ViaLite HD
Fibre Optic Link System

User Manual

HRK-HB-1

CR2724 08/03/2010

Pulse Power & Measurement Ltd, 65 Shrivenham Hundred Business Park, Watchfield, Swindon, Wiltshire SN68TY, UK
Tel +44 (0)1793 784389 Fax +44 (0)1793 784391 Email sales@ppm.co.uk Web www.vialite.com

Instrument Care and Safety Information

*Please read the whole of this section before using your **ViaLiteHD** product. It contains important safety information and will enable you to get the most from your Fibre Optic link.*

Electrical Safety

The *ViaLiteHD* rack case provides the termination for power inputs and can be fitted with power supplies.

The *ViaLiteHD* rack case is a Safety Class 1 product (having metal case directly connected to earth via the power supply cable).

When operating the equipment note the following precautions:

- Hazardous voltages exist within the equipment. There are no user serviceable parts inside; the covers should only be removed by a qualified technician.
- There are no user replaceable fuses in the rack case mounted equipment. Replacement should only be carried out by a PPM technician.
- The rack case earth stud SHOULD be connected to the safety earth.
- When using a 2 pin power supply cable the rack case earth stud MUST be connected to the safety earth.
- The *ViaLiteHD* Power Supply Modules do not have an isolating switch on the mains voltage inlet. For this reason, the *ViaLiteHD* Rack Case must be installed within easy reach of a clearly labelled dual pole mains isolation switch, which supplies the equipment.

ESD Precautions

The *ViaLiteHD* rack case is not equipped with any active electronics but it may be fitted with them.

Precautions for handling electro-static sensitive devices should be observed when handling all *ViaLiteHD* modules. Technicians should ensure that they use effective personal grounding (i.e. ESD wrist strap etc.) when servicing the equipment. Any equipment or tools used should be grounded to prevent static charge build-up. Good practice should be observed at all times. For reference see relevant standards.
EN 61340-5-1, “Protection of Electronic Devices from Electrostatic Phenomena – General Requirements”

Optical Safety

The *ViaLiteHD* rack case is not equipped with optical units but it may be fitted with them

The *ViaLiteHD* RF Transmitter and Transceiver modules contain laser diode sources operating at nominal wavelengths of 1270nm to 1610nm.

These devices are rated as EN60825-1:1994 CLASS 1 radiation emitting devices. A class 1 laser is safe under all conditions of normal use.

When operating the equipment note the following precautions:

- Never look into the end of an optical fibre directly or by reflection either with the naked eye or through an optical instrument.
- Never leave equipment with radiating bare fibres – always cap the connectors.
- Do not remove equipment external covers when operating.

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1 Initial Inspection

Unpack and inspect the equipment as soon as possible. If there is any sign of damage or any parts missing, do not install the equipment before seeking advice from PPM or your local agent.

The equipment received should match the delivery note that is shipped with the equipment. If there are any discrepancies, contact PPM or your local agent.

2 Introduction to the *ViaLiteHD* Range

The *ViaLiteHD* range has been developed to provide a modular solution to the transmission of a wide range of analogue and digital data where traditional 'copper wire' systems cannot be used, for example, in electrically noisy environments or over long distances.

The range is ideal for permanent and semi-permanent installation in Satellite communications, GPS, antenna remoting and other related applications.

The variety of links available includes low frequency timing (2kHz) to wideband RF (4.2GHz), RF splitters, Oscillators, Amplifiers and Protection switches; they also include a full suite of supporting functions including RS232/422/485, Ethernet (to 1000 BT) and control systems to monitor and control the system with both Web and SNMP interfaces.

All *ViaLiteHD* equipment operates over high quality glass fibre optic cable, which can be supplied in low-cost 3mm jacket, riser and outdoor specifications. The links can also be used with existing cable systems at customer premises.

A *ViaLiteHD* system can be added to at any time, enabling the system to evolve with the needs of the user.

3 *ViaLiteHD* and *ViaLite* Classic compatibility

The RF and optical interfaces of most *ViaLiteHD* and *ViaLite Classic* modules are compatible. However the physical size, mounting systems and control of the units are different, so it will not be possible to fit *ViaLiteHD* module in a *ViaLite Classic* rack case or housing and vice versa. However it is possible for units of different types to interwork and be used to expand existing systems. Listed below is a brief summary of inter family compatibility.

- RF — Compatible optical and RF interfaces
- RF + digital — Compatible optical and RF interfaces
- RS232 — Compatible optical and digital interfaces
- RS422 — Compatible optical and digital interfaces
- RS485 — Compatible optical and digital interfaces
- Ethernet — Units of matching speed have compatible optical and digital interfaces
- Protection Switch — Compatible RF interfaces may need interface cable (no optical interface)
- RF Splitters — Compatible RF interfaces (no optical interface)
- Amplifier — Compatible RF interfaces (no optical interface)
- Oscillator — Compatible RF interfaces (no optical interface)
- SNMP — Not compatible

Contact PPM or your local agent for more details.

4 *ViaLiteHD* System Components

4.1 *ViaLiteHD* 19" Rack Case

4.2 Description

The 19" rack case is suitable for 19" rack mounting. There are two versions, one for alternating current (AC) power and one for direct current (DC) power.

The rack cases accommodate up to thirteen (5HP) plug-in RF/data modules, one (7HP) control module and two (6HP) plug-in power supplies. The hot-swappable, dual power supply capability provides full redundancy and maximum reliability to avoid traffic loss in the event of a power supply failure. The rack cases incorporate a backplane PCB for the distribution of DC power, status alarms and data.

