



**Sentry Series
Video Quality Monitors
Serial Numbers B020101 and Above
Installation and Safety Instructions**



071-3526-04



**Sentry Series
Video Quality Monitors
Serial Numbers B020101 and Above
Installation and Safety Instructions**

Register now!

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For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit www.tek.com to find contacts in your area.

Sentry Technical Support

Sentry Technical support is available on Business Days from 6:00 AM to 5:00 PM Pacific Time and 9:00 AM to 5:00 PM Indian Standard Time on the following numbers:

- US/Canada toll-free 1-844-219-5329
- India toll-free 1800 3000 4835
- Russia toll-free 810800-22554411
- United Kingdom 44 1344 39 2541
- Europe* toll-free 00800-22554411

* Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Spain, Sweden, Switzerland, and UK.

Worldwide, please email videosupport@tektronix.com.

Warranty

Tektronix warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by Tektronix for warranty work may be new or reconditioned to like new performance. All replaced parts, modules and products become the property of Tektronix.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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Important safety information

This manual contains information and warnings that must be followed by the user for safe operation and to keep the product in a safe condition.

To safely perform service on this product, additional information is provided at the end of this section. (See page vi, *Service safety summary*.)

General safety summary

Use the product only as specified. Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. Carefully read all instructions. Retain these instructions for future reference.

Comply with local and national safety codes.

For correct and safe operation of the product, it is essential that you follow generally accepted safety procedures in addition to the safety precautions specified in this manual.

The product is designed to be used by trained personnel only.

Only qualified personnel who are aware of the hazards involved should remove the cover for repair, maintenance, or adjustment.

Before use, always check the product with a known source to be sure it is operating correctly.

This product is not intended for detection of hazardous voltages.

Use personal protective equipment to prevent shock and arc blast injury where hazardous live conductors are exposed.

When incorporating this equipment into a system, the safety of that system is the responsibility of the assembler of the system.

To avoid fire or personal injury

Use proper power cord. Use only the power cords specified for this product and certified for the country of use.

Do not use the provided power cords for other products.

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

Do not disable the power cord grounding connections.

Power disconnect. The power cords disconnect the product from the power sources. Both power cords must be disconnected to remove all power from the product. See instructions for the location. Do not position the equipment so that it is difficult to operate the power cords; they must remain accessible to the user at all times to allow for quick disconnection if needed.

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

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

The measuring terminals on this product are not rated for connection to mains or Category II, III, or IV circuits.

Do not operate without covers. Do not operate this product with covers or panels removed, or with the case open. Hazardous voltage exposure is possible.

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

Do not operate with suspected failures. If you suspect that there is damage to this product, have it inspected by qualified service personnel.

Disable the product if it is damaged. Do not use the product if it is damaged or operates incorrectly. If in doubt about safety of the product, turn it off and disconnect the power cords. Clearly mark the product to prevent its further operation.

Examine the exterior of the product before you use it. Look for cracks or missing pieces.

Use only specified replacement parts.

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

Do not operate in wet/damp conditions. Be aware that condensation may occur if a unit is moved from a cold to a warm environment.

Do not operate in an explosive atmosphere.

Keep product surfaces clean and dry. Remove the input signals before you clean the product.

Provide proper ventilation. Refer to the installation instructions in the manual for details on installing the product so it has proper ventilation.

Slots and openings are provided for ventilation and should never be covered or otherwise obstructed. Do not push objects into any of the openings.

Provide a safe working environment. Always place the product in a location convenient for viewing the display and indicators.

Avoid improper or prolonged use of keyboards, pointers, and button pads. Improper or prolonged keyboard or pointer use may result in serious injury.

Be sure your work area meets applicable ergonomic standards. Consult with an ergonomics professional to avoid stress injuries.

Use care when lifting and carrying the product.

Use only the provided rackmount hardware specified for this product.

Be careful to avoid tipping the rack when extending the product out from it. The rackmount hardware is not designed to support more weight than that of the product.

Service safety summary

The *Service safety summary* section contains additional information required to safely perform service on the product. Only qualified personnel should perform service procedures. Read this *Service safety summary* and the *General safety summary* before performing any service procedures.

To avoid electric shock. Do not touch exposed connections.

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

Disconnect power. To avoid electric shock, switch off the product power and disconnect the power cords from the mains power before removing any covers or panels, or opening the case for servicing.

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.

Verify safety after repair. Always recheck ground continuity and mains dielectric strength after performing a repair.

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.*

Symbols and 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.



When this symbol is marked on the product, be sure to consult the manual to find out the nature of the potential hazards and any actions which have to be taken to avoid them. (This symbol may also be used to refer the user to ratings in the manual.)

