ENERGY CcM

MORE THAN METERING

Electrical metering and submetering devices

With a simple and versatile design, Energy CcM direct measurement devices are easy to install and practical. They cover all the information needs and possible combinations in an electrical installation.

ENERGY CCM

Submetering System

With their versatile installation design, CcM devices meet all possible needs and configurations. Practical and easy to install.

Thanks to their design any user can successfully apply energy efficiency policies in buildings and homes. Our aim is to make this action popular; help reduce emissions and participate in the control of climate change.

This product family has been designed and developed to comply with 2012/27/EU energy efficiency directive which establishes a series of binding measures to help the EU meet its objective to increase energy efficiency in cities by 20% by 2020.

Existing distribution boards don't need to be modified for the installation. Devices adapt to most electrical systems and designs, including the oldest distribution boards.

Our products meet all industry class III standards.

Photovoltaic

CcM devices provide the perfect and universal solution for photovoltaic SELF-CONSUMPTION installations.

It enables users to check the consumption or demand as well as the production or generation in real time, which generates photovoltaic savings curve. It also enables regulation of inverters to avoid overturning the network. (Discharge 0). The CcM devices may be configured in TWO-DIRECTIONAL mode to show both the consumption and production at the same time.

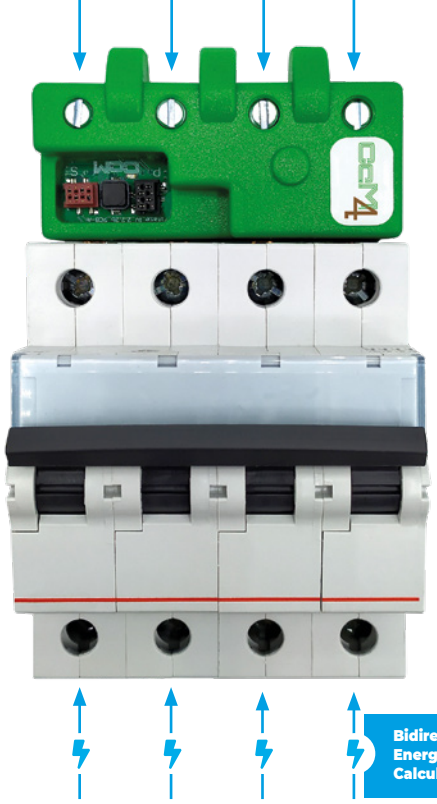
European Commission
Horizon 2020
European Union funding for Research & Innovation
SEAL OF EXCELLENCE

Our CcM product family meets all industry standards and has been awarded a seal of excellence by the EU.

Principal devices (grid analysers)

These grid analysers or smart meter (without transformers) provide metering of all the electric parameters of the installation from basic values (current and voltage) to more complex values (harmonics distortion, energies, etc).

- They have an **accuracy of up to 99.4% RD** in type B2 energy.
- They have a signal of 4.000 measurements per second displaying the **average per second to the client**.
- They are **self-powered** and power the secondary CcM devices (current meters) by ModBus RTU protocol (RS485).
- They have **electric category III** so they can be placed between the meter and protection.
- **They provide all the electrical values** for each of its phases and the total electrical value of the device being consulted.
- The energy calculation can be configured in one-directional (Consumption) or two-directional (**imported and exported**) mode.



Household Consumption

CcM2-W

SINGLE PHASE DIRECT MEASUREMENT GRID ANALYSER UP TO 63 A WITH INTEGRATED WI-FI COMMUNICATIONS FOR HOME USE

Solution designed to work in isolation from the rest of the CcM devices via Wi-Fi. It is ideal for submetering in domestic installations or points in electrical panels remote or isolated from the rest of the electrical installation. It measures the energy, which circulates in one or both phases of a one or two-phase magnet and it communicates using Wi-Fi.

This device has a CcM Wi-Fi data logger inside which allows the device to communicate via Wi-Fi only and store the data for up to 3 months.

Technical Specifications Principal Devices CcM	
Maximum operation current	63 A rms [1]
Current measurement range	[0.2, 63] A rms
Maximum allowed voltage	300 V rms
Signal frequency	50/60 Hz
Communication protocol	Modbus RTU [2]
Work temperature	[-20, 50] °C
Maximum consumption	1 W
Power supply	85-300 V rms

[1] CcM4-125 measures up to 125 A rms
[2] CcM2-W communicates via Modbus RTU over TCP

Estimated errors in the measurement of variables	
Amperage	< 0.5 % RD
Voltage	< 0.2 % RD
Active energy	< 1 % RD
Reactive energy	< 2 % RD

CcM2-W communication options

Cloud mode: The device automatically sends the collected data to the server, where through our WEB portal or mobile APP the user can view current and historical, graphic or statistical data. By default, it sends electrical data from the devices every 10 seconds, this timing being configurable according to customer needs.

FTP mode: It has a configuration mode whereby the device will write the measurement data in a CSV file on a client's FTP server. By default, it sends electrical data from the devices every 10 seconds, this timing being configurable according to customer needs.

Gateway mode: The device receives requests remotely using an IP connection via ModBus RTU over TCP or ModBus TCP.

Dimensions of the CcM2-W	
Overall dimensions	35x36´5x42´5 mm
Comb dimensions	3x5x12´5 mm

Variables measurable by the CcM Principal Devices
RMS current - by phases
RMS fundamental current - by phases
Harmonic current distortion - by phases (up to 5th harmonic)
Harmonic Voltage Distortion - by phases (up to 5th harmonic)
Active energy - by phases, quadrants 1 and 4
Active energy - by phases, quadrants 2 and 3
Fundamental active energy - phased
Total active energy - Quadrants 1 and 4
Total active energy - Quadrants 2 and 3
Apparent energy - by phases
Total apparent energy
Reactive energy - by phases and by each quadrant
Fundamental reactive energy - by phases
Reactive energy total - by quadrants
Power factor - by phases
Voltage failure
Line frequency - by phases
Active power - by phases
Apparent power - by phases
Reactive power - by phases
Temperature - by phases
RMS voltage - by phases
Fundamental RMS voltage - phased

[1] CcM2-W does not measure harmonic distortion.

CcM2, CcM4 & CcM4-125

They are designed to be part of a set of devices connected to the same bus, unlike the autonomous or isolated CcM2-W. These devices make the information or measurement data accessible to the user, being required to be interrogated by one of our Wi-Fi data loggers, the CcMaster device or a conventional PLC using ModBus RTU or TCP protocol.

The combination and use of different family devices offer multiple possibilities for commercial and industrial environments. Thus, having a wired, wireless or mixed communication installation, connecting the different devices to each other to create communication buses establishing configurable master-slave hierarchies.

The principal devices with Red and Black connectors (CcM2, CcM4 and CcM4-125) feed and obtain the data of the secondary devices of the CcM family (CcM1-C, CcM1-DC, CcM3-C and CcM3-DC).

Applications

They are used to measure electrical parameters (voltage, current, energy, harmonics, etc.) in single-phase or three-phase installations with neutral. Inserted directly into a single-phase circuit breaker or differential switch, the device is connected in series with the consumption line.

These devices offer all the individual electrical values or parameters of each of its total phases in such a way that they serve to discriminate consumption by phases or, in conjunction with other CcM devices, complete the analysis and supervision of an electrical installation with multiple measuring points.

CcM2

SINGLE-PHASE NETWORK ANALYSER WITH DIRECT MEASUREMENT UP TO 63 A WITH MODBUS RTU COMMUNICATIONS AND RS-485 CONNECTION BUS

The device does NOT require the neutral to be installed on the magnetic neutral.

Dimensions of the CcM2	
Overall dimensions	45x36x49 mm
Comb dimensions	3x5x12 mm

CcM4 & CcM4-125

THREE-PHASE GRID ANALYSERS WITH DIRECT MEASUREMENT UP TO 63 AND 125 A RESPECTIVELY WITH MODBUS RTU COMMUNICATIONS AND RS-485 CONNECTION BUS

The device requires that the neutral be installed in the neutral switch.

