ViaLiteHD
1U GPS Splitter

User Manual

GPS Splitter
HRK-12-x-HB-5

CR5266   02/03/23   C E

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** chassis provides the termination for power inputs and can be fitted with power supplies.

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

NOTE: Before removing ANY of the POWER SUPPLIES the power to that position MUST be ISOLATED (i.e. AC power is not applied to its inlet connectors). **ViaLite Communications** ships all units fitted with a single power supply with a blanking plug in the unused AC inlet, to prevent power being applied to that position; the HPS-1-0 blanking plug must not be removed unless a power supply is fitted.

When operating the equipment note the following precautions:

- Hazardous voltages exist within the equipment.
- There are no user serviceable parts inside; the covers MUST NOT be removed.
- There are no user replaceable fuses in the chassis mounted equipment. Replacement should only be carried out by a **ViaLite Communications** technician.
- The chassis earth stud SHOULD be connected to the safety earth.
- When using a 2 pin power supply cable the chassis 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** chassis MUST be installed within easy reach of a clearly labelled dual pole mains isolation switch, which supplies the equipment.
- PSU modules fused on one input feed (see section 5), should be externally fused on both inputs if the polarity of the connectors could be reversed; rating should match those given in section 5.3.

ESD Precautions

The **ViaLiteHD** 1U chassis is equipped with active electronics and will be fitted with additional active modules while in use.

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

These devices are rated as EN60825-1 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.

Hot surface

The **ViaLiteHD** Redundancy load module may have hot surfaces when operating under fulll load. The hot surfaces are not accessible when fitted in an approved chassis installation.

Suitable precaution should be taken when handling this device.
- Allow to cool for 10 minutes
- Do not touch metallic surfaces or printed circuit board when hot.
- When handling, hold front panel and handle only.

NOTE: THIS EQUIPMENT IS NOT SUITABLE FOR USE IN LOCATIONS WHERE CHILDREN ARE LIKELY TO BE PRESENT

TABLE OF CONTENTS

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 **ViaLite Communications** or your local agent.

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

Check that ALL unfitted POWER SUPPLY positions are ISOLATED (i.e. AC power is not applied to its inlet connectors). **ViaLite Communications** ships all chassis fitted with a single power supply, with a blanking plug in the unused AC inlet; to prevent power being applied to that position the HPS-1-0 blanking plug must NOT be removed unless a power supply is fitted. Failure to do this will cause a potential electrical hazard.

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, amplifiers and RF switches; they also include a full suite of supporting functions including RS232/422/485, Ethernet 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.

ViaLiteHD is a product brand manufactured by Pulse Power and Measurement Ltd (PPM). **ViaLite Communications** is a division of Pulse Power and Measurement Ltd (PPM).

3 *ViaLiteHD* GPS Splitter

3.1 Description

The GPS Splitter is a 19" rack mount 1U chassis, the chassis must be factory configured for either AC or DC power. Power supplies MUST match the chassis type (either AC or DC) failure to do so may result in permanent damage to your system. The modules fitted in the chassis must be either single or dual output blind mate GPS RX modules – Section 3.1.1.

3.1.1 GPS blind mate RX modules.

The modules fitted in your Splitter chassis will either be Type 'D' or Type 'E' to identify which you have refer to the pictures below: The type 'E' is the newer style module. It should be noted that because of the different RF and fibre connectors the two are not interchangeable. Should you wish to upgrade your Splitter rack then please contact PPM to discuss your requirements and availability of modules.
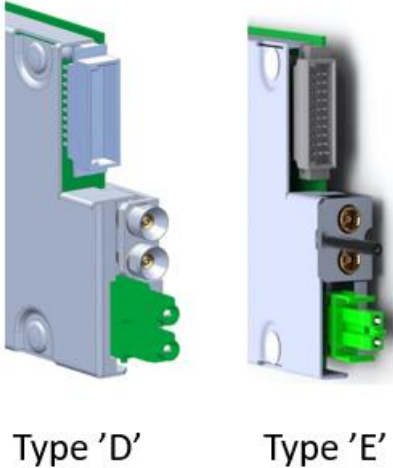
Type 'D'   Type 'E'

There are two factory configured powered versions;

3.1.2 Redundant AC Version.

Depending on part number selection the chassis will ship with two power modules fitted and both AC inputs accessible or a single power supply with a blanking plug in the unused AC inlet, to prevent power being applied to that position; the HPS-1-0 blanking plug must not be removed unless a power supply is fitted in the relevant power supply slot.

3.1.3 Redundant DC Version.

Depending on part number selection the chassis will ship with two power modules fitted and both DC inputs accessible or a single power supply however both DC inputs will still be accessible, care should be taken when connecting the DC inputs to ensure a power supply is fitted in the relevant power supply slot.

The chassis dual power supply configuration provides full redundancy and maximum reliability to avoid GPS signal loss in the event of a power supply failure. Before removing any power supply, the input power must be isolated from that module.

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

GPS Splitter Rack accommodates up to two single or dual GPS RX modules and one embedded control module and two front mount power supplies

The plug-in modules simply plug into the chassis, allowing the user to replace modules quickly and easily. For ease of upgrade and replacement, the GPS RX modules must be blind mate compatible allowing for simple plug and play operation. – refer to section 3.1.1 above.

