

SOLAR iBOOST+



Installation and Operating Instructions

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Technical Specifications

Solar iBoost+ Controller:

Operating Voltage:	220-240 Vac
Control type:	1B
Maximum Permissible Loads:	13A Resistive (max 3kW immersion)
Rated Impulse Voltage Withstand	4kV
Insulation Properties	Pollution Degree 2 in accordance with IEC 664
Operating Ambient Temperature Range:	0 to 40°C
Approvals:	EN 60730-2-7, EN 301 489-3, EN 300 220
Dimensions:	225 x 158 x 92 mm

Solar iBoost+ Sender:

Battery Type:	2 x AA IEC LR6 1.5V alkaline (supplied)
Battery Life Cycle:	1 year (user replaceable)
Operating Radio Frequency	868.3 MHz
Radio Range	1 to 30m indoors (dependant on construction and local conditions)
Operating Ambient Temperature Range:	-5 to 40°C
Approvals:	EN 60950, EN 301 489-3, EN 300 220
Dimensions:	95 x 75 x 35 mm (excluding clamp)

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Thank you for purchasing a Solar iBoost+.

Before use, please read these instructions carefully

These instructions provide information on the installation, operation and programming of the unit. Please keep this booklet safe for future reference.

The Solar iBoost+ is designed to be used in conjunction with micro-generation systems, e.g. solar PV, where surplus energy generated can be stored within a domestic hot water cylinder in the form of hot water. By monitoring the amount of energy being exported to the National Grid the Solar iBoost+ unit will divert energy into an immersion heater when the energy generated exceeds the amount of energy consumed within the property. Solar iBoost+ controls the energy delivered to the immersion heater in proportion to that exported.

Solar iBoost+ Features.

- Up to two immersion heater connections, when the first immersion heater is satisfied the energy flows automatically to the second immersion heater
- Manual Boost and programmable Timed Boost (eg. For economy settings)
- A single, battery powered, wireless sender with measurement clamp
- Displayed energy saving information
- Up to 3kW immersion heater capability
- Solar iBoost+ is pre-programmed for wireless connection to the optional iBoost+ Buddy home energy monitor
- Programmable language option



Checks Before Commencing Installation

Please note and ensure the following before commencing any installation...

1. The electrical installation of this device must only be undertaken by a suitably trained and qualified electrician; all local safety standards must be observed.
To comply with safety regulations it is necessary to have a means of full disconnection of the iBoost+ from the supply after installation, it is recommended the installation incorporates a double pole isolation switch in the incoming supply.
All work must satisfy Building/IEE Wiring regulations in force at the time.
2. Solar iBoost+ is suitable for heating water tanks with up to two immersion heaters rated up to 3kW each which **MUST** include a working thermostat.
3. There should be **NO** electronic controls or switches between the Solar iBoost+ and the immersion heater, only direct connections to the immersion and mechanical thermostat are suitable for Solar iBoost+.

The Solar iBoost+...

Check you have received:



Solar iBoost+ Quick Start Guide

Pre-Installation

1. Read **Checks Before Commencing Installation** and ensure compliance.
2. Locate a suitably **ventilated, flat and vertical surface** close to the hot water tank to fix the Solar iBoost+, observing all clearances shown on page 6. Positioning should be convenient for running a cable from a fused spur to the Solar iBoost+ and on to the immersion heater(s).

Connection

3. Hard wire the Solar iBoost+ in accordance with the selected wiring diagram on pages 7-9, noting the warnings on page 8. Installation should follow IEE Regulations or local regulations. Replace the terminal cover but do not power up.
4. Connect the Measurement Clamp into the Sender and fit the batteries in the Sender. Keep the Sender at 1-2m from the main unit. Do NOT press the button on the Sender.
5. Switch on the power supply to the Solar iBoost+ and a short start up procedure runs until Water Heating Off is displayed.
6. Programme Time and Timed Boosts if desired, see page 15.

