



BLUETOWN

INSTALLATION MANUAL

BLUETOWN BLUE ONE



INTRODUCTION

This manual describes the installation of the products BLUETOWN BLUE ONE and a VSAT dish mounting bracket. Both products are included in the box and can be setup with the included tools. The BLUE ONE System is designed for fast and easy installation.

Before starting the installation, read this manual and ensure that you follow the required guidelines.

System overview

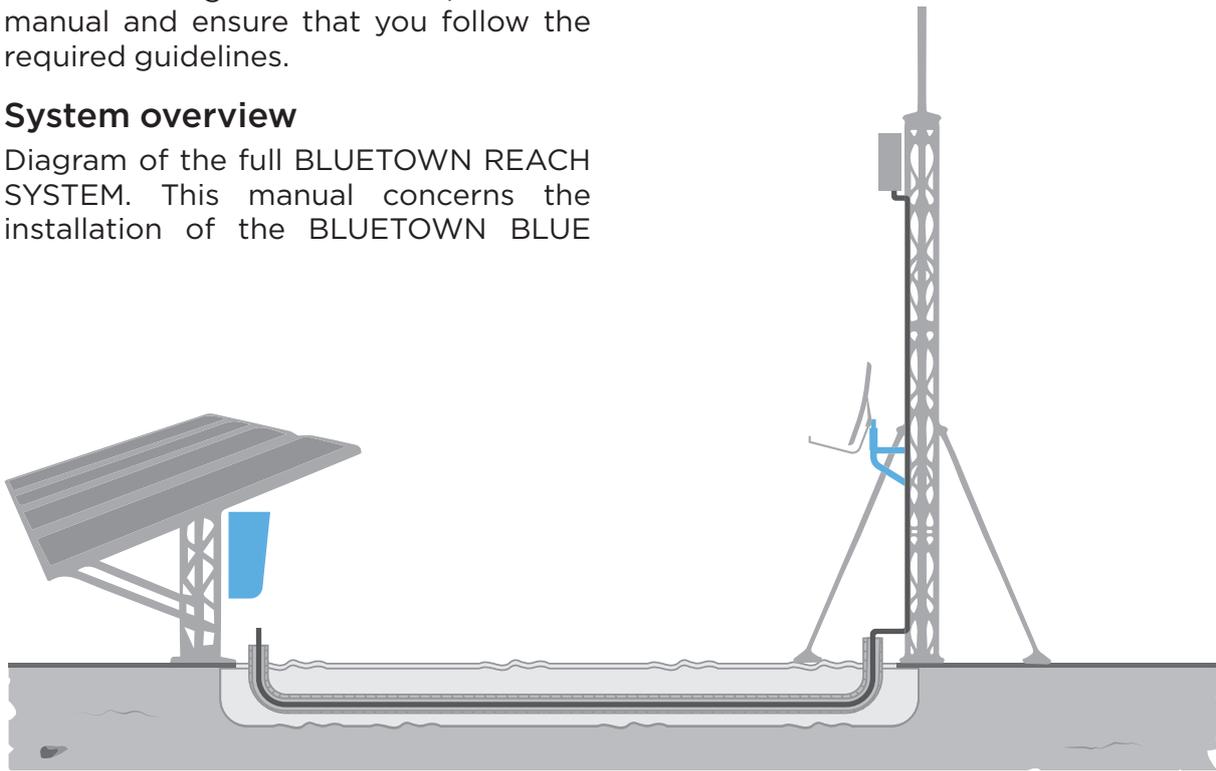
Diagram of the full BLUETOWN REACH SYSTEM. This manual concerns the installation of the BLUETOWN BLUE

ONE and VSAT mounting bracket, which are marked blue in the diagram.

Terms & Conditions

This product is subject to BLUETOWN's general terms and conditions.

Refer to www.bluetown.com



Safety during installation of BLUETOWN BLUE ONE

A minimum of two people are required for the installation.

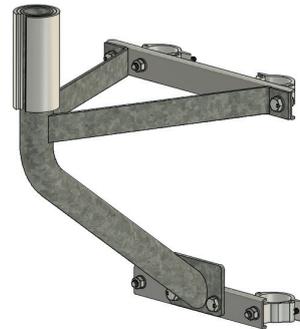
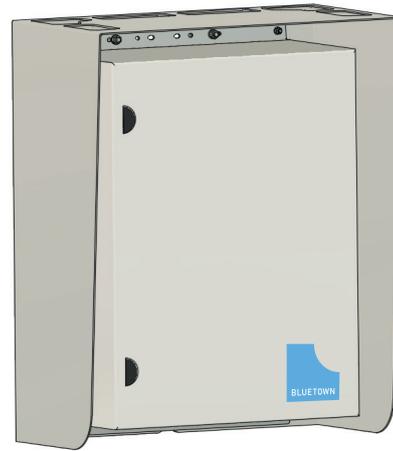
Make sure that the persons performing the installation are experienced installation technicians or electrician, holding documented education or certification proving knowledge on safe handling of electrical installation and battery handling.

Make sure that the persons performing the installation have received the necessary training and qualification.

Do not perform the installation during thunder and lightning storms.

Make sure that the installation area is only accessible to people participating in the installation!

Please note that BLUETOWN BLUE ONE contains batteries that pose a danger to the involved personnel if not treated as described in this manual.



Planned work sequence at the site

Task description	Persons needed	Time
Reach installation and testing		Approx 1-2 hours
Risk assessment	2	
Installation of the vsat dish mount	2	
Installation of the Blue One box	2	
Connect all cables and close the trench	2	
System power up	1	
System test	1	
As build documentation	2	

PREPARATION

Upon receiving BLUETOWN BLUE ONE please inspect the equipment and verify the following:

- Battery/batteries are undamaged and are without holes, cracks or other signs of damage.
- Cables are without scratches or cracks and don't have signs of having been squashed.

The metal cabinet shows no signs of having been dropped, taken damage or someone having tried to gain irregular access. System components inside the

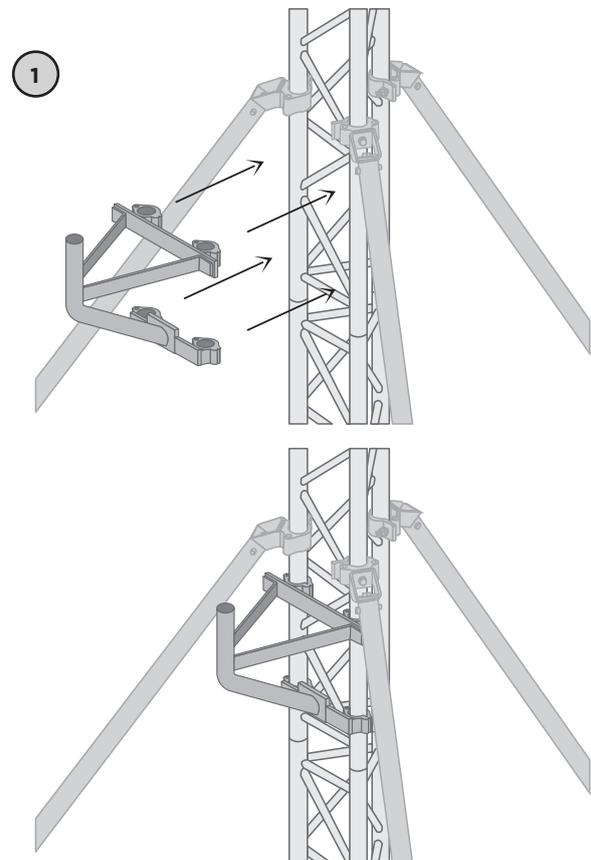
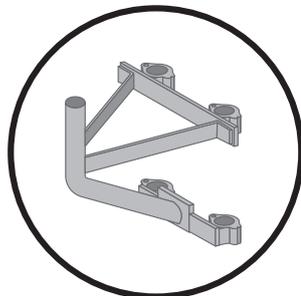
cabinet show no signs of damage or are broken loose.

- If BLUETOWN BLUE ONE is to be installed on a BLUETOWN REACH BLUE ONE SOLAR, finalize the installation of the other BLUETOWN REACH products before proceeding with BLUETOWN BLUE ONE.
- If BLUETOWN BLUE ONE is being installed on a BLUETOWN REACH TOWER, the same process as described below can be used. *NOTE: In this case, ensure that BLUETOWN BLUE ONE is installed with the rear part facing the equator.*

VSAT DISH MOUNTING BRACKET INSTALLATION

Install the VSAT dish mounting bracket just below the BLUETOWN REACH TOWER support legs. Remember to tighten all bolts, when the bracket has been placed.

Note: The VSAT dish mounting bracket must be installed on the side of the BLUETOWN REACH TOWER that faces satellite azimuth.

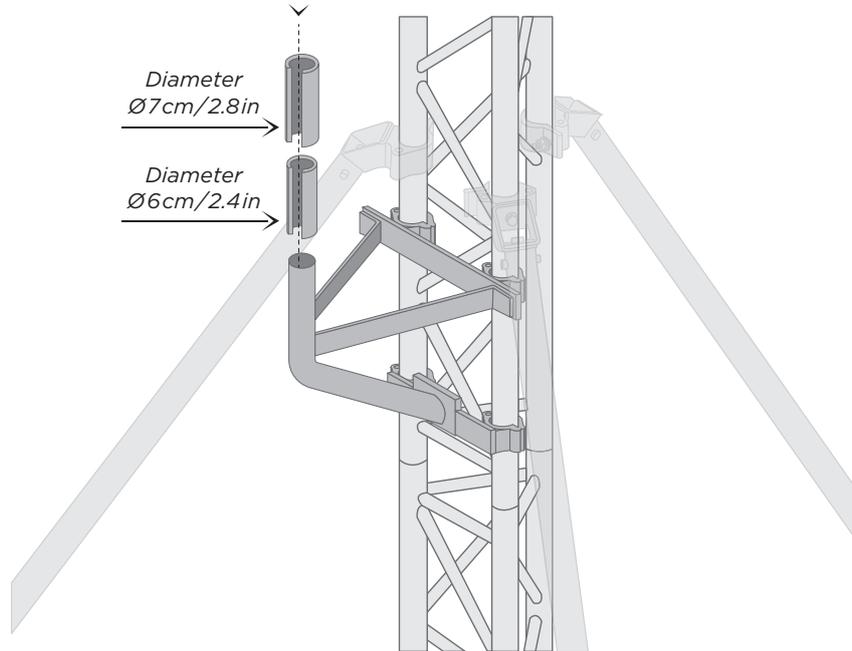


For the installation of the VSAT dish, follow the installation manual provided by the VSAT dish manufacturer. The VSAT dish mounting bracket is diameter $\varnothing 5\text{cm}/2\text{in}$. If the diameter of the mounting bracket needs to be increased,

diameter $\varnothing 6\text{cm}/2.4\text{in}$ and diameter $\varnothing 7\text{cm}/2.8\text{in}$ shims are provided.

To install the shims, slide them onto the diameter $\varnothing 5\text{cm}/2\text{in}$ bracket.

