

Triton Plus

CONTROL PANELS

User Manual

Revision 3

JANUARY 2009



Affiliate with the N.V. KEMA in The Netherlands

CERTIFICATE

Certificate Number: 510040.001

The Quality System of:

Grass Valley, Inc.

400 Providence Mine Road
Nevada City, CA 95945
United States

15655 SW Greystone Ct.
Beaverton, OR 97006
United States

10 Presidential Way
3rd Floor, Suite 300
Woburn, MA 01801
United States

Nederland B.V.
4800 RP BREDA
The Netherlands

Weierstadt, Germany
Brunnenweg 9
D-64331 Weierstadt
Germany

Rennes, France
Rue du Clos Courtel
Cesson-Sevigne, Cedex
France

Technopole Brest Iroise
CS 73808
29238 Brest Cedex 3
France

17 rue du Petit Albi-BP 8244
95801 Cergy Pontoise
Cergy, France

2300 South Decker Lake Blvd.
Salt Lake City, UT 84119
United States

7140 Baymeadows Way
Suite 101
Jacksonville, FL 32256
United States

Including its implementation, meets the requirements of the standard:

ISO 9001:2000

Scope:

The design, manufacture and support of video hardware and software products and related systems.

This Certificate is valid until: June 14, 2009
This Certificate is valid as of: August 30, 2006
Certified for the first time: June 14, 2000

H. Pierre Sallé
President
KEMA-Registered Quality

The method of operation for quality certification is defined in the KEMA General Terms And Conditions For Quality And Environmental Management Systems Certifications. Integral publication of this certificate is allowed.

KEMA-Registered Quality, Inc.
4377 County Line Road
Chalfont, PA 18914
Ph: (215)997-4519
Fax: (215)997-3809
CRT 001 073004

Accredited By:
ANAB



Triton Plus

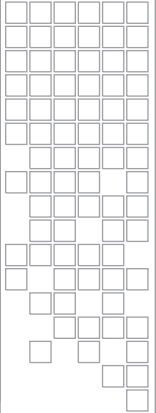
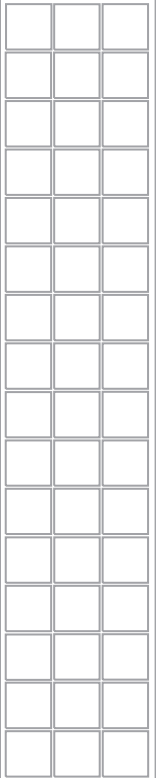
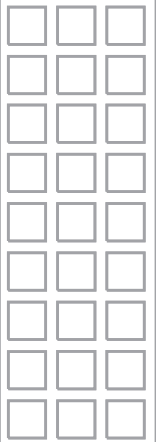
CONTROL PANELS

User Manual



Revision 3

JANUARY 2009



Contacting Grass Valley

International Support Centers	France 24 x 7	+800 8080 2020 or +33 1 48 25 20 20 +800 8080 2020 or +33 1 48 25 20 20	United States/Canada 24 x 7	+1 800 547 8949 or +1 530 478 4148
Local Support Centers (available during normal business hours)	Asia	Hong Kong, Taiwan, Korea, Macau: +852 2531 3058 Indian Subcontinent: +91 22 24933476 Southeast Asia/Malaysia: +603 7805 3884 Southeast Asia/Singapore: +65 6379 1313 China: +861 0660 159 450 Japan: +81 3 5484 6868		
		Australia and New Zealand: +61 1300 721 495	Central/South America: +55 11 5509 3443	
		Middle East: +971 4 299 64 40 Near East and Africa: +800 8080 2020 or +33 1 48 25 20 20		
	Europe	Belarus, Russia, Tadzikistan, Ukraine, Uzbekistan: +7 095 2580924 225 Switzerland: +41 1 487 80 02 S. Europe/Italy-Roma: +39 06 87 20 35 28 -Milan: +39 02 48 41 46 58 S. Europe/Spain: +34 91 512 03 50 Benelux/Belgium: +32 (0) 2 334 90 30 Benelux/Netherlands: +31 (0) 35 62 38 42 1 N. Europe: +45 45 96 88 70 Germany, Austria, Eastern Europe: +49 6150 104 444 UK, Ireland, Israel: +44 118 923 0499		

Copyright © Thomson. All rights reserved.

This product may be covered by one or more U.S. and foreign patents.

