SUBMETERING
ELECTRICAL BOXES

HOSPITALS

INDUSTRIES

NEIGHBOURHOOD COMMUNITIES

PUBLIC BUILDINGS

CCM 4

3 Phases + Neutral
Energy Meter

HOTELS

SHOPPING CENTER

INDUSTRIAL
*Perfect **TOOL***

- Analysis
- Energy Efficiency

DOMESTIC
*Perfect **SOLUTION***

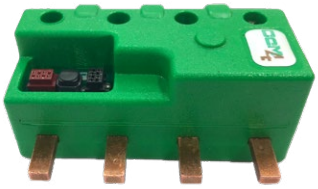
- Save Energy
- Alerts & phone

Take care of YOUR PLANET...
...**Take care** of YOURSELF

CURRENT METER TO MEASURE THREE-PHASE + NEUTRAL CIRCUIT BREAKER ELECTRICAL VALUES

CcM4 is one of the devices from CcM product family designed to measure electrical parameters (voltage, current, energy, harmonic distortion, etc.) in three-phase installations with a neutral wire. CcM product range consists of a set of devices used for the monitoring of electrical parameters inside the electrical switchboard in single- and three-phase installations. It is best suitable for installation in thermal-magnetic switches or residual-current circuit breakers.

CcM4, in particular, is one of the "**principal**" CcM product family devices (CcM4, CcM3 and CcM2 - version 485). Their function is two-fold. To work as a slave of the general master (PLC or PC, Windows/Linux) inside the principal bus and as a master inside the secondary bus, commanding other devices of the CcM family – CcM1 slaves **("Secondary device")**.



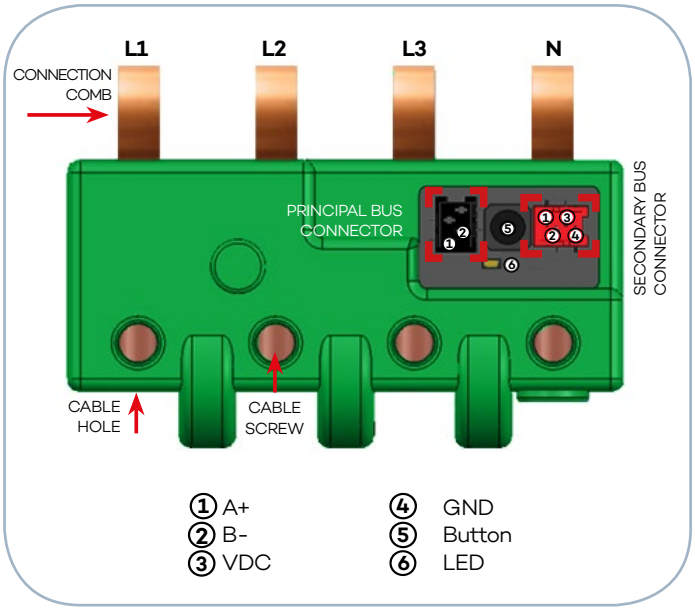
The user is able to access the data from CcM4 through RS-485 communication cable, using Modbus RTU protocol or through one of the software tools offered by CcM free of charge, such as CcManager (configuration, viewing and storing in a local network) or the Energy CcM webpage (viewing and storing data in the cloud). It is also possible to add CcM Wi-Fi peripheral to obtain data through a Wi-Fi network using or not our App CcM

As it can be combined and used with different devices within the product range, product's family offers multiple configuration options and allows users to configure the most convenient solution for both, their domestic and industrial installations. Installations can be wireless or connected with a communication cable. The devices can be connected to each other and create communication buses, establishing configurable master-slave hierarchies.

