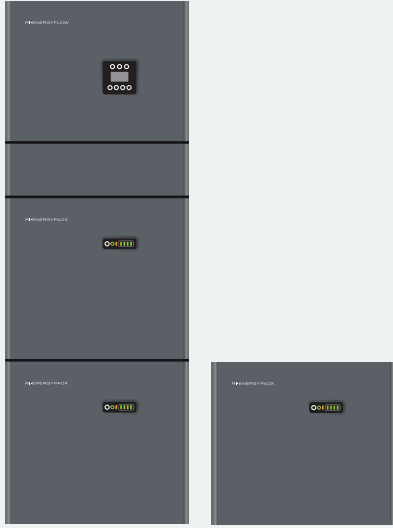


Quick Start Installation Guide

RI-ENERGYFLOW-MODULAR SERIES



Installation safety precautions:

- This system must only be installed by qualified personnel familiar with applicable wiring regulations.
- Isolate all power supplied to the device prior to undertaking any work on the system.
- Check all wiring connections before energising any part of the system.
- Do not remove or dismantle the device modules. There are no user serviceable parts within the products. Dismantling or tampering with the modules will void the warranty.
- Only clean the modules with a clean cloth.
- Suitable RCD protection must be installed according to local wiring regulations
- Read the full user manual prior to commencing installation.



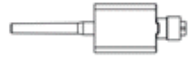


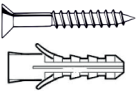
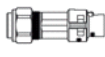

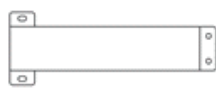

Getting Started

Step 1: Remove all modules from the cardboard boxes and associated packaging materials. Ensure that the brackets and included accessories are kept.

Step 2: Inspect all parts for damage. Do not proceed with the installation if damage is observed. If in doubt please call the supplier.

Step 3: Ensure all accessories are present and correct. The included accessories should be as shown below.

Inverter Module Accessories:

 4off M5x12mm Screws	 2 pairs of MC4 plugs	 1off WIFI Module	 1off AC Grid Connector and 2.5mm Allen Key	 1off Back-up Connector
 2off Mounting Screws and Nylon Wall Plugs	 1off CT/ Meter Connector (4Way)	 1off DRM Connector (6Way)	 1off Wall Bracket	 1off Current Transformer

Battery Module Accessories:

 4off Mounting Screws and Nylon Wall Plugs	 3off M5x12mm Screws	 4off M6 Flat Washers	 1off Wall Bracket	 Wiring Kit **
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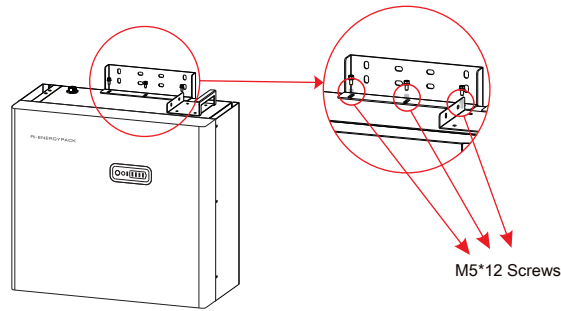
**An additional wiring kit will be required if the installation contains more than one battery module. Refer to table below.

Wiring Kits for Additional Battery Modules:

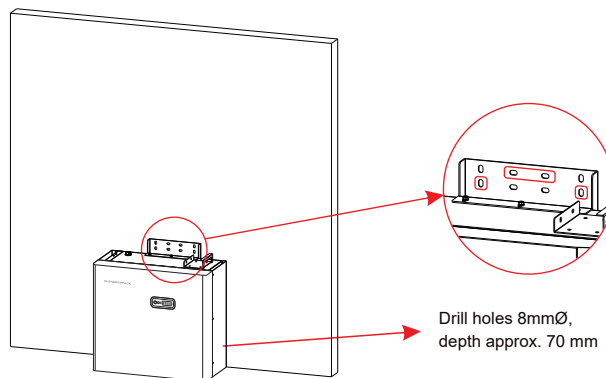
Total Number Of Battery Modules	Wiring Kit Part Number
2	RI-MOD-KIT10.2
3	RI-MOD-KIT15.3
4	RI-MOD-KIT20.4

Battery Installation - Note: The installation location must be in accordance with the User Manual

