

# LG PCS400R Pro:Centric Server Warranty



**Broadcast Products** Welcome to the LG family! We believe that you will be pleased with your new PCS400R Pro:Centric Server. Please read this warranty carefully, it is a "LIMITED WARRANTY" as defined under Federal Law. This warranty gives you specific legal rights, and you may also have other rights that vary from state-to-state within the U.S.A.

## LG's RESPONSIBILITY

- Warranty Term** One year parts and labor from date of purchase or delivery date.
- Parts** New or remanufactured replacements for factory-defective parts may be used. Such replacement parts are warranted for the remaining portion of the original warranty period.
- Warranty Service** Warranty service is provided at LG. Customer pays for shipping charges to LG; LG pays for return shipping charges to return PCS400R Pro:Centric Server to customer. Call **1-888-865-3026** for further information.
- Not Covered** This warranty covers manufacturing defects and does not cover installation, adjustment of customer controls, installation or repair of antenna systems, cable converters or cable company-supplied equipment; it also does not cover damage due to misuse, abuse, negligence, acts of God or other causes beyond the control of LG. Any alteration of the product after manufacture voids this warranty in its entirety.

**THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND LG SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INDIRECT, OR INCIDENTAL DAMAGES OF ANY KIND, INCLUDING LOST REVENUES OR PROFITS IN CONNECTION WITH THIS PRODUCT. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.**

## OWNER'S RESPONSIBILITY

- Effective Warranty Date** Warranty begins on the date of delivery of the PCS400R Pro:Centric Server. **For your convenience, keep the dealer's dated bill of sale or delivery ticket as evidence of the purchase date.**
- Installation Guide** Read the Installation & Setup Guide carefully so that you will understand the operation of the PCS400R Pro:Centric Server and how to adjust the settings.
- Warranty Service** **For warranty service information, call 1-888-865-3026.** Parts and service labor that are LG's responsibility (see above) will be provided without charge. Other service is at the owner's expense. If you have any problem in obtaining satisfactory warranty service, call **1-888-865-3026**. You must provide the model number, serial number and date of purchase or date of original installation.

For Customer Support/Service, please call:

**1-888-865-3026**

[www.lg.com/us/business](http://www.lg.com/us/business)




**LG Pro:Centric®**

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## PCS400R Pro:Centric® Server Installation & Setup Quick Reference | Warranty

The latest product information and documentation is available online at:  
[www.lg.com/us/business](http://www.lg.com/us/business)







**WARNING**  
RISK OF ELECTRIC SHOCK  
DO NOT OPEN



**WARNING:**  
TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER TO QUALIFIED SERVICE PERSONNEL.

 The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

 The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**WARNING:**

TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

L'appareil ne doit pas être exposé à des égouttements d'eau ou des éclaboussures et de plus qu'aucun objet rempli de liquide tel que des vases ne doit être placé sur l'appareil.

**WARNING:**

This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. ***Wash hands after handling.***

**FCC NOTICE (For USA and Canada):**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation of the device. Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**CAUTION:**

Do not attempt to modify this product in any way without written authorization from LG Electronics U.S.A., Inc. Unauthorized modification could void the user's authority to operate this product.

**COMPLIANCE:**

The responsible party for this product's compliance is: LG Electronics U.S.A., Inc. 2000 Millbrook Drive, Lincolnshire, IL 60069, USA • Phone: 1-847-941-8000

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Refer to the extended ***PCS400R Pro:Centric Server Installation & Setup Guide*** for detailed open source software information. Product documentation is available online at: [www.lg.com/us/business](http://www.lg.com/us/business).

 **Warning: The PCS400R is intended for Commercial use only. It is not a Consumer product and should not be installed in residential dwellings.**

To obtain the source code under GPL, LGPL, MPL and other open source licenses, that is contained in this product, please visit <http://opensource.lge.com>. In addition to the source code, all referred license terms, warranty disclaimers and copyright notices are available for download.

LG Electronics will also provide open source code to you on CD-ROM for a charge covering the cost of performing such distribution (such as the cost of media, shipping, and handling) upon email request to [opensource@lge.com](mailto:opensource@lge.com). This offer is valid for a period of three years after our last shipment of this product. This offer is valid to anyone in receipt of this information.

## Dimensions

Height:	1.692 inches (42.977 mm)
Width:	19.0 inches (482.6 mm) (for EIA standard 19-inch rack mount)
Depth:	8.5 inches (215.9 mm)
Weight:	5.65 pounds (2.56 kgms) rack-only weight

## Environmental Operating Conditions

Temperature (Tma):	0° to 40° Celsius 32° to 104° Fahrenheit
Humidity:	95% non-condensing

## Environmental Storage Conditions

Temperature:	-20° to 70° Celsius -4° to 158° Fahrenheit
Humidity:	95% non-condensing

