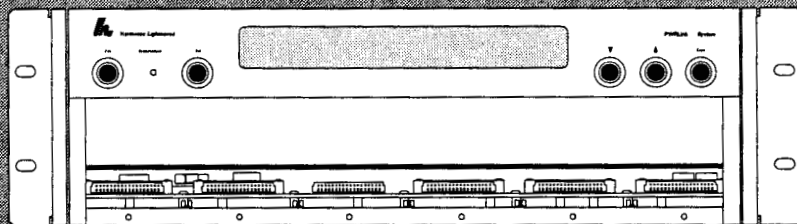


# HLP 4200 Instruction Manual



Harmonic *Lightwaves*

## **Warranty Summary\***

This Harmonic Lightwaves product is warranted against defects in material and workmanship for thirty-six (36) months from the date of shipment. Harmonic Lightwaves will, at its option, either repair or replace products that prove to be defective.

For warranty or repair, return this product to a service facility designated by Harmonic Lightwaves. Buyer shall prepay shipping charges to Harmonic Lightwaves, and Harmonic Lightwaves shall pay shipping to return the product to the Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to Harmonic Lightwaves from another country.

Harmonic Lightwaves warrants that its software, as well as firmware designated by Harmonic Lightwaves for use with the product, will execute its programming instructions when installed properly. Harmonic Lightwaves does not warrant that the operation of the product or software or firmware will be uninterrupted or error-free.

## **Limitations of Warranty**

The foregoing warranty shall not apply to defects resulting from abuse, neglect by Buyer, improper installation or application by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site penetration or maintenance.

**Note: No other warranty is expressed or implied. Harmonic Lightwaves specifically disclaims the implied warranties or merchantability and fitness for a particular purpose.**

## **Exclusive Remedies**

The remedies provided herein are the buyer's sole and exclusive remedies. Harmonic Lightwaves shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based upon contract, tort, or any other legal theory.

## **Assistance**

For assistance, contact your nearest Harmonic Lightwaves Sales and Service office.

Harmonic Lightwaves  
549 Baltic Way  
Sunnyvale, CA. 94089  
Tel. 408-542-2500  
Fax 408-542-2511

Part Number: 700-0005058-2  
Revision A: January, 1998

\*See Order Acknowledgment for complete warranty details.

# ATTENTION

**CAUTION:** There are no user serviceable parts inside, refer all servicing to qualified service personnel. Other than those specific measurements, adjustments and tests specified in this manual, make NO attempt to modify or alter any circuit or assembly in any manner.

**CAUTION:** Toute intervention sur cet équipement est formellement déconseillée par le fabricant. En dehors des réglages décrits dans le manuel, l'utilisateur doit contacter une personne qualifiée par le fabricant pour toute modification ou réparation.

710-000002

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## 1.0 General Information

This section gives general information about this manual, some suggested applications for the product, a description of the product, and a list of the product's specifications.

### 1.1 About this Manual

This instruction manual is a complete guide to installing and operating the HLP 4200 Platform. It includes product diagrams and instructions for installing the Platform and connecting cables. Please read the entire document before beginning installation or operation.

### 1.2 Product Application

The HLP 4200 Platform is used with a number of plug-in modules such as the PWRLink™ series of 1310 nm laser transmitters, the MAXLink™ series of 1510 nm laser transmitters and optical amplifiers, as well as the HRM 3810 receiver, the QAM modulator, and optical switches. The HLP 4200 Platform is designed to meet the economic and technical requirements of broadband service providers. The modular design of the product offers the user a number of advantages:

- The flexibility to add other plug-in modules as industry requirements change, without the need to replace equipment shelves, power supplies or status monitoring equipment.
- The economic advantage of maintaining spare plug-in modules rather than entire subsystems.
- Reduced network downtime because of plug-in module replacements.

### 1.3 Product Description

The HLP 4200 is a rack mount platform, 3 rack units in height, designed to be fitted to a 19 inch EIA standard rack flange. It will accommodate six of Harmonic Lightwaves' standard 2.6 inch wide plug-in modules. A typical configuration would contain one or two CPS 4200 Power Supply modules, as well as other Harmonic Lightwaves modules. The main functions of the HLP 4200 are shown in Figure 1.

The HLP 4200 can be ordered without a front display and control panel when local control and monitoring is not required (model HLP 4200 ND). With the exception of the display and control buttons, all other features are included.

Controlling and monitoring of the Power Supply and modules is accomplished by the following means:

- Local control and monitoring using the momentary push buttons and forty character display on the front panel of the Platform. (On units with display).
- Local control and monitoring via the RS-232 host using a personal computer equipped with Harmonic Lightwaves NETWatch Element Management software.
- Remote control and monitoring by means of the RS-485 interface with other Harmonic Lightwaves products such as the HTR 2000D Transceiver.

The forty character display on the Platform front panel provides the following:

- Name and slot position of each module contained within the Platform.
- NETWatch address setting.
- Diagnostic menus for each module in the Platform.

#### 1.3.1 Front Panel Description

Figure 2 describes the HLP 4200 front panel features and locations.

#### 1.3.2 Rear Panel Description

Figure 3 describes the HLP 4200 rear panel features and locations.