Grass Valley Web Site

The www.thomsongrassvalley.com web site offers the following:

Online User Documentation — Current versions of product catalogs, brochures, data sheets, ordering guides, planning guides, manuals, and release notes in .pdf format can be downloaded.

FAQ Database — Solutions to problems and troubleshooting efforts can be found by searching our Frequently Asked Questions (FAQ) database.

Software Downloads — Download software updates, drivers, and patches.



END-OF-LIFE PRODUCT RECYCLING NOTICE

Grass Valley's innovation and excellence in product design also extends to the programs we've established to manage the recycling of our products. Grass Valley has developed a comprehensive end-of-life product take back program for recycle or disposal of end-of-life products. Our program meets the requirements of the European Union's WEEE Directive, the United States Environmental Protection Agency, and U.S. state and local agencies.

Grass Valley's end-of-life product take back program assures proper disposal by use of Best Available Technology. This program accepts any Grass Valley branded equipment. Upon request, a Certificate of Recycling or a Certificate of Destruction, depending on the ultimate disposition of the product, can be sent to the requester.

Grass Valley will be responsible for all costs associated with recycling and disposal, including freight. However, you are responsible for the removal of the equipment from your facility and packing the equipment to make it ready for pickup.



For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the U.S. and Canada please call 800-547-8949 or 530-478-4148, and ask to be connected to the EH&S Department. Additional information concerning the program can be found at: www.thomsongrassvalley.com/environment



Contents

Triton Plus Control Panels	7
Product Overview	7
Product Versions	8
Connection Details	9
Power Supply Pinouts	10
Configuration	11
Level Configuration	11
Fallback Mode	12
Dynamic Fallback Mode	12
Hard-set Fallback Mode	12
Joystick Priority	13
Release Before Switch	13
Switch Before Release	13
Power Alarm	13
Joystick Mode	14
GPI Mode	14
Joystick Release Mode	14
Configuring Output on Single Bus Panels	14
LED Status Indication	15
Start Up	15
Alarm States	15
Router Communication	16
Serial Connection	16
Maximum Cable Length (RS-232)	17
NCB Connection	17
Connecting Control Panels	17
Pinout and Cable Type	17
Termination Plug	18
Control Bus Structure	19
Maximum Distance Between NCB Devices	19
GPI Connections	20
Control Panel Operation	21
Button Description	21
A/V Toggle	21
Panel Enable	22
Take On/Off	22
Take	22
Output	22
Input	22
Specifications	23

Triton Plus Control Panels

Product Overview

Thomson Grass Valley is proud to present the second generation of the compact small and medium routing switcher family – Triton Plus. With Triton Plus, Thomson Grass Valley now provides a stable and proven product line including the most complete signal format and size offering available.

With the new ultra-slim, multi-format and flexible product range, Triton Plus fulfils the most demanding requirements from the professional broadcast market.

This User Manual presents the features, installation, and operation of the control panels available with the Triton Plus series.

Product Versions

The following control panel versions are available for the Triton Plus series:

- 19 in. 1 RU ([Table 1](#))
- 19 in. 2 RU ([Table 2](#))
- 19 in. 4 RU ([Table 3](#))

Table 1. 19 in. 1 RU Control Panels

Control Panel Model	Descriptions
TPS-16XY-CP	Multi bus X-Y 16x16 panel
TPS-8XY-CP	Multi bus X-Y 8x8 panel
TPS-16D-CP	Dual bus 16x2 panel
TPS-32S-CP	Single bus 32x1 panel
TPS-32S-CP-GPI	Single bus 32x1 panel with GPI/Joystick/Tally interface
TPS-16S-CP	Single bus 16x1 panel
TPS-16S-CP-GPI	Single bus 16x1 panel with GPI/Joystick/Tally interface
TPS-8S-CP	Single bus 8x1 panel
TPS-8S-CP-GPI	Single bus 8x1 panel with GPI/Joystick/Tally interface
TPS-16XY-CP	Multi bus X-Y 16x16 panel

Table 2. 19 in. 2 RU Control Panels

Control Panel Model	Descriptions
TPS-32XY-CP	Multi bus X-Y 32x32 panel
TPS-64S-CP	Single bus 64x1 panel
TPS-64S-CP-GPI	Single bus 64x1 panel with GPI/Joystick/Tally interface

Table 3. 19 in. 4 RU Control Panels

Control Panel Model	Descriptions
TPS-64XY-CP	Multi bus X-Y 64x64 panel

Connection Details

Available service connectors at the back panel of the Triton Plus Routers are shown in [Figure 1](#).

