

SINGLE PHASE DIN RAIL ENERGY METER

COUNTIS M03

MANUAL V1.1



Statement

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Contents

Part 1. Product overview

1.1 Brief Introduction -----1

1.2 Product characteristics -----1

1.3 Application -----1

Part 2. General Specifications

2.1 Specifications-----2

2.2 Accuracy -----2

2.3 RS485 Communication-----3

2.4 Environment-----3

2.5 Dimensions-----4

2.6 Wiring Diagram-----4

Part 3. Operation Instructions

3.1 Display and Operation-----5

3.1.1 Display -----5

3.1.2 Button Definition-----5

3.2 Measurement-----5

Part 4. Modbus register Map-----8

Part 1 Product overview

1.1 Brief Introduction

COUNTIS M03 energy-meter “with a white back-lighted LCD screen for perfect reading” is used to measure single-phase like residential, utility and Industrial application. The unit measures and displays various important electrical parameters; provide a RS485 communication port for remote reading and monitoring. Bi-directional energy measurement makes the unit a good choice for solar PV energy metering. The compact design and DIN rail installation provides an easy and economical solution for your metering demand.

1.2 Product characteristics

- Measures kWh, Kvarh, KW, Kvar, KVA, PF, Hz, dmd, V, A, etc.
- Bi-directional measurement IMP & EXP
- Two pulse outputs
- RS485 Modbus
- DIN rail mounting 17.5mm
- 45A direct connection

1.3 Application

COUNTIS M03 is a multi-functional single phase energy meter, designed for power system, public facilities, industrial applications and residential power monitoring needs. It can also be used in AC charging pile, solar photovoltaic and other occasions. Its complete communication function makes it very suitable for real-time power monitoring systems.

Part 2 General Specifications

2.1 Specifications

- ◆ Voltage: Rated Voltage (U_n): 230V AC
Operational voltage: $\pm 20\%$ of U_n
- ◆ Current: Rated Current (I_b): 5A
Max Current (I_{max}): 45A
Over current withstand: 30 I_{max} for 0.01s
- ◆ Operational frequency: Rated: 50/60Hz
Range: 45-65 Hz
- ◆ Insulation capabilities: AC voltage withstand 4KV/1min
Impulse voltage withstand 6kV – 1.2 μ S waveform
- ◆ Internal Power Consumption: ≤ 2 W.
- ◆ Pulse Output 1: Configurable
- ◆ Pulse Output 2: Fixed 1000imp/kWh
- ◆ Display: LCD with backlit
- ◆ Max reading: 99999.9 kWh

2.2 Accuracy

- ◆ Voltage: 0.5%
- ◆ Current: 0.5%
- ◆ Frequency: 0.2%
- ◆ Power Factor: 1%
- ◆ Active Power: 1%
- ◆ Reactive Power: $\pm 1\%$

- ◆ Apparent power: $\pm 1\%$
- ◆ Active energy: Class1
- ◆ Reactive energy: Class2

2.3 RS485 Communication

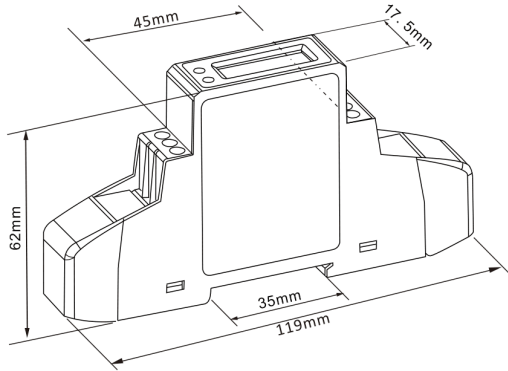
- ◆ Bus Type: RS485
- ◆ Communication Protocol: Modbus RTU
- ◆ Baud rate: 1200/2400/4800/9600bps
- ◆ Modbus Address: 1-247
- ◆ Bus load: 64pcs
- ◆ Communication distance: 1000m
- ◆ Parity: EVEN /ODD/NONE
- ◆ Data bit: 8
- ◆ Stop bit: 1

2.4 Environment

- ◆ Operating humidity: $\leq 90\%$
- ◆ Storage humidity: $\leq 95\%$
- ◆ Operating temperature: $-25^{\circ}\text{C}\sim+55^{\circ}\text{C}$
- ◆ Storage temperature: $-40^{\circ}\text{C}\sim+70^{\circ}\text{C}$
- ◆ Standard: IEC 63052-11/IEC62053-21
- ◆ Accuracy: Class 1
- ◆ Installation category: CAT II
- ◆ Protection against penetration of dust and water: IP51 (indoor)

