Outdoor enclosure type A4
ODE-A4

User Guide

HAx-HB (Issue 9)

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Precautions

General Safety

- This product is **not** intended for use at altitude greater than **2000 m above sea level**.
- This product is intended to be installed and used by an **Operator***. Read the product handbook in full, and ensure Operators* are aware of any hazards, before attempting to install or use this product.
- There are no serviceable parts inside; component covers **MUST NOT** be removed.
- Moving parts are present in this product. **Moving parts can crush and cut**. Beware of moving parts.
- Coaxial cables are intended for use within the same earthing network. Coax cables that leave the earthing network must be reviewed by an Operator*.

Electrical Safety

ViaLite Power Supply Units are Safety Class 1 products (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.
- The equipment does not have an external mains isolating switch. Equipment must be installed within easy reach of a dual pole mains isolation switch.
- User replaceable fuses and module replacement should only be carried out by a Skilled Person*.
- Installation of this equipment into the customer system must be carried out by a suitably Skilled Person* in an electrically safe manner.
- The environment in which the equipment is installed must not be accessible by an Ordinary Person* so as to avoid unintentional contact with live surfaces.

ESD Precautions

Precautions for handling electro-static sensitive devices should be observed when handling all ***ViaLite*** modules. Operators* 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 buildup. 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 ***ViaLite*** RF Transmitter modules contain laser diode sources operating at nominal wavelengths of 1270 nm to 1610 nm.
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.

*PPM defines the following persons (based on IEC 62368):

- *Ordinary Person*
  - Person who is neither a *Skilled Person* nor an *Operator*.
- *Operator* (also known as “*Instructed person*” or “*User*”):
  - Person instructed or supervised by a skilled person as to any hazards and who can responsibly use equipment safeguards with respect to those hazards.
- *Skilled Person*:
  - Person with relevant education or experience to enable him or her to identify hazards and to take appropriate actions to reduce the risks of injury to themselves and others.

Contents

1 INTRODUCTION 4
1.1 Typical deployment 4
1.2 ViaLiteHD compatibility 4
1.3 Care of fibre optic connectors 5
1.4 Fibre optic cable & connectors 5
1.4.1 Connector and cable types 5
1.4.2 Connecting and disconnecting 5
1.4.3 Cleaning optical connectors, cleaning before every use 5
1.4.4 Cleaning optical connectors, high levels of contamination 5
1.4.5 FC/APC Connectors 6
1.4.6 SC/APC Connectors 7
1.4.7 Minimum bend radius 7

2 SETTING UP THE ODE-A4 8
2.1 ODE-A4 external features 8
2.1.1 Humidity control/ventilator gland 9
2.2 Weatherproof interface connections 9
2.3 Mounting the ODE-A4 10
2.3.1 Using the 70002 wall mounting bracket 10
2.3.2 Using the 70004 pole mounting kit 11
2.4 Solar and wind shield, 70001 12
2.5 Lightning Suppressor 12
2.6 Antennas 14
2.7 Termination of RF Connections 14
2.8 Termination of power 15
2.9 Termination of Optical fibre 16
2.10 Remote Management and Control 17

3 ODE-A4, INTERNAL FEATURES 18
3.1 Normal Configuration 18
3.1.1 MTP Configuration ONLY 19
3.2 LNB Voltage selection 20
3.2.1 LNB Customer variable voltage source 20
3.2.2 LNB Voltage tolerance 20
3.3 High voltage or High power LNB/BUC supply options 21
3.4 ODE-A4 power supplies 21
3.5 Replacement of Power Supply Modules 21
3.6 Replacement of OEM Modules 21
3.7 PSU power isolation switches 22
3.8 ODE-A4 switch bar replaceable fuse 22

4 PRODUCT WARRANTY 23

1 Introduction

The Outdoor Enclosure type A4 (ODE-A4), is a cost-effective weatherproof enclosure for ***ViaLiteHD*** systems and associated hardware. It is intended to service the requirements of most GPS timing and satellite communication systems though can be configured to suit a wide range of other applications.

The ODE-A4 system is comprised of the following key parts:
- IP-65 rated external enclosure fitted with:
- Dual power supplies (redundancy or power sharing)
- Capacity of up to four ***ViaLiteHD*** OEM modules with front panel connections
- Termination of input power cable (inside the supplied quick release latching connector)
- Patch box for termination of optical cable (various fibre cable lengths available)
- Connectorised RF inputs / outputs

It has a wide range of optional accessories including:
- Lightning suppressor(s)
- GPS active antenna (s) + fixings
- Optical cable
- Wall or pole mount fixings
- Solar shield
- Ancillary RF devices.
- Remote management and control
- GPS splitter

ViaLiteHD RF Fibre Optic Links (FOLs) are a family of fibre optically coupled link systems designed for the transmission of RF analogue signals over long distances for the communications market.

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

1.1 Typical deployment

A typical system operates as follows.

The ODE-A4 would house a set of FOL TX modules, in a remote outdoor location connected to antenna equipment. **NOTE: deployment must not occur at more than 2000m above sea level.** Antenna electrical signals are input to the transmitter modules, which contain RF signal conditioning and laser control circuitry. The modules modulate the intensity of a beam of light with the RF signal for optical transport over a fibre optic cable.

The light travels through the optical fibres to corresponding receiver modules. The distance between transmitter and receiver can range from 1m to 100km; distance in excess of 100km can be achieved with more complex optical transport systems, depending on the system specified.

The receiver module converts the modulated light back into an electrical signal, which is available at its output.

1.2 ViaLiteHD compatibility

The RF and optical interfaces are compatible with all ***ViaLiteHD*** Blue modules.

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

1.3 Care of fibre optic connectors

When the fibre optic cables are not connected, it is essential that the cable and equipment connectors are protected by the dust caps provided with the system. Failure to do so may result in damage to the fibre ends, which are critical to the system performance. Please refer to section 1.4 for fibre optic cable handling details.

1.4 Fibre optic cable & connectors

1.4.1 Connector and cable types

All ***ViaLiteHD*** RF modules use single mode (9µm/125µm) cable terminated in a range of optical connectors detailed below. Cross-site fibre optic cables are available from ***ViaLite Communications*** as either standard patch leads or heavy-duty multicore cables.

Warning!

Angle polished (APC) and standard (PC) connector must not be confused. The two connector types are not interchangeable and mating one with the other will damage both the cable and the module connectors.

