



Ambition 2PU CT Series MID Three phase energy meter

## **User manual**

Version: 0.08

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# **2 Safety instructions**

#### Information for your own safety

This manual does not contain all of the safety measures for operation of this meter because special operating conditions, local code requirements or local regulations may necessitate further measures. However, it does contain information which must be adhered to for your own personal safety and to avoid material damage. This information is highlighted by a warning triangle with an exclamation mark or a lightning bolt depending on the degree of actual or potential danger:



#### 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.

#### **Qualified personnel**

Installation and operation of the device described in this manual may only be performed by qualified personnel. Only people that are authorized to install, connect and use this device, are considered qualified personnel in this manual. They have the proper knowledge about labeling and grounding electrical equipment and circuits. They can do so in accordance with local (safety)regulations.

#### Use for the intended purpose

This device may only be used for the application cases specified in the catalog and the user manual and only in connection with devices and components recommended and approved by Inepro Metering B.V.

#### **Proper handling**

The prerequisites for perfect, reliable operation of the product are proper transport, storage, installation and connection, as well as proper operation and maintenance. During its operation certain parts of the meter might carry dangerous voltages.

- Only use insulated tools suitable for the voltages this meter is used for.
- Do not connect while the circuit is connected to a power or current source.
- Only place the meter in a dry environment.
- The meter is intended to be installed in a Mechanical Environment 'M1', with Shock and Vibrations of low significan-ce and Electromagnetic Environment 'E2', as per 2014/32/EC Directive. The meter is intended for indoor use. The meter shall be installed inside a suitable IP rated enclosure, in accordance with local codes and regulations.
- Do not mount the meter in an explosive area or exposed to dust, mildew and/or 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 touch the meter's connection clamps directly with your bare hands, with metal, blank wire or other conducting material as you will risk an electric shock that could cause possible injury, serious injury or death.
- Make sure the protection covers are replaced after installation.
- Maintenance and repair of the meter should only be carried out by qualified personnel.
- Never break any seals (if present on this meter) to open the front cover as this might influence the functionality or accuracy of the meter, and will void all warranty.
- Do not drop, or allow physical impact to the meter as there are high precision components inside that may break and affect the meter measurement negatively.
- All clamps should be properly tightened.
- Make sure the wires fit properly in the connection clamps.
- If the wires are too thin it will cause a bad contact which can spark causing damage to the meter and its surroundings.
- If the product has become wet, we advise to send back the product and let the manufacturer evaluate the product to see if it is still safe to use or not. Do not install products that have been wet inside the plastic housing.
- Do not install in explosive atmospheres. If this product will be used in ambient condition with flammable or explosive material, please take additional measures in accordance to EN 50281-1-1.

• If the product has been dropped from more than 1 meter high on a concrete floor and no obvious damage is visual, we advise to send back the product and let the manufacturer evaluate the product to see if it is still safe to use or not. Do not installed products that has fallen from more than 1m hight on solid surfaces.

• Do not install in explosive atmospheres.

#### **Exclusion of liability**

We have checked the contents of this manual and every effort has been made to ensure that the descriptions are as accurate as possible. However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors or omissions in the information given. The data in this manual are checked regularly and the necessary corrections will be included in subsequent editions. If you have any suggestions, please do not hesitate to contact us.

#### Subject to technical modifications without notice.

No liability will be assumed for any detail when technical modifications are executed without prior notice to, and agreement with, the supplier.

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## **3 Foreword**

Thank you for purchasing this energy meter. Inepro has a wide product range of devices. We have introduced a large number of energy meters on the market suitable for 110V AC to 400V AC (50 or 60Hz). Besides the normal energy meters we also developed our own pre-paid meters with chip card, chip card re-loaders and a complete PC management control system. For more information on other products please contact our sales department at sales@ineprometering. com or visit our website at www.ineprometering.com.

Although we produce this device according to international standards and our quality inspection is very accurate it's still possible that this device shows a defect or failure for which we do apologize. Under normal conditions your product should give you years of trouble free operation. In case there is a problem with the energy meter you should contact your distributor immediately. Most of our energy meters are sealed with a special seal. Once this seal is broken there is no possibility to claim any warranty. Therefore NEVER open an energy meter or break the seal of the device. The limited warranty is 5 years after production date, divided into various periods., after production, and only valid for production faults.

## **4 Certificates**



# **5** Specifications

Casing Nominal voltage (Un) Operational voltage Insulation capabilities: - AC voltage withstand - Impulse voltage withstand Basic current (Ib) Maximum rated current (Imax) Operational current range Overcurrent withstand Operational frequency range Internal power consumption Test output flash rate (RED LED) Pulse output rate Pulse width

Data store

### **5.1 Performance criteria**

Operating humidity Storage humidity International standard Accuracy class Protection against penetration of dust and water Insulating encased meter of protective class Operating temperature range

#### **5.2 Basic errors**

0,05Ib	$\cos \phi = 1$	±1,5%
0,1Ib	$\cos\phi = 0.5L$	±1,5%
	$\cos\phi = 0.8C$	±1,5%
0,1Ib - Imax	$\cos \phi = 1$	±1,0%
0,2Ib - Imax	$\cos\phi = 0.5L$	±1,0%
	$\cos \phi = 0.8C$	±1,0%

#### 5.3 Bluetooth specification

Protocol Frequency range BLE 4.2 Bluetooth 4.0: 2402 - 2480 MHz (40 CH)

### **5.4 M-bus communication specifications**

Bus type Baud rate Range Downlink signal Uplink signal Cable Protocol Unit loads Max. number of meters

300, 600, 1200, 2400 (default), 4800 and 9600  $\leq$ 1000m Master to slave. Voltage modulation Slave to master. Current modulation JYSTY (nx2x0,8) EN13757-3 001 64 per bus\*

PC flame resistant plastic 230/400V AC (3~) 3\*230/400V ±20%

4KV for 1 minute  $6KV - 1,2\mu S$  waveform 1A 5A 0,4%Ib-Imax = 0,004A - 5A30Imax for 0,01s 45-60Hz  $\leq 2W/Phase - \leq 10VA/Phase$  (active - reactive) 10.000 imp/kWh 10.000/2.000/1.000/100/10/1/0,1/0,01 imp/kWh Selectable 2-99ms (depending on pulse output rate setting)

The data can be stored for more than 10 years without power

≤ 75% ≤ 95% EN50470-1/3 B (=1% accuracy)

IP51: The meter must be installed in approved IP51 enclosure.

II -40°C - +70°C

M-bus

## 5.5 RS485 communication specifications

Bus type Protocol Baud rate Address range Maximum bus load Range

RS485 MODBUS RTU with 16 bit CRC 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600 and 115200 1-247 user settable 60 meters per bus\* 1000m

\*Note that the maximum number of meters is dependent on the converter, baudrate (the higher the baudrate, the smaller the number of meters which can be used) and the circumstances under which the meters are installed.

### **5.6 Dimensions**

Height without protection cover Height Width Depth LCD Weight without protection covers 98 mm 140,5 mm 36 mm 65 mm 35x45 mm 162 gr (net)



### **5.7 Wire connection**

Connection technology Actuation type Push-in CAGE CLAMP® Lever

WAGO serie 2604Solid conductor0.2 ... 4 mm² / 24 ... 12 AWGFine-stranded conductor0.2 ... 4 mm² / 24 ... 12 AWGFine-stranded conductor; with insulated ferrule0.25 ... 2.5 mm²

Push-in technology can be used for Solid conductors and fine-stranded conductors with insulated ferrule. Fine-stranded conductors require opening the levers for connection.

## **5.8 Connection diagram**

	Connection Diagram	Maximum allowed load
IA, IB, IC	In and Out CT's	5 A, 27 VDC
U1	L1 (in) Phase 1 input - L1 (out) Phase 1 output	400 VAC, 5A; 4kV 1 min.; 300A for 0.01s
U2	L2 (in) Phase 2 input - L2 (out) Phase 2 output	400 VAC, 5A; 4kV 1 min.; 300A for 0.01s
U3	L3 (in) Phase 3 input - L3 (out) Phase 3 output	400 VAC, 5A; 4kV 1 min.; 300A for 0.01s
N	Neutral input	0 VDC, 3 mA
4	S0 output 1 (+) industry-standard pulse output	Imax = 100 mA, 5 - 27 VDC
5	Ground (-); Signal wire connection	0 VDC, 3 mA
6	S0 output 2 (+)	Imax = 100 mA, 5 - 27 VDC
7	Modbus communication contact A	3.3 V, 3 mA
8	Modbus communication contact B / M-bus commu- nication contact (-) - connector RS485	3.3V, 3 mA; ±5V?
9	M-bus communication contact (+)	3.3V, 3 mA
10, 11	Tariff switching	230 VAC?



## 1 Norwegian IT network is the same as Open Delta with Aron connection

## **6 Installation**

### 5.9 UART-port

UART port 3.3 mV 4 pins connection RS485 connection RTU

The UART port is essential for the connection to the interface adjacent. This keeps the meter MID-certified. This adjacent interface kan be delivered by any organisation, containing all kind of protocols to read out the energy information and transfer it to a computer or website.

For remote access you need to register via a "Cyclic Redundancy Check (CRC). The CRC value is actually calculated by the software. The CRC-value will change every time the code is modified.

With the software version 102 --> CRC = 21001416 (59629173)



## **6** Installation

### 6.1 Check meter

Before mounting the meter please check visual from the ouside on damage.

*NOTE: The housing is sealed, do not open the meter! No warranty if the housing is opened or the seal is removed.* 

This meter is delivered with protection covers for wiring.

## 6.2 Mount the meter on a DIN-rail

Before mounting the meter pull the slide outward (1), place the meter in the DIN-rail and push the slide inwards (2). On photograph: slide in inward position.

### 6.3 Disassemble the meter from the DIN-rail

Pull the slide outward (1), remove the meter and push the slide inwards (2).



## **6.4 Installation warnings**



- Turn off and if possible lock all sources supplying the energy meter and the equipment that is connected to it before working on it.
- Always use a properly rated voltage sensing device to confirm that power is off.



- The installation should be performed by qualified personnel familiar with applicable codes and regulations.
- Use insulated tools to install the device.
- A fuse, thermal cut-off or single-pole circuit breaker should be fitted on the supply line and not on the neutral line.
- The connecting wire, connecting the device to the outside circuit, should be sized in accordance with local
  regulations for the maximum amount of the current breaker or other overcurrent protection devices used in the
  circuit.
- An external switch or a circuit-breaker should be installed on the supply wires, which will be used to disconnect the meter and the device supplying energy. It is recommended that this switch or circuit-breaker is placed near the meter because that is more convenient for the operator. The switch or circuit-breaker should comply with the specifications of the building's electrical design and all local regulations.
- An external fuse or thermal cut-off used as an overcurrent protection device for the meter must be installed on the supply side wires. It's recommended that this protection device is also placed near the meter for the convenience of the operator. The overcurrent protection device should comply with the specifications of the building's electrical design and all local regulations.
- This meter can be installed indoor, or outdoor enclosed in a meter box which is sufficiently protected, in accordance with local codes and regulations.
- To prevent tampering, an enclosure with a lock or a similar device can be used.
- The meter has to be installed against a fire resistant wall.
- The meter has to be installed in a well-ventilated and dry place.
- The meter has to be installed in a protective box if the meter is exposed to dust or other contaminants.
- The meter can be installed and used after being tested and can be sealed afterwards.
- The device can be installed on a 35mm DIN rail.
- The meter should be installed on a location where the meter can be read easily.
- In case the meter is installed in an area with frequent surges for example due to thunderstorms, welding machines, inverters etc., the meter is required to be protected with a Surge Protection Device.
- The device should be sealed immediately after installing it in order to prevent tampering.

