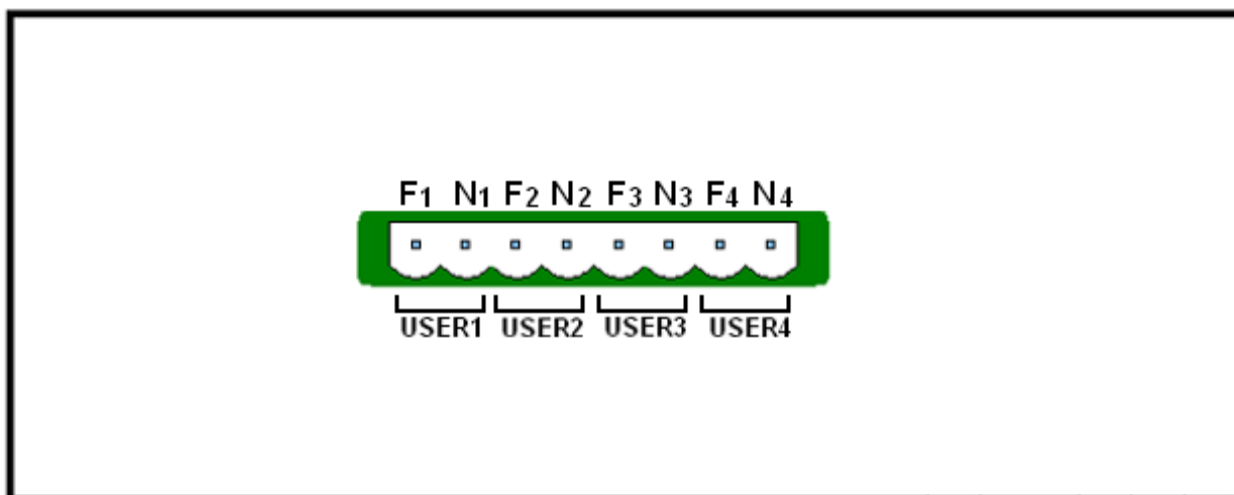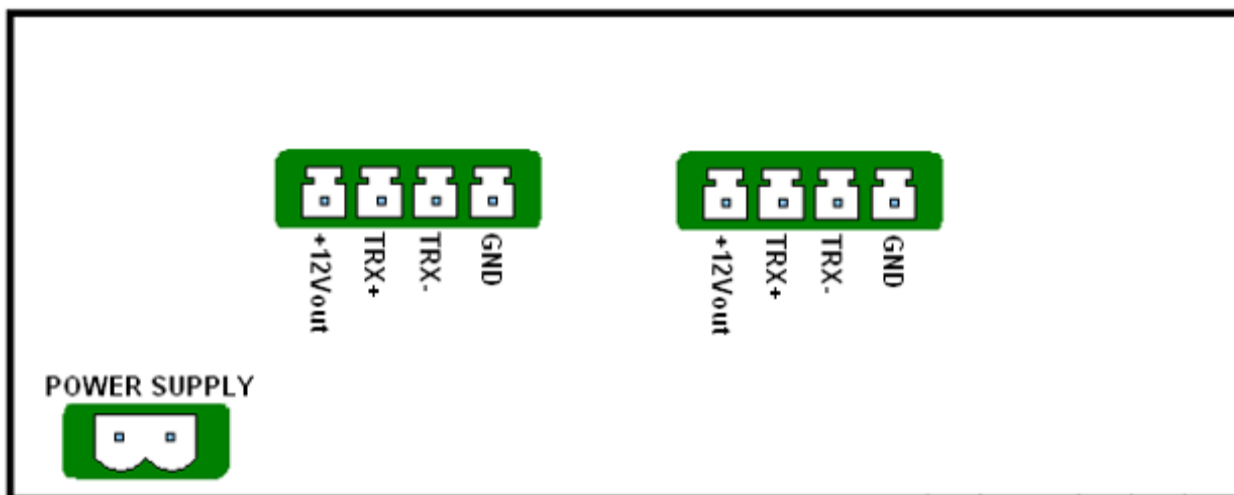# CEM04

Energy Meter Control For Four Users

- One global AC power input and four AC power outputs relè controlled (one per user)
- Wide power supply range: 90..260 Vac up to 1KW per user power control
- User friendly HMI with wide display LCD 16 x 4 and four key
- independent energy measurament for each user

ELECTRIC CHARACTERISTICS	
Power supply range	90 ÷ 260Vac
Microprocessor	STM31F100
Power Consuption	Lower than 3 Watt
Communication Ports	2 serial lines (COM 0 , COM 1). *COM 1* : It's in RS485 mode with many different standard comunication protocols for connect other devices *COM 0* : It's in RS485 mode with many different standard comunication protocols for connect other devices

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I/O Connections

+12Vout
TRX+
TRX-
GND

+12Vout
TRX+
TRX-
GND

POWER SUPPLY

F₁ N₁ F₂ N₂ F₃ N₃ F₄ N₄

USER1 USER2 USER3 USER4

MECHANICS CHARACTERISTICS	
Temperature Range	from -10 °C to +70 °C
Humidity Range	from 10 to 90% (non-condensing)
Operating Atmosphere	Without corrosive gas
Noise Immunity	According to rules in force
Fixing System	DIN rail bar
Weight	400 gr
Keyboard	Membrane customizable keyboard with 4 keys
Display	Alphanumeric display 16 characters on 4 rows
Size	110mm x 90mm depth 55mm

FUNCTIONAL DESCRIPTION

The meter is designed to connect up to four users, it is powered at 100 ÷ 240 Vac and the same Vac (phase) is connected to an input connector which is the common of the four outputs relais, meanwhile the neutral is connected directly to outputs, so the output Vac phase is driven by the four outputs relais, controlled by the firmware. An output relais is enabled when:
- the user is enabled
- the user has residual prepayed credit
- the user has not exceeded one of the Threshold.

If one of the Threshold is exceeded the output is disconnected for a programmable time, after the time is elapsed the output is reconnected and the cycle is repeated. When the corresponding output is connected the meter measure the power supplied to the single user and accumulate it to count the energy supplied, meanwhile it decrements the prepayed credit on the basis of the current time slot. At the same time the meter updates two independent counters, one can be read hourly by an external PLC to calculate and log the total amount of energy produced in a hour and the other can be read every time. The PLC decide to switch from one source of energy to another, to keep track of the energy produced by every energy source. When the complexity of a plant increase, the external PLC can be programmed to manage the different energy sources, renewable or traditional, switching or mixing one to another, choosing time by time the best and cheaper energy source. Every function can be controlled on the PLC HMI in the control room or by remote connection using a GPRS modem or Ethernet connection or bridge.