Control of the modules is performed by an embedded SNMP controller, which is NOT field replaceable. The controller is required to provide system level monitoring and control of the two GPS module bays within the chassis.

All of the module digital alarms, analogue monitors, summary alarm relay, LNA power, external power are routed to a common chassis connector on the rear panel. This permits the integration of the *ViaLiteHD* equipment into a Maintenance & Control system.

3.2   Power Interface Management

External power can be provided to, or taken from the chassis via the "Common Chassis" connector J1, the current should be limited to 5A per pin. The power level (sum of chassis and external power) must be within the capability of the chassis power supplies, see specification in section 5.

3.2.1   External backplane power

If the chassis is powered externally the input DC voltage measured at the common chassis connector should be 12Vdc +/- 0.5V. If chassis power supplies are also fitted we would advise that a low voltage drop diode (i.e. Schottky or similar) be used to OR the power feeds.

3.2.2   Module bias feed

Port 1 on each of the 4 output banks are capable of passing an incoming bias feed through the distribution network to the relevant GPS modules. All other GPS outputs are capable of simulating a bias load to downstream devices.

3.3   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.

The GPS modules provide an alarm output to the chassis 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 chassis an alarm is registered for that module position.

3.3.1   Common Chassis 25way Connector J1

All module alarms are provided for the user on the 25 way "Common Chassis" connector on the chassis rear panel. These outputs are "open collector" outputs. There are also two analogue monitors per module position.

3.3.2   Connecting to an "open collector" output.

All the alarm lines will be loaded and pulled up. The alarm lines are pulled up to 3.3V via 4.7k ohms. Applying external voltage to these pins may cause damage, contact *ViaLite communications*. 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 chassis, the alarm will be raised for that module position.
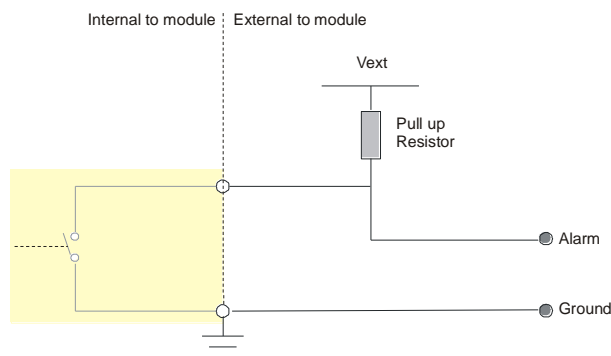
The capability of the open collector is dependent on the module that provides it.
The typical capability of the Open Collector/Drain is 50mA maximum current sink and 15V maximum voltage (Vext)

3.3.3   Summary Alarm

A summary alarm can be provided by the chassis, this function is provided by the embedded SNMP control module (automatic sensing of module presence)

There is a volt free 3-pin connection present on "Common Chassis" Connector J1. The three connections are Normally Open (NO), Common (COM) and Normally Closed (NC).

Condition 1 - Power applied to Chassis, no alarms (i.e. normal condition)
- Pin NO is open circuit
- Pin NC is connected to COM

Condition 2 - Power removed from Chassis and/or one or more module alarms (i.e. Alarm condition)
- Pin NO is connected to COM
- Pin NC is open circuit

RELAY_x   [1= normally closed, 2=common, 3=normally open]

3.3.4   Module Alarm Defeat

In some installations, the Chassis 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 software alarm mask of the SNMP control module for Chassis positions where modules are "present" is set correctly. If a software mask is set incorrectly 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 software mask.

3.4   Heat management

The chassis is designed to meet its environmental specification, when operating in a typical configuration. A typical configuration is all modules populated (2*GPS RX, 2*PSU), chassis power consumption 13 watts, no external DC power input or DC output and no obstruction to convection air path.

All module and power supply slots are cooled by convection.

- Airflow above chassis blocked: maximum operating temperature reduced by -10°C
- Airflow below chassis blocked: maximum operating temperature reduced by -5°C

3.5   Unused module positions

We advise that all unused slots be fitted with blanking panels. They fit the 5HP general purpose (slots 1-2), they can be used with any *ViaLiteHD* 19inch chassis and will prevent accidental/unwanted access and the ingress of dust.

Blanking panels are not fitted to an unused power supply position, but any unfitted power supply slot MUST be isolated from the AC power source. *ViaLite Communications* provide blanking plugs for any unused AC inlet. If only a single PSU is in use it can be fitted in either position.

Blanking panels available are.

- 85050   *ViaLiteHD* Blank Panel, 5HP reusable   Slots 1-2 (in HRK1C), Slots 1-3 (in HRK1S)
- 85049   *ViaLiteHD* Blank Panel, 7HP reusable   Slot 3 (in HRK1C)

- 85044   *ViaLiteHD* Blank Panel, 5HP   Slots 1-2 (in HRK1C), Slots 1-3 (in HRK1S)
- 85046   *ViaLiteHD* Blank Panel, 7HP   Slot 3 (in HRK1C)
- HPS-1-0   *ViaLiteHD* Blank plug, power supply   Slots 4-5

Contact *ViaLite Communications* or your local agent for more details.