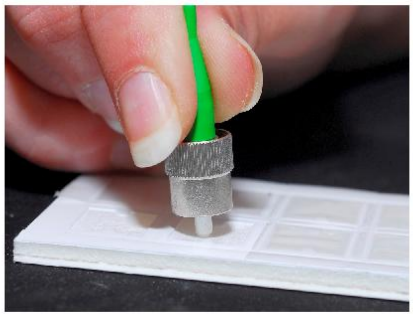
The specification of optical connector is critical to the performance of the complete fibre optic link. System performance can only be guaranteed with fibre optic cables and connectors supplied by ***ViaLite Communications***. When FC/APC connectors are specified they must be “narrow key width”

1.4.2 Connecting and disconnecting

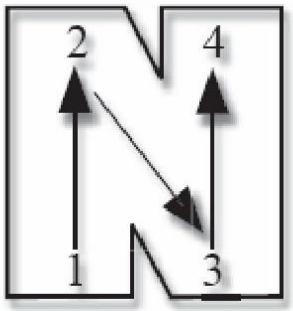
Before connecting optical fibres to the module or to each other, ensure that the mating connectors are clean (see below).

1.4.3 Cleaning optical connectors, cleaning before every use

Optical connectors MUST be cleaned before use, even where they have been protected with dust caps.
A large percentage of performance issues can be attributed to dirty fibres.



- Peel the plastic cover from an unused “N” cleaning pad.
- Hold the connector between your thumb and forefinger
- Clean the connector using firm pressure by swiping in a pendulum motion through each segment of the “N” shape, following the diagram
- Do not swipe over the same space twice.



For more details please read the cleaning instruction which accompanies the connector cleaning kit.

1.4.4 Cleaning optical connectors, high levels of contamination

If there are performance issues that are not resolved by basic cleaning in section 1.4.3, then the following procedure should be used. If the level of contamination is high it will be necessary to repeat this procedure.

Cleaning items required

- Lint free fibre cleaning tissues and/or cleaning sticks (normal cosmetic tissues produce dust and are not acceptable).
- Reagent grade Iso Propyl Alcohol (IPA).
- Air duster or filtered compressed air line.

Cable Connector Cleaning

- Dampen a patch of cleaning tissue with IPA and clean all surfaces of the plug ferrule.
- Using a dry cleaning tissue, dry the ferrule and clean the end face.
- Using the air duster, blow away any residue from the end of the connector.

Module Female Receptacle Cleaning (only recommended if problems are being experienced)

- Either use an optical cleaning stick or twist a cleaning tissue to form a stiff probe, moisten either with IPA. Gently push the probe into the receptacle and twist around several times to dislodge any dirt.
- Repeat the above process with a dry tissue.
- Using the air duster, blow away any residue from the receptacle.

Important Notes

- IPA is flammable. Follow appropriate precautions / local guidelines when handling and storing.
- IPA can be harmful if spilt on skin. Use appropriate protection when handling.
- It should only be necessary to clean the female receptacles on the modules if problems are being experienced.

Never inspect an optical fibre or connector with the naked eye or an instrument unless you are convinced that there is no optical radiation being emitted by the fibre. Remove all power sources to all modules, and completely disconnect the optical fibres.

1.4.5 FC/APC Connectors

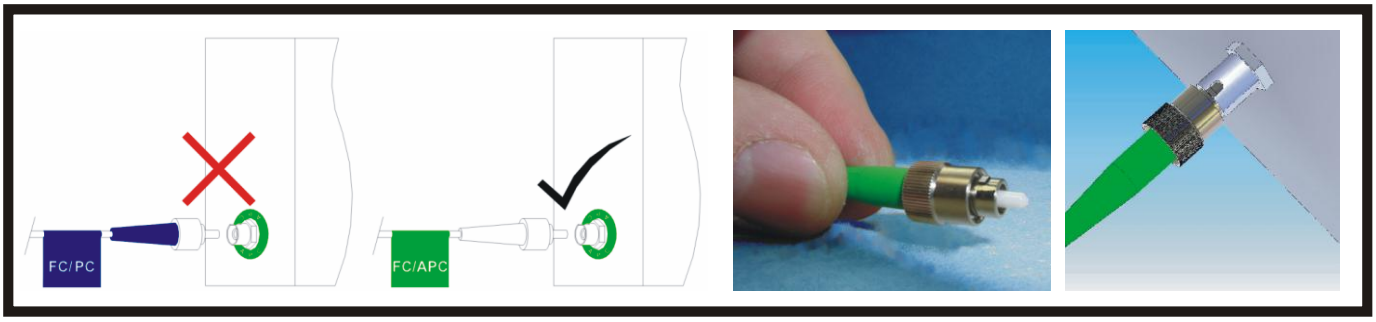
To connect FC/APC optical connectors follow these steps:

- Remove the dust caps and align the white ceramic centre ferrule on the cable connector with the mating receptacle.
- There is a key (lug) on the side of the ferrule, which must match the keyway (gap) in the receptacle shroud.
- When they are aligned, gently push the plug home.
- Finger tighten the knurled collet nut onto the threaded receptacle.

To disconnect follow these steps:

- Using fingers fully unscrew the knurled collet nut, gently withdraw the connector.
- Replace the dust caps on both the receptacle and the cable plug.

Warning! It is possible to tighten the knurled collet without aligning the lug and gap. This will result in poor light transmission. Check that the lug and gap are aligned before tightening the knurled collet



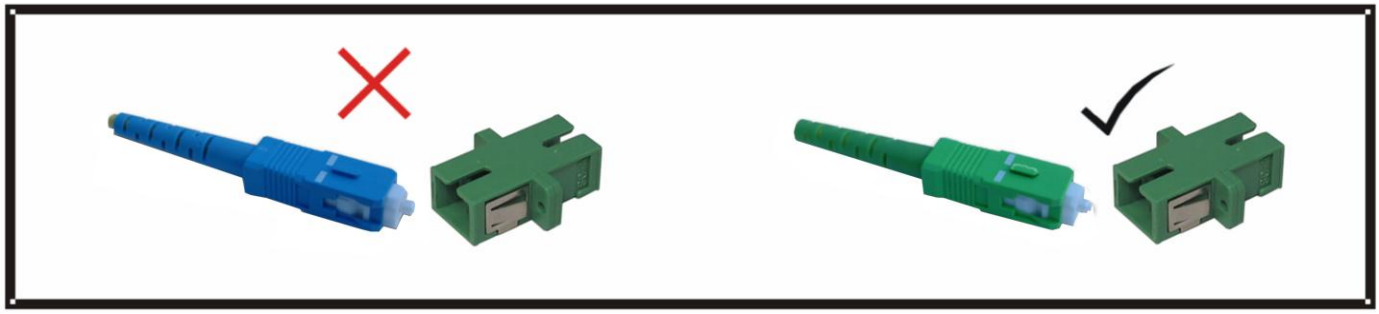
1.4.6 SC/APC Connectors

To connect SC/APC optical connectors follow these steps:

- Remove the plug protective cover.
- Align the connector keyway slot in the adaptor to the key of the plug.
- Gently push the plug-into the adapter until a click is heard and the connector locks.