Dimensions of the CcM4	
Overall dimensions	32x72x50 mm
Comb dimensions	3x5x12 mm

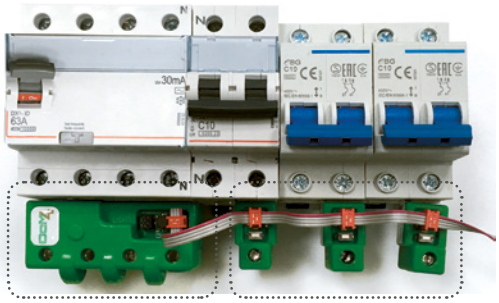
Available from 2nd semester 2020

Dimensions of the CcM4-125	
Overall dimensions	43x107x82´5 mm
Comb dimensions	3x10x16 mm

Current measuring devices

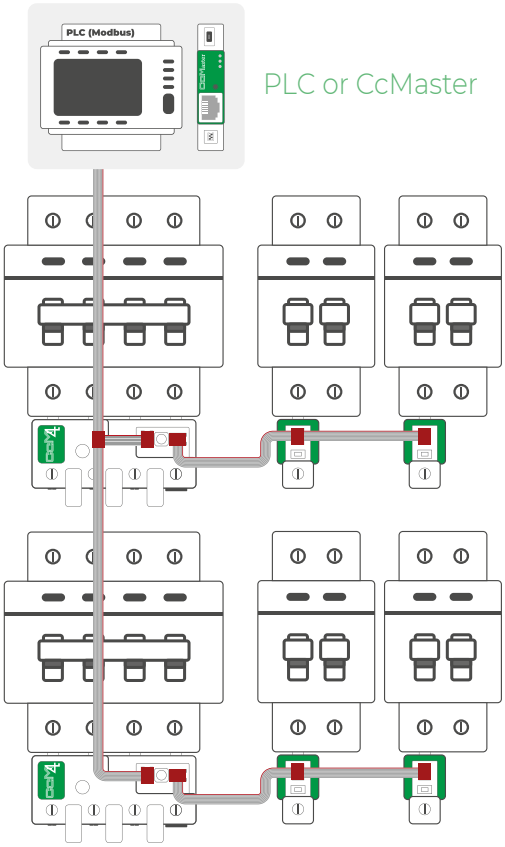
They are a perfect complement to the principal device in multi-point installations, complementing the main measures of the installation with consumption values or secondary thermal-magnetic current such as lighting, air conditioning, temporary processes, etc.

The CcM family secondary devices are devices that **only measure current** and need a Principal or Master CcM device that feeds and interrogates them to obtain the data through its red connector and the 4-wire cable that connects them.



Principal device **Current measuring devices**

They could work as isolated current sensors, with direct media without a transformer, if they were powered by an external source and interrogated by an RS-485 device with ModBus RTU protocol.



Installation and connection of principal and secondary CcM devices. **RS-485 bus ModBus Principal and secondary**

These CcM Smart metering family devices are used to measure direct or alternating current by means of a magnetic sensor (direct measurement without transformer), and to deliver the data through a ModBus RTU connection using an RS-485 bus.

Current measuring CcM devices technical specifications	
Maximum current	63 A rms AC/30 A DC
AC intensity measurement range	[0.2, 63] A rms
DC intensity measurement range	[0, 30] A
Measuring frequency	50/60 Hz
Intensity measurement error	< 1 % FS
Communication protocol	Modbus RTU
Work temperature	[-25, 50] °C
Average response time	0.1 s
Maximum consumption	0.36 W
Electrical power supply	12 VDC

CcM1-C
CcM1-DC

Technical specifications CcM1-C y CcM1 DC	
Overall dimensions	26x18x42 mm
Comb dimensions	3x5x12 mm

CcM3-C
CcM3-DC

Technical specifications CcM3-C y CcM3-DC	
Overall dimensions	28x54x43 mm
Comb dimensions	3x5x13 mm

The different versions for direct or alternating current in these devices differ in the measurement firmware, sharing the same hardware for both alternatives (AC and DC).

Photovoltaic devices current meters (DC)

ONE, THREE OR FOUR CHANNEL DIRECT CURRENT METERS FOR PHOTOVOLTAIC PROJECTS

The direct current meters for the solar sector measure direct current using magnetic sensors with a measurement accuracy error of 1%. With ModBus RTU and RS-485 communications, they are designed to be connected and interrogated by the CcM Solar Master device or the follower's PLC and can be configured with an individual address inside the ModBus Communications Bus.

It differs from the CcM1-DC and CcM3-DC devices in that the current coming from each fuse holder enters through the comb of each channel and, thanks to its ability to drive large currents, it is muddy into a common outlet allowing cost optimisation in BusBar boxes.

The CcM3-solar 30/50 is designed to measure current in BusBar boxes of 1st level series located in the photovoltaic trackers. The device is placed on the base fuse holder. It charges and measures the series currents for 1,000 and/or 1,500 V and can circulate 30/50 amps per input with a unified output of up to 90/150 A.

The main advantage of using this device in the BusBar of the follower series is that it saves communications wiring and power in the second level boxes (combiner boxes) and increases the photovoltaic production of the follower if used as a maximum current reference.

The CcM3-Solar 30/50 and CcM4-Solar 100 units are designed to measure pre-muddy or unified photovoltaic series currents of **up to 100 amps in second or third level boxes** within the photovoltaic electrical structure of large industrial facilities.

Technical specifications solar devices current meters	
Current	DC
DC intensity measurement range	0 to 30 A DC
Maximum voltage	1500 V
Communication protocol	Modbus RTU
Work temperature	[-25, 70] °C
Average response time	0.1 s
Maximum consumption	0.3 W
Electrical power supply	12-24 VDC
Working altitude	0-2000 m
IP Rating	IP20
Pollution degree	2
Relative humidity	[0, 95%] to 45 °C
Overvoltage Category	III (according to IEC 61010 + IEC 61010-2030)
Intensity Protection	External device (**Fuse holder bases**)

Example of installation of the CcM3 Solar 30 A in a fan BusBar with 3 series

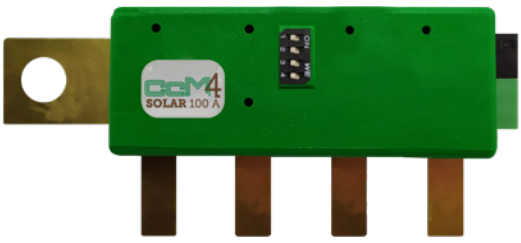
CcM3-Solar 30/50 A

THREE-PHASE CURRENT METER FOR DIRECT CURRENT UP TO 150 A

Technical specifications CcM3-Solar 30/50 A	
Maximum current CcM Solar 30A	90 A DC
Maximum current CcM Solar 50A	150 A DC
Overall dimensions	15x88x40 mm
Busbar dimensions	3x12.5x17.5 mm
Comb dimensions	3x5x15 mm
Distance between combs	17 mm
Conductive material CcM3-Solar 30 A	Nickel
Conductive material CcM3-Solar 50 A	Copper

CcM4-Solar 100A

THREE-PHASE CURRENT METER FOR DIRECT CURRENT UP TO 400 A



Technical specifications CcM3-Solar 100 A	
Maximum current	400 A DC
Overall dimensions	173x64x19 mm
Comb dimensions	10x3x15 mm
Distance between combs	27 mm
Conductive material	Copper

Wi-Fi Data Loggers

The CcM Wi-Fi device is a data logger and intelligent information manager that stay on the principal device and take from them both power and data.

With the CcM Wi-Fi family devices or external module, the user can access data taken by the CcM family principal devices wireless via Wi-Fi. It connects directly to the CcM device in question through the red and black connectors. It is an easy solution to install, adapting to the physical form of the principal devices and without requiring an external power supply, since it is supplied by the device that houses it.

In addition to supplying or sending information from the principal device that hosts it and/or its secondary bus wireless via Wi-Fi to a cloud server or allow viewing this data through a mobile application in a convenient and simple way, they also store the information, allow a more complex configuration of the principal device that hosts it and each model of the CcM Wi-Fi data loggers provides complementary home automation functions to its main function.

All Wi-Fi devices geographically place the Principal CcM device in a geographic coordinate allowing it to be adjusted to local time, configure the interval of time of sending the data to the needs of the client and allows configuring the measurement of energy of the principal device in one-directional mode or two-directional according to the direction of the current.

Technical specifications Dataloggers CcM Wifi	
Communication protocol	802.11b/g/n
Work temperature	[-25, 50] °C
Maximum consumption	0.4 W
Electrical power supply	12 VDC
IP Rating	IP20
Relative humidity	[0, 95%] to 45 °C

CcM-W communication options

Cloud mode: The device automatically sends the collected data to the server, where through our WEB portal or mobile APP the user can view current and historical, graphic or statistical data. By default, it sends electrical data from the devices every 10 seconds, this timing being configurable according to customer needs.

FTP mode: It has a configuration mode whereby the device will write the measurement data in a CSV file on a client's FTP server. By default, it sends electrical data from the devices every 10 seconds, this timing being configurable according to customer needs.

Gateway mode: The device receives requests remotely using an IP connection via ModBus RTU over TCP or ModBus TCP.

CcM-W

The CcM W is one of the CcM family devices whose objective is to connect to the CcM family principal devices CcM2, CcM4 and CcM4-125 to provide them with **wireless connectivity.**

This device, like all Wi-Fi data loggers, allows in Gateway mode, to maintain ModBus communication between the main ones and respecting the wired connection between the main one that hosts it and the secondary ones that depend on the main one by the secondary bus or cable.

