NETTHINGS®

ENERGY MANAGER

INSTALLATION & USER GUIDE

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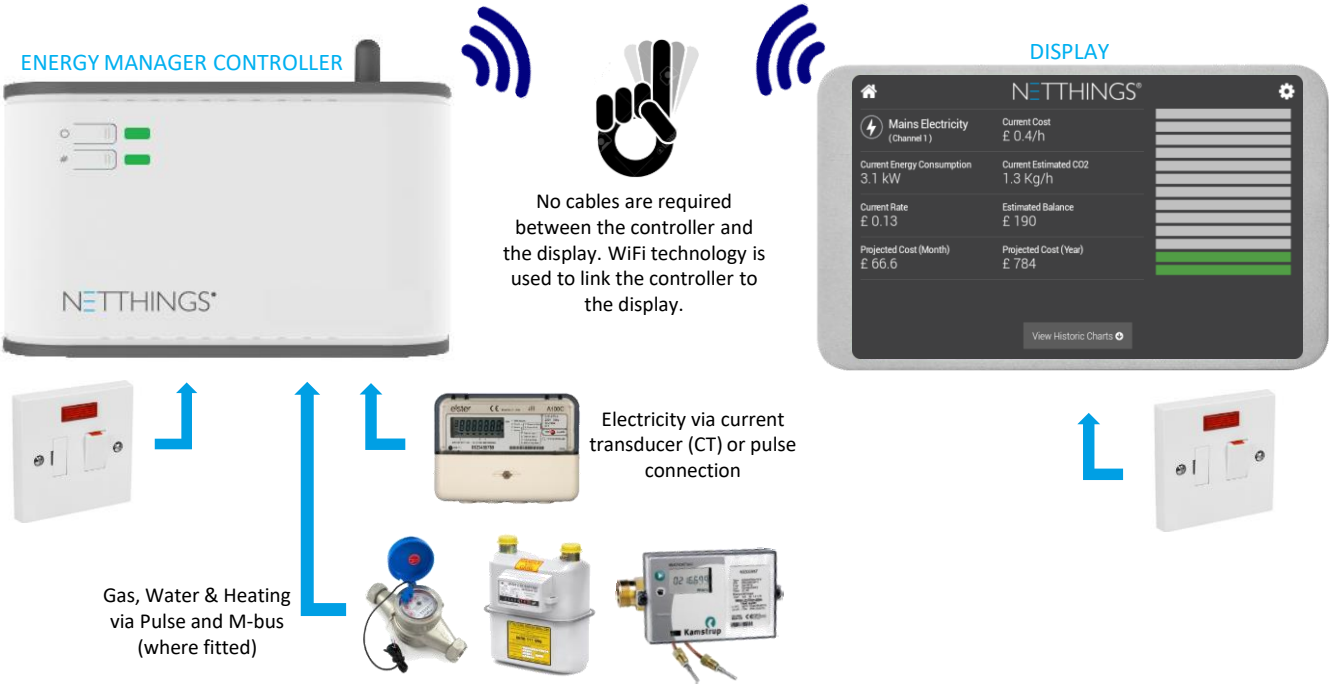
INSTALLATION OVERVIEW

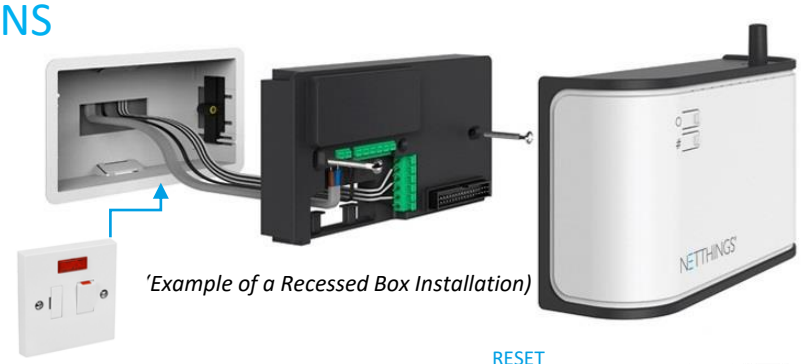


8 STEPS TO A SUCCESSFUL INSTALLATION

1. Choose suitable locations for the Energy Manager and Display, ensuring that the data ports on the bottom of the Energy Manager are easily accessible for the end user. This product uses WiFi technology to link the controller to the display. The signal from the Energy Manager should reach the Display within modern houses but solid walls and obstructions can affect this. **To ensure best performance the distance between the Display and Energy Manager should not exceed 5 metres.** If you are in doubt about the effectiveness of the signal strength please check before installation.
2. Ensure a mains power supply is available at these locations.
3. If your chosen location for the Energy Manager is not adjacent to the services you require to be monitored then run cabling between these positions during your first fix installation.
4. Fix the Energy Manager and Display in their final positions and make power supply connections.
5. Make connections to the service you require to be monitored. Note: Additional equipment may be required to connect to other manufacturer's products. Please contact NetThings if in doubt.
6. Pair the Display to the Energy manager, and complete the channel setup.
7. Use energy on systems that you have connected to and check that this registers on your display.
8. Leave information with the end user for them to gain maximum usage of this product.