To disconnect follow these steps:

- grip the body of the plug and gently pull the plug from the adaptor, replace the protective cover.



Only connect SC/APC cable to SC/APC.

1.4.7 Minimum bend radius

Because optical fibre is made of glass, it is important not to subject it to excessive stress. For this reason, each type of cable has a minimum bend radius (MBR) specification, beyond which the cable cannot be bent without permanent damage occurring.

The minimum bend radius (MBR) of fibre optic cable fitted to ***ViaLite*** modules is 50mm. MBR specifications for ***ViaLite Communications*** supplied fibre optic cables are given in the ***ViaLiteHD*** System Handbook Hxx-HB.

2 Setting up the ODE-A4

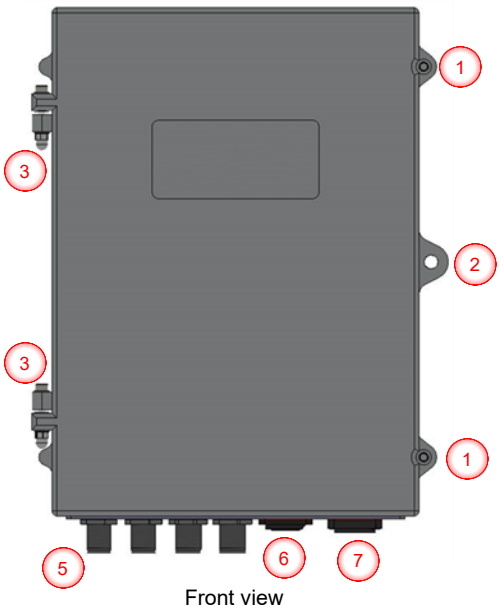
This section describes the connections between your ODE-A4 and external systems and steps that must be taken to set it up. Your ODE-A4 should be delivered preconfigured and ready, but will require connections to external services. This will generally require that you take the following steps:

- Mount the ODE-A4 and the patch box in the required locations
- Terminate the fibre connections within the patch box
- Terminate the RF connections at the ODE-A4 base plate
- Terminate the input power at the ODE-A4 base plate

2.1 ODE-A4 external features

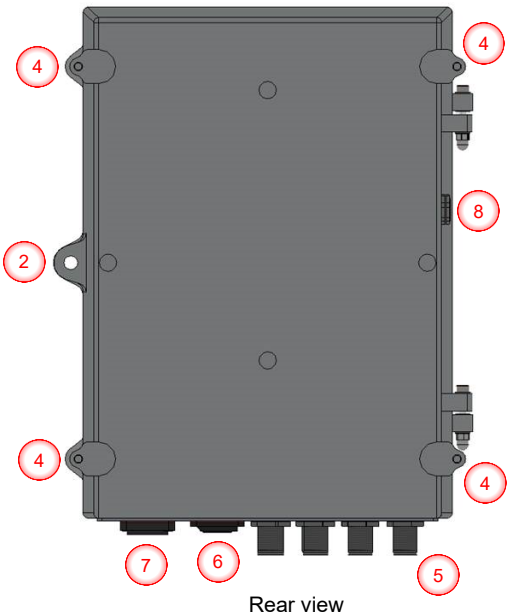
The ODE-A4 is closed via two M5 screws (91052) this can be torqued with a 4mm AF hexagonal key (supplied with system). The rear provides fixing points for mounting the unit to either a wall mount plate or a pole mounting kit. The unit may also be fitted with a solar shield, this is advisable for any application where there may be significant solar gain.

70001	Sunshield & Windshield- use in high or low ambient temperatures, attaches onto 75010 Outdoor Enclosure lid.
70002	Wallmount Plate for 75010 Outdoor Enclosure, Kit & Fixings
70004-XXX	Pole mounting kit, pole diameter XXX (diameters range from 15 – 168mm)
70005	GPS Marine Antenna SA200 with mounting hardware
70073	Lightning Suppressor Kit for Outdoor Enclosure, 800-2500MHz Passband + DC Path, 1 required per RF Channel (2 Max)
70013	Lightning Suppressor Kit for Outdoor Enclosure, DC-5800MHz Passband, 1 required per RF Channel



Front view

1. Lid securing screws
2. Optional lock attachment
3. Hinges
4. Securing points for mounting hardware
5. RF Connections
6. Fibre connection to patch box
7. Power connection
8. Gore Vent



Rear view

2.1.1 Humidity control/ventilator gland

The enclosure incorporates a side mounted vent that allows the air pressure inside the enclosure to equalise with the external environment. Furthermore, it allows excess humidity to leave the enclosure whilst preventing moisture from entering.
Upon installation and sealing of the enclosure, this vent facilitates a stable low pressure differential to ease stress on the seals and a natural continual drying of the internal humidity for improved reliability of the electronics.
It is important to not obstruct / remove or repurpose the vent gland.

2.2 Weatherproof interface connections

To maintain the enclosure's IP rating, you should observe the following:

- The front door should be closed and screws tightened.
- All glands should be compressed on to either a cable or blanking rod.
- All connectors should be mated to either a matching half or suitable sealing dust cap.
- All RF coaxial connectors exposed to the weather should be weatherproofed. *

**A typical way of doing this is by wrapping the mating point with a layer of self-amalgamating tape (also known as self-fusing or self-vulcanizing) for waterproofing, plus a layer of UV-resistant electrical tape on top for UV protection. The electrical tape may benefit from a cable tie over the end / last wrap to prevent it unwinding.*