The following symbol(s) may appear on the product:



CAUTION
Refer to Manual



Protective Ground
(Earth) Terminal



Standby



WARNING
High Voltage



Disconnect all
Power Sources



Do not
Tip Rack

Preface

This document contains the following information:

- Important safety precautions to avoid injury and prevent damage to this product or any products connected to it
- EMC (electromagnetic compliance), safety, and environmental standards with which the instrument complies
- Voltage, power, and environmental requirements to use the product
- Installation procedure
- Power-on and power-off procedure

Read the *General Safety Summary* before installing this product. (See page iv.)

Sentry Series products

Sentry Series products include two different chassis options:

- **Standard:** Sentry Standard is a comprehensive video and audio quality monitoring solution for advanced video networks. It enables video service providers to deliver services with optimum quality while reducing operational expenditures.

Sentry standard also provides optional interface cards for monitoring ASI, QAM-A/B/C, ATSC, DVB-S/S2, and DVB-T/T2 demodulation and making RF signal measurements.

- **Premium:** Sentry Premium provides the same video and audio quality monitoring solution as the standard platform but with increased performance. It enables video service providers to monitor up to 1500 MPEG streams / 4000 programs, with up to 8 Gbps quality of experience (QoE) or 1.5 Gbps picture quality (PVQ) in a single platform.

The following table provides a high-level description of the Tektronix Sentry Series products.

Table i: Sentry Series product descriptions

Products	Description
Sentry	Sentry is an MPEG transport stream monitoring device that supports next generation digital services and traditional program monitoring. Sentry supports MPEG-2, H.264 AVC, H.265 HEVC, MPEG-4 part 10, JPEG2000, and VC-1 video compression standards, with GigE, ASI, RF, 10GbE and dual input support available.
Sentry Verify	Sentry Verify enables video service providers to accurately determine the health of the MPEG/IP transport network, with 10GbE, RF and dual input support available. Sentry Verify provides alerts and generates useful reports in the same fashion as the Sentry product.
Sentry ABR	Sentry ABR is an “active” monitoring product that proactively monitors ABR content on origin servers or CDN caching servers. It does this by actively requesting and validating program playlists / manifests that it has been configured to monitor. It then requests from the server, in turn, all of the fragments of each profile / representation for each program – calculating availability and performance metrics and generating alerts in real time.
Optional interface cards (Standard chassis only)	<p>Sentry provides critical monitoring at the edge of a network and offers specific reporting and alerting capabilities for services in the RF domain. The Sentry Standard chassis can provide the following interface cards:</p> <ul style="list-style-type: none"> ■ Either single-port or 4 port for ASI demodulation ■ Dual tuners for QAM-B and ATSC demodulation ■ Either 4 channels or 8 channels of QAM demodulation (QAM A/B/C) and provide RF measurements such as MER, BER, signal level, RF lock, EVM, and constellation ■ Dual tuners for DVB-S/S2 demodulation with RF measurements such as MER, CNR, SNR, BER, signal level, RF lock, and constellation ■ DVB-T/T2 demodulation with RF measurements such as MER, BER and signal strength
Medius Application Manager	Medius is an aggregation device that provides a central location to view manage and configure your Sentry products. The Medius product allows you to compare like programs across multiple Sentry units, to correlate reports for anomalies and view trending data for all of your services.
Consul System Monitor	Consul aggregates reports and trending data from multiple Medius units and offers video service providers an effective way of utilizing monitoring data in large-scale monitoring deployments.

Product documentation

The following table lists the documentation supporting the Sentry Series products with serial number B020101 and above. You can download the latest versions of these documents on the Tektronix Web site (www.tek.com).

Table ii: Sentry Series product documentation

Item	Tektronix part number	Purpose	Location
Sentry Series Installation and Safety Instructions (this manual)	071-3526-XX	Provides safety and compliance information with hardware installation instructions for all of the Sentry monitors	Printed manual
Sentry Software Installation and Safety Instructions	071-3528-XX	Provides software installation instructions for the Sentry software-only product	Printed manual
Sentry Series Video Quality Monitor User Guide	077-1328-XX	Provides operation and application information for the Tektronix Sentry, Sentry Verify, Sentry Edge, Sentry Edge II, Sentry Assure, and Sentry ABR Video Quality Monitors	PDF-only manual
Medius Application Manager User Guide	077-1329-XX	Provides operation and application information for the Tektronix Medius Application Manager	PDF-only manual
Consul Application Manager User Guide	077-1330-XX	Provides operation and application information for the Tektronix Consul Application Manager	PDF-only manual
Sentry Series Premium Chassis Declassification and Security Instructions	077-1331-XX	Provides declassification and security instructions for the Premium Sentry chassis for users who need to clear sensitive information from the instrument	PDF-only manual
Sentry Series Standard Chassis Declassification and Security Instructions	077-1332-XX	Provides declassification and security instructions for the Standard Sentry chassis for users who need to clear sensitive information from the instrument	PDF-only manual

Accessories

Unpack the instrument and verify that you have received all of the items listed in the following table. Check our Web site (www.tek.com) for the most current information on product accessories.

You may want to save the shipping carton and packing materials (including the anti-static bag) in case you need to ship the instrument.

