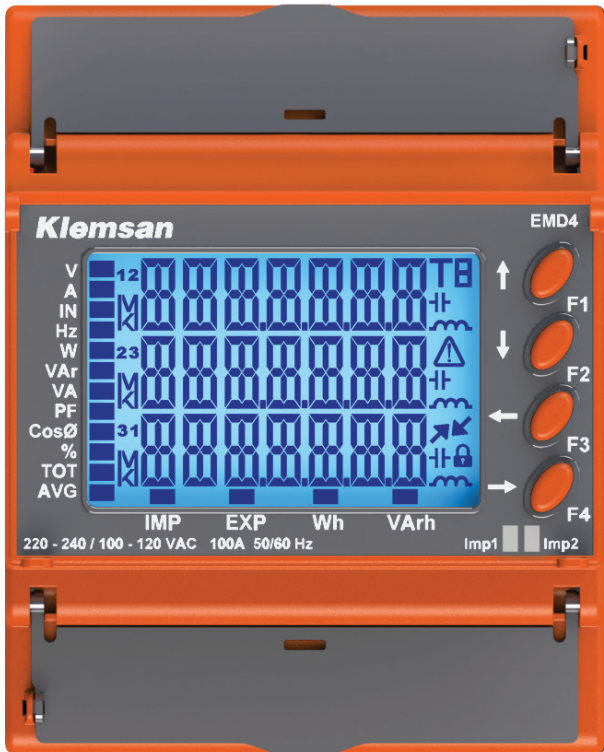


EMD 4 User Manual



PART 1 / GENERAL INFORMATION

| | |
|---|---|
| 1.1 Device Features and Model Selection | 4 |
|---|---|

PART 2 / INSTALLATION

| | |
|---|---|
| 2.1 Preparation for Installation | 6 |
| 2.2 Mounting | 6 |
| 2.3 Terminals and Wiring Ducts | 7 |
| 2.3.1 Devices with Current Transformer Connection | 8 |
| 2.3.2 Devices with Direct Connection | 8 |
| 2.3.3 Common Connection | 8 |
| 2.4 Icons and LED Indications | 8 |

PART 3 / MENUS

| | |
|---|----|
| 3.1 MEASUREMENTS (MEASURE) | 10 |
| 3.1.1 Instant Measurements (INSTANT) | 11 |
| 3.1.2 Harmonic Data (HARMNIC) | 12 |
| 3.1.3 Energy Data (ENERGY) | 12 |
| 3.1.4 Demand Data | 13 |
| 3.1.5 Min-Max Data (MIN-MAX) | 14 |
| 3.1.6 Input Counter (IN CNT) | 15 |
| 3.1.7 General Counters (GE CNT) | 16 |
| 3.1.8 Voltage – Current Unbalance Data (UNBLNC) | 16 |
| 3.2 SETTINGS (SETTING) | 17 |
| 3.2.1 Serial Connection Settings (SERIAL) | 17 |
| 3.2.2 Pulse Output Settings (PULSE 1 & PULSE 2) | 18 |
| 3.2.3 Digital Digital Settings (DI1 & DI2) | 19 |
| 3.2.4 Network Settings (NETWORK) | 20 |
| 3.2.5 Demand Settings (DEMAND) | 21 |
| 3.2.6 Alarm Settings (ALARM) | 22 |
| 3.2.7 Device Settings (DEVICE) | 24 |
| 3.2.8 Security Settings (SECURE) | 25 |
| 3.2.9 Clear (CLEAR) | 25 |
| 3.3 INFO (INFO) | 26 |
| 3.4 LOGIN (LOGIN) | 26 |

PART 4

| | |
|---------------------|----|
| RS485 COMMUNICATION | 28 |
|---------------------|----|

PART 5

| | |
|--------------------------|----|
| FACTORY DEFAULT SETTINGS | 44 |
|--------------------------|----|

PART 6

| | |
|--------------------------|----|
| TECHNICAL SPECIFICATIONS | 46 |
|--------------------------|----|

EMD 4

PART 1

GENERAL INFORMATION

1.1 Device Features and Model Selection

Klemsan EMD 4 series devices are energy meters that measure and record basic electrical parameters for monitoring three-phase electrical systems. Optionally, the devices have below features;

- RS485 (Modbus RTU)
- Direct connection up to 100x3 amperes in addition to CT connection option
- Measurement of electrical parameters in addition to kWh
- 4 Quadrant Energy Measurement Addresses
- 3 Tariffs
- Ability to store minimum, maximum, and demand values
- On hour, run hour and power interruption counters
- Digital Input
- Pulse Output
- THDV, THDI

| Stock Code | | 606808 | 606809 | 606817 | 606810 | 606811 | |
|--------------------------------|-----------------------|----------------------------------|----------------------------------|----------------------------------|---------------------------------------|---------------------------------------|------------|
| Product Name | | 5100-1M-V1CT | 5100-1M-V2CT | 5100-1Q-V2CT | 5100-1Q-V1 | 5100-1Q-V2 | |
| Supply Voltage | | 85-300V AC | 85-300V AC | 85-300V AC | 85-300 V AC | 85-300 V AC | |
| Current Connection | | CT Connection (10mA .. 6A AC) | CT Connection (10mA .. 6A AC) | CT Connection (10mA .. 6A AC) | Direct Connection up to 100Amps | Direct Connection up to 100Amps | |
| Mounting Type | | Rail Mount | Rail Mount | Rail Mount | Rail Mount | Rail Mount | |
| Connection Type | | 3P4W | 3P4W | 3P4W | 3P4W | 3P4W | |
| MEASUREMENT | CLASS (62053-21) | | Class 0,5 | Class 0,5 | Class 0,5 | Class 0,5 | |
| | Power Parameters | Active Power | √ | √ | √ | √ | √ |
| | | Reactive Power | √ | √ | √ | √ | √ |
| | | Apparent Power | √ | √ | √ | √ | √ |
| | Electrical Parameters | Current | √ | √ | √ | √ | √ |
| | | Voltage | √ | √ | √ | √ | √ |
| | | Frequency | √ | √ | √ | √ | √ |
| | Quality Parameters | Harmonics | up to 31st | up to 31st | up to 31st | up to 31st | up to 31st |
| | Demand Calculation | | √ | √ | √ | √ | √ |
| | Alarm | | √ | √ | √ | √ | √ |
| Communication | Modbus RTU (RS485) | √ | √ | √ | √ | √ | |
| Digital Inputs | | - | 2 | 2 | - | 2 | |
| Pulse Outputs | | - | 2 | 2 | - | 2 | |
| LED (Impulse) | | - | 2 | 2 | - | 2 | |
| Energy Measurement | | Imp & Exp | Imp & Exp | Imp & Exp | Imp & Exp | Imp & Exp | |
| 4Q Reactive Energy Measurement | | - | - | √ | √ | √ | |
| Tariffs | | 1 | 3 | 3 | 1 | 3 | |
| Protection Class | | IP51 | IP51 | IP51 | IP51 | IP51 | |

EMD 4

PART 2
INSTALLATION

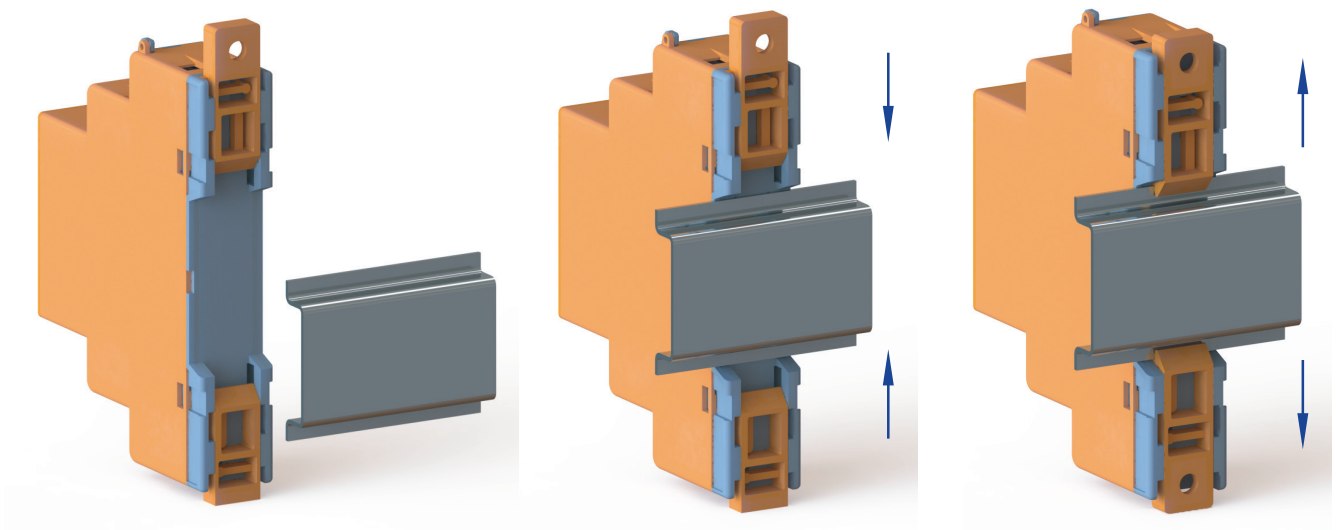
2.1 Preparation for Installation

- Installation and connections of EMD 4 series devices must be done under the instructions provided in the user manual by authorized personnel. The device should not be operated before connections are made correctly.
- Before connecting the device to the grid, ensure that the power is disconnected.
- Use a dry cloth to clean the device and remove dust. Do not use alcohol, thinner, or abrasive substances.
- The device should only be powered on after all connections have been made.
- Do not open the device. There are no parts inside that users can manipulate.
- Keep the device away from humid, wet, vibrating, and dusty environments.

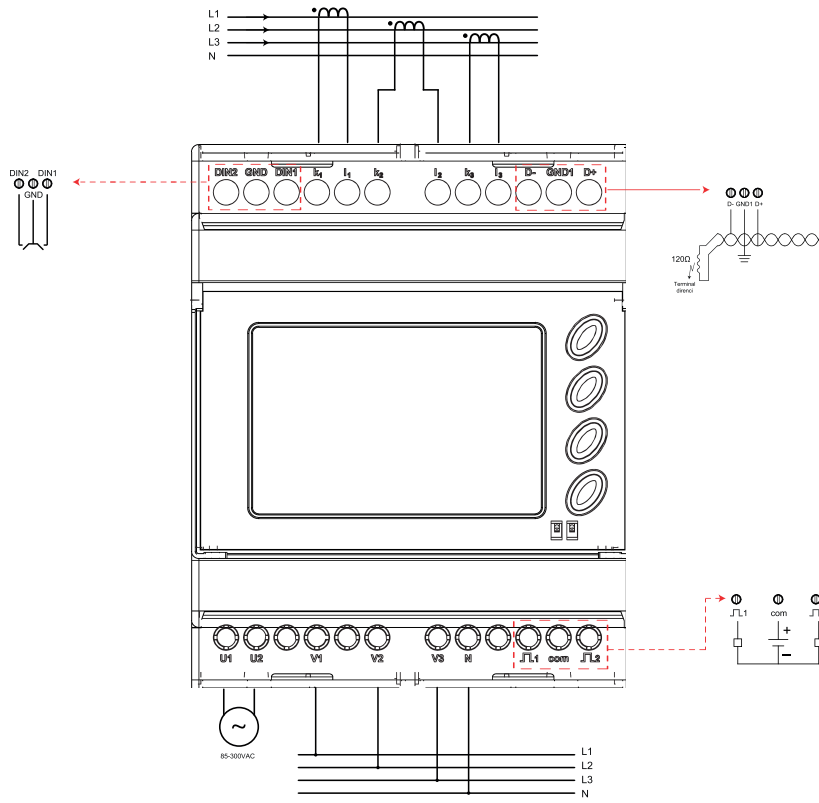


The manufacturer is not responsible for any unwanted situations arising from failure to implement the above precautions.

