PowerCube 2.0 AC
Installation Guide – Australia & NZ

Feb 2018

V1.4

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- 2. Unpacking the products
- 3. System Installation Steps
- 4. WIFI Monitoring Setup Guide

System Introduction

01

- System Topology
- Power Box
- PowerCube 2.0

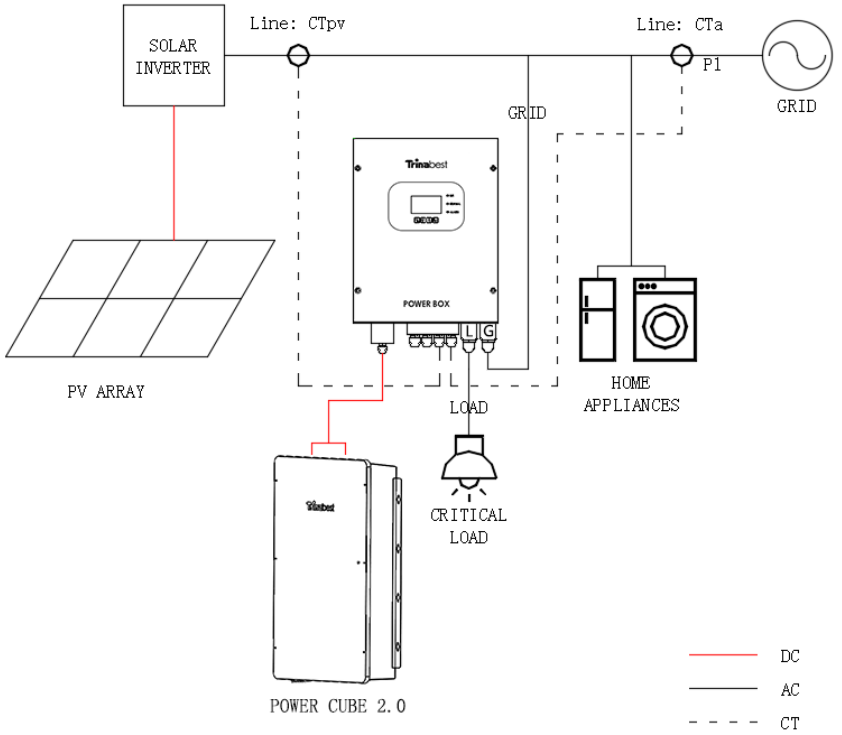
PowerCube System Topology

Power Box (AC – "Inverter"):

- DC/AC bi-directional Power Conversion Equipment (PCE)
- Mainly applied and developed for the renewable energy generation system
- The interface between the grid and the battery storage
- Designed for lithium-ion batteries

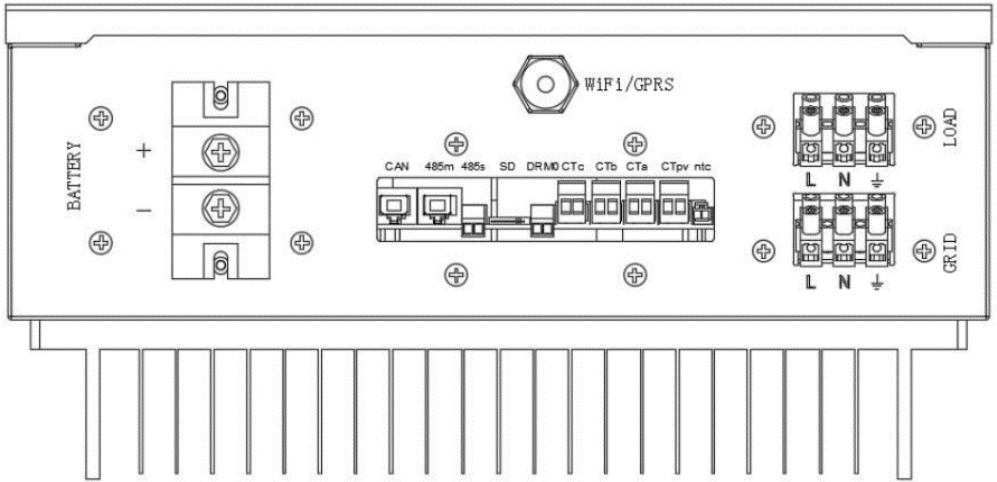
PowerCube – Battery Energy Storage:

- Lithium Iron Phosphate (LiFePO4)
- Contain at most 4 battery packs
- Capacity: 4.8kWh – 9.6kWh
- Voltage range: 44.5V – 54V

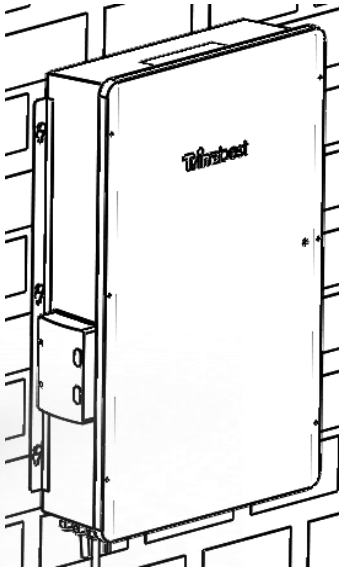


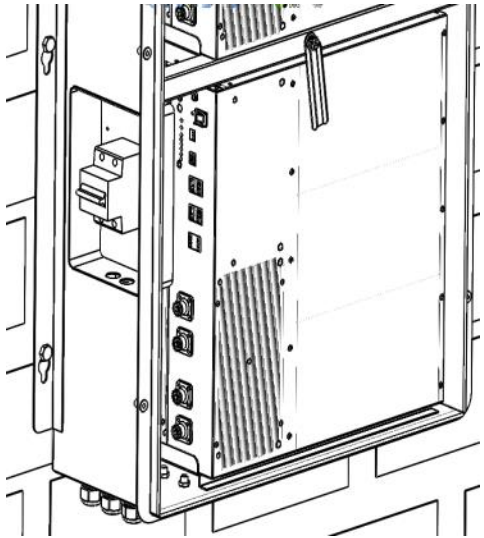
Power Box (AC – Bess Inverter)

Length	532mm
Width	360mm
Height	173mm
Weight	16kg



PowerCube (Battery Storage)





Advantages:

- The PowerCube and accessories are designed for **simplicity and convenience**
- Can be **completed by one person**
- **Integrated Isolator design** to reduce the cost and time required for installation
- Outdoor rating – **IP54**

PowerCube 2.0 Casing:

Length	1000mm
Width	600mm
Height	210mm
Weight	app. 20kG

Battery Pack:

Length	410mm
Width	440mm
Height	88.5mm
Weight	25kg

02

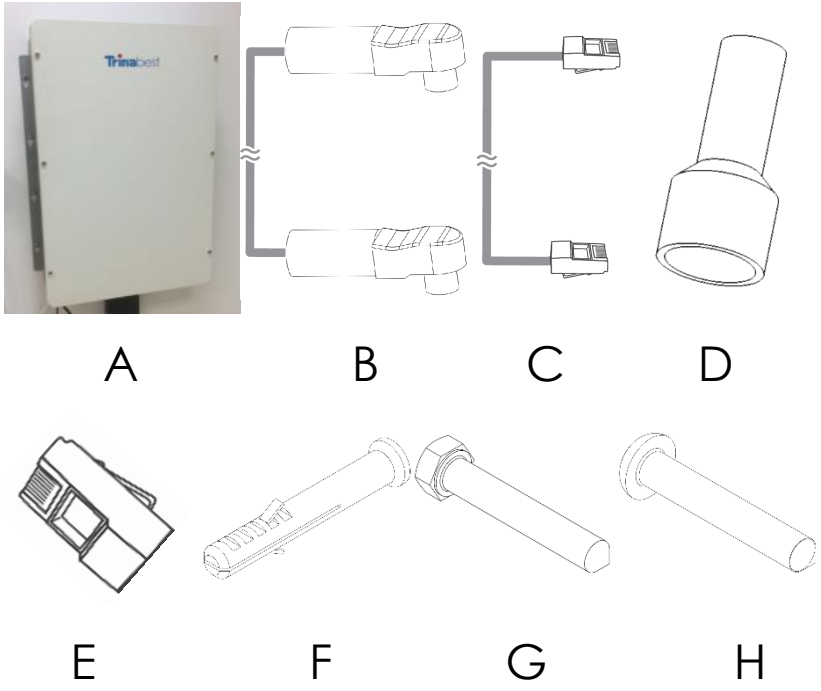
Upacking the products

- Battery Packs
- PowerCube 2.0 Casing
- Power Box

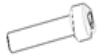
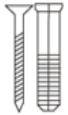
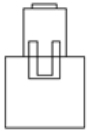
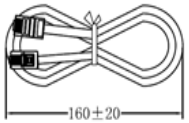
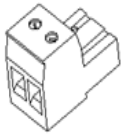
Battery Packs