Note: Each power supply position requires a separate power source to provide fully redundant protection.

The plug-in modules simply plug into the rack case, allowing the user to replace modules quickly and easily or to upgrade the system with additional modules at any time. For ease of upgrade and replacement, most modules are offered with the option of a Blindmate interface, where all interface cables are captive in the rack hardware and not the module.

Each of the RF/data module positions has a dedicated D type connector that provides access to all the digital data for that module; this is fitted to the rack backplane.

All of the module alarm outputs, both digital alarms and analogue monitors, are routed to a SCSI-3 connector on the rear panel of the rack case. This connector also has the interface for the summary alarm relay if a module has been fitted to provide this function. This permits the integration of the *ViaLiteHD* equipment into a Maintenance & Control system.

All of the module external power connections (LNA feeds) and rack case backplane external power connections are routed to a second SCSI-3 connector on the rear panel of the rack case.

Module slots 1-14 have a data bus that can be used for sending and receiving data between modules.

4.3 Power Interface Management

External power can be provided to, or taken from the rack via the "Power Concentrator" connector J4, the current should be limited to 1A per pin for single pins or 0.8A per pin for shared pins. The power level must be within the capability of the rack case power supplies, see specification in section 5.

4.3.1 External backplane power

If the rack case is powered externally with no PSUs fitted, the DC voltage measured at J4 should be 12Vdc +/- 0.5V.

It is also possible to provide external power to rack cases fitted with PSUs, for this reason the current share bus (CSB) is available on "Power Concentrator" connector J4. If this option is used the rack case must be interfaced to PPM approved external power supplies, and the +12Vdc, GND and CSB lines for each power source should be connected in parallel.

4.3.2 Module bias feed

It is possible to provide a bias voltage from the modules to connected devices. Dependent on module type, this can be either internally sourced from the module or provided via the “Power Concentrator” connector J4. The current limit is dependent on module type fitted.

4.4 Alarm Management

The alarm strategy on the *ViaLiteHD* system caters for all levels of Alarm and Monitoring System complexity from simple module failure LED indication, to local and remote end alarm notification and redundancy switching.

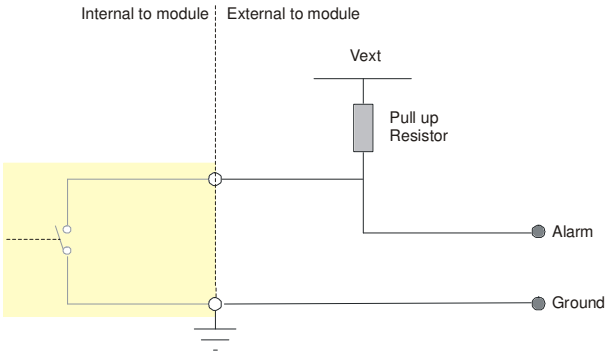
All modules provide an alarm output to the rack case backplane to indicate that the module is present and working correctly. The alarm is fail-safe in that when a working module is withdrawn from the rack case an alarm is registered for that module position.

4.4.1 “Alarm Concentrator” 50way Connector J1

All module alarms are provided for the user on the 50 way “Alarm Concentrator” connector on the rack case rear panel. These outputs are "open collector" outputs. There are also two analogue monitors per module position. Their function depends on the type of module fitted.

4.4.2 Connecting to an "open collector" output.

The alarm output pin should be connected to a suitable current source (a positive voltage via a 10kohm pull-up resistor is adequate). When the module is in a working (non-alarm) state, the alarm output pin is short circuited to ground by the module. If the module enters an alarm state, the alarm pin is released to a high impedance state and current is no longer drawn from the constant current source. In the case of a positive voltage and pull-up resistor, the voltage on the alarm output pin will rise to indicate the alarm state. It follows that, if a module is removed from the rack case, the alarm will be raised for that module position.



The capability of the open collector is dependent on the module that provides it.
The typical capability of the Open Collector/Drain is 50mA maximum current sink and 15V maximum voltage (Vext)

4.4.3 Summary Alarm

A summary alarm can be provided if an appropriate module is fitted in the 7HP slot (slot 14). This function can be provided by either of the following modules

- SNMP control module (automatic sensing of module presence)
- Summary alarm relay module (manual setting of module presence)

If no module is fitted the summary alarm relay connections will all be open circuit.

If an appropriate module is fitted there is a volt free 3-pin connection present on “Power Concentrator” Connector J4. The three connections are Normally Open (NO), Common (COM) and Normally Closed (NC).

Condition 1 - Power applied to Rack Case, no alarms (i.e. normal condition)

- Pin NO is open circuit
- Pin NC is connected to COM

Condition 2 - Power removed from Rack Case and/or one or more module alarms (i.e. Alarm condition)

- Pin NO is connected to COM
- Pin NC is open circuit

4.4.4 Module Alarm Defeat

In some installations, the Rack Case might not be fully populated with modules. In this case, the module alarm output for the vacant positions would register a continuous alarm state and the Summary Alarm Output would also register an alarm condition.

It is very important to ensure that the DIP switches on the Summary alarm relay module or software alarm mask of the SNMP control module for Rack Case positions where modules are “present” is set correctly. If a DIP switches/software mask is set incorrect for a “present” module, then if this module were to fail, NEITHER THE MODULE ALARM NOR THE SUMMARY ALARM WOULD DETECT THE

FAILURE. The front panel LEDs of the module will always register an alarm condition correctly regardless of the state of the DIP switches/software mask.