### 1.4 Technical Specifications

HLP 4200 technical specifications:

Electrical:

Backup 24V Power Connection:	22-28 VDC Surge protection to be provided by customer if necessary
Platform Power Consumption:	1 Watt (Platform only)
Rear Panel Connectors	
RS 485:	RJ11
RS 232:	DB9 Female
Alarm:	DB25 Female
System Controller:	DB62 Female
Access Bus:	For factory use only
Rear Back Plane Current Capacity:	11 A

Displays and Control:

Front Panel Display:	40 characters, alphanumeric
Front Panel LED:	Bi-state LED, Alarm = Red, Normal = Green
Push Buttons:	5, See Figure 2

Mechanical:

Dimensions	
Size:	19" W x 5.25" H x 13" D 48.3 x 13.3 x 33.02 cm
Weight:	17.25 lbs 7.8 kg
Rack Mount:	19" EIA flange

Environmental:

Operating Temperature:	0° to 50° C
Storage Temperature:	-40° to 70° C
Relative Humidity:	Up to 85% non-condensing

Optional Equipment:

HLP 4200 Platform Without Display:	HLP 4200 ND
Blank Panel(s):	HLC 4000
Panel Kit:	PNL 4200

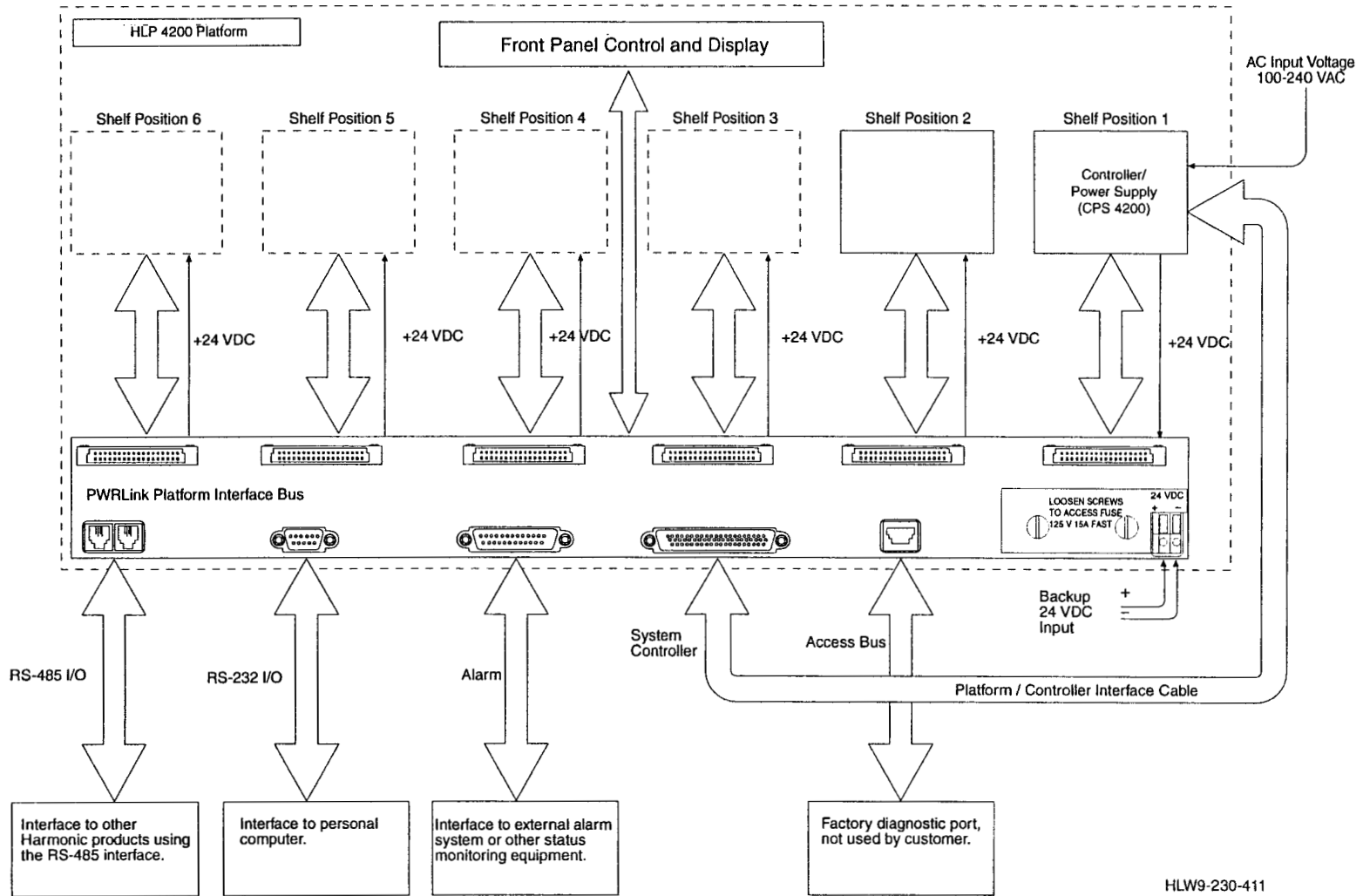
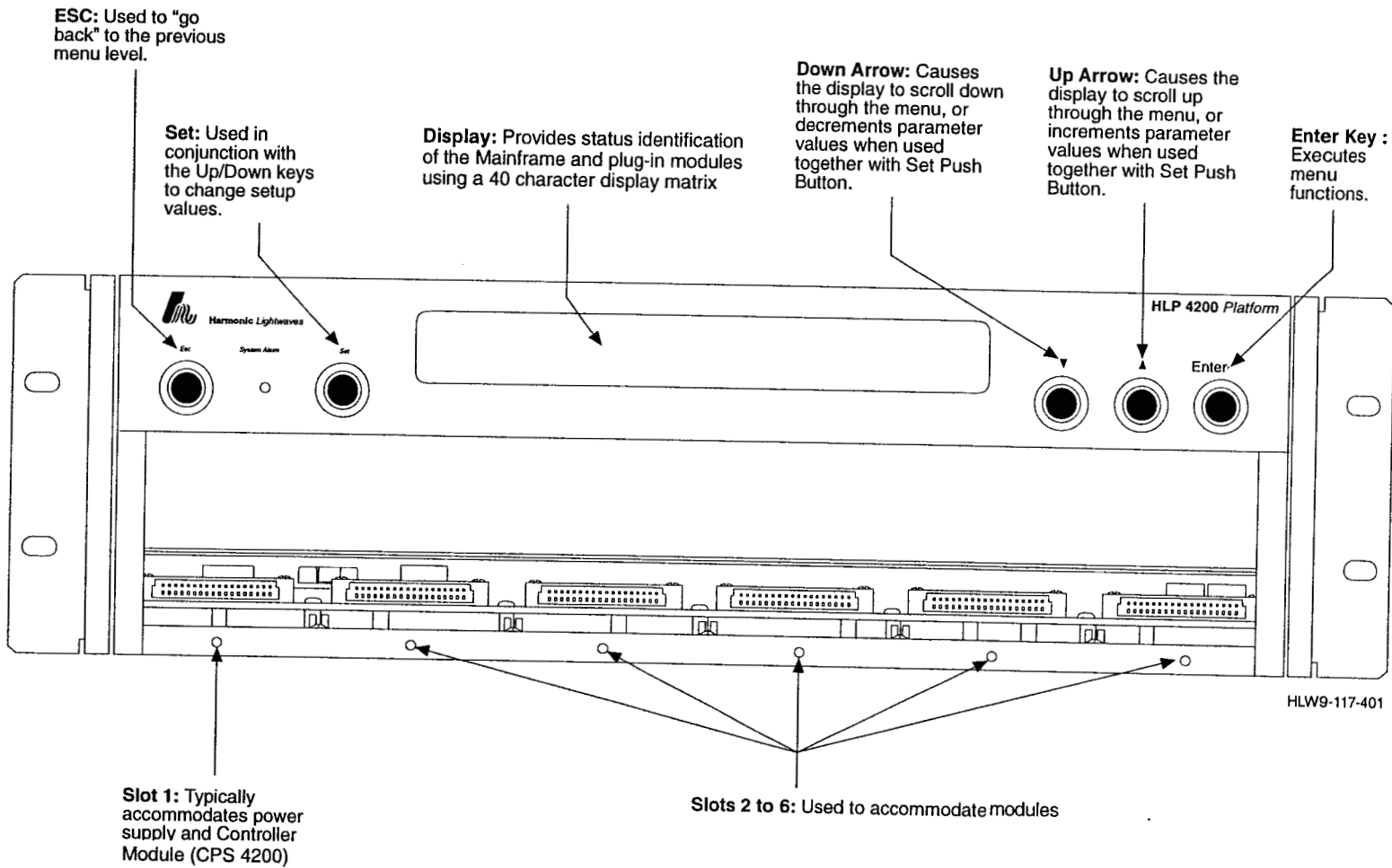