# 7 Operation

## 7.1 Display part 1

Part 1 of the display shows the MID relevant software version number, the meter serial number, the CRC code, the actual tariff. Meter serial number and CRC code are scrolling every 10 seoconds. When Bluetooth communication is activated, icon 1 will be shown. When Modbus or M-bus communication is activated, a telephone hook sign will be shown on the display. The display also shows the present CT ratio set in the meter.



### 7.2 Display part 2

Part 2 of the display shows the MID relevant measurement values. OBIS codes are used to identify the corresponding measurement values:

1.8.1: Positive active energy in tariff 1

- 1.8.2: Positive active energy in tariff 2
- 1.8.3: Positive active energy in tariff 3 (will be shown in the display when T3 and/or T4 are activated)
- 1.8.4: Positive active energy in tariff 4 (will be shown in the display when T3 and/or T4 are activated)

2.8.1: Negative active energy in tariff 1

2.8.2: Negative active energy in tariff 2

2.8.3: Negative active energy in tariff 3 (will be shown in the display when T3 and/or T4 are activated)

2.8.4: Negative active energy in tariff 4 (will be shown in the display when T3 and/or T4 are activated)



The meter has a 6+3 digit display for kWh values. When reaching 999999,999 the kWh value goes back to 000000,000.

Scrolling time for T1/T2 and T3/T4 is 10 seconds.

## 7.3 Display part 3

Part 3 of the display shows data like current direction, trip counter, reactive energy, power factor, present quadrant, frequency, active power, apparent power, reactive power, voltage and current.

Scroll through the display pages (Total - L1 - L2 -L3) using the capacitive touch buttons on the frontside of the meter. In display part 3 the CT history pages become visible after activation (see 7.6.15 CT ratio).



## 7.4 Settings

Activate settings mode by holding the middle button (\*) for >3 seconds.



The following display will appear:



## 7.5 Bluetooth

Select the Bluetooth icon 3 and press the middle button to activate the Bluetooth function:



Scan the QR code on the display using the inepro Metering mobile phone app.



When Bluetooth connection is active, the Bluetooth activation icon  $\clubsuit$  will be shown on the display:

_	
v102-210 t1	150006 * rt 150075
1.8.1:000	00609.9kWk
2.8.1 000	00269.7kWk
2 → 49.99H	0.000 KVAR
4 « - 4	5/5 <b>4</b> × Ξ
E MOO	MID T XXXXX
L=0.1Wh/imp	RL=0. tvarts/imp

Go to <u>Appendix 4 - Bluetooth</u> for the inepro Metering mobile phone app user guide.

### 7.6 Button settings

Settings can also be done using the capacitive touch buttons on the front of the meter. Scroll through the options using the left << and right >> button. Confirm the setting using the middle button. When the middle button is pressend long to enter the setting page, without pressing the button to select, it automatically time out and exit. Select the following page to go to the settings menu:



Enter the password to get acces to the settings menu (default 0000). Confirm each digit (1-9) using the middle button:



The settings menu will appear after entering the password correctly:



#### 7.6.1 Password

The button setting function can be protected by setting a password. This password is also valid for settings via Bluetooth. The default password is 0000. This password can only be changed using the button function.



#### 7.6.2 Tariff

The default tariff is 1. The tariff can be set to T2, T3 or T4. The active tariff is always in LCD part 1, T3 and T4 will the added to the automatic scroll of LCD part 2.



#### 7.6.3 S0 output

The energy meter is equipped with two pulse outputs (forward & reverse or active & reactive) which are optically isolated from the inside circuit. It generates pulses in proportion to the measured consumption for purpose of remote reading or accuracy testing.

The function of the S0 can be set via Bluetooth or via buttons in the setting menu.

The pulse output is a polarity dependent, open-collector transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage (Ui) should be lower than 27V DC. The maximum switching current (Imax) is 100mA. To connect the impulse output, connect 5-27V DC to connector 4/6 (collector), and the signal wire (S) to connector 5 (emitter).

The default imp/kWh setting for the S0 output is 1.000. The S0 output setting can be modified to 10.000 / 2.000 / 100 / 10 / 1 / 0.01 imp/kWh.



#### 7.6.4 Pulse type setting

The default pulse type setting is active & reactive. This means that the two pulse outputs pulse based on the active and reactive energy. The pulse type can be set to forward & reverse, which means that the pulse outputs pulse based on forward and reverse active energy.

v102-21050006 t1 c1500/5 1.8.1 00000609.9/W 1.8.2 00000000.0/W 2.8.1 00000259.7/W	
2.8.2 00000000.0.00 * 50 00TPUT 1000 TVPE FUZRV ULOTH 30 76 1 1/2	
CEMOO S MID T xxxx	R L

#### 7.6.5 S0 Pulse width

The default S0 pulse width is 30ms. The pulse width setting can be modified to 2-99ms (depending on the imp/kWh setting).



#### 7.6.6 Modbus ID

The Modbus ID can be set from 001 to 247, the default Modbus ID is 001.



#### 7.6.7 Modbus baud rate

The default Modbus baud rate setting is 9600. The Modbus baud rate setting can be modified to 115.200 / 56.700 / 38.400 / 19.200 / 4800 / 2400 / 1200 / 600 / 300 bps.



#### 7.6.8 Modbus parity

The default Modbus parity setting is even. The Modbus parity can be modified to none or odd.



#### 7.6.9 M-bus ID

The M-bus ID can be set from 000 to 250, the default M-bus ID is 000.



#### 7.6.10 M-bus baud rate

The default M-bus baud rate setting is 2400. The M-bus baud rate setting can be modified to 9600 / 4800 / 1200 / 600 / 300 bps.



#### 7.6.11 Backlight

The meter is equipped with a blue backlight. The backlight can be set to always on, off or button mode.



#### 7.6.12 Powerdown counter

The powerdown counter registers the number of times that the meter has been turned off. The counter can be reset via Bluetooth or buttons.



#### 7.6.13 Trip counter

The meter is equipped with a trip counter that can be set to zero by the user. This is the energy calculated based on the combination code setting (see 7.6.15).



#### 7.6.14 OBIS codes

OBIS is default set to ON. This can be set OFF for part 3 of the LCD via BT or the buttons. LCD part 2 always shows OBIS and kWh and here OBIS cannot be set off. The OBIS code is a text string composed according to the OBIS standard (see IEC 62056-61).



#### 7.6.15 Combination code (Modbus, M-bus & Bluetooth setting only)

The meter allows you to display the total energy (usage) shown on the display in accordance to different calculation methods. This meter gives five different ways to calculate and display your energy, defined with a code. You can use the following calculation methods for total energy:

Code	Total (active) energy		
C-01	Forward only		
C-02	Reverse only		
C-03	Forward + Reverse		
C-04	Forward - Reverse		
C-05	Forward - Reverse*		

Example of flow through the meter				
L1	+5 kWh			
L2	+5 kWh			
L3	-12 kWh			

LCD reading and calculation of total energy							
Code	C-01	C-02	C-03	C-04	C-05*		
Total	10	-12	22	-2	-2		
Forward	10	10	10	10	0		
Reverse -12 -12 12 -12 -2							
*Meters ordered or set afterwards to C-05 cannot be set to another calculation mode.							

#### 7.6.16 Scroll time

The scrolling time for LCD part 3 can be modified. It can be programmed between 1 - 30 seconds. Default is 5 seconds



#### 7.6.17 CT ratio

The CT-ratio is default set on 5/5. In the screen here below the CT ratio is set on 0500/5. That means that with a basic current of 500A the 2PU CT meter will have a current of 5A.

The primary current can be modified to 0001 - 9999A (when secondary current is /1A) or 0005 - 9995A (when secondary current is /5A). The secondary current can be set to /1A or /5A.

Each time you set a CT ratio the previous ratio and value is stored in the CT history. You can do this 7 times maximum. At start-up the ratio is set to 5/5. After first time setting the CT ratio, the kWh value in part 2 will start counting according to this ratio.



In the CT history menu, the meter will also continue counting based on the 5/5 ratio in register CT history 1. After every CT ratio reset, the kWh value + CT ratio from display part 2 will be stored in a new CT history register.



v 102-59629173 t1 ct 050 1.8.3:00000000. 1.8.4:00000000. 2.8.3:00000000. 2.8.4:0000000. IT HISTORY 06 0000 1.8.1:00000.000	372 36/46 36/46 36/46 36/46 17/06 6/46
1.8.2:00000.000 ↓ ≪ ↓ ₀к »↓ CE MOO § MID T	1/2 xxxxx
kWh-	kvarh-@



# **8 Troubleshooting**



- During repair and maintenance, do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other conducting material as that will cause an electric shock and possibly cause injury, serious injury or even death.
- Turn off and if possible lock all sources supplying the energy meter and the equipment that is connected to it
  before opening the protection cover and working on it.
- Turn off and lock all power supply to the energy meter and the equipment to which it is installed before opening the protection cover to prevent the hazard of electric shock.



- Maintenance or repair should only be performed by qualified personnel familiar with applicable codes and regulations.
- Use insulated tools to maintain or repair the meter.
- Make sure the protection cover is in place after maintenance or repair.
- The case is sealed, failure to observe this instruction can result in damage to the meter.

Problem	Possible cause	Check/solution				
The red consumption LED is not flashing (PULSE LED).	There is no load connected to the meter. The load on the line is very low.	Connect a load to the meter. Check with an Ohm-meter if the load value is very low.				
The register doesn't count.	There is almost no load connected to the meter.	Check if the red consumption LED is flashing.				
No pulse output.	The pulse output is not supplied with DC power. The pulse output is not connected correctly.	Check the external voltage source (Ui) is 5-27V DC with a voltage meter. Check if the connection is correct: the 5-27V DC should be connected to the collector connection (pin 18/20+) and the signal wire (S) to the emitter connection (pin 19/21-).				
If none of the above works, please contact technical support						

## 8.1 Errors / Diagnostics display

All measurement values are stored twice with the accompanying checksums. In case the checksum fails, the backup data is used. If both the normal storage and backup fail, the meter will stop working and indicate error XX:

XX is the hexadecimal data, convert the data to binary to analyze the data

bit0: The data in the main storage area and backup area of the energy is wrong or cannot be operated

- bit1: The energy mantissa area cannot be operated bit2: The energy backup area cannot be operated bit3: The main energy storage area cannot be operated
- bit4: Data error in the energy mantissa area bit5: Data error in the energy backup area (integer bit)
- bit6: Data error in the main energy storage area (integer bit)
- bit7: EEPROM cannot be fully initialized

#### 8.2 Technical support

For questions about one of our products please contact:

- Your local Inepro Metering distributor
- Email: support@ineprometering.com •
- Website: www.ineprometering.com



# **Appendix 1 - Multi tariff function**

## A1.1 How to switch between T1 and T2

The meter is equipped with a multi tariff functionality. T1 and T2 can be activated by an external voltage connected to the terminals 10/11.