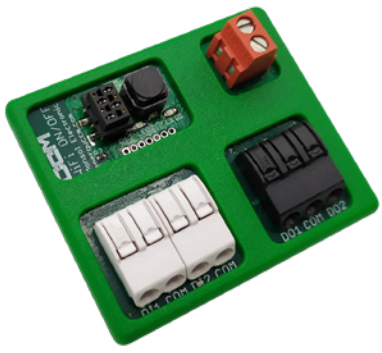
Dimensions of the CcM Wifi	
Overall dimensions	19x36x20 mm

CcM-W On/Off*

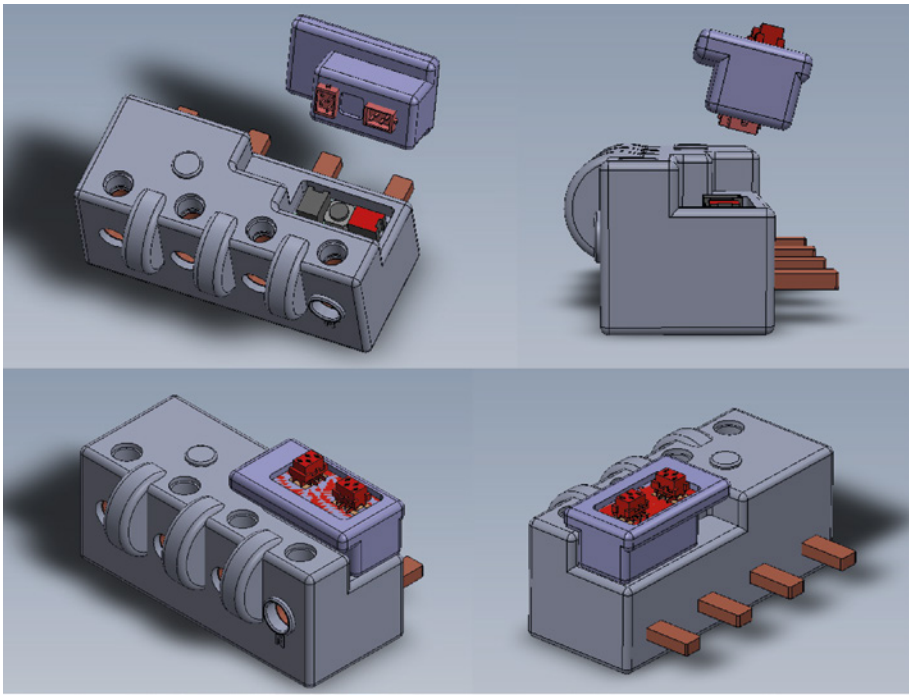
It is the most basic solution for implementing the measurement of a photovoltaic self-consumption system with regulation. Likewise, it is a device designed to interact with power cuts or control thermal-magnetic energy.

- ✓ **2 x digital inputs** or pulse counters (gas and water)
- ✓ **2 x digital outputs** to command two contactors or a remote
- ✓ **1 x RS-485** output to interrogate other third-party devices (PV inverters)

**** This WiFi device is the only one that does not store data.***



Dimensions of the CcM-W On/Off	
Overall dimensions	32x45x38 mm



CcM-W HC**

Serves to measure currents through current traps (indirect measurement) and thus be able to incorporate high currents to the system of up to 5,000 A. They incorporate the measurement of these high currents as if they were 3 secondary CcM devices but upstream of the Principal that lodges it.

The necessary current transformers are special devices that convert the current reading into an intensity signal for it to be read by our device.

- ✔ **3 x inputs to install 3 power supplies**, up to 5,000 A
- ✔ **Up to 3 months of data memory** in case of connection loss.

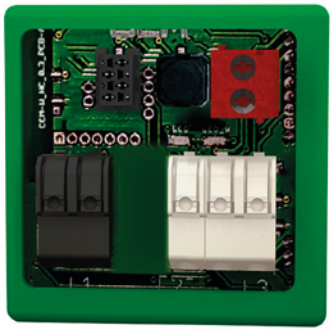
***This Wi-Fi device is the only one that can NOT interrogate other manufacturers ModBus RTU devices.**

CcM-W PT100

This Wi-Fi device is designed for the cold/heat sector as it incorporates a Pt-100 input for a high-precision temperature probe and two digital outputs to turn the power supply on and off by means of two contactors or a remote in a circuit breaker.

- ✔ **1 x high precision Pt-100 analogue input** to measure temperature.
- ✔ **2 x digital outputs** to command two contactors or a remote.
- ✔ **1 x RS-485 output** to interrogate other third-party devices (PV inverters)
- ✔ **Up to 3 months of data memory** in case of connection loss.

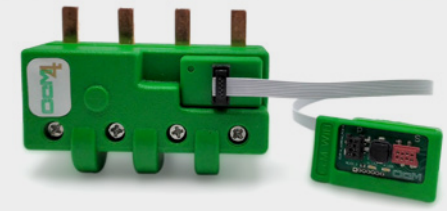
Dimensions of the cM-W HC	
Overall dimensions	36x36x22 mm



Dimensions of the CcM PT100	
Overall dimensions	45x38x32 mm

Advantages of using the extension cable

With the extension cable we manage to give versatility to the installation and improve the communication of CcM Wi-Fi with the router.

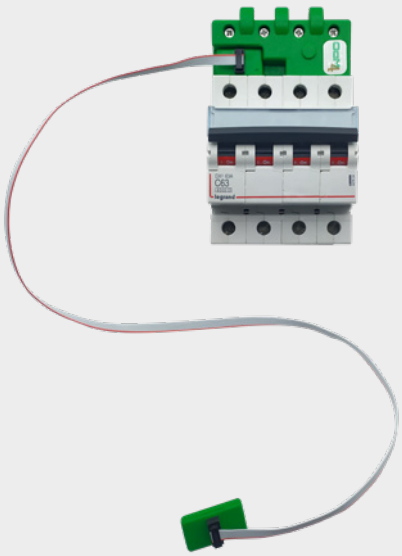


Benefit 1

With the extension cable we manage to give versatility to the installation and improve the communication of CcM Wi-Fi with the router.

Benefit 2

In case of installation needs, such as the location of our device on the top of the magnet with its neutral on the left, it forces us to install the Principal CcM device with the connectors turned towards the inside of the panel. Using the extension cable, we recover the interface (button and LEDs) to interact with the device more efficiently.



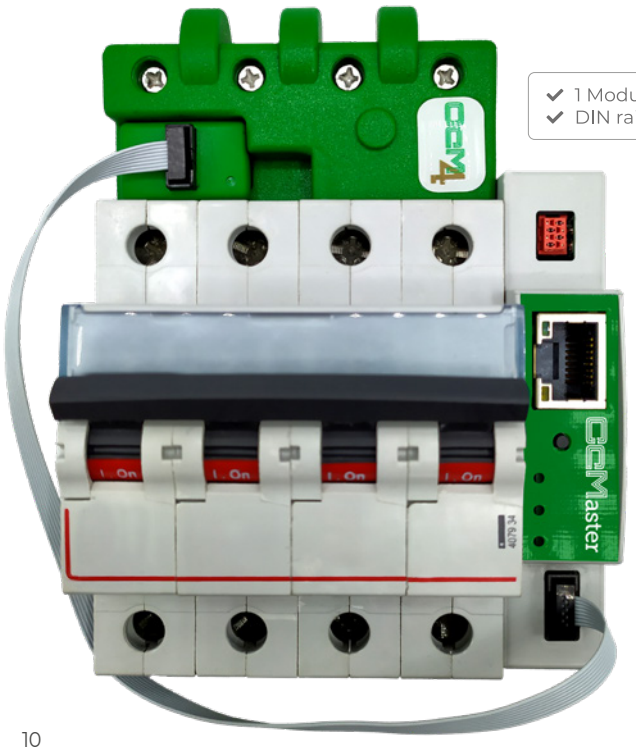
CcMaster

The CcMaster device is an intelligent multi-device hub designed to provide **up to six possible connectivity solutions: NBIoT/2G, Wi-Fi, Bluetooth, Ethernet, two RS-485 ports and an RS-232 port**. In addition, the devices also has two digital outputs and an adjustable voltage output from 0 to 10 V.

The CcMaster allows you to read CcM devices natively. It also has the DLMs and IEC protocols of meter boxes and other ModBus device such as photovoltaic inverters or grid analysers. In this way, in a comfortable and native way, information can be obtained and commanded on them through any of its data inputs (Rs 485/232/Ethernet, Wi-Fi).

Therefore, CcMaster becomes a unique communications solution for energy and self-consumption applications. And all this, following the Energy CcM philosophy of quality, safety and minimising the size of our products, being the most compact devices on the market now (1 DIN rail module).