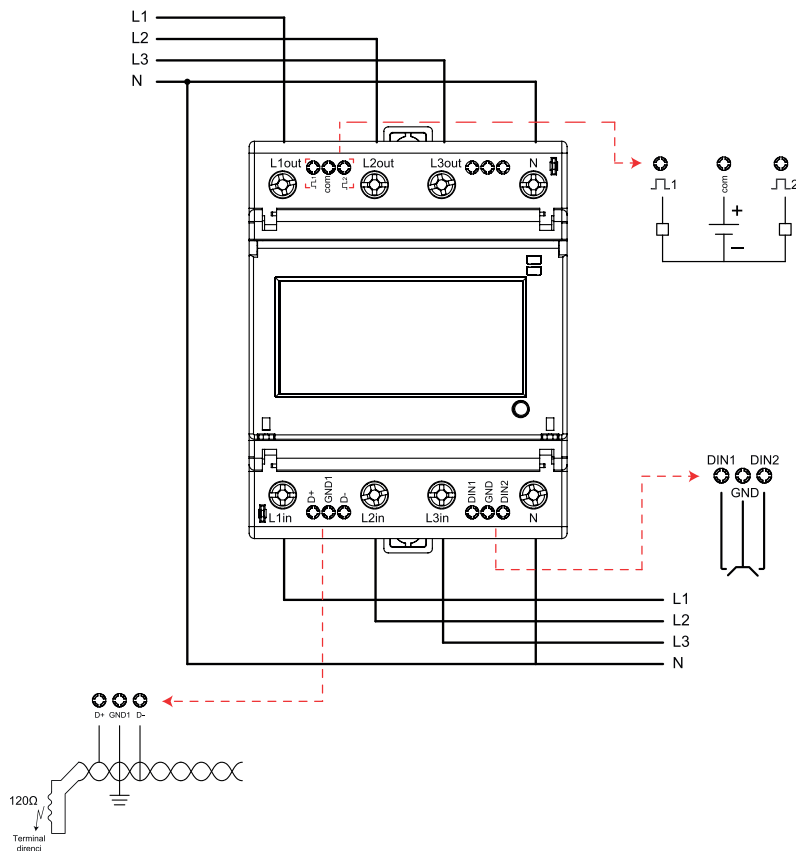
2.2 Mounting



2.3 Terminals and Wiring Ducts



The above connection diagram is general for CT connection devices and varies according to the model.



The above connection diagram is general for direct connection devices and varies depending on the model.

2.3.1 Devices with Current Transformer Connection

L1 – L2 – L3 Terminals: These are the phase inputs of the three-phase alternating voltage being measured.

N Terminal: This is the neutral input of the three-phase alternating voltage being measured.

k1 – k2 – k3 Terminals: These are the inputs for the three-phase alternating current being measured.

I1 – I2 – I3 Terminals: These are the outputs of the three-phase alternating current being measured.

U1-U2 Terminals: These terminals are used for supplying power to the device.


2.3.2 Devices with Direct Connection


L1in – L2in – L3in Terminals: These are the inputs for the three phases being measured. The connection can be made for up to 100A for each phase.

L1out – L2out – L3out Terminals: These are the outputs for the three phases being measured.

N Terminal: This is the input for the neutral connection of the line.

2.3.3 Common Connection

Pulse 1 Output (): This is the output terminal for the DC voltage applied to the "com" terminal when digital output 1 is active. Pulse 1 output is adjustable and provides 500 impulses (500 imp/kWh) for each kWh measured by default. Pulse duration is 60 ms.

Pulse 2 Output (): This is the output terminal for the DC voltage applied to the "com" terminal when digital output 2 is active. Pulse 2 output is adjustable and provides 500 impulses (500 imp/kVArh) for each kVArh measured by default. Pulse duration is 60 ms.

com: This is the terminal where the positive end of the DC voltage for digital switching will be connected (common).

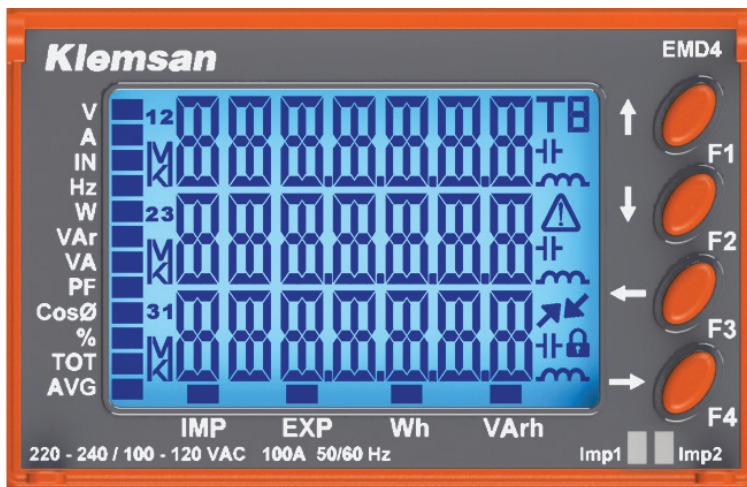
D+: This is the data+ input of the RS-485 interface.




GND1: This is the input where the ground connection of the RS-485 interface is made.

D-: This is the data- input of the RS-485 interface.

DIN1 – GND – DIN2: Desired digital input will be active when making short-circuited with GND.

2.4 Icons and LED Indications



-  ➔ An icon indicating a screen where adjustments are not allowed.
-  ➔ Communication status indicator. A downward arrow indicates that the query has been sent to the device, while an upward arrow indicates data transmission from the device.
-  ➔ Indicates an error condition of the device.
 - Only exclamation mark ➔ Current direction is reversed.
 - Only triangle frame ➔ Phase sequence
 - Exclamation mark + Frame ➔ Pulse Error

EMD 4

PART 3
MENUS

There are 4 main menus in the devices. It may vary depending on the device model.

| | | |
|------------------|------------------------|-------------|
| MAIN MENU | MEASUREMENTS (MEASURE) | → OK ← X |
| | ↓ | |
| | SETTINGS (SETTINGS) | → OK ← X |
| | ↓ | |
| | INFO (INFO) | → OK ← X |
| ↓ | | |
| | LOGIN (LOGN) | → OK ← X |



3.1 MEASUREMENTS (MEASURE)

Measured data on the device are shown in the measurements menu.

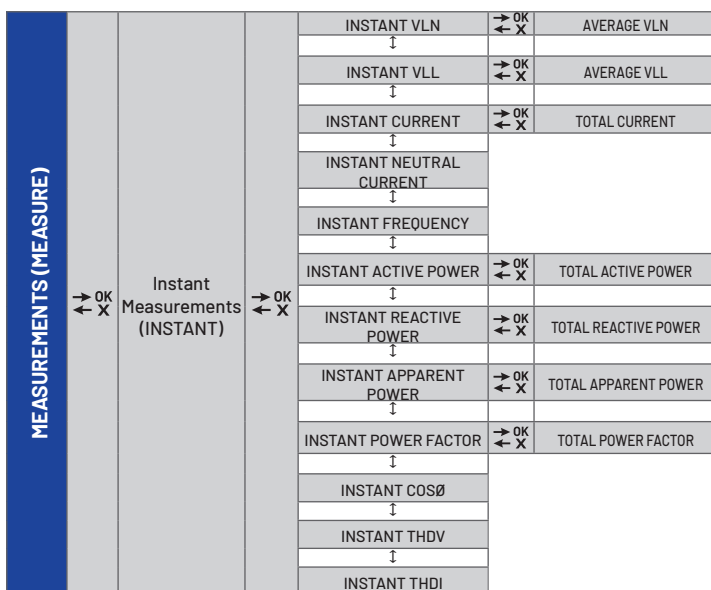
| | | |
|-------------------------------|--------------------------------|-------------|
| MEASUREMENTS (MEASURE) | Instant Measurements (INSTANT) | → OK ← X |
| | ↓ | |
| | Harmonik Verileri (HARMNIC) | → OK ← X |
| | ↓ | |
| | Energy Values (ENERGY) | → OK ← X |
| | ↓ | |
| | Demand Values (DEMAND) | → OK ← X |
| | ↓ | |
| | Min-Max Values (MIN-MAK) | → OK ← X |
| | ↓ | |
| Input Counters (IN CNT) | → OK ← X | |
| ↓ | | |
| General Counters (GE CNT) | → OK ← X | |
| ↓ | | |
| Unbalance (UNBLNC) | → OK ← X | |

3.1.1 Instant Measurements (INSTANT)

The following parameters and the average and total values of these parameters (varies depending on the parameter) are also shown on the instant measurements page.

- Voltage (Phase-Neutral, Phase - Phase)
- Current
- Neutral Current
- Frequency
- Active Power
- Reactive Power
- Apparent Power
- Power Factor
- CosØ
- Total Harmonic Distortion for Voltage (THDV)
- Total Harmonic Distortion for Current (THDI)

Switching between parameters are made with the ↑ and ↓ buttons. Switching between the instant, total, and average menus is done with the → and ← buttons.



! The menu structure above is general and varies depending on product features. The parameters and units displayed are indicated by the lines on the left side of the screen.



Phase 1, Phase 2, and Phase 3 values (V12, V23, and V31 for VLL voltage) are shown on the screen from top to bottom, respectively. The middle indicator is used to show expressions without phase representation. (Average, total, etc.)

3.1.2 Harmonic Data (HARMNIC)

In the harmonic data menu, individual harmonic values of current and voltage parameters are shown. The device measures odd harmonic data up to 31.

| | | | | | | | | | |
|------------------------|-------------|---------------------------|-------------|-----------------------------|-----------------------------|-------------------|-------------------|---------------------|---------------------|
| MEASUREMENTS (MEASURE) | → OK ← X | Harmonic Values (HARMNIC) | → OK ← X | Voltage Harmonics (VOLTAGE) | → OK ← X | Phase 3 (PHASE 3) | → OK ← X | 1..31 Odd Harmonics | |
| | | | | | | ↓ | | | |
| | | | | | | Phase 3 (PHASE 3) | → OK ← X | 1..31 Odd Harmonics | |
| | | | | | | ↓ | | | |
| | | | | | | Phase 3 (PHASE 3) | → OK ← X | 1..31 Odd Harmonics | |
| | | | | | | ↓ | | | |
| | | | | | Current Harmonics (CURRENT) | → OK ← X | Phase 3 (PHASE 3) | → OK ← X | 1..31 Odd Harmonics |
| | | | | | | | ↓ | | |
| | | | | | | | Phase 3 (PHASE 3) | → OK ← X | 1..31 Odd Harmonics |
| | | | | | | | ↓ | | |
| | | | | | | | Phase 3 (PHASE 3) | → OK ← X | 1..31 Odd Harmonics |
| | | | | | | | ↓ | | |

3.1.3 Energy Data (ENERGY)

There are meters for the following energy parameters under this menu.

