query: `SYST:SYSR?`

Response: 1

Related Commands `SYSTem:SYSReset:IMMediate`

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SYSTem:SYSReset:IMMediate

Immediately initiates a VXI SYSRESET signal. This command will cause all VXI instruments installed in the IntelliFrame Mainframe to be reset.

When SYSRESET is enabled in the Enhanced Monitor, asserting this command will also reset the Enhanced Monitor. When disabled, asserting this command will only initialize the Enhanced Monitor VXI interface; all other Enhanced Monitor functions are not affected.

Syntax `SYSTem:SYSReset:IMMediate`

Parameters

<Boolean>	Query response
Not Applicable	Not Applicable

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `SYST:SYSR:IMM`

Related Commands SYSTem:SYSReset

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SYSTem:TIME
SYSTem:TIME?

Sets or queries the time displayed on the front panel.

Time is keep in 24 hour clock format. Time is not maintained across power down. At power up the time will be reset to 0,0,0.

Syntax

```
SYSTem:TIME <hours>, <minutes>, <seconds>
SYSTem:TIME?
```

Parameters

Parameter	Query response
<NRf>, <NRf>, <NRf>	<hour>, <minute>,<second>

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the time to an illegal value.

Dependencies

None

Examples

Query: `SYST:TIME?`

Response: `18,3,3`

Related Commands

SYSTem:DATE?

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SYSTem:TIME:LMAintenance?

Returns the number of hours the IntelliFrame Mainframe has been operating since the last factory maintenance. There is no command associated with this query.

Syntax

```
SYSTem:TIME:LMAintenance?
```

Parameters

Parameter	Query response
None	<hour>,<minute>,<second>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `SYST:TIME:LMA?`

Response: `101,3,3`

Related Commands

SYSTem:TIME:ON?

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SYSTem:TIME:ON?

Returns the number of hours the IntelliFrame Mainframe has been operating since power on. There is no command associated with this query.

Syntax

```
SYSTem:TIME:ON?
```

Parameters

Parameter	Query response
Not Applicable	<hour>,<minute>,<second>

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `SYST:TIME:ON?`

Response: `1,2,55`

Related Commands

SYSTem:TIME:LMAintenance?

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SYSTem:VERSion?

Returns the SCPI version number to which the IntelliFrame Mainframe complies. There is no command associated with this query.

Syntax

```
SYSTem:VERSion?
```

Parameters

Parameter	Query response
Not Applicable	<NR2> 1995.0

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `SYST:VERS?`

Response: `1995.0`

Related Commands

*IDN?

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TEST Subsystem

This section describes each command and query in the TEST subsystem. These commands are used to execute internal self tests. The TEST subsystem controls the parameters shown in Figure 3–9.

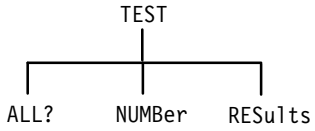


Figure 3–9: TEST subsystem hierarchy

Table 3–19 lists all of the internal self tests of the IntelliFrame Mainframe.

Table 3–19: IntelliFrame Mainframeself test

Test number	Test name	Execution time (seconds)	Power on test	Included in TEST?	Invoked by TEST:NUMBer?
1000	Fan Speed Control	116	No	Yes	Yes
1010	ADC and DAC Control	< 1	Yes	Yes	Yes
1100	Front Panel Display Control Test 1	25	No	No	Yes
1110	Front Panel Display Control Test 2	36	No	No	Yes
1120	Front Panel Display Control Test 3	6	No	No	Yes

A description of each self test is listed below:

- Fan Speed Control test. This test varies the fan speed control and verifies that the fan speed changes accordingly.
- ADC and DAC Control test. This test verifies the internal ADC and DAC circuitry.
- Front Panel Display Control Test 1. This test performs the following sequences:

  a. Turns on all display pixels.

  b. Turns off all display pixels.

  c. Writes the character 8 to each display position.

  d. Turns on all display pixels.

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e. Turns off all display pixels.

f. Writes the character 8 to each display position.

g. Turns off all display pixels.

- Front Panel Display Control Test 2. This test writes the following ASCII characters to the display: " " 0x20 to "~" 0x7E. These characters are followed by "Δ" and "°C."
- Front Panel Display Control Test 3. This test writes the following blinking message to the display: "Text is BLINKING."

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TEST
TEST?

This command executes all internal self tests. If a failure occurs and the halt control is enabled, the test will immediately end. The query form returns the unique numeric identifier of the first test that failed. A value of zero is returned if there are no failures. The command form executes the same tests but returns no results code.

Each internal self test has a unique numeric identifier in the range of 1000 to 1999 (see Table 3–19 on page 3–149).

*TST? and TEST? are aliases.

Syntax

```
TEST[:ALL]
TEST[:ALL]?
```

Parameters

Parameter	Query response
Not Applicable	<NR1> 0 1000 ≤ N ≤ 1999

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `TEST`

Query: `TEST?`

Response: 0

Related Commands TEST:RESults?
TEST:RESults:VERBose?

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TEST:NUMBer
TEST:NUMBer?

The command executes the specified self test but does not return the test results. The query returns the results of the specified test. A value of zero is returned if there are no failures.

Each internal self test has a unique numeric identifier in the range of 1000 to 1999 (see Table 3–19 on page 3–149).

Syntax

```
TEST:NUMBer <test>
TEST:NUMBer? <test>
```

Parameters

Parameter	Query response
{<NRf>|<Non-decimal number>} 1000 ≤ N ≤ 1999	<NR1> 0 1000 ≤ N ≤ 1999

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Command: `TEST:NUMB 1000`

Query: `TEST:NUMB? 1000`

Response: `0`

Related Commands

TEST:RESults?
TEST:RESults:VERBose?

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TEST:RESults?

This query returns the results code for the last executed self test command. The unique numeric identifier of the first individual test that failed is reported. A value of zero is returned if there were no failures.

There is no associated command for this query.

Each internal self test has a unique numeric identifier in the range of 1000 to 1999 (see Table 3–19 on page 3–149).

Syntax

```
TEST:RESults[:CODE]?
```

Parameters

Parameter	Query response
Not Applicable	<NR1> 0 1000 ≤ N ≤ 1999

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `TEST:RES?`

Response: 0

Related Commands

TEST
TEST:RESults:VERBose?

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TEST:RESults:VERBose?

This query returns a string describing the results of the last executed self test command. The unique numeric identifier of the first individual test that failed is reported. A value of zero is returned if there were no failures.

There is no associated command for this query.

Syntax

```
TEST:RESults:VERBose?
```

Parameters

Parameter	Query response
Not Applicable	<string> error number: <NR1> 0 1000 ≤ N ≤ 1999 verbose message: (error specific)

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `TEST:RES:VERB?`

Response: `1001,"Test ADC and DAC failed"`

Related Commands

TEST
TEST:RESults?

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VXIMonitor Subsystem

The VXI Monitor commands allow the user to monitor certain signals that only occur on the VXI backplane. The VXI Monitor commands allow the user to control how long to monitor (VXIM:TINT), continuously monitor (VXIM:REPEAT ON) and to start the VXImonitor (VXIM:STATE ON).

The VXIMonitor subsystem controls the parameters shown in Figure 3–10.

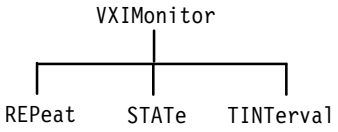


Figure 3–10: VXIMonitor subsystem hierarchy

The VXI backplane is monitored in six areas:

<VXI signal>	Retrieve results using
BERR (Bus Error)	STAT:OPER:VXIM:BERR?
SYSFAIL	STAT:OPER:VXIM:SYSF?
ACFAIL	STAT:OPER:VXIM:ACF?
AS (Address Strobe)	STAT:OPER:VXIM?
VXI Triggers	STAT:OPER:VXIT?
VXI Interrupts	STAT:OPER:VXII?

After operating the monitor, it is recommended that the summary register be queried to check if any of these events occurred. If the bit is set, then the corresponding register should be queried for more detail. For example, if the command “STAT:OPER?” yields a result of 32 (0 x 20), the VXI Trigger should be queried (“STAT:OPER:VXIT?”). This will determine which line was triggered. Knowing what line was triggered, the command “STAT:OPER:VXIT:TRIG? TTL2” (using trigger line 2 as an example) will yield the time (since power up) that this particular line was triggered. This time will only be erased when VXI Monitor is restarted.

Programming example;

1. Set up VXI Monitor to run continuously:
   VXIM:REPEAT ON

2. For this example, assume that an external VXI module set a trigger line, asserted SYSFAIL, and a Bus Error occured.

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3. Query operation register to check if either D5, D8, D9 or D10 are set.
   STAT:OPER?
   The system response: 288 (0 x 120 – VXI Triggers set and VXI Monitor)

4. Since the VXI Trigger bit was set, now query the Trigger register.
   STAT:OPER:VXIT?
   The system response: 16 (0 x 10 – TTL4 Trigger occurred).

5. Query the time that TTL Trigger line 4 triggered.
   STAT:OPER:VXIT:TRIG? TTL4
   The system response: 0,34,30 (Trigger occurred on line TTL4 34.5 minutes after power on).

6. When the "STAT:OPER?" query was performed, the VXI Monitor bit was also set. Use the following command to examine specifically what event occurred.
   STAT:OPER:VXIM?
   The system response: 3 (BERR and SYSFAIL are set).

7. STAT:OPER:VXIM:BERR?
   The system response: A16 (Bus Error occurred in A16 address space).

8. STAT:OPER:VXIM:SYSF?
   The system response: 1, 30, 0 (SYSFAIL occurred one and one-half hours after power-up)

NOTE. *If this test were run with the VXI Monitor enable register set to zero* ("STAT:OPER:VXIM:ENABLE 0"), *the VXI Monitor bit would not be set in the operation register. However, if the VXI Monitor enable register was set to 0 x F* ("STAT:OPER:VXIT:ENABLE 15"), *then only triggers on TTL0, TTL1, TTL2 and TTL3 lines will cause the VXIT trigger bit to be set in the operation register* ("STAT:OPER?"). *The VXI Trigger register* ("STAT:OPER:VXIT?") *will always show all Trigger lines that are triggered, regardless of the setting in the enable register.*

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VXIMonitor:REPeat
VXIMonitor:REPeat?

Sets or queries the repeat mode of the VXI Monitor. When the repeat mode is on, the VXI Monitor continuously monitors the VXI bus.

When the repeat mode is off, the VXI Monitor monitors the VXI bus for the specified time interval.

The factory default setting is OFF(0).

Syntax

```
VXIMonitor:REPeat <Boolean>
VXIMonitor:REPeat?
```

Parameters

<Boolean>	Query response
<NR1> N ≠ 0 0 ON OFF	<NR1> 1 0 1 0

Reset Value Not Applicable

Errors and Events –221, “Settings Conflict.”
You attempted to set the interval while the VXI Monitor was executing.

Dependencies None

Examples Command: `VXIM:REP ON`

Query: `VXIM:REP?`

Response: 1

Related Commands VXIMonitor:TINTerval

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VXIMonitor:STATe
VXIMonitor:STATe?

Starts or stops the VXI Monitor. The query returns whether the VXI Monitor is running.

Syntax

```
VXIMonitor:STATe <Boolean>
VXIMonitor:STATe?
```

Parameters

<Boolean>	Query response
<NR1>	<NR1>
N ≠ 0	1
0	0
ON	1
OFF	0

Reset Value

0

Errors and Events

–213, “Init Ignored”
You sent INITiate while the VXI Monitor was already monitoring the VXI bus.

Dependencies

None

Examples

Command: `VXIM:STAT 1`

Query: `VXIM:STAT?`

Response: 1

Related Commands

VXIMonitor:TINTerval
VXIMonitor:REPeat

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VXIMonitor:TINTerval
VXIMonitor:TINTerval?

Sets or queries the time interval the VXI Monitor monitors the VXI bus. The VXI monitor monitors the bus for the specified number of seconds and reports any detected VXI Monitor event.

The factory default setting is 10 seconds.

Syntax

```
VXIMonitor:TINTerval <time>
VXIMonitor:TINTerval?
```

Parameters

<time>	Query response
<NRf> 1 ≤ N ≤ 2147483647 MIN MAX	<NR1> 1 2147483647

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the interval to an illegal value.

–221, “Settings Conflict.”
You attempted to set the interval while the VXI Monitor was executing.

Dependencies

None

Examples

Command: `VXIM:TINT 100`

Query: `VXIM:TINT?`

Response: `100`

Related Commands

VXIMonitor:REPeat
VXIMonitor:STATe

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IEEE 488.2 Common Commands

This section describes each of the IEEE 488.2 common commands implemented in the IntelliFrame Mainframe.

*CLS

This command clears the SCPI and IEEE 488.2 event registers and the Error/ Event queue. There is no query associated with this command. SCPI and IEEE 488.2 enable registers are not cleared by this command.

Syntax `*CLS`

Parameters None

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `*CLS`

Related Commands STATus:PRESet

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*ESE
*ESE?

Sets or queries the enable mask for the Standard Event Status Register. The STATus:PRESet command does not change this enable mask.

The factory default setting is 0.

Syntax

```
*ESE <mask>
*ESE?
```

Parameters

Parameter	Query response
{<NRf> | <Non-Decimal Numeric>} 0 ≤ N ≤ #HFF	<NR1>

Standard status byte definition	Query response
D0	Operation Complete
D1	Not Used
D2	Query Error
D3	Device Dependent Error
D4	Execution Error
D5	Command Error
D6	Not Used
D7	Power On

Reset Value

Not Applicable

Errors and Events

–222, “Data Out of Range”
You attempted to set the enable mask to an illegal value.

Dependencies

None

Examples

Command: `*ESE #H40`

Query: `*ESE?`

Response: `64`

Related Commands

*ESR?

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*ESR?

This query returns the event(s) from the Standard Event Status Register. There is no command associated with this query. The Error/Event queue contains a chronological record of the events.

Syntax *ESR?

Parameters

Parameter	Query response
Not Applicable	<NR1>

Standard status byte definition	Query response
D0	Operation Complete
D1	Not Used
D2	Query Error
D3	Device Dependent Error
D4	Execution Error
D5	Command Error
D6	Not Used
D7	Power On

Reset Value Not Applicable

Errors and Events None

Dependencies Reading this register clears it.

Examples Query: *ESR?

Response: 0

Related Commands *ESE

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*IDN?

This query returns the IntelliFrame Mainframe identification message. There is no command associated with this query. The fourth field of the id message includes both the SCPI and firmware version numbers.

Syntax

```
*IDN?
```

Parameters

Parameter	Query response
Not Applicable	<Syntax Defined by IEEE 488.2> Manufacturer, Model Number, Serial Number, Firmware Version (or Equivalent)

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `*IDN?`

Response: `TEKTRONIX,VX1420A,B123456,SCPI:95.0 RM1:1.0 RM2:1.0`

Related Commands

None

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*OPC
*OPC?

The command synchronizes command execution with the controller. The command causes the device to set the OPC bit in the Standard Event Status register after the previous command has completed execution.

The query causes an ASCII one to be placed in the output queue after the previous command has completed execution.

Syntax

```
*OPC
*OPC?
```

Parameters

None

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Command: `*OPC`

Query: `*OPC?`

Response: 1

Related Commands

*WAI

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*PSC
*PSC?

Sets or queries the setting of the power-on state clear flag. If the <Value> parameter is zero, the power-on state clear flag is set to FALSE; otherwise the flag is set to TRUE.

If the power-on state clear flag is FALSE, at power on, the Service Request Enable Register, the Standard Event Status Enable Register, and the SCPI Enable Register settings will be restored to their previous settings. Otherwise, the settings will be cleared.

The factory default setting is 0.

Syntax

```
*PSC <Value>
*PSC?
```

Parameters

<Value>	Query response
{<NRf> | <Non-Decimal Numeric>}	<NR1>
N ≠ 0	1
0	0
–32767 ≤ N ≤ 32767	

Reset Value

Not Applicable

Errors and Events

–224, “Illegal Parameter Value”
You attempted to set the parameter to an illegal value.

Dependencies

None

Examples

Command: `*PSC 0`

Query: `*PSC?`

Response: `0`

Related Commands

STATus

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*RST

This command resets instrument settings to a default state. There is no query associated with this command. This command has no effect other than stopping the VXI Monitor.

The VXI Monitor stops execution while other monitors remain active.

Syntax `*RST`

Parameters None

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `*RST`

Related Commands STATus:PRESet
*CLS

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*SRE
*SRE?

Sets or queries the enable mask for the Service Request (Status Byte) Register. Setting unused enable bits does not generate an error; they are ignored. The STATus:PRESet command does not change this enable mask.

The IntelliFrame Mainframe accepts NonDecimal Numeric masks even though this is not required by IEEE 488.2.

The factory default setting is 0.

Syntax

```
*SRE <mask>
*SRE?
```

Parameters

<Mask>	Query response
{<NRf> | <Non-Decimal Numeric>} 0 ≤ N ≤ #HFF	<NR1>

Standard status byte definition	Query response
D0	Not Used
D1	Not Used
D2	Error/Event Queue
D3	Questionable Event Register
D4	MAV
D5	ESB Standard Event Status Reg
D6	Not Defined
D7	Operation Event Register

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Command: `*SRE #H60`

Query: `*SRE?`

Response: `96`

Related Commands

*STB?

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*STB?

This query returns the contents of the Status Byte Register. There is no command associated with this query.

Syntax *STB?

Parameters

Parameter	Query response
Not Applicable	<NR1>

Standard status byte definition	Definition
D0	Not Used
D1	Not Used
D2	Error/Event Queue
D3	Questionable Event Register
D4	MAV
D5	ESB Standard Event Status Reg
D6	RQS/MSS
D7	Operation Event Register

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Query: *STB?

Response: 96

Related Commands *SRE

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*TST?

This query initiates an internal self test and returns a failure code. If more than one failure occurred, only the the unique numeric identifier of the first self test that failed is reported. A value of zero is returned if there were no failures.

Each internal self test has a unique identifier in the range of 1000 to 1999.

*TST? and TEST? are identical queries. There is no command associated with this query. You can obtain additional test results with the TEST:RESult:VERBose? command.

Syntax

```
*TST?
```

Parameters

<failure code>	Query response
Not Applicable	<NR1> 0 | 1000 ≤ N ≤ 1999

Reset Value

Not Applicable

Errors and Events

None

Dependencies

None

Examples

Query: `*TST?`

Response: `0`

Related Commands

TEST
TEST:RESults:VERBose?

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*WAI

This command is used to synchronize command execution with the controller. There is no query associated with this command.

*WAI prevents the instrument from executing further commands until the previous command has completed execution.

Syntax `*WAI`

Parameters None

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Command: `*WAI`

Related Commands *OPC

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Status and Events

The IntelliFrame Mainframe complies with SCPI version 1995.0. You can use the SYSTem:VERSion? command to read the latest version or the *IDN? command to read a more detailed identification message.

The IntelliFrame Mainframe supports the Status Byte model shown in Figure 3–11. The figure shows the core of the SCPI-required status reporting capability.

The status registers fit into a 16-bit integer with the most-significant bit always zero (positive logic). Unused or “don’t care” bits in masks and registers always return zeros when queried.

The Operation Status register and the Questionable Status register outputs are logically ORed together as shown in Figure 3–11.

The Operation Status register contains information on the normal operation of the IntelliFrame Mainframe In particular, bit 8 contains summary information on the VXI Monitor status register (see Figure 3–12). The VXI Monitor Status register monitors activity on bits 0 through 3.

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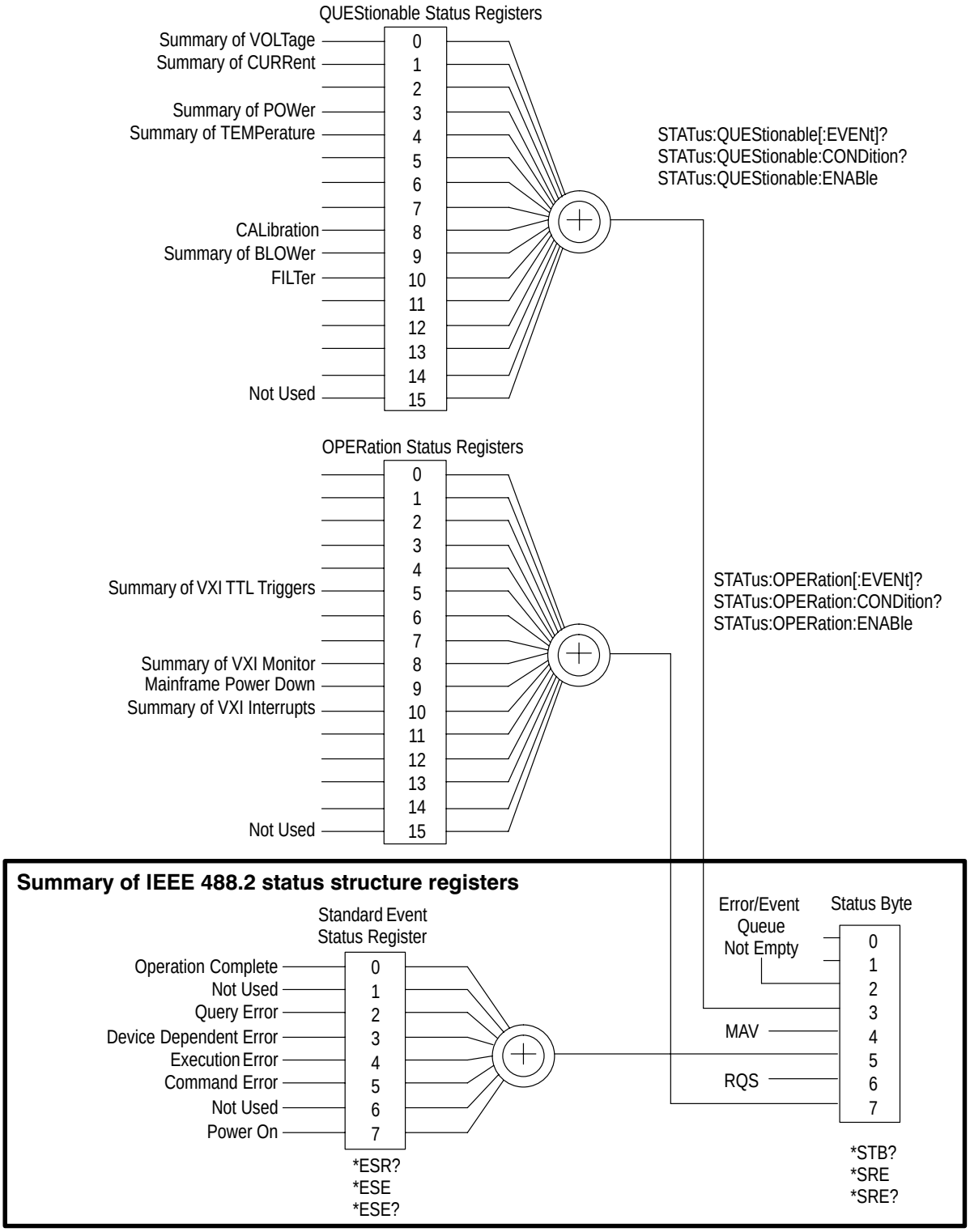


Figure 3–11: SCPI and IEEE status and event registers

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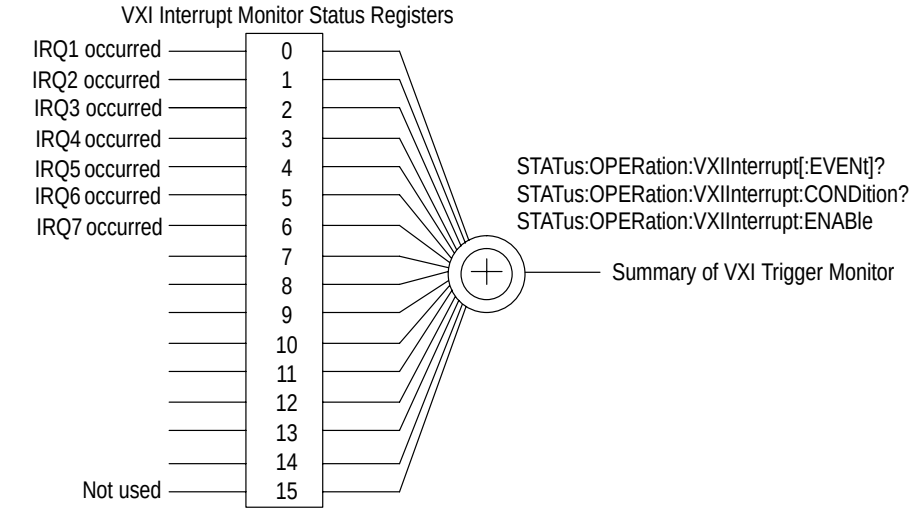


Figure 3–12: VXI Interrupt Monitor status register

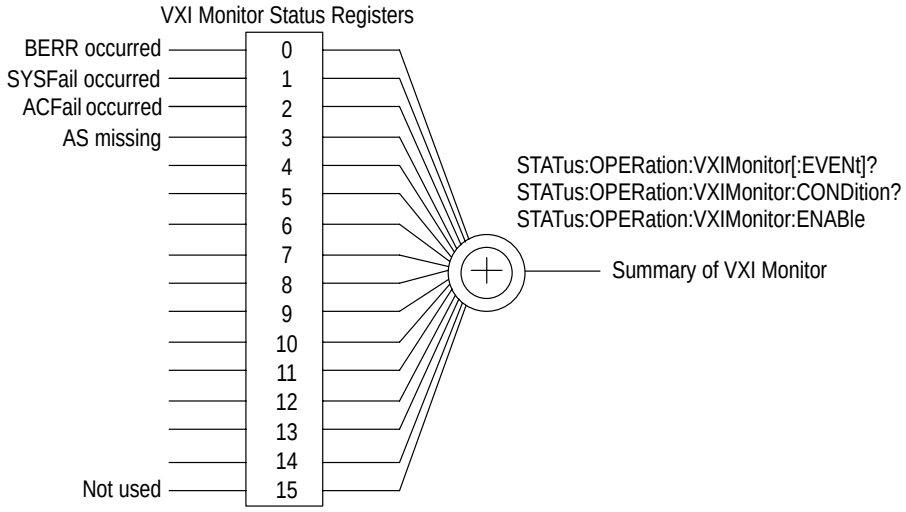


Figure 3–13: VXI Monitor status register

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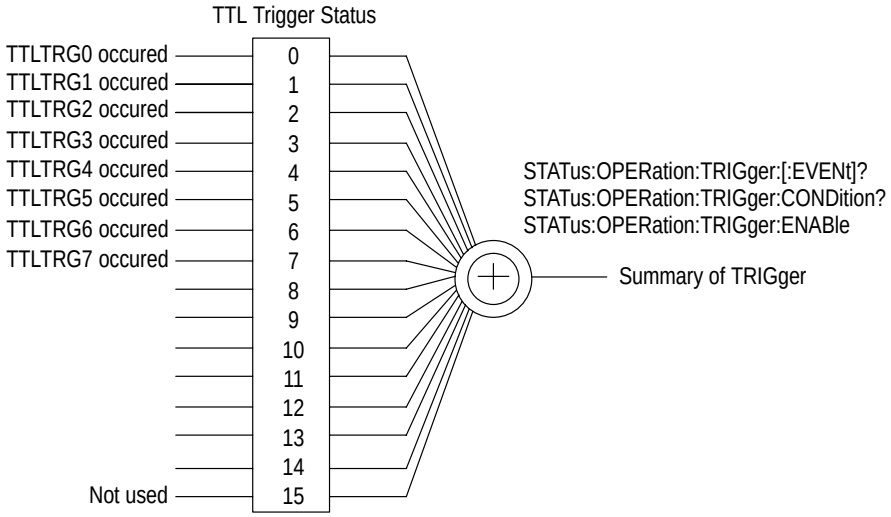


Figure 3–14: VXI TTL Trigger Monitor status register

The Questionable Status register contains information on the quality of the signals within the mainframe. In the event problems occur within the mainframe (for example, one of the power supplies is not working properly), you could program the mainframe to warn you of possible problems.

