inepro®

User Manual



User Manual

1100	PRO1 1U AC 45A S MID	PRO1-S
1101	PRO1 1U AC 45A Mo T MID	PRO1-Mod
1102	PRO1 1U AC 45A Mo T Ba MID	PRO1-Mod-Ba

User manual | Version: 1.3

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RoHS Compliant

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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, who have the proper knowledge about labeling and grounding electrical equipment and circuits and can do so in accordance with local (safety) regulations, are considered qualified personnel in this manual.

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 the manufacturer.

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 significance 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 reinstalled after installation of the wires.
- 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 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
- If the product has been dropped from more than 1 meter high on a concrete floor and no obvious damage is visible, 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 fallen from >1m height on concrete surfaces

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.

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3. Foreword

Foreword

Thank you for purchasing this energy meter. inepro offers a wide range of devices. We have introduced numerous energy meters to the market, designed for use with 120V AC to 400V AC (50 and 60Hz) and up to 1000V/1500A DC. For more information on other products, please contact our sales department at sales@ineprometering.com or visit our website at www.ineprometering.com.

While we manufacture this device according to international standards and conduct rigorous quality inspections, it is still possible that a defect or malfunction may occur, for which we apologize. Under normal conditions, your product should provide years of reliable operation. Should you experience an issue with the energy meter, please contact your distributor immediately.

Most of our energy meters are secured with a special seal. Once this seal is broken, warranty claims cannot be honored. Therefore, please NEVER open the device housing or break the device seal. The limited warranty covers a period of 5 years from the production date, applicable only to production faults.

4. Compliance and Conformity

MID Certificate	EU Declaration of Conformity
	

5. Specifications

Casing	PC flame resistant plastic UL94-V0
Nominal voltage (Un)	120~230V AC (1~)
Operational voltage	120~230V AC ±20%
Insulation capabilities:	
- AC voltage withstand	4kV for 1 minute
- Impulse voltage withstand	6 kV (1.2/50 µs)
- Overvoltage category	OVC III
Basic current (Ib)	5A
Maximum rated current (Imax)	45A
Starting current (I_{st})	0.02A
Minimum current (I_{min})	0.15A
Overcurrent withstand	30 Imax (-10% ... +0%)
Operational frequency range	50/60Hz ±2%
Internal power consumption	≤2W, <10VA/phase
Test output flash rate (RED LED)	1000 imp/kWh
Pulse output rate S0	1000 imp/kWh
Pulse width	80ms
Data store	The data can be stored for more than 10 years without power

5.1 Performance criteria

Operating humidity	≤95% non-condensing
Storage humidity	≤95% non-condensing
International standards Modbus	EN IEC 62052-11:2021+A11:2022 EN 50470-3:2022 EN IEC 62052-31:2024
Reference instructions	MID 2014/32/EU
Accuracy class	C (≤0.5% accuracy)
Protection against penetration of dust and water	IP51 (front side), IP20 (connection terminals)
Protection class of enclosure	Class II, double insulated
Altitude	≤2000m
Flammability rating	UL94-V0
Operating temperature range	-40°C ... +70°C
Extended operational temperature range for the measurement mechanism	-40°C ... +70°C
Storage temperature range	-40°C ... +70°C

5.2 Basic error

This meter adheres to Accuracy Class C requirements for active energy measurement under reference conditions. The basic error shall remain within the specified limits under the applicable standard test conditions.

Value of current		Power factor cosφ	Acceptable percentage error limits for meters of class
for directly connected meters	for transformer operated meters		0,5
I min ≤ I < 0.1 In	I min ≤ I < 0.05 In	1	±1,0
0.1 In ≤ I ≤ I max	0.05 In ≤ I ≤ I max	1	±0,5
0.1 In ≤ I < 0.2 In	0.05 In ≤ I < 0.1 In	0,5 inductive 0,8 capacitive	±1,0 ±1,0
0.2 In ≤ I < I max	0.2 In ≤ I ≤ I max	0,5 inductive 0,8 capacitive	±0,6 ±0,6

5.3 Modbus specification (only for PRO1-Mod & PRO1-Mod Ba)

Bus type	RS485
Protocol	Modbus RTU with 16-bit CRC
Baud rate	9600, 19200, 38400, 57600 and 115200
Address range	1-247 user settable
Maximum bus load	60 devices per bus*
Range	1200m

Defaults:

Modbus address	001
Baud rate	9600
Parity	EVEN

* The maximum number of devices (like meters) depends on the converter, baud rate (higher baud rates reduce the maximum number of devices that can be used), and the specific conditions under which the devices have been installed.

5.4 Tariff specification

Only for PRO1-Mod and PRO1-Mod-Ba. The PRO1-S does not support tariffs. The PRO1-Mod does support DS only. The PRO1-Mod-Ba does support both DS and RTC.

RTC (Real-Time-Clock) Tariff	4 Tariffs (default), 8 time periods (Ba version only)
Digital Switch (DS) Tariff	2 Tariffs (default)

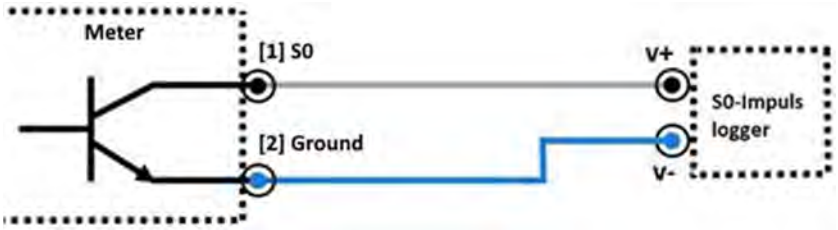
5.5 S0 Pulse Output

This function is only supported by the PRO1-S.

The energy meter is equipped with 1 pulse output (forward and reverse, or active and reactive) that are optically isolated from the internal circuitry. These outputs generate pulses proportional to the measured consumption, intended for remote reading or accuracy testing.

The pulse output is a polarity dependent, open-collector transistor output that requires an external voltage source for proper operation. The external voltage source (Ui) must not exceed 27V DC. The maximum switching current (I_{max}) is 100mA. To connect the pulse output, apply 5 ... 27V DC to connector 1 (S0), and connect the signal wire to connector 2 (Ground).

According to IEC 62056-21, the minimum pulse width is defined as 30 ms. However, when dealing with high pulse rates or high-power measurements, it may be necessary to shorten the pulse width. Ensure you consult the manual of your S0-logger to determine its minimum allowable pulse width, as exceeding this limit could result in data loss or inaccurate logging.

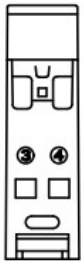


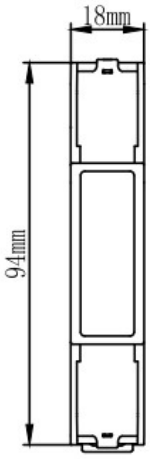
5.6 Dimensions

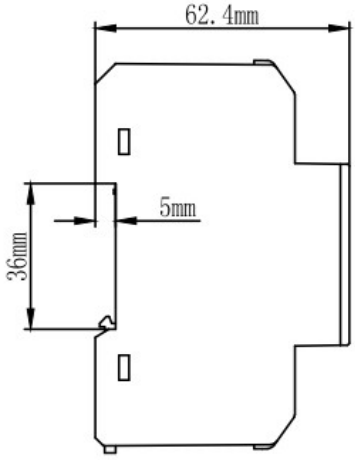
Height	94 mm
Width	18 mm
Depth	62.4 mm

Weight (net)

Pro1-S	79g
Pro1-Mod	80g
Pro1-Mod Ba	82g



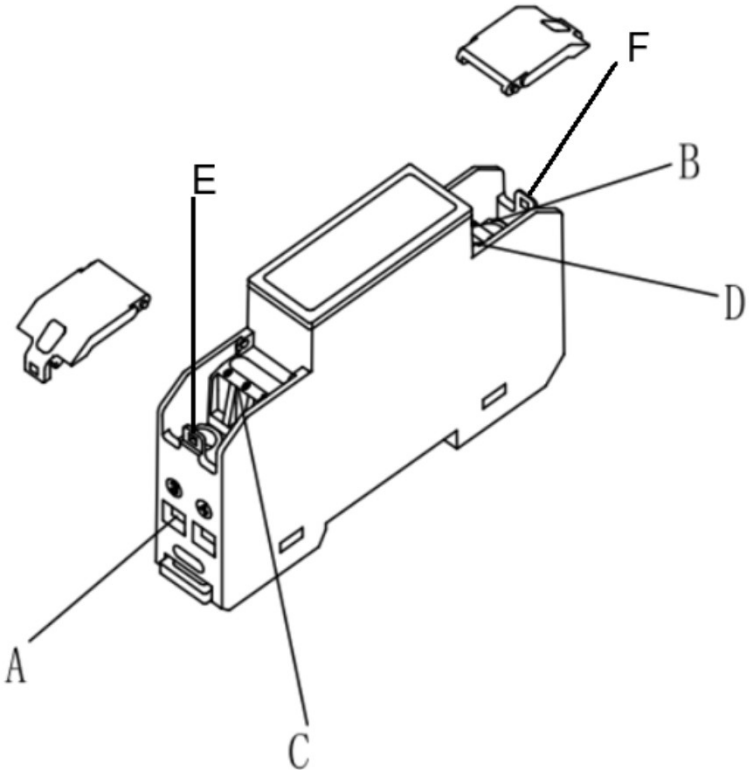




5.7 Connection Diagram

Structure

A Line input (left), Line output (right)
B & D Tariff switch (only PRO1-Mod & PRO1-Mod Ba)
C RS485 terminal (only PRO1-Mod & PRO1-Mod Ba) or S0 terminal (only PRO1-S)
E Wire seal



PRO1-S



Terminal name	Pin Description
1	Neutral in (N -IN)
2	Neutral out (N -OUT)
3	Phase 1 input
4	Phase 1 output
8	Modbus communication contact A
10	Modbus communication contact B
5,6, 7 & 9	Not Connected

PRO1-Mod & PRO1-Mod Ba



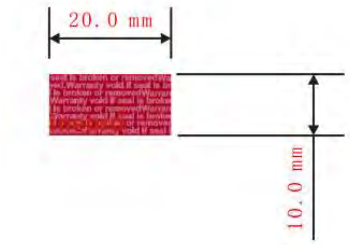
Terminal name	Pin Description
1	Neutral in (N -IN)
2	Neutral out (N -OUT)
3	Phase 1 input
4	Phase 1 output
5 & 7	Digital Switch (DS) Tariff
8	Modbus communication contact A
10	Modbus communication contact B
6 & 9	Not Connected

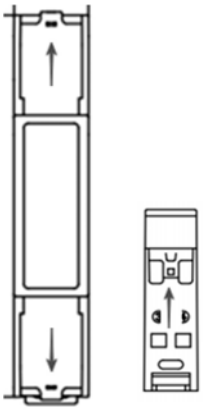
5.8 Wire Connection

Parameter	Terminals 1, 2, 3, 4	Terminals 5,7,8,10
Conductor Cross-Section	Solid core wire: 1 ... 10 mm^2 Soft core wire: 1 ... 10 mm^2	Solid core wire: 0.5 ... 1.5mm^2 Soft core wire: 0.5 ... 1.5 mm^2
Stripping Length	8-10 mm	5-6 mm
Screwdriver Size	Flat-head: 5 / 6 mm or Posidrive: PZ2	Flat-head: 3 mm or Posidrive: PZ1
Tightening Torque	1.5 Nm	0.4 Nm

When connecting wires No. 5, 7, 8 and 10, the torque should be controlled within 0.4 N·m. When connecting wires No. 1, 2, 3 and 4, the torque should be controlled within 1.5 N·m. Otherwise, it may cause the screws to strip.