Table iii: Standard and optional accessories

Accessory	Std.	Opt.	Tektronix part number
Statement of Compliance	•		Not applicable
Registration card	•		Not applicable
Software license agreement	•		001-1616-xx
Supplemental Information Sheet for China RoHS	•		071-2183-xx
<i>Sentry Series Installation and Safety Instructions</i>	•		071-3526-xx
Power cords (2x) ¹	•		Not applicable
NOTE. See <i>International power cord options</i> below for the type of power cord included with your instrument.			
Rackmount kit for installation in a standard 19-inch, rail equipment rack	•		RAIL-V
Rackmount kit for installation in a 19-inch, square hole equipment rack (no tools required)		•	RAIL-NT
Rackmount kit for installation in a two-post equipment rack		•	RAIL-2P
1GbE SFP+ transceiver module; RJ-45		•	GE2
10GbE long range SFP+ module		•	XG-LR
10GbE short range SFP+ module		•	XG-SR

¹ If you ordered Option 99, no power cords are provided.

International power cord options

- Opt. A0 – North America power (standard)
- Opt. A1 – Universal EURO power
- Opt. A2 – United Kingdom power
- Opt. A3 – Australia power
- Opt. A5 – Switzerland power
- Opt. A6 – Japan power
- Opt. A10 – China power
- Opt. A11 – India power
- Opt. A12 – Brazil power
- Opt. A99 – No power cord

Operating requirements

Read this section before installing the instrument. This section provides the information that you need to know to operate your product safely and correctly.

Verify that you have received all of the parts of your instrument and for the following:

- Correct power cords for your geographical area
- If ordered, a rackmount kit with installation instructions (shipped separately from the product)



WARNING. To prevent serious injury or damage to the product, do not operate this product with covers or panels removed. The covers should be removed only at the direction of a Tektronix Support or Sales Engineer.

Environmental ratings

The following table describes the environmental requirements for the Sentry Series monitors.



CAUTION. To ensure proper cooling allow sufficient airflow around the instrument, avoid blocking any exhaust fans or vents when using the instrument. Inadequate clearances can cause the instrument to overheat.

Table 1: Environmental specifications

Characteristic		Description
Temperature	Operating	5 °C to +40 °C (+41 °F to +104 °F)
Humidity	Operating	Between 0% and 80% relative humidity for temperatures up to 31° C, decreasing linearly to 50% relative humidity at 40° C
Altitude	Operating	0 m to 2000 m (6562 ft.)
Cooling		This product is provided with forced-air cooling; do not block ventilation openings.

Electrical ratings

Power requirements

The power requirements for the Sentry Series monitors are listed in the following table.

Table 2: Power requirements

Feature	Description
Standard chassis	
Source voltage range and frequency	100-127 / 200-240 VAC ($\pm 10\%$ max), 50/60 Hz
Power consumption ¹	Maximum: 4 / 2 A (x2)
Premium chassis (with AC power supplies)	
Source voltage range and frequency	100-127 / 200-240 VAC ($\pm 10\%$ max), 50/60 Hz
Power consumption ¹	Maximum: 7.0 / 3.5 A (x2)
Premium chassis (with DC power supplies)	
Source voltage range	-48 VDC to -60 VDC
Power consumption ¹	Maximum: 19 A to 15 A (x2)
Overvoltage category	II (as defined in IEC61010-1)
Pollution degree	2 (as defined in IEC61010-1) rated for indoor use only

¹ The Sentry chassis includes a redundant Power Supply module. One supply at a time powers the instrument up to the maximum rating, with the redundant supply operating in standby mode.

Site considerations

If ordered, use the rackmount hardware (shipped separately from the product) to best position the product in the instrument rack.



WARNING. To avoid injury or damage to the equipment, make sure that the electrical circuits are not overloaded, the equipment is properly grounded, and there are no objects placed on top of the instrument.

Installation

Rackmount installation



CAUTION. To avoid a fire hazard, place the instrument in the equipment rack only as specified; proper ventilation must be maintained. Do not restrict airflow to the ventilation openings on the sides and rear of the instrument.

Efficient cooling will be maintained in a rack-mounted instrument only if the air temperature at all intake air vents (inside the equipment rack) does not exceed 40 °C.

The Tektronix Sentry Series monitors are designed to be used in various types of equipment racks. Each instrument is shipped with a RAIL-V rackmount kit for installation in a standard 19-inch, rail equipment rack.

Two additional types of rackmount kits are available as optional accessories:

- **RAIL-NT.** Intended for use in a 19-inch, square hole equipment rack (no tools required)
- **RAIL-2P.** Intended for use in a two-post equipment rack.

The instructions for installing the instrument in an equipment rack are included with each of the rackmount kits.