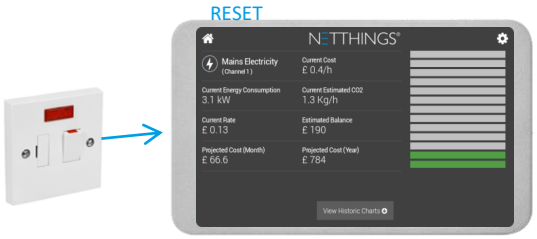
INSTALLATION CONNECTIONS

The Energy Manager Controller is typically mounted in a recessed 2-gang pattress box, however should the Controller be mounted in a surface box or directly to the wall, glands and cable restraints should be used as required. It is powered via a 3A Switched Fused Spur, marked to show its purpose and easily accessible.

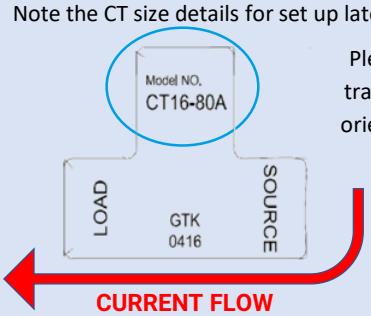


'Example of a Recessed Box Installation)

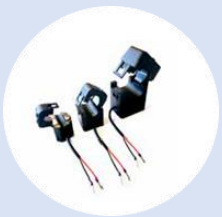
The Energy Manager Display should be mounted in a recessed 2-gang pattress box and powered via a 3A Switched Fused Spur, marked to show its purpose and easily accessible. The power and reset button for the display can be accessed via the small hole on the top left of the display mount with the supplied allen key.



Note the CT size details for set up later.



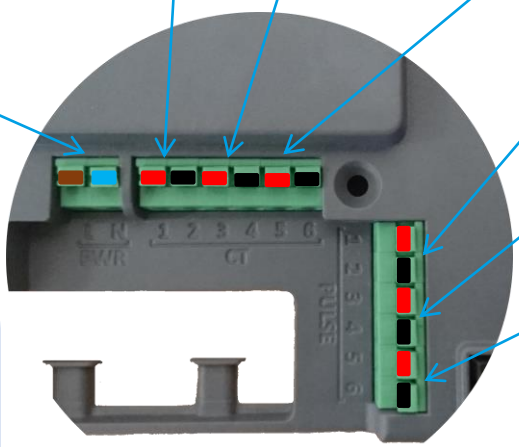
Please install current transducers in correct orientation as detailed on the device.



When connecting current transducers:

- Install **single phase** monitoring to **channel one**.
- For 3 phase CT follow L1, L2, L3 normal logical connection.

The supply should be a 3A Switched Fused Spur, marked to show its purpose and easily accessible.



When connecting PULSE cables, start connections at channel 4 first before connecting to channel 5 & 6.

INSTALLATION TIPS

- Cables between Netthings controller and pulse enabled meters should be **Belden 9501** or equivalent.
- Ensure gas meters that are pulse enabled are fitted with the appropriate pulse block. As there are several different types please ensure that the correct pulse block is ordered.
- The Display and the Controller need to be within 5m of each other otherwise the WIFI communication may be unreliable.

SUPPORTED M-Bus Meter Manufacturers

The following manufacturers of M-Bus meters are currently supported for use with Energy Manager.

Diehl, GWF, Kamstrup, Sontex, Danfoss.

Please contact Netthings or visit www.netthings.co.uk for further information

Channel 6 is used for both PULSE & M-Bus (where fitted) inputs.

PLEASE NOTE:

- The M-bus functionality is enabled via the M-Bus menu in the Configuration Setup. If enabled, ensure no pulse connections are made on Channel 6
- M-bus wiring has no polarity
- Unsupported meters that are discovered on the scan may need further setup to define the correct M-bus records to report on.

If you have any questions about installing this product please contact NetThings or visit www.netthings.co.uk

COMMISSIONING THE ENERGY MANAGER

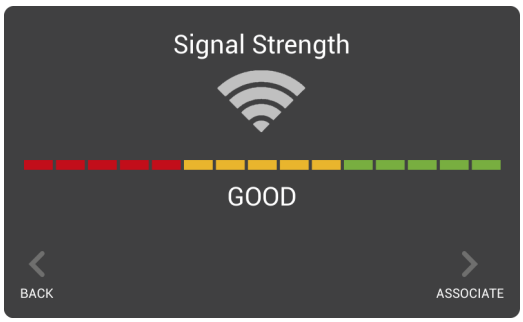
POWER UP

Once the Controller and Display have been correctly installed, power up both and wait for the controller to broadcast its own Wi-Fi signal. The display can be turned on using the allen key provided, inserted into the top of the frame. The SSID (wireless connection name) for the controller will be shown on the Display when the Controller has successfully started (it can take up to 3 minutes before the SSID is shown on the display). The list can be refreshed by swiping downwards on the screen.

WIFI CONNECTION (WPS)

WPS is the easiest method to connect the Controller & Display

- Press and hold the # button on the energy manager for 3 seconds until its LED turns solid Green and release.
- Press the WPS symbol on the screen of the display.
- The display will automatically connect to the controller and show the home page.



WIFI CONNECTION (Alternative Method)

The Controller and Display can also be paired using the password supplied with the Controller.

- The SSID and password to pair Controller and Display can found within the packaging and also on a label on the top of the controller.
- Select the correct Energy Manager WIFI from the list displayed to pair the display. The SSID will start with 'NT_'.
- Enter the password for the chosen Controller.
- Check the signal strength and press *ASSOCIATE*.