This is an AC voltage between 10 and 11:



### A1.2 How to switch between T3 and T4

T3 and T4 can only be activated by Bluetooth, Modbus, M-bus or using the button function. After activating T3 and/or T4 once, the energy values per tariff (3 / 4) will be displayd in the MID relevant part of the display. This cannot be undone.

## Appendix 2 - M-bus

## A2.1 Communicating via the M-bus output

The 2PU CT meter is equipped with an M-bus port, the data can be read out via this port. The communication protocol conforms to the EN13757-3 standard.

The meter can communicate with your PC. In order to read out the meter registers first install and configure the PC software. Use an M-bus level converter to connect the PC and the meter. The cable should be connected to terminals 8 and 9. The default communication address of the meter is 000.

The defaults for M-bus communication are:

- Baud rate 2400
- 8 data bits
- Even parity
- 1 stop bit



The secondary addressing (253/FD) is preset to the last 8 digits of the serial number printed on the side of the meter. However this can be changed to a more convenient number through IR or M-bus communication.

The baud rate can be changed to values 9600, 4800, 1200, 600 and 300 baud. Data, parity and stop bit cannot be changed.

For the registers used in the meter and how to interpreted the data, please use the M-bus register map on the next page.

More detailed information on M-Bus can be found: <u>www.m-bus.com</u>

## A2.2 M-bus register map

## <u>Read</u>

M-bus Com- mand	Contents	M-bus register header DIF	M-bus re- gister VIF	Response/ example	Remarks
1. REQ UD2:				68 xx xx 68 08	68 [data length] 68 08 [address] 72
10 5B xx				xx 72	[header] [datablocks] [checksum]
					16
	Serial number	Header		46 02 02 19	
	Manufacturer ID			CD 25	
	Version			01	Same as the mayor version of the software
	Medium			02	Electricity
	Acces number	1		04	Every time the meter is read this
					number is increased by 1 up to 255, then it becomse 0 again
	Status	-		00	00 = OK 02 = error
	Signature	-		00 00	Always 00 00
Datablocks	Total forward active energy	04	03	15 CD 5B 07	123456789 Wh
	Forward active energy T1	84 10	03	15 CD 5B 07	123456789 Wh
	Forward active energy T2	84 20	03	15 CD 5B 07	123456789 Wh
	Forward active energy T3	84 30	03	15 CD 5B 07	123456789 Wh
	Forward active energy T4	84 80 10	03	15 CD 5B 07	123456789 Wh
	Total reverse active energy	04	83 3C	15 CD 5B 07	123456789 Wh
	Reverse active energy T1	84 10	83 3C	15 CD 5B 07	123456789 Wh
	Reverse active energy T2	84 20	83 3C	15 CD 5B 07	123456789 Wh
	Reverse active energy T3	84 30	83 3C	15 CD 5B 07	123456789 Wh
	Reverse active energy T4	84 80 10	83 3C	15 CD 5B 07	123456789 Wh
	Total kWh (resettable)	04	83 FC 10	15 CD 5B 07	123456789 Wh
	Forward reactive energy	04	FB 82 73	15 CD 5B 07	123456,789 kVARh
	Reverse reactive energy	04	FB 82 F3 3C	15 CD 5B 07	123456,789 kVARh
	L1 voltage	02	FD C7 FC 01	E4 59	230,12 V
	L2 voltage	02	FD C7 FC 02	E4 59	230,12 V
	L3 voltage	02	FD C7 FC 03	E4 59	230,12 V
	L1 current	03	FD D9 FC 01	1B 87 01	100123 mA
	L2 current	03	FD D9 FC 02	1B 87 01	100123 mA
	L3 current	03	FD D9 FC 03	1B 87 01	100123 mA
	Total active power	03	2B	87 D6 12	1234567 W
	L1 active power	03	AB FC 01	87 D6 12	1234567 W
	L2 active power	03	AB FC 02	87 D6 12	1234567 W
	L3 active power	03	AB FC 03	79 29 ED	-1234567 W
	Total reactive power	03	FB 14	87 D6 12	1234,567 kVAR

## <u>Read (2)</u>

M-bus Com- mand	Contents	M-bus register header DIF	M-bus re- gister VIF	Response/ example	Remarks
	L1 reactive power	03	FB 94 FC 01	87 D6 12	1234,567 kVAR
	L2 reactive power	03	FB 94 FC 02	87 D6 12	1234,567 kVAR
	L3 reactive power	03	FB 94 FC 03	87 D6 12	1234,567 kVAR
	Total apparent power	03	FB 34	87 D6 12	1234,567 kVA
	Total power factor	0A	FD 3A	00 01	1,00
	Grid frequency	03	FB 2C	37 C7 00	50,999Hz
	Tariff	09	7C 01 54	01	T1
	CT rate (only for CT version)	0A	FD 3A	05 95 99	9995/5
	Checksum			xx xx	

## <u>Write</u>

Contents	Command	Ad-	Command	New value	Response	Remarks
	part 1	dress	part 2			
Baudrate	68 03 03 68 53	01	-	BB	E5 (new Baud	B8 = 300; B9 = 600; BA = 1200; BB =
					2400)	2400; BC = 4800; BD = 9600
Primary	68 06 06 68 53	01	51 01 7A	01	E5 (new id 01)	000 - 250 write in HEX
address						
Secondary	68 09 09 68 53	01	51 0C 79	15 01 23 45	E5 (new address	4 bytes BCD same as read
address					1501 2345)	
Tariff mode	68 08 08 68 53	01	51 09 7C 01 54	02	E5 (tariff 2)	T1 = 01 ; T2 = 02 ; T3 = 03 ; T = 04
Combined	68 07 07 68 53	01	51 09 FD 3A	05	E5 (combined code	01, 02, 03, 04 and 05
code					05)	
S0 rate	68 0A 0A 68 53	01	51 0C FD 3A	00 00 01 00	E5 (S0 rate 100)	10.000 / 2.000 / 1.000 / 100 / 10 / 1 / 0,1
						/ 0,01
Resettable	68 09 09 68 53	01	51 0C 04	00 00 00 00	E5	Value is ignored, always set to 0
kWh						
Reset power	68 08 08 68 53	01	51 0A FD 60	00 00	E5	Value is ignored, always reset to 0
down counter						
SND NKE	10 40	01	-	-	E5	Can be send to primary or secondary ad-
						dress and resets all communication values
Selecting slav	ve by secondary	Serial n	umber	Manufactu-	Generation	Medium
addressing				rer ID	version	
68 0B 0B 68 53	3 FD 52	aa aa aa	аа	bb bb	сс	dd
Input		01 00 07	' 13	CD 25	01	02
Remarks		5926990	3	-	Major version of	Electricity
					the software	

## A3.1 Communicating via the Modbus output

The meter can communicate with your PC. In order to read out the meter registers first install and configure the PC software. Use an RS485 level converter to connect the PC and the meter. The cable should be connected to terminals 7 and 8. The default communication address of the meter is 001.

The PRO380-Mod can be connected for Modbus communication. The Modbus implementation used is Modbus basic (standard). This means the following:

- Baud rate 9600
- 8 data bits
- Even parity
- 1 stop bit

The baud rate can be changed to values 115200, 56700, 38400, 4800, 2400, 1200, 600 and 300. The parity can be set to none or odd. Data and stopbit cannot be changed.



When connecting the meter through a serial converter (RS485) for testing, please be aware that because of not implementing the complete Modbus infrastructure, there will be a need to put an additional resistor (120 ohms/ 0,25 watts) across the terminals (7 & 8) on the meter side.

For the registers used in the meter and how to interpreted the data, please use the Modbus register map on the next pages.

More info on Modbus can be found:

Physical: <u>http://www.modbus.org/docs/Modbus\_over\_serial\_line\_V1\_02.pdf</u> Protocol: <u>http://www.modbus.org/docs/Modbus\_Application\_Protocol\_V1\_1b3.pdf</u>

## A3.2 Modbus register map

Reg. address	Content	Function code	Length	Unit	Data type
4000	Serial number	03	2	-	HEX
4002	Meter code	03	1	-	HEX
	4PU: 1111 - 4PS: 1112 - 2PCT: 1113				
4003	Madaus ID	<b>0</b> 3	1	-	Signed
4004	Baud rate	<b>0</b> 3	1	-	Signed
	1: 300 - 2: 600 - 3: 1200 - 4: 2400				
	5: 4800 - 6: 9600 - 7: 19200 - 8: 38400				
	9: 57600 - 10: 115200		-		rd
4005	Protocol version	<u>u</u>	2	-	Host ABCD
4007	r_6	<b>6</b> 3			
400/	Surukare Version		2	-	HOR ABLD
4000	Uhadaran warian	<b>n</b> a	2		
-			۷	-	
4009	Mater sever	03	1	4	Gener
			1	<i>n</i>	
400C	CT ratio	03	1	A	HEX
			-	~	
4000	50 output rate	0.3	2	imp/kWh	Float ABCD
	-				
400F	Combination code	03	1	-	Signed
	1: forward only - 2: reverse only				
	3: forward+reverse - 4: import-export				
	5: immet-exact (10)				
4010	LCD cycle time*	03	1	sec.	HEX
			-		
4011	Parity setting	<u>u</u>	1	-	Signed
4012	1: even - 2: none - 3: 000 Courset direction	02	4		ACCIT
4012	Current direction	05	1	-	ASCII
4012	12 Current direction	03	1		ASCIT
1013	E: forward - R: reverse	05	1	-	1261
4014	13 Current direction	03	1	-	ASCII
	F: forward - R: reverse		-		
4015	Error code*	03	1	-	Signed
4016	Power down counter	03	1	-	Signed
4017	Present quadrant	03	1	-	Signed
4018	L1 Quadrant	03	1	-	Signed
4010	13 Outlines	02	4		Canad
4019	L2 Quadrant	05	1	-	Signea
4014	13 Quadrant	03	1		Signed
1010		05	1	-	Jigneu
401B	Checksum	03	2	-	HEX
			-		
401D	Active status word	03	2	-	HEX
401F	CT ratio	03	2	A	Signed
	9995 005 = 9995/5				
4021	Pulse width	03	1	ms	Signed
	Value between 2-99 ms				
4022	Pulse type setting	03	1	-	HEX
(0.5.5	1: active & reactive 2: forward & reverse		-		
4023	Checksum 2 (non-relevant)	03	2	-	HEX
4035	Deserved		4		
4025	reserved	-	1	-	-