The 5 and 7 HP blanking panels (85044 and 85046) are fitted with snap-in plastic barbs. These are designed to permanently hold the blanking panel in position. Please ensure that you have fully planned the configuration of you cabinet, as the plastic barbs are a close tolerance fit and removal results in the barbs being broken; the panel should then be discarded. If you wish to remove the card, reusable panels can be ordered (85050 and 85049).

85044 *ViaLiteHD* Blank Panel, 5HP   HPS-1-0 Blank plug

The power supply blanking plugs are friction fitted, they are simply inserted and withdrawn from the IEC inlets, they are a tight tolerance fit to ensure that they are retained in position.

3.6 Minimum power supply load

The 1U chassis has no minimum load requirement for either AC or DC versions

3.7   Chassis Specification

	GPS Splitter	GPS Splitter - DC
Description	19" Rack Mounting Chassis	
Max. No. of GPS modules	2 (in slots 1-2 only)	
Max. No. of PSU modules	2 (in slots 4,5 only)	
19" Rack Mounting	Yes	
Desktop Mounting	Not Suitable	
Width, internally	84 HP	
Width, externally	483 mm	
Height, internally	1U	
Height, externally	44 mm	
Depth, externally	335 mm	
Maximum weight	5.4 kg (Chassis ONLY), 5.9 kg (Chassis and slot modules)	
Cooling	Convection	
Operating Temperature	-10°C to +50°C	
Humidity	0-95%, Non-condensing	
Compatible Power Supply	HPS-1-GPS HPS-1 HPS-1-0	HPS-1-GPS-DC HPS-1-DC HPS-1-DC24 HPS-1-DC48
Chassis power input	2 x IEC 60320, 3 pins each Live & Neutral isolated Earth to chassis	2 x 4mm screw terminal, 2 pins each Positive and negative isolated
Chassis earth	Rear panel M4 stud Earth to chassis and common with backplane/RF GND	
"Common Chassis" Connector J1: 25 way D	25way Female D with screw-lock termination at the rear of the chassis • This concentrates all the modules and chassis connections in one location.	
ViaLiteHD plug-in/ blindmate module compatibility	GPS RX / GPS_RX Dual output	

3.8   Chassis connector pinouts

Pin out – J1 "Common Chassis" connector*

Pin	Chassis J1	Pin	Chassis J1	Pin	Chassis J1	Pin	Chassis J1
1	ALARM_1	8	BUC_feed_A_2	15	ALARM_P_1	22	GND
2	GND	9	GND	16	Analogue_monitor_B_1	23	BUC_feed_B_2
3	ALARM_P_2	10	BUC_feed_B_1	17	Analogue_monitor_B_2	24	Relay_1 (NC)
4	GND	11	TTL_OUT_A_2	18	Analogue_monitor_A_1	25	Relay_3 (NO)
5	TTL_OUT_A_1	12	Relay_2 (COM)	19	TTL_OUT_B_1		
6	Analogue_monitor_A_2	13	+12Vdc	20	BUC_Feed_B_2		
7	GND	14	ALARM_2	21	TTL_OUT_B_2		

Note: The Chassis and power ground are common

Note: See module handbooks for assignment and function of the "Analogue_monitor" pins
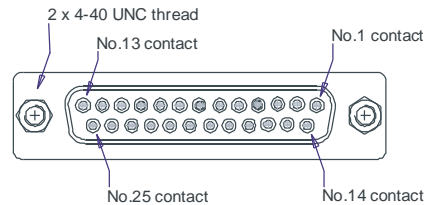
All connectors are viewed looking into connector from mating interface
Each connector is shown in the correct orientation for normally mounted 1U chassis

3.9 LNA feed simulation

Each GPS output port provides a simulated LNA loading, via a 200Ohm resistive path. Port 1 on each bank of connections provides an intelligent load; these ports are highlighted on the rear panel by a circle around the SMA connector.

The Intelligent load ports utilises communications from the TX module to the RX module, should an antenna fault, or loss of signal be detected the simulated load on these ports will be disabled allowing fault information to be passed down to the end user equipment.

4 Integral *ViaLiteHD* HRC-3 Module

Fitted internally to the HRK-12 GPS Splitter is a *ViaLiteHD* HRC-3 SNMP module. This module allows for full monitoring and control of the modules within the HRK-12 GPS Splitter, as well as acting as an Ethernet bridge between the 3 ports on the GPS Splitter (front mounted copper and 2x rear optical Ethernet). Please consult the HRC-3 user manual (HRC-3-HB) for full details of the features and capabilities offered by the HRC-3.

The integral HRC-3 module is not user-serviceable, however *ViaLite* regularly releases new software updates to resolve issues and add new features.

4.1 Software Update

The integral HRC-3 is subject to regular software updates, provided via the *ViaLite* website. These updates can be installed using the same methods described within the HRC-3 user manual (HRC-3-HB), available from the *ViaLite* website.

Alternatively, a standalone upgrade guide is available here:
https://www.vialite.com/resources/guides/performing-a-hrc-3-software-update/

4.2 Reset Button

A reset button is located on the rear panel below J1 - under all normal operating circumstances, this will not be required to be used. Short pressing the reset button will cause the module to reboot, and long pressing the reset button will cause the module to reset back to the factory default settings.