- Import Active Energy
- Export Active Energy
- Import Reactive Energy
- Export Reactive Energy

Devices with Digital Input have 3 different tariffs. Tariff configuration are explained under [3.2.3 Digital Input Settings \(DI1 & DI2\)](#).



| | | | | | | | | | | | | |
|--|-------------|--|-------------|--|-------------|--|-------------|--|-------------|--|-------------|--|
| MEASUREMENTS (MEASURE) | → OK ← X | Energy Values (ENERJi) | → OK ← X | Meter Values (METER) | → OK ← X | TOTAL | → OK ← X | Import Active Energy (Total) (Wh) | → OK ← X | Import Active Energi (3 phase) (Wh) | | |
| | | | | | | | | ↓ | | | | |
| | | | | | | | | Export Active Energy (Total) (Wh) | → OK ← X | Export Active Energi (3 phase) (Wh) | | |
| | | | | | | | | ↓ | | | | |
| | | | | | | | | Import Reactive Energy (Total) (VArh) | → OK ← X | Import Reactive Energy (3 phase) (VArh) | | |
| | | | | | | | | ↓ | | | | |
| | | | | | | | | Export Reactive Energy (Total) (VArh) | → OK ← X | Export Active Energi (3 phase) (Wh) | | |
| | | | | | | | | ↓ | | | | |
| | | | | | | | | ↓ | | | | |
| | | | | | | | | T1 | → OK ← X | Import Active Energy (Total) (Wh) | → OK ← X | Import Active Energi (3 phase) (Wh) |
| | | | | | | | | | | ↓ | | |
| | | | | | | | | | | Export Active Energy (Total) (Wh) | → OK ← X | Export Active Energi (3 phase) (Wh) |
| | | | | | | ↓ | | | | | | |
| | | | | | | Import Reactive Energy (Total) (VArh) | → OK ← X | | | Import Reactive Energy (3 phase) (VArh) | | |
| | | | | | | ↓ | | | | | | |
| | | | | | | Export Reactive Energy (Total) (VArh) | → OK ← X | | | Export Active Energi (3 phase) (Wh) | | |
| | | | | | | ↓ | | | | | | |
| | | | | | | ↓ | | | | | | |
| | | | | | | T2 | → OK ← X | | | Import Active Energy (Total) (Wh) | → OK ← X | Import Active Energi (3 phase) (Wh) |
| | | | | | | | | | | ↓ | | |
| | | | | | | | | | | Export Active Energy (Total) (Wh) | → OK ← X | Export Active Energi (3 phase) (Wh) |
| | | | | | | | | ↓ | | | | |
| | | | | | | | | Import Reactive Energy (Total) (VArh) | → OK ← X | Import Reactive Energy (3 phase) (VArh) | | |
| | | | | | | | | ↓ | | | | |
| Export Reactive Energy (Total) (VArh) | → OK ← X | Export Active Energi (3 phase) (Wh) | | | | | | | | | | |
| ↓ | | | | | | | | | | | | |
| ↓ | | | | | | | | | | | | |
| T3 | → OK ← X | Import Active Energy (Total) (Wh) | → OK ← X | Import Active Energi (3 phase) (Wh) | | | | | | | | |
| | | ↓ | | | | | | | | | | |
| | | Export Active Energy (Total) (Wh) | → OK ← X | Export Active Energi (3 phase) (Wh) | | | | | | | | |
| | | ↓ | | | | | | | | | | |
| | | Import Reactive Energy (Total) (VArh) | → OK ← X | Import Reactive Energy (3 phase) (VArh) | | | | | | | | |
| | | ↓ | | | | | | | | | | |
| | | Export Reactive Energy (Total) (VArh) | → OK ← X | Export Active Energi (3 phase) (Wh) | | | | | | | | |
| | | ↓ | | | | | | | | | | |
| | | ↓ | | | | | | | | | | |

3.1.4 Demand Data

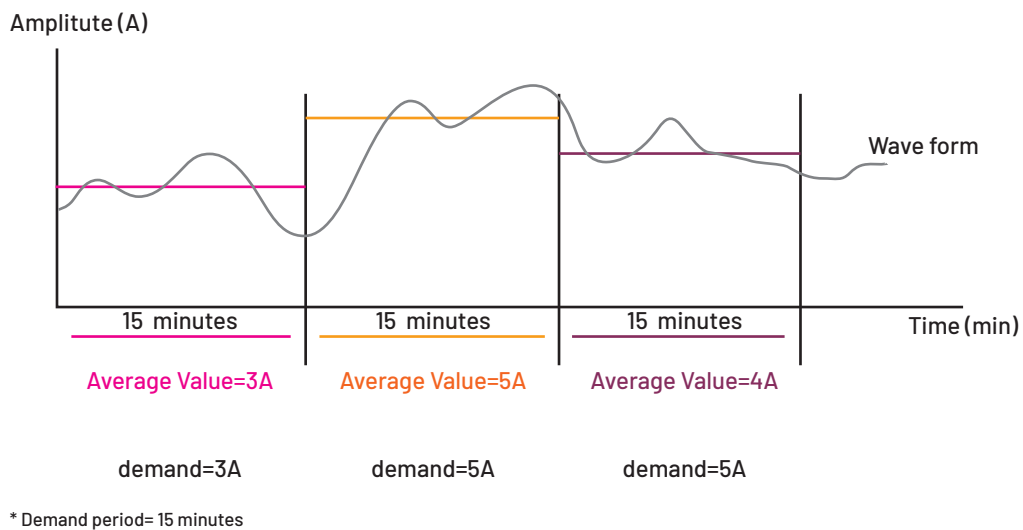
In the demand values menu, the average values of current and power values during the set demand period and the maximum values of these values are displayed.

| | | | | | | | | |
|------------------------|-------------|--------------------------|-------------|---------------------------|-------------|--------------------------------------|-------------|--------------------------|
| MEASUREMENTS (MEASURE) | → OK ← X | Demand Value (DEMAND) | → OK ← X | Previous Demand (PREV) | → OK ← X | Current Demand (Total) | → OK ← X | Current Demand (3 phase) |
| | | | | | | ↓ | | |
| | | | | | | Import Active Power Demand (Total) | | |
| | | | | | | ↓ | | |
| | | | | | | Export Active Power Demand (Total) | | |
| | | | | | | ↓ | | |
| | | | | | | Import Reactive Power Demand (Total) | | |
| | | | | | | ↓ | | |
| | | | | | | Export Reactive Power Demand (Total) | | |
| | | | | | | ↓ | | |
| | | | | | | Apparent Power Demand (Total) | | |
| | | | | | | ↓ | | |
| | | | | Maximum Demand (MAX) | → OK ← X | Current Demand (Total) | → OK ← X | Current Demand (3 phase) |
| | | | | | | ↓ | | |
| | | | | | | Import Active Power Demand (Total) | | |
| | | | | | | ↓ | | |
| | | | | | | Export Active Power Demand (Total) | | |
| | | | | | | ↓ | | |
| | | | | | | Import Reactive Power Demand (Total) | | |
| | | | | | | ↓ | | |
| | | | | | | Export Reactive Power Demand (Total) | | |
| | | | | | | ↓ | | |
| | | | | | | Apparent Power Demand (Total) | | |

In the PREV menu, previous demand values of the following parameters are calculated at the end of the previous demand period. In the MAX menu, the maximum demand values of the following parameters are calculated since the device was energized.

- Current Demand (Total and 3 phase)
- Import Active Power Demand (Total)
- Export Active Power Demand (Total)
- Import Reactive Power Demand (Total)
- Export Reactive Power Demand (Total)
- Apparent Power Demand (Total)

As an example, the graph below shows the averages (previous demand) and the max demand values of the current signal for the 15-minute demand period.



Switching between parameters is done with the “Λ” and “V” buttons.

3.1.5 Min-Max Data (MIN-MAX)

Under this menu, the minimum and maximum data of the following parameters measured on the device since the device was first turned on are shown.

- Voltage (LN) (Average and 3 phase)
- Voltage (LL) (Average and 3 phase)
- Current (Total and 3 phase)
- Import Active Power (Total and 3 phase)
- Export Active Power (Total and 3 phase)
- Import Reactive Power (Total and 3 phase)
- Export Reactive Power (Total and 3 phase)
- Apparent Power (Total and 3 phase)
- Inductive Power Factor (Total and 3 phase)
- Capacitive Power Factor (Total and 3 phase)
- Frequency

| | | | | | | | | |
|----------------------------------|----------------------------------|-----------------------------|------------------|-------------------------|-------------|-------------------------------|--------------------|--------------------|
| MEASUREMENTS (MEASURE) | → OK ← X | Min-Max Values (MIN-MAX) | → OK ← X | Minimum Values (MIN) | → OK ← X | MIN VLN (VLN) | → OK ← X | AVERAGE (AVG) |
| | | | | | | ↓ | | |
| | | | | | | MIN VLL (VLL) | → OK ← X | AVERAGE (AVG) |
| | | | | | | ↓ | | |
| | | | | | | MIN CURRENT (I) | → OK ← X | TOTAL (TOTAL) |
| | | | | | | ↓ | | |
| | | | | | | MIN IMPORT ACTIVE POWER (P) | → OK ← X | TOTAL (TOTAL) |
| | | | | | | ↓ | | |
| | | | | | | MIN EXPORT ACTIVE POWER (P) | → OK ← X | TOTAL (TOTAL) |
| | | | | | | ↓ | | |
| | | | | | | MIN IMPORT REACTIVE POWER (Q) | → OK ← X | TOTAL (TOTAL) |
| | | | | | | ↓ | | |
| | | | | | | MIN EXPORT REACTIVE POWER (Q) | → OK ← X | TOTAL (TOTAL) |
| | | | | | | ↓ | | |
| | MIN APPARENT POWER (S) | → OK ← X | TOTAL (TOTAL) | | | | | |
| | ↓ | | | | | | | |
| | MIN INDUCTIVE POWER FACTOR (PF) | → OK ← X | TOTAL (TOTAL) | | | | | |
| | ↓ | | | | | | | |
| | MIN CAPASITIVE POWER FACTOR (PF) | → OK ← X | TOTAL (TOTAL) | | | | | |
| | ↓ | | | | | | | |
| | MIN FREQUENCY (F) | | | | | | | |
| | ↓ | | | | | | | |
| | → OK ← X | Min-Max Values (MIN-MAX) | → OK ← X | Maximum Values (MAX) | → OK ← X | MAX VLN (VLN) | → OK ← X | ORTALAMA (ORT) |
| | | | | | | ↓ | | |
| | | | | | | MAX VLL (VLL) | → OK ← X | ORTALAMA (ORT) |
| | | | | | | ↓ | | |
| | | | | | | MAX CURRENT (I) | → OK ← X | TOPLAM (TOPLAM) |
| | | | | | | ↓ | | |
| MAX IMPORT ACTIVE POWER (P) | | | | | | → OK ← X | TOPLAM (TOPLAM) | |
| ↓ | | | | | | | | |
| MAX EXPORT ACTIVE POWER (P) | | | | | | → OK ← X | TOPLAM (TOPLAM) | |
| ↓ | | | | | | | | |
| MAX IMPORT REACTIVE POWER (Q) | | | | | | → OK ← X | TOPLAM (TOPLAM) | |
| ↓ | | | | | | | | |
| MAX EXPORT REACTIVE POWER (Q) | | | | | | → OK ← X | TOPLAM (TOPLAM) | |
| ↓ | | | | | | | | |
| MAX APPARENT POWER (S) | → OK ← X | TOPLAM (TOPLAM) | | | | | | |
| ↓ | | | | | | | | |
| MAX INDUCTIVE POWER FACTOR (PF) | → OK ← X | TOPLAM (TOPLAM) | | | | | | |
| ↓ | | | | | | | | |
| MAX CAPASITIVE POWER FACTOR (PF) | → OK ← X | TOPLAM (TOPLAM) | | | | | | |
| ↓ | | | | | | | | |
| MAX FREQUENCY (F) | | | | | | | | |

3.1.6 Input Counter (IN CNT)

In devices with a Digital Input, the activation count of the relevant input and the time it remains active (its unit is hour) is shown under this menu.

