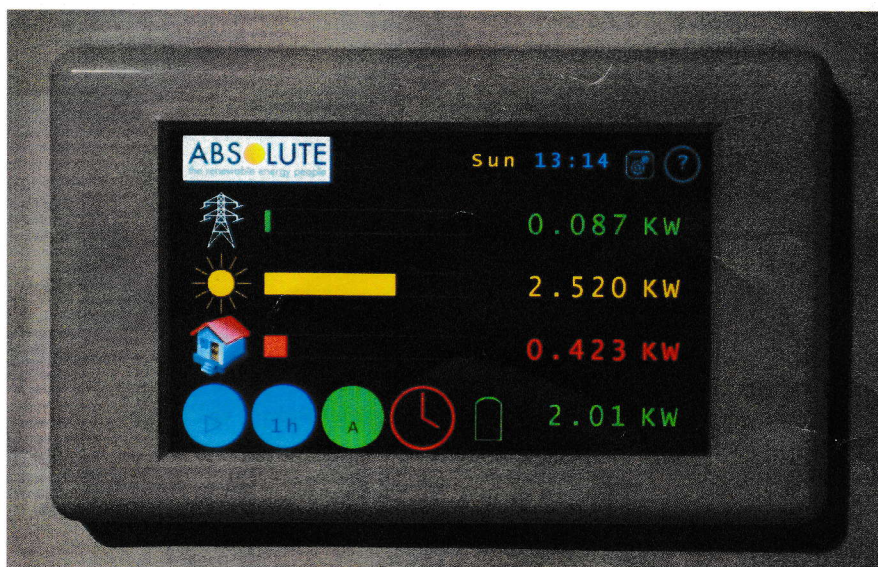


ABSOLUTE Energy Master

Installation Guide



The Absolute Energy Master is a sophisticated system which diverts surplus generated energy to one or more heaters or resistive loads. It is also a comprehensive energy monitor and recorder which provides the user with detailed up-to-the-minute information about power and energy usage, and historical information over the past 28 days. It is therefore important to discuss with the user where he or she wants the controller to be mounted. It should be at eye-level in a place where it can be read and operated easily. Failure to do this will result in a second visit to re-position the controller!

We recommend that you read right through this guide before you begin, but in summary:

1. Think about where to mount the power throttle, and discuss where to mount the controller with the user. The current transformer (CT) clips leads are terminated with standard audio phono plugs, and can be extended easily up to 10 m using standard audio extension leads. (DSM Energy Control Ltd. can supply these if required).
2. Make connections as shown below in Figures 1 to 3. Clip the current transformers either way around in their correct positions (see Figure 2).



Check the power throttle connections. The diagrams are for the standard 3 KW version.

3. Electrically test the circuits and then energize the system. Set up the parameters and carry out the calibration step as described below. Remember to give the User Guide to the householder, and to demonstrate how the system works before leaving.



The system should be installed only by a suitably qualified person

General information (see also the separate User Guide)

Absolute Energy Master measures how much power is flowing through the electricity meter using a *current transformer* (CT clip) which clips around the live wire of the feed from the Grid. When there are more than 50 Watts being exported, it brings up the immersion heater (water heater), always adjusting the exact level so as to maintain the exported power below about 200 Watts. Electric appliances can be turned on and off in the house and Absolute Energy Master makes the appropriate adjustment. Absolute Energy Master also measures the amount of power being generated by the PV installation using a second clip-on current transformer. This information is displayed and recorded, but has no effect on the control of the water-heater.

What's in the box?

In the box you should find a wall-mounting controller unit, a wireless power throttle, two CT clips with phono terminations, mounting screws for the controller, and a plug-in AC power supply for the controller. Please identify each of these components. Call 01223 440100 if there is a discrepancy. You will also need fixings for the power throttle.

All components must be fitted to the same phase of the electricity supply.

