socomec
Innovative Power Solutions

551887B

COUNTIS M34/M36
THREE-PHASE AND SINGLE-PHASE DIGITAL ENERGY METERS
DIRECT CONNECTION 100A

COUNTIS M34 (MID)
ref. **48C0 3134**

COUNTIS M36 (MID)
ref. **48C0 3136**

Certificate of conformity with MID Directive.

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Safety instruction

Information for your own safety

Important Safety Information is contained in the Maintenance section. Familiarize yourself with this information before attempting installation or other procedures. Symbols used in this document:

Warning
This means that failure to observe the instruction can result in death, serious injury or considerable material damage.

Caution
This means hazard of electric shock and failure to take the necessary safety precautions will result in death,serious injury or considerable material damage.

Proper handling

The equipment (device, module) may only be used for the application specified in the catalogue and the user manual,and only be connected with devices and components recommended and approved by Socomec.

- Use only insulating tools.
- Do not connect while circuit is live (hot).
- Install and use the meter only in a dry, indoor environment.
- Do not mount the meter in an explosive area or expose the meter to dust, mildew and insects.
- Make sure the used wires are suitable for the maximum current of this meter.
- Make sure the AC wires are connected correctly before applying current/voltage to the meter.
- Do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other material as you may get an electrical shock.
- Make sure the protection cover is placed after installation.
- Installation, maintenance and reparation should only be done by qualified personnel.
- Never break the seals and open the front cover as this might influence the functionality of the meter, and will avoid any warranty.
- Do not drop, or allow physical impact to the meter as there are high precision components inside that may break.

Introduction

This document provides operating, maintenance and installation instructions. This device measures and displays the characteristics of single-phase (two-wires, 1P+N), three-phases (3 wires, 3P) and three-phases (4 wires, 3P+N) networks. The measuring parameters include voltage (V), frequency (Hz),current (A), power (kW/kVA/kVAr),import, export and total Energy (kWh/kVArh).
The unit can also measure Maximum demand of current and power. This is measured over preset periods of up to 60 minutes.

They can measure loads up to 100A direct connection and do not require external current transformers (CT). 2 built-in pulse outputs and either RS485 Modbus or M-bus communication. Configuration is password protected.

Characteristics

This series covers 2 models

Model	Current Input	Communication	MID
COUNTIS M34	Direct connect 100 A	RS485 Modbus	•
COUNTIS M36	Direct connect 100 A	M-Bus EN 13757-3	•

### RS485 Serial-Modbus RTU

*For COUNTIS M34
The meter provides a RS485 port for remote communication. Modbus RTU is the protocol applied. For Modbus RTU, the following RS485 communication parameters can be configured from the set-up menu :
Baud rate: 2400, 4800, 9600, 19200, 38400 bps (default : 9600)
Parity: NONE/EVEN/ODD (default : none)
Stop bits: 1 or 2 (default : 1)
Modbus Address: 1 to 247 (default : 001)

M-bus

*For COUNTIS M36
The meter provides an M-Bus port for remote communication. The protocol fully complies with EN13757-3.The following communication parameters can be configured :
Baud rate: 300, 600, 1200, 2400, 4800, 9600bps (default : 2400)
Parity: NONE/EVEN/ODD (default : none)
Stop bits: 1 or 2 (default : 1)
M-Bus network primary address: 3 digits number from **001** to **250**
M-Bus network secondary address: **00 00 00 00** to **99 99 99 99** (default : serial number of the meter)
Communication tables can be downloaded on the Socomec website
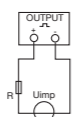
ATTENTION!
Pulse output must be fed as shown in the wiring diagram on the left. Scrupulously respect polarities and the connection mode.
Opto-coupler with potential-free SPST-NO Contact.
Contact range: 5~27 VDC / Max. current Input: 27mA DC

Pulse Output 1

Pulse output 1 is configurable. The pulse output 1 can be set to generate pulses to represent total / import/ export kWh or kVArh. The pulse weight can be set to generate 1 pulse per:
0.0025 (default)/0.01/0.1/1/10/100kWh/kVArh.
Pulse duration: 200/100(default)/60ms.

Pulse output 2

Pulse output 2 is non-configurable. It is fixed to total kWh.
The pulse weight is 400 pulses per kWh. The Pulse duration is 100ms.

Start Up Screens

(all-segment display)	The first screen lights up all display segments and can be used as a display check.
SoFt 1.302 2014	Software version information. (The information depicted in the screenshot here is only for example).
InSt tESt PASS	The interface performs a self-test and indicates the result if the test passes.