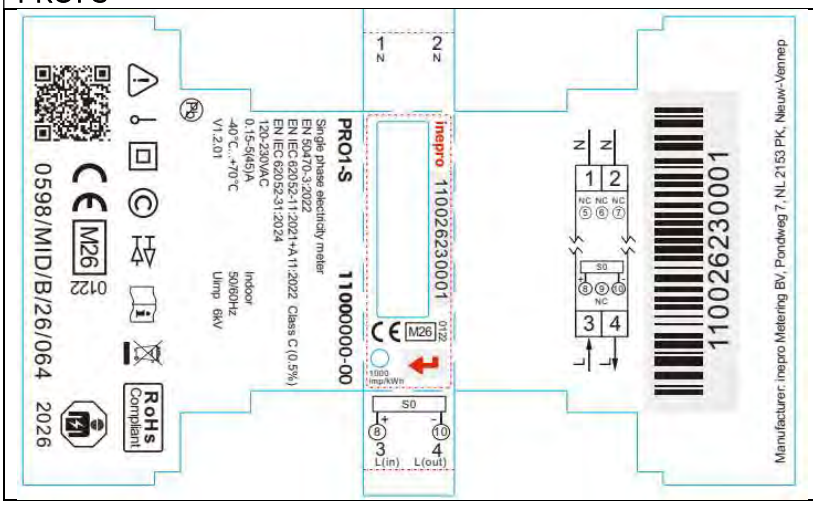
5.9 Location of seals

Anti tempering seal	
The meter is equipped with a holographic anti-tampering seal on its side. Ensure that this seal is intact and undamaged prior to installation.	

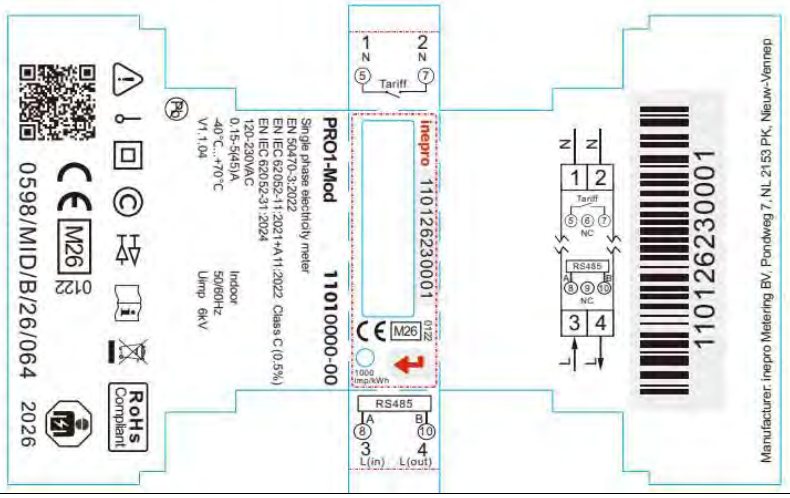
Wire seal holes	
The meter is equipped with two designated holes for applying wire seals after installation of the terminal covers to prevent unauthorized access.	

5.10 Name plate

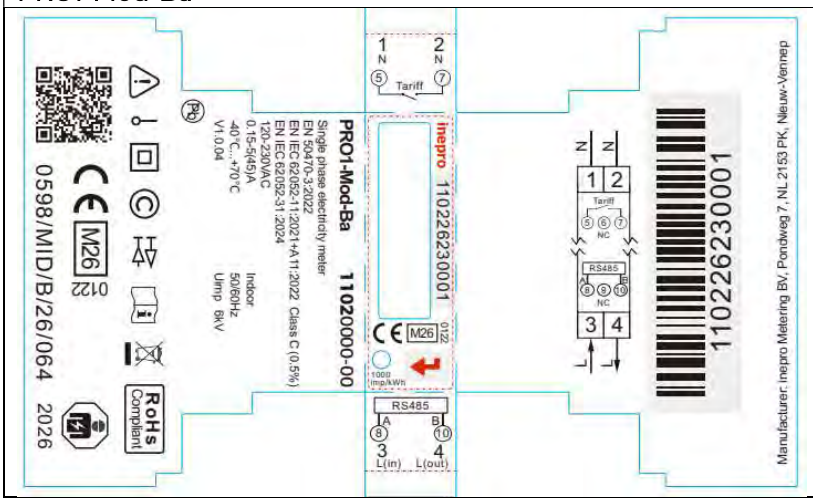
PRO1-S



PRO1-Mod



PRO1-Mod-Ba



6. Installation

Caution

- **Avoid direct contact**: During repair and maintenance, do not touch meter connecting clamps with bare hands, metal objects, bare wire, or any conductive material to prevent electric shock, injury, or death.
- **Isolate power sources**: Before removing the protective cover, shut down and, if possible, lock all power supplies to the meter and connected equipment.

Warning

- **Qualified Personnel Only**: Maintenance or repair should only be performed by qualified personnel familiar with relevant codes and regulations.
- **Use Insulated Tools**: Always use insulated tools when working on the meter.
- **Replace the Protective Cover**: Ensure the protective cover is securely reinstalled after maintenance or repair.
- **Maintain Sealed Integrity**: The case is sealed; failure to reassemble properly may result in meter damage.

General

- **Wiring Size**: The connecting wire must be sized per local regulations, based on the maximum current rating of the circuit's breaker or other overcurrent protection devices.
- **Disconnect Switch**: Install an external switch or circuit breaker on the supply wires to disconnect the meter and energy source. Place it near the meter for operator convenience, ensuring compliance with building electrical specifications and local regulations.
- **Overcurrent Protection**: Install an external fuse or thermal cut-off on the supply wires for overcurrent protection, ideally near the meter, and in accordance with local and building codes.
- **Installation Environment**: The meter may be installed indoors or outdoors in a suitably protected meter box per local codes.
- **Tamper Prevention**: Use a lockable enclosure to prevent tampering.
- **Fire Resistance**: Mount the meter on a fire-resistant wall.
- **Ventilation and Dryness**: Install the meter in a dry, well-ventilated area.
- **Contaminant Protection**: Use a protective box if the meter is exposed to dust or other contaminants.
- **Testing and Sealing**: Test the meter prior to installation and seal it afterward.
- **DIN Rail Mounting**: The device is compatible with 35 mm DIN rail mounting.
- **Readability**: Install the meter in an easily readable location.
- **Surge Protection**: In surge-prone areas (e.g., thunderstorms, welding, inverters), protect the meter with a Surge Protection Device.
- **Immediate Sealing**: Seal the device immediately after installation to prevent tampering.
- **Insulation Integrity**: After wiring the auxiliary terminals, ensure the insulation between the RS485 and live circuits remains sufficient (rated impulse voltage: 6 kV R1).

7. Operation

The PRO1 display is organized into five main page groups: **Measurement**, **Tariff**, **Demand**, **Information** and **Settings**. During normal operation, the meter shows measurement data and allows the user to move through the available page groups using the front button. Depending on the meter variant and active configuration, additional tariff and configuration-related screens may be shown.

7.1 Display behavior at power-up

When the meter is energized, the display first performs a full segment test. After this start-up screen, the meter enters the normal display cycle and begins showing the available operating pages.



7.2 Available display pages

After start-up, the meter enters the normal display cycle. The available pages are grouped by function, allowing the user to review measurement values, tariff counters, demand values, device information and settings. The **T1 to T5** table indicator in the upper left corner shows which display page is currently active. Press the middle button briefly (< 3 s) to enter a display page. Press and hold the middle button (> 3 s) to return to the display pages.

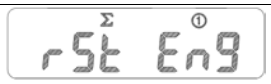
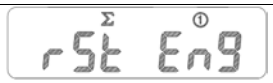
0	Measurement Page	
0	Tariff Page	
0	Demand Page	
0	Information Page	
7.2.5	Settings Page	

7.2.1 Measurement Page

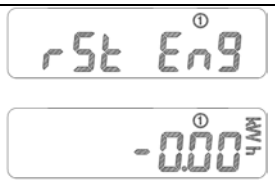
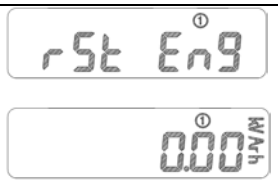
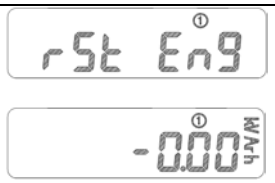
The Measurement page is the primary operating page of the meter. It shows the main measured energy values and electrical parameters used for daily reading and system monitoring.

The following illustrations are for DS Tariff mode, Tariff 1 situation (The symbol ① will be displayed above the LCD screen, but PRO1-S does not have DS tariff mode).

Energy Registers		
1	Total Active Energy	
2	Total Reactive Energy	
3	Total Apparent Energy	

Resettable Total Energy Registers		
4	Total Active Energy (**Resettable**)	 
5	Total Reactive Energy (**Resettable**)	 

Forward and Reverse Energy Register		
6	Total Forward Active Energy	
7	Total Reverse Active Energy	
8	Total Forward Reactive Energy	
9	Total Reverse Reactive Energy	

Resettable Forward and Reverse Energy Register		
10	Forward Total Active Energy (**Resettable**)	
11	Reverse Total Active Energy (**Resettable**)	
12	Forward Total Reactive Energy (**Resettable**)	
13	Reverse Total Reactive Energy (**Resettable**)	

Instantaneous values		
14	Voltage	
15	Current	
16	Active Power	
17	Reactive Power	
18	Apparent Power	
19	Power Factor	
20	Frequency	

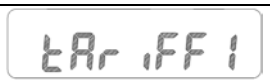
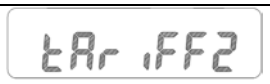
Power quality indicators		
21	Voltage Harmonic Content	
22	Current Harmonic Content	

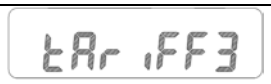
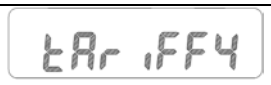
Operating Time		
23	Operating Time (KW+)	
24	Operating Time (KW-)	
25	Operating Time (KW+) (**Reset**)	 
26	Operating Time (KW-) (**Reset**)	 
27	Total Operating Time	

7.2.2 Tariff Page

The Tariff page shows the energy registers assigned to the active tariff structure. Depending on configuration, the meter can operate either in (RCT) Real-Time-Clock tariff mode or in Digital Switch (DS) tariff mode. The RTC tariff mode is only available on the PRO1-Mod Ba version. The PRO1-S does not support tariffs.

These two tariff modes (RTC and DS) can be switched in Tariff Mode setting page.