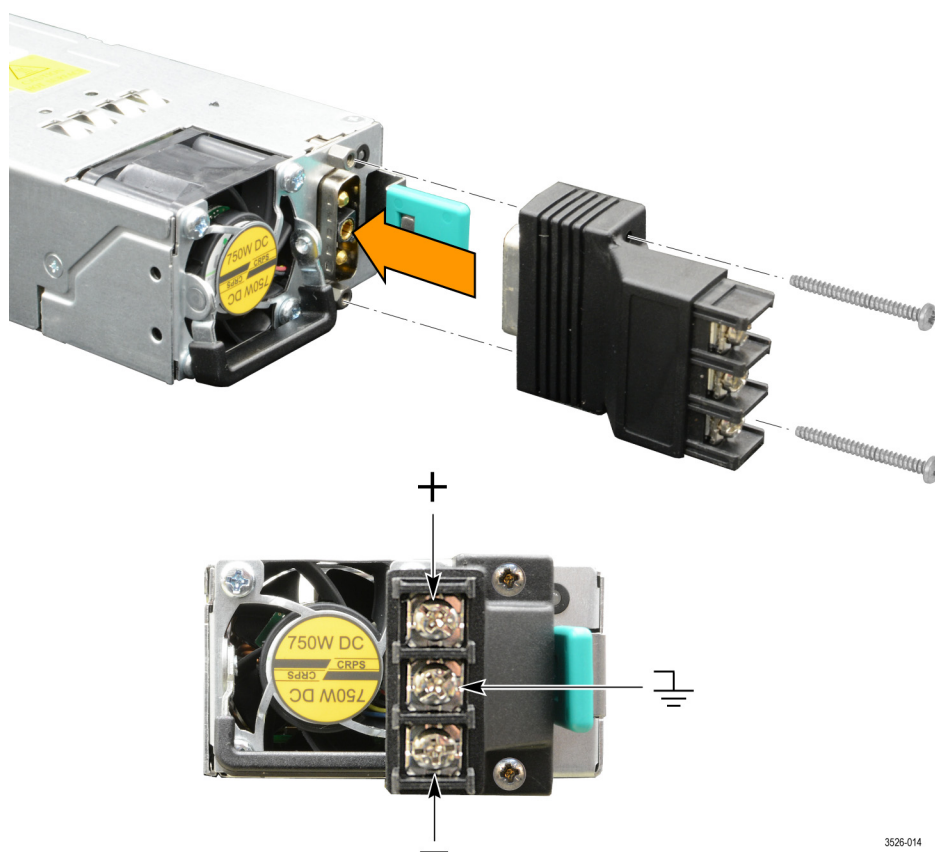
Power and signal connections

After the instrument is installed in the equipment rack, perform the following steps to connect power and signal cables:

1. Connect both power cords to the rear of the instrument.

NOTE. When installing the instrument or when removing the instrument from service, the power cords should be the first things connected to the instrument and the last things disconnected from the instrument.

If your instrument has the optional DC power supplies, you can use the supplied adapter to connect power wires to the instrument.



3526-014

Figure 1: Adapter for the optional DC power supplies

2. If your instrument has the optional Ethernet-based transport stream input capability (GigE), connect one end of an Ethernet cable to the **IP/MPEG Input Port** on the rear of the instrument. (See Figure 5 on page 12.) Connect the other end of the cable to your video transport stream source. (See page 13, *Optional interface cards (Standard chassis only)*.)

NOTE. *You will be able to configure the video inputs after you perform the network installation. (See page 9, Video input configuration.)*

3. If your instrument has one of the optional ASI, RF, or 10 GbE interface cards installed, connect the appropriate signal cable(s) to the input connector(s). (See page 13, *Optional interface cards (Standard chassis only)*.)

NOTE. *The 4-port ASI interface uses mini-BNC connectors. Instruments with this interface are supplied four mini-BNC-to-BNC adapters as standard accessories.*

You will be able to configure the video inputs after you perform the network installation. (See page 9, Video input configuration.)

4. Use the front-panel On/Standby button to power on the instrument. (See page 6, *Power-on and power-off procedures*.)

Power-on and power-off procedures

This instrument operates from a single-phase power source with the neutral conductor at or near earth ground. A protective ground connection through the grounding conductors in the power cords is essential for safe operation.

- Power-on**
1. Connect both power cords to the rear of the instrument.

NOTE. *When installing the instrument or when removing the instrument from service, the power cords should be the first things connected to the instrument and the last things disconnected from the instrument.*

2. Push the On/Standby button on the instrument front-panel and the instrument will turn on. (See Figure 1 on page 4.)

NOTE. *The On/Standby button on the front-panel does not disconnect mains power. Only the power cord at the rear of the product can disconnect mains power.*

3. Wait for the instrument to complete the power-on process.
4. Refer to the appropriate User Guide for more information for using your Sentry Series monitor. (See page xi, *Product documentation*.)

- Power-off**
1. Use the **Configure > Power Off** menu option from the user interface to start the power-off process.