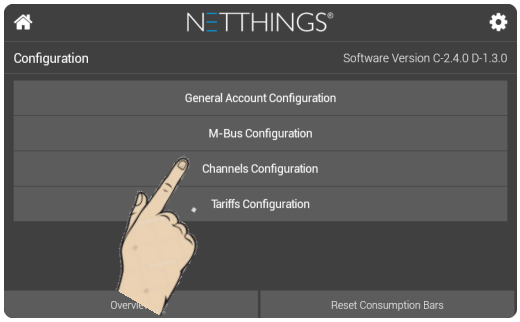
CONFIGURATION

Following a successful WIFI connection between the Controller and the Display, the Energy Manger should now be configured to enable the energy sources that are connected to the meter.

PLEASE CONTINUE AND COMPLETE THE CONFIGURATION OF THE METERING CONNECTIONS

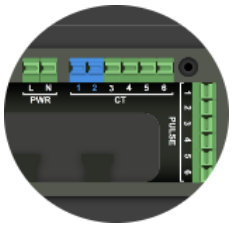
To Setup the system, press the setup icon in the top right hand corner of the screen.

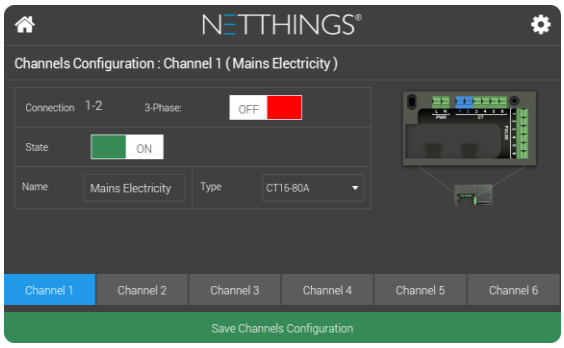
Press *Channels Configuration* to start configuration of the channels. (Please Note: M-bus options are only visible and enabled on M-bus capable hardware)



SETTING UP ELECTRICITY CHANNELS

- Check that all connected channels are enable by turning the *State to ON* and that the correct CT types are selected.
- If monitoring a 3-phase supply then turn 3-phase ON in Channel 1.
- The **Name** field can be used for the installer to identify what is connected.
- The **Type** field is used to select the CT that has been used in the installation.
- The terminal blocks shown as blue indicate the connection pair that correspond to the channel.
- Press *Save Channel Configuration* before exiting and use setup button in the top right hand corner to return to the Configuration Menu.



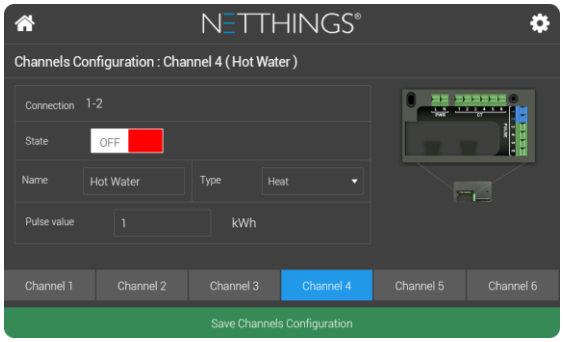


(Typical example of a Single Phase Electricity Configuration)

SETTING UP PULSE INPUT CHANNELS

(If intending to use M-Bus functionality as well, please set this up first and return to the pulse setup once complete)

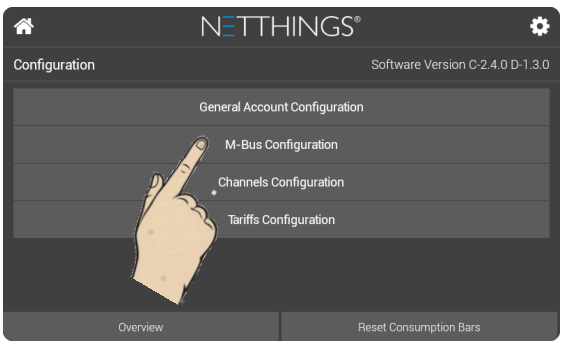
- Check that all connected channels are enable by turning the *State to ON*.
- The **Type** field has a drop down menu and this will allow you to choose the correct utility type that is connected to your energy manager.
- The **Name** field can be used for the installer to identify what is connected.
- The **Pulse Value** field should be set to the corresponding value of the energy source that you are connecting to. This value may be indicated on the connected energy source.
- Press *Save Channel Configuration* before exiting and use setup button in the top right hand corner to return to the Configuration Menu.



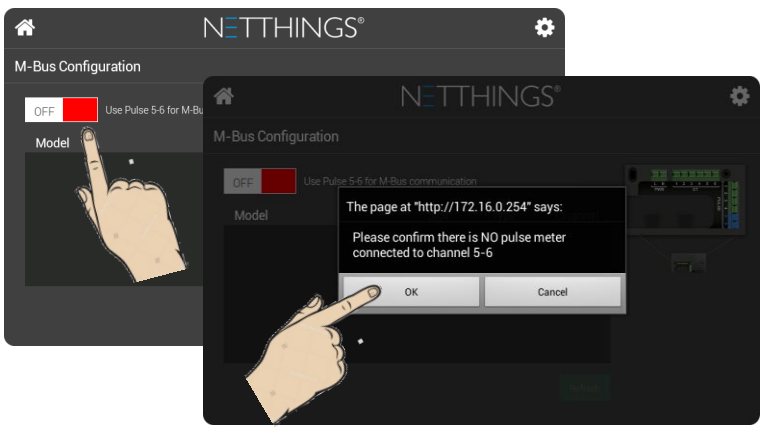
SETTING UP M-BUS CHANNELS (only available on M-Bus supported Energy Managers)

(If M-bus functionality is not required, skip to page 8)

The M-Bus functionality is only available on hardware that supports M-Bus communication. If the Energy Manager supports M-Bus, a menu item for M-bus will be available in the Configuration page.