Real-Time-Clock (RTC) Tariff In RTC mode, the meter allocates energy to tariffs T1 to T4 based on the internal real-time clock and the configured tariff schedule. (PRO1-Mod Ba only)		
1	T1	
2	T1 Total Active Energy	
3	T1 Total Reactive Energy	
4	T1 Forward Total Active Energy	
5	T1 Reverse Total Active Energy	
6	T1 Forward Total Reactive Energy	
7	T1 Reverse Total Reactive Energy	
8	T2	
9	T2 Total Active Energy	
10	T2 Total Reactive Energy	
11	T2 Forward Total Active Energy	
12	T2 Reverse Total Active Energy	
13	T2 Forward Total Reactive Energy	

14	T2 Reverse Total Reactive Energy	
15	T3	
16	T3 Total Active Energy	
17	T3 Total Reactive Energy	
18	T3 Forward Total Active Energy	
19	T3 Reverse Total Active Energy	
20	T3 Forward Total Reactive Energy	
21	T3 Reverse Total Reactive Energy	
22	T4	
23	T4 Total Active Energy	
24	T4 Total Reactive Energy	
25	T4 Forward Total Active Energy	
26	T4 Reverse Total Active Energy	
27	T4 Forward Total Reactive Energy	
28	T4 Reverse Total Reactive Energy	

Digital Switch (DS) Tariff In DS mode, the meter uses the external tariff input to switch between DS1 and DS2. The display can show the energy assigned to both tariff registers. (PRO1-Mod & PRO1-Mod-Ba only)		
1	DS1	
2	DS1 Total Active Energy	
3	DS1 Total Reactive Energy	
4	DS1 Forward Total Active Energy	
5	DS1 Reverse Total Active Energy	
6	DS1 Forward Total Reactive Energy	
7	DS1 Reverse Total Reactive Energy	
8	DS2	
9	DS2 Total Active Energy	
10	DS2 Total Reactive Energy	
11	DS2 Forward Total Active Energy	
12	DS2 Reverse Total Active Energy	
13	DS2 Forward Total Reactive Energy	
14	DS2 Reverse Total Reactive Energy	

7.2.3 Demand Page

The Demand page shows the highest recorded demand values calculated over the configured demand interval. These values are intended for power monitoring and load analysis.

The way these values are calculated depends on the selected demand type and demand interval settings.

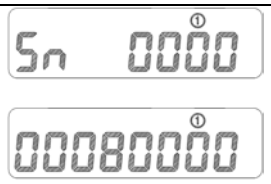
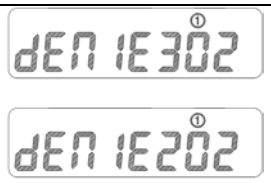
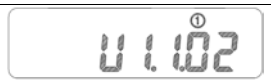
Total maximum demand		
1	Total Active Maximum Demand	
2	Total Reactive Maximum Demand	
3	Total Apparent Maximum Demand	

Total Forward and Reverse Demand		
4	Forward Total Active Maximum Demand	
5	Reverse Total Active Maximum Demand	
6	Forward Total Reactive Maximum Demand	
7	Reverse Total Reactive Maximum Demand	

Current Maximum Demand		
8	Current Maximum Demand	

7.2.4 Information Page

The Information page provides device identification data and an overview of the currently active meter configuration. It can be used during commissioning and diagnostics to verify communication settings, tariff mode, demand settings and alarm thresholds without changing any values.

Device Identity		
1	Serial Number	
2	Model	
3	Manufacturing Year	
4	Version Number	
5	Checksum	
6	Metering Mode	
7	Tariff Mode (DS Mode, only for PRO1-Mod and PRO1-Mod Ba)	

Active Communication Settings		
8	Modbus ID of meter	
9	Communication Baud Rate	
10	Communication Parity	
11	Communication Stop Bits	

Operating Mode settings		
12	Demand Type Default setting: 0 Settable 1: Block Interval 2: Sliding Window	
13	Demand Time	
14	Backlight Time (Unit: Minutes)	
15	Display Mode (Rotation Display)	
16	Home Mode Display Page	
17	Alarm Information Fig 1: No Alarm Fig 2 Example: Phase Voltage, Active Power, Wiring Error alarm simultaneously 1-Phase Voltage; 2- (None); 3-Current; 4-Power Factor; 5-Active Power; 6-Reactive Power; 7-Apparent Power; 8-Wiring Error.	 

Alarm Thresholds		
18-1	Phase Voltage Threshold Switch Default is off state; 18-1, 18-2, 18-3 switch display alternately.	
18-2	Phase Voltage Threshold setH	
18-3	Phase Voltage Threshold setL	
19-1	Current Threshold Switch Default is off state; 19-1, 19-2, 19-3 switch display alternately.	
19-2	Current Threshold setH	
19-3	Current Threshold setL	
20-1	Power Factor Threshold Switch Default is off state; 20-1, 20-2, 20-3 switch display alternately.	
20-2	Power Factor Threshold setH	
20-3	Power Factor Threshold setL	
21-1	Active Power Threshold Switch Default is off state; 21-1, 21-2, 21-3 switch display alternately.	
21-2	Active Power Threshold setH	
21-3	Active Power Threshold setL	
22-1	Reactive Power Threshold Switch Default is off state; 22-1, 22-2, 22-3 switch display alternately.	

22-2	Reactive Power Threshold setH	
22-3	Reactive Power Threshold setL	
23-1	Apparent Power Threshold Switch Default is off state; 23-1, 23-2, 23-3 switch display alternately.	
23-2	Apparent Power Threshold setH	
23-3	Apparent Power Threshold setL	
24	Alarm Delay Time Default setting 60; Unit (seconds)	

7.2.5 Settings Page

The Settings page provides access to the configurable parameters of the meter. Access to this page is password protected. Detailed navigation and setting behavior are described in Section 8.

8. Settings and configuration

8.1 Button operation

The front button is used both for page navigation and for access to the settings menu.

- **Short press (< 3 s)** Change value or move to next item
- **Press and hold (≥ 3 s)** Advance to next level (digit / page / setting)
- **Press and hold (≥ 5 s)** Confirm the selected value or setting
- **Press and hold (≥ 8 s)** Exit current menu

From the normal display pages, a long press opens the menu structure.

8.2 PIN code

After entering the settings menu, a 4-digit PIN code must be entered to prevent tampering with the settings. The default PIN is **0000**

- Use a short press to increase the selected digit.
- Hold the button for 3 seconds to move to the next digit.
- Repeat this until all digits have been entered.
- Hold the button for 5 seconds to confirm the PIN.
- Hold the button for 8 seconds to exit without confirming.

8.3 Settings screens

The Settings page is used to change configurable meter parameters such as tariff mode, communication settings, demand calculation method, display behavior and alarm thresholds. Access to this page is password protected.

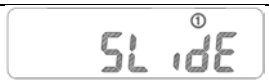
Navigation

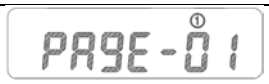
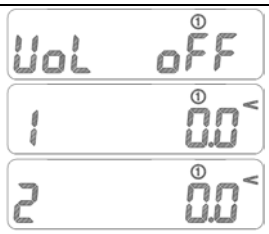
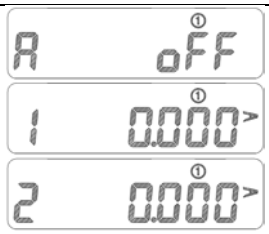
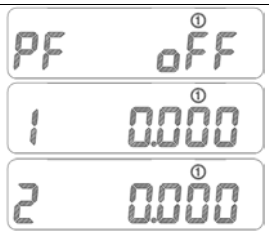
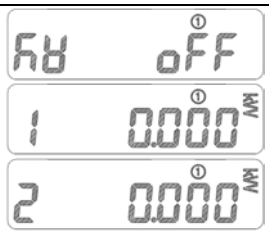
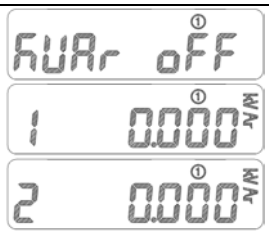
- Use **short press** to scroll through available settings
- Press and hold (≥ 3 s): enter the selected setting

Parameter Editing

- **Short press:** change the current parameter value
- **Press and hold (≥ 3 s):** move to the next parameter field
- **Press and hold (≥ 5 s):** confirm and exit the setting
- **Press and hold (≥ 8 s):** exit without saving and return to the home page

The table below provides an overview of the available settings and their position in the navigation sequence.

Menu position	Setting	Description	Screen
1	Metering mode	Defines how energy is calculated Defines how energy is calculated (refer to chapter 8.4) - A forward + reverse (default) - B forward – reverse - C forward only - D reverse only	
~~2~~	Tariff mode	Selects tariff operation (DS or RTC) (refer to chapter 8.5) PRO1-Mod-Ba supports switching between RTC Tariff and DS Tariff PRO1-Mod only has DS Tariff configurable.	 
3	Modbus address	Defines the Modbus communication address Default: 1 Configurable: 1 … 247 (only for PRO1-Mod& PRO1-Mod-Ba)	
4	Baud rate	Sets communication speed (refer to chapter 8.6) Default: 9600 Configurable: 19200/38400/57600/115200 (for PRO1-Mod & PRO1-Mod-Ba)	
5	Parity	Sets communication parity (refer to chapter 8.6) Default: even Configurable: none/even/odd (only for PRO1-Mod & PRO1-Mod-Ba)	
6	Demand type	Defines demand calculation method (refer to chapter 8.7) Default: 0 Configurable: 0 = Block interval, 1 = Sliding type	
7	Demand interval	Defines demand integration time (refer to chapter 8.7) Unit: minutes Default: 15 Configurable: 1, 5, 10, 15, 20, 30, 60	
8	Backlight time	Defines display backlight duration (refer to chapter 8.8.1) Unit: minutes Default: 1 Configurable: off, 1, 2, 5, 10, 15, 30, 60, on	
9	Display mode	Selects rotation or home mode (refer to chapter 8.8.2) Explanation: after 5 minutes of inactivity, the system will perform difference actions depending on the display mode set. - Homepage: the screen will show homepage	

		- Slide: start slide show and display the selected pages in a loop Default: Slide Configurable: Slide, Home	
10	Home page	Defines default display page (refer to chapter 8.8.2) Explanation: it defines which measurement page should be displayed as the fixed homepage (refer to chapter 7.2.1) Default: page 01 Configurable: page01 – page21	
11	Voltage alarm	Configure phase voltage threshold Default: off , When setting the threshold, H must be greater than L, When setting the threshold, L must be smaller than H	
12	Current alarm	Configure current threshold Default: off When setting the threshold, H must be greater than L When setting the threshold, L must be smaller than H	
13	Power factor alarm	Configure power factor threshold Default: off When setting the threshold, H must be smaller than L When setting the threshold, L must be greater than H	
14	Active power alarm	Configure active power threshold Default: off When setting the threshold, H must be greater than L When setting the threshold, L must be smaller than H	
15	Reactive power alarm	Configure reactive power threshold Default: off When setting the threshold, H must be greater than L When setting the threshold, L must be smaller than H	
16	Apparent power alarm	Configure apparent power threshold Default: off When setting the threshold, H must be greater than L When setting the threshold, L must be smaller than H	

			
17	Alarm delay	Defines alarm delay time (refer to chapter 8.2) Unit: seconds Default: 60 Configurable: 5 - 3600	
18	Setting password	Defines access PIN Default: 0000 Configurable: 0000 - 9999	

8.4 Metering mode

Defines how energy is calculated:

A. Forward + Reverse (default)
B. Forward – Reverse
C. Forward only
D. Reverse only

8.5 Tariff

The PRO1 Mod Ba supports two tariff modes, The PRO1 Mod only supports 1 tariff mode (DS). The PRO1-S does not support tariffs.

