



CPS 4800 Power Supply

for the HLP 4800 Platform

User's Guide

VERSION 1.0

Disclaimer

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Compliance and Approval

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, Subpart B of the Federal Communications Commission (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. It may cause harmful interference to radio communications if it is not installed and used in accordance with the instructions in this manual. Operation of this equipment in a residential area is likely to cause harmful interference. If this occurs, the user will be required to correct the interference at his or her 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.

Connections between the Harmonic equipment and other equipment must be made in a manner that is consistent with maintaining compliance with FCC radio frequency emission limits. Modifications to this equipment not expressly approved by Harmonic may void the authority granted to the user by the FCC to operate this equipment.

WEEE/RoHS Compliance Policy

Harmonic Inc. intends to comply fully with the European Union's Directive 2002/96/EC as amended by Directive 2003/108/EC, on Waste Electrical and Electronic Equipment, also known as "WEEE," and Directive 2002/95/EC, as amended, on the Restriction of use of Hazardous Substances, also known as "RoHS."

Harmonic will ensure that product which cannot be reused will be recycled in compliance with the WEEE Directive. To that end, users are advised that (1) Harmonic equipment is not to be discarded in household or office garbage, (2) Harmonic Inc. will pay the freight for shipment of equipment to be disposed of if it is returned to Harmonic, (3) customers should call the normal RMA telephone numbers to arrange for such shipment, and (4) for additional and updated information on this process customers may consult the Harmonic website: http://harmonicinc.com/ah_weee_recycle.cfm.

Harmonic will ensure that its products will be either reused or recycled in compliance with the WEEE Directive. For the latest information concerning Harmonic's WEEE/RoHS Compliance Policy and its Recycling and Take-Back process, please visit our web site.



产品中的有毒有害物质或元素的名称及含量表 Names and Contents of the Toxic and Hazardous Substances or Elements in the Products if the Part is Present

该表显示哈雷公司产品中可能含有的有毒有害物质元配件的信息，除了来源于元配件供应商的物料成分资料，亦来自其它相关的机构与资料。哈雷产品不一定使用这些元配件。

This table shows those components where hazardous substances may be found in Harmonic products based on, among other things, material content information provided by third party suppliers. These components may or may not be part of the product.

除非特殊注明，哈雷公司产品的环保使用期限 均为 20 年。该环保使用期限的有效条件为：必须遵循该产品使用手册的规定，对该产品进行使用或存储。

The Environmental Protective Use Period for Harmonic products is 20 years unless displayed otherwise on the product. The EPUP period is valid only when the products are operated or stored as per the conditions specified in the product manual.

部件名称 (Part name)	有毒有害物质或元素 (Hazardous Substance)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CrVI)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板 (Printed Circuit Assemblies)	X	O	O	O	O	O
机械组件 (Mechanical Subassemblies)	X	O	O	O	O	O
光学组件 (Optical Subassemblies)	X	O	O	O	O	O
电源 (Power Supplies)	X	O	O	O	O	O
缆线 / 线束 (Cables, harnesses)	X	O	O	O	O	O
屏幕 / 显示器 (Screens, Monitors)	X	O	O	O	O	O
金属零件 (Metal Parts)	O	O	O	O	O	O
塑料 / 发泡材料 (Plastics, foams)	O	O	O	O	O	O
电池 (Batteries)	X	O	O	O	O	O

O: 表示在该部件的所有均质材料中，此类有毒有害物质的含量均小于 SJ/T11363-2006 标准所规定的限量。

O: Indicates the content of the toxic and hazardous substances at the homogeneous material level of the parts is below the limit defined in SJ/T11363 2006 standard.

X: 表示至少在该部件的某一均质材料中，此类有毒有害物质的含量超出 SJ/T11363-2006 标准规定的限量。

X: Indicates that the content of the toxic and hazardous substances in at least one of the homogeneous materials of the parts is above the limit defined in SJ/T11363 2006 standard.



Power Supply Cord Notice

CAUTION – This unit has more than one power supply connection; all connections must be removed to remove all power from the unit.

ATTENTION – Cette unité est équipée de plusieurs raccordements d'alimentation. Pour supprimer tout courant électrique de l'unité, tous les cordons d'alimentation doivent être débranchés.

WARNUNG – Diese Einheit verfügt über mehr als einen Stromanschluß; um Strom gänzlich von der Einheit fernzuhalten, müssen alle Stromzufuhren abgetrennt sein.