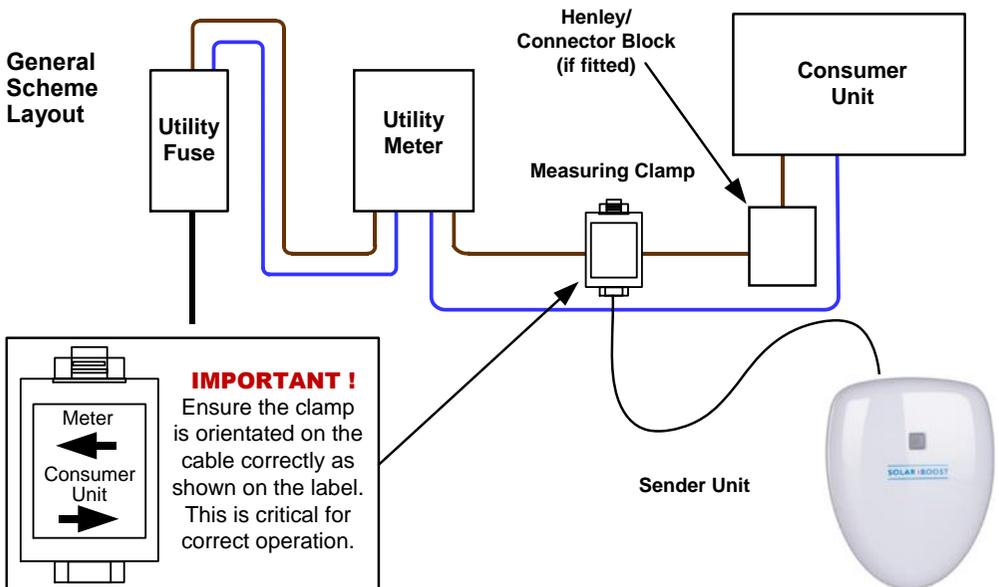
Locate the Sender

7. At the utility meter (NOT the Generation meter) place the Measurement Clamp over the **household main incoming live cable** and latch into place. Note that the Clamp must be installed on the utility meter side of any connector (or Henley) blocks.

IMPORTANT: the orientation of the clamp must be observed to ensure only excess current is detected and used for water heating.

Commissioning

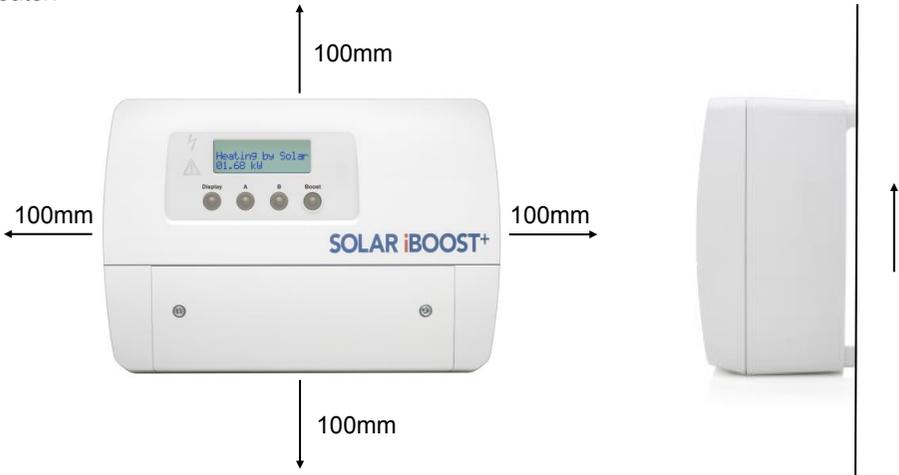
8. To commission, perform the tests shown in section 5.



1. Installation

Positioning

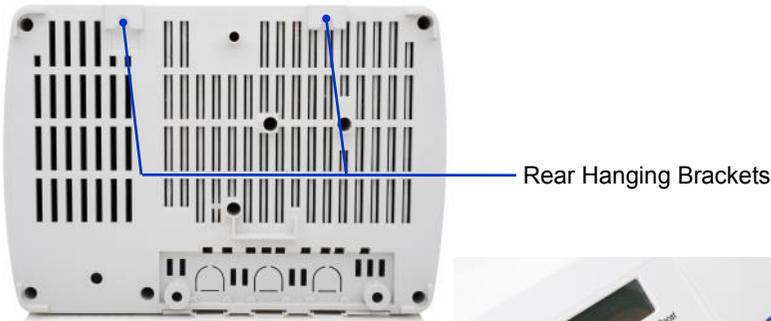
The Solar iBoost+ unit is typically located close to the hot water tank (airing cupboard or similar) and electrically connected between a fused outlet or MCB and the immersion heater.