## Electrical


RF Out Connectors (2)*:	75 Ohm, Type 'F'
Frequency:	VHF/UHF 54-865 MHz
RF Output Span:	Up to 8 Contiguous Channels (typically 48–64 MHz)
RF Output Frequency Range:	54 MHz to 865 MHz
Active Output Level at RF Out jacks:	-1 dBm (+47.75 dBmV) Typical
Test Output Level:	-47.75 dBm (+1 dBmV) Typical
Frequency Accuracy:	±5 ppm
Impedance at ASI Out jack:	75 Ohms
Level at ASI Out jack:	800 mv
DC Input:	+19V DC @ 2.2 Amps
Ethernet Connector (Control Port):	10/100/1000BaseT, RJ-45
Ethernet Connector (Feature Port):	100/1000BaseT Full Duplex, RJ-45

## Modulation Specifications

Standard:	ITU-T J.83 Annex B (QAM-B)	
Constellations:	64-QAM, 256-QAM	
Symbol Rate:	64-QAM	5.056941 MBaud
	256-QAM	5.360537 MBaud
Interleaving:	Fixed I = 128, J = 1	
Standard:	EN 300 429 V1.2.1 (DVB-C)	
Constellations:	64-QAM, 256-QAM	
Symbol Rate:	64-QAM / 256-QAM	5.056 MBaud
	64-QAM / 256-QAM	6.111 MBaud
	64-QAM / 256-QAM	6.9 MBaud
Standard:	ABNT NBR 15601:2007 (ISDB-T)	
Parameters:	64-QAM, 7/8 Convolutional Code, 1/32 Guard Interval Ratio, 2K FFT, 13 Segments	
Sample Rate:	8.126984 Ms/s	

\* RF TAP connector reserved for service technician use only.

Note: Design and specifications subject to change without prior notice.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources, such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where it exits from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination in order to avoid injury from tip-over.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
14. Power Sources  
This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your INSTALLATION, consult your product dealer or local power company.
15. Overloading  
Do not overload wall power outlets and extension cords as this can result in a risk of fire or electric shock.
16. Disconnect Device  
The AC mains plug is used as the disconnect device. The disconnect device must remain readily operable.
17. Object and Liquid Entry  
Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product. Do not use liquid cleaners or aerosol cleaners.
18. Outdoor Use  
 **Warning: To prevent fire or shock hazards, do not expose this product to rain or moisture.**
19. Wet Location  
Do not use this product near water or moisture or in an area, such as a basement, that might become flooded. The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
20. Test Equipment  
In some cases, LG has supplied or recommended the use of test equipment and devices for the setup and testing of the equipment. The operation and maintenance of test equipment is described in their associated instruction manuals. Please refer to these manuals for explicit instructions regarding the safe use and handling of the equipment.


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## 21. Damage Requiring Service

Unplug this product from the wall power outlet and refer servicing to qualified service personnel under the following conditions:

- a. If the power-supply cord or plug is damaged.
- b. If liquid has been spilled, or objects have fallen into the product.
- c. If the product has been exposed to rain or water.
- d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- e. If the product has been dropped or the cabinet has been damaged.
- f. If the product exhibits a distinct change in performance.

 **Caution: Refer all servicing to qualified service personnel.**

## 22. Servicing



**Caution: These servicing instructions are for use by qualified service personnel only.**

**To reduce the risk of electrical shock, do not perform any servicing other than that described in the operating instructions unless you are qualified to do so.**

## 23. Replacement Parts

When replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer or that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.

## 24. Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

## 25. Handling Notice



**Caution: Only qualified service personnel should handle and install this unit. A series of screws with lock washers are used to secure the top and bottom covers of the unit. Use caution when handling the unit as the lock washers may have rough edges. Do NOT run your fingers over the top and bottom covers of the unit.**

**Caution: Only qualified service personnel should handle and install this unit. A series of screws with lock washers are used to secure the top and bottom covers of the unit. Use caution when handling the unit as the lock washers may have rough edges. Do NOT run your fingers over the top and bottom covers of the unit.**

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11. If you made any configuration changes in steps 9 or 10, reset the PCS400R: At the Command > prompt, type **reset** and press **Enter**.

The reset process may take several minutes, after which the PCS400R resumes normal operation.

12. Make the appropriate connection to the RF distribution system or IP distribution network depending on the PCS400R output option to be used.

- ASI output: Connect the RF output on the upconverter to the RF distribution center combiner, and balance the RF signal so that the Pro:Centric signal level at the TV(s) is between 0 to +7 dBmV.
- RF output: Connect RF OUT on the PCS400R to the RF distribution center combiner, and balance the RF signal so that the Pro:Centric signal level at the TV(s) is between 0 to +7 dBmV.
- IP output: Connect a CAT5E or better Ethernet cable between the Feature Port on the PCS400R rear panel and the institution's IP distribution network.



