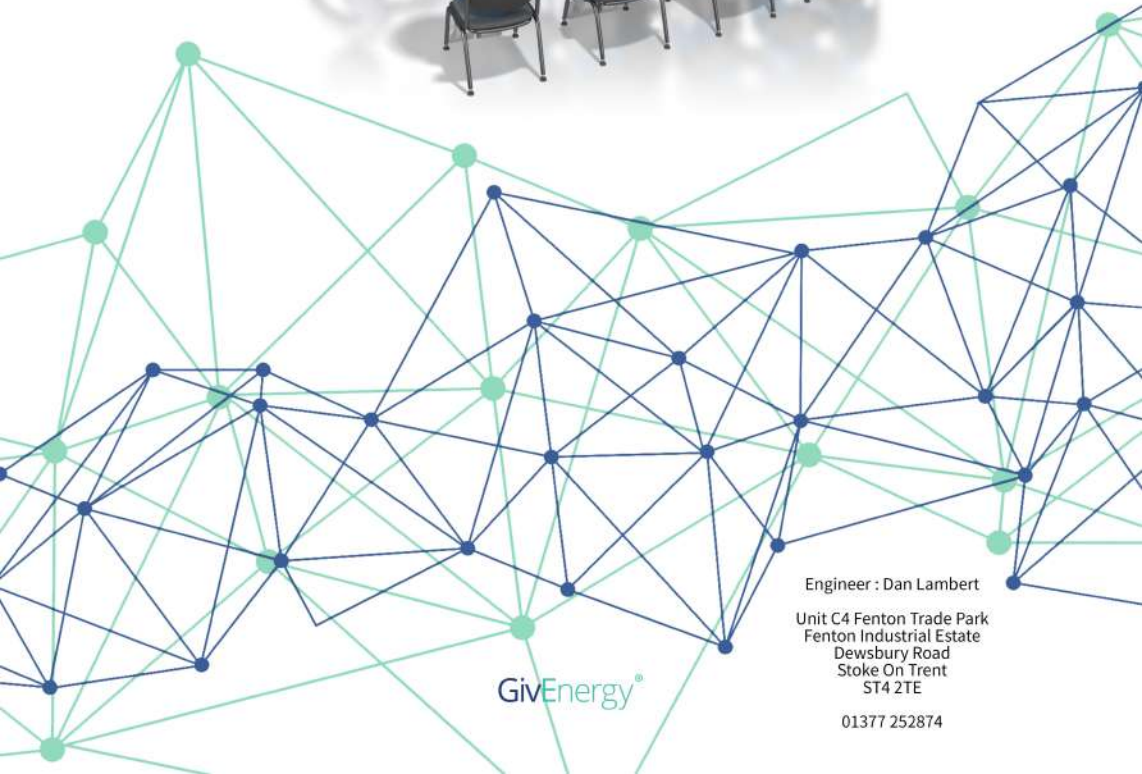




Installation Training Guide

2020



Engineer : Dan Lambert

Unit C4 Fenton Trade Park
Fenton Industrial Estate
Dewsbury Road
Stoke On Trent
ST4 2TE

01377 252874

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Before starting any Job

Safety is priority

Make sure the workspace is clear and free from any objects that may result in a slip, trip or fall.



Approved methods of Manual handling should be considered when carrying the equipment as not injure yourself or anyone else around you. Correct PPE must be worn at all times when Handling or installing the equipment as per manufacturers instruction.



Unpacking













When unboxing the equipment, please ensure sufficient space is available to carefully place down all system parts.

Any damage caused to the equipment due to mishandling will automatically void any warranty. If the external packaging is damaged or any internal components are damage, please contact your distributor immediately. With any warranty claims, all equipment must be sent back in its original OEM packaging including cables, plugs, connectors etc.







Tools

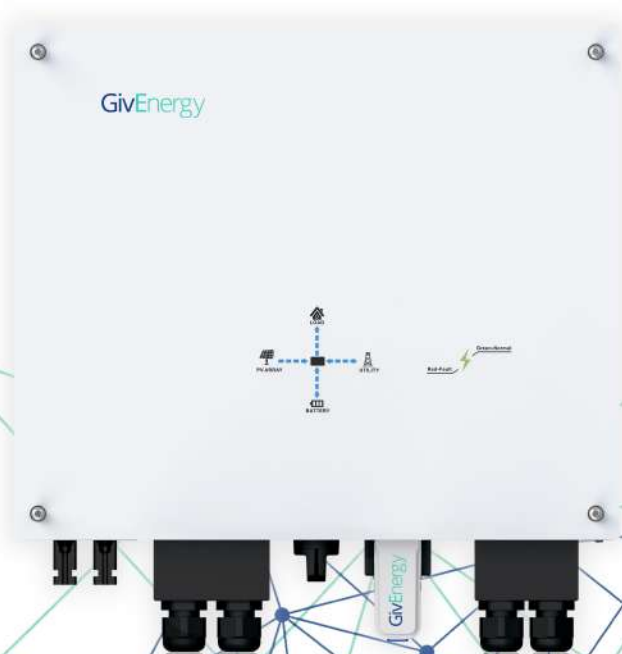
Equipment needed for installation

No.	Tool	Model	Function
1		Hammer drill, masonry and wood bits inc hole saw.	Used to drill holes for mounting brackets
2		VDE Screwdriver set	Electrical Connections
3		Wire Stripper	Strip Wire
4		Allen Keys	To Remove battery front panels
5		Crimping Tools	For ferrules and ring terminals
6		Multi- Meter	Checking Connections
7		Marker Pen	To Plot Brackets
8		Tape measure	To ensure correct clearance
9		Level	To ensure mounting brackets are level
10		Cut resistant gloves	To protect hands from sharp edges
11		Safety Goggles	For protection whilst using the drill
12		Anti-dust respirator	For working in dusty environments (eg Loft)

Testing Equipment

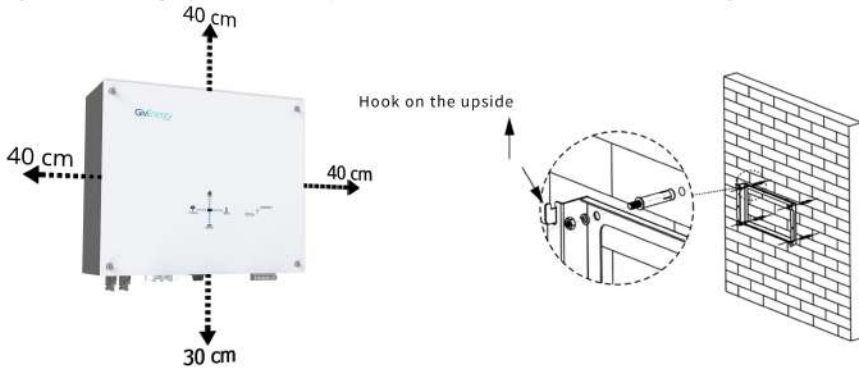
No.	Tool	Model	Function
1		USB Stick	Update Inverter and battery Firmware
2		Laptop	Checking Web Portal
3		Clamp Meter	Testing wires
4		RS485-USB Adaptor	Software Update

HYBRID INVERTER INSTALLATION



Mounting the Inverter with Bracket

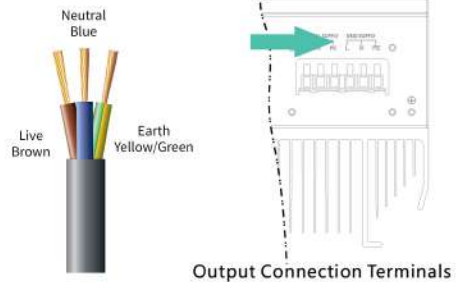
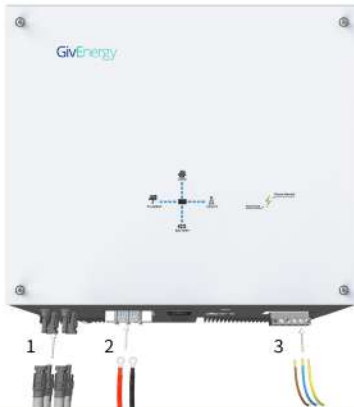
- There must be sufficient clearance between the individual inverters to ensure that the ambient air from the adjacent inverter is not taken in.
- If necessary, increase the clearance spaces and make sure there is enough fresh air supply to ensure sufficient cooling of the inverters, and heat dissipation
- Using the mounting frames as a template, drill holes as illustrated in the image shown.



Connections

- 1- Connect the PV
- 2 - Connect the Battery
- 3 - Connect Grid supply into the 3 right hand side terminals, labelled "Grid Supply"

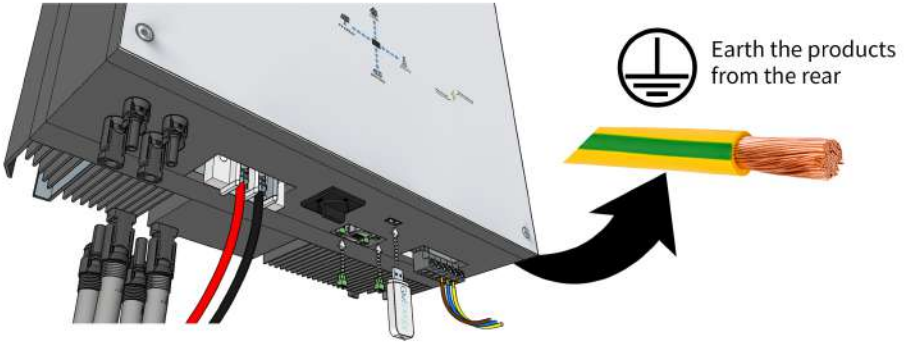
- * 3.6kW Hybrid C20A MCB and wired in 2.5mm 3 core cable
- * 5.0kW Hybrid C32A MCB and wired in 4.0mm 3 core cable
- * Fit C63 DC MCB in-line between inverter and master battery



- * Ensure batteries and inverter are secured

Under side of the inverter of connection points

- * Ensure inverter and battery packs are earthed.
- * A minimum size cable of 4.0mm Shall be used to provide adequate protection.
- * Ensure the inverter supply is wired in 4.0mm 3 core cable.

