

CONTO D1

Single Phase Din Rail Energy Meter Installation Manual



Version	Model
BASIC	CE1D45A0
PULSE	CE1D45AP CE1DMID45AP

Version	Model
MODBUS	CE1D45AMB CE1DMID45AMB
MBUS	CE1D45AM CE1DMID45AM



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DESCRIPTION

The CONTO D1 45A series is an advanced multifunction single phase energy monitoring solution with optional outputs such as pulses, RS485 RTU Modbus, Mbus and kWh meter. Equipped with scroll display button for ease of navigation through the various parameters. Housed for DIN rail mounting, IP51 protection. Certified in the UK according to EU Directive 2014/32/EU. MID certificate number 0120 / SGS0141.

Model	Version	Display	Measurement	Outputs
CE1D45A0	Basic	LCD	kWh	No
CE1D45AP	Pulse	LCD with Backlight	kWh	Pulse
CE1D45AMB	ModBus	LCD with Backlight	Multi-parameters	Impulsi & RS485
CE1D45AM	Mbus	LLCD with Backlight	Multi-parameters	Impulsi & Mbus



Model	Version	Display	Measurement	Outputs
CE1DMID45AP	Pulse	LCD with Backlight	kWh	Pulse
CE1DMID45AMB	ModBus	LCD with Backlight	Multi-parameters	Pulses & RS485
CE1DMID45AM	Mbus	LCD with Backlight	Multi-parameters	Pulses & Mbus

APPLICATION

The energy-meters are used to measure single-phase applications like residential, utility and Industrial. The unit measures and displays various important electrical parameters. It equipped with a white back-lighted LCD screen for perfect reading (only LCD for Basic version). Bi-directional energy measurement makes it 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.

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DANGERS AND WARNINGS

Information for your own safety

This manual does not contain all of the safety measures for operation of the equipment (module, device), because special operating conditions, and local code requirements or regulations may necessitate further measures. However, it does contain information which must be read for your personal safety and to avoid material damages. This information is highlighted by a warning triangle and is represented as follows, depending on the degree of potential danger.

Qualified personnel

Operation of the equipment (module, device) described in this manual may only be performed by qualified personnel. Qualified personnel in this manual means person who are authorized to commission, start up ground and label devices, systems and circuits according to safety and regulatory standards.

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 IME.

- Use only insulating tools
- Do not connect while circuit is live (hot)
- Place the meter only in dry surroundings
- 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 activating the current/voltage to the meter
- Do not connect the meter to a 3 phase - 400VAC - network
- 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 void any warranty
- Do not drop or allow physical impact to the meter as there are high precision components inside that may break

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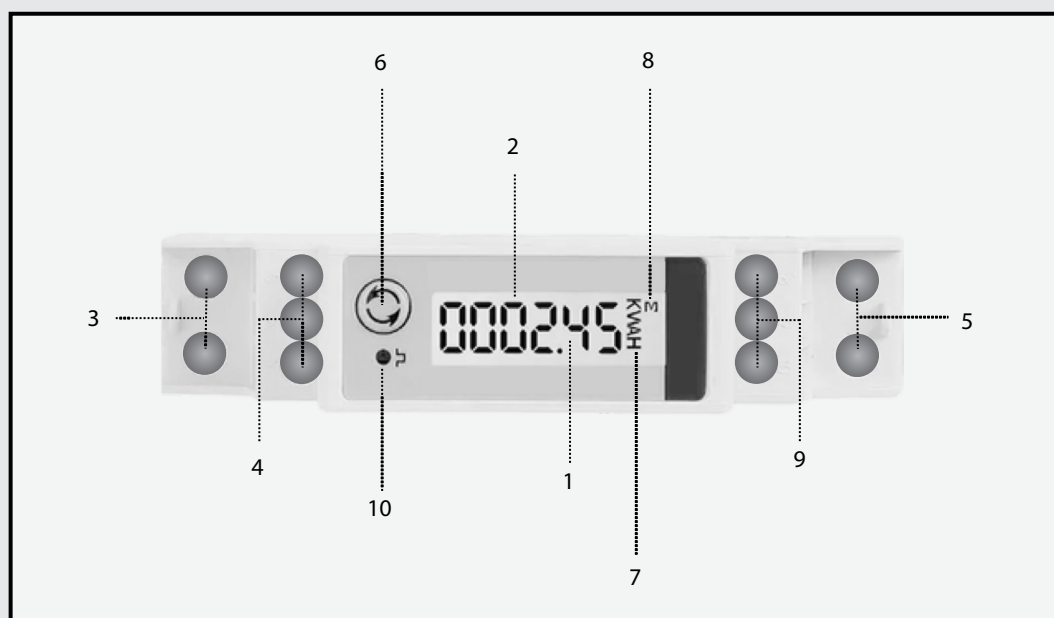
■ PRELIMINARY OPERATIONS