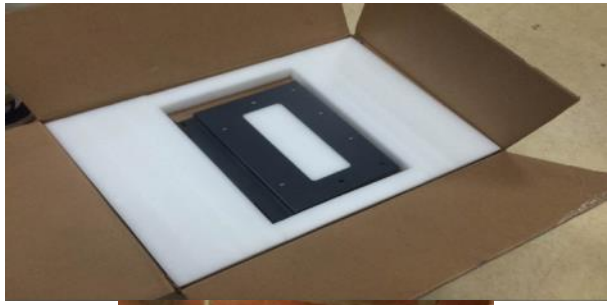
PowerCube

Component	Part Name	Quantity
A	Casing	1
B	Battery Pack Power Cable with connectors connecting between battery packs	6
C	RJ45 communication line with connectors	3
D	Connectors without Power Cable	2
E	RJ45 communication connectors	2 (1*backup)
F	Wall plug	6
G	M8 bolt	4
H	M8 Anti-Theft bolt	2



Power Box

 Mounting Bracket×1	 AC terminal×6	 M5 screw×2	 PowerCube 2.0 terminal×2
 M6 flat washer×8	 Wall plug & Screw ×8	 Terminal cap×4	 CT terminal×2
 Current Transformer× 2	 User Manual×1	 Warranty card×1	 Quality Certificate×1
 communication line×1	 RS485s terminal×2		

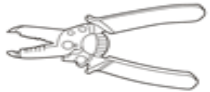


03

System Installation Steps

- Installation tools and accessories
- Single Line Diagram
- Powercube installation
- Powerbox installation
- System Connection
- System Start-up
- System Setting

Installation Tools

No.	Tool	Model
1		Hammer drill Recommend drill dia.6mm
2		Screwdriver
3		Wire stripper
4		4mm Allen Wrench
5		Crimping tools
6		Multi-meter

No.	Tool	Model
7		Marker pen
8		Measuring tape
9		Level
10		ESD gloves
11		Safety goggles
12		Anti-dust respirator

Installation Accessories

Depending on the site-specific situation and local electrical compliance requirements, some if not all of the following parts will be required:

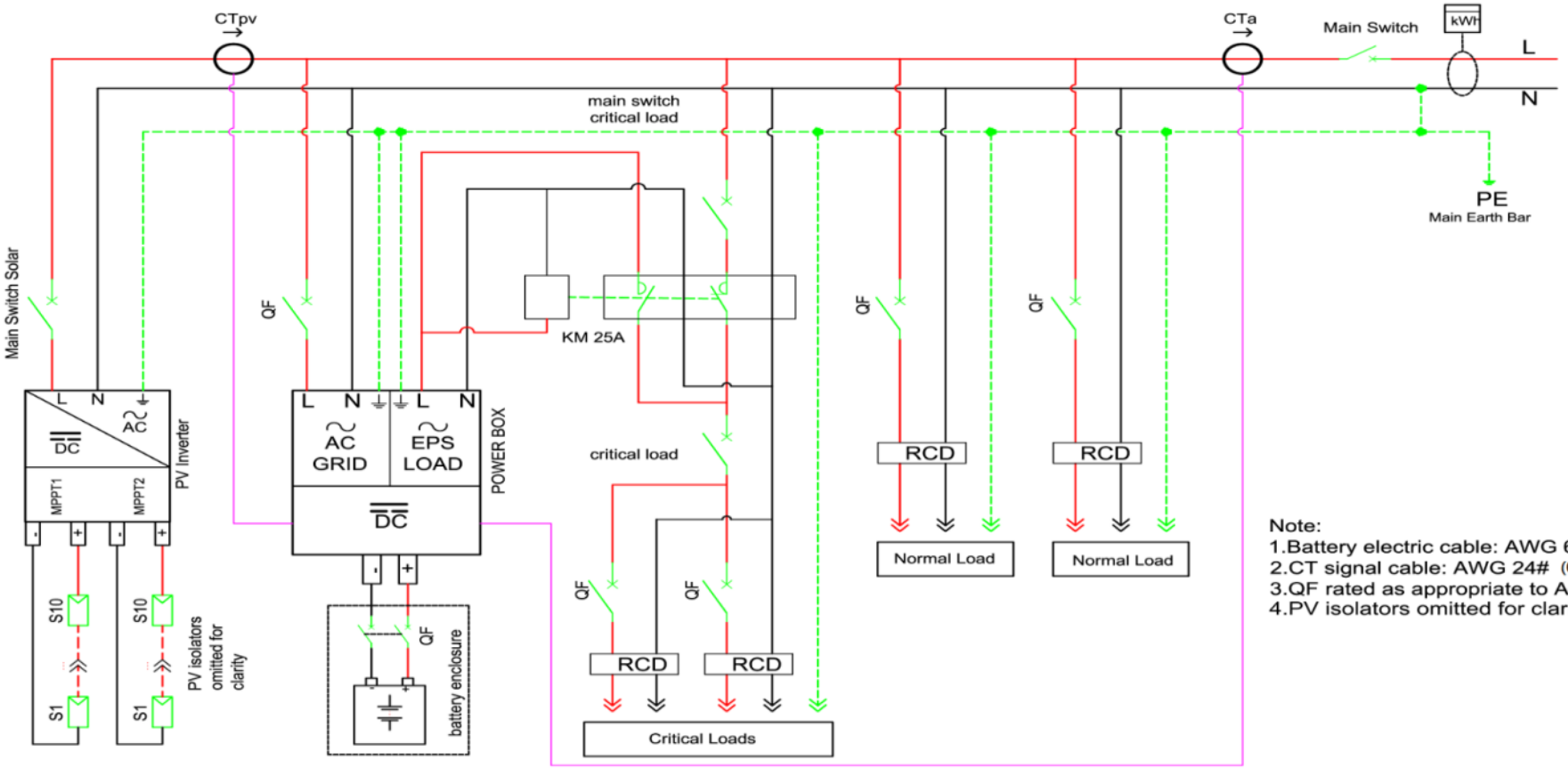
- **AC circuit breakers** – Minimum **one 20A circuit breaker** is required next to the powerbox and extra ones for extended distance away from switchboard/distribution board
- **Automatic Transfer Switch (25A Contactor)** – For **automatic switching to critical load** only. Minimum requirements: Auxiliary Contacts + 1NC + 1NO
- **AC cables (≥4mm²)** – From powerbox to Switchboard/Distribution board

- **DC cables (≥25mm²)**– From powercube to powerbox (2 to 5 metres)

- **Ethernet/CAT5 cables** – To extend the **communication cable**, distance between the powercube and the powerbox. Or to extend the **CT sensor cables**.

- **Conduits** – 20mm

System Connection – Single Line Diagram



Note:
1.Battery electric cable: AWG 6# (16mm²)
2.CT signal cable: AWG 24# (0.25mm²)
3.QF rated as appropriate to AS3000
4.PV isolators omitted for clarity

Powerbox installation – Power Box Mounting

Step 1: Put the **mounting bracket** on the wall and mark the 8 drill holes by using a marker pen. Drill 8 holes (drill bit 6mm) on the wall.

Step 2: Insert the **wall plug** vertically into the hole, note the insertion depth.

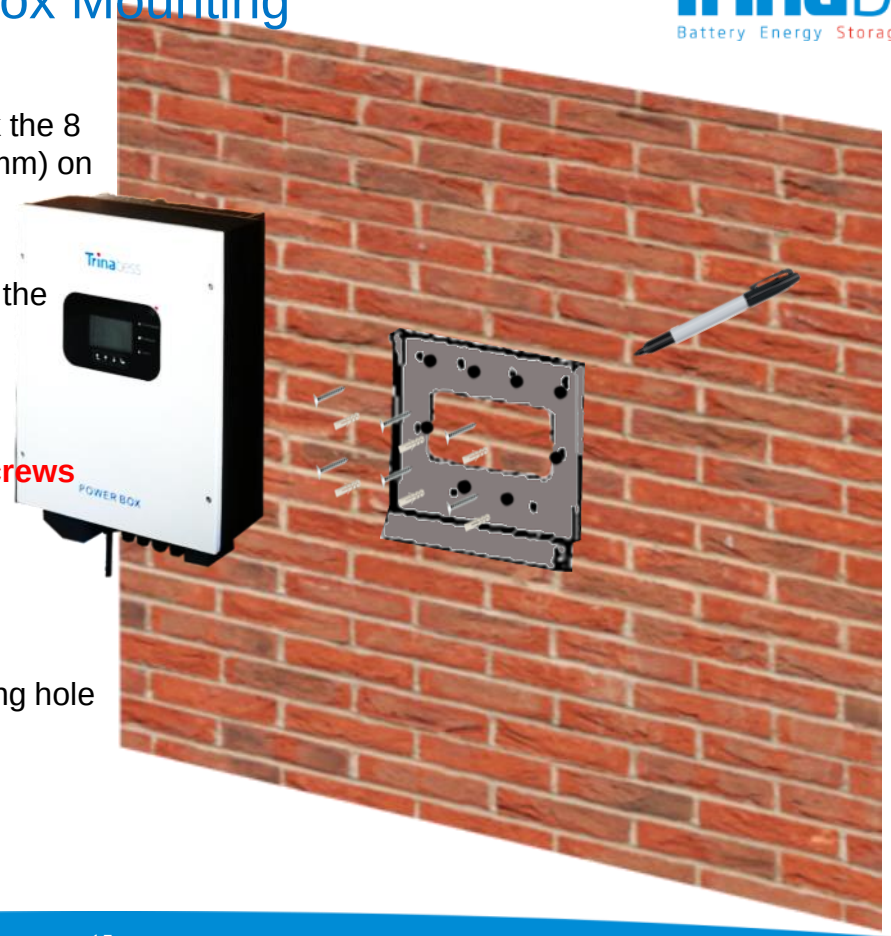
Note: Not too shallow or too deep

Step 3: Fix the mounting bracket on the wall by using **screws & flat washers**

Step 4: Put the **POWER BOX** on the mounting bracket.