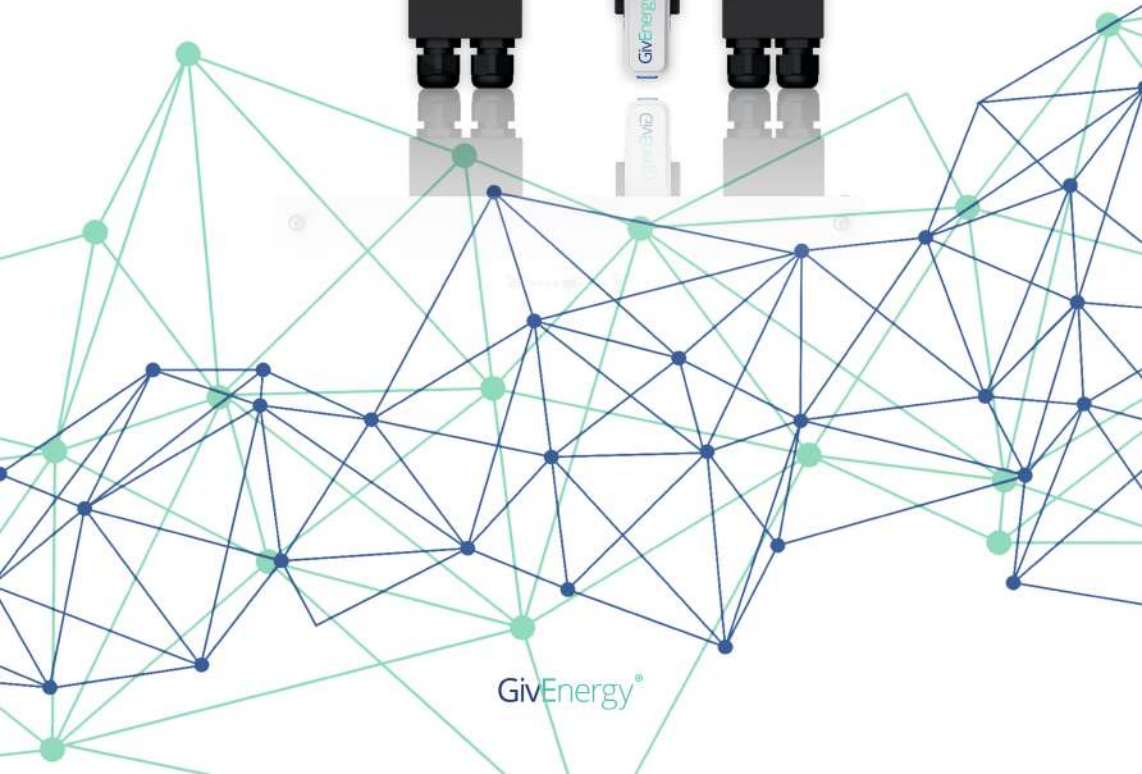


- * Perform a tug test on connectors and terminals and make sure they are in the correct ports and polarity position.

Notes

GivEnergy®

AC COUPLED INVERTER

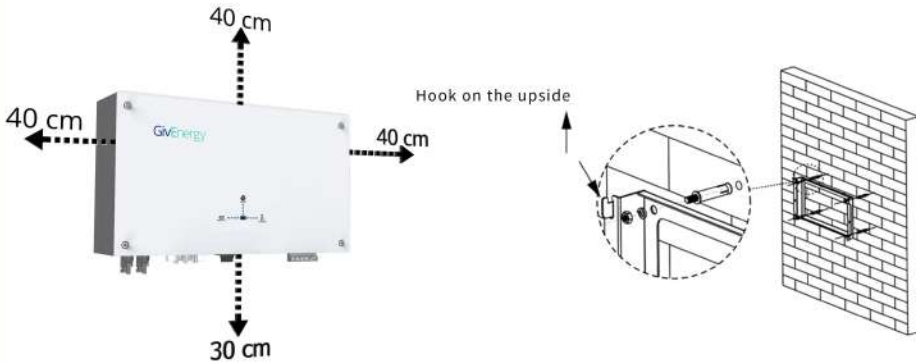


GivEnergy®

1

Mounting the Inverter with Bracket

- There must be sufficient clearance between the individual inverters to ensure that the ambient air from the adjacent inverter is not taken in.
- If necessary, increase the clearance spaces and make sure there is enough fresh air supply to ensure sufficient cooling of the inverters, and heat dissipation
- Using the mounting frames as a template, drill holes as illustrated in the image shown.

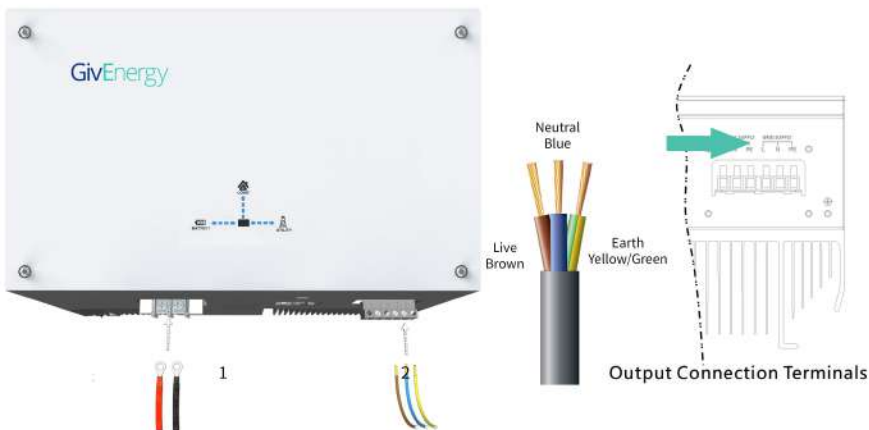


2

Connections

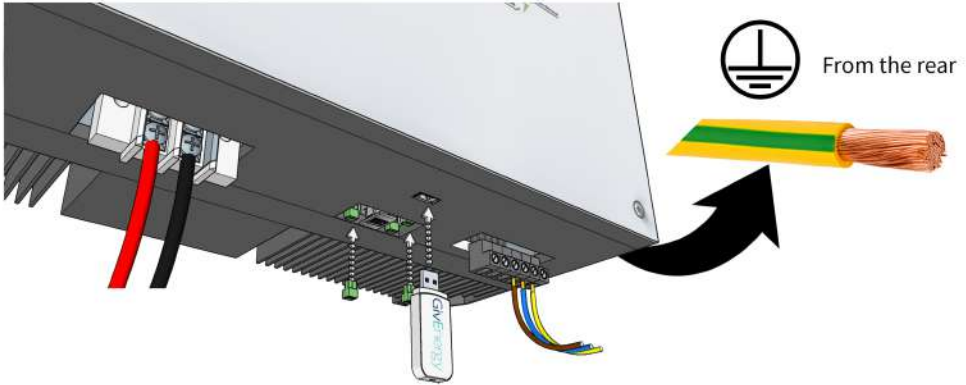
- 1- Connect the Battery
- 2 -Connect Grid supply into the 3 right hand side terminals, labeled "Grid Supply".

- * Ensure batteries and inverter are secured
- * MUST be fitted with C20A MCB or RCBO.
- * Fit C63 DC MCB in-line between inverter and master battery



Under side of the inverter of connection points

- * Ensure inverter and battery packs are earthed.
- * A minimum size cable of 4.0mm Shall be used to provide adequate protection.
- * Ensure the inverter supply is wired in 4.0mm 3 core cable.

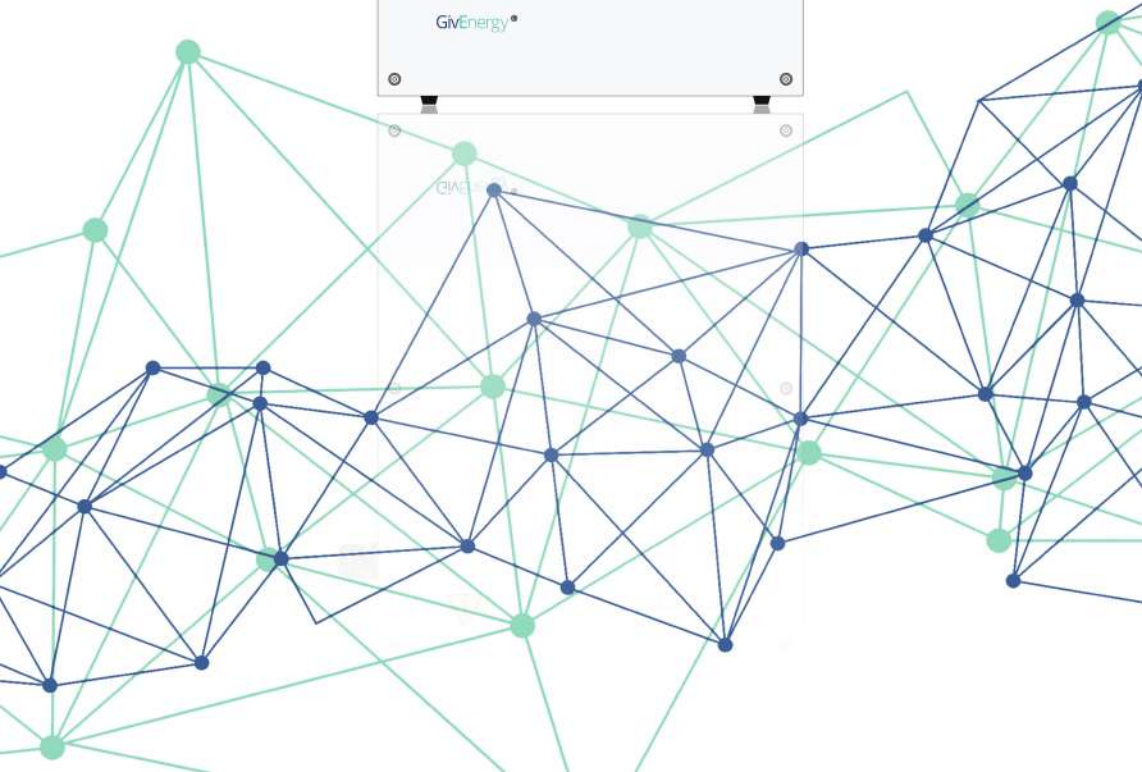


- * Perform a tug test on connectors and terminals and make sure they are in the correct ports and polarity position.

Notes



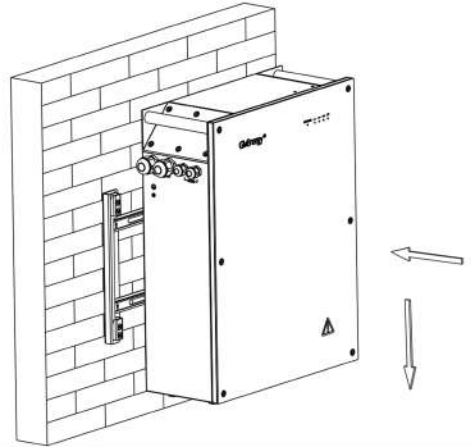
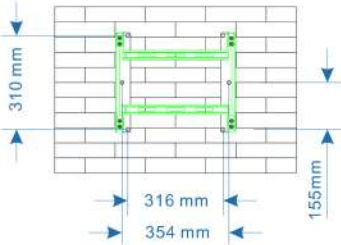
8.2kWh Lithium Battery



1

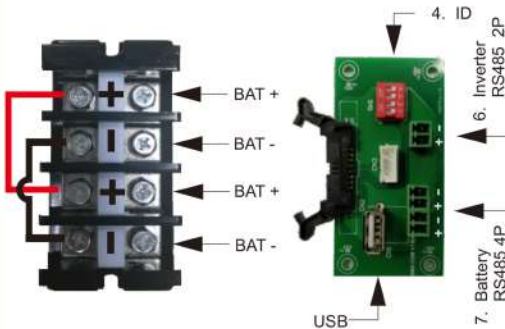
Wall mounting the Battery

1. The thickness of the wall must be greater than 120mm. If less than 120mm, adequate support is required to support the weight of this battery pack.
2. Put the wall mount rack on the wall, and mark the position of the holes on the wall ensuring it is level.
3. Drill six holes at the marked points (using 10mm drill bit) the depth should not be less than 75mm.
4. Fix the wall mount rack with 6 expanding bolts.
5. Hang the battery onto the rack, as below picture.



