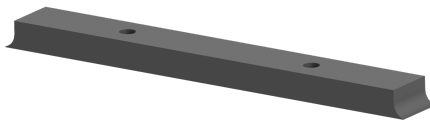
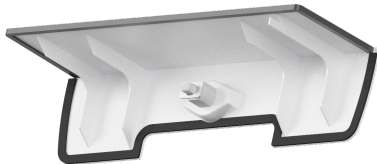
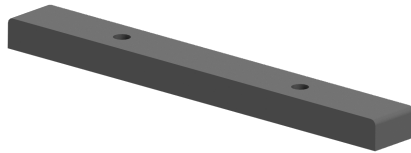


To prevent the ingress of water and dust, a film of mounting grease (supplied) should be applied to the lid gasket and the cable sealing gland.



Under the access cover is a bracket and grommet system which secures the fibers and permanent cables in place to seal them and to provide strain relief. It is released by removing the four pozidriv screws as shown in the picture below. The grommet holes should be adjusted by removing the concentric rubber layers until each cable is a neat and weatherproof fit in the slot.



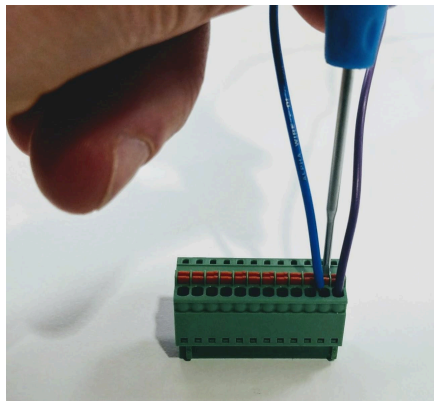
If the cover is not securely shut an Access Cover Alarm will be indicated. As it is impossible to reach any of the cables or connections without opening the cover it has a sensor which also functions as a tamper alarm. On replacing the cover, always lock it in place and replace the lid covering the lock.

## External alarm and relay connection

The External Alarm Connector is a cage type with clamping spring terminals on a 0.1" Pitch in an Orange Insulating body. The acceptable range of wire gauge is 20-28 AWG. Stranded wire is recommended.

The cage spring of each terminal is released by the adjacent actuating lever. It is helpful to have a fine bladed screwdriver to depress the lever for wire insertion or removal.

The connector itself can be unplugged from the unit, allowing it to do all the connections externally and then plug the connector back into the unit once all cabling is done.





External alarm input contains a series resistor of 2.2 kOhm internally to limit the current through the photodiode. For maximum ratings of the inputs, see next section.

## External Alarm Input Ratings

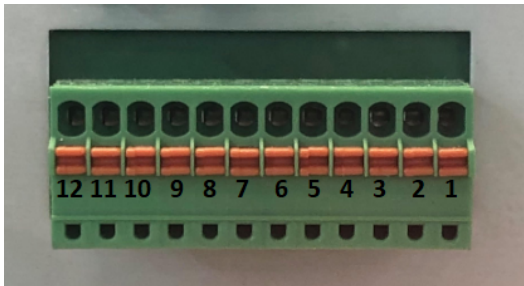
The external alarm inputs are via photodiodes in an Opto-Coupler. To cater for as many different interface scenarios as possible they are isolated from one another and from Earth.

Parameter	Value
Maximum input level	30 V
Isolation between adjacent circuits	Do not exceed 100 V AC/DC

## Alarm Relay Contact Ratings

Parameter	Value
Max Switching Voltage	30 V
Rated Current	1 A DC, 0.3 A AC
Max Switched Power	30 W, 30 VA (resistive load)
Minimum Switching Voltage	100 $\mu$ V
Contact Resistance	< 100 mOhm

## Connector Pinout



Pin	Function / Usage
12	External Alarm Input 1 - Isolated Photodiode, Cathode -Ve
11	External Alarm Input 1 - Isolated Photodiode, Anode +Ve
10	External Alarm Input 2 - Isolated Photodiode, Cathode -Ve
9	External Alarm Input 2 - Isolated Photodiode, Anode +Ve
8	External Alarm Input 3 - Isolated Photodiode, Cathode -Ve
7	External Alarm Input 3 - Isolated Photodiode, Anode +Ve
6	External Alarm Input 4 - Isolated Photodiode, Cathode -Ve
5	External Alarm Input 4 - Isolated Photodiode, Anode +Ve

4	Spare – Not Used, do not connect
3	External Alarm Relay Normally Closed Connected to Common when Alarm is BAD or Power OFF
2	External Alarm Relay Common
1	External Alarm Relay Normally Open Connected to Common when Alarm is GOOD

# Installation of the Orion Master Unit

## Handling of Master Units

The Orion Master Unit weighs up to 8kg. No special handling is required except to protect against mechanical shock by suitable buffering materials.

For reduced weight the rack and PSU / Band Modules can be transported separately.