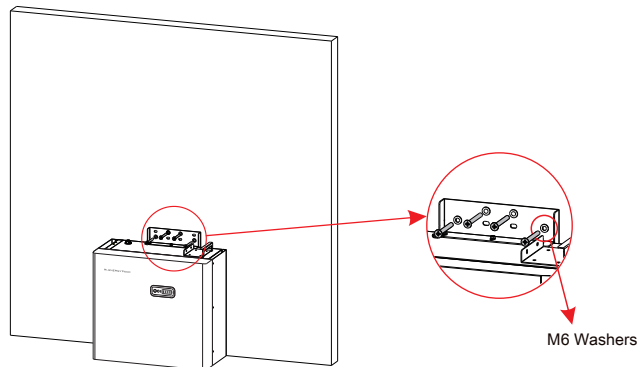
Step 1: Attach the supplied wall mounting bracket to the battery module using the supplied M5x12mm screws.



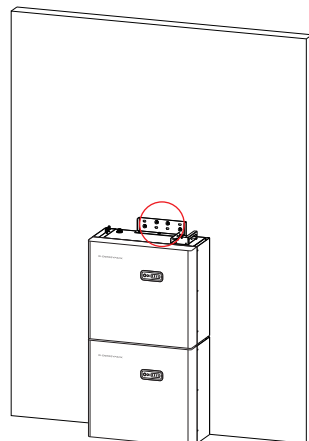
Step 2: Place the battery module against the wall and mark the 4 holes indicated below that are to be drilled. Using an 8mm Ø masonry drill bit, drill 4 x holes approximately 70mm depth. Gently tap supplied nylon wall plugs in to the holes.



Step 3: Remove any debris. Secure the battery module to the wall using the supplied mounting screws and M6 washers. On the last battery module of the stack, leave the two central screws unfitted and proceed to the next section for **Inverter Installation**

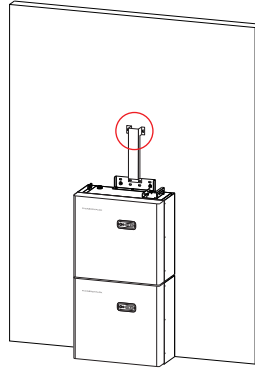


Step 4: Repeat steps 1-3 for any additional batteries. Please note, for installs with more than 2 battery modules it will be necessary to start a second battery stack to the right-hand side of the first.

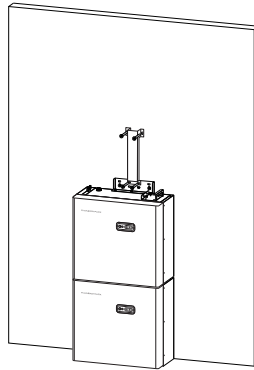


Inverter Installation

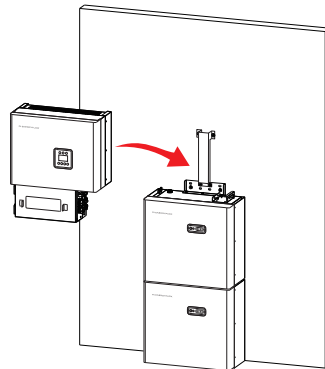
Step 1: Place the wall mounting bracket included with the inverter against the wall and mark the two top holes. Using an 8mmØ masonry drill bit, drill 2 x holes approximately 70mm depth. Gently tap supplied nylon wall plugs in to the holes.



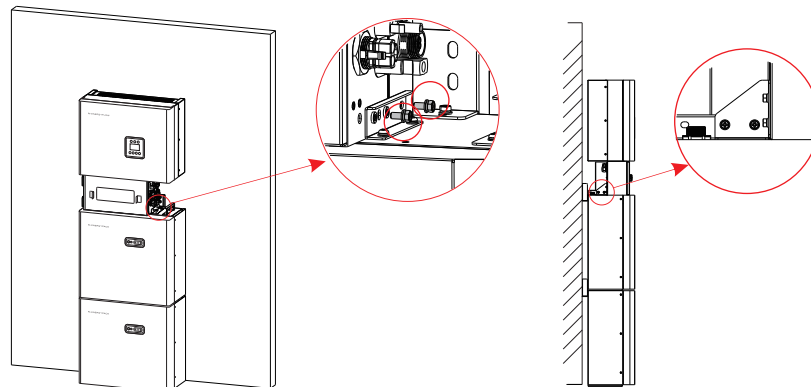
Step 2: Remove any debris. Secure the inverter bracket to the wall using the supplied screws (2 from battery installation + washers for the bottom holes and 2 without washers for the top holes).