CcMASTER versions	LITE	LITE PLUS	LITE NB/2G	PRO
Wifi	✓	✓	✓	✓
Bluetooth	✓	✓	✓	✓
CcM native bus	✓	✓	✓	✓
RS-232 (DLMS y IEC)	✓	✓	✓	✓
RS-485 ModBus RTU	✓	✓	✓	✓
NBIoT/2G	✗	✗	✓	✓
Ethernet	✗	✓	✗	✓
Digital outputs	✗	✓	✓	✓
0-10 V output	✗	✗	✗	✓

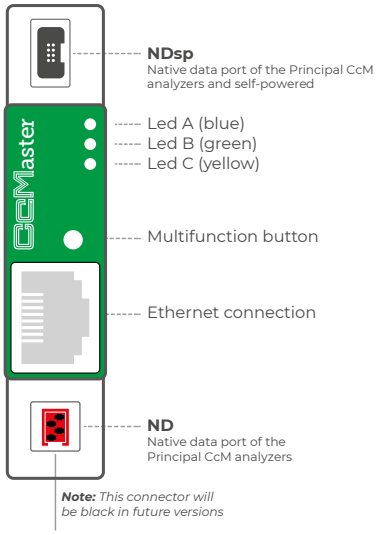


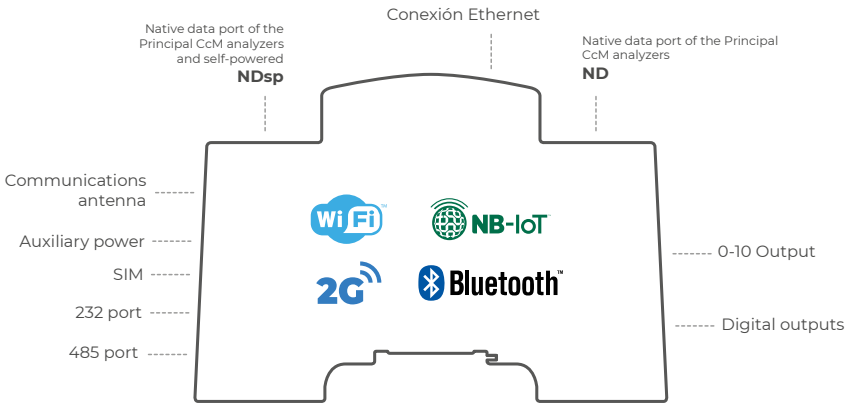
✓ 1 Module
✓ DIN rail

Universal Solution

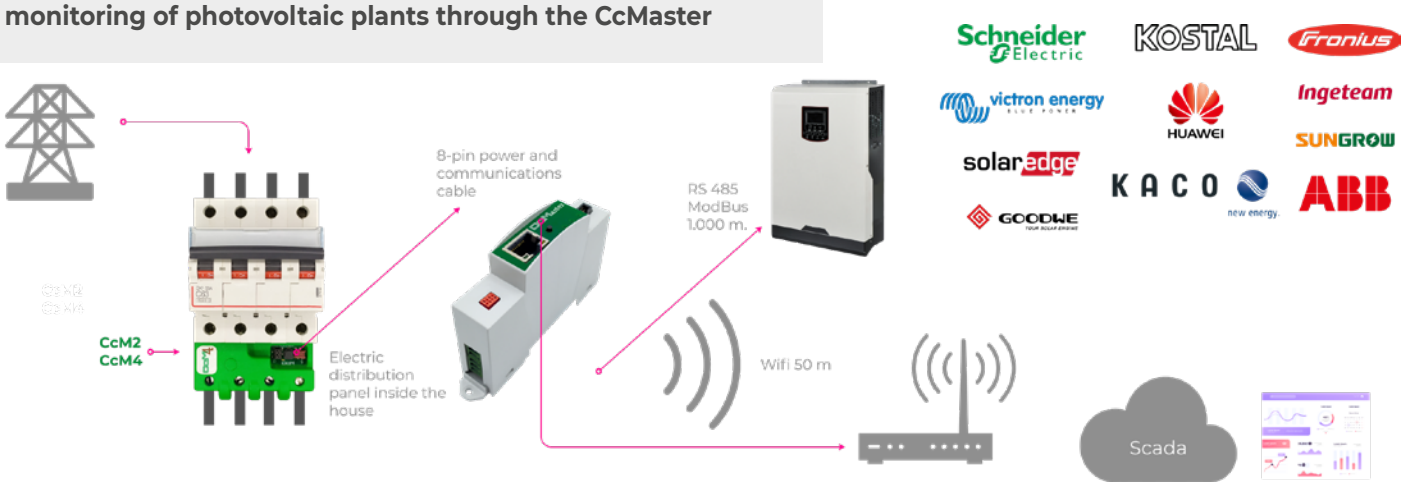
Our principal device feeds the CcMaster through the 8-wire connection or cable we supply, so that they form a perfect and compact “DUO” between them. Meanwhile, a device measures the electrical parameters and feeds the CcMaster, transmits the data of this and other connected devices, being a versatile, autonomous and compact solution.

CcMaster external features	
Work temperature	[-20, 70] °C
Storage temperature	[-30, 85] °C
Overall dimensions	62x18x89 mm
Case material	PC/ABS flame retardant
Mounting	1 rail DIN IEC/EN 60715
Declaration of conformity	CE marking





Universal technical solution for self-consumption and monitoring of photovoltaic plants through the CcMaster



CcMaster Features

- Compact design, single module DIN rail.
- Dual power supply system, through CcM principal devices (grid analysers) and/or an external power supply (9-12V@2A), with automatic power system selector.
- LiPo battery support for notifications and power failure events.
- Native connection with CcM principal devices (grid analysers) through IDC connector
- Real Time Clock with battery backup.
- Logging and storage of connected devices readings, as well as events related to the installation.
- MQTT high level communication protocol for connection to energy efficiency, IoT and SmartCity platforms.
- Remote Update System
- Signalling LEDs.
- Cortex M0+ processor of the STM32 family, with FreeRTOS real-time operating system.
- Communications:
  - Ethernet Base 10/100M, for wired network connection and external Ethernet expansions.
  - 2G/NBIoT with Micro-SIM and external MMCX antenna
  - Bluetooth Low Energy
  - Wi-Fi (802.11 b/g/n) with integrated antenna
  - SigFox (optional and not compatible with 2G/NBIoT connection)
- Fieldbuses:
  - RS-485 ModBus: Principal CcM devices (Grid analysers)
  - RS-485 ModBus Ext: Isolated RS-485 port for external devices connection (photovoltaic inverters, grid analysers and other approved devices)
  - RS-232: Non-isolated RS-232 port for electricity meters connection
- Inputs/outputs:
  - 2 isolated/potential-free bistable relay outputs (230V@2A) for controlling external elements
  - 1 adjustable DC voltage output, from 0 to 10 V, for controlling external systems

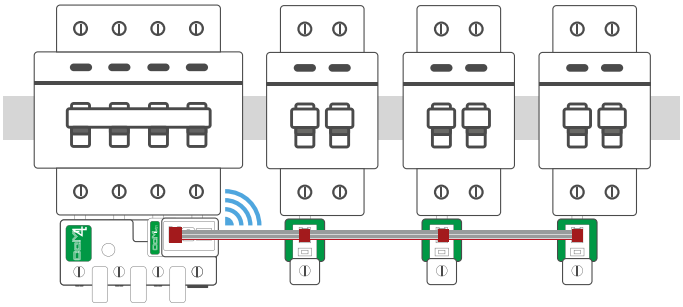
Settings

Basic configuration with a secondary bus attached to a principal device

A CcM Principal device with a CcM Wi-Fi data logger can read multiple measurement points and send the data and can also interact with the environment.

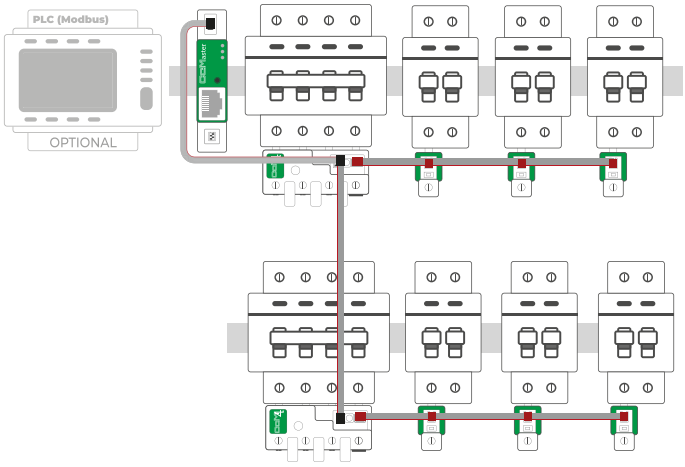
From the CcM Principal device a very precise and complete measurement of all the electrical parameters is obtained in a three-phase or single-phase magnet that is usually of main and distribution connection. This CcM Principal device is coupled with a CcM Wi-Fi that can turn on or off, measure temperature or acquire ModBus data from other devices (inverters.)

Up to 4 secondary CcM devices (Red connector) can be added to the same CcM Wi-Fi device that measure other points of consumption and interest for the client such as air conditioning, lighting, etc. In this way all the data is sent through the CcM - Wi-Fi to our platform, that of a third party or that provided by the client.



