

## Managed Smart Metering Installation Guide

Connected rail-mount energy metering and power monitoring with Cloud visualisation and analytics

- Billing-grade Smart Meters: compact Class 1 (SANS 1799) Internet-connected smart metering
- Per-minute telemetry (real and reactive power and energy, current, voltage, power factor) displayed in user-friendly web-based Portal
- Configure rules for alarms and notifications
- Full four-quadrant, <1% accuracy for metering of electricity generation and consumption
- Single phase, three phase and three-way stacked single phase
- Wi-Fi connectivity for flexible, low-cost wireless deployment
- Simple to integrate with other software systems through open API
- Simple to install: dual mount, fits any CBI mini rail and DIN rail distribution board
- Seven-digit anti-tamper human-readable total energy (kWh) counter



# Managed Smart Metering

## Class 1 Single Phase, Three Phase and Multi-way Bi-Directional Smart Energy Meters with Per-Minute Telemetry and Cloud-based Analytics

Thank you for purchasing this product from CBI :energy.

You can access this installation guide on the Web at [www.cbi.energy/meter-installation](http://www.cbi.energy/meter-installation) or by scanning this QR code.



**Keep this leaflet safe – it contains valuable reference information!**



Total system visibility for performance management, troubleshooting, service assurance and security.



Total access to detailed site data via portals and API for detailed telemetry views, aggregated analytics and customer billing.



Massively scalable data collection systems to allow sophisticated business capabilities into the future.

# Please note these very important points:

## Internet Access

To transmit telemetry and connect to the :energy managed service back end, devices must be connected via a 2.4GHz Wi-Fi network that has an active connection to the Internet..

## Annual Subscription

- This Managed Smart Meter is backed by a service which costs R15/month per device. The first 36 months are included in the price you paid, but please ensure your customer is aware that after the 36 month inclusive subscription, we will contact them on the supplied email address to allow them to renew.
- It is very important that the email address you provide for your customer is correct when creating a new customer installation using our Customer management website. We will send the end user their login to the :energy Portal to this email address.
- The :energy Portal ([portal.cbi.energy](http://portal.cbi.energy)) is where you and end users can inspect the information being transmitted by their Smart Meter as raw data, graphs and charts.
- CBI :energy will use the email address you supply for the end user to contact them about subscription renewal before it expires.

**NOTICE:** This electronic/electrical device can only be installed by competent and qualified electricians. Failure to adhere to the requirements of the Occupational Health and Safety Act (Electrical Installation Regulations) will render any warranty claims void.

# Getting Started

Before you can start with an installation, you must create your installer account. This must be done before you can use the :energy field services mobile app to install and activate this Managed Smart Metering device.

To create your installer account visit [www.cbi.energy/installer](http://www.cbi.energy/installer) or scan this QR code. Enter your company name, name, contact numbers, email and city/town.



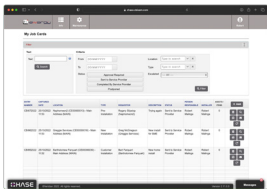
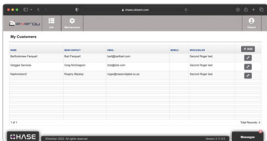
This will create an installer account in our system and send you a welcome email, which has a link to your new installer profile on the CBI :energy site, and your login details.

Please log in to this website to verify your registration to proceed.

You can then create your Customers on this site (enter the customer name and contact details), and then create a new Job Card for each installation.

This process should take less than five minutes.

You only register as an installer once. You create a new Customer and/or a new Job card for each installation.



# Installation Instructions

If you want detailed instructions visit this site [www.cbi.energy/meter-installation](http://www.cbi.energy/meter-installation) or scan this QR code:



## Equipment Required

- Appropriate hand tools (screwdrivers, side cutters, etc)
- Mobile device (smartphone, tablet) or laptop with an Internet connection to activate the device onsite.
- This instruction leaflet

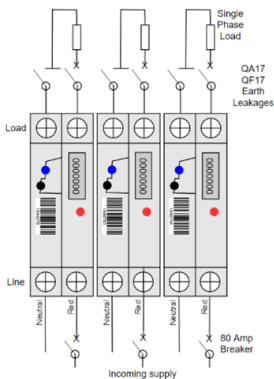
## Notes:

1. This device must be installed by a qualified electrician.
2. Isolate supply before installing the Smart Meter.
3. Install the Smart Meter on either mini rail or DIN rail (dual mount, fits only 57mm escutcheon).
4. Wire the Smart Meter according to the 'Wiring Instructions' overleaf. Ensure line and load are correctly oriented for polarity to ensure readings correctly reflect consumption or generation. Carefully check product markings for orientation. Do not swap Live and Neutral!
5. Apply power to the load through the Smart Meter, this will power up the device.
6. A solid red light will be displayed indicating the device start up sequence.
7. Once initialisation is complete the light will alternate between red and blue, indicating that the device is ready to be paired to a Wi-Fi network and activated.

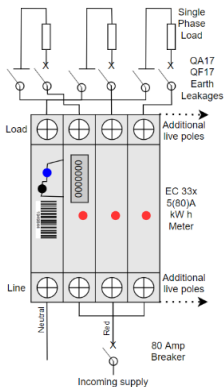
# Wiring Instructions

## Metering of multiple independent loads

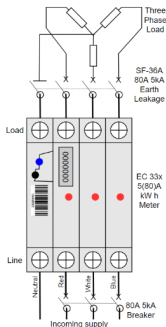
Multiple single-phase EBMs



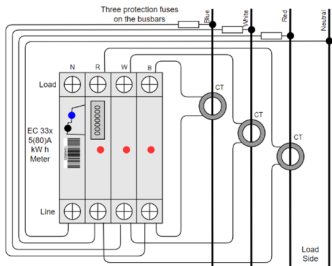
One multi-way single phase stacked EBM



## Metering of a three phase load



## Metering of a three phase load or three independent loads with external CTs (each load draw >80A)



**WARNING:** The CTs are at phase potential and must not be earthed. All metal parts must be insulated.

External CT to be supplied by CBI to ensure compliance. See CT ordering sheet for more information.

# Pairing and Activation

Follow these steps to activate the Smart Meter:

1. Apply power to the Smart Meter – it will start up and act as if it were a Wi-Fi Access Point (“pairing mode”, the combined LED/button pulses alternating red and blue).

2. Connect to the Wi-Fi access point identity broadcast by the Smart Meter. You can use any Wi-Fi enabled device (laptop computer or smartphone).

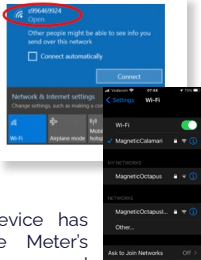
3. The Smart Meter will appear as a Wi-Fi network in the list of available Wi-Fi networks. To join, choose the Meter, which is identifiable as the device's barcode with an 'S' in front.

4. Connect to the Smart Meter by selecting it (no username/password).

5. Once your Wi-Fi enabled device has successfully connected to the Meter's Wi-Fi network, open a Web browser and enter '10.0.10.1' in the address bar.

6. A page will open to allow you to enter credentials of the Wi-Fi network to which you want the Smart Meter to connect.

7. Select the network to which you want the Smart Meter to be connected to and enter the Wi-Fi password.





8. Restart the Smart Meter by pressing the reset button (the lower black push-button).
9. The lights on the Smart Meter will stop flashing indicating that it is restarting (takes less than 10 seconds).
10. Once successfully connected to the chosen network the light will pulse blue.
11. The Smart Meter is now sending its telemetry data to the Internet.
12. You can log into the CBI Energy Portal at [portal.cbi.energy](https://portal.cbi.energy) using the credentials emailed to you when you created your Installer profile. Your end-user customer can log in using the credentials sent to them on the email address you supplied. Confirm that the meters are sending data correctly, and enjoy!

### **Getting Connected: Problem Solving**

- If the light flashes red, incorrect Wi-Fi credentials have been entered. Start the pairing process again.
- If the light flashes blue rapidly, it is successfully connected to Wi-Fi, but the Wi-Fi Access Point does not have an active connection to the Internet. Check the configuration of the Wi-Fi Access Point and that its Internet connection is up.
- To start again, reset the Smart Meter to factory settings. Press and hold down the LED light/button for 5 seconds, this will return the Smart Meter to factory settings.
- To disconnect and reboot the device to its previous state press and hold down the black button. This will restart the Smart Meter.

