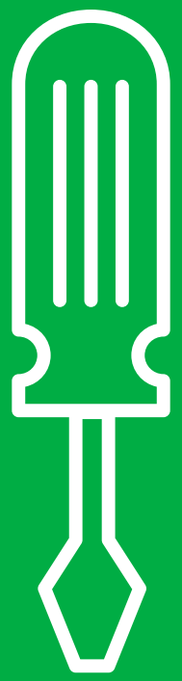
Installer guide

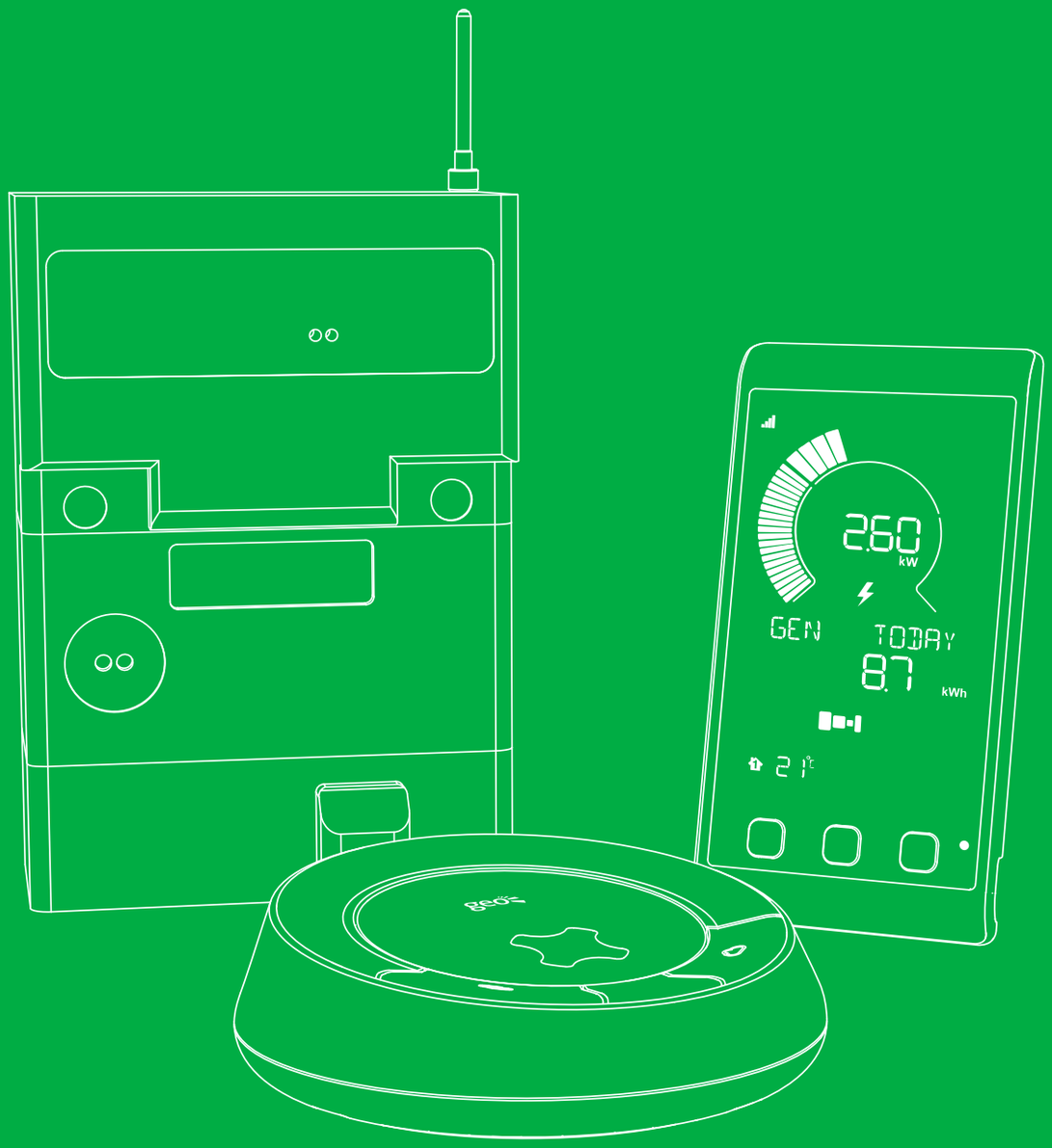


Solo III + GSM version

Important safety notice

The following safety regulations must be observed at all times.
Failure to observe precautions could result in severe injury or death.