Figure 1 - HLP 4200 Function Diagram





**Note:** When redundancy is desired a second power supply and controller module can be put in any position.

Figure 2- HLP 4200 Front Panel



**RS 485:** Used to interface with all Harmonic Lightwaves products using the RS-485 protocol.

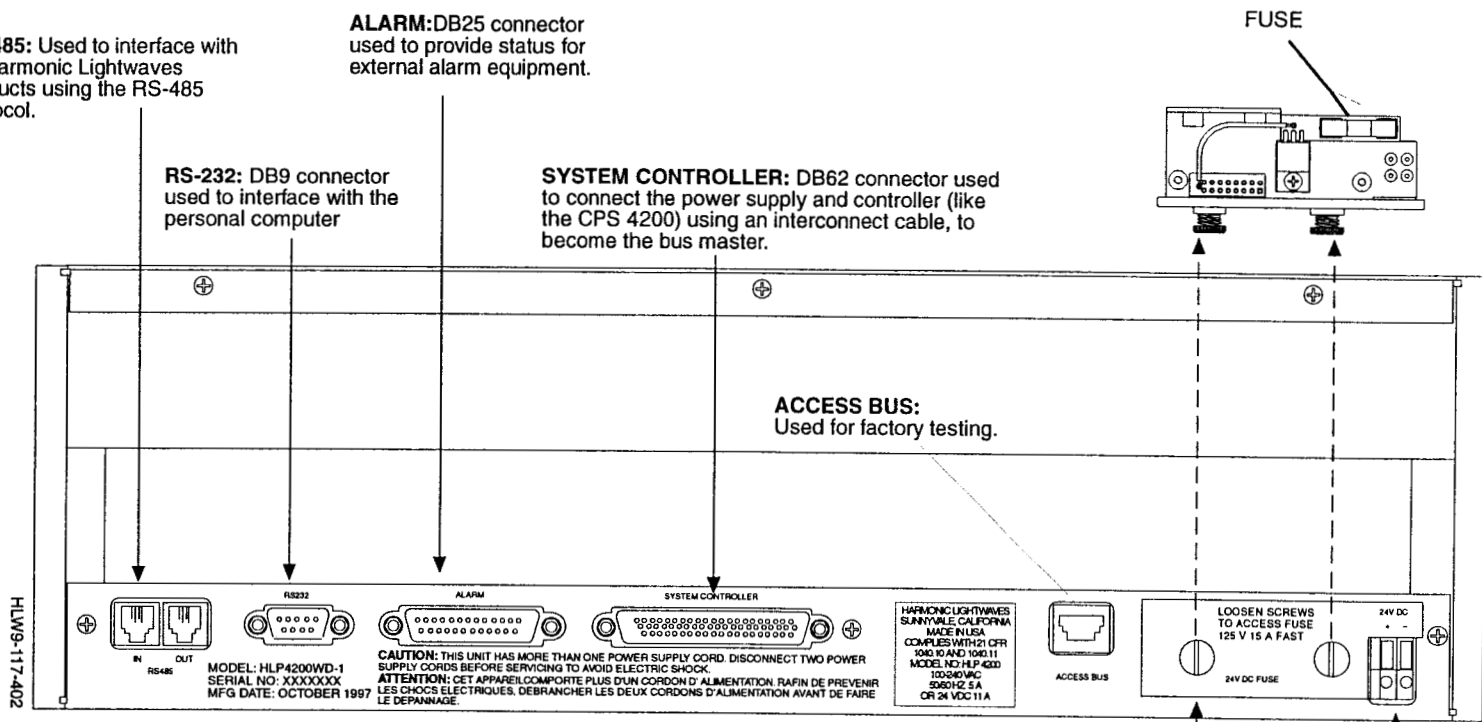
**ALARM:** DB25 connector used to provide status for external alarm equipment.

**RS-232:** DB9 connector used to interface with the personal computer

**SYSTEM CONTROLLER:** DB62 connector used to connect the power supply and controller (like the CPS 4200) using an interconnect cable, to become the bus master.

FUSE

**ACCESS BUS:** Used for factory testing.



**24 VDC:** Barrier strip used to connect an external 24 VDC power source.

**24 VDC FUSE:** 24 VDC fuse used to protect the external 24V power supply (15 Amp fuse)

Figure 3- HLP 4200 Rear Panel



## 2.0 Installing the HLP 4200 Platform

The following sections provide the information necessary to install the HLP 4200. Please read all the instructions before beginning installation.

### 2.1 Receiving and Inspection

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 Lightwaves (800/730-4099). To protect the operator from potential injury, and to protect the equipment from further damage, do not perform any operational tests.

### 2.2 Mounting the Unit in the Rack

The HLP 4200 occupies three rack unit spaces in an EIA standard 19 inch rack. To mount the unit in the rack:

1. Mark the exact position in the rack where you want to install the unit.
2. Prepare the four mounting screws and #2 Phillips screwdriver.
3. Position the unit in the rack, align the holes in the mounting brackets with the threaded holes in the rack upright, and secure the four mounting screws through the chassis ears.

### 2.3 Power Requirements

The HLP 4200 accepts power supply modules that generate 24 VDC for the internal bus. For standard 100-240 VAC, 50/60 Hz input the CPS 4200 module is used.

It is possible to power the HLP 4200 platform with the CPS 4000 power supply. However, the CPS 4000 may not provide sufficient current to drive the newest modules available from Harmonic Lightwaves. Please consult a Harmonic representative before using a CPS 4000 supply in an HLP 4200 platform.

The unit can have backup power by an external 24 VDC source. This input is only protected by a fuse, and it is the customer's responsibility to keep this voltage below + 28 V and have surge and spike protection, otherwise the plug-in units may be damaged.

### 2.3.1 Connecting an External 24 VDC Power Source

Connect the external 24 VDC power source to the barrier strip connector located on the rear of the HLP 4200 according to Figure 4. Switch the external supply off prior to making the connection and observe the correct polarity. Use number 14 AWG wire. Refer to Figure 4.

---

**WARNING:** To avoid personal injury and equipment damage, switch off power from the DC source prior to installation. Never handle "live" wiring.

---

### 2.3.2 DC Fuse Replacement

The HLP 4200 uses one fuse at the 24 VDC input to protect the external power supply. To replace the fuse, turn off the power source and use a flat blade screwdriver to release the screws that fasten the fuse panel assembly to the Platform. Remove fuse panel assembly and replace with a fuse of the same type and rating; specifically, 125V, 15 A, 5 x 20 mm, FAST.