Note [Figure 1](#) shows a 1 RU Triton Plus router. However, the connectors are identical to the 1 RU also on the 2 RU and 4 RU units. The only connectors that differ are the applicable signal connectors.

Figure 1. Rear View of Triton Plus Control Panel



- SYNC: Not in use on control panels.
- LOOP: Not in use on control panels.
- NCB IN: Network Control Bus Input. The protocol of this bus is equal, and compatible to the MIDI bus protocol.
- NCB OUT: Network Control Bus Output.
- ETHERNET: Not supported at this time.
- RS-232: RS-232 for external control protocols.
- POWER A: $\pm 15\text{VDC}$ Power Input.
- POWER B: $\pm 15\text{VDC}$ Power Input, redundant supply.
- CONFIGURATION: Configuration switches (8 pcs).

Power Supply Pinouts

The DB9 power pinouts for Triton Plus routers and Control Panels are given in [Table 4](#).

Table 4. Power Supply Pinouts

Pin Number	Description
1	Gnd
2	Not Connected
3	Not Connected
4	+15 VDC
5	Not Connected
6	Not Connected
7	Not Connected
8	-15 VDC
9	Not Connected

Configuration

This section highlights the main configuration options, available on the DIP switches on the rear of the unit.

Level Configuration

Switches 1-4 on the configuration switch set the router's level for communication with the Router Management System and other units in the NCB system. The panels on the NCB dedicated to operate with the router must be configured to the same level as that router.

The levels can be switched according to the patterns given in [Table 5](#). The default level is **1**.

Table 5. Level Switch Patterns

SW 1	SW 2	SW 3	SW 4	Level	NCB Address
Off	Off	Off	Off	1	0
Off	Off	Off	On	2	1
Off	Off	On	Off	3	2
Off	Off	On	On	4	3
Off	On	Off	Off	5	4
Off	On	Off	On	6	5
Off	On	On	Off	7	6
Off	On	On	On	8	7
On	Off	Off	Off	9	8
On	Off	Off	On	10	9
On	Off	On	Off	11	10
On	Off	On	On	12	11
On	On	Off	Off	13	12
On	On	Off	On	14	13
On	On	On	Off	15	14
On	On	On	On	16	15

Fallback Mode

Note This information is applicable only on GPI versions.

Switch **SW 5** on the configuration switch sets the fallback mode of the GPI panel, either to **dynamic** or to **hard-set**.

Note This is only useful when the GPI panel is in Joystick release mode, see [Joystick Mode on page 14](#).

Dynamic Fallback Mode

When the GPI is activated the X-point status is saved before switching. When the GPI is released again, the panel will switch back to the previous saved X-point status.

Hard-set Fallback Mode

When the GPI is released, the panel will switch to a previously configured fallback input. The fallback input is configured using the input buttons, see [Button Description on page 21](#).

The modes can be switched as described in [Table 6](#). The default mode is **Hard-set**.

Table 6. Fallback Mode Switching

SW 5	Fallback Mode
Off	Hard-set
On	Dynamic

Joystick Priority

Note This information is applicable only on GPI versions.

Switch **SW 6** on the configuration switch set the Joystick priority of the GPI panel, either to release before switch or to switch before release.

Release Before Switch

This is used in both GPI and Joystick mode. The activation of a new input line will have no effect until the previous line is released. If more lines are activated in sequence, the latest activated one will result in a switching as soon as the previously active is released.

Switch Before Release

This is used in both GPI and Joystick mode. The activation of a new input line will generate a switching, regardless of how many other lines that are already set.

The priority can be switched with switch **SW 6** according to the pattern given in [Table 7](#). The default setting is **Switch Before Release** (Off)..

Table 7. Joystick Priority Mode Switching

SW 6	Joystick Priority
Off	Switch before release
On	Release before switch

Power Alarm

The power alarm can be switched with switch **SW 7** according to the pattern given in [Table 8](#). The default setting is power alarm disabled (Off).

Table 8. Power Alarm Mode Switching

SW 7	Power Alarm
Off	Disables Power Alarm
On	Enables Power Alarm

Joystick Mode

Note This information is applicable only on GPI versions.