Step 3: Fit the inverter on to the bracket. Take care to ensure the rear tang correctly engages with the bracket.

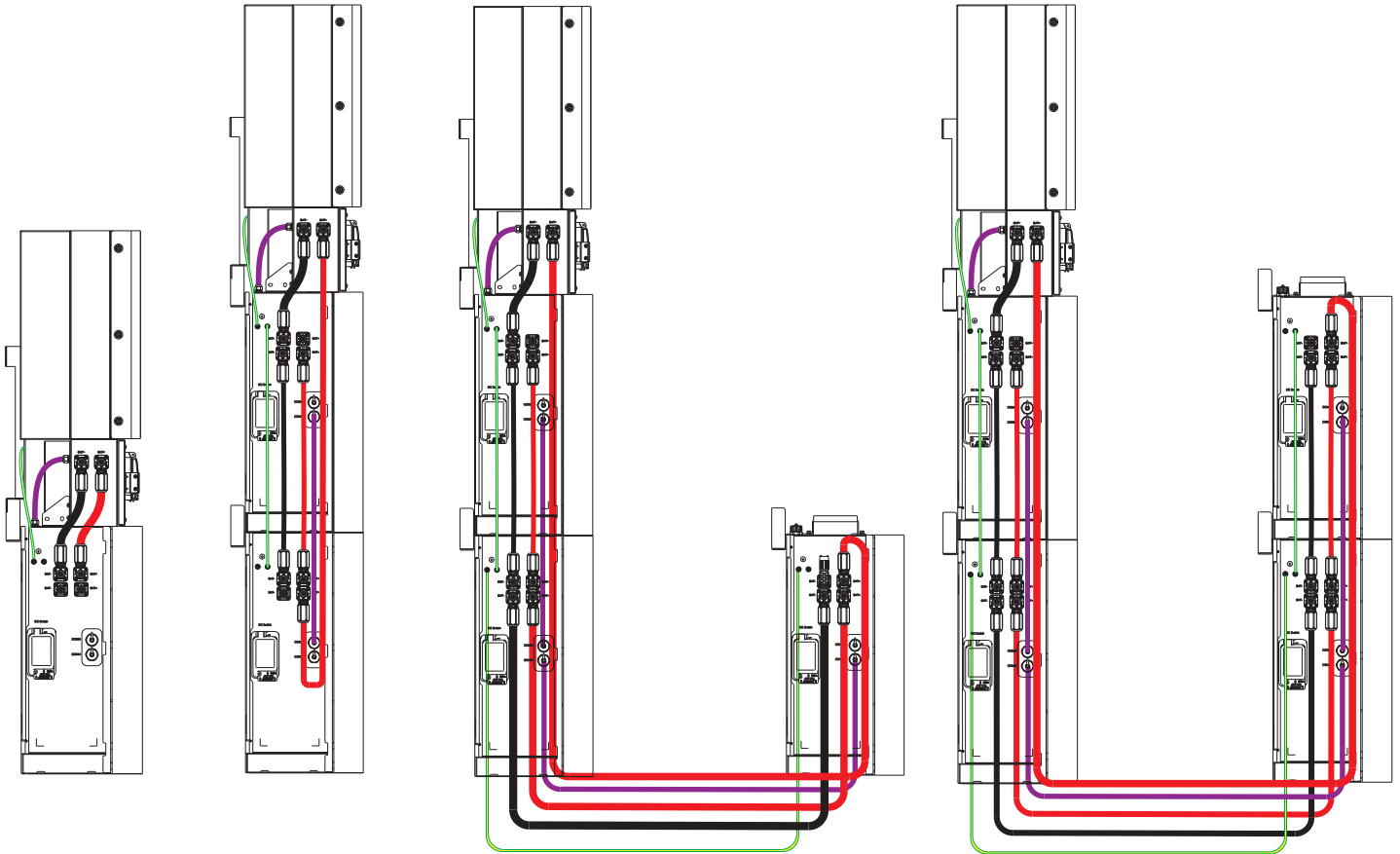


Step 4: Loosely fit the 4xM5x12mm screws through the battery brackets in to the inverter. Before tightening the screws position the inverter so that the removable inverter cover fits flush with the battery front panel(s). Do not fit the cover at this stage.