- Press *M-Bus Configuration* to start using the M-bus functionality.
- Once in the M-bus Menu, turn the state from *OFF to ON*.
- In order to prevent any damage to equipment, when using M-bus mode, no pulse meters should be connected to Channel 5-6. Confirm this is correct and press *OK*, otherwise Cancel and connect Channels 5-6 to the M-bus communicating meters.
- The Energy Manger will now scan and search for M-bus enabled devices.

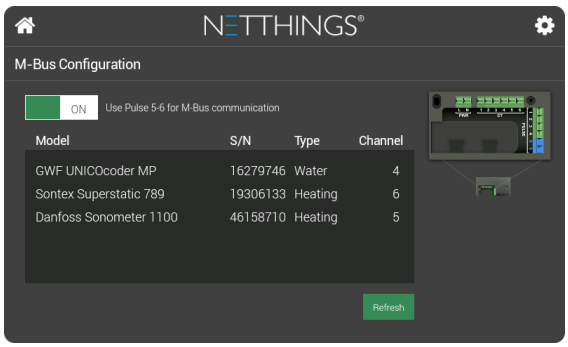


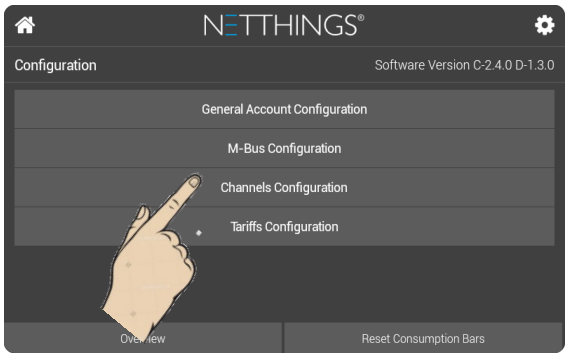
M-Bus Scan Information

📖 The scan results will show all meters that been discovered, however a maximum of 3 will have a channel assigned.

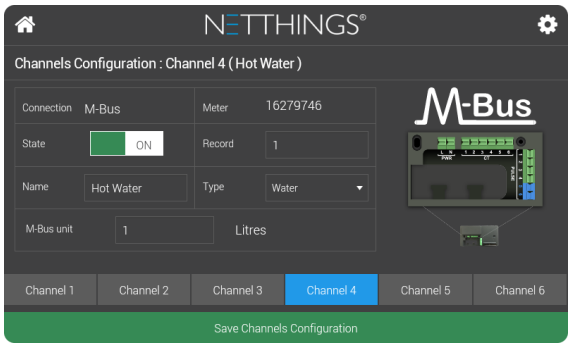
📖 When starting from an empty list, the order in which meters are found and allocated channels is dependant on the sequence in which the devices communicate to the Energy Manager. On subsequent refreshes, if the meters found are the same serial number and model, then the order is preserved.

📖 The list of supported meters can be found on the 'Installation Connections' pages in this guide. Supported meters will be correctly identified by type during the scan and should require no further setup. Unsupported meters that at are discovered on the scan may need further setup to define the correct M-bus records to report on. The scan will try and find a record appropriate for the type of meter found, for example, on a Heatmeter, a record containing a multiple of kWh will be sought. Further detail can be found below.



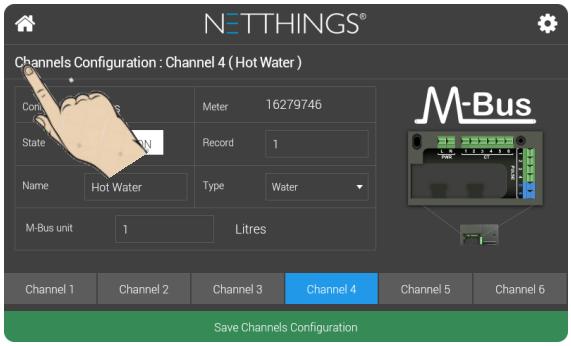


- The scan should identify all units that the Energy Manger is able to connect to. If this list does not identify the expected meters, check all wiring to connected devices and press *Refresh* to restart the scan.
- If the scan is successful and identifies all the required connections, return to the Configuration Menu by pressing the setup icon in the top right corner of the display.
- Now press the *Channel Configuration* option to check the settings that have now been put in place for M-bus.
- Each channel that has been allocated a M-bus meter should now be checked to ensure that the parameters are correct and match up with the expected records to be read and their associated units.