*After a short delay, the screen will display active energy information as follows:

0000 kWh Σ 031.4	Total active energy in kWh.

Measurements

Button	Function
U I ESC	Selects the Voltage, Current and THD display screens. In Set-up Mode, this is the "Left" or "Back" button.
F PF ▲	Select the Frequency, Power factor and max demand display screens. In Set-up Mode, this is the "Up" button.
P ▼	Select the Power display screens. In Setup Mode, this is the "Down" button.
E ↵	Select the Energy display screens. In Setup mode, this is the "Enter" or "Right" button.

Voltage and Current

Each successive press of the **U I** ESC button selects a new parameter:

L1 000.0 V / L2 000.0 / L3 000.0	Phase to neutral voltages (1P+N and 3P+N).
L1-2 380.0 V / L2-3 380.0 / L3-1 380.0	Phase to phase voltages (3P and 3P+N).
L1 0.000 A / L2 0.000 / L3 0.000	Current on each phase.
L1 00.00 V %THD / L2 00.00 / L3 00.00	Phase to neutral voltage THD% (1P+N and 3P+N).
L1-2 00.10 V %THD / L2-3 00.10 / L3-1 00.10	Phase to phase voltage THD% (3P and 3P+N).
L1 00.00 I%THD / L2 00.00 / L3 00.00	Current THD% for each phase.

Frequency, Power Factor and Demand

Each successive press of the **F PF** ▲ button selects a new parameter:

M 00.00 Hz / 0.999 PF	Frequency and Power Factor (total).
L1 0.999 / L2 0.999 / L3 0.999 PF	Power Factor of each phase.
MD L1 0.000 A / L2 0.000 / L3 0.000	Maximum Current Demand.
MD 0.000 kW M	Maximum Power Demand.

Power

Each successive press of the **P** ▼ button selects a new parameter:

L1 0.000 kW / L2 0.000 / L3 0.000	Instantaneous Active Power in kW.
L1 0.000 kVAr / L2 0.000 / L3 0.000	Instantaneous Reactive Power in kvar.
L1 0.000 / L2 0.000 / L3 0.000 kVA	Instantaneous Volt-Amps in KVA.
0.000 kW M 0.000 kVAr / 0.000 kVA	Total kW, kvar, kVA.

Energy Measurements

Each successive press of the **E** ↵ button selects a new parameter:

0000 kWh M 031.4	Total Active Energy in kWh.
0000 kVArh M 000.0	Total Reactive Energy in kVArh.
IMPORT 0000 kWh 0.314	Import Active Energy in kWh (Ea+).
EXPORT 0000 kWh 000.0	Export Active Energy in kWh (Ea-).
IMPORT 0000 kVArh 000.0	Import Reactive Energy in kVArh (Er+).
EXPORT 0000 kVArh 000.0	Export Reactive Energy in kVArh (Er-).

Set Up

To enter set-up mode, press the **E** ↵ button for 3 seconds until the password screen appears.

PASS 0000	Setting up is password protected. The user should enter the correct password (default '1000') before proceeding.
PASS Err	If an incorrect password is entered, the display will show: PASS Err

To exit set-up mode, press **U I** ESC repeatedly until the measurement screen is restored.

Menu Option Selection

1. Use **U I** ESC and **P** ▼ buttons to scroll through the different options of the set up menu.
2. Press **E** ↵ to confirm your selection
3. If an item flashes, then it can be adjusted by the **F PF** ▲ and **P** ▼ buttons.
4. Having selected an option, press **E** ↵ to confirm your selection.
5. Having completed a parameter setting, press **U I** ESC to return to a higher menu level. You will be able to use the **F PF** ▲ and **P** ▼ buttons for further menu selection.
6. On completion of all setting-up, press **U I** ESC repeatedly until the measurement screen is restored.

Number Entry Procedure

When setting up the unit, some screens require the entering of a number. In particular, on entry to the set-up section, a password must be entered. Digits are set individually, from left to right. The procedure is as follows:

1. The current digit to be set flashes and is set using the **F PF** ▲ and **P** ▼ buttons.
2. Press **E** ↵ to confirm each digit setting.
3. After setting the last digit, press **U I** ESC to exit the number setting routine.