1- Real time clock (RTC) Tariff
   - Up to default 4 tariffs
   - Up to 8 switching time periods per day
2- Digital Switch (DS) tariff
   - Dual tariff controlled via external input

8.5.1 Digital Switch (DS) Dual Tariff

Hardware tariff switch function (PRO1-Mod and PRO1-Mod-Ba only):

Tariff input is a potential-free input (Volt-free Contact), which supports dry contact signals. The internal sensing voltage is 12 VDC, with a maximum input current of 10 mA. The design uses 12 VDC sensing voltage instead of 24 VDC. The input is a passive switch signal interface, so no external auxiliary power supply is required.

When the input is open, the meter is in DS1 tariff; when the input is shorted, the meter switches to DS2 tariff.

Terminals	State	Tariff
5 and 7	Open	Tariff 1
5 and 7	Closed	Tariff 2

8.5.2 Real time clock (RTC) Tariff

The PRO1-Mod Ba supports two tariff modes: a Real time clock (RTC) tariff mode and a Digital Switch (DS) tariff mode. In RTC mode, the meter distributes energy across up to four tariffs based on configurable time schedules. Each day can contain up to eight switching points, defining when a tariff becomes active. In DS mode, the tariff is controlled externally via a digital input, allowing switching between two tariffs.

In Real time clock mode, the meter distinguishes between three types of days: weekday, weekend (Saturday and Sunday), and holiday. Each day type has its own tariff schedule. When determining which schedule to apply, the meter evaluates the current date using a fixed priority. First, it checks whether the date is configured as a holiday. If so, the holiday schedule is applied. If not, the meter checks whether the date falls on a weekend. If neither condition applies, the weekday schedule is used.

If no tariff schedule is configured, the meter defaults to Tariff 1. In RTC mode, Tariff 1 is applied based on the internal clock. In DS mode, the meter defaults to DS1.Tariff Settings

8.5.3 Tariff switching and Energy Measurement Logic

The meter records energy consumption (in kWh) into tariff registers. Two tariff modes are available — Digital Switch (DS) and Real-time-clock (RTC) — but only one can be active at a time. The meter's operating mode determines which one is active, and therefore where consumption is recorded:

- In **DS mode**, energy is recorded in a DS register (DS1 or DS2), depending on the state of the digital input.
- In **RTC mode**, energy is recorded in an RTC register (RTC-T1 to RTC-T4), depending on the active time schedule.

The two modes never count energy at the same time. While the meter is in RTC mode, the DS registers are frozen and do not increase; while it is in DS mode, the RTC registers are frozen and do not increase.

When you switch modes, the registers of the previous mode **keep their last recorded values — they are not reset**. The newly active mode simply continues counting into its own registers. No energy is lost or double-counted during a switch.

Example

Suppose 2 kWh are consumed in total, with a mode change partway through:

Phase 1 — meter in DS mode, tariff DS2 active. 1 kWh is consumed:

DS2 register: 1 kWh

RTC-T1 register: 0 kWh (RTC mode inactive)

The meter is then switched to RTC mode.

Phase 2 — meter in RTC mode, tariff RTC-T1 active. A further 1 kWh is consumed:

RTC-T1 register: 1 kWh (counted while in RTC mode)

DS2 register: 1 kWh (frozen at its previous value)

8.5.4 Tariff Settings

Each tariff schedule consists of a list of switching points. A switching point defines the time at which a tariff becomes active. The tariff remains active until the next switching point is reached.

For each day type (weekday, weekend, and holiday), a separate tariff table can be configured. Each table can contain up to eight entries. Unused entries are ignored.

Example Refer to Appendix 1

8.6 Modbus Communication settings

Modbus address: 1 ... 247 (default Modbus Meter ID: 001)

Baud rate: 9600/19200/38400/57600/115200 (default Baud rate 9600)

Parity: Even / None / Odd (default Parity Even)

Stop Bit: 1 or 2. Stop bit 1 is used with parity even or odd. Stop bit 2 is used with parity none

8.7 Demand

8.7.1 Average Value Calculation

Demand represents the average value of an electrical parameter over a defined time interval. The meter continuously measures the selected parameter and calculates its average over the configured integration interval.

The default integration interval is **15 minutes.**

The meter supports two calculation methods:

Block interval mode (default)

The demand value is calculated over fixed, consecutive intervals. Each value represents the average over one complete integration period and is updated at the end of each interval.

Interval mode (time range is 5 min) The yellow part is the value involved in the calculation							
Time (min)	Power (W)		Time (min)	Power (W)		Time (min)	Power (W)
1	100		1	100		1	100
2	200		2	200		2	200
3	300		3	300		3	300
4	400		4	400		4	400
5	500		5	500		5	500
			6	600		6	600
value	300		7	700		7	700
			8	800		8	800
			9	900		9	900
			10	1000		10	1000
						11	1100
			value	800		12	1200
						13	1300
						14	1400
						15	1500
						Value	1300

Sliding window mode

The demand value is continuously updated using a moving time window. The value is recalculated periodically (typically every minute), reflecting the average over the most recent integration interval.

The sliding demand calculation interval is 1 minute. For example, when the demand period is set to 5 minutes, the first calculation is based on the values from minute 1 to minute 5. After one minute, the calculation window moves forward and the value is recalculated based on the values from minute 2 to minute 6. The demand value is continuously updated using this sliding time window.

Interval mode (time range is 5 min)
The yellow part is the value involved in the calculation

Time (min)	Power (W)	Time (min)	Power (W)	Time (min)	Power (W)	Time (min)	Power (W)	Time (min)	Power (W)	Time (min)	Power (W)
1	100	1	100	1	100	1	100	1	100	1	100
2	200	2	200	2	200	2	200	2	200	2	200
3	300	3	300	3	300	3	300	3	300	3	300
4	400	4	400	4	400	4	400	4	400	4	400
5	500	5	500	5	500	5	500	5	500	5	500
		6	600	6	600	6	600	6	600	6	600
value	300			7	700	7	700	7	700	7	700
		value	400			8	800	8	800	8	800
				value	500			9	900	9	900
						value	600			10	1000
								value	700		
										value	800

8.7.2 Integration Interval

The integration interval defines the duration over which the demand value is calculated.

A new integration cycle starts after power-on (the meter will automatically reset the demand calculation) or when a reset is performed (set a new demand integration time in setting page). The first valid demand value becomes available only after the first full integration interval has elapsed.

The following example illustrates the demand calculation:

- Reset time: 10:00
- Integration interval: 15 minutes

The first demand value is calculated over the period from **10:00 to 10:15** and becomes available at **10:15**.

8.8 LCD Settings

8.8.1 Backlight Time

The backlight time defines how long the display remains illuminated after user interaction.

The default setting is **1 minute**. The value can be configured in minutes according to user preference.

After the configured time has elapsed without any button interaction, the backlight is automatically turned off to reduce power consumption.

8.8.2 Screen Saver

If the screen saver function is enabled, the meter automatically changes its display behavior after a period of inactivity. The default inactivity time is **5 minutes**.

The behavior depends on the selected display mode:

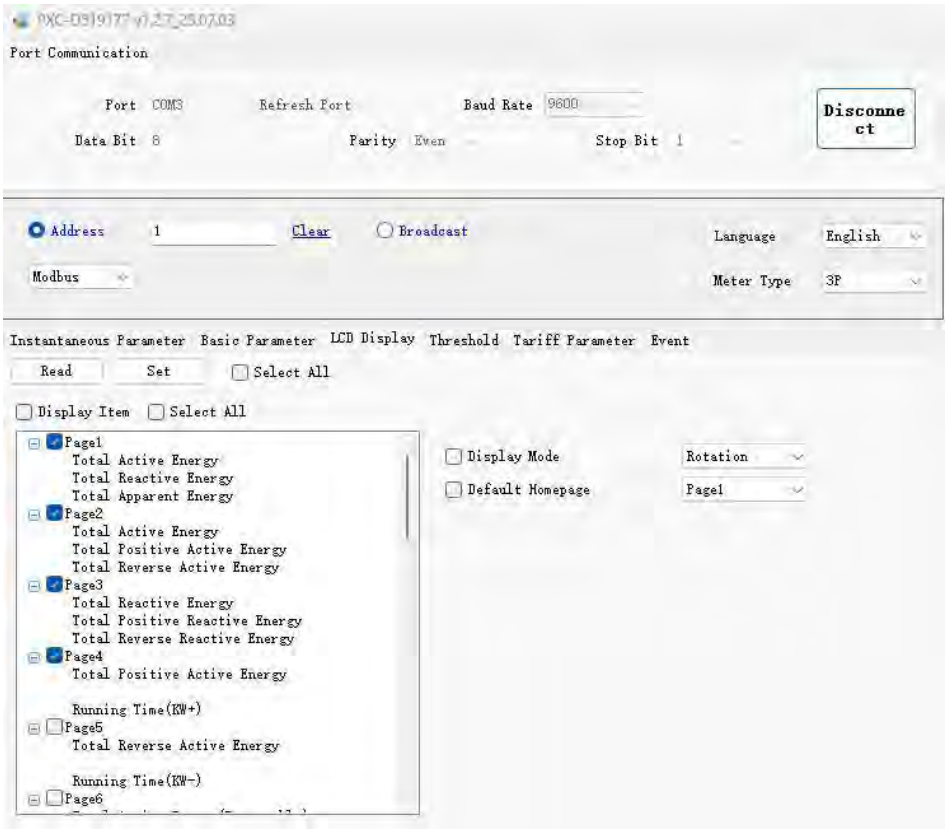
- In **Homepage mode**, the display returns to the configured home page
- In **Slide mode** (default), the meter automatically cycles through all available pages or through selected pages if a page filter is applied

8.8.3 Page Filter

The page filter function allows specific display pages to be hidden using the configuration software. This makes the display sequence more concise and relevant for the application.

Pages that are disabled using the page filter will not appear during automatic page rotation or when navigating manually using the front button.

Open the PXC software as shown in the figure below and go to the LCD Display page. The list on the left-hand side of the page will show the pages available for the LCD screen. Those with the checkbox ticked will be displayed, whilst those without will not display.



8.9 Alarm

The PRO1 series supports alarm functions for monitoring electrical parameters. An alarm is defined by a monitored variable, an upper threshold (**setH**), a cancel threshold (**setL**), and a delay time.

The alarm threshold (**setH**) defines the level at which an alarm condition is triggered, while the cancel threshold (**setL**) defines the level at which the alarm condition is cleared. The delay time defines how long the threshold condition must persist before the alarm is activated.