(Typical example of a Water Meter connected on M-bus)

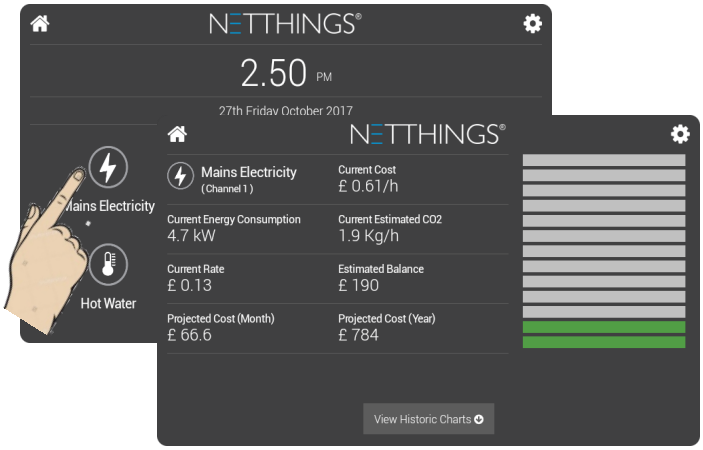
📖 **Name:** This field can be changed by the installer to further identify the connected service.
Record: This is the M-bus record that is being read on the connected meter. It can be changed if it is incorrect or another record is required.
Type: This is the type of connection being monitored, for example, Heat, Cooling, & Water. This determines the type of data that the Energy Manager expects to read from the M-bus data.
M-Bus unit: This field defines the resolution of the value read in the record specified above.



- Press the *Save Channels Configuration* to accept any changes made to the channels.
- Once channels have been checked press the Home button in the top left of the display to return the main screen.

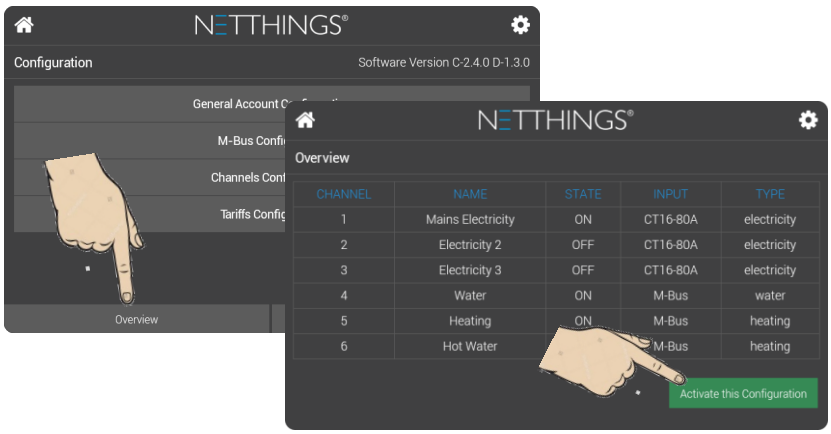
ACTIVATE CONFIGURATION & COMPLETE COMMISSIONING

- At the home page the display will now show the channels that have been enabled.
- Select an icon to observe the information being reported.
- IMPORTANT: At this point the system operation should be verified by consuming energy and checking that the channels are recording correctly on the home display.

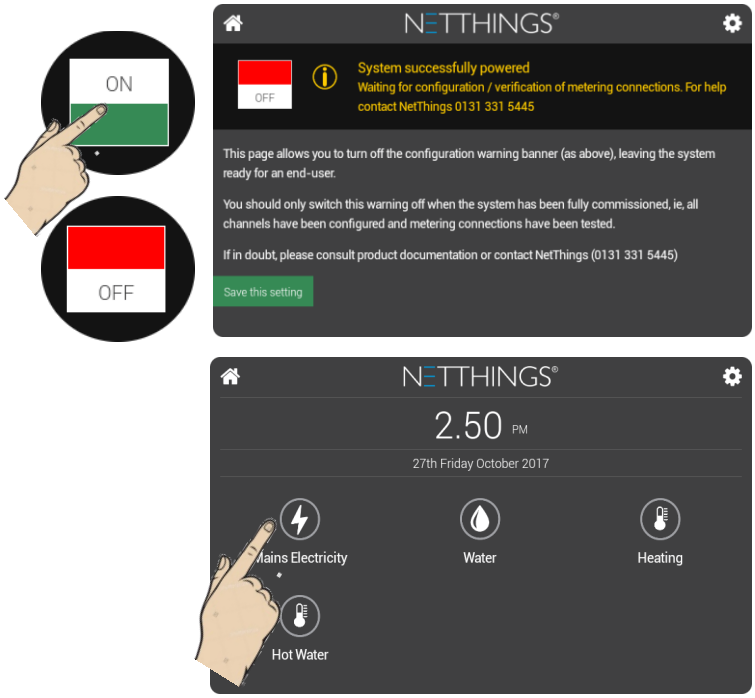


(Typical example of an Electricity Connection)

- Once all the channels have been verified, press the setup menu icon to enter the Configuration menu and then press *Overview.*
- Press *Activate this Configuration* if the Overview is correct.



- IMPORTANT: Once the system is fully commissioned and ready to be handed over, the yellow warning banner should be removed by changing the banner switch from *ON to OFF*.
- Press *Save this Setting*
- Return to the home screen.



THE COMMISSIONING PROCESS IS NOW COMPLETE

USING THE ENERGY MANAGER

Energy Manager for the home is a sophisticated, mains powered energy monitoring solution that saves money by helping you reduce your energy consumption.
The mounted display is the user interface for the connected utilities and will be your gateway to your energy consumption and spending information.