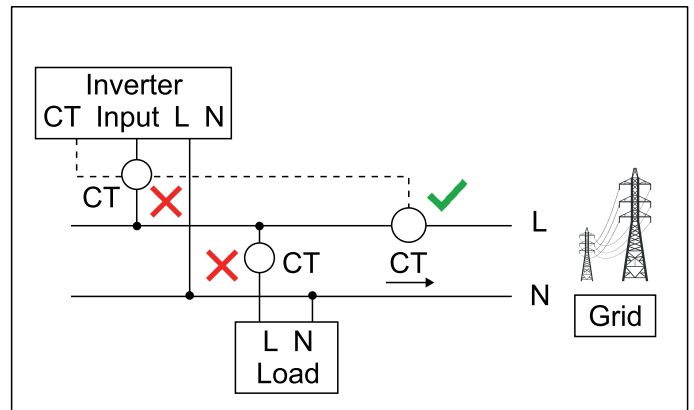
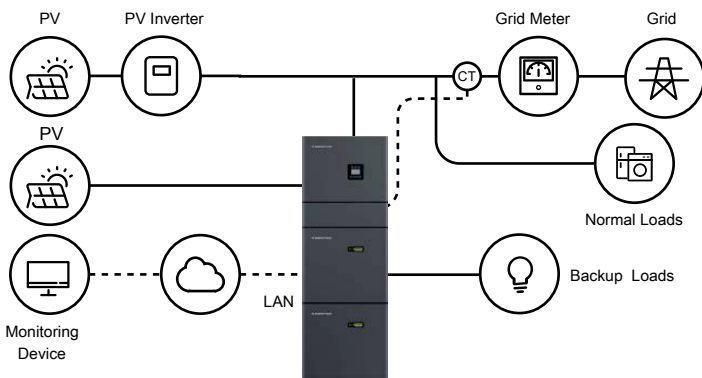


Connecting the Modules

Using the applicable wiring kit, depending on the number of installed battery modules, connect the modules together as shown below



Connecting the Load Sensing Current Transformer



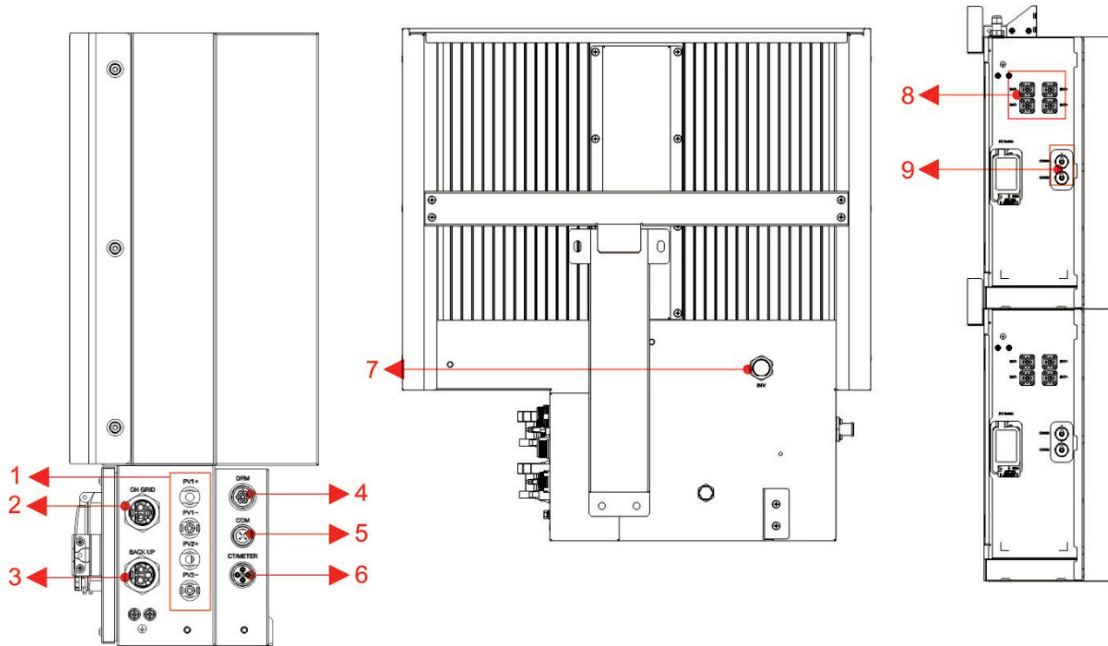
In order for the system to work correctly, a load sensing current transformer **MUST** be installed. Alternatively, an external Modbus meter may be used. Meter installation is outside of the scope of this guide. Please refer to the full user manual if meter measurement is needed.