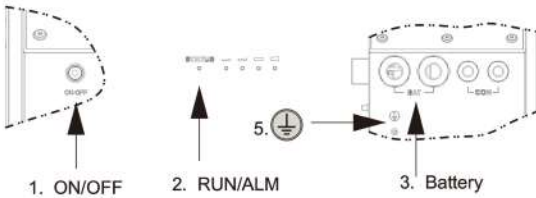
2

1. Connect the BMS comms to the inverter using the 2 core screened cable and dry connectors provided. If installing a single battery plug the BMS comms cable into the 2 PIN socket inside the battery pack.
2. If installing multiple battery packs, using the 2 core screened cable and dry connectors provided, connect the comms between batteries using the 4 pin ports as shown in the image below.
3. Set the I.D of each battery pack using the DIN switches inside each battery pack and set them according to the table below. A maximum of 5 packs can be installed underneath each inverter.
4. Push the ON/OFF (I/O) button to switch on the battery pack.



Battery	ID	Description
Master		0, 0, 0, 0
Slave 1		1, 0, 0, 0
Slave 2		0, 1, 0, 0
Slave 3		0, 0, 1, 0
Slave 4		0, 0, 0, 1

5. Ensure that the status LED is solid green and a number of battery percentage indicators are also lit. If for any reason the battery will not switch on, please consult GivEnergy.

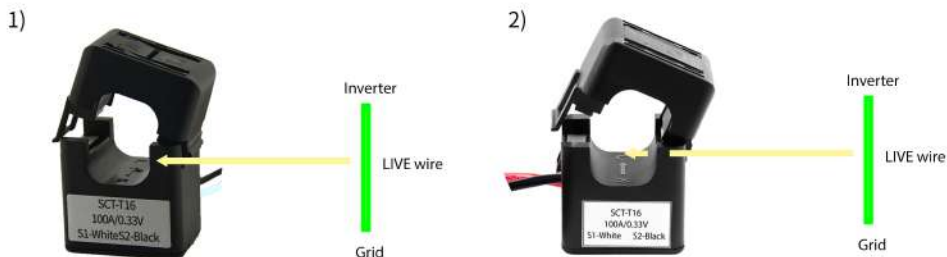


- * Perform a tug test on connectors and terminals and make sure they are in the correct ports and polarity position.

Notes

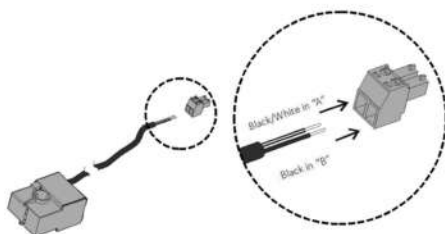
CT Installation

- Please be aware the CT must be positioned around LIVE wire only with arrow pointing TOWARDS inverter.

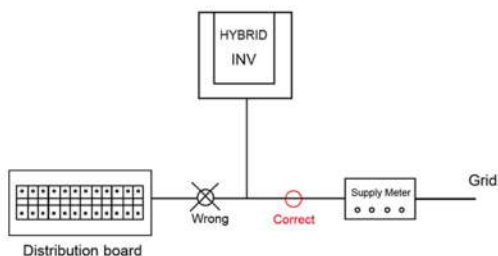


- Please note.

- 1) If installing the Hybrid inverter and using the CT to measure IMPORT/EXPORT, the CT must be positioned with the Arrow pointing in the direction of Grid Import.
- 2) If installing the AC Coupled Inverter and using the CT to measure PV generation, the CT must be positioned with the Arrow pointing in the direction of PV generation into the consumer unit. The connection of the CT into the TWO PIN dry connector is shown below.

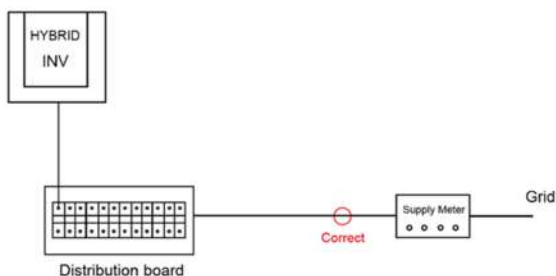


- If the Inverter is installed from a dedicated D/B fed off a Henley block, separate to the main D/B in the property then the CT must be positioned as shown below.

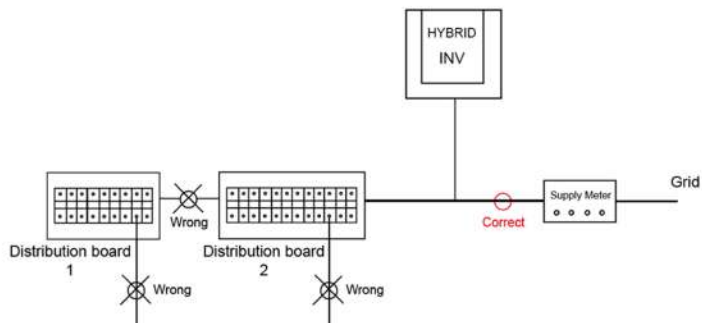


CT Installation

- If the inverter is wired in the distribution board, the CT install position is as below

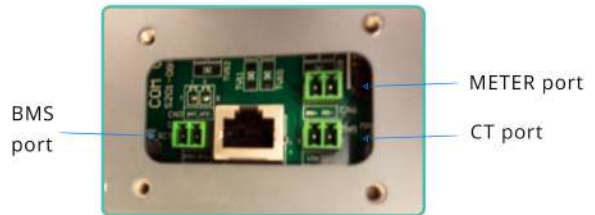
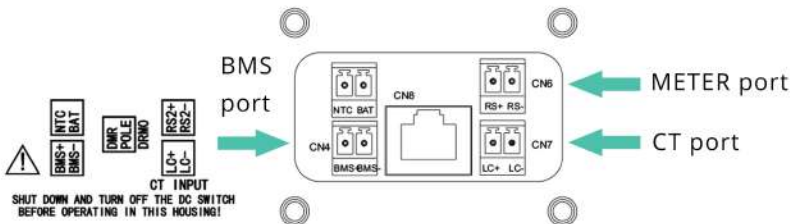


- Please be aware the CT must be installed on the same phase as the hybrid system.
- Please be aware the CT can not be wired on the distribution board branches.



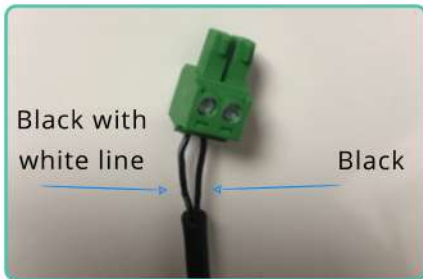
Communication Cable Connection

Inverter underside port connections

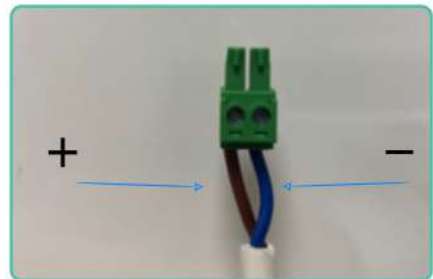


- Step 1: You can use network cable & terminal caps to extend CT wires if necessary, the maximum CT cable length is 5m.
- Step 2: Wrap the CT around L wire of incoming mains, make sure that the CT must be positioned around the main incoming live supply tail and the arrow pointing in the direction of grid import. (GRID to HOME).

CT Polarity



BMS + Meter Polarity

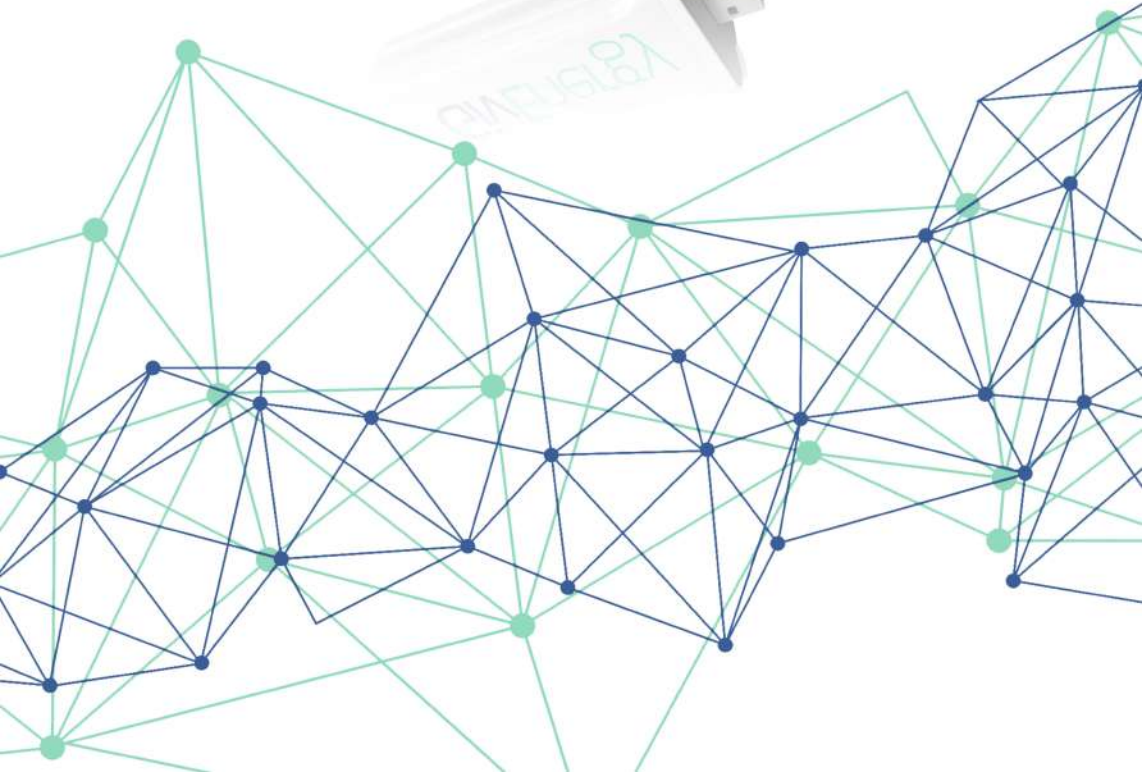


When handling cables do not pull as this will stretch the cable and lose its integrity

Visual checks to ensure the cables are correctly positioned



Installation and Configuration of the
GivEnergy USB
Communications Device (Dongle)



GivEnergy USB Dongle

1.1 – The Communications Device



USB Dongles come in 2 varieties - WiFi or 3G/4G. WiFi modules typically have a serial number that starts with ' W ', and 4G typically start with ' G' .

