

PowerCube 2.0 AC Installation Guide – Australia & NZ

Feb 2018





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01

System Introduction

- 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)









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:

FINE

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
В	Battery Pack Power Cable with connectors connecting between battery packs	6
С	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
Н	M8 Anti-Theft bolt	2





В

А

С

D



Power Box







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	No.	Wire stripper
4		4mm Allen Wrench
5		Crimping tools
6		Multi-meter

No.	Tool	Model
7		Marker pen
8		Measuring tape
9	0-180*	Level
10	m m	ESD gloves
11		Safety goggles
12		Anti-dust respirator

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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





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

Trina

Powercube installation – PowerCube Mounting



L-100mm

>300mm

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

> Breaker Negative cable Breaker Positive cable Inverter comms cable



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 – 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









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:

- 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 <u>softstart</u> 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.
- Press "Up" or "Down" to change the 1st digit, press "OK" to switch to next digit, after inputting the current time, press "OK"





1.Enter	Setting	
1.Batt P	arameter 🤇	7.Set Language
2.Clear	Energy Data	8.Set Time
3.Clear	Events	9.Set EPS Mode
4.Set C	ountry	10. DRMs0 Control
5.Set	Communication	11. Auto Test
Add		
6.Funct	ion to Set Country	12. Work Mode Set

04

WIFI Monitoring Setup Guide

- 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

Vindows Security			×
The server 10.10.100. and password.	254 at IGEN -WIFI req	uires a username	
Warning: This server sent in an insecure m connection).	is requesting that you nanner (basic authentio	r username and pas cation without a sec	sword be ure
adr	nin		
	xemember my creden	TRAIS	
			1

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

							Help
Connect	ion setting	B .					The STA mode of wireless
							by system automatically
							network connection.
	Wireles	is connect	ion				Whether to keep the AP
	Cable (onnection	1	Wire	iess En	ibled 🗸	or not can be set by turning
							function.
15		1	2	5	Ļ	7	
	Connect	Connection Setting Wreter Cable of	Connection Settings: Wresess connect Cable connector	Connection Settings:	Connection Settings: Wresess connection Cable connection Wresess	Connection Settings: Wreless connection Catile connection Wireless	Connection Settings: Wreless connection Cable connection Wreless Enabled

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

		Help			Help
Status	Please select your current wireless network:	This step will help to	Status	Please enter the wireless network password:	
Wireless	Site Survey	connect the device to your desired WLAN. If you do not	Wizard		Please make sure you have
Cable	() TO LINY, ETTE IN: 4E 99 5e 67 75 60% 4	find your wireless router on the left list, please refresh	Wireless		password.
Advanced	Genst 54.4a.00.79.a2:10 55% 4 O TG_Office 54.4a.00.79.a2:11 55% 4	several times or add it. manually	Cable		
Upgrade	O T85200T1705270047 c6 93.46.34.61.dd 34% 9	Please check your wireless	Advanced		
Restart	O T85200T1705270015 c8 93 46 34 5e 6e 65% 9	router for the right	Linorade	Password (8-64 bytes)	
Reset	O T85200T1705270063 c0.93.46-34.5d.e5 39% 9 O T85200T1705270008 c6.93.46-34.60.64 50% 9	encryption algorithm.	Restart	(Note: case sensitive)	
	O T85200T1705150007 08 93 46 34 62 ea 24% 9	If your wireless router does	Rest	Show Password	
	Note: When RSSI of the selected WiFi network is lower than 15%, the connection may be unstable, please select other available network or shorten the distance between the device and router.	add a wireless network manually.	Reset		
	Add wireless network manually:				
	Network name (SSID) (Note: case sensitive) TG_Guest			Back Next	
	Encryption method WPA2PSK V				
	Encryption algorithm AES V			1 2 3 4 5 6 7	
	Back 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'

Status	Please fill i	n the fol	lowing info	ormatio	in:			Martinit
Wizard Wireless Cable	Olau	btain an IP Itomaticall	address	Er	nable 🗸			Most syst function o IP addres Please se add it ma
Advanced	IP	address		0.	0.0.0			does not :
Upgrade	St	ubnet mas	k	0.	0.0.0		1	TOUR DON.
Restart	Gateway address			0.	0.0.0			
Reset	D	NS server	address					
					Back	Next	a	
	4	2	3	4	5 6	7		

Help t systems support the tion of DHCP to obtain ddress automatically, se select disable and it manually if your router is not support such tion.