Step 5: **Ground** the POWER BOX by using the grounding hole on the heat sink.

Step 6: **OPTIONAL**: you can **lock** the POWER BOX



Powercube installation – PowerCube Mounting

Step 1: Remove the **enclosure cover**

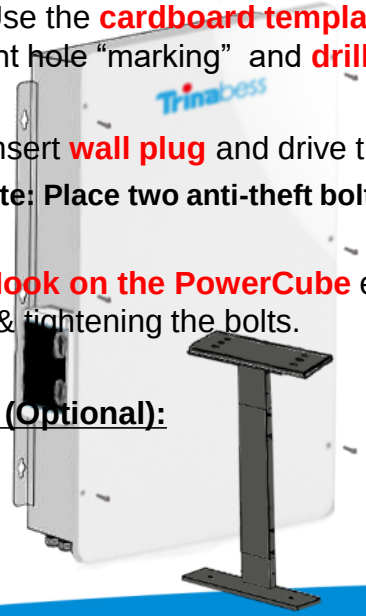
Step 2: Remove the **Circuit Breaker cover**

Step 3: Use the **cardboard template** provided to do wall-mount hole “marking” and **drill holes** accordi

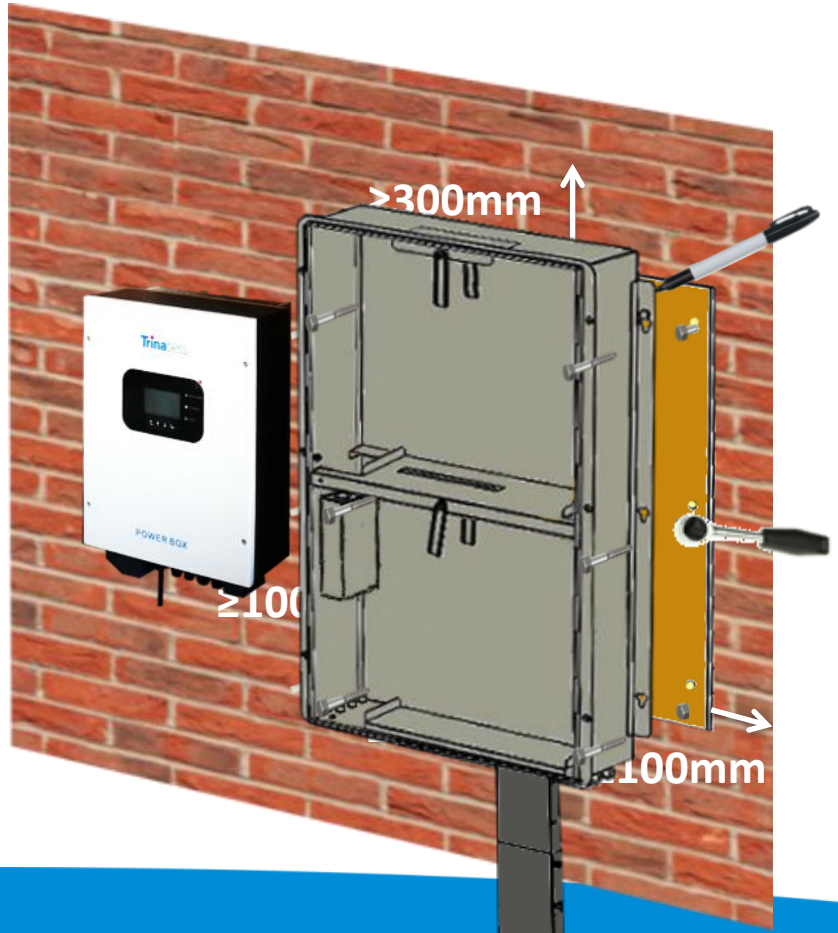
Step 4: Insert **wall plug** and drive the **M8 bolts**

Note: Place two anti-theft bolts in the middle hole

Step 5: **Hook on the PowerCube** enclosure before securing & tightening the bolts.



Pedestal (Optional):

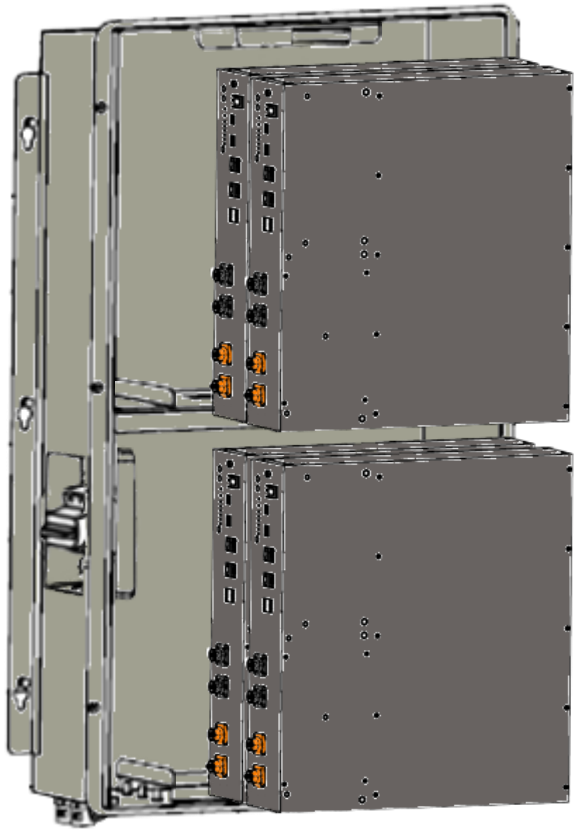


Powercube installation – Battery packs

Once the <u>Powercube enclosure</u> have been secured with bolts.

Step 1: Insert the packs into the mounted casing

Step 2: Turn the baffle to **secure** the battery packs



Powercube installation – BESS connections

Connecting the packs together

Step 1: Pick a **master** pack. The master should have the **breaker Negative cable** connected to it.

Step 2: Connect rest of the **negative** cables

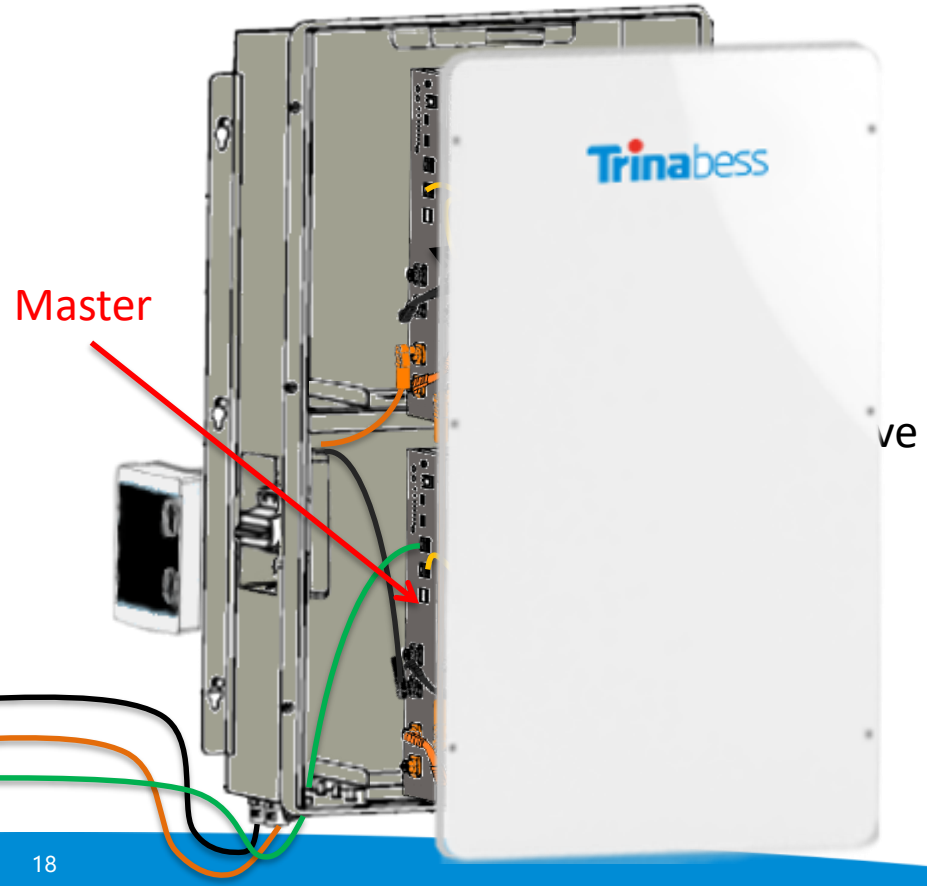
Step 3: Connect the **positive cables**.