There are five status registers that provide summary information to the Questionable Status register: the Current Status register, Power Status register, Voltage Status register, the Temperature Status register, and the Blower Status register.

The Power Status register provides status information on the total power supply wattage (see Figure 3–15). You can detect problems with total power supply wattage by monitoring the corresponding bit in the Power Status register. If a problem occurs, the corresponding bit will be set in the register.

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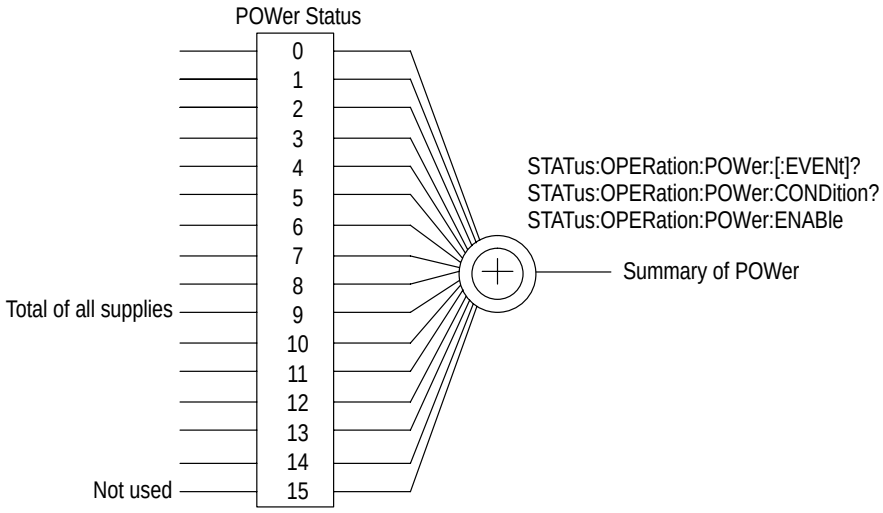


Figure 3–15: Power status register

The Current Status register provides status information on the individual power supply Amperages (see Figure 3–16). You can detect problems with any power supply current by monitoring the corresponding bit in the Current Status register. If a problem occurs, the corresponding bit will be set in the register.

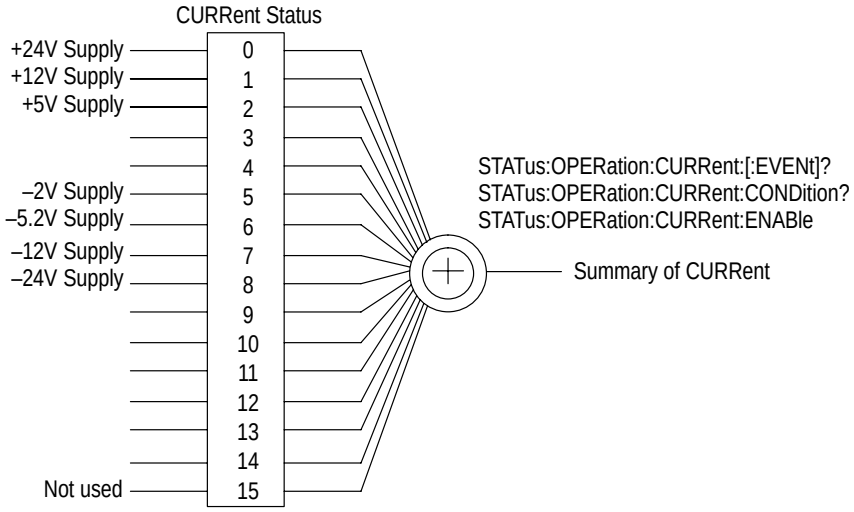


Figure 3–16: Current Status register

The Voltage Status register provides status information on the individual power supply voltages (see Figure 3–17). You can detect problems with any one of the power supply voltages by monitoring the corresponding bit in the Voltage Status register. If a problem occurs, the corresponding bit will be set in the register.

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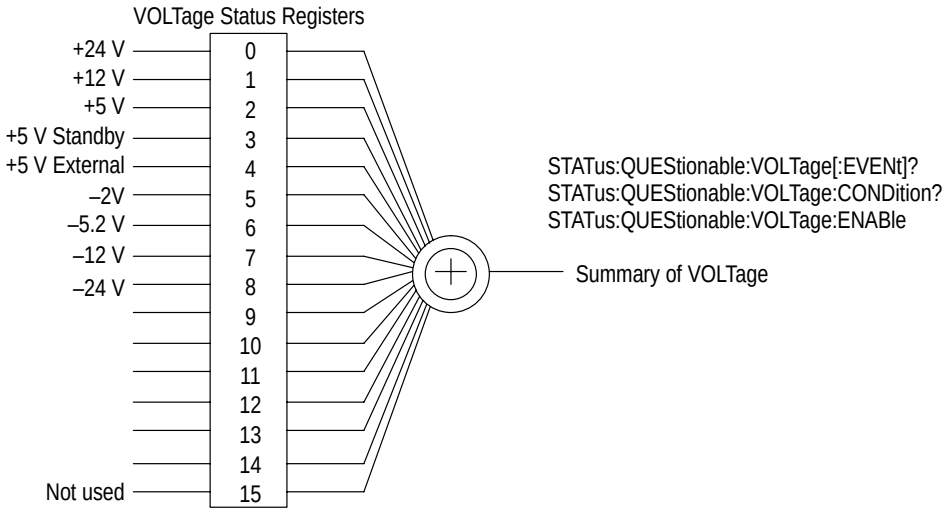


Figure 3–17: Voltage status register

The Temperature Status register provides status information on the delta temperature for each slot in the mainframe (see Figure 3–18). You can detect temperature problems with any one of the mainframe slots by monitoring the corresponding bit in the Temperature Status register. If a problem occurs, the corresponding bit will be set in the register.

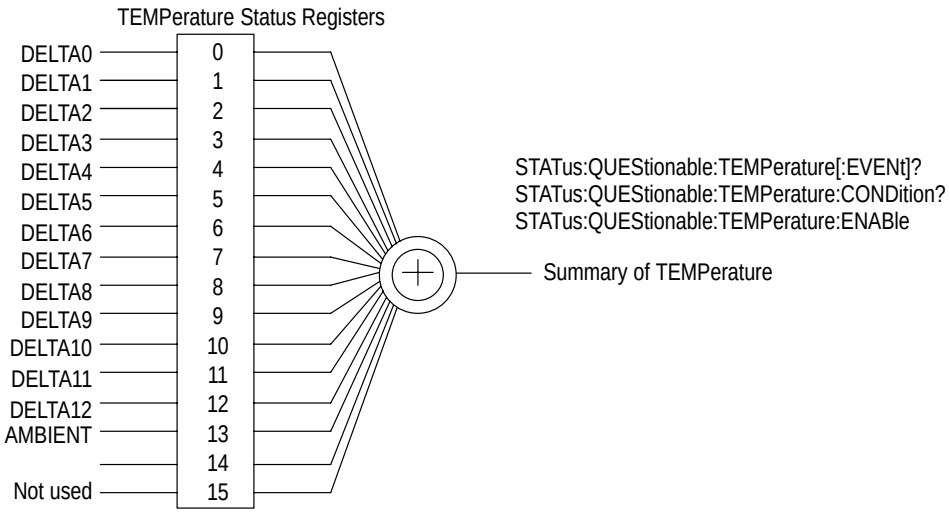


Figure 3–18: Temperature status register

The Blower Status register provides status information on the two fans in the mainframe (see Figure 3–19). You can detect problems with either fan by monitoring the corresponding bit in the Blower Status register.

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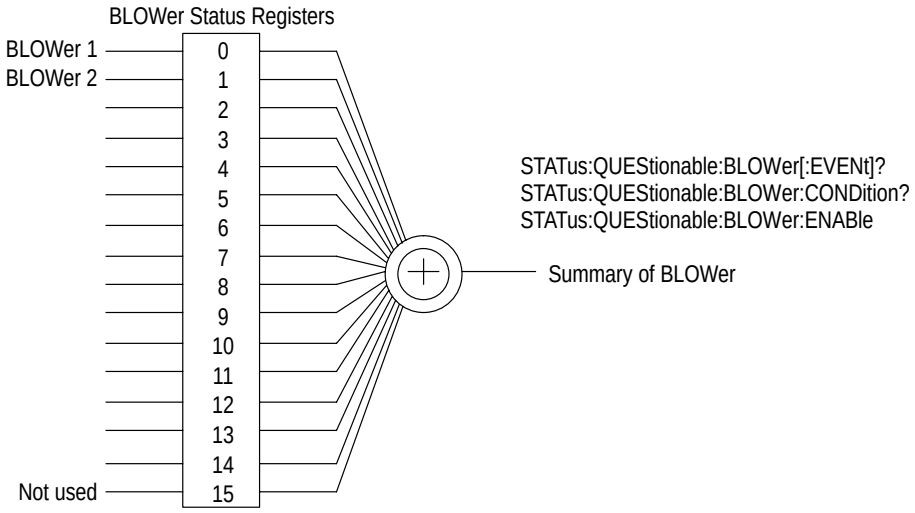


Figure 3–19: Blower status register

RS-232 and VXI Interface Status and Events

The RS-232 and VXI interfaces have separate status and event systems. There are two sets of status and event registers and two separate Error/Event queues for the two interfaces. You can send the commands listed below from the interface to set up only those status and event registers of that interface. This allows the RS-232 interface to have different settings than the VXI interface.

- STATus:OPERation:ENABle
- STATus:OPERation:VXIInterrupt:ENABle
- STATus:OPERation:VXIMonitor:ENABle
- STATus:OPERation:VXITrigger:ENABle
- STATus:QUEStionable:BLOWer:ENABle
- STATus:QUEStionable:CURRent:ENABle
- STATus:QUEStionable:ENABle
- STATus:QUEStionable:POWer:ENABle
- STATus:QUEStionable:TEMPerature:ENABle

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- STATus:QUEStionable:VOLTage:ENABle
- STATus:QUEStionable:VOLTage:PTR
- STATus:QUEue:ENABle
- *ESE
- *SRE

Error Messages

Table 3–20 on page 3–181 lists some of the error messages that you may encounter while sending commands and queries to the IntelliFrame Mainframe. The IntelliFrame Mainframe reports the following categories of errors:

- Command Errors
- Execution Errors
- Device Specific Errors
- Query Errors

Command Errors

Command errors have error codes within the range of –100 and –199. These errors indicate syntax errors. The syntax errors can be due to the command parser detecting an IEEE 488.2 syntax error or an unrecognized header that was received. Command errors may also occur when you attempt to send an unemployment IEEE 488.2 common command.

Execution Errors

Execution errors have error codes within the range of –200 and –299. These errors are detected by the IntelliFrame Mainframe execution control block. Execution errors can occur when a program data element following a header was evaluated as outside of the legal input range or when the program data element is inconsistent with the capabilities of the mainframe.

Device Specific Errors

Device specific errors have error codes within the range of –300 and –399. These errors may indicate that some operations failed to complete due to abnormal hardware or firmware conditions.

Query Errors

Query errors have error codes within the range of –400 and –499. These errors indicate that the IntelliFrame Mainframe detected a problem with the message exchange protocol. Query errors set the query error bit in the Event Status register. These errors may result when you attempt to read data from the output queue when no input is present or pending. The errors may also occur when the data in the output queue is lost.

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Table 3–20: IntelliFrame Mainframe error and event codes

Code	Message
0	No error. The error queue is empty. Every error or event has been read or was purposely cleared.
–100	Command error.
–101	Invalid character.
–102	Syntax error.
–103	Invalid separator.
–104	Data type error.
–108	Parameter not allowed. More parameters than expected were received for the header.
–109	Missing parameter.
–110	Command header error.
–112	Program mnemonic too long.
–113	Unidentified header.
–120	Numeric data error.
–141	Invalid character data.
–144	Character data too long.
–160	Block data error.
–161	Invalid block data.
–200	Execution Error.
–203	Command protected.
–213	Init Ignored. The measurement initiation was ignored because another measurement was already in progress.
–220	Parameter error. A program data element related error occurred.
–221	Settings conflict. A legal program data element was parsed but could not be executed due to the current state of the mainframe.
–222	Data out of range. The value of the data was outside of the legal range.
–223	Too much data.
–224	Illegal parameter value. The parameter value must be one of the exact values from the command list.
–315	Configuration memory Lost. Some instrument setting may be lost.
–350	Queue Overflow. An error occurred but there was no room in the queue to record the error.
–380	Calibration failed.
–381	Execution queue overflow. Internal error.
–410	Query INTERRUPTED.

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Table 3–20: IntelliFrame Mainframe error and event codes (Cont.)

Code	Message
–420	Query UNTERMINATED.
–430	Query DEADLOCKED.
–440	Query UNTERMINATED after indefinite response.
100	System Message

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Examples

This section describes a few brief examples using some of the commands described in this manual. These examples are intended to show how the commands from the Command section work together to complete a task.

Example 1: Monitor Power Supply Voltages

This example shows how to monitor the mainframe power supply voltages

1. Send the STATus:QUEStionable:VOLTage:ENABle command to enable the bits in the Voltage Enable register. This command lets you monitor all voltage limits.

   ```
   STAT:QUES:VOLT:ENAB 32767
   ```

2. Send the STATus:QUEStionable:ENABle command to enable the bit 0 in the Questionable Enable register. If any problems occur with any of the power supplies, bit 0 of the register will be set.

   ```
   STAT:QUES:ENAB 1
   ```

Example 2: Monitor the Delta Temperature

This example shows how to monitor the delta temperature in slots 0, 1, 2, and 3. The maximum allowable delta temperature for slots 0 and 1 is 10 °C; the maximum allowable delta temperature for slots 2 and 3 is 5 °C.

1. Send the STATus:QUEStionable:TEMPerature:LIMit command to set the temperature limits for the four slots (one command per slot):

   ```
   STAT:QUES:TEMP:LIM DELTA0, 10
   STAT:QUES:TEMP:LIM DELTA1, 10
   STAT:QUES:TEMP:LIM DELTA2, 5
   STAT:QUES:TEMP:LIM DELTA3, 5
   ```

2. Send the STATus:QUEStionable:TEMPerature:ENABle command to enable the bits in the Temperature Enable register. This command allows you to measure temperatures for the individual slots.

   ```
   STAT:QUES:TEMP:ENAB #H0F
   ```


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3. Send the STATus:QUEStionable:ENABle command to enable bit 4 in the Questionable Enable register. If any problems occur with any of the slots, the corresponding bit will be set.

```
STAT:QUES:ENAB 16
```

Example 3: Summarize Status Information

The following example shows how to return a summary of the status information using the STAT:SEVent command.

Send the STAT:SEVent? query and note the returned information. For example, assume that the query returns a decimal value of 1073741947 (0X4000007b). Decoding the information indicates that both fans failed and that the temperatures for slots 0 through 3 exceeded the specified limits.

Since bit 30 is set, the overflow register should also be checked (STAT:S2EV?).

Example 4: Monitor the Power Supply Currents

See STATus subsystem on page 3–31.

Example 5: VXIMonitor

See VXIMonitor subsystem on page 3–155.

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Specifications

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Specifications

This chapter contains the complete specifications for the IntelliFrame Mainframe. Within each section, the specifications are arranged in functional groups such as: *AC Power Source*, *Secondary Power*, *Cooling*, *Certifications and compliances*, *Environmental*, *Backplane*, *Display System* and *Mechanical*.

All specifications are warranted unless unless labeled *typical*. Typical specifications are provided for your convenience but are not guaranteed. Specifications that are marked with the ✓ symbol are checked in the *Performance Verification* chapter beginning on page 5–1.

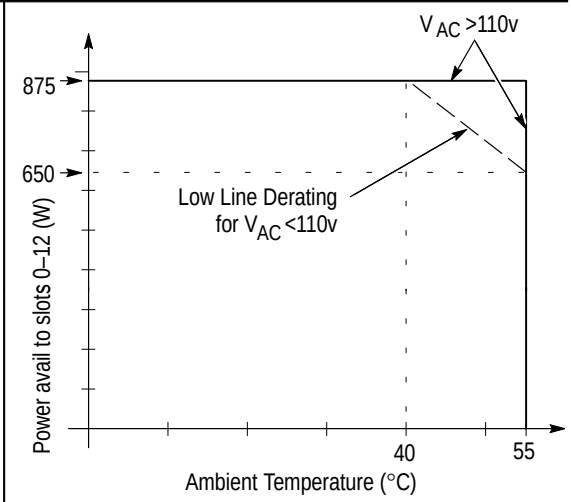
***NOTE**. All VX1410A specifications listed in this chapter also apply to VX1411A mainframes that have been upgraded. All VX1420A specifications also apply to upgraded VX1410A and VX1411A mainframes.*

Table 4–1: AC Power Source

Characteristic	Description
Source Voltage	90 V_{RMS} to 250 V_{RMS}, continuous range
Source Frequency	115 V Operation: 45 to 66 Hz or 360 to 440 Hz 230 V Operation: 45 to 66 Hz
Power Consumption	VX1410A:1350 W line power maximum VX1420A:1450 W line power maximum
Fuse Rating	
90 V – 132 V Operation	0.25 in × 1.25 in, Slow Blow, 20 A, 250 V
103 V – 250 V Operation	0.25 in × 1.25 in, Fast Blow, 15 A, 250 V
207 V – 250 V Operation	5 mm × 20 mm, Fast Blow, 6.3 A, 250 V
Inrush Surge Current	70 A maximum
Input Current	VX1410A:15 A maximum at 90 V_{RMS} 6.3 A maximum at 207 V_{RMS} VX1420A:16.5 A maximum at 90 V_{RMS} 6.3 A maximum at 207 V_{RMS}
Power Factor Correction	0.99 @ 60 Hz operation 0.95 @ 400 Hz operation
Power Disconnect	Front Panel On/Standby. No primary switch on rear panel. Power cord provides main power disconnect. The Front Panel On/Standby switch may be disabled for remote operation. Enhanced monitor provides ability to turn the instrument on/off under program control.

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Table 4–2: Secondary Power

Characteristic	Description		
Maximum Power Available to slots 0–12			
VX1410A DC Current Capacity (I_{MP}[1])	*Total available from power supply*	*Maximum mainframe usage*	*Minimum Available for slots 0–12*
Voltage			
+24 V	13 A	1 A_{RMS}	12 A
+12 V	13 A	Negligible[2]	13 A
+5V	95 A	3 A	92 A
–2 V	–30 A	Negligible[2]	–30 A
–5.2 V	–60 A	Negligible[2]	–60 A
–12 V	–13 A	Negligible[2]	–13 A
–24 V	–13 A	–1 A_{RMS}	–12 A
+5 V Stdby[3]	0 A	0 A	0 A
VX1420A DC Current Capacity (I_{MP}[1])	*Total available from power supply*	*Maximum mainframe usage*	*Minimum Available for slots 0–12*
Voltage			
+24 V	13 A	2 A_{RMS}	11 A
+12 V	13 A	Negligible[2]	13 A
+5V	95 A	3 A	92 A
–2 V	–30 A	Negligible[2]	–30 A
–5.2 V	–60 A	Negligible[2]	–60 A
–12 V	–13 A	Negligible[2]	–13 A
–24 V	–13 A	–2 A_{RMS}	–11 A
+5 V Stdby[3]	0 A	0 A	0 A

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Table 4–2: Secondary Power (Cont.)

Characteristic	Description	
Maximum Current Capacity (I_{MD}[4])	*Voltage*	*I_{MD} (dynamic current)*
	+24 V	9 A
	+12 V	3 A
	+5 V	14.5 A
	–2 V	–7 A
	–5.2 V	–12 A
	–12 V	–3 A
	–24 V	–9 A
	+5 V STDBY	0 A (user supplied)
DC Voltage Regulation	*Voltage*	*Tolerance, $\triangle V$*
	+24 V	+1.2 V, –720 mV
	+12 V	+600 mV, –360 mV
	+5 V	+250 mV, –125 mV
	–2 V	–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 DC Load 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}

1 **Rated mainframe peak DC output current as defined by the VXIbus specification.**

2 **Typical mainframe current usage is <100 mA**

3 **If user supplied 1 A**

4 **Rated mainframe peak-to-peak dynamic current as defined in the VXIbus specification by a current verses frequency curve.**

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Table 4–2: Secondary Power (Cont.)

Characteristic	Description	
Maximum DC Induced Ripple/Noise	*Voltage*	*Ripple/Noise*
	+24 V	150 mV_{pp}
	+12 V	50 mV_{pp}
	+5V	50 mV_{pp}
	–2 V	50 mV_{pp}
	–5.2 V	50 mV_{pp}
	–12 V	50 mV_{pp}
	–24 V	150 mV_{pp}
Protection	Over voltage protection Under voltage protection Over temperature protection Short circuit protection	
Voltage Readout	Readout of ±24 V, ±12 V, +5 V, –2 V, –5.2 V, +5 V Standby if present, and +5V External via VXIbus or RS232	
Voltage Readout Accuracy, typical	±3% maximum	
Current Readout	Readout of the present current usage on the ±24, ±12 , +5, –2, and –5.2 V supplies with VXIbus or RS232	

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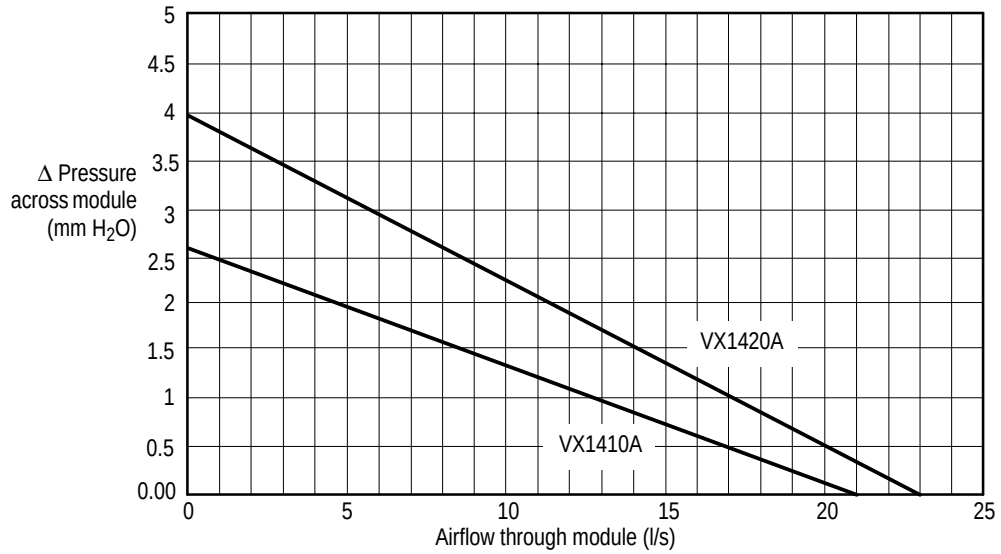
Table 4–3: Cooling

Characteristic	Description
Cooling System	VX1410A: Forced air circulation (positive pressurization) with one removable filter. Two internal DC fans provide cooling for the power supply and the 13 VXIbus module slots. VX1420A: Forced air circulation (positive pressurization) with two removable filters. One DC fan provides cooling for the power supply and 13 VXI module slots.
Fan Speed Control	Slot exhaust air and ambient air temperature are monitored such that a maximum ΔTemperature is maintained. Rear Panel switch chooses between full speed and variable speed.
Slot Activation	Installing a VXIbus module activates the cooling for the corresponding occupied slots by opening the IntelliGuide mechanism. Only provides cooling to installed modules.
Slot Airflow Direction	P2 to P1, bottom of module to the top of module.
Mainframe Intake	VX1410A: Lower rear of mainframe. VX1420A: Bottom rear and lower rear of mainframe.
Mainframe Exhaust	Top rear and top sides of mainframe.
Cooling Clearance	Two inches on both sides and rear of mainframe.
Pressurization	Positive (modules pressurized).
Filter Access	VX1410A: Single air filter accessible from rear of the mainframe. VX1420A: Dual air filters accessible from rear of the mainframe.
Temperature Readout	Readout of intake air temperature and individual slot exhaust temperature through VXIbus or RS-232.
Fan Speed Readout	VX1410A: RPM = 30 *(Tach Frequency) or RPM =15 /(+Pulse Width), where (+Pulse Width) is the positive pulse width of either of the Tach1 or Tach2 fan output signals. Readout of system fan speed through VXIbus or RS-232. VX1420A: RPM = 20 *(Tach Frequency) or RPM = 10/(+Pulse Width) where (+Pulse Width) is the positive pulse width of the Tach 1 fan output signal measured in seconds. Readout of system fan speed is also available via VXIbus and RS-232 with Enhanced Monitoring.
ΔTemperature Sensitivity, typical	100 mV per ° C, 0° C rise corresponds to 0 V output.

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Table 4–3: Cooling (Cont.)

Characteristic	Description
Temperature Sense Range, typical	–10° C to +90° C, ΔTemperature rise ≤ 50° C
Fan Speed Range	VX1410A:1200 to 3350 RPM VX1420A: 650 to 2250 RPM



Note 1. Proposed VXI–8 cooling methods fan filter removed, fans at full speed and sea level.
Note 2. These curves represent airflow through a single slot with all other shutters closed. The airflow will decrease as additional shutters are opened.

Figure 4–1: Mainframe cooling curve

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Table 4–4: Certifications and compliances

Characteristic	Description
EC Declaration of Conformity	Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility and Low Voltage Directive 73/23/ECC for Product Safety. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities: EMC Directive 89/336/EEC: EN 55011 Class A Limits for Conductive Emissions. EN60555-2 AC Power Line Harmonic Emissions. EN 55011 Class A Limits for Radiated Emissions. EN 50082-1 Immunity: IEC 801-2 Electrostatic Discharge Immunity IEC 801-3 RF Electromagnetic Field Immunity IEC 801-4 Electrical Fast Transient/Burst Immunity IEC 801-5 Power Line Surge Immunity Low Voltage Directive 73/23/EEC: EN61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use
Australian Declaration of Conformity (C-Tick Mark)	Complies with Australian EMC Framework, under the Standard applicable product class 2064, governing radiated and conducted emissions.
Immunity, Enclosure, Electrostatic Discharge (ESD)	Up to 8 kV with no change to control settings or impairment of normal operation, and up to 15 kV with no loss of stored data or damage that prevents recovery of normal operation by the user (IEC 801-2).
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 (IEC 801-3).
Immunity, Fast Transients, Common Mode	No loss of stored data, change to control settings, degradation of performance, or temporary loss of function will occur when the mainframe is subjected to the following transients (IEC 801-4): *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

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Table 4–4: Certifications and compliances (Cont.)

Characteristic	Description		
Immunity, AC Power Line Transients	No loss of stored data, change to control settings, degradation of performance, or temporary loss of function will occur when the mainframe is subjected to the transients as described below (IEC 801-5).		
	Mode	*Peak Voltage*	*Tr/Th*[5]
	Common Differential	2 kV 1 kV	1.2/50 μs 8/20 μs
FCC	The mainframe complies with the radiated and conducted emissions requirements of FCC 47 CFR, Part 15, Subpart B, Class A equipment.		
Certifications	UL3111-1 Standard for electrical measuring and test equipment CAN/CSA C22.2 No. 1010.1–Safety requirements for electrical equipment for measurement, control and laboratory use.		
Conditions of Approval	Installation CAT II [Local-level mains (wall sockets). This instrument is cord-connected]. Certifications are made for the following conditions: Pollution Degree 2 (rated for indoor use only) Safety Class I (grounded product) Altitude (maximum operating) 2000 meters Equipment Type: Test and Measuring		
Installation Category Definitions	Category:	Examples of Products in this category:	
	CAT III	Distribution-level mains, fixed installation	
	CAT II	Local-level mains, appliances, portable equipment	
	CAT I	Signal levels in special equipment or parts of equipment, telecommunications, electronics	

[5] **Open circuit voltage (short circuit current) transient characteristics.**

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Table 4–5: Environmental

Characteristic	Description
Classification	The IntelliFrame Mainframe is suitable for operation in the Tektronix and MIL-T-28800E (Type III, Class 5, Style E or F) environments as specified in this table.
Atmospherics	
Temperature	Meets the limits stated in MIL-T-28800E for Type III, Class 5
Operating	0° C to 55° C, derated 1° C/1000 ft (305 m) above 5000 ft (1524 m)
Nonoperating	–40° C to 75° C
Relative Humidity	
Operating	Up to 95% at up to 30° C and up to 45% at up to 55° C
Nonoperating	Up to 95% at up to 55° C
Altitude	
Operating	15,000 ft. (4570 m) operating temperature derated 1° C/1000 ft (305 m) above 5000 ft (1524 m)
Nonoperating	40,000 ft (12,190 m)
Dynamics	
Random Vibration	Three axis, 30 minutes total, 10 minutes per axis, without VXI modules installed. Rear face exempted.
Operating	0.27 g_{RMS} total from 5 Hz to 500 Hz
Nonoperating	2.28 g_{RMS} total from 5 Hz to 500 Hz
Mechanical Shock, Nonoperating	Half Sine, 30 g's, 11 ms duration, 3 drops each side, 18 shocks total, without VXI modules installed or with installed VXI modules weighing less than 5 lbs each. Meets functional shock requirements of Mil–T–28800E, Type III, Class 5.
User Handling, Operating	Each edge lifted four inches and allowed to free fall onto a solid wooden bench surface without VXI modules installed. Rear face exempted.