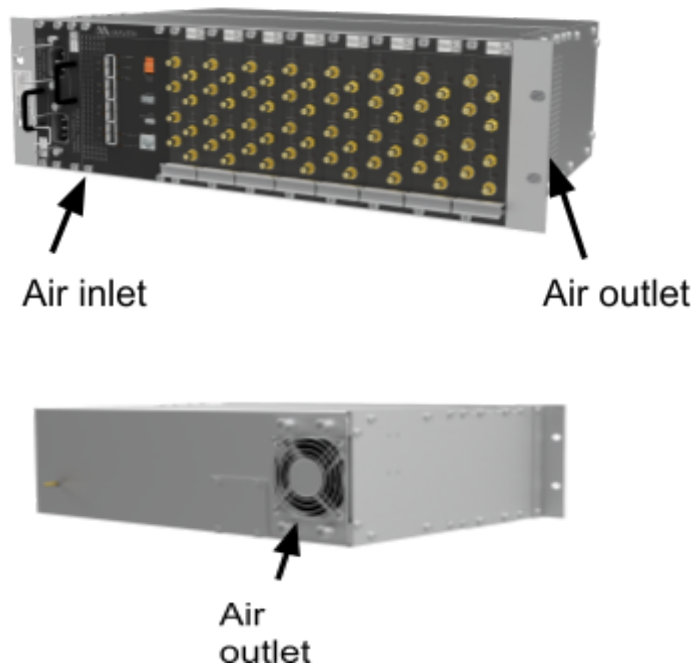
## Orion Rack Mounting Installation Package

Orion package includes:

- 1 pcs Master unit
- 4 pcs M6 mounting bolts
- 1 pcs Power cable, 2 meters

## 19" rack installation & cooling requirements

Pay attention to air inlets and air outlets. These must not be blocked.

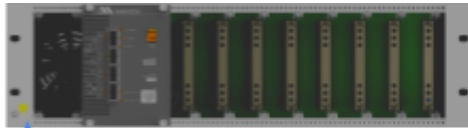


## Earthing the Orion Master Unit

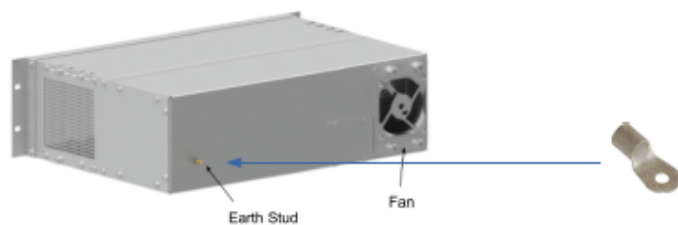
AC and DC Powered Orion units have Protection Earth (PE) connections via the power cable.

For permanent installations, to cater for the situation when the power cable or power supply module is removed, breaking the Earth connection, a secondary Earth is strongly advised.

Provision for permanent Protection Earthing is realised by means of an M4 stud, located in the lower left corner of the rear chassis panel, with an alternative M6 stud position on the left bracket on the front panel. An Earthing cable should be connected here, stranded copper with minimum cross sectional area of 5 mm<sup>2</sup> with Green/Yellow over jacket is recommended. The opposite end of the Earthing cable should be connected to other metalwork already bonded to Earth or the cable should run all the way to the site common Earthing point.



M6 Earth Stud



*Uninsulated ring terminals should be used, such as that shown, securely soldered or crimped to the cable. (The joint should be left unsleeved to permit the condition of the connection to be periodically inspected)*

## AC Power arrangements for the Orion Master Unit

The Master Unit is supplied complete with a matching AC power supply cable, 2 m long, terminated at one end by a 2-pin + CEE 7/4, at the opposite end is a molded IEC C13 female connector. The cable is constructed with 1.0 mm<sup>2</sup> wire and rated for 10 A at 250V AC. For the UK market the supplied cable has a 3-pin Plug with an internal 3 A Fuse. If a replacement cable is used, for safety, it must conform to these specifications.

As the Master Node is intended for continuous operation and because it should not be easy to accidentally interrupt the service, the equipment does **not** have a power switch. The chosen power arrangements should provide stable and secure power to the units.

Isolating the equipment when servicing is important for safety and for this reason the equipment must be fed via a plug and socket combination or, if the power cable is to be permanently wired, an external circuit breaker or switch & fuse box. This provides means to isolate the equipment and it provides fault protection for the power cable and connections before the protection contained in the internal power supply.



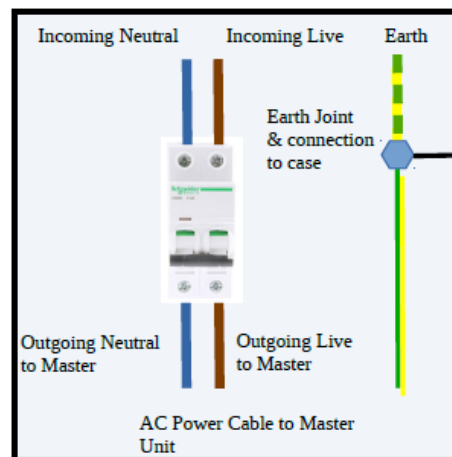
*As the European 2Pin and Earth plug and C13 socket combination is unfused and the cable rating is 10A, the rating of the fuse which supplies the circuit to a Master Unit should be a maximum of 5A.*

The plug and socket, circuit breaker or switch & fuse box should be located in the vicinity of the equipment, in such a location that it cannot be operated by accident. The switch status should be clearly visible from the Master Unit position. If this cannot be arranged it should be possible to protect the switch state by a locking device so that power cannot be restored while personnel are working on the equipment. If power is distributed via overhead cable tray the circuit breaker/switch may conveniently be contained in an earthed spur box mounted on the underside of the tray. In rack mounting situations DIN Rail mounted hardware will often be most suitable.