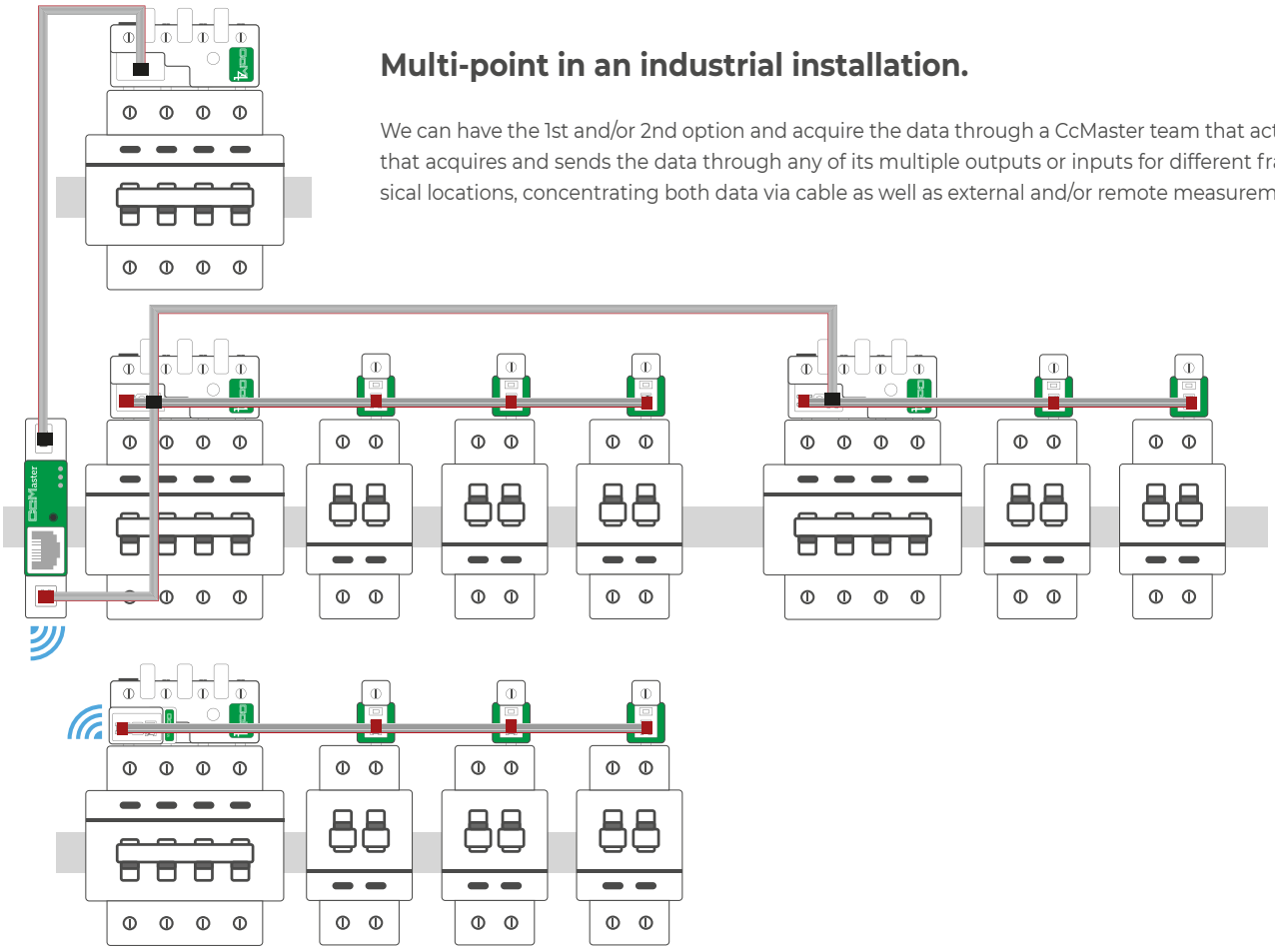
Full submetering configuration

If we must take precise and detailed measurements at more than one point, in addition to these elementary measurements of the previous example, we can add one or several CcM Principal devices linked together by a cable (black connector). The CcM Principal devices in turn can read and feed other CcM Secondary devices, establishing a mesh or network of readings of up to 32 Principal devices (A.R.) and 4 CcM secondary devices per principal device up to 160 measuring points in the same frame. All the information comes together in a single exit point that can be interrogated by a standard ModBus PLC, by the CcMaster or through a wireless connection (Gateway Mode).



Multi-point in an industrial installation.

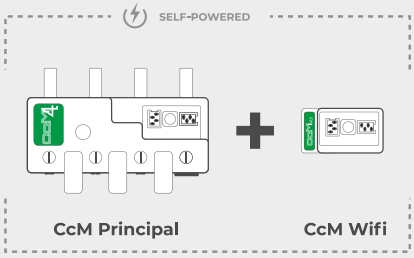
We can have the 1st and/or 2nd option and acquire the data through a CcMaster team that acts as a hub and that acquires and sends the data through any of its multiple outputs or inputs for different frames and physical locations, concentrating both data via cable as well as external and/or remote measurements via Wi-Fi.



“Packs” indicative by utilities

“Pack” Residential

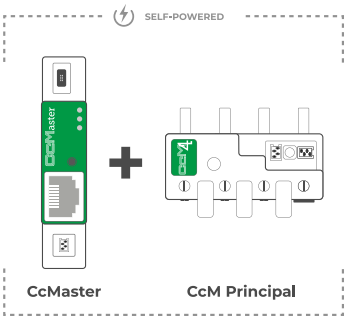
This combination between CcM principal device (grid analysers) and Wi-Fi data logger, allows to obtain consumption data from a specific point, being its most basic and common application a home, commercial premises or restaurant. Allows knowing the instantaneous consumption and powers as well as historical data through our mobile application and free web platform.



Residential (CcM Wifi)	1 x CcM2	1x CcM4
CcM-W	R-w1	R-w4
CcM-On/Off	R-on/off2	R-on/off4
CcM-Pt 100	R-Pt2	R-Pt4
CcM-H.C.	R-Hc2	R-Hc4

“Pack” Standard

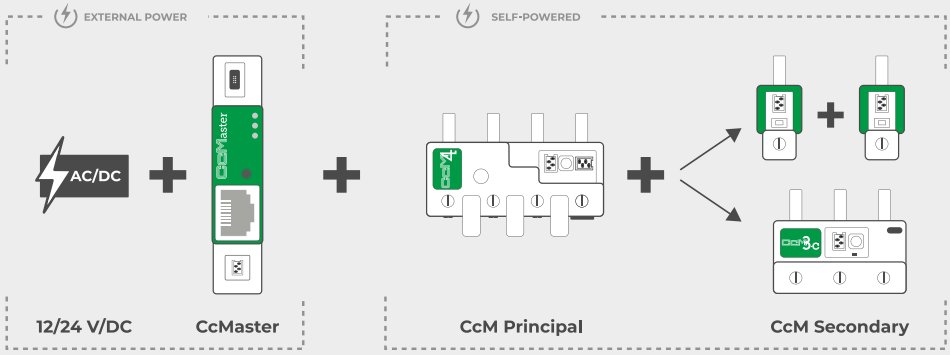
It only measures a single point (by default the main connection magnet), but by including the CcMaster it provides a complete improvement in communications, with much greater Wi-Fi coverage and/or the possibility of using SIM card (GPRS) as well as reading other devices, such as photovoltaic inverters, grid analysers and/or meters. It is an ideal solution for solar self-consumption system, isolated installations, sports facilities, engines, treatment plants or dashboards in public lights. In short, measuring points that do not have Wi-Fi coverage or that have poor coverage.



Estandard (CcMaster)	1 x CcM2	1 x CcM4
Lite	St-l2	St-l4
Lite Plus	St-lP2	St-lP4
Lite NBIoT/2G	St-NB2	St-NB4
Pro	St-pro2	St-pro4

“Pack” Company

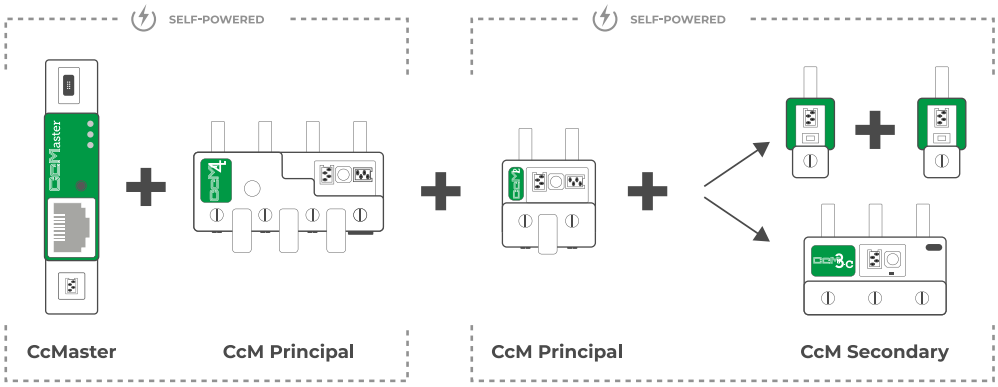
This “pack” meets more needs with 2 measurement points in addition to the principal or general. An installation type is a store that in addition to the total energy or power, wants to know the consumption of air conditioning and lighting or the state and consumption of the showcase light specifically, etc., which provides a more complete or fragmented view of consumption.



Company (CcMaster)	1 x CcM2 2 x CcM1 1 x Ac/Dc	1 x CcM4 2 x CcM 1 x Ac/Dc	1 x CcM4 1 x CcM3-C 1 x Ac/Dc
Lite	E-l2-1c	E-l4-1c	E-l4-3c
Lite Plus	E-lP2-1c	E-lP4-1c	E-lP4-3c
Lite NBIoT/2G	E-NB2-1c	E-NB-1c	E-NB4-3c
Pro	E-Pro2-1c	E-Pro4-1c	E-Pro4-3c

“Pack” Industry

This solution completes the vision of the company pack consumption with a second point of measurement of high precision and quality, such as an engine we want to know about the reactive energy that it generates or the consumption of bakery’s oven or a printing press, elevator engine of a workshop or a 2nd specific industrial process within the activity of the company that we want to know in detail and with as much information as possible.