To ensure the safety of personnel and equipment, it is imperative to thoroughly review the contents of this booklet prior to operating the machine.

Upon receipt of the box containing the device, it is essential to verify the following points:

- the condition of the packaging
- the lack of damage or breakage resulting from transportation
- the correlation between the appliance code and the ordered code
- the inclusion of both the item and the instruction sheet in the packaging

■ PRESENTATION



- | | |
|----|------------------|
| 3 | Line |
| 2 | Values |
| 7 | Measurement unit |
| 4 | Pulse Output |
| 1 | LCD |
| 6 | Scroll display |
| 5 | Neutral |
| 8 | Energy type |
| 9 | Communication |
| 10 | Metrological LED |

Note: For further information on other meter variants - models with pulse output only or without any features - please see the 'Wiring diagrams' section

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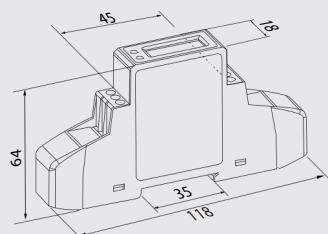
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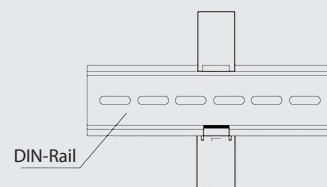
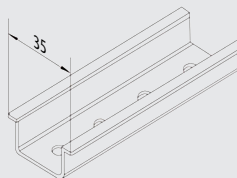
INSTALLATION

Dimensions and Prescriptions

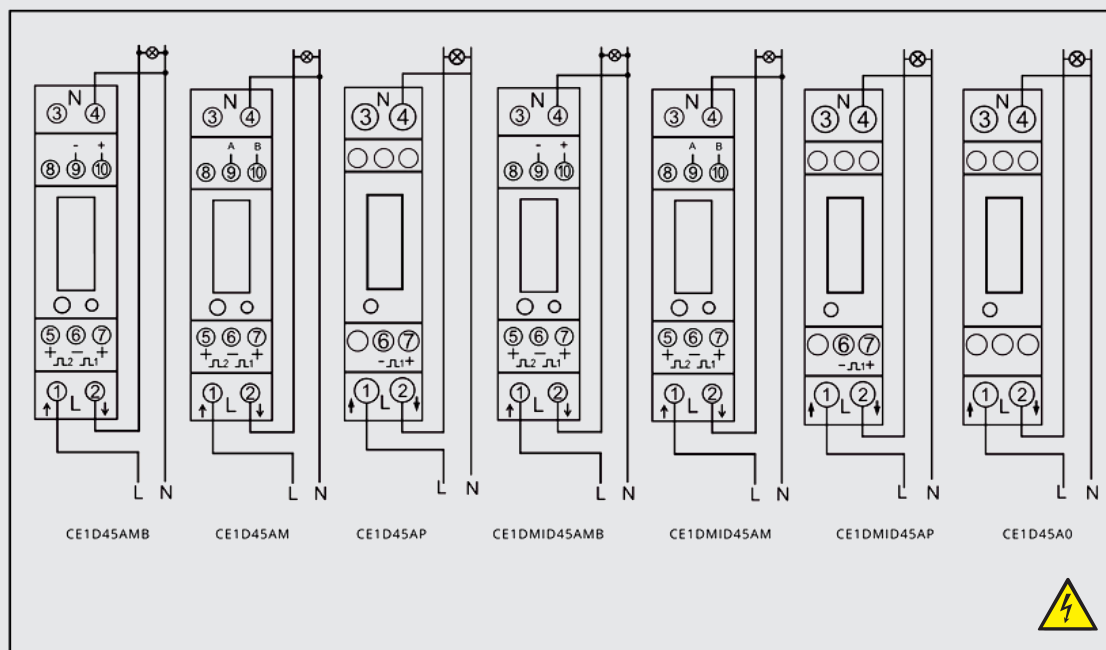
Maintain distance from systems that produce electromagnetic disturbances.