1 Mount the power throttle

The power throttle can be installed next to the immersion heater in the airing cupboard, or connected anywhere between the immersion heater spur and immersion heater. We recommend that the controller and associated AC circuitry is protected by a 30mA RCD



The power throttle may run hot at times! Mount the unit on a non-flammable **vertical** surface and make sure that air is free to run through the vents. If in doubt, we recommend spacing the power throttle from the wall surface by 10 mm. **Make sure that the power throttle cannot get buried underneath blankets, clothes etc. in the airing cupboard!**



Inspect the existing immersion heater integral thermostat to ensure that it complies with safety requirements and regulations to provide thermal overload protection where the hot-water system includes a plastic header tank.

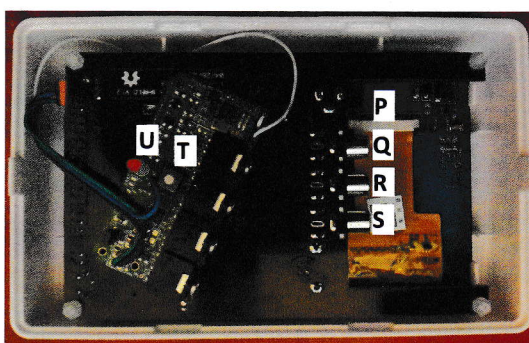


Figure 1 showing the controller unit inside the front housing

P: controller low-voltage AC power supply input from the plug-in AC power supply

Q: socket for either of the clip-on current transformers

R: socket for either of the clip-on current transformers

S: low-voltage control signal output to an additional wired power throttle (not normally fitted)

T: wireless transmitter pairing button

U: transmitter signal LED

2 Mount the control unit

Remove the front housing by pressing in the centre of the left-hand side of the front housing. It will release from the left-hand side of the base, hinging at the right-hand side. Refit the front housing by aligning the locator at the right-hand side, gently pushing home on the left-hand side.

Mount the controller unit carefully on a flat surface so as not to distort the enclosure. Failure to do this may result in damage to the unit and poor fitting of the front housing. Please consult the user about where to mount the controller.

Note that there is an SD card slot access on the bottom of the front housing which must be kept clear.

The cable entry slot in the base is designed to allow the power and phono cables to be threaded through from the rear or from the bottom. We recommend that you first prepare and loosely fix the base part to the wall, and then, before tightening the fixings, thread the plugs through the cable entry slot and insert them into their respective sockets, starting at the top and working down. There should be no need to make additional holes in the base.

3 Wiring and connections

Make the connections as shown in the two diagrams Figures 2 and 3 below. Clip on the current transformers as shown in Figure 2. Note that the connection block (labelled Block) is not always present. **Take care to ensure that the magnet surfaces are clean and engage properly.**



British standard BS 7671: 2008 (amended 2011), regulation 537.3.2.1, requires you to provide a double-pole isolation switch next to the power throttle as 'the means of local isolation'. This can be the existing immersion heater on/off switch if fitted.

You may need to install a 13 A socket near the control unit for the plug-in AC power supply if there isn't an existing socket available.