**Caution (ASI/RF output only): For proper system performance, the Pro:Centric signal level at the TV input (ANTENNA IN) must be between 0 to +7 dBmV. Note that additional equipment may be required to adjust the signal level.**



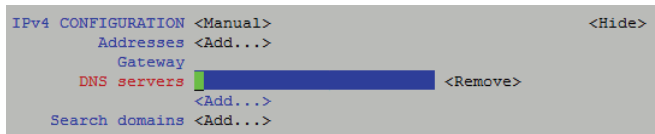
**Caution: When not in use, the RF TAP (0 dBmV) connector must remain terminated with attached terminator accessory.**

The remainder of the system setup—configuration of ASI, RF, or IP output parameters, video playout settings, Pro:Centric Channel Map, etc.—is performed in the Admin Client that is appropriate for your system (based on your selection in step 7 of the procedure above). Refer to either the *Pro:Centric Server Admin Client User Guide* (Java application) or the *Pro:Centric Direct Admin Client User Guide* (HTML application), as applicable, for further information.

**Note:** By default, the server output is enabled for 256-QAM-B modulation (RF output), with the data channel set to 75.

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- Select/highlight **<Add...>** and press **Enter** in the DNS Servers field, and type the primary DNS IP address (in the format xxx.xxx.xxx.xxx). Add a secondary DNS IP address, as required.



- When you are finished with network configuration for the selected port, select/highlight **<OK>** at the bottom right of the Edit Connection screen and press **Enter**.
- Repeat steps (c) to (f), as required, to complete configuration for the second port.
- When you are finished with port configuration, select/highlight **<Quit>** at the bottom right of the port selection screen and press **Enter** to return to the Network Manager menu. To exit the Network Manager and return to the `Command >` prompt, select **Quit** and press **Enter**.

**Note:** Review the configuration data for each port carefully before you confirm the settings. Ensure each of the addresses was entered correctly.

**Note:** You may also edit the host name from the Network Manager menu, if desired. See the extended Installation & Setup Guide for further information. Avoid using spaces or special characters, such as ?, -, etc., in the host name.

- (Optional) Set the time zone and/or the date and time on the PCS400R.

By default, the PCS400R is synchronized with an NTP server and configured for the US Eastern time zone. If the PCS400R is connected to the Internet, the NTP client will periodically update the time setting on the PCS400R. You can set the time zone as required. If the PCS400R is not connected to the Internet, you also have the option to specify date and time data manually.

Use the PCS400R “tz” and/or “time” commands (available from the `Command >` prompt) and follow the system prompts to set the time zone and/or date and time on the PCS400R. Refer to the extended Installation & Setup Guide for further information on these commands.

**Note:** If you changed the time zone, you will be prompted to reset the system. Continue with step 11.

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## PCS400R Rack Installation

(also see pages 11 to 12)

- Wear a properly grounded, antistatic wrist strap to avoid causing electrostatic (ESD) damage to the PCS400R.
- Carefully slide the PCS400R into a standard 19-inch equipment rack.
- When mounting in the rack, make sure to use the appropriate hardware. ALL FOUR MOUNTING SCREWS MUST BE USED.
- This equipment is not designed to support other devices. Do NOT stack other equipment on the top of the PCS400R.
- Rear cabling must be dressed and supported so that the weight of the cabling is not a strain on the PCS400R connectors.
- MOUNTING OF THE EQUIPMENT IN THE RACK SHOULD BE SUCH THAT A HAZARDOUS CONDITION IS NOT ACHIEVED DUE TO UNEVEN MECHANICAL LOADING.

## Rack-mount Considerations

### A. Elevated Operating Ambient

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer. See specifications information in this document.

### B. Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. To ventilate the system normally and avoid overheating, leave at least 1 inch (2.5 cm) on each side (including top and bottom) of the PCS400R. Do NOT stack other equipment on the top of the PCS400R. Also, ensure that the unit’s AC power adapter is never stacked or bundled with other AC power adapters. Each adapter should have adequate ventilation and should be isolated from other heat sources.

### C. Circuit Overloading

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring.

### D. Reliable Earthing

Maintain reliable earthing of rack-mounted equipment. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

### E. Mains Outlet Earthing

The apparatus with Class I construction must be connected to a mains socket outlet with a protective earthing connection.

The LG PCS400R Pro:Centric® server is a stand-alone, remotely-controlled processor and controller for the Pro:Centric system. The server enables you to create and remotely manage portal and application content for LG TVs, using either the Pro:Centric Java or Pro:Centric Direct HTML application.


**Features**

- Supports the Pro:Centric Java or Pro:Centric Direct HTML application
- Three output options: ASI, RF, or IP
  - ASI output: The PCS400R generates one channel for GEM data only or multiplexed GEM/site data.
  - RF output: QAM-B (6 MHz), DVB-C (6 MHz, 7 MHz, or 8 MHz), and ISDB-T (6 MHz) modulations are supported. The PCS400R generates one 256-QAM or 64-QAM RF channel for GEM/site data.
  - IP output: The PCS400R generates two multicast streams for GEM/site data.
- Customer may work with content provider to create Pro:Idiom® encrypted content for RF or IP video playout channels
  - QAM-B and DVB-C RF output: In addition to the GEM/site data channel, the PCS400R generates up to seven contiguous RF channels for video playout. Each of these channels supports either two or three program streams multiplexed on each channel. This capability provides output of up to 21 programs of video content.
  - ISDB-T RF output: In addition to the GEM/site data channel, the PCS400R generates up to one (Java application) or two (HTML application) contiguous RF channels for video playout. Each of these channels supports either two or three program streams multiplexed on each channel. This capability provides output of up to three (Java application) or six (HTML application) programs of video content.
  - IP output: In addition to two multicast streams for GEM/site data, the PCS400R generates 21 multicast data streams for video playout. Each data stream supports one program. This capability provides output of up to 21 programs of video content.
- Provides remote management capability over Ethernet
- Small, lightweight chassis
- 19-inch rack-mountable
- 1U height profile to minimize rack space usage