Communication

Modbus or M-bus Primary Address

SEt Addr 001	(The range is from 001 to 247 for Modbus and 001 to 250 for M-bus)
SEt Addr 001	From the set-up menu, press **F PF** ▲ and **P** ▼ buttons to select the address ID.
SEt Addr 101	Press **E** ↵ button to enter the selection routine. The current setting will flash.
SEt Addr 101	Use **F PF** ▲ and **P** ▼ buttons to choose Modbus or M-bus primary address.

Press **E** ↵ button to confirm the setting and press **U I** ESC button to return the main set-up menu.

Mbus Secondary Address

*For COUNTIS M36

-Id- 9999 9999	Secondary address: 00 00 00 01 to 99 99 99 99. From the set-up menu, use **F PF** ▲ and **P** ▼ buttons to find the setting page.
-Id- 9999 9999	Press **E** ↵ to enter the selection routine. The current setting will flash.
-Id- 1193 8171	Use **F PF** ▲ and **P** ▼ buttons to set the secondary adress.

Press **E** ↵ to confirm the setting and press **U I** ESC to return to the main set up menu.

Baud Rate

Baud rate range for Modbus RTU: 2.4k, 4.8k, 9.6k, 19.2k, 38.4k.
For Mbus: 0.3k, 0.6k, 2.4k, 4.8k, 9.6k.

SEt bAud 9.6 k	From the set-up menu, use **F PF** ▲ and **P** ▼ buttons to select the baud rate option.
SEt bAud 9.6 k	Press **E** ↵ to enter the selection routine. The current setting will flash.
SEt bAud 38.4 k	Use **F PF** ▲ and **P** ▼ buttons to choose baud rate 2.4k, 4.8k, 9.6k, 19.2k, 38.4k

Press **E** ↵ to confirm the setting and press **U I** ESC to return to the main set-up menu.

Parity

SEt PArI EUEN	From the set-up menu, use F PF▲ and P▼ buttons to select the parity option.
SEt PArI EUEN	Press E↵ to enter the selection routine. The current setting will flash.
SEt PArI NONE	Use F PF▲ and P▼ buttons to choose parity (EVEN / ODD / NONE (default)).

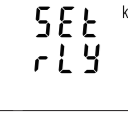Press E↵ to confirm the setting and press UI ESC to return to the main set-up menu.

Stop Bits

SEt StoP 2	From the set-up menu, use F PF▲ and P▼ buttons to select the stop bit option.
SEt StoP 2	Press E↵ to enter the selection routine. The current setting will flash.
SEt StoP 1	Use F PF▲ and P▼ buttons to choose stop bit (2 or 1) Note: default is 1, can only be set to 2 if the parity is previously set to NONE.

Press E↵ to confirm the setting and press UI ESC to return to the main set-up menu.

Pulse Output

The option allows you to configure the pulse output 1. The output can be set to provide a pulse for a defined amount of active or reactive energy. Use this section to set up the pulse for: Total kWh / Total kVArh - Import kWh / Export kWh - Import kVArh / Export kVArh

SEt rLY kWh	From the set-up menu, use F PF▲ and P▼ buttons to select the Pulse Output option.
SEt rLY kWh	Press E↵ to enter the selection routine. The unit symbol will flash.
SEt rLY kVArh	Use F PF▲ and P▼ buttons to choose kWh or kVArh.

Press E↵ to confirm the setting and press UI ESC to return to the main set up menu.

Pulse weight

Use this to set the energy represented by each pulse.
Rate can be set to 1 pulse per dFt (0.0025)/0.01/0.1/1/10/100 kWh or kVArh.

SEt rAtE 10	(It shows 1 impulse = 10 kWh or kVArh)
SEt rAtE 10	From the set-up menu, use F PF▲ and P▼ buttons to select the pulse rate option.
SEt rAtE 10	Press E↵ to enter the selection routine. The current setting will flash. When it's dFt (default), it means 2.5 Wh or varh.

Use F PF▲ and P▼ buttons to choose pulse rate. Press E↵ to confirm the setting and press UI ESC to return to the main set up menu.

Pulse Duration

The pulse duration can be set to 200, 100 (default) or 60ms.

SEt PULS 100	(It shows pulse width of 100ms)
SEt PULS 100	From the set-up menu, use F PF▲ and P▼ buttons to select the pulse duration option.
SEt PULS 100	Press E↵ to enter the selection routine. The current setting will flash.

Use F PF▲ and P▼ buttons to choose pulse duration. Press E↵ to confirm the setting and press UI ESC to return to the main set-up menu.