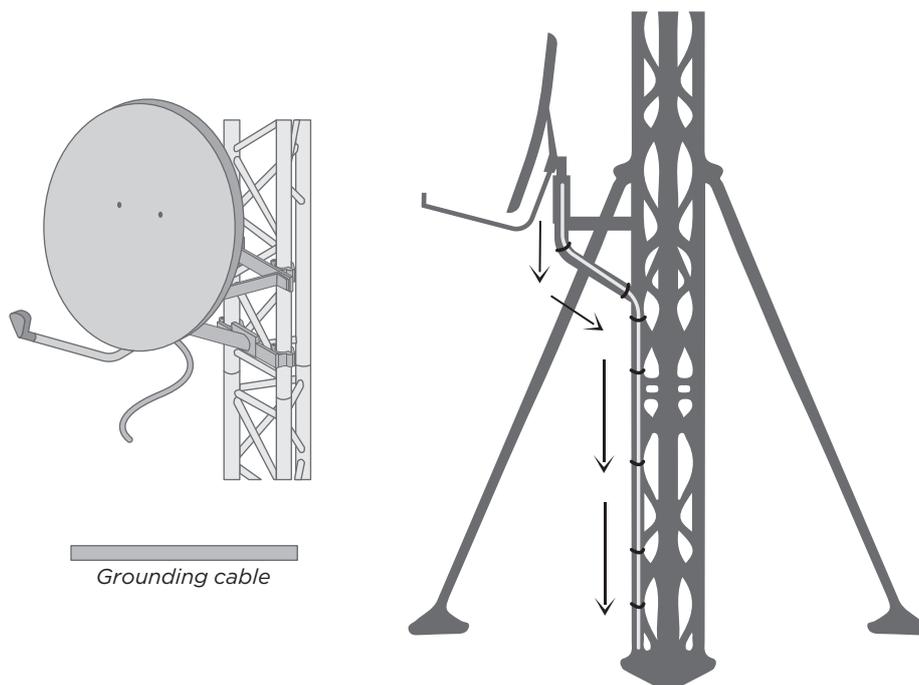
2



When the VSAT dish has been installed, connect the in-box supplied 4m/13ft grounding cable to the BUC. Route the

cable along the VSAT dish mounting bracket and the BLUETOWN REACH TOWER.

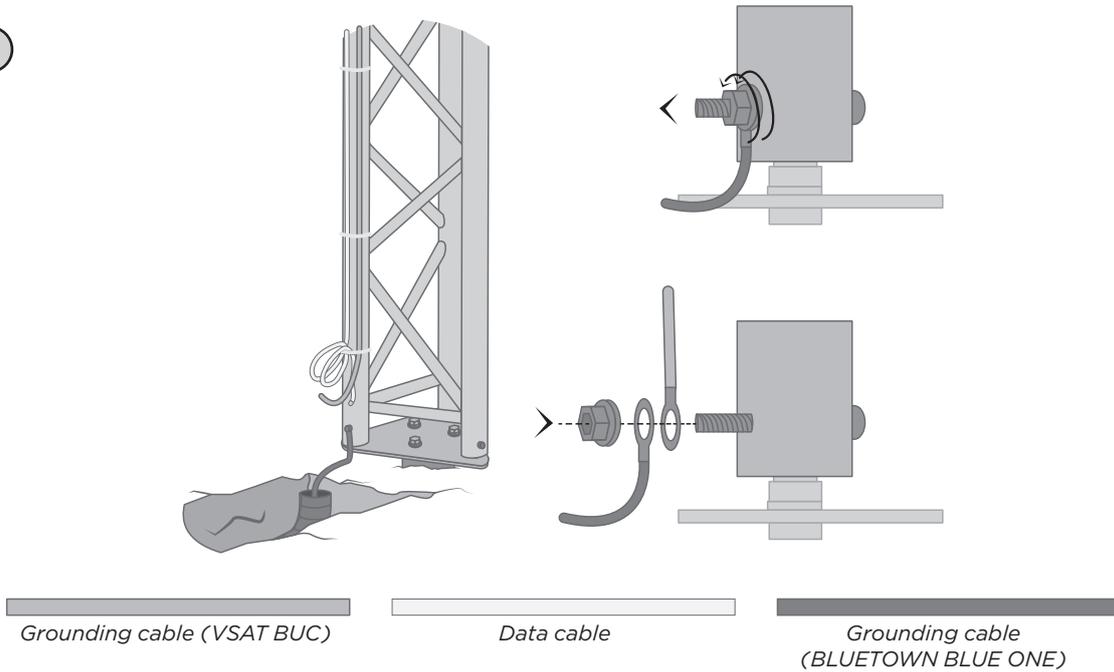
3



Connect the grounding cable to one of the three lowest threaded pins on the tower. Secure the grounding cable to the

tower sections using in-box supplied cable ties.

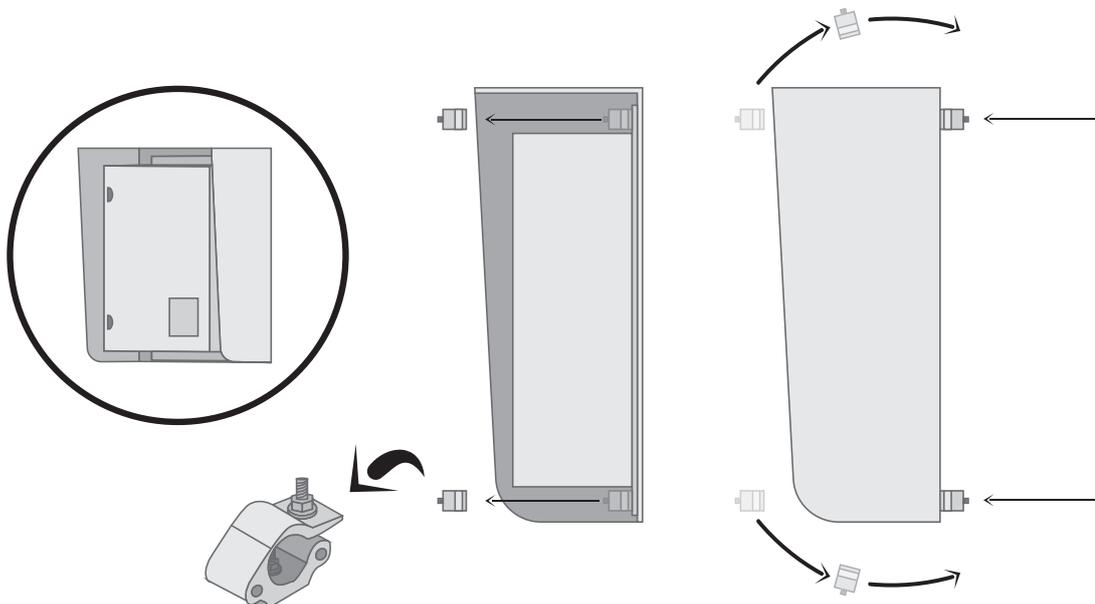
4



INSTALLING BLUETOWN BLUE ONE

BLUETOWN BLUE ONE comes with a solar shield. Start by moving the installed clamps from the inside of the solar shield to the outside rear of the solar shield.

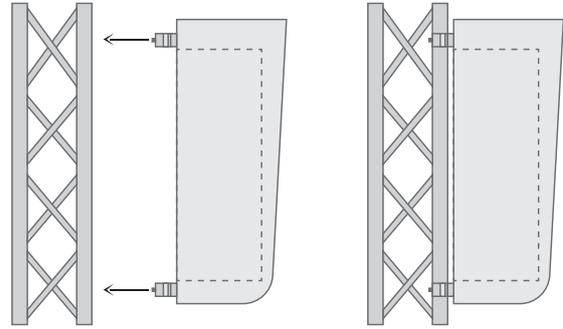
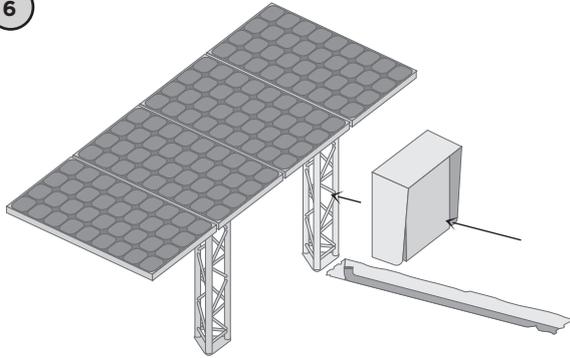
5



Install BLUETOWN BLUE ONE on the BLUETOWN BLUE ONE SOLAR tower section where the cables and trench lead to. The cabinet cable glands must point

downwards. When correct placement has been found, tighten the nuts on the clamps.

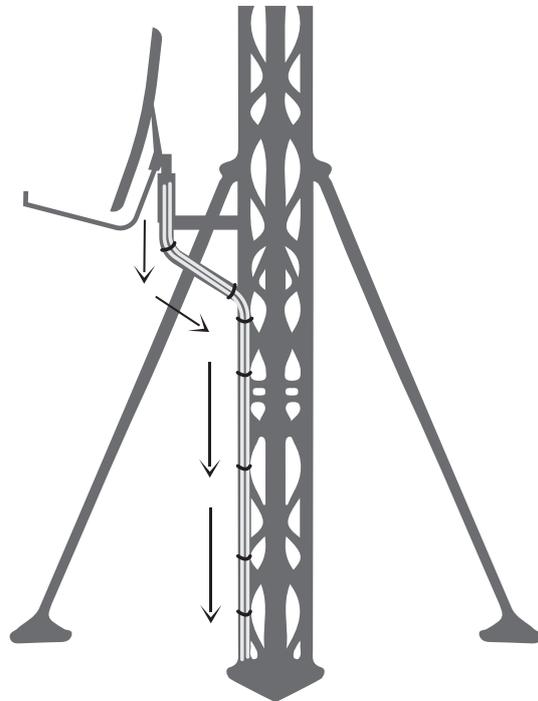
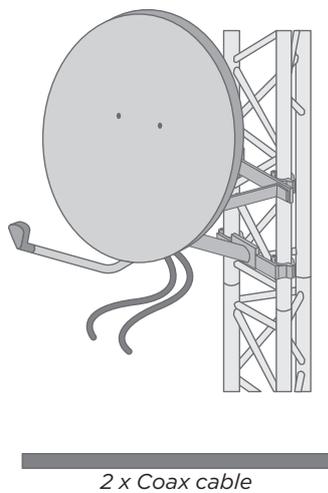
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INSTALLING COAX AND DATA CABLES

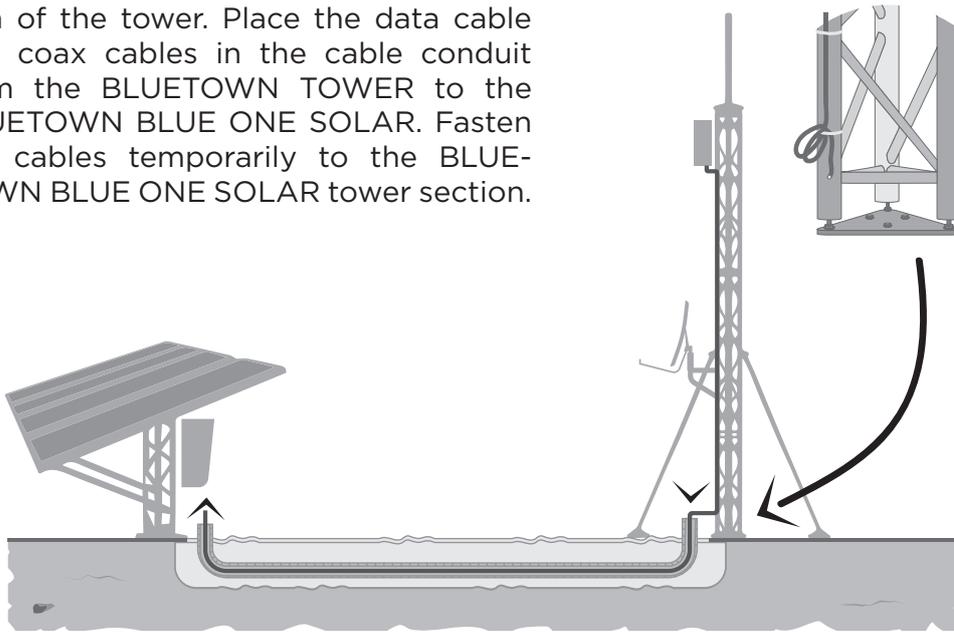
Starting at the VSAT dish, route the two coax cables provided with the VSAT dish along the tower to the ground. Secure the cables on the tower using the provided cable ties.