An Internet browser-based Admin Client graphical user interface (GUI), provided for system integrator (SI) partners and lodging/institution administrators, facilitates support and maintenance of the Pro:Centric system. The Admin Client enables users to remotely manage system backups, output configuration, software updates, portal/information section content, TV configuration settings, etc.

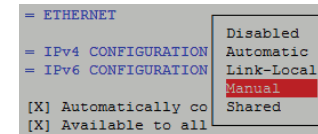
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Once you select a port, the Edit Connection screen for that port will be displayed.

 **Note: Steps (d) and (e) identify all fields that may require modification for the purposes of the Pro:Centric network. In order to avoid a service interruption, do not modify any of the other fields in the Edit Connection screen. In particular, do NOT modify the data in the Profile Name and Device fields.**

 **Note: The Feature Port MUST IP address MUST be on a different subnet than the Control Port IP address. Also, while either IPv4 or IPv6 is supported for the Control Port, the Feature Port must be configured on an IPv4 network.**

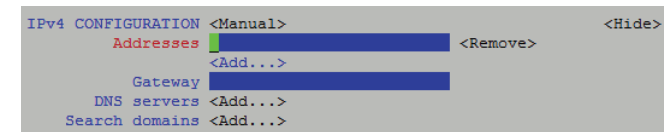
- d) Select/highlight the appropriate IP Configuration field (IPv4 or IPv6—see also note above) and press **Enter**. Then, select **Manual** from the drop-down list of options.



- e) Select/highlight **<Show>** at the right of the IP Configuration field and press **Enter** to view the expanded configuration fields. Then:

- Select/highlight **<Add...>** and press **Enter** in the Addresses field, and type the appropriate IP address in the format xxx.xxx.xxx.xxx/xx, where the last two digits (after the forward slash) identify the network mask bits for the IP address.

Also, type the gateway IP address (in the format xxx.xxx.xxx.xxx) in the Gateway field.



**Note:** If you do not specify the network mask bits in the port's IP address, as indicated above, the system will not create a local route over the network interface (unless the interface is used as the system's default route).

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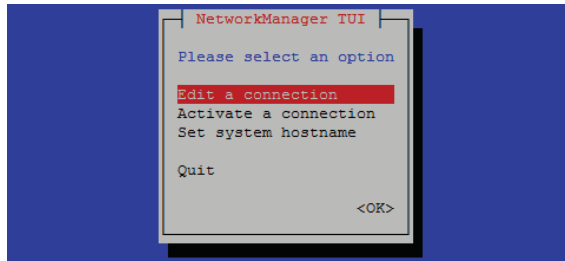
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**Note:** If the Control Port network is configured for DHCP but the Control Port IP address is not displayed in the System Information display (see note above), refer to “Network Setup” troubleshooting information in the extended Installation & Setup Guide.

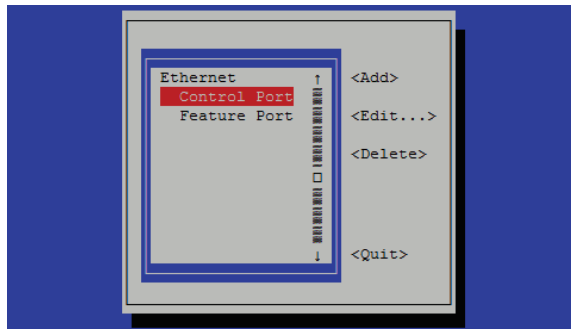
- 9. (Optional) Set a static IP address for the Control Port and/or Feature Port.

**Note:** The TCP/IP configuration described in this step is performed in the CentOS Network Manager TUI (text-based user interface). This step specifies the parameters that must be configured; however, for more detailed information and additional screen samples, refer the the extended Installation & Setup Guide.

- a) At the `Command >` prompt, type **setip** and press **Enter**.  
The system will display the Network Manager menu, for example:



- b) Select/highlight **Edit a connection** and press **Enter**.
- c) In the next screen, select/highlight the port you wish to configure and press **Enter**.



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Check the following items before you begin PCS400R installation and setup procedures.

**Note:** Once the PCS400R hardware and software is installed and the initial setup completed, output parameters are configured in the appropriate Pro:Centric Admin Client. Along with this document, it is recommended that you have readily available a copy of either the **Pro:Centric Server Admin Client User Guide** (for the Java application) or the **Pro:Centric Direct Admin Client User Guide** (for the HTML application), as applicable.

**PCS400R**

- Unpack the PCS400R Pro:Centric server unit and all accessories.  