Height: 118 mm
Width: 18 mm
Depth: 64 mm
Weight: 0,1 Kg



Wiring diagrams



 1 - 2 3 - 4	8 mm MAX 1 x 2,5 mm ² 1 x 2,5 mm ² 1 x 10 mm ²	max 1,5 Nm 4mm PZ1
 5 - 6 - 7 8 - 9 - 10	5 mm MAX 1 x 0,5 mm ² 1 x 0,5 mm ² 1 x 1,5 mm ²	max 0,2 Nm 3mm PZ0

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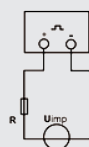
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■ COMMUNICATION

The meter is equipped with pulse output, which is fully isolated from the inside circuit. That generates pulses in proportion to the measured energy. The pulse output is polarity dependent, passive transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage shall be 5-27VDC, and the maximum input current shall be 27mA DC.



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 V DC Max.
Current input: 27 mA DC

Pulse output for CE1D45AP/CE1DMID45AP:

Pulse constant: 1000imp/kWh; Pulse width: 80ms

Pulse Output for CE1D45AMB/CE1DMID45AMB/CE1D45AM/ CE1DMID45AM:

Mbus and ModBus vers. provide two pulse outputs. Both pulse outputs are passive type. Pulse output 1 is configurable. The pulse output can be set to generate pulses to represent total/import/export kWh or kVarh.

The default is export kWh. Pulse width: 50(default)/100/200 ms.

The pulse constant can be set to: 1000(default)/100/10/1imp/kWh/kVarh.

Pulse output 2 is non-configurable. It is fixed to import kWh.

The constant is 1000imp/kWh. Pulse width: 100ms.

RS485 Output for CE1D45AMB/CE1DMID45AMB:

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 via Modbus communication or from the Set-up Mode.

- Baud rate: 2.4k, 4.8k, 9.6k, 19.2k, 38.4k bps
- Parity: None/Even/Odd
- Stop bits: 1 or 2
- Modbus Address: 001 to 247

Default parameters for communication:

- Baud rate: 19.2k bps
- Parity: Even
- Stop bit: 1
- Modbus address: 0x05

Mbus Communication for CE1D45AM/CE1DMID45AM - EN13757-3:

The meter provides an Mbus port for remote communication. The protocol fully comply with EN13757-3.

The following communication parameters can be configured via Mbus communication or from the Set-up Mode.

- Baud rate: 600, 1200, 2400, 4800, 9600 bps
- Parity: None/Even/Odd
- Stop bits: 1 or 2
- Mbus primary address: nnn - 3 digits number from 001 to 250
- Mbus secondary address: 00 00 00 00 to 99 99 99 99

Default parameters for communication:

- Baud rate: 2400 bps
- Parity: Even
- Stop bit: 1
- Mbus primary address: 0x01
- Mbus secondary address: last 8 digits of SN

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Key Guide



Keep pressing the button for 3 seconds, the meter will enter set-up mode

Settings Screens

01.a	ModBus Address
01.b	Mbus Primary Address
02.a	ModBus Baud Rate
02.b	Mbus Baud Rate
03	Parity (ModBus and Mbus vers.)
04	Stop Bits (ModBus and Mbus vers.)
05	Mbus Secondary Address - High
06	Mbus Secondary Address - Low

ModBus vers.