### 2.4 Installing the RS-485, RS 232 and Alarm Cables

#### 2.4.1 RS-232 Cable Installation

The RS-232 serial port interfaces between the NETWatch Element Management System computer and the HLP 4200 Platform. To install the RS-232 cable, connect a 9 pin cable from COM PORT 1 on the NETWatch computer to the RS-232 serial port on the Platform rear panel. Refer to Figure 4 for location.

The cable should be less than 50 feet long. If the NETWatch computer is located more than 50 feet from the transceiver, use a line extender.

#### 2.4.2 RS-485 Cable Installation

The RS-485 ports on the Platform are used for connecting to the NETWatch Element Management System. Connect the RJ11 cable from the RS-485 OUT port on the transceiver to the RS-485 IN port of any Harmonic Lightwaves product that supports the RS-485 interface. You can connect other units in a series by using the RS-485 IN and OUT ports located on all Harmonic Lightwaves equipment. Refer to Figure 4.



In some cases the RJ11 connectors on the cables are aligned differently. When this happens, "OUT" and "IN" must be exchanged so that "OUT" connects to "OUT" and "IN" connects to "IN".

The most effective way to daisy chain systems properly is to connect them one by one. If a system does not communicate, and it is verified that the address and connections are correct, try to connect the incoming cable to the "OUT" connector. If this works, connect the next unit from the "IN" connector and test it the same way.

**2.4.3 External Alarm**

External alarm equipment can be connected to the HLP 4200. The pin out from the "ALARM" connector is shown in Figure 4.

The alarm pin out is as follows:

PIN NO.	Description
23	Alarm Module No. 1
11	Alarm Module No. 2
24	Alarm Module No. 3
12	Alarm Module No. 4
25	Alarm Module No. 5
13	Alarm Module No. 6
10	Composite Alarm
22	Alarm Relay NC
9	Alarm Relay NC
21	Alarm Relay NO
8	Alarm Relay NO
5	Module 1 Exist
18	Module 2 Exist
6	Module 3 Exist
19	Module 4 Exist
7	Module 5 Exist
20	Module 6 Exist
16,17	Ground

Table 1 - Alarm Connector Pin Out

The alarm and relays are derived as follows:

- a) Each module reports its existence in the HLP 4200 Platform by grounding the slot location pin (Pins 5, 18, 6, 13, 7, 20).
- b) During an alarm condition, the module grounds its own alarm pin (Pins 23, 11, 24, 12, 25, 13).
- c) The composite alarm is pulled to ground potential, and triggered by any one of the modules reporting an alarm.
- d) Alarm relays are provided with normally open, normally closed contacts.

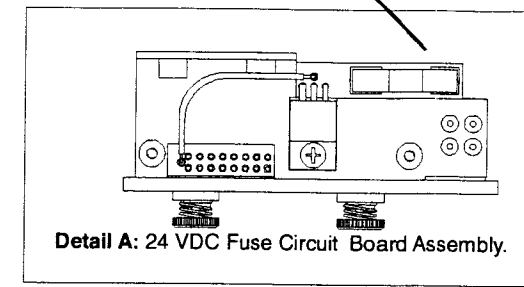
**2.4.4 Controller Cable**

Connect the controller cable (supplied in the accessories) to the CPS 4200 Controller/Power Supply as shown in Figure 4.