The IEC C13 power connectors are not rated for connection or disconnection under load. For this reason, power to the unit must be switched at the socket, circuit breaker or switch before and after the front panel connector is mated or unmated. As a secondary precaution this connector should remain disconnected while working on the equipment.

It is recommended that any circuit breaker or switch should be of the double pole type, interrupting both the Line and Neutral and conductors. In many situations a single pole in the Live conductor alone might be sufficient but the double pole type offers additional protection should the Neutral Voltage rise above Earth in fault conditions. In some areas AC supplies can be presented as two line conductors with Voltages which are balanced with respect to Earth. In this case the two pole types **must** be used.

Circuit breakers and fuse ratings must be chosen to comply with local power regulations but provide sufficient headroom to guard against nuisance tripping. The maximum current requirements are 1.3A @110V AC or 0.65A @ 230V AC.



*AC Wiring example*

The conductors used for incoming AC power wiring must have a cross sectional area of at least 1 mm<sup>2</sup> and comply with the National Regulations of the country of use.

## DC Power arrangements for the Orion Master Unit

The Orion Master Unit 48V DC Power Supplies (PSU00009 & PSU00011) have a floating earth input so that they can be used at sites employing either positive or negative earth wiring convention. The power supply employs a 3 pole connector with the middle pole connected to the PSU chassis for earthing. This is also connected to the chassis of the master unit rack when the PSU is inserted. Maven recommend that earth should be connected to both the PSU input connector and to the earth bolt on the rear of the master unit chassis allowing earth connections to be maintained while the PSU is inserted / withdrawn during replacement operations.

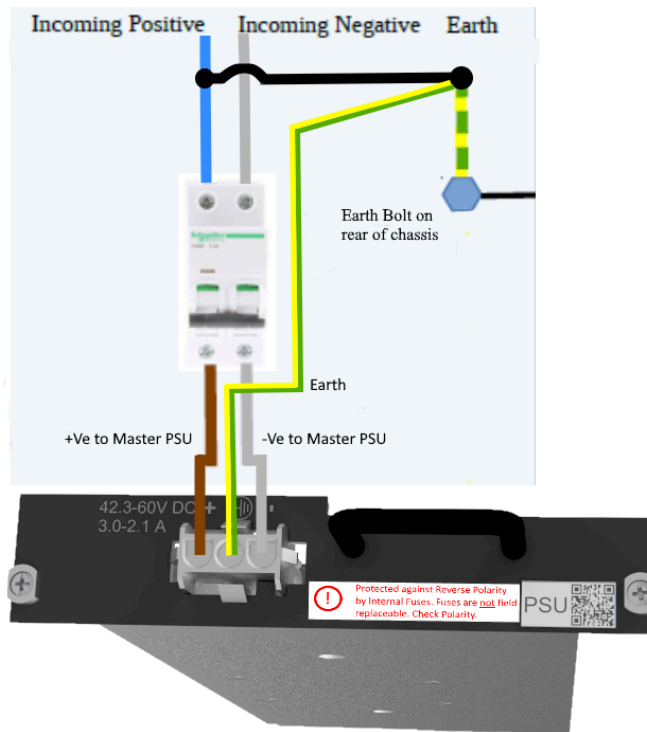
As the Master Node is intended for continuous operation and because it should not be easy to accidentally interrupt the service, the PSU does **not** have a power switch. The chosen power arrangements should provide stable and secure power to the units. A means of isolating the equipment when servicing is important for safety. The PSU connectors are **not** rated for connection / disconnection under load so for this reason, power to the unit must be switched at the socket, circuit breaker or switch before and after PSU connectors are mated or un-mated.

If the power cable is to be permanently wired, an external circuit breaker or switch & fuse box should be used. This provides fault protection for the power cable and connections before the protection contained in the internal power supply. The plug and socket, circuit breaker or switch & fuse box should be located in the vicinity of the equipment, in such a location that it cannot be operated by accident. The switch status should be clearly visible from the Master Unit position. If this cannot be arranged it should be possible to protect the switch state by a locking device so that power cannot be restored while personnel are working on the equipment. If power is distributed via overhead cable tray the circuit breaker/switch may conveniently be contained in an earthed spur box mounted on the underside of the tray. In rack mounting situations DIN Rail mounted hardware will often be most suitable.