You can also tell the difference by removing the blue rubber cap at the base of the device and taking a look inside. WiFi modules have a small reset button, whereas 3G/4G modules have a SIM card slot.



1.2 – Configuring the WiFi Module

1.2.1 – Powering the WiFi Module

Insert the WiFi module into the USB port on the underside of the GivEnergy Hybrid Inverter. The inverter must be powered in order for the setup to take place. If you don't currently have access to an inverter that is switched on, you may plug it in to a computer like you would any other USB device. Once the dongle receives power, it will start to flash slowly.



1.2.2 - Connecting to the WiFi Module using your Computer

If the module is flashing, this means that it's ready to be configured. Open up your list of wireless networks, and find the network with the same name as the serial number of the dongle.



Click connect. Once connected you won't have an internet connection anymore, so this is a good way to test if you have connected properly.



1.2.3 - Connecting the WiFi Module to the Internet

Open up a web browser (we recommend Google Chrome) and type in 10.10.100.254. You should be prompted to enter credentials to access this page. By default, the username and password are both 'admin'. This can be reconfigured later for security, if you or the end user wishes for this to be changed.



If the page loads in another language, click 'English' in the top-left corner to change it.

Click 'STA Interface Setting' on the left to configure the dongle, and the following page will load. Click 'Search' next to AP's SSID at the top of the page and look for the wireless network you wish for the dongle to connect to. If you can't find the network you're looking for, press refresh.

SSID	BSSID	RSSI	Channel	Encryption	Authentication	Network Type
DIRECT-4B-HP OfficeJet Pro 7740	1a 60 24 65 89 4b	55%	6	AES	WPA2PSK	Infrastructure
BTHub3-QHGQ	00 c2 01 2d d7 ce	91%	6	AES	WPA2PSK	Infrastructure
PLUSNET-CJJC	e8 ad a6 10 ac c8	100%	6	AES	WPA2PSK	Infrastructure
HP Print-02 Color LaserJet Pro	68 14 01 74 27 07	100%	6	AES	WPA2PSK	Infrastructure
BTW-8	02 c2 01 2d d7 ce	78%	6	NONE	OPEN	Infrastructure
Bilion-8800LR2	60 03 47 37 32 76	44%	6	AES	WPA2PSK	Infrastructure
BTHub6-STVP	00 cb 51 5e 4e 14	57%	11	AES	WPA2PSK	Infrastructure

If selected correctly, the SSID will populate the AP's SSID field. Ensure the correct security mode is elected (typically WPA2PSK) and enter the password in the 'Pass Phrase' field. Click 'Apply' to confirm these settings

STA Interface Parameters

AP's SSID	PLINE T-CJJC
MAC Address (Optional)	
Security Mode	WPA2PSK
Encryption Type	AES
Pass Phrase	

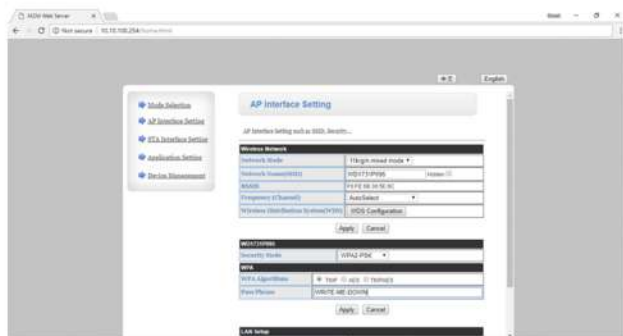
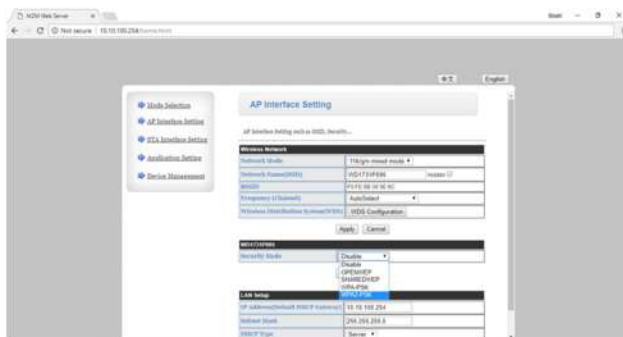
WLAN Connection Type: DHCP/Static config

DHCP Mode

DHCP Mode	HP-421
-----------	--------

1.2.4 - Changing the security settings on the WiFi Module

Select 'AP Interface Setting' on the left of the page. This brings up the page to configure the security settings for the dongle itself.

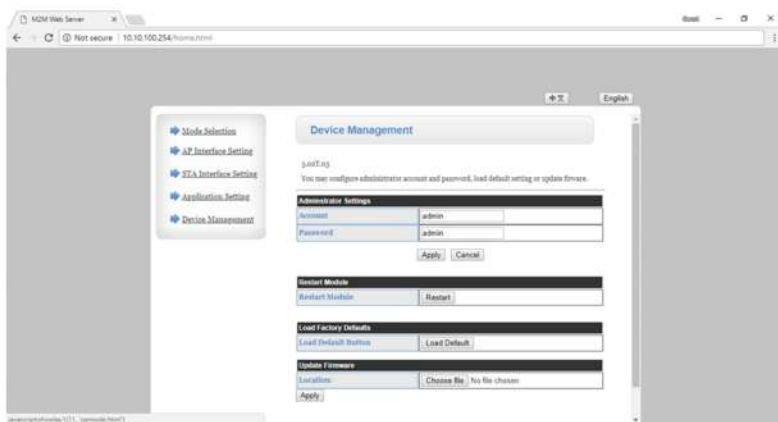


Change the 'Security Mode' to WPA2-PSK.

Once the box appears, please enter the passcode that will be used to connect to the Dongle in the future. By default, this is set to 12345678 You may set this to whatever the customer wishes, but please make sure that this password is written down somewhere as it will be necessary to connect to the Dongle again.

Once you have entered the correct settings, click apply.

If you wish to change the login username and password for the Dongle, select 'Device Management' on the left-hand side. Here you may change 'Account' and 'Password' for increased security. As with the above, please make sure you write this down if you change it. Click 'Apply' to confirm these changes. Press the 'Restart' button to restart the dongle, and wait a few seconds for it to start back up



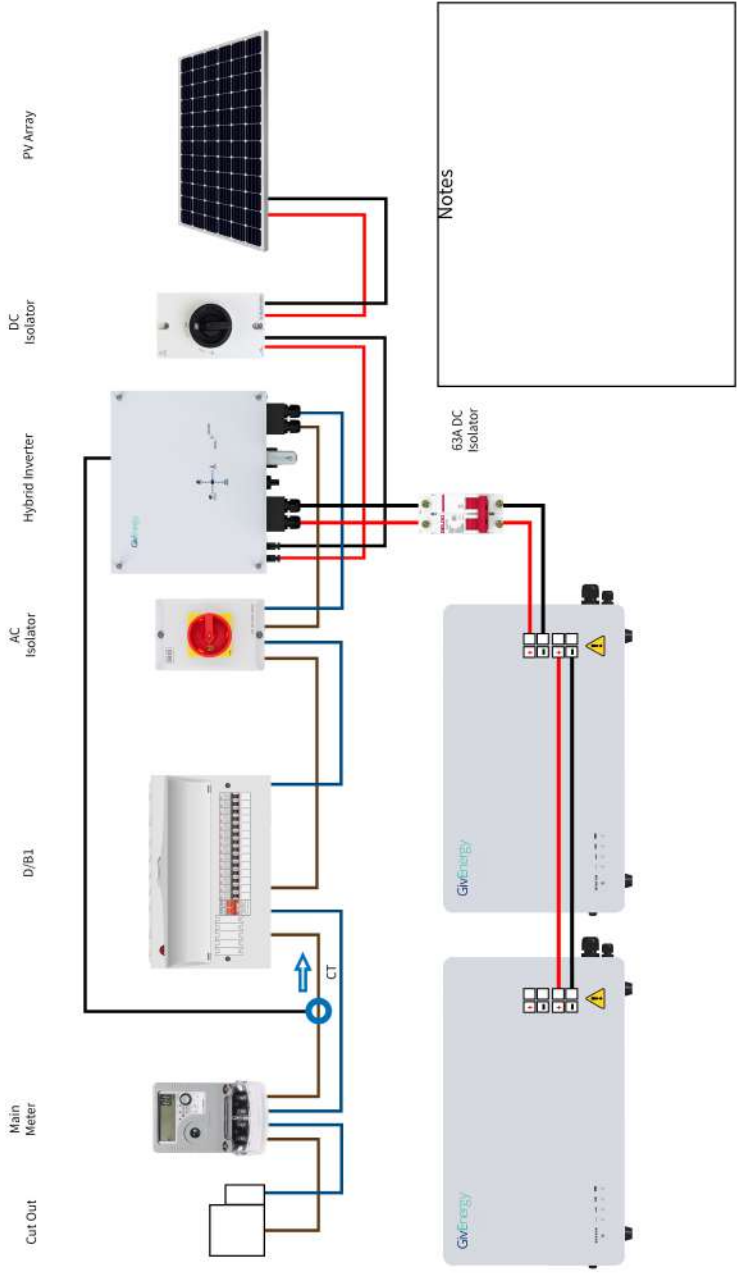
1.2.5 - Checking the WiFi Dongle is connected to the internet

If all of the previous settings were configured correctly, your computer should no longer be connected to the dongle. Connect to the Dongle using the same steps listed in .2.2. This time, you'll need to enter the password for the dongle, as set on 'AP Settings Interface' in .2.4. The device should now display as 'secured' among the list of nearby WiFi networks.