**Pin assignment for the "ALARM" connector.**

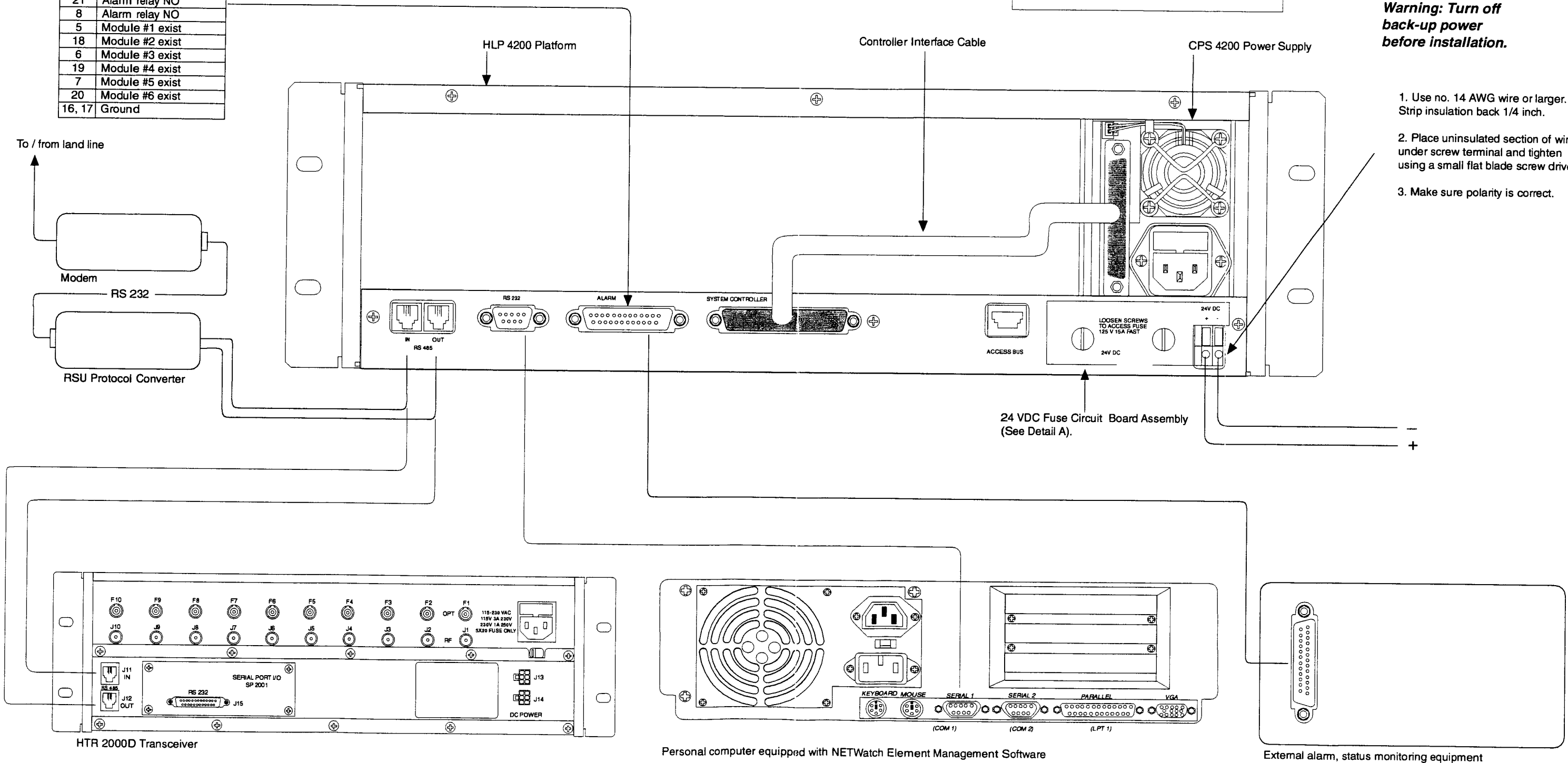
Pin No	Description
23	Alarm module number 1
11	Alarm module number 2
24	Alarm module number 3
12	Alarm module number 4
25	Alarm module number 5
13	Alarm module number 6
10	Composite alarm
22	Alarm relay NC
9	Alarm relay NC
21	Alarm relay NO
8	Alarm relay NO
5	Module #1 exist
18	Module #2 exist
6	Module #3 exist
19	Module #4 exist
7	Module #5 exist
20	Module #6 exist
16, 17	Ground

FUSE



**Warning: Turn off back-up power before installation.**

1. Use no. 14 AWG wire or larger. Strip insulation back 1/4 inch.
2. Place uninsulated section of wire under screw terminal and tighten using a small flat blade screw driver.
3. Make sure polarity is correct.





### 3.0 Operation

Follow these steps to verify that the HLP 4200 Platform is operating properly:

1. Install the power supply module (CPS 4200 for example). See the power supply instruction manual for detailed instructions.
2. Press the power button on the power supply.
3. The display will show "SYSTEM READY."
4. Press any key on the front panel and the display will show "MODULE SELECTION."
5. The NETWatch address can now be set. Press the Up/Down arrow key once. The display will show "ADDRESS: XXXX <ENTER> TO CHANGE."  
Press <ENTER> and the display will show "ADDRESS: XXXX <SET> + <UP/DOWN> TO CHANGE."

To set the address number hold down the "SET" button while pressing the Up or Down Arrow key until the desired address number is displayed. Press the "ENTER" key to set the address.

"ESC" instead of "ENTER" will retain the previous address.

6. Use the Up/Down Arrow or "ESC" key to return to the "MODULE SELECTION" menu and press "ENTER." The display will show which modules are plugged into the shelf. For example, the display will show "POSITION 1: CPS4200 P. SUPPLY BUS MASTER"

Such a display would mean that a CPS 4200 power supply occupies slot 1. The bus master indicates that the controller circuitry of this (slot 1) power supply is controlling the Platform. If other modules are installed the user can use the Up/Down Arrow keys to scroll through the module list. For additional information on a particular module, press the "ENTER" key to display a module diagnostic menu. Refer to the instruction manual that came with the module for a detailed description of each menu. Note that an alarmed module will always display first in the "MODULE SELECTION" sub-menu. Figure 5 shows the entire HLP 4200 menu.

7. After 5 minutes, the display will shut down unless there is an alarm message. The display will restart upon use of any button.