CAUTION – The power supply cord is used as the main disconnect device, ensure that the socket outlet is located/installed near the equipment and is easily accessible.

ACHTUNG – Zur sicheren Trennung des Gerätes vom Netz ist der Netzstecker zu ziehen. Vergewissern Sie sich, daß die Steckdose leicht zugänglich ist.

ATTENTION – Le cordon d'alimentation est utilisé comme interrupteur général. La prise decourant doit être située ou installée à proximité du matériel et être facile d'accès.



AC Version

WARNING – This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).

ATTENTION – Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 120 V alt., 15 A U.S. maximum (240 V alt., 10 A international) est utilisé sur les conducteurs de phase (conducteurs de charge).

WARNUNG – Dieses Produkt ist darauf angewiesen, daß im Gebäude ein Kurzschluß- bzw. Überstromschutz installiert ist. Stellen Sie sicher, daß eine Sicherung oder ein Unterbrecher von nicht mehr als 240 V Wechselstrom, 10 A (bzw. in den USA 120 V Wechselstrom, 15 A) an den Phasenleitern (allen stromführenden Leitern) verwendet wird.



DC Version

WARNING – This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 15A is used on the phase conductors (all current-carrying conductors).

ATTENTION – Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 15A est utilisé sur les conducteurs de phase (conducteurs de charge).

WARNUNG – Dieses Produkt ist darauf angewiesen, daß im Gebäude ein Kurzschluß- bzw. Überstromschutz installiert ist. Stellen Sie sicher, daß eine Sicherung oder ein Unterbrecher von nicht mehr 15A an den Phasenleitern (allen stromführenden Leitern) verwendet wird.

Standards

The following tables list regulatory standards:

North America

Standards
EMI: FCC Part 15, Subpart B, Class A, ICES-003, Issue 3, Class A
Safety: UL 60950-1, CSA C22.2 No 60950-1, 21 CFR 1040 (CDRH)

Europe

Standards
EMI/EMC: EN55022, EN55024, EN61000-3-2, EN61000-3-3
Safety: EN 60950-1, EN 60825-1

Japan

Standards
EMI: VCCI V-3 / 2007.04

Australia and New Zealand

Standards
EMI: AS/NZS-CISPR 22: 2005

Documentation Conventions

This manual uses some special symbols and fonts to call your attention to important information. The following symbols appear throughout this manual:



DANGER: The Danger symbol calls your attention to information that, if ignored, can cause physical harm to you.



CAUTION: The Caution symbol calls your attention to information that, if ignored, can adversely affect the performance of your Harmonic product, or that can make a procedure needlessly difficult.



LASER DANGER: The Laser symbol and the Danger alert call your attention to information about the lasers in this product that, if ignored, can cause physical harm to you.



NOTE: The Note symbol calls your attention to additional information that you will benefit from heeding. It may be used to call attention to an especially important piece of information you need, or it may provide additional information that applies in only some carefully delineated circumstances.



TIP: The Tip symbol calls your attention to parenthetical information that is not necessary for performing a given procedure, but which, if followed, might make the procedure or its subsequent steps easier, smoother, or more efficient.

In addition to these symbols, this manual uses the following text conventions:

- `Data Entry`: indicates text you enter at the keyboard.
- `User Interface`: indicates a button to click, a menu item to select, or a key or key sequence to press.
- `Screen Output`: shows console output or other text that is displayed to you on a computer screen.
- **Bold**: indicates the definition of a new term.
- *Italics*: used for emphasis, cross-references, and hyperlinked cross-references in online documents.

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1.1 Overview of this Manual

This manual is the user's guide to the CPS 4800 Power Supply. Please read the entire document before beginning installation.

- Chapter 1, *Preface* (this chapter) gives an overview of the book.
- Chapter 2, *Overview*, gives an overview of the CPS 4800 power supply.
- Chapter 3, *Installing The CPS 4800*, describes the installation procedure.
- Chapter 4, *Front Panel Interface*, describes the user interface.
- Chapter 5, *Maintenance and Troubleshooting*, has information about maintenance, and how to contact Harmonic, Inc.
- Appendix A, *Technical Specifications*, provides technical specifications.

The CPS 4800 Power Supply is a highly efficient compact plug-in module designed for use in Harmonic's HLP 4800 equipment platform.