*Note: for better performance, connect the **breaker positive cable** to the **last battery pack**.*

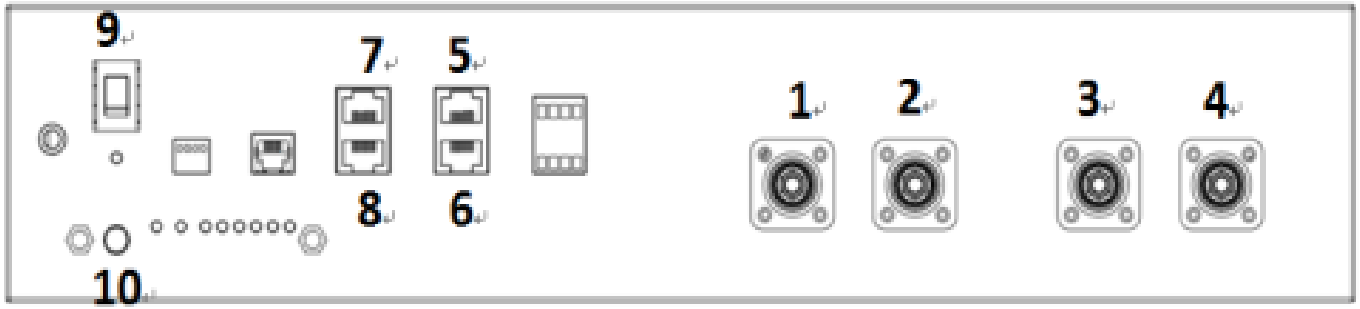
Step 4: Connect the **inverter comms cable** (to Master only)

Step 5: Connect the **comms cable** between the battery packs

Step 6: Measure the **required distance from powercube to Powerbox** & prepare a positive and negative DC cable and connect to battery breaker



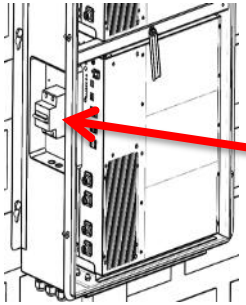
System connection – Powercube Battery pack overview



Connection Points (CP)

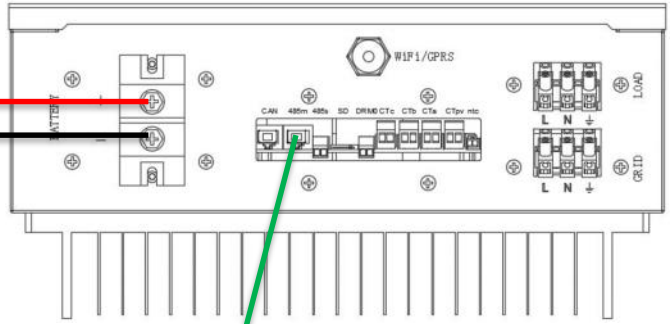
CP 1	Cathode (-)	**CP 6**	Link Port 1
CP 2	Cathode (-)	**CP 7**	CAN
CP 3	Anode (+)	**CP 8**	RS485
CP 4	Anode (+)	**CP 9**	POWER（ON/OFF）
CP 5	Link Port 0	**CP 10**	Soft Starter

System connection - Battery Modules (3 Packs)
Connection - Wire

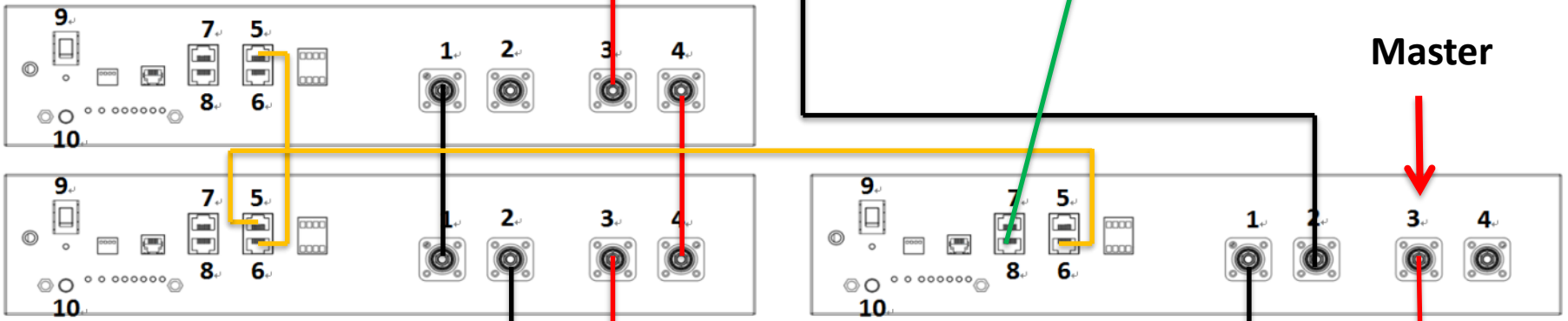


DC isolator
(supplied)