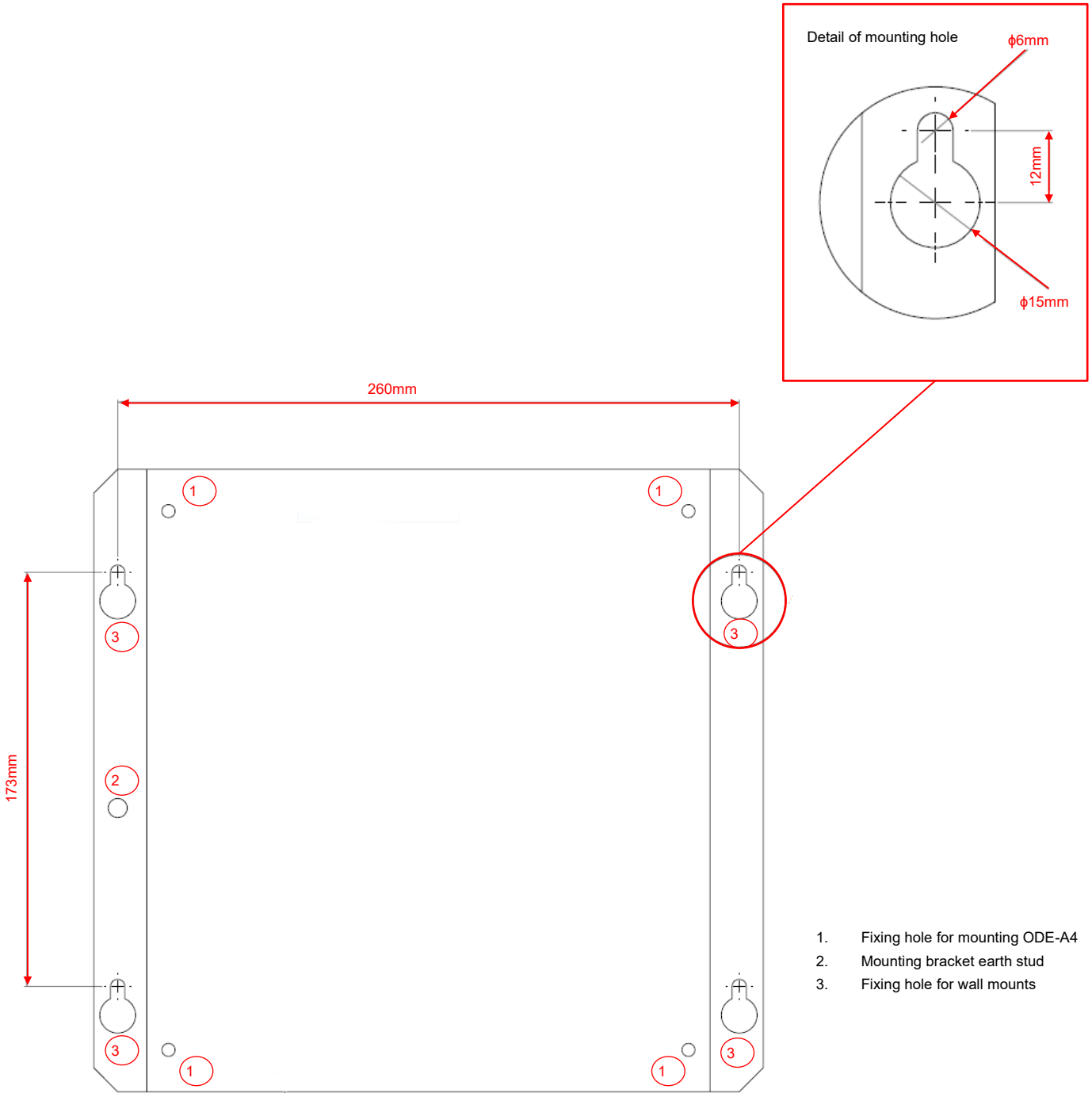
For an external coaxially connected component like a Lightning Arrestor, both coaxial connections should be waterproofed.

2.3 Mounting the ODE-A4

2.3.1 Using the 70002 wall mounting bracket

To wall mount your enclosure follow these steps:

- Drill holes in wall/ panel as per dimensions in drawing.
- Mount screws/ fixing hardware into wall.
- Slide Outdoor Enclosure/ Wall Bracket onto position using the keyhole slots.
- Once on wall, tighten fixing hardware to ensure Assembly is firmly held in situ.



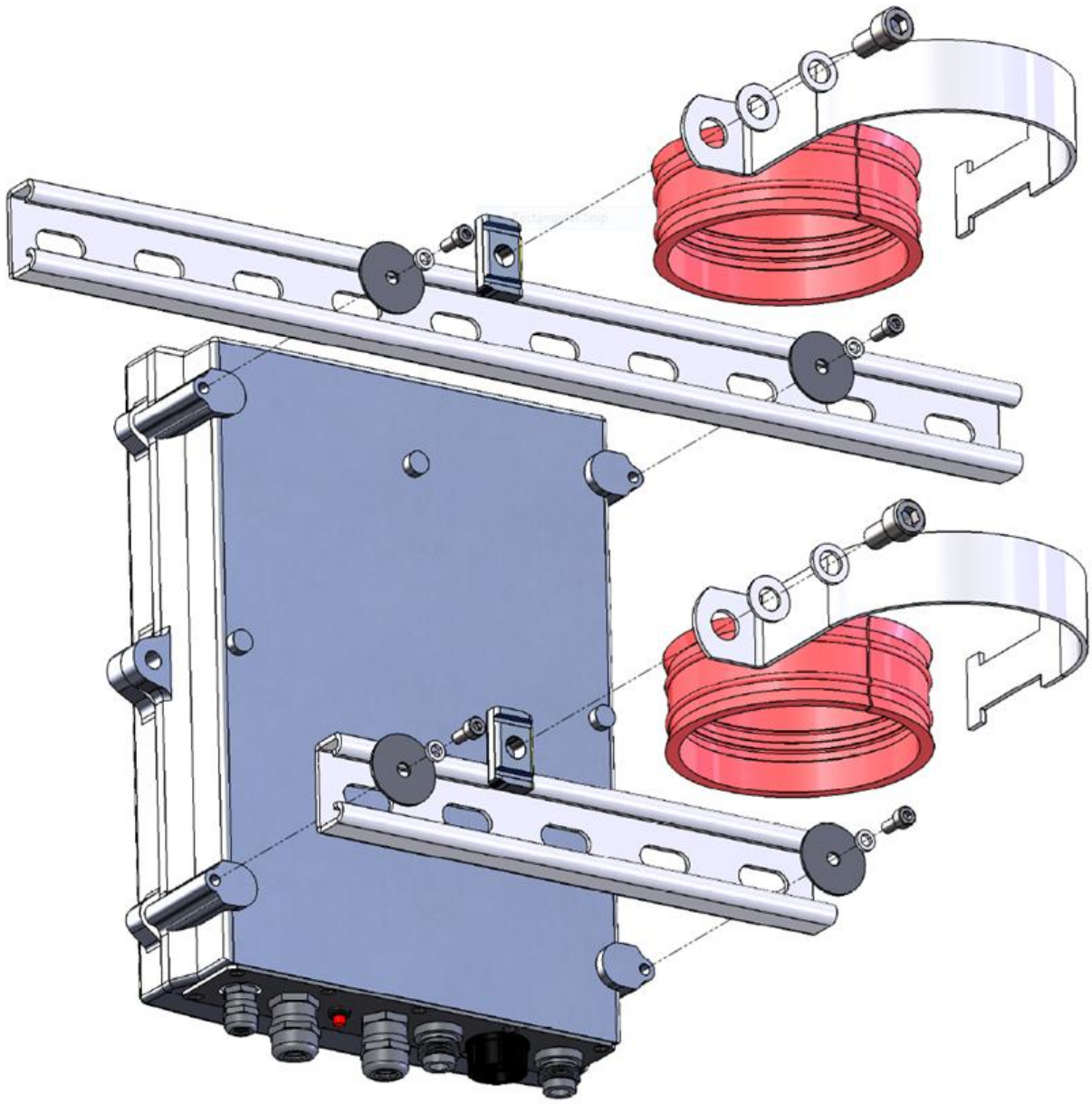
1. Fixing hole for mounting ODE-A4
2. Mounting bracket earth stud
3. Fixing hole for wall mounts

2.3.2 **Using the 70004 pole mounting kit**

The pole mounting kit comes with installation instructions, see section 2.1 that shows the range of pole mounting kits available and the pole sizes onto which they fit.