- This equipment contains two disconnection switches for interruption of supply that do not provide supply isolation. Means of isolation from the supply must be provided as part of the building installation. Do not work on the equipment unless the supply is isolated. If isolation is made by removal of fuses or other cut-outs, the removed devices must be kept secure from replacement whilst work is performed. If isolation is provided by a switch, the switch must conform to the requirements of IEC 947-1 and IEC 947-3 or equivalent.
- Over-current protection is not provided by the equipment and must be provided as part of the building installation. For the domestic supply the maximum over-current device rating is 100A at 415V AC, conforming to the requirements of BS1361 or equivalent.
- Only suitably trained and qualified personnel shall be allowed to work on the equipment. Local safety standards shall be observed and shall take precedence over these regulations in points of conflict.
- The meters must be held securely during installation. They can cause injury if dropped.
- Meters that have fallen must not be installed. Even if no damage is apparent, meters must be returned to the manufacturer for testing. Internal damage can result in functional disorders or short-circuits.
- The meters must only be cleaned whilst disconnected and with a dry cloth without solvent and on no account be cleaned with running water or with high-pressure devices. Penetrating water can cause internal short-circuits.
- A terminal cover protects inadvertent exposure to the meter tail connections and must be fitted prior to energising the electrical supply.

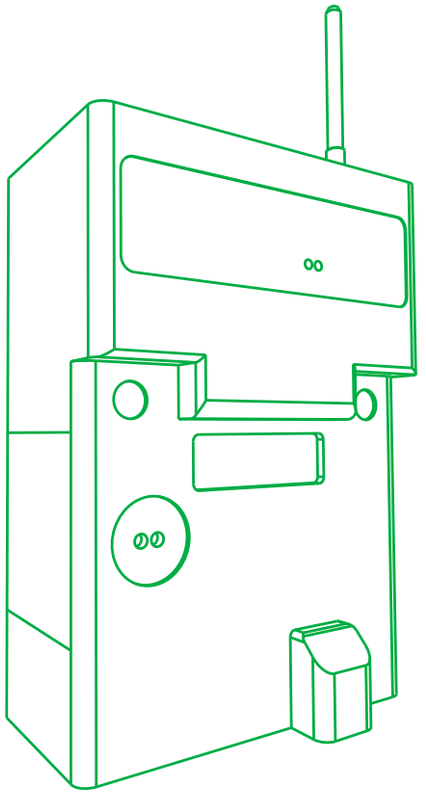


System overview

Twin element meter

The twin element meter connects to both the PV system and the consumer unit to allow the Solo III system to measure generation, import, export and consumption via a low-powered radio link.

The meter measures active and reactive energy consumption in single-phase two-wire installations.



The meter:

- is intended for installation in E2 electromagnetic and M1 mechanical environments where shock and vibrations are of low significance (2004/22/EC directive),
- is to be installed directly onto the distribution company's supply tails and generation cabling within a residential environment,
- conforms to British Standards,
- must be installed away from sources of electromagnetic interference,
- is classified as a Category III device according to EN61010-1 2001.

Meters must be fitted by qualified personnel and should be used in accordance with the technical specifications provided in this installer guide.

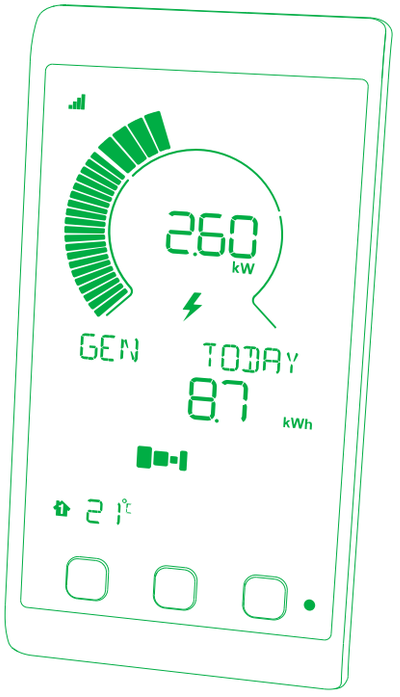
A metal meter cabinet may affect communication between the meter and the display, it may also affect communications via GSM.

Solo III display

The Solo III display is paired to the meter to show the user cost and energy consumption, import and export and generation information in real time.

A limited amount of historical data is also visible.

The display does not contain any user serviceable parts and does not contain batteries. It is powered using an external power supply which is supplied with the unit.