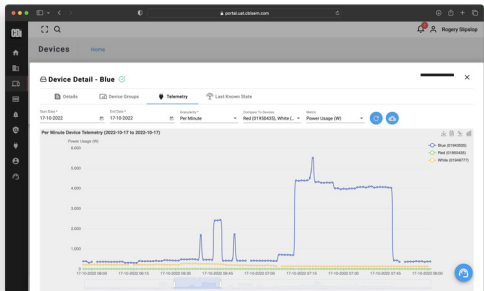
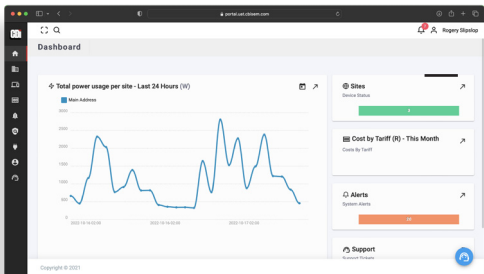
# **Analytics Portal**

Log in to [portal.cbi.energy](https://portal.cbi.energy) where you and your end user customer can view their meter telemetry, see graphs and charts of consumption, see their live electrical parameters and examine their energy costs.

Login credentials were sent to you when you first registered as a CBI :energy installer. Login credentials were sent to your end-user customer when you first created them as a customer and set up the Job Card for the meter installation.

By logging in to the Portal you will get access to:

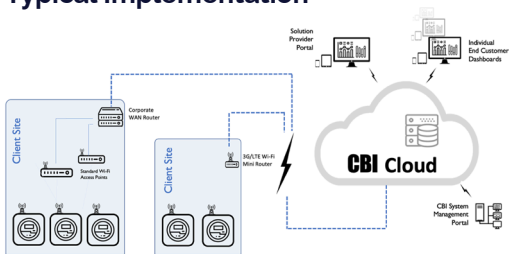
- Secure, resilient data storage to industry best practices
- Cloud-based management of Devices and Sites with advanced visualisations
- Granular monitoring of points of supply, points of generation, sub-DBs and specific loads
- Advanced cost analytics (please enter the site tariff information in the "Cost Configuration" tab on the Portal)
- Advanced energy analytics
- Next-generation energy management capabilities
- Key parameters measured and communicated to central monitoring system to provide real time data at one minute intervals showing:
  - Nett Energy (kWh)
  - Import and Export Energy (Wh)
  - Reactive Cumulative Energy (VARh)
  - Real Power (W)
  - Reactive Power (VA)
  - RMS Voltage (V)
  - RMS Current (A)
  - Power Factor
  - Signal Strength (RSSI)
  - Device temperature (C)



# Solution Requirements

- Availability of 2.4GHz Wi-Fi with Internet access for device connectivity. Users can typically use corporate Wi-Fi (via segregated VLAN) or aggregate devices onto single Wi-Fi router with its own 3G/LTE backhaul)
- Please confirm that there is sufficient Wi-Fi signal strength at the location the device will be installed. If signal is not strong enough, consider adding a closer Wi-Fi Access Point connected to company LAN, or add a low-cost Wi-Fi router with a 3G/LTE backhaul.
- Web browser with Internet access to see user interfaces
- Site requires standard 230V/415V AC electrical distribution network with accessible wiring plant
- Site must be compliant with relevant electrical, safety, quality and radio regulations

## Typical Implementation



# Frequently Asked Questions

**The Smart Meter is connected to the Wi-Fi. The LED is flashing rapid blue, and no data is appearing in the Portal.**

The Meter is connected to the Wi-Fi network, but the Wi-Fi Access Point is not connected to the Internet. Check using a mobile or laptop connected to the same Wi-Fi if it can browse the Web. If not, contact the operator of the Wi-Fi network or Internet Service provider for the location. If you can browse, the Wi-Fi Access Point has an active Internet connection, but the Smart Meter is not being allowed to access it. Check the Access Point or Internet-facing router's network configuration for device white-listing or other security restrictions. If the LED flashes slow (1 sec) blue then the error is resolved, Confirm that data is being displayed correctly in the Portal.