To provide redundancy and enhance system reliability, two CPS 4800 modules may be installed in one HLP 4800 platform. The second CPS 4800 can be "hot plugged" into a running system. The HLP 4800 chassis accommodates ten application modules in 3 RU height.

2.1 AC and DC Power Supplies

The power supply board of the CPS 4800 drives all modules in the HLP 4800 platform using a common DC power bus. The CPS 4800-AC and CPS 4800-DC provide the same functions. However, the CPS 4800-AC requires AC power input, while the CPS 4800-DC uses DC power input.

2.1.1 CPS 4800-AC power supply

The CPS 4800-AC transforms 100–240 VAC input to +24 VDC. It can provide primary powering for a single HLP 4800 platform fully loaded with modules. The CPS 4800-AC can also provide redundant powering to the HLP 4800 platform.

Two CPS 4800-AC modules can be mounted in one HLP 4800 platform to provide redundancy at the module level.

2.1.2 CPS 4800-DC power supply

The CPS 4800-DC transforms –48 VDC input to +24 VDC. It can provide primary powering for a single HLP 4800 platform fully loaded with modules, such as the PWRLink II series DFB transmitter modules. The CPS 4800-DC can provide two levels of redundant powering to the HLP 4800 platform:

- Two independent –48 VDC power sources can be connected to the CPS 4800-DC, for redundancy at the –48 VDC supply level. Each CPS 4800-DC accepts two –48 VDC source inputs (A or B).
- Two CPS 4800 modules can be mounted in one HLP 4800 platform to provide redundancy at the module level.

For further information on providing power redundancy, see [3.5 Power Redundancy Options](#) on page 13.

2.2 Diagrams and Features

Front and rear panels of the CPS 4800-AC panels are shown in [Figure 2-1](#) on page 10.

Front and rear panels of the CPS 4800-DC are shown in [Figure 2-2](#) on page 10.