CAUTION. *To avoid losing important information in the internal database, do not power off the instrument using the front panel On/Standby button. You should power off the instrument from using the Configure > Power Off menu selection within the application.*

2. In the event that you cannot access the user interface, press the front panel **On/Standby** button once to power off the instrument.

NOTE. *The LCD display does not indicate that the instrument has begun a Safe Power Off process. Please wait more than 30 seconds for the instrument to visibly start to power-off.*

3. To completely remove power from the instrument after a safe power-off, disconnect both power cords from the rear of the instrument.

Network installation

After the instrument is installed and powered on, you need to configure the network parameters so that the instrument can be accessed by a computer through the Management Port.

The computer can be connected to the Management Port using either of the following two methods:

- Connect an Ethernet cable from a standalone computer directly to the instrument
- Connect an Ethernet cable from your local Ethernet network to the instrument, which allows you to operate the instrument from any computer on the network

NOTE. *When you first receive the instrument, you must initially connect a computer directly to the Management Port on the instrument in order to configure the network settings. Depending on how you configure the network settings on the instrument, you can then connect the instrument to your local Ethernet network.*

Perform the following steps to configure the network parameters of the instrument:

1. Connect an Ethernet cable between the **Management Port** on the instrument and the Ethernet port on a standalone computer. (See page 12, *Rear panel connectors*.)
2. Log on to the instrument:

NOTE. *The IP address of the Management Port is shown on the front-panel LCD display.*

- a. Enter the IP address of the Management Port in the address box of a Web browser such as Internet Explorer. This opens the Sentry Log In page.
- b. In the Sentry Log In page, enter the user name and password for your instrument and then click **Log In**. This opens the Sentry home page.

NOTE. *The factory default user name and password for your instrument are provided on the configuration document that was shipped with the instrument. The user name and password values listed on the document are case sensitive.*

3. If you are going to continue to operate the instrument directly from a standalone computer after installation, perform the following steps. Otherwise, proceed to step 4.

NOTE. *The following procedure assumes that you want to change the network parameters on the instrument to match those on your computer. If desired, you can instead change the network parameters on the computer to match those on the instrument.*

- a. Make a note of the network IP, subnet mask, and gateway addresses on your computer.
- b. In the Sentry home page, select **Configure > System Settings**.
- c. In the System Settings page, make the following entries and then click the **Save Settings** button:
 - In the **LAN2 IP** field, enter an IP address that is one digit lower than the IP address assigned to the computer. For example, if the computer has an IP address of 10.0.10.202, then configure the LAN2 IP address on the instrument to be 10.0.10.201.
 - In the **Netmask** and **Gateway** fields, enter the same addresses as the subnet mask and gateway addresses on the computer.
4. If you are going to operate the instrument from a computer on your local Ethernet network after installation, perform the following steps:
 - a. Contact your local network administrator for the correct IP, subnet mask, and gateway addresses to use for the instrument.



CAUTION. *To prevent communication conflicts on your Ethernet network, be sure to ask your local network administrator for the correct IP, subnet mask, and gateway addresses before you connect the instrument to your local Ethernet network.*

- b. In the Sentry Series home page, select **Configure > System Settings**.
- c. In the System Settings page, enter the addresses you received from your network administrator in the **LAN2 IP**, **Netmask**, and **Gateway** fields.
- d. Click the **Save Settings** button to save the changes.
- e. After the network configuration changes are saved, close the Sentry Series window on the standalone computer and connect an Ethernet cable from the Management Port on the instrument to the Ethernet hub port of your local network. You can now access the instrument from a computer on your network.

Video input configuration

After you complete the network installation, you will be able to configure the video input(s). From the Sentry Home page, use the **Configure > MPEG Input Settings** menu selection to configure the necessary video input parameters.

The available configuration parameters depend on the type of video input installed on your instrument (ASI, RF, GigE, dual GigE, or 10GbE). See the User Guide for your Sentry monitor for information about how to configure the video inputs for your instrument. (See page xi, *Product documentation*.)

Controls and connections

Front panel controls

The front panel of a Sentry Series monitor provides the following controls:

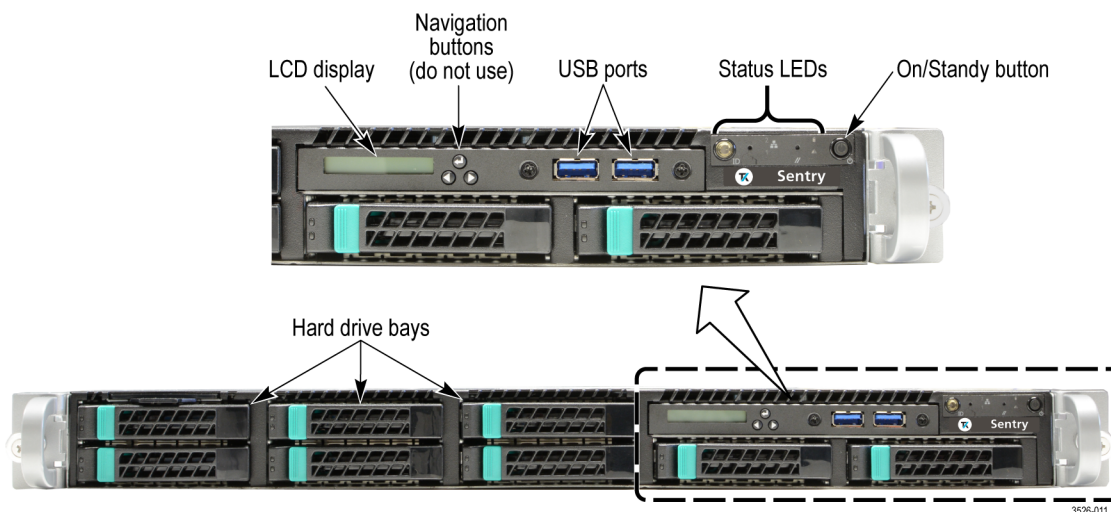


Figure 2: Front panel controls

LCD display

The LCD (Local Control Display) is a 16-character, one-line display with two backlight colors:

- Green. The LCD backlight is green under normal operating conditions.
- Amber. If a hardware problem is detected with the server, the LCD backlight turns amber. When the problem is cleared, the backlight returns to green.

Under normal operation, the readout will display the IP address of the Management Port in the form “Tektronix Sentry IP: xxx.xxx.xxx.xxx.”

Depending on the status of the instrument, you may see additional status messages such as Rebooting, Shutdown, Stopped, etc. When errors are encountered, associated error messages may be displayed.

Navigation buttons

The navigation buttons can be used to access and navigate an internal menu system provided by the manufacturer of the Sentry chassis.








CAUTION. To prevent operational problems with the instrument, do not attempt to make any changes to the menu settings.

USB ports Use the two USB 2.0 ports to connect external USB devices to the instrument.

Status LEDs The status LEDs indicate the following information about the state of the instrument:

Table 3: Status LED indicators

Item	Description
ID	System ID button with LED
	On/Standby button illuminates when the instrument is powered on
2  1 	Illuminates when activity occurs on the Management Port (1) and on the IP Video port (2)
	Illuminates when there is drive activity
	System status LED

On/Standby button Use the On/Standby button to power the instrument on and off. (See page 6, *Power-on and power-off procedures*.)

Rear panel connectors

Standard chassis The following figure shows the rear panel connectors for the Standard chassis.

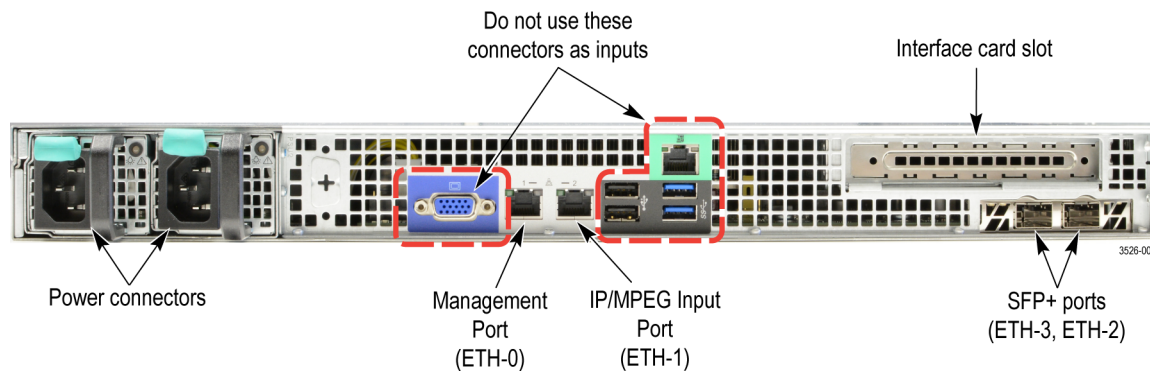


Figure 3: Rear panel connectors – Standard chassis

Premium chassis The following figures show the rear panel connectors for the Sentry Premium chassis.

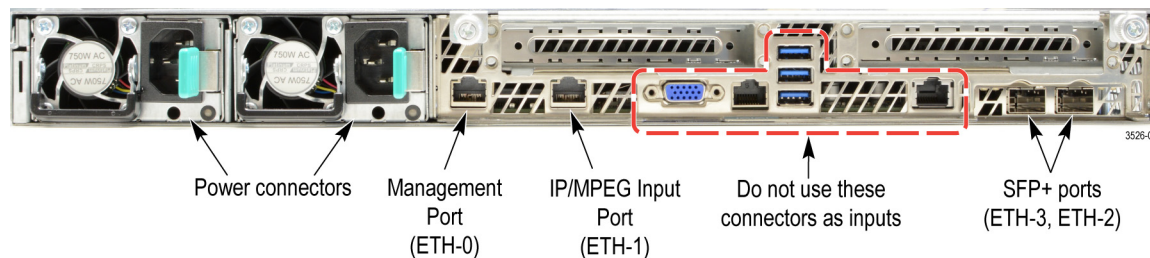


Figure 4: Rear panel connectors – Premium chassis with the standard AC power supplies