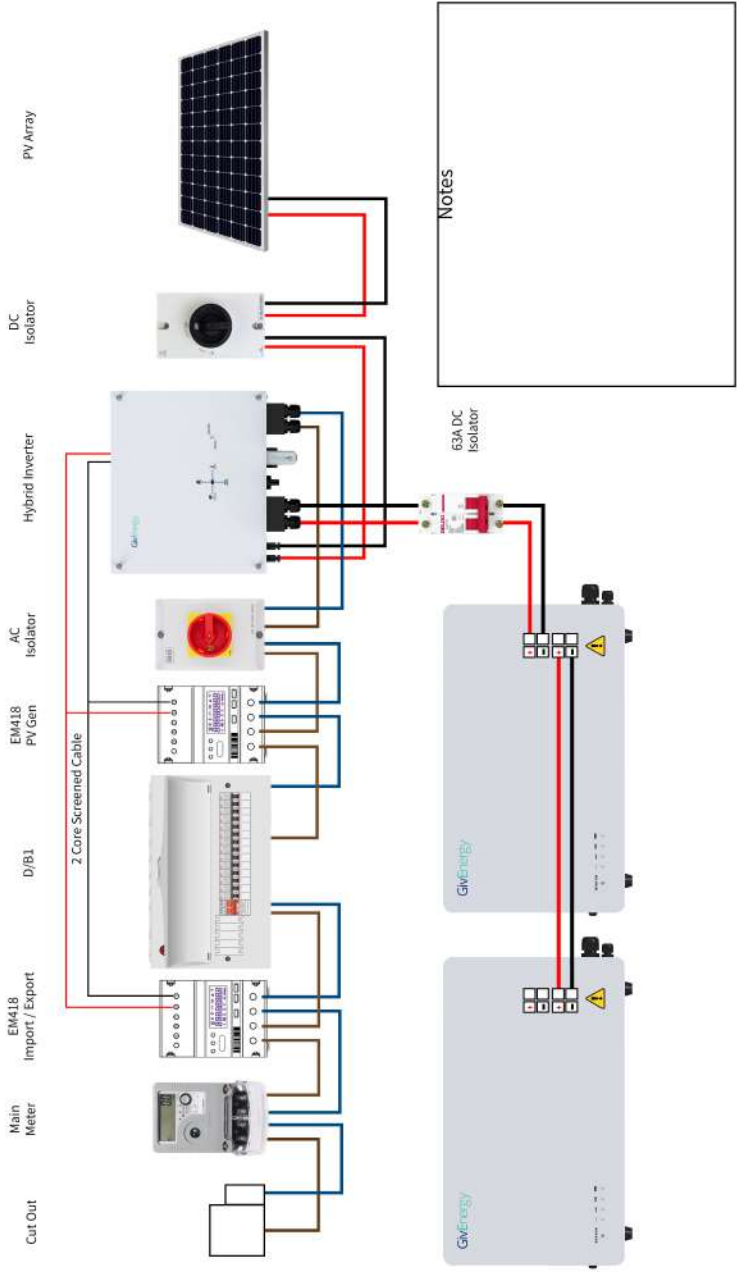
Once connected, you should be able to connect to the internet as you normally would on another WiFi network. Confirm that the dongle has been currently configured by loading a web page in a web browser.