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Table 4–6: Backplane

Characteristic	Description
Bus Grant/ Interrupt Acknowledge	Solid state, auto-configuring (jumperless)
VXIbus CLK10 Distribution	The ECL clock, CLK10, is distributed from Slot 0 to Slots 1 through12 in full differential form.

Table 4–7: Display System VX1410A Option 1M or VX1420A

Characteristic	Description
Display Type	3.74 in x 0.20 in (95 mm x 5 mm), Fluorescent Indicator Module.
Display Resolution	One line by 20 alphanumeric characters, implemented in a 5 x 7 dot matrix with cursor underline.

Table 4–8: Mechanical

Characteristic	Description
Overall Dimensions	
Mainframe	
Height (with feet)	13.65 in (35.00 cm)
Width	16.7 in (42.55 cm)
Depth	VX1410A:24 in (60.96 cm) VX1420A 26.5 in (69.99 cm)
Mainframe with Rackmount	
Height	13.25 in (33.6 cm)
Width	18.9 in (48.01 cm)
VX1410A: Depth	26.4 in (67.06 cm) to 31.4 in (79.76 cm) in 0.5 in increments, user selectable
VX1420A: Depth	28.9 in (71.06 cm) to 33.9 in (82.76 cm) in 0.5 in increments, user selectable
Cable Tray, Option 1U	(See Figure 4–4 for overall mainframe dimensions)
Height	1.75 in (4.45 cm)
Width	16.6 in (42.16 cm)
Depth	18.5 in (47.43 cm)

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Table 4–8: Mechanical (Cont.)

Characteristic	Description
Cable Tray, Option 2U	(See Figure 4–5 for overall mainframe dimensions)
Height	3.50 in (8.89 cm)
Width	16.6 in (42.16 cm)
Depth	18.5 in (47.43 cm)
Weight	
VX1410A mainframe	45.5 lbs (20.7 kg) with no modules installed
VX1420A mainframe	48 lbs (22.1 kg)
Rackmount Option 1R	20 lbs (9.1 kg)
Rackmount Option 2R	22 lbs (10 kg)
Rackmount Option 3R	3 lbs (1.4 kg)
Cable Tray Option 1U	7 lbs (3.2 kg)
Cable Tray Option 2U	9 lbs (4.1 kg)
Shipping Weight	
Instrument package	90 lbs (40.9 kg) maximum with no modules installed
Options package	38 lbs (17.3 kg) maximum
Module Size	13 C-size VXI slots. The mainframe also accepts A-size or B-size modules using the 73A-851 module.
Finish	Tektronix silver grey and Tektronix TV grey paint on an aluminum chassis

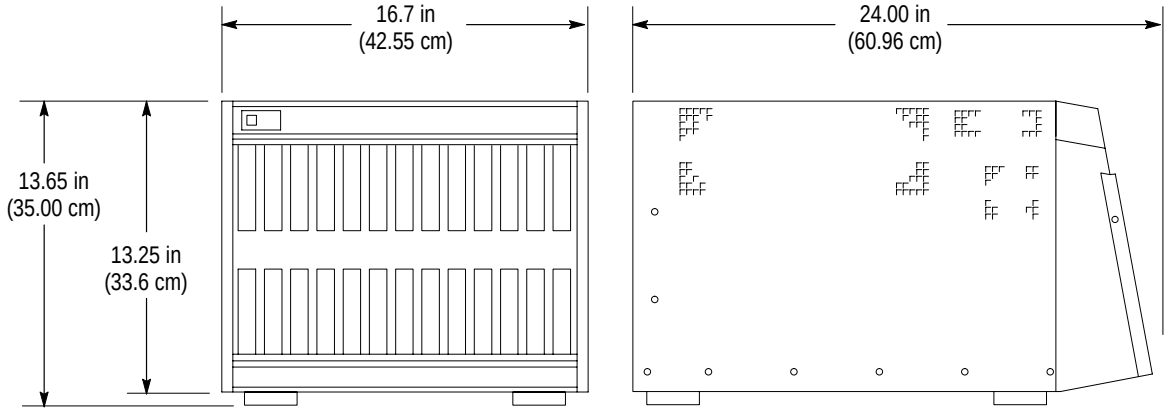


Figure 4–2: Front view and side view of VX1410A IntelliFrame Mainframe

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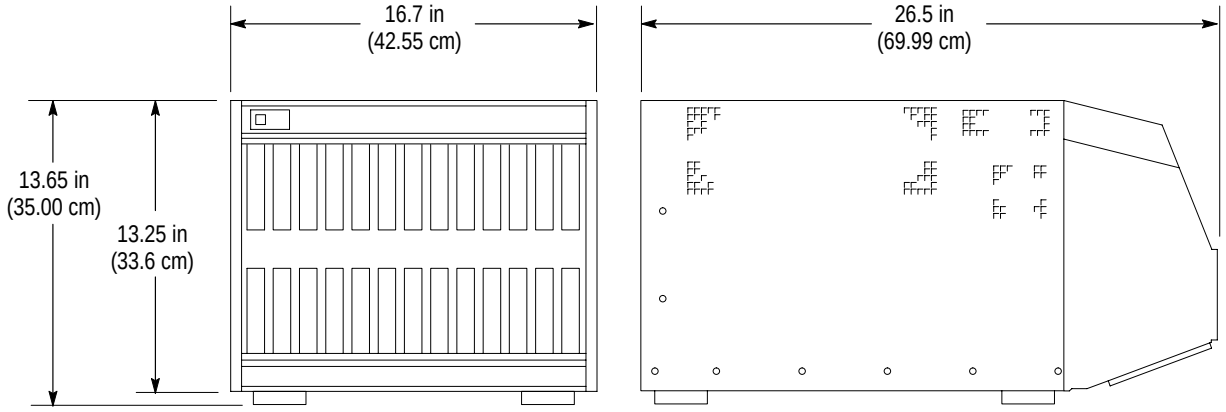


Figure 4–3: Front view and side view of VX1420A Super Cooler

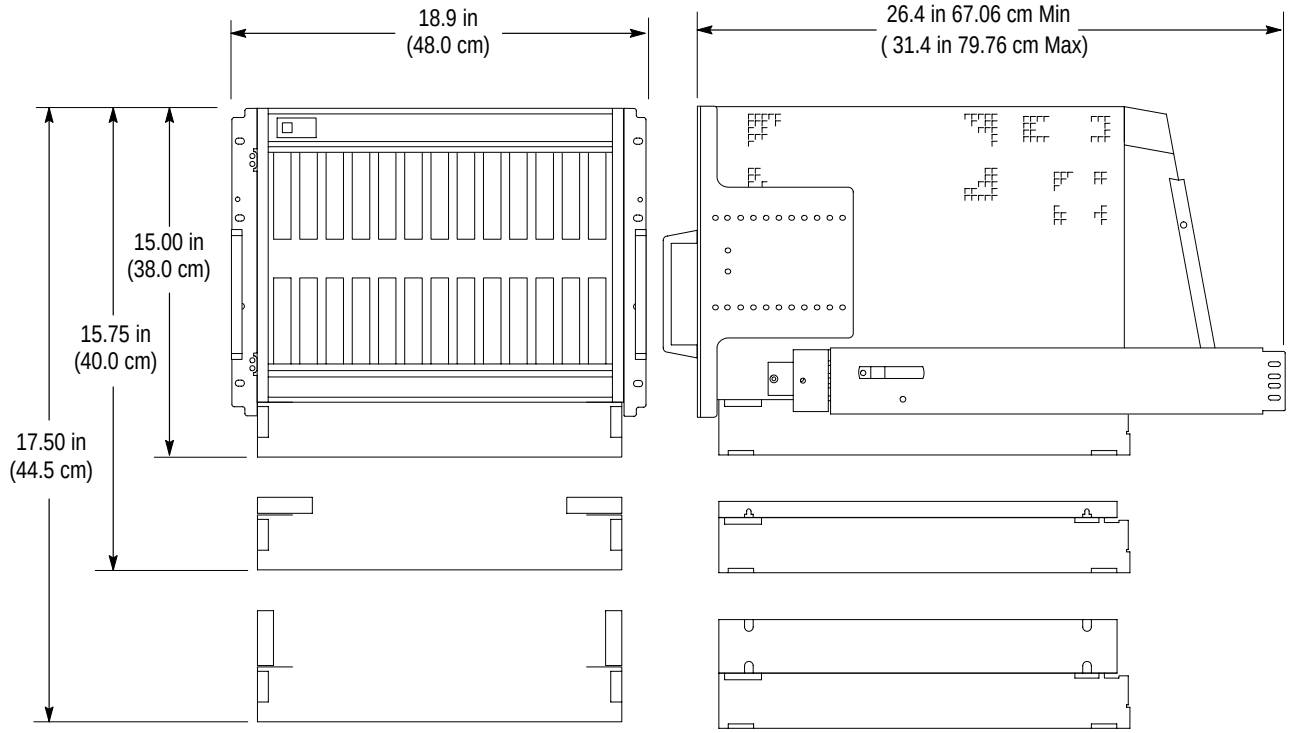


Figure 4–4: Front view and side view of IntelliFrame Mainframe with Option 1U and rackmount option

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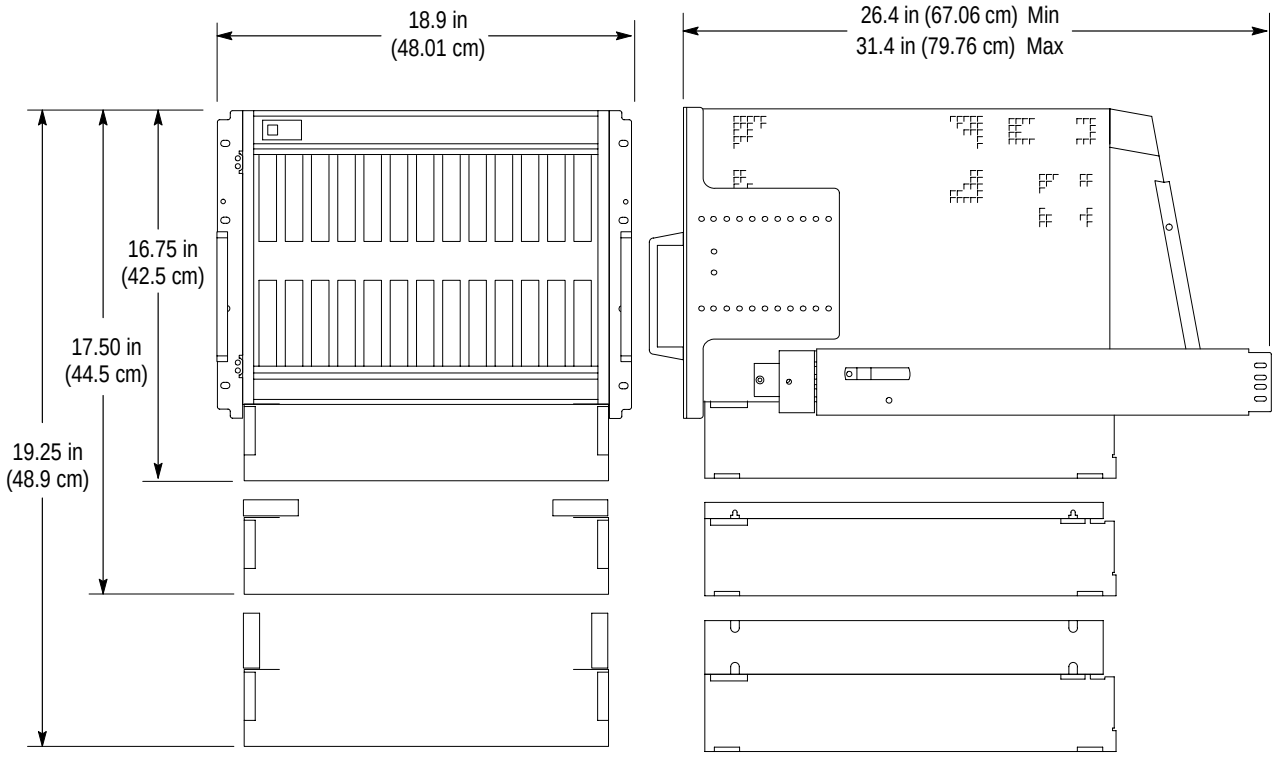


Figure 4–5: Front view and side view of IntelliFrame Mainframe with Option 2U and Rackmount Option

Table 4–9: VXI and Plug & Play

Characteristic	Description
VXI	Fully compatible with VXIbus System Specifications, Rev 1.4
VXI*Plug&Play*	
Mainframe	VXI*Plug&Play* compliant with the following: WIN Framework 4.0 WIN 95 Framework WIN NT Framework

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WARNING

The following servicing instructions are for use only by qualified personnel. To avoid injury, do not perform any servicing other than that stated in the operating instructions unless you are qualified to do so. Refer to all Safety Summaries before performing any service.

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Performance Verification

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Performance Verification

Use the steps in this chapter to verify that the IntelliFrame Mainframe operates properly. The checks consist of checking the power supply voltages at the 25-pin Rear Panel Passive Monitor connector at the rear of the mainframe.

Equipment Required

You will need the following equipment to complete the performance verification checks in this chapter:

- Digital Voltmeter (Tektronix DM250 series digital voltmeter)
- Oscilloscope, 20 MHz BW, with 1X Probe with < one-inch ground lead, (Tektronix TDS500A series oscilloscope with a P6101B probe)

DC Voltage Regulation

The DC voltage regulation can be verified by following the steps listed under *Functional Check* beginning on page 1–25. If you have the VX1410A with Option 1M or the VX1420A, perform the additional following steps:

1. Scroll through the various status messages on the front panel display and check that the display does not flash and that no failures appear.
2. Compare the seven voltages that you measured under *Functional Check* on page 1–25 against the readouts of the voltages on the display.
3. Verify that the voltage readings on the display are within ±3% of the voltage measured at the 25-pin connector.

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DC Load Ripple and Noise

Use an oscilloscope to check the DC Load Ripple and Noise on the pins of the 25-pin connector and compare the results against the limits listed in Table 5–1.

1. Set up the oscilloscope as follows:

Bandwidth Limit	20 MHz
Input Coupling	AC
Volts/Division	10 mV/div
Time Base	1 s/div
Trigger Mode	Auto
Acquisition Mode	Peak Detect

2. Connect a ground lead (less than one inch) to the 1X oscilloscope probe (P6101B).
3. Connect the probe to Pin 1 of the 25-pin connector and connect the ground lead to one of the ground pins listed in Table 5–1.
4. Check that peak-to-peak voltage displayed on the oscilloscope is less than the limits listed in Table 5–1.
5. Check the remaining voltages in Table 5–1.

Table 5–1: DC load ripple and noise check

Pin	Supply	Limits (V_{p-p})
1	+5 V	50 mV
2	–12 V	50 mV
3	–24 V	150 mV
4	–2 V	50 mV
14	+12 V	50 mV
15	+ 24 V	150 mV
16	–5.2 V	50 mV
9, 17, 8,19, 20, 22, 24	Ground	

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Theory of Operation

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Theory of Operation

Theory of Operation

This Chapter provides a brief overview of the theory of operation for the VX1410A & VX1420A IntelliFrame Mainframe. Figure 6–1 shows the functional block diagram of the mainframe and the major components.

IntelliFrame Mainframe

The standard mainframe contains the following major components:

- Power supply
- Backplane
- Enhanced Monitor board
- Temperature Sense board

Power Supply. The power supply provides all voltages and currents to the mainframe. The power supply connects to the backplane at P25, P26, P27, and P28 through the Power Supply. The power supply can be replaced as a single unit.

Backplane. The Backplane (A4) provides all the connections to module slots 0 through 12 in the mainframe. It also has connections to all other circuit boards and modules in the mainframe.

The front panel On/Standby DC switch connects to one of two connectors at the top of the backplane. When the switch is connected to J22, the switch controls the power in the mainframe. When the switch is connected to J23, the power-on functions are controlled by an external source through the 25-pin connector on the Monitor board. Although the switch still illuminates when power is applied to the mainframe, the on/off function of the switch is disabled. (Refer to *Remote Power Switch Configuration* on page B–1 for information on powering the mainframe with a remote momentary switch.)

The backplane connects to the Power Supply at J25 to J28. A 30-wide ribbon cable at 0J4 on the backplane connects to J16 on the Temperature Sense board. Connectors 0J1, 0J2, and 0P3 carry instrument monitoring information from the backplane to the Monitor board.

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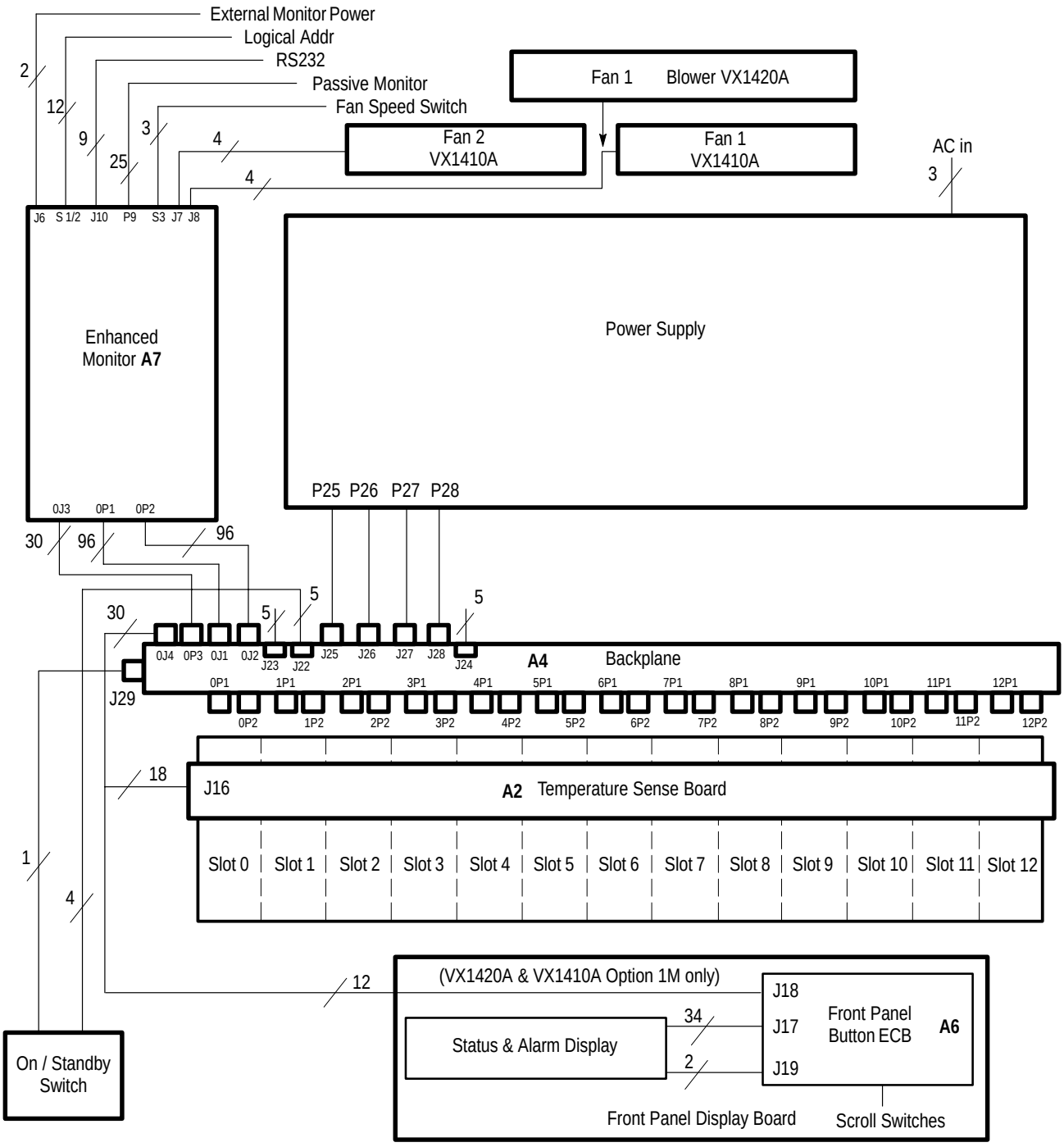


Figure 6–1: Mainframe block diagram

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Temperature Sense Board. The Temperature Sense board (A2) monitors the exhaust air temperatures for each slot within the mainframe. The Temperature Sense Board connects to the backplane through the ribbon cable at J16.

Enhanced Monitor Board. Your IntelliFrame Mainframe comes standard with the Enhanced Monitor board. The Front Panel Display board is standard on the VX1420A and is Option 1M on the VX1410A. The Enhanced Monitor board (A7) collects the monitoring information from the power supply, fans, and Temperature Sense board and passes it to the 25-pin D connector. The Monitor board connects directly to the backplane at 0J3, 0P1 and 0P2. The Enhanced Monitor includes a nine-pin RS-232 port to connect to an external host. Address switches near the bottom rear of the board allow you to select the VXIbus address. A green READY indicator and amber ACCESSED indicator located at the bottom of the board indicate the operating status of the mainframe.

VX1410A-The two fans connect to the Monitor board at J7 (Fan2) and J8 (Fan1). The Fan Speed switch (S3) selects either variable fan speed (VAR) or full speed (FULL).

VX1420A-The blower connects to the Monitor board at J8 (Fan2). The Fan Speed switch (S3) lets you select either variable fan speed (VAR) or full speed (FULL).

Table 3–1 on page 3–2 shows the pinouts of the 25-pin D connector.

The Enhanced Monitor board also has circuitry to allow you to communicate with the mainframe with SCPI commands. These commands are detailed in the *Reference* section of this manual.

An Auxiliary Power input connector is available to connect 5 volts from an outside source to power the communication circuitry in the event of power failure of the mainframe.

Mainframe with Option 1M

Option 1M provides your VX1410A mainframe with a Front Panel Display board. You may upgrade your mainframe with a front panel display by ordering the VXF1M field upgrade kit. This display should be standard on your VX1420A mainframe.

Display Panel. The Front Panel Display board (A6) has a 20-character alphanumeric display that displays the system messages on the front panel. Scroll keys allow you to scroll through the messages one at a time. The Front Panel Display board connects to the backplane through the ribbon cable at J18.

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Adjustment Procedures

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Adjustment Procedures

This chapter describes adjustment procedures for the IntelliFrame Mainframe. There are no hardware adjustments required for the IntelliFrame Mainframe. The information in this chapter describes the command set for service related tasks. Perform the calibration procedures when major modules have been replaced in the mainframe, such as the Enhanced Monitor, Backplane or Sense circuit boards.

The information in this section is designed for use by qualified service personnel. Read the *General Safety Summary and Service Safety Summary* at the front of this manual and *Service Strategy* on page 8-1 before attempting any procedures in this chapter. Refer to the *Operating Basics* chapter for information on the location of controls, indicators, and connectors used with the mainframe.

***NOTE**. This procedure assumes that you have a PC running MS Windows with the Microsoft Terminal program.*

The following steps describe the calibration procedure using the CALibration command:

1. Place the IntelliFrame Mainframe in a constant-temperature environment.
2. Remove all modules from the IntelliFrame Mainframe.
3. Install the empty slot panel fillers upside down so the shutters are open and air can flow in all 13 slots.
4. Set the fan speed to the FULL position.
5. Power on the IntelliFrame Mainframe and let it run for five minutes.
6. While you are waiting for the mainframe to warm up, execute the Microsoft Terminal program.

   The Microsoft Terminal program is located in the Accessories folder (for the default setup of Microsoft Windows).
7. Connect an RS-232 cable between the COM port on the PC and the RS-232 connector at the rear of the IntelliFrame Mainframe. Refer to Table 3–14 on page 3–111 for a list of the factory default RS-232 settings.
8. Select the **Communications...** command from the Settings menu of the Terminal program and select the appropriate COM port (for example, COM1 or COM2) from the dialog box.

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9. Refer to Table 7–1 and set up the PC RS-232 port configurations. The RS-232 settings must match those of the mainframe.

Table 7–1: PC RS-232 settings for the calibration Procedure

RS-232 Parameter	Setting
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	Xon/Xoff

10. Make sure that the mainframe has had at least five minutes to warm up before continuing this procedure.

11. Send the following commands to enable the password and to calibrate the IntelliFrame Mainframe:

```
SYST:PASS "VX1410"

CAL?
```

12. Check that the CAL? query returns a value of zero to indicate no error has been detected during the calibration.

***NOTE**. Steps 13 and 14 are only necessary if the you have replaced the Enhanced Monitor. If you haven't replaced the Enhanced Monitor go to step 15.*

13. Note the serial number on the rear panel of the mainframe.

14. Send the following command to set up the serial number in the Enhanced Monitor:

```
SYST:SER "Bxxxxxx"
```

The value of Bxxxxxx is the serial number as noted from the rear of the mainframe.

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15. VX1410A with Option 1M or a VX1420A: Use then the front panel Next and Prev buttons to scroll through the delta temperature of the slots. All delta temperatures should read 0 °C ±1 °C.

16. Power down the mainframe.

17. This completes the calibration procedure.

The rest of this section describes the CALibration and SYSTem:PASSword commands in detail.

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CALibration
CALibration?

This a service-related command. The command calibrates the exhaust temperature of each slot. While the mainframe executes the command, the command sets the CALibrating bit in the Operation Status Condition register.

The query performs the same function as the command but it also returns a pass or fail response. A return value of 0 means that the calibration has passed and a return value between 10 and 22 indicates a calibration failure in slots 0 through 12.

Syntax

```
CALibration[:ALL]
CALibration[:ALL]?
```

Parameters

<Parameter>	Query response
Not Applicable	<NR1> 0 10 – 22

Reset Value

Not Applicable

Errors and Events

–203, “Command Protected”
You attempted to execute a command that is protected by a password. See the SYSTem:PASSword command beginning on page 7–5 for more information.

Dependencies

None

Examples

Command: `CAL`

Query: CAL?

Response: 0

Related Commands

None

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SYSTem:PASSword:CDISable

This command disables the protected command CALibration. If the user sends the CALibration command after this command, the IntelliFrame Mainframe will generate an error.

Syntax

```
SYSTem:PASSword:CDISable <Password>
```

Parameters

<Password>	Query response
<string> "VX1410"	Not Applicable

Reset Value

Not Applicable

Errors and Events

–221, "Settings Conflict."
You attempted to send an invalid password.

Dependencies

None

Examples

Command: `SYST:PASS:CDIS "VX1410"`

Related Commands

SYSTem:PASSword:CENable

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SYSTem:PASSword:CENable

This command enables the protected command CALibration. The user has to send this command before the CALibration command; otherwise the Intelli-Frame Mainframe will generate an error.

Syntax

```
SYSTem:PASSword[:CENable] <Password>
```

Parameters

<Password>	Query response
<string> "VX1410A"	Not Applicable

Reset Value

Not Applicable

Errors and Events

–221, "Settings Conflict."
You attempted to send an invalid password.

Dependencies

None

Examples

Command: `SYST:PASS:CEN "VX1410"`

Related Commands

SYSTem:PASSword:CDISable

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SYSTem:PASSword:CENable:STATe?