The current transformer must be connected to the inverter using the supplied 4 way CT/Meter connector shown on page 1 of this guide - The White wire (S1+) must be connected to pole 1 of the connector. the Black wire (S2-) must be wired to pole 2.

The current transformer must be installed as shown above. The arrow on the transformer **must** point towards the incoming utility meter. **The inverter must be able to see 100% of the load or it will not work correctly**

External Connections

Using the connectors described in the **Getting Started** section within this guide, proceed to connect the applicable items described in the below table. Connect the included WIFI module to the **COM** connector. All wiring must be performed in accordance with local wiring regulations.



Object	Designation	Description
1	PV1, PV2	Connection for PV panels
2	ON GRID	AC Grid tied connection
3	BACKUP	AC Output for up to 16A regardless of grid tied status
4	DRM	DRM Interface (Demand response management)
5	COM	RS485 communications port
6	CT/METER	Connection for external Current transformer or Modbus meter input
7	INV	1 st battery module communications port
8	BAT+,BAT-	Positive and negative battery connections
9	2x RJ45	2 x RJ45 ports for daisy chaining additional battery module communications

Switching the System ON

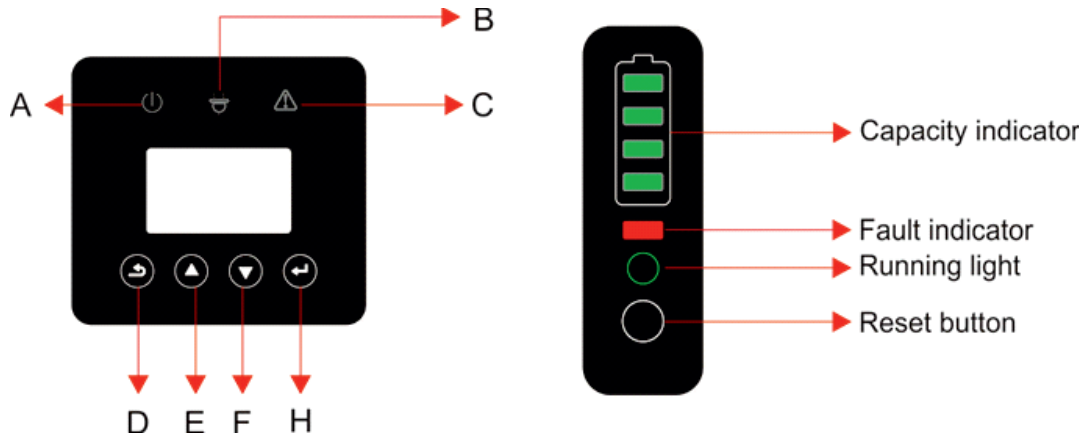
When switching ON the system the user must follow the following procedure to prevent potential damage to the system

- Step 1: On the side of each battery module there is a plastic cover, labelled **DC Switch**, lift the cover and switch ON each isolator
- Step 2: Switch ON the external PV isolator (usually located in close proximity to the installation).
- Step 3: Switch ON the external AC grid isolator or circuit breaker.
- Step 4: On the inverter module, lift the hinged plastic cover on the cable box and switch ON **Battery Switch** and the **PV Switch**. If the **Backup** load function is being used, switch the **Load Switch** ON also.
- Step 5: Close the plastic cable box cover.
- Step 6: On each battery module, on the front panel, there is a pushbutton, press the pushbutton until the lights illuminate. Repeat this step for all battery modules.
- Step 7: Fit the steel cover over the inverter cable box. Close and secure the hinged side covers on the battery module(s).
- Step 8: The system is now powered. At this stage it is wise to switch on a load (for example a kettle) and check that the installation behaves correctly.