In order to activate the reset, a small object (for example bent paperclip) should be used to depress the button. The button has positive feedback and the user should feel it activating.

5 *ViaLiteHD* Power Supplies

5.1 Slide in Chassis AC Power Supplies, HPS-1-GPS

The HPS-1-GPS power supply has an AC input PSU that provides DC power to all modules in the 19" chassis. The HPS-1-GPS has a universal AC mains input. There are two power supply positions in chassis, slot S1 on the chassis left hand side and s2 which is the right hand PSU Slot when viewed from the front of the chassis. HPS modules will provide dual redundant operation. Separate mains power supply connections mean that they can be operated from different supplies for even higher levels of availability. During normal operation, the output of the power

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supplies are diode OR'd, hence one unit will provide most if not all of the chassis power requirements. In the event of a failure, all the chassis current can be provided by the remaining operational module. The Power supply front panel LED provides a visual indication of failure, and a power good alarm output is available for use at the "Chassis common" connector.
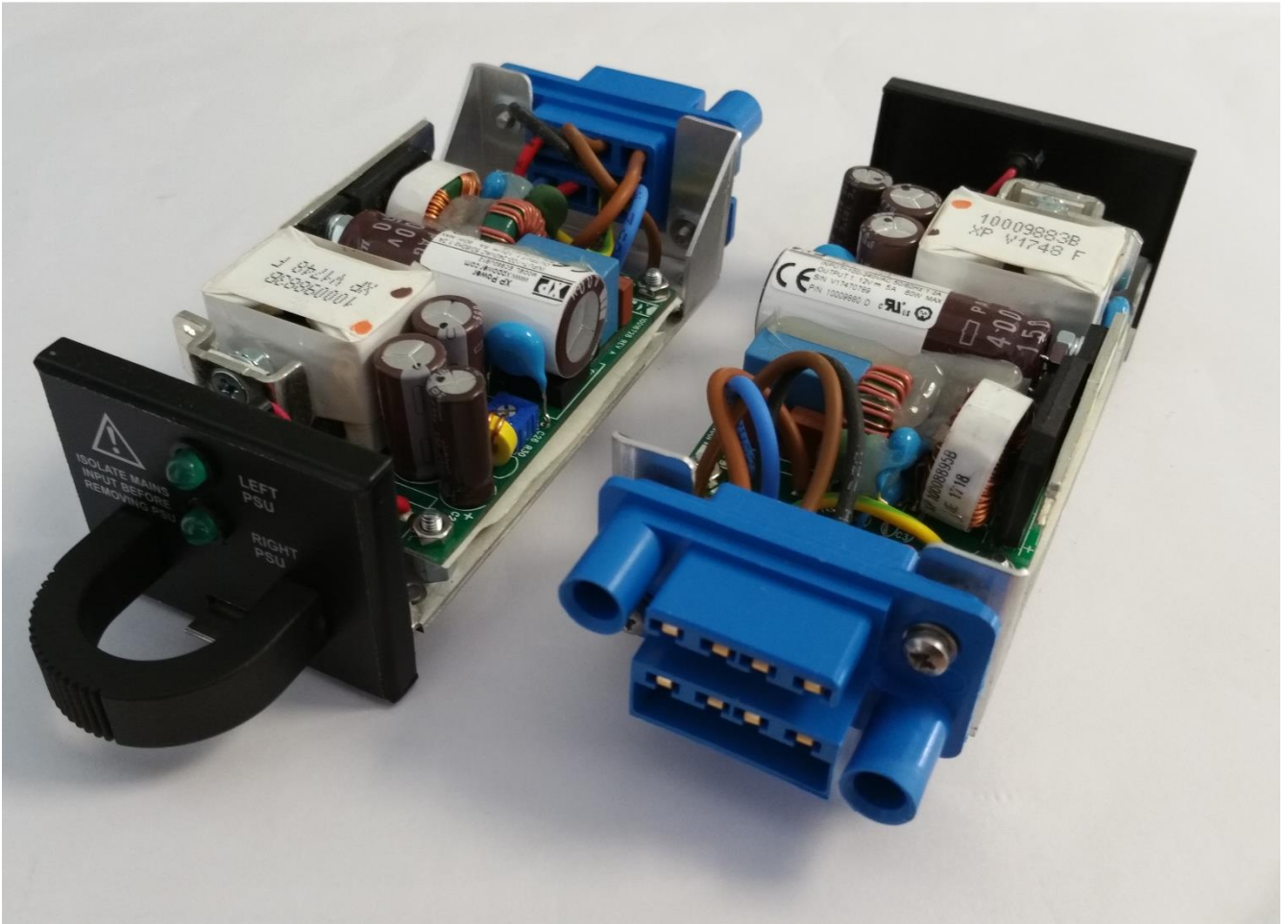
The HPS-1-GPS power supply has a wide range alternating current (AC) input and can operate from 110V and 230V nominal mains supplies. Mains power is applied at the rear of the chassis via an earthed IEC60320 connector, and regulated direct current (DC) power is supplied to the Chassis Backplane PCB for distribution to the plug-in modules. This connector is also used for reporting PSU alarm status.