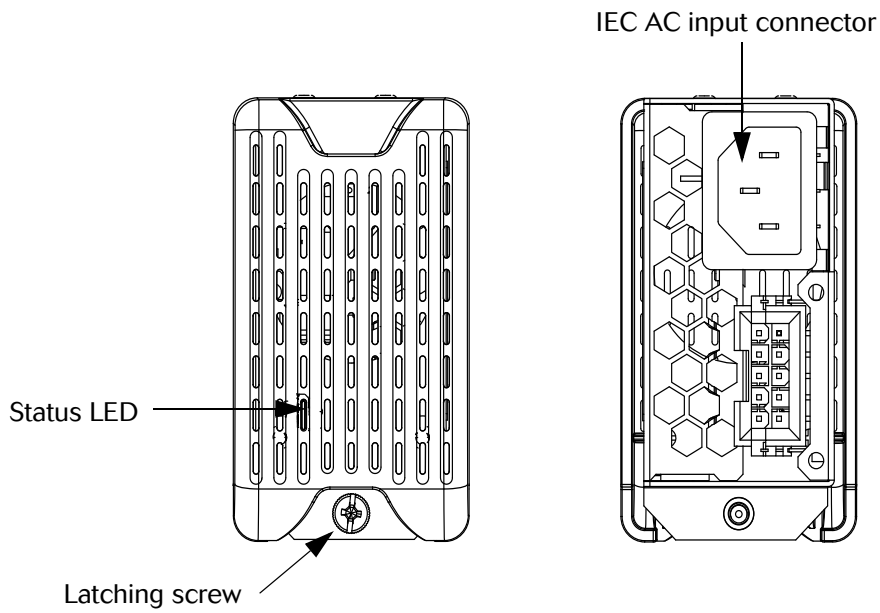


Figure 2-1: CPS 4800-AC front and back panels

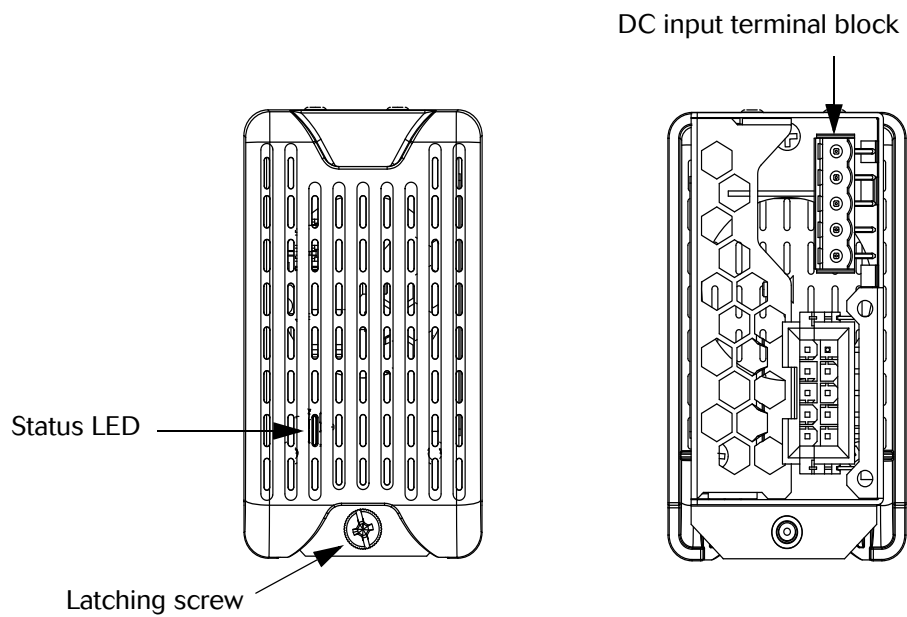


Figure 2-2: CPS 4800-DC front and back panels

The following sections provide the information necessary to install the CPS 4800. Please read all instructions before beginning installation.

This chapter describes:

- How to receive and inspect the CPS 4800
- How to mount the module in the HLP 4800 platform
- How to connect the power source

After you have successfully installed the CPS 4800 and the HNC 4800 controller, you can access the user interfaces, as described in the *HNC 4800 Users Guide*.



CAUTION: To protect yourself from potential injury and to protect the equipment from further damage, do not perform any operational tests if the equipment appears to be damaged.

3.1 Tools and Accessories

The following tools and accessories are provided with the CPS 4800:

- 1 DC power terminal block (DC power model only)
- 1 AC power cord (AC power model only)

The following tools are necessary for installation and are not included with the CPS 4800:

- # 2 Phillips screwdriver
- #1 Flat-bladed screwdriver

3.2 Receiving and Inspecting

As you unpack your unit, inspect the shipping container and equipment for damage. Save the shipping material for future use. If the container or the equipment is damaged, notify both the freight carrier and Harmonic. See [Maintenance and Troubleshooting](#) on page 16 for information about contacting Harmonic.

CAUTION: Before removing equipment from its antistatic bag, touch a ground point for several seconds. For a suitable ground point, you can use an unpainted part of the chassis of a grounded piece of equipment.

3.3 Mounting the CPS 4800

Insert the CPS 4800 module into one of the two dedicated power supply slots in the HLP 4800 platform shown in [Figure 3-1: HLP 4800 platform](#) on page 12.