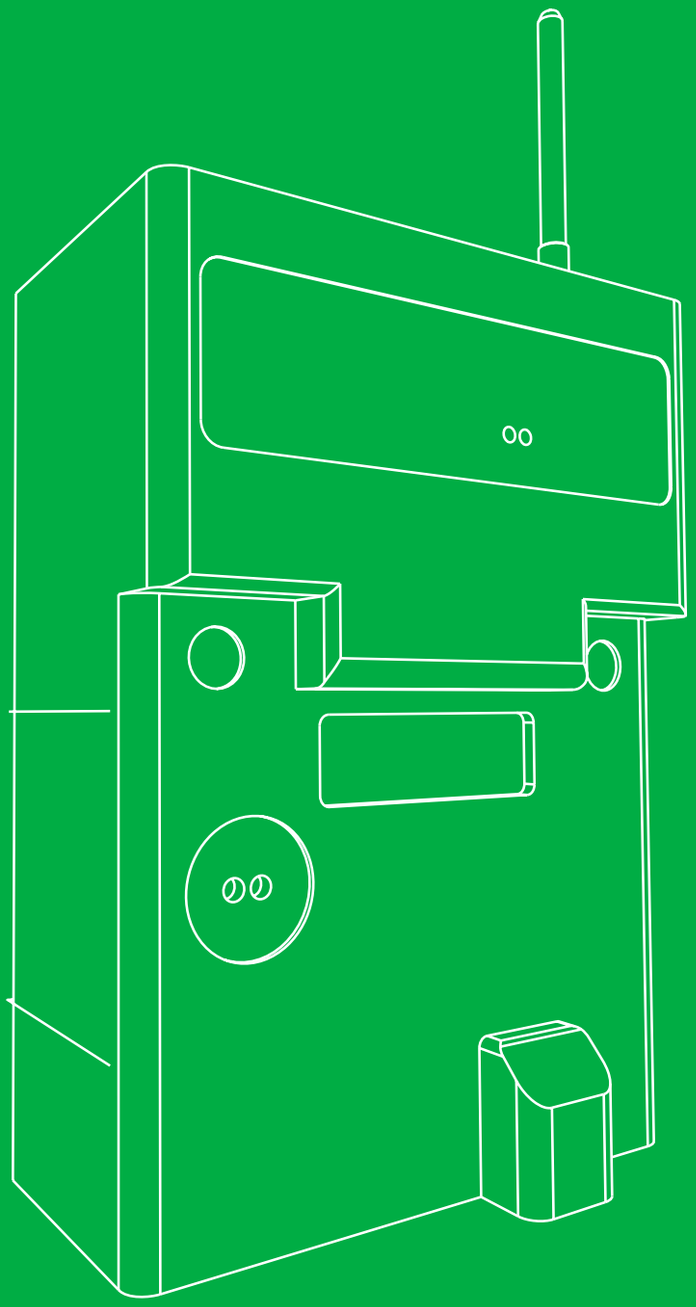
GSM module

The meter has a mobile radio module (using the GSM network) and needs to be installed in a location where network coverage is available.

The GSM module:

- connects the Solo III installation to the solution provider for monitoring purposes,
- must be installed in a suitable location with mobile network coverage,
- contains no user serviceable parts or batteries,
- may require an external antenna in an area of poor signal (not supplied with meter).

See "GSM mobile network" on page 11 for information relating to where the meter should be installed to maximise the GSM signal available to the meter.



Meter installation

Preparation

*Before installing the meter the supplies to **both** the PV and consumer systems **must** be isolated. Never operate on a live system and power should only be restored once the meter installation is complete.*

Isolation of power supply

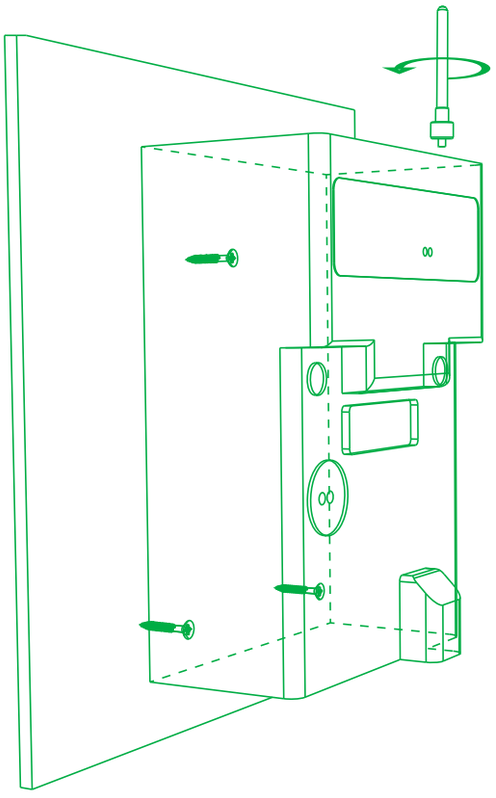
Before installing the meter, you must do the following:

- Isolate the PV and consumer supplies

Mounting the meter

The meter must be securely mounted to a wall or meter board.

- Unscrew and remove the lower-front meter panel to expose the terminal connections
- Mount the meter using a suitable round headed screw that is fitted to the wall or meter board. The width of the slot in the hanging bracket is 5mm
- The screw depth should be adjusted so that the head fits snugly under the hanging point and the meter is held firm against the wall or board
- Finally the meter should be firmly screwed to the wall or board using the two mounting holes located under the terminal cover



Wiring

The meter should be installed and wired according to the diagram below. Neutral is only required to be connected to either terminal 2 or 3 of the meter.

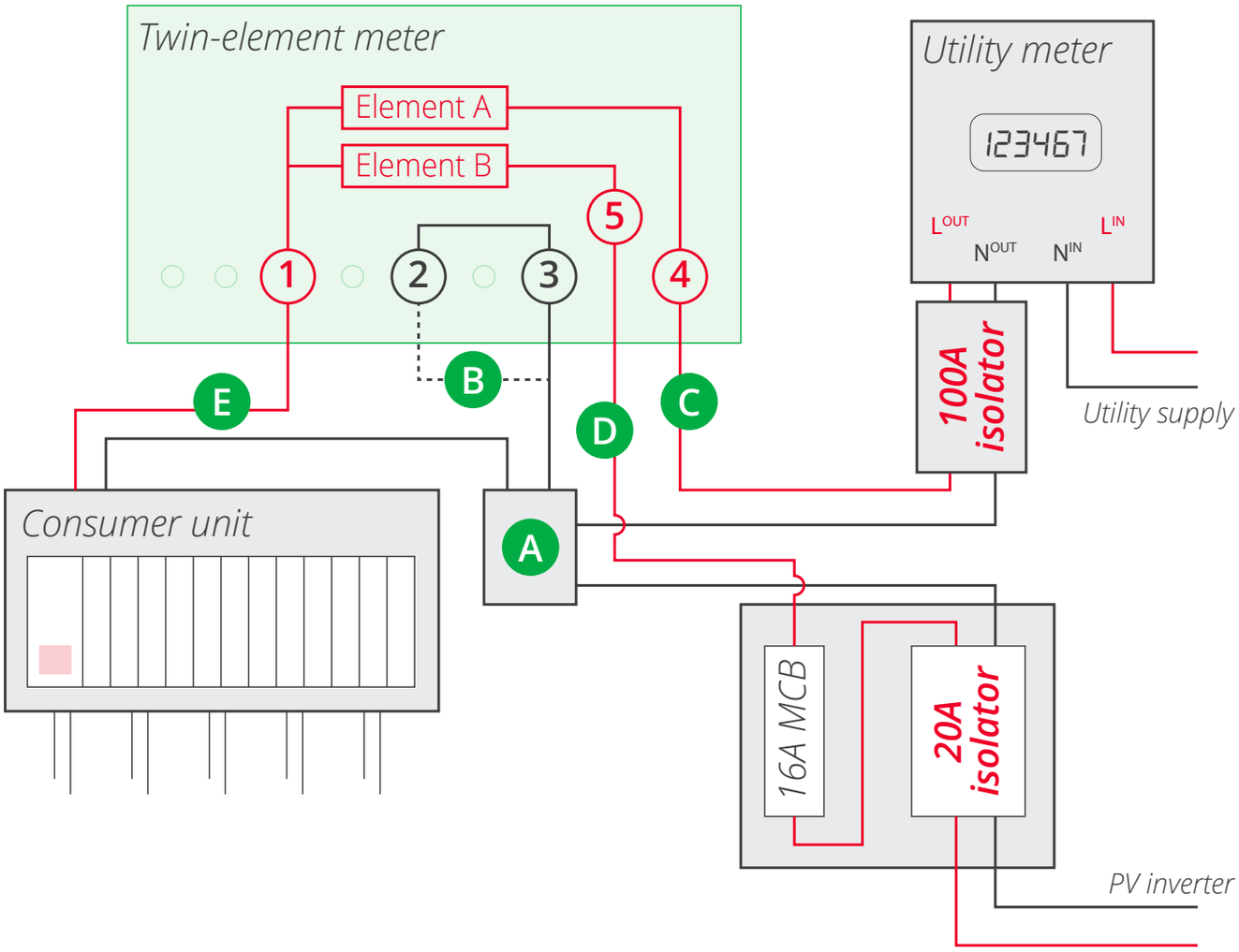
(A) All **N** wires can be connected together