To set the digital inputs as counter, see the **“3.2.3 Digital Input Settings (DI1 & DI2)”** menu.

When DI1 and DGND terminals are short-circuited for at least the set delay time, the **“IN1 COUNT”** increases by 1, and the active time is counted. The total active time unit is displayed in hours under the **“IN1 HOUR”** tab.

When DI2 and DGND terminals are short-circuited for at least the set delay time, the "IN2 NUMBER" increases by 1, and the active time is counted. The total active time unit is displayed in hours under the "IN2 HOUR" tab.

| | | | | |
|---------------------------|-------------|-------------------------|-------------|---------------------------|
| MEASUREMENTS (MEASURE) | → OK ← X | Input Counters (IN CNT) | → OK ← X | Input 1 Count (IN1 COUNT) |
| | | | | ↓ |
| | | | | Input 1 Hour (IN1 HOUR) |
| | | | | ↓ |
| | | | | Input 2 Count (IN2 COUNT) |
| ↓ | | | | |
| | | | | Input 2 Hour (IN2 HOUR) |

3.1.7 General Counters (GE CNT)

Under this menu, there are "On Hour Counter", "Run Hour Counter" and, "Power Interruption Counter".

On Hour Counter: The total on-hour of the device is counted. Its unit is hour.

Run Hour Counter: The total run hour of the device is counted. Its unit is hour.

Power Interruption Counter: Power interruption of the device is counted. The corresponding counter increments by 1 with each power cut.

| | | | | |
|---------------------------|-------------|-------------------------|-------------|--|
| MEASUREMENTS (MEASURE) | → OK ← X | Input Counters (IN CNT) | → OK ← X | On Hour Counter (ON HOUR) |
| | | | | ↓ |
| | | | | Run Hour Counter (RUN HOUR) |
| | | | | ↓ |
| | | | | Power Interruption Counter (POWER INT) |

! Only the "Run Hour Counter" can be reset by the user.

3.1.8 Voltage – Current Unbalance Data (UNBLNC)

The unbalance data of the voltage and current signals measured in the device are displayed. The calculation formula is as follows.

- $V_{avg} = (V1+V2+V3)/3$
- $MaxDevV = \max [\text{abs} (V1-V_{avg}), \text{abs} (V2-V_{avg}), \text{abs} (V3-V_{avg})]$
- $Unbalance = MaxDevV/V_{avg}$

| | | | | |
|---------------------------|-------------|--------------------|-------------|-----------------------------|
| MEASUREMENTS (MEASURE) | → OK ← X | Unbalance (UNBLNS) | → OK ← X | Voltage Unbalance (VOLTAGE) |
| | | | | ↓ |
| | | | | Current Unbalance (CURRENT) |

! In current calculations, a similar process is performed by taking the average of the phase currents.

3.2 SETTINGS (SETTING)

Device configurations are made under this tab.

| | | |
|----------------------------|-------------------------------------|-------------|
| SETTING (SETTINGS) | Serial Connection Settings (SERIAL) | → OK ← X |
| | ↓ | |
| | PULSE 1 | → OK ← X |
| | ↓ | |
| | PULSE 2 | → OK ← X |
| | ↓ | |
| | DI1 | → OK ← X |
| | ↓ | |
| | DI2 | → OK ← X |
| | ↓ | |
| | Network Settings (NETWORK) | → OK ← X |
| | ↓ | |
| | Demand Settings (DEMAND) | → OK ← X |
| | ↓ | |
| Alarm Settings (ALARM) | → OK ← X | |
| ↓ | | |
| Device Settings (DEVICE) | → OK ← X | |
| ↓ | | |
| Security Settings (SECURE) | → OK ← X | |
| ↓ | | |
| Clear (CLEAR) | → OK ← X | |

The menu structure above may vary in different models.

3.2.1 Serial Connection Settings (SERIAL)

Under this menu, the following communication parameters that will be required for MODBUS RTU communication are set.

- Baudrate (BAUD)
 - 1200 – 57600 baudrates are supported.
- Parite (PARITY)
 - Odd parity, even parity and none parity options are supported.
- Stop Bit (STOP)
 - Stop bit 1 and Stop bit 2 options are supported.
- Data Type (DTATYP)
 - It is the menu where the bit order of the data to be sent is selected.

The following sorting types are supported.

- BBE (Big Endian)
- LE (Little Endian)
- BE SWAP (Big Endian Byte Swap)
- LE SWAP (Little Endian Byte Swap)

| | | | | | | |
|--------------------|-------------|--|-------------|---------------------|-------------|--|
| SETTING (SETTINGS) | → OK ← X | Serial Connection Settings (SERIAL) | → OK ← X | Slave ID (ID) | → OK ← X | 1.247 |
| | | | | ↓ | | ↓ |
| | | | | Baudrate (BAUD) | → OK ← X | 1200 2400 4800 9600 19200 38400 57600 |
| | | | | ↓ | | ↓ |
| | | | | Parity (PARITY) | → OK ← X | None Odd Even |
| | | | | ↓ | | ↓ |
| | | | | Stop Bit (STOP) | → OK ← X | 1 2 |
| | | | | ↓ | | ↓ |
| | | | | Date Type (DTA TYP) | → OK ← X | BE (Big Endian) LE (Little Endian) BESP (Big Endian Byte Swap) LESP (Little Endian Byte Swap) |

3.2.2 Pulse Output Settings (PULSE 1 & PULSE 2)

There are optionally 2 pulse outputs in the devices. Digital outputs are used to get pulses according to the counted energy value.

| | | | | | | |
|--------------------|-------------|---------|-------------|-------------------|-------------|---|
| SETTING (SETTINGS) | → OK ← X | PULSE 1 | → OK ← X | Source (SOURCE) | → OK ← X | T1 Total Import Active (I ACT) |
| | | | | ↓ | ↓ | T1 Total Export Active (E ACT) |
| | | | | ↓ | ↓ | T1 Total Import Reactive (I REA) |
| | | | | ↓ | ↓ | T1 Total Export Reactive (E REA) |
| | | | | ↓ | ↓ | ENERGY ALARM |
| | | | | Value (VALUE) | → OK ← X | 1..9 |
| | | | | ↓ | ↓ | ↓ |
| | | | | Multiplier (MULT) | → OK ← X | 1 x10 (MUL10) x100 (MUL100) x1000 (MUL1000) /1000 (DIV1000) /100 (DIV100) /10 (DIV10) |
| | | | | ↓ | ↓ | ↓ |
| | | | | Duration (DUR) | → OK ← X | 30 .. 2500 msn |
| | | | | ↓ | ↓ | ↓ |
| | | | | ↓ | ↓ | ↓ |
| | | | | ↓ | ↓ | ↓ |
| | | | | ↓ | ↓ | ↓ |
| SETTING (SETTINGS) | → OK ← X | PULSE 2 | → OK ← X | Source (SOURCE) | → OK ← X | T1 Total Import Active (I ACT) |
| | | | | ↓ | ↓ | T1 Total Export Active (E ACT) |
| | | | | ↓ | ↓ | T1 Total Import Reactive (I REA) |
| | | | | ↓ | ↓ | T1 Total Export Reactive (E REA) |
| | | | | ↓ | ↓ | ENERGY ALARM |
| | | | | Value (VALUE) | → OK ← X | 1..9 |
| | | | | ↓ | ↓ | ↓ |
| | | | | Multiplier (MULT) | → OK ← X | 1 x10 (MUL10) x100 (MUL100) x1000 (MUL1000) /1000 (DIV1000) /100 (DIV100) /10 (DIV10) |
| | | | | ↓ | ↓ | ↓ |
| | | | | Duration (DUR) | → OK ← X | 30 .. 2500 msn |
| | | | | ↓ | ↓ | ↓ |
| | | | | ↓ | ↓ | ↓ |
| | | | | ↓ | ↓ | ↓ |
| | | | | ↓ | ↓ | ↓ |

In the configuration of the digital output, the energy source to get pulses, the amount of energy to be counted to get pulses and the duration of the signal must be entered.

Source (SOURCE): The source of the energy to get pulses is selected. 4 different energy sources can be selected.

- Import Active Energy (I ACT)
- Export Active Energy (E ACT)
- Import Reactive Energy (I REA)
- Export Reactive Energy (E REA)

Value (VALUE) ve Multiplier (MULT): An integer from 1 to 9 must be entered for “Value”. It is multiplied by the parameter selected from the “Multiplier” section and it is determined how much energy will be counted for a pulse.

Duration (DUR): The duration that the pulse will remain active is set.

For example, DO1 configurations are as follows;
 Source (SOURCE) Import Active Energy (I ACT)
 Value (VALUE) 5
 Multiplier (MULT) MUL10 (means multiply by 10)
 Duration (DUR) 1000 (unit is msec.)

The device will give 1 pulse output for every 5x10 = 50Wh energy. The pulse will remain active for 1000 msec (1 second).

! These values are the total energy data of the 1st tariff. Energy units are Wh and VARh.

3.2.3 Digital Digital Settings (DI1 & DI2)

Operating mode (SOURCE), delay time (DELAY), and detection edge (EDGE) settings of the inputs are made under this tab.

| | | | | | | |
|--------------------|-------------|------|-------------|-----------------|-------------|--------------------------------|
| SETTING (SETTINGS) | → OK ← X | DI 1 | → OK ← X | Source (SOURCE) | → OK ← X | Input Counter (IN CNT) |
| | | | | ↓ | | Tariff (TARIFF) |
| | | | | Delay (DELAY) | → OK ← X | 100 .. 2000 msec |
| | | | | ↓ | | Rising Edge (RISE) |
| | | | | Edge (EDGE) | → OK ← X | Falling Edge (FALL) |
| | | | | | | Rising and Falling Edge (BOTH) |
| | → OK ← X | DI 2 | → OK ← X | Source (SOURCE) | → OK ← X | Input Counter (IN CNT) |
| | | | | ↓ | | Tariff (TARIFF) |
| | | | | Delay (DELAY) | → OK ← X | 100 .. 2000 ms |
| | | | | ↓ | | Rising Edge (RISE) |
| | | | | Edge (EDGE) | → OK ← X | Falling Edge (FALL) |
| | | | | | | Rising and Falling Edge (BOTH) |

Digital Input Source (SOURCE): The operating mode of the digital input is selected here. There are 2 different operating modes: 2nd and 3rd tariff activation (TARIFF) and entry counter (IN CNT).

If the source is set as tariff activation for both inputs;

When DI1 is active, the device will start counting to the 2nd tariff, and when DI2 is active, the device will start counting to the 3rd tariff.



2 different tariffs cannot be active with devices at the same time. If one tariff is active and the other tariff is desired to be activated, the device will only count on the 1st tariff.

If the source is set to input counter (IN CNT), it counts with each state changing depending on the detection edge.

- If rising edge detection (RISE) is chosen for the detection edge, the counter will increase by 1 on each activation of the dry contact that is connected to the digital input.
- If falling edge detection (FALL) is chosen for the detection edge, the counter will increase by 1 on each deactivation of the dry contact that is connected to the digital input.
- If rising and falling edges detection (BOTH) is chosen for the detection edge, the counter will increase by 1 on each activation and deactivation of the dry contact that is connected to the digital input.