4.5 Heat management

The rack is designed to meet it environmental specification, when operating in a typical configuration. A typical configuration is all modules populated (13*Transceiver, 1*SNMP, 2*PSU), rack power consumption 67 watts, no external DC power input or DC output and no obstruction to convection air path.

Under normal operating conditions module slots 1-14 are cooled by convection, module slots 15 and 16 are force air cooled with exhaust at rear of the rack. The rack will continue to run without the forced cooling provided by the integrated fan but its operating temperature will be reduced.

- Single PSU only fitted: maximum operating temperature reduced by -5°C
- Airflow above blocked: maximum operating temperature reduced by -10°C
- Airflow below blocked: maximum operating temperature reduced by -5°C
- No forced air: maximum operating temperature reduced by -15°C

4.6 Unused module positions

It is advised that all unused slots be fitted with blanking panels. Different widths of blanking panel are available these fit the 5HP general purpose (slots 1-13), 7HP controller card slots (slot 14), 6HP power supply (slots 15,16). They can be used with any *ViaLiteHD* 19inch rack case and will prevent accidental/unwanted access and the ingress of dust.

4.7 Minimum power supply load

If the rack case power supplies are operating in dual redundant configuration, there should be a minimum load of 20 watts to ensure that both power supplies are active, below this level one power supply may be in idle mode (its LED will not be illuminated). If necessary a dummy load board can be supplied, to fit into any unused slots to meet this minimum power requirement.

4.8 Rack case Specification

	HRK2	**HRK2-DC**
Description	19” Rack Mounting Case	
Max. No. of 5HP modules	13 (in slots 1-13 only)	
Max. No. of 7HP modules	1 (in slots 14 only)	
Max. No. of 6HP modules	2 (in slots 15,16 only)	
19” Rack Mounting	Yes	
Desktop Mounting	Not Suitable (use *ViaLite Classic* products)	
Width, internally	84 HP	
Width, externally	483 mm	
Height, internally	3U	
Height, externally	134 mm	
Depth, externally	265 mm	
Weight (excl. modules)	1.6 kg	
Cooling	Convection (slots 1-14); Forced air (slots 15,16) exhaust at rear	
Operating Temperature	-10°C to +50°C	
Power Supply compatibility	HPS	HPS-DC
Rack power input	2 x IEC 60320, 3 pins each	2 x screw terminal, 2 pins each
Chassis earth	Rear panel M4 stud	
Fan power	IDC male, Dual row 6 pin • DC power to rear mounted fan cassette	
Data Connector	9way Female D with screw-lock termination at the rear of each module position (1 per 5 HP slot). • Data input/output for individual modules.	
Alarm Concentrator Connector J1: SCSI-3	This concentrates the alarms from each module to a common point. • Open Drain alarm (1 per 5 & 7HP slot) • Power Good (2 per 6 HP slot) • Analogue Monitor (2 per 5 HP slot) • Ground Type: 50 way connector Har-mik® female [SCSI-3]	
Power Concentrator Connector J4: SCSI-3	This concentrates the power connections and summary alarms to a common point. • +12Vdc backplane power • Ground • Current sharing bus • Summary Alarm relay (optional) • External LNA bias (1 per 5 HP slot) Type: 50 way connector Har-mik® female [SCSI-3]	
ViaLiteHD plug-in module compatibility	All types	

4.9 Rack connector pinouts

Pin out – J1 "Alarm Concentrator" connector*

Pin	Rack J1*	Pin	Rack J1*	Pin	Rack J1*	Pin	Rack J1*
1	GND	14	Analogue_monitor_B_8	27	ALARM_3	40	Analogue_monitor_B_11
2	ALARM_2	15	Analogue_monitor_B_1	28	ALARM_5	41	Analogue_monitor_B_13
3	ALARM_4	16	Analogue_monitor_B_1	29	ALARM_7	42	GND
4	ALARM_6	17	GND	30	ALARM_9	43	GND
5	ALARM_8	18	GND	31	ALARM_11	44	Analogue_monitor_A_2
6	ALARM_10	19	Analogue_monitor_A_1	32	ALARM_13	45	Analogue_monitor_A_4
7	ALARM_12	20	Analogue_monitor_A_3	33	GND	46	Analogue_monitor_A_6
8	ALARM_14	21	Analogue_monitor_A_5	34	ALARM_P_1	47	Analogue_monitor_A_8
9	ALARM_P_2	22	Analogue_monitor_A_7	35	Analogue_monitor_B_1	48	Analogue_monitor_A_10
10	GND	23	Analogue_monitor_A_9	36	Analogue_monitor_B_3	49	Analogue_monitor_A_12
11	Analogue_monitor_B_	24	Analogue_monitor_A_1	37	Analogue_monitor_B_5	50	GND
12	Analogue_monitor_B_	25	Analogue_monitor_A_1	38	Analogue_monitor_B_7		
13	Analogue_monitor_B_	26	ALARM_1	39	Analogue_monitor_B_9		