The power supply is internally fused on both the live and neutral lines; these fuses will only fail under gross fault conditions. The fuse is not replaceable; the unit must be returned to *ViaLite Communications* for replacement.

On the front panel the module has two LED indicators. These report the status of both the power supply modules. IF the LED is GREEN the module is operating in its normal non-alarm state. If the LED is OFF, the power supply is not supplying 12V and has failed.

These AC power supplies MUST ONLY be fitted in AC chassis types.

5.2   Slide in Chassis DC Power Supplies, HPS-1-GPS-DC

The HPS-1-GPS-DC power supply has a DC input that provides DC power to all plug-in modules in the 19" chassis. The HPS-1-GPS-DC has wide range DC power input. There are two power supply positions in chassis, slot 4 on the chassis left hand side and slot 5 which is the right hand PSU Slot when viewed from the front of the chassis. HPS modules will provide dual redundant operation. Separate DC supply connections mean that they can be operated from different supplies for even higher levels of availability. During normal operation, the output of the power supplies are diode OR'd, hence one units will provide most if not all the chassis power requirements. In the event of a failure all the chassis current can be provided by the remaining operational module. The Power supply front panel LED provides a visual indication of failure, and a power good alarm output is available for use at the "Chassis common" connector.
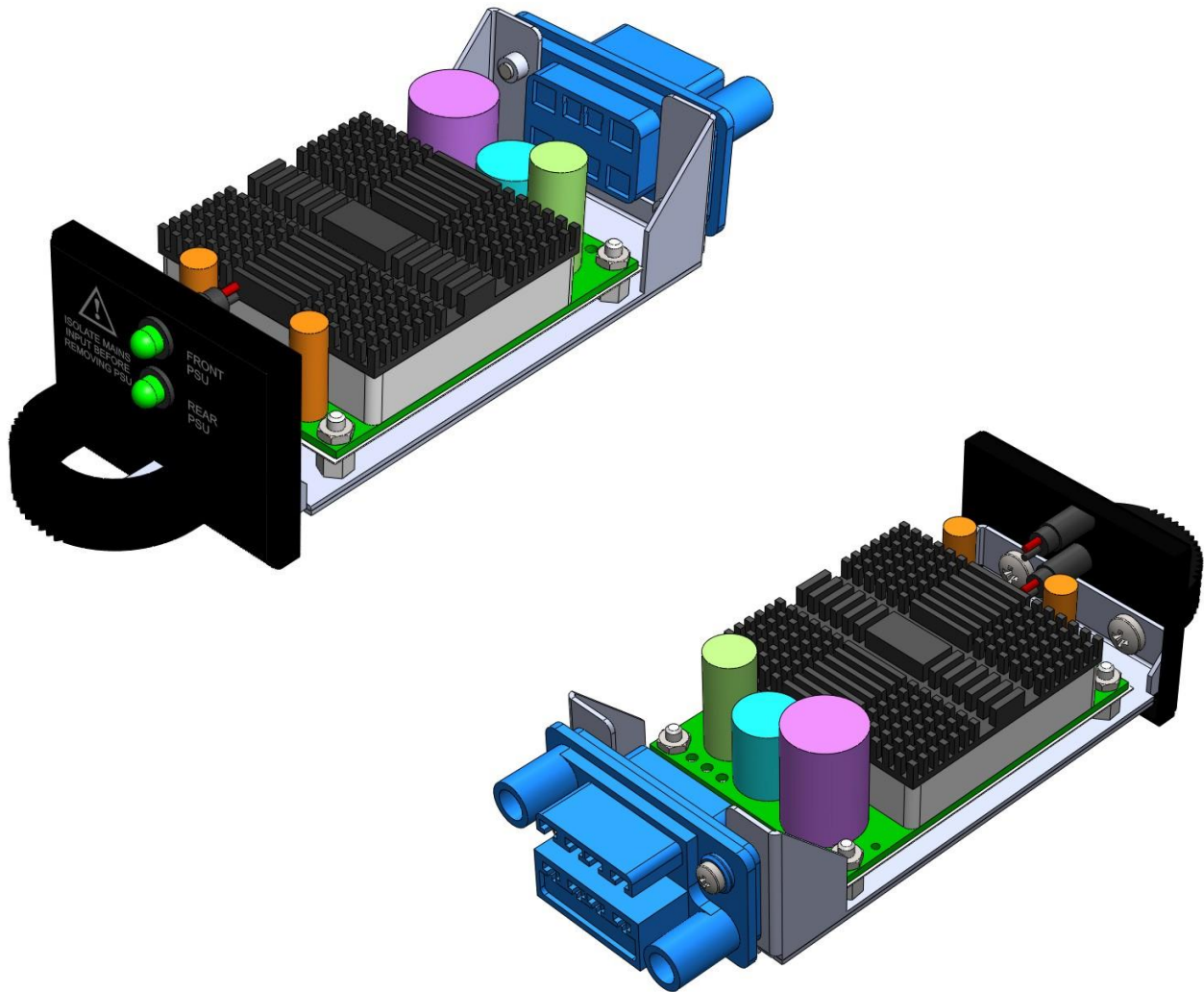
The HPS-1-GPS-DC power supply has a wide range direct current (DC) input and can operate from weight nominal DC supplies. DC power is applied at the rear of the chassis via 4mm screw terminals, and regulated direct current (DC) power is supplied to the chassis backplane PCB for distribution to the plug-in modules. This connector is also used for reporting PSU alarm status.