Powerbox

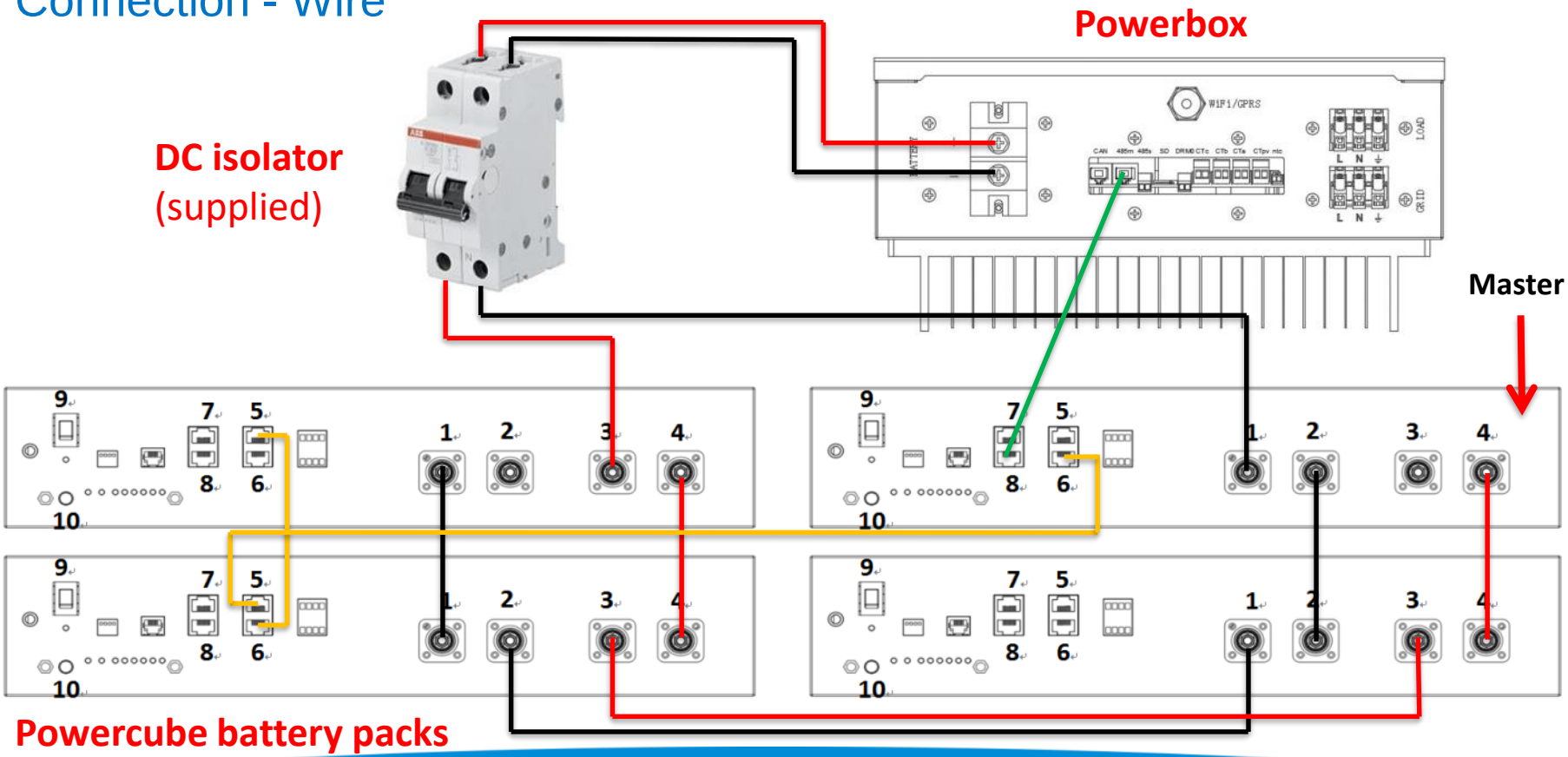


Master



Powercube battery packs

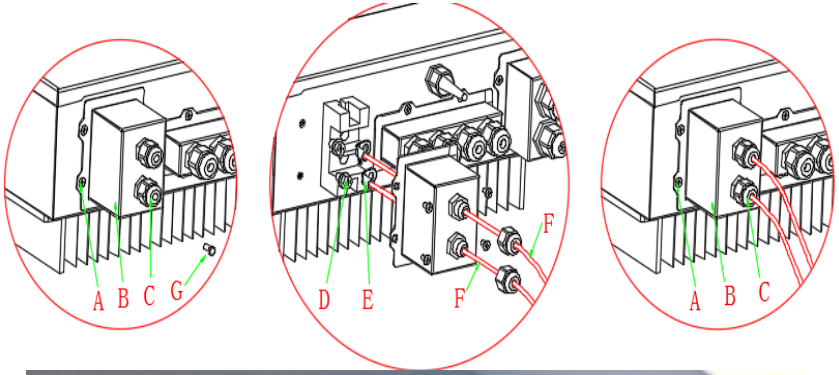
System connection - Battery Modules (4 Packs)
Connection - Wire



System Connection – Power Cube 2.0

Removing waterproof covers

Step 1: Loosen **4 screws (part A)**, remove the **waterproof cover (B)**, loosen the **cable gland (C)**, and then remove the **stopper (G)**



Connecting the wires

Step 2: Route the **PowerCube wires (F)** through the cable gland, then connect PowerCube wires using **Crimp Ring terminal (E)**

System Connection – Grid terminal

Removing the waterproof cover

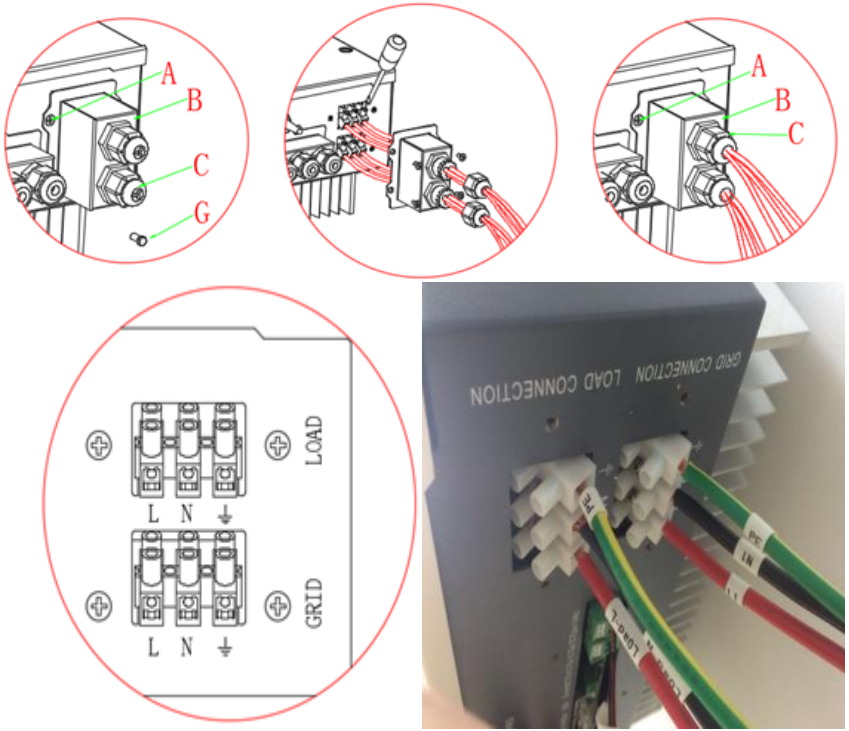
Step 1: Loosen **4 screws (part A)** using a screwdriver

Step 2: Remove the **waterproof cover (part B)**, loosen the **cable gland (part C)**, then remove the **stopper (part G)**

Connecting the wires

Step 3: Route **3-core cable** through GRID cable gland, then connect 3 wires to corresponding terminal blocks. (Brown/Red – L, Blue/Black – N, Yellow/Green– PE)

Step 4: Fasten the waterproof cover using 4 screws.



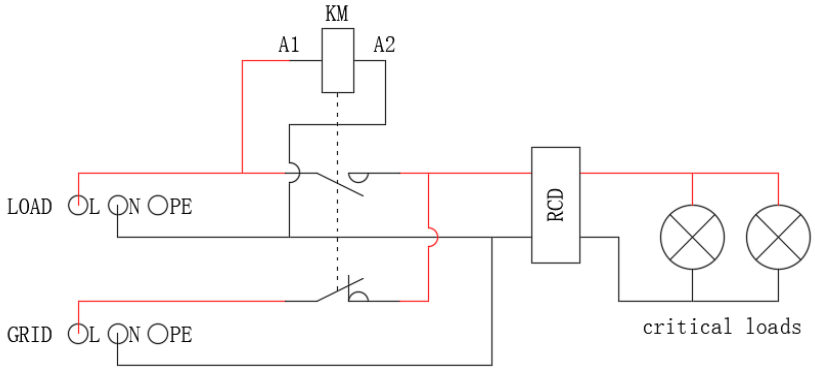
System connection – sample installs

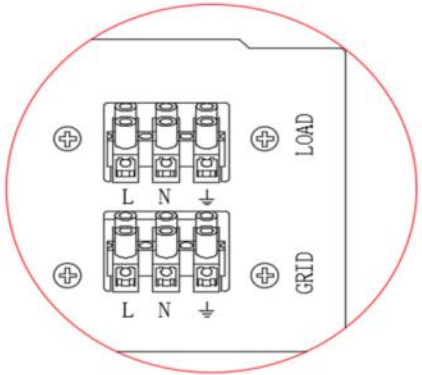
System Connection – Critical Load terminal

The connection terminal procedure to **LOAD port** is the **same as grid connection**. Brown/Red to Live (L), Blue/Black to Neutral (N), Green & Yellow to Earth (PE).

Note:

- **LOAD port is only for critical load connection. Please make sure that you've have the AC contactor accessory for Automatic Transfer capability.**
- **DO NOT LOAD ANY LIVE CIRCUITS ON THIS PORT! IT WILL DAMAGE THE INVERTER!**
- **Only connect Inductive load or capacitive load that are in total no more than 1kW. Maximum critical load is 3.0kVA.**





Inductive load
~300W

Capacitive load
~60W

System Connection – Automatic Transfer Switch (Contactor) sample wiring

Powerbox (EPS)
– L terminal

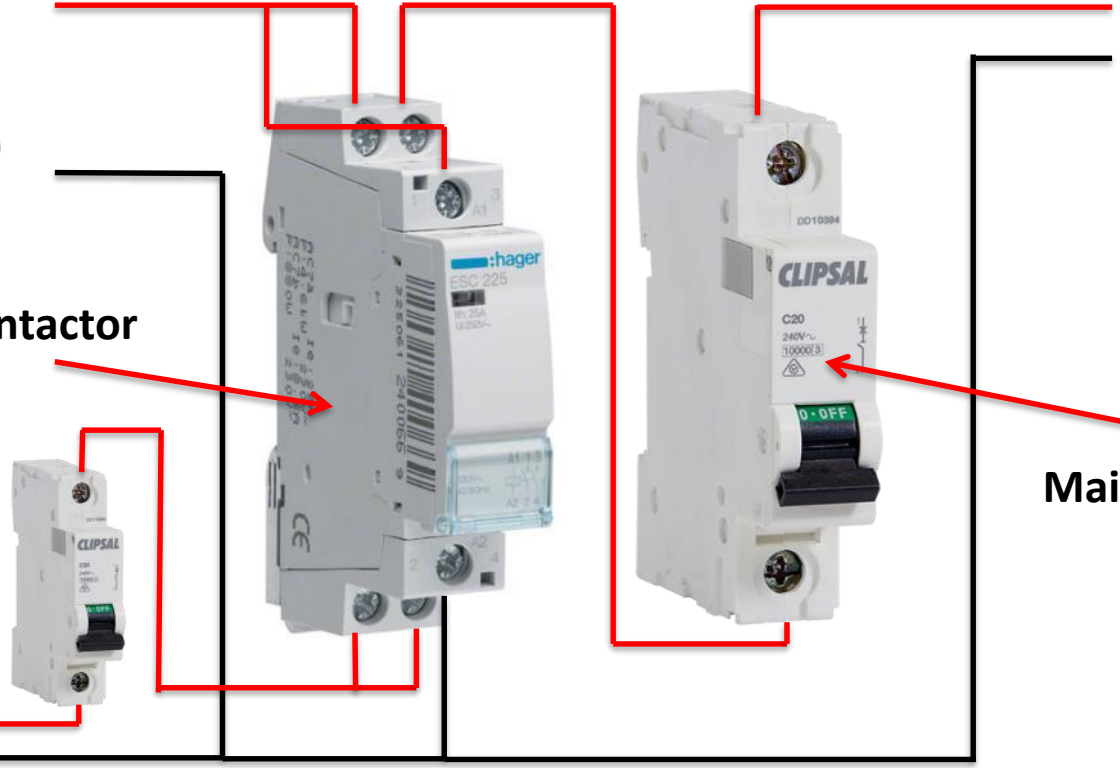
Powerbox (EPS)
– N terminal

ATS Relay/Contactor

Critical Loads

To meter

Grid
Main Circuit Breaker



System Connection – CT sensors

CT Sensors are used to measure the current flow in the circuit. It provide data to Powerbox for energy management.