<b>PCS400R Accessories:</b>	• AC Power Cord and Adapter
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- Select the location for mounting the PCS400R. Ensure adequate ventilation is available.
- Obtain the necessary attachment hardware to mount the PCS400R chassis in its targeted location.
- Plan and install the necessary cabling and network (Ethernet) and AC power access for the PCS400R. You also will need the following to connect a PC directly to the PCS400R for system setup purposes: FTDI TTL-USB cable (P/N TTL-232R-5V-AJ).

**Video Channel Assignments for RF Output (QAM-B)**

Each input program is limited to one-half or one-third of the output channel bitrates (Mbps), which in turn are dependent on the modulation format. 256-QAM modulation supports up to 38.8 Mbps per channel, and 64-QAM modulation supports up to 26.97 Mbps per channel.

- Create a channel assignment plan for the installation site, or modify an existing plan to incorporate the RF output of the PCS400R. Ensure that up to eight contiguous CATV broadcast channels are allocated for the PCS400R RF output. The PCS400R uses a 256-QAM or 64-QAM modulation format, thereby occupying approximately 48 MHz of frequency spectrum.  

The RF start channel is user-assigned during system setup (in the Admin Client), and the remaining channels (up to seven) are then automatically assigned per EIA-542 STD CATV frequency allocation standards. For example, if the RF start channel assignment is channel 2, the seven remaining channels will be 3, 4, 5, 6, 95, 96, and 97. Refer to EIA-542 STD CATV frequency allocation tables for further information.

The highest available RF channel number for the PCS400R is 135. Thus, to allocate all eight channels available for PCS400R RF output, the RF start channel must be set no higher than 128.
- Find a location on the frequency spectrum that is free of existing noise.

**Video Channel Assignments for RF Output (DVB-C)**

Each input program is limited to one-half or one-third of the output channel bitrates (Mbps), which in turn are dependent on the modulation format. 256-QAM modulation supports up to 37.27 Mbps (6 MHz bandwidth), 45.05 Mbps (7 MHz bandwidth), or 50.87 Mbps (8 MHz bandwidth) per channel, and 64-QAM modulation supports up to 27.95 Mbps (6 MHz bandwidth), 33.79 Mbps (7 MHz bandwidth), or 38.15 Mbps (8 MHz bandwidth) per channel.

- Create a channel assignment plan for the installation site, or modify an existing plan to incorporate the RF output of the PCS400R. Ensure that up to eight contiguous CATV channel frequencies are allocated for the PCS400R RF output. The PCS400R uses a 256-QAM or 64-QAM modulation format, thereby occupying approximately 48 MHz, 56 MHz, or 64 MHz (depending on channel bandwidth) of frequency spectrum.

The RF start channel frequency is user-assigned, in KHz, during system setup (in the Admin Client), and the remaining channel frequencies (up to seven) are then automatically assigned in accordance with the specified bandwidth. For example, if the RF start channel frequency assignment is 57000 KHz with a 7 MHz bandwidth, the seven remaining channel frequencies will be 64000 KHz, 71000 KHz, 78000 KHz, 85000 KHz, 92000 KHz, 99000 KHz, and 106000 KHz.

The highest available RF channel frequency for the PCS400R is 861000 KHz.

- Find a location on the frequency spectrum that is free of existing noise.

**Video Channel Assignments for RF Output (ISDB-T)**

Each input program is limited to one-half or one-third of the output channel bitrates (Mbps). ISDB-T modulation supports up to 23.23 Mbps (6 MHz bandwidth) per channel.

- Create a channel assignment plan for the installation site, or modify an existing plan to incorporate the RF output of the PCS400R. Ensure that up to two (Java application) or three (HTML application) contiguous CATV broadcast channels are allocated for the PCS400R RF output. The PCS400R occupies up to 18 MHz of frequency spectrum.

The RF start channel is user-assigned during system setup (in the Admin Client), and the remaining channels (up to one for the Java application or two for the HTML application) are then automatically assigned in accordance with the 6 MHz bandwidth. For example, if the RF start channel assignment is channel 7 on a server configured for the HTML application, the two remaining channels will be 8 and 9.

The data channel number must be between 7 and 69. Thus, for example, to allocate all three channels available for PCS400R RF output with the HTML application, the RF start channel must be set no higher than 67.

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The system will display a prompt for you to select the Pro:Centric portal application you will be using:

You must select a portal application to continue.

Available portal applications are:

```
1 pca (Java)
2 pcd (HTML)
```

Enter 1 or 2 to select a portal application:

7. Either:

- Type **1** and press **Enter** to select the Java application.
- Type **2** and press **Enter** to select the HTML application.

**Note:** Select the appropriate application based on the purchase order associated with this server. The software license specifies the Java or HTML application, and the application type must be set accordingly in this step.

Once you make your selection, the server will display confirmation before initiating a reboot, for example:

```
You selected the pcd (HTML) application
```

```
System will now reboot to run the selected application
```

8. When the reboot is complete, you should see a new login prompt. Log back in to the server (see step 6).

Once you are logged in, you will see a `Command >` prompt.