This query returns whether the password protected commands are enabled/disabled. Enabled commands return a value of 1; disabled commands return a value of 0.

Syntax

```
SYSTem:PASSword[:CENable]:STATe?
```

Parameters

<Parameter>	Query response
Not Applicable	<NR1> 1 0

Reset Value Not Applicable

Errors and Events None

Dependencies None

Examples Query: `SYST:PASS:STAT?`

Response: 1

Related Commands SYSTem:PASSword:CDISable

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SYSTem:SERial
SYSTem:SERial?

This command stores the serial number of the instrument in nonvolatile RAM. The query returns the serial number previously stored.

The command converts all lower case characters in the serial number to upper case.

Syntax

```
SYSTem:SERial <Serial Number>
SYSTem:SERial?
```

Parameters

<Parameter>	Query response
<string> The serial number must start with an alphabetical character followed by an optional alphabetical character and by a maximum of six digits.	<string>

Reset Value

Not Applicable

Errors and Events

–221, “Settings Conflict.”
You attempted to execute a command that is protected by a password. See the SYSTem:PASSword command beginning on page 7–5 for more information.
–220, “Parameter Error”
Invalid serial number.

Dependencies

None

Examples

Command: `SYST:SER "B123456"`

Query: `SYST:SER?`

Response: `"B123456"`

Related Commands

*IDN

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Maintenance

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Maintenance

This chapter provides procedures for inspecting and cleaning the IntelliFrame Mainframe, removing and replacing internal mainframe components, and isolating problems to module levels.

Service Strategy

The service procedures in this manual provide removal and replacement procedures to repair the IntelliFrame Mainframe to a module level. Instrument level repairs are accomplished by exchanging faulty modules with known-good modules or parts. No component-level repair is provided in this manual.

Preparation

The information in this section is designed for use by qualified service personnel. Read the *General Safety Summary and Service Safety Summary* at the front of this manual and *Service Strategy* before attempting any procedures in this chapter. Refer to the *Operating Basics* chapter 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.*

Observe the following precautions to avoid damaging the mainframe:

- Do not handle static-sensitive components on boards.
- Transport and store static-sensitive boards in their original containers or on conductive foam. Label any package that contains static-sensitive assemblies.
- Wear a wrist strap attached to the mainframe while handling the boards to discharge the static voltage from your body.

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- Do not allow anything capable of holding or generating a static charge on the work surface.
- Do not slide a board over any surface.
- Avoid handling boards in areas that have a floor or work surface cover that is capable of generating a static charge.

***NOTE**. Always power down the mainframe and disconnect the power cord before cleaning or servicing the mainframe.*

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. Inspect the mainframe for physical damage incurred during transit. Retain the mainframe packaging in case shipment for repair is necessary. If there is damage or deficiency, contact your local Tektronix representative.

Cleaning procedures consist of exterior and interior cleaning of the mainframe and cleaning the fan filter. Periodic cleaning reduces instrument breakdown and increases reliability. Clean the mainframe as needed, based on the operating environment. Refer to your module user documentation for information on cleaning the individual VXIbus modules.

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, use a cloth or swab dipped in a 75% isopropyl alcohol solution. Use a swab to clean narrow spaces around controls and connectors. Do not use abrasive compounds on any part of the mainframe.

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CAUTION. *To avoid damaging the instrument, avoid getting moisture inside the mainframe during exterior cleaning; use just enough moisture to dampen the cloth or swab.*

Do not wash the front-panel On/Standby switch. Cover the switch while washing the mainframe.

Use only deionized water when cleaning. Use a 75% isopropyl alcohol solution as a cleanser and rinse with deionized water.

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

Cleaning the Fan or Blower Filters

The fan/blower filters are easily removed from the rear of the mainframe. The filters slide out of the rear of the mainframe as shown in Figure 8–1.

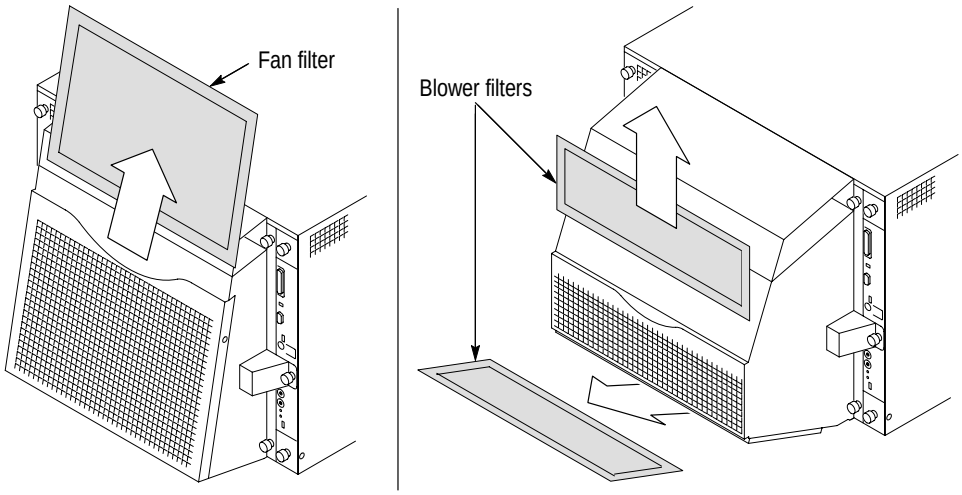


Figure 8–1: Removing the fan/blower filters

Clean the fan/blower filters by vacuuming or blowing air through the filter. Rinse the filter in cool water and dry it before replacing it in the mainframe.

You can reset the filter cleaning interval with the VXI*plug&plug* soft front panel or by sending the STATus: QUEStionable: FILTer:TRESet command. If your mainframe has the front panel display (Option 1M), you can also reset the filter cleaning interval by scrolling to the air filter cleaning time and simultaneously pressing both the NEXT and PREV buttons.

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Removal and Replacement

The following procedures describe how to remove and replace module-level components of the IntelliFrame Mainframe Refer to the exploded view illustrations in *Replaceable Parts* for an overview of the assembly and disassembly of the mainframe.



WARNING. *To avoid electric shock, always power down the mainframe and disconnect the power cord before cleaning or servicing the mainframe.*

Tools Required

The following tools are required to disassemble the IntelliFrame Mainframe to the module level:

- Small flat blade screwdriver
- Diagonal cutters (for removing cable ties)
- Torx screwdriver with a T-10, T-15 and T-20 tip
- A 3/32-inch Allen wrench (hex wrench)
- #2 Phillips or #1 Pozidriv driver

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Procedure 1: Removing the Mainframe Cover

To remove the mainframe cover, refer to Figure 8–2 while performing the following steps:

1. Remove the 12 hex drive screws (6 each side) using a 3/32 Allen wrench.
2. Lift the front bottom corners up.
3. After tilting the cover up about 3 inches, lift the cover straight off the instrument.

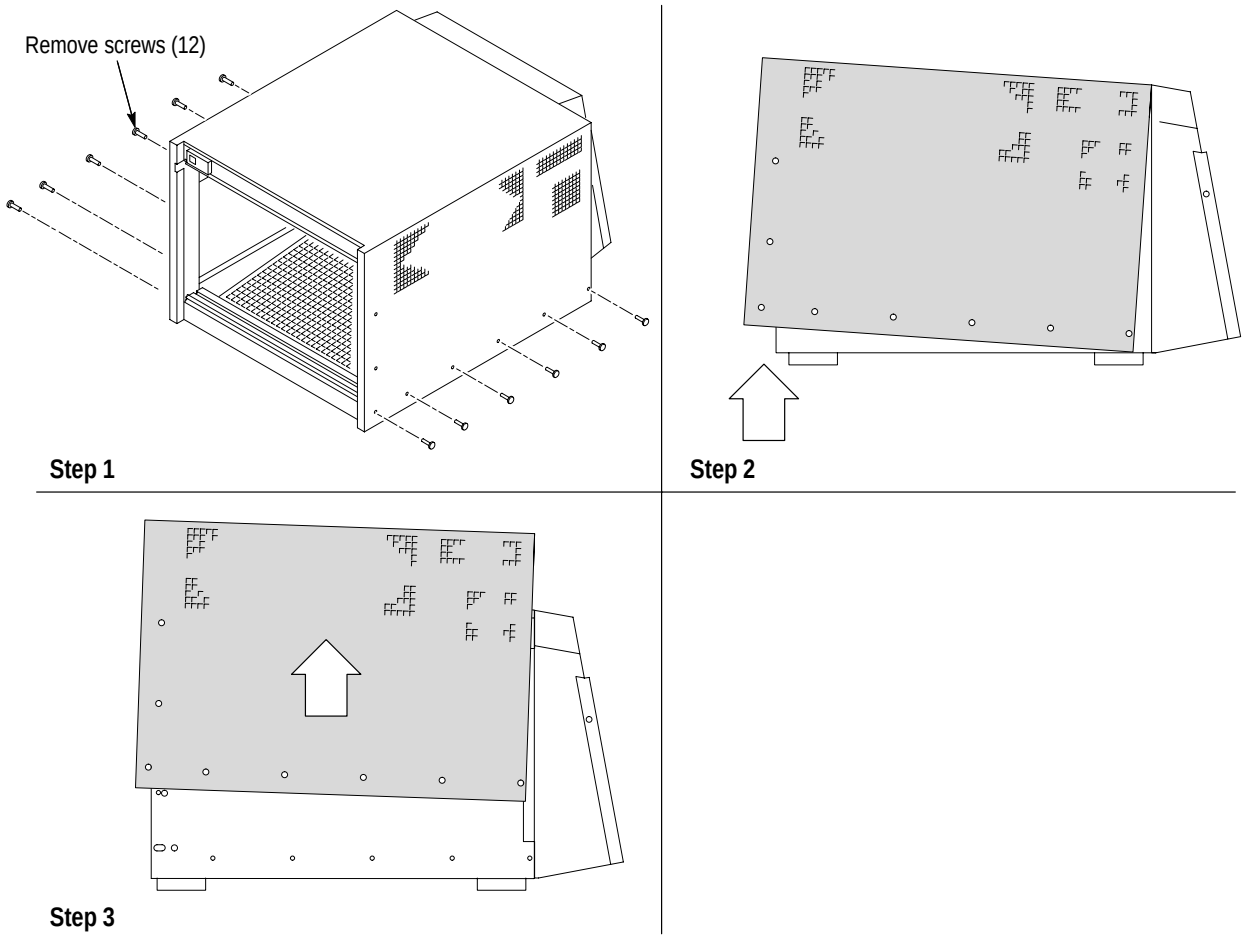


Figure 8–2: Removing the mainframe cover

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Procedure 2: Removing the Fan or Blower Assembly

To remove the VX1410A and VX1420A fan/blower assemblies, refer to Figures 8–3, 8–4, 8–5, 8–6 and 8–7 while performing the following steps:

1. Loosen the captive screw that secures the fan cable cover to the instrument. Remove the cable cover. Refer to Figures 8–3 and 8–4.
2. Unplug the cables.
3. Remove the Chassis Ground (if installed) screw using a T-20 tip.
4. From the back of the mainframe, loosen the five captive screws using a Phillips screwdriver. Refer to Figure 8–3 for screw locations.
5. Remove the fan cable fan/blower assembly from the instrument and set the fan/blower assembly aside on a clean working surface.
6. VX1410A: Remove the filter from the fan assembly.
7. VX1410A: Remove the two hex socket screws that secure the filter cover to the fan assembly using a 3-32 Allen wrench. Then remove the filter cover from the fan assembly.
8. VX1410A: Remove the three 6-32 screws (with a pozidriv tip) that secure each fan to the inside of the fan assembly as shown in Figure 8–5.
9. VX1410A: Remove the cable tie holding the fan cables to the assembly. Then remove the fans from the assembly.
10. VX1420A: Perform steps 1 through 5.
11. VX1420A:Remove the ten 8-32 screws that secure the shroud to the chassis using a 3/32 Allen wrench. Six screws are located on the sides of the shroud and four screws are located on the bottom of the shroud. Separate the shroud from the blower assembly. See Figure 8–7.
12. VX1420A: Remove the four 8-32 Torxdrive T-20 screws that secure the blower to the chassis.
13. VX1420A: Remove the two sheet metal Torxdrive T-20 screws that secure the blower to the blower assembly brackets. Remove the blower from the blower assembly brackets.
14. VX1420A: To help prevent losing the screws while replacing the blower, temporarily replace the two sheet metal screws removed in step 13

***NOTE**. When reconnecting the fan cables to the mainframe, verify that you connect the fan cables to their respective connectors. Match the labels on the fan cables to their respective connector on the rear of the mainframe.*

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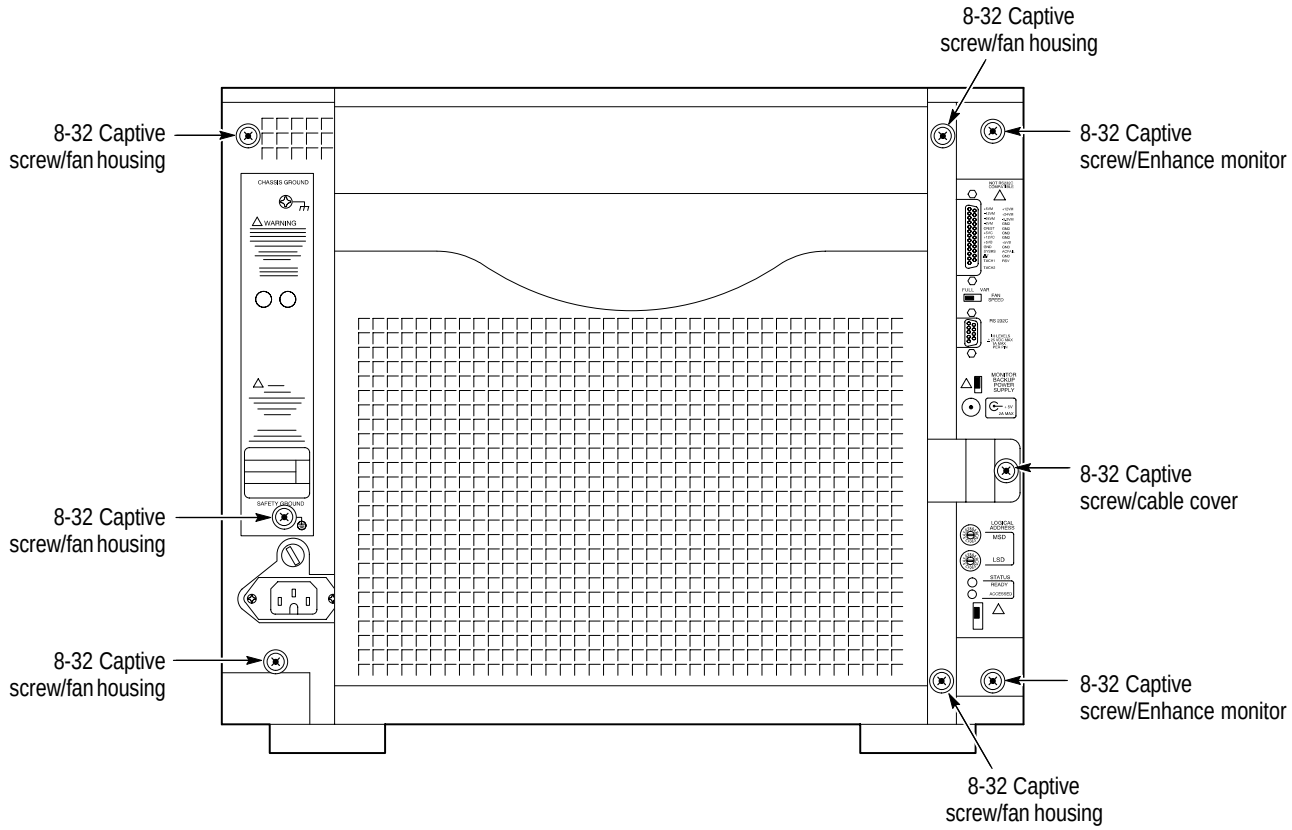


Figure 8–3: Location of fan assembly screws on the rear of the mainframe

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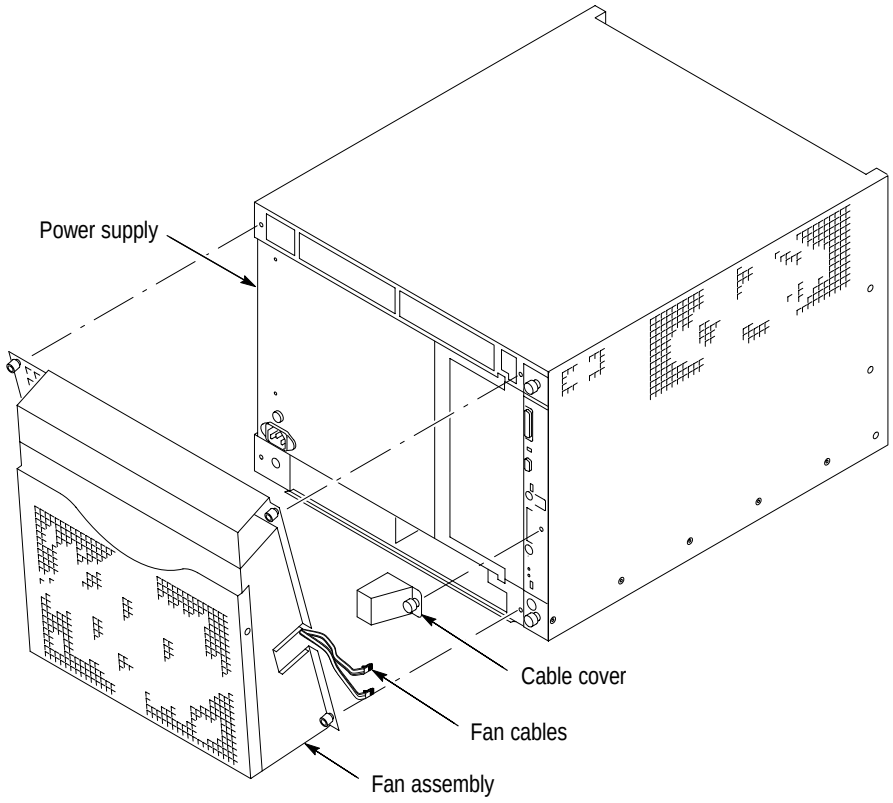


Figure 8–4: VX1410A–Removing the fan assembly

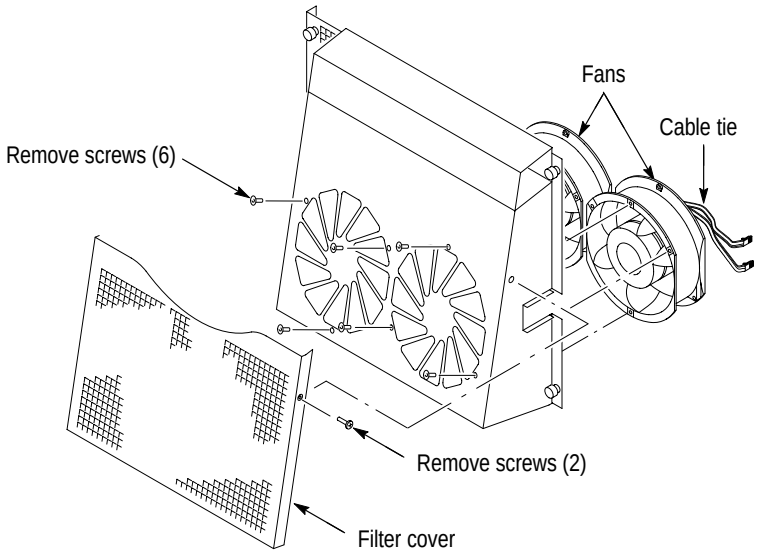


Figure 8–5: VX1410A–Removing the fans

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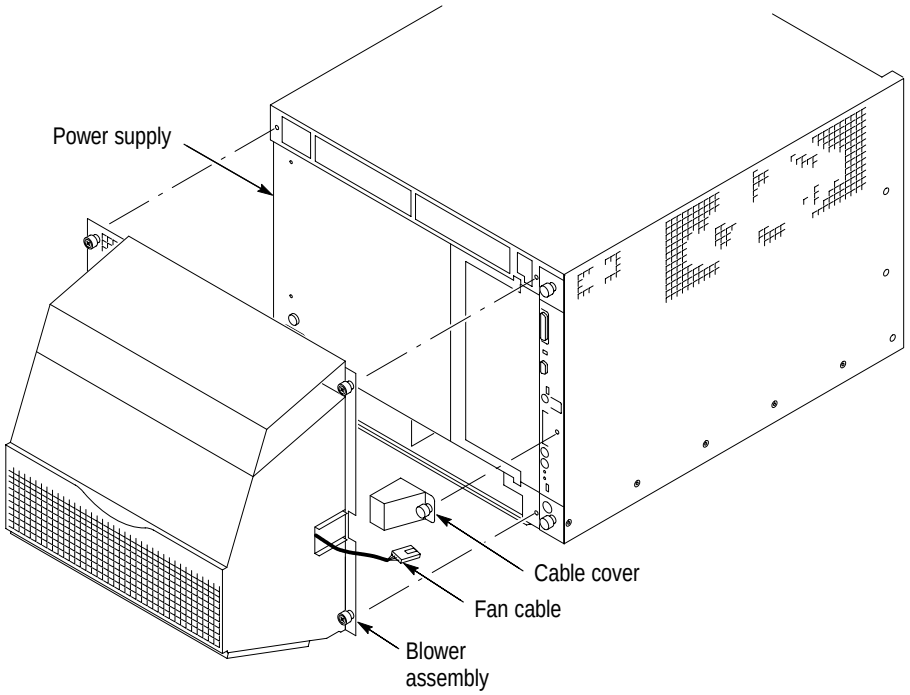


Figure 8–6: VX1420A–Removing the blower assembly

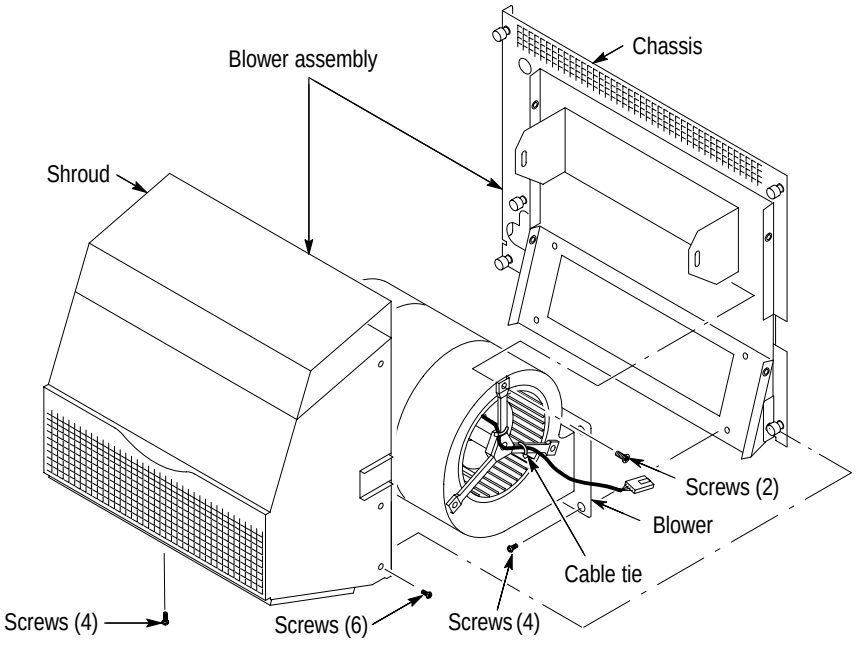


Figure 8–7: VX1420A–Removing the blower

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Procedure 3: Removing the Enhanced Monitor

To remove the enhanced monitor, perform the following procedure (refer to Figure 8–8):

1. Loosen the captive screw that secures the cable cover to the back panel, and then remove the cable cover.
2. Disconnect the fan cables.
3. Loosen the two captive screws that secure the enhanced monitor to the rear panel. Then slide the enhanced monitor out of the mainframe.

NOTE. *If you replace the Enhanced Monitor, remember to calibrate the mainframe. Refer to* Adjustment Procedures *beginning on page 7–1 for information on calibrating the mainframe. Refer to Table 8–1 to ensure J2, J38 and J19 jumper configurations are matched to appropriate instrument, as indicated by the Lexan Front Panel.*

Table 8–1: IntelliFrame Mainframe Enhanced Monitor jumper configurations

Jumpers (location)	Pins	Mainframes	Label on board
J2 (top of board)	1-2	VX1410A	10A
J2	2-3	VX1411A	11A
J2	3-4	VX1420A	20A
J38 (middle of board)	1-2	————	Dual
J38	2-3	————	Blower
J19 (bottom of board)	1-2	————	Dual
J19	2-3	————	Blower

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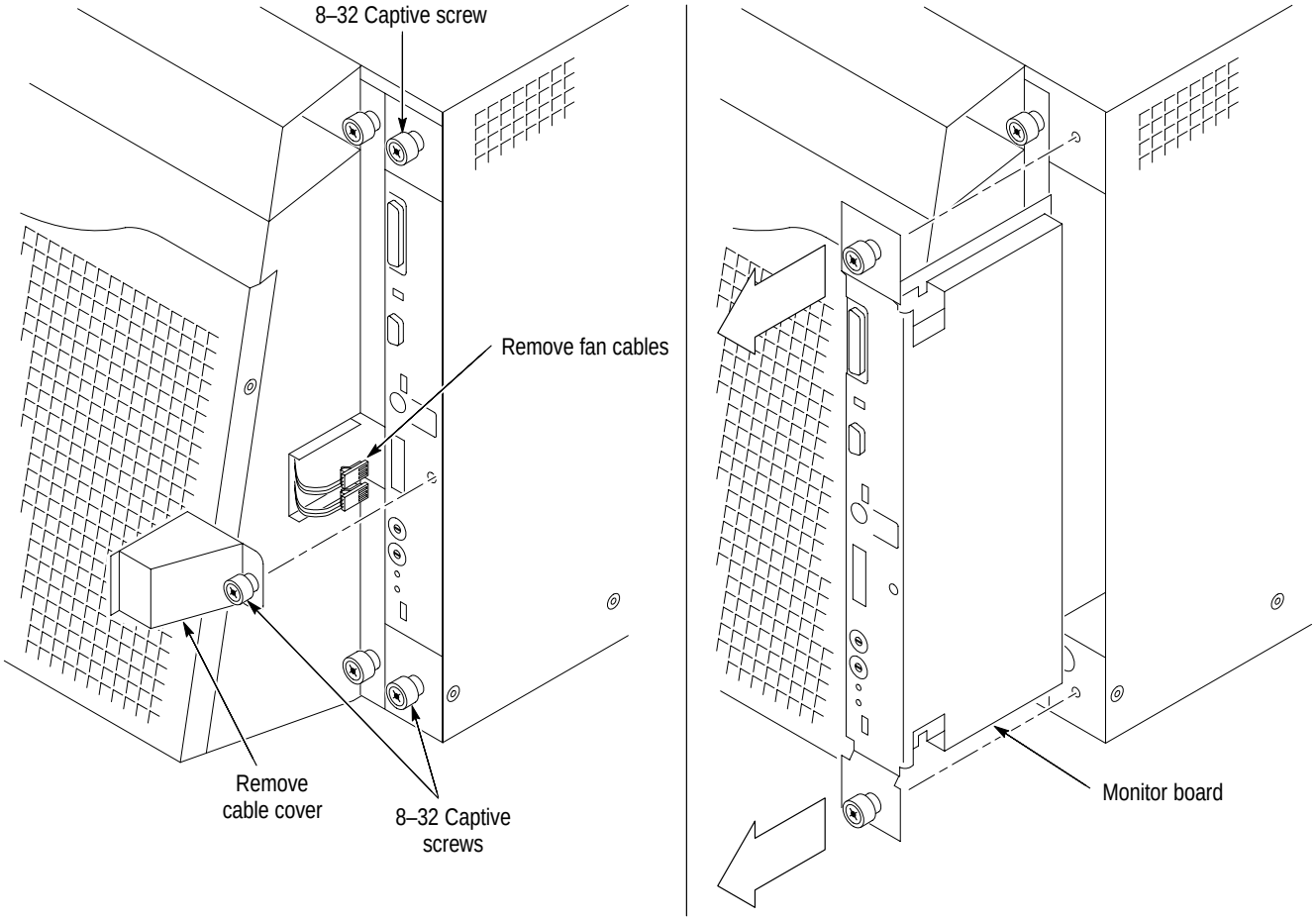


Figure 8–8: Removing the Enhanced Monitor

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Procedure 4: Removing the Power Supply

To remove the power supply from the mainframe you must first remove the fan assembly. Perform Procedure 2 on page 8–6, to remove the fan assembly then continue with the following steps:

1. Using the handle on the power supply, firmly pull out the power supply from the rear of the mainframe.
2. Remove two 3/32 hex-drive screws and washers to remove the handle from the power supply.