To pole mount your enclosure follow these steps:

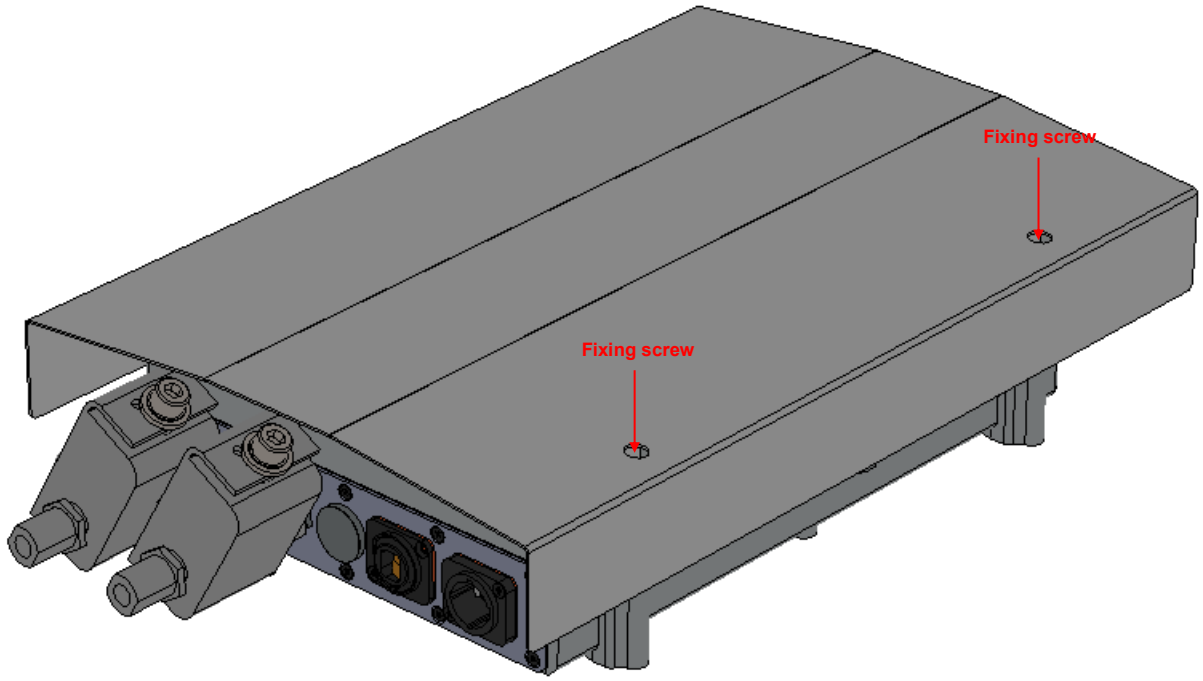
- Mount the long length of unistrut centrally to the top of the ODE-A4 using the supplied washers and screws (small).
- Mount the short length of unistrut centrally to the bottom of the ODE-A4 using the supplied washers and screws (small).
- Slide one unistrut nut into the top and one into the bottom.
- Wrap the pole with the pipe grommet, in the top position.
- Slide one end of the clamp into the top unistrut channel.
- Torque the screw (large) and supplied washers to the unistrut nut in the top channel.
- Wrap the pole with the pipe grommet, in the bottom position.
- Slide one end of the clamp into the bottom unistrut channel.
- Torque the screw (large) and supplied washers to the unistrut nut in the bottom channel.
- Ensure all screws are tight and the mounting is secure



2.4 Solar and wind shield, 70001

Your enclosure can be supplied with an optional solar / wind shield. In hot climates this will significantly reduce the solar gain of the outdoor enclosure and create a chimney effect between the solar shield and enclosure. In cold climate it can be used as a wind shield reducing the unwanted cooling effect of high velocity winds.

Your solar shield will be supplied fitted. The solar shield shares the same hinge assembly as the enclosure front door. It is fastened and released with the screws that hold the enclosure door shut



2.5 Lightning Suppression

There are a number of options available to protect your enclosure and equipment from electromagnetic pulses, each suppressor will protect a single RF channel. The larger 70006 suppressor has a grounding fixing (M8) on the suppressor, this should be used to achieve maximum protection. The standard options are:

- 70073 Lightning Suppressor Kit for Outdoor Enclosure, 800-2500MHz Passband + DC Path, 1 required per RF Channel (2 Max per ODE-A4 due to the size of the suppressor). Kit includes 51645 suppressor. N female/ N male sockets. Fitted externally to the ODE-A4. Illustrated above,

- 70013 Lightning Suppressor Kit for Outdoor Enclosure, DC-5800MHz Passband, 1 required per RF Channel. Kit includes 51644 suppressor, which is a bulkhead type mounted inside the ODE-A4, 2x N female sockets.
-

Lightning Suppressor, DC-6000MHz, N female/ N male sockets. IP67. DC pass. Fitted externally to the ODE-A4. The suppressor is 51651. Max power 90W at 30MHz.

2.6 Antennas

Example GPS antennas compatible with the ODE-A4 are shown below.

- 70005 GPS marine active antenna, 5dBi plus 28dB amplifier.
- 70040 GPS active antenna, 3.5dBi plus 50dB amplifier.

70005, 33dBi Gain antenna

70040, 53.5dBi Gain antenna

2.7 Termination of RF Connections

The main enclosure terminates the RF input/output via N-Type female connections located on its baseplate. N-Type connectors are available in both 50 and 75 ohm variants. 50 ohm N-Types are used in the majority of applications, though if 75 ohm connectors are fitted, you MUST ensure that both halves are the same impedance; mating dissimilar connectors will cause permanent physical damage.

- RF inputs and outputs should not be exposed to external DC voltage levels in excess of ±36V. (+12V DC max for GPS splitter variants). Some units may tolerate more power, please see module handbook.
- Absolute maximum no damage RF input level is nominally +13 dBm. (0 dBm max for inputs to GPS splitter ports)

Some transmitter modules are pre-configured to have a DC voltage present on the RF input connector to power low noise amplifiers and similar equipment. All receiver modules will create up to 2V peak DC transient from the RF output at start up into a 50Ω load (approximately 5V into a 1MΩ load). This may cause failure in some very sensitive equipment.