The next step describes how to set static IP addresses for the Control Port and/or Feature Port, if desired/applicable. The Control Port is used for remote management/communication purposes, while the Feature Port is designated for PCS400R IP output (not applicable if your system is using RF or ASI output). By default, both ports are configured for DHCP.

**Note:** You can press **Enter** at any PCS400R command prompt to view current menu, if desired.

**Note:** To view the server's current configuration settings, type **info** and press **Enter** at the `Command >` prompt. The System Information display Ctrl IP field will show the IP address that has been assigned to the Control Port (if the network is configured for DHCP) and the output configuration. See the extended Installation & Setup Guide for further information.

(Continued on next page)



### Setting Up the Pro:Centric Network

This section describes how to complete the initial network configuration for the PCS400R. See also typical setup and VPN network connections diagrams above.

1. If your system is using ASI output, make the following connections; otherwise, go to step 2.
  - Connect a 75 ohm BNC-to-BNC coaxial cable between ASI OUT on the PCS400R and ASI IN on the modulator.
  - Connect an RF coaxial cable between IF OUT on the modulator and IF IN on the upconverter.

 **Note: The BNC cable must be less than 30 feet (9.2 meters) in length.**

2. To enable remote management, connect one end of a CAT5 RJ-45 Ethernet cable to the Control Port on the PCS400R rear panel, and connect the other end of the cable to the institution's network.
3. Connect the PCS400R power supply to the POWER connector on the PCS400R rear panel. Then, plug the AC power cord into a powered AC line receptacle. When power is applied, the PWR (Power) LED on the PCS400R front panel will initially flash red and then turn green (blinking during boot-up).
 

The boot-up process for the PCS400R may take several minutes. When boot-up is complete, the PWR LED on the PCS400R front panel will light continuously green.
4. Once the PWR LED is lit continuously (no longer blinking), use the FTDI TTL-232R-5V-AJ cable to connect a PC to the Service Port on the PCS400R rear panel.
5. Using HyperTerminal or an equivalent terminal emulation program on the PC, configure the serial port as follows: Bits per second/ baud = 115200; Data bits = 8; Parity = None; Stop bits = 1; Flow Control = None

**Note:** To avoid configuration errors, make sure the keyboard settings on the terminal emulator assign the backspace character to Ctrl + H (ASCII 8).

Once the connection is established, you should see a login prompt. (If the login prompt is not automatically displayed, press **Enter** to refresh the screen.)

6. At the `login as:` prompt, type **admin** and press **Enter**. Then, at the `password:` prompt, type **Password4Partners** (case-sensitive) and press **Enter**.

 **Note: After the initial system setup is complete, it is highly recommended that you change the admin user password from its default value. Refer to the extended Installation & Setup Guide for further information.**

(Continued on next page)

**Note:** The Pro:Centric server cannot generate channels 13 and 14 simultaneously. If you intend to configure more than one channel, set the data channel number from 7 to 12 (two channels) or 7 to 11 (three channels) or from 14 to 68.

— Find a location on the frequency spectrum that is free of existing noise.

### Video Channel Assignments for IP Output

Each IP stream is limited to 19.4 Mbps.

— The PCS400R outputs IPv4 multicast streams. Ensure the institution's IP network and room receivers support IPv4 multicast and that the network is capable of selectively routing multicast traffic. Refer to vendor equipment documentation for further information.

— Create a channel assignment plan for the installation site, or modify an existing plan to incorporate the IP output of the PCS400R. Ensure that up to 23 unused and unreserved IPv4 multicast addresses, within the designated range 224.0.0.0 to 239.255.255.255, are allocated for the PCS400R IP output.

The IP start channel is user-assigned during system setup in the Admin Client, and the remaining channel assignments are then automatically incremented. For example, if the IP start channel assignment is 227.0.0.40, the remaining channels will be 227.0.0.41, 227.0.0.42, etc. Since the first two streams are reserved for site data, the first video content channel in this scenario will be 227.0.0.42.

— Reserve one User Datagram Protocol (UDP) port for the multicast data streams. You can use the system default (1234) or another unassigned port number, for example, 50000, 50001, etc. The port must avoid conflict with other protocols in use.

**Note:** Refer to the IANA IPv4 Multicast Address Space Registry and/or the IANA Service Name and Transport Protocol Port Number Registry for further IP address/port information as required.

### ASI Output (Optional)

ASI output supports up to 19.4 Mbps each for GEM and site data (total of 38.8 Mbps).

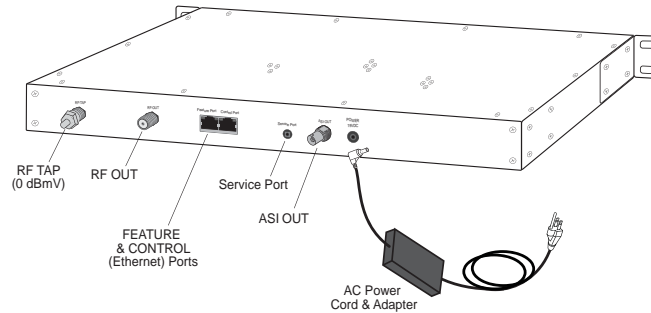
— If the system is using ASI output, install the modulator and upconverter that will receive the ASI output signal from the PCS400R. Refer to the manufacturer's documentation.