(B) Connect **N** to either terminal **2** or **3**

(C) Connect **L** from utility meter to terminal **4**

(D) Connect **L** from PV MCB / isolator to terminal **5**

(E) Connect **L** from consumer unit to terminal **1**



You must check all wiring before restoring power to the PV and consumer systems and the new meter. The meter must only be used in single-phase installations.

Post-install verification

Complete installation

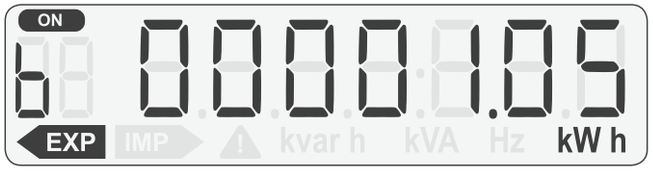
Before restoring power, do the following:

- Double-check the wiring to the meter
- Re-insert the meter front panel and secure tightly
- Restore power to the PV and consumer systems
- Attach the small supplied radio antenna to the **top** of the meter module
- An external antenna may also be attached to the **side** of the meter for the GSM module - this is not supplied with the meter

Meter diagnostics

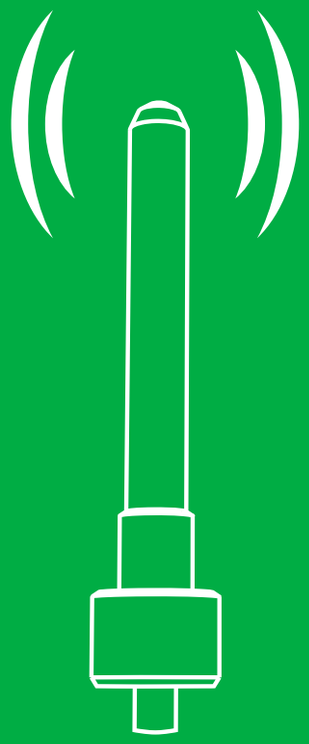
The LCD display on the meter will turn on - this confirms that power is OK.

Below is a typical screen:



Once the system has been powered on, the two LEDs on the module will flash and indicate the module is correctly installed.

The meter module is transmit only - the LEDs will flash irrespective of whether it is paired to a Solo III display or not.



GSM commissioning

GSM mobile network

The integrated GSM communications module requires an available mobile signal to operate properly.

Where possible, do the following:

- Determine a suitable location for the meter - avoid large metal objects and other electrical equipment (such as garage door motors)
- Use a *GSM Network Signal Analyser* to check there is an available mobile signal at the proposed location of the meter
- If the mobile signal quality is low, you may need to use an external antenna (such as an extender or long-range antenna). The antenna is attached to the side of the meter module

GSM module auto-registration

When powered on, the GSM module will attempt to register with the mobile network. This registration process is fully automated and does not require any input from the installer.

Network scan

The module will first scan for an available mobile network. This can take up to 5 minutes and the red LED (Nwk) will flash on and off at 1 second intervals.