Schematic -00 Hybrid with CT



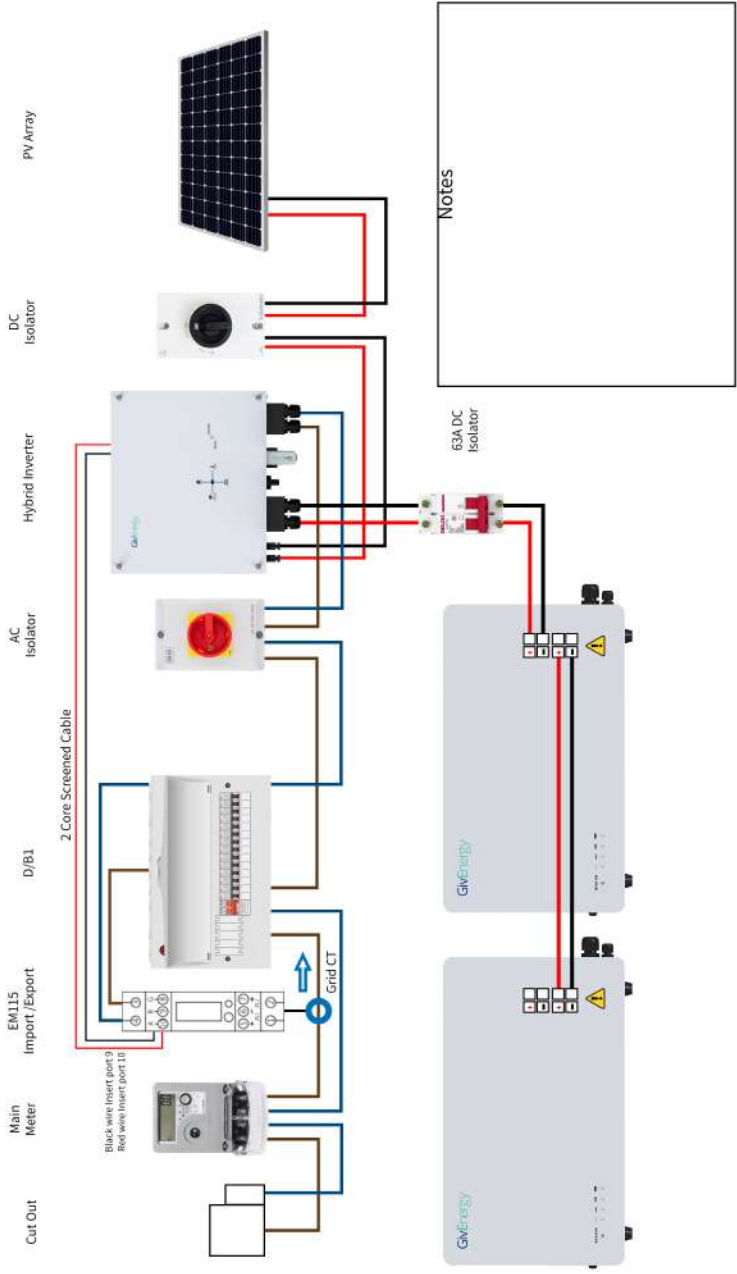
Schematic -01

Hybrid with 2 x EM418



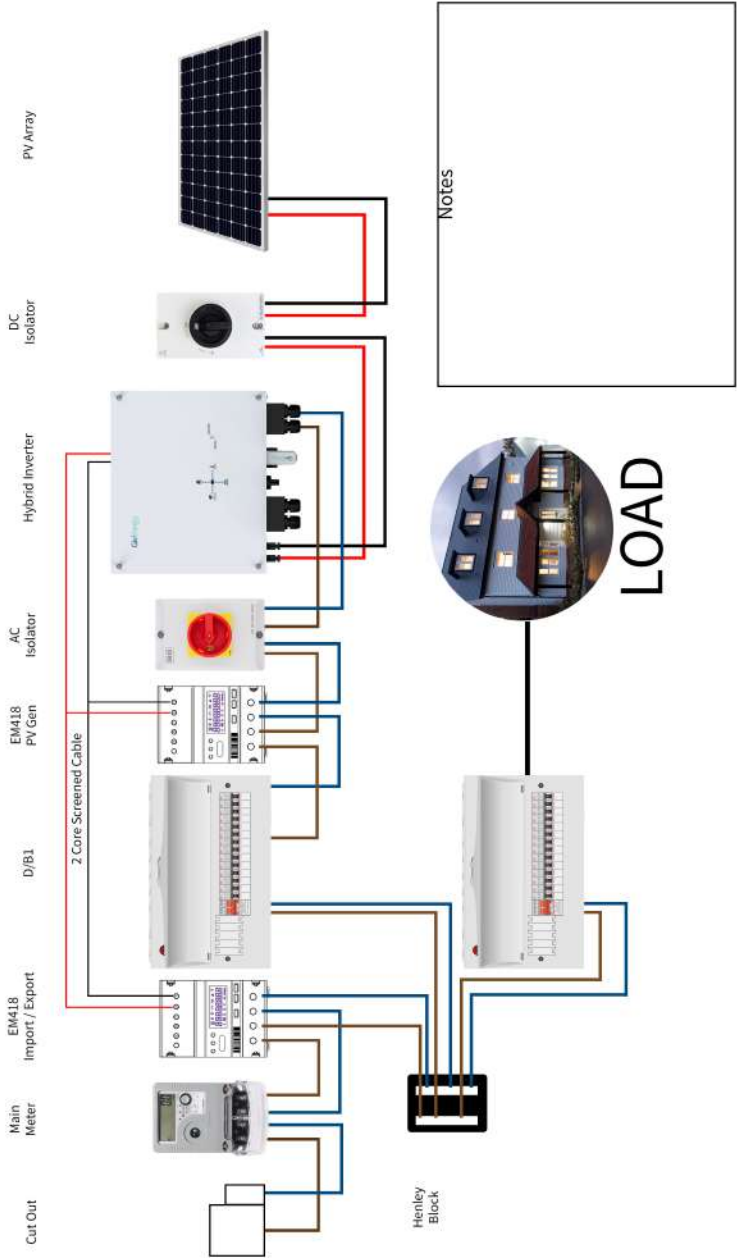
Schematic -02

Hybrid with 1 x EM115

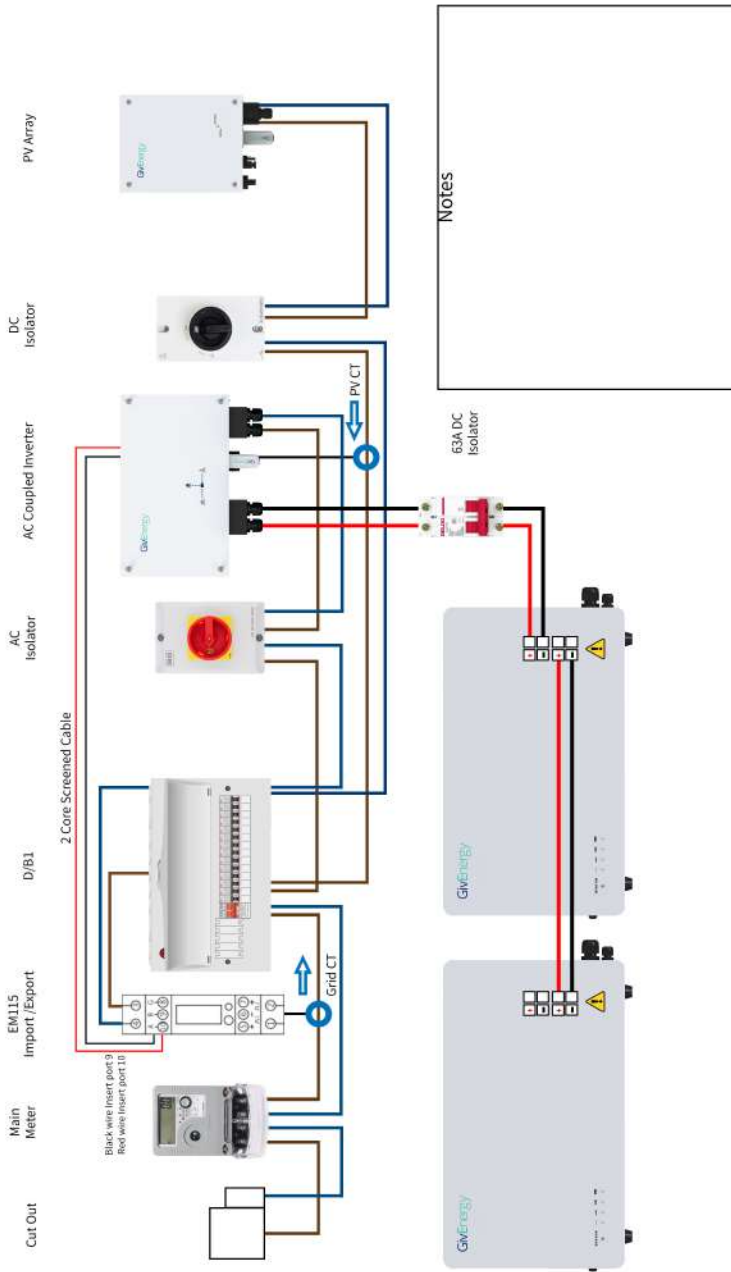


Schematic -03

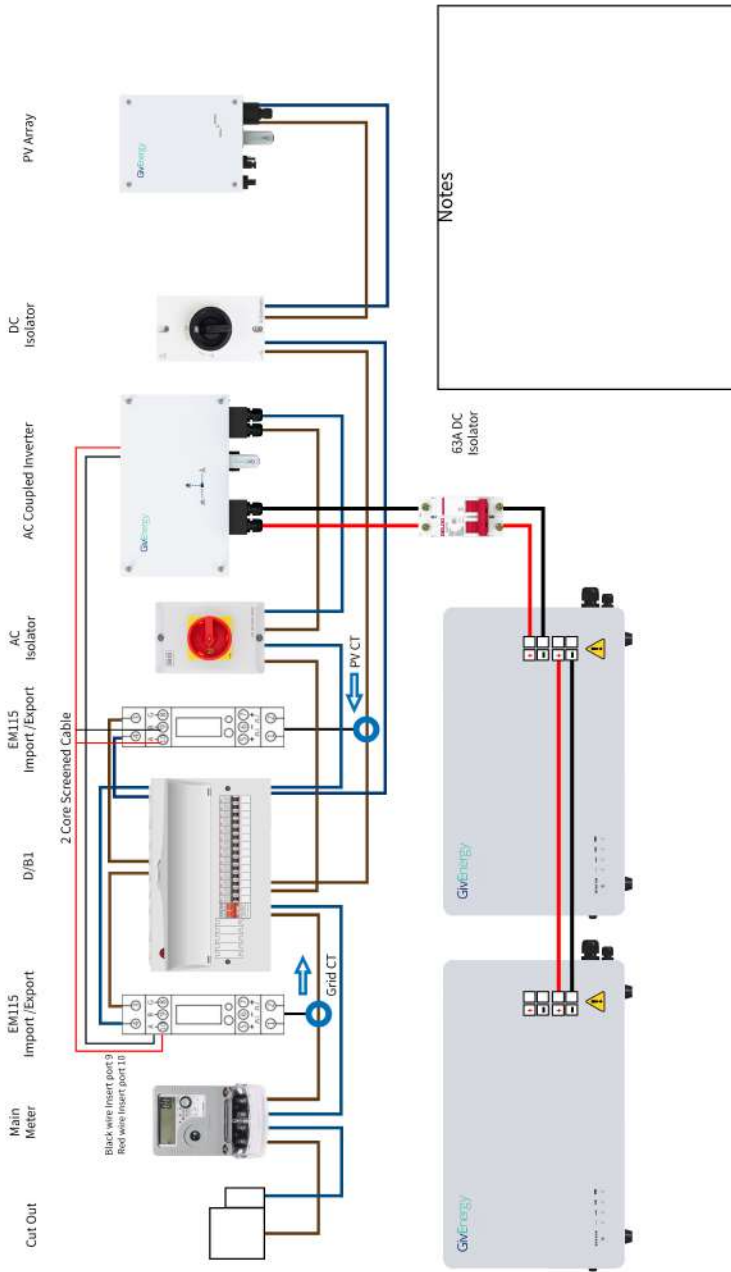
Hybrid with 2 x EM418



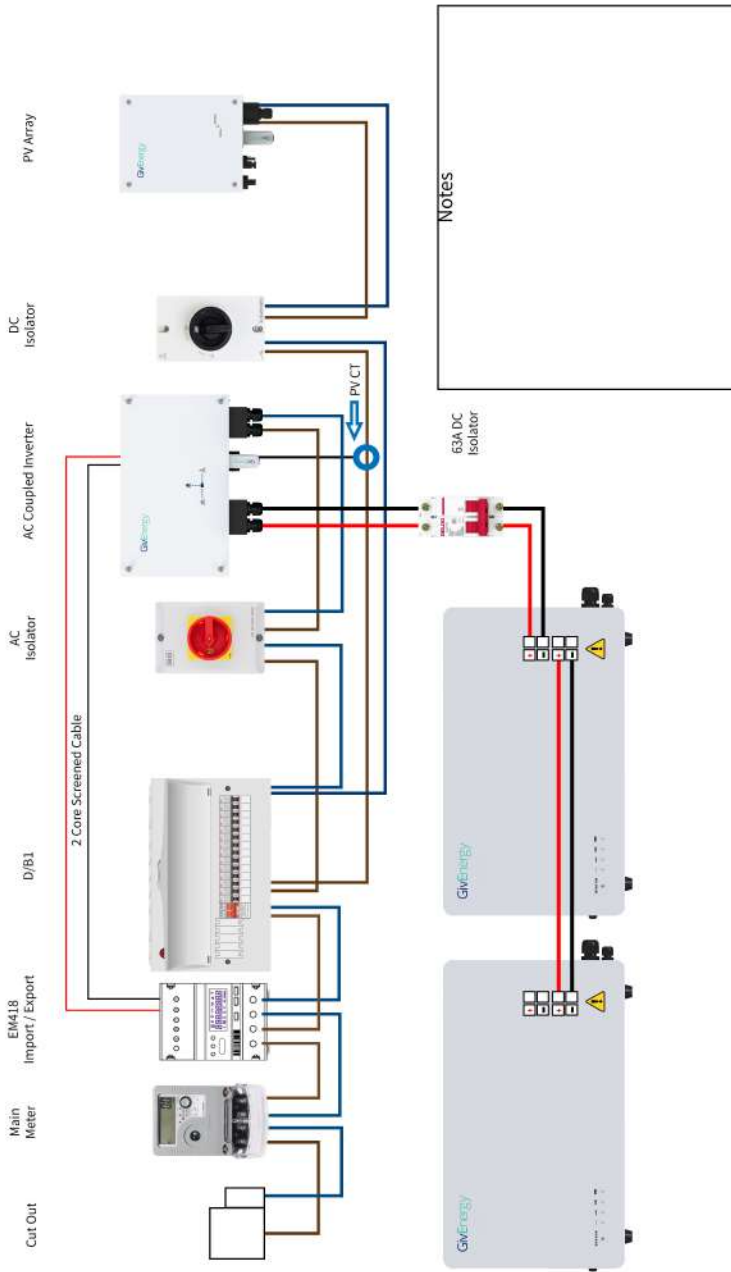
Schematic -04 AC Coupled with 1 x EM115



Schematic -05 AC Coupled with 2 x EM115

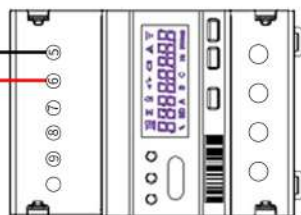
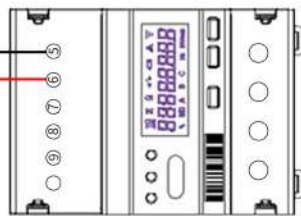
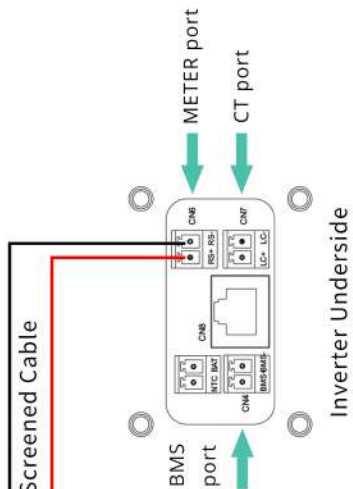


Schematic -06 AC Coupled with 1 x EM418

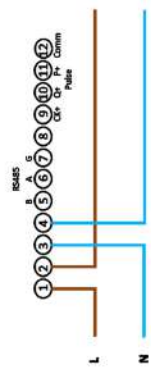


Schematic -07

2 x EM418 Meter Comms



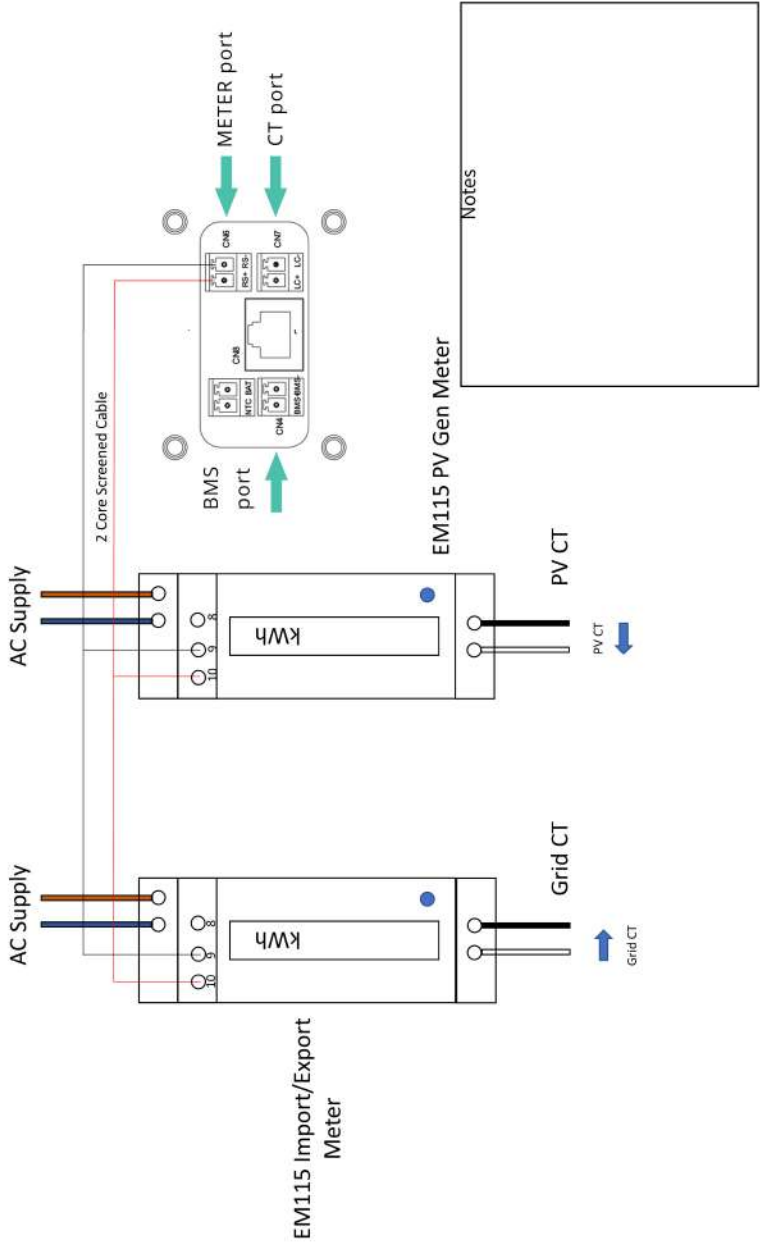
- 1/2 L1 In & Out
- 3/4 Neutral In & Out
- 5 RS485 B TX/RX (-)
- 6 RS485 A TX/RX (+)
- 7 RS485 A
- 7 RS485 B GND
- 8 Not Connected
- 9 Not Connected
- 10 Not Connected
- 11/12 Test pulse output contact (12-, 11+)