4026	Data type setting	03	1	-	Signed
	1: standard - 2: integer				
4027	Reserved	-	11	-	-
4022	Carron direction	02	1		Ganad
4032	Screen direction	05	1	-	Signed
4033	OBIS code ON/OFF	03	1	-	Signed
	0: OFF - 1: ON		-		
Reg. address	Content	Function code	Register	Unit	Data type
5000	Voltage*	03	2	V	Float ABCD
5002	L1 Valtana	02	2	v	Elect ABCD
5002	LI Voltage	03	2	v	FIDAL ADCD
5004	L2 Voltage	03	2	v	Float ABCD
5006	L3 Voltage	03	2	V	Float ABCD
			-		
5008	Grid frequency	03	2	Hz	Float ABCD
5004	Current*	02	2	٨	Elest ABCD
500A	currenc	05	2	^	FIDAL ADOD
500C	L1 Current	03	2	A	Float ABCD
500E	L2 Current	03	2	A	Float ABCD
			-		-
5010	L3 Current	03	2	A	Float ABCD
5012	Tetal active newer	03	2	Lw	Flast ABCD
5012	Total active power	05	2	KVV	FIDAL ABCD
5014	L1 Active power	03	2	kW	Float ABCD
5016	L2 Active power	03	2	kW	Float ABCD
			-		-
5018	L3 Active power	03	2	kW	Float ABCD
5014	Total reactive nower	03	2	kvar	Float ABCD
Join			-	NYGI	noac noco
501C	L1 Reactive power	03	2	kvar	Float ABCD
501E	L2 Reactive power	03	2	kvar	Float ABCD
5030	13 Prosting annual	02	2		
5020	L3 Reactive power	05	2	куаг	FIDAT ABCD
5022	Total apparent power	03	2	kVA	Float ABCD
			-		
5024	L1 Apparent power	03	2	kVA	Float ABCD
					_
5026	L2 Apparent Power	03	2	kVA	Float ABCD
5020	12 Apparent Dower	03	2	LVA.	Elest ABCD
5020	LS Apparent Power	05	2	KVA	FIDAL ADCD
502A	Power factor	03	2	-	Float ABCD
502C	L1 Power factor	03	2	-	Float ABCD
					-
502E	L2 Power factor	0.5	2	-	Float ABCD
5030	13 Power factor	03	2	-	Float ABCD
5050			2	-	I IOBIC ADCID
5032	L1-L2 Voltage	03	2	v	Float ABCD
5034	L1-L3 Voltage	03	2	V	Float ABCD

5036	L2-L3 Voltage	03	2	٧	Float ABCD
Reg. address	Content	Function code	Length	Unit	Data type
6000	Total active energy	03	2	kWh	Float ABCD
6002	T1 Total active energy	03	2	kWh	Float ABCD
6004	T2 Total active energy	03	2	kWh	Float ABCD
6006	L1 Total active energy	03	2	kWh	Float ABCD
6008	L2 Total active energy	03	2	kWh	Float ABCD
600A	L3 Total active energy	03	2	kWh	Float ABCD
600C	Forward active energy	03	2	kWh	Float ABCD
600E	T1 Forward active energy	03	2	kWh	Float ABCD
6010	T2 Forward active energy	03	2	kWh	Float ABCD
6012	L1 Forward active energy	03	2	kWh	Float ABCD
6014	L2 Forward active energy	03	2	kWh	Float ABCD
6016	L3 Forward active energy	03	2	kWh	Float ABCD
			-		
6018	Reverse active energy	03	2	kWh	Float ABCD
			-		
601A	T1 Reverse active energy	03	2	kWh	Float ABCD
			~		
601C	T2 Reverse Active Energy	03	2	kWh	Float ABCD
			~		
601E	11 Reverse active energy	03	2	kWh	Float ABCD
			~		
6020	12 Reverse active energy	03	2	kWh	Float ABCD
	E nereise seare energy		~		
6022	13 Reverse active energy	03	2	kWh	Float ABCD
JULL	es neverse deute energy	05	~	STIL	nout noco
6074	Total reactive energy	03	2	kvarh	Float ABCD
0021	Total reactive energy	05	-	NYSIII	noac nace
6026	T1 Total reactive energy	03	2	kvarh	Float ABCD
0020	Trible reactive energy	05	-	NYGITI	noac naca
6028	T2 Total reactive energy	03	2	kvarh	Float ABCD
0020	T2 Total reactive energy	05	-	NYGITI	noac noco
6074	11 Total reactive energy	03	2	kvarh	Float ABCD
0020	LI Total reactive energy	05	2	NYGITI	TIOBL ADCD
607C	12 Total reactive energy	03	2	kvarh	Float ABCD
0020	E2 Total reactive energy	05	-	NYGITI	noac noco
607E	13 Total reactive energy	03	2	kvarh	Float ABCD
0022	co rotal reactive energy	05	2	NYGITI	TIOBL ADED
6020	Ferring martine energy	02	2	launde	Elest ABCD
0000	rotwaru reacuve energy		2	AVdr11	FIUAL ADCU
6022	T1 Forward reactive accordy	03	2	lavarb	Eleat ABCD
0032	ra Forward reactive energy		2	KVdffi	FIUAL ADCU
(024	T2 Comment and the second	02	2	la an al-	Flack ADCO
0034	12 Forward reactive energy		2	KVarn	FIDAL ABUD
(0)(	11 Ferryard searching are seen	02	2	la an al-	Figure ADCD
6036	L1 Porward reactive energy	03	2	kvarn	FIGAT ABCD
(030	12 Ferreral constitution	02	2	la sa di	Flash ADOD
6038	L2 Forward reactive energy	03	2	kvarn	FIGAT ABCD

603A	L3 Forward reactive energy	03	2	kvarh	Float ABCD
603C	Reverse reactive energy	03	2	kvarh	Float ABCD
602E	T1 Reverse reactive energy	03	2	aarb	Eleat ABCD
OUSE	TT Reverse reactive energy	05	2	KVarn	FIDAL ADCD
6040	T2 Reverse reactive energy	03	2	kvarh	Float ABCD
6042	L1 Reverse reactive energy	03	2	kvarh	Float ABCD
6044	17 Reverse reactive energy	03	2	ovarh	Float ABCD
0011	E2 Reverse reactive energy	05	-	KYGIII	noac Abeb
6046	L3 Reverse reactive energy	03	2	kvarh	Float ABCD
					-
6048	Taritt	03	1	-	Signed
6049	Resettable day counter	03	2	kWh	Float ABCD
			-		
6048	T3 Total active energy	<b>G</b>	2	ki i	Finat ABCD
684D		-	7		
6040	14 lotal active energy	<u>u</u>	4		HOREABCD
604F	T3 Forward active eveny	<b>G</b>	2	k.Wh	Figet ABCD
6051	T4 Forward active energy	Ø	2	kwh.	Finat ABCD
6051	TT Roumon active experies	<b>m</b>	3	Lunda.	First ABCD
		-	2	<b></b>	
6055	T4 Reverse Active Energy	<b>G</b>	2	kwh.	Figat ABCD
6057	T3 Total reactive energy	<b>G</b>	2	loarh	Final ABCD
6 <b>7</b> 59	TA Testal coacting common	63	3	laada	
0403			<u> </u>	Main	
6058	T3 Forward reactive energy	69	2	karh	Final: ABCD
		-	_		_
6050	14 Forward reactive energy	8	2	karh	Final: ABCD
605F	T3 Rearse partive energy	<b>a</b>	7	loarh	First ABCD
6061	T4 Reverse reactive energy	63	2	karh	Final: ABCD
(0)	Tran Task string provider systems in Diff. (and ).		1	Land.	
008.1	hurb newsness searche energy in VI (1999)		ŕ	1019 h	
6065	Imp. Inductive reactive energy in Q1 (T1)	<b>a</b>	2	kwh.	Float ABCD
6067	Imp. Inductive reactive energy in Q1 (12)	63	2	kwh.	Final ABCD
6000	Too Tody time marting analysis (11 (T3)	ED.	3	Lauri-	Elect AB(T)
0443		-	<u>×</u>	<b></b> .	
6068	Imp. Inductive reactive energy in Q1 (T4)	œ	2	kwh.	Final: ABCD
EGED	µmp. capacitive reactive energy in Q2 (total)	<b>u</b>	2	kWh.	Hoat ABCD
60GF	Imp. capacitive reactive energy in O7 (T1)	<b>a</b>	7	kunta	First ARCD
		-	Ē		
6071	Imp. capacitive reactive energy in Q2 (T2)	<b>G</b>	2	kwh.	Finat ABCD
6073	ump. capacitive reactive energy in Q2 (13)	<u>ш</u>	2	kWh.	Hoat ABCD
6075	Inn. caracitive reactive econy in (27774)	03	7	kurk.	First ARCD
047.3		1	ř		

6077	Exp. Inductive reactive energy in Q3 (total)	Œ	Z	kWh	Float ABCD
6079	Eq. Inductive reactive energy in Q3 (F1)	<b>I</b> II	z	kWh	Float ABCD
6078	Exp. Inductive reactive energy in Q3 (12)	•	Z	kWh	Float ABCD
6070	Eq. Inductive reactive energy in Q3 (T3)	•	Z	kWh	Float ABCD
607F	Exp. Inductive reactive energy in Q3 (T4)	<u> I</u> ]	z	kWh	Fibrat ABCD
6061	Exp. capacitive reactive energy in O4 (kda/)		z	kawh	Float ABCD
6063	Eq. capacitive reactive energy in Q4(T1)	Œ	Z	kawh	Float ABCD
6085	Eq. capacitive reactive energy in Q4 (12)		z	kawh	Fibrat ABCD
6087	Eq. capacitive reactive energy in Q4 (T3)	<u> </u>	z	kiwh	Float ABCD
6069	Exp. capacitive reactive energy in Q4 (14)	B	z	kiWh	Ficat ABCD
6088	Resettable day counter L1	<b>B</b>	2	kiWh	Ficat ABCD
608D	Resettable day counter L2		z	kWh	Fibat ABCD
608F	Resettable day counter L3	<b>B</b>	z	kwh	Figat ABCD