To ensure proper operation, the alarm threshold must be greater than the cancel threshold (**setH > setL**).

An alarm is triggered when the monitored value exceeds the configured threshold (**setH**) for longer than the defined delay time. Once active, the alarm remains active until the monitored value falls below the cancel threshold (**setL**).

The meter supports monitoring of the following parameters:

- Voltage (phase voltage or line voltage)
- Current
- Power factor
- Power (active, reactive, and apparent)

When alarm is triggered, a waring icon ⚠ will appear at the top right corner of the screen. View the specific alarm on Alarm Information page.

9. Modbus register map

9 Modbus register map

Default Address	Description	Register type	Length	Unit	Data type
0X5002	Voltage L1	input	2	V	Float ABCD
0X500C	Current L1	input	2	A	Float ABCD
0X5014	Active Power L1	input	2	kW	Float ABCD
0X501C	Reactive Power L1	input	2	kvar	Float ABCD
0X5024	Apparent Power L1	input	2	kVA	Float ABCD
0X502C	Power Factor L1	input	2	-	Float ABCD
0X5012	Total Active Power	input	2	kW	Float ABCD
0X501A	Total Reactive Power	input	2	kvar	Float ABCD
0X5022	Total Apparent Power	input	2		Float ABCD
0X502A	Total Power Factor	input	2	-	Float ABCD
0X500A	Current	input	2	A	Float ABCD
0X5008	Grid Frequency	input	2	Hz	Float ABCD
0X5060	Forward Active Power Demand Peak	input	2	kW	Float ABCD
0X5062	Reverse Active Power Demand Peak	input	2	kW	Float ABCD
0X600C	Total Forward Active Energy	input	2	Wh/kWh	✳UINT32/Float ABCD
0X6018	Total Reverse Active Energy	input	2	Wh/kWh	UINT32/Float ABCD
0X6030	Total Forward Reactive energy	input	2	varh/kvarh	UINT32/Float ABCD
0X603C	Total Reverse Reactive energy	input	2	varh/kvarh	UINT32/Float ABCD
0X6000	Total Active Energy	input	2	Wh/kWh	INT32/Float ABCD
0X6024	Total Reactive Energy	input	2	vah/kvah	INT32/Float ABCD
0X60B9	Total Apparent energy	input	2	vah/kvah	UINT32/Float ABCD
0X6063	Import inductive reactive energy in Q1 (total)	input	2	varh/kvarh	UINT32/Float ABCD
0X606D	Import capacitive reactive energy in Q2 (total)	input	2	varh/kvarh	UINT32/Float ABCD
0X6077	Export inductive reactive energy in Q3 (total)	input	2	varh/kvarh	UINT32/Float ABCD
0X6081	Export capacitive reactive energy in Q4 (total)	input	2	varh/kvarh	UINT32/Float ABCD

0X600E	Total Forward Active Energy DS-T1	input	2	Wh/kWh	UINT32/Float ABCD
0X6010	Total Forward Active Energy DS-T2	input	2	Wh/kWh	UINT32/Float ABCD
0X601A	Total Reverse Active Energy DS-T1	input	2	Wh/kWh	UINT32/Float ABCD
0X601C	Total Reverse Active Energy DS-T2	input	2	Wh/kWh	UINT32/Float ABCD
0X6032	Total Forward Reactive Energy DS -T1	input	2	varh/kvarh	UINT32/Float ABCD
0X6034	Total Forward Reactive Energy DS -T2	input	2	varh/kvarh	UINT32/Float ABCD
0X603E	Total Reverse Reactive Energy DS -T1	input	2	varh/kvarh	UINT32/Float ABCD
0X6040	Total Reverse Reactive Energy DS -T2	input	2	varh/kvarh	UINT32/Float ABCD
0X6002	Total Active Energy DS -T1	input	2	Wh/kWh	INT32/Float ABCD
0X6004	Total Active Energy DS -T2	input	2	Wh/kWh	INT32/Float ABCD
0X6026	Total Reactive Energy DS -T1	input	2	varh/kvarh	INT32/Float ABCD
0X6028	Total Reactive Energy DS-T2	input	2	varh/kvarh	INT32/Float ABCD
0X6159	Total Forward Active Energy RTC-T1 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X616B	Total Forward Active Energy RTC-T2 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X616D	Total Forward Active Energy RTC-T3 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X616F	Total Forward Active Energy RTC-T4 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X6171	Total Reverse Active Energy RTC-T1 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X6173	Total Reverse Active Energy RTC-T2 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X6175	Total Reverse Active Energy RTC-T3 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD

0X6177	Total Reverse Active Energy RTC-T4 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X6179	Total Forward Reactive energy RTC-T1 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X618B	Total Forward Reactive energy RTC-T2 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X618D	Total Forward Reactive energy RTC-T3 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X618F	Total Forward Reactive energy RTC-T4 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6191	Total Reverse Reactive Energy RTC-T1 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6193	Total Reverse Reactive Energy RTC-T2 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6195	Total Reverse Reactive Energy RTC-T3 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6197	Total Reverse Reactive Energy RTC-T4 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6199	Total Active Energy RTC-T1 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X619B	Total Active Energy RTC-T2 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X619D	Total Active Energy RTC-T3 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X619F	Total Active Energy RTC-T4 Only for Ba version with RTC	input	2	Wh/kWh	UINT32/Float ABCD
0X6201	Total Reactive Energy RTC-T1 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6203	Total Reactive Energy RTC-T2	input	2	varh/kvarh	UINT32/Float ABCD

	Only for Ba version with RTC				
0X6205	Total Reactive Energy RTC-T3 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6207	Total Reactive Energy RTC-T4 Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6065	Import inductive reactive energy in Q1 (DS-T1)	input	2	varh/kvarh	UINT32/Float ABCD
0X606F	Export capacitive reactive energy in Q2 (DS-T1)	input	2	varh/kvarh	UINT32/Float ABCD
0X6079	Import capacitive reactive energy in Q3 (DS-T1) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6083	Export inductive reactive energy in Q4 (DS-T1) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0X6067	Import capacitive reactive energy in Q1 (DS-T2)	input	2	varh/kvarh	UINT32/Float ABCD
0X6071	Export inductive reactive energy in Q2 (DS-T2)	input	2	varh/kvarh	UINT32/Float ABCD
0X607B	Import inductive reactive energy in Q3 (DS-T2)	input	2	varh/kvarh	UINT32/Float ABCD
0X6085	Export capacitive reactive energy in Q4 (DS-T2)	input	2	varh/kvarh	UINT32/Float ABCD
0x6129	Import inductive reactive energy in Q1 (RTC-T1) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x613B	Import capacitive reactive energy in Q2 (RTC-T1) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x613D	Export inductive reactive energy in Q3(RTC-T1) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x613F	Export capacitive reactive energy in Q4 (RTC-T1) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD

0x6141	Import inductive reactive energy in Q1 (RTC-T2)	input	2	varh/kvarh	UINT32/Float ABCD
0x6143	Import capacitive reactive energy in Q2 (RTC-T2) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x6145	Export inductive reactive energy in Q3 (RTC-T2) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x6147	Export capacitive reactive energy in Q4 (RTC-T2) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x6149	Import inductive reactive energy in Q1 (RTC-T3) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x614B	Export inductive reactive energy in Q2 (RTC-T3) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x614D	Import capacitive reactive energy in Q3 (RTC-T3) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x614F	Export capacitive reactive energy in Q4 (RTC-T3) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x6151	Import inductive reactive energy in Q1 (RTC-T4) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x6153	Export inductive reactive energy in Q2 (RTC-T4) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x6155	Import capacitive reactive energy in Q3 (RTC-T4) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD
0x6157	Export capacitive reactive energy in Q4 (RTC-T4) Only for Ba version with RTC	input	2	varh/kvarh	UINT32/Float ABCD

0X6209	Workday Hour Schedule Only for Ba version with RTC	input /holding	16		BCD
0X6219	Weekend Timetable Only for Ba version with RTC	input /holding	16		BCD
0X6229	Holiday Timetable Only for Ba version with RTC	input /holding	16		BCD
0X6239	100 Holidays Only for Ba version with RTC	input /holding	100		BCD
0X503E	THD+N Voltage L1	input	2	%	Float ABCD
0X5044	THD+N Current L1	input	2	%	Float ABCD
0X504A	THD+N Average Voltage	input	2	%	Float ABCD
0X504C	THD+N Average Current	input	2	%	Float ABCD
0X4000	Serial Number	input	2	-	BCD
0X4007	Version Number	input	2	-	Float ABCD
0X4002	Meter Code	input	1	-	HEX
0X401B	CRC	input	2	-	HEX
0X4003	Modbus ID	input /holding	1	-	UINT16
0X4004	Modbus Baud Rate	input /holding	1	bps	enum
0X4011	Modbus Parity	input /holding	1	-	enum
0X4175	Active Power Demand Interval	input /holding	1	minutes	enum
0X400F	Combination code	input /holding	1	-	enum
0X4C02	Backlight function/time	input /holding	1	-	enum
0X4010	LCD Cycle Time	input /holding	1	seconds	UINT16
0X4400	LCD Password	input /holding	1	-	UINT16
0X1000	Time (RTC) Only for Ba version with RTC	input /holding	4		BCD
0X6048	Tariff Mode	input	1	-	enum
0X6048	DS Mode Only for Ba version with RTC	input	1	-	enum
0X4005	Protocol Version Number	input	2	-	Float ABCD

0X4009	Hardware Version Number	input	2	-	Float ABCD
0X400B	Maximum Current	input	1	A	UINT16
0X4012	Current Direction L1	input	1	-	ASCII
0X400D	S0 output rate	input	1	imp/kWh	UINT16
0x4015	Error information	input	1		UINT16
0X4017	Total Power quadrant	input	1	-	enum
0X4018	Power Quadrant L	input	1	-	enum
0X4023	CRC (Checksum) Legally non-relevant firmware	input	2	-	UINT32
0X4025	Product code	input	1	-	UINT16
0X4026	Data Format Setting	input /holding	1	-	enum
0x4170	Measurement interval	input	1	ms	UINT16
0X4171	Backlight Brightness Level	input	1	%	UINT16
0X4176	Tariff Mode Only for Ba version with RTC	input /holding	1		enum
0X4C04	Backlight to idle time-out	input /holding	1	minutes	enum
0X4E80	Year of Manufacture	input	1	-	UINT16
0x6049	Resettable day counter	input /holding	2	Wh	INT32