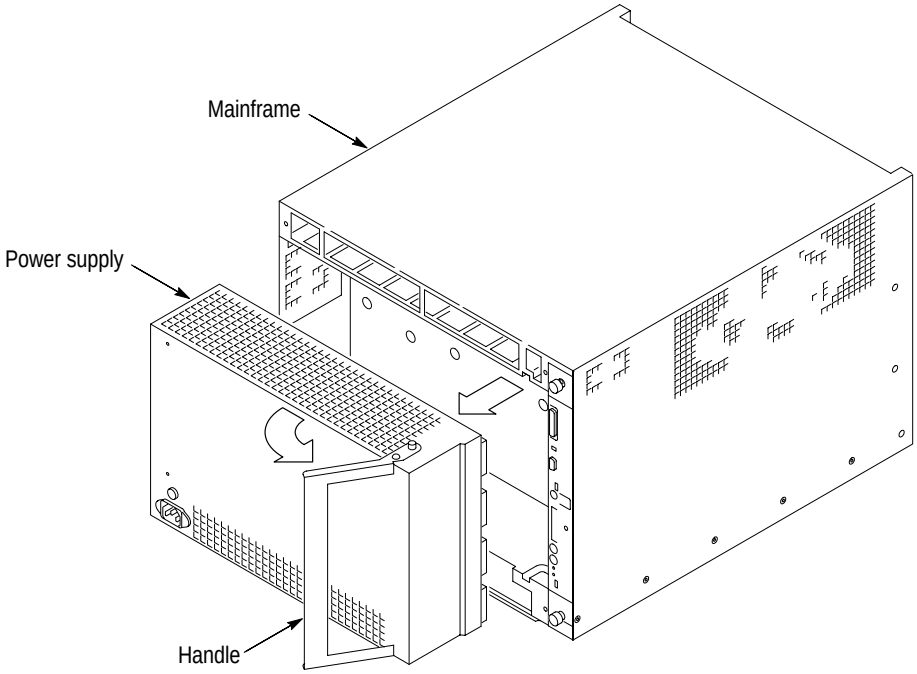


Figure 8–9: Removing the power supply

Procedure 5: Removing the Card Guides

The card guides at the top and bottom of the mainframe are very similar. The main difference is that the bottom guides (IntelliGuides) include the spring-loaded shutters to redirect air into the mainframe. The procedure for removing both guides is identical. Refer to Figure 8–10 while performing the following steps:

1. Use a small flat blade screw driver to pry up the tab of the card guide at the front of the mainframe, being careful not to damage the card guide or the mainframe.
2. Gently pull the card guide forward until it pops out of place.
3. Remove the card guide.

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NOTE. *The bottom card guides (IntelliGuides) are replaced as a unit. The IntelliGuides are not intended to be disassembled.*

To replace a card guide, slide the card guide towards the rear of the mainframe and allow the front of the card guide to snap into place.

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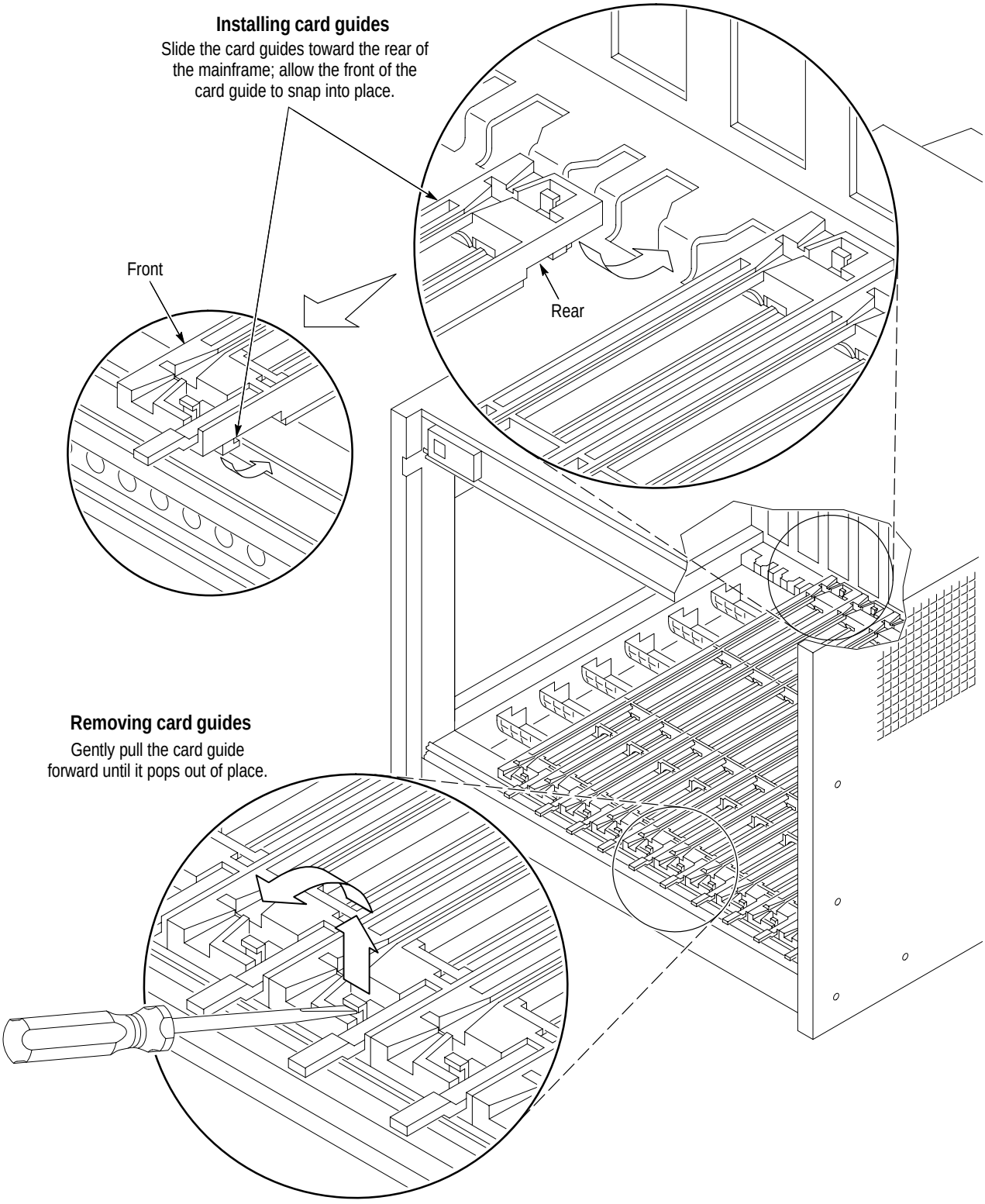


Figure 8–10: Removing the top and bottom card guides

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Procedure 6: Replacing the Top and Bottom Nut Rails

The nut rails at the top and the bottom of the front of the IntelliFrame Mainframe allow the user to secure installed modules into the mainframe by screwing the top and bottom of the modules to the front of the mainframe. Refer to Figure 8–11 to remove these nut rails, and perform Procedure 1 on page 8–5 to remove the mainframe cover.

1. Loosen all module retaining screws (it may be necessary to slide the modules partially out of the mainframe).
2. Slide the nut rail out of hole on the side of mainframe.

Replace the nut rail by sliding it back in the side of the mainframe and pushing it into place.

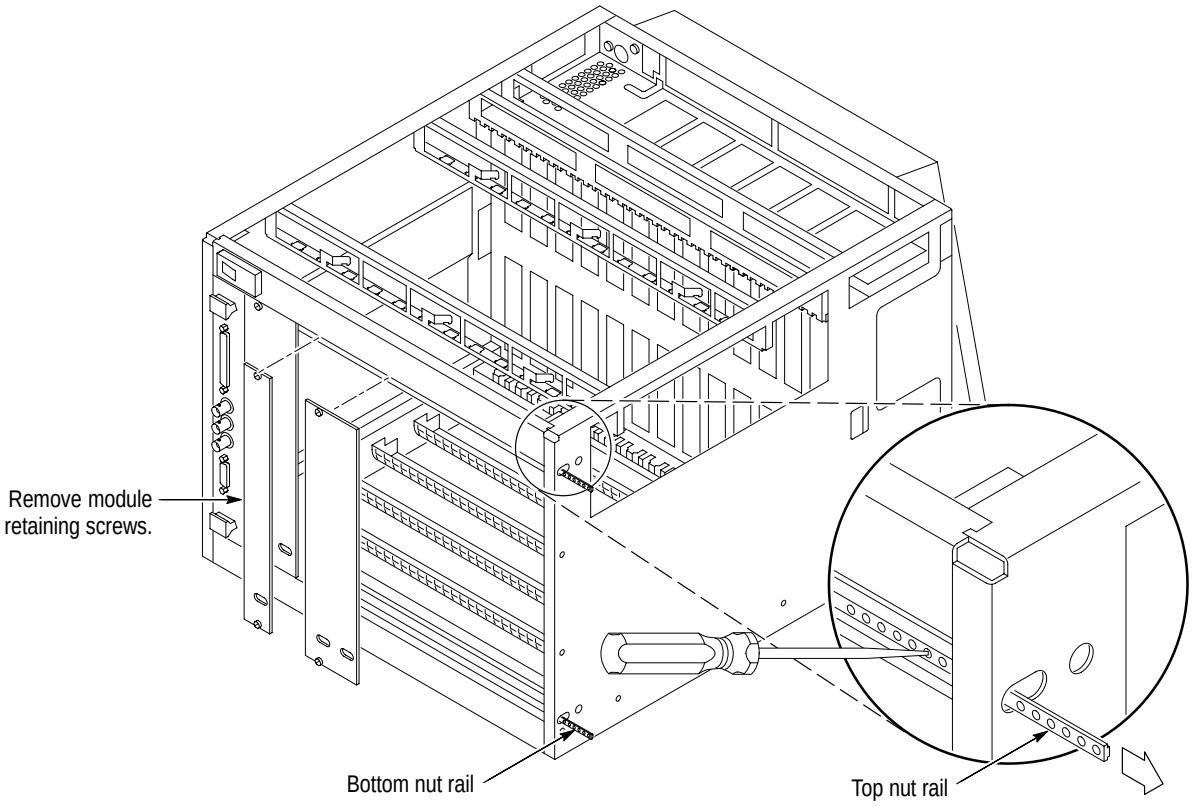


Figure 8–11: Replacing the top and bottom nut rails

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Procedure 7: Removing the Temperature Sense Board

To remove the Temperature Sense board, perform Procedure 1 on page 8–5 to remove the mainframe cover, and then complete the following steps:

1. Disconnect the ribbon cable from the Temperature Sense board.
2. Refer to Figure 8–12 and gently pry up on each retainer holding the Temperature Sense board in place.
3. Tilt the board forward and lift the board out of the holes at the top of the mainframe, being careful not to damage any components on the circuit board.

***NOTE**. If you replace the Temperature Sense board, you have to calibrate the mainframe. Refer to* Adjustment Procedures *beginning on page 7–1 for information on calibrating the mainframe.*

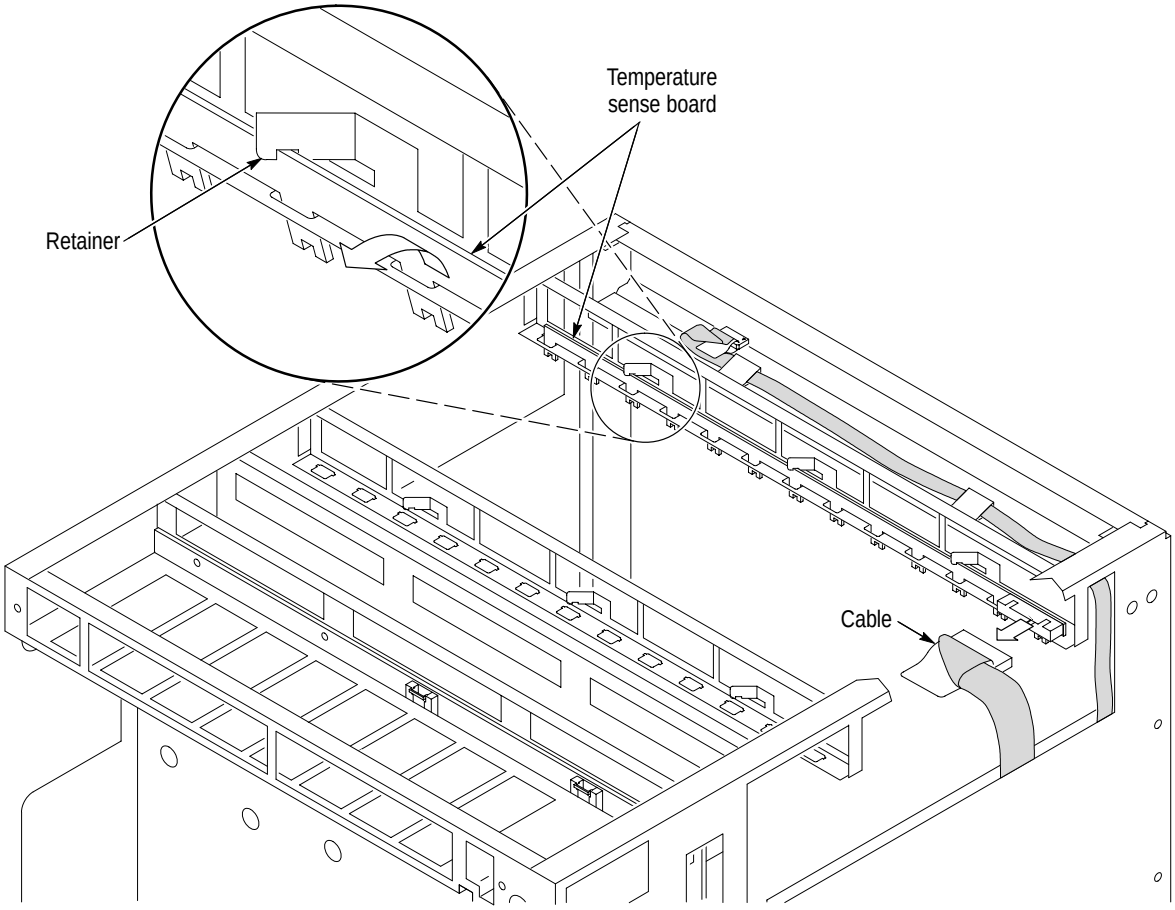


Figure 8–12: Removing the temperature sense board

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Procedure 8: Removing the Front Panel Display Assembly

To remove the front panel Display assembly (for VX1410A with Option 1M or VX1420A mainframes), perform Procedure 1 on page 8–5 and complete the following steps:

1. Remove the top cover of the mainframe (see Figure 8–11 on page 8–15, if necessary).
2. Refer to Figure 8–13 and disconnect the ribbon cable from the rear of the Display assembly.
3. Remove the 6-32 screws holding the Display assembly in place.
4. Gently remove the Display assembly from the mainframe.

   When you reconnect the ribbon cable to the Display assembly, observe the orientation of Pin 1 as shown in Figure 8–13.

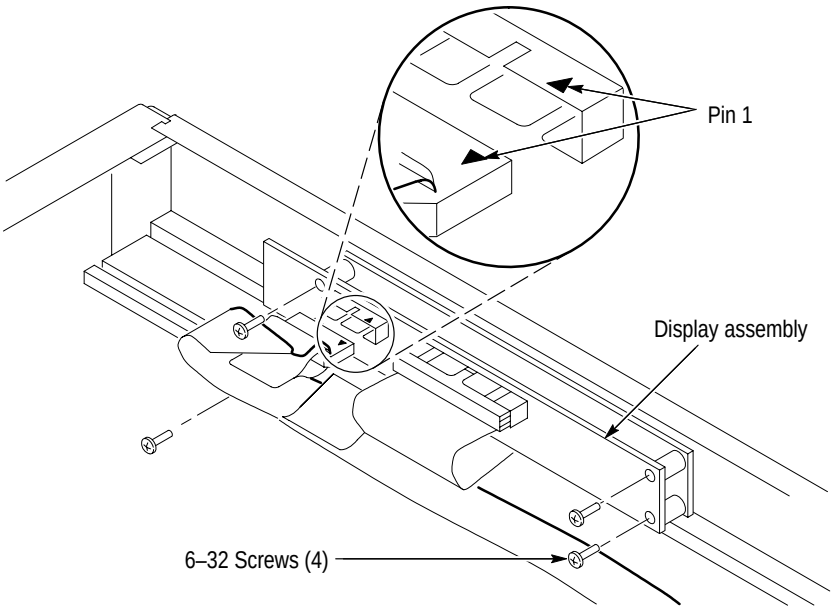


Figure 8–13: Removing the front panel monitor display

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Procedure 9: Removing the EMI DIN Shields

Perform the following steps to remove the EMI DIN shields:

1. Remove any modules surrounding the slots where you intend to remove the Backplane EMI DIN shields. Refer to Figure 8–14.
2. Remove two 4-40 Torxdrive T-10 screws that secure each EMI DIN shield to the backplane.
3. Remove EMI DIN shield from the backplane.

Install the EMI DIN shield by reversing the disassembly procedure.

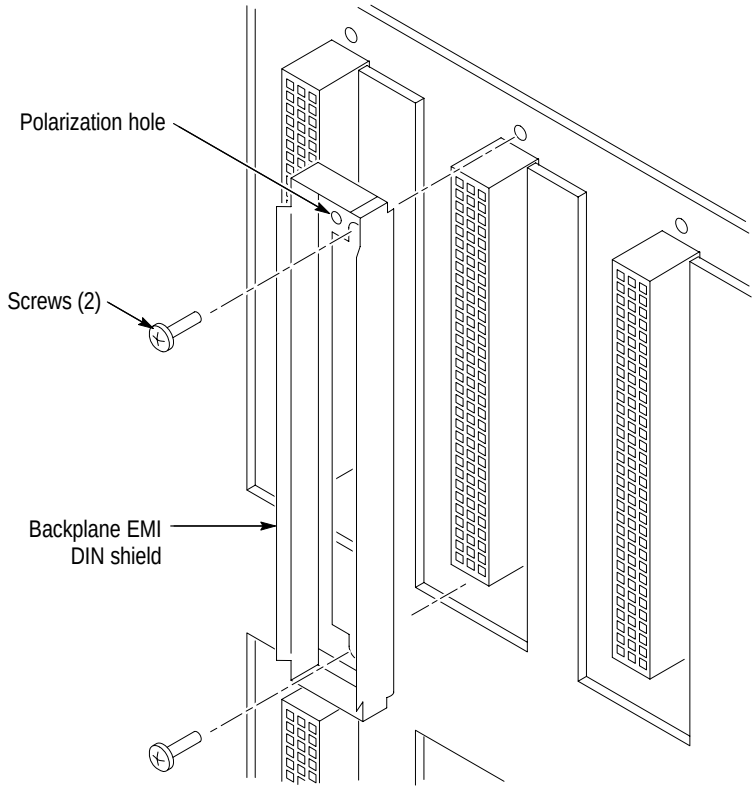


Figure 8–14: Removing the backplane EMI DIN shields

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Procedure 10: Removing the Backplane

To remove the backplane, perform Procedures 1, 2, 3, and 4 on page, beginning on page 8–5. Refer to Figure 8–15 and then complete the following steps:

1. Remove all the modules that are from installed in the mainframe.
2. Disconnect the ribbon cable 0J4 located on the right end (viewed from the rear of the instrument) of the backplane.

***NOTE**. Note which connector the power switch and SysReset cables are connected to on the backplane circuit board.*

3. Disconnect the power switch cable at J22 (or from J23) at the top of the backplane circuit board.
4. Disconnect the SysReset cable (if attached) at J29 at the top of the backplane circuit board.
5. From the rear of the mainframe, remove the five 6-32 screws on the top of the backplane, the seven 6-32 screws from the center, and the five 6-32 screws from the bottom.
6. After removing all screws from the backplane, remove the backplane from the mainframe by sliding it out of the right side.

Install the backplane by reversing the disassembly procedure.

***NOTE**. If the backplane was replaced, the mainframe must be recalibrated. Refer to* Adjustment Procedure 5 *on page 7–1.*

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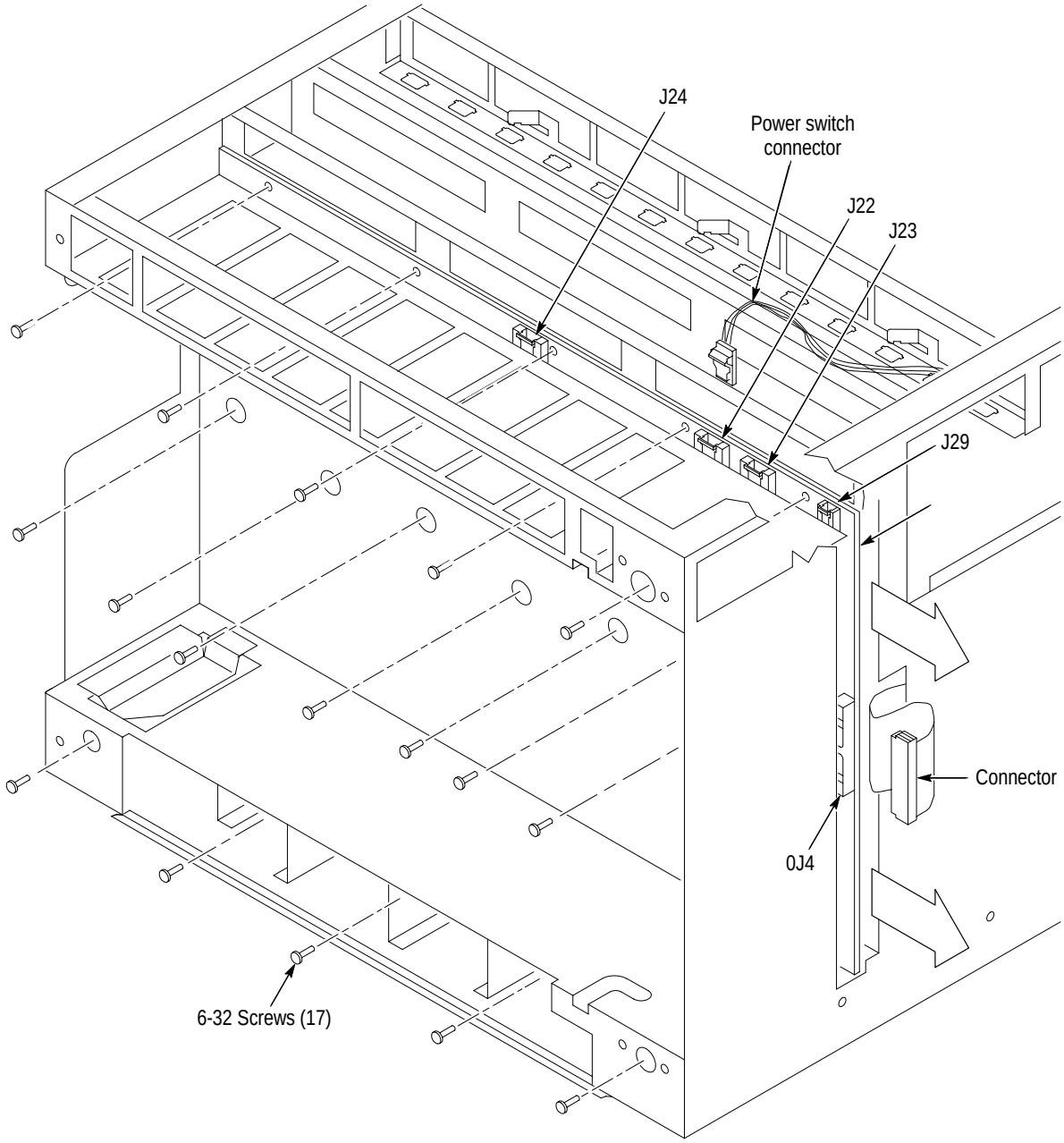


Figure 8–15: Removing the backplane

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Troubleshooting Procedures

The troubleshooting procedures are designed to isolate problems to a module level. No component-level procedures are provided.

Equipment List

The following test equipment is recommended for troubleshooting procedures:

- Digital Voltmeter (Tektronix DMM 16 digital voltmeter)
- Oscilloscope, 20 MHz BW, with 10x Probe with < 1-inch ground lead, (Tektronix TDS500B series oscilloscope)

Diagnostic Information

The IntelliFrame Mainframe does include diagnostics. Refer to the *TEST Subsystem* command descriptions on page 3–19 for more information. The functionality of the mainframe can be verified by following the performance verification procedures as described in *Performance Verification* beginning on page 5–1.

Fuses

The mainframe has one line fuse. The line fuse can be one of three different kinds depending on the operating voltage of the mainframe. Table 8–2 summarizes the different fuses that can be used as the line fuse in the mainframe.

Table 8–2: Fuses

Voltage	Rating	Tektronix replacement part number
103 V to 250 V operation	15 A, Fast Blow, 250 V	159-0256-00
90 V to 132 V operation	20 A, Slow Blow, 250 V	159-0379-00
207 V to 250 V operation	6.3 A, Fast Blow, 250 V	159-0381-00

Fault Isolation

The main focus of the troubleshooting procedures is to isolate problems to one of the major modules within the mainframe. You may find it helpful to refer to the functional block diagram in Figure 6–1 on page 6–2 to isolate problems to one of the modules within the mainframe:

Power Supply Problems. Use the following information to isolate power supply problems to the power supply or to other modules.

- Isolate the problem to either the mainframe or to one of the installed VXIbus Modules. Remove the modules from the mainframe and check that the problem still exists.
- Run the mainframe diagnostic tests.

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- Try isolating the problem to a module by either replacing the module with an known-good module or moving the module to a different slot.
- Check the fuses in the mainframe.
- Perform the procedures as described in *Performance Verification* beginning on page 5–1 to verify the power supply voltages are present and within the specified limits. If the voltages are not present on the 25-pin connector at the rear of the mainframe, try replacing either the power supply or the Enhanced Monitor board. If any of the voltages are not within the specified limits, replace the power supply.

Inadequate Cooling. If there is a cooling problem, perform the following checks:

- Verify that the air filter is clean. If not, remove the air filter and clean it.
- One or both fans may not be operating properly. Check that both fans rotate.
- Verify that each fan is properly connected to the monitor board (see Figure 8–4 on page 8–8).
- Check that both fans are working at their proper speeds.
- Verify that all of the empty slots within the mainframe are closed when no modules are installed. If necessary replace the faulty shutter assembly.
- Verify that the ribbon cable from the Temperature Sense board to the backplane is properly connected.
- Verify that all VXIbus modules have front panels that activate the Intelli-Guides (shutters).

Repackaging Instructions

If you need to send the IntelliFrame Mainframe to a Tektronix field service center for repair, attach a tag to the mainframe with the owner name and address, the serial number, and a brief description of the problem(s) encountered or the service required. Always return all accessories so that the entire system can be tested.

When repacking the mainframe for shipment, use the original packaging. If the packaging is unavailable or unfit for use, contact your local Tektronix representative to obtain new packaging.

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Replaceable Parts

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Replaceable Parts

This section contains a list of the replaceable modules for the IntelliFrame Mainframe. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix products are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest improvements. Therefore, when ordering parts, it is important to include the following information in your order.