DIT Demand Integration Time

This sets the period in minutes over which the current and power readings are integrated for maximum demand measurement.
The options are: 0, 5, 8, 10,15, 20, 30, 60 minutes.

SEt dIt 10	From the set-up menu, use F PF▲ and P▼ buttons to select the DIT option. The screen will show the currently selected integration time.
SEt dIt 10	Press E↵ to enter the selection routine. The current time interval will flash.
SEt dIt 20	Use F PF▲ and P▼ to select the time required. Press E↵ to confirm your selection.

Use F PF▲ and P▼ buttons to choose the selection. Press E↵ to confirm the setting and press UI ESC to return to the main set-up menu.
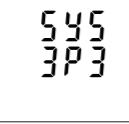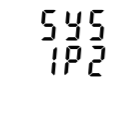
Backlight Set-up

The meter provides a function to set the backlight lasting time (0/10/30/60/120 minutes).
Option 0 means the backlight will remain always on.

SEt LP 60	Default: 60
SEt LP 60	Use F PF▲ and P▼ buttons to choose the time.

Press E↵ to confirm the setting and press UI ESC to return to the main set-up menu.
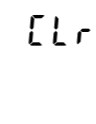
Electrical network

The unit has a default setting of 3 phases-4wires (3P+N).
Use this section to set the type of electrical network.

SYS 3P3	From the set-up menu, use F PF▲ and P▼ buttons to select the system option. The screen will show the currently selected system type.
SYS 3P3	Press E↵ to enter the selection routine. The current selection will flash.
SYS 1P2	Use F PF▲ and P▼ buttons to select the required system option: 1P2 : 1 phase + neutral 3P3 : 3 phases without neutral 3P4 : 3 phases with neutral

Press E↵ to confirm the selection. Press UI ESC to exit the system selection routine and return to the menu.

CLR

The meter provides a function to reset the maximum demand value of current and power.

CLr	From the set-up menu, use F PF▲ and P▼ buttons to select the reset option.
MD CLr	Press E↵ to enter the selection routine. The "MD" will flash.

Press E↵ to confirm the reset and press UI ESC to return to the main set-up menu.

Change Password

SEt PASS 1000	Use the F PF▲ and P▼ to choose the change password option.
SEt PASS 1000	Use the F PF▲ and P▼ to choose the change password option.
SEt PASS 1000	Press the E↵ to enter the change password routine. The new password screen will appear with the first digit flashing.
SEt PASS 1000	Use F PF▲ and P▼ to set the first digit and press E↵ to confirm your selection. The next digit will flash.
SEt PASS 1100	Repeat the procedure for the remaining three digits.
SEt PASS 1100	After setting the last digit, Press E↵ to confirm the selection.

Press UI ESC to exit the number setting routine and return to the Set-up menu.

Specifications

Measured Parameters

The unit can monitor and display the following parameters of a single phase two wires (1P+N), three phase three wires (3P) or three phase four wires (3P+N) system.

Voltage and Current

- Phase to neutral voltages 100 to 276V a.c. (in case of neutral present).
- Voltages between phases 173 to 480V a.c. (not available in single phase).
- Percentage total voltage harmonic distortion (THD%) for each phase to N (in case of neutral present).
- Percentage voltage THD% between phases (in case of neutral present).
- Current THD% for each phase

Power Factor, Frequency and Max. Demand

- Frequency in Hz
- Power factor
- Instantaneous power:
  - Power 0 to 99999 W
  - Reactive power 0 to 99999 VAr
- Volt-amps 0 to 99999 VA
- Maximum demand power since last reset
- Maximum neutral current demand, since last Reset (in case of neutral present)

Energy Measurements

- Import/Export active energy (ea+/ea-) 0 to 999999.99 kWh
- Import/Export reactive energy (er+/er-) 0 to 999999.99 kVArh
- Total active energy 0 to 999999.99 kWh
- Total reactive energy 0 to 999999.99 kVArh