Industry (CcMaster)	2 x CcM2 2 x CcM1	1 x CcM4 1 x CcM2 2 x CcM1	1 x CcM4 1 x CcM2 1 x CcM3-C	2 x CcM4 2 x CcM1	2 x CcM4 1 x CcM3-C
Lite	IN-l2-2-1c	IN-l4-2-1c	IN-l4-2-3c	IN-l4-4-1c	IN-l4-4-3c
Lite Plus	IN-lP2-2-1c	IN-lP4-2-1c	IN-lP4-2-3c	IN-lP4-4-1c	IN-lP4-4-3c

Industry (CcMaster)	2 x CcM2 2 x CcM1	1 x CcM4 1 x CcM2 2 x CcM1	1 x CcM4 1 x CcM2 1 x CcM3-C	2 x CcM4 2 x CcM1	2 x CcM4 1 x CcM3-C
Lite NBIoT/2G	IN-NB2-2-1c	IN-NB4-2-1c	IN-NB4-2-3c	IN-NB4-4-1c	IN-NB4-4-3c
Pro	IN-PRO2-2-1c	IN-PRO4-2-1c	IN-PRO4-2-3c	IN-PRO4-4-1c	IN-PRO4-4-3c

Photovoltaic devices current meters (DC)

ONE, THREE OR FOUR CHANNEL DIRECT CURRENT METERS FOR PHOTOVOLTAIC PROJECTS

The direct current meters for the solar sector measure direct current using magnetic sensors with a measurement accuracy error of 1%. With ModBus RTU and RS-485 communications, they are designed to be connected and interrogated by the CcM Solar Master device or the follower's PLC and can be configured with an individual address inside the ModBus Communications Bus.

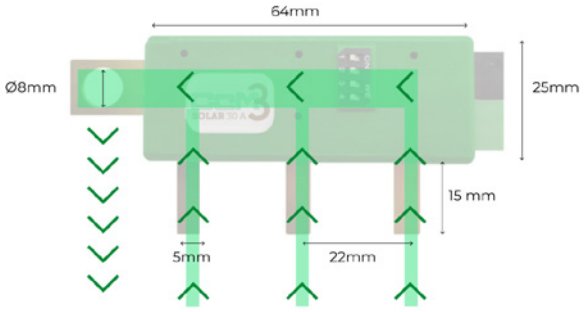
It differs from the CcM1-DC and CcM3-DC devices in that the current coming from each fuse holder enters through the comb of each channel and, thanks to its ability to drive large currents, it is muddy into a common outlet allowing cost optimisation in BusBar boxes.

The main advantage of using this device in the BusBar of the follower series is that **it saves communications wiring and power in the second level boxes** (combiner boxes) and increases the photovoltaic production of the follower if used as a maximum current reference.

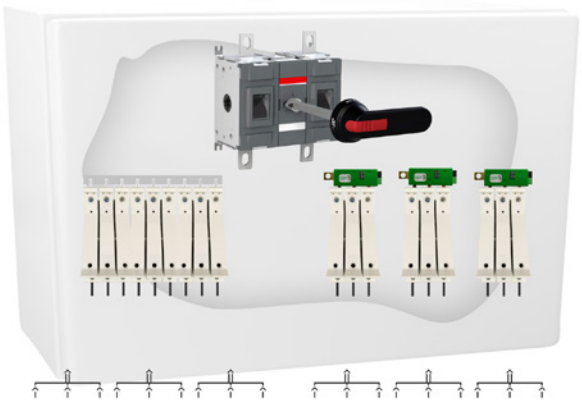
CcM3-Solar 30/50 A

THREE-PHASE CURRENT METER FOR DIRECT CURRENT UP TO 150 A

The CcM3-solar 30/50 is designed to measure current in **BusBar boxes of 1st level series located in the photovoltaic trackers**. The device is placed on the base fuse holder. It charges and measures the series currents for 1,000 and/or 1,500 V and can circulate 30 amps per input with a unified output of up to 90 A.

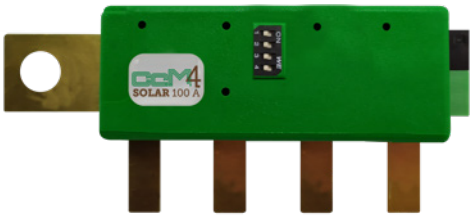


Combiner box



CcM4-Solar 100A

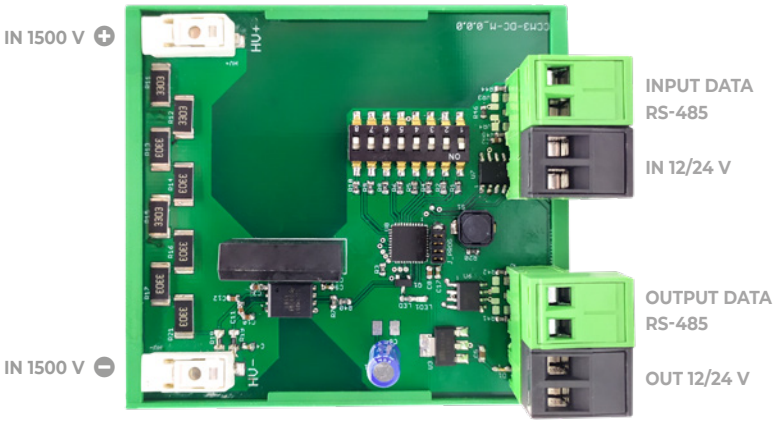
THREE-PHASE CURRENT METER FOR DIRECT CURRENT UP TO 400 A



The CcM4-Solar 100 is designed to measure pre-muddy or unified photovoltaic series currents of up to 100 amps in second or third level boxes within the **photovoltaic electrical structure of large industrial facilities**.

CcM Solar Master

CCM SOLAR SERIES READING MASTER DEVICE

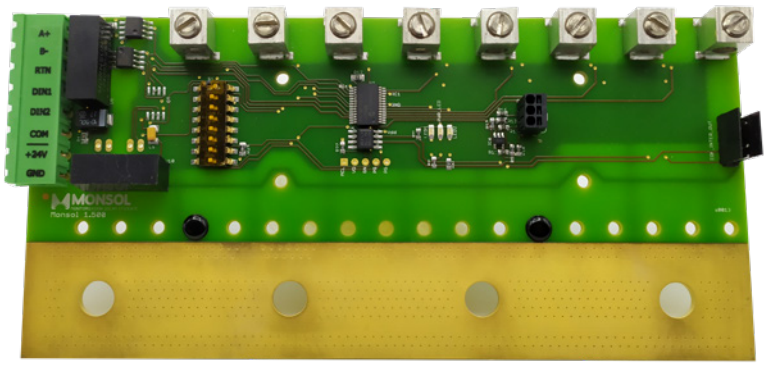


Device to give and/or distribute 12 V current to the CcM Solar meters, read the data from them on the internal bus, measure voltage and make all the data available to a higher master for Rs 485 - ModBus.

CcM Hall

PHOTOVOLTAIC SERIES CURRENT METER

CcM 1,500 Hall is a measuring device designed to monitor the current flow from the 1st or 2nd level BusBars to the inverters. Its design replaces the multi-phase electrical distribution BusBar. We recommend that it be installed during the first level BusBar assembly.



CHARACTERISTICS OF THE CCM 1500 HALL CURRENT METER

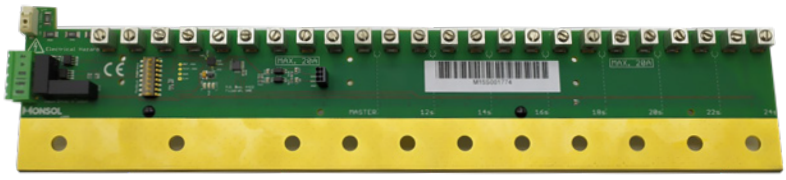
The system is composed of an 8-channel master unit or current inputs. It can be placed in the boxes of strings (combiner boxes) in the negative or positive pole, the negative pole being recommended, and measures by Hall effect the current flow through each input up to 20 A or two photovoltaic series. It is extended with up to 3 more modules that can all be current measurement (8 x 4 = 24 inputs) or 3 current and one extra voltage and all data from them come together and feed from the master.

Technical specifications CcM 1500 Hall	
Number of channels	Up to 32 channels
Number of strings per channel	3 strings (96 strings in total)
Max. current per channel	35 A DC (3 strings parallel)
Current measurement range	± 30 A (on request 50A)
Pole max. measurement voltage	Up to 1,500 V
Current measurement error	±1 % (FS)
Communication protocol	Modbus RTU over RS-485
Digital inputs	2
Analogue inputs	1 (pt100)
Maximum altitude	3500 m AMSL
Operating temperature range	min. -40°C, Max. 80°C
Supply voltage	24Vdc ± 10%
Dimensions	
Length x thickness x width (mm)	170x20x82
Extras	
Expanded features CcM	1500_Volt
Maximum voltage measurement error	1500 Vdc; error ± 1% (FS)

CcM Shunt

PHOTOVOLTAIC SERIES CURRENT METER

CcM 1,000/1,500 Hall is a measuring device designed to monitor the current flow from the 1st or 2nd level BusBars to the inverters. Its design replaces the multi-phase electrical distribution BusBar. We recommend that it be installed during the first level BusBar assembly.