Switching the system OFF

- Step 1: Press the pushbutton on each battery module and wait for the lights to turn OFF.
- Step 2: Remove the steel cover from over the inverter cable box.
- Step 3: Open the hinged plastic cover on the inverter cable box.
- Step 4: Switch OFF the **Battery Switch** and the **PV Switch**. If the **Backup** load function is being used, turn OFF the **Load Switch** too.
- Step 5: Turn off the external AC grid isolator or circuit breaker.
- Step 6: Turn OFF the external PV isolator (usually located in close proximity to the installation).
- Step 7: The system is now isolated. If maintenance is to be undertaken, the DC switch on the side of each module will also need to be switched OFF.

Inverter and Battery Module Displays



Object	Name	Description
A	Indicator LED	Green: Grid connection (Solid). Not connected (Flashing)
B		Green: Indication of Off-grid status
C		Red: The inverter is in fault.
D	Key Function	Return key: Enter programming or return one level
E		Up key: Move cursor up or increase value.
F		Down key: Move cursor down or decrease value.
H		Enter key: Confirm the selection.

The inverter online pages will be shown below. The displayed page will change every 3 seconds automatically. If the user wishes to manually cycle through the pages, use the UP and DOWN buttons. If the user wishes to stop the pages cycling, press the ENTER key to lock the screen.

PV1 INPUT

- VOLT : 33.8V → PV1 Input Voltage
- CURR : 0.00A → PV1 Input Current
- POWER : 0W → PV1 Input Power

PV2 INPUT

- VOLT : 49.8V → PV2 Input Voltage
- CURR : 0.00A → PV2 Input Current
- POWER : 0W → PV2 Input Power

DC VOLTAGE

- BUS : 310.8V → DC Bus Voltage

BATTERY

- VOLT : 42.2V → Battery Input Voltage
- CURR : 20.2A → Battery Current
- CAPACITY : 40Ah → Battery Capacity

BMS PARAM

- TYPE : RI-MOD 5.1 → Battery Type
- TEMP : 25°C → Battery Temperature
- SOC : 90% → Percentage of Battery

BMS PARAM

- CHAR VOLT : 50V → Battery Charging Voltage
- CHARGE : 60A → Battery Charging Current
- DISCHARGE : 10A → Battery Discharging Current

GRID DATA

- VOLT : 239.8V → Mains Voltage
- CURR : 0.00A → Mains Current
- FREQ : 50.12Hz → Mains Frequency

INV DATA

- VOLT : 50.0V → Inverter Voltage
- CURR : 0.00A → Inverter Current
- FREQ : 0.00Hz → Inverter Frequency

BACKUP DATA

- VOLT : 237.3V → Backup Output Voltage
- CURR : 0.00A → Backup Output Current

POWER

- INV : W → Inverter Total Power
- GRID : W → Grid Total Power
- LOAD : W → Load Total Power

POWER

- PV : W → PV Generation Power
- BACKUP : W → Backup Output Power
- BAT : W → Total Power Supplied from battery

TEMPERATURE

- INV : 23.1°C → Inverter Heat-sink Temperature
- DCDC : 21.5°C → DC-DC Heat-sink Temperature
- AMBIENT : 24°C → Internal Ambient Temperature

STATE

- SYS : G-BYPASS → Current System Status
- INV : STANDBY → Current Inverter Status
- DCDC : STANDBY → Current DC-DC Status

ERROR NO.

- WARNING : W20-1 → Warning Code
- FAULT : XXX-X → Fault Code

SYSTEM

- STATE : SELF CSM → Setup Status (Work Mode)
- GRID : U.K. → Grid Standard
- PV I/P : INDEPEN → PV Mode (PV Input)