Each HPS-1-GPS-DC PSU is capable of supplying 40W of output power, this is sufficient to power a fully populated chassis configurations with some margin. The HPS-1-GPS-DC is supplied as the standard DC power supply for the 1U chassis. If higher output power is required (up to 60W) different power supplies can optionally be provided, the HPS-1-GPS-DC24 and HPS-1-GPS-DC48 have a narrower voltage input range see paragraph 5.3, please contact *ViaLite Communications* for more details.

The DC power supply is internally fused ONLY on the positive input; this fuse will only fail under gross fault conditions. The fuse is replaceable – access to the fuse is from the bottom of the module. See section 5.2.1 for more details.

On the front panel the module has two LED indicators. These report the status of both the power supply modules. IF the LED is GREEN the module is operating in its normal non-alarm state. If the LED is OFF, the power supply is not supplying 12V and has failed.

These DC power supplies MUST ONLY be fitted in DC chassis types.

5.2.1   Fuse replacement in DC Power Supplies

To replace the fuse of the HPS-1-GPS-DC you will need a tweezers or small pliers.
- Isolate the power input to the supply.
- Remove the power supply from the chassis.
- Use a pair of tweezers to remove the failed fuse.
  NOTE: The fuse is fitted in a socket, see below for a picture of the removable part
- Replace the fuse with a suitable part, details below.
- Check the fuse is securely fixed.
- Replace the power supply.
- Restore the power input to the supply.

Suitable replacement fuse:
Description: 5A, 125V, slow blow, OMNI-BLOK, SMD socketed
PPM part number: 59887
Source: Littelfuse Suppliers part number: 0454005.MR

Slot in base to access the fuse

OMNI-BLOK removable fuse
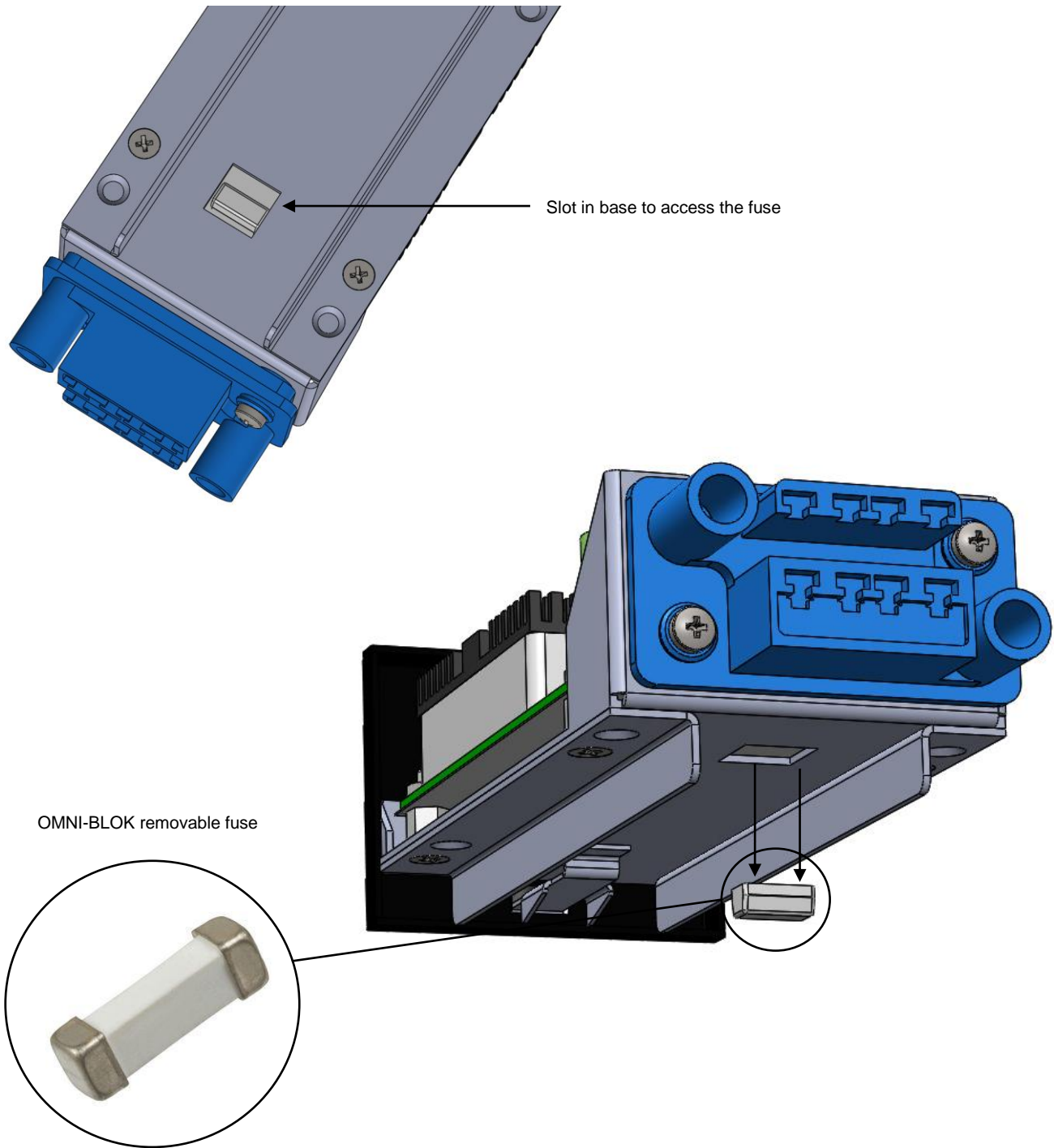
Position and replacement of HPS-1-GPS-DC fuse