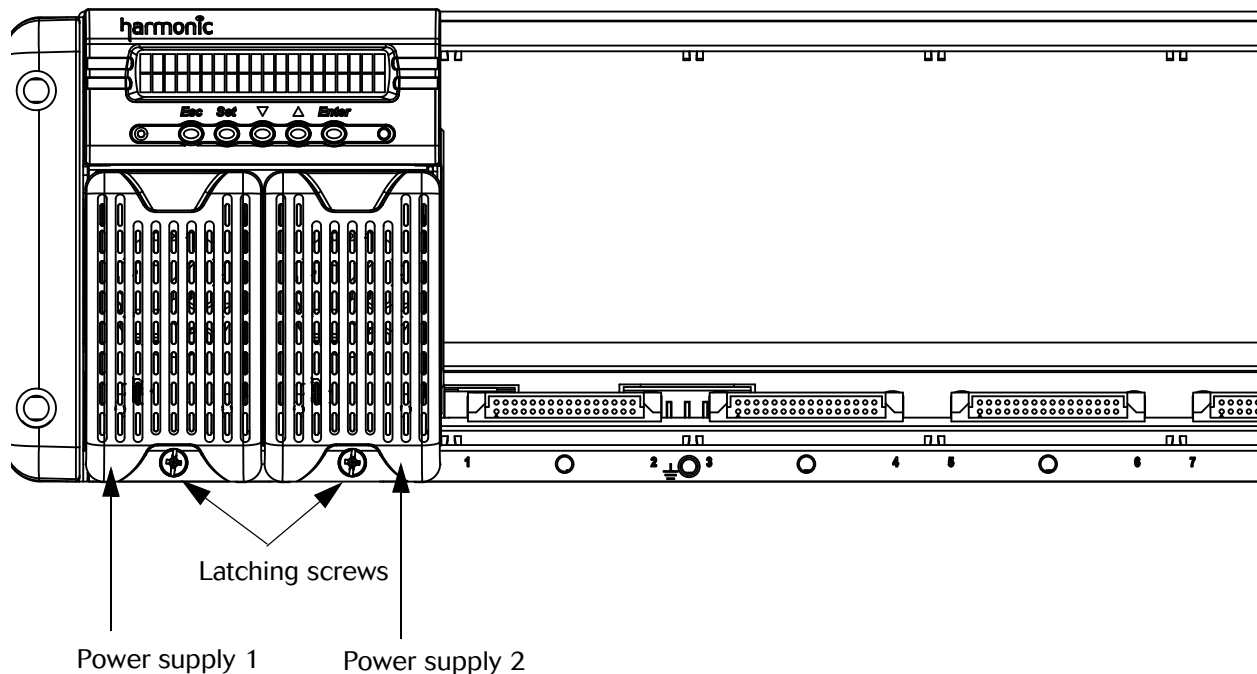


Figure 3-1: HLP 4800 platform

Once a module is seated, lock the unit into position by turning the module latching screw clockwise until tight. See [Figure 3-1](#) on page 12.

3.4 Connecting the Power Source

After you have installed the CPS 4800 in the platform, connect electrical power to the module as described below. For information on providing redundant power, see [3.5 Power Redundancy Options](#) on page 13.

3.4.1 CPS 4800-AC – AC Power Input

The CPS 4800-AC accepts a universal AC power source of 100–240 VAC at 50/60 Hz.

To connect AC input power to the CPS 4800:

Connect the power cord (included with the unit) to the AC input socket on the rear of the CPS 4800-AC, shown in [Figure 2-1: CPS 4800-AC front and back panels](#) on page 10.

3.4.2 CPS 4800-DC – DC Power Input

The CPS 4800-DC accepts one or two DC power sources of –48 VDC (–36 to –72 VDC). The power input terminals are located on the rear panel of the CPS 4800-DC, as shown in [Figure 2-2: CPS 4800-DC front and back panels](#) on page 10. To connect DC input power to the CPS 4800-DC:

1. Connect the primary –48 VDC power source to the –48V A terminal and return terminal (+48VA) on the DC terminal block on the rear of the CPS 4800-DC module, shown in [Figure 3-2](#) on page 13

- If redundancy is needed, connect the secondary -48 VDC power source to the -48 V B terminal and return terminal (+48 VB). See the DC power plug (part number 406-0000636) in [Figure 3-2](#) on page 13.

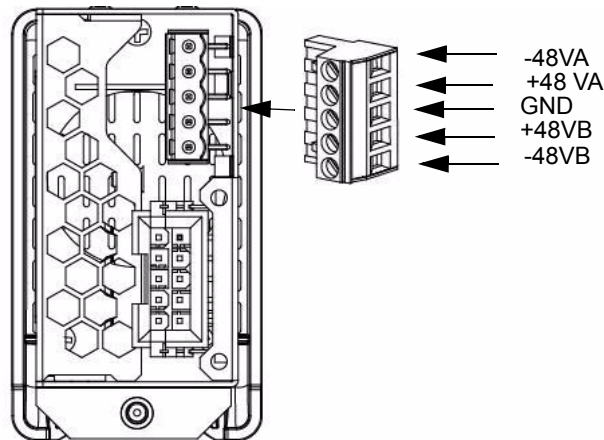


Figure 3-2: DC power plug

- Connect the GND terminal to the earth ground of the power sources.
- Connect one or both of the HLP 4800 chassis ground terminals to protective earth ground for electrical safety, as described in the *HLP 4800 Users Guide*.
- Connect the terminal block to the receptacle on the rear of the CPS 4800-DC power supply.

3.5 Power Redundancy Options

There are three ways you can provide redundant (backup) powering to the HLP 4800 platform:

- CPS 4800-DC with two power inputs
- Two CPS 4800 modules
- External power supply

3.5.1 CPS 4800-DC with two power inputs

For redundancy at the -48 VDC supply level, you can connect two independent -48 VDC power sources to the CPS 4800-DC. Each CPS 4800-DC accepts two -48 VDC source inputs (A and B). The module draws power from the source that supplies the larger (more negative) voltage. The DC power inputs are internally diode or'd, providing automatic sourcing of power from either source A or source B. The oring diodes also protect against accidental input reverse bias.