Programming and menu

Menu Path: *Setup > Enter Password (Default 00000) > SYS Setting:*

SYS Setting	Work Mode	Self Consume	Charge from Grid: Enable Disable	Enable	The energy generated by the solar panels will be used in the following order: Feed the home loads; Charge the battery and then, feed into the grid. When the sun is not present, the load will be supported by the battery to enhance self-consumption. If the power supply from the batteries is not sufficient, the grid will support the load demand.
		Peak SFT	Time Setting	Disable	This mode is designed for time-use mode. The customer can set up the desired charging/discharging time & power via the inverter screen or APP.
			Charge		Manually forces the system to charge the batteries from the grid
			DISCHG		Manually forces the system to discharge to the connected load
		BAT Priority	Disable	The battery is only used as a backup power supply when the grid fails. As long as the grid works, the batteries won't be used to power the loads. The battery is charged with the power generated by the PV system or from the grid.	
	PV input	Independent CV Parallel	Independent	Allows the user to change the PV array configuration (wiring changes would also apply!)	
	Zero export	Disable	Disable	Allows the user to set the export to grid limit	
		Enable		If Enable is selected, the user will be prompted to enter the power	
	DRM Enable	Disable Enable	Disable	Only applicable in Australia and New Zealand at this time	
	EPS Enable	Disable Enable	Disable	Enables the Backup output (the Load Switch needs to be turned ON).	
	Remote CTRL	Disable Enable	Disable	Allows control via RS485 (Scada system for example)	
	Start Delay	20...300	180s (when set to UK)	This is the boot delay from when power is applied to the inverter	
	CEI SPI Ctrl	Disable Enable	Disable	This function is only applicable to use via DRM for remote control (Australian and New Zealand markets only)	
GFCICLK ENB	Disable Enable	Enable	Ground fault monitoring on the AC grid connection		
DISC MODE	Rated power Load priority	Rated power	Allows the user to select the mode of discharge. Rated power means that the applied discharge power percentage. Load priority mean that the system supplies the full output to drive the load		

Menu Path: Setup > Enter Password (Default 00000) > SYS Setting: (CONTINUED)

SYS Setting	DOD Enable	Disable Enable	Enable	Depth of discharge. This should always be enabled. Disabling will result in the battery discharging to 0%	
	Generator	Disable Enable	Disable	This option allows the user to install a secondary means of generation. For example, wind generator or diesel	
	CT or METER	CT		CT	CT option is used for measuring the system current
		Meter	Estron Acrel Rayleigh		Meter option is used for measuring the system current
	AC Couple	Disable Enable	Disable	Allows the user to connect an external inverter to the system (either instead of PV, or in-addition to PC -	
	CT Direction	Positive Negative	Positive	Reverses the direction of current flow measurement	
	ISLAND	Disable Enable	Enable	When enabled, the inverter will continue to export power via the BACKUP port in the event grid	

Menu Path: Setup > Enter Password (Default 00000) > BAT Setting

BAT Setting	BAT Type	Lead Acid RI-MOD 5.1	RI-MOD 5.1	Shows the user what type of battery is connected to the system	
	DISC Depth	0...100%	90%	Sets the maximum depth of discharge during grid connected state	
	OFFGRID DOD	0...100%	90%	Sets the maximum depth of discharge when off-grid	
	CHG CURR	0...100A	60A	Sets the maximum battery charge current	
	DISC Power	0...100%	80%	Sets the maximum discharge power - % of rated output	
	CHG Power	0...100%	100%	Sets the maximum charge power - % of rated output	
	BAT End Volt	0...48V	43.2V	Sets the voltage that is seen as 0% remaining	
	BAT Wake-up	Enable		Enable	If enabled the battery will constantly monitor state of charge and depth of discharge. If time option is selected, the battery will wake up and check the state of charge and depth of discharge at the interval set
		Time	Set time		If time is selected the user will be prompted to enter a value 0...300 minutes
	Heating FLIM	Automatic ON OFF	Automatic	Allows the user to enable or disable the heating film installed within the battery modules. Automatic means the system measures the Outside temperature and turns the film on as needed. Only applicable if heating film is requested at time of ordering	
	BMS DOD	Disable Enable	Disable	Leave disabled. The inverter will monitor depth of discharge.	
Maintain SOC	Disable Enable	Enable	Disable: The minimum SOC will not be maintained. Enable: The minimum SOC 2% is maintained. When the battery SOC is less than 2%, the grid charges the battery pack to 5% through the inverter.		
Force Wake	Disable Enable	Disable	Enabling this option means the battery will always remain online and will not go to sleep		

Menu Path: Setup > Enter Password (Default 00000) > Grid STD):