Notes

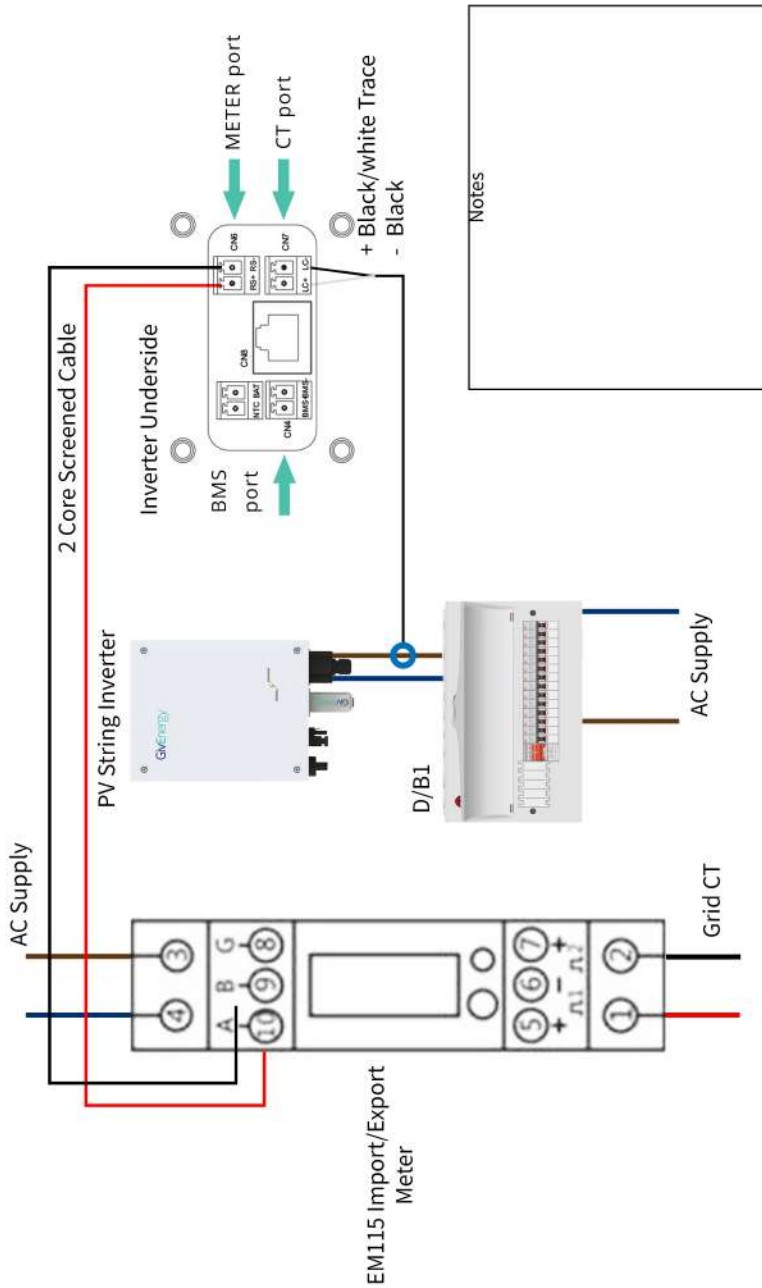
Schematic -08

2 x EM115 Meter Comms

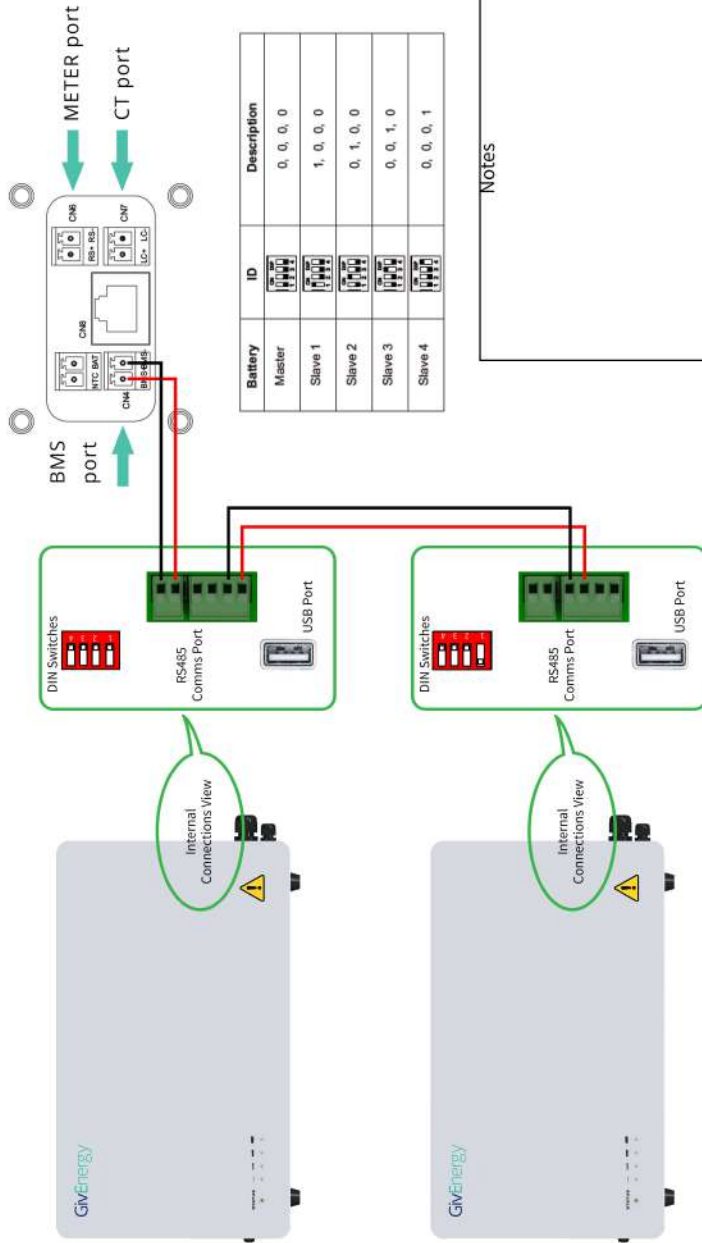


Schematic -09

1 x EM115 Meter Comms with CT

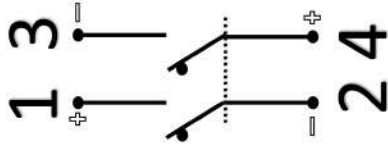
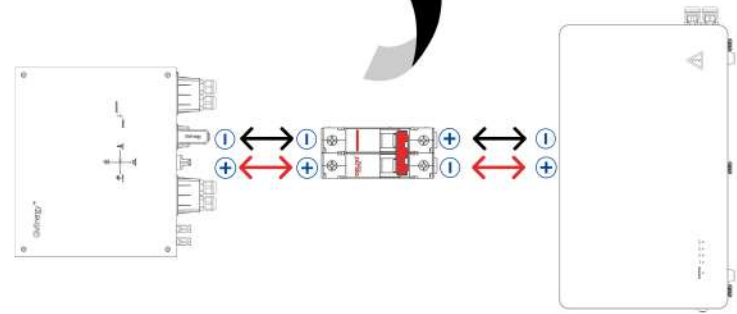