Take some time to get familiar with the product and learn about its display functions and how it will provide you with information which will assist you save on your energy bill

The system works independently from your utility provider, they have no control over the device, however it may use the utility meters to calculate your energy consumption and calculate your spend.

On-going energy consumption and costs are stored continually within the system and viewed on your home display showing real time energy usage or historical consumption information.

No connection to your existing broadband is required.

Please visit www.netthings.co.uk for further assistance and to view our latest product range.

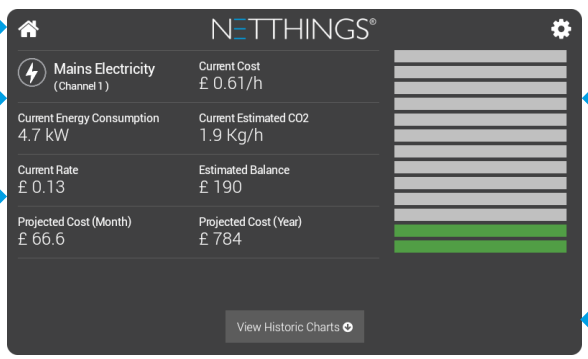
UNDERSTANDING THE INFORMATION

- To return to the home screen at any point, press the Home icon on the top left hand side of the display.
- Channels that have been enabled during the commissioning process will now be visible. Press the icon relating to the utility that you wish to monitor in order to see further information about your energy usage.

Return to the Home Screen.

Channel number, description and icon.

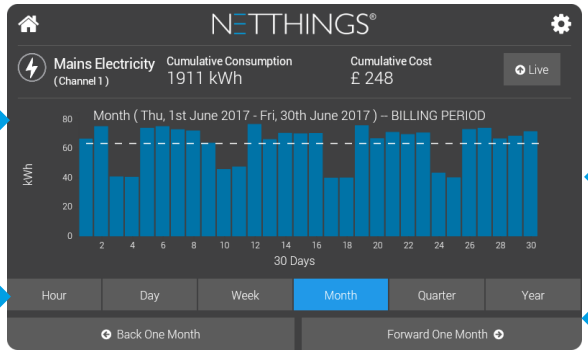
This section of the display shows the current energy consumption and costs involved based on the rates that have been setup.



Graphic representation of the energy currently being used. Colours will change from green to amber and red with increased usage.

Press View Historic Charts to show the use of energy use over different time periods.

Time period of the current view



The dotted line shows the average of the recorded energy over the period.

Choose the time period required.

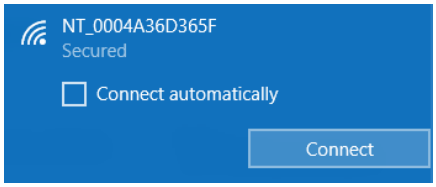
Navigate forwards and backwards based on the time period selected.

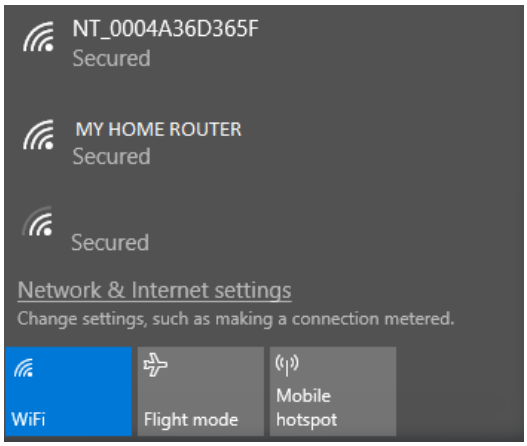
CONNECTING TO THE ENERGY MANAGER

The Energy Manager is not part of your home network as the Controller and Display communicate directly with each other, however it is possible to connect directly to the Controller and control your Energy Manger on your home PC, tablet or smartphone.

Please Note: The procedure below is based on a Windows10 connection. Other platforms will follow a similar process.

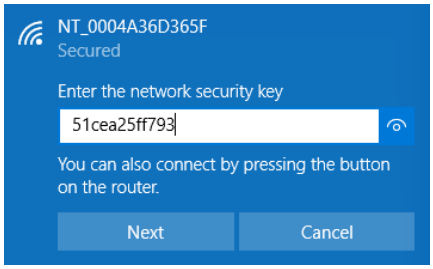
- Search for available WIFI connections on your device.
- The Netthing Controller will look something similar to: NT_0004A36D365F. Check that this matches up with the label on the top of the Controller as it is possible that you may be able to find other Controllers that are nearby.
- Do not select 'Connect Automatically' as you typically will not want to connect to the Energy Manager by default.