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Undo the coiled data cable from the bottom of the tower. Place the data cable and coax cables in the cable conduit from the BLUETOWN TOWER to the BLUETOWN BLUE ONE SOLAR. Fasten the cables temporarily to the BLUETOWN BLUE ONE SOLAR tower section.

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BLUETOWN BLUE ONE OVERVIEW

BLUETOWN BLUE ONE is grounded via the clamps that are used for mounting the cabinet to the BLUETOWN BLUE ONE SOLAR tower section.

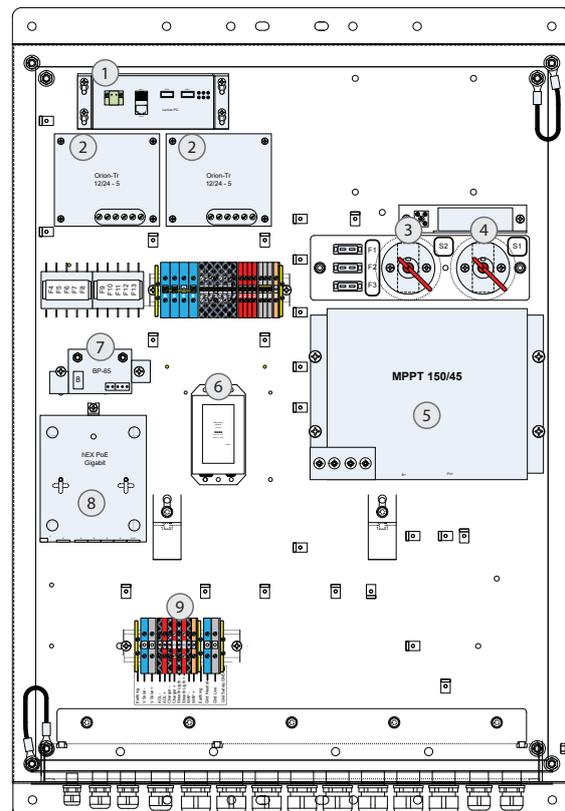
The cabinet is waterproof (rated IP65). To ensure a waterproof sealing at the cabinet cable entry routing, cable glands must have a tight closure. See step 16 for detailed instructions

The batteries must not be charged at temperatures below 0°C, as they will then deteriorate. Hence it is important to maintain the cabinet in a location with a temperature ranging from 0°C to 40°C.

The system comes pre-wired in such a way that all on-site installation is performed mainly in the bottom section of the box, with the batteries being installed as the last step. Step 10–15 provides a full overview of the cabinet's content. We recommend to briefly familiarize yourself with the placement.

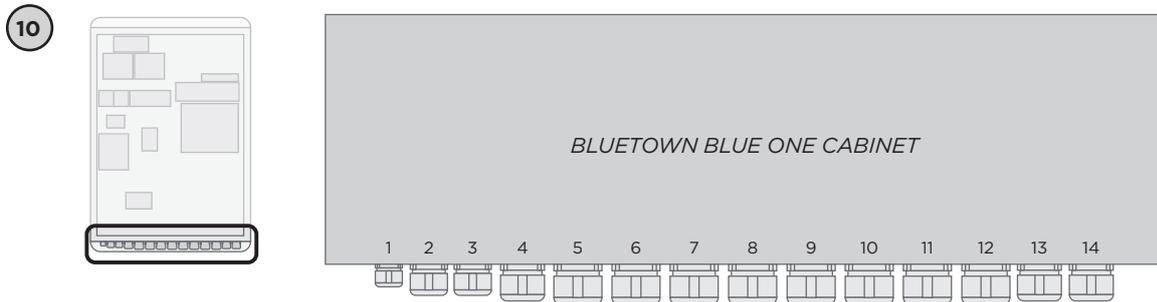
Note: This overview does not showcase any of the cables.

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- | | |
|-------------------------------|-----------------------------------|
| 1. Content server | 6. Battery thermal protection |
| 2. 12V to 24V DC/DC converter | 7. Battery protection |
| 3. System ON/OFF | 8. Router |
| 4. Charger ON/OFF | 9. Screw terminal for cable entry |
| 5. MPPT battery charger | |

All external cables entry into the cabinet are routed through cable glands.



Cable gland routing overview:

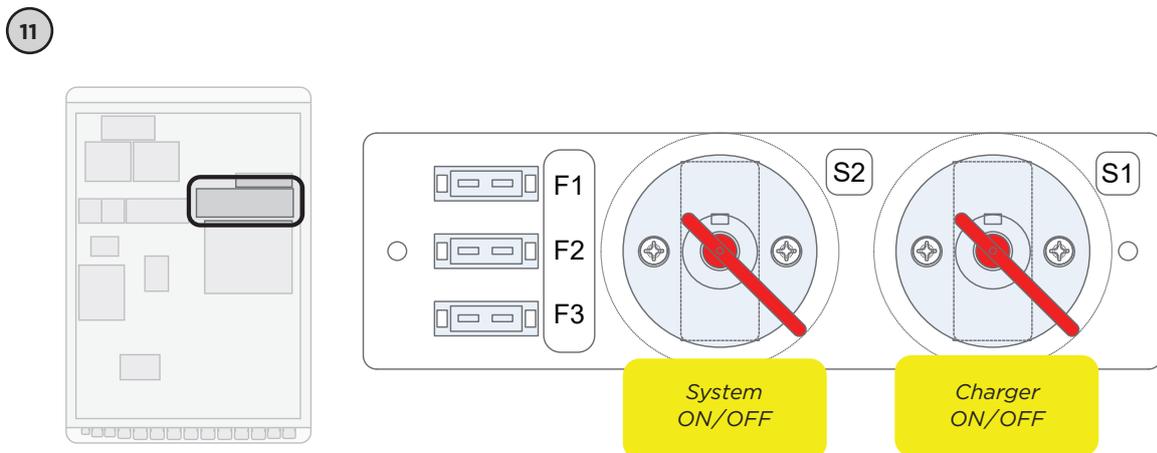
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|--|--|
| 1. Grounding wire entry | 8. Access point entry (sector 3) entry |
| 2. Negative solar panel wire entry | 9. Access point entry (sector 4) entry |
| 3. Positive solar panel wire entry | 10. Access point entry/Optional charger |
| 4. Mains cable entry | 11. Access point entry/Optional Street Light |
| 5. Wi-Fi Access Point (WAP) entry | 12. Access point entry/Optional Aviation Obstruction Light |
| 6. Access point entry (sector 1) entry | 13. VSAT cable entry |
| 7. Access point entry (sector 2) entry | 14. VSAT cable entry |

Please note that the fuses are divided into two groups: One group being the source fuses and the second being the load fuses.

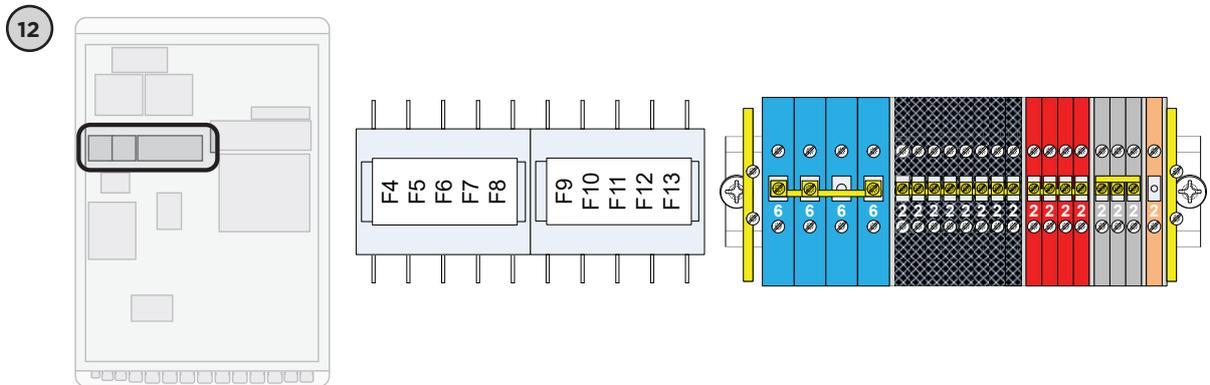
Note: The F1 and F2 fuses are always used regardless of whether one or two batteries are installed. If one battery is used—then the battery cables are connected in parallel to the battery.

The source fuses are located on the Switch Board:

- F1: 30A (left battery)
- F2: 30A (right battery)
- F3: 15A (system power)



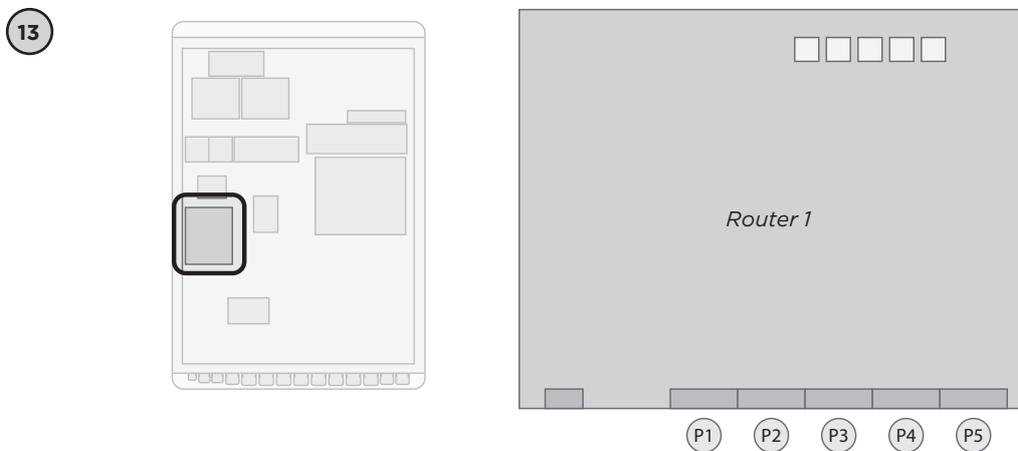
The load fuses are located under protective covers, which need to be removed for access to the fuses.