Pin out – J4 "Power Concentrator" connector*

Pin	Rack J4*	Pin	Rack J4*	Pin	Rack J4*	Pin	Rack J4*
1	CSB	14	GND	27	Relay_terminal_1	40	LNA_feed_3
2	Relay_terminal_2	15	LNA_feed_2	28	GND	41	LNA_feed_5
3	GND	16	LNA_feed_4	29	GND	42	LNA_feed_7
4	GND	17	LNA_feed_6	30	GND	43	LNA_feed_9
5	GND	18	LNA_feed_8	31	+12Vdc	44	LNA_feed_11
6	+12Vdc	19	LNA_feed_10	32	+12Vdc	45	LNA_feed_13
7	+12Vdc	20	LNA_feed_12	33	+12Vdc	46	GND
8	+12Vdc	21	GND	34	+12Vdc	47	GND
9	+12Vdc	22	GND	35	+12Vdc	48	GND
10	+12Vdc	23	GND	36	+12Vdc	49	GND
11	+12Vdc	24	GND	37	+12Vdc	50	GND
12	+12Vdc	25	GND	38	LNA_feed_1		
13	+12Vdc	26	Relay_terminal_3	39	GND		

Note: The Chassis and power ground are common

Pin Out – J19 to J31 "Module Data" connectors

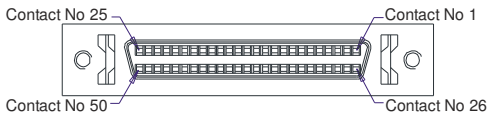
Pin	Module	Pin	Rack Summary	Pin	Rack Summary
1	GND	4	*TX_232_IN*	7	*RX_422_OUT-*
2	*TX_422_IN+*	5	GND	8	*RX_232_OUT*
3	*TX_422_IN-*	6	*RX_422_OUT+*	9	*RST_485*

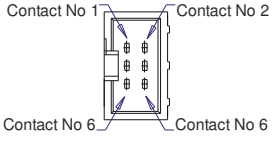
Note: Data on the connector is only for the module fitted in that 5HP slot and is printed beneath (J19 = slot 1, J20 = slot 2 … J31 = Slot 13)
Connections in *Blue* are optional and only available on some types of module

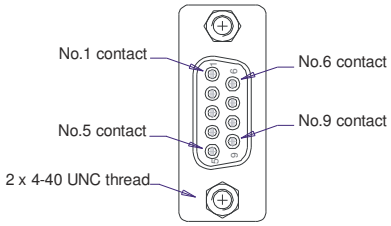
Pin Out – J32 "Fan power" connector

Pin	Module	Pin	Rack Summary	Pin	Rack Summary
1	+12Vdc	3	+12Vdc	5	GND
2	+12Vdc	4	GND	6	GND

Note: Colour indicates relevant connector drawing
* An optional mating half cable is available for use in *ViaLiteHD* system







Rack connector:
50 way SCSI-3 Har-mik® female

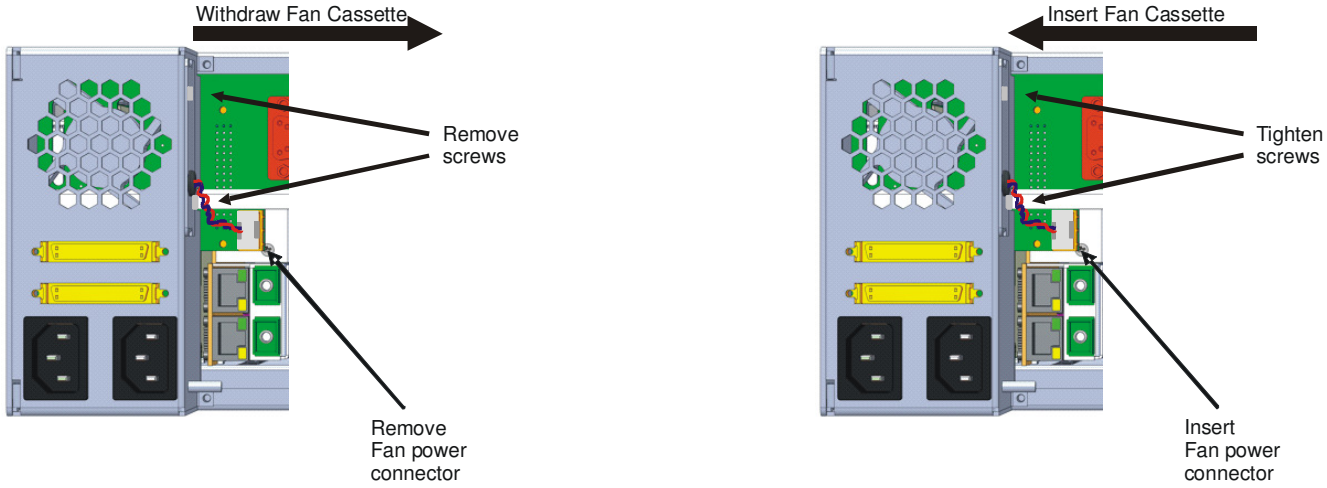
Fan connector:
6 way IDC dual row male

Module connector:
9 way D-Type connector female

All connectors are viewed looking into connector from mating interface
Each connector is shown in the correct orientation for normally mounted 3U rack case

4.10 Fan replacement

If the fan is not turning, the fan cartridge assembly should be replaced. This can be completed without disconnecting the unit from the mains supply.



Please ensure that when the fan is outside of its safety enclosure it is disconnected from its power connector

The fan is removed by the following procedure.

- Disconnect the fan power connector J32.
- Using a magnetic screw driver remove the two screws fixing the fan cassette
- Withdraw the fan cassette

The fan is replaced by the following procedure.