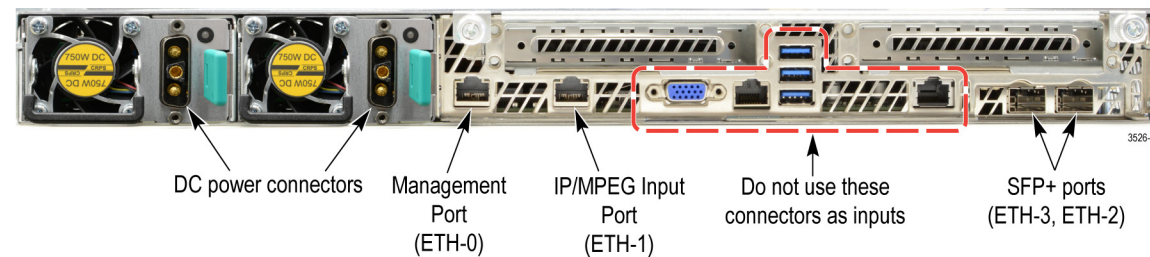
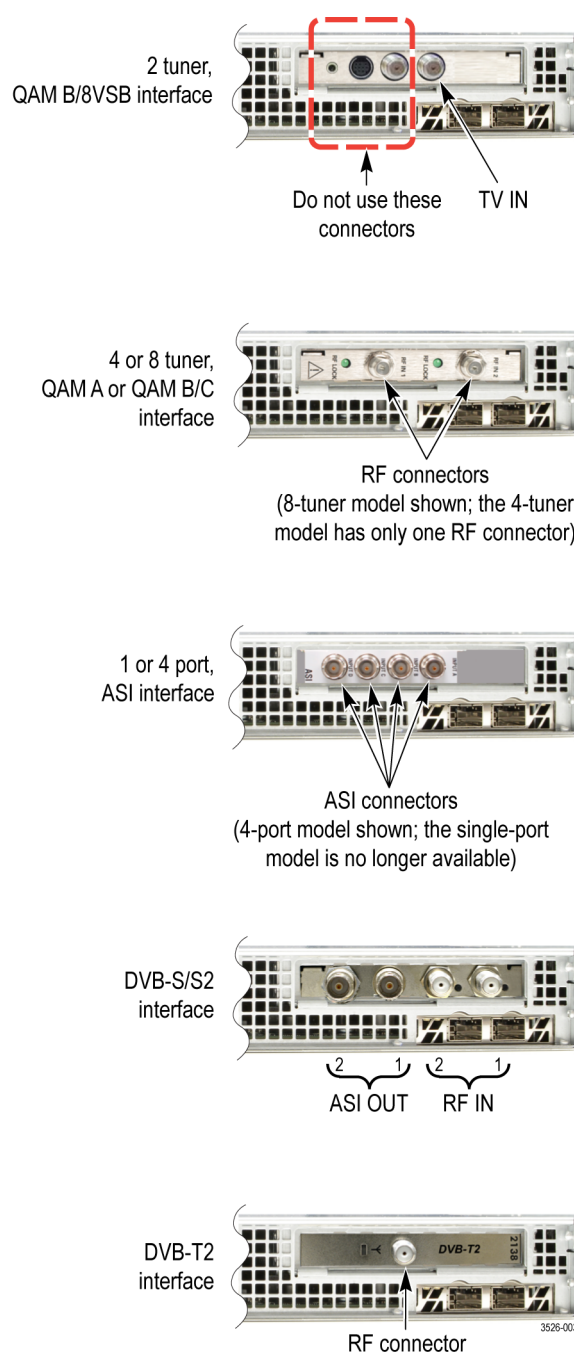


Figure 5: Rear panel connectors – Premium chassis with the optional DC power supplies

**Optional interface cards
(Standard chassis only)****Figure 6: Optional interface card connectors (Standard chassis only)**

SFP module installation

If you received an optional SFP module, install the SFP module as shown below.



CAUTION. You need to install the first SFP module in Slot 1 (the outside SFP+ port)



Figure 7: Installing an SFP module

SFP module removal

To uninstall the SFP module, remove the module as shown below.