Connected

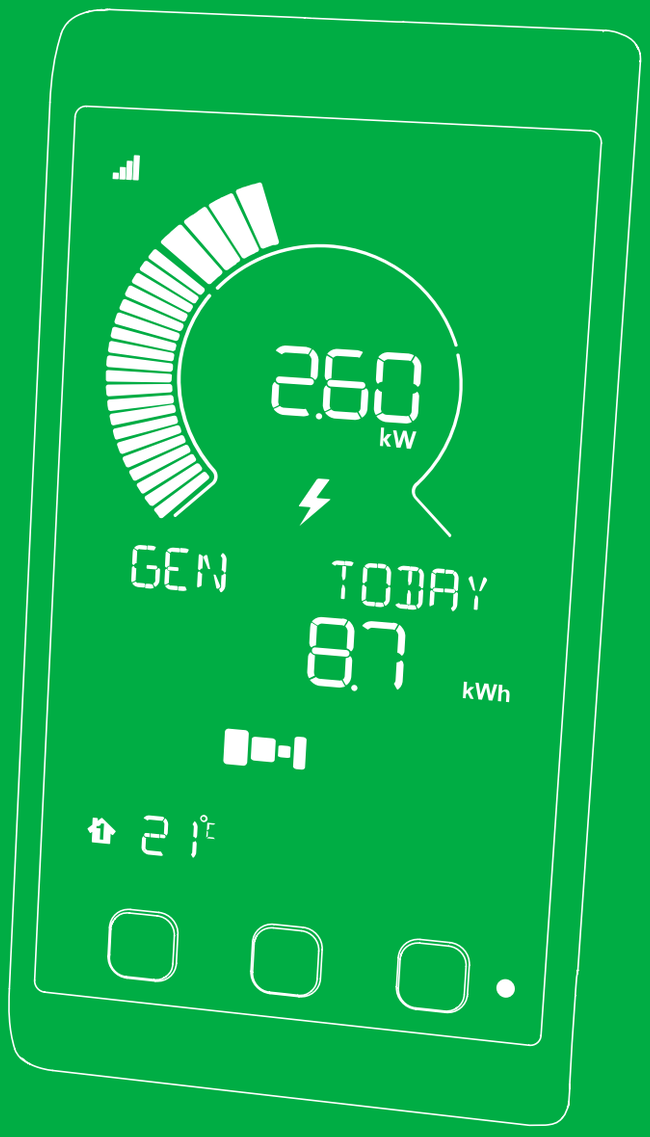
Once connected, both the red (Nwk) and green (Sts) LEDs will flash at varying intervals.

GSM module diagnostics

The system has been designed to register with the mobile network automatically.

If auto-registration fails - more than 5 minutes from power-up and the green (Sts) LED is not flashing - then use the table below to diagnose the problem.

Green LED	Red LED	Diagnostics
OFF	OFF	The module does not have any power. Check that it is installed correctly and that there is power to the meter (the display will have numbers shown on it).
ON - 4 seconds OFF - 4 seconds	OFF	The module is powering up.
ON - 4 seconds OFF - 4 seconds	ON - 1 second OFF - 1 second	The module is self-testing.
ON - 1 seconds OFF - 1 seconds	ON - 1 second OFF - 1 second	The SIM card is being read.
2 flashes per second	ON - 1 second OFF - 1 second	The module is currently scanning for a suitable mobile network. This should take less than 5 minutes. If the module has been unable to find a suitable mobile network after 5 minutes, the meter must be moved or an antenna extension added.
Rapid flashing	ON - 1 second OFF - 1 second	The mobile has registered on a mobile network and is preparing to connect.
Flashing ON and OFF at varying intervals	ON - 1 second OFF - 4 seconds	The module has successfully connected to an available GSM mobile network and the meter is communicating with the service provider.



Solo III display

Display overview

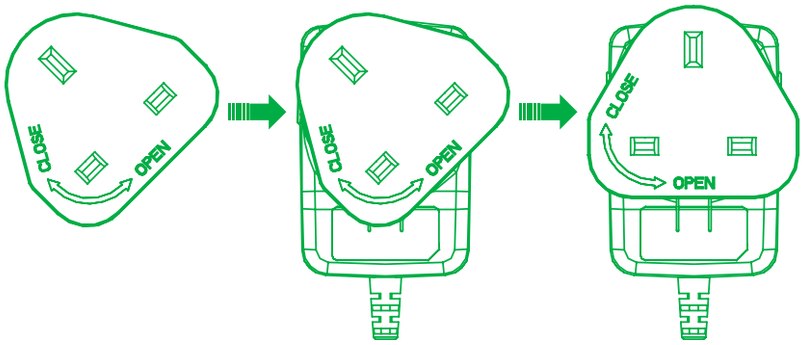
The Solo III display shows real-time generation, consumption and savings. Savings are calculated using the configured energy tariff (which is entered on the display).

See “Setting tariffs” on page 17.

Powering the display

The Solo III display is packaged with adapter pins for a number of countries (recycle adapters that are not suitable for your country). **Do not** power the display using the USB port.