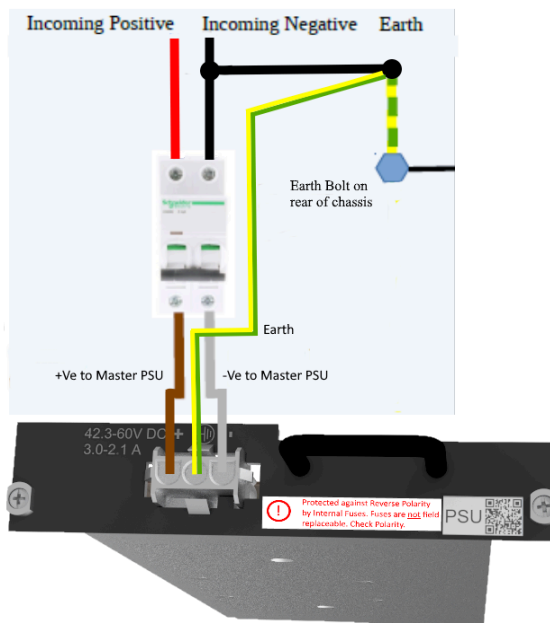
Circuit breakers and fuse ratings should be chosen to comply with local power regulations but provide sufficient headroom to guard against nuisance tripping. The maximum current requirements are 3.5A @ 36V DC or 1.75A @ 72V DC. Note that the circuit breakers / fuses used must be rated for use with DC.

The conductors used for incoming DC power wiring must have a cross sectional area of at least 1.5 mm<sup>2</sup> (16 AWG) The construction & cable colour codes should comply with the National Regulations of the country of use and according to the local site electrical supply convention.





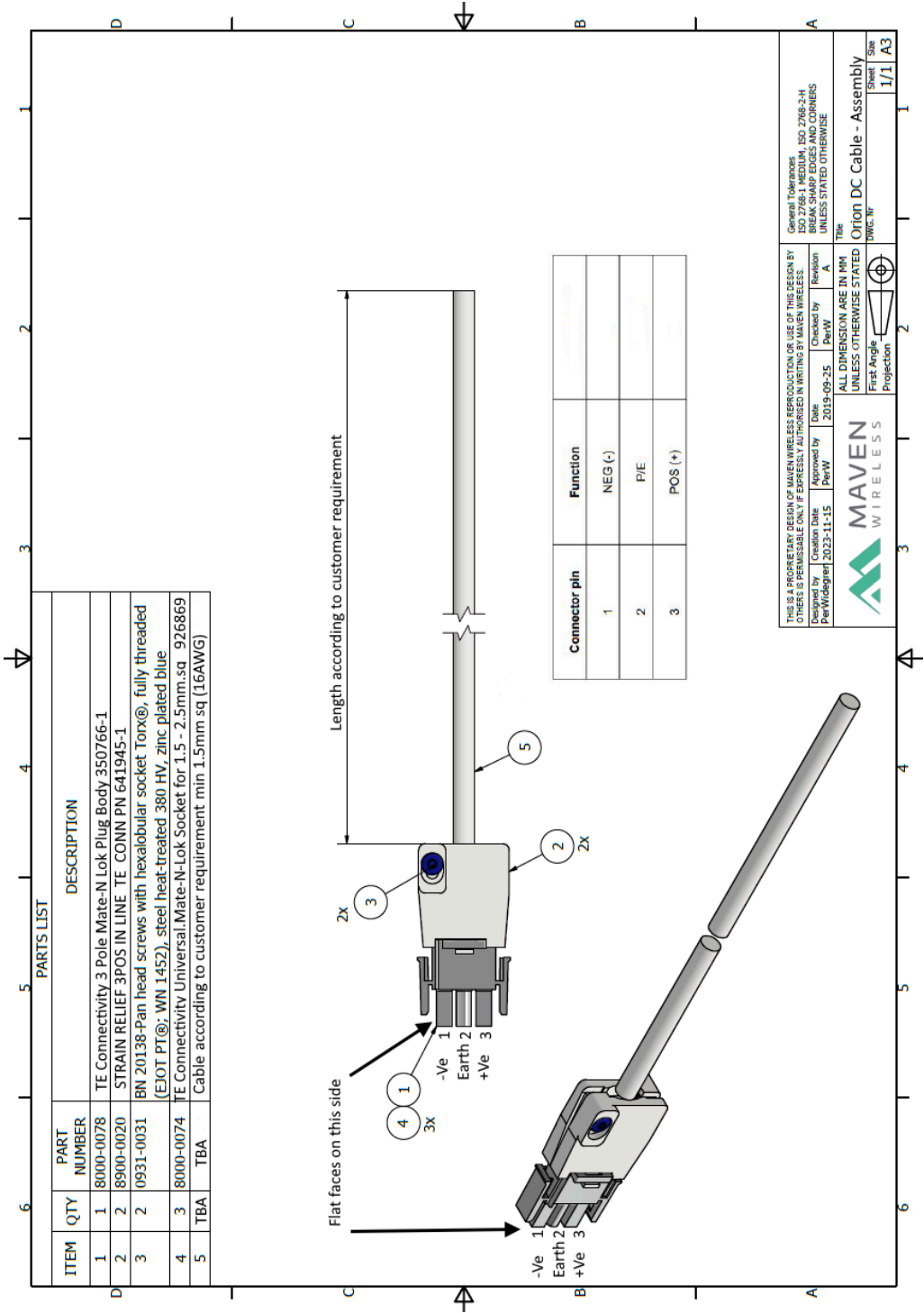
Wiring suggestion for sites with positive earth convention.



Wiring suggestion for sites with negative earth convention.