All modules that have AC coupled inputs and/or outputs and will be sensitive to large transients (>5V) applied to either input or output. This may result in permanent damage to the units, particularly to low frequency units. Some receiver modules are equipped with DC loads on their outputs, please see module handbook.
Contact ***ViaLite*** communications for more details.

2.8 Termination of power

The ODE-A4 Enclosure can receive power via a NEUTRIK NAC3 power connector. The male connector is fitted to the baseplate and the cable mounting free female is supplied for on-site termination.

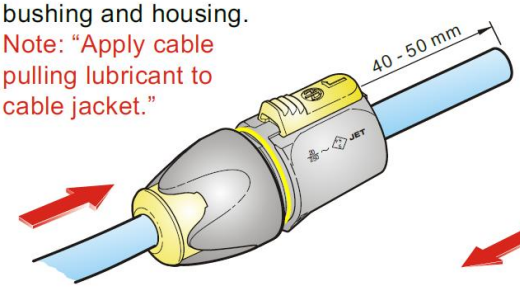
These are used for both AC and DC power. For AC connection connect LIVE/NEUTRAL/EARTH as labelled. When used for DC power the POSITIVE should be connected to the LIVE and the NEGATIVE should be connected to the NEUTRAL. The supplied mating half is:

NAC3FX-W Female Black, Yellow 2P+E Power Connector Mains 20A Socket Cable Mount, 250 V ac Polyamide.

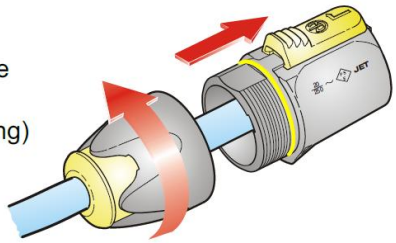
This equipment must be earthed in accordance with the local codes. Incomplete or incorrect earthing will cause a safety hazard. The incoming power cable must have a diameter between 6 and 12mm to be correctly retained by the connector. The electrical conductor cross sectional area should be within the range of 1 - 2.5 mm^2 to ensure sufficient current handling of up to 2 Amps. This equipment is not intended for direct connection to building installation wiring; ensure connection is via an overcurrent protection breaker and/or residual current device.

Ensure that the power cable is isolated and no power is present during installation.
Follow the steps below to fit the power connector

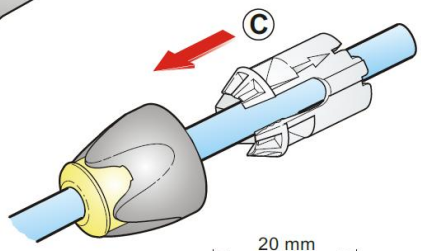
Ⓐ Insert cable into the bushing and housing. Note: "Apply cable pulling lubricant to cable jacket."



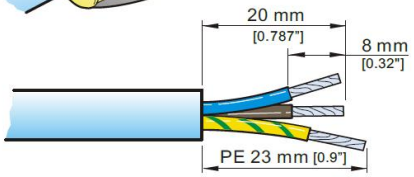
Ⓑ Separate the housing from the bushing (cable remain in bushing)

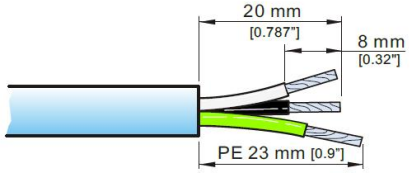


Ⓒ Place chuck over the cable.

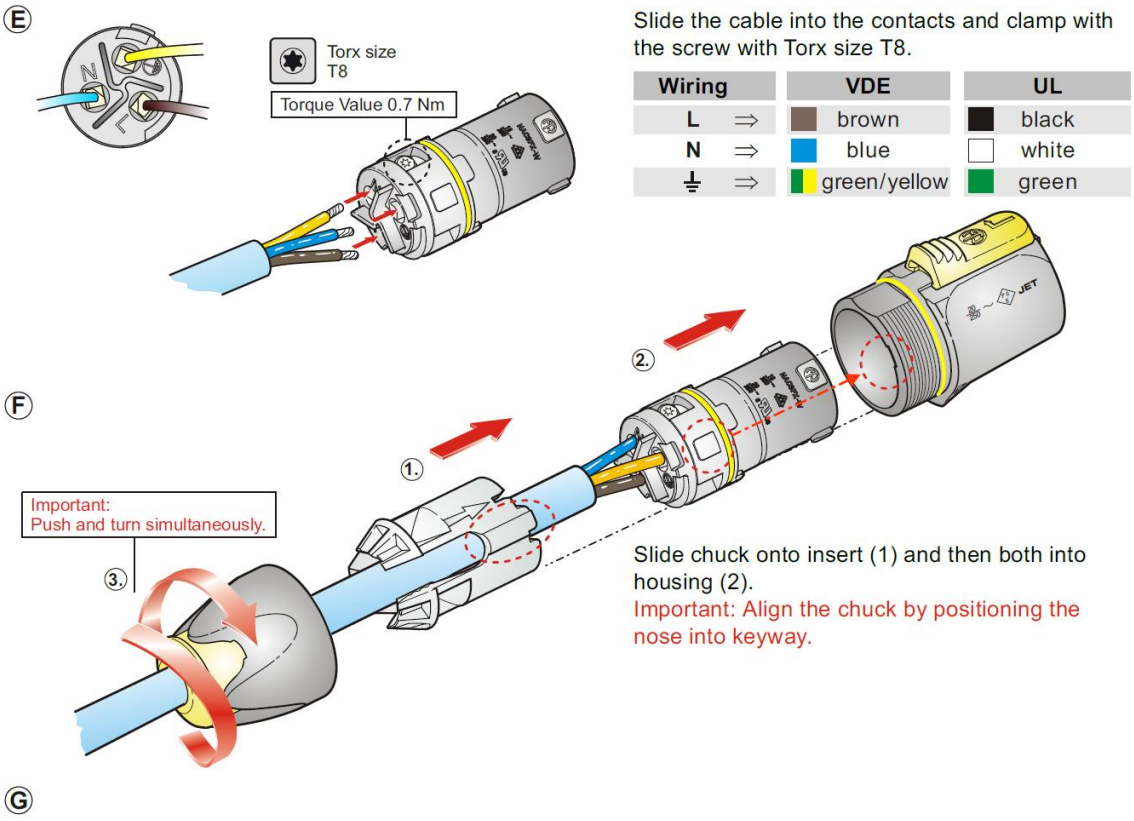


Ⓓ Prepare cable as shown.





VDE (EN 60320-1/EN60320-2-2) **UL** (UL 498 / CSA C22.2 No. 182.3)



2.9 Termination of Optical fibre

The optical fibre is terminated in the accompanying patch box. As standard, the patch cable presents SC/APC connections to the end user within the patch box as shown in the picture below. Options to terminate in LC/APC or FC/APC are available.