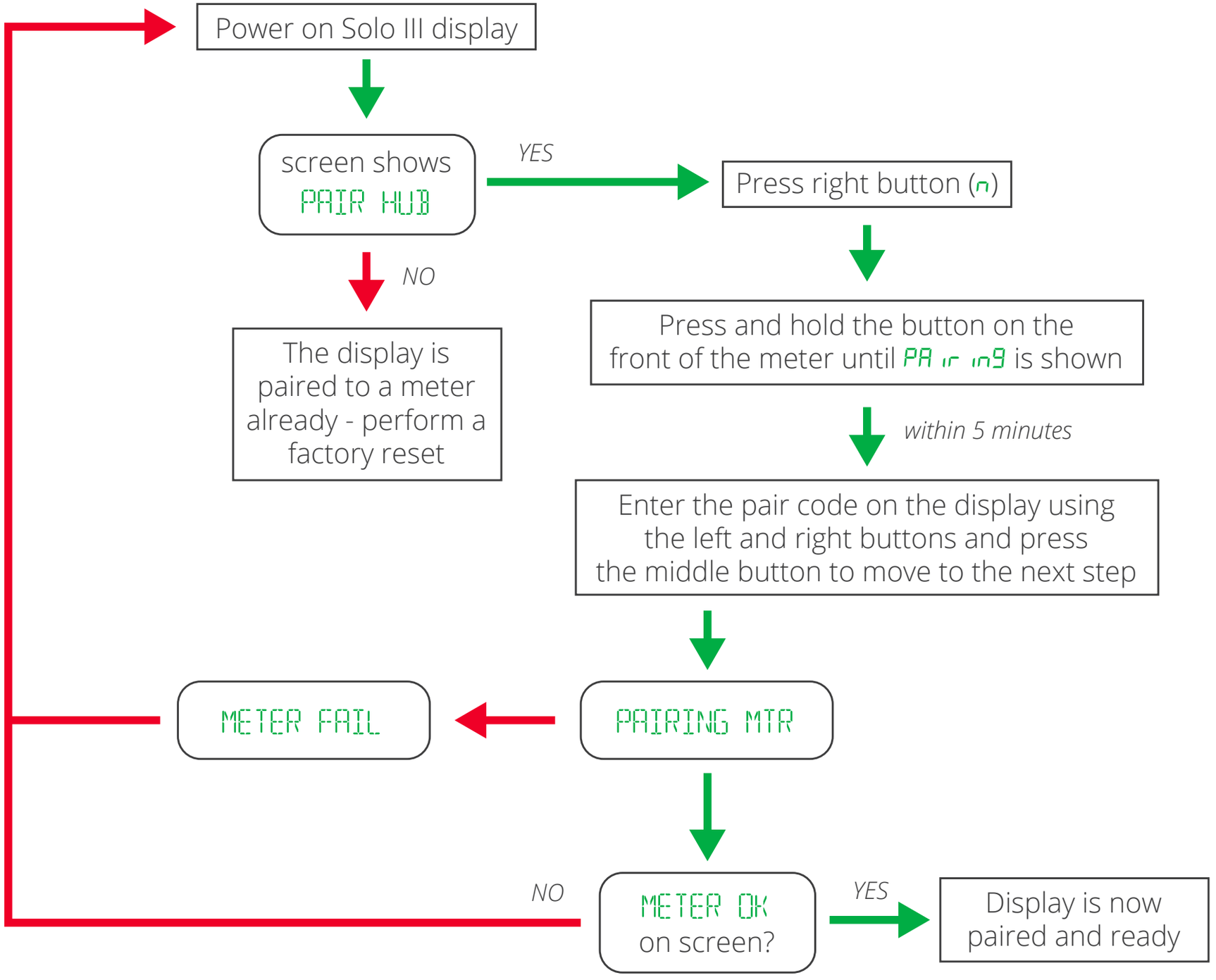
- Assemble the power supply by twisting the pins on to the adapter in a clockwise direction until you hear a click
- Connect the power adapter into the Solo III display
- Insert the power supply into the electricity socket
- Power on the Solo III display
- Once the display is powered on, it will show PAIR HUB on the screen



If the display has previously been paired to a meter, it will need to be reset. Refer to the back of this installer guide for details on performing a factory reset.