F4: Optional 5A (external charger)
F5: Optional 5A (Street Light)
F6: Not used
F7: Not used
F8: 5A (VSAT modem)

F9: 1A (fan)
F10: 1A (content server)
F11: 3A (Router 1)
F12: 3A (Router 2)
F13: Optional 1A (Aviation Obstruction Light)

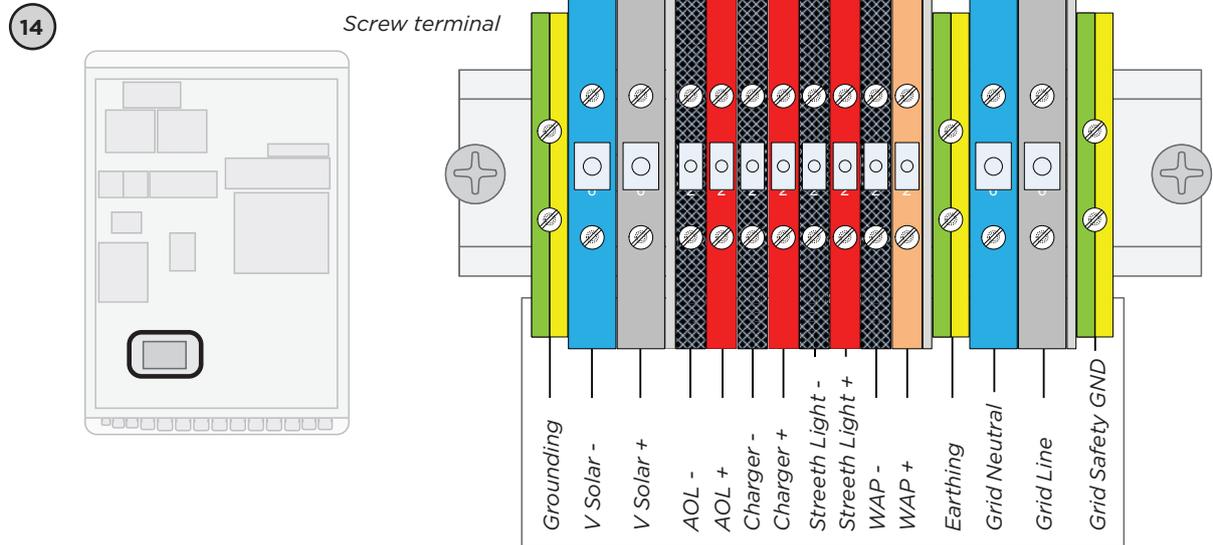
The ports on Router 1 are used as follows.



P1: Inter data connection to content server (Pre-wired)
P2: Not used
P3: PoE enabled data connection for optional indoor AP
P4: PoE enabled data connection for AP (BLUETOWN WAP)
P5: Inter Data connection to VSAT modem (Pre-wired)

Most cables (except the data and coax cables from the tower) that are routed to BLUETOWN BLUE ONE are terminated in the screw terminal. The screw terminal location is in the lower left side of BLUE-

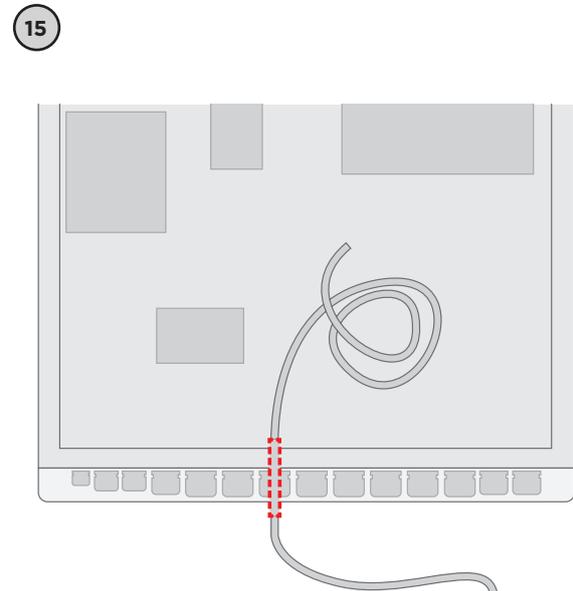
TOWN BLUE ONE and the connections point are identifiable via a label located just below the screw terminal. Most of the installation is done here.



WATERPROOFING AND TIGHTENING OF THE CABLE GLANDS

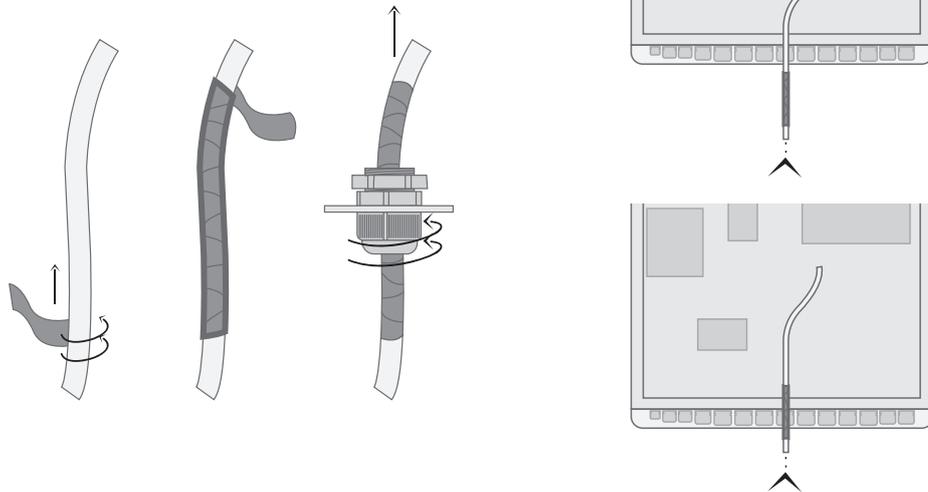
For convenience during installation the cable glands on BLUETOWN BLUE ONE (refer to step 10) have a large inner diameter. Cables with a diameter below $\sim 6\text{mm}^2/0.24\text{in}^2$ must be applied tape to before tightening the cable gland. This ensures the best waterproofing. For best results we recommend using self-amalgamating tape.

Start by identifying the point where the cable will be going through the cable gland. There must be enough cable left inside the cabinet for proper installation. Rather a bit too much cable.



Apply the tape on the identified point on the cable, starting from the bottom, and slowly thickening it, so it fits tightly in the cable gland.

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BLUETOWN BLUE ONE ELECTRICAL INSTALLATION INSTRUCTIONS

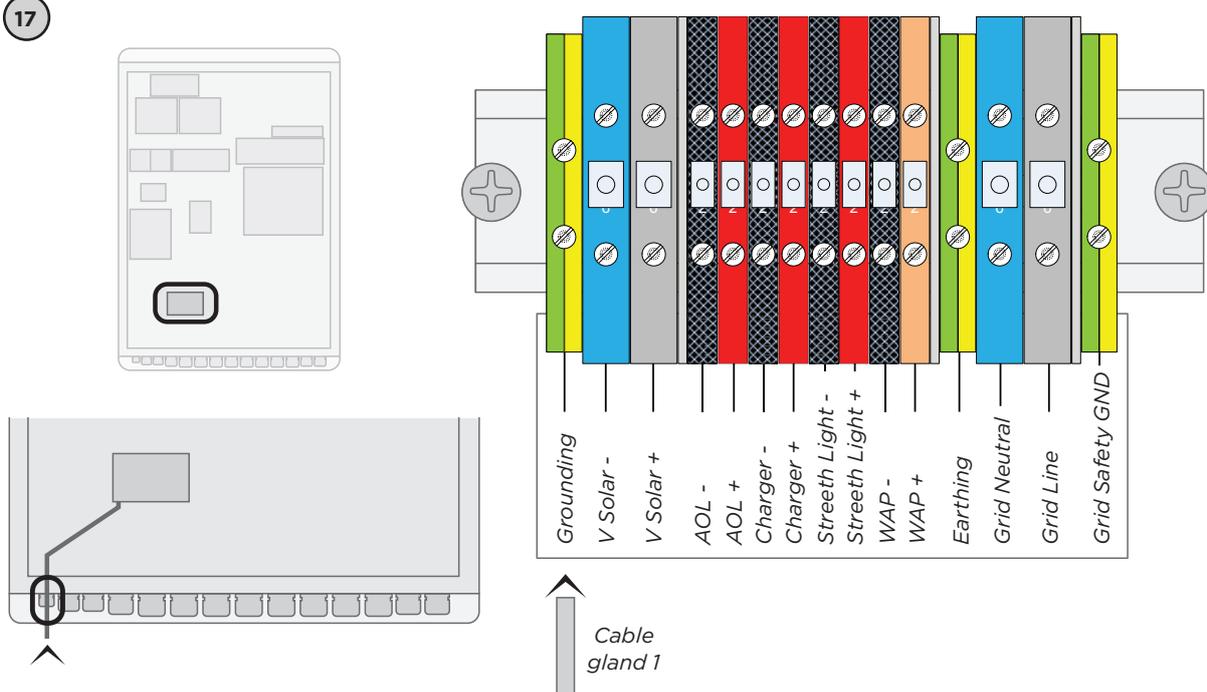
The installation must follow the steps described in this manual. The order of installation minimizes risk of electric

shock, and risk of equipment damage from electrostatic discharge.

Note: All cables, except data cables, must be equipped with a ferrule to protect the cores in the wire.

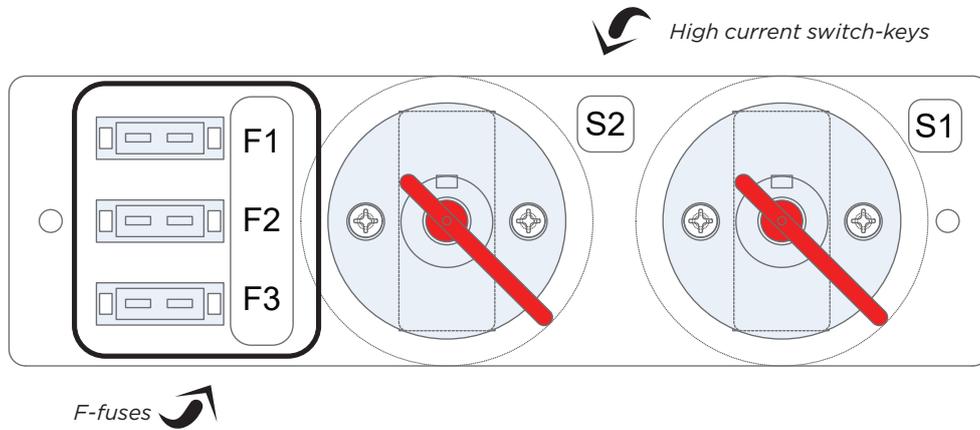
Pass the grounding cable from the cable conduit through the first cable gland, using a screwdriver to connect it securely to the screw terminal.

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Remove the two high current switch-keys from the system and store safely for later use. Then remove the fuses F1, F2 and F3 from the system and store these safely for later use as well.

18



Guide the data cable from BLUETOWN REACH TOWER (see step 8) through cable gland 5 and insert the cable into port 4 on router 1. Remember to waterproof the cable as shown in step 16.