CHARACTERISTICS OF THE CCM 1500 HALL CURRENT METER

Able to measure the voltage or output voltage of the String box without the need for extra systems, allowing to obtain the voltage drop by comparison between the voltage of the String box and the input voltage of the Inverter. In order to maximise space and minimise costs in the final assembly it is possible to adapt, always upon request, the size of the device by modifying the PCB and adapting the number of channels. In this way we can obtain devices with the number of channels adaptable to each project, enabling devices of 10, 12, 14, 16, 18, 20, 22 and 24 channels.

Technical specifications CcM Shunt	
Number of channels	Up to 24 channels
Number of strings	Up to 48 strings (2 per channel)
Photovoltaic field voltage	Up to 1500 V
Max. current circulation	Up to 30A
Current measurement range	30A
Max. recommended operation current	20 A (2 strings)
Communication	Modbus RTU RS-485
Digital inputs	2
Measurement error	< ± 1% (FS)
Temperature reading	Internal
Configuration	Compact from 10 to 24 inputs
Measuring location	Negative pole
Voltage monitoring	Integrated
Mounting	Integrated with a busbar
Electrical connection	Hybrid system of both, metal terminals and a comb
Power Supply	24 V DC ±10 %
Consumption	<80 mA
Measurement resolution	14 bits
Dimensions	
Max. Height x Length x Thickness	**86 x 387 x 25 mm**

Software Energy CcM

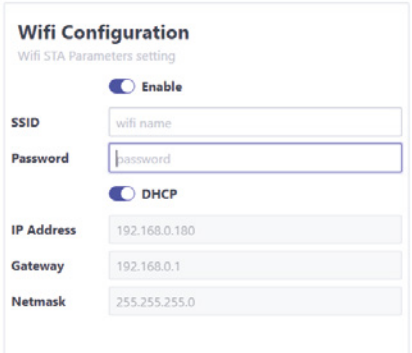
Energy CcM APP

CcM free App for monitoring is an Android application that facilitates the search and configuration of Wi-Fi devices through a mobile phone. It allows you to link them to the local Wi-Fi network, physically locate them, configure them and save historical data.

Energy CcM App for Android allows all devices with Wi-Fi and Internet connection:

- ✔ Read instant data in local mode (within the range of the phone's Wi-Fi) without creating user (every 1 second).
- ✔ Store data in the internal memory (3 months) in case of server connection loss.
- ✔ Find CcM configured within the Local Wi-Fi network and not configured (AP Mode) within the range of the phone's Wi-Fi.
- ✔ Create users to view historical data (every 10 seconds).
- ✔ Parameterisation/Configuration of historical data (10 sec, 1 min, 15 min, 30 min, 1 hr, 1 day)
- ✔ Visualise graphs and historical power, energy and power factor and in turn by specific dates, date range and months.
- ✔ Configure the Wi-Fi connection mode (Cloud, FTP or Gateway).
- ✔ Link the CcM device with the user's router.
- ✔ Transfer the CcM device to another user or appoint a supervisor (Share the data with another user).
- ✔ Geographically locate each CcM device.
- ✔ Add photos and annotations about the installation.
- ✔ Configuration of automatic/manual mode of connection between the smartphone and the Wi-Fi of the CcM device.
- ✔ View the complete WEB catalogue of CcM devices
- ✔ Link from the App to the User WEB Module (Login)
- ✔ Remote firmware updates
- ✔ Create or group devices by groups (Tables, buildings, etc.).
- ✔ Configuration and reading of temperature probes or Pt100 inputs.
- ✔ Configuration and reading of Water and Gas meters (Pulse Inputs).
- ✔ Configuration and reading of digital inputs/outputs.
- ✔ Configuration and reading of high current traffic up to 5,000 A.
- ✔ Set the counter device in one-directional or two-directional measurement mode.
- ✔ Change the symbol of current direction (Energy consumed or generated).
- ✔ Manual switching on and off of contactors, relays and remotes remotely.
- ✔ Internet or connection loss alarm.
- ✔ Abnormal frequency alarm.
- ✔ Power offset alarm in the 3 phases.
- ✔ Over voltage and voltage drop alarm.
- ✔ Voltage loss and recovery alarm.
- ✔ Maximum and minimum power and energy alarms
- ✔ Consumption chronometer with instantaneous power measurement (maximum and minimum) and total energy consumed
- ✔ Encendido y apagado manual de contactores, relés y rearmadores remotamente.
- ✔ Alarma de pérdida de internet o conexión.
- ✔ Alarma de frecuencia anómala.
- ✔ Alarma de desfases de potencia en las 3 fases.
- ✔ Alarma de sobretensión y bajada de tensión.
- ✔ Alarma de pérdida de tensión y de recuperación.
- ✔ Alarmas de potencias y energías máximas y mínimas
- ✔ Cronómetro de consumo con medida de potencia instantánea (máximo y mínimo) y total de energía consumida.

Web Server Wifi



Web Server Wi-Fi is a web portal embedded in our Wi-Fi devices. It acts as a program for acquiring the data and sending it to a remote display. It also allows a simple visualisation of data in local mode within the same Wi-Fi network.

CcManager Windows

CcManager is a program for local use to configure, name and establish communication and electrical hierarchies between different CcM smart metering and/or different electrical panels in a complex submetering installation.

Once all the frames, devices, buses and hierarchies have been configured and customised, it allows the acquisition of data in local mode and links to our website www.energyCcM.com for remote viewing.

It is recommended for multiple panels and/or devices in an industrial installation on a local PC or PLC (Windows).

Web Metering Platform

Energy CcM is a web platform hosted on our server, which includes a free hosting service for data collection by smart meter CcM, in addition to its processing and visualisation.

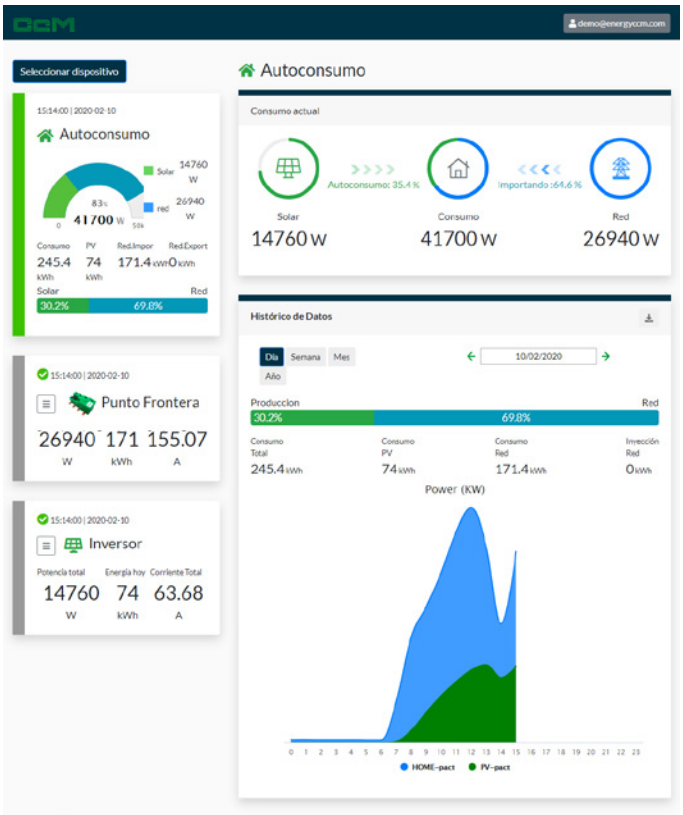
The data and its visualisation on this platform come from CcM Devices that have a CcM Wi-Fi data logger or that converge on a CcMaster device. The sending of the data is oriented, by default, to our own server or URL address ("Cloud" mode of communications).

WHAT CAN WE USE ENERGY CCM FOR?

Through this website you can visualise the data, link smart meter CcM to users and register both users and new devices for remote control and viewing. The functionalities in web format are superior to those granted by our App, allowing carrying out a deeper study of the graphics and information obtained by the devices.

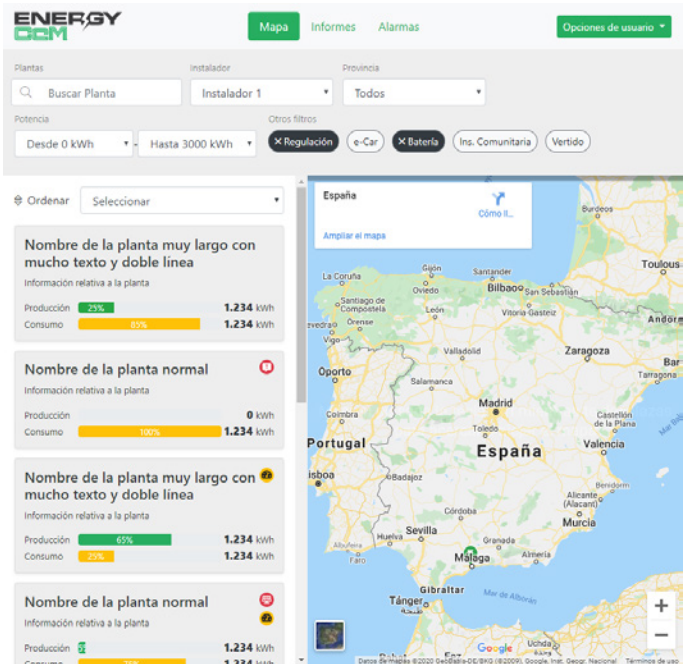
CcM Self-Consumption Web Platform

This specific use platform for self-consumption allows us to visualise our CcM measurement devices and also the data of one or several photovoltaic inverters, generating the self-consumption curve of an electrical installation. It allows you to see both the energy consumed from self-generation/surplus (exported) and show the final balance. It allows placing alarms and data analysis in the three parts of a self-consumption installation (Imported, generated and sum of both).