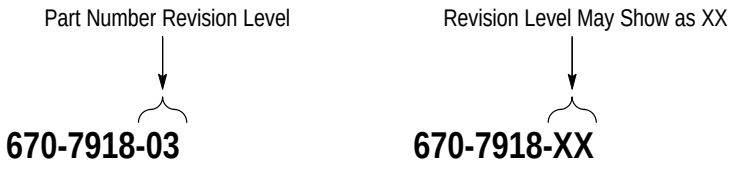
- Part number (see Part Number Revision Level below)
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

Part Number Revision Level

Tektronix part numbers contain two digits that show the revision level of the part. For most parts in this manual, you will find the letters XX in place of the revision level number.



When you order parts, Tektronix will provide you with the most current part for your product type, serial number, and modification (if applicable). At the time of your order, Tektronix will determine the part number revision level needed for your product, based on the information you provide.

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Module Servicing

Modules can be serviced by selecting one of the following two options. Contact your local Tektronix service center or representative for repair assistance.

Module Repair and Return. You may ship your module to us for repair, after which we will return it to you.

New Modules. You may purchase replacement modules in the same way as other replacement parts.

IntelliFrame Mainframe Common Replaceable Parts

Table 9–1 provides a quick reference list of parts that you are most likely to replace. The table only provides a summary of information on the parts. For more detailed information refer to the individual parts lists in this chapter.

Table 9–1: IntelliFrame Mainframe common replaceable parts

Name	Description	Tektronix part number
Power Supply Module	Power supply	119-5553-XX
Air Filter, VX1410A	Air filter:Woven Polypropylene, black, 0.125 thick, 2 layer, vinyl,edging	378-2075-00
Air Filter, VX1420A	Air filter:Woven Polypropylene, black, 0.125 thick, 2 layer, vinyl,edging	378-0442-00
Fuse	Fuse, cartridge:15A,250V,Fast	159-0256-00
Fuse	Fuse, cartridge:20A,250V,5 Sec Min @ 200%,0.25 X 1.25,US REC:326020	159-0379-00
Fuse	Fuse, cartridge:5MM X 20MM,250V,6.3A,High Breaking capacity,ceramic;VDE	159-0381-00
Bottom Card Guide with Shutters	Baffle Assy: VXI Slot, Single, Molded Polycarbonate Alloy	378-0438-00
Card Guide	Guide:Plastic Guide,ECB,VXI Molded Ckt Bd Guide, VXI Form Factor	351-1007-00
Fan, VX1410A	Fan,DC:48v;Tubeaxial,Programmable With Tach Out, 15w,2500 Rpm,170 Cfm,48dBA,6.75” X 5.9” X 2.0”	119-4801-XX
Blower, VX1420A	Fan, DC:Blower,48v,Dual Inlet,450 Cfm,177 W,60 Dba,W/Programmable Tachometer	119-5199-XX

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Using the Replaceable Parts List

This section contains a list of the mechanical and/or electrical components that are replaceable for the IntelliFrame Mainframe Use this list to identify and order replacement parts. The following table describes each column in the parts list.

Parts List Column Descriptions

Column	Column Name	Description
1	Figure & Index Number	Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.
2	Tektronix Part Number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial Number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entries indicates the part is good for all serial numbers.
5	Qty	This indicates the quantity of parts used.
6	Name & Description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.
7	Mfr. Code	This indicates the code of the actual manufacturer of the part.
8	Mfr. Part Number	This indicates the actual manufacturer's or vendor's part number.

Abbreviations

Abbreviations conform to American National Standard ANSI Y1.1–1972.

Mfr. Code to Manufacturer Cross Index

The table titled Manufacturers Cross Index shows codes, names, and addresses of manufacturers or vendors of components listed in the parts list.

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Manufacturers cross index

Mfr. code	Manufacturer	Address	City, state, zip code
0B445	ELECTRI–CORD MFG CO INC	312 EAST MAIN STREET	WESTFIELD, PA 16950
0J9P4	DELTA ENGINEERING & MFG. CO.	19500 SW TETON	TUALATIN, OR 97062
0KB01	STAUFFER SUPPLY CO	810 SE SHERMAN	PORTLAND, OR 97214–4657
0KB05	NORTH STAR NAMEPLATE INC	5750 NE MOORE COURT	HILLSBORO, OR 97124–6474
TK1943	NEILSEN MANUFACTURING INC	3501 PORTLAND RD NE	SALEM, OR 97303
TK2157	CONNECTOR TECHNOLOGY INC	5065 E HUNTER AVE	ANAHEIM, CA 92807–6001
TK2469	UNITREK CORPORATION	3000 LEWIS & CLARK HWY SUITE 2	VANCOUVER, WA 98661
TK2548	XEROX CORPORATION	14181 SW MILLIKAN WAY	BEAVERTON, OR 97005
3M099	PORTLAND SCREW COMPANY	6520 N BASIN AVE	PORTLAND, OR 97217
8X345	NORTHWEST SPRING MFG CO	5858 WILLOW LANE	LAKE OSWEGO, OR 97035
5Y921	COMAIR ROTRON INC	2675 CUSTOMHOUSE CT	SAN YSIDRO, CA 92073
52152	3M COMPANY	INDUSTRIAL TAPE DIVISION 3M CENTER	ST PAUL, MN 55144–1000
01295	TEXAS INSTRUMENTS INC	SEMICONDUCTOR GROUP 13500 N CENTRAL EXPRESSWAY PO BOX 655303	DALLAS, TX 75272–5303
04713	MOTOROLA INC	SEMICONDUCTOR PRODUCTS SECTOR 5005 E MCDOWELL ROAD	PHOENIX, AZ 85008–4229
06383	PANDUIT CORP	17303 RIDGELAND AVE	TINLEY PARK, IL 60477–3048
24931	BERG ELECTRONICS INC	BERG ELECTRONICS RF/COAXIAL DIV 2100 EARLYWOOD DR PO BOX 547	FRANKLIN, IN 46131
61935	SCHURTER INC	1016 CLEGG CT PO BOX 750158	PETALUMA, CA 94975–0158
68579	PERMATRON CORP.	11400 MELROSE ST	FRANKLIN PARK, IL 60131
71400	BUSSMANN	DIVISION COOPER INDUSTRIES INC PO BOX 14460	ST LOUIS, MO 63178
73893	MICRODOT INC	50631 E RUSSELL SCHMIDT BLVD	MT CLEMENS, MI 48045
74594	COMPONENT RESOURCES INC	BUSSMAN PARTS C/O CASEY LAKEY 14525 SW WALKER ROAD	BEAVERTON, OR 97006
75915	LITTELFUSE INC	800 E NORTHWEST HWY	DES PLAINES, IL 60016–3049
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON, OR 97077–0001
86928	SEASTROM MFG CO INC	456 SEASTROM STREET	TWIN FALLS, ID 83301

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Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
9–1					**CABINET AND CHASSIS ASSEMBLY**		
–1	212–0193–00			12	SCREW,EXT RLV:8–32 X 0.375 BUTTON HEAD,HEX DRIVE,STAINLESS STEEL,BLACK OXIDE FINISH,0.093 DRIV	0KB01	ORDER BY DESCRIPTION
–2	200–4330–00			1	COVER:MAINFRAME,0.050 ALUM, SILVER GRAY	80009	200–4330–00
–3	441–2115–00			1	CHASSIS:VXI MAINFRAME,SHEET METAL ASSY, INCLUDES ITEMS 3 THROUGH 5	80009	441–2115–00
–4	348–1542–00			4	FOOT,CABINET:BLACK RUBBER	74594	348–1542–00
–5	212–0204–00			4	SCR,ASSY WSHR:8–32 X 0625 L,PNH,PLATED CARBON STL,W/SQUARE CONE WASHER,PHILLIPS DRIVE,	3M099	212–0204–00
					STANDARD ACCESSORIES		
	070–9645–XX			1	MANUAL, TECH: INSTRUCTION, VX1410A & VX1420A	80009	070-9645-XX
	161–0213–00			1	CABLE ASSY,PWR:3,16 AWG,2.5 METER,SJT,GREY,105 DEG C,MCA–3T X BME–3S,13A/250V,NORTH AMERICAN,	0B445	161–0213–00
	161–0218–00			1	CABLE ASSY,PWR:3,14 AWG,100 L,SJT,BLK, 60 DEG C,5–20P X BME–3S,15A/125V,	0B445	161–0218–00

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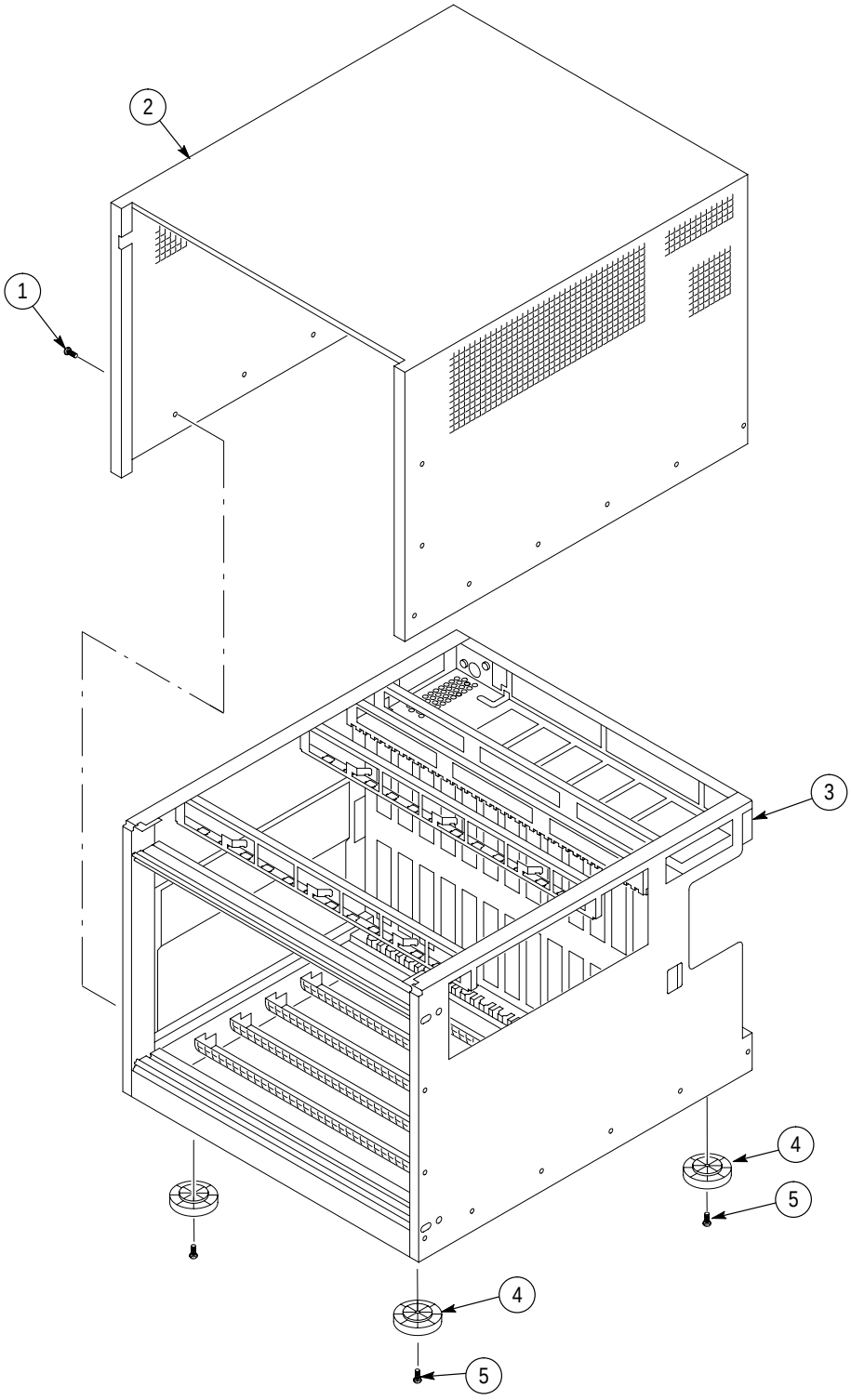


Figure 9–1: Cabinet and chassis assembly

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Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
9–2					**CIRCUIT BOARDS AND CHASSIS PARTS**		
–1	260–2682–00			1	SWITCH,PUSH:SPST,GOLD OVER NICKEL CONTACT,0.4V @ 28V,ILLUMINATED BUTTON, PANEL MNT W/CABLE	80009	260–2682–00
–2	333–4233–00			1	PANEL,FRONT,ASSY:0.062 ALUM,W/LABEL, VX1410A	80009	333–4233–00
–2	333–4237–00			1	PANEL,FRONT, ASSY:0.062 ALUM, W/DISPLAY WINDOW, W/LABEL, VX1420A	80009	333–4233–00
–3	174–3697–00			1	CABLE ASSY:RIBBON,CABLE TEMP SENSE/BACKPLANE,28AWG,2x15,2x10,2x15	TK2469	174–3697–00
–4	671–3219–00			1	CIRCUIT BD ASSY:TEMP SENSE,389–1876–XX WIRED,TESTED	80009	671–3219–00
–5	211–0720–00			17	SCR,ASSEM WSHR:6–32 X 0.500,PNH,STL,CDPL,T–15 TORX DR	0KB01	ORDER BY DESCRIPTION
–6	118–9417–00			1	BACKPLANE VXI:BACKPLANE VXI COMPATIBLE WITH 13 C–SIZE SLOTS ELECTRONIC AUTOMATIC	80009	118–9417–00
–7	020–2194–00			1	COMPONENT KIT:BACKPLANE,EMI SHIELD KIT CONTAINS DIN SHIELD WITH 2 SCREWS ITEMS 7 & 8	80009	020-2194-00
–8	343–0775–00			2	CABLE,CLAMP:RIBBON,1.0X1.0,GRAY,POLYVINYL, W/URETHANE FOAM TAPE BACKING	52152	80610029243/3484–1000
–9	220–0199–01			2	NUT BAR: VXI, M2.5 THREADS	OKB01	ORDER BY DESCRIPTION
–10	378–0438–00			13	BAFFLE ASSY:VXI SLOT, SINGLE, SHUTTER	80009	378–0438–00
–11	351–1007–00			13	GUIDE,SINGLE:PLASTIC	80009	351–1007–00
–12	333–4208–00			5	PANEL,FRONT:DOUBLE,BLANK,AL,PAINTED SILVER GRAY	80009	333–4208–00
–13	333–4207–00			1	PANEL,FRONT:SINGLE,BLANK,AL,PAINTED SILVER GRAY	80009	333–4207–00
					OPTIONAL ACCESSORIES		
–14	333–4206–00			5	PANEL,FRONT:DOUBLE,BLANK,EMI,AL,PAINTED SILVER GRAY	TK1943	333–4206–00
–15	333–4205–00			1	PANEL,FRONT:SINGLE,BLANK,EMI,AL,PAINTED SILVER GRAY	TK1943	333–4205–00
–16	337–4046–00			1	SHIELD,ELEC:AL,DVG1,TG2000	80009	337–4046–00

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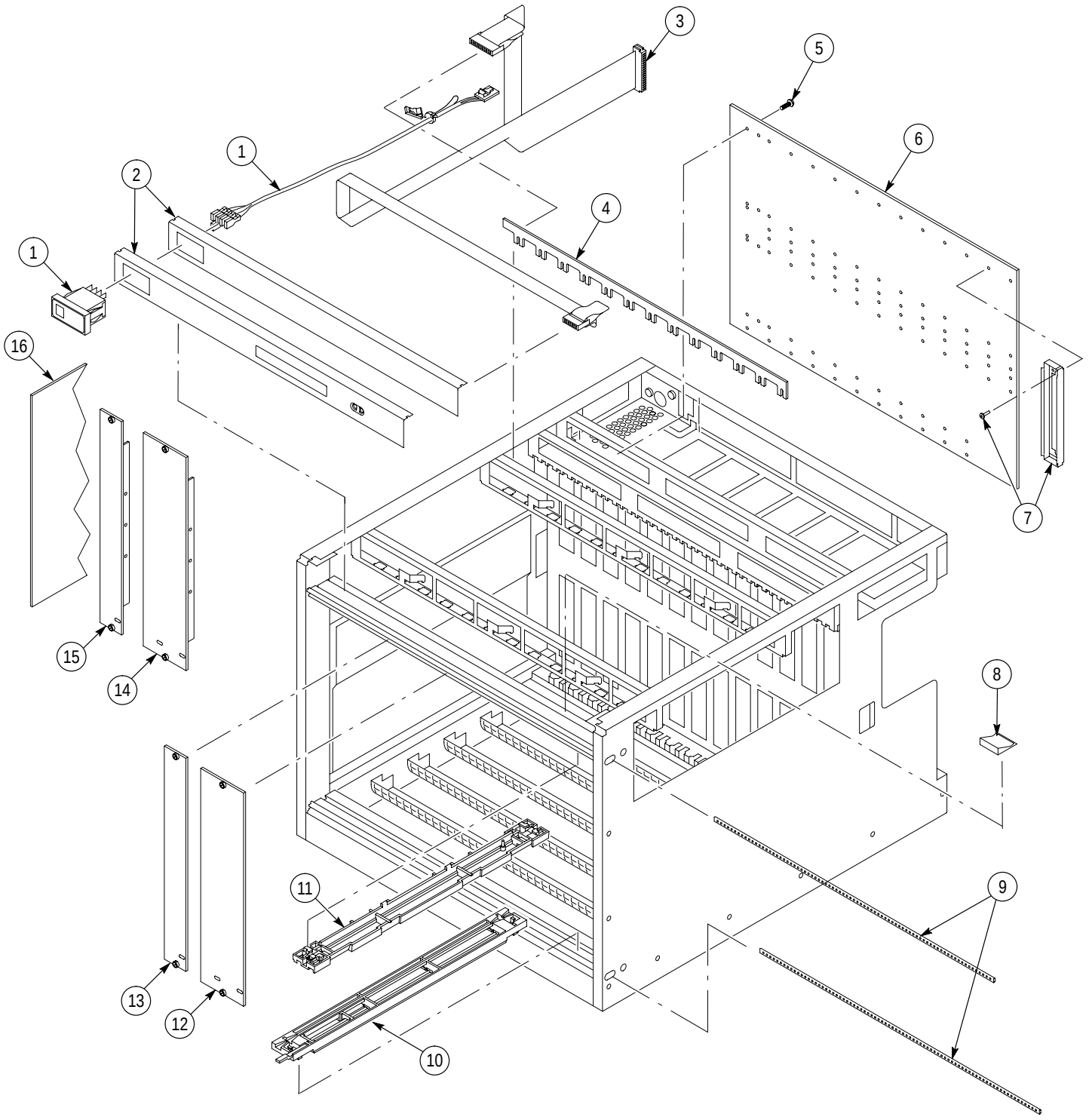


Figure 9–2: Circuit boards and chassis parts

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Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
9–3					**POWER SUPPLY, MONITOR, AND VX1410A FAN**		
–1	671–3982–00			1	CIRCUIT BD ASSY:ENHANCED MONITOR (CONTAINS ITEMS 1 THRU 5)	80009	671–3982–00
–2	333–4236–00			1	PANEL,MONITOR ASSY:ENHANCED,0.062 ALUM,W/LEXAN OVERLAY	80009	333–4236–00
–3	214–3903–01			4	SCREW,JACK:4–40 X 0.312 EXT THD,4–40 INT THD,0.188 HEX,STEEL,CADPLATE	0KB01	214–3903–01
–4	See Figure –1			1	CIRCUIT BD:ENHANCED MONITOR	———	————————
–5	211–0747–00			4	SCREW,MACHINE:6–32 X 0.188,PNH,STL,CDPL,T–15	0KB01	ORDER BY DESCRIPTION
–6	200–4344–00			1	COVER:FAN CABLE,0.040 A1 ALLOY	TK1943	200–4344–00
–7	380–1110–00			1	HOUSING:FAN, PAINT, TEK TV GRAY	80009	380–1110–00
–8	378–2075–00			1	AIR FILTER:WOVEN POLYPROPYLENE,BLACK,0.125 THICK,2 LAYER,VINYL EDGING	74594	378–2075–00
–9	212–0193–00			2	SCREW,EXT RLV:8–32 X 0.375 BUTTON HEAD,HEX DRIVE,STAINLESS STEEL,BLACK OXIDE FINISH,0.093 DRIV	0KB01	212–0193–00
–10	211–0512–00			6	SCREW,MACHINE:6–32 X 0.5,FLH,100 DEG, STL,POZ	73893	ORDER BY DESCRIPTION
–11	119–4801–XX			2	FAN,DC:48V,TUBEAXIAL,REGULATED,PROGRAMMABLE,7–22W,1275–3460RPM,80–235CFM	5Y921	JQ48R0X (031569)
–12	343–0549–00			2	STRAP,TIEDOWN:0.098 W X 4.0 L,ZYTEL	06383	PLT1M
–13	200–4326–00			1	CAP,FUSEHOLDER:5MM X20MM STM FUSE CARRIER, USE W/ BUSS HTB SCREWDRIVER SLOTTED FUSEHOLDER	71400	STM
–14	159–0256–00			1	FUSE,CARTRIDGE:15A,250V,FAST	71400	ABC–15
–14	159–0379–00			1	FUSE,CARTRIDGE:20A,250V,5 SEC MIN @ 200%,0.25 X 1.25,UL REC,326020	75915	326 020
–14	159–0381–00			1	FUSE,CARTRIDGE:5 X 20 MM,6.3A,250V,FAST BLOW,HIGH BREAKING CAPACITY,UL REC,SEMKO	71400	GDA–6.3
–15	119–5553–XX			1	POWER SUPPLY:VXI MAINFRAME, 925W	80009	119–5553–XX
–16	367–0494–00			1	HANDLE:EJECTOR POWER SUPPLY,VX1410A	TK1943	367–0494–00 0BD
–17	211–0932–00			2	SCREW:SHLDR,8–32 X 0.187 OD X 0.125 L,0.187 L	24931	PZ–6–3
–18	210–0804–00			2	WASHER,FLAT:0.17 ID X 0.375 OD X 0.032 STL	86928	76430–000

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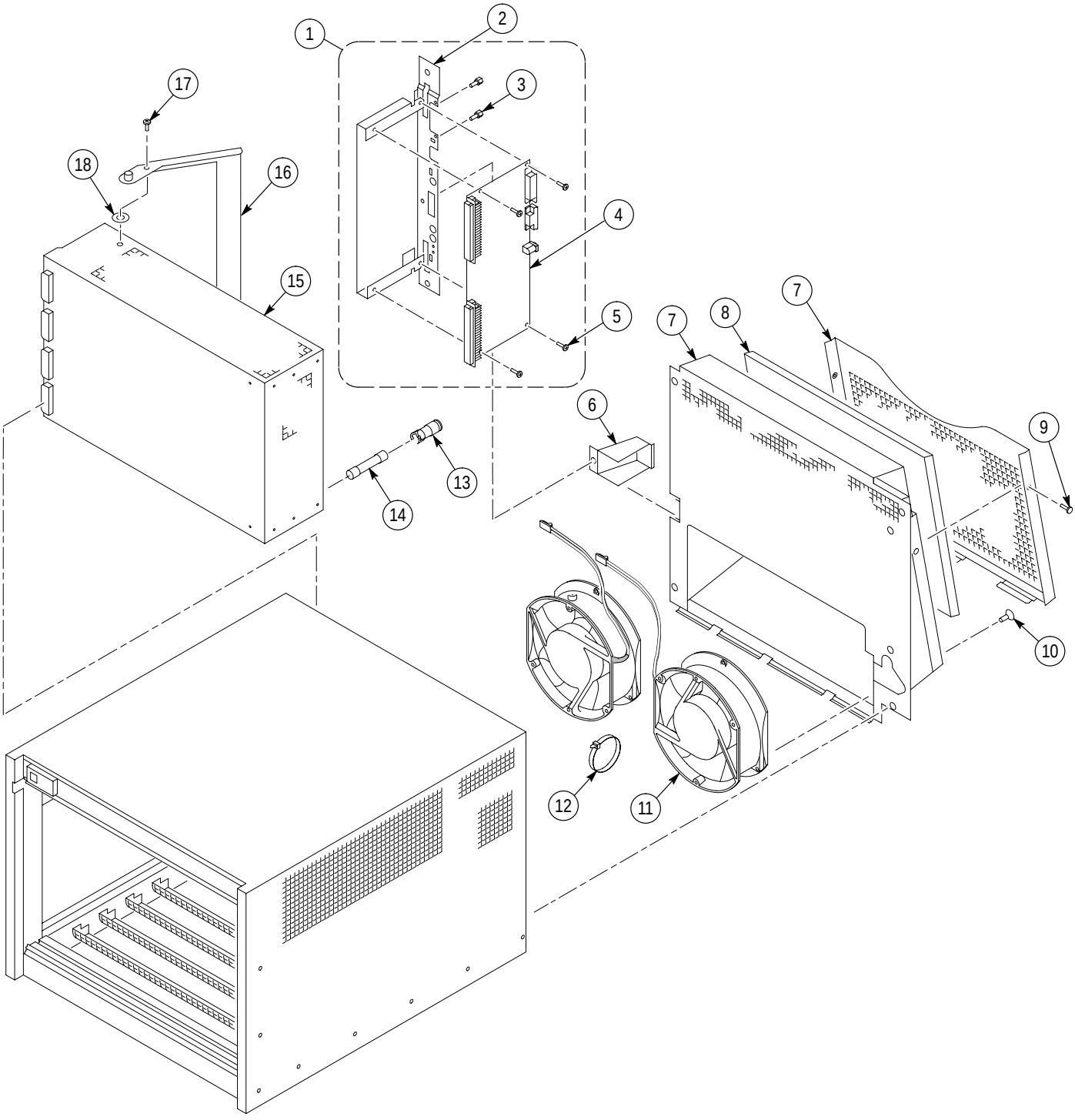


Figure 9–3: Power supply, monitor, and VX1410A fan assembly

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Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
9–4					**VX1420A OR VXF20A BLOWER ASSEMBLY**		
–1	380–1112–00			1	HOUSING:FAN HOUSING BLOWER	TK1943	380–1112–00
–2	200–4344–00			1	COVER:FAN CABLE COVER,0.040 A1 ALLOY	TK1943	OBD 200–4344–00
–3	119–5199–00			1	FAN, DC:BLOWER,48V,DUAL INLET,450 CFM,177 W, WITH 6 SCREWS	80009	119–5199–00
–4	212–0400–00			4	SCREW,MACHINE:8–32 X 0.250,PNH,STL,ZINC,T–20	3M099	BY DESCRIPTION
–5	212–0193–00			10	SCREW,EXT RLV:8–32 X 0.375 BUTTON HEAD,HEX DRIVE,STAINLESS STEEL,BLACK OXIDE	0KB01	212–0193–00
–6	378–0442–00			2	FILTER,AIR:WOVEN POLYPROPYLENE,BLACK,0.125 THICK,2 LAYER,VINYL EDGING	68579	378–0442–00