# DC Power Cable Assembly

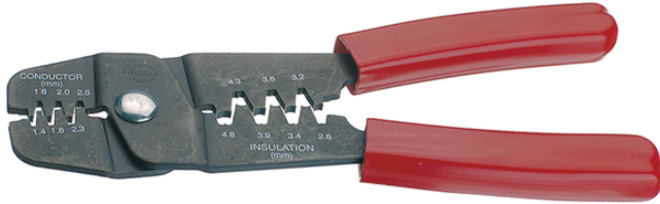
As customers have different preferences for the type of cable used to supply DC units, Maven supplies the components necessary for them to assemble the DC power cable for themselves. The wire used should be a minimum of 1.5 mm<sup>2</sup> (16AWG). See figure below.



## Tools required for DC Cable assembly

DC supply cables can be assembled with standard electrical hand tools for cable stripping, for the assembly of strain reliefs etc.

A special tool is required for correctly crimping the connector pins. Molex **63811-1000** is suitable.



Should rework be required a connector pin removal tool will also be necessary. The AMP - TE CONNECTIVITY **1804030-1** is recommended.



# Installation of Stratus, Cumulus and Cirrus Units

## Handling of the unit

The unit weighs 25 kg, and while this is an allowable one man lift appropriate PPE e.g. toe protecting shoes, lifting belt and gloves should be provided.

Transportation to the installation site over uneven ground, ramps, rails, stairs etc should be considered. Protect the unit from mechanical shock by suitable buffering materials.

Use handling aids such as stair climbing trolleys or, for units to be installed at height, hoists, lifting platforms etc.

Protect access to the work site in a suitable manner.

All these matters should be reviewed in a risk assessment before every installation.

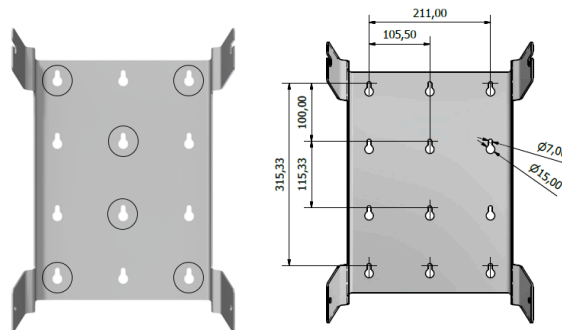
## Installation of unit using wall bracket

### Wall mounting package contents

- 1 pcs remote or off-air master
- 4 pcs M6 mounting bolts
- 4 pcs washers Nordlock NL6SP
- 1 pcs wall mounting bracket
- 1 pcs power cable, length 2 meters
- 1 pcs USB cable

### Installation procedure

1. Assess the strength of the wall at the proposed mounting location. Studwork & Plasterboard walls are generally unsuitable to carry the weight of Remote Units unless considerable reinforcement is added. In case of doubt consult a structural expert. Brick, Blockwork and Concrete Walls are generally suitable types. Procure the correct type of M6 mounting bolts to secure the mounting bracket to the wall in question in a safe manner. A minimum of 5 bolts should be used.
2. Mount the mounting bracket on the wall, Marked mounting holes are preferred and the plate can be used as a template for that step. Drill holes of diameter and depth as specified by the mounting bolt hardware. Four bolts should be mounted at the outer corner holes. A fifth should be fitted in either upper or lower center position.



3. Mount the unit in the brackets using the included set of hexagon head screws (M6x16) 4x and washers (NordLock NL6) 4x. Mount the two upper mounting screws and washers.

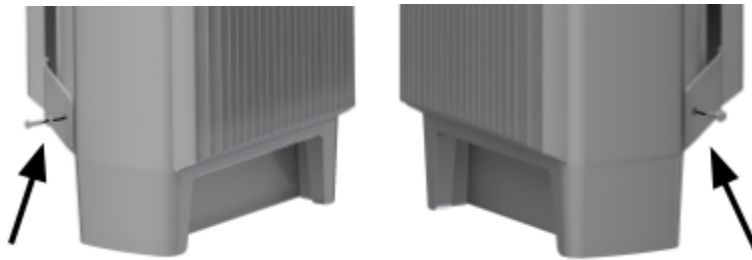


Leave a space of 5 mm, with the washers outermost under the screw head, to hook the unit into the wall mount bracket.

4. Place the unit into the mount plate engaging the two upper pre-mounted screws - washers must be **outside** the bracket faces.



5. Adjust the position of the unit in the bracket for alignment of the lower holes and insert these screws and washers. Fully tighten the two upper screws followed by the two lower screws.



## Installation of unit using 19" rack bracket

### Rack Mounting package contents

- 1 pcs remote or off-air master
- 4 pcs M6 mounting bolts
- 4 pcs washers Nordlock NL6SP
- 2 pcs rack mounting brackets
- 1 pcs power cable, length 2 meters
- 1 pcs USB cable

## Installation procedure

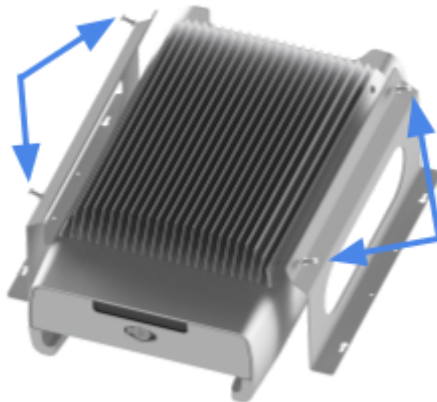
Before mounting the supplied brackets to the unit they can be used as templates to fit cage nuts in the rack uprights at the correct positions.