Schematic -10 BMS Comms



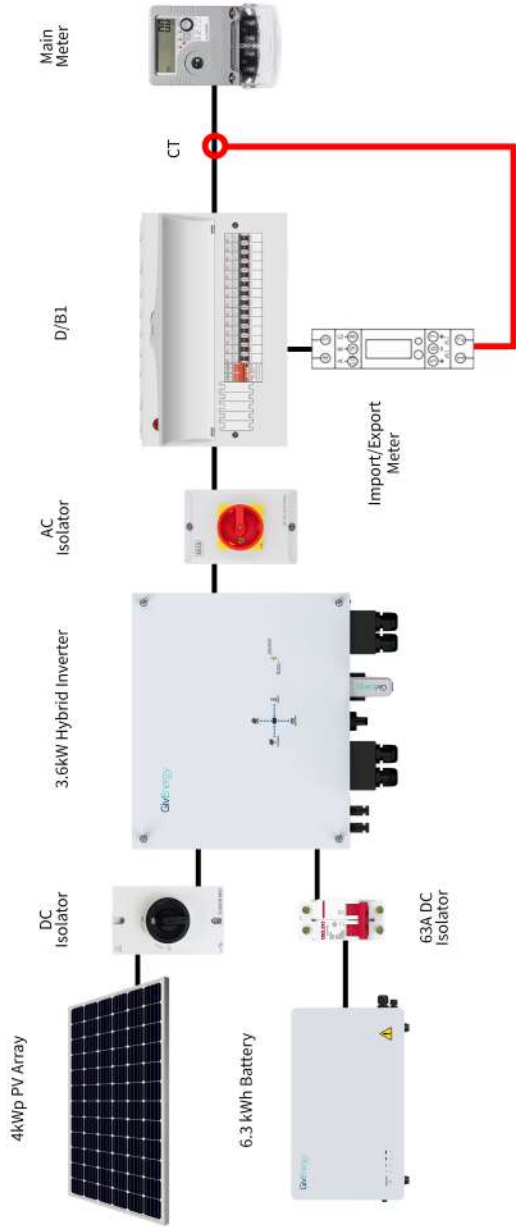
Notes

Schematic -11 63A DC MCB Connection

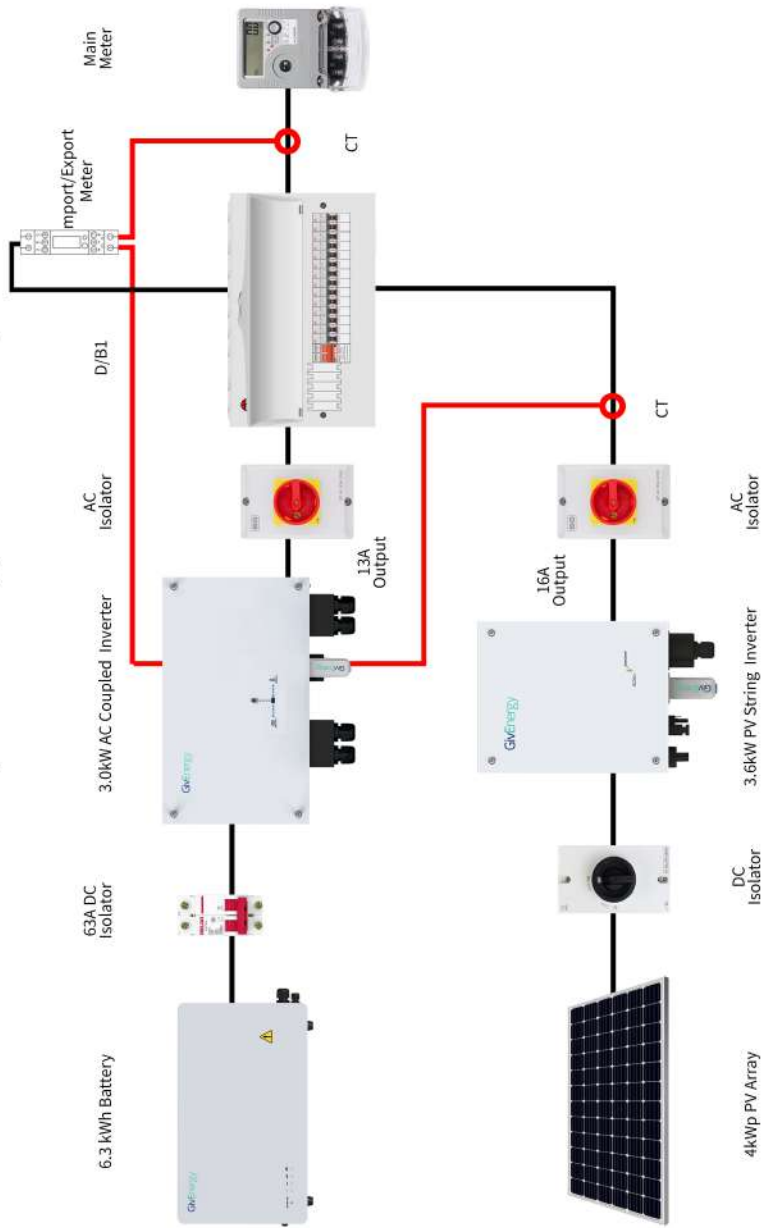


Notes

Schematic -12 Hybrid Diagram Example



Schematic -13 AC Coupled Diagram Example



1

Commissioning

Once the System has been installed as per the above instructions and the wifi dongle has a solid blue LED indicating that it has successfully connected onto the customers wifi network.

Open up the GivEnergy Monitoring Portal.

www.givenergy.cloud

Please enter your Engineer account log in credential and log into your account.



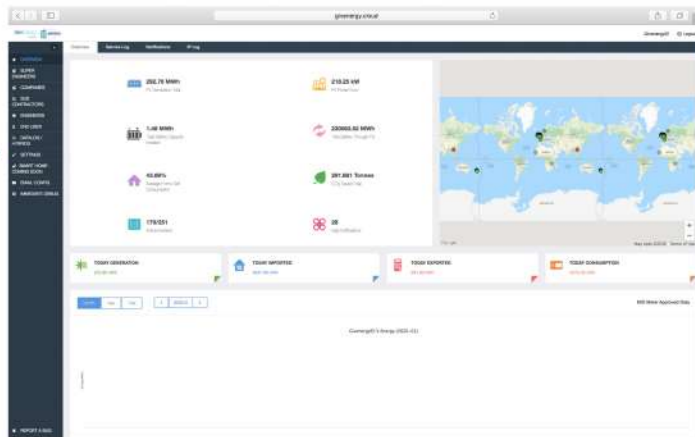
Enter details

2

Once logged into the main page.

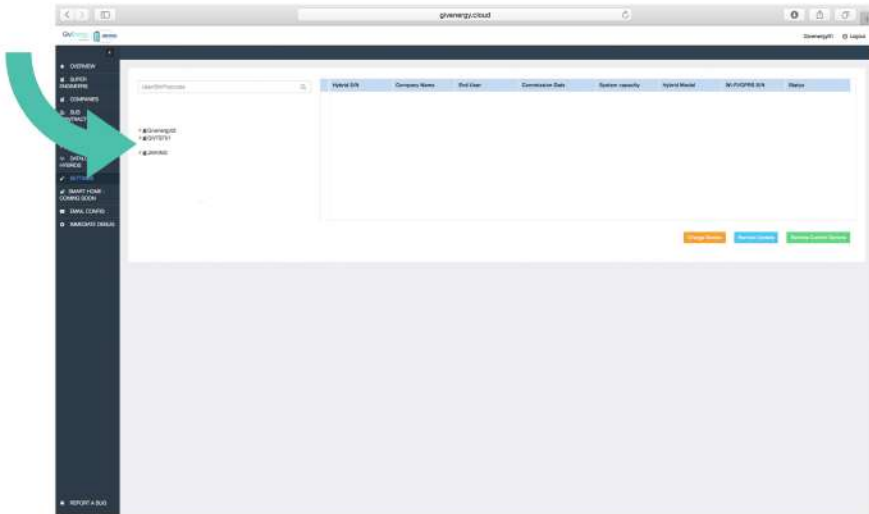
On the left hand side click on "Settings", select the system from the drop down list and then click on "Settings"

Enter
'Settings'
Tab

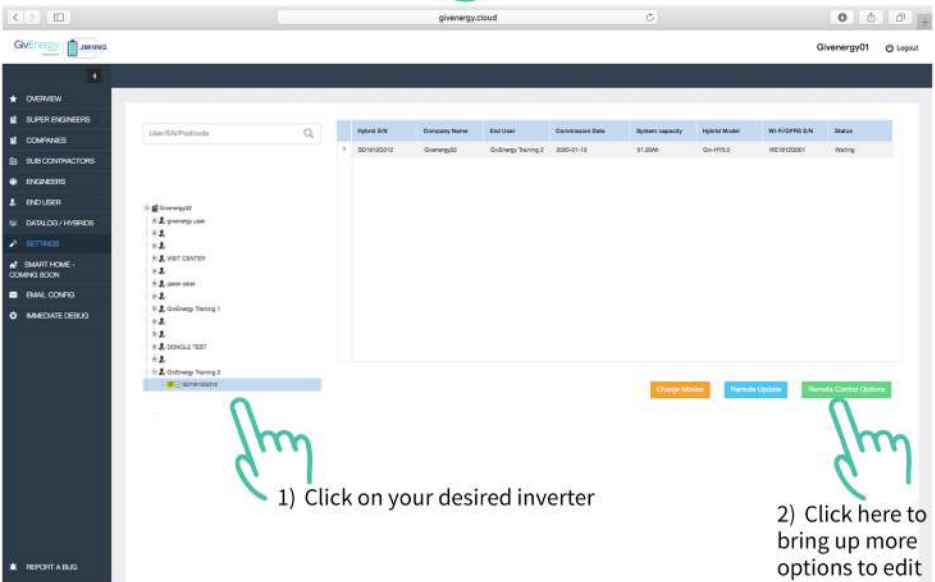


3

A list of your clients will appear



4



Please note you will need to click on the SN of the inverter before it will establish a connection between the inverter and the server.

5

Serial Number must be clicked on initially to establish a connection between the inverter and the server

1) Set Time & Date

2) enable mid meter
3) enable meter type
4) enable meter direction

Storage Setting

- Battery Type
- Battery Capacity(Ah)
- Battery Charge Upper Limit(0.01V)
- Discharge Lower Limit(0.01V)

Click on each sub heading (radio Button) before making any changes

Please note, when installing with a dual EM418 meter setup, Grid Import is positive and PV generation is Negative so a value of 16 must be set here.

6

5) Check Battery Capacity

6) Set the BMS Type

Setting the BMS Type to 1 will allow the inverter to read the BMS inside the battery pack. This will allow individual cell monitoring and also allow the inverter to read the battery capacity, which comes in handy when commissioning. Check the battery capacity i.e 160Ah = 8.2kWh

7

The screenshot shows the GivEnergy cloud interface. On the left is a navigation menu with options like Overview, Inverter, Components, and Settings. The main area displays 'Selected Hybrids' for a specific system. A table lists various inverters with columns for Name, Status, and a Restart button. A green hand icon points to the 'Restart' button for the 'Hybrid' inverter.

7) Click to restart

Restart the inverter and run a SOC calibration, ensure the inverter & battery have the latest Firmware.

8

Testing the system

Return back to the dashboard.

Enter
"Datalog/ Hybrids"
Tab

The screenshot shows the GivEnergy cloud dashboard. The navigation menu on the left has a green arrow pointing to the 'Datalog/ Hybrids' tab. The main dashboard area displays several key metrics: 282.78 kWh, 1.43 kWh, 33.86%, 179.85%, 274.23 kWh, 330W/32 kWh, 271.051 TWh, and 28. A world map is visible on the right side of the dashboard.

An over view page of lists of inverters will display. Select the desired inverter.

Click on 'Actions' drop down list then click on 'View'

The screenshot shows the GivEnergy cloud dashboard. On the left is a navigation menu with options like Overview, Supply Forecasts, Companies, etc. The main area displays a table of inverters with columns for Name, Inverter S/N, Model, Inverter P/N, Company, and Status. A dropdown menu is open for the first inverter, showing options: View, Edit, Refresh, Delete, Invert, and Service Log. A green arrow points to the 'View' option with the text 'Click "View"'. The browser address bar shows 'giverenergycloud'.

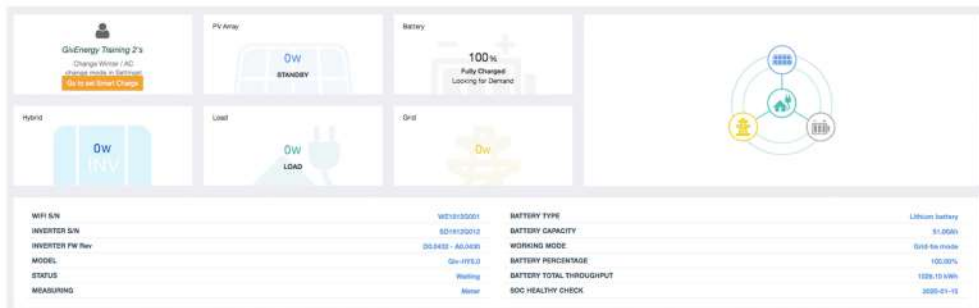
Switch off the PV regardless of whether AC Coupled or Hybrid Installed.

Also switch off the battery pack so any load within the property is purely imported from the grid. Turn on a load such as a kettle and check the active power reading on the meter, ensure that the value is reading a positive import which matches the demand in the property.

The screenshot shows the 'Status' page for an inverter in the GivEnergy cloud interface. The top section has several status cards: 'GivEnergy Trading E/s' (Change Status - Off), 'PV Array' (On), 'Battery' (TBD), 'Grid' (On), and 'Load' (On). Below these are detailed status fields for 'Inverter S/N', 'Inverter P/N', 'Model', 'Serial', and 'Manufacturer'. A graph at the bottom shows power consumption over time, with a sharp spike indicating a load event. The browser address bar shows 'giverenergycloud'.

Last step is to turn on the PV the import value should decrease as the PV generates.
Then the final step is to turn on the battery it will either show on the meter as discharging or charging.

An overview after installation with all the information of the install.



A visual check of the system would be that all lights are green on the Battery & Inverter

Notes