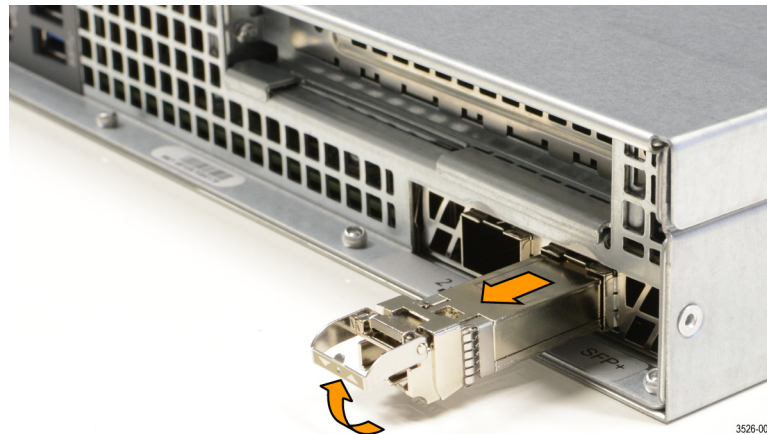


Figure 8: Removing an SFP module

Compliance information

This section lists the EMC (electromagnetic compliance), safety, and environmental standards with which the instrument complies.

EMC compliance

EU EMC Directive

Meets intent of Directive 2014/30/EU for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:

EN 55032. Electromagnetic compatibility of multimedia equipment - Emission requirements ^{1 2}

Class A radiated and conducted emissions

EN 55103-2. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use - Part 2 Immunity. ²

Environment E2 – commercial and light industrial

- IEC 61000-4-2. Electrostatic discharge immunity
- IEC 61000-4-3. RF electromagnetic field immunity
- IEC 61000-4-4. Electrical fast transient / burst immunity
- IEC 61000-4-5. Power line surge immunity
- IEC 61000-4-6. Conducted RF Immunity
- IEC 61000-4-11. Voltage dips and interruptions immunity
- EN 55103-2 Annex A. Radiated magnetic field immunity

EN 61000-3-2. AC power line harmonic emissions

EN 61000-3-3. Voltage changes, fluctuations, and flicker

European contact.

Mfr. Compliance Contact
Tektronix, Inc. PO Box 500, MS 19-045
Beaverton, OR 97077, USA
www.tek.com

¹ This product is intended for use in nonresidential areas only. Use in residential areas may cause electromagnetic interference.

² Emissions which exceed the levels required by this standard may occur when this equipment is connected to a test object.

**Australia / New Zealand
EMC**

Complies with the EMC provision of the Radiocommunications Act per the following standard, in accordance with ACMA:

- EN 55032. Radiated and conducted emissions, Class A.

Safety compliance

This section lists the safety standards with which the product complies and other safety compliance information.

EU low voltage directive

Compliance was demonstrated to the following specification as listed in the Official Journal of the European Union:

Low Voltage Directive 2014/35/EU.

- EN 61010-1. Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements.

**U.S. nationally recognized
testing laboratory listing**

- UL 61010-1. Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements.

Canadian certification

- CAN/CSA-C22.2 No. 61010-1. Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements.

Additional compliances

- IEC 61010-1. Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements.

Equipment type

Test and measuring equipment.

Safety class

Class 1 – grounded product.

Pollution degree descriptions	<p>A measure of the contaminants that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated.</p> <ul style="list-style-type: none"> ■ Pollution degree 1. No pollution or only dry, nonconductive pollution occurs. Products in this category are generally encapsulated, hermetically sealed, or located in clean rooms. ■ Pollution degree 2. Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service. ■ Pollution degree 3. Conductive pollution, or dry, nonconductive pollution that becomes conductive due to condensation. These are sheltered locations where neither temperature nor humidity is controlled. The area is protected from direct sunshine, rain, or direct wind. ■ Pollution degree 4. Pollution that generates persistent conductivity through conductive dust, rain, or snow. Typical outdoor locations.
Pollution degree rating	Pollution degree 2 (as defined in IEC 61010-1). Rated for indoor, dry location use only.
Measurement and overvoltage category descriptions	<p>Measurement terminals on this product may be rated for measuring mains voltages from one or more of the following categories (see specific ratings marked on the product and in the manual).</p> <ul style="list-style-type: none"> ■ Category II. Circuits directly connected to the building wiring at utilization points (socket outlets and similar points). ■ Category III. In the building wiring and distribution system. ■ Category IV. At the source of the electrical supply to the building. <hr/> <p>NOTE. Only mains power supply circuits have an overvoltage category rating. Only measurement circuits have a measurement category rating. Other circuits within the product do not have either rating.</p> <hr/>
Mains overvoltage category rating	Overvoltage category II (as defined in IEC 61010-1).

Environmental considerations

This section provides information about the environmental impact of the product.

Product end-of-life handling

Observe the following guidelines when recycling an instrument or component:

Equipment recycling. Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. To avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.



This symbol indicates that this product complies with the applicable European Union requirements according to Directives 2012/19/EU and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries. For information about recycling options, check the Tektronix Web site (www.tek.com/productrecycling).

Perchlorate materials. This product contains one or more type CR lithium batteries. According to the state of California, CR lithium batteries are classified as perchlorate materials and require special handling. See www.dtsc.ca.gov/hazardouswaste/perchlorate for additional information.