Reg. address         Content         Function code         Length         Unit         Date type           4003         Modbus 10         06         1         -         Signed           Command:         01.06.4003.000.4 (new ID: 10)         01.~247 - 01.default - 00 broadcast           4004         Baud rate         06         1         -         Signed           4005         Modbus 10         06 (new Baudrate: 9600)         5: 4600 - 5: 5560 - 10: 115200         8: 39400 - 5: 5560 - 10: 115200           4000         S0 output rate         10         2         Imp/WM [Roat ABCD           4000         S0 output rate         10         2         Imp/WM [Roat ABCD           4000         S0 output rate         10         2         Imp/WM [Roat ABCD           4000         Go 00 (new code: 4 F-R)         10:forward -reverse only         3: forward -reverse only           01.06 400 F 000 4 (new code: 4 F-R)         1: forward orly - 2: reverse only         3: forward -reverse           411         Parity setting         06         1         is import-export           5: import-export         5: import-export         5: import-export         5: import-export           6015         Power down counter         06         1         is -         Signed </th <th>Write</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	Write							
4003         Modbus ID         jos         1         -         Signed           Command:         01.06.4003.000.4 (new ID: 10)         01~247-01 default -00 broadcast         -         Signed           4004         Baudrate         06         1         -         -         Signed           4004         Baudrate         06         1         -         -         Signed           4007         S: 4800 - 6: 5000 - 7: 15200         S: 38400 - 9: 57600 - 7: 15200         Signed         S: 4800 - 6: 57600 - 7: 15200           4006         S0 output rate         10         0.000 - 2.000 - 1.000 - 100 - 10 - 1.0, 1 - 0, 1         -         Signed           4007         Combination code         06         1         -         -         Signed           4007         Combination code         06         1         -         -         Signed           4010         LCD cycle time         06         1         -         -         Signed           4011         Parity setting         06         1         -         Signed           60mand:         01.06.4011.0022 (new time: 25 sec.)         01 - 30         O1 - 30         -           6010         LCD cycle time         06         1         - <th>Reg. address</th> <th>Content</th> <th>Function code</th> <th>Leng</th> <th>yth</th> <th></th> <th>Unit</th> <th>Data type</th>	Reg. address	Content	Function code	Leng	yth		Unit	Data type
Command:         01 06 4003 000A (new ID: 10)         01~247~01 default - 00 broadcast           4004         Baud rate         (06         1         -         [Signed]           4004         Baud rate         (06         1         -         [Signed]           4007         01 06 4004 00 06 (new Baudrate: 9600)         1: 300 - 2: 600 - 3: 1200 - 4: 2400         8: 38400 - 6: 9600 - 7: 1200 - 4: 2400           4000         S0 output rate         10         2         [Imp/kVM] Float ABCD           Command:         01.0 400D 0002 04 41 20 00 00 (new S0: 10)         10.000 - 100 - 100 - 10, 1 - 0, 1 - 0, 0.01           400F         Combination code         06         1         -         Signed           400F         Combination code         06         1         -         Signed           4000         S0 output rate         06         1         -         Signed           4000         Combination code         06         1         -         Signed           Command:         01.06 4010 0025 (new time: 25 sec.)         01 -30         -         Signed           Command:         01.06 4011 0002 (new parity: none)         01: even - 02: none - 03: odd         -         Signed           Command:         01.06 4011 0002 (new parity: none) <td< td=""><td>4003</td><td>ModbusID</td><td>06</td><td>1</td><td></td><td></td><td>-</td><td>Signed</td></td<>	4003	ModbusID	06	1			-	Signed
Command:         Discrete Participation           004         Baud rate         06         1         -         -         Signed           001         01.06 4004.00.06 (new Baudrate: 9600)         5: 38400 - 6: 5500 - 7: 15200         6: 38400 - 6: 5500 - 7: 15200           0000         S0 output rate         10         2         Imp/KWh [Float ABCD           0000         S0 output rate         10         2         Imp/KWh [Float ABCD           0000         S0 output rate         10         2         Imp/KWh [Float ABCD           0000         S0 output rate         10         2         Imp/KWh [Float ABCD           0000         S0 output rate         10         2         Imp/KWh [Float ABCD           0000         S0 output rate         10         -         Signed           01.06 4000 F 0004 (new code: 4 F-R)         3: forward+reverse         4: import-export           01.00 F 4001 00025 (new time: 25 sec.)         01 -30         01 -30           01.01 E000 F 0004 (new code: 4 F-R)         3: forward+reverse         4: import-export           01.00 F 401 00025 (new tarift: 2)         01: even -02: none - 03: odd         01           01.01 E002 (new parity: none)         01: even -02: none - 03: odd         00           01.01 E002 (new parity: n	Command:	01 06 4003 0	00A (new ID: 10)	-	01~247	- 01 default - I	00 broadci	ast
4004         Baud rate         (06         1         -         Signed           Command:         01.06.4004.00.06 (new Baudrate: 9600)         1: 300 - 2: 600 - 3: 1200 - 4: 2400         5: 4800 - 6: 9600 - 7: 1200         8: 38400 - 9: 57600 - 10: 115200           4000         S0 output rate         [10         2         Imp/kth [Float ABCD           4000         S0 output rate         [10         2         Imp/kth [Float ABCD           400F         Output rate         [06         1         -         Signed           400F         Combination code         [06         1         -         Signed           Command:         01.06.4010.0025 (new time: 25 sec.)         01-30         -         Signed           4011         Parity setting         [06         1         -         Signed           Command:         01.06.4011.0002 (new tartff: 2)         11: T1 - 2: T2 - 3: T3 - 4: T4         -           6016         1         - <t< td=""><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td></t<>				_				
Command:         Did 6 4004 00 06 (new Baudrate: 9600)         1: 300 - 2: 600 - 3: 120 - 4: 2400           01 06 4004 00 06 (new Baudrate: 9600)         5: 4800 - 6: 5600 - 7: 19200           0000         S0 output rate         10           0106         Command:         01.10 400D 0002 04 41 20 00 00 (new S0: 10)           0000         S0 output rate         10           0000         Combination code         06           1         1: forward only - 2: reverse only           3: forward + reverse         4: limport-export           5: limport-export         5: limport-export           01.06 400F 0004 (new code: 4 F-R)         01-30           4010         LCD cycle time         06           1         sec.         JHEX           Command:         01.06 401.0002 (new parity: none)         01: even - 02: none - 03: odd           4016         Power down counter         06         1         -           6049         Tariff         06         1         -         Signed           Command:         01.06 6018.0002 (new tatriff: 2)         1: T1 - 2: T2 - 3: T3 -	4004	Baud rate	06	1				Signed
Command:         01 06 4004 00 06 (new Baudrate: 9600)         11 500 - 2 500 - 71 19200           6000         S0 output rate         10         2         imp/swh [Roat ABCD           0000         S0 output rate         10         2         imp/swh [Roat ABCD           0000         S0 output rate         10         2         imp/swh [Roat ABCD           0000         S0 output rate         10         2000 - 2.000 - 1.000 - 100 - 10 - 10 - 10, 1 - 0, 1 - 0, 10           0007         Combination code         06         1         -         [Signed]           0007         Combination code         06         1         -         [Signed]           0101         LCD cycle time         06         1         sec.         HEX           Command:         01.06 4001 0025 (new code: 4 F-R)         31 code and only - 2 reverse only         3: forward + reverse           4: import-export (10)         -         Issec.         HEX           Command:         01.06 4010 0025 (new code: 4 F-R)         01 -         Signed           Command:         01.06 4010 0022 (new code: 4 F-R)         01 -         Signed           Command:         01.06 4010 0022 (new code: 4 F-R)         01 -         Signed           Command:         01.06 4010 0022 (new code: 1 - 0.<	1001	badd race	00	-	1, 200	2. 600 - 2. 12	00 - 41 34	
Command:         Dial of 100 00 (per basic bits 1000)         8: 38400 - 9: 57600 - 10: 115200           4000         SD output rate         10         2         imp/kWh [Float ABCD           4000         SD output rate         10         2         imp/kWh [Float ABCD           4007         Combination code         06         1         imp/kWh [Float ABCD           4007         Combination code         06         1         import export           4007         Combination code         06         1         import export           4007         Combination code         06         1         import export           4010         LCD cycle time         06         1         import export           4011         Dit 64010.0025 (new time: 25 sec.)         01 - 401         5 import export           4016         Porty setting         06         1         - 5 igned           Command:         01.06 4011.0002 (new parity: none)         01: even - 02: none - 03: odd         - 5 igned           Command:         01.06 4011.0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         - 5 igned           Command:         01.06 6048.0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         - 5 igned           Command:         01.06 6048.0002 (new tar	Commande	01 05 4004 00 05	(new Baudrate: 9600)	1	1: 300-	2:000-3:12	7-10200	
Command:         Discrete Structure         Discrete Structure         Discrete Structure           4000         SD output rate         10         2         Imp/KWh [Float ABCD           Command:         0110 4000 0002 04 4120 00 00 (new S0: 10)         10.000 - 2.000 - 1.00 - 10 - 1 0, 1 - 0, 01           400F         Combination code         06         1         Imp/KWh [Float ABCD           400F         Combination code         06         1         Imp/KWh [Float ABCD           Command:         01.06.400F 0004 (new code: 4 F-R)         3: forward + reverse 4: Import-export (10)         3: forward + reverse 4: Import-export (10)           4010         LCD cycle time         06         1         jecc.         HEX           Command:         01.06.4010.0002 (new code: 25 sec.)         01-30         01-30           4011         Parity setting         06         1         jecc.         Jisigned           Command:         01.06.4010.0002 (new parity: none)         01: even - 02: none - 03: odd         01           4016         Power down counter         06         1         jecc.         Jisigned           Command:         01.06.4016.0000 (new parity: none)         1: T1 - 2: T2 - 3: T3 - 4: T4         Signed           Command:         01.06.6048.0002 (new tatriff: 2)         1: T	Command:	01 00 4004 00 00	filew badd ace. 9000j	1	8. 38.40	0 - 0. 57600 -	10: 115200	•
4000         S0 output rate         10         2         jimp/kWh         Float ABCD           Command:         01 10 400D 0002 04 4120 00 00 (new S0: 10)         10.000 - 2.000 - 1.000 - 10 - 10 - 10, 1 - 0,01           400F         Combination code         06         1         -         Signed           400F         Combination code         06         1         -         Signed           400F         Combination code         06         1         :forward only - 2: reverse only           3: forward reverse         4: import-export         S: import-export           6010         LCD cycle time         06         1         sec.         MEX           Command:         01 06 4010 0025 (new time: 25 sec.)         01 ~30         01 ~30         -           4010         LCD cycle time         06         1         -         Signed           Command:         01 06 4011 0002 (new parity: none)         01: even - 02: none - 03: odd         -           4016         Power down counter         06         1         -         Signed           Command:         01 06 6048 0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -           6049         Reset bo 0         1         Iw/Wh         Float ABCD		-		_	0.30%	- 3. 37000 -	10. 11520	0
40.00         S0 output rate         [10         (10	40.00	m	4.0	1.			b	10.00 ADCD
Command:         0110 4005 0002 0+ 120 00 00 (new still)         100 400 - 1000 - 100 - 100 - 100 - 1000 - 100 - 100 - 100 - 100 - 10	400D	SU OUTPUT PACE	110	2	10.000 - 2.000	- 1 000 - 100	imp/kwn	HOAT ABCD
400F         Combination code         06         1         -         Signed           Command:         01.06.400F0004 (new code: 4 F-R)         1: forward only - 2: reverse only 3: forward + reverse 4: import-export (10)           4010         LCD cycle time         06         1         sec.         HEX           Command:         01.06.400 0025 (new time: 25 sec.)         01.~30         HEX           Command:         01.06.401 0002 (new parity: none)         01.~30           4011         Parity setting         06         1         sec.         HEX           Command:         01.06.401 0002 (new parity: none)         01: even - 02: none - 03: odd         ddd           4016         Power down counter         06         1         -         Signed           Command:         01.06.401.6000.         Reset to 0         Reset to 0         6048         1         -         Signed           Command:         01.06.6048.0002 (new parity: none)         1: T1 - 2: T2 - 3: T3 - 4: T4         6049         Resettable day counter         10         IWM         Float ABCD           Command:         01.06.6048.0002 (new parity: and)         1: T1 - 2: T2 - 3: T3 - 4: T4         6049         Reset able day counter         10         IWM         Float ABCD           Command:	Command:	01104000000204	4120 00 00 (new S0: 10)		10.000 - 2.000	- 1.000 - 100	-10-1 0	,1-0,01
400F         Combination code         06         1								
Command:         01.06.400F0004 (new code: 4 F-R)         1: forward only - 2: reverse only 3: forward +reverse 4: import-export 5: import-export           4010         LCD cycle time         06         1         jsc.	400F	Combination code	06	1			-	Signed