Technical characteristics

| General	
Voltage AC (Un)	3x230 / 400VAC
Voltage range	80%~120% of Un
Base Current	10 A
Max. Current	100 A
Min. Current	0.5 A
Power consumption	<2W/10VA
Frequency	50Hz ±2%
Input waveform	Sinusoidal (distortion factor < 0.005)
AC voltage withstand	4KV for 1 minute
Impulse voltage withstand	6KV~1.2uS waveform
Overcurrent withstand	30Imax for 0.01s
Pulse output 1	configurable : 0.01,0.1,1,10,100,400 pulses per kWh/kVArh
Pulse output 2	non-configurable : 400 pulses per kWh
Display	LCD with white backlight
Max. Reading	999999.99 kWh/kVArh
Accuracy	
Voltage	0.5%
Current	0.5%
Frequency	0.2%
Power factor	1%
Active power	1%
Reactive power	1%
Apparent power	1%
Active energy	Class B EN50470-1/3
Reactive energy	Class 2 IEC 62053-23
Total harmonic distortion	1% up to 31st harmonic
Values refresh rate	1s, typical, to >99% of final reading, at 50 Hz
Environment	
Operating temperature	-40°C to +70°C (3K7)
Storage and transportation temperature	-40°C to +70°C
Reference temperature	23°C ±2°C
Relative humidity	0 to 95%, non-condensing
Altitude	Up to 2000m
Warm up time	3s
Mechanical environment	M1
Electromagnetic environment	E2
Degree of pollution	2
Mechanics	
Din rail dimensions	72 x 100 x 66 mm (WxHxD) DIN 43880
Mounting	DIN rail 35mm
Ingress protection	IP51
Material	Self-extinguishing UL94V-0

Interfaces for External Monitoring

Three interfaces are provided:

- RS485 Modbus RTU or M-bus for remote communication.
- Pulse output (Pulse 1) indicating real-time measured energy (configurable).
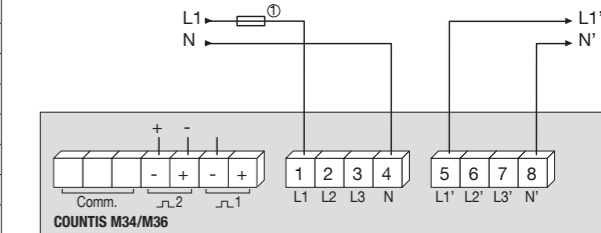- Pulse output (Pulse 2) 400 pulses per kWh (non-configurable).

The Modbus configuration (baud rate etc.) and the pulse output assignments (kWh / kVArh, import / export etc.) are configured through the set-up screens.
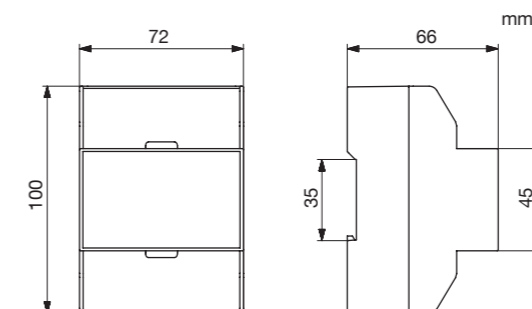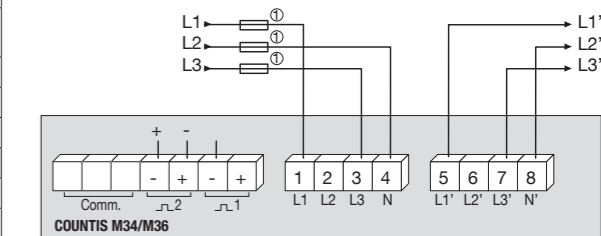
Wiring diagram

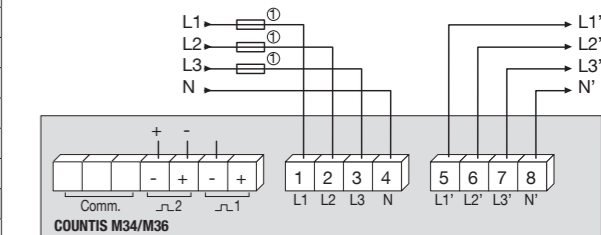### Single phase 2 wires (1P+N)

3 phases 3 wires (3P)

3 phases 4 wires (3P+N)

N - L: network input.
N' - L': network output.

Comm. terminals for RS485: NC - +

Comm. terminals for M-bus: MBUS1 MBUS2

① 100 A gG / Am fuses max.

Cable dimensions and tightening torque

Cables dimensions	COMM / Pulse	0.5~1.5mm²
	Load	4~25mm²
Tightening torque	COMM / Pulse	0.4Nm
	Load	3Nm

Declaration of Conformity for the MID approved version meter only

 Certificate of conformity with MID Directive.

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Dimensions

Print: 70 g/m² - A3 > A7 - R/V - B&W.
The bar code must be visible once the document is folded.
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