Delay (DELAY): It is the delay time used to determine the position of the digital input. If the input is still in the same position at the end of the set detection delay time, it is decided whether the related input is active or passive. The most important purpose of use is to filter out factors such as contact bounce or noise that may occur at the digital input.

Detection Edge (EDGE): This is the menu where you select the position in which the digital input will be detected as active or passive. This menu is valid for the "Input Counter (IN CNT)" option in digital input sources. For tariff activation, rising edge detection (RISE) always applies.

! When digital inputs are set as input counter, tariff configuration is done using commands over communication.

! Digital input is based on the dry contact detection principle. Never apply signal to inputs. Otherwise, there is a risk of damaging the device.

3.2.4 Network Settings (NETWORK)

The network and basic settings of the device are made under this tab.

| | | | | | | |
|---------------------------|-------------|----------------------------|-------------|----------------------------|-------------|---------------|
| SETTING (SETTINGS) | → OK ← X | Network Settings (NETWORK) | → OK ← X | CT Primary (CT PRI) | → OK ← X | 5 .. 9999 |
| | | | | ↓ | | |
| | | | | CT Secondary (CT SEC) | → OK ← X | 1/5 |
| | | | | ↓ | | |
| | | | | VT Primary (VT PRI) | → OK ← X | 100 .. 999999 |
| | | | | ↓ | | |
| | | | | VT Secondary (VT SEC) | → OK ← X | 100 .. 500 |
| | | | | ↓ | | |
| | | | | System Frequency (SYS FRQ) | → OK ← X | 50 / 60 |
| ↓ | | | | | | |
| Connection Typw (CON TYP) | → OK ← X | 3P4W / 3P3W | | | | |
| ↓ | | | | | | |
| Trabsformer Option (TRA) | → OK ← X | WITH WITHOUT | | | | |

CT Primary Setting (CT PRI): This is the section where the primary value of the current transformers connected to the current inputs is entered. A value between 5 and 9999 can be entered.

CT Secondary Setting (CT SEC): This is the section where the secondary value of the current transformers connected to the current inputs is entered. 1 or 5 can be selected.

! The current values measured from the current inputs are multiplied by the ratio of the CT Primary and CT Secondary values and shown in the displays and Modbus addresses.

VT Primary Setting (VT PRI): This is the section where the primary value of the transformers connected to the voltage inputs is entered. A value between 100 and 9999 can be entered.

VT Secondary Setting (VT SEC): This is the section where the secondary value of the transformers connected to the voltage inputs is entered. A value between 100 and 500 can be entered.

! The voltage values measured from the voltage inputs are multiplied by the ratio of the VT Primary and VT Secondary values and shown in the displays and Modbus addresses.

System Frequency (SYS FRQ): It is the section where the system frequency is selected. 50 and 60 Hz frequencies are supported on the devices.

Connection Type (CON TYP): The connection type to the device is selected under this tab. 3P3W and 3P4W connection options are supported on the devices.

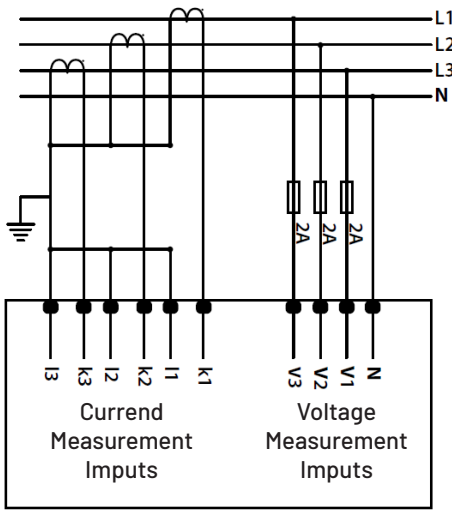


Figure 3 3P4W Connection

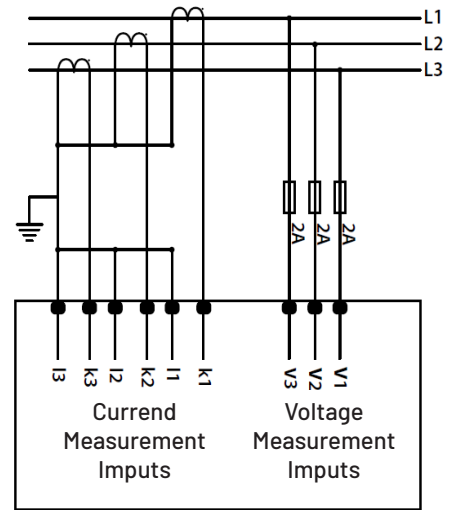


Figure 4 3P3W Connection

Transformer Option (TRA): The connection type to the device is selected under this tab. 3P3W and 3P4W connection options are supported on the devices.

For example, CT ratio, VT ratio, current and voltage values are as follows.

- CT ratio: 100
- Measured 1st phase current: 100A (1A without CT ratio)
- VT ratio: 1
- Measured 1st phase voltage: 230

When the transformer option is set to "WITH", the index increase after one hour for the 1st phase;
 $230 \times 100 = 23000$ (23 kWh)

When the transformer option is set to "WITHOUT", the index increase after one hour for the 1st phase;
 $230 \times 1 = 230$ Wh

! The Transformer Option is only for changing the increase in the index data, and the current and voltage values shown on the screen will be displayed with a multiplier independent of this parameter.

3.2.5 Demand Settings (DEMAND)

Under this tab, the demand calculation method and period are entered. The device has 3 different demand calculation methods: fixed, sliding, and rolling.

| | | | | | | |
|-----------------------|-------------|-----------------------------|-------------|-----------------------|-------------|---------------------|
| SETTING (SETTINGS) | → OK ← X | Demand Settings (DEMAND) | → OK ← X | Method (METHOD) | → OK ← X | Sliding (SLIDIN) |
| | | | | | | Fixed (FIXED) |
| | | | | | | Rolling (ROLLIN) |
| | | | | ↓ | | |
| | | | | Period (PERIOD) | → OK ← X | 1.60 |
| | | | | | | |
| | | | | Sun Interval (SUBINT) | → OK ← X | 1.60 |

Fixed Method: It is calculated by taking the average of the power values during the set demand period.

Sliding Method: Demand values are calculated in blocks of time determined according to the set time. Time blocks are the value in seconds of demand time intervals set in minutes. In other words, the demand measurements of a device with a demand time of 15 minutes are updated with time blocks of each 15 seconds. The device updates the demand value at the end of the time interval.

Rolling Method: Demand values are calculated in blocks of time determined according to the set time. Time blocks are the value in seconds of demand time intervals set in minutes. In other words, the demand measurements of a device with a demand time of 15 minutes are updated with time blocks of each 15 seconds. The device updates the demand value at the end of the time interval.

The default values are as follows.

Method: Sliding

Period: 15 min.

Sub-Interva: 1 min. (It is unimportant in demand calculation because method is "Sliding")

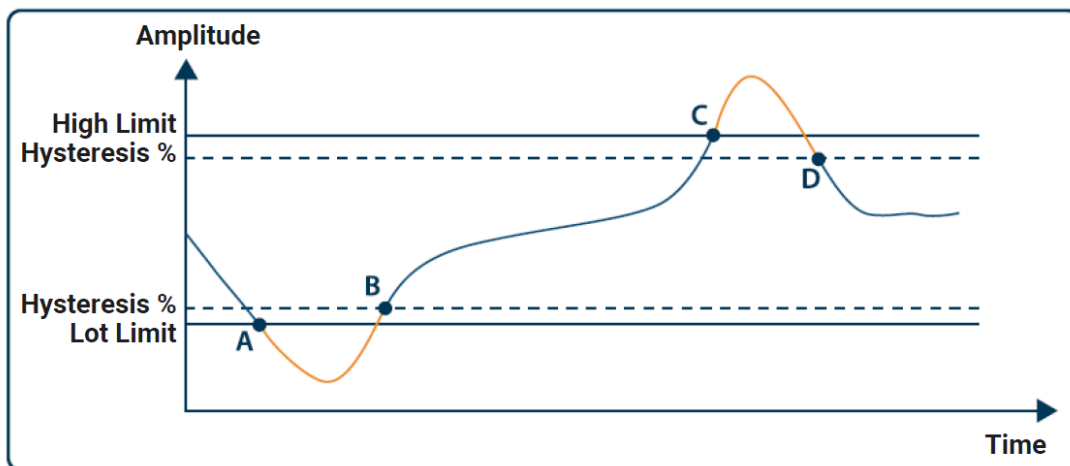
3.2.6 Alarm Settings (ALARM)

Alarm limits, hysteresis, delays, and relay assignment settings are made for the following parameters under this menu.

| | | | | | | | | | |
|--------------------|-------------|-----------------------|-------------|-------------------|-------------|---------------------------|--------------------------|-------------|---------------------------------|
| SETTING (SETTINGS) | → OK ← X | Alarm Setting (ALARM) | → OK ← X | Voltage Alarm (V) | → OK ← X | Low Limit Setting (LOW) | | | |
| | | | | | | High Limit Setting (HIGH) | | | |
| | | | | | | | Gecikme Ayarı (GECKME) | | |
| | | | | | | | Hysteresis (HYSTRS) | | |
| | | | | | | | Relay Assignment (OUT) | → OK ← X | OFF 1(PULSE 1) 2(PULSE 2) |
| | | | | | | | ↓ | | |
| | | | | | | | Current Alarm (I) | | |
| | | | | | | | ↓ | | |
| | | | | | | | Active Power Alarm (P) | | |
| | | | | | | | ↓ | | |
| | | | | | | | Reactive Power Alarm (Q) | | |
| | | | | | | | ↓ | | |
| | | | | | | | Apparent Power Alarm (S) | | |
| | | | | | | ↓ | | | |
| | | | | | | Power Factor Alarm (PF) | | | |
| | | | | | | ↓ | | | |
| | | | | | | Frequency Alarm (F) | | | |

- Voltage
 - Low (LOW)
 - Low voltage limit setting is made.
 - High (HIGH)
 - High voltage limit setting is made.
 - Delay (DELAY)
 - The delay time for the voltage alarm to be detected is set.
 - Hysteresis (HYST)
 - Voltage alarm hysteresis setting is made.
 - Relay Assignment (Out)
 - Relay assignment is made for the related alarm parameter in this tab for devices with relay output.
- Current
- Frequency
- Active Power
- Reactive Power
- Apparent Power
- Power Factor

When it is desired to set the alarm as off state for a parameter, the low and high values have to be entered as the same.



Point A low limit alarm occurs.

Point B, the alarm condition disappears.

Point C high limit alarm occurs.

Point D, the alarm condition disappears.