Refer to the *PCS400R Pro:Centric Server Installation & Setup Guide* for further installation and configuration information.

Product documentation is available online at: [www.lg.com/us/business](http://www.lg.com/us/business).

Note: Design and specifications subject to change without prior notice.

## PCS400R Rear View



### Disconnect Device

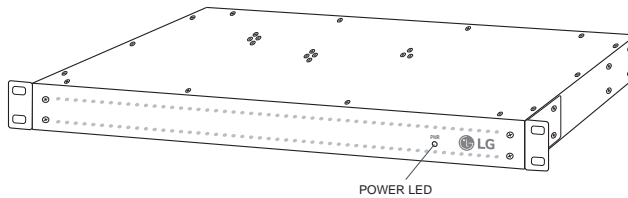
The AC mains plug is used as the disconnect device. The disconnect device must remain readily operable.



### RF TAP Connector

Reserved for service technician use only. When not in use, this connector must remain terminated with attached terminator accessory.

## PCS400R Front View



### Ventilation

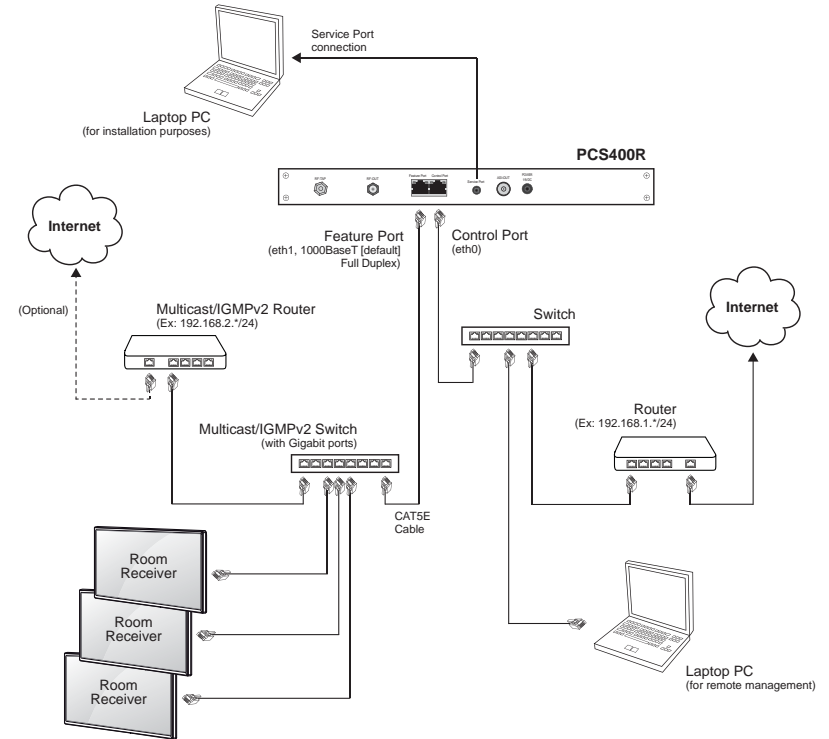
Air flow must not be obstructed. To ventilate the system normally and avoid overheating, leave at least 1 inch (2.5 cm) on each side (including top and bottom) of the PCS400R. Do NOT stack other equipment on the top of the PCS400R.



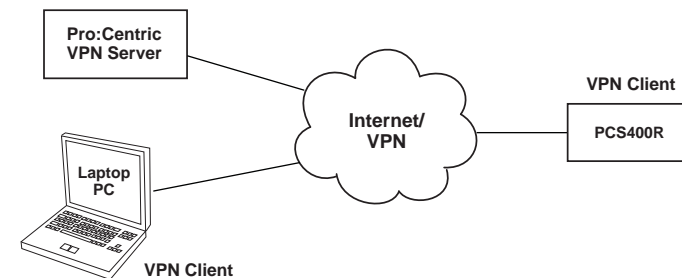
### Screws with Lock Washers

Only qualified service personnel should handle and install the PCS400R. A series of screws with lock washers are used to secure the top and bottom covers of the PCS400R. Use caution when handling the unit as the lock washers may have rough edges. Do NOT run your fingers over the top and bottom covers of the unit.