Grid STD	1. China	13. Thailand	6. UK	Allows the user to select the country that the system is installed in
	2. Germany	14. South Africa		
	3. Australia	15. 50549		
	4. Italy	16. Brazil		
	5. Spain	17. 0126		
	6. UK	18. Ireland		
	7. Hungary	19. Israel		
	8. Belgium	20. Poland		
	9. New Zealand	21. Chile		
	10. Greece	22. Local		
	11. France	23. 60Hz		
	12. Bangkok	24. Denmark		

Menu Path: Setup > Enter Password (Default 00000) > Run Setting:

Run Setting	REACT MODE	Power Factor	Enabled - PF1.0 (UK)	The inverter can monitor reactive power in several ways. This setting is set according to the selected grid standard and should not be changed. For UK grid setting the default method is power factor.
		React Power		
		QU Curve		
		QP Curve		
	GRID POWER	0...110%	100%	Limit or increase the power exported from the system to the grid.
	VOLT MAX	INV Max	264V (UK)	<p>These settings should not be altered. They are set automatically according to the country selected within Grid Setting.</p> <p>If the inverter sees that these values have been reached, or exceeded, then the inverter will stop generating.</p>
		Grid Max	276V (UK)	
	VOLT MIN	INV Min	184V (UK)	
		Grid Min	172V (UK)	
	FREQ MAX	INV Max	52Hz (UK)	
		Grid Max	53.5Hz (UK)	
	FREQ MIN	INV Min	47Hz (UK)	
		Grid Min	46Hz (UK)	
	OVER VOLT	Disable Enable	Enabled (264V UK)	
	UNDER VOLT	Disable Enable	Enabled (200V UK)	
	OVER FREQ	Disable Enable	Enabled (50.2Hz UK)	
	UNDER FREQ	Disable Enable	Enabled (49.25Hz UK)	
	REACT RESP	0...60	10 Seconds	This is the time it takes for the exported reactive power to reach the grid standard level. This setting should not be changed and is set according to the grid standard.
	VRT ENABLE	Disable Enable	Enable	Voltage-ride-through. This setting should not be changed and is set automatically according to the grid
	POW SI RATE	0...300%	100%	This is the rate of change of the output. This setting should not be changed and is set according to grid standard. 100% means that the output will hit full power

Menu Path: Setup > Enter Password (Default 00000) > All other settings within Setup :

485 Address	1...255	1	Allows the user to select the RS485 address for the COM port
Baud Rate	1. 2400 2. 4800 3. 9600	3. 9600	Allows the user to select the RS485 serial baud rate for the COM port
Language	1. Chinese 2. English 3. Italian	2. English	Allows the user to select Chinese, English or Italian language
Backlight	0...120 seconds	20 seconds	Allows the user to select how long the display back light remains lit
Date/Time	Set time, date and day		Allows the user to set the time, date and day
Clear REC	Cancel Confirm	Cancel	Clears all stored records
Password	Old password New password Confirm new password	00000	Allows the user to change the programming password
Maintenance	User cannot access	N/A	Not accessible to user
Factory RESET	Cancel Confirm	Cancel	Resets the system to factory default settings
Auto Test	Not applicable in UK	N/A	Only applicable in Italy

Menu Path: Inquire:

INV Module	Shows the user what model of inverter is in use
Module SN	Shows the user the serial number of the inverter
Firmware	Shows the user the firmware version
Record	Shows the user the active faults or errors
BMS Info	Shows the user the battery modules connected and connection status

Menu Path: Statistic:

Time stat	Run: Grid: Unit: hours	Shows the user the hours run of Inverter and Grid connection
Conne Time	Times:	
Peak Power	History: Today: Units: watts	Shows the user the total generated watts and today's generated watts
E-Today	PV: xx kWh Meter: xx kWh Grid: xx kWh Load: xx kWh Charge: xx kWh Discharge: xx kWh	Shows the user what was generated today

Menu Path: *Statistic: (CONTINUED)*

E-Month	PV: xx kWh Meter: xx kWh Grid: xx kWh Load: xx kWh	Shows the user what was generated this month
E-Year	PV: xx kWh Meter: xx kWh Grid: xx kWh Load: xx kWh	Shows the user what was generated this year
E-Total	PV: xx kWh Meter: xx kWh Grid: xx kWh Load: xx kWh Charge: xx kWh Discharge: xx kWh	Shows the user what has been generated since the system was installed



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and Other
Documents.**