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SOLAR PANEL CABLE INSTALLATION

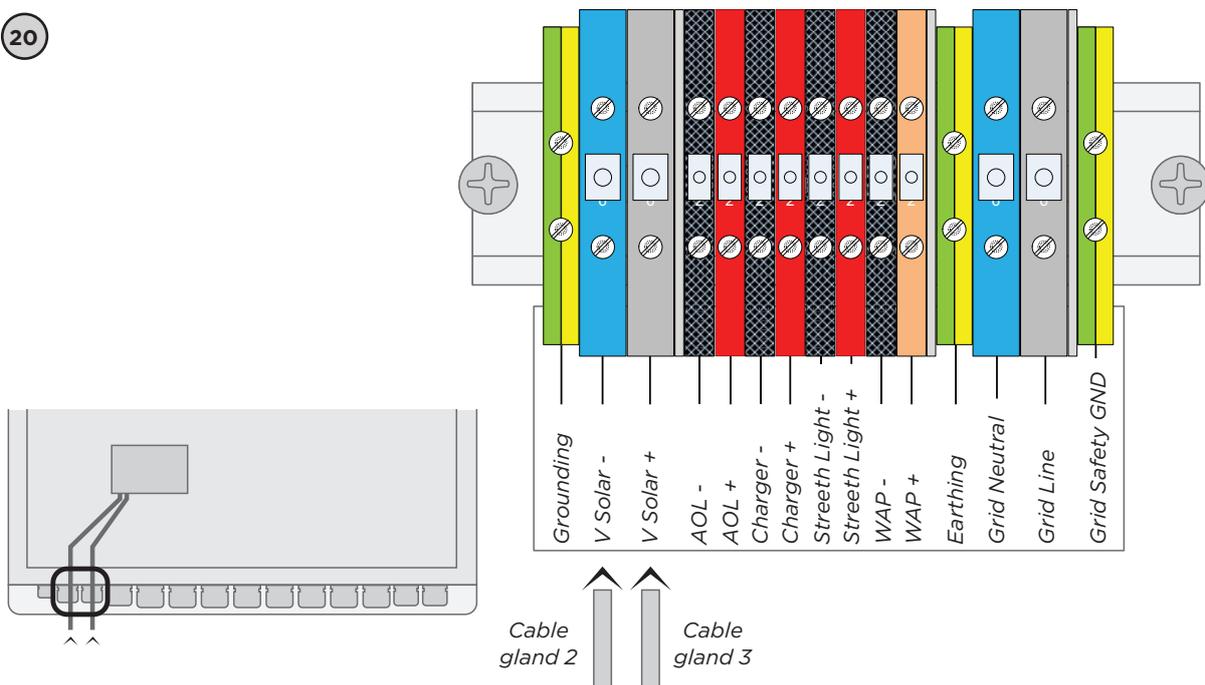
Please follow the steps below in the advised order to further minimise the risk of electric shock.

- Pass the positive wire from the solar panels through cable gland 3.
- Using a flat screwdriver, firmly secure the positive solar panel wire to the (+) marked location on the screw terminal marked "V Solar +"

marked location on the screw terminal marked "V Solar +"

- Pass the negative wire from the solar panels through cable gland 2.
- Using a screwdriver, firmly secure the negative solar panel wire to screw terminal marked "V Solar -"
- Refer to step 16 to secure waterproofness and tightening of the cable glands.

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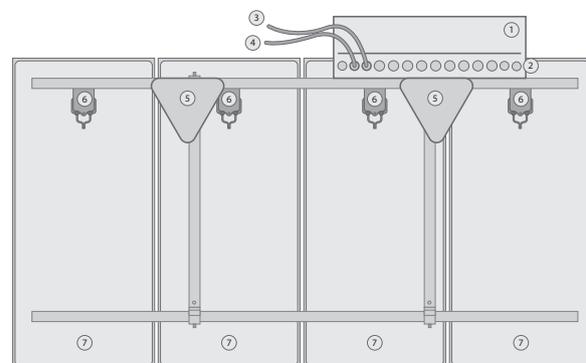


Now you will need to connect the wire to the solar panels. We recommend to briefly familiarize yourself with the set up shown below.

WARNING: Solar Panels have a high DC voltage across their terminals the moment they are exposed to sunlight. This voltage poses an electric shock risk, so please be careful and follow instructions in correct order!

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Rear view of solar panels and bottom view of BLUETOWN BLUE ONE

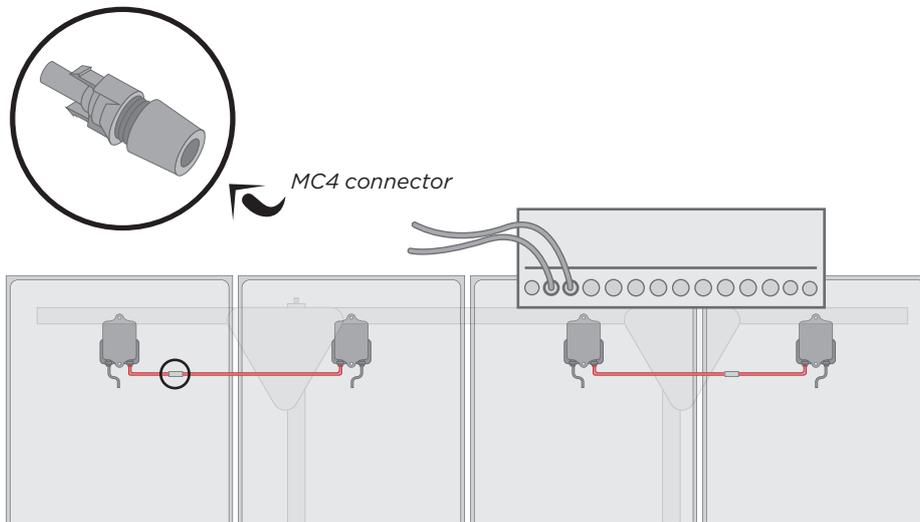


- | | |
|--------------------------|--------------------------------------|
| 1. BLUE ONE | 5. Solar panel support tower section |
| 2. BLUE ONE cable glands | 6. Solar panel cable box |
| 3. Positive wire | 7. Solar panel |
| 4. Negative wire | |

Start by connecting the positive loose hanging Photo Voltanic (PV) cables attached to one of the Solar Panels power boxes to another box's negative PV

cable as shown. Use the MC4 connector to add a longer PV cable piece to the connection, if more length is needed. All MC4 connectors are fully insulated.

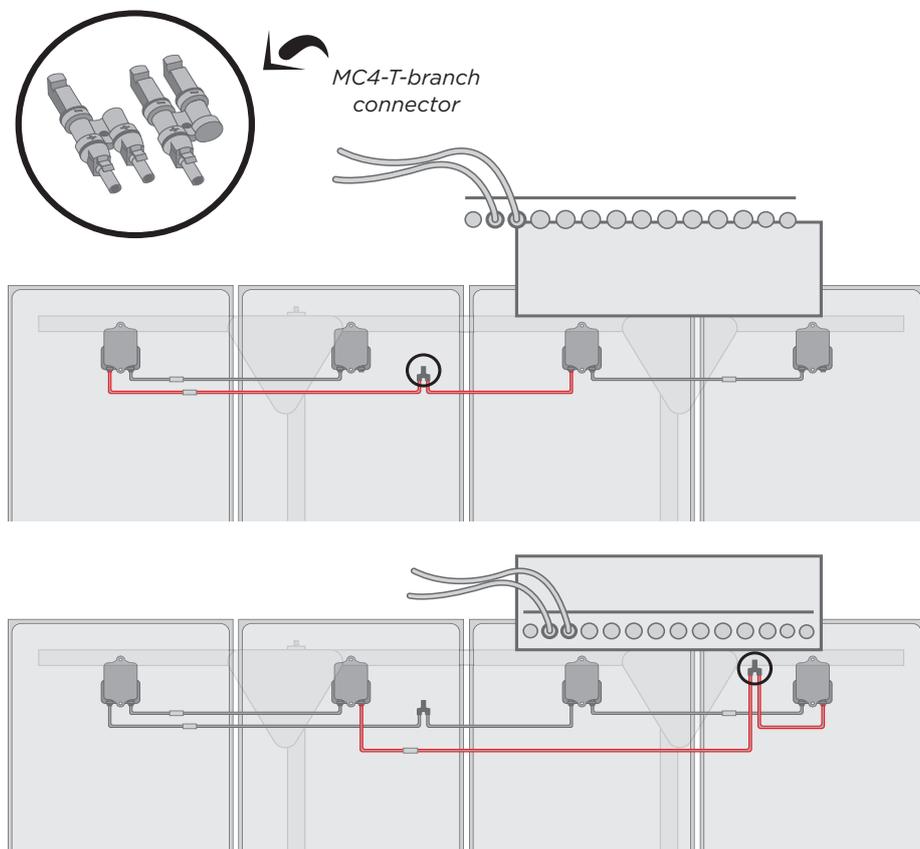
22



Now connect the two remaining positive PV cables attached to the solar panels power boxes with the MC4-T-branch connector. Once again use the MC4

connectors, if more length is needed. Then repeat the process with the negative PV cables attached to the Solar Panels power boxes.

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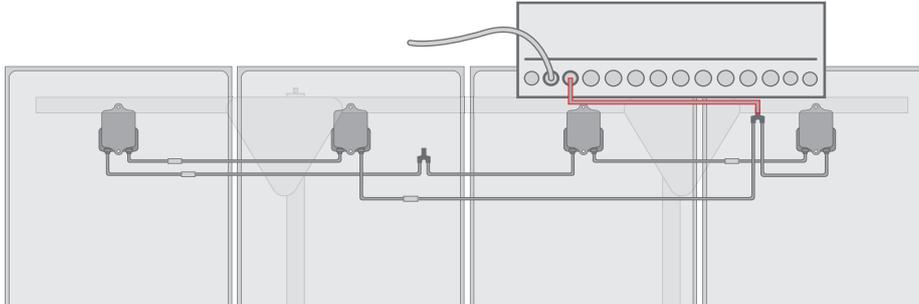


Connect the positive cable from the Blue One cabinet (see step 19) to the MC4-T-branch connecting the negative cables on the solar panels. Then do the same with the negative cable from the BLUETOWN BLUE ONE cabinet and connect it to the MC4-T-branch connecting the positive cables on the solar panels.

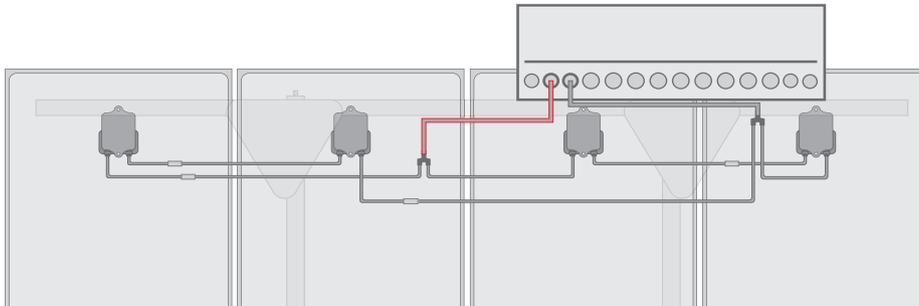
Finally secure all cables onto nearby pipes and the BLUETOWN BLUE ONE SOLAY tower section using the supplied cable ties.

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Step 1



Step 2

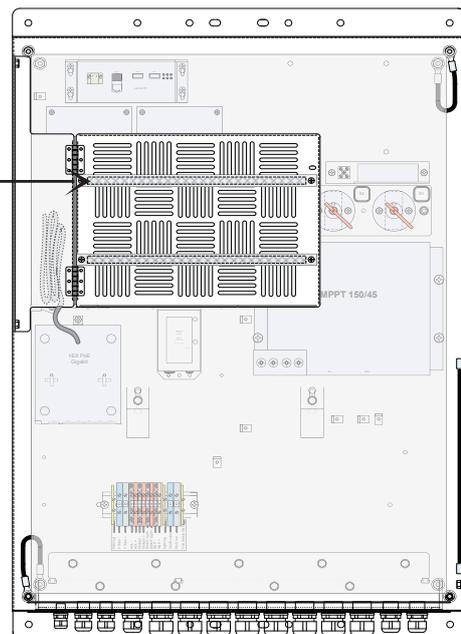


VSAT MODEM INSTALLATION

The VSAT modem is installed on the hinged shelf, which can be opened to allow access to the electronics behind it. This shelf is kept in place by a single 5mm screw. The DC power connector is a standard DC connector used by most VSAT modems. BLUETOWN BLUE ONE is flexible towards various VSAT modem models.