Command:         01 06 400F 0004 (new code: 4 F-R)         3: forward + reverse 4: import-export 5: import-export 01 05           4010         LCD cycle time         06         1         sec.         HEX           Command:         01 06 4010 0025 (new time: 25 sec.)         01 n-30         01 n-30           4011         Parity setting         06         1         -         [Signed]           4011         Parity setting         06         1         -         [Signed]           4016         Power down counter         06         1         -         [Signed]           4016         Power down counter         06         1         -         [Signed]           Command:         01.06.6018.0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -           6048         Tariff         06         1         -         [Signed]           Command:         01.06.6018.0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -           6049         Resetable day counter         10         1         [MWh]         [Roat ABCD]           Command:         01.10.6019.0002.04.0000.0000         Reset to 0         -         Signed           Command:         01.10.401F.0002.04.9995.0005         Set to 9995/5         - <td></td> <td></td> <td></td> <td></td> <td>1: forw</td> <td>and only - 2: n</td> <td>everse only</td> <td>Y</td>					1: forw	and only - 2: n	everse only	Y
Command:         Common Cost Data Press         Cost Cost Cost Data Press         Cost Cost Cost Cost Press         Cost Press <td>Command:</td> <td>01.06.400E.000</td> <td>4 (new code: 4 E-R)</td> <td>1</td> <td>3</td> <td>: forward+rev</td> <td>verse</td> <td></td>	Command:	01.06.400E.000	4 (new code: 4 E-R)	1	3	: forward+rev	verse	
Stimport-export (10)           4010         LCD cycle time         06         1         sec.         HEX           Command:         01.06.4010.0025 (new time: 25 sec.)         01.~30         01.~30           4011         Parity setting         06         1         -         Signed           Command:         01.06.4011.0002 (new parity: none)         01: even - 02: none - 03: odd         -         Signed           4015         Power down counter         06         1         -         Signed           4016         Power down counter         06         1         -         Signed           6048         Tariff         06         1         -         Signed           Command:         01.06.6048.0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -           6049         Resettable day counter         10         1         KWh         Float ABCD           Command:         01.10.6049.0002.04.9995.0005         Set to 9995/5         -         Signed           401F         CT ratio         Q         -         Signed         -         Signed           Command:         01.10.6012.0030 (new setting: 30ms)         2~99 ms         -         Signed           Command:	Commenta.		There aboes the try	1	_	4: import-exp	ort	
010         LCD cycle time         06         1         jsec.         HEX           Command:         0106 4010 0025 (new time: 25 sec.)         01~30           4011         Parity setting         06         1         -         Signed           Command:         01.06 4011 0002 (new parity: none)         01: even - 02: none - 03: odd         -         Signed           Command:         01.06 4011 0002 (new parity: none)         01: even - 02: none - 03: odd         -         Signed           Command:         01.06 4016 0000         1         -         Signed         -         Signed           Command:         01.06 6048 0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -         Signed           Command:         01.10 6049 0002 04 0000 0000         Reset to 0         -         Signed           Command:         01.10 6049 0002 04 0000 0000         Reset to 0         -         Signed           Command:         01.10 601F 0002 04 9995 0005         Set to 9995/5         -         Signed           Command:         01.10 401F 0002 04 9995 0005         Set to 9995/5         -         Signed           Command:         01.06 4021 0030 (new setting: 30ms)         2~99 ms         -         Signed           Command:         01.06		1			5	import-export	t (10)	
40.0         LCD cycle time         06         1         jsec.         JHEX           Command:         01 06 40 10 00 025 (new time: 25 sec.)         01~30         01~30           40.11         Parity setting         06         1         -         Signed           Command:         01.05 4011 0002 (new parity: none)         01: even - 02: none - 03: odd         01           40.16         Power down counter         06         1         -         Signed           Command:         01.05 4016 0000         Reset to 0         -         Signed           6048         Tariff         06         1         -         Signed           Command:         01.06 6048 0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -           6049         Reset table day counter         10         1         KWh         Roat ABCD           Command:         01.10 6049 0002 04 0000 0000         Reset to 0         -         Signed           401F         CT ratio         2         -         Signed           Command:         01.10 401F 0002 04 9995 0005         Set to 9995/5         -           4021         Pulse width         06         1         ms         Signed           Command:         01.								
Command:         01 06 4010 0025 (new time: 25 sec.)         01~30           4011         Parity setting         06         1         -         Signed           Command:         01 06 4011 0002 (new parity: none)         01: even - 02: none - 03: odd         -         Signed           Command:         01 06 4011 0002 (new parity: none)         01: even - 02: none - 03: odd         -         Signed           Command:         01 06 4016 0000         Reset to 0         -         Signed         -           Command:         01 06 6048 0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -         Signed           Command:         01 0 6048 0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -         Signed           Command:         01 10 6048 0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -         Signed           Command:         01 10 6048 0002 04 0000 0000         Reset to 0         -         Signed         -         Signed           Command:         01 10 401F 0002 04 9995 0005         Set to 9995/5         -         Signed         -         Signed           Command:         01 10 401F 0002 (new setting: 30ms)         2~-99 ms         -         Signed         -         Signed         -         Signed         -	4010	LCD cycle time	06	1			sec.	HEX
4011         Parity setting         06         1         -         Signed           Command:         01.06.4011.0002 (new parity: none)         01: even - 02: none - 03: odd         40.16           40.16         Power down counter         06         1         -         Signed           Command:         01.06.4016.0000         Reset to 0         -         Signed           Command:         01.06.6018.0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -           60:48         Tariff         06         1         -         Signed           Command:         01.06.6018.0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4         -         Signed           60:49         Resettable day counter         10         1         jkWih         Roat ABCD           Command:         01.10.60:49.0002.04.0000.0000         Reset to 0         -         Signed           Command:         01.10.60.1F.0002.04.9995.0005         Set to 9995/5         -         Signed           Command:         01.10.60.1F.0002.04.9995.0005         Set to 9995/5         -         Signed           Command:         01.10.64.021.00.30 (new setting: 30ms)         2~99 ms         -         Signed           Command:         01.06.4022.0002 (new setting: forward &	Command:	01 06 4010 002	5 (new time: 25 sec.)			01~30		
4011       Parity setting       06       1       -       Signed         Command:       01.06 40110002 (new parity: none)       01: even - 02: none - 03: odd         4016       Power down counter       06       1       -       Signed         4016       Power down counter       06       1       -       Signed         4016       Out 06 4016 0000       Reset to 0       Reset to 0       6048         6048       Tariff       06       1       -       Signed         Command:       01.06 5048 0002 (new tariff: 2)       1: T1 - 2: T2 - 3: T3 - 4: T4       74         6049       Resettable day counter       10       1       [kWh       [Roat ABCD         Command:       01.10 6049 0002 04 0000 0000       Reset to 0       8       74: T4         6049       Resettable day counter       10       1       [kWh       [Roat ABCD         Command:       01.10 6049 0002 04 9995 0005       Set to 9995/5       9       9         401F       CT ratio       2       -       Signed         Command:       01.06 4021 0030 (new setting: 30ms)       2~-99 ms       9         4022       Puise width       06       1       -       Signed <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>								
Command:         01 06 4011 0002 (new parity: none)         01: even - 02: none - 03: odd           4016         Power down counter         06         1         -         Signed           Command:         01 06 4016 0000         Reset to 0	4011	Parity setting	06	1			-	Signed
Command:         Command:         O         Image: Command:         Image: Command:         Signed           6048         Tariff         06         1         -         [Signed]           6048         Tariff         06         1         -         [Signed]           6048         Tariff         06         1         -         [Signed]           6049         Resettable day counter         10         1         [KWh]         [Roat ABCD]           6049         Resettable day counter         10         1         [KWh]         [Roat ABCD]           Command:         01 10 6049 0002 04 0000 0000         Reset to 0         -         Signed           Command:         01 10 401F 0002 04 9995 0005         Set to 9995/5         -         Signed           Command:         01 10 4021 0030 (new setting: 30ms)         2~99 ms         -         Signed           Command:         01 06 4022 0002 (new setting: 10msard & reverse)         2 = forward & reverse         -         Signed           4022         Pulse type         06         1         -         Signed           Command:         01 06 4022 0002 (new setting: integer)         1 = standard, 2=Integer         -         Signed           4026         Data typ	Command:	01 06 4011 000	2 (new parity: none)	-	01: ex	en - 02: none	- 03: odd	
4016       Power down counter       06       1       -       Signed         Command:       01.06.4016.0000       Reset to 0         6048       Taniff       [06       1       -       [Signed         Command:       01.06.6048.0002 (new tariff: 2)       1: T1 - 2: T2 - 3: T3 - 4: T4         Command:       01.06.6048.0002 (new tariff: 2)       1: T1 - 2: T2 - 3: T3 - 4: T4         Command:       01.10.6049.0002.04.0000.0000       Reset to 0         Command:       01.10.6049.0002.04.0000.0000       Reset to 0         401F       CT ratio       2       -       Signed         Command:       01.10.401F.0002.04.9995.0005       Set to 9995/5       Set to 9995/5         4021       Pulse width       06       1       ms       Signed         Command:       01.06.4021.0030 (new setting: 30ms)       2~99 ms       2       forward & reverse         4022       Pulse type       06       1       -       Signed         Command:       01.06.4022.0002 (new setting: integer)       1 =standard, 2=Integer       4026         Command:       01.06.4026.0002 (new setting: integer)       1 =standard, 2=Integer         4032       Screen direction       06       1	Community.							
Prover down double         Dos         1         Power down double         Reset to 0           6048         Tariff         06         1         1         F         Signed           6049         Resettable day counter         10         1         I: T1 - 2: T2 - 3: T3 - 4: T4           6049         Resettable day counter         10         1         I: T1 - 2: T2 - 3: T3 - 4: T4           6049         Resettable day counter         10         1         I: T1 - 2: T2 - 3: T3 - 4: T4           6049         Resettable day counter         10         1         I: T1 - 2: T2 - 3: T3 - 4: T4           6049         Resettable day counter         10         1         I: T1 - 2: T2 - 3: T3 - 4: T4           6049         Reset day counter         10         1         I: T1 - 2: T2 - 3: T3 - 4: T4           6049         Reset day counter         10         1         I: T1 - 2: T2 - 3: T3 - 4: T4           6049         Reset day counter         10         1         I: T1 - 2: T2 - 3: T3 - 4: T4           6041         CT ratio         I: T1 - 2: T2 - 3: T3 - 4: T4         I: T1 - 3: Signed      <	4016	Bower down counter	06	1			L.	Claned
Command:         01.05-4016 0000         1         -         Signed           60-48         Tariff         [06         1         -         [Signed]           Command:         01.06 6048 0002 (new tariff: 2)         1: T1 - 2: T2 - 3: T3 - 4: T4           60-49         Resettable day counter         [10         1         [WWh         [Roat ABCD           Command:         01.10 6049 0002 04 0000 0000         Reset to 0         Reset to 0         -         Signed           Command:         01.10 401F 0002 04 9995 0005         Set to 9995/5         -         Signed           401F         CT ratio         2         -         Signed           Command:         01.10 401F 0002 04 9995 0005         Set to 9995/5         -           4021         Pulse width         [06         1         [ms         [Signed]           Command:         01.06 4021 0030 (new setting: 30ms)         2~99 ms         -         Signed           4022         Pulse hype         06         1         -         Signed           Command:         01.06 4022 0002 (new setting: forward & reverse)         2 = forward & reverse         -           4025         Data type setting         [06         1         -         Signed	Commands	Power down counca	101 6 0000	-		Decet In 0	<u>r</u>	pigned
6048       Tariff       [06       1        -       [Signed]         Command:       01.06.6048.0002 (new tariff: 2)       1: T1 - 2: T2 - 3: T3 - 4: T4         6049       Resettable day counter       10       1       [KWh       [Roat ABCD         Command:       01.10.6049.0002.04.0000.0000       Reset to 0       Reset to 0         401F       CT ratio       2       -       Signed         Command:       01.10.401F.0002.04.9995.0005       Set to 9995/5       Set to 9995/5         4021       Pulse width       [06       1       ms       Signed         Command:       01.06.4021.0030 (new setting: 30ms)       2~99 ms       -       Signed         4022       Pulse type       06       1       -       Signed         Command:       01.06.4022.0002 (new setting: 10mward & newerse)       2 = forward & reverse       -         4022       Pulse type       06       1       -       Signed         Command:       01.06.4022.0002 (new setting: integer)       1=standard, 2=Integer         4026       Data type setting       [06       1       _       Signed         Command:       01.06.4032.0001 (new setting: turn 180 degrees)       0: standard - 1: turn 180 degrees         4033 <td>Command:</td> <td>0106</td> <td>4016 0000</td> <td>-</td> <td></td> <td>Reset to 0</td> <td></td> <td></td>	Command:	0106	4016 0000	-		Reset to 0		
Bornand:         Interf         IDS         I         Image: Point Stress St			le:	1.				C