- ◆ Insulating encased meter of protective class: II
- ◆ Altitude: ≤2000m

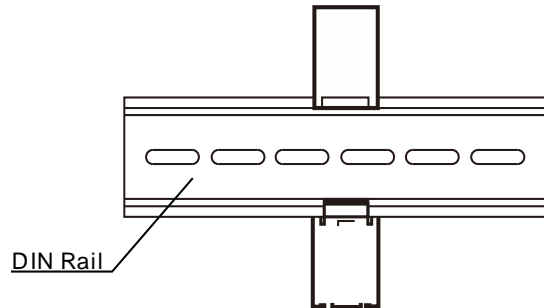
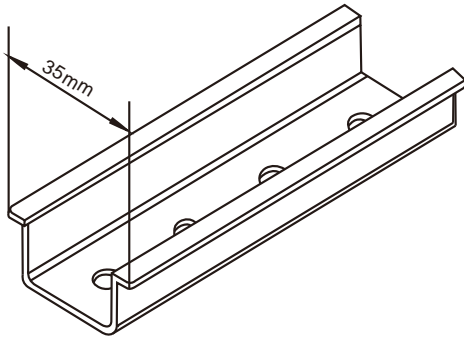
2.5 Dimensions



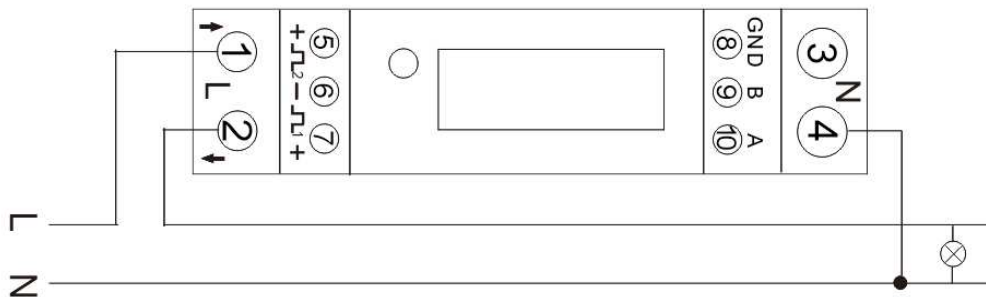
Height: 62 mm

Width: 17.5 mm

Length: 119 mm



2.6 Wiring Diagram



Part 3. Operation Instructions

3.1 Display and Operation

3.1.1 Display


When the meter is powered on, the meter will initialize and do self-checking

1	Full screen
2	Software version
3	Total active energy(kWh)

3.1.2 Button Definition



There is one button on the front panel.








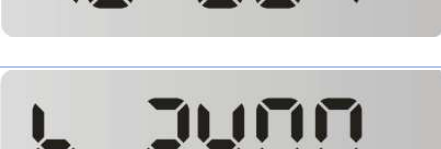
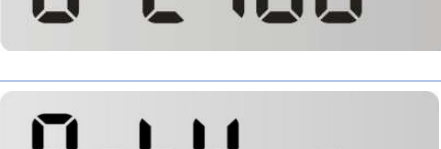
The default page is total kWh. If the user wants to check other information, please press the scroll button on the front panel.

	Click the button, the LCD display will scroll the measurements.
	Keep pressing the button for 3 seconds, the meter will enter set-up "SET" mode (If the user wants to set the parameter, like ID, baud rate etc by Modbus, he has to press the button to open the SET model, then set the parameters via Modbus.)

3.2 Measurement

Click the button, the LCD display will scroll the measurements.