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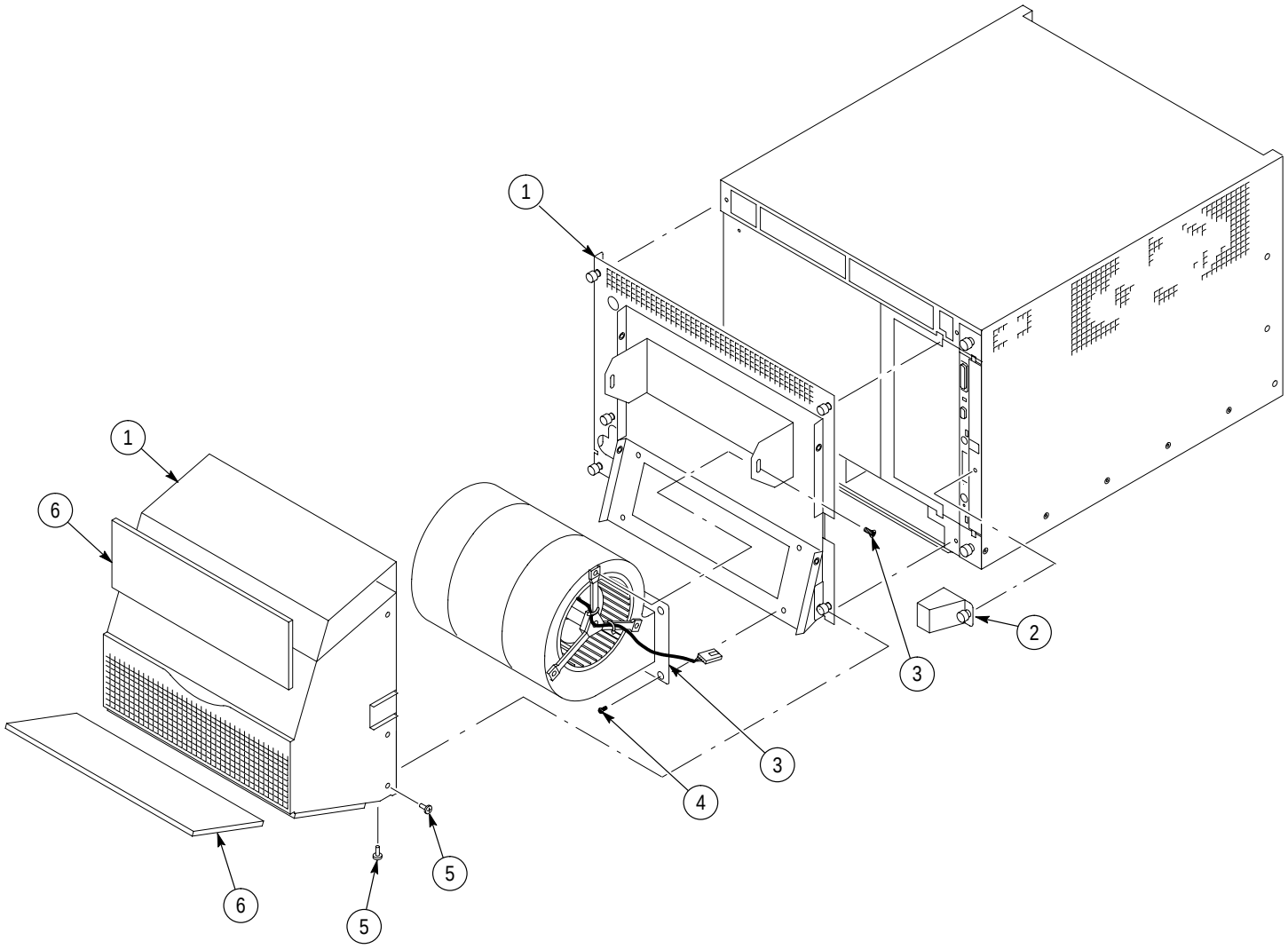


Figure 9–4: VX1420A or Option VXF20A blower assembly

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Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
9–5					**1R RACKMOUNT ASSEMBLY**		
–0	020–2221–XX			1	COMPONENT KIT:RACKMOUNT KIT 1R, (KIT CONTAINS ITEMS 1 THRU 8)	80009	0202221XX
–1	950–0991–00			2	HANDLE ALUMINUM BLK	80009	950099100
–2	212–0157–00			14	SCREW,MACHINE:8–32 X 0.5,FLH,100 DEG,STL CDPL,T–15	0KB01	ORDER BY DESC
–3	407–4524–00			1	BRACKET:LEFT,RACKMOUNT,SILVER GRAY	TK1943	407–4524–00
–4	212–0671–00			4	SCREW,MACHINE:10–32 X 0.625,FLH,100 DEG,STL,CD PL, TORX	0KB01	ORDER BY DESC
–5	407–4525–00			1	BRACKET:RIGHT, RACKMOUNT,SILVER GRAY	TK1943	407–4525–00
–6	351–1010–00			1	GUIDE:RACK SLIDE EXTENSION BRACKET,CLOSED SLOT,9.7 X 8.1 INCHES	06666	B–814–2
–7	351–0800–00			1	GUIDE,SLIDE:CHASSIS TRACK, (PAIR)	06666	CTS–124
–8	386–6999–00			1	PLATE,LEFT:OFFSET SPACER,16 X 1.45,0.062 THICK AL	TK1943	386–6999–00

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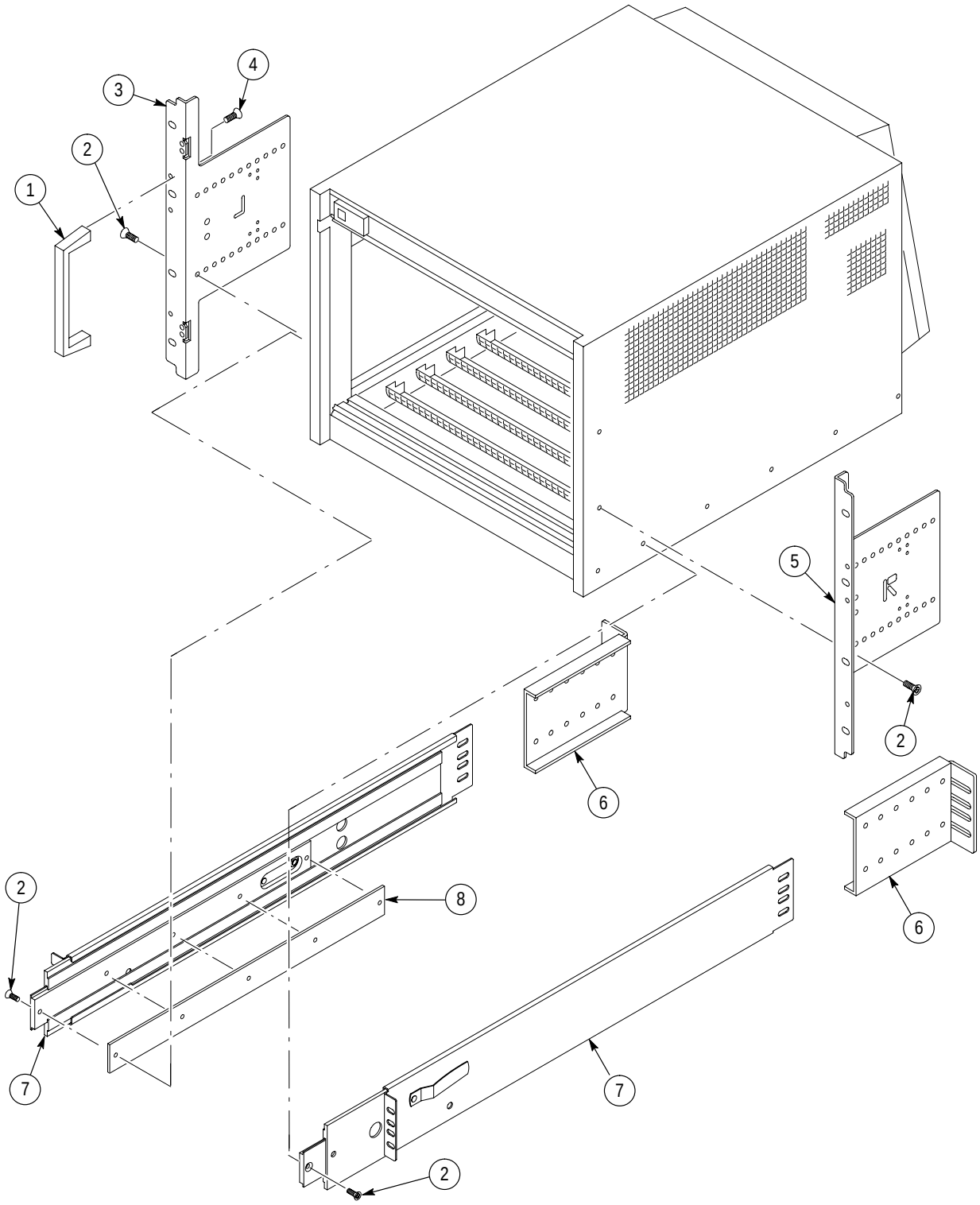


Figure 9–5: 1R Rackmount assembly

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Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
9–6					**2R RACKMOUNT AND DOOR ASSEMBLY**		
6–0	020–2222–XX			1	COMPONENT KIT:RACKMOUNT KIT 2R (KIT CONTAINS THE ITEMS 1 THRU 12)	80009	0202222XX
–1	950–0991–00			2	HANDLE ALUMINUM BLK	80009	950099100
–2	212–0157–00			14	SCREW,MACHINE:8–32 X 0.5,FLH,100 DEG,STL CDPL, T–15	0KB01	ORDER BY DESC
–3	214–4678–00			2	HINGE LIFT OFF, BLACK	80009	214467800
–4	407–4524–00			1	BRACKET:LEFT,RACKMOUNT,SILVER GRAY	TK1943	407–4524–00
–5	211–0718–00			8	SCREW,MACHINE:6–32 X 0.312,FLH100,STL,CDPL,T–10	0KB01	211–0718–00
–6	212–0671–00			4	SCREW,MACHINE:10–32 X 0.625,FLH,100 DEG,STL,CD PL, TORX DRIVE	0KB01	ORDER BY DESC
–7	212–0158–00			2	SCREW,MACHINE:8–32 X 0.375,PNH,STL,CDPL,T–20	0KB01	ORDER BY DESC
–8	200–4243–01			1	DOOR ASSY:LEXAN,W/LATCH HARDWARE ATTACHED	80009	200424301
–9	407–4525–00			1	BRACKET:RIGHT, RACKMOUNT,SILVER GRAY	TK1943	407–4525–00
–10	351–1010–00			1	GUIDE:RACK SLIDE EXTENSION BRACKET,CLOSED SLOT,9.7 X 8.1 INCHES	06666	B–814–2
–11	351–0800–00			1	GUIDE,SLIDE:CHASSIS TRACK (PAIR)	06666	CTS–124
–12	386–6999–00			1	PLATE,LEFT:OFFSET SPACER,16 X 1.45,0.062 THICK AL	TK1943	386–6999–00

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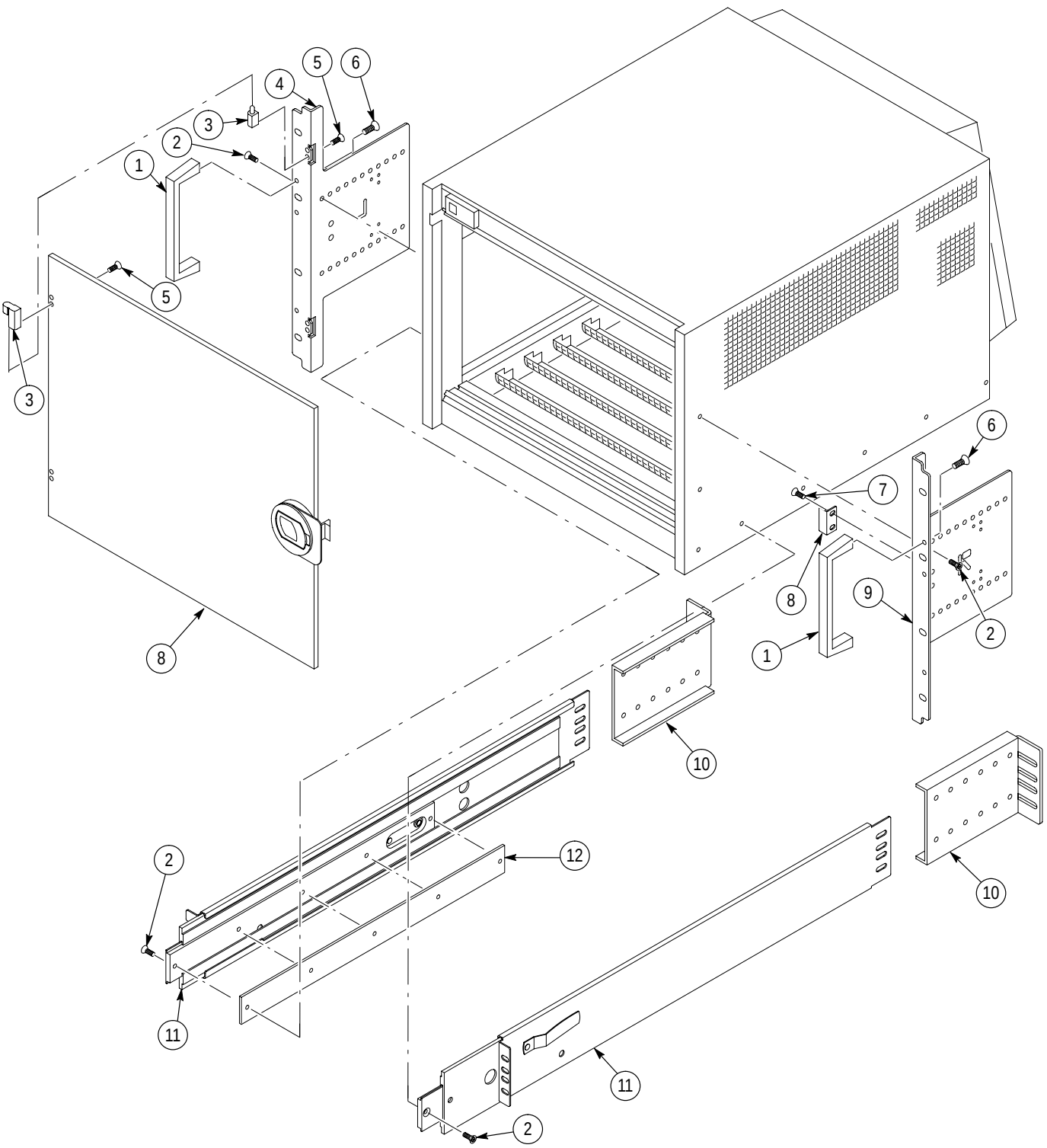


Figure 9–6: 2R Rackmount and door assembly

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Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
9–7					**OPTION 1U CABLE TRAY**		
–0	020–2223–XX			1	COMPONENT KIT:CABLE TRAY 1U KIT (KIT INCLUDES ITEMS 1 THRU 3)	80009	0202223XX
–1	212–0158–00			14	SCREW,MACHINE:8–32 X 0.375,PNH,STL,CDPL,T–20	0KB01	ORDER BY DESC
–2	333–4158–00			1	PANEL,CONN:0.09ALUM	80009	333415800
–3	407–4482–00			1	CABLE TRAY:0.09 ALUMINUM,PAINTED SILVER GRAY	80009	407–4482–00
–4	426–2537–00			2	RAIL,FOOT:CHASSIS,ALUM SHEET METAL SILVER GRAY	TK1943	426–2537–00

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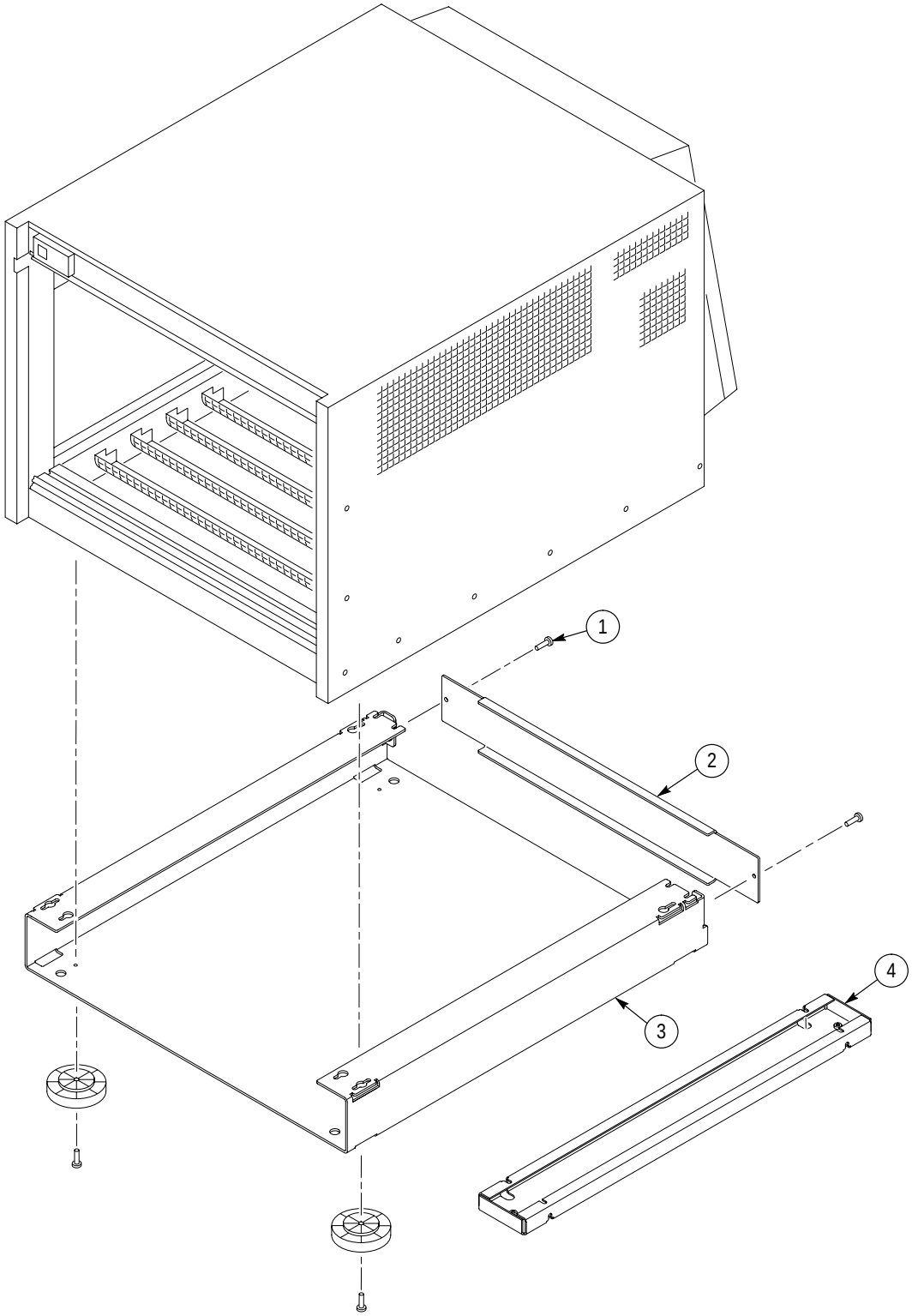


Figure 9–7: Option 1U cable tray

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Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
9–8					**OPTION 2U CABLE TRAY**		
–0	020–2224–XX			1	COMPONENT KIT: CAB;E TRAY 2U KIT (KIT INCLUDES THE ITEMS 1 THRU 4)	80009	0202224XX
–1	426–2537–00			2	RAIL,FOOT:CHASSIS,ALUM SHEET METAL	TK1943	426–2537–00
–2	212–0158–00			16	SCREW,MACHINE:8–32 X 0.375,PNH,STL,CDPL,T–20	0KB01	ORDER BY DESC
–3	333–4162–00			1	PANEL,CONN:2U,0.09 AL	80009	333416200
–4	333–4159–00			1	PANEL,CONN:1U,0.09 AL	80009	333415900
–5	407–4502–00			1	TRAY,CABLE:16.600 X 3.045,0.09 ALUM,TEK SILVER GRAY,2U	0J9P4	407–4502–00

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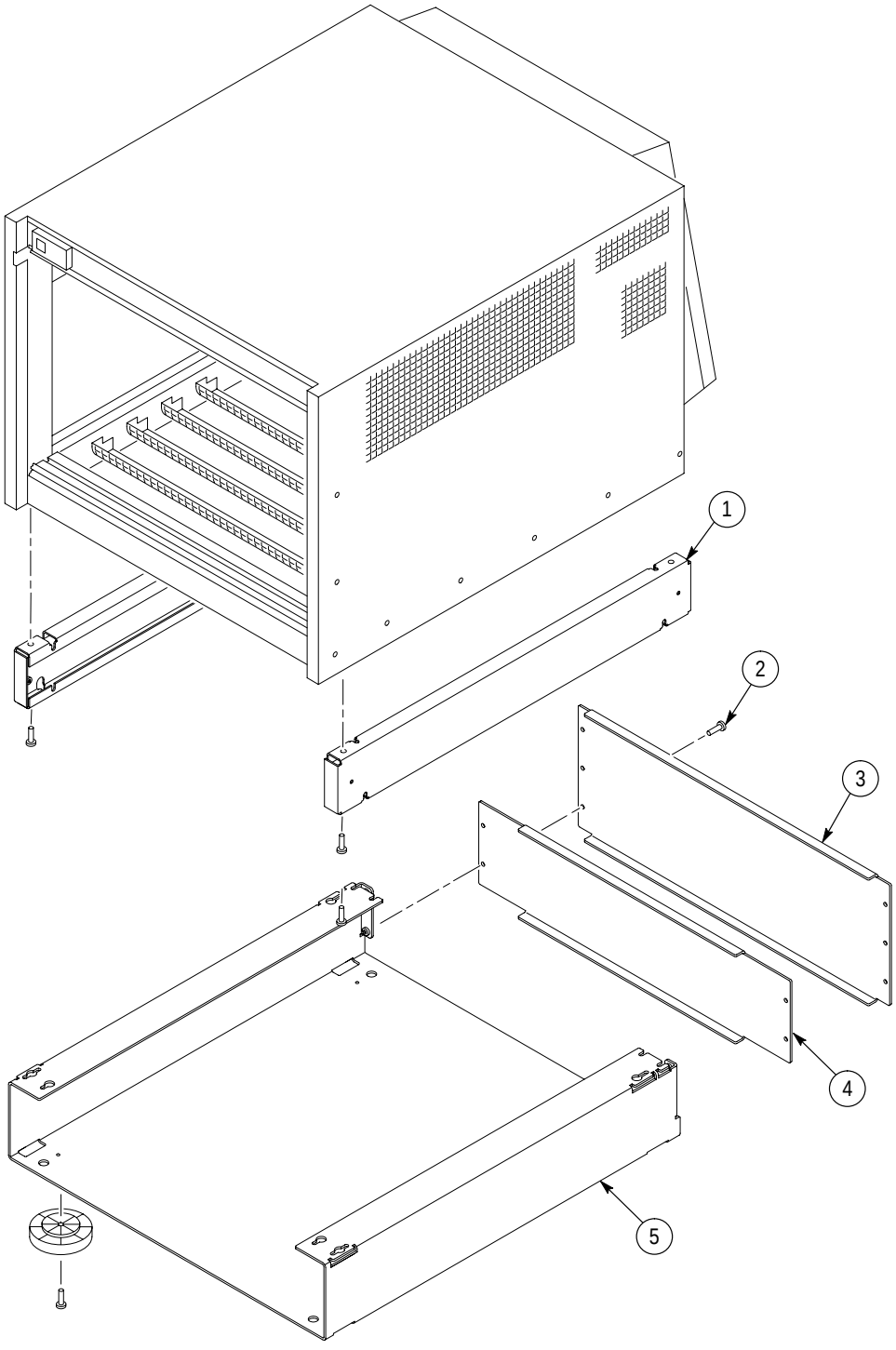


Figure 9–8: Option 2U cable tray

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Replaceable parts list

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description	Mfr. code	Mfr. part number
9–9					**DISPLAY PANEL**		
–1	333–4234–00			1	PANEL,FRONTASSY:0.062 AL, W/LABEL,DISPLAY,*VX1410A OPT 1M*	80009	333–4234–00
–1	333–4237–00			1	PANEL,FRONTASSY:0.062 AL, W/LABEL,DISPLAY,*VX1420A*	80009	333–4237–00
–1	333–4241–00			1	PANEL,FRONTASSY:0.062 AL, W/LABEL,DISPLAY,*VX1411A OPT 1M*	80009	333–4241–00
–2	119–5086–00			1	DISPLAY MODULE:VACUUM, FLOURESCENT 1 X 20 ALPHANUMERIC, 5 X 7 DOT MATRIX W/CURSOR	4T165	FC20X1RA–AA/AB
–3	671–3290–00			1	CKT BD ASSY:FRONT PANEL DISPLAY	80009	671–3290–00
–4	211–0732–00			4	SCR,ASSEM WSHR:6–32 X 0.75,PNH,STL,CD PL,TORX T15	0KB01	ORDER BY DESCRIPTION
–5	174–0034–00			1	CA ASSY,SP,ELEC:28 AWG,3.0 L,RIBBON 2X17 X 2X17 0.1 CTR BOX	23633	ORDER BY DESCRIPTION
–6	174–3503–00			1	CA,ASSY SP:DISCRETE,CABLE DISPLAY POWER,LDI,2,26 AWG,3L,1X2,LATCHING,RCPT	TK2469	174–3503–00
–7	366–1538–00			2	PUSH BUTTON:IVORY GRAY,0.3 X 0.665 H	TK1163	ORDER BY DESCRIPTION

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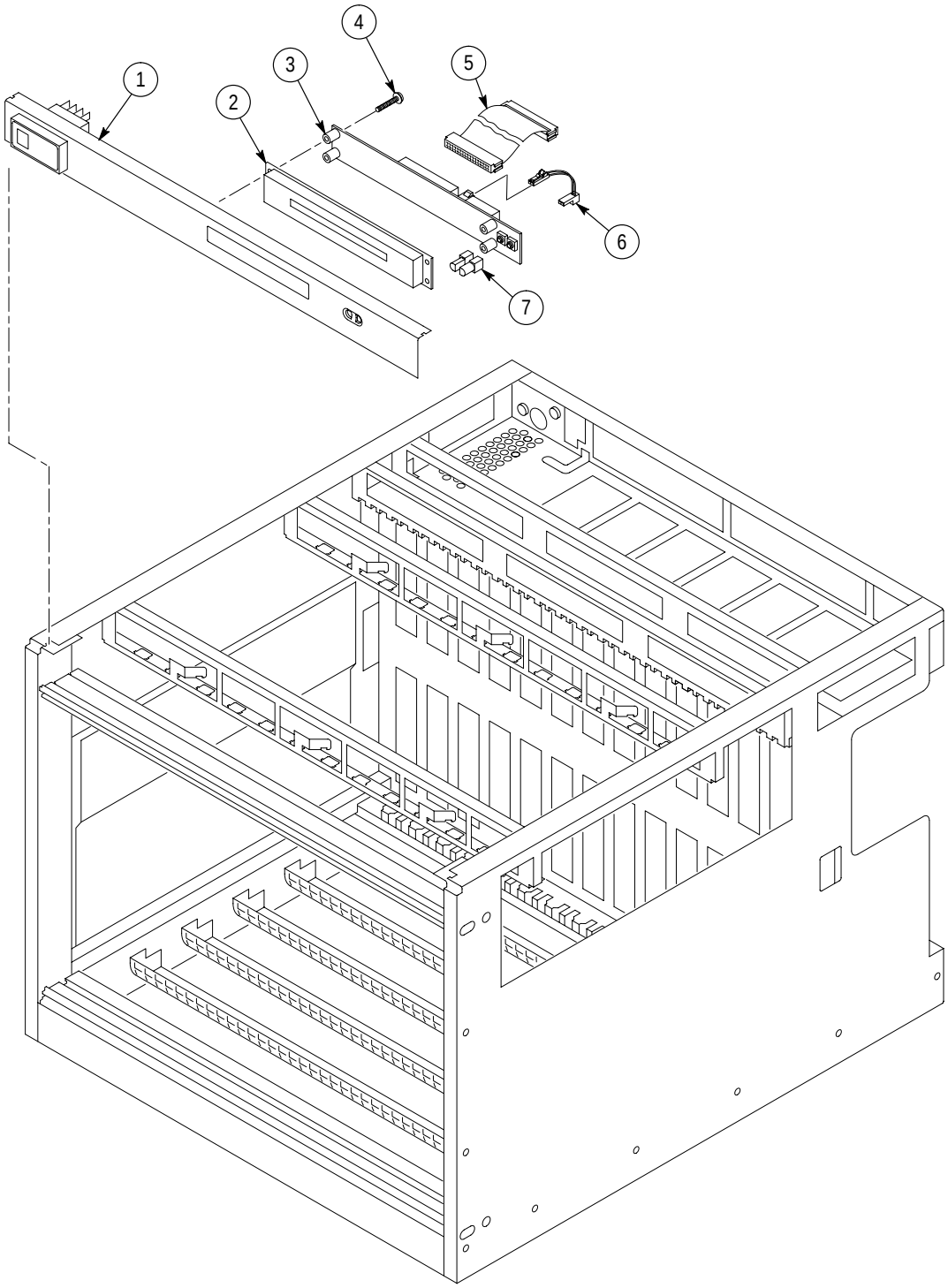


Figure 9–9: Display panel, VX1420A or Option 1M

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Appendices

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Appendix A: Power Budget Worksheet

Use the Power Budget Worksheet to determine the operating parameters of the IntelliFrame Mainframe and any installed modules. Enter the steady-state current (I_{MP}) and the dynamic current (I_{MD}) for each module. Add the individual currents to determine the total current needed for each power rail. Calculate the total power for the mainframe.