3.5.2 Multiple CPS 4800 modules

For power supply redundancy at the module level, you can mount two CPS 4800 modules in the HLP 4800 platform. In this arrangement, the power supplies operate in an auto-parallel mode. You do not have to shut off the system to add or remove CPS 4800 modules. [Figure 3-1](#) on page 12 shows the CPS 4800 in this redundant configuration. In this configuration, if power supply 1 fails, the main platform controller and modules continue to operate, drawing power from the redundantly powered platform bus through power supply 2.

3.5.3 External power supply

The HLP 4800 can also be powered by an external +24 VDC power supply. For further information, see the *HLP 4800 Installation Manual*.

3.6 Removing the CPS 4800

To remove the CPS 4800 power supply from the HLP4800 chassis

1. Disconnect all power feed cables from their source
2. Disconnect the power feed cable from the power supply
3. Unscrew the latching mechanism. Turn the latching screw counter-clockwise to disengage it.
4. Grasp the power supply bezel at the top and bottom to gently pull out the power supply

4.1 CPS 4800 Front Panel LED Indicator

The CPS 4800 front panel includes one LED, as shown in Figure 2-1 and Figure 2-2 on page 10.

The Status LED illuminates red if an alarm condition exists within the power supply, and for a short period during power up. The Status LED illuminates green if no alarm condition exists and the CPS 4800 is operating normally.

Maintenance and Troubleshooting

This chapter has information about maintenance and troubleshooting. It also has information about how to contact Harmonic, Inc.

5.1 Maintenance

There are no user-serviceable parts in the CPS 4800.

5.2 Solving Problems

Should a problem occur, check the following.

Symptom	Suggestions
Power LED on the front panel does not illuminate	Verify that the power supply source is connected properly to the power supply. - The DC power supply input is rated from -36V to -72V - The AC power supply is rated from 100V to 240V 50/60Hz. If that does not correct the problem, contact Harmonic Support
Power LED on the front panel is red	A malfunction has occurred to the power supply. Contact Harmonic, Inc. (See 5.3 Contacting Harmonic Support on page 16.)

5.3 Contacting Harmonic Support

The Harmonic Customer and Technical Support groups are available to help you with any questions or problems you may have regarding Harmonic products.

For assistance from within the U.S. and Canada, call toll free:

1.888.673.4896

For assistance from outside the U.S. and Canada, call:

1.408.490.6477

The fax number is 408.490.6770.

The email address is techhelp@harmonicinc.com.

The corporate address for Harmonic Inc. is:

Harmonic Inc.
 549 Baltic Way
 Sunnyvale, CA 94089, U.S.A.
 Attn: Customer Support

The corporate telephone numbers for Harmonic Inc. are:

Tel. 1.800.788.1330 (from the U.S. and Canada)
Tel. +1.408.542.2500 (outside the U.S. and Canada)
Fax.+1.408.490.6708

The web address for Harmonic Inc. is www.harmonicinc.com.

A.1 Technical Specifications

User Interface

Front Panel	Bi state Status LED: Normal = green, alarm = red Latching screw
Rear Panel: CPS 4800-DC CPS 4800-AC	Detachable screw-type terminal block IEC male power connector

Output Power

Output Voltage	24.5, plus or minus 1.0 VDC
Output Current	11 Amps maximum
Short circuit and over voltage protection	

Environmental

Operating Temperature Range	0° to 50° C / +32° to +122° F
Storage Temperature Range	-40° to +85° C / -40° to -185° F
Relative Humidity	Maximum 95% non-condensing

Physical

Dimensions	4.87 cm W x 8.67 cm H x 26.55 cm D 1.92" W x 3.4"H x 11.86" D
Weight	1 kg / 2.2 lbs
Mounting HLP 4800 platform; dedicated power supply slot	

Power Requirements

CPS 4800-DC Input Voltage	-36 to -72 VDC, 12 A max.
CPS 4800-AC Input Voltage	100-240 VAC, 5 A max., 47-63 Hz

Part Numbers

HLP4800	Chassis
HNC4800	Display and controller
CPS4800-AC	AC power supply
CPS4800-DC	DC power supply
FW-HNC4800-WEB/SNMP	WEB/SNMP license



harmonic

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