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

		Help		
Status	Enhance Security	~		
Wizard		Hide AP		
Wireless	You can enhance your system security by choosing the following methods	network will be invisible if		
Cable	Hide AP	enter the SSID manually		
Advanced		when you need to		
Upgrade	Change the encryption mode for AP	connect to AP next time.		
Restart	Change the user name and password for Web server	Change the encryption mode for AP		
Reset	Back Next	If you set password for the AP network, you will need to enter the password to connect to AP.		
	1 2 3 4 5 6 7	Change the user name		
		If you change the username and password for the web server, you will need to enter the new username and password		

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

			Help
Status	 Device information 		
Wizard	Device serial number	805574402	The device can be used as
Wireless	Firmware version	H4.01.51MW.2.01W1.0.53(sofar-03- 291-0)	mode) to facilitate users to configure the device, or it
Cable	Weeless AP mode	Enable	can also be used as a
Advanced	SSID	AP_805574402	(STA mode) to connect the
Upgrade	IP address	10.10.100.254	remote server via wireless.
Restart	MAC address	BC 54 F9 F4 23 50	router.
Reset	Wireless STA mode	Enable	
	Router SSID	TG_Guest	
	Signal quality	44%	
	IP address	10.58.7.41	
	MAC address	BC:54.F9:F4:23:59	
	Cable mode	Disable	
	IP address		
	MAC address		
	Connected Inverter Type	Tripa	
	Number	1	
	Number Inverter serial number	1 TE1ES330H4K083	
	Number Inverter serial number Firmware version (main) Firmware version (stave)	1 TE1E5330H4K083	
	Number Inverter serial number Firmware version (main) Firmware version (slave) Inverter model	1 TE1E5330H4K083) V031 	
	Number Inverter senal number Firmware version (main) Firmware version (slave) Inverter model Rated pover	1 TE1E5330H4K083 V V031 TE1E5330	
	Number Invetter senial number Firmware version (main) Firmware version (slave) Invetter model Rated power Current power	1 TE1E5330H44083 V V031 	
	Number Invetter senial number Firmware version (nalit) Firmware version (stave) Invetter model Rated power Current power Yield today	TE1E533044605100 V031 TE1E5330 TE1E5330 0 W 0 W/	
	Nurzber Inventor senial number Firmmare version (main) Firmmare version (slave) Inventor model Rated power Current power Yried today Total yried	TE1E533044085 V031 TE1E5330 0 W 0 W 0 W 0 W	
	Number Inventor senal number Pirmuare version (main) Pirmuare version (stave) Inventor model Rated power Current power Yield today Todal yield Alerts	TE 1E5330440435 V031 V031 TE 1E5330 0 VW 0 VW 0 VW 0 VW 0 VW	
	Number Inverter serval number Firmware version (invan) Firmware version (invo) Inverter nodel Ruther power Current power Vield today Toda yield Alerts Last updated	TE 1653044605 00 V031 TE 165300 0 W 0 W 0 W 0 W 0 W 0 W 0 W 0	
	Number Inverter servar number Firmware version (train) Firmware version (train) Firmware version (train) Ruted power Gurrent power Unat today Visit today Toda yield Aters Last updated	TE1E53304400500 V031 TE1E5330 0 W0 0 WW0 0 0 WW0 0 0 WW0 0 0 WW0 0 0 WW0 0 0 WW0	



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-useof-pv-owners-app/id1269498647?mt=8

Or simply scan the QR code below:



solarman-The best use of PV owners APP By IGEN Tech Co., Ltd. This app is only available on the App Store for IOS devices.



Category: Utilities Updated: 01 September 2017 Version: 1.2.3 Size: 39.5 MB Languages: English, Simplified Chinese

Free

Description

-Real-time Remote Monitoring Users can check their own plants via SOLAI consumption, storage battery, etc(daily, we

IGEN Tech Co., Ltd. Web Site > solarman

What's New in Version 1.2.3

This update: -Fix some bugs.

iPhone Screenshots

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:

×	Login	Register		
Email or tele	ephone number			
Password		\odot		
	Login			
Can't log in?				



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



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



4. Enter plant info





5. Locate the plant on the maps



Plant '

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System Monitoring Set-Up – Plant Setting



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

Back	Confirm Plant Info	Complete				
Name Your Plant!(no more than 50)						
Contact(for EPC to contact you)					

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