1. Locate the two upper cage nuts in the uprights at an appropriate height, ensuring that they are level.
2. Partially insert screws into the two cage nuts, having first ensured that the screw heads can pass through the circular holes of the keyway slots in the mounting brackets.
3. Hang the brackets in position on the upper screws and mount the lower cage nuts to correspond with the narrow portion of the keyway slots at the bottom of the brackets. The cage nuts are now located and the brackets can be fitted to the unit.



*The screws in the upper screws should **remain** in place for the following step.*

4. Dismantle the pre-mounted screws and washers on the remote units outer heat fins.
5. Mount the 19 inch brackets using included set of hexagon head screws (M6x16) 4 x washers (NordLock NL6) 4x, ensure the tightness of all fastenings.



*Attachment points for rack mounting bracket -  
note orientation of bottom of Unit (with Access Cover)*

6. Now the Remote Unit can be lifted and hung in place in the rack using the screws which were left in the upper cage nuts. It will hang on them with the main body slightly forward of true vertical.
7. Inward pressure against the body of the unit will swing it into the vertical position allowing the lower screws to be inserted into the bottom cage nuts and tightened.
8. Tighten the upper screws and check all is secure.

## AC Power arrangements for Stratus, Cumulus and Cirrus units

The Remote Node is supplied complete with a matching AC power supply cable, 2 m long, Binder part number 77-0690-0000-50704-0200. The AC connector is pre-terminated and it must not be disassembled.

The cable has 4 cores of 1.5 mm<sup>2</sup>, 3 power wires are identified by numbers printed in White at intervals in the Black outer insulation. The Earth wire is coloured Yellow/Green. The whole is molded with a strong protective jacket.

### Pin assignments and wire labellings:

Pin	Usage	Colour	Label
1	Neutral	Black	Printed with number 1
2	Not used	Black	Printed with number 2. It can be cut short as it is not required.
3	Live (phase)	Black	Printed with number 3
4	Earth / Ground	Green / Yellow	

As the Remote Node is intended for continuous operation and because it should not be easy to accidentally interrupt the service, the equipment does not have a power switch. In most circumstances the use of standard AC plugs and sockets to power a permanent installation will be quite unsuitable, however, these may be fitted for testing in a laboratory environment.

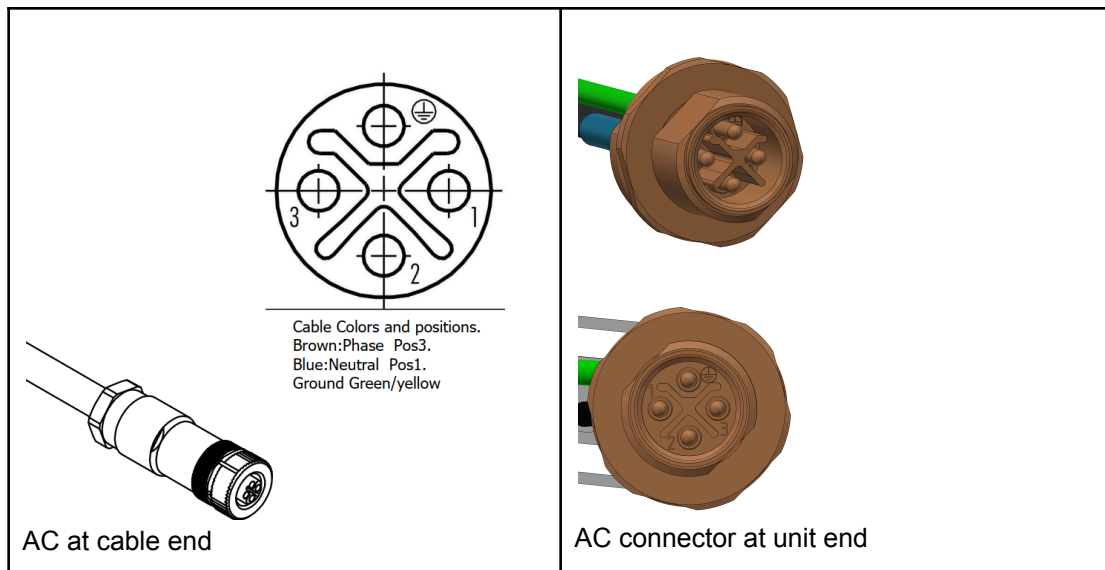


*As the European 2-pin and Earth plug and socket combination is unfused the rating of the fuse which supplies the circuit to a Remote Unit should be a maximum of 10A .*

## Mating the AC Power Connectors

Please note that the Binder AC power connectors include a shaped keying arrangement as part of the design. This ensures the correct orientation of the connections but it requires care when mating the connectors together.

The route of the AC cable should be a gentle curve where there is enough slack for the free AC cable socket to reach the Remote Unit panel mounted plug without undue sideways strain. The AC socket should be offered up to the panel mounted plug and the body gently rotated until the keyways align and first engagement can be felt. Now push the two further together and tighten the outer locking ring on the power cable socket.