Switch **SW 8** on the configuration switch set the Joystick mode of the GPI panel to either **GPI Mode** or to **Joystick Release Mode**.

GPI Mode

Releasing the input lines will keep the previous status. Operation of the front panel is allowed with any number of active GPI-lines simultaneously.

Joystick Release Mode

When all the input lines are released, a default input (either dynamically chosen or static) is set. The front panel is locked if any of the input lines are active.

The modes can be switched with switch **SW 8** according to the pattern given in [Table 9](#). The default mode is **GPI Mode** (Off).

Table 9. Joystick Mode Switching

SW 8	Joystick Mode
Off	GPI Mode
On	Joystick Release Mode

Configuring Output on Single Bus Panels

Refer to [Input on page 22](#) for configuring default output to be controlled from a single bus control panel.

LED Status Indication

Start Up

The LED located at the front of the router indicates the status of the router. At start-up, the LED will alternate between red (R) and green (G) every 500ms for about two seconds. After the start-up sequence the LED will indicate the Alarm state of the router.

Alarm States

The LED can either be red (R), green (G), or have no light (N).

The LED state is described in [Table 10](#) below with twenty letters, each representing 100ms, which totals an alarm sequence of two seconds. The X indicates that the LED keeps the color it has the moment the alarm sequence begins (green, yellow or no light).

Table 10. LED Alarm States

Description	LED State	Alarm	Comment
Continuous Green Light	GGGGG GGGGG GGGGG GGGGG	No Alarm Status OK	
Long Red Blinking	RRRRR NNNNN RRRRR NNNNN	Power is too low	
One Short Red Blink	RXXXX XXXXX XXXXX XXXXX	Power A failed	Only active if power alarm DIP is set.
Two Short Red Blinks	XXXXX XXXXX RXRXX XXXXX	Power B failed	

Router Communication

You gain access to router for communication purposes by connecting either the router's serial port to your computer.

Serial Connection

Connection can be made through the serial port(s) of the router; see also [Connection Details on page 9](#) for connection details.

The communication parameters are configurable. Please refer to the protocol documentation of the appropriate communication/control protocol.

Example: The protocol parameters of the Triton Plus Compact routers are as follows:

- Bit rate 19200 bit/s
- Data bits 8 bits
- Stop bits 1
- Parity: No parity

For further detail concerning this protocol, please refer to the following manual: *Compact Router Control Protocol*.

The DB9 female connector for the serial port(s) of the router has the following pinout ([Table 11](#)):

Table 11. Serial Connection Pinout

Pin #	RS-232 Mode
1	Not in use
2	Tx
3	Rx
4	Not in use
5	GND
6	GND
7	RTS
8	CTS
9	Do Not Connect!

Note If the standard RS-232 cable specification (DCE) is followed:

A cable with Male+Male or Female+Female connectors at the cable ends is used for Rx/Tx crossed connection.

A cable with Male+Female connectors at the cable ends is used for a straight through connection.

Maximum Cable Length (RS-232)

IEEE has specified the maximum cable length for an RS-232 connection to 15m. Longer distances can be installed depending on the environmental conditions of the installation site. It is the responsibility of the installer/user to secure a proper installation of the RS-232 connection.

NCB Connection

Via the Network Control Bus system, several routers and control panels can be interconnected.

Up to 16 levels of routers, or combinations of routers, can be controlled. The NCB system and all RS-232 ports interchange the system status. This means that any control system, either from Grass Valley, or from a third party manufacturer, connected to any RS-232 port in the NCB loop, will have access to all communication data on the bus.

Connecting Control Panels

To get a control panel working with a specific router, configure the control panel to the same level as the router. Several panels can be configured to control the same router. Panels can also be connected to a router via the RS 232 interface. Please refer to your control panel manual for installation.