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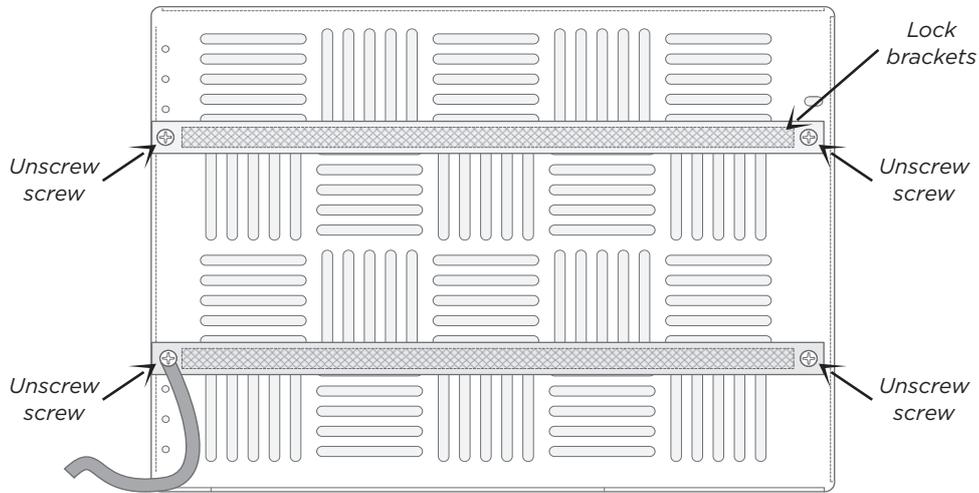
Lock brackets



Start by removing the lock brackets by unscrewing the four screws. The grounding wire connected to the lower left

screw will need to be connected again after VSAT modem has been installed.

26



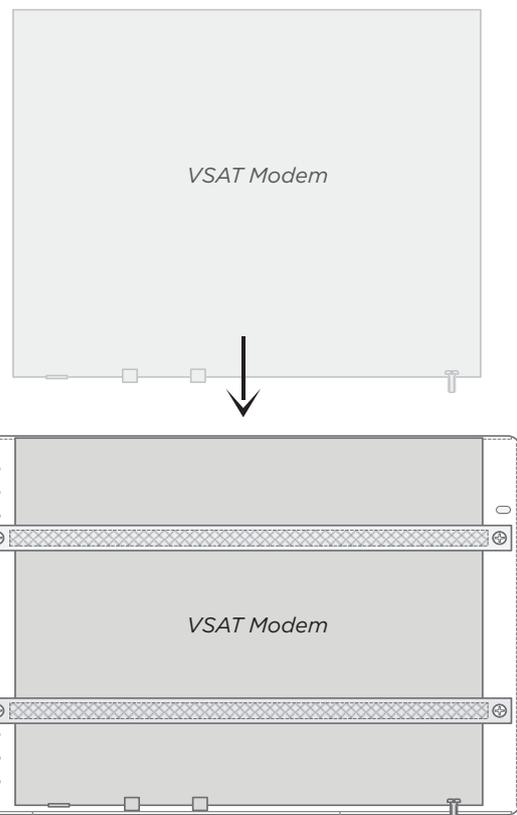
Insert the VSAT modem on the shelf with connectors pointing downwards. Secure the modem by reinstalling the lock brackets.

27

If possible, then connect the grounding wire to the threaded rod on the VSAT modem. Please note that placement of the threaded rod can differ from one VSAT modem model to another.

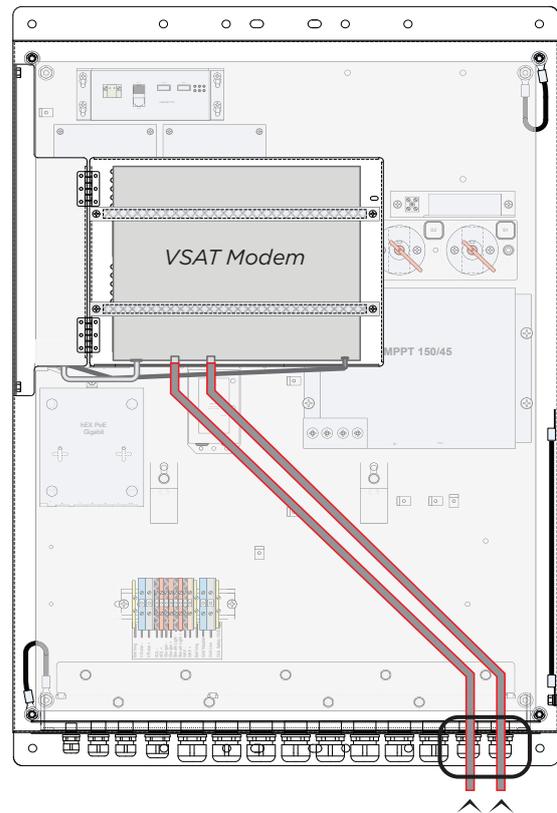
If no threaded rod is available, connect the grounding wire to one of the four screws holding the lock brackets.

Insert the DC power connector to the VSAT modem.



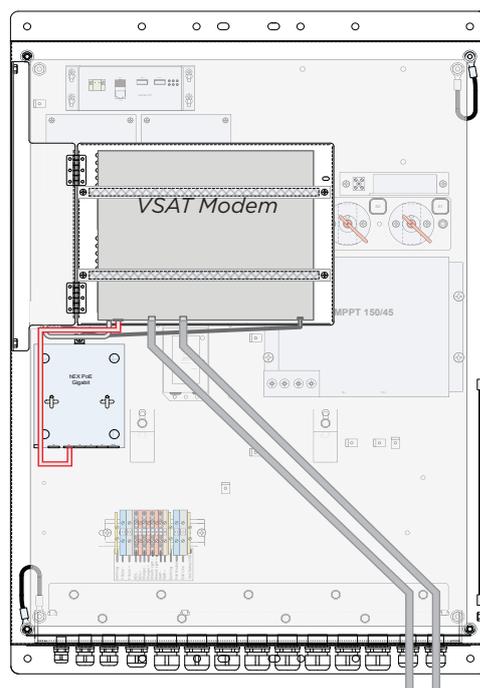
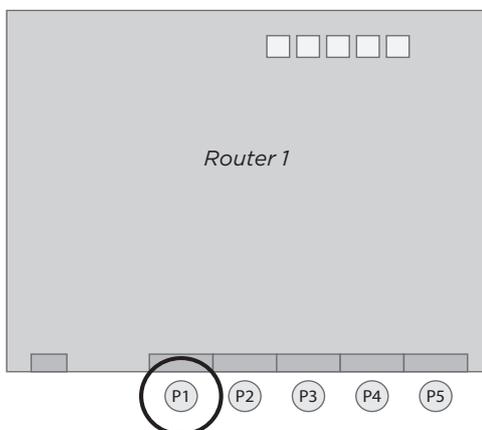
Connect the coax cable from the cable conduit to the appropriate connectors on the VSAT modem. Use cable gland 13 and 14 for the coax cables. Remember to waterproof the cables if needed (refer to step 16).

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Find the loose end of the data cable connected to port 1 on router 1 and connect the loose end to the LAN port on the VSAT modem.

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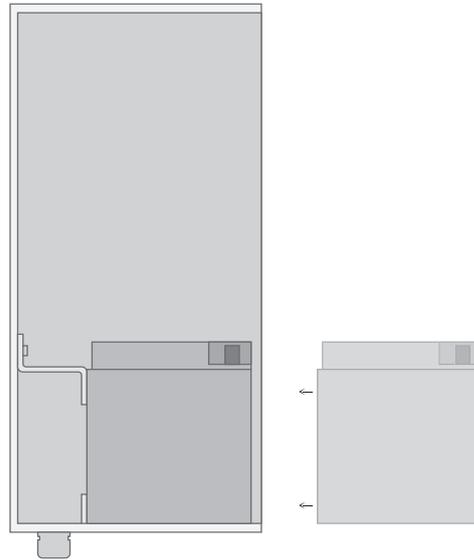
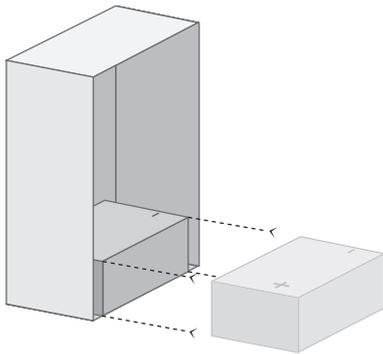


BATTERY INSTALLATION

BLUETOWN BLUE ONE is equipped with either a single battery or two batteries connected in parallel.

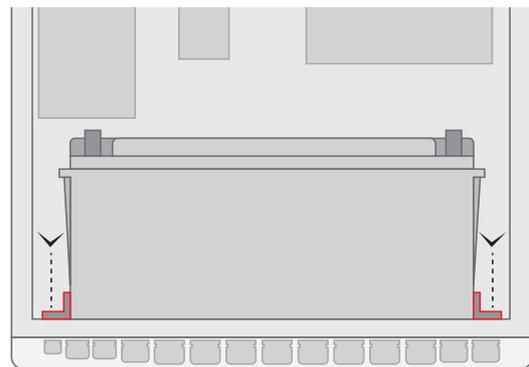
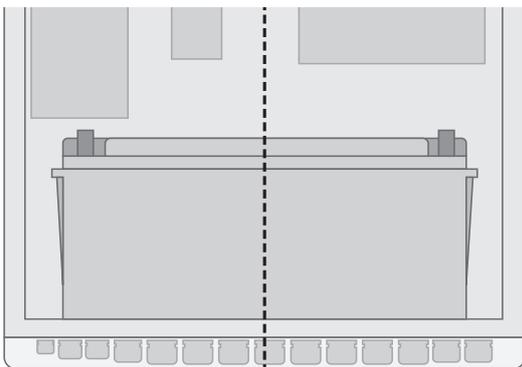
Place the battery on the battery shelf with the battery terminals facing up and with the positive terminal to the left and the negative terminal to the right. Push the battery all the way into the cabinet until it reaches the battery stop on the shelf.