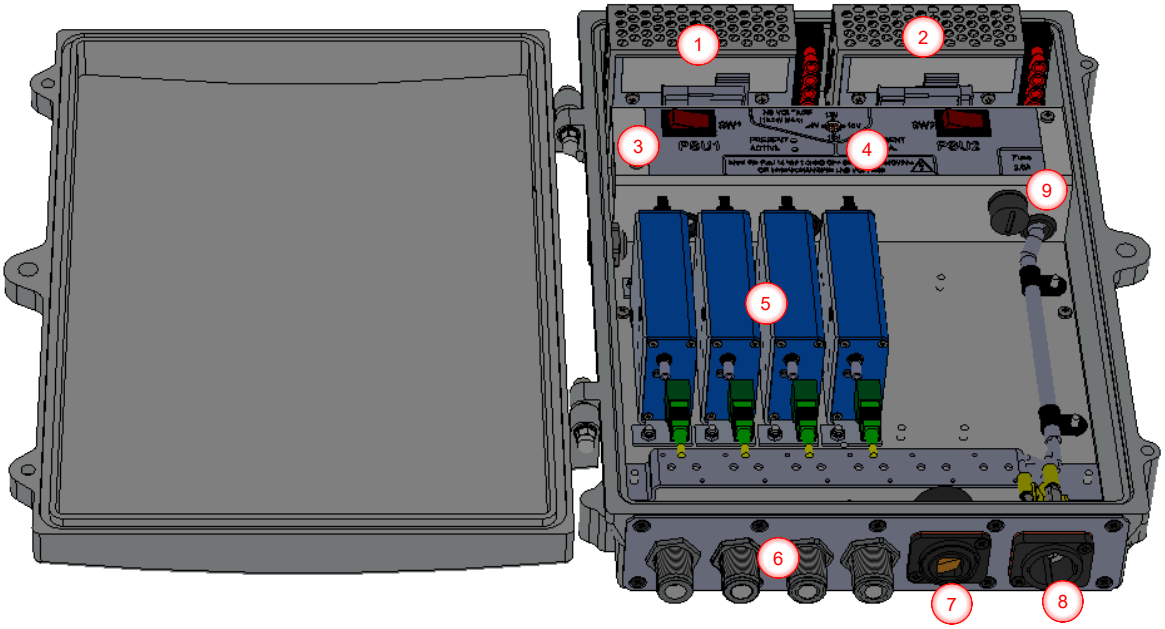
2.10 Remote Management and Control

A web GUI is provided with the optional management and control interface. The web GUI provided is described in the HRC3 handbook available on the ViaLite website.
Connectivity to the network is via an RJ45 or optical connection as specified in the part number, refer to the provided quick start guide for the enclosure.

3 ODE-A4, internal features

3.1 Normal Configuration

The internals of the ODE-A4 are presented as follows:

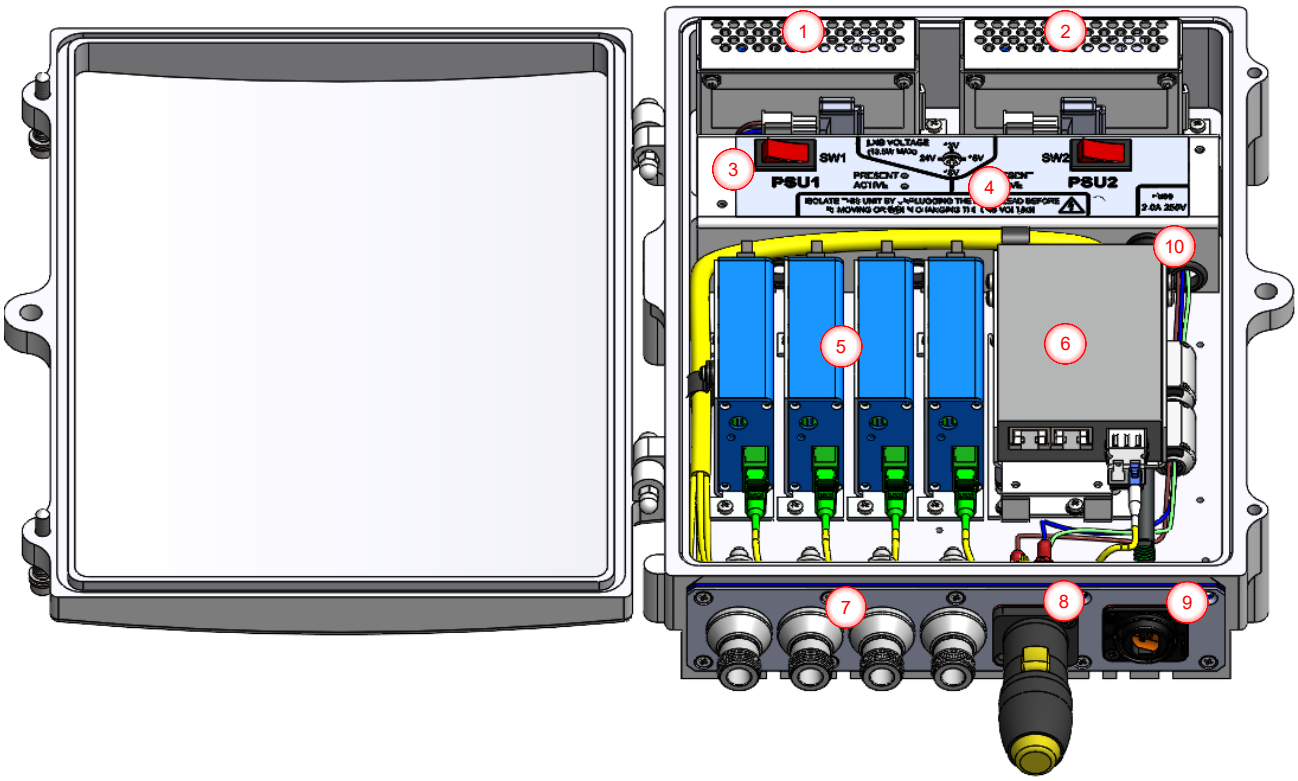


1. Primary PSU
2. Secondary PSU
3. PSU switch
4. LNB Voltage Selector
5. Blue FOL Module
6. RF Connection(s)
7. Optical connector
8. Power Connector
9. Fuse

The top section houses the dual power supplies which sit directly above the power distribution bar. Within this bar are the power sharing electronics to support the redundant power supply feature and the LNB voltage generator. LEDs indicating the presence and state of each PSU module are presented to aid both installation and diagnostic processes. A replaceable fuse is present also.

The main module bay in the centre, supports up to 6 brackets for the fitting of ***ViaLiteHD*** blue link and support modules.

