

ENERGYDOCK

DC RANGE



ENERGYDOCK DC Range

TECHNICAL DATA SHEET WITH INSTALLATION INSTRUCTIONS

ENERGYDOCK DC RANGE	
Product Code	DBLi1
Weight	19.6kg
Dimensions	440mm (h) x 330mm (w) x 160mm (d)



To be completed by Distributor:

IMPORTANT INFORMATION

- PROJECT No.
- CLIENT NAME
- CLIENT CONTACT DETAILS
- DATE PURCHASED/INSTALLED
- SERIAL NUMBER of UNIT
- SSS REPRESENTATIVE

Please retain this booklet as proof of your warranty.

If this section has not been completed by a registered SSS Distributor, please submit a copy of the above to the following email address to ensure that your warranty will be valid:

info@specializedsolarsystems.co.za



ENERGYDOCK

TABLE OF CONTENTS

1.	Introduction	page 3
2.	Components	page 4
3.	Technical Specifications	page 6
4.	Victron Monitoring APP	page 8
5.	Current Limiter Function	page 8
6.	Short Circuit Protection	page 9
7.	Wiring Diagrams	page 10
8.	Safety Instructions	page 11
9.	Installation Procedure	page 12
10.	How to Connect a Second Battery	page 13
11.	Quality Control and Sign-Off	page 15



ENERGYDOCK DC RANGE

INTRODUCTION

To ensure the journey to sustainability for rural areas, a long-term intelligent device needed to be supplied. With innovation in battery technology, we are proud to release our modular lithium phosphate DC energy system, the DBLi300/20/640 (DBLi1) energy system.

The load and solar panels should be applied to this unit proportional to their use. Please see a sample of our Load Calculator below, which is available on request:

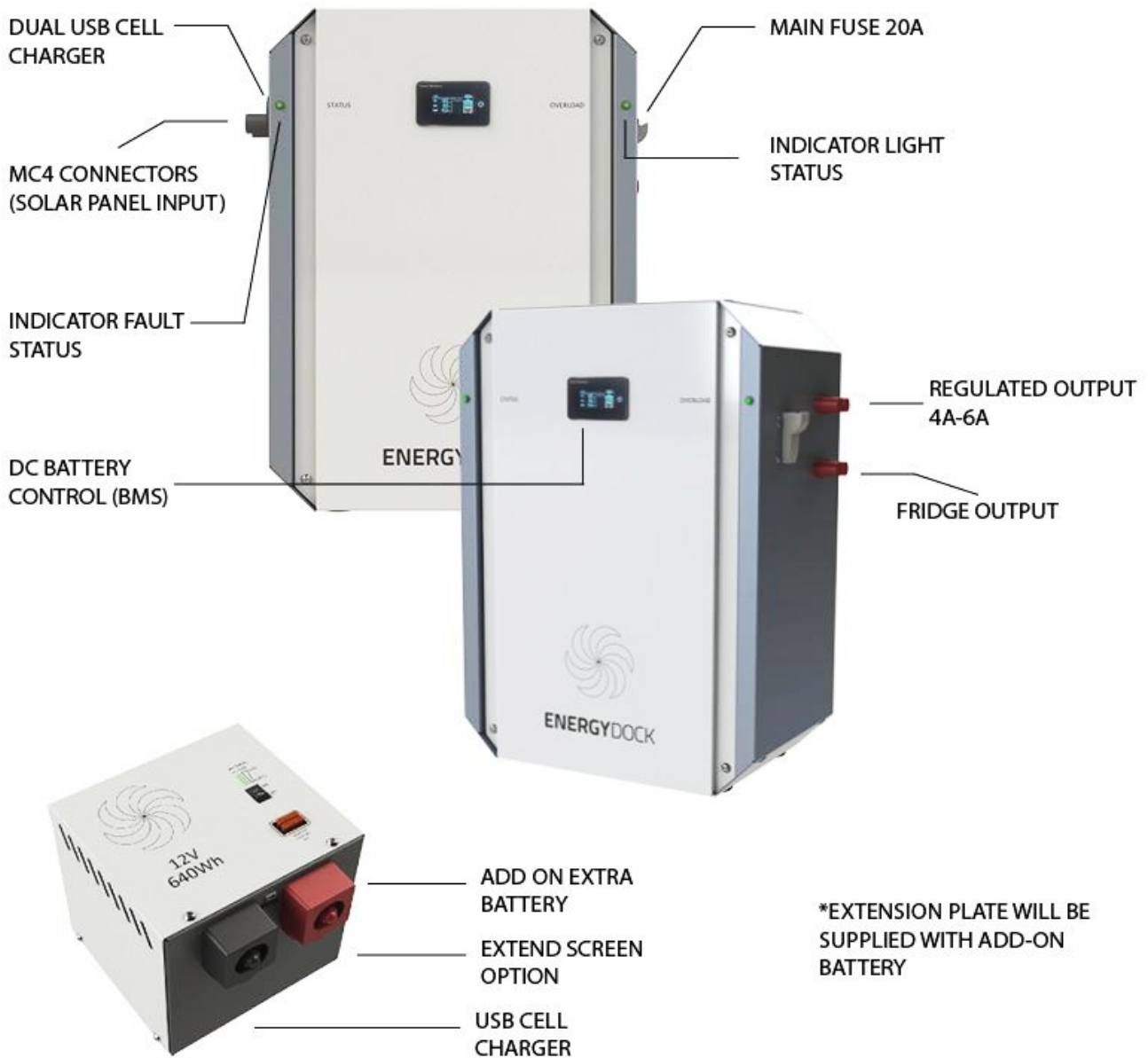
Retail System Calculation				
INPUT REQUIRED				
Appliance	Amount	Hours per Day	Wh per Appliance	Total Wh Needed
Internal Lights	3	8	24	72
External Lights	0	14	42	0
Cell Charger	1	24	5	5
Radio	1	14	21	21
TV 17"	1	6	120	120
TV 22"	0	6	240	0
HiFi	0	0	0	0
DVD Player	0	0	0	0
HD TV Receiver	0	0	0	0
DSTV	1	24	360	360
Fridge/Freezer	0	0	0	0
Freezer only	0	0	0	0
TOTAL POWER REQUIRED:	578 Wh			
System Required for your Allocation:			DB2 360/20/1280	
DB1 240/20/33 Battery usage: (subject to standard testing conditions)			145.96 %	
DB1 360/20/1280 Battery usage: (subject to standard testing conditions)			45.16 %	

When the user exceeds the storage capacity of the installed battery in DBLi1, he would be able to purchase a second 640 Wh battery and be able to double the storage capacity of the unit. The second battery will need to be externally mounted with cables to the internal battery. A battery connection plate will be required when measuring the battery size. This will be supplied when ordering and connecting a second battery.



ENERGYDOCK DC RANGE

COMPONENTS



ENERGYDOCK DC RANGE

INTERNAL CONFIGURATION



CONSUMABLE LIST

This EnergyDock DC unit is packed with the following consumables included:

- Primary Bracket (Top part of the unit)
- Secondary Bracket (Bottom part of the unit)
- 6 x M10 Rawl bolts
- 2 x M8 bolts
- 2 x M8 nuts
- 2x M8 spring washers
- 2x M8 washers