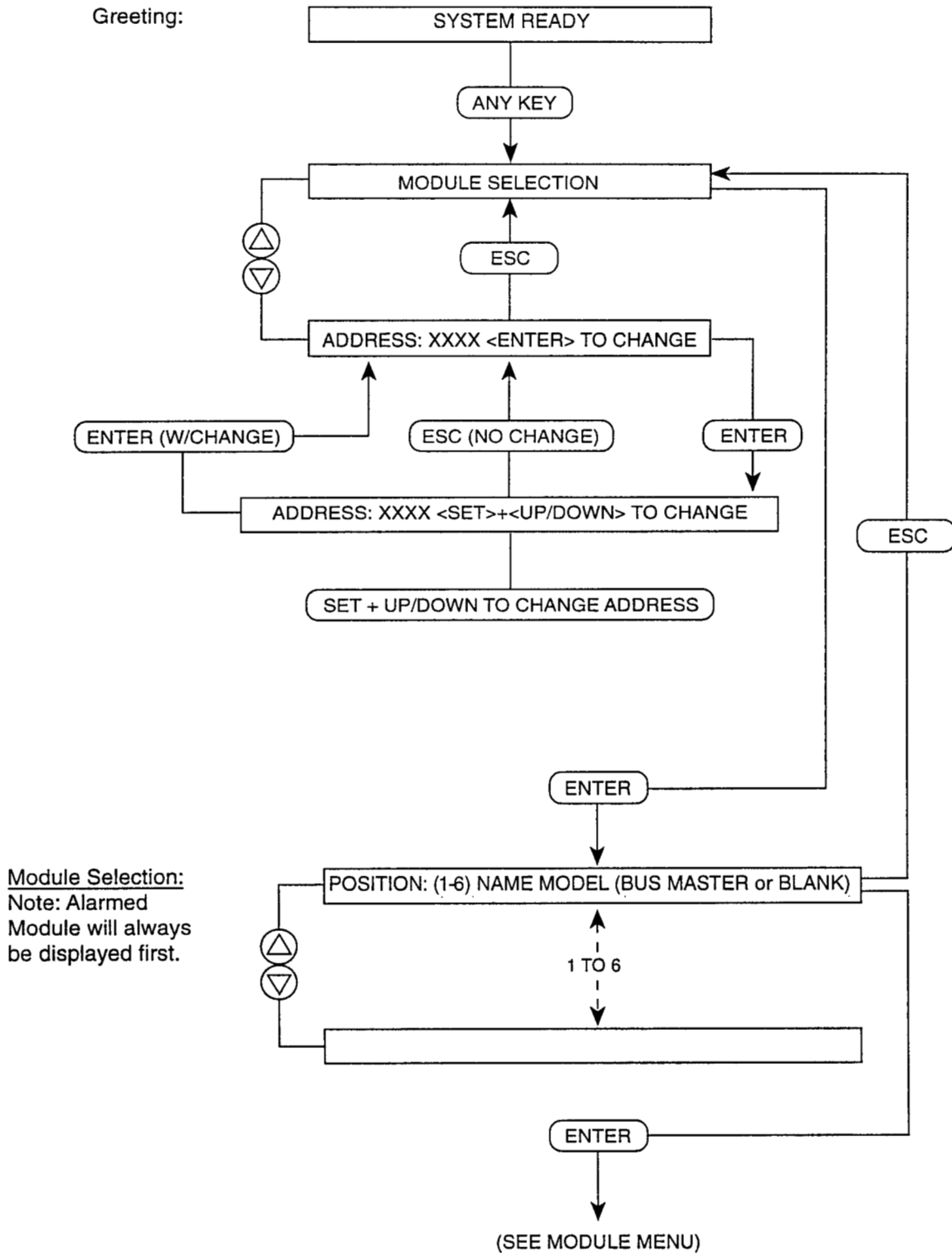


Figure 5- HLP 4200 Menu Display



## 4.0 In Case of Problems

Should a problem occur, check the following:

1. Are any LEDs lit? If not, check fuse.
2. If the fuse is operational, check the interface cable.
3. Try using an alternate power supply module with the platform. Move the interface cable while the system is operational.

Should a problem persist, contact the Harmonic Lightwaves Customer Service Department at (800) 730-4099. A service technician will assist you in determining whether a fault exists with the unit.

If the service technician determines that you need to return the unit, he or she will issue you a Return Material Authorization Number. Please make note of this number. You will need to include it on the shipping container when returning the unit, and with all correspondence regarding the unit.

The return address is:

Harmonic Lightwaves, Inc.  
549 Baltic Way  
Sunnyvale, CA 94089  
Atten: Customer Service  
RMA no. \_\_\_\_\_





## Sales Office Listing

### Corporate Office

Harmonic Lightwaves, Inc.  
549 Baltic Way  
Sunnyvale, CA 94089  
**Tel: 408/542-2500**  
**Tel: 800/730-4099**  
Fax: 408/542-2511

International Sales  
Tel: 408/542 2500 ext. 2782  
Fax: 408/542 2514

Technical Support  
800/730-4099

Customer Service  
800/730-4099

Return Materials Authorization  
408/542-2650

### United Kingdom Sales & Support Center

Harmonic UK  
Unit 17 Alban Field  
Hatfield Road  
St. Albans, Herts  
UK AL40JJ  
**Tel: 011-727-839-565**

### Eastern Regional Office

Harmonic Lightwaves, Inc.  
600 West Gernmantown Pike  
Plymouth Meeting, PA 19462  
**Tel: 610/940-1711**  
Fax: 610/940-1707

### Northeast Regional Office

Harmonic Lightwaves, Inc.  
17 Garvin Road  
Derry, NH 03038  
**Tel: 603/434-1378**  
Fax: 603/434-0478

### Midatlantic Regional Office

Harmonic Lightwaves, Inc.  
14051 Gared Dr.  
Glenwood, MD 21738  
**Tel: 410/489-7971**  
Fax: 410/489-7972