ModBus Address

01

Under this menu, long press this button for 3 seconds enter to the address setting



→

Adr-001

02

The leftmost digit will flash, press this button to increase or decrease number and then waiting for 2 seconds, the next digits will flash, press this button again to increase number, and waiting for 2 seconds, repeat above options until all the digits are set

Adr-001

→



03

After the setting of final digit, waiting for 2 seconds, the information will be stored automatically and the display will show 'Good' before returning to the setting mode

Adr-001

→

Adr-101

Address Options

• von 001 bis 247

Mbus vers.

Mbus Primary Address

01

Under this menu, long press this button for 3 seconds enter to the address setting



→

Adr-001

02

The leftmost digit will flash, press this button to increase or decrease number and then waiting for 2 seconds, the next digits will flash, press this button again to increase number, and waiting for 2 seconds, repeat above options until all the digits are set

Adr-001

→



03

After the setting of final digit, waiting for 2 seconds, the information will be stored automatically and the display will show 'Good' before returning to the setting mode

Adr-001

→

Adr-101

Address Options

• von 001 bis 250

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ModBus vers.	ModBus Baud Rate
02.a	01 Under this menu, long press this button for 3 seconds enter to the set-up mode  → br 384 ^x
	02 The digits will flash, press this button to choose 'Baud Rate Options', then waiting for 2 seconds. br 384 ^x → 
	03 After the setting of final digit, waiting for 2 seconds, the information will be stored automatically and the display will show 'Good' before returning to the setting mode br 384 ^x → br 24 ^x
	Baud Rate Options • 2.4k, 4.8k, 9.6k, 19.2k, 38.4k bps

Modbus/Mbus vers.	Parity
03	01 Under this menu, long press this button for 3 seconds enter to the set-up mode  → Prty n
	02 The digit will flash, press this button to choose 'Parity Options', then waiting for 2 seconds. Prty n → 
	03 After the setting of final digit, waiting for 2 seconds, the information will be stored automatically and the display will show 'Good' before returning to the setting mode Prty n → Prty o
	Parity Options • None (n) • Even (e) • Odd (o)

Mbus vers.	Mbus Secondary Address - High
05	01 Under this menu, long press this button for 3 seconds enter to the set-up mode  → H 2 126
	02 The leftmost digit will flash, press this button to increase or decrease number and then waiting for 2 seconds, the next digits will flash, press this button again to increase number, and waiting for 2 seconds, repeat above options until all the digits are set H 2 126 → 
	03 After the setting of final digit, waiting for 2 seconds, the information will be stored automatically and the display will show 'Good' before returning to the setting mode H 2 126 → H 2 126
	Address Options • 00 00 bis 99 99

ModBus vers.	Mbus Baud Rate
02.b	01 Under this menu, long press this button for 3 seconds enter to the set-up mode  → b 9600
	02 The digits will flash, press this button to choose 'Baud Rate Options', then waiting for 2 seconds. b 9600 → 
	03 After the setting of final digit, waiting for 2 seconds, the information will be stored automatically and the display will show 'Good' before returning to the setting mode b 9600 → b 9600
	Baud Rate Options • 600, 1200, 2400, 4800, 9600 bps

Modbus/Mbus vers.	Stop Bits
04	01 Under this menu, long press this button for 3 seconds enter to the set-up mode  → StoP 1
	02 The digit will flash, press this button to choose 'Stop Bits Options', then waiting for 2 seconds. StoP 1 → 
	03 After the setting of final digit, waiting for 2 seconds, the information will be stored automatically and the display will show 'Good' before returning to the setting mode StoP 1 → StoP 2
	Stop Bits Options • 1 • 2