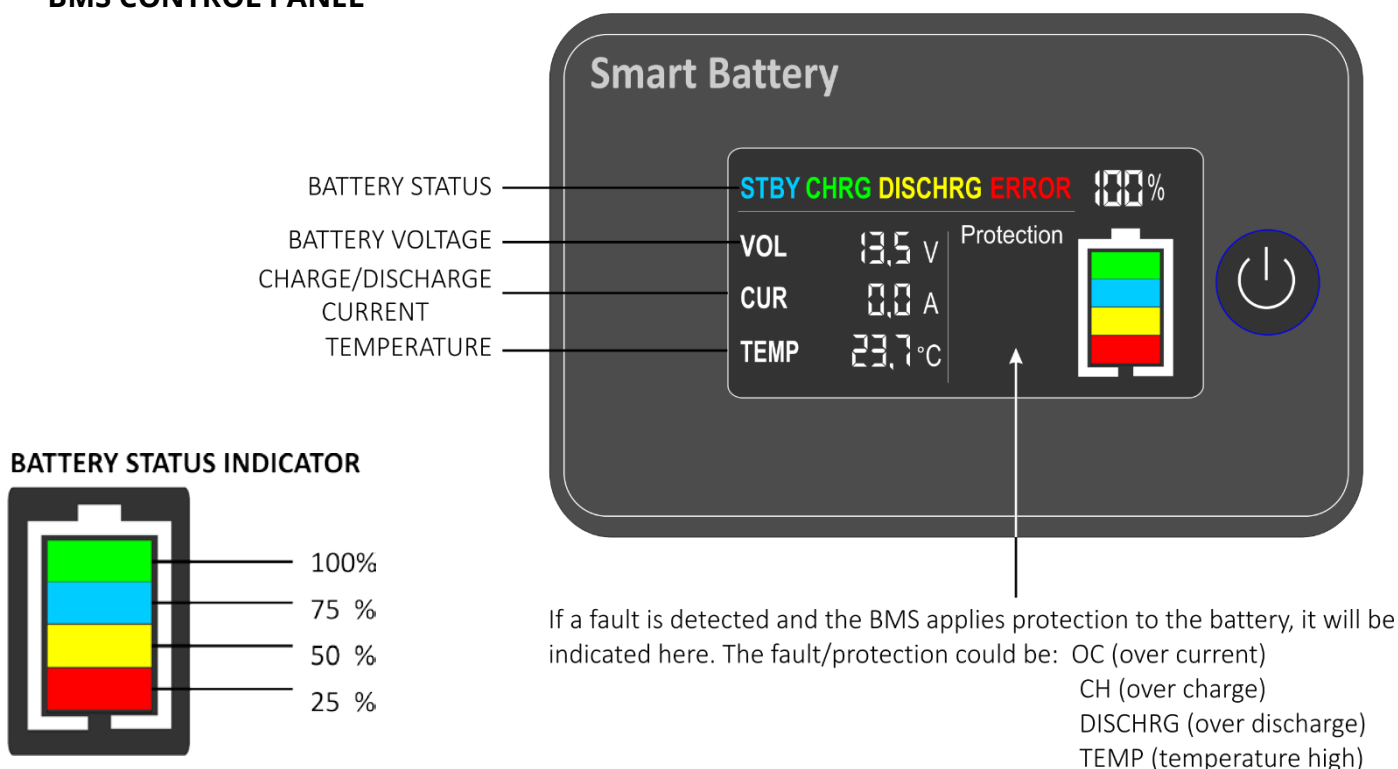
Please ensure that you remove these from the packaging before discarding it as you will need these to correctly install the unit.



3. TECHNICAL SPECIFICATIONS

STORAGEDOCK ES0.64K/12V LiFePO ₄ BATTERY	
Battery type	Grade A LiFePO ₄ Prismatic Cells
Nominal Voltage	12.8 VDC
Nominal capacity	50 Ah
Total Energy Capacity	0.64 kWh
Energy Capacity at 80% DoD	0.512 kWh
Standard charge current	25 A
Max charge current	35 A
Charge voltage Bulk/Absorb	14.1 VDC
Float voltage	14.0 VDC
Standard discharge current	30 A
Max discharge current	50 A
Discharge cut-off voltage	12 V @ 0.005C
BMS	Charge: 80A / Discharge: 80A
Protection	2 x 40 Amp fuses
Parallel connection ports	No
CAN-bus communication	No
Operating temperature - Charge:	0 to 45° C
Discharge:	0 to 55° C
Cycle life	4000 cycles at 0.5C 80% depth of discharge