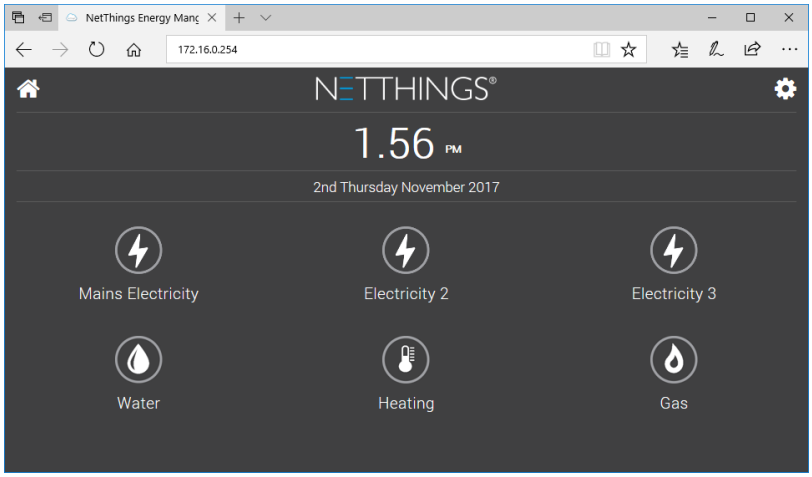


(Windows 10 Example of available WIFI)

- Enter the password that is found on the label on the Controller.

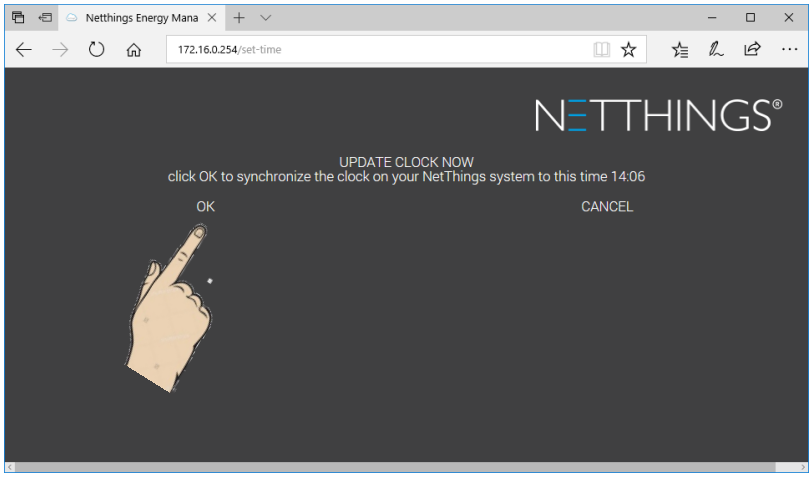


- Your device will now connect to the Netthings Controller. Open your web browser and enter 172.16.0.254. This Energy Manger should now be visible.



SETTING THE TIME ON THE DISPLAY

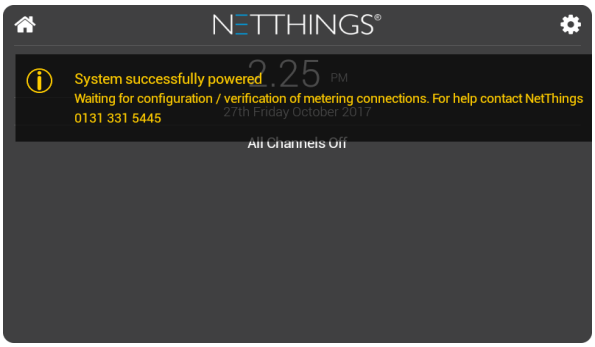
- As the controller isn't directly connected to the World Wide Web it cannot be 100% accurate with its internal clock. If you wish to adjust this follow the steps above for connecting a device but enter this address. 172.16.0.254/set-time
- Press OK and the unit will update with the time shown.
- The wall mounted display may need to be restarted for the change to be received.



ADDITIONAL INFORMATION

YELLOW WARNING BANNER

If the yellow warning banner is still visible on the Controller, then the commissioning process has not be fully completed. In the first instance, if possible, please contact your installer/ site manager as they have responsibility for the services that are connected to the Energy Manager and the details required to complete the commissioning process.



WHAT DO THE BUTTONS DO?

The controller has two buttons next to the green flashing LEDs which are mainly used for set up purposes. The illustration shows three functions that can be performed.
The colour of the LED changes and stops flashing momentarily when the buttons are held for the indicated number of seconds.

Hold O button for 7 seconds — FACTORY RESET !!! Deletes all setup & recorded data !!!

Hold # button for 3 seconds — Allows WPS connection to the display or your device

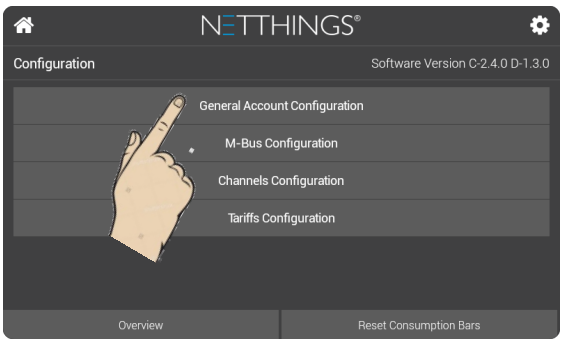
Hold # button for 5 seconds — Allows Wi-Fi channel changing from Channel1 to 6 or 11

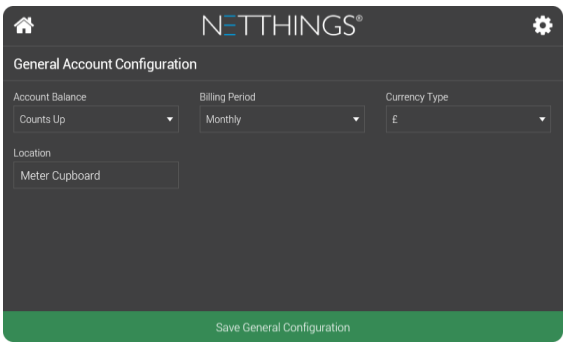
NETWORK CONNECTIONS

You do not need to have your home Wi-Fi connected to the Energy Manager system in order for it to function. The system broadcasts its own signal to transfer the information to your home display.
No external World Wide Web pages can be shown on the NetThings home display