Pinout and Cable Type

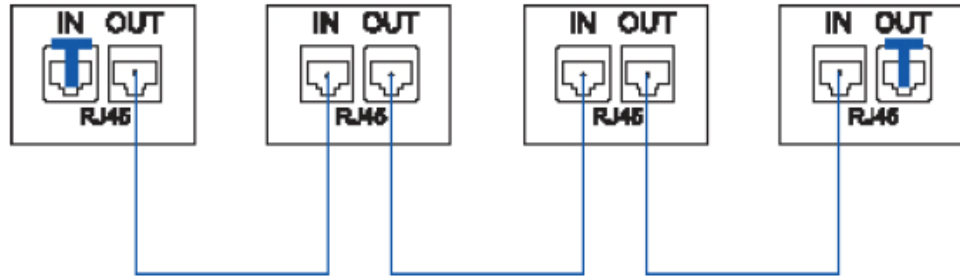
Triton Plus routers and Control Panels use RJ45 connectors for the Network Control Bus ports. The following pinout shown in [Table 12](#) is used:

Table 12. RJ45 Connector Pinouts

Pin #	Description	Illustration
1	Not Connected	
2	Not Connected	
3	Data (return)	
4	Data	
5	Data	
6	Data (return)	
7	Not Connected	
8	Not Connected	

The following connection example (Figure 2) shows connection of four Triton Plus devices with RJ45 connectors and bus termination:

Figure 2. Four Devices Connected Together Using RJ45



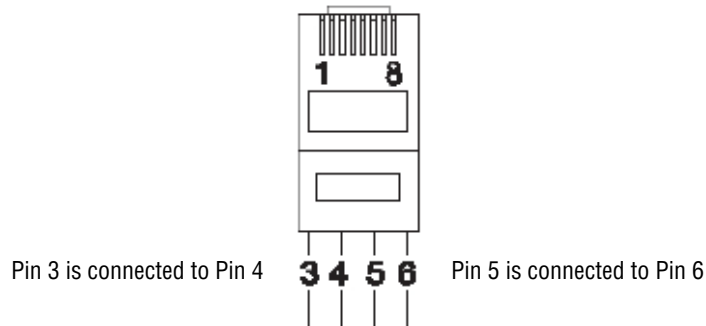
Note Each device at the end of the chain has a termination plug, indicated with the letter T. This termination plug must be inserted in the correct connection port. If not, no NCB communication is possible.

Termination Plug

The termination plug that is mentioned in the previous chapter is necessary when you want to avoid closing the loop with a (long) cable.

The termination plug is a standard RJ45 plug with the following internal wiring shown in Figure 3.

Figure 3. RJ45 Termination Plug Wiring



Control Bus Structure

The Network Control Bus structure follows the standard MIDI bus definition. The NCB is defined as a closed chain of units. This means that the NCB OUT of the last unit must be connected to the NCB IN of the first unit in the NCB chain. To avoid problems with the control of Triton Plus units the installer/user has to assure that the bus structure is installed according to this definition.

Note The total number of Triton Plus devices in an NCB chain is limited to 50.

Maximum Distance Between NCB Devices

The standard MIDI definition allows a maximum cable length of 200-250 meters between two devices. Longer distances can be made with MIDI repeater units. To avoid grounding problems all NCB ports have opto-coupled inputs.

GPI Connections

Note This information is applicable only on GPI panel versions.

The GPI / Joystick / Tally signals are connected to the Triton Plus Control Panel with GPI options using DB25 male connectors. Each Triton Plus CP with GPI I/O has 32 GPI inputs and 32 GPI outputs available, independent of panel size.

Note The GPI connectors on the CP are DB25 females.

The GPI pinouts are given in [Table 13](#).

Table 13. GPI Pinouts

GPI I/O Channel #	Connector Pin #
1 and 17	12
2 and 18	24
3 and 19	23
4 and 20	10
5 and 21	09
6 and 22	21
7 and 23	20
8 and 24	07
9 and 25	06
10 and 26	18
11 and 27	17
12 and 28	04
13 and 29	03
14 and 30	15
15 and 31	14
16 and 32	01

All inputs internally connected to +5V via a pull-up resistor. The inputs will be activated when pulling them to ground. Ground is available on the following pins: 2, 5, 8, 11, 13, 16, 19, 22, 25 and on the connector chassis.

All outputs are of open collector type. An output can switch a maximum load of 100mA at 30V. Any device to be controlled by the GPI outputs (lamp, LED or similar) needs to be connected to an external supply voltage on one end and to the GPI output on the other end.

WARNING Do not connect external supply voltages higher than 30V DC.

Control Panel Operation

All local control panels are given a default configuration, which includes the buttons **A/V Toggle**, **Panel Enable**, **Take On/Off**, and **Take**. In addition, **Input** and **Output** buttons are pre-configured.

Note The extra buttons on the 2RU and 4RU panels are not preconfigured. They may be configured by the user.