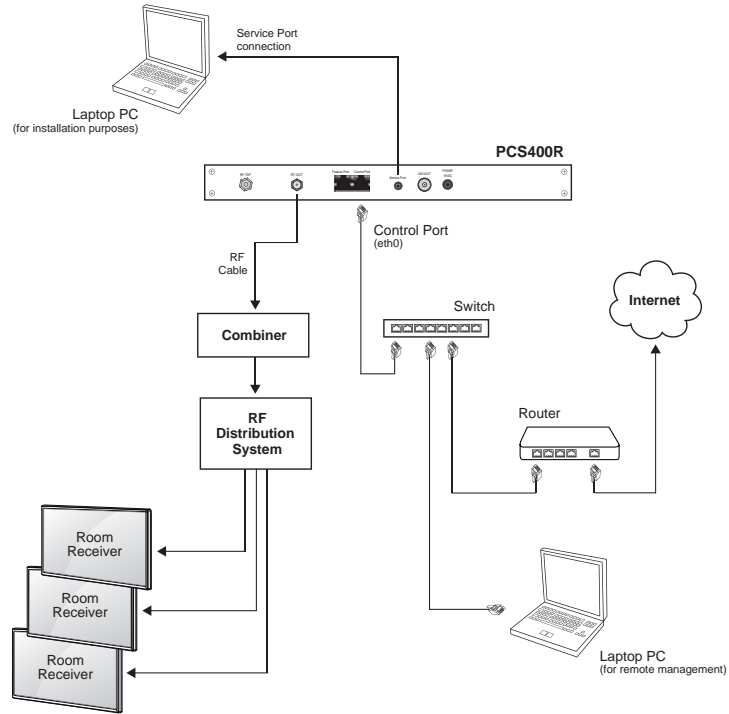
## Typical Setup Diagram for PCS400R with IP Output



## VPN Network Connections Overview

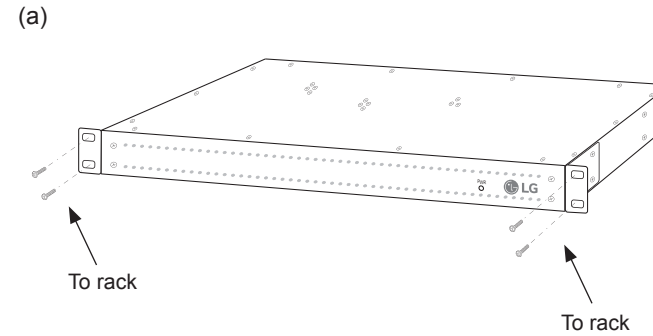


Typical Setup Diagram for PCS400R with RF Output



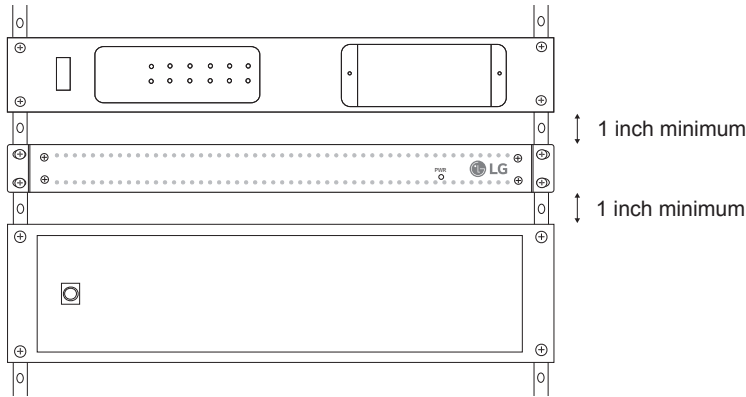
Typical Rack Installation

1. To avoid causing electrostatic (ESD) damage to the PCS400R during installation, attach an antistatic wrist strap to a properly grounded rack/object and put it on.
2. (Optional) As shipped, the PCS400R mounting brackets are attached flush with the front of the unit (see diagram a). If desired, the mounting brackets may be detached from the unit and reattached, for example, so that they are flush with the rear of the unit (see diagram b). If you wish to change the location/orientation of the mounting brackets, carefully remove each of the four (M4 x 10 mm) screws and attendant washers (one flat and one lock washer per screw) holding each bracket in place. Then, use the same screws and washers to reattach the mounting brackets in the desired location.
3. Carefully slide the chassis into a standard 19-inch equipment rack.
4. Use all four mounting screws to secure the chassis to the rack.



Use flat washer and lock washer with each M4 x 10 mm mounting bracket screw.

Front View of Rack Cabinet



## Rack-mount Considerations

### A. Elevated Operating Ambient

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer (see Specifications information in this document).

### B. Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. To ventilate the system normally and avoid overheating, leave at least 1 inch (2.5 cm) on each side (including top and bottom) of the PCS400R. Do NOT stack other equipment on the top of the PCS400R. Also, ensure that the unit's AC power adapter is never stacked or bundled with other AC power adapters. Each adapter should have adequate ventilation and should be isolated from other heat sources.

### C. Circuit Overloading

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring.

### D. Reliable Earthing

Maintain reliable earthing of rack-mounted equipment. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

### E. Mains Outlet Earthing

The apparatus with Class I construction must be connected to a mains socket outlet with a protective earthing connection.

Refer to the following diagrams, and complete the system installation as described on pages 16 to 21.

**Caution:** Do NOT make system connections until instructed to do so during the system installation procedure. In some instances, configuration steps must be performed before physical connections are made.

## Typical Setup Diagram for PCS400R with ASI Output