30



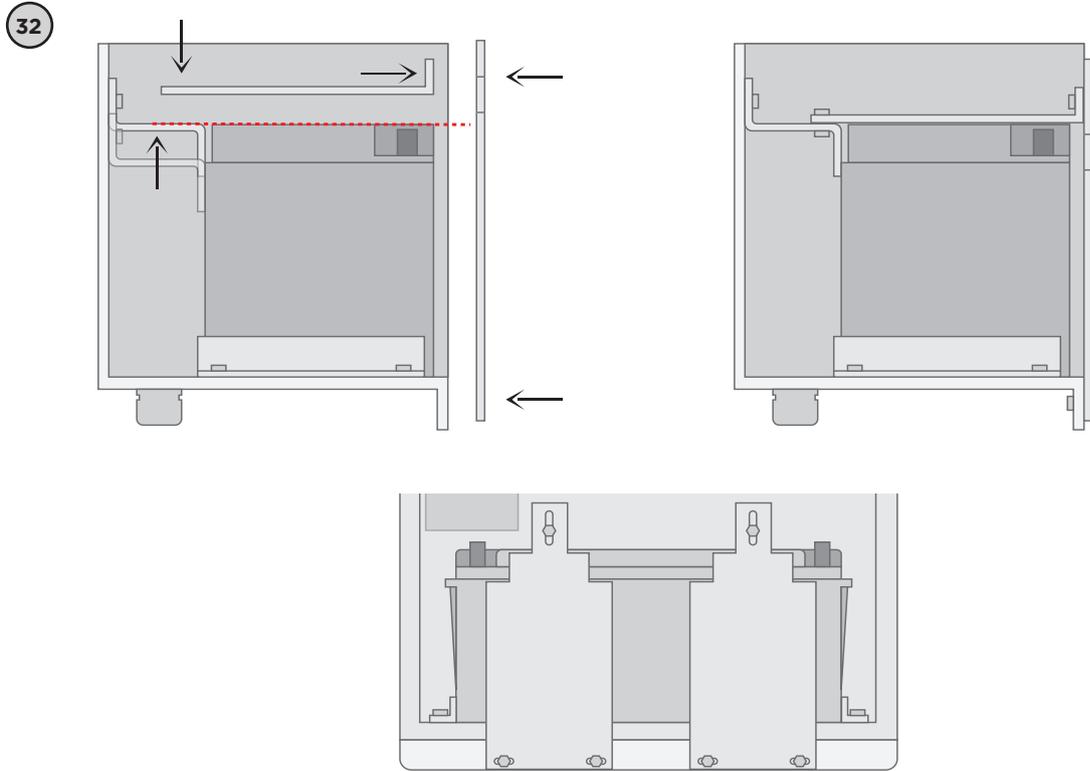
To balance the weight, centre the battery on the shelf and install the supplied battery side stops as shown on the image.

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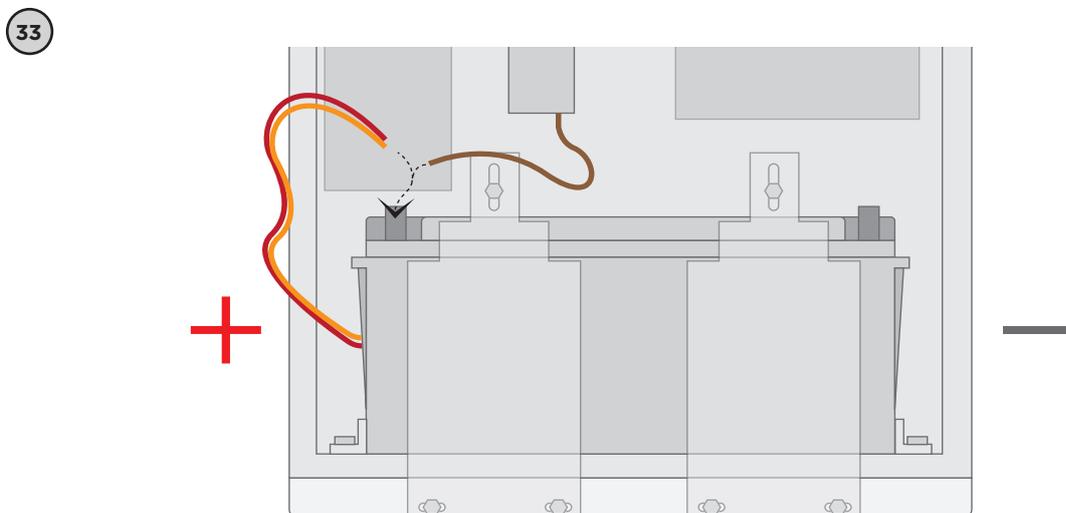
Adjust the top battery stop to be flush with the top of the battery. There is an extra screw hole provided on the back panel if needed. Then install the two battery front stops and use the top stop to secure the battery physically.

Be careful not to create a short circuit between the battery terminals and the part used to secure the battery.



There is one red and one orange 6mm² cable located behind the battery. There is also a brown cable connected to the battery thermal protector. Connect all

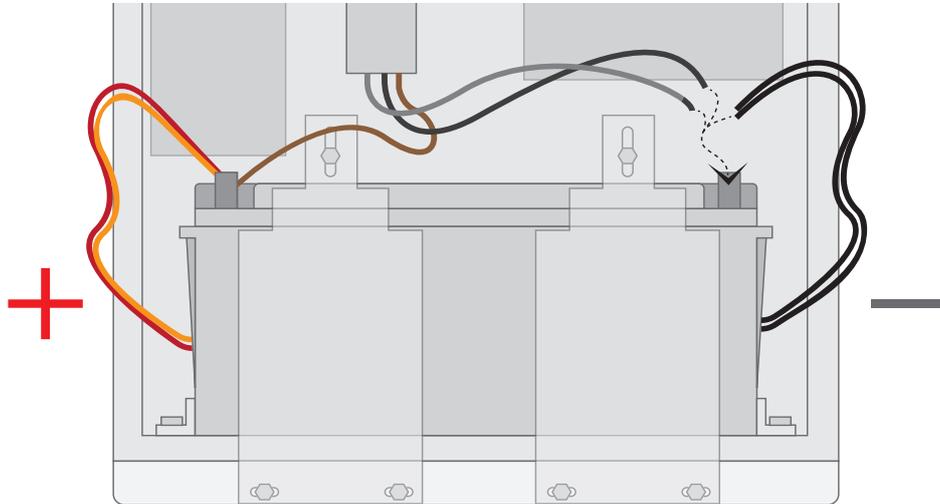
three cables to the positive terminal on the battery and secure the bolt using a 13mm/0.5in wrench.



There are two black 6mm² cables located behind the battery. There are also a black cable and a grey cable (temperature sensor) from the battery thermal

protector. Connect the 3 black cables plus the temperature sensor to the negative terminal on the battery. Secure the bolt using a 13mm/0.5in wrench.

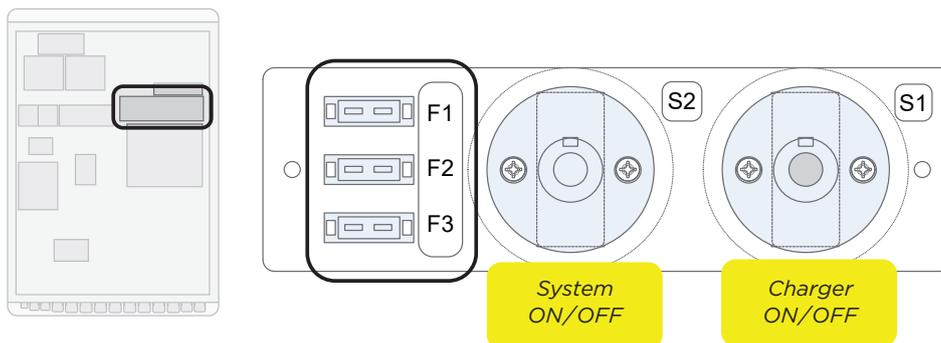
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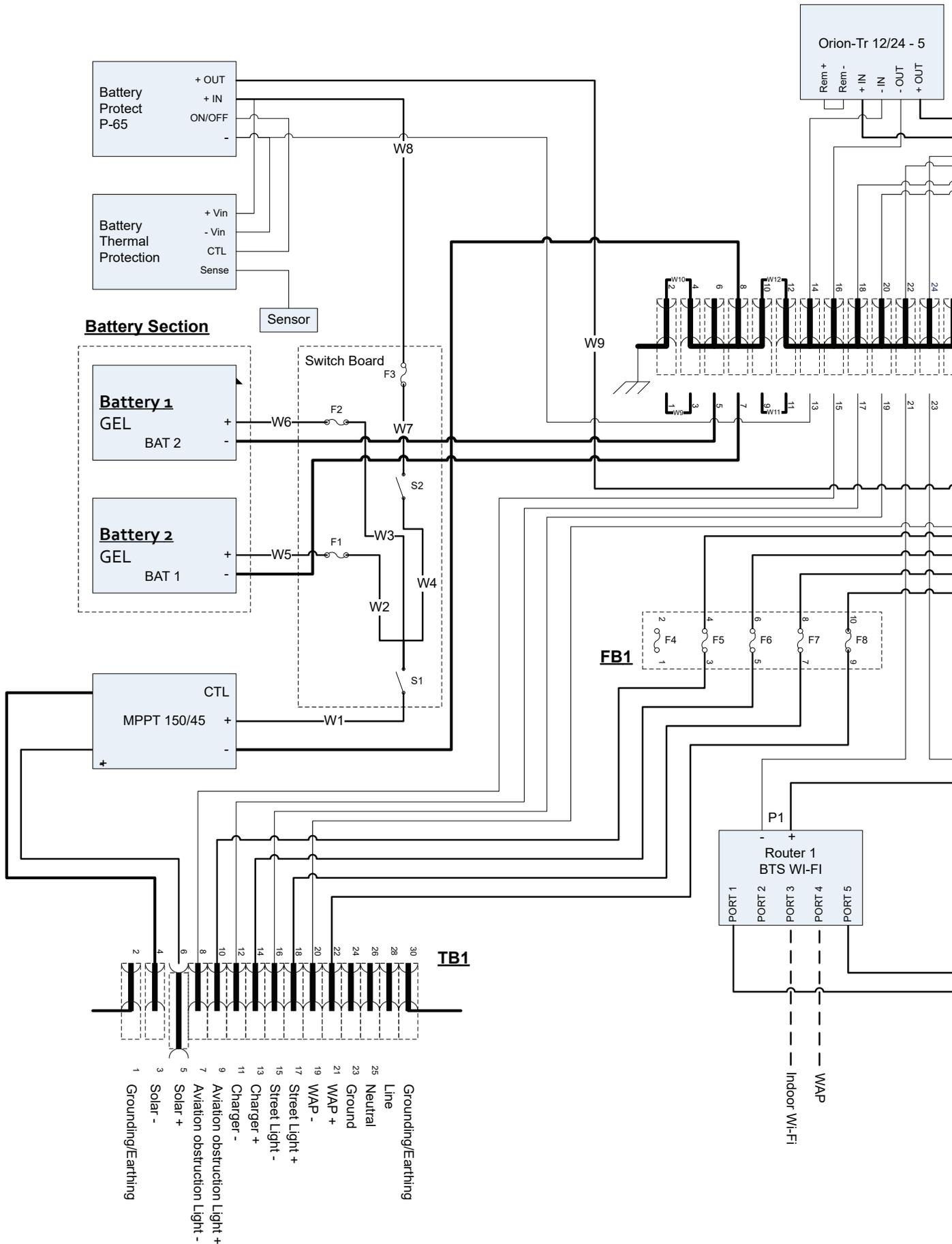