Minimum clearance is 100mm all around. Do not allow airflow to be obstructed.

Fixing the Solar iBoost+

Two hanging brackets and two lower fixing screw points are provided:



Fixing Screw Points

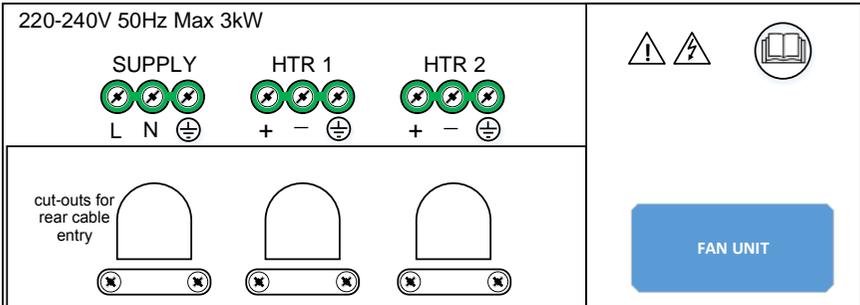


Use screws supplied or suitable screws for the mounting surface.

2. Connecting the Solar iBoost+

The Solar iBoost+ installation must be protected against overcurrent by connecting it via a 16A MCB or 13A fused outlet.

Remove the terminal cover, terminals are arranged as follows:



Terminal Description:

SUPPLY

- L** 220-240V Live Input—must be protected by 16A MCB or 13A fused outlet
- N** Neutral
-  Earth (all earth terminals common)

HTR 1 Terminals

- +** Connect to the Live terminal of the immersion heater, max 13A
- Connect to the Neutral terminal of the immersion heater
-  Earth

HTR 2 Terminals (connect to second immersion heater if fitted)

- +** Connect to the Live terminal of the immersion heater, max 13A
- Connect to the Neutral terminal of the immersion heater
-  Earth

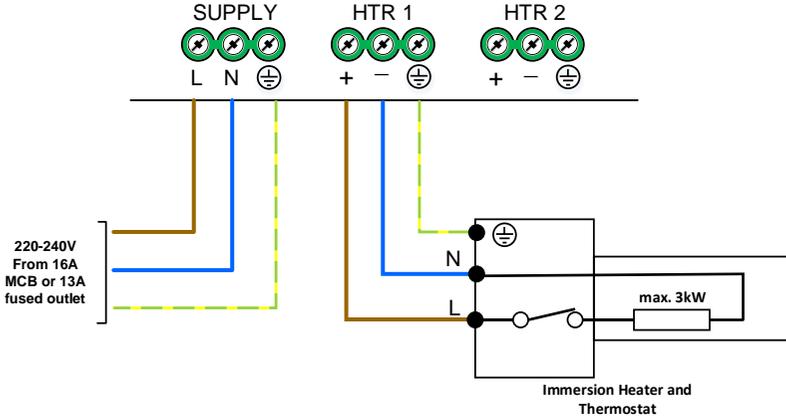
- Hard wire the Solar iBoost+ in accordance with the selected wiring options on the pages overleaf.
- Terminals allow the connection of up to 4mm² solid copper conductor or multi-strand cable.
- Ensure terminals are fully tightened and cable is clamped using the cable clamps provided. Where necessary, invert the plastic cable clamp to provide the correct grip.
- Replace the terminal cover, do not switch on power at this stage (go to section 3)

Wiring Diagrams



Single Immersion Heater

Where a single immersion heater is fitted (most common installation) the Solar iBoost+ should be connected as shown.