Step 1: Use **network cable & terminal cap to extend the CT wire**. *Hint: keep network cable sheath for better connectivity*

Note: Network cable is not provided

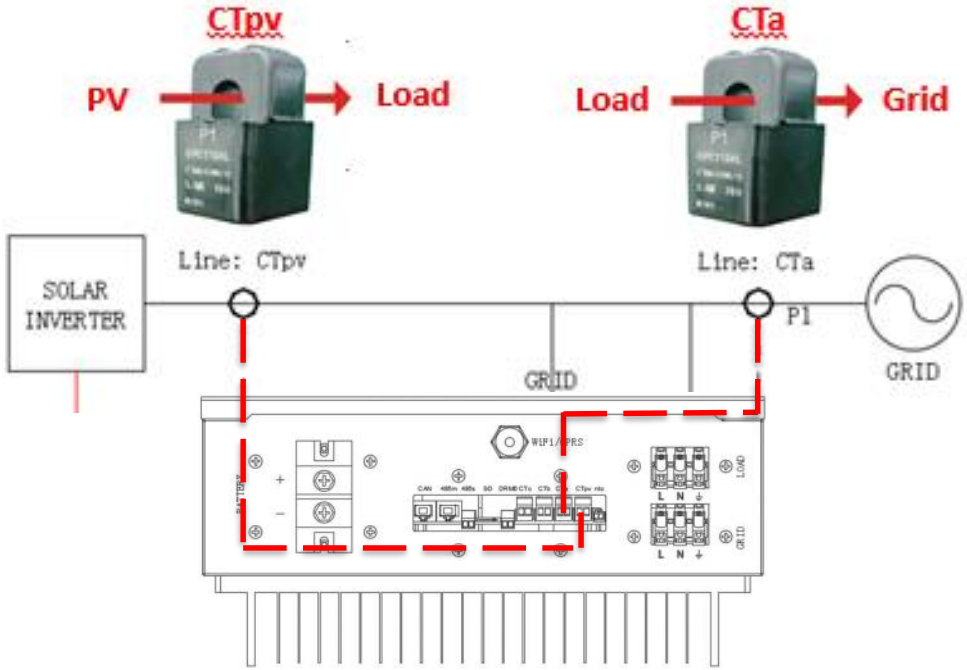
Step 2: Loosen **4 screws,** remove the **waterproof cover**, loosen the **cable gland**, and then remove the **stopper**

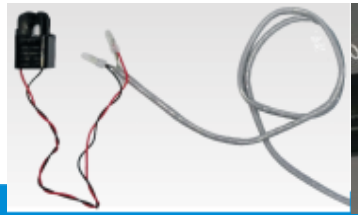
Step 3: Route **CT cable through the cable gland** and connect CT cable to CT terminal

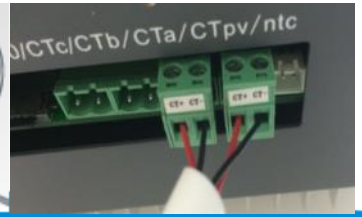
Step 4: Insert CT terminal into corresponding ports:

- Connect **Grid CT to CTa port**;
- Connect **PV CT to CTpv port**;

CT wire	Extension cable (network cable)	POWER BOX
Red	Orange / white orange / brown / white brown	CT+
Black	Green / white green / blue / white blue	CT-





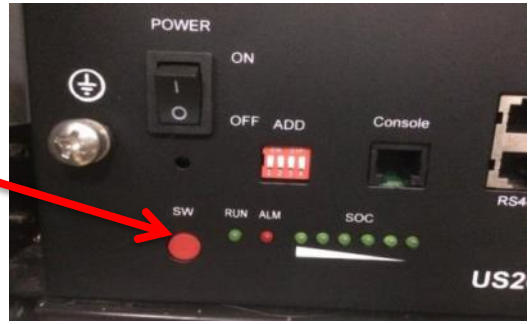


System Initialization

Note: Please double check the connections before operation.

Power on the POWER BOX per the following steps:

1. Turn **OFF the solar inverter**. Make sure there's no power generation in the Power Box's phase.
2. Turn **ON all the battery packs** by pressing any one of the red softstart button on the pack
3. Turn **ON DC circuit breaker/isolator** between PowerCube 2.0 & Power Box
4. Turn **ON AC circuit breaker** between Power Box Grid port & Grid. The Power Box should start to operate now.
5. Turn **ON some home appliances or load**. Make sure power consumption in the Power Box's phase is greater than 200W.
6. You should be able to **read the data on the screen**.
7. Turn **ON the solar inverter**. (power generation > 100W)



IMPORTANT!

ALWAYS TURN ON BATTERY DC POWER FIRST BEFORE TURNING ON AC POWER

- Otherwise the inverter won't light up

System menu keys

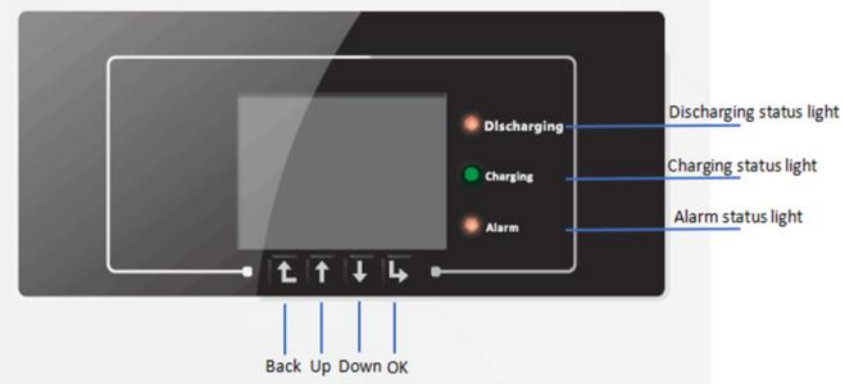
Buttons:

press **“Back”** to the previous screen or enter the main interface;

press **“Up”** to the upper menu option or value plus 1;

press **“Down”** to the lower menu option or value minus 1;

Press **“OK”** to select the current menu option or switch to the next digit.



System Setting – Changing the time for the first time

Time Setting:

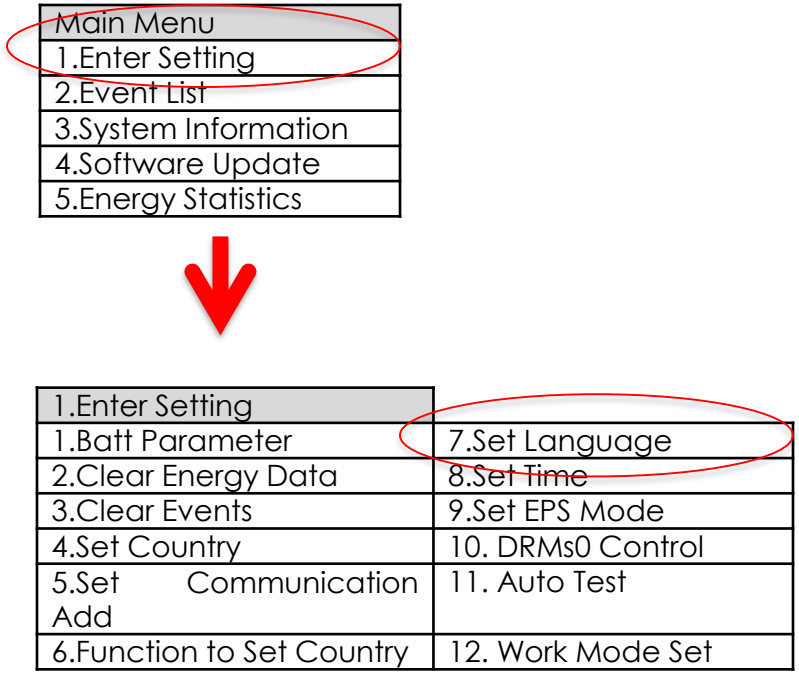
Usually during the **first initialization**, the time need to be changed.