3.1.1 MTP Configuration ONLY



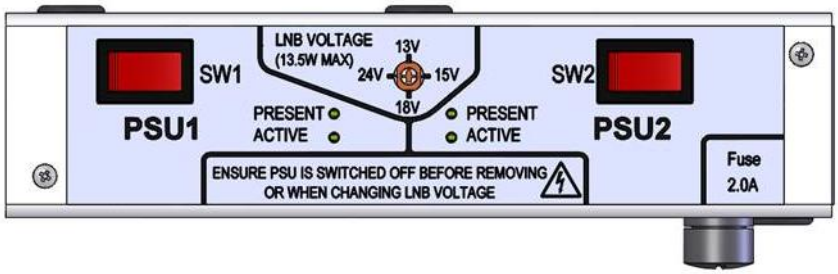
1. Primary PSU
2. Secondary PSU
3. PSU Switch
4. LNB Voltage Selector
5. Blue FOL Module
6. Monitoring and Control (M&C)
7. RF Connection(s)
8. Power Connector
9. Optical Connector
10. Fuse

3.2 LNB Voltage selection

ViaLiteHD Blue modules have the option to pass a voltage via its internal bias-T to any connected RF equipment (e.g. LNBs).
There are options for (NONE), (Fixed 5V), (Fixed 12V), (Fixed 48V) and customer variable (13V, 15V, 18V or 24V) as illustrated below. Refer to the transmitter module handbook for Fixed voltage LNB specification and tolerances.
An option for 13V output is also available partnered with the customer selectable voltage (usually 18V) to power LNBs with voltage defining polarisation switching. This allows the user to operate two optical links, one serving each polarisation from a dual LNB.

3.2.1 LNB Customer variable voltage source

The ODE-A4 incorporates an optional, selectable voltage power supply to facilitate antenna LNB powering if required.
The user must ensure that the power requirements of their LNB(s) do not exceed the ODE-A4 power capacity which is labelled internally. To drive external equipment with very high-power requirements, (e.g. a BUC) the option for dual redundant power supplies can be substituted for a dedicated supply to provide this function which bypasses this selector. See next section (ODE-A4 power supplies) for details.



The ODE-A4 LNB voltage setting is factory set to match the customer requirement prior to shipping, but should it need changing, the following procedure should be performed:

- Power down the enclosure by switching both power supplies off.
- Using a 2.5mm flat blade screwdriver, adjust 4 position switch such that its arrow head is pointing toward the desired voltage.
- Re-establish power by switching on the power supply switches.

3.2.2 Customer Variable LNB Voltage tolerance

The LNB voltage presented at the RF ports is nominally per the setting, but manufacturing variances have the potential for the following:

LNB Voltage setting	Minimum	Maximum
13	12.6	13.5
15	14.6	15.6
18	17.5	18.8
24	23.3	25.0

WARNING: When connecting any equipment to the RF ports that aren't capable of handling the LNB voltage, ensure a DC block is used to protect it.

3.3 High voltage or High power LNB/BUC supply options

When the on-board variable supply is not suitable for an application, the option for using a dedicated PSU can be considered.
Power supply redundancy for the ODE-A4 is then no longer possible, but the option for 12V or 48V at up to 15W is possible or even 25W for temperature environments < 45 Degrees Centigrade.

Please consult with the factory for this arrangement as it will be built to order and there are no customer re-configurable options.

3.4 ODE-A4 power supplies

The ODE-A4 is equipped with internal power supply modules. They are generally used in a dual redundant configuration with identical modules in the left hand (LH) and right hand (RH) positions. It can optionally be equipped with either just a single main PSU module (LH) or with a main PSU (LH) and LNA/BUC PSU (RH). The voltage inputs for the various power supplies options have the following requirements.

- AC input wide range 100 – 240V_{AC} 50-60Hz Power supply: LPS-A4
- DC input 18 – 48V_{DC} Power supply: LPS-A4-DC

3.5 Replacement of Power Supply Modules

The outdoor housing can be fitted with either one or two power supply modules, the latter provides dual redundant power supply protection for the housing. The power supplies come pre-installed in the outdoor housing. Should it be necessary to replace a power supply module, the procedure is as follows:

- First isolate the unit from the mains power inlet by switching the power isolation switch adjacent to the unit OFF.
- Disconnect the electrical connections between the power supply module and the switch bar.
- Undo the two nuts holding the power supply unit in place. Retain the nuts to refit the new power supply.
- Locate the new module on the studs on the rear plate. Replace the nuts to hold the power supply module in place.
- Reconnect the electrical connector between the power supply module and the switch bar.
- Apply power by switching the power isolation switch ON.

3.6 Replacement of OEM Modules

Should it be necessary to replace an OEM module, the procedure is as follows:

- Power OFF the unit by switching OFF all power isolation switches (adjacent to the power supplies).
- Disconnect the optical connection and place a dust cap in the open optical connector.
- Disconnect the RF and electrical connection to the OEM module.
- Undo the two nuts holding the OEM module in place. Retain the nuts to refit the new OEM module.
- Remove the OEM module.
- Remove optical dust caps. Clean new OEM module optical connector. Fit optical connection
- Locate the new OEM module onto the studs.
- Re-fit the nuts to secure in position.
- Connect the RF and electrical connection to the OEM module.
- Power ON the unit by switching ON all power isolation switches (adjacent to the power supplies).

3.7 PSU power isolation switches

Each power supply is fitted with an isolation switch that will disconnect the incoming power to the unit immediately above it. The switch is a two-pole switch, switching both live and neutral.

These switches will illuminate when ON for enclosure with AC or DC power feeds they will be extinguished when the switch is OFF.

3.8 ODE-A4 switch bar replaceable fuse

The incoming power to the ODE-A4 is protected by a common replaceable fuse. This is fitted to the power switch bar inside the ODE-A4. Details of this fuse if different to the standard fuse are given in your custom handbook. The standard fuse is used in all AC, $48V_{DC}$ and $24V_{DC}$ powered units, unless otherwise advised.

- Standard replaceable fuse — 2A, 250V, anti-surge, 20 x 5mm, PPM part number 57107, please check before replacing

Units fitted with low voltage input DC power supplies (below $12V_{DC}$ nominal or below) will generally be fitted with higher current rated fuses.

- $12V_{DC}$ replaceable fuse — 5A, 250V, anti-surge, 20 x 5mm, PPM part number 57109, please check before replacing

To replace the fuse, the procedure is as follows:

- First isolate the unit from the mains power inlet by switching the power isolation switches OFF.
- Unscrew the top of the fuse holder, you may do this by hand or using a slotted screwdriver.
- Fully withdraw the fuse holder in which the fuse will be captive.
- Remove the failed fuse from the fuse holder and replace with your new fuse.
- Screw the fuse holder back into the switch bar.
- Apply power by switching the power isolation switches ON.

4 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.

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