Command:         0105 5098 0002 (new tantf: 2)         1: 11 - 2: 12 - 3: 13 - 4: 14           6049         Resettable day counter         10         1         jkWin         Float ABCD           Command:         01 10 6049 0002 04 0000 0000         Reset to 0         Reset to 0         Reset to 0           401F         CT ratio         2         -         Signed           Command:         01 10 401F 0002 04 9995 0005         Set to 9995/5         Set to 9995/5           4021         Pulse width         06         1         ms         [Signed           Command:         01 06 4021 0030 (new setting: 30ms)         2~99 ms         -         Signed           4022         Pulse type         06         1         -         Signed           Command:         01 06 4022 0002 (new setting: forward & reverse)         2 = forward & reverse         -           4026         Data type setting         06         1         -         Signed           Command:         01 06 4022 0002 (new setting: integer)         1=standard, 2=Integer         -           4032         Screen direction         05         1         (-         Signed           Command:         01 06 4032 0001 (new setting: turn 180 degrees)         0: standard - 1: turn 180 degrees <td< td=""><td>6048</td><td></td><td>106</td><td><u>µ</u></td><td>1. 74</td><td>3. 73 3. 7</td><td>-</td><td>Isigned</td></td<>	6048		106	<u>µ</u>	1. 74	3. 73 3. 7	-	Isigned
6049       Resettable day counter       10       1       kWh       Float ABCD         Command:       01 10 6049 0002 04 0000 0000       Reset to 0         401F       CT ratio       2       -       Signed         Command:       01 10 401F 0002 04 9995 0005       Set to 9995/5         4021       Pulse width       06       1       ms       Signed         Command:       01.06 4021 0030 (new setting: 30ms)       2~99 ms       -       Signed         4022       Pulse type       06       1       -       Signed         4022       Pulse type       06       1       -       Signed         4026       Data type setting       106       1       -       Signed         4026       Data type setting       06       1       -       Signed         4032       Screen direction       06       1       -       Signed         4033       081S code ON/OFF       06       1       0: standard - 1: turn 180 degrees         4033       081S code ON/OFF       06       1       0: OFF - 1: ON	Command:	0106-6048-0	002 (new tann: 2)		1:11	- 2: 12 - 3: 1	3-4:14	
60.49         Resettable day counter         10         1         IKWn         Float ABCD           Command:         01.10.6049.0002.04.0000.0000         Reset to 0         Reset to 0         Reset to 0           401F         CT ratio         2         -         Signed           Command:         01.10.401F.0002.04.9995.0005         Set to 9995/5         Set to 9995/5           4021         Pulse width         06         1         ms         Signed           Command:         01.06.4021.0030 (new setting: 30ms)         2~99 ms         2         99 ms           4022         Pulse type         06         1         -         Signed           Command:         01.06.4022.0002 (new setting: forward & reverse)         2 = forward & reverse         2           4026         Data type setting         06         1         -         Signed           Command:         01.06.4022.0002 (new setting: integer)         1=standard, 2=Integer         4032           Goreen direction         06         1         (-         Signed           Command:         01.06.4032.0001 (new setting: turn 180 degrees)         0: standard - 1: turn 180 degrees           4033         OBIS code ON/OFFF         06         1         0 = (Signed		-	1. *	1.				-
Command:         01 10 6049 0002 04 0000 0000         Reset to 0           401F         CT ratio         2         -         Signed           Command:         01 10 401F 0002 04 9995 0005         Set to 9995/5         Set to 9995/5           4021         Pulse width         06         1         ms         Signed           Command:         01.06 4021 0030 (new setting: 30ms)         2~99 ms         -         Signed           4022         Pulse type         06         1         -         Signed           4025         Data type setting         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4025         Data type setting         06         1         -         Signed           4026         Data type setting: integer)         1=standard, 2=Integer         -           4032         Screen direction         06         1         (-         Signed           4033         OBIS code ON/OFF         06         1         0: standard - 1: turn 180 degrees           4033         OBIS code ON/OFF         <	6049	Resettable day counter	10	1			kWh	Float ABCD
401F         CT ratio         2         -         Signed           Command:         01 10 401F 0002 04 9995 0005         Set to 9995/5           4021         Pulse width         06         1         ms         Signed           4021         Pulse width         06         1         ms         Signed           4021         Pulse width         06         1         -         Signed           Command:         01.06 4021 0030 (new setting: 30ms)         2~99 ms         -         Signed           4022         Pulse type         06         1         -         Signed           Command:         01.06 4022 0002 (new setting: forward & reverse)         2 = forward & reverse         -         Signed           4026         Data type setting         06         1         -         Signed           4032         Screen direction         06         1         (-         Signed           4032         Screen direction         06         1         (-         Signed           4033         0815 code ON/OFF         06         1         0 = (Signed           4033         0815 code ON/OFF         06         1         0 = (Signed	Command:	01 10 6049 0	002 04 0000 0000			Reset to 0		
401F         CT ratio         2         -         Signed           Command:         01 10 401F 0002 04 9995 0005         Set to 9995/5								
Command:         01 10 401F 0002 04 9995 0005         Set to 9995/5           4021         Pulse width         06         1         ms         Signed           Command:         01 06 4021 0030 (new setting: 30ms)         2~99 ms         2~99 ms           4022         Pulse type         06         1         -         Signed           4022         Object to 4022 0002 (new setting: forward & reverse)         2 = forward & reverse         2           4026         Data type setting         06         1         -         [Signed           Command:         01 06 4026 0002 (new setting: integer)         1=standard, 2=Integer         4032         Screen direction         06         1         (-         [Signed           4033         OBIS code ON/OFF         06         1         0 = (Signed         0 = (Signed           4033         OI 106 4033 0001 (new setting: OBIS ON)         0: OFF - 1: ON         0         0	401F	CT ratio			2		-	Signed
4021         Pulse width         06         1         ms         Signed           Command:         0106 4021 0030 (new setting: 30ms)         2~99 ms           4022         Pulse type         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4032         Screen direction         06         1         @-         Signed           4033         OBIS code ON/OFF         06         1         0 = @Signed           4033         OBIS code ON/OFF         06         1         0 = @Signed	Command:	01 10 401F 0	002 04 9995 0005			Set to 9995	/5	
4021         Pulse width         06         1         ms         Signed           Command:         0106 4021 0030 (new setting: 30ms)         2~99 ms           4022         Pulse type         06         1         -         Signed           4022         Pulse type         06         1         -         Signed           4022         Pulse type         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4032         Screen direction         06         1         -         Signed           4032         Screen direction         06         1         (-         Signed           4033         OBIS code ON/OFF         06         1         0: standard - 1: turn 180 degrees           4033         OBIS code ON/OFF         06         1         0: OFF - 1: ON								
Command:         0106 4021 0030 (new setting: 30ms)         2~99 ms           4022         Pulse type         06         1         -         Signed           4022         Pulse type         06         1         -         Signed           Command:         01 06 4022 0002 (new setting: forward & reverse)         2 = forward & reverse         2 = forward & reverse           4026         Data type setting         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4027         Ot 06 4026 0002 (new setting: integer)         1=standard, 2=Integer         -           4032         Screen direction         06         1         (-         Signed           4032         Screen direction         06         1         0: standard - 1: turn 180 degrees           4033         OBIS code ON/OFF         06         1         0 = @Signed           4033         OBIS code ON/OFF         06         1         0: OFF - 1: ON	4021	Pulse width	06	1			ms	Signed
4022         Pulse type         06         1         -         Signed           Command:         01 06 4022 0002 (new setting: forward & reverse)         2 = forward & reverse         2 = forward & reverse           4026         Data type setting         06         1         -         Signed           4026         Data type setting         06         1         -         Signed           4027         Ot 06 4026 0002 (new setting: integer)         1=standard, 2=Integer         -         Signed           4032         Screen direction         06         1         (-         Signed           4032         Screen direction         06         1         0: standard, 2=Integer           4033         081S code ON/OFF         06         1         0: standard - 1: turn 180 degrees           4033         081S code ON/OFF         06         1         0 = @Signed           4033         081S code ON/OFF         06         1         0: OFF - 1: ON	Command:	0106 4021 0030	(new setting: 30ms)			2~99 ms		
4022         Pulse type         06         1         -         Signed           Command:         01 06 4022 0002 (new setting: forward & reverse)         2 = forward & reverse         2 = forward & reverse           4026         Data type setting         06         1         -         Signed           Command:         01 06 4022 0002 (new setting: integer)         1=standard, 2=Integer         -         Signed           4032         Screen direction         06         1         (-         Signed           4032         Screen direction         06         1         0: standard - 1: turn 180 degrees           4033         081S code ON/OFF         06         1         0 = (Signed           4033         081S code ON/OFF         06         1         0: OFF - 1: CN				-				
Command:         01 06 4022 0002 (new setting: forward & reverse)         2 = forward & reverse           4026         Data type setting         06         1         -         [Signed           4026         Data type setting         06         1         -         [Signed           4027         01 06 4026 0002 (new setting: integer)         1=standard, 2=Integer           4032         Screen direction         06         1         (-         [Signed           4032         Screen direction         06         1         0: standard - 1: turn 180 degrees           4033         081S code ON/OFF         06         1         0: OFF - 1: CN	4022	Pulse type	06	T	1		-	Signed
Command:         Of 60 + 601 0001 (new setting: integer)         1         -         [Signed]           4026         Data type setting         [06         1          -         [Signed]           Command:         01.06 4026 0002 (new setting: integer)         1=standard, 2=Integer           4032         Screen direction         [06         1         (-         [Signed]           4032         Screen direction         [06         1         0: standard - 1: turn 180 degrees]           4033         OBIS code ON/OFF         [06         1         0 = (Signed]           4033         OBIS code ON/OFF         [06         1         0: OFF - 1: CN	Command:	01.05.4022.0002 (new	setting: forward & reverse)	+	- 2	= forward & n	everse	
4026         Data type setting         [06         1         -         [Signed]           Command:         01.06.4026.0002 (new setting: integer)         1=standard, 2=Integer           4032         Screen direction         [06         1         (-         [Signed]           4032         Screen direction         [06         1         (-         [Signed]           4033         01.06.4032.0001 (new setting: turn 180 degrees)         0: standard - 1: turn 180 degrees         0 = (Signed]           4033         OBIS code ON/OFF         [06         1         0 = (Signed]           4033         OBIS code ON/OFF         [06         1         0 = (Signed]	Command.	or co harr occer frien	scorg, locked a relately	_		101112-0-011		
N200         Data type secting         [000         1         [1] Instandard, 2=Integer           Command:         01.06 4026 0002 (new setting: integer)         1=standard, 2=Integer           4032         Screen direction         06         1         (-         [Signed           4032         Screen direction         06         1         (-         [Signed           4033         01.06 4032 0001 (new setting: turn 180 degrees)         0: standard - 1: turn 180 degrees         0 = (Signed           4033         0BIS code ON/OFF         06         1         0 = (Signed           4033         0BIS code ON/OFF         06         1         0 = (Signed	40.26	Data tune setting	106	11			L	Signed
Command:         OT 06 4032 0002 (new setting: http://www.setting: http://wwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwww	Command	01.06.4026.0002	(now cotting: integer)	<u>+</u>	1-	standard 2-T	ntonor	laidige
4032         Screen direction         06         1         (-         [Signed]           Command:         01 06 4032 0001 (new setting: turn 180 degrees)         0: standard - 1: turn 180 degrees           4033         OBIS code ON/OFF         06         1         0 = (Signed)           4033         OBIS code ON/OFF         06         1         0 = (Signed)           4033         01 06 4033 0001 (new setting: OBIS ON)         0: OFF - 1: ON         0		01 00 4020 0002	They sering unceded		1=	scandaru, 2=1	noger	
40.32         Screen direction         ID5         I         Q-         [Signed]           Command:         01.06.40.32.00.01 (new setting: turn 180 degrees)         0: standard - 1: turn 180 degrees           40.33         OBIS code ON/OFF         06         1         0 = (Signed)           Command:         01.06.40.33.00.01 (new setting: OBIS ON)         0: OFF - 1: ON         0		la #	loc .	1.				
Command:         01 05 4032 0001 (new setting: turn 180 degrees)         0: standard - 1: turn 180 degrees           4033         OBIS code ON/OFF         06         1         0 = (Signed           Command:         01 05 4033 0001 (new setting: OBIS ON)         0: OFF - 1: ON         0: OFF - 1: ON	4032	Screen direction	lue .	1			ų-	signed
4033         OBIS code ON/OFF         06         1         0 = (Signed           Command:         01 06 4033 0001 (new setting: OBIS ON)         0: OFF - 1: ON	Command:	01 05 4032 0001 (new	v setting: turn 180 degrees)		0: stand	lard - 1: turn 1	.80 degree	s
4033         OBIS code ON/OFF         06         1         0 = (Signed           Command:         01 06 4033 0001 (new setting: OBIS ON)         0: OFF - 1: ON								
Command: 01 06 4033 0001 (new setting: OBIS ON) 0: OFF - 1: ON	4033	OBIS code ON/OFF	06	1			0 =	Signed
	Command:	01 06 4033 0001	(new setting: OBIS ON)			0: OFF - 1: 0	DN	