BMS CONTROL PANEL



VICTRON SMARTSOLAR 100/20 MPPT	
Battery voltage (auto)	12 V
Rated charge current	20 A
Nominal PV power, 12V	290 W / 360 Wp
Max. PV short circuit current	20 A
Automatic load disconnect	Yes
Max. PV open circuit voltage	100 V
Peak efficiency	98%
Self-consumption – load on	26 mA / 20 mA / 19mA
Self-consumption – load off	10 mA / 8mA / 7mA
Charge voltage 'absorption'	14.1 V
Charge voltage 'float'	14.0 V
Charge algorithm	Multi-stage adaptive
Temperature compensation	-16mV /°C resp. -32 mV/°C
Max. continuous load current	20 A
Low voltage load disconnect	Battery Life algorithm
Low voltage load re-connect	Battery Life algorithm
Protection	Output short circuit / Over temperature
Operating temperature	0°C to 45°C (full rated output up to 40°C)
Humidity	95%, non-condensing
Data communication port	VE.Direct

DC UNIT GENERAL SPECIFICATIONS	
Case enclosure	Wall mountable metal enclosure, painted. Indoor/protected under-cover use
Weight	19.6kg
Dimensions (L x W x D)	440 x 330 x 160mm



4. VICTRON CONNECT MONITORING APP

By downloading the monitoring app, 'Victron Connect', you can view the MPPT's status and monitor the energy production of the solar panels, all from your cell phone or smart device via Bluetooth.



5. CURRENT LIMITER FUNCTION

By selecting the ampere required for maximum output on the load (4A or 6A), this DB box will automatically disconnect the load when more current is requested at the output load. This allows the consumer to stay within the load profile according to the system design. If there is over-current on the circuit, the circuit will disconnect in 20ms. After this the following will take place:

5.1 After over-current circuit disconnect the following will take place:

- The red LED on the front of the DB box will flash.
- The battery indicator will stay on.
- The solar panels will still charge the battery in this position.
- The load will be disconnected and the unregulated output and fridge output (inside the DB box) will stay on.



5.2 Restoring the Current Trip Regulator

- Make sure that the load output has been restored to below your current setting (4-6A).
- Make sure that there is no short circuit on the line.
- Take the load off the DB box if you are unsure.
- Open the DB box.
- Push reset on the current limiter and the red LED will deactivate.
- The load will now be activated.
- Reconnect your load output cables and see that the system is functioning correctly.

Please Note: *If the **RED** LED is active, the load will disconnect, but the battery indicator will remain on.*

If the unit should not be limited, please connect the output load to the “Non-Regulated or Fridge Output” on the DB box.