All installations -

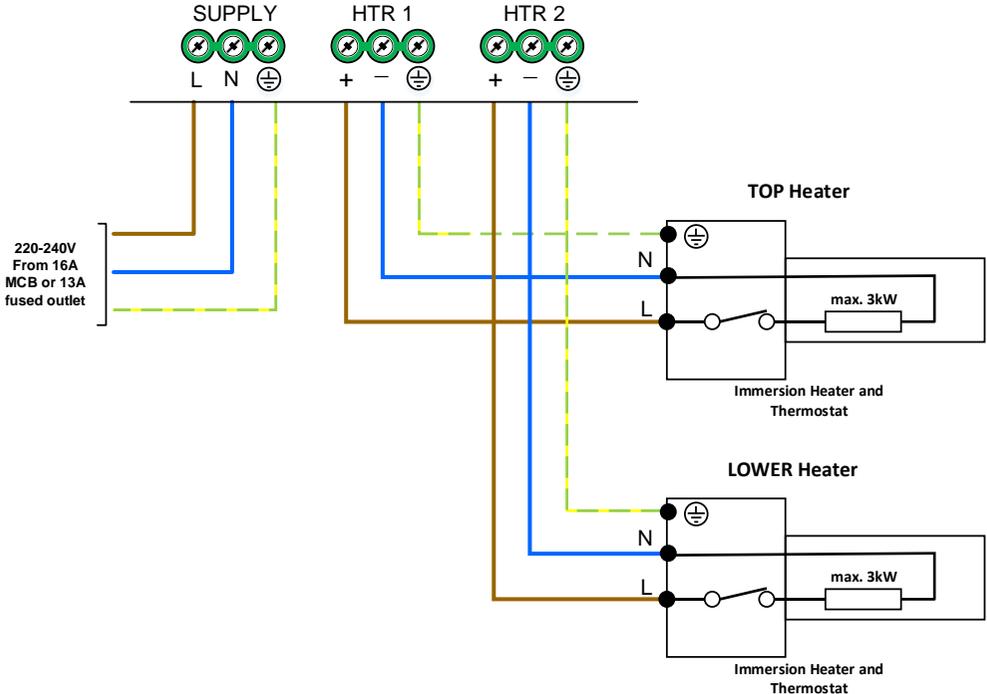
- Test that the thermal cut-out in the immersion heater functions, replace if necessary. Do not install the Solar iBoost+ where a functioning thermostat is not present.
- There must be no control of the immersion heater(s) by any equipment other than the Solar iBoost+. In addition, there should not be any additional source of power connected between the Solar iBoost+ and the immersion heater.
The Solar iBoost+ will replace any Boost controls or Hot Water Timers.

Failure to comply will result in damage to the Solar iBoost+.



Dual Immersion Heater

Where two immersion heaters are present, wire the heaters into the Solar iBoost+ as shown below. It is important the upper most heating element in the tank is connected to the HTR1 terminals so that this element receives heating priority.



Dual Immersion Heater Operation

The Solar iBoost+ automatically detects when two immersion heaters are connected.

As hot water is drawn from the upper part of the tank, it is important the heaters are connected as shown so that the Solar iBoost+ can automatically give heating priority to the top heater. Excess generation is diverted to the top heater until temperature is reached and the heater thermostat opens. Solar iBoost+ then automatically switches to the lower heater to continue to divert excess generation until the lower heater is also satisfied and 'Water Tank HOT' is displayed.

When diverting to the lower heater the Solar iBoost+ will periodically (every 15 minutes) switch to the top heater and the cycle of heating begins again. This maintains the temperature in the upper part of the tank.

An indication of the current heater being supplied is shown on the 'Heating by Solar' display, see page 13.

This operating mode is the same whether diverting excess generation or in boost function.

3. Assembling the Sender and Measurement Clamp

The Sender unit has a Measurement Clamp that detects export current when correctly fitted on the live incoming supply cable from the utility meter. The unit sends measurements wirelessly to the Solar iBoost+ unit.

Note: The Sender and Solar iBoost+ units are factory paired. **Do not press the button on the sender or pairing may be lost.**

Assemble the Sender

1. Fit the plug from the Measurement Clamp wire into the Sender.



2. Fit batteries (included) or DC mains power supply (supplied separately).

When fitting batteries or DC power supply the sender should be at least 1-2m away from the Solar iBoost+



A DC mains power supply is available to purchase separately.

Only an approved iBoost+ power supply shall be used, contact your supplier for details.

Fit the connector from the power supply into the socket marked on the sender.



3. Switch on the power to the Solar iBoost+. A set up procedure runs and the 2 devices connect automatically, usually within 30 seconds. If necessary follow the instructions for pairing on page 16.

Initialising
Please Wait

4. Fitting the Measurement Clamp

At the utility meter (**Caution!** not the Generation meter) identify the live cable feed to the property's consumer unit.