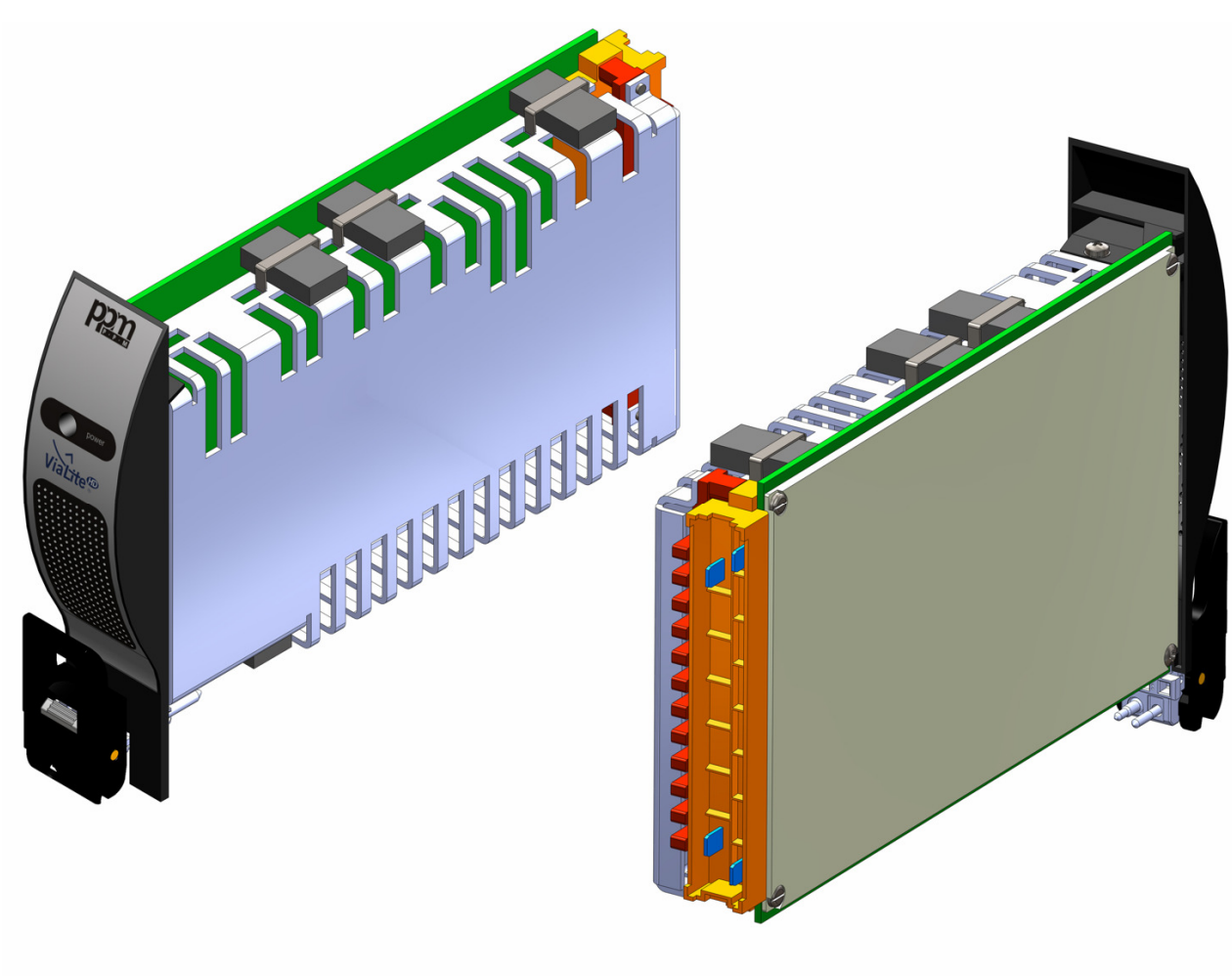
- Insert the fan cassette
- Using a magnetic screw driver fix the cassette in place using the two screws provided
- Connect the fan power connector J32.
- Check that air is being exhausted

5 *ViaLiteHD* Power Supplies

5.1 6HP Rack Case Power Supplies

The HPS series power supplies provide DC power to all plug-in modules in the 19" rack case. Two versions are offered, HPS with universal mains input and HPS-DC with wide range DC input. Either one or two HPS modules can be fitted. Two HPS modules will provide dual redundant operation. Separate supply inputs mean that they can be operated from different supplies for even higher levels of availability. During normal operation, the supplies current share to maximise reliability. In the event of a failure all the rack current will be provided by the remaining operational module. The front panel LED provides a visual indication of failure, and a power good alarm output is available for use at the "Alarm Concentrator" connector.

The units are fan-cooled for maximum reliability and each PSU offers an MTBF of 270,000 hours at an ambient temperature of 40°C.



The HPS power supply has a wide range alternating current (AC) input and can operate from 110V and 230V nominal mains supplies. Mains power is applied at the rear of the units via an earthed IEC60320 connector, and regulated direct current (DC) power is supplied to the Rack Backplane PCB for distribution to the plug-in modules through a rear-mounted connectors. This connector is also used for reporting PSU alarm status.

For DC versions HPS-DC, power is applied at the rear of the units via a 2-pole screw terminal connector; it will operate from a wide range DC input 20-72Vdc.

Both types of power supply are internally fused; this fuse is only expected to fail under fault conditions. The fuse is located internally underneath the earthed safety cover; this is not user serviceable and must be returned to PPM for replacement.