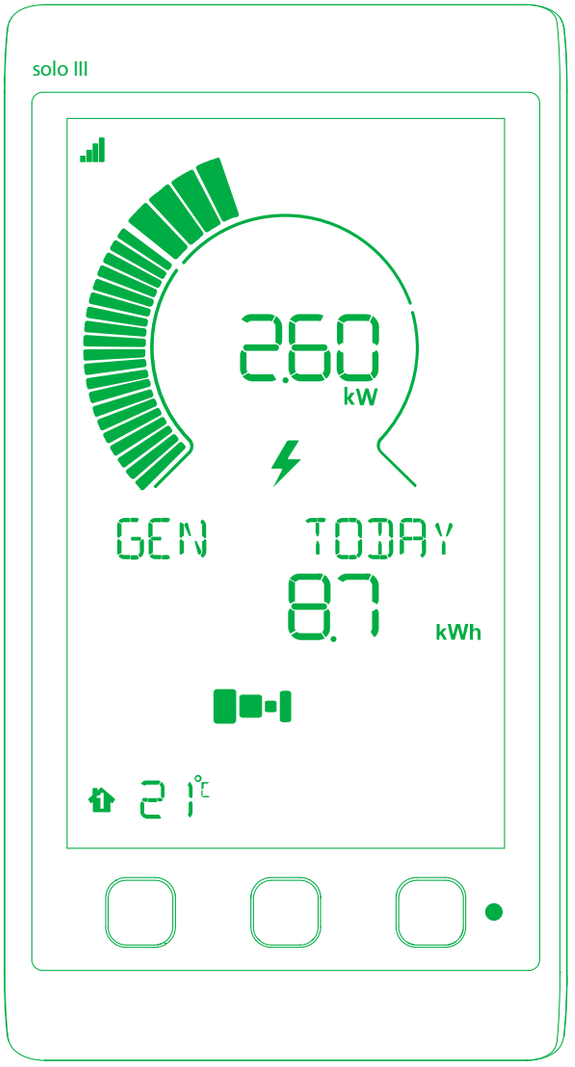
Pairing to the meter

Pair the display to the meter using the pairing code written on the top of the meter (e.g. ABC123):



Using the display

The Solo III will immediately start to show live generation and consumption readings taken directly from the smart meter.



Pressing the left button will cycle through the following screens:

- GEN TODAY
  Total generation from the PV system for today
- USE TODAY
  Total usage for the whole house for today
- IMP TODAY
  Total amount of energy imported from the grid for today

Pressing the right button will change between TODAY, Y'DAY (yesterday), THISWK (this week), LSTWK (last week) and this and last month (e.g. AUG, JUL).

Pressing the middle button will also show SAVE (for savings, based on energy that has not been imported from the energy supplier) and COST (for total cost of charges from the energy supplier).

After a new installation all the readings will start from zero and begin to increment from the point at which the Solo III and the meter are first paired.

Setting tariffs

Working out energy tariffs

The Solo III display can work with a single energy tariff (same charge throughout the day) and also a dual rate tariff (where the charges vary between day time and night time).

If the energy supplier does not provide this information on the bill, then the tariff(s) and standing charge (if charged by the supplier) can be worked out by the following simple equations:

tariff = *(charge for period in £/€) / (energy used during period in kWh)*

daily standing charge = *(charges for period in £/€) / (number of days in period)*

Entering the tariff

To enter the tariff information on the display, do the following:

- Press and hold the middle button on the display
- Press the right button until SETTINGS is shown and then press the middle button
- Repeatedly press the middle button until TARIFF1 is shown
- Use the left and right buttons to decrease and increase the tariff and then press the middle button to store the value. If using more than one tariff, enter the night-time rate first
- If there is more than one tariff, enter another tariff for TARIFF2. If there is no second tariff leave it as £0.000. Enter the start time and end time for the tariff
- Finally, enter any daily standing charge
- Press the middle button to complete tariff settings

Support

Technical support

For technical queries relating to the installation, please call 01223 850 218. Lines are open Monday to Friday, 0900 to 1730 (UK hours).

Further information on the Solo III is available here:
http://www.greenenergyoptions.co.uk/support/solo3

FAQs

Why are both LEDs on the meter module off?

Switch off power to the property and then remove and re-insert the top module. If the problem persists replace the meter or contact support.

How do I reset the Solo III display?

Remove power to the display and then press and hold the three buttons while powering the display back on. Press the right (n) for DATA RESET and then the left button (Y) to confirm FULL RESET.

You will need to repeat the pairing process to connect the Solo III display to the meter.

Why is no data being shown on the Solo III display?

Check that the Solo III is paired to the meter. The signal strength bars on the top left of the display show the quality of the signal between the display and the meter - the more bars, the better the signal.

Try to move the display closer to the meter.

If the problem persists, perform a factory reset of the display and then repeat the pairing procedure.

Solo III PV

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