Open the Measurement Clamp and remove any plastic packaging. Position the clamp around the cable observing the correct orientation as shown below. Close the Clamp and ensure that the latch is engaged.

Note: Mechanical meters (with rotating disks) can cause distortions to measurements. Position the clamp along the meter cable, away from the base of the meter.

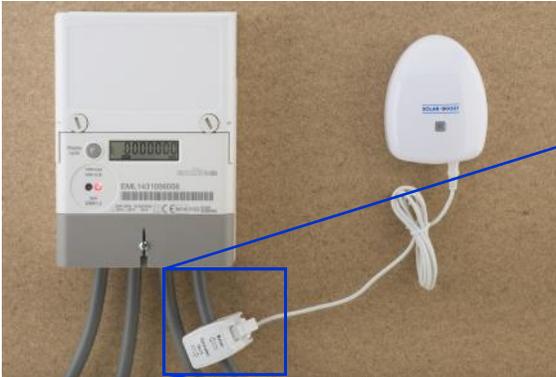
Fitting Examples

A. Utility meter live input to consumer unit **without** Henley /Connector blocks.



For best results, install the sender upright as shown below, using the rear hanging hook.

IMPORTANT: the orientation markings on the clamp must be observed to ensure only excess current is detected and used for water heating.



B. Utility meter live input to consumer unit **with** Henley / Connector blocks.



Where a Henley or other connector block is fitted, the Measurement Clamp is fitted between the utility meter and the connection block.

5. Test the System

These tests are designed to verify that only excess generation is used by the Solar iBoost+. Installers must check that increased energy consumption in the home results in less energy being supplied into the immersion heater. This is indicated in the 'Heating by Solar' display. The availability of high energy appliances (e.g. kettle, electric showers etc.) are useful during these tests.

- Before testing, if "Tank Hot" displays, run off some hot water.
- Perform tests 1, 2 and 4. When there is no PV generation, perform tests 3 and 4 .

Test 1

When sufficient excess generation is available and "Heating by Solar" is displayed, check that the Solar iBoost+ stops diverting energy when the PV system is off.

- Shutdown the PV array and the display changes to "Water Heating OFF."
- Reinstate the PV array.

Test 2

When the PV generation is above 100W, check that switching off appliances in the home results in greater energy diversion by the Solar iBoost+ unit.

- Shut down all the MCB's / Fuses except for the PV and immersion.
- Check the level of PV generation on the inverter.
- The "Heating by Solar" level should be approximately 100W less than generation.
- Reinstate MCB's / Fuses.

NB. If no reading is possible from the inverter a reduction in "Heating by Solar" value or "Water Heating OFF" should be seen after the MCB's / Fuses have been reinstated, switch on a high energy appliance if necessary.

Test 3

At times when no PV generation is available (e.g. commissioning after dark) test the installation by simulating export energy, achieved by reversing the orientation of the Measurement Clamp.

- Shut down the PV array
- Reverse the orientation of the measurement clamp (consumption in the home is then measured as export energy)
- Switch on a kettle or high energy device
- Whilst the kettle is on "Heating by Solar" is displayed and Solar iBoost+ function is proved.

IMPORTANT! Return the clamp to its correct operating position and reinstate the PV array.

Test 4

Test the boost function is operational.

- Press the Boost button 2 times, "Manual Boost ON" displays
- Check that water is heating
- Scroll the Boost button until it reads "Manual Boost OFF"

User Operation

 Flashes when energy is being diverted to the immersion heater. Symbol is permanently lit when any boost function is on

 Indicates a problem with the unit when lit (see Trouble Shooting)



Display

Each press moves through the Display Cycle (see Display Cycle)

A

Enables programming mode (see Programming)

B

Enables the sender pairing process (see Pairing the Sender)

Boost

Provides a Boost of Hot Water (see Manual Boost)

Normal Operation

During normal operation the unit will show one of the following displays:

Heating by Solar
01.45 kW Htr1

Solar iBoost+ is diverting energy to the hot water tank. The instant value of energy being diverted is shown together with an indication of the immersion heater currently being supplied (if two heaters are connected will switch between Heater 1 and 2).

When energy is diverted the blue symbol flashes: 

Water Tank
HOT

Shown when the unit is attempting to divert energy to the immersion heater but tank has reached maximum temperature and switched off.