On the front panel the module has a single LED indicator. This reports the status of the module. IF the LED is GREEN the unit is operating in its normal non-alarm state. If the LED is OFF, the power supply is not supplying 12V and has either failed or is in standby mode, see section 4.7.

5.2 19" Rack Case Power Requirements

The exact power requirements of modules are given in the module handbooks, however the details below maybe used to approximate the power output requirements from the rack mounted PSUs. The input power requirements can be calculated by using the power supply efficiency given in section 5.3

Single Transmitter	2.0 W Typical per slot
Single Receiver	1.3 W Typical per slot
Dual Transmitter	4.0 W Typical per slot
Dual Receiver	2.6 W Typical per slot
Transceiver	3.3 W Typical per slot
SNMP controller	5.0 W Typical per slot
Dummy load	12.0 W Typical per slot
LNA feed	up to an additional 11 watts per slot, if used
AC to DC efficiency	see section 5.3
DC to DC efficiency	see section 5.3

5.3 Specification

	HPS	**HPS-DC**
Description	Wide input range AC power supply	Wide input range DC power supply
Dimensions, internal (W x H)	6HP * 3U	
Dimensions, external (W x H x D)	188 x 129 x 30 mm	
Weight	1.5kg	
Input Supply Power	110V or 230V nominal at 50/60Hz 88 - 264V absolute range	20 – 72Vdc
Fuse	Internally fused 4 A / 250 Vac	Internally fused 10 A / 125 V
Efficiency	75%	84%
Switch on current	<20A @ 230Vac	<6.5A @ 20V input
Output Voltage	12.0 +/ -0.5Vdc	
Output Ripple	50mV	
Maximum Output Power	100 W single PSU 180 W dual redundant PSUs	
Minimum Load Power	0 W single PSU 20 W dual redundant PSUs	
Inlet air Temperature	-10 to +50°C	
Derating >+50°C	1.5% / °C, absolute maximum 70°C	3% / °C, absolute maximum 70°C
Hot-swapping and Dual Redundant	Yes	
Output overload	Built in overload protection switches output OFF and automatically restarts at 110% nominal current	
Output over voltage protection	19Vdc	
Status Indicators	Front panel GREEN power LED	
Rear Panel alarm outputs	Power Good on J1 "Alarm Concentrator" connector 12V = Normal operation; 0V = Alarm	
MTBF @40°C	270 000 hours at 100% load	

6 Installation Guide

6.1 Rack case Installation

The *ViaLiteHD* Power Supply Modules do not have an isolating switch on the mains voltage inlet. For this reason, the *ViaLiteHD* Rack Case must be installed within easy reach of a clearly labelled dual pole mains isolation switch, which supplies the equipment.

The *ViaLiteHD* 19" Rack Case is designed to fit 19" cabinets and occupies a height of 3U. The Rack Case is provided with flanges for mounting to the rack. The Rack Case backplane contains 9-way D-type data connectors for each module position. This provides user access to data connections from relevant modules (depends on module type). The pinouts of these connectors depend on the type of module in use in that rack position. There is also an "Alarm concentration" connector providing access to alarms and monitoring information from all modules and a "Power Concentration" connector that provides access to various power feeds and the summary alarm.

6.2 6HP Power Supply Module Installation (slots 15 and 16)

The *ViaLiteHD* Power Supply Module powers the plug-in modules via the Rack Case backplane PCB. It occupies slots 15 and 16.

To install a 6HP power supply module

- Push the release button of the module handle down and simultaneously pull the top of the handle forwards.
- Align the module upright and perpendicular to the front face of the rack so that the PCB slides into the "straight" card guides top and bottom.
- Gently push the module down its guide, applying pressure via the handle; you may also apply pressure just above the LED. Avoid applying pressure on the ventilation grill.
- As the module is fully mated the top of the handle should snap back and lock in position.
- The pawls of the handle should be fully engaged in the matching slots.

To remove a 6HP power supply module

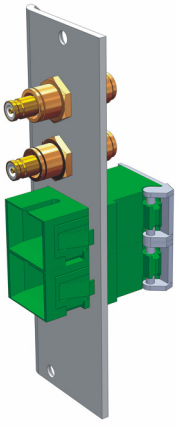
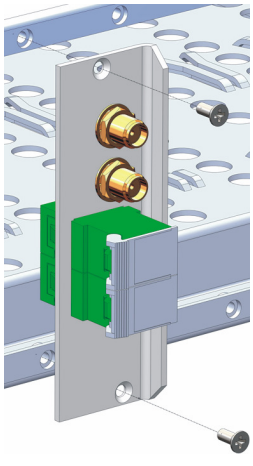
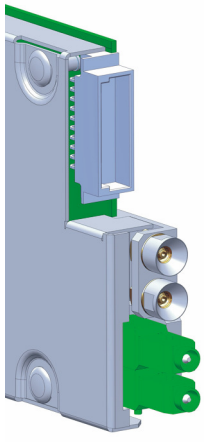
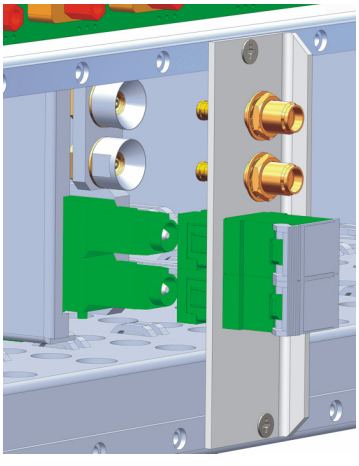
- Push the release button of the module handle down and simultaneously pull the top of the handle forwards.
- Apply pressure via the handle and gently withdraw the module from the rack.