5.3   Specification

	HPS-1-GPS	HPS-1-GPS-DC	HPS-1-GPS-DC24	HPS-1-GPS-DC48
Description	Wide input range AC power supply			
Dimensions, internal (W x H)	1U high			
Dimensions, external (W x H x D)	41 x 53 x 130 mm			
Weight	0.25 kg			
Input Supply Power	88 - 264V Nominal 110V/230Vac at 50/60Hz,	20 – 72Vdc	18-36Vdc	36-72Vdc

Fuse [Fused inputs]	Internal, 15A / 250V [LIVE and NEUTRAL]	Internal, 5A / 125V [POSITIVE]		
Efficiency	85% typical	89% Typical	90% Typical	
Switch on current, cold start	<40A @ 230Vac	<4.5A @ 20V		<4.5A @ 36V
Output voltage	12.0 +/ -0.5Vdc			
Output ripple	120mV pk-pk			
Maximum input current	1.0A	2.5A		1.4A
Maximum output power	60 W	40W	60 W	
Minimum load power	No minimum load			
Inlet air temperature	-10 to +50°C			
Derating >+50°C	2.5% / °C, absolute maximum 70°C			
Hot-swapping	No, power must be isolated before extracting modules and not restored until new unit is in place			
Dual Redundant	Yes			
Output overload	Built in overload protection switches output OFF and automatically restarts at >130% nominal current			
Output over voltage protection	14Vdc Typical	15Vdc Typical		
Status Indicators	Front panel GREEN power LED, one for Left and one for Right module			
Rear Panel alarm outputs	Power Good on J1 "Chassis common" connector 12V = Normal operation; 0V = Alarm			
Cooling	Convection			
MTBF @25°C at 100% load	470 000 hours	150 000 hours	110 000 hours	

5.4   19" Chassis Power Requirements

Ensure that the power supplies fitted in your system are sufficient to power the complete system. The power supplies are design to operate in dual redundancy, without current sharing. Hence power capability of one supply must be sufficient to power the complete chassis.

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 chassis mounted PSUs.

The input power requirements can be calculated by using the power supply efficiency given in section 5.3.

Single Receiver	1.5 W Typical per slot
Dual Receiver	2.6 W Typical per slot
SNMP controller	4.0 W Typical per slot
Alarm and Load	1 W Typical, plus 0/3/6/9/12 W load, per slot
DC to DC efficiency	see section 5.3
DC to DC efficiency	see section 5.3

6   Installation Guide

6.1   Chassis Installation

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

The *ViaLiteHD* 19" Chassis is designed to fit 19" racks and occupies a height of 1U. The Chassis is provided with flanges for mounting to the rack. There is also a "Common Chassis" connector providing access to alarms, monitoring information from all modules, power feeds and the summary alarms.

6.2   Power Supply Module Installation (slots 4 and 5)

The *ViaLiteHD* Power Supply Module powers the plug-in modules via the Chassis backplane PCB. It occupies slots S1 and S2.

To install a power supply module
*   Ensure the power to power supply module is isolated.
*   Align the module ensuring that the guides on the sledge engage in the crow's feet.
*   While fully lifting the catch gently push the module down its guide, applying pressure via the handle; ensure as the module fully engages and that the front panel is fully within the chassis slot.
*   When full engaged the module should lock in position.
*   Power may now be applied.

To remove a power supply module from the rack – a safeguard is in place
*   Isolate power to the module to be removed.
*   Use a tool (flat blade screwdriver) to unlatch the catch then release the power supply by pulling the module towards yourself.
*   The module can be fully withdrawn.
*   If the slot is to be left unpopulated for any period of time please fit the modules inlet with an HPS-1-0 blanking plug.

Note: The plug on the power supply cord is used as a disconnect device, thus the socket-outlet must be easily accessible.

6.3   GPS RX Plug-in Modules (slots 1-2)

All *ViaLiteHD* GPS RX plug-in modules are hot-swappable, so it is not necessary to power-down the chassis before inserting a module. All Optical and electrical connections are blind mate and as such will disengage on removal of the module from the chassis.

To install a GPS RX 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.
- Ensure that the rear plate is free of any dust and contamination, if necessary clean with filtered compressed air.
- 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 to the front face of the chassis 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.
- 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 chassis 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 GPS RX 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 chassis.