Water Heating
OFF

There is no excess generation for the Solar iBoost+ to divert to the hot water tank.

These messages will be overridden when other functions such as timed or manual boost are active.

Display Cycle

The display cycle allows the user to view the recorded energy saving. Each press of the **Display** button will move through the following sequence:

Saved Today 03.66 kWh	Present days energy diverted into the immersion heater
Saved Yesterday 10.56 kWh	Previous days energy diverted into the immersion heater
Saved Last 7 days 03.66 kWh	Total energy diverted into the immersion heater in the past 7 days
Saved Last 28 days 65.53 kWh	Total energy diverted into the immersion heater in the past 28 days
Saved Amount 390.20 kWh	Total value of energy diverted into the immersion heater since Solar iBoost+ was installed
Time 10:15 01/07/15	Current time and date in 24hr format

In Winter Boost
Toggle Press A

Final press



In Summer Boost
Toggle Press A



Timed Boosts Off
Toggle Press A

Boost Season selection.

Hot water boosts can be programmed for different seasons (see programming section).

The boost season can be changed here by pressing the A button when required.

Each press of the A button will change the setting between Summer, Winter and Boost OFF selections.



Switching the timed programme function between Winter/Summer/OFF can be activated remotely within the home using the optional iBoost+ Buddy home energy monitor.

Programming

The programming function allows:

- Setting the time and date of the clock
- Programming of Timed Boosts when grid power is automatically switched on to heat the water. This feature can be used in place of existing timers.

The Solar iBoost+ unit is programmed using push buttons A and B. The first press of any button switches on the backlight only. To programme:

1. Press and hold button A for 3 seconds, release. The first item in the sequence below is shown (set time).
2. The first digit becomes active and flashes. Press button B, each press adds 1 to the value until the digit required is reached.
3. Press button A once to confirm and move on. Repeat 2, press A to confirm and move on.

Set Time
10:15 01/07/15

B1 Summer Wk/Day
00:00 0.00hrs

B2 Summer Wk/Day
00:00 0.00hrs

B3 Summer Wk/End
00:00 0.00hrs

B4 Summer Wk/End
00:00 0.00hrs

B5 Winter Wk/Day
00:00 0.00hrs

B6 Winter Wk/Day
00:00 0.00hrs

B7 Winter Wk/End
00:00 0.00hrs

B8 Winter Wk/End
00:00 0.00hrs

Timed Boosts

Timed Boost periods can be entered against Summer and Winter seasons. This enables longer boost times to be set in Winter periods when solar generation maybe less. Two boost periods are available each day and can be programmed on a 5 day weekday/2 day weekend basis.

Programme the start time and duration of the boost using the A and B buttons as described above. Start times are selectable in 15 minute steps and the duration of the boost in 30 minute steps.

e.g. a setting of 07:00 1.5hrs will switch on the boost at 7 am for 1 hour 30 minutes.

An unused boost is left at 00:00 for 0:00 duration.

The operating boost season is set manually using the Boost Season feature found at the end of the normal Display Cycle, see page 14. Boosts may be temporarily disabled (e.g. for holiday periods) by selecting 'Timed Boosts OFF'.

Pairing the Sender Unit

The Solar iBoost+ and Sender are supplied uniquely paired and should not require the following operation.

However, if the signal becomes lost or a new pairing is required the following procedure should be performed with the sender positioned 1m or more from the Solar iBoost+.

1. Press any button on the Solar iBoost+ to switch on the backlight.
2. Press and hold button B for 5 seconds then release.
3. When **Pairing with Sender** is displayed, press and hold the green button on the Sender for up to 10 seconds to pair the devices.

Repeat the procedure if necessary until pairing is achieved.

The result of pairing is shown on the screen as follows:



IMPORTANT! Do not press the sender button except when performing the pairing process. If it is pressed for more than one second the pairing may be lost and the display shows a 'Lost Signal' message (see Trouble Shooting). To correct, either reset the sender by removing and refitting the batteries or use the above procedure to reset the pairing.

Language Settings

The Solar iBoost+ can be configured to show different languages on the display.