### Southeast Regional Office

Harmonic Lightwaves, Inc.  
236 Prairie Dune Way  
Orlando, FL 32828  
**Tel: 407/384-8759**  
Fax: 407/384-8743

### Midwest Regional Office

Harmonic Lightwaves, Inc.  
1520 W. Wolfram Street  
Chicago, IL 60657  
**Tel: 312/248-1195**  
Fax: 312/248-1196

### Mountain Regional Office

Harmonic Lightwaves, Inc.  
2505 Dover Court  
Lakewood, CO 80215  
**Tel: 303/629-1550**  
Fax: 303/233-1370

### Western Regional Office

Harmonic Lightwaves, Inc.  
4931 Pathway Court  
Fair Oaks, CA 95628  
**Tel: 916/966-2200**  
Fax: 916/966-2122



**Argentina**  
**SiFirst**  
Corrientes 676, Piso 3  
(1043) Buenos Aires, Argentina  
Tel: 54-1-394-9702  
Fax: 54-1-394-9574

**Australia**  
**Fibernet Pty. Ltd.**  
24 Laser Drive, Rowville  
Victoria, 3178, Australia  
Tel: 61-3-764-2111  
Fax: 61-3-764-2120

**Austria**  
**Helmut Normman Company**  
Linzerstrasse 139  
Wels A-4600, Austria  
Tel: 43-7242-709210  
Fax: 43-7612-70598

**Brasil**  
**FTD Comunicacao de Dados Ltda.**  
Rua Dr. Joao Pedro Peroti  
154-Campo Belo  
Sao Paulo - SP  
CEP 04636 Brasil  
Tel: 55-11-5561-5031  
Fax: 55-11-5561-2966

**Canada**  
**Capella Telecommunications**  
60 Vanedward Drive, Unit 6  
Port Perry, Ontario L9L 1G3 Canada  
Tel: 905-985-9911  
Fax: 905-985-9592

**Chile**  
**North Supply Chile**  
Celia Solar 210, Casilla 527-V  
Correo 21  
Santiago, Chile  
Tel: 56-2-551-1990  
Fax: 56-2-555-4815

**China**  
**Pacific Satellite**  
16/Block B  
Cheung Lee Industrial Building  
9 Cheung Lee St.  
Chaiwan, Hong Kong  
Tel: 852-2898-1383  
Fax: 852-2558-0406

**Photon Technology Corp.**  
6/F 3 Bldg.  
Duoli Industrial District  
Shangmeilin, Shenzen 518049  
Tel: 86-755-331-1215  
Fax: 86-755-331-1216

**Star Electronic Co. Ltd.**  
Youth Road  
Economic & Tech. Dev. Zone  
Quinhuangdao, Hebei 66004  
Tel: 86-335-805-0092  
Fax: 86-335-805-0091

**Colombia**  
**Mass Media International**  
Carrera 57, No. 121-01  
Bogota, Colombia  
Tel: 57-1-624-1229  
Fax: 57-1-623-1230

**France**  
**JP2**  
15, rue Le Corbusier  
Creteil Cedex 94035 France  
Tel: 33-4399-4732  
Fax: 33-4399-0758

**Hungary**  
**OptoTrans Comm. Ltd.**  
Istvan ut. 16  
Budapest H-1041 Hungary  
Tel: 36-1-399-6600  
Fax: 36-1-399-6699

**Israel**  
**Rotal Ltd.**  
3 Efal Street  
Kiryat Arei Industrial Area,  
POB 3779  
49130 Israel  
Tel: 972-3-922-8040  
Fax: 972-3-922-3299

**New Zealand**  
**FiberNet New Zealand**  
47 Kenepuru, PO Box 51140, Tawa  
Wellington, New Zealand  
Tel: 644-237-9144  
Fax: 644-237-6528

**Poland**  
**Klonex VCS**  
ul. Sienklewicz 20  
Opole 45-307 Poland  
Tel: 48-77-544-462  
Fax: 48-77-530-044

**Portugal**  
**Omnitecnica**  
Estrada de Alfragide,  
Amadora 2720, Portugal  
Tel: 351-1-471-5517  
Fax: 351-1-471-3610

**Spain**  
**SGT**  
Avenida Manoteras  
22, Edificio Alfa II, Local 106  
Madrid 28050, Spain  
Tel: 34-1-383-2160  
Fax: 34-1-383-9916

**Switzerland**  
**Catec AG**  
Luzernerstrasse 147  
Litthau CH-6014 Switzerland  
Tel: 41-41-259-8257  
Fax: 41-41-259-8219

**Taiwan**  
**HWA Com Systems**  
8F, -181 Cheng-The Road, Sec. 2  
Taipei, Taiwan (ROC)  
Tel: 886-2-558-7575  
Fax: 886-2-559-4407

**Thailand**  
**TeleEngineering & Services Co. Ltd.**  
Chumnan Phenjati Business Center  
65/48-52, Rama 9 Rd., Huaykwang  
Bangkok, Thailand  
Tel: 662-643-933  
Fax: 662-643-9220

**HWA Com Systems**  
8F, -181 Cheng-The Road, Sec. 2  
Taipei, Taiwan (ROC)  
Tel: 886-2-558-7575  
Fax: 886-2-559-4407