Mbus vers.	Mbus Secondary Address - Low
06	01 Under this menu, long press this button for 3 seconds enter to the set-up mode  → L 8300
	02 The leftmost digit will flash, press this button to increase or decrease number and then waiting for 2 seconds, the next digits will flash, press this button again to increase number, and waiting for 2 seconds, repeat above options until all the digits are set L 8300 → 
	03 After the setting of final digit, waiting for 2 seconds, the information will be stored automatically and the display will show 'Good' before returning to the setting mode L 8300 → L 8300
	Address Options • 00 00 bis 99 99

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USE

Display Start-up Screens

01.a	Initialization-FullScreen (Basic and Pulse vers.)
01.b	Initialization-FullScreen (ModBus and Mbus vers.)
02.a	Software Version (All models)
02.b	Software Version (Basic and Pulse vers.)
02.c	Software Version (All models)
03	CRC High Bit (Tutti i modelli)
04	CRC Low Bit (Tutti i modelli)
05.a	Active Energy (Basic and Pulse vers.)
05.b	Total Active Energy (ModBus and Mbus vers.)

Basic/Pulse vers.	Initialization - FullScreen	
01.a		Initialization - Full screen

ModBus/Mbus vers.	Initialization - FullScreen	
01.b		Initialization - Full screen

Tutti i modelli	Software Version	
02.a		Software Version

Basic/Pulse vers.	Software Version	
02.b		Software Version

Tutti i modelli	Software Version	
02.c		Software Version

Tutti i modelli	CRC high bit	
03		CRC high bit

Tutti i modelli	CRC Low Bit	
04		CRC low bit

Basic/Pulse vers.	Active Energy	
05.a		Active energy

ModBus/Mbus vers.	Total Active Energy	
05.b		Total active energy

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■ Display Screens

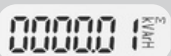
01.a	Active Energy (Basic and Pulse vers.)
01.b	Total Active Energy (ModBus and Mbus vers.)
02	Import Active Energy (ModBus and Mbus vers.)
03	Export Active Energy (ModBus and Mbus vers.)
04	Total Reactive Energy (ModBus and Mbus vers.)
05	Voltage (ModBus and Mbus vers.)
06	Current (ModBus and Mbus vers.)
07	Active Power (ModBus and Mbus vers.)
08	Frequency (ModBus and Mbus vers.)
09	Power Factor (ModBus and Mbus vers.)
10.a	Modbus Address
10.b	Mbus Primary Address
11.a	ModBus BaudRate
11.b	Mbus Baud Rate
12	Parity (ModBus and Mbus vers.)
13	Mbus Secondary Address - High
14	Mbus Secondary Address - Low

Basic/Pulse vers.	Active Energy
01.a	 Active energy

ModBus/Mbus vers.	Total Active Energy
01.b	 Total active energy

ModBus/Mbus vers.	Import Active Energy
02	 Import active energy

ModBus/Mbus vers.	Export Active Energy
03	 Export active energy

ModBus/Mbus vers.	Total Reactive Energy
04	 Total reactive energy

ModBus/Mbus vers.	Voltage
05	 Voltage

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ModBus/Mbus vers.	Current
06	20.18 ^A Current

ModBus/Mbus vers.	Active Power
07	000 ^{kW} Active power

ModBus/Mbus vers.	Frequency
08	50.04 ^{Hz} Frequency

ModBus/Mbus vers.	Power Factor
09	PF 100 Power factor

ModBus vers.	ModBus Address
10.a	Adr-001 Modbus address

Mbus vers.	Mbus Primary Address
10.b	Adr-001 Mbus primary address

ModBus vers.	ModBus Baud Rate
11.a	b 384 ^K Baud rate

Mbus vers.	Mbus Baud Rate
11.b	b 2400 Baud rate

ModBus/Mbus vers.	Parity
12	Prty n Parity

Mbus vers.	Mbus Secondary Address - High
13	H 0000 Mbus secondary address - High

Mbus vers.	Mbus Secondary Address - Low
14	L 0000 Mbus secondary address - Low

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TECHNICAL SPECIFICATIONS

Display

Type

All devices are equipped with a LCD with backlit, except for model CE1D45A0, which features a standard LCD display.