FUSE INSTALLATION

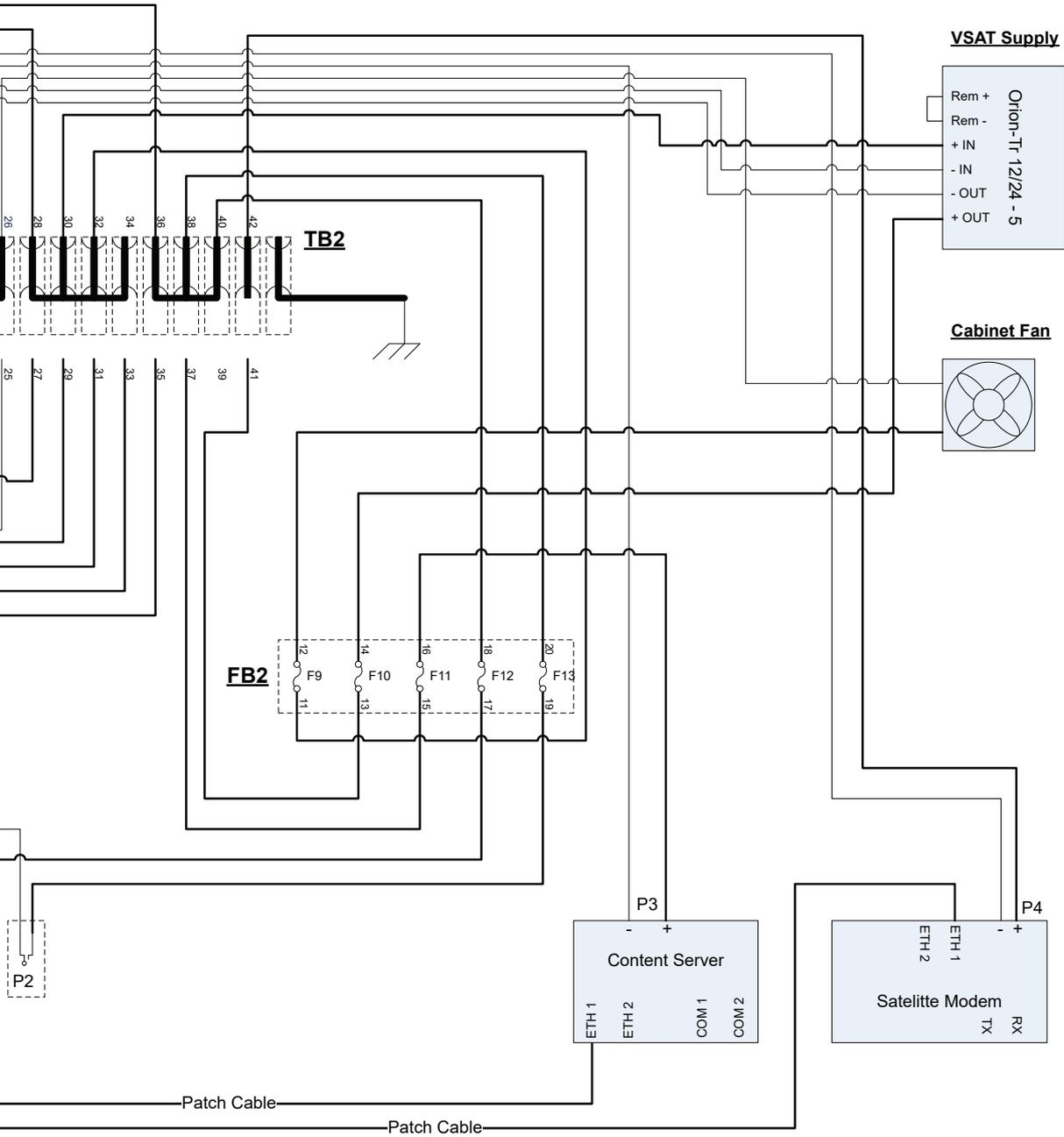
Install the three fuses: F1, F2 and F3. Please refer to the enclosed system wiring diagram for detailed fuse wiring information. See marking labels on the Switch Board.

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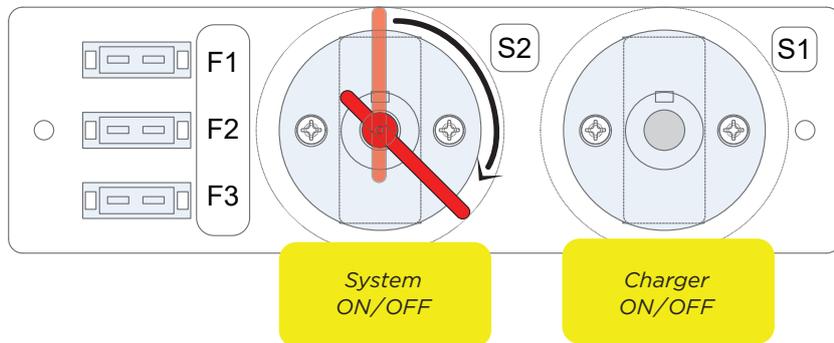


System Supply



Insert a key into the high current switch marked “System ON/OFF” and turn the key clockwise to power up the system

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After max 30 seconds (due to potential battery protection timeout) power will be applied to the system. Now please check the following (refer to the overview in step 11):

- The green LED on the DC/DC converters turns on.
- The power LED on router 1 turns on.
- The red LEDs associated with port 4 on the router 1 turns on, indicating that power is applied for the AP (BLUE-

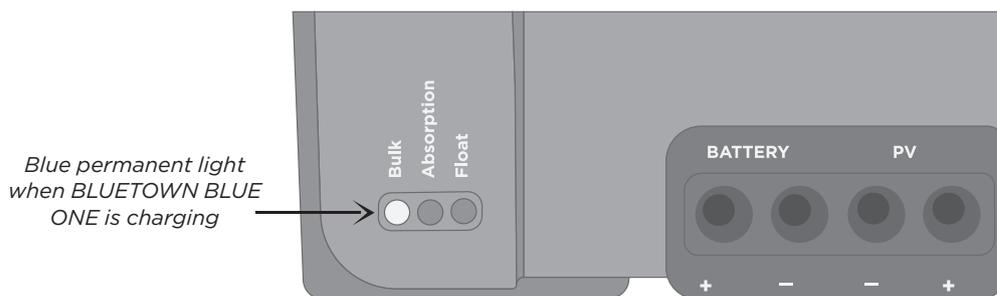
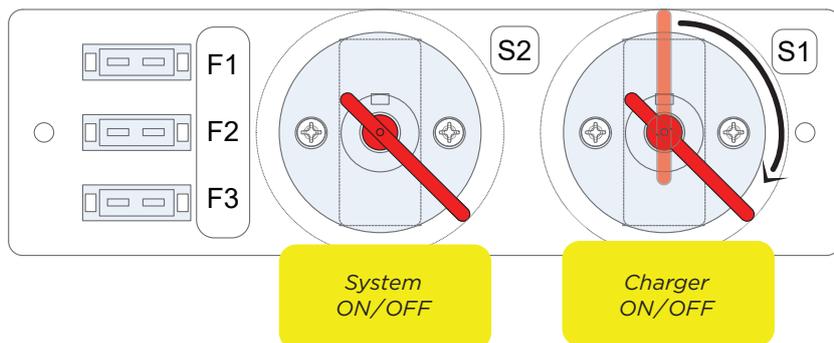
TOWN WAP).

- The green LED associated with port 1 and port 5 on router 1 will turn on.

Insert a key into the high current switch marked “Charger ON/OFF” and turn the key clockwise. Check that the “Bulk” LED on the solar battery charger lights up.

Note: The bulk LED will only light up if the solar panels deliver current, i.e. if there is sufficiently sunlight.

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The MPPT will run in “Bulk” mode until the battery voltage has become sufficiently high. It then changes to “Absorption” mode until the battery is fully charged. Hereafter it changes to “Float” mode.

With all cables installed and the system is up and running, cover the trench with the dirt from the excavation. Compact the soil so it is firm again. Make sure that the trench is completely filled.

SAFETY & INSPECTION

Ensure all cables are properly fixated as specified by the below wiring diagram. Any cable hanging loose must be

secured to the tower sections by using the provided cable ties.

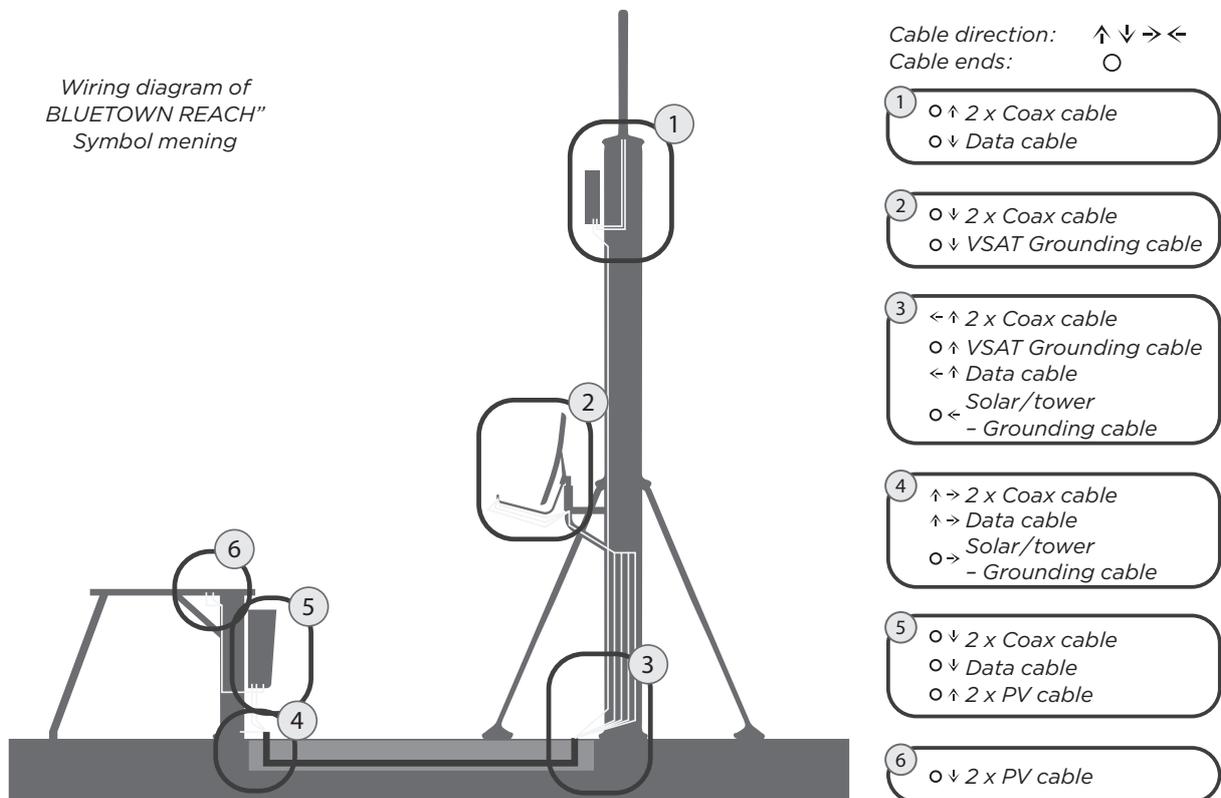
Go through nuts and bolts and ensure that all fasteners are properly tightened and secured.

COMMISSIONING TEST

Power up BLUETOWN BLUE ONE and configure the VSAT modem to establish the satellite connection. Fine tune the VSAT dish and ensure to enable sleep-mode on the VSAT modem.

Wait for the BLUETOWN REACH SSID to come live. Then connect to the SSID using password: “reach the world”.

When you can access the internet, the satellite connection is live. The system is now ready to receive the final configuration over the internet.



NOTES:

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BLUETOWN is a global Internet and content service provider founded with a vision of making connectivity accessible and affordable for everyone.

See more about BLUETOWN's products and services on our website

www.bluetown.com