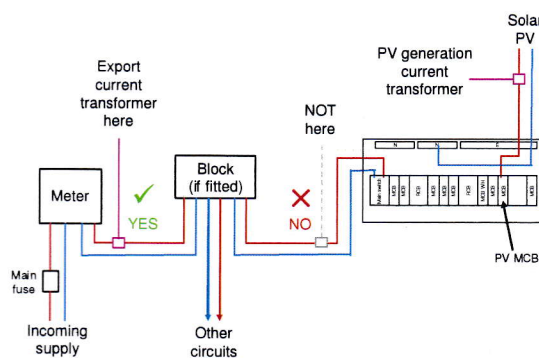


Figure 2: current transformer placement

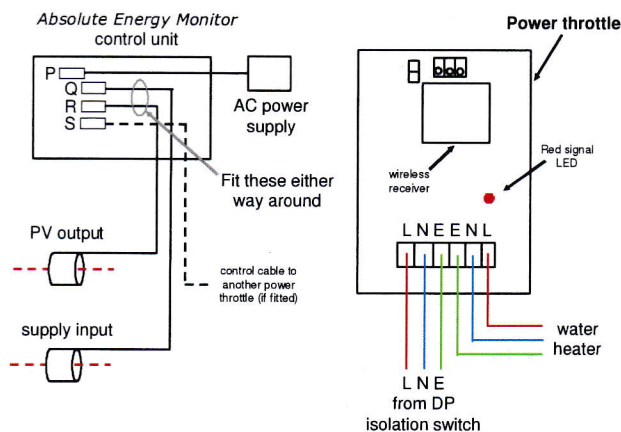


Figure 3: control unit and power throttle wiring

4 Commissioning

Check that all AC electrical connections are complete and ready for energizing. Carry out appropriate electrical tests of your wiring, according to BS7671:2008 (amended 2011). Switch on the immersion heater MCB in the consumer unit and the power throttle DP isolation switch to energize the system. Switch on the AC power supply.

The controller screen is touch-sensitive. Use the end of a pencil or something similar to operate the buttons on the screen.

Check that the power throttle is receiving the signal from the controller as follows. The red led inside the controller (labelled U in Figure 1) should flash regularly once per second, with a double flash every six seconds. The signal LED inside

the power throttle will flash on and off every 2 seconds for the first 90 seconds after switching on, or until it has received a pairing message from the controller. When the flashing has stopped, touch the circular grey button in the bottom left-hand corner of the controller screen. It has a small triangle on it. The button will change to red, and the legend "boosting" will appear on the right-hand side of the screen. Now look at the red signal LED in the power throttle noted on Figure 3. This should be lit continuously. Touch the button again. It will go back to grey and the words "heat OFF" should appear on the right-hand side of the screen. The red signal LED in the power throttle should now be off. Touch the button labelled "A". It should turn green. This is the default setting of the unit.

Touch the "settings" button (cog-wheels on the top right-hand side of the screen), and go through the screens, setting the date, time, and day of the week, the load type connected on the wireless link (normally "Immersion heater"), the load type connected on the wired link (usually "Not connected" unless fitting a second wired power throttle), and the heater priority (if fitting both wireless and wired power throttles). Then carry out a calibration as follows.

Make sure that the PV system is switched on and that the load(s) connected to the power throttle(s) is (are) turned on and able to absorb power. You may need to run off some hot water if the immersion tank is already up to temperature. The power throttle should have been on for at least 90 seconds. The calibration process takes less than one minute to complete, but during this time, **it is very important that the house base load remains constant**. Ensure that all domestic appliances, washing machine, dishwasher, electric kettle etc. remain off. Touch the red button to start the calibration process. The controller first checks the current transformers for polarity and connection. If an error message appears, check the placement of the current transformers, and that the load is connected and is demanding power. Check also that the current transformers are plugged in to the unit correctly (in positions Q and R – see Figure 1). Reset the controller by touching the screen, and try again. Call DSM Energy Control (details at the end) if the error message keeps on appearing.

If you have not performed a calibration within 5 minutes from switching on the unit, an error message will appear. You will need to touch the screen to clear the message and get another five-minute window.

5 Monitor-only mode

The Absolute Energy Master controller should be set in monitor-only mode in installations not requiring a power-throttle, for example where there is no immersion heater. Proceed as follows:

Touch the cog-wheels button on the home screen to get the settings menu page. Select "Other settings". Go to the "Screen timeout" page and touch the centre of the clock, and then touch the display within 5 seconds to clear the memory. The controller should now be in monitor-only mode, and the word "monitor" should appear at the top of the home screen. The controller must be calibrated in this mode (which requires an electric kettle or other heating device). From the menu, select "Calibrate" and then follow the instructions on the screen.

The controller can be converted back to full-function mode with the use of a pin code. Touch the cog-wheels button on the home screen to get the settings menu page. Select "Other settings". Go to the "Pin code" page, enter the pin code, and then touch the "H" button. The controller should now be restored to full-function. The controller must be calibrated in this mode. From the menu, select "Calibrate" and then follow the instructions on the screen.

6. Handover and technical support

Please remember to give the householder the User Guide, and show that the system is operating correctly. You will also need to demonstrate how it works, particularly the parameter setting pages.

Absolute Energy Master is sold for professional use and installation. Please contact our technical support team at DSM Energy Control Ltd. if you have any questions regarding the installation or operation of the system. Email support@solarcache.co.uk or call a telephone number given below.

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