Caratteristiche elettriche

Voltage AC (Un)

230V
176~276V AC (Basic/Pulse vers.)

Voltage range

100~277V AC (Modbus/Mbus vers.)
0.15-5(45)A (Max. 45A)

Current input

<2W/10VA

Voltage Circuit

<1VA

Current Circuit

50/60Hz

Frequency

4KV for 1 minute

AC voltage withstand

6KV~1.2uS waveform

Impulse voltage withstand

30Imax for 0.01s

Overcurrent withstand

1000/100/10/1imp/kWh/kVArh (conf.)

Pulse output 1

1000imp/kWh (no conf.)

Pulse output 2

99999.9kWh/kVArh

Max. Reading

Accuracy (IEC/EN61557-12)

Voltage

cl. 0.5

Current

cl. 0.5

Frequency

cl. 0.2

Power factor

cl. 1

Active power

cl. 1

Reactive power

cl. 1

Apparent power

cl. 1

Environment

Reference temperature

23°C±2°C

Installation category

CATIII

Relative Humidity

0 to 95%, non-condensing

Altitude

Up to 2000m

Location

Dry

Warm up time

3s

Mechanical characteristics

Weight

0.1 kg

Din rail dimensions

18x118x64 (WxHxD) DIN 43880

Mounting

DIN rail 35mm

(wall or Mounting cabinet mounting)

Protection class:

- Terminal protection index against solid bodies and liquids
- Housing protection index against solid bodies and liquids

IP20 (IEC/EN 60529).

IP51 (IEC/EN 60529).

Material

Self-extinguishing UL94V-0

Class II

Front panel with cover plate

Level of pollution

2

Protection class against external mechanical impacts

IK02 (IEC/EN 62052-31)

Mechanical environment

M1

Electromagnetic environment

E2

Climatic characteristics

Operating room temperatures

T min. = - 40 °C; T max. = + 70 °C

Storage room temperatures

T min. = - 40 °C; T max. = + 80 °C

Diagnostic

Current output diagnostic

Open circuit

Voltage output diagnostic

Low output load

■ CONFORMITY AND CERTIFICATIONS

European Directives:

2014/30/EU

2014/32/EU

2014/35/EU

According to the standard:

Low voltage Directive IEC/EN 61010-1.

EMC compatibility: EN/IEC 62052-11 / EN 50470-3

Active energy: Class 0.5 Wh (EN 62053-21)

Class C (EN 50470-3) (MID version)

Reactive energy: Class 2 varh (EN 62053-23)

Respecting the environment - Conformity with CEE Directives: Compliance with the 2011/65/EU Directive, as modified by the 2015/863/EU Directive (RoHS), on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Conformity with the REACH Regulation (1907/2006): at the date of publication of this document no substance in the annex XIV is found in these products.

RAEE Directive (2012/19/EU): the sale of this product includes a contribution to the appointed environmental bodies of each European country in charge of handling, at the end of their life, the products falling within the scope of the EU Directive on Electrical and Electronic Equipment Waste.

Plastic materials:

Plastic materials without Halogens.

Parts marking according to standards ISO 11469 and ISO 1043.

Packaging:

Packaging designed and produced in accordance with Decree 98-638 of 20/07/98 and Directive 94/62/CE.



APPENDIX**Mbus protocol****1. Initialization slave**

Format:

Start	C Field	A Field	Check Sum	Stop
10	40	XX	CS	16

XX=1 to FF

The address field serves to address the recipient in the calling direction, and to identify the sender of information in the receiving direction. The size of this field is one Byte, and can therefore take values from 0 to 255. The addresses 2 to 250 can be allocated to the individual slaves, up to a maximum of 250. Unconfigured slaves are given the address 1 at manufacture and as a rule are allocated one of these addresses when connected to the M-bus. The address 254 (FE) is used to transmit information to all participants (Broadcast). The latter case naturally results in collisions when two or more slaves are connected, and should only be used for test purposes. The address 253 (FD) indicates that the addressing has been performed in the Network Layer instead of Data Link Layer, the FD used when using the second level address. The remaining addresses 251 and 252 have been kept for future applications.