Extensive Address	Description	Function code	Length	Unit	Data type
0X0000	Voltage	input	2	V	Float ABCD
0X0006	Current	input	2	A	Float ABCD
0X000C	Active Power	input	2	W	Float ABCD
0X0018	Reactive Power	input	2	var	Float ABCD
0X0012	Apparent Power	input	2	VA	Float ABCD
0X001E	Power Factor	input	2	-	Float ABCD
0X0034	Total Active Power	input	2	W	Float ABCD
0X003C	Total Reactive Power	input	2	var	Float ABCD
0X0038	Total Apparent Power	input	2	VA	Float ABCD
0X003E	Total Power Factor	input	2	-	Float ABCD
0X0046	Total Frequency	input	2	Hz	Float ABCD
0X0058	Total Forward Active Power Demand	input	2	W	Float ABCD
0X005C	Total Reverse Active Power Demand	input	2	W	Float ABCD
0X0064	Total Apparent demand	input	2	VA	Float ABCD
0X005A	Total Forward Active Maximum Demand	input	2	W	Float ABCD
0X005E	Total Reverse Active Maximum Demand	input	2	W	Float ABCD
0x0048	Total Forward Active Energy	input	2	kWh	Float ABCD
0X004A	Total Reverse Active Energy	input	2	kWh	Float ABCD
0X004C	Total Forward Reactive energy	input	2	kvarh	Float ABCD
0X004E	Total Reverse Reactive energy	input	2	kvarh	Float ABCD
0X0156	Total Active Energy	input	2	kWh	Float ABCD
0X0158	Total Reactive Energy	input	2	kvarh	Float BCD
0X0184	Reset Forward Active Energy	input	2		Float ABCD
0X0186	Reset Reverse Active Energy	input	2		Float ABCD
0X0180	Reset Active Energy	input	2		Float ABCD
0X0182	Reset Reactive Energy	input	2		Float ABCD
0x0102	Current demand	input	2	A	Float ABCD
0x0108	Current maximum demand	input	2	A	Float ABCD
0XFC00	Serial Number	input /holding	2	-	BCD
0XFC02	Meter Code	input /holding	1	-	BCD
0XFC03	Software version	input	1		Float ABCD
0X0014	Modbus ID	input /holding	2	-	Float ABCD

0X001C	Communication Baud Rate	input /holding	2		Float ABCD
0X0012	Parity	input /holding	1	-	Float ABCD
0XF500	Demand Cycle/Interval	input /holding 0	1	-	BCD
0XF7D6	Measurement Mode	input /holding	1	-	enum
0XF501	Backlight Time	input /holding	1	-	BCD
0XF900	LCD Cycle Time	input /holding	1	-	UINT16
0x0018	Password	input /holding	2	-	Float ABCD
0XF930	Total Running Time	input	2	hour	Float ABCD
0X003C	Backlight to idle time-out	input /holding	2	minutes	Float ABCD
0X000E	Communication Password Lock	input	2	-	Float ABCD
0xF010	Clear Demand	holding	1	-	UINT16

YTL register	Description	Function code	Length	Unit	Data type
0x0000	Voltage	input	2	0.1*V	UINT32
0x000C	Current	input	2	0.001*A	UINT32
0x0014	Active Power	input	2	W	INT32
0x001A	Reactive Power	input	2	var	INT32
0x0020	Apparent Power	input	2	VA	UINT32
0x0026	Power Factor	input	1	0.001	UINT16
0x0029	Frequency	input	2	0.001*Hz	UINT16
0x002F	Total Active Power	input	2	W	INT32
0x0031	Total Reactive Power	input	2	var	INT32
0x0033	Total Apparent Power	input	2	VA	UINT32
0x0035	Total Power Factor	input	1	0.001	UINT16
0x0036	Voltage	input	2	0.1*V	UINT32
0x0038	Current	input	2	0.001*A	UINT32
0x003A	Total Frequency	input	2	0.001*Hz	UINT16
0x006A	Total Forward Active Power Demand	input	2	W	UINT32
0x006C	Total Reverse Active Power Demand	input	2	W	UINT32
0x006E	Total Forward Reactive Power Demand	input	2	var	UINT32
0x0070	Total Reverse Reactive Power Demand	input	2	var	UINT32
0x0072	Total Active Power Demand	input	2	W	UINT32
0x0074	Total Reactive Power Demand	input	2	var	UINT32
0x0076	Total Apparent Demand	input	2	VA	UINT32
0x00A2	Total Forward Active Maximum Demand	input	2	W	UINT32
0x00A4	Total Reverse Active Maximum Demand	input	2	W	UINT32
0x00A6	Total Forward Reactive Maximum Demand	input	2	var	UINT32
0x00A8	Total Reverse Reactive Maximum Demand	input	2	var	UINT32
0x00AA	Total Active Power Maximum Demand	input	2	W	UINT32
0x00AC	Total Reactive Power Maximum Demand	input	2	var	UINT32
0x00AE	Total Maximum Apparent Power Demand	input	2	VA	UINT32
0x0106	Total Forward Active Energy	input	4	0.001kWh	UINT64
0x010A	Total Reverse Active Energy	input	4	0.001kWh	UINT64
0x010E	Total Forward Reactive energy	input	4	0.001kvarh	UINT64
0x0112	Total Reverse Reactive energy	input	4	0.001kvarh	UINT64

0x0116	Total Active Energy	input	4	0.001kWh	INT64
0x011A	Total Reactive Energy	input	4	0.001kvarh	INT64
0x011E	Total Apparent energy	input	4	0.001kVAh	UINT64
0x0152	Total First Quadrant Reactive Energy	input	4	0.001kvarh	UINT64
0x0156	Total Second Quadrant Reactive Energy	input	4	0.001kvarh	UINT64
0x015A	Total Third Quadrant Reactive Energy	input	4	0.001kvarh	UINT64
0x015E	Total Fourth Quadrant Reactive Energy	input	4	0.001kvarh	UINT64
0x016A	Total Forward Active Energy RTC-T1	input	4	0.001kWh	UINT64
0x016E	Total Forward Active Energy RTC-T2	input	4	0.001kWh	UINT64
0x0172	Total Forward Active Energy RTC-T3	input	4	0.001kWh	UINT64
0x0176	Total Forward Active Energy RTC-T4	input	4	0.001kWh	UINT64
0x017A	Total Reverse Active Energy RTC-T1	input	4	0.001kWh	UINT64
0x017E	Total Reverse Active Energy RTC-T2	input	4	0.001kWh	UINT64
0x0182	Total Reverse Active Energy RTC-T3	input	4	0.001kWh	UINT64
0x0186	Total Reverse Active Energy RTC-T4	input	4	0.001kWh	UINT64
0x018A	Total Forward Reactive energy RTC-T1	input	4	0.001kvarh	UINT64
0x018E	Total Forward Reactive energy RTC-T2	input	4	0.001kvarh	UINT64
0x0192	Total Forward Reactive energy RTC-T3	input	4	0.001kvarh	UINT64
0x0196	Total Forward Reactive energy RTC-T4	input	4	0.001kvarh	UINT64
0x019A	Total Reverse Reactive Energy RTC-T1	input	4	0.001kvarh	UINT64
0x019E	Total Reverse Reactive Energy RTC-T2	input	4	0.001kvarh	UINT64
0x01A2	Total Reverse Reactive Energy RTC-T3	input	4	0.001kvarh	UINT64
0x01A6	Total Reverse Reactive Energy RTC-T4	input	4	0.001kvarh	UINT64
0x01AA	Total Active Energy RTC-T1	input	4	0.001kWh	INT64
0x01AE	Total Active Energy RTC-T2	input	4	0.001kWh	INT64
0x01B2	Total Active Energy RTC-T3	input	4	0.001kWh	INT64
0x01B6	Total Active Energy RTC-T4	input	4	0.001kWh	INT64

0x01BA	Total Reactive Energy RTC-T1	input	4	0.001kvarh	INT64
0x01BE	Total Reactive Energy RTC-T2	input	4	0.001kvarh	INT64
0x01C2	Total Reactive Energy RTC-T3	input	4	0.001kvarh	INT64
0x01C6	Total Reactive Energy RTC-T4	input	4	0.001kvarh	INT64
0x01CE	Total Forward Active Energy DS-T1	input	4	0.001kWh	UINT64
0x01D2	Total Forward Active Energy DS-T2	input	4	0.001kWh	UINT64
0x01D6	Total Reverse Active Energy DS-T1	input	4	0.001kWh	UINT64
0x01DA	Total Reverse Active Energy DS-T2	input	4	0.001kWh	UINT64
0x01DE	Total Forward Reactive Energy DS-T1	input	4	0.001kvarh	UINT64
0x01E2	Total Forward Reactive Energy DS-T2	input	4	0.001kvarh	UINT64
0x01E6	Total Reverse Reactive Energy DS-T1	input	4	0.001kvarh	UINT64
0x01EA	Total Reverse Reactive Energy DS-T2	input	4	0.001kvarh	UINT64
0x01EE	Total Active Energy DS-T1	input	4	0.001kWh	INT64
0x01F2	Total Active Energy DS-T2	input	4	0.001kWh	INT64
0x01F6	Total Reactive Energy DS-T1	input	4	0.001kvarh	INT64
0x01FA	Total Reactive Energy DS-T2	input	4	0.001kvarh	INT64
0x01FE	Reserved		4		UINT64
0x0202	Total First quadrant Reactive Energy RTC-T1	input	4	0.001kvarh	UINT64
0x0206	Total Second quadrant Reactive Energy RTC-T1	input	4	0.001kvarh	UINT64
0x020A	Total Third quadrant Reactive Energy RTC-T1	input	4	0.001kvarh	UINT64
0x020E	Total Fourth quadrant Reactive Energy RTC-T1	input	4	0.001kvarh	UINT64
0x0212	Total First quadrant Reactive Energy RTC-T2	input	4	0.001kvarh	UINT64
0x0216	Total Second quadrant Reactive Energy RTC-T2	input	4	0.001kvarh	UINT64
0x021A	Total Third quadrant Reactive Energy RTC-T2	input	4	0.001kvarh	UINT64
0x021E	Total Fourth quadrant Reactive Energy RTC-T2	input	4	0.001kvarh	UINT64
0x0222	Total First quadrant Reactive Energy RTC-T3	input	4	0.001kvarh	UINT64
0x0226	Total Second quadrant Reactive Energy RTC-T3	input	4	0.001kvarh	UINT64

0x022A	Total Third quadrant Reactive Energy RTC-T3	input	4	0.001kvarh	UINT64
0x022E	Total Fourth quadrant Reactive Energy RTC-T3	input	4	0.001kvarh	UINT64
0x0232	Total First quadrant Reactive Energy RTC-T4	input	4	0.001kvarh	UINT64
0x0236	Total Second quadrant Reactive Energy RTC-T4	input	4	0.001kvarh	UINT64
0x023A	Total Third quadrant Reactive Energy RTC-T4	input	4	0.001kvarh	UINT64
0x023E	Total Fourth quadrant Reactive Energy RTC-T4	input	4	0.001kvarh	UINT64
0x0242	Total First Quadrant Reactive Energy DS-T1	input	4	0.001kvarh	UINT64
0x0246	Total Second Quadrant Reactive Energy DS-T1	input	4	0.001kvarh	UINT64
0x024A	Total Third Quadrant Reactive Energy DS-T1	input	4	0.001kvarh	UINT64
0x024E	Total Fourth Quadrant Reactive Energy DS-T1	input	4	0.001kvarh	UINT64
0x0252	Total First Quadrant Reactive Energy DS-T2	input	4	0.001kvarh	UINT64
0x0256	Total Second Quadrant Reactive Energy DS-T2	input	4	0.001kvarh	UINT64
0x025A	Total Third Quadrant Reactive Energy DS-T2	input	4	0.001kvarh	UINT64
0x025E	Total Fourth Quadrant Reactive Energy DS-T2	input	4	0.001kvarh	UINT64
0x0266	Reset Forward Active Energy	input	4	0.001kWh	UINT64
0x026A	Reset Reverse Active Energy	input	4	0.001kWh	UINT64
0x026E	Reset Forward Reactive Energy	input	4	0.001kvarh	UINT64
0x0272	Reset Reverse Reactive Energy	input	4	0.001kvarh	UINT64
0x0276	Reset Active Energy	input	4	0.001kWh	INT64
0x027A	Reset Reactive Energy	input	4	0.001kvarh	INT64
0x027E	Reset Apparent Energy	input	4	0.001kvAh	UINT64
0x0300	Voltage Harmonic Content L1	input	1	0.01*%	UINT16
0x0303	Current Harmonic Content L1	input	1	0.01*%	UINT16
0x0310	Current Demand L1	input	2	0.001*A	UINT32
0x0316	Current Maximum Demand L1	input	2	0.001*A	UINT32
0x031C	Average Voltage Harmonic Demand	input	2	0.01*%	UINT32
0x031E	Average Current Harmonic Demand	input	2	0.01*%	UINT32
0x03E8	Serial Number	input / holding	3		BCD
0x03EB	Version Number	input	1		UINT16