1. At the standard interface, press the “back” button to **enter the main menu**.

2. The main menu includes five options: **Enter settings**, event list, system information, software upgrade, and energy statistics.

3. Select “**8.Set Time**”, press “OK” to enter into time setting interface, the format of the time is YYYY-MM-DD HH:MM:SS.

4. Press “Up” or “Down” to change the 1st digit, press “OK” to switch to next digit, after inputting the current time, **press “OK”**



WIFI Monitoring Setup Guide

04

- Establish WLAN (Wi-Fi) Connection
- APP Installation
- System Monitoring Set-Up

Establish WLAN (Wi-Fi) Connection - Open the WLAN Interface

Step 1: Open the WLAN Interface of Inverter

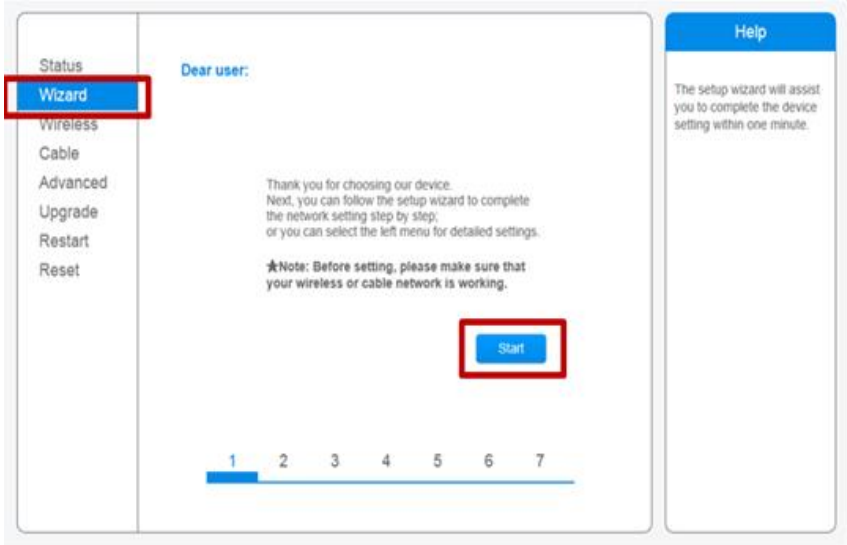
- Identify Inverter SSID

- Open up an internet browser using a computer PC or from any smart device.
- Enter the inverter IP address in the address bar (URL) to open up its settings and configurations: 10.10.100.254.
- Default username ; Password: admin / admin

Establish WLAN (Wi-Fi) Connection - Set-up the WLAN Monitoring

Step 2: Set-up the WLAN Monitoring

- Click Start Button under Wizard

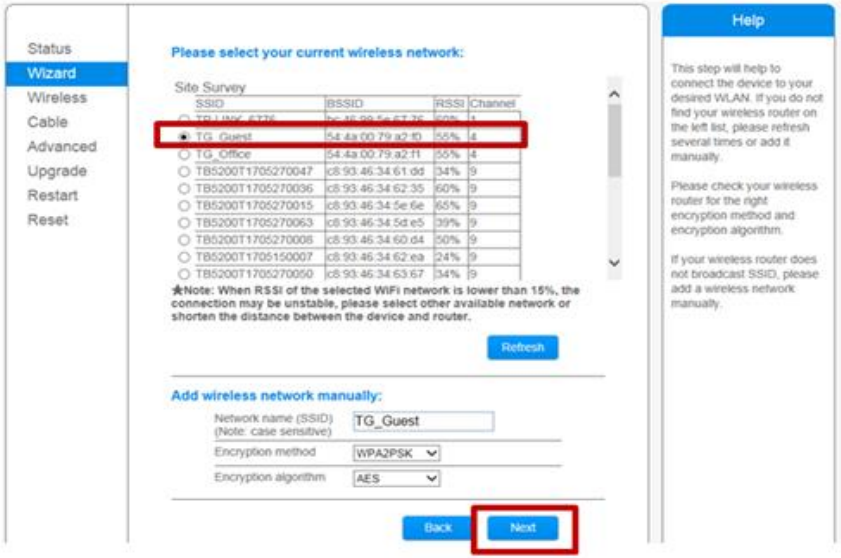


- Select Wireless connection, click NEXT

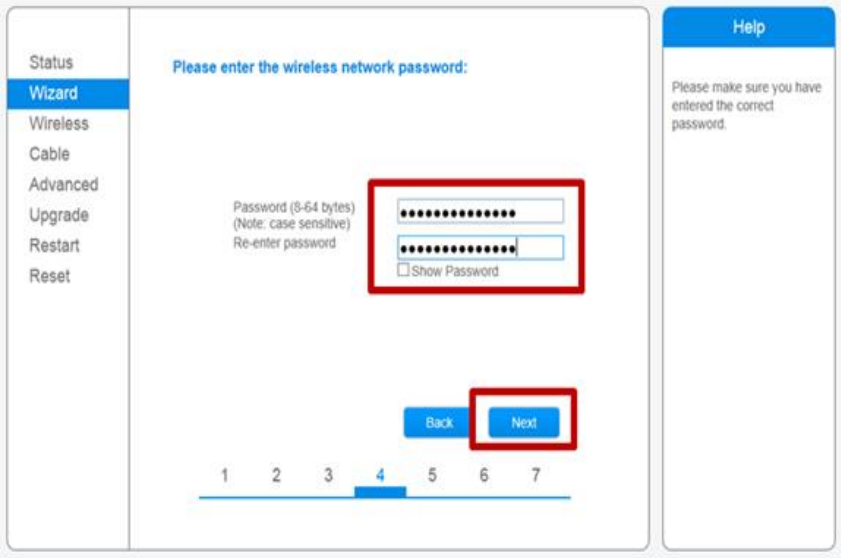
Establish WLAN (Wi-Fi) Connection - Set-up the WLAN Monitoring

Step 2: Set-up the WLAN Monitoring

- Then, select your current wireless network:



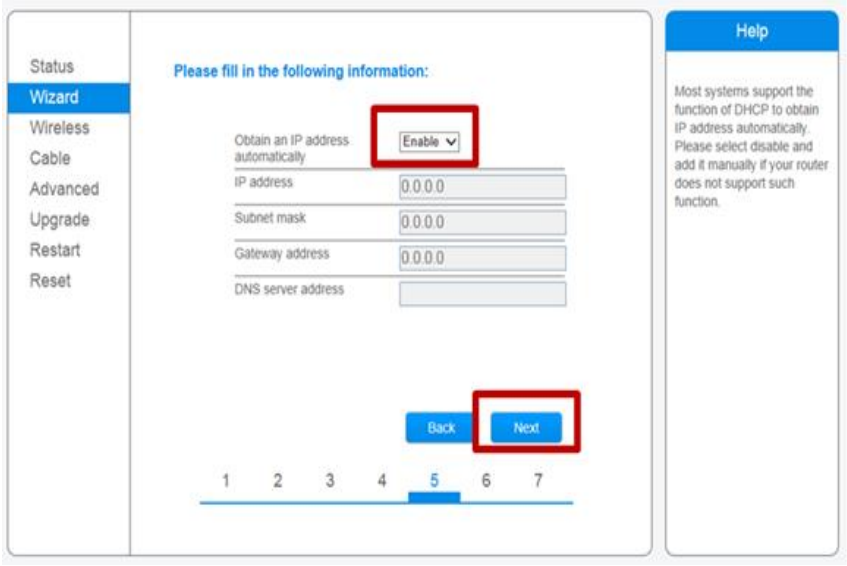
- enter your WLAN/Wi-Fi password and re-enter it again, Click NEXT



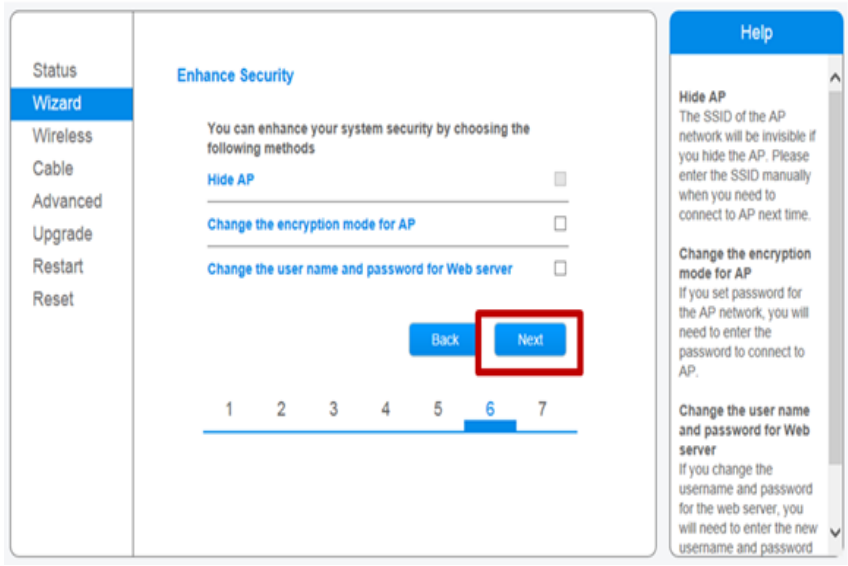
Establish WLAN (Wi-Fi) Connection - Set-up the WLAN Monitoring