1.1 How to initialize a meter which you don't know the address

Master to slave: 10 40 fe 3e 16

Slave to master: e5 (success)

1.2 Remove the secondary address matching symbol of all the meters on BUS.

Master to slave: 10 40 fd 3d 16

Slave : No answer

1.3 How to Initialize a Slave with specific address

Example: Address 02

Master to slave: 10 40 01 41 16

Slave to master: e5

2. How to Set Baud Rate

2.1 Point to point baud-rate setting command format(Control Frame)

Format:

Start	L-Field	L-Field	Start	C-Field	A-Field	CI-Field	Check Sum	Stop
68H	03	03	68H	53/73	fe	b8~bd	CS	16

L - Field-----Byte length

C - Field-----ControlField,FunctionField

A - Field-----AddressField

CI - Field-----control information field

Check Sum-----The Check Sum is calculated from the arithmetical sum of the data mentioned above, without taking carry digits into account.

B9-----600

BA-----1200

BB-----2400

BC-----4800

BD-----9600

Example:

(1) How to change Baudrate to 2400bps

Master to slave: 68 03 03 68 53 fe bb 0c 16

Slave to master: e5

(2) How to change Baudrate to 9600

Master to slave: 68 03 03 68 53 fe bd 0E 16

Slave to master: e5

3. How to Set primary address

3.1 How to set the address of a Slave to 02

Format:

Start	L-Field	L-Field	Start	C-Field	A-Field	CI-Field	DIF	VIF	Address Data	Check Sum	Stop
68H	06	06	68H	53/73	fe	51	01	7A	XX	CS	16

Example:

Master to slave: 68 06 06 68 53 fe 51 01 7a 02 1e 16

Slave to master: e5

3.2 How to change Address from 02 to 03

Formato:

Start	L-Field	L-Field	Start	C-Field	A-Field	CI-Field	DIF	VIF	Address Data	Check Sum	Stop
68H	06	06	68H	53/73	XX	51	01	7A	YY	CS	16

XX--current primary Address

YY--new primary address

Master to slave: 68 06 06 68 73 02 51 01 7A 03 42 16

Slave to master :e5

3.3 How to Set primary address to 02 by using secondary address

For example:

secondary address: 12345678

Step1 - Initialize the slave

Master to slave: 10 40 fe 3e 16

Slave to master: e5

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Step2 - Check the secondary address. After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.

Master to slave: 68 0B 0B 68 73 FD 52 78 56 34 12 FF FF FF FF D2 16

FD---the primary Address used when you use secondary address to read data.

78 56 34 12 ---the meter's secondary address is 12 34 56 78

Master to slave: e5 (success)

Step3 - Change the primary address to 02

Master to slave: 68 06 06 68 73 FD 51 01 7A 02 3D

02---- new primary address

Slave to master: e5

4. Set the complete identification of the slave

(ID=12345678, Man=166E (PAD), Gen=1, Med=02 (energy))

Start	L-Field	L-Field	Start	C-Field	A-Field	CI-Field	DIF	VIF	Identification No	Manufacturer ID	Generation	Medium	Check Sum	Stop
68H	0D	0D	68H	53/73	fe	51	07	79	4 byte	2 byte	1 byte	1 byte	CS	16

Master to slave: 68 0D 0D 68 53 FE 51 07 79 78 56 34 12 24 40 01 02 9D 16

Slave to master: e5

5. How to read out of Energy information

5.1 Use primary address 01 to read Energy information

Format:

Master to slave: 10 7B/5B adr cs 16

Slave to master: Variable data structure

Example: 10 7B 01 7C 16

5.2 How to read out a meter's Energy information by using broadcast address 254 (FE)

Master to slave: 10 7b/5b fe cs 16

Slave to master: Variable data structure

Example: 10 5B FE 59 16

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5.3 How to read out the meter's Energy information by using secondary Address

For example:

Secondary address: 12 34 56 78

Step1 - Initialize the slave

Master to slave: 10 40 fe 3e 16

Slave to master: No answer

Step2 - Check the secondary address.