Gently fix the curved shape from cable to socket fixed in the unit. Once it is aligned in position push it gently inside the socket and tighten up with the outer ring on the power cable.

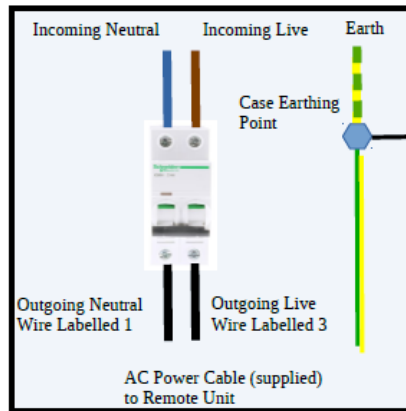
Isolating the equipment when servicing is important for safety and for this reason, if the power cable is to be permanently wired, an external circuit breaker or switch & fuse box must be fitted with a maximum rating of 10 A. This provides means to isolate the equipment and it provides fault protection for the power cable and connections before the protection contained in the internal power supply.

The circuit breaker or switch & fuse box should be located in the vicinity of the equipment, in such a location that it cannot be operated by accident. The switch status should be clearly visible from the Remote Unit position. If this cannot be arranged it should be possible to protect the switch state by a locking device so that power cannot be restored while personnel are working on the equipment.

The Binder power connectors are **not** rated for connection or disconnection under load. For this reason, power to the unit must be switched at the circuit breaker or switch before and after the front panel connector is mated or unmated. As a secondary precaution this connector should remain disconnected while working on the equipment.

It is recommended that any circuit breaker or switch should be of the double pole type interrupting both the Line and Neutral and conductors. In many situations a single pole in the Live conductor alone might be sufficient but the double pole type offers additional protection should the Neutral Voltage rise significantly above Earth in fault conditions. In some areas AC supplies can be presented as two line conductors with Voltages which are balanced with respect to Earth. In this case the two pole type **must** be used.

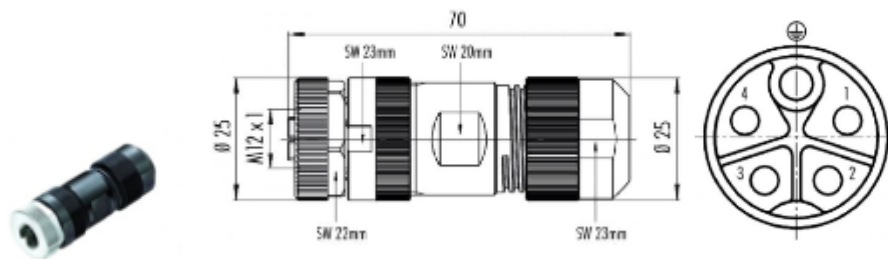




The conductors used for incoming AC power wiring must have a cross sectional area of **at least** 1.5mm<sup>2</sup> and comply with the National Regulations of the country of use.

## DC Power arrangements for Stratus, Cumulus and Cirrus units

The Remote Node is supplied complete with a matching DC power supply connector, Binder part number 99-0700-29-05.



Maximum Wire Gauge is 2.5 mm<sup>2</sup> or a minimum wire gauge of 2.05 mm<sup>2</sup> is recommended (14 AWG).

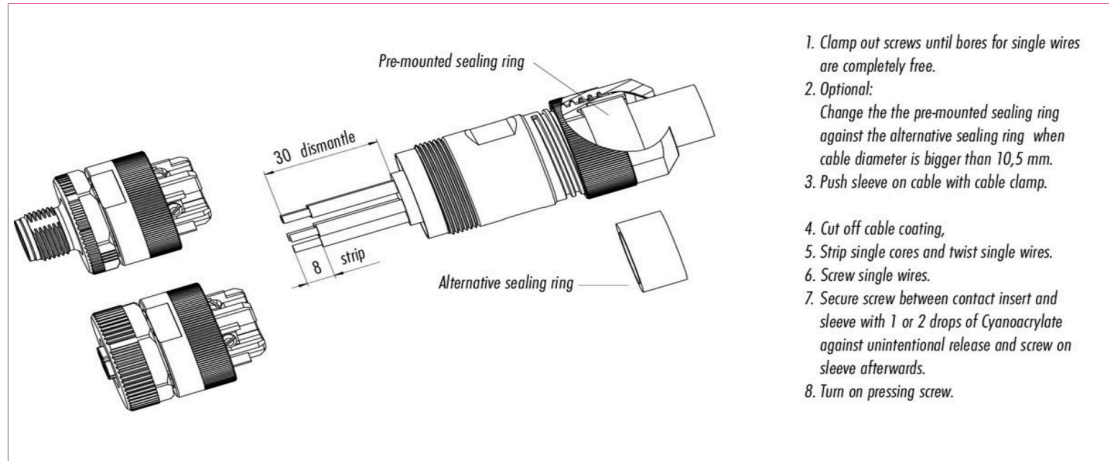
### Pin assignments and usage:

Pin	Usage
1	PSU A Positive
2	PSU A Negative
3	PSU B Negative (not connected in single PSU variants)
4	PSU B Positive (not connected in single PSU variants)
5	Earth / Ground



*The DC inputs are isolated from Earth for use at sites with either Positive or Negative Earth convention in the power supply arrangements.*

The connector is assembled as shown below. Select the sealing ring to suit the cable in use.