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Power Requirements

Slot	Module	I_{MP} +5V	I_{MD}	I_{MP} +12V	I_{MD}	I_{MP} −12V	I_{MD}	I_{MP} +24V	I_{MD}	I_{MP} −24V	I_{MD}	I_{MP} −5.2V	I_{MD}	I_{MP} −2V	I_{MD}
0															
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
	Mainframe Usage	3A	—					20A: 2A 10A: 1A	—	20A: 2A 10A: 1A	—				
	External Usage (1 A max +5 V, +12 V)														
	Total Current (I_{MP}, I_{MD})														
	Power Supply Current Limit	95A	14.5A	13A	3A	13A	3A	13A	9A	13A	9A	60A	12A	30A	7A
	Individual Current Sums Less Than Power Supply Current Limits?														

Power Calculation
(V x total I_{MP})

Total Power

<925W (1410A)
< 1000W (1420A)

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Appendix B: Special Configuration Options

This appendix contains information for configuring your IntelliFrame Mainframe for specific situations not documented earlier in this manual. These special configuration options require you to disassemble parts of the mainframe to access jumpers or circuit boards. Refer to *Maintenance* for detailed information on the assembly and disassembly procedures. You may also need to refer to the exploded views in *Replaceable Parts*.

The information in this section is intended for use by qualified service personnel. Read the *General Safety Summary* and *Service Safety Summary* at the front of this manual and the static precautions on page 8–1 before attempting any procedures in this appendix. Refer to the *Operating Basics* chapter for information on the location of controls, indicators, and connectors used with the mainframe.



CAUTION. *To avoid damage from high currents on the backplane, always power off the mainframe and disconnect the power cord before performing any of the configuration procedures for the mainframe described in this appendix.*

Remote Power Switch Configuration

You can control the power-on function of the mainframe by the front panel On/Standby switch and from a remote momentary switch through the connections of the 25-pin rear panel connector. If you connect a remote switch to pins 5 and 18 (return side) of the 25-pin connector, the remote switch and the front panel On/Standby switch control the power-on functions of the mainframe.

You can also disable the front panel switch and control the power-on functions from the remote switch only. The backplane has two connectors that control the power-on functions. If the front panel switch is connected to the backplane at J22, the switch controls the power-on functions. If the switch is connected to J23, the front panel switch is disabled, however, the light still illuminates when the mainframe is powered on. To configure the mainframe to disable the front panel On/Standby switch, perform the following steps:

1. Disconnect the power cord from the mainframe.
2. Remove the cover from the mainframe.
3. Refer to Figure B–1 and locate the two connectors at the top of the backplane.

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4. Disconnect the On/Standby switch cable at J22 and connect it to J23.
5. Replace the mainframe cover.
6. Connect the momentary switch to pins 5 and 18 (return side) of the 25-pin rear panel connector.

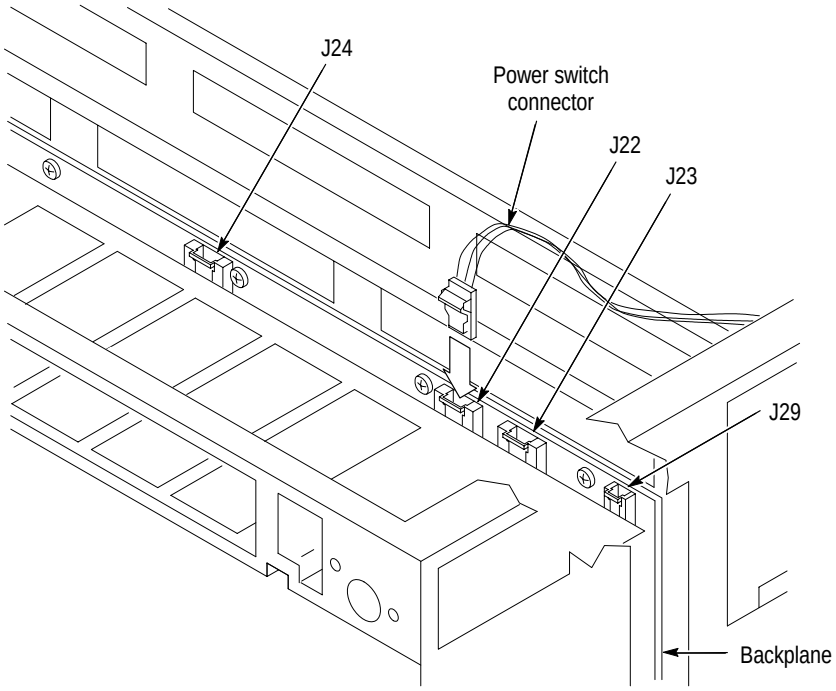


Figure B–1: Power switch connectors

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Front Panel SYSReset Cable Connector Configuration

The IntelliFrame Mainframe front panel switch cable connector must be configured as shown in Figure B–2 before the SYSReset feature can be utilized. Perform the following procedures to activate the SYSReset feature:

1. Remove the mainframe cover.
2. Cut the tie wrap that secures the SYSReset connector to the front panel switch cable.
3. Connect the SYSReset connector to J29 on the backplane circuit board.
4. Replace the mainframe cover.

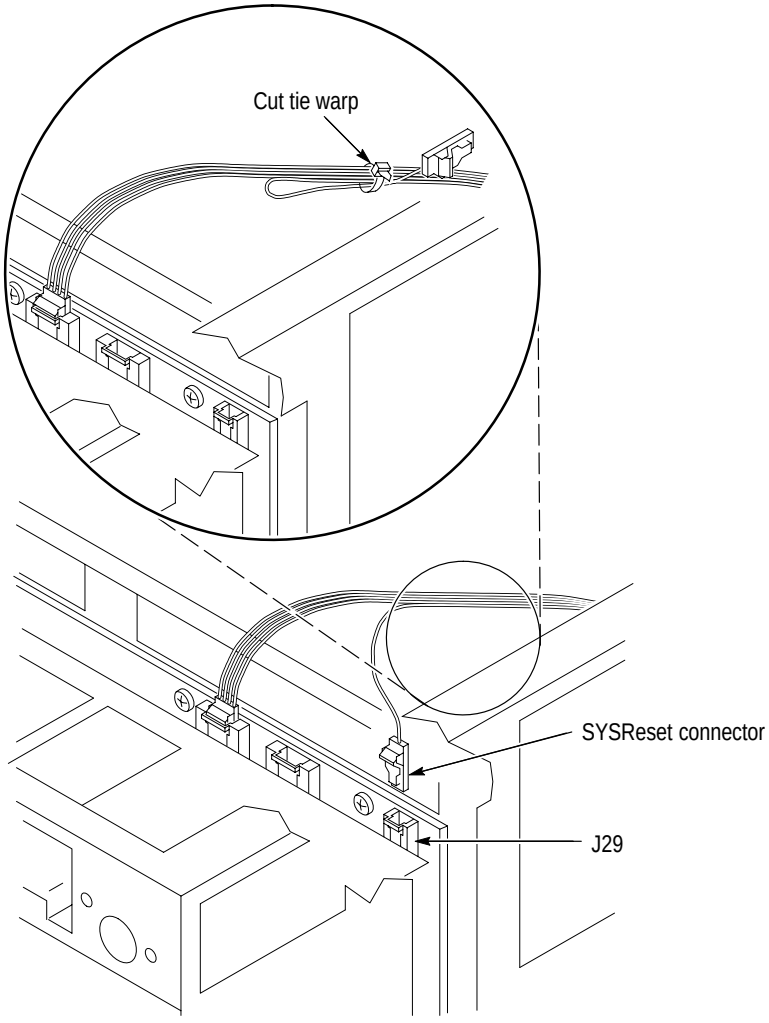


Figure B–2: SYSReset cable connector

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Enhanced Monitor Board Jumpers

The Enhanced Monitor board has two jumpers accessible from the rear of the mainframe. Figure B–3 shows the factory default settings of these jumpers.

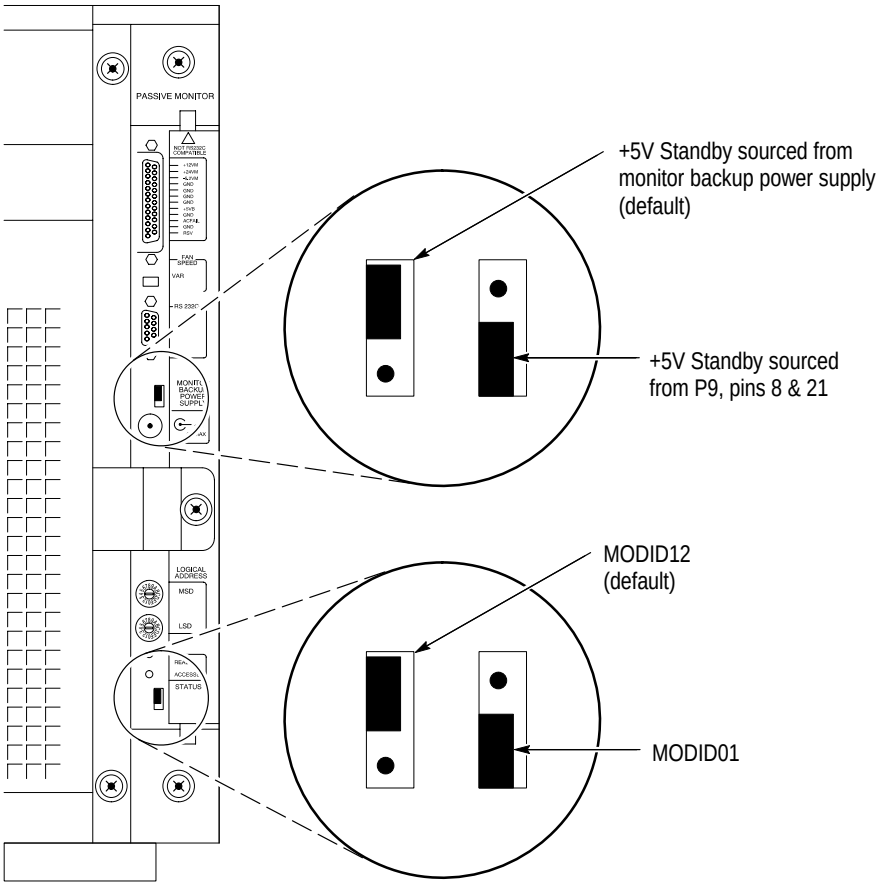


Figure B–3: Enhanced monitor board jumpers

You can also select the source of the +5 V Standby voltage. If you source the +5 V Standby voltage from the +5 V external supply (Monitor Backup Power Supply connector), then the external supply will provide the backplane with the +5 V external voltage (1 A maximum). If you source the +5 V Standby voltage from the 25-pin connector, you must provide the +5 V to pins 8 and 21 of the 25-pin connector. The default jumper setting is to provide the voltage from the external source (+5 V external power supply).

The Enhanced Monitor can answer to the slot 1 or slot 12 MODID line for the VXI configuration manager. The default position is slot 12 since it is most likely to be empty. Slot 1 is available if you use a 2 slot embedded controller.

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Appendix C: SCPI Conformance Information

All commands in the IntelliFrame Mainframe conform to SCPI Version 1995.0. Table C–1 lists all commands supported by the IntelliFrame Mainframe. The columns at right show whether a command is defined in the SCPI 1995.0 Standard or not.

Table C–1: SCPI conformance information

Command				Defined in SCPI 1995.0	Not defined In SCPI 1995.0
CALibration	:ALL[?]			✓	
DISPlay[?]	[:WINDow]	:TEXT	[:DATA][?]	✓	
			:MARQuee		✓
STATus	:OPERation	[:EVENt]?		✓	
		:CONDition?		✓	
		:ENABle[?]		✓	
		:VXIInterrupt			✓
			[:EVENt]?		✓
			:CONDition?		✓
			:Interrupt?		✓
			:ENABle		✓
		:VXIMonitor	[:EVENt]?		✓
			:ACFail?		✓
			:BERR?		✓
			:CONDition?		
			:ENABle[?]		✓
			:SYSFail?		✓
		:VXITrigger			✓
			[:EVENt]?		✓
			:CONDition?		✓
			:TRIGger?		✓
			:ENABle[?]		✓
	:PRESet			✓	
	:QUEStionable	[:EVENt]?		✓	
		:BLOWer	[:EVENt]?		✓

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Table C–1: SCPI conformance information (Cont.)

Command		Defined in SCPI 1995.0	Not defined In SCPI 1995.0
	:CONDition?		✓
	:ENABle[?]		✓
	:SPEed?		✓
:CONDition?		✓	
:CURRent		✓	
	[:EVENt]?	✓	
	:CMAXimum?		✓
	:CONDition?	✓	
	:ENABle[?]	✓	
	:LEVel?		✓
	:LIMit		✓
	:MAXimum?		✓
:ENABle[?]		✓	
:FILTer	:TINTerval[?]		✓
	:TREMaining?		✓
	:TRESet		✓
:POWer		✓	
	[:EVENt]?	✓	
	:CMAXimum?		✓
	:CONDition?	✓	
	:ENABle[?]	✓	
	:LEVel?		✓
	:LIMit		✓
	:MAXimum?		✓
:TEMPerature	:[EVENt][?]	✓	
	:CMAXimum?		✓
	:CONDition?	✓	
	:ENABle[?]	✓	
	:LEVel?		✓
	:LIMit[?]		✓
	:MAXimum?		✓
:VOLTage	[:EVENt]?	✓	

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Table C–1: SCPI conformance information (Cont.)

Command						Defined in SCPI 1995.0	Not defined In SCPI 1995.0
			:CONDition?			✓	
			:ENABle[?]			✓	
			:LEVel?				✓
			:PTR[?]			✓	
	:QUEue	[:NEXT]?				✓	
		:ALL?					✓
		:CODE	[:NEXT]?				✓
			:ALL?				✓
		:COUNt?					✓
		:ENABle[?]				✓	
			:ALL?				✓
	:SCONdition?						✓
	:S2CONdition?						✓
	:SEVent?						✓
	:S2EVent?						✓
SYSTem	:COMMunicate	:SERial	[:RECeive]	:BAUD[?]		✓	
			[:RECeive]	:BITS[?]		✓	
			:CONTrol	:RTS[?]		✓	
			:ECHO[?]				✓
			:ERESponse[?]				✓
			:LBUFfer[?]				✓
			[:RECeive]	:PACE[?]		✓	
			[:RECeive]	:PARity	[:TYPE][?]	✓	
			:PRESet	[:ALL]			✓
				:RAW			✓
				:TERMinal			✓
			[:RECeive]	:SBITs[?]		✓	
	:DATE	:LMAintenance?				✓	
	:ERRor?					✓	
		:ALL?					✓
		:CODE	[:NEXT]?				✓
			:ALL?				✓

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Table C–1: SCPI conformance information (Cont.)

Command			Defined in SCPI 1995.0	Not defined In SCPI 1995.0
		:COUNt?		✓
		:ENABle[?]	✓	
		:ALL		✓
	:FACTory			✓
	:HELP	:SYNTax?	✓	
	:IEMessage			✓
	:MODel?			✓
	:NVRecall			✓
	:NVSave			✓
	:OPTions?			✓
	:PASSword	:CDISable	✓	
		[:CENable]	✓	
		:STATe?	✓	
	:POWer			✓
		:CYCLe?		✓
		:SOURce?		✓
	:SYSReset[?]			✓
		[:MONitor]		✓
		:IMMeditate		✓
	:TIME	:LMAintenance?	✓	
		:ON?		✓
	:VERSion?		✓	
TEST	[:ALL][?]			✓
	:NUMber[?]			✓
	:RESults	[:CODE]?		✓
		:VERBose?		✓
VXIMonitor	:REPeat[?]			✓
	:STATe[?]			✓
	:TINTerval[?]			✓
IEEE 488.2 Common Commands				
*CLS			✓	
*ESE[?]			✓	

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Table C–1: SCPI conformance information (Cont.)

Command	Defined in SCPI 1995.0	Not defined In SCPI 1995.0
*ESR?	✓	
*IDN?	✓	
*OPC[?]	✓	
*PSC[?]	✓	
*RST	✓	
*SRE[?]	✓	
*STB?	✓	
*TST?	✓	
*WAI?	✓	

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Glossary

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Glossary

The terms in this glossary are defined as used in the VXIbus System. Although some of these terms may have different meanings in other systems, it is important to use these definitions in VXIbus applications. Terms which apply only to a particular instrument module are noted. Not all terms appear in every manual.

Accessed Indicator
An amber LED indicator that lights when the module identity is selected by the Resource Manager module, and flashes during any I/O operation for the module.

ACFAIL*
A VMEbus backplane line that is asserted under these conditions: 1) by the mainframe Power Supply when a power failure has occurred (either ac line source or power supply malfunction), or 2) by the front panel ON/STANDBY switch when switched to STANDBY.

A-Size Card
A VXIbus instrument module that is 100.0 × 160 mm × 20.32 mm (3.9 × 6.3 in × 0.8 in), the same size as a VMEbus single-height short module.

Asynchronous Communication
Communications that occur outside the normal "command-response" cycle. Such communications have higher priority than synchronous communication.

Backplane
The printed circuit board that is mounted in a VXIbus mainframe to provide the interface between VXIbus modules and between those modules and the external system.

B-Size Card
A VXIbus instrument module that is 233.4 × 160 mm × 20.32 mm (9.2 × 6.3 in × 0.8 in), the same size as a VMEbus double-height short module.

Bus Arbitration
In the VMEbus interface, a system for resolving contention for service among VMEbus Master devices on the VMEbus.

Bus Timer
A functional module that measures the duration of each data transfer on the Data Transfer Bus (DTB) and terminates the DTB cycle if the duration is excessive. Without the termination capability of this module, a Bus Master attempt to transfer data to or from a non-existent Slave location could result in an infinitely long wait for the Slave response.

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Butch Plate
A connector plate that optionally connects to the rear of the cable tray options. The plate can be modified to accept cable connectors thus reducing the number of cables under the IntelliFrame Mainframe.

Client
In shared memory protocol (SMP), that half of an SMP channel that does not control the shared memory buffers.

CLK10
A 10 MHz, ±100 ppm, individually buffered (to each module slot), differential ECL system clock that is sourced from Slot 0 and distributed to Slots 1–12 on P2. It is distributed to each module slot as a single source, single destination signal with a matched delay of under 8 ns.

CLK100
A 100 MHz, ±100 ppm, individually buffered (to each module slot), differential ECL system clock that is sourced from Slot 0 and distributed to Slots 1–12 on P3. It is distributed to each module slot in synchronous with CLK10 as a single source, single destination signal with a maximum system timing skew of 2 ns, and a maximum total delay of 8 ns.

Commander
In the VXIbus interface, a device that controls another device (a servant). A commander may be a servant of another commander.

Command
A directive to a device. There are three types of commands:

In Word Serial Protocol, a 16-bit imperative to a servant from its commander.

In Shared Memory Protocol, a 16-bit imperative from a client to a server, or vice versa.

In a Message, an ASCII-coded, multi-byte directive to any receiving device.

Communication Registers
In word serial protocol, a set of device registers that are accessible to the commander of the device. Such registers are used for inter-device communications, and are required on all VXIbus message-based devices.

Configuration Registers
A set of registers that allow the system to identify a (module) device type, model, manufacturer, address space, and memory requirements. In order to support automatic system and memory configuration, the VXIbus standard specifies that all VXIbus devices have a set of such registers, all accessible from P1 on the VMEbus.

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C-Size Card
A VXIbus instrument module that is 340.0 × 233.4 mm × 30.48 mm (13.4 × 9.2 in × 1.2 in).

Custom Device
A special-purpose VXIbus device that has configuration registers so as to be identified by the system and to allow for definition of future device types to support further levels of compatibility.

Data Transfer Bus
One of four buses on the VMEbus backplane. The Data Transfer Bus allows Bus Masters to direct the transfer of binary data between Masters and Slaves.

Delta Temperature
The difference between the exhaust temperature of a given slot within the IntelliFrame Mainframe and the input air temperature.

Device Specific Protocol
A protocol for communication with a device that is not defined in the VXIbus specification.

D-Size Card
A VXIbus instrument module that is 340.0 × 366.7 mm × 30.48 mm (13.4 × 14.4 in × 1.2 in).

DTB
See Data Transfer Bus.

DTB Arbiter
A functional module that accepts bus requests from Requester modules and grants control of the DTB to one Requester at a time.

DUT
Device Under Test.

ECLTRG
Six single-ended ECL trigger lines (two on P2 and four on P3) that function as inter-module timing resources, and that are bussed across the VXIbus subsystem backplane. Any module, including the Slot 0 module, may drive and receive information from these lines. These lines have an impedance of 50 Ω; the asserted state is logical High.

Embedded Address
An address in a communications protocol in which the destination of the message is included in the message.

ESTST
Extended STart/STop protocol; used to synchronize VXIbus modules.

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Extended Self Test
Any self test or diagnostic power-on routine that executes after the initial kernel self test program.

External System Controller
The host computer or other external controller that exerts overall control over VXIbus operations.

IACK Daisy Chain Driver
The circuit that drives the VMEbus Interrupt Acknowledge daisy chain line that runs continuously through all installed modules or through jumpers across the backplane.

ID-ROM
An NVRAM storage area that provides for non-volatile storage of diagnostic data.

Instrument Module
A plug-in printed circuit board, with associated components and shields, that may be installed in a VXIbus mainframe. An instrument module may contain more than one device. Also, one device may require more than one instrument module.

IntelliFrame Mainframe
A family of VXI mainframes from Tektronix that automatically direct airflow to the installed modules, have an autoconfigure backplane, have adjustable rack kits and cable trays (optional), and can be upgraded.

IntelliGuides
The card guides used in the IntelliFrame Mainframe. The card guides on the bottom of the mainframe shut off airflow when no modules are installed in the respective slots.

Interface Device
A VXIbus device that provides one or more interfaces to external equipment.

Interrupt Handler
A functional module that detects interrupt requests generated by Interrupters and responds to those requests by requesting status and identity information.

Interrupter
A device capable of asserting VMEbus interrupts and performing the interrupt acknowledge sequence.

IRQ
The Interrupt ReQuest signal, which is the VMEbus interrupt line that is asserted by an Interrupter to signify to the controller that a device on the bus requires service by the controller.

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Local Bus
A daisy-chained bus that connects adjacent VXIbus slots.

Local Controller
The instrument module that performs system control and external interface functions for the instrument modules in a VXIbus mainframe or several mainframes. See Resource Manager.

Local Processor
The processor on an instrument module.

Logical Address
The smallest functional unit recognized by a VXIbus system. It is often used to identify a particular module.

Mainframe
Card Cage. For example, the Tektronix VX1410A Mainframe, an operable housing that includes 13 C-size VXIbus instrument module slots.

Memory Device
A storage element (such as bubble memory, RAM, and ROM) that has configuration registers and memory attributes (such as type and access time).

Message
A series of data bytes that are treated as a single communication, with a well defined terminator and message body.

Message Based Device
A VXIbus device that supports VXI configuration and communication registers. Such devices support the word serial protocol, and possibly other message-based protocols.

MODID Lines
Module/system identity lines.

Physical Address
The address assigned to a backplane slot during an access.

Power Monitor
A device that monitors backplane power and reports fault conditions.

P1
The top-most backplane connector for a given module slot in a vertical mainframe such as the Tektronix VX1410A. The left-most backplane connector for a given slot in a horizontal mainframe.

P2
The bottom backplane connector for a given module slot in a vertical C-size mainframe such as the VX1410A; or the middle backplane connector for a given module slot in a vertical D-size mainframe.

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P3
The bottom backplane connector for a given module slot in a vertical D-size mainframe.

Query
A form of command that allows for inquiry to obtain status or data.

READY Indicator
A green LED indicator that lights when the power-on diagnostic routines have been completed successfully. An internal failure or failure of +5 V power will extinguish this indicator.

Register Based Device
A VXIbus device that supports VXI register maps, but not high level VXIbus communication protocols; includes devices that are register-based servant elements.

Requester
A functional module that resides on the same module as a Master or Interrupt Handler and requests use of the DTB whenever its Master or Interrupt Handler requires it.

Resource Manager
A VXIbus device that provides configuration management services such as address map configuration, determining system hierarchy, allocating shared system resources, performing system self test diagnostics, and initializing system commanders.

Self Calibration
A routine that verifies the basic calibration of the instrument module circuits, and adjusts this calibration to compensate for short- and long-term variables.

Self Test
A set of routines that determine if the instrument module circuits will perform according to a given set of standards. A self test routine is performed upon power-on.

Servant
A VXIbus message-based device that is controlled by a commander.

Server
A shared memory device that controls the shared memory buffers used in a given Shared Memory Protocol channel.

Shared Memory Protocol
A communications protocol that uses a block of memory that is accessible to both client and server. The memory block operates as a message buffer for communications.

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Slot 0 Controller
See Slot 0 Module. Also see Resource Manager.

Slot 0 Module
A VXIbus device that provides the minimum VXIbus slot 0 services to slots 1 through 12 (CLK10 and the module identity lines), but that may provide other services such as CLK100, SYNC100, STARBUS, and trigger control.

SMP
See Shared Memory Protocol.

STARX
Two (2) bi-directional, 50 Ω, differential ECL lines that provide for inter-module asynchronous communication. These pairs of timed and matched delay lines connect slot 0 and each of slots 1 through 12 in a mainframe. The delay between slots is less than 5 ns, and the lines are well matched for timing skew.

STARY
Two (2) bi-directional, 50 Ω, differential ECL lines that provide for inter-module asynchronous communication. These pairs of timed and matched delay lines connect slot 0 and each of slots 1 through 12 in a mainframe. The delay between slots is less than 5 ns, and the lines are well matched for timing skew.

STST
STart/STop protocol; used to synchronize modules.

Super Cooler™
This is a IntelliFrame Mainframe with all the features of the VX1410A mainframe, but with higher cooling capacity and very quiet operation.

SYNC100
A Slot 0 signal that is used to synchronize multiple devices with respect to a given rising edge of CLK100. These signals are individually buffered and matched to less than 2 ns of skew.

Synchronous Communications
A communications system that follows the “command-response” cycle model. In this model, a device issues a command to another device; the second device executes the command; then returns a response. Synchronous commands are executed in the order received.

SYSFAIL*
A signal line on the VMEbus that is used to indicate a failure by a device. The device that fails asserts this line.

System Clock Driver
A functional module that provides a 16 MHz timing signal on the Utility Bus.

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System Hierarchy
The tree structure of the commander/servant relationships of all devices in the system at a given time. In the VXIbus structure, each servant has a commander. A commander may also have a commander.

Test Monitor
An executive routine that is responsible for executing the self tests, storing any errors in the ID-ROM, and reporting such errors to the Resource Manager.

Test Program
A program, executed on the system controller, that controls the execution of tests within the test system.

Test System
A collection of hardware and software modules that operate in concert to test a target DUT.

TTLTRG
Open collector TTL lines used for inter-module timing and communication.

VXIbus Subsystem
One mainframe with modules installed. The installed modules include one module that performs slot 0 functions and a given complement of instrument modules. The subsystem may also include a Resource Manager.

Word Serial Protocol
A VXIbus word oriented, bi-directional, serial protocol for communications between message-based devices (that is, devices that include communication registers in addition to configuration registers).

Word Serial Communications
Inter-device communications using the Word Serial Protocol.

WSP
See Word Serial Protocol.

10-MHz Clock
A 10 MHz, ±100 ppm timing reference. Also see CLK10.

100-MHz Clock
A 100 MHz, ±100 ppm clock synchronized with CLK10. Also see CLK100.

488-To-VXIbus Interface
A message based device that provides for communication between the IEEE-488 bus and VXIbus instrument modules.

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