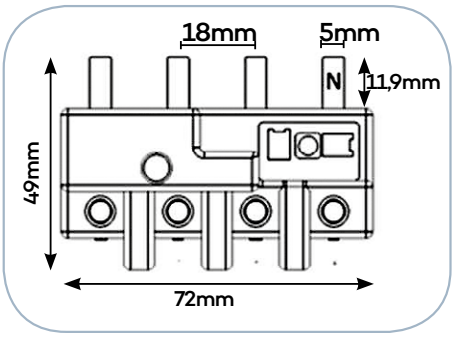
CcM4, for instance, behaves similarly to an energy meter or a grid analyzer. Inserted directly into a thermal-magnetic switch or a residual-current circuit breaker, the device is connected in series with the consumption line, registering voltage, current, power, active and reactive energy as well as harmonic distortion in each of the phases.

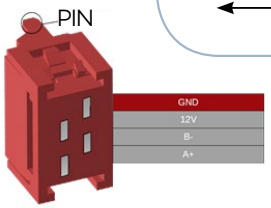
CcM 4 (Three-phase current meter)	
Maximum operation current	63 Arms
Current measurement range	[0.2, 63] Arms
Maximum allowed voltage	300 Vrms
Measurement frequency	50 Hz, 60 Hz
Current measurement error	< 0.5 % RDG
Voltage measurement error	< 0.2 % RDG
Active energy measurement error	< 1 % RDG
Reactive energy measurement error	< 2 % RDG
Communication protocol	Modbus RTU
Operating temperature	-25 < Ta < +50 °C
Maximum consumption	1 W
Power supply	85 – 300 Vrms
Dimensions (width x length x height)	
Total dimensions	72 x 49 x 31 mm
Comb dimensions	5 x 11.9 x 3 mm

CONNECTIONS

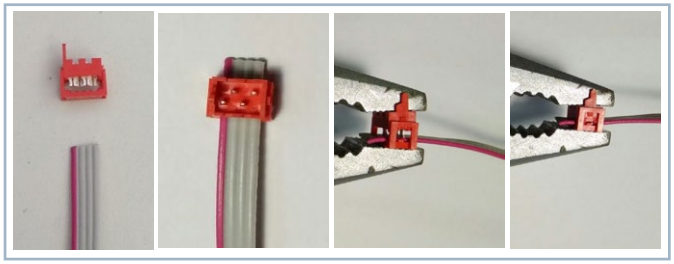


DIMENSIONS

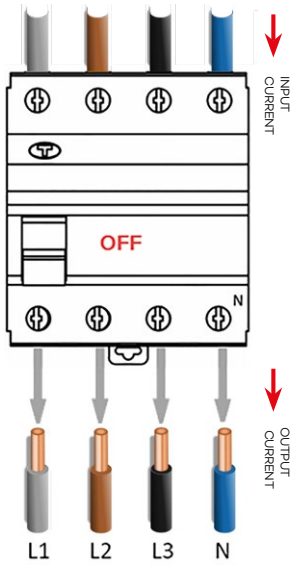




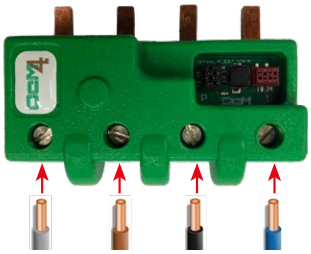
Customizable comunication cable included



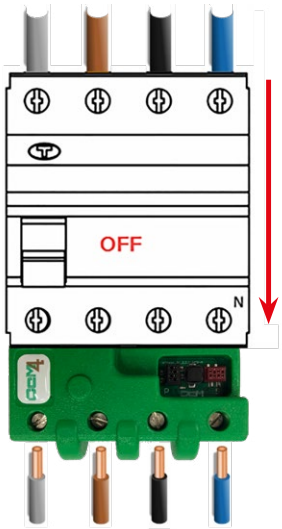
INSTALLATION 1



INSTALLATION 2



INSTALLATION 3



The main use of Monsol's CcM devices is to analyze WHERE, HOW and WHEN energy is consumed in a building, obtaining data on consumption at the level of electrical phases and monitoring in detail (sub-metering). Thanks to their versatile installation design, CcM devices meet all possible needs and configurations. Practical and easy to install, their design allows any user to 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 the vast majority of electrical systems and designs, including the oldest distribution boards.

Despite its versatility and easy installation, we strongly recommend that our devices should be installed by a professional to prevent safety hazards during manipulation.