To change language, press the display button once to light the display then press and hold the Boost button for 5 seconds or more and release. Each long press of the Boost button will move the language between:

English → French → Italian → Spanish → Portuguese → German → English

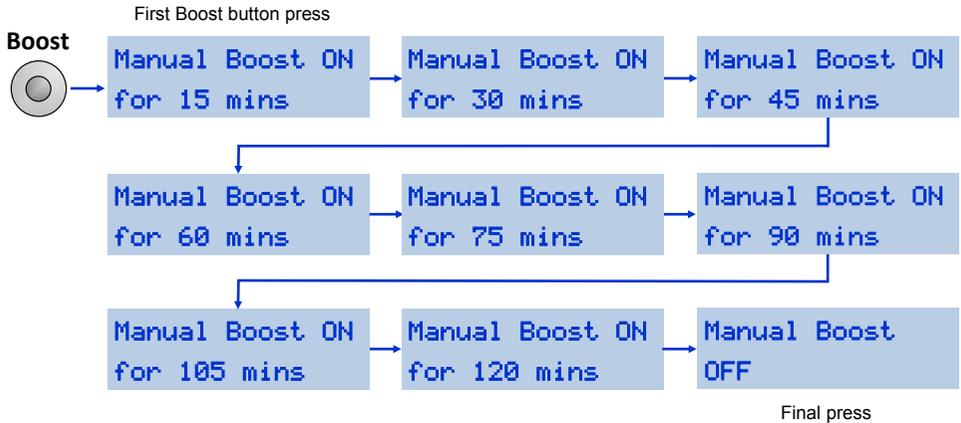
All programming and information displays will be shown in the selected language.

If an iBoost+ Buddy is fitted, the unit will automatically change to the language chosen on the Solar iBoost+

Manual Boost

Switches on full power to the immersion heater for the period of time selected. Note that electricity is drawn from the grid if the excess generation is too low.

1. Press any button on the Solar iBoost+ to switch on the backlight.
2. Each press of the Boost button adds 15 minutes to the boost time up to maximum of 2 hours. The amount of time remaining is shown on the display.
3. To cancel the boost simply press the Boost button repeatedly until 'Manual Boost OFF' is shown.



The Boost function can be activated remotely within the home using the optional iBoost+ Buddy home energy monitor.

Troubleshooting - Warnings and Messages

The Solar iBoost+ internal diagnostics notify if any fault arises in the system. When a fault is detected the red warning triangle on the front of the unit is illuminated. A message on the display details the specific fault:



Sender Battery
LOW

Batteries are low in the sender unit – replace batteries at earliest opportunity. **Do not** use rechargeable batteries.

Lost Signal to
Sender

The unit is no longer receiving messages from the sender unit. Possible causes:

1. Batteries may be exhausted.
2. Solar iBoost+ is positioned too far or near to the sender.
3. Sender unit pairing button may have been pressed inadvertently outside of the pairing process (see Pairing the Sender).

Unit Coolins...
Check vents

The Solar iBoost+ unit is over its working temperature - check that the unit is clear of obstructions and that there is adequate airflow to the unit. The unit will automatically recover when the internal temperature has reduced to within the normal operating range.

Maximum Power
Exceeded Htr 1

The Solar iBoost+ will check for overload during initialisation and during normal operation. If overload of either heating circuit is detected the output will be disabled. Check the load of the immersion heater and supply voltage are within specification. This warning can be reset by power cycling the Solar iBoost+ unit.

Shutting Down

Solar iBoost+ can be left to operate year round. Should you wish to power it down (e.g. during holidays) the following options are possible:

- Switch off at the fused spur - No solar energy will be captured by the Solar iBoost and timed settings will not operate.
- Temporarily remove the batteries from the sender - No solar energy will be captured but timed settings will continue to operate.
- Select OFF in Winter/Summer/OFF timed settings. Solar energy will be captured but timed settings will not operate.

Accumulated savings and programmed times are retained in memory.

Further Support

To find out more about how Solar iBoost+ works visit www.solariboost.co.uk

Consult your qualified installer / electrician for any user queries.

Technical support for qualified installers and electricians +44 (0) 1536 447866

Important Information about Legionella

Legionella bacteria are common and can be found naturally in environmental water sources such as rivers, lakes and reservoirs, usually in low numbers. As legionella bacteria are commonly encountered they may eventually colonise manufactured water systems and if conditions are favourable the number of bacteria may grow. Contamination risks are however low due to the low availability of nutrients and the regular chlorination of the water supply.