3.2.7 Device Settings (DEVICE)

Under this tab, the language of the device, backlight status, and menu settings are made.

| | | | | | | | | | | | | | | |
|-----------------------|-------------|-----------------------------|-------------|------------------------|-------------|-------------------------------|-------------|----------------------------|-------------|---|--|--|--|--|
| SETTINGS (SETTING) | → OK ← X | Device Settings (DEVICE) | → OK ← X | Language (DIL LANG) | → OK ← X | Türkçe (TUR) English (ENG) | | | | | | | | |
| | | | | ↓ | | | | | | | | | | |
| | | | | Backlight (BCKLGH) | → OK ← X | Backlight State (STATE) | → OK ← X | Time Dependent (TIMDEP) | | | | | | |
| | | | | | | | | ↓ | | | | | | |
| | | | | | | | | Off (OFF) | | | | | | |
| | | | | | | | | ↓ | | | | | | |
| | | | | | | | → OK ← X | On (ON) | | | | | | |
| | | | | ↓ | | | | | | | | | | |
| | | | | | → OK ← X | Time (TIME) | → OK ← X | 10..600 | | | | | | |
| | | | | ↓ | | | | | | | | | | |
| | | | | Menü (MENU) | → OK ← X | | → OK ← X | Scroll (SCROLL) | → OK ← X | ON OFF | | | | |
| | | | | | | | | ↓ | | | | | | |
| | | | | | | | | Start Page (START) | → OK ← X | Instant Values (INSTAN) Energy Values (ENERGY) | | | | |
| | | | | ↓ | | | | | | | | | | |
| | → OK ← X | Döngü Süresi (PERİYOT) | → OK ← X | 1..60 | | | | | | | | | | |

The device supports 2 different language options, Turkish and English. The default language is English.

The backlight can be adjusted in 3 different options: continuously on (ON), continuously off (OFF), and time-dependent (TIMDEP). If it is selected time-dependent, how long it will remain active (TIME) should be selected. In the menu setting, the start screen (START), the menu loop (SCROLL), and the time required to stay on each page (PERIOD) are set.

Two different start screens can be selected, instantaneous measurements and energy. When the scroll is activated, the values are displayed by waiting for the cycle time (PERIOD) among the selected start screen parameters.

3.2.8 Security Settings (SECURE)

Password protection activation configuration (ACTIVE) and password (PASS) can be adjusted under this tab.

| | | | | | | |
|--------------------|-------------|----------------------------|-------------|---------------------|-------------|--------------------|
| SETTING (SETTINGS) | → OK ← X | Security Settings (SECURE) | → OK ← X | Activation (ACTIVE) | → OK ← X | OFF ON |
| | | | | ↓ | | ↓ |
| | | | | Password (PASS) | → OK ← X | 0000000 .. 9999999 |

3.2.9 Clear (CLEAR)

C6 different parameters can be cleared under this menu.

| | | | | | | |
|--------------------------|-------------|---------------|-------------|---------------------|-------------|-----------|
| SETTING (SETTING) | → OK ← X | Clear (CLEAR) | → OK ← X | Settings (SETTING) | → OK ← X | NO YES |
| | | | | ↓ | | |
| | | | | Energy (ENERGY) | → OK ← X | NO YES |
| | | | | ↓ | | |
| | | | | Demand (DEMAND) | → OK ← X | NO YES |
| | | | | ↓ | | |
| | | | | Min & Max (MIN-MAX) | → OK ← X | NO YES |
| | | | | ↓ | | |
| Input Counter (IN CNT) | → OK ← X | NO YES | | | | |
| ↓ | | | | | | |
| General Counter (GE CNT) | → OK ← X | NO YES | | | | |

The parameter to be cleared should be set to "YES". When exiting the settings menu, selecting "YES" for the "SAVE" question will delete the settings.

! In order to save the settings made after the setting change, the "X" button must be pressed several times. The "NO" statement on the "SAVE" screen that appears on the screen should be changed to "YES" using the buttons. Afterward, the "OK" button should be pressed.

3.3 INFO (INFO)

Device information is shown under this tab.

| | | |
|----------------|-------------|--------------------------------|
| INFO (INFO) | → OK ← X | Order Number (ORDER) |
| | | ↓ |
| | | Serial Number (SERIAL NO) |
| | | ↓ |
| | | Software Version (FIRMWARE) |
| | | ↓ |
| | | Modbus Version (MODBUS) |

3.4 LOGIN (LOGIN)

| | | |
|------------------|-------------|---------------------------|
| LOGIN (LOGIN) | → OK ← X | Success Login (SUCCES) |
|------------------|-------------|---------------------------|

EMD 4

PART 4
RS485
COMMUNICATION

The devices have an optional RS485 interface. Devices communicate with Modbus RTU protocol over the RS485 communication interface. The following functions are supported.

03H fonksiyonu: This function reads the readable addresses in the Modbus table.

10H fonksiyonu: This function writes the writable addresses in the Modbus table.

Definitions:

R / W: Can read and write the value in this address.

RO: Can only read the value in this address.

WO: Can only write to this address.

float: 32-bit floating number.

| General Phase Values | | | | | | |
|----------------------|-------------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 0 | Average Phase Neutral Voltage | float | RO | 03H | V | |
| 2 | Total Current | float | RO | 03H | A | |
| 4 | Total Active Power | float | RO | 03H | W | |
| 6 | Total Reactive Power | float | RO | 03H | VAr | |
| 8 | Total Apparent Power | float | RO | 03H | VA | |
| 10 | System Power Factor | float | RO | 03H | - | |
| 12 | Frequency | float | RO | 03H | Hz | |
| 14 | Neutral Current | float | RO | 03H | A | |
| 16 | Phase-Phase Voltage V12 | float | RO | 03H | V | |
| 18 | Phase-Phase Voltage V23 | float | RO | 03H | V | |
| 20 | Phase-Phase Voltage V31 | float | RO | 03H | V | |
| 22 | Average Phase Phase Voltage | float | RO | 03H | V | |
| 24 | Phase Sequence | int32t | RO | 03H | - | |

| Phase Values (3Ph) | | | | | | |
|--------------------|------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 100 | Phase 1 Voltage | float | RO | 03H | V | |
| 102 | Phase 2 Voltage | float | RO | 03H | V | |
| 104 | Phase 3 Voltage | float | RO | 03H | V | |
| 106 | Phase 1 Current | float | RO | 03H | A | |
| 108 | Phase 2 Current | float | RO | 03H | A | |
| 110 | Phase 3 Current | float | RO | 03H | A | |
| 112 | Phase 1 Active Power | float | RO | 03H | W | |
| 114 | Phase 2 Active Power | float | RO | 03H | W | |
| 116 | Phase 3 Active Power | float | RO | 03H | W | |
| 118 | Phase 1 Reactive Power | float | RO | 03H | VAr | |
| 120 | Phase 2 Reactive Power | float | RO | 03H | VAr | |
| 122 | Phase 3 Reactive Power | float | RO | 03H | VAr | |
| 124 | Phase 1 Apparent Power | float | RO | 03H | VA | |
| 126 | Phase 2 Apparent Power | float | RO | 03H | VA | |
| 128 | Phase 3 Apparent Power | float | RO | 03H | VA | |
| 130 | Phase 1 Power Factor | float | RO | 03H | - | |
| 132 | Phase 2 Power Factor | float | RO | 03H | - | |
| 134 | Phase 3 Power Factor | float | RO | 03H | - | |
| 136 | Phase 1 Cos ϕ | float | RO | 03H | - | |
| 138 | Phase 2 Cos ϕ | float | RO | 03H | - | |
| 140 | Phase 3 Cos ϕ | float | RO | 03H | - | |

| THD Data | | | | | | |
|----------|---|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 500 | Total Harmonic Distortion Voltage Phase 1 | float | RO | 03H | % | |
| 502 | Total Harmonic Distortion Voltage Phase 2 | float | RO | 03H | % | |
| 504 | Total Harmonic Distortion Voltage Phase 3 | float | RO | 03H | % | |
| 506 | Total Harmonic Distortion Current Phase 1 | float | RO | 03H | % | |
| 508 | Total Harmonic Distortion Current Phase 2 | float | RO | 03H | % | |
| 510 | Total Harmonic Distortion Current Phase 3 | float | RO | 03H | % | |

| Harmonic Data | | | | | | |
|---------------|-----------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 600 | V Harmonic 1 Phase 1 | float | RO | 03H | % | |
| 602 | V Harmonic 3 Phase 1 | float | RO | 03H | % | |
| 604 | V Harmonic 5 Phase 1 | float | RO | 03H | % | |
| 606 | V Harmonic 7 Phase 1 | float | RO | 03H | % | |
| 608 | V Harmonic 9 Phase 1 | float | RO | 03H | % | |
| 610 | V Harmonic 11 Phase 1 | float | RO | 03H | % | |
| 612 | V Harmonic 13 Phase 1 | float | RO | 03H | % | |
| 614 | V Harmonic 15 Phase 1 | float | RO | 03H | % | |
| 616 | V Harmonic 17 Phase 1 | float | RO | 03H | % | |
| 618 | V Harmonic 19 Phase 1 | float | RO | 03H | % | |
| 620 | V Harmonic 21 Phase 1 | float | RO | 03H | % | |
| 622 | V Harmonic 23 Phase 1 | float | RO | 03H | % | |
| 624 | V Harmonic 25 Phase 1 | float | RO | 03H | % | |
| 626 | V Harmonic 27 Phase 1 | float | RO | 03H | % | |
| 628 | V Harmonic 29 Phase 1 | float | RO | 03H | % | |
| 630 | V Harmonic 31 Phase 1 | float | RO | 03H | % | |
| 632 | V Harmonic 1 Phase 2 | float | RO | 03H | % | |
| 634 | V Harmonic 3 Phase 2 | float | RO | 03H | % | |
| 636 | V Harmonic 5 Phase 2 | float | RO | 03H | % | |
| 638 | V Harmonic 7 Phase 2 | float | RO | 03H | % | |
| 640 | V Harmonic 9 Phase 2 | float | RO | 03H | % | |
| 642 | V Harmonic 11 Phase 2 | float | RO | 03H | % | |
| 644 | V Harmonic 13 Phase 2 | float | RO | 03H | % | |
| 646 | V Harmonic 15 Phase 2 | float | RO | 03H | % | |
| 648 | V Harmonic 17 Phase 2 | float | RO | 03H | % | |
| 650 | V Harmonic 19 Phase 2 | float | RO | 03H | % | |
| 652 | V Harmonic 21 Phase 2 | float | RO | 03H | % | |
| 654 | V Harmonic 23 Phase 2 | float | RO | 03H | % | |
| 656 | V Harmonic 25 Phase 2 | float | RO | 03H | % | |
| 658 | V Harmonic 27 Phase 2 | float | RO | 03H | % | |
| 660 | V Harmonic 29 Phase 2 | float | RO | 03H | % | |
| 662 | V Harmonic 31 Phase 2 | float | RO | 03H | % | |
| 664 | V Harmonic 1 Phase 3 | float | RO | 03H | % | |
| 666 | V Harmonic 3 Phase 3 | float | RO | 03H | % | |
| 668 | V Harmonic 5 Phase 3 | float | RO | 03H | % | |
| 670 | V Harmonic 7 Phase 3 | float | RO | 03H | % | |
| 672 | V Harmonic 9 Phase 3 | float | RO | 03H | % | |
| 674 | V Harmonic 11 Phase 3 | float | RO | 03H | % | |