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 blanking panel installation

Blanking panels should be the last panel installed into your chassis

To install the blanking panel
- Firstly inspect the blanking panel ensure that the plastic barbs are in good condition.
- Align the plastic barbs with the larger holes centrally above and below the slot on the chassis top and bottom rails.
- Firmly push the panel in until you feel the barbs click.

To remove the blanking panel
- Pull the blanking panel towards you, it may be necessary to use extra leverage.
- Discard the panel as the plastic barbs will now be over stressed and will not provide a reliable fixing.

6.5   Power supply blanking panel installation (slots 4, 5)

Blanking panels HPS-1-0 should be fitted on any unused AC power supply inputs, to ensure there are no exposed AC connections.

To install the blanking panel
- Align with the PSU connector and push in. Removal is the opposite of installation.

6.6   Electrical power connection

Power should be applied to the chassis with the supplied power cords, if these are not used a suitable alternative should be used. A substitute power cord should be rated as following

- Current rating   10A
- Voltage rating   To match your installation requirement
- Mating connector (AC)   IEC 60320 C13 socket
- Mating connector (DC)   Either 4mm plug or stripped wire

You should ensure that all cable is routed carefully to protect them from mechanical damage especially those caused by sharp edges.

Each chassis has two separate power feeds, these separately feed slots 4 and 5, as shown below. To fully isolate the chassis BOTH power feeds MUST be removed.

Ground Stud (M4)
Right PSU AC Feed
Left PSU AC Feed

Electrical power connection locations for AC chassis

6.7   Fibre Connections

Depending on chassis / model configuration the system will present between 1 and 4 fibres allow for system redundancy. Each Optical input feed a dedicated set of RF outputs; there is no internal switching capability. Connectivity between optical ports and RF ports is referenced below:

    HRK-1C-081   1:8 splitter x 1
       S1A -> S1A-1 to S1A-8

    HRK-1C-082   1:8 splitter x 2
       S1A -> S1A-1 to S1A-8
       S2A -> S2A-1 to S2A-8

    HRK-1C-084   1:8 splitter x 4
       S1A -> S1A-1 to S1A-8
       S1B -> S1B-1 to S1B-8
       S2A -> S2A-1 to S2A-8
       S2B -> S2B-1 to S2B-8

    HRK-1C-161   1:16 splitter x 1
       S1A -> S1A-1 to S1A-16

    HRK-1C-162   1:16 splitter x 2

    S1A -> S1A-1 to S1A-16
    S2A -> S2A-1 to S2A-16

Prior to installing any optical connections care should be taken to ensure that both mating halves of the connection are free of any dust and contamination, if necessary clean with filtered compressed air.

6.8   <u>SNMP Fibre Connections</u>

There are a pair of dual LC fibre connections on the rear panel allowing redundant gigabit communications links to the embedded SNMP module. These are standard optical Ethernet connections and can be connecting into a management network.

Note: The SNMP module bridges its Ethernet ports and as such any should be connected to a single network to remove the risk of data leaking between two distinct networks. Only a single IP address is assigned to the SNMP module.

6.9   <u>SNMP Ethernet Connections</u>

A third Copper Gigabit Ethernet connection is present on the front panel allowing service personnel to connect to the SNMP module at a chassis level. This port is also bridged with the two rear optical ports and should be handled accordingly.

6.10   <u>GPS connection</u>

Connections to the GPS RF ports on the rear of the unit should be made as follows:

1. Confirm that the required bank has an optical connection fitted.
2. Start with the lowest number port available in the relevant bank
3. If fitted remove the relevant 50Ohm termination and store for future use
4. Connect and 50Ohm SMA terminated cable to the port on the rear of the unit, tighten to finger tight being careful not to cross thread the connector.
5. Once finger tight torque to 0.9nM via an appropriate SMA torque spanner.

7   <u>Part Numbering</u>

For part numbering please refer to the relevant datasheet which can be found on our website or contact us.

8   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.	Connect mains power to the rear of the PSU. Check fuses of power leads.
	Fuse has blown in AC PSU.	Return the module to **ViaLite Communications** or your local agent.
	Fuse has blown in DC PSU	Replace fuse
Power LED does not light.	Power supply is not connected.	Attach power source.
	Incorrect rack or power supply type	Check that rack type (AC or DC) matches your power source.
		Check that power supply type matches your power source type (AC or DC) and voltage.
Difficulty inserting module.	Incorrect alignment.	Check that the module is correctly fitted in the card guides.
		Check that module is correctly orientates with the chassis.
Summary alarm triggered when no module failure is indicated.	Open collector alarms for unused slots not masked.	Check the software alarm mask of the SNMP control module for all chassis positions is set correctly.
	Failed Module.	Return the module to **ViaLite Communications** or your local agent.

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

For module fault finding information see module handbooks

9 Product Warranty

The guarantee / warranty period, unless otherwise agreed in writing, shall be as stated in document F292 - PPM Manufactured Product – Warranty, which is available at: https://ppm.co.uk/warranty-periods/. Extended warranty options are available at the time of purchase.

Prior to returning any goods for warranty or non-warranty repairs please contact PPM / *ViaLite Communications* for a returns reference.

10 FCC Approval

Information to the user of *ViaLiteHD* products.

For a Class A digital device or peripheral, the following instructions are furnished to the user. 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 instruction 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.