Our products comply with all industry standards.

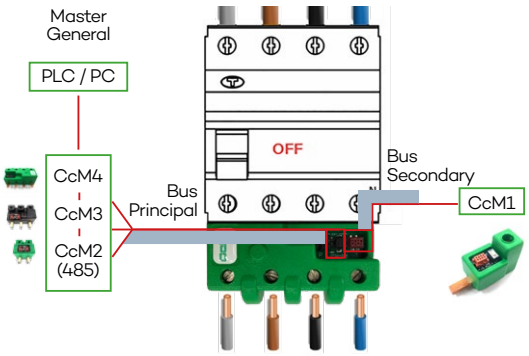
Thanks to its design, our CcM product family has been awarded a seal of excellence by the EU.

IEC
•61010-1
•61010-2-030
•61326-1

CE
Made in Europe

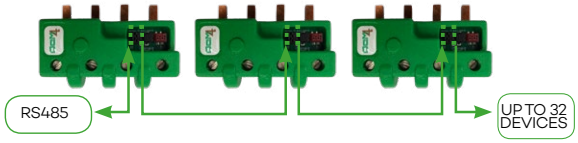
UL
Pending

CONNECTION BUS 4

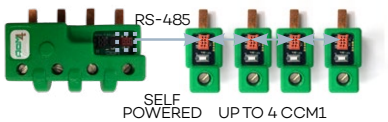


CONNECTION BETWEEN "PRINCIPAL" CcM DEVICES 5

Optional WiFi module | *Gateway Mode (Up to 32 Ccm4)
* Cloud Mode (One by one)

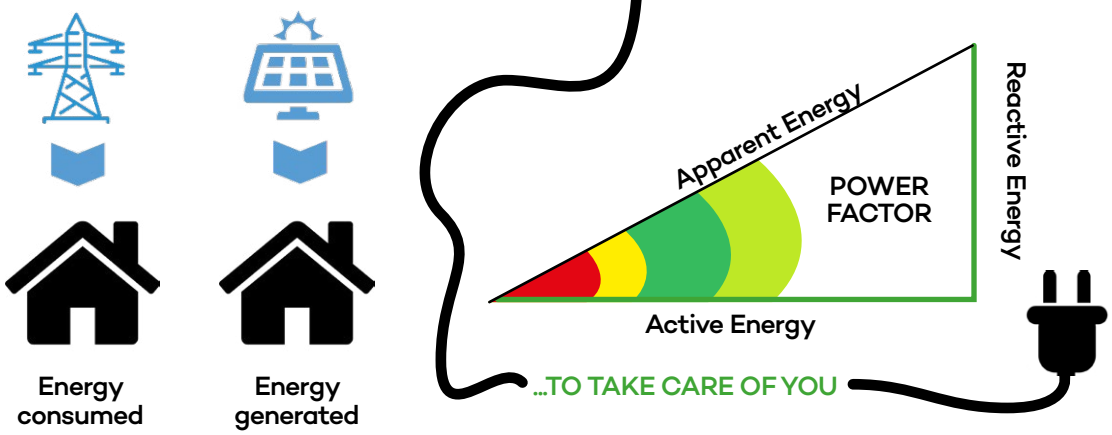


CCM1 CONNECTION TO "PRINCIPAL" CCM DEVICES



IMPORTANT! The device considers the positive charge to be flowing from the comb into the cable through-hole. If the device is connected in the opposite direction at the opposite end of the switch or at its top, the power values will appear with a minus sign and CcM4 will not be protected by the thermal-magnetic switch/residual-current circuit breakers. It is therefore recommended to install the device on the output current cables at all times.

ENERGY MEASUREMENT ON YOUR HANDS...