6.3 5HP Blindmate Plug-in Modules (slots 1-13)

All *ViaLiteHD* plug-in modules are hot-swappable, so it is not necessary to power-down the Rack Case before inserting a module. All blind mate optical connectors are provided with spring loaded covers that will protect the optics of any inserted modules. As there is no cover on the opposite side, mating cables should not be installed until the slot modules are present.

To install a blind mate module and matching interface plate

- Firstly inspect the rear Blindmating plate, ensure that the connector barrels are fitted into all RF connectors and are centrally aligned.
- Remove protective covers from the inside face of the optical connector if fitted
- Ensure that the rear plate is free of any dust and contamination, if necessary clean with filtered compressed air.
- Screw the Blindmating plate into the appropriate slot at the rear of the rack, using the supplied screws and a "Pozidriv Number 1" screwdriver
- Push the release button of the module handle down and simultaneously pull the top of the handle forwards.
- Remove the protective cover from the modules optical connectors and clean any optical connectors
- Align the module upright and perpendicular to the front face of the rack so that the PCB slides into the "crow's feet" card guides top and bottom.
- Gently push the module down its guide, applying pressure via the handle, you may also apply pressure between the LED and test connector.
- As the module is fully mated the top of the handle should snap back and lock in position.
- The pawls of the handle should be fully engaged in the matching slots.
- If power is applied to the rack the module power LED should light as soon as the module is fully inserted
- Connect any interface cables to the blind mate plate

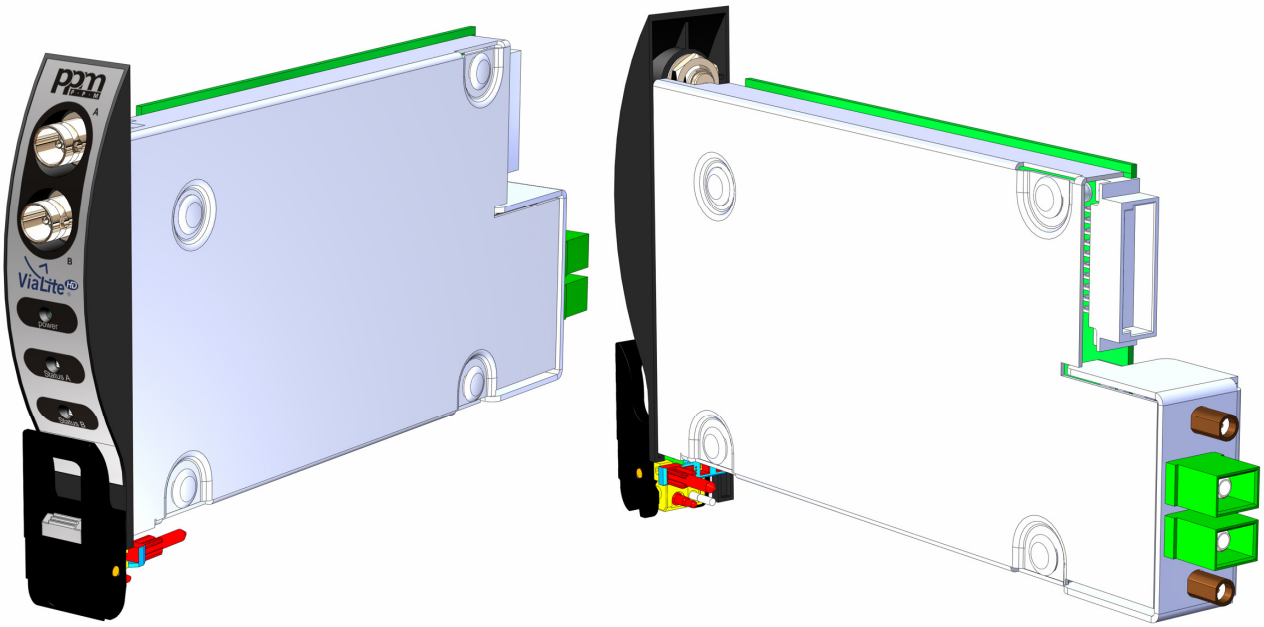





To remove a blind mate module
- Push the release button of the module handle down and simultaneously pull the top of the handle forwards.
- Apply pressure via the handle and gently withdraw the module from the rack.
- Check that the RF mating barrel is retained by the rack Blindmating plate
- All cables with be retained by the rack case.

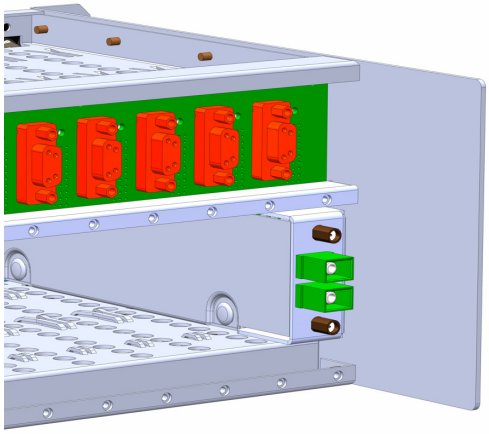
Note if modules are absent for an extended period there is chance of the optical fibres being contaminated as the optical mating interface is unprotected. If this happens it will be necessary to clean both the blind mating adaptor and fibre optic cable.