**The Smart Meter is successfully connected to the Wi-Fi, but the Portal is showing zero readings for the telemetry.**

Confirm the load is wired correctly to the meter, and that it is receiving power.

**The Smart Meter is showing no lights at all.**

Note that the Neutral line must be connected to at least one terminal of the Smart Meter to ensure proper supply of power to the Smart Meter, and to provide the correct reference for the voltage across the load,

**The data in the Portal is not showing correctly - it's out by some factor.**

Ensure that the Smart Meter is correctly configured if it is wired to use external CTs with the correct turns ratio.

**I cannot log into the Portal.**

Ensure that you are using the correct username/password that was sent to you in the welcome email, and that you are visiting [portal.cbi.energy](https://portal.cbi.energy). If you are sure it is right, please contact support on +27 11 928 2020.

**Can my Customers see each other's data?**

No, each Customer site is segregated from the others. A particular customer can only see their own data. You (as the installer for your Customers) can see the data for all the Smart Meters you installed.

**I would like to get additional meters to install, is it easy?**

Visit [www.cbi.energy](https://www.cbi.energy) for a list of suppliers nationwide. If you are adding new meters to an existing site, ensure that the Job Card correctly identifies the customer — any new meters will appear under the same Customer login in the Portal for easy inspection and comparison with other meters installed for that Customer.

# Technical Specifications

	EC320CM-W	EC330CM-W
Phases	1 + N	3 + N
Nominal Voltage (Un)	120 / 240 V	
Operational Voltage Range	80 - 285 V	
Over Voltage Withstand	480 V ( $\leq$ 48 hr)	
DC Voltage Withstand	1 kV ( $\leq$ 1 min)	
Impulse Voltage Withstand	6 kV	
ESD Withstand	15 kV	
Operational Freq Range	50 / 60 Hz	
Max Rated Current (Imax)	80 A	
Operational Current Range	0.015 - 125 A	
LED Output Flash Rate	1000 impulse / kWh	
Accuracy Class	Class 1 accuracy $<$ 1%	
Protection Class	Class 2 double insulated	
Degree of Ingress Protection	IP45 when installed	
Operating Temp Range	-40 °C to +75 °C	
Mounting Options	Dual mounting (DIN & mini rail)	
Telemetry upload rate	1 minute interval	
Conformity to Standards	SANS/IEC 62052-11 SANS/IEC 62053-21 SANS 1799	



<b>Meter Status LED</b>	<b>Description</b>
Pulses RED	Normal consumption (1000 pulses/kWh)
Solid RED	Error condition (internal test failed)
Pulses GREEN	Low load (less than 30 watts)
Solid GREEN	No load (meter is powered up)
Pulses ORANGE	Abnormal load (supply voltage 265 - 460V or 60 - 90V AC)
Solid ORANGE	Unsafe load condition ( >125A or supply >460V AC)
No LED	No LED indication (insufficient supply voltage)
<b>Wi-Fi Status LED</b>	<b>Description</b>
Pulses BLUE (one sec)	Connected Wi-Fi with Internet access
Flashes BLUE (rapid)	Connected Wi-Fi, but no Internet access
Pulse RED	Failed to connect to Wi-Fi
Pulse alternate RED/BLUE	Device in Wi-Fi pairing mode
Flashing PURPLE (RED+BLUE)	Device firmware updating



### **Warranty and Returns Information**

This product is warrantied for a period of twelve months against faulty manufacture. Warranty is void if the product is installed contrary to the instructions in this leaflet, and warranty does not cover damage caused by external factors (lightning, intentional or unintentional mechanical damage, overload)

For product Technical Data Sheet please visit [www.cbi.energy/technical](http://www.cbi.energy/technical).

### **Extending and Enhancing with Full, Automated Load Control**

This Managed Smart Metering system can form part of the advanced CBI :energy Building Energy Management solution, which has metering capabilities (ECM-320-CM-W and ECM-330-CM-W) as well as automated load control capabilities (Single Channel Smart Controller (SC-1-W), Smart Plug (SP-4X4-W) and Smart Isolator (SI-4X2-W). For more about the full Building Energy Management solution visit [www.cbi.energy/bem](http://www.cbi.energy/bem).

Please review our Ts&Cs at [www.cbi.energy/meter-ts-cs](http://www.cbi.energy/meter-ts-cs).

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