CCM4 MEMORY MAP

Holding and Input Register (R = FCODE 3 & 4 | W = FCODE 6)				
Description	Modbus register	Length	Type	Unit
Product Identification Code	0	1	R	-
Device Serial Number	1	2	R	-
Modbus address	3	1	R/W	-
Detected slaves quantity	19	1	R	-
Current RMS - Phase 1	20	2	R	Arms x 100
Voltage RMS - Phase 1	22	2	R	Vrms x 100
Current RMS - Phase 2	24	2	R	Arms x 100
Voltage RMS - Phase 2	26	2	R	Vrms x 100
Current RMS - Phase 3	28	2	R	Arms x 100
Voltage RMS - Phase 3	30	2	R	Vrms x 100
Power Factor - Phase 1	36	1	R	PF x 1000
Power Factor - Phase 2	37	1	R	PF x 1000
Power Factor - Phase 3	38	1	R	PF x 1000
Active energy - Phase 1, quandrants 1 and 4	40	2	R	Wh
Active energy - Phase 2, quandrants 1 and 4	42	2	R	Wh
Active energy - Phase 3, quandrants 1 and 4	44	2	R	Wh
Active energy - Phase 1, quandrants 2 and 3	46	2	R	Wh
Active energy - Phase 2, quandrants 2 and 3	48	2	R	Wh
Active energy - Phase 3, quandrants 2 and 3	50	2	R	Wh
Reactive energy - Phase 1, quadrant 1	52	2	R	Wh
Reactive energy - Phase 1, quadrant 2	54	2	R	Wh
Reactive energy - Phase 1, quadrant 3	56	2	R	Wh
Reactive energy - Phase 1, quadrant 4	58	2	R	Wh
Reactive energy - Phase 2, quadrant 1	60	2	R	Wh
Reactive energy - Phase 2, quadrant 2	62	2	R	Wh
Reactive energy - Phase 2, quadrant 3	64	2	R	Wh
Reactive energy - Phase 2, quadrant 4	66	2	R	Wh
Reactive energy - Phase 3, quadrant 1	68	2	R	Wh
Reactive energy - Phase 3, quadrant 2	70	2	R	Wh
Reactive energy - Phase 3, quadrant 3	72	2	R	Wh
Reactive energy - Phase 3, quadrant 4	74	2	R	Wh
Fundamental active energy - Phase 1	76	2	R	Wh
Fundamental active energy - Phase 2	78	2	R	Wh
Fundamental active energy - Phase 3	80	2	R	Wh
Fundamental reactive energy - Phase 1	82	2	R	Wh
Fundamental reactive energy - Phase 2	84	2	R	Wh
Fundamental reactive energy - Phase 3	86	2	R	Wh
Instantaneous active power - Phase 1	88	2	R	W
Instantaneous active power - Phase 2	90	2	R	W
Instantaneous active power - Phase 3	92	2	R	W
Instantaneous reactive power - Phase 1	94	2	R	Var
Instantaneous reactive power - Phase 2	96	2	R	Var
Instantaneous reactive power - Phase 3	98	2	R	Var
Instantaneous apparent power - Phase 1	100	2	R	VA
Instantaneous apparent power - Phase 2	102	2	R	VA
Instantaneous apparent power - Phase 3	104	2	R	VA
Harmonic distortion on voltage - Phase 1	106	2	R	THD%
Harmonic distortion on current - Phase 1	108	2	R	THD%
Harmonic distortion on voltage - Phase 2	110	2	R	THD%
Harmonic distortion on current - Phase 2	112	2	R	THD%
Harmonic distortion on voltage - Phase 3	114	2	R	THD%
Harmonic distortion on current - Phase 3	116	2	R	THD%
Fundamental RMS current - Phase 1	118	2	R	Arms x 100
Fundamental RMS voltage - Phase 1	120	2	R	Vrms x 100
Fundamental RMS current - Phase 2	122	2	R	Arms x 100
Fundamental RMS voltage - Phase 2	124	2	R	Vrms x 100
Fundamental RMS current - Phase 3	126	2	R	Arms x 100
Fundamental RMS voltage - Phase 3	128	2	R	Vrms x 100
Temperature - Phase 1	132	2	R	°C x 100
Temperature - Phase 2	134	2	R	°C x 100
Temperature - Phase 3	136	2	R	°C x 100
Signal frequency - Phase 1	140	1	R	Hz x 100
Signal frequency - Phase 2	141	1	R	Hz x 100
Signal frequency - Phase 3	142	1	R	Hz x 100