Step 2: Set-up the WLAN Monitoring

- Select ‘Enable’ for Obtain an IP address automatically, and click ’next’



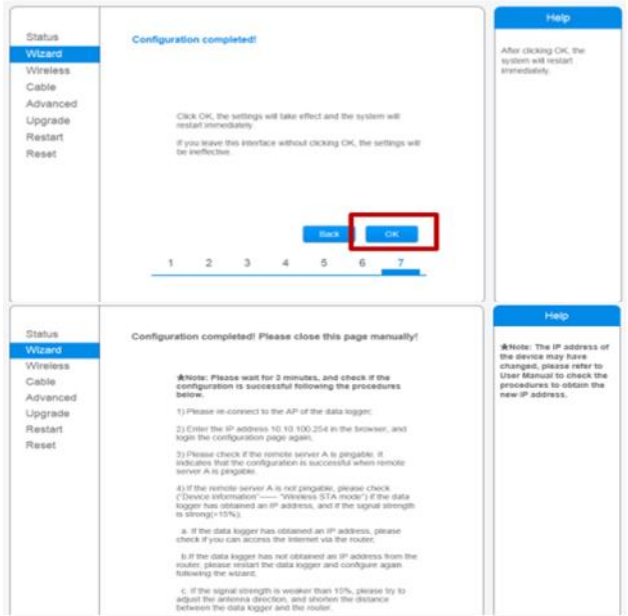
- Do not select any option under steps 6, click NEXT



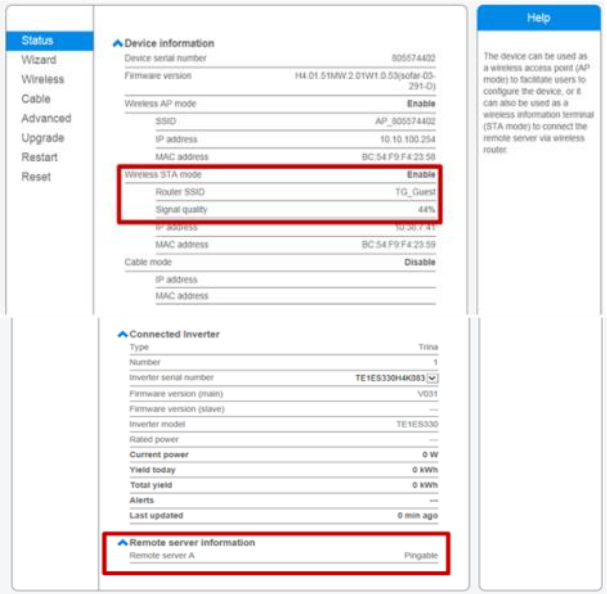
Establish WLAN (Wi-Fi) Connection - Set-up the WLAN Monitoring

Step 2: Set-up the WLAN Monitoring

- Click NEXT and wait for it to show ‘Configuration completed!’ then press OK to continue.



- Select ‘Status’ and under Device Information confirm that the inverter Wi-Fi is connected to selected router SSID (WI-FI name). Also make sure ’Remote server A’ is configured to ‘Pingable



APP Installation

For IOS system：Search “**solarman**” in APP Store and install, or via this link

https://itunes.apple.com/au/app/solarman-the-best-use-of-pv-owners-app/id1269498647?mt=8

Or simply scan the QR code below:

For Android system：Search “**Solarman**” in Google Play and install, or via this link

https://play.google.com/store/apps/details?id=com.igen.rrg

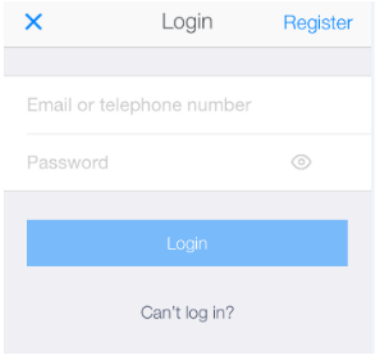
Or simply scan the QR code below:

System Monitoring Set-Up – Register and Login

Open the APP:

If you already have an account, please click “Login”:

Input account and password:



If you do not have an account, please click “Register”:

1 Click “Register”

2 Input username

3 Input email or phone number as account name

4 Set password

5 Choose “Register” to finish registration

6 After registration, choose “Login” to start using the APP

Note: Please use email to register in Australia area. Only one account is allowed to be set up per inverter (once the inverter WiFi has binded with an account, the user must delete the plant profile/WiFi logger to unbind the connection). It is suggested the installer sets up the account on behalf of the end user.

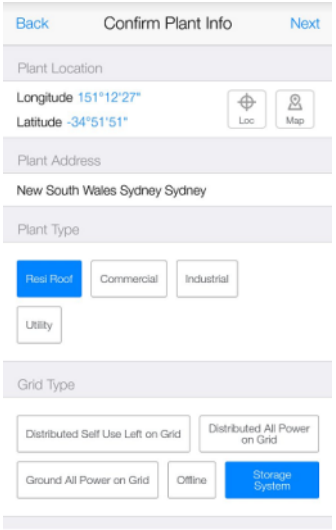
System Monitoring Set-Up – Plant Setting

1 Click  on the left bottom to visit “Homepage”

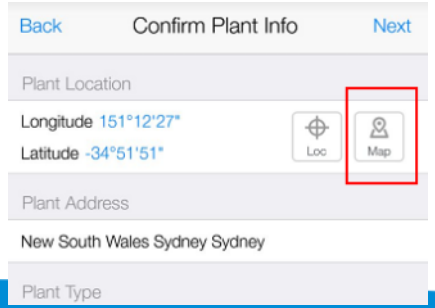
2 Create plant

3. c. Scan/Enter WiFI serial number (SN)

4. Enter plant info

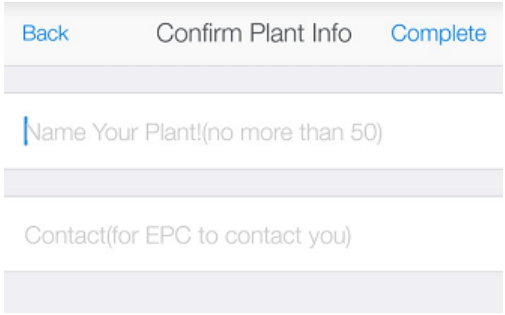


5. Locate the plant on the maps

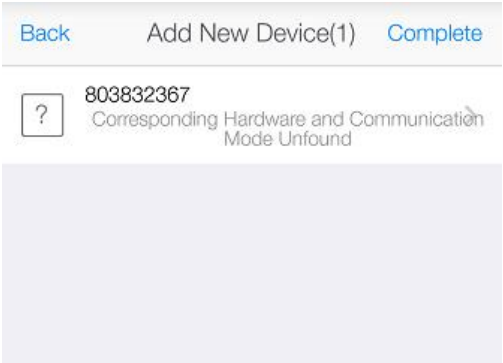


System Monitoring Set-Up – Plant Setting

6. Name the plant and put in installer/person who manages the app

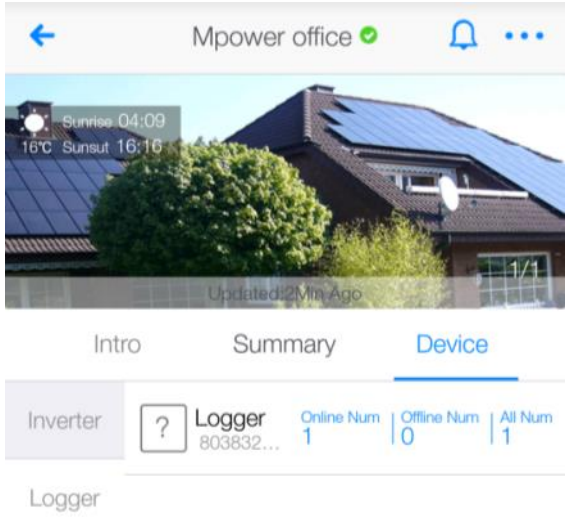


7. Check and ensure the correct WiFi SN has been entered.



System Monitoring Set-Up – Plant Setting

8. Choose «Complete» to finish configuration. After **configuration has successfully** completed, please **wait for 10-20min** (depend on network speed) for the WiFi logger to establish connection and upload data to the server. You should see the following screen and a **green tick** once inverter has established the connection. ***Please note that the data uploads frequency is every 5 minutes.***



If configuration fails, please ensure inverter WiFi is connected to local router and there's established internete connection. If problem persists, please contact customer service.

Some of the Completed Installations


Thank You