Note The GPI functions are not programmable on Triton Plus GPI control panels. They have a fixed, preconfigured function as described earlier in [Configuration on page 11](#).

Button Description

A/V Toggle

The **A/V Toggle** button enables/disables audio and video on a specified address. The address can either be read from the DIP switches or be fixed. The button toggles between three states.

Note If the button is pressed for more than 1 second, it will go into a fourth state where both audio and video are disabled.

In this state the button will be dimmed. If the button is pressed for more than 1 second again, it will enable both audio and video if present. Refer to [Table 14](#).

Table 14. A/V Toggle Button

Button Color	Video Enabled	Audio Enabled
Yellow	Yes	Yes
Green	Yes	No
Red	No	Yes
Dimmed	No	No

If neither audio nor video is present, it will be marked as disabled and the toggle state will not be used.

Toggle status changes will be stored in flash and used when the panel is powered up later.

Panel Enable

If a **Panel Enable** button is present, the panel will start up not enabled. In this state the button will be red and all the other buttons will be disabled. When pressing the button the panel will be enabled and the color will change to green. A status request will also be sent to get information on active levels.

If no **Panel Enable** button is present, the panel will start up enabled.

Take On/Off

The **Take On/Off** button enables or disables the **Take** button. If no **Take** button is defined, **Take On/Off** is always off. On first start-up the **Take** button is enabled. Later it will read the last status from the flash memory.

Note Activating a GPI I/O will not influence the **Take** on/off function, nor will a **Take** on/off function influence the activation of a GPI I/O function.

Take

The **Take** buttons LED is normally off. If the **Take On/Off** button is set to on, no commands will be sent from the panel until the **Take** button is pressed. The last selected buttons and the **Take** button will blink, until the **Take** button is pressed and the command is sent from the panel.

Note Activating a GPI I/O will not influence the **Take** on/off function, nor will a **Take** on/off function influence the activation of a GPI I/O function.

Output

An **Output** button is used for selecting an output. Selecting an output activates it, so that it is switched to the next input that is selected.

Input

An **Input** button switches the active output to the selected input. If the **Take** button is enabled, the switch will not be executed until the **Take** button is pressed.

When switching using the **Input** button, all enabled audio- and video-levels will be switched from the selected input to the active output.

Note The **Input** button can also be used to select the active output for single bus panels and fallback inputs for GPI panels. Press and hold the **Panel Enable** button while selecting the active output by pressing an **Input** button. Press and hold the **Panel Enable** button while first toggling **A/V Toggle** and then selecting the fallback input by pressing an Input button.

Unlike the buttons on the front of the panel, GPI inputs 1-32 cannot be reconfigured to represent other inputs, i.e. they are fixed inputs (1-32), operating on the selected output.

Specifications

Note All specifications are subject to change without notice.

Table 15. Triton Plus Control Panel Specifications

Parameter	Value
Mechanical	
Dimensions	<ul style="list-style-type: none"> HxWxD = 44x483x50mm (19 in., 1 RU) HxWxD = 88x483x50mm (19 in., 2 RU) HxWxD = 176x483x50mm (19 in., 4 RU)
Safety/Emission standards	Compliant with CE EN55103-1 and 2
Power Supply	
TPS-PWR-40	40W power supply unit for 8x8 to 32x32
AC supply voltage range	100-240VAC, 50-60Hz max 1.6A
AC mains connector	IEC 320
DC output	<ul style="list-style-type: none"> +15V, max. 2.2A/-15V, max 1.35A. Maximum 43W for 8x8–32x32 versions
DC connector	DB9, female
Status monitoring	Via LED in front of router/CP
Control	
Standard Features	
Serial port	RS-232 for protocol conversion, to Triton Plus compact control protocol, or to 3rd party protocols
Connector	DB9, female
NCB ports	For integration with Triton Plus compact router configuration
Connectors (2)	RJ45 (1 in/1 out)
Ethernet port	10/100BaseT Ethernet is not supported at this time
Connector	RJ45
Environmental	
Equipment will meet guaranteed performance specifications under the following conditions:	
Operating room temperature range	0° C to 45° C
Operating relative humidity range	< 95% (non-condensing)
Equipment will operate without damage under the following conditions:	
Temperature range	-10° C to 55° C
Relative humidity range	< 95% (non-condensing)