Holding and Input Register (R = FCODE 3 & 4 | W = FCODE 6)				
Description	Modbus register	Length	Type	Unit
Total active energy - Quadrants 1 and 4	144	2	R	Wh
Total active energy - Quadrants 2 and 3	146	2	R	Wh
Total reactive energy – quadrant 1	148	2	R	Wh
Total reactive energy – quadrant 2	150	2	R	Wh
Total reactive energy – quadrant 3	152	2	R	Wh
Total reactive energy – quadrant 4	154	2	R	Wh
Total apparent energy	156	2	R	Wh
Apparent energy - Phase 1	160	2	R	Wh
Apparent energy - Phase 2	162	2	R	Wh
Apparent energy - Phase 3	164	2	R	Wh
Energy registers restart	500	1	W	-
Device restart	501	1	W	-
Unidirectional/bidirectional working mode	504	1	R/W	-

Holding and Input Register (R = FCODE 3 & 4 | W = FCODE 6)				
Description	Modbus register	Length	Type	Unit
Instantaneous current value	200	1	R	Arms x 10
Average current RMS value	201	1	R	Arms x 10
Maximum current value registered	202	1	R	Arms x 10
Minimum current value registered	203	1	R	Arms x 10
Slave Modbus address	204	1	R	hex
Slave Serial Number	205	2	R	hex
Instantaneous current value	207	1	R	Arms x 10
Average current RMS value	208	1	R	Arms x 10
Maximum current value registered	209	1	R	Arms x 10
Minimum current value registered	210	1	R	Arms x 10
Slave Modbus address	211	1	R	hex
Slave Serial Number	212	2	R	hex
Instantaneous current value	214	1	R	Arms x 10
Average current RMS value	215	1	R	Arms x 10
Maximum current value registered	216	1	R	Arms x 10
Minimum current value registered	217	1	R	Arms x 10
Slave Modbus address	218	1	R	hex
Slave Serial Number	219	2	R	hex
Instantaneous current value	221	1	R	Arms x 10
Average current RMS value	222	1	R	Arms x 10
Maximum current value registered	223	1	R	Arms x 10
Minimum current value registered	224	1	R	Arms x 10
Slave Modbus address	225	1	R	hex
Slave Serial Number	226	2	R	hex
Instantaneous current value	228	1	R	Arms x 10
Average current RMS value	229	1	R	Arms x 10
Maximum current value registered	230	1	R	Arms x 10
Minimum current value registered	231	1	R	Arms x 10
Slave Modbus address	232	1	R	hex
Slave Serial Number	233	2	R	hex
Instantaneous current value	235	1	R	Arms x 10
Average current RMS value	236	1	R	Arms x 10
Maximum current value registered	237	1	R	Arms x 10
Minimum current value registered	238	1	R	Arms x 10
Slave Modbus address	239	1	R	hex
Slave Serial Number	240	2	R	hex
Instantaneous current value	242	1	R	Arms x 10
Average current RMS value	243	1	R	Arms x 10
Maximum current value registered	244	1	R	Arms x 10
Minimum current value registered	245	1	R	Arms x 10
Slave Modbus address	246	1	R	hex
Slave Serial Number	247	2	R	hex
Instantaneous current value	249	1	R	Arms x 10
Average current RMS value	250	1	R	Arms x 10
Maximum current value registered	251	1	R	Arms x 10
Minimum current value registered	252	1	R	Arms x 10
Slave Modbus address	253	1	R	hex
Slave Serial Number	254	2	R	hex

HEADQUARTERS

CcM

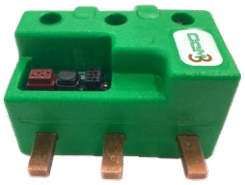
Edificio ProMálaga I+D,
Polígono Industrial Santa Cruz
C/ la Gitanilla, Nave 1
29004 (Málaga) SPAIN

OTHER FAMILY CcM DEVICES

CcM 1

CCM2-W

CcM 3



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