| Harmonic Data | | | | | | |
|---------------|-----------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 676 | V Harmonic 13 Phase 3 | float | RO | 03H | % | |
| 678 | V Harmonic 15 Phase 3 | float | RO | 03H | % | |
| 680 | V Harmonic 17 Phase 3 | float | RO | 03H | % | |
| 682 | V Harmonic 19 Phase 3 | float | RO | 03H | % | |
| 684 | V Harmonic 21 Phase 3 | float | RO | 03H | % | |
| 686 | V Harmonic 23 Phase 3 | float | RO | 03H | % | |
| 688 | V Harmonic 25 Phase 3 | float | RO | 03H | % | |
| 690 | V Harmonic 27 Phase 3 | float | RO | 03H | % | |
| 692 | V Harmonic 29 Phase 3 | float | RO | 03H | % | |
| 694 | V Harmonic 31 Phase 3 | float | RO | 03H | % | |
| 696 | I Harmonic 1 Phase 1 | float | RO | 03H | % | |
| 698 | I Harmonic 3 Phase 1 | float | RO | 03H | % | |
| 700 | I Harmonic 5 Phase 1 | float | RO | 03H | % | |
| 702 | I Harmonic 7 Phase 1 | float | RO | 03H | % | |
| 704 | I Harmonic 9 Phase 1 | float | RO | 03H | % | |
| 706 | I Harmonic 11 Phase 1 | float | RO | 03H | % | |
| 708 | I Harmonic 13 Phase 1 | float | RO | 03H | % | |
| 710 | I Harmonic 15 Phase 1 | float | RO | 03H | % | |
| 712 | I Harmonic 17 Phase 1 | float | RO | 03H | % | |
| 714 | I Harmonic 19 Phase 1 | float | RO | 03H | % | |
| 716 | I Harmonic 21 Phase 1 | float | RO | 03H | % | |
| 718 | I Harmonic 23 Phase 1 | float | RO | 03H | % | |
| 720 | I Harmonic 25 Phase 1 | float | RO | 03H | % | |
| 722 | I Harmonic 27 Phase 1 | float | RO | 03H | % | |
| 724 | I Harmonic 29 Phase 1 | float | RO | 03H | % | |
| 726 | I Harmonic 31 Phase 1 | float | RO | 03H | % | |
| 728 | I Harmonic 1 Phase 2 | float | RO | 03H | % | |
| 730 | I Harmonic 3 Phase 2 | float | RO | 03H | % | |
| 732 | I Harmonic 5 Phase 2 | float | RO | 03H | % | |
| 734 | I Harmonic 7 Phase 2 | float | RO | 03H | % | |
| 736 | I Harmonic 9 Phase 2 | float | RO | 03H | % | |
| 738 | I Harmonic 11 Phase 2 | float | RO | 03H | % | |
| 740 | I Harmonic 13 Phase 2 | float | RO | 03H | % | |
| 742 | I Harmonic 15 Phase 2 | float | RO | 03H | % | |
| 744 | I Harmonic 17 Phase 2 | float | RO | 03H | % | |
| 746 | I Harmonic 19 Phase 2 | float | RO | 03H | % | |
| 748 | I Harmonic 21 Phase 2 | float | RO | 03H | % | |
| 750 | I Harmonic 23 Phase 2 | float | RO | 03H | % | |
| 752 | I Harmonic 25 Phase 2 | float | RO | 03H | % | |
| 754 | I Harmonic 27 Phase 2 | float | RO | 03H | % | |
| 756 | I Harmonic 29 Phase 2 | float | RO | 03H | % | |
| 758 | I Harmonic 31 Phase 2 | float | RO | 03H | % | |
| 760 | I Harmonic 1 Phase 3 | float | RO | 03H | % | |
| 762 | I Harmonic 3 Phase 3 | float | RO | 03H | % | |
| 764 | I Harmonic 5 Phase 3 | float | RO | 03H | % | |
| 766 | I Harmonic 7 Phase 3 | float | RO | 03H | % | |
| 768 | I Harmonic 9 Phase 3 | float | RO | 03H | % | |

| Harmonic Data | | | | | | |
|---------------|-----------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 770 | I Harmonic 11 Phase 3 | float | RO | 03H | % | |
| 772 | I Harmonic 13 Phase 3 | float | RO | 03H | % | |
| 774 | I Harmonic 15 Phase 3 | float | RO | 03H | % | |
| 776 | I Harmonic 17 Phase 3 | float | RO | 03H | % | |
| 778 | I Harmonic 19 Phase 3 | float | RO | 03H | % | |
| 780 | I Harmonic 21 Phase 3 | float | RO | 03H | % | |
| 782 | I Harmonic 23 Phase 3 | float | RO | 03H | % | |
| 784 | I Harmonic 25 Phase 3 | float | RO | 03H | % | |
| 786 | I Harmonic 27 Phase 3 | float | RO | 03H | % | |
| 788 | I Harmonic 29 Phase 3 | float | RO | 03H | % | |
| 790 | I Harmonic 31 Phase 3 | float | RO | 03H | % | |

| Energy Data | | | | | | |
|-------------|--------------------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 1000 | Total Import Active Energy | double | RO | 03H | Wh | |
| 1004 | Total Phase 1 Import Active Energy | double | RO | 03H | Wh | |
| 1008 | Total Phase 2 Import Active Energy | double | RO | 03H | Wh | |
| 1012 | Total Phase 3 Import Active Energy | double | RO | 03H | Wh | |
| 1016 | Total Export Active Energy | double | RO | 03H | Wh | |
| 1020 | Total Phase 1 Export Active Energy | double | RO | 03H | Wh | |
| 1024 | Total Phase 2 Export Active Energy | double | RO | 03H | Wh | |
| 1028 | Total Phase 3 Export Active Energy | double | RO | 03H | Wh | |
| 1032 | Total Import Reactive Energy | double | RO | 03H | VARh | |
| 1036 | Total Phase 1 Import Reactive Energy | double | RO | 03H | VARh | |
| 1040 | Total Phase 2 Import Reactive Energy | double | RO | 03H | VARh | |
| 1044 | Total Phase 3 Import Reactive Energy | double | RO | 03H | VARh | |
| 1048 | Total Export Reactive Energy | double | RO | 03H | VARh | |
| 1052 | Total Phase 1 Export Reactive Energy | double | RO | 03H | VARh | |
| 1056 | Total Phase 2 Export Reactive Energy | double | RO | 03H | VARh | |
| 1060 | Total Phase 3 Export Reactive Energy | double | RO | 03H | VARh | |
| 1064 | Total T1 Import Active Energy | double | RO | 03H | Wh | |
| 1068 | Phase 1 T1 Import Active Energy | double | RO | 03H | Wh | |
| 1072 | Phase 2 T1 Import Active Energy | double | RO | 03H | Wh | |
| 1076 | Phase 3 T1 Import Active Energy | double | RO | 03H | Wh | |
| 1080 | Total T1 Export Active Energy | double | RO | 03H | Wh | |
| 1084 | Phase 1 T1 Export Active Energy | double | RO | 03H | Wh | |
| 1088 | Phase 2 T1 Export Active Energy | double | RO | 03H | Wh | |
| 1092 | Phase 3 T1 Export Active Energy | double | RO | 03H | Wh | |
| 1096 | Total T1 Import Reactive Energy | double | RO | 03H | VARh | |
| 1100 | Phase 1 T1 Import Reactive Energy | double | RO | 03H | VARh | |
| 1104 | Phase 2 T1 Import Reactive Energy | double | RO | 03H | VARh | |
| 1108 | Phase 3 T1 Import Reactive Energy | double | RO | 03H | VARh | |
| 1112 | Total T1 Export Reactive Energy | double | RO | 03H | VARh | |
| 1116 | Phase 1 T1 Export Reactive Energy | double | RO | 03H | VARh | |
| 1120 | Phase 2 T1 Export Reactive Energy | double | RO | 03H | VARh | |
| 1124 | Phase 3 T1 Export Reactive Energy | double | RO | 03H | VARh | |
| 1128 | Total T2 Import Active Energy | double | RO | 03H | Wh | |

| Energy Data | | | | | | |
|-------------|-----------------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 1132 | Phase 1 T2 Import Active Energy | double | R0 | 03H | Wh | |
| 1136 | Phase 2 T2 Import Active Energy | double | R0 | 03H | Wh | |
| 1140 | Phase 3 T2 Import Active Energy | double | R0 | 03H | Wh | |
| 1144 | Total T2 Export Active Energy | double | R0 | 03H | Wh | |
| 1148 | Phase 1 T2 Export Active Energy | double | R0 | 03H | Wh | |
| 1152 | Phase 2 T2 Export Active Energy | double | R0 | 03H | Wh | |
| 1156 | Phase 3 T2 Export Active Energy | double | R0 | 03H | Wh | |
| 1160 | Total T2 Import Reactive Energy | double | R0 | 03H | VArh | |
| 1164 | Phase 1 T2 Import Reactive Energy | double | R0 | 03H | VArh | |
| 1168 | Phase 2 T2 Import Reactive Energy | double | R0 | 03H | VArh | |
| 1172 | Phase 3 T2 Import Reactive Energy | double | R0 | 03H | VArh | |
| 1176 | Total T2 Export Reactive Energy | double | R0 | 03H | VArh | |
| 1180 | Phase 1 T2 Export Reactive Energy | double | R0 | 03H | VArh | |
| 1184 | Phase 2 T2 Export Reactive Energy | double | R0 | 03H | VArh | |
| 1188 | Phase 3 T2 Export Reactive Energy | double | R0 | 03H | VArh | |
| 1192 | Total T2 Import Active Energy | double | R0 | 03H | Wh | |
| 1196 | Phase 1 T3 Import Active Energy | double | R0 | 03H | Wh | |
| 1200 | Phase 2 T3 Import Active Energy | double | R0 | 03H | Wh | |
| 1204 | Phase 3 T3 Import Active Energy | double | R0 | 03H | Wh | |
| 1208 | Total T3 Export Active Energy | double | R0 | 03H | Wh | |
| 1212 | Phase 1 T3 Export Active Energy | double | R0 | 03H | Wh | |
| 1216 | Phase 2 T3 Export Active Energy | double | R0 | 03H | Wh | |
| 1220 | Phase 3 T3 Export Active Energy | double | R0 | 03H | Wh | |
| 1224 | Total T3 Import Reactive Energy | double | R0 | 03H | VArh | |
| 1228 | Phase 1 T3 Import Reactive Energy | double | R0 | 03H | VArh | |
| 1232 | Phase 2 T3 Import Reactive Energy | double | R0 | 03H | VArh | |
| 1236 | Phase 3 T3 Import Reactive Energy | double | R0 | 03H | VArh | |
| 1240 | Total T3 Export Reactive Energy | double | R0 | 03H | VArh | |
| 1244 | Phase 1 T3 Export Reactive Energy | double | R0 | 03H | VArh | |
| 1248 | Phase 2 T3 Export Reactive Energy | double | R0 | 03H | VArh | |
| 1252 | Phase 3 T3 Export Reactive Energy | double | R0 | 03H | VArh | |

NOT eklenmeli.
In models with a
single tariff, energy
data can be read
from addresses
1068-1124.

| Demand Data | | | | | | |
|-------------|---------------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 3000 | PD* Phase 1 Current | float | RO | 03H | A | |
| 3002 | PD* Phase 2 Current | float | RO | 03H | A | |
| 3004 | PD* Phase 3 Current | float | RO | 03H | A | |
| 3006 | PD* Total Current | float | RO | 03H | - | |
| 3008 | PD* Total Import Active Power | float | RO | 03H | W | |
| 3010 | PD* Total Export Active Power | float | RO | 03H | W | |
| 3012 | PD* Total Import Reactive Power | float | RO | 03H | VAr | |
| 3014 | PD* Total Export Reactive Power | float | RO | 03H | VAr | |
| 3016 | PD* Total Apparent Power | float | RO | 03H | VA | |
| 3018 | MD* Phase 1 Current | float | RO | 03H | A | |
| 3020 | MD* Phase 2 Current | float | RO | 03H | A | |
| 3022 | MD* Phase 3 Current | float | RO | 03H | A | |
| 3024 | MD* Total Current | float | RO | 03H | - | |
| 3026 | MD* Total Import Active Power | float | RO | 03H | W | |
| 3028 | MD* Total Export Active Power | float | RO | 03H | W | |
| 3030 | MD* Total Import Reactive Power | float | RO | 03H | VAr | |
| 3032 | MD* Total Export Reactive Power | float | RO | 03H | VAr | |
| 3034 | MD** Total Apparent Power | float | RO | 03H | VA | |

! *PD: Demand data measured at the end of the previous demand period.