0x03EC	Program Verification	input	1		UINT16
0x03ED	Modbus ID	input/ holding	1		UINT16
0x03EE	Modbus Baud Rate	input/ holding	1		enum
0x03EF	Modbus parity	input/ holding	1		enum
0x03F0	Communication Stop Bit	input/ holding	1		enum
0x03F1	Demand Type	input/ holding	1		enum
0x03F2	Demand Time	input/ holding	1		enum
0x03F3	Combination code	input/ holding	1		enum
0x03F4	Wiring Mode	input/ holding	1		enum
0x03F5	Backlight function/time	input/ holding	1	minute	enum
0x03F6	Scrolling Display Time	input/ holding	1		UINT16
0x03F7	LCD Password	input/ holding	1		UINT16
0x03F8	Display Mode	input/ holding	1		enum
0x03F9	Default Homepage	input/ holding	1		UINT16
0x03FA	Page Display Enabled	input/ holding	4		HEX
0x0404	Total Running Time	input	2	second	UINT32
0x0406	Active Forward Running Time	input	2	second	UINT32
0x0408	Active Reverse Running Time	input	2	second	UINT32
0x040A	Reset Active power Forward Running Time	input	2	second	UINT32
0x040C	Reset Active power Reverse Running Time	input	2	second	UINT32
0x040E	Phase Voltage Threshold H	input/ holding	2	0.1*V	UINT32
0x0410	Phase Voltage Threshold L	input/ holding	2	0.1*V	UINT32
0x0416	Current Threshold H	input/ holding	2	0.001*A	UINT32
0x0418	Current Threshold L	input/ holding	2	0.001*A	UINT32
0x041A	Power Factor Threshold H	input/ holding	2	0.001	UINT32

0x041C	Power Factor Threshold L	input/ holding	2	0.001	UINT32
0x041E	Active Power Threshold H	input/ holding	2	W	UINT32
0x0420	Active Power Threshold L	input/ holding	2	W	UINT32
0x0422	Reactive Power Threshold H	input/ holding	2	var	UINT32
0x0424	Reactive Power Threshold L	input/ holding	2	var	UINT32
0x0426	Apparent Power Threshold H	input/ holding	2	VA	UINT32
0x0428	Apparent Power Threshold L	input/ holding	2	VA	UINT32
0x042A	Phase Voltage Threshold Enable	input/ holding	1		enum
0x042C	Current Threshold Enable	input/ holding	1		enum
0x042D	Power Factor Threshold Enable	input/ holding	1		enum
0x042E	Active Power Threshold Enable	input/ holding	1		enum
0x042F	Reactive Power Threshold Enable	input/ holding	1		enum
0x0430	Apparent Power Threshold Enable	input/ holding	1		enum
0x0431	Threshold Alarm Delay	input/ holding	1		UINT16
0x0432	Tariff Mode	input/ holding	1		enum
0x0433	Workday Hour Schedule	input/ holding	16		BCD
0x0443	Weekend Timetable	input/ holding	16		BCD
0x0453	Holiday Timetable	input/ holding	16		BCD
0x0463	100 Holidays	input/ holding	100		BCD
0x04C7	Alarm Log 1	input	8		BCD+HEX
0x04CF	Alarm Log 2	input	8		BCD+HEX
0x04D7	Alarm Log 3	input	8		BCD+HEX
0x04DF	Alarm Log 4	input	8		BCD+HEX
0x04E7	Alarm Log 5	input	8		BCD+HEX
0x04EF	Alarm Log 6	input	8		BCD+HEX
0x04F7	Alarm Log 7	input	8		BCD+HEX
0x04FF	Alarm Log 8	input	8		BCD+HEX

0x0507	Alarm Log 9	input	8		BCD+HEX
0x050F	Alarm Log 10	input	8		BCD+HEX
0x0517	Alarm Log 11	input	8		BCD+HEX
0x051F	Alarm Log 12	input	8		BCD+HEX
0x0527	Alarm Log 13	input	8		BCD+HEX
0x052F	Alarm Log 14	input	8		BCD+HEX
0x0537	Alarm Log 15	input	8		BCD+HEX
0x053F	Alarm Log 16	input	8		BCD+HEX
0x0547	Alarm Log 17	input	8		BCD+HEX
0x054F	Alarm Log 18	input	8		BCD+HEX
0x0557	Alarm Log 19	input	8		BCD+HEX
0x055F	Alarm Log 20	input	8		BCD+HEX
0x0567	Alarm Log 21	input	8		BCD+HEX
0x056F	Alarm Log 22	input	8		BCD+HEX
0x0577	Alarm Log 23	input	8		BCD+HEX
0x057F	Alarm Log 24	input	8		BCD+HEX
0x0587	Alarm Log 25	input	8		BCD+HEX
0x058F	Alarm Log 26	input	8		BCD+HEX
0x0597	Alarm Log 27	input	8		BCD+HEX
0x059F	Alarm Log 28	input	8		BCD+HEX
0x05A7	Alarm Log 29	input	8		BCD+HEX
0x05AF	Alarm Log 30	input	8		BCD+HEX
0x05B7	Alarm Log 31	input	8		BCD+HEX
0x05BF	Alarm Log 32	input	8		BCD+HEX
0x05C7	Alarm Log 33	input	8		BCD+HEX
0x05CF	Alarm Log 34	input	8		BCD+HEX
0x05D7	Alarm Log 35	input	8		BCD+HEX
0x05DF	Alarm Log 36	input	8		BCD+HEX
0x05E7	Alarm Log 37	input	8		BCD+HEX
0x05EF	Alarm Log 38	input	8		BCD+HEX
0x05F7	Alarm Log 39	input	8		BCD+HEX
0x05FF	Alarm Log 40	input	8		BCD+HEX
0x0607	Alarm Log 41	input	8		BCD+HEX
0x060F	Alarm Log 42	input	8		BCD+HEX
0x0617	Alarm Log 43	input	8		BCD+HEX
0x061F	Alarm Log 44	input	8		BCD+HEX
0x0627	Alarm Log 45	input	8		BCD+HEX
0x062F	Alarm Log 46	input	8		BCD+HEX
0x0637	Alarm Log 47	input	8		BCD+HEX
0x063F	Alarm Log 48	input	8		BCD+HEX
0x0647	Alarm Log 49	input	8		BCD+HEX
0x064F	Alarm Log 50	input	8		BCD+HEX
0x0680	Alarm Status	input	4		UINT32

0x0687	DS input Status	input	1		enum
0x0688	Year of Manufacture	input	1		UINT16
0x0689	Meter Type	input	4		ASCII
0x068D	Protocol version	input	2		Float
0x068F	Hardware version	input	2		Float
0x0691	Maximum Current	input	1		UINT16
0x0693	Direction current	input	1		ASCII
0x0696	Error information	input	1		UINT16
0x0697	Current Quadrant of Total Power	input	1		enum
0x0698	Power Current Quadrant	input	1		enum
0x069D	CRC Check 2	input	2		UINT32
0x069F	Production Code	input	1		UINT16
0x06A0	Data Format Setting	input	1		enum
0x06A1	Measurement Interval (ms)	input	1		UINT16
0x06A2	Backlight Brightness Level	input	1		UINT16
0x06A3	Backlight Off Time In Button Mode	input	1		enum
0x06A4	Communication Password Lock	input	2		Float
0x07D0	Clear Demand	holding	1		UINT16
0x07D1	Clear Reset Energy	holding	1		UINT16
0x07D2	Clear Running Time	holding	1		UINT16
0x07D3	Clear Event Records	holding	1		UINT16
0x0900	Active Energy Reversal Record		20*5		BCD+HEX
0x0964	Active Energy Reversal Record		20*5		BCD+HEX

✳ serial number: the whole serial number sequence is differently in 2 register maps,
in default register, it is batch number-serial number-article number
in YTL number, it is article number- batch number-serial number.

✳ LCD password: extensive meter only can be changed by button,

✳ Scrolling time and Backlight time: For the extensive register map we take it F501, Auto scrolling time (seconds)range will be: 0-30s (default 5s), backlight time(minutes) range (0,1,2) the same as inepro.

✳ UNIT32/Float ABCD: there is a register 4026 (data type setting), use software or commix to write this register, data format can be change UNIT32 to Float ABCD, Float ABCD to UNIT32

Note:
- For registers listed in the *Read section*, if a function is not supported by the meter or a specific variant, the register remains readable and returns **0**.
- Write access to such registers is not supported and will result in a Modbus exception response.

9.1 Writing

This section describes registers that can be written using Modbus function code 0x10 (Write Multiple Registers) and code 0x06 (Write Single Register)

If a function is not supported by the meter variant:

- the register remains readable
- a fixed default value is returned
- write access is not supported

9.1.1 Writable Registers (inepro models)

These registers are writable only on specific meter variants. If the function is not supported, the register remains readable and returns a fixed value.