1		Total active energy (kWh) Display format: 0000.00→9999.99→10000.0→ 99999.9→0000.00
1-1		Import active energy (kWh) Display format: 0000.00→9999.99→10000.0→ 99999.9→0000.00

1.2		<p>Export active energy (kwh)</p> <p>Display format: 0000.00→9999.99→10000.0→ 99999.9→0000.00</p>
2		Voltage (V)
3		Current (A)
4		Active power (W)
5		Frequency (F)
6		Power factor (PF)
7		<p>Modbus Address (ID)</p> <p>Default: 001</p>
8		<p>Baud rate</p> <p>Default: 2400</p>
9		<p>Parity: None/even/odd</p> <p>Default: none</p>

10



020 105

Software version in kind prevail

Part 4. Modbus register Map

Function code	
04	to read input parameters
03	to read holding parameter

Address (Register)	Input Register Parameter			Modbus Protocol Start Address Hex	
	Parameters	unit	format	Hi byte	Lo byte
0001	Voltage	Volts	Float	00	00
0007	Current	Amps	Float	00	06
0013	Active power	Watts	Float	00	0C
0019	Apparent power	VA	Float	00	12
0025	Reactive power	var	Float	00	18
0031	Power factor	No	Float	00	1E
0071	Frequency	Hz	Float	00	46
0073	Import active energy	kWh	Float	00	48
0075	Export active energy	kWh	Float	00	4A
0077	Import reactive energy	kvarh	Float	00	4C
0079	Export reactive energy	kvarh	Float	00	4E
0085	Total system power demand	W	Float	00	54
0087	Maximum total system power demand	W	Float	00	56
0089	Import system power demand	W	Float	00	58
0091	Maximum Import system power demand	W	Float	00	5A
0093	Export system power demand	W	Float	00	5C
0095	Maximum Export system power demand	W	Float	00	5E
0259	Current demand.	Amps	Float	01	02
0265	Maximum current demand.	Amps	Float	01	08
0343	Total active energy	kWh	Float	01	56
0345	Total reactive energy	Kvarh	Float	01	58

Function code	
10	to set holding parameter
03	to read holding parameter
04	to read input parameters

Address Register	Holding Register Parameter		Modbus Protocol Start Address Hex		Description
	Parameters	Format	Hi byte	Lo byte	
0003	Demand Period	Float	00	02	Write demand period: : 0, 5,8, 10, 15, 20, 30, 60 minutes, default 60. Setting the period to 0 will cause the demand to show the current parameter value, and demand max to show the maximum parameter value since last demand reset.
0013	Pulse 1 Width	Float	00	0C	Write Pulse 1 Width in milliseconds: 60, 100 or 200, default 60ms. Length : 4 byte Data Format : Float
0019	Network Parity Stop	Float	00	12	Write the network port parity/stop bits for MODBUS Protocol. where: 0 = One stop bit and no parity, 1 default.= One stop bit and even parity. 2 = One stop bit and odd parity.3 = Two stop bits and no parity. Requires a restart to become effective. Length : 4 byte Data Format : Float
0021	Meter ID	Float	00	14	Ranges from 1 to 247. Default ID is 1. Length : 4 byte Data Format : Float

0029	Baud rate	Float	00	1C	<p>Write baud rate for MODBUS Protocol, where:</p> <p>0 = 2400 baud (default) 1 = 4800 baud. 2 = 9600 baud 5=1200 baud.</p> <p>Length : 4 byte</p> <p>Data Format : Float</p>
0087	Pulse 1 output mode	Float	00	56	<p>Write MODBUS Protocol input parameter for pulse out 1:</p> <p>0001: Import active energy, 0002: Total active energy (Imp + exp) 0004: Export active energy, (default). 0005: Import reactive energy, 0006:Total reactive energy (Imp+ exp) 0008: Export reactive energy,</p> <p>Length : 4 byte</p> <p>Data Format : Float</p>
61457	Reset historical data	Hex	F0	10	<p>00 00: reset demand info</p> <p>Length : 2 byte</p> <p>Data Format : Hex</p>
63745	Time of scroll display	BCD	F9	00	<p>0-60s Default 0:does not display in turns</p> <p>Length : 2 byte</p> <p>Data Format : BCD</p>
63761	Pulse 1 output	Hex	F9	10	<p>0000:0.001kWh/imp(default) 0001:0.01kWh/imp 0002:0.1kWh/imp</p>

					<p>0003:1kWh/imp</p> <p>Length : 2 byte</p> <p>Data Format : HEX</p>
63777	Measurement mode	Hex	F9	20	<p>0001:mode 1(total = import)</p> <p>0002:mode 2 (total = import + export) (default)</p> <p>0003:mode 3 (total = import - export)</p> <p>Length : 2 byte</p> <p>Data Format : HEX</p>
64513	Serial number	Unsigned int32	FC	00	<p>Serial number (only read)</p> <p>Length : 4 byte</p> <p>Data Format :Unsigned int32</p>