Virtual Control Centre

It consists of a single interface to join and filter multiple installations with CcM devices, allowing unifying all the readings, alarms and clients under a single interface and have a complete and global vision. You can search by powers, location, brands of investors, three-phase or single-phase installations, etc. It allows a global management of information and alarms for multi-point or multi-maintenance companies. They are **fully customisable developments to meet the specific needs of our customers.**



Applications

Self-consumption

With the Energy CcM metering devices you can know the consumption or demand and the production or generation, obtain the photovoltaic saving curve or regulate the inverters to avoid tipping over the grid. The CcM devices may be configured in TWO-DIRECTIONAL mode to show both the consumption and production at the same time.

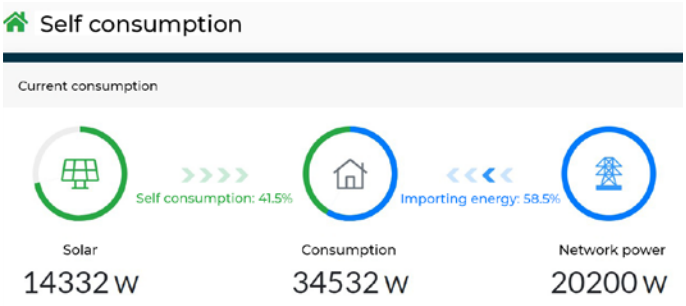


Image of our self-consumption web platform

Public Light fixtures

Our standard "packs", composed of CcM meter (grid analyser) and Cc-Master, allow to control powers through its 0-10 Volt output, turn on and off, measure energy and send data autonomously (GPRS -NBIoT). Equipment is very easy to install, without taking up space and is self-powered, which creates a perfect solution to measure and control the control panels of existing public light fixings in a precise, easy and economical way. **The CcMaster itself, in addition to obtaining data from our grid analyser (Principal CcM), can read DLMs and IEC 102 counters through the RS485 and RS232 stations**.

Energy efficiency

By having installation data, we can apply policies that help reduce consumption and encourage energy and economic savings.

Photovoltaic

Allows knowing in real time the demand of the network and the production of energy, to adapt our habits of energy expenditure.

Hotels

Allows knowing the detailed consumption of a hotel from the main tables to the consumption of a room in real time.

Household Consumption

Our equipment is ideal to know the general consumption by the general public and instant power of your home.

Holiday Homes

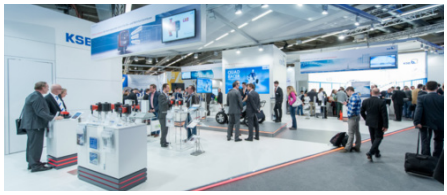
Through the App Checkbnb for holiday rental homes that allows knowing and reducing the consumption of tenants.

Campsites, ports...

It allows you to control the consumption of the facilities and their customers, allowing customers to individually bill their actual consumption.

Solar Pumping

The use of our equipment allows knowing the energy contributed by the solar system and the demand of the pumps or drives.

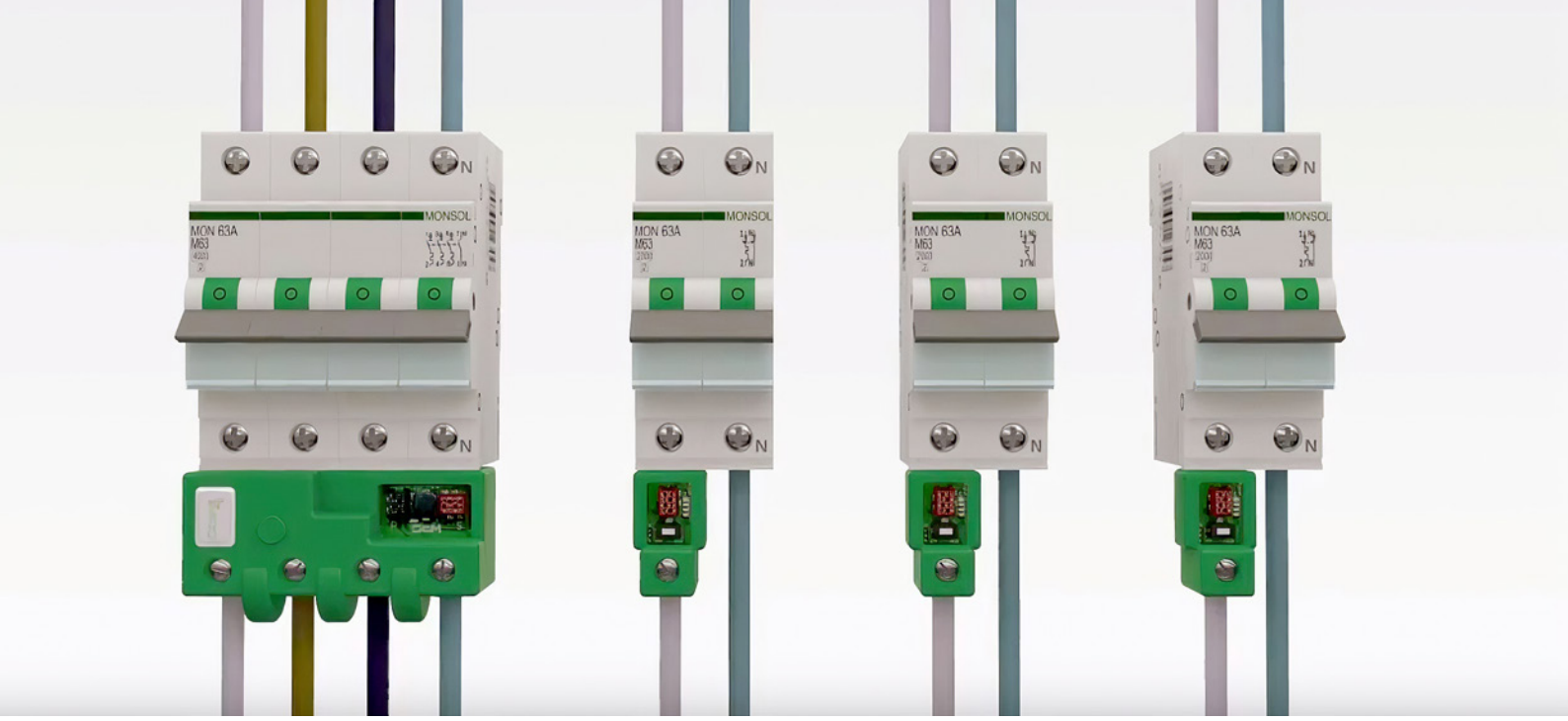


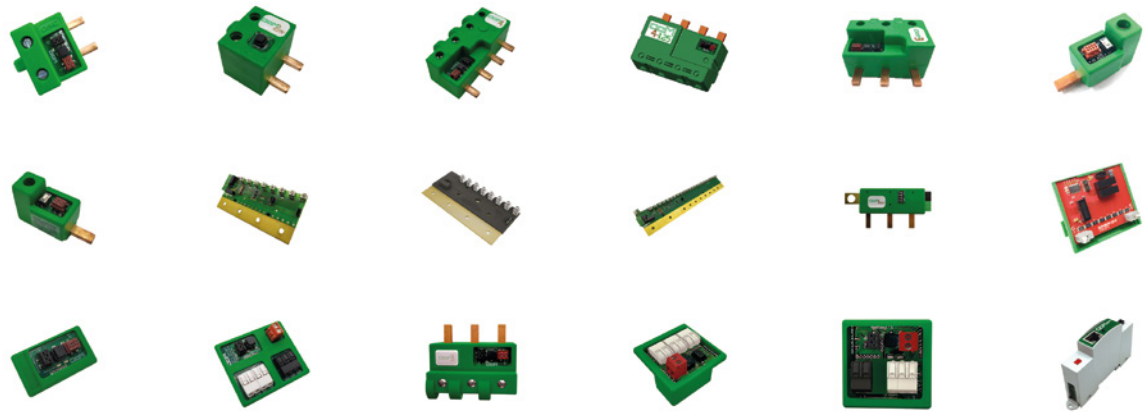
Public events

The CcM equipment allows weaving a clientelistic network between different users, portable and of easy installation.

Business centres

Both you and your customers will know your instant consumption every 10 seconds and the energy consumed over a certain period.





Know when, who, how and what your electrical installation consumes in real time

ENERGY CCM

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