Reg. address	Content	Function code	Length	Unit	Data type
0x1000	**UTC date/time (RTC)**	10	2	seconds	UINT32
Command	01 10 10 00 00 02 04 66 3C 5C 00 (Date/time: 1970-01-01 00:00:00)				
0x4003	**Modbus ID**	03/06	1	–	UINT16
Command:	01 06 4003 000A (new ID: 10)		01–247 (default: 01, 00 = broadcast)		
0x4004	**Baud rate**	03/06	1	–	ENUM
Command:	01 06 4004 0006 (9600 bps)		6=9600 (default) · 7=19200 · 8=38400 · 9=57600 · 10=115200		
0x400F	**Combination code**	03/06	1	–	ENUM
Command:	01 06 400F 0004 (mode B)		1=Forward (Mode C) · 2=Reverse (Mode D) · 3=Forward + Reverse (mode A, default) · 4=Forward - Reverse (mode B)		
0x4010	**LCD cycle time**	03/06	1	s	UINT16
Command:	01 06 4010 001E (30 s)		Possible value: 0-30s 0 = always home page		
0x4011	**Parity**	03/06	1	–	ENUM
Command:	01 06 4011 0003 (odd)		1 = Even · 2 = None · 3 = Odd		
0x4026	**Data type**	03/06	1	–	ENUM
Command:	01 06 4026 0001 (INT32)		1=INT32 (default) · 2=FLOAT		
0x4175	**Demand Interval**	03/06	1	min	UINT16
Command:	01 06 4175 000F (15 min)		01=1min 05=5min, 0A=10min, 0F=15min(default), 14=20min, 1E=30min, 3C=60min		
0x4400	**Password**	03/06	1	–	UINT16
Command:	01 06 4400 04D2 (1234)		0000 ~ 9999		
0x4C02	**Backlight**	03/06	1	–	ENUM
Command:	01 06 4C02 0002 (button)		0=On · 1=Off · 2=Button (default)		
0x4C04	**Backlight time (only if backlight is set to button)**	03/06	1	–	UINT16
Command:	01 06 4C04 0004 (10 s)		1=1min(default), 2=2min, 3=5min, 4=10min, 5=15min, 6=30min, 7=60min		

0x5060	Forward demand peak	10	2	kW	FLOAT
Command:	01 10 5060 0002 00000000 (reset)				Write 0 to reset
0x5062	Reverse demand peak	10	2	kW	FLOAT
Command:	01 10 5062 0002 00000000 (reset)				Write 0 to reset
0x6049	Resettable day counter	10	2	–	INT32
Command:	01 10 6049 0002 00000000 (reset)		Resets all counters		

9.1.2 Variant-Dependent Write Registers

These registers are writable only on specific meter variants. If the function is not supported, the register remains readable and returns a fixed value.

Reg. address	Content	Function code	Length	Unit	Data type
0x400C	**CT rate**	03/06	1	A	UINT16
Command:	01 06 40 0C 03 E8 (1000 A)		Used together with 401F (CT secondary) only for CT meter models		
0x401F	**CT ratio**	10	2	A	UINT16
Command:	01 10 40 1F 00 02 00000005 (5 A)		Allowed values: 1 or 5 only for CT meter models		
0x400D	S0 output rate	10	2	imp/kWh	FLOAT
Command:	01 10 40 0D 00 02 447A0000 (1000 imp/kWh)		10000 · 2000 · 1000 · 100 · 10 · 1 · 0.1 · 0.01 only for meters with a digital S0 output pulse		
0x4027	**Modbus ID**	03/06	1	–	UINT16
Command:	01 06 40 27 00 01 (ID = 1)				
0x4028	**Modbus Bps**	03/06	1	–	ENUM
Command:	01 06 40 28 00 02 (code 2)				
0x4170	**Measurement interval**	03/06	1	ms	UINT16
Command:	01 06 41 70 00 4B (75 ms)		Only for Modbus supported meter models		
0x6048	**Tariff**	03/06	1	–	ENUM
Command:	01 06 60 48 00 01 (T1)		1 = T1 · 2 = T2 (T3/T4 not supported) Only for Digital Switch Tariff meter models		

10. Troubleshooting

Caution
• **Avoid direct contact**: During repair and maintenance, do not touch meter connecting clamps with bare hands, metal objects, bare wire, or any conductive material to prevent electric shock, injury, or death. **Isolate power sources**: Before removing the protective cover, shut down and, if possible, lock all power supplies to the meter and connected equipment.
Warning
• **Qualified Personnel Only**: Maintenance or repair should only be performed by qualified personnel familiar with relevant codes and regulations. • **Use Insulated Tools**: Always use insulated tools when working on the meter. • **Replace the Protective Cover**: Ensure the protective cover is securely reinstalled after maintenance or repair. • **Maintain Sealed Integrity**: The case is sealed; failure to reassemble properly may result in meter damage.

Common failures

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 Ohmmeter if the load value is very low.
The red consumption LED flashing very fast, but the energy register is not changing.	The measurement mode is set incorrectly.	The measurement mode can be adjusted to the "Forward + Reverse" mode.
The energy register does not increase.	There is almost no load connected to the meter.	Please check if there is any load connection or if the wiring is incorrect.
No pulse output (S0)	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 pin 1 or 3 and the signal wire (S) to pin 2 (Ground).
Display shows an error	Critical error	See §10.1.2
If none of the above works, please contact technical support		

10.1.1 Error codes

In the event of a critical error, the meter will display an error code and can no longer be used for billing purposes. The device must be replaced. Please contact your supplier for further assistance.

LCD code	Error
0d	The data in the main memory + the data error in the backup area
40	The data error in the main memory area
20	The data error in the backup area
10	Decimal data error
30	The decimal data + the data error in the backup area
50	The data in the main memory + the decimal data error
1d	New EEPROM

If none of the above works, please contact technical support.

10.1.2 Support

For questions about one of our products please contact:

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

11. Maintenance and repair

 Caution
• **Avoid direct contact**: During repair and maintenance, do not touch meter connecting clamps with bare hands, metal objects, bare wire, or any conductive material to prevent electric shock, injury, or death. **Isolate power sources**: Before removing the protective cover, shut down and, if possible, lock all power supplies to the meter and connected equipment.
 Warning
• **Qualified Personnel Only**: Maintenance or repair should only be performed by qualified personnel familiar with relevant codes and regulations. • **Use Insulated Tools**: Always use insulated tools when working on the meter. • **Replace the Protective Cover**: Ensure the protective cover is securely reinstalled after maintenance or repair. • **Maintain Sealed Integrity**: The case is sealed; failure to reassemble properly may result in meter damage.

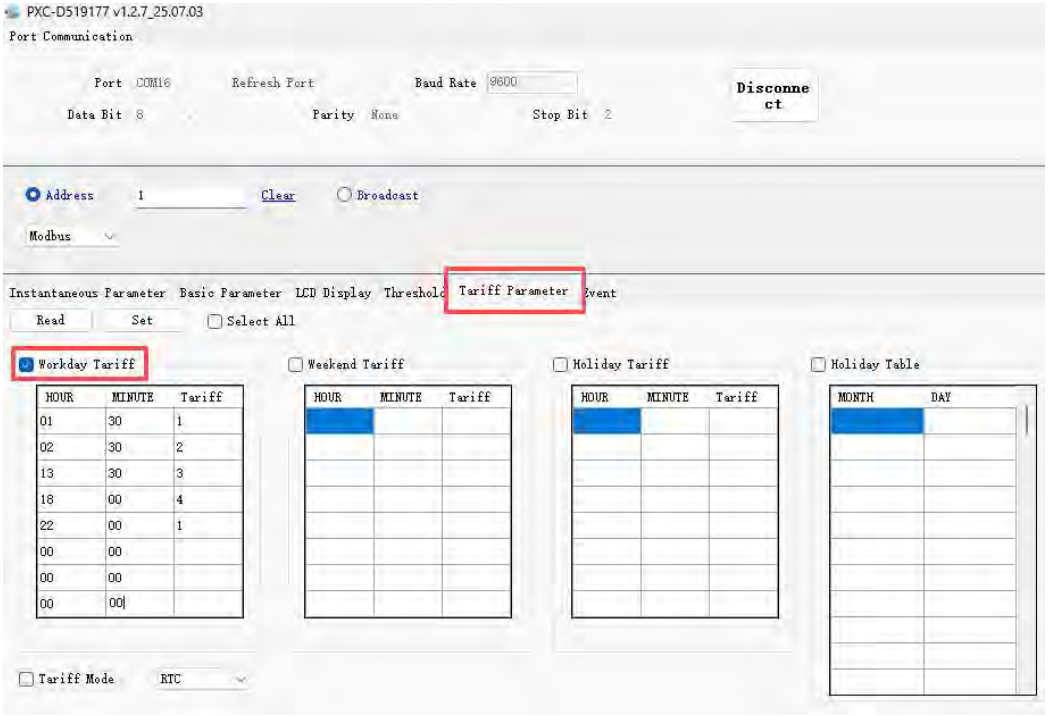
This product is designed for long-term, maintenance-free operation. Simply ensure it is kept clean and protected from dust and moisture to maintain optimal performance. To clean the device, use a dry cloth, do not use alcohol, abrasive or solvents. No additional routine maintenance is required.

This product is designed without serviceable parts and is not intended to be repaired by the user. Any malfunction or damage should be addressed by contacting your distributor directly. Attempting to repair or modify the device may void the warranty and compromise safety and performance.

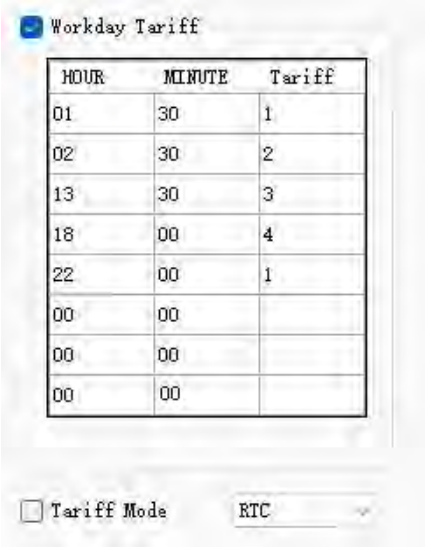
12. Appendix

Example - weekday tariff table

1, open the software and connect to meter correctly by RS485, choose tariff Parmeter section, then choose workday tariff



Up to 8 switching points can be defined per day. Each entry defines the time at which a tariff becomes active.



If the rate field is blank, it's an invalid value

In this example from software setting page, the tariff behavior during a weekday is as follows:

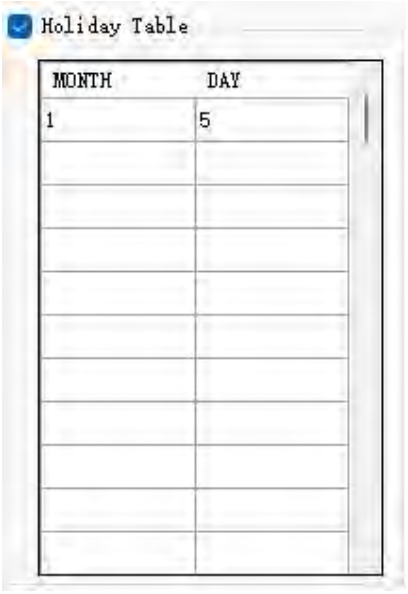
From 01:30 to 02:30, Tariff 1 is active. From 02:30 to 13:30, Tariff 2 is active. From 13:30 to 18:00, Tariff 3 is active. From 18:00 to 22:00, Tariff 4 is active. From 22:00 to 01:30, Tariff 1 becomes active again. During each period, the measured energy is accumulated in the corresponding tariff register.

The weekend and holiday tariff tables are configured in the same way as the weekday table and follow the same behavior.

Example - Holiday configuration

Holidays are defined explicitly by entering calendar dates using a **month and day combination**. Each entry represents a full calendar day on which the holiday tariff schedule should be applied.

For example, an entry of **Month = 1 and Day = 5** defines January 5th as a holiday. On that date, the meter will apply to the holiday tariff table instead of the weekday or weekend schedule.



Up to 100 holiday entries can be configured. If the current date matches one of the configured entries, the holiday tariff schedule takes priority over all other schedules.