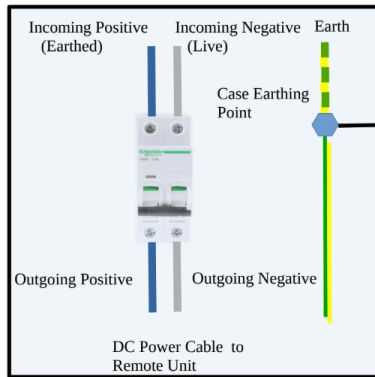
As the Remote Node is intended for continuous operation and because it should not be easy to accidentally interrupt the service, the equipment does **not** have a power switch.

The Binder power connectors are not rated for connection or disconnection under load. For this reason, power to the unit must be switched at the circuit breaker or switch before and after the front panel connector is mated or unmated. As a secondary precaution, that connector should remain disconnected while working on the equipment.

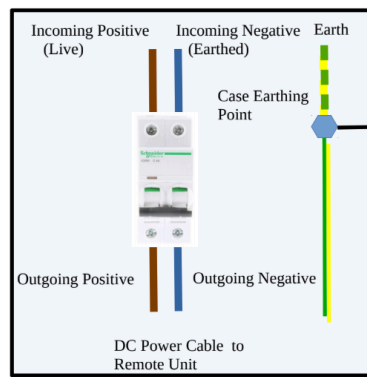
Isolating the equipment when servicing is important for safety and for this reason, if the power cable is to be permanently wired, an external circuit breaker or switch & fuse box with a maximum rating of 10A. This provides means to isolate the equipment and it provides fault protection for the power cable and connections before the protection contained in the internal power supply.

The circuit breaker or switch & fuse box should be located in the vicinity of the equipment, in such a location that it cannot be operated by accident. The switch status should be clearly visible from the equipment position. If this cannot be arranged it should be possible to protect the switch state by a locking device so that power cannot be restored while personnel are working on the equipment.

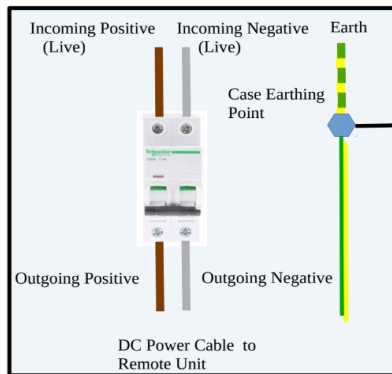
It is recommended that any circuit breaker or switch should be of the double pole type interrupting both the Positive and Negative conductors. For DC Installations it is usual practice that one conductor pole is also ground. In such cases, at the discretion of the responsible site engineer, the circuit breaker or switch & fuse can be a single pole type placed in the "live" (Non Earthed) conductor.



*Positive Earth Convention*



*Negative Earth Convention*



*Floating Earth Convention*

## Earthing the Stratus, Cumulus and Cirrus units

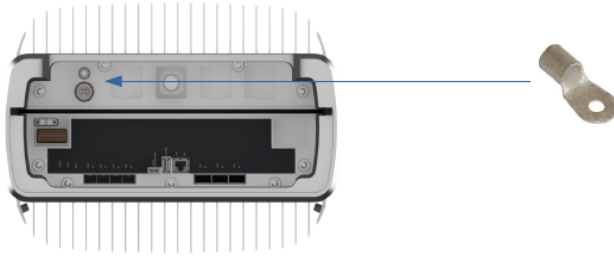
AC Powered units have a safety Earth connection via the power cable.

The AC input filter, required to ensure minimal disturbance from cable conducted interference, means the unit has a small Earth leakage current and a secondary Earth connection must be maintained at all times. For this reason and to cater for the situation when the power cable is removed from the unit breaking the Earth connection, a secondary Earth connection must be fitted. A notice to this effect is given on the front panel.

In some installations Earthing of units and associated antenna system cables will be mandated by additional safety considerations - these must be followed.

First provision for safety earthing comes through the power cable connector itself, A second provision for connecting safety Earth is realized by means of an M6 Earth stud. This is located adjacent to the Power & Antenna connections on the bottom panel. An Earthing cable must be connected here, stranded copper with minimum cross sectional area of 5mm<sup>2</sup> with Green/Yellow over jacket is recommended.

The opposite end of the Earthing cable should be connected to other metalwork already well bonded to Earth or otherwise the cable should run all the way to the site common Earthing point.



*Uninsulated ring terminals should be used, such as that shown, securely soldered or crimped to the cable. (The joint should be left unsleeved to permit the condition of the connection to be periodically inspected)*

## Stratus, Cumulus and Cirrus power up sequence

Connect the power connector before switching CB ON.



## Stratus, Cumulus and Cirrus power down sequence

Switch CB OFF before removing the power connector.



## Attaching Power cable

In order to ensure proper power cable connection Maven wireless highly recommends the use of proper tool.