**MD: It is the maximum of the demand data measured in the device.

| Min/Max Data | | | | | | |
|--------------|-----------------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 4000 | Min Phase 1 Voltage | float | RO | 03H | V | |
| 4002 | Min Phase 2 Voltage | float | RO | 03H | V | |
| 4004 | Min Phase 3 Voltage | float | RO | 03H | V | |
| 4006 | Min Phase 1-2 Voltage | float | RO | 03H | V | |
| 4008 | Min Phase 2-3 Voltage | float | RO | 03H | V | |
| 4010 | Min Phase 3-1 Voltage | float | RO | 03H | V | |
| 4012 | Min Phase 1 Current | float | RO | 03H | A | |
| 4014 | Min Phase 2 Current | float | RO | 03H | A | |
| 4016 | Min Phase 3 Current | float | RO | 03H | A | |
| 4018 | Min Phase 1 Import Active Power | float | RO | 03H | W | |
| 4020 | Min Phase 2 Import Active Power | float | RO | 03H | W | |
| 4022 | Min Phase 3 Import Active Power | float | RO | 03H | W | |
| 4024 | Min Phase 1 Export Active Power | float | RO | 03H | W | |
| 4026 | Min Phase 2 Export Active Power | float | RO | 03H | W | |
| 4028 | Min Phase 3 Export Active Power | float | RO | 03H | W | |
| 4030 | Min Phase 1 Import Active Power | float | RO | 03H | VAr | |
| 4032 | Min Phase 2 Import Reactive Power | float | RO | 03H | VAr | |
| 4034 | Min Phase 3 Import Reactive Power | float | RO | 03H | VAr | |
| 4036 | Min Phase 1 Export Reactive Power | float | RO | 03H | VAr | |
| 4038 | Min Phase 2 Export Reactive Power | float | RO | 03H | VAr | |

| Min/Max Data | | | | | | |
|--------------|-------------------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 4040 | Min Phase 3 Export Reactive Power | float | RO | 03H | VAr | |
| 4042 | Min Phase 1 Apparent Power | float | RO | 03H | VA | |
| 4044 | Min Phase 2 Apparent Power | float | RO | 03H | VA | |
| 4046 | Min Phase 3 Apparent Power | float | RO | 03H | VA | |
| 4048 | Min Phase 1 Inductive Power Factor | float | RO | 03H | - | |
| 4050 | Min Phase 2 Inductive Power Factor | float | RO | 03H | - | |
| 4052 | Min Phase 3 Inductive Power Factor | float | RO | 03H | - | |
| 4054 | Min Phase 1 Capacitive Power Factor | float | RO | 03H | - | |
| 4056 | Min Phase 2 Capacitive Power Factor | float | RO | 03H | - | |
| 4058 | Min Phase 3 Capacitive Power Factor | float | RO | 03H | - | |
| 4060 | Min Average Phase-Neutral Voltage | float | RO | 03H | V | |
| 4062 | Min Average Phase-Phase Voltage | float | RO | 03H | V | |
| 4064 | Min Total Current | float | RO | 03H | A | |
| 4066 | Min Total Import Active Power | float | RO | 03H | W | |
| 4068 | Min Total Export Active Power | float | RO | 03H | W | |
| 4070 | Min Total Import Reactive Power | float | RO | 03H | VAr | |
| 4072 | Min Total Export Reactive Power | float | RO | 03H | VAr | |
| 4074 | Min Total Apparent Power | float | RO | 03H | VA | |
| 4076 | Min Total Inductive Power Factor | float | RO | 03H | - | |
| 4078 | Min Total Capacitive Power Factor | float | RO | 03H | - | |
| 4080 | Min Frequency | float | RO | 03H | Hz | |
| 4082 | Max Phase 1 Voltage | float | RO | 03H | V | |
| 4084 | Max Phase 2 Voltage | float | RO | 03H | V | |
| 4086 | Max Phase 3 Voltage | float | RO | 03H | V | |
| 4088 | Max Phase 1-2 Voltage | float | RO | 03H | V | |
| 4090 | Max Phase 2-3 Voltage | float | RO | 03H | V | |
| 4092 | Max Phase 3-1 Voltage | float | RO | 03H | V | |
| 4094 | Max Phase 1 Current | float | RO | 03H | A | |
| 4096 | Max Phase 2 Current | float | RO | 03H | A | |
| 4098 | Max Phase 3 Current | float | RO | 03H | A | |
| 4100 | Max Phase 1 Import Active Power | float | RO | 03H | W | |
| 4102 | Max Phase 2 Import Active Power | float | RO | 03H | W | |
| 4104 | Max Phase 3 Import Active Power | float | RO | 03H | W | |
| 4106 | Max Phase 1 Export Active Power | float | RO | 03H | W | |
| 4108 | Max Phase 2 Export Active Power | float | RO | 03H | W | |
| 4110 | Max Phase 3 Export Active Power | float | RO | 03H | W | |
| 4112 | Max Phase 1 Import Reactive Power | float | RO | 03H | VAr | |
| 4114 | Max Phase 2 Import Reactive Power | float | RO | 03H | VAr | |
| 4116 | Max Phase 3 Import Reactive Power | float | RO | 03H | VAr | |
| 4118 | Max Phase 1 Export Reactive Power | float | RO | 03H | VAr | |
| 4120 | Max Phase 2 Export Reactive Power | float | RO | 03H | VAr | |
| 4122 | Max Phase 3 Export Reactive Power | float | RO | 03H | VAr | |
| 4124 | Max Phase 1 Apparent Power | float | RO | 03H | VA | |
| 4126 | Max Phase 2 Apparent Power | float | RO | 03H | VA | |

| Min/Max Data | | | | | | |
|--------------|-------------------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 4128 | Max Phase 3 Apparent Power | float | RO | 03H | VA | |
| 4130 | Max Phase 1 Inductive Power Factor | float | RO | 03H | - | |
| 4132 | Max Phase 2 Inductive Power Factor | float | RO | 03H | - | |
| 4134 | Max Phase 3 Inductive Power Factor | float | RO | 03H | - | |
| 4136 | Max Phase 1 Capacitive Power Factor | float | RO | 03H | - | |
| 4138 | Max Phase 2 Capacitive Power Factor | float | RO | 03H | - | |
| 4140 | Max Phase 3 Capacitive Power Factor | float | RO | 03H | - | |
| 4142 | Max Phase-Neutral Voltage | float | RO | 03H | V | |
| 4144 | Max Phase-Phase Voltage | float | RO | 03H | V | |
| 4146 | Max Total Current | float | RO | 03H | A | |
| 4148 | Max Total Import Active Power | float | RO | 03H | W | |
| 4150 | Max Total Export Active Power | float | RO | 03H | W | |
| 4152 | Max Total Import Reactive Power | float | RO | 03H | VAr | |
| 4154 | Max Total Export Reactive Power | float | RO | 03H | VAr | |
| 4156 | Max Total Görünüt Power | float | RO | 03H | VA | |
| 4158 | Max Total Inductive Power Factor | float | RO | 03H | - | |
| 4160 | Max Total Capacitive Power Factor | float | RO | 03H | - | |
| 4162 | Max Frequency | float | RO | 03H | Hz | |

| Digital Input Counters | | | | | | |
|------------------------|-------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 5000 | Digital Input 1 Counter | uint32_t | RO | 03H | - | |
| 5002 | Digital Input 1 On Time | uint32_t | RO | 03H | hour | |
| 5004 | Digital Input 2 Counter | uint32_t | RO | 03H | - | |
| 5006 | Digital Input 2 On Time | uint32_t | RO | 03H | hour | |

| General Counters | | | | | | |
|------------------|----------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 6000 | On Time | uint32_t | RO | 03H | hour | |
| 6002 | Run Hour Time | uint32_t | RO | 03H | hour | |
| 6004 | Power Interruption Counter | uint32_t | RO | 03H | - | |

| Unbalance Data | | | | | | |
|----------------|-------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 7000 | Voltage Unbalance | float | RO | 03H | % | |
| 7002 | Current Unbalance | float | RO | 03H | % | |

| 4Q Reactive Energy Data | | | | | | |
|-------------------------|----------------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 8000 | Total Q Reactive Energy | double | RO | 03H | VArh | |
| 8004 | Total Phase 1Q Reactive Energy | double | RO | 03H | VArh | |
| 8008 | Total Phase 2 Q Reactive Energy | double | RO | 03H | VArh | |
| 8012 | Total Phase 3 Q Reactive Energy | double | RO | 03H | VArh | |
| 8016 | Total 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8020 | Total Phase 1 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8024 | Total Phase 2 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8028 | Total Phase 3 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8032 | Total 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8036 | Total Phase 1 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8040 | Total Phase 2 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8044 | Total Phase 3 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8048 | Total 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8052 | Total Phase 1 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8056 | Total Phase 2 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8060 | Total Phase 3 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8064 | T1Q Reactive Energy | double | RO | 03H | VArh | |
| 8068 | T1 Phase 1Q Reactive Energy | double | RO | 03H | VArh | |
| 8072 | T1 Phase 2 Q Reactive Energy | double | RO | 03H | VArh | |
| 8076 | T1 Phase 3 Q Reactive Energy | double | RO | 03H | VArh | |
| 8080 | T1 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8084 | T1 Phase 1 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8088 | T1 Phase 2 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8092 | T1 Phase 3 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8096 | T1 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8100 | T1 Phase 1 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8104 | T1 Phase 2 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8108 | T1 Phase 3 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8112 | T1 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8116 | T1 Phase 1 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8120 | T1 Phase 2 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8124 | T1 Phase 3 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8128 | T2 Q Reactive Energy | double | RO | 03H | VArh | |
| 8132 | T2 Phase 1Q Reactive Energy | double | RO | 03H | VArh | |
| 8136 | T2 Phase 2 Q Reactive Energy | double | RO | 03H | VArh | |
| 8140 | T2 Phase 3 Q Reactive Energy | double | RO | 03H | VArh | |
| 8144 | T2 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8148 | T2 Phase 1 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8152 | T2 Phase 2 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8156 | T2 Phase 3 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8160 | T2 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8164 | T2 Phase 1 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8168 | T2 Phase 2 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8172 | T2 Phase 3 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8176 | T2 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8180 | T2 Phase 1 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8184 | T2 Phase 2 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8188 | T2 Phase 3 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8192 | T3 Q Reactive Energy | double | RO | 03H | VArh | |

4Q Reactive Energy Data

| Address | Parameter | Data Type | W/R | Function | Description | Default |
|---------|------------------------------|-----------|-----|----------|-------------|---------|
| 8196 | T3 Phase 1Q Reactive Energy | double | RO | 03H | VArh | |
| 8200 | T3 Phase 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8204 | T3 Phase 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8208 | T3 2Q Reactive Energy | double | RO | 03H | VArh | |
| 8212 | T3 Phase 12Q Reactive Energy | double | RO | 03H | VArh | |
| 8216 | T3 Phase 22Q Reactive Energy | double | RO | 03H | VArh | |
| 8220 