# **Appendix 4 - Bluetooth**

All Ambition meters are capable to be read out and configured by Bluetooth communication.

You can download the inepro Meter Manager app for android or IOS in the stores.

Download on the App Store:



Download on the Google Play store:



## A 4.1 Bluetooth app

Activate Bluetooth on the meter following the steps of 7.5 Bluetooth.

Start the mobile phone app.





## A 4.2 Connect the meter

The meter can be connected using the Scan Bluetooth or Scan QR function.

1. Scan Bluetooth: the app scans for all the Bluetooth meters in the area.

Select the correct serial number for connection.



2. Scan QR: the app opens the mobile phone camera<sup>1</sup> to scan the QR code on the meter display.

Once scanned, the meter is connected.



## A 4.3 Device connected

The meter is now connected to the mobile phone app 'inepro meter manager'.

The device page shows the meter type, serial number, software version and check Sum 1&2.

	* 🛯 💎 🖓 🖌 85% 🕯	15:29
÷	Device	
5.5.6	a ser an	
	Ambition 2PU CT	
	Serial number: 21100043	
- Carte	Software version: 1.03	
	Checksum 1: 59607739	
	Checksum 2: 21022000	
and the	A SARA XIN-CA	1
4	Energy values	>
	na an amana 🖉 🖉 - Mana ang ang ang ang	
((c 3))	Instantaneous	>
0	Settings	>



Read data by selecting Energy values or Instantaneous values:

## **Read meter data**

Read data by selecting Energy values or Instantaneous values:

13:23 🛱 🗩 M 🔸	<b>4</b> % / 2	13:23 🖬 🕞 🕶 🔸
← Energy	B U	← Instar
Total active energy	0.073 kWh	Voltage*
T1 Total active energy	0.073 kWh	L1 Voltage
T2 Total active energy	0 kWh	L2 Voltage
L1 Total active energy	0.078 kWh	L3 Voltage
L2 Total active energy	0 kWh	Grid frequency
L3 Total active energy	0 kWh	Current*
Forward active energy	0.073 kWh	L1 Current
T1 Forward active energy	0.073 kWh	L2 Current
T2 Forward active energy	0 kWh	L3 Current
L1 Forward active energy	0.078 kWh	Total active po
L2 Forward active energy	0 kWh	L1 Active powe
L3 Forward active energy	0 kWh	L2 Active powe
Reverse active energy	0 kWh	L3 Active powe
III O	<	111

13:23 🖬 🕞 🕫 🔹	<b>K</b> S. (1)
← Instantaneous	B U
Voltage*	0 \
L1 Voltage	238.39 \
L2 Voltage	0 \
L3 Voltage	0 \
Grid frequency	50.01 H
Current*	04
L1 Current	0.4
L2 Current	04
L3 Current	0.4
Total active power	0 kV
L1 Active power	0 kV
L2 Active power	0 kV
L3 Active power	0.kV
III O	<

The data format is CSV.

Refresh the data using the refresh button in the right upper corner.

Save the data using the save button. Data can be saved and shared to different mobile phone applications.

## Settings

Settings can selected individualy and/or saved all at once. Select the settings that need to be modified. The modified settings will be marked green.

23 >

0.073 kwH 🔅

13:23 🖬 🖸 🕫 🔹	<b>*</b> %.	× % 1		13:48 🖬 🛇 🛤		
← Settings				÷	Settings	
Modbus ID (1-247)				Modbur	10 (1.287)	
1				1	s ((1247)	
Baud rate				Baud ra	te	
115200		٠		11520	00	
SD output rate				S0 outp	ut rate	
1000		٣		1000		
Combination code				Combin	ation code	
Forward – reverse (10)		٠		Forwa	ard – reverse (10)	
Parity setting				Parity s	etting	
Even		٣		Even		
Power down counter	23	2		Powe	r down counter	
Tariff				Tariff		
T1		٣		Т1		
Trip counter	0.073 kwH	2		Trip c	ounter	
Pulse width				Pulse w	ridth	
30				30		
Pulse type				Pulse ty	rpe.	
Active & reactive		*		Active	e & reactive	
III O	<				111 (	

If you set the value over the range and save it, APP will show save error.

13:34 🗢 🖬 🕮 🖉		<b>0</b> 😂 🖓 🖓 🖓 🕬
÷	Settings	8
Set	d! The following setting us ID (1-247)	× Is did not save:
Baud r 9600	ate )	¥

The modified setting(s) will only be set, when it is also saved. Press the Save button to store the settings in the meter. First a pop-up menu for password will appear. The default password is 0000. The password can only be modified in the meter using the buttons. After entering the correct password the new settings will be stored in the meter:



13:49 🖬 🕓 🛤 🔹	<b>*</b> Stat #
← Settings	
Y Save complete	\$
All settings where saved succe	essfully
1	
Baud rate	
115200	-
S0 output rate	
1000	
Combination code	
Forward – reverse (10)	
Parity setting	
Even	
Power down counter	23
Tariff	
т1	,
Trip counter	0.073 kwH
Pulse width	
30	
Pulse type	
Active & reactive	
III O	<

## Settings

The following settings can selected in the mobile app "INEPRO METER MANAGER".

2PU CT			
Setting	Default	Range or settings	Unit
Modbus ID (1 - 247)	1	1 - 247	
Baudrate	9600	115.200 / 56.700 /	bps.
		38.400 / 19.200 / 9600 / 4800 / 2400 / 1200	
		/ 600 / 300	
M-Bus ID (0-250)	1	0 - 250	
M-bus Baud rate	2400	300 / 600 / 1200 / 2400 / 4800 / 9600	
S0 output rate	1000	10.000 / 2.000 / 1000 /100 / 10 / 1 / 0,1 /	imp/kWh
		0,01	
Combination code	Forward - reverse (10)	Forward only; Reverse only; Forward + Re-	
		verse; Forward - Reverse; Forward - Reverse	
		(10)	
Parity setting	Even	Even / None / Odd	
Power down counter	1 (or higher)	Are you sure you want to reset this to 0?	
		Cancel / OK	
Tariff	T1	T1 / T2 / T3 / T4	
Trip counter	0 kWh	Are you sure you want to reset this to 0?	kWh
		Cancel / OK	
Puls width	30		ms
Pulse Type	Forward & Reverse	Active&reactive / Forward & Reverse	
Data type setting	Standard	Standard / Integer	
Screen direction	Standard	Standard / Turn 180 degrees	
OBIS code ON/OFF	On	Off / On	