As with any hot water storage system it is important to avoid water stagnation and ensure the water is regularly heated to a minimum temperature of 55-60°C to reduce potential risks.

It is therefore recommended that the hot water tank be heated to 55-60°C at least once per week either using Boost facility or through other heating controls.

Limited Warranty

The SIB Energy Company Limited Warranty provides free replacement cover for all defects in parts and workmanship for 24 months from the date of purchase. SIB Energy Ltd obligation in this respect is limited to replacing parts which have been promptly reported to the seller and are in the seller's opinion defective and are so found by SIB Energy Ltd upon inspection. A valid proof of purchase is required if making a warranty claim.

Defective parts must be returned by prepaid post and accompanied by a Returns Authorisation available in advance from Marlec Engineering Company Limited, Rutland House, Trevithick Road, Corby, Northamptonshire, NN17 5XY, England, or to an authorised agent.

This Warranty is void in the event of improper installation, unauthorised service, use of unauthorised components, owner neglect, misuse or natural disasters including lightning strike. This warranty does not extend to ancillary equipment not supplied by the manufacturer. No responsibility is assumed for incidental damage. No responsibility is assumed for consequential damage.

Disclaimer

SIB Energy Limited has a policy of continuous improvement in product quality and design. The company, therefore reserves the right to change the specification of its models at any time. All items in this guide are for illustration purposes only and may not apply to your particular situation.

Disposal of Old Electrical Appliances



For electrical products sold within the European Community. At the end of this products useful life, it should not be disposed of with household waste.

Please recycle where facilities exist. Check with your local authority or retailer for recycling advice in your local area.

Maximise the Benefit of Your New Solar iBoost+

We want you to get the most from owning Solar iBoost+ so here's a few tips to help capture and save more energy using your Solar iBoost+.

Reduce or Delay the “ON” Periods of your Current Water Heater

Change your heater settings to later in the day, after sundown if possible, as this allows the Solar iBoost+ to preheat water in the tank using the excess PV energy. Normal water heating will top-up to the thermostatically set temperature of your tank so you have plenty of hot water available but your usual fuel usage and costs will be reduced. Adjust any morning settings according to your household need but mindful that greater benefits are achieved if there is excess PV available and the tank is not already hot at the start of the day.

Consider which Immersion Heater to Connect to

Single Immersion Systems are normally installed at the top of the tank and additional benefit is gained by installing a longer immersion or a de-stratification pump to circulate the hot water throughout the tank.

Dual Immersion Systems – we recommended connecting the top immersion heater to HTR1 and the bottom to HTR2, enabling the whole tank to benefit from the cascading PV energy feature. When the top immersion heater is satisfied the energy diverts to the bottom immersion heater automatically. The system regularly checks that top immersion heater remains fully satisfied.

Vary your Heating Times by Season

In Summer months the Solar iBoost+ alone may provide a plentiful supply of hot water and other water heating systems can be temporarily switched off. When required the built-in Boost feature can be used for short top-ups from the grid. This is activated on the Solar iBoost+ or remotely using the iBoost+ Buddy if installed.

Using the **Winter / Summer / Off** timed programming feature you can set and store 2 timed periods of grid power operation on a 5 day/2 day basis for Winter and Summer. Simply swap between the stored settings at the press of a button on the Solar iBoost+ or remotely on iBoost+ Buddy if installed. This timer can, in most circumstances, replace existing economy tariff timers on electrical water heating systems. OFF can be simply selected during holiday periods.

Ensure Your Water Tank is Well Insulated

Enjoy the free warm water for longer. Water consumed in the morning will allow a new day's "Heating By Solar" to begin again, maximising your PV system with your Solar iBoost+.

Minimise the Base Levels of Energy Consumption in your Property

Reducing your home's energy consumption will maximise the excess power available for Solar iBoost+ to divert. For example instead of using standby why not power down appliances when not in use?

Add an iBoost+ Buddy

It's the ideal energy monitor and remote control accessory for Solar iBoost+ . Find out if you are generating spare free PV energy to optimise your self consumption once your water tank is hot. Its intuitive traffic light system with easy to read display keeps you informed of your available generation. Installation is simple as it pairs to your Solar iBoost+ with a press of a button.



Visit www.solariboost.co.uk for more information.