6.4 5HP Standard Plug-in Modules (slots 1-13)

All *ViaLiteHD* plug-in modules are hot-swappable, so it is not necessary to power-down the rack before inserting a module. All standard optical connectors are retained by the module. So it will be necessary to either disconnect any cables or have a sufficiently long service loop.



To install a 5HP Standard module and matching interface plate
- The protective covers on the connectors may be left in place.
- Push the release button of the module handle down and simultaneously pull the top of the handle forwards.
- Align the module upright and perpendicular to the front face of the rack so that the PCB slides into the “crow’s feet” card guides top and bottom.
- Gently push the module down its guide, applying pressure via the handle, you may also apply pressure between the LED and test connector.
- As the module is fully mated the top of the handle should snap back and lock in position.
- The pawls of the handle should be fully engaged in the matching slots.
- If power is applied to the rack the module power LED should light as soon as the module is fully inserted
- Remove protective covers and connect any interface cables



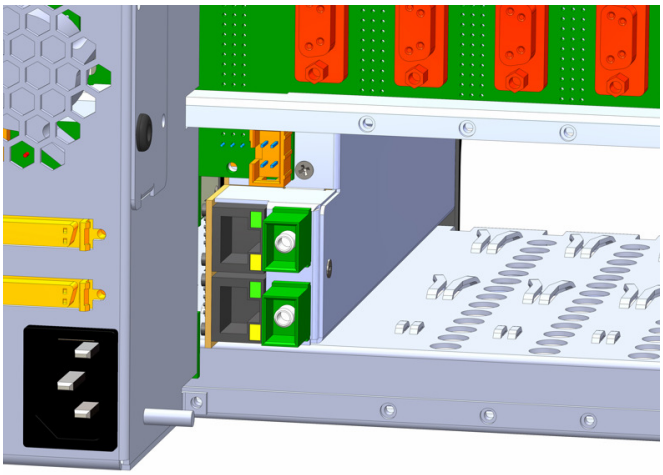
To remove a 5HP Standard module
- Disconnect any cables if necessary
- Push the release button of the module handle down and simultaneously pull the top of the handle forwards.
- Apply pressure via the handle and gently withdraw the module from the rack.

6.5 7HP Standard Plug-in Modules (slot 14 only)

All *ViaLiteHD* plug-in modules are hot-swappable, so it is not necessary to power-down the rack before inserting a module. All standard optical connectors are retained by the module. So it will be necessary to either disconnect any cables or have a sufficiently long service loop.

To install a 7HP Standard module

- The protective covers on the connectors may be left in place.
- Push the release button of the module handle down and simultaneously pull the top of the handle forwards.
- Align the module upright and perpendicular to the front face of the rack so that the PCB slides into the “crow’s feet” card guides top and bottom.
- Gently push the module down its guide, applying pressure via the handle, you may also apply pressure between the LED and test connector.
- As the module is fully mated the top of the handle should snap back and lock in position.
- The pawls of the handle should be fully engaged in the matching slots.
- If power is applied to the rack the module power LED should light as soon as the module is fully inserted
- Remove protective covers and connect any interface cables



To remove a 7HP Standard module

- Disconnect any cables if necessary
- Push the release button of the module handle down and simultaneously pull the top of the handle forwards.
- Apply pressure via the handle and gently withdraw the module from the rack.

7 Maintenance and Fault-Finding Guide

Refer to the following table that gives a list of commonly encountered problems and suggested solutions.

Fault	Possible Causes	Solution
Power LED does not illuminate on the plug-in PSUs.	Power is not connected to the PSU. PSU is in idle mode. Fuse has blown in PSU.	Connect mains power to the rear of the PSU. Check fuses of power leads. Add additional dummy load board or plug in modules. Return the unit to PPM or your local agent.
Power LED does not light.	Power supply is not connected.	Attach power source.
Fan not turning.	Fan power disconnected.	Check fan power connector is inserted.
Difficulty inserting module.	Incorrect alignment. Incorrect module slot.	Check that the module is correctly fitted in the card guides. Check that module is in correct slot Slots 1-13 for 5HP modules Slot 14 for 7 HP modules Slot 15-16 for 6 HP modules
Summary alarm triggered when no module failure is indicated.	Open collector alarms for unused slots not masked. Failed Module.	Check that the DIP switches on the Summary alarm relay module for all rack case positions are set correctly. Check the software alarm mask of the SNMP control module for all rack case positions is set correctly. Return the unit to PPM or your local agent.

In the event of any problems or queries about the equipment, contact PPM or your local agent.

For module fault finding information see module handbooks

8 Product Warranty

The Company guarantees its products, and will maintain them for a period of three years from the date of shipment and at no cost to the customer. Extended warranty options are available at the time of purchase.

Please note that the customer is responsible for shipping costs to return the unit to PPM.

The Company or its agents will maintain its products in full working order and make all necessary adjustments and parts replacements during the Company's normal working hours provided that the Customer will pay at the rates currently charged by the Company for any replacements made necessary by accident, misuse, neglect, wilful act or default or any cause other than normal use.

Claims must be made promptly, and during the warranty period.

IMPORTANT:-

Please contact both your selling agent and PPM prior to returning any goods for Warranty or Non-Warranty repairs. Goods will not be accepted without a valid Goods Return Number (GRN).

PPM, 65 SHRIVENHAM HUNDRED BUSINESS PARK, SWINDON, SN6 8TY, UK.
TEL: +44 1793 784389 FAX: +44 1793 784391
EMAIL : SALES@PPM.CO.UK WEBSITE : WWW.VIALITE.COM