GENERAL ACCOUNT OVERVIEW

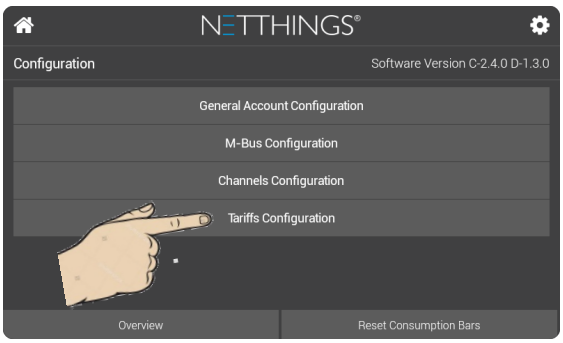
From the Configuration menu, press General Account Configuration to view and change if necessary.

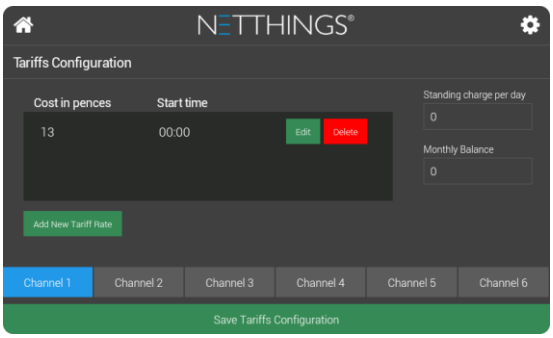




TARIFFS CONFIGURATION

From the Configuration menu, press Tariffs Configuration to view and change if necessary. Default values have been set for Tariff information that will allow the system to operate sufficiently, but these can be changed as required.





ADDITIONAL INFORMATION

VERIFICATION OF PULSES

Any of the following could prevent NetThings Energy Manager recording use of energy on the pulse connections.

- Faulty secondary equipment not supplying any pulses
- Reversed polarity on the interconnecting cables from meters to Energy Manager. Pulses generated by a transistor logic (TTL) output should have their polarity observed and maintained. Meters with mechanical pulse outputs are not polarity dependant.
- Breaks in the interconnecting cables from meters to Energy Manager
- Installing cables exceeding the distance specified in IEC-62053-31 (100meters)
- Installing incorrect pulse cable type (Belden 9501 or similar is recommended)
- Incorrectly connecting pulse inputs to CT connections and vice versa

M-BUS DATA

M-Bus data received is processed and presented to the user under the following circumstances:

Consumed energy readings are collected every minute and updated every minute in the historical charts.
Power/ Instantaneous Consumption values are updated differently depending on the meter:

- Netthings Supported Heatmeters:
  Values are read directly from the meter at the same time as the energy readings.
- Water Meters & Unsupported Heatmeters:
  The value is a rolling average of the past 15 minutes of energy measurements.

CARE AND MAINTENANCE

The NetThings Energy Manager and Display require no regular maintenance. Do not spray with water or any cleaning products, which may damage the surfaces or cause a risk of electric shock.

SERVICE AND REPAIR

This equipment is NOT user serviceable.
Please do not dismantle the unit. For alterations to the connected utilities please consult a suitably qualified electrician.
In the unlikely event of a fault developing please refer to www.netthings.co.uk.

SPECIFICATION

Name of Manufacturer	NetThings Limited
Unique reference number (model number)	EMK-200-01
Purpose of product (Energy Manager)	Monitoring building energy consumption
Dimensions	Controller: 165mm x 95mm x 52mm Display: 173mm x 99mm x 18mm
Operating temperature range	0°C to 40°C - 85% RH
Storage Temperature	0°C to 65°C - 85% RH
Enclosure protection	IP 20
Level of protection from electric shock	Double insulated
Case material fire rating	UL94 – V0
Supply Voltage	90-264VAC
Power Supply Frequency Hz	50-60 Hz
Max power in watts	7W
WiFi IEEE 802.11 Frequency Band	IEEE 802.11 B/G/N 2.4 GHz
WiFi Security	Wi-Fi Protected Access (WPA) security protocol and certification program
Type of Memory & Data Storage Capacity	Internal memory allowing storage for > 2 years. External-microSD card slot for downloading data.
Power supply for display	8W Switching Power Supply: I/P 90-264VAC unterminated wire for spur connection. O/P USB Connection DC 5V. Dimensions, 73mm x 30mm x 23.5mm
Number of monitored channels	Up to 6: Max of 3 x Electricity via CTs & 3 x any pulse or M-Bus enabled meter
CT Current Transformer related measurements (16mm/24mm)	Kilowatt and kilowatt/hour kW and kW/h
M-Bus Communication NEW	Wired M-Bus for supported Heat, Cooling & Water Meters to Standard EN 13757:2013.
Real-time, instantaneous Measurements	Energy units consumed £/h (gas, water, electricity, heat, cooling, solar power)
Continued Utility Measurements	Historical total energy consumed in currency, kWh and Carbon CO2

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