6. SHORT CIRCUIT PROTECTION

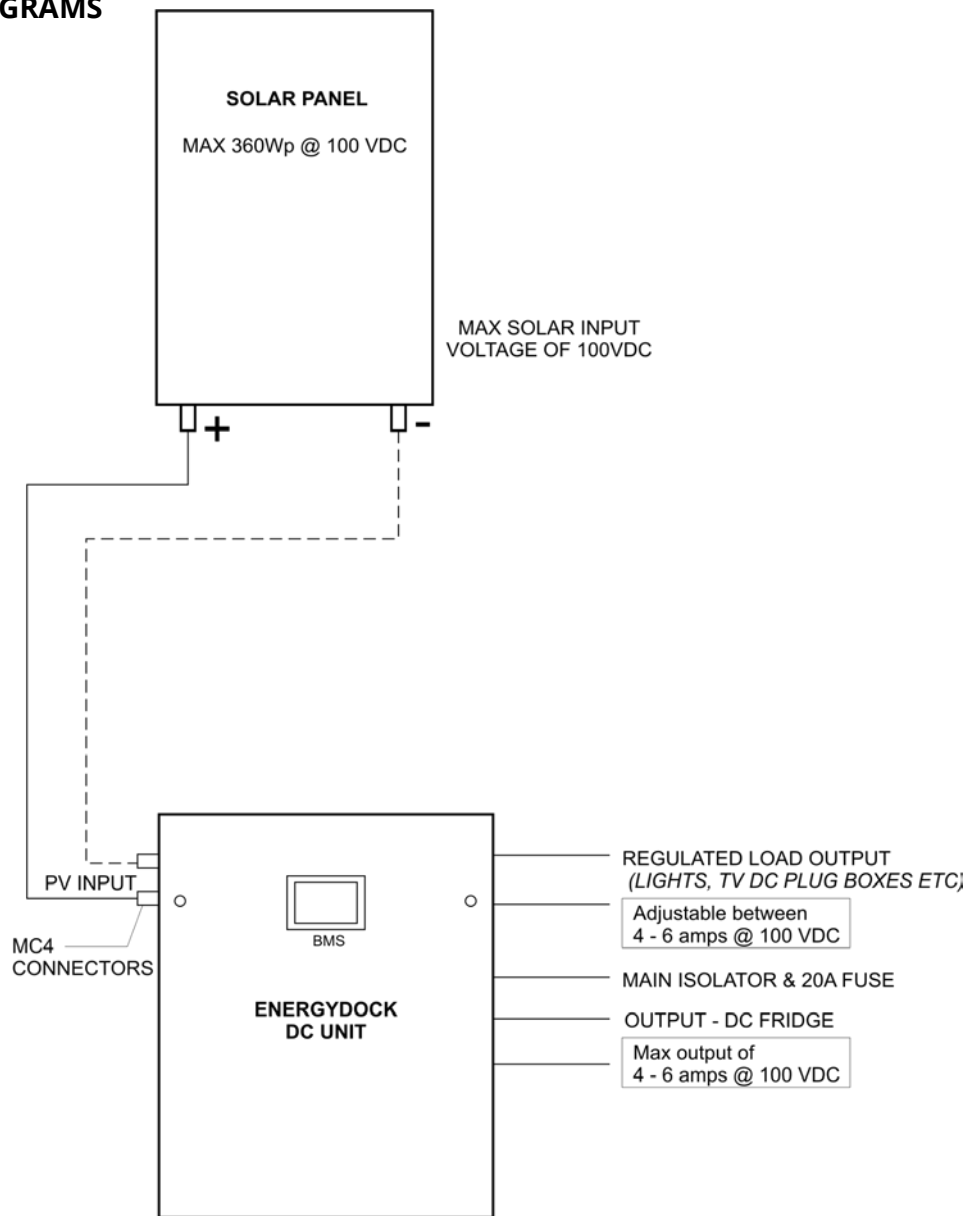
The circuit limiter board also has short circuit protection. Please note that depending on what solar control unit is installed, the solar control unit may fulfill the short circuit function instead of the current limiter (because of a faster response). At present, our circuit limiter and short circuit board have a 20 millisecond short circuit trip. Some MPPT's controllers have a 15 millisecond short circuit trip. If this is the case (protection via solar control unit), the red LED will not activate but the load will disconnect. Some controllers will deactivate, while others try to activate itself again. If the short circuit persists, they will shut themselves down.

6.1 Reactivating the SCU Short Circuit

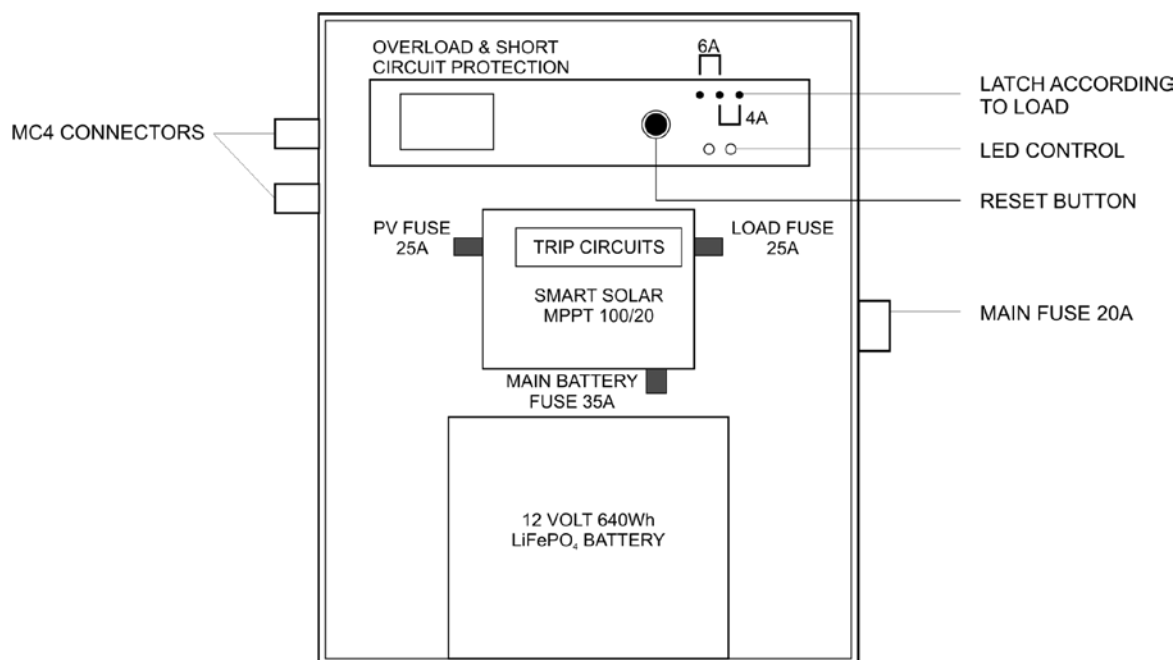
- Disconnect the load cable.
- Push the button on SCU.
- System will reactivate.
- Connect load cables and check if system is operational



7. WIRING DIAGRAMS



Internal DC Board fusing and trip circuits



8. SAFETY INSTRUCTIONS

8.1 General safety instructions

Please read all documentation supplied with this product first so that you are familiar with the safety indicators and instructions before using this product. This equipment should be used for the designated application only.

WARNING: *Danger and electrical shock*

- This product is used in combination with a permanent energy source (battery). Even if the equipment is switched off, a dangerous electrical voltage can occur at the input or output terminals. Always switch the AC power OFF and disconnect the battery before any maintenance is carried out.
- Never use the product at sites where a gas or a dust explosion could occur. The product is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or with a lack of experience or knowledge.
- An approved service agent must take responsibility of the installation of this product.

8.2 Transport and storage safety instructions

- When transporting or storing the product, ensure that the main supply and the battery leads are disconnected.
- Transport the product in the original packaging only.
- Store all products in a dry environment and preferably at a temperature of 25°C.

9. INSTALLATION PROCEDURE

Before starting with the installation procedure, please note the following:

- For electrical work, always follow the National Wiring Standards and Regulations of South Africa.
- Never replace a protective device with a component of a different kind.
- Before switching the energy system on, first check that the input voltage is correct.
- Ensure that the equipment is used in the correct operating conditions.
- Never operate in wet or dusty conditions
- Ensure that there is sufficient free space for ventilation around the installed equipment.
- Install the product in a heat proof environment.
- Ensure that there are no chemicals, plastic pots or curtains in the immediate vicinity of the installation.
- Always ensure that you follow the correct installation video/manual procedures when attempting to install this unit.
- If mounting the system on a wall, ensure that the supporting structure (wall) is able to carry weight. 8-10mm size bolt must be used to secure the unit to the supporting structure.



The following steps must be followed for the installation procedure:

1. Mount the unit on the wall.
2. Remove the front cover plate, be careful of the cable between the battery and the front cover.
3. Switch the battery on at the small on/off switch.
4. Put in the 20A fuse and close fuse holder on the side of the box (Main fuse).
5. The MPPT will now be on as well as the screen.
6. Connect the solar panel to the solar input at the MC 4 connectors.
7. Check on Bluetooth that the system is charging. The display will also indicate "charge".
8. Check load is operational.
9. Once you have logged on, connect the solar panel to the MC4 connector and on the Victron Connect app check the PV input voltage and that the unit is charging. For this unit, the bulk and float charge should be at 14.1 V and 14.0 V respectively. Please see confirmation of MPPT settings in the following table:

VICTRON CONNECT SETTINGS	
Battery	12V locked
	20 A
	Charger enabled
Select preset - Smart Lithium	
Absorb	14.1 VDC
Float	14.0 VDC
Temperature Charge Cut Out disabled	
LOAD OUTPUT	
Operational mode	
User defined	
Algorithm 1	
Load switch high voltage level to 14.1 VDC	
Load switch low voltage level to 12.0 VDC	
No other function will be set	

10. The unit is now operational.
11. Proceed to connect the output loads (lights, plugs, TV etc), ensuring that the polarity is correct.
12. Do not exceed the pre-set ampere in your trip circuit 4A – 6A @ 12V.
13. If you have an over current or short circuit on the unit, the **RED LED** light will light up and the **GREEN LED** light will go off.
14. If the above does happen, then restore/repair the fault and press the reset button. The circuit will now switch off the fault light and activate the **GREEN LED** light.



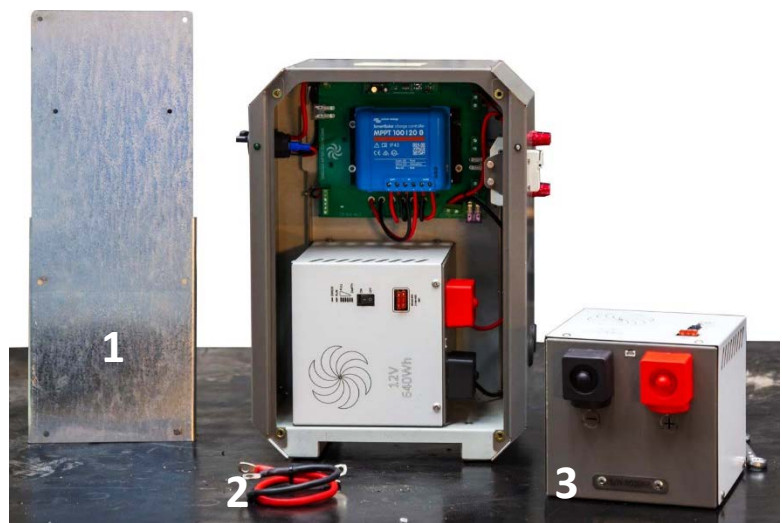
15. Do not exceed solar panels of 360 Wp. Do not exceed 100 VDC VOC input.
16. The unit has been programmed via the MPPT on 'Algorithm Battery Life'. This means that we have programmed the unit on User Defined Algorithm 1, which means that the DBLi unit will disconnect at the low voltage of 12.0 VDC and will only reconnect at 13.4 VDC. For trained technicians, these settings can be pre-programmed under different conditions.
17. Please note that all incoming and outgoing power is monitored by the Victron app and the history of the energy flow would also be available.

10. TO CONNECT A SECOND BATTERY

Should you wish to increase the DC system's storage capacity, a second 640 Wh can be connected externally. When a second battery is purchased, it will include a battery connection plate and an interconnecting battery cable (red and black).

Left: **Equipment required for connecting a second battery:**

1. Battery connection plate
2. Interconnecting battery cable
3. Second 640 Wh battery
4. 4 x A-screws (not shown) for second battery connection.
5. Optional second add-on touch screen for second battery (not shown)



To install the second battery, please follow the following procedure:

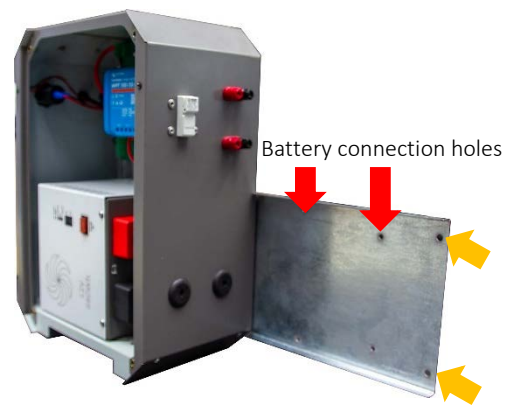
- Disconnect all PV input.
- Disconnect the main isolator fuse.
- It is always advisable to only add the second battery when the first battery is at 90% to 100% SOC. The two batteries' SOC should be within a close percentage of each other.
- First remove the front cover of the DC unit and **ensure that the battery is switched off**. Loosen the four screws at the back of the DC unit and place the battery connection plate into position. Replace the four screws through the holes in the battery connection plate and tighten into the DC unit's battery. Keep the existing battery in the off position.



Remove screws from back



Replace screws, securing plate



Holes to secure to wall

- Now add the two battery connecting cables that are supplied with the second battery. Make a hole in the rubber grommet and insert the cables into the DC unit.
- **Ensure that the second battery is off**, then secure it to the battery connection plate. Place the four screws into the holes of the battery connection plate and tighten them into the second battery.
- Connect the cables between the batteries and ensure that the polarity is correct: red to red and black to black.
- Replace the DC unit front cover.
- Secure the DC unit back to the wall and screw the wall screws into the battery connection plate, securing it also to the wall.



Once the second battery is connected and the complete system is secured against the wall, the following sequence must be followed:

1. Switch battery 1 in DC unit ON.
2. Allow this battery to go through its test cycle.
3. Once the test cycle is complete, switch battery 2 ON and allow it to go through its test cycle.
4. Both batteries will now equalize. And should not indicate any errors.
5. Switch the charge isolator back ON and connect the main fuse of the DC unit.
6. The unit is now paralleled, and the process is complete.

A second add-on BMS touch screen can be purchased to monitor the second battery

***For more information and videos,
please scan the following QR code:***



SPECIALIZED **SOLAR** SYSTEMS QUALITY CONTROL & SIGN-OFF

PRODUCT NAME:	DC HOME SYSTEM	ASSEMBLER NAME:	
SERIAL NUMBER:		QUALITY CONTROLLER NAME:	

CHECKLIST			
PASS	FIT & FINISH	QUALITY CONTROLLER INSPECTION	COMMENTS
	INSERT 20A MAIN FUSE		
	PUT BATTERY ON AND CHECK NO ALARMS		
	CHECK IF MPPT IS ON		
	SET MPPT - BLUETOOTH CONNECTION		
	UPDATE FIRMWARE		
	SET CHARGING VALUES		
	SET LOAD OUTPUT SETTINGS: - 14.1 SMART LITHIUM		
	- 14.0 ENABLE		
	- USER DEFINE ALGORITHM 1 12-14		
	PLUG PV CHARGE CABLES IN & CHECK UNIT IS CHARGING		
	PLUG LOAD INTO REGULATED CIRCUITS AT 3A		
	SET UP TO 4A AND CONFIRM LOAD TRIPS		
	RESET UNIT - CHECK LED's		
	PLUG LOAD INTO UNREGULATED SUPPLY AND SET TO 8A		
	KEEP CHECKING THE MPPT IS CHARGING		
	CHECK FOR ANY LOOSE WIRES AND USB TEST		
	UNPLUG ALL CABLES		
	DISCONNECT BLUETOOTH		
	SWITCH OFF SYSTEM		
	CHECK FOR SCRATCHES AND OUTSIDE COVER CONDITION		
	REPLACE COVER AND INSERT SCREEN		
	TEST SCREEN AND THEN TIGHTEN SCREWS		
	APPLY ALL WARNING STICKERS		
	PACKAGE UNIT, PLUG BOX, MOUNTING BRACKET AND BOOKLET		
SIGN OFF:		DATE:	



PASS	PACKAGING	QUALITY CONTROLLER INSPECTION	COMMENTS
	PACKAGING MATERIAL AND MOUNT		
	SHIPPING LIST		
	PRODUCT SPECIFICATION BROCHURE		
	HANGER BRACKET KIT		
	QC LABEL		
	SERIAL NUMBER TAG		
SIGN OFF:		DATE:	
FINAL SIGN-OFF AND APPROVAL			
NAME OF COMMISSIONER:			
DATE:			
SIGN OFF:			

NOTE: PLEASE RETAIN THIS BOOKLET AS PROOF OF YOUR WARRANTY