After receiving the command, the Slave will check if the secondary address in the command is same with its secondary address or not.

Master to slave: 68 0b 0b 68 73 fd 52 78 56 34 12 ff ff ff ff d2 16

Slave to master: E5

Step3 - Read the Energy information

Master to slave: 10 7b fd 78 16

Slave to master:

DIF=====Coding of the Data Information Field

VIF=====Codes for Value Information Field

bytes	Parameters	data structure	Notice
4	header telegram	68 len len 68	header of RSP_UD telegram
3		08 0A 72	C field =08 address A CI field 72
4		78 56 34 12	Identification number =12345678
2		6E 16	Manufacturer ID 166E
1		01	Generation 1
1		02	electricity
1		xx	ACCESS NO
1		00	STATUS
2		00 00	Signature
8	Current total active energy	8C	DIF: 8digit BCD
		80	DIFE:
		40	DIFE:unit 2
		04	VIF: 10wh (0.01Kwh)
		78 56 34 12	123456.78kwh
6	Current import active energy	0C	DIF: 8digit BCD
		04	VIF: 10wh (0.01Kwh)
		78 56 34 12	123456.78kwh
7	Current export active energy	8C	DIF: 8digit BCD
		40	DIFE:unit 1
		04	VIF: 10wh (0.01Kwh)
		78 56 34 12	123456.78kwh
10	Current resettable total active energy	8C	DIF: 8digit BCD
		80	DIFE
		40	DIFE:unit 2
		84	VIF: 10wh (0.01Kwh)
		ff	VIFE next byte is manufacturer specific
		72	VIFE resettable energy
	Current resettable import active energy	78 56 34 12	123456.78kwh
8		0C	DIF: 8digit BCD
		84 ⁽¹⁾	VIF: 10wh (0.01Kwh)
		ff	VIFE next byte is manufacturer specific
		72	VIFE resettable energy
	Current resettable export active energy	78 56 34 12	123456.78kwh
9		8C	DIF: 8digit BCD
		40	DIFE:unit 1
		84	VIF: 10wh (0.01Kwh)
		ff	VIFE next byte is manufacturer specific

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		72	VIFE resettable energy
		78 56 34 12	123456.78kwh
9	Current total reactive energy	8C	DIF: 8digit BCD
		80	DIFE
		40	DIFE:unit 2
		FB	VIF:FB
		02	VIFE: 1 KVArh
		78 56 34 12	12345678kVarh
7	Current import reactive energy	0C	DIF: 8digit BCD
		FB	VIF:FB
		02	VIFE: 1 KVArh
		78 56 34 12	12345678kVarh
8	Current export reactive energy	8C	DIF: 8digit BCD
		40	DIFE:unit 1
		FB	VIF:FB
		02	VIFE: 1 KVArh
		78 56 34 12	12345678kVarh
11	Current total resettable reactive energy	8C	DIF: 8digit BCD
		80	DIFE
		40	DIFE:unit 2
		FB	VIF:FB
		82	VIFE: 1KVArh
		FF	VIFE next byte is manufacturer specific
		72	VIFE resettable energy
		78 56 34 12	12345678kVarh
9	Current resettable import reactive energy	0C	DIF: 8digit BCD
		FB	VIF:FB
		82	VIFE: 1KVArh
		FF	VIFE next byte is manufacturer specific
		72	VIFE resettable energy
		78 56 34 12	12345678kVar
10	Current resettable export reactive energy	8C	DIF: 8digit BCD
		40	DIFE:unit 1
		FB	VIF:FB
		82	VIFE: 1KVArh
		FF	VIFE next byte is manufacturer specific
		72	VIFE resettable energy
		78 56 34 12	12345678kVar
1	CHECK SUM	CS	
1	End	16	

(1) VIF=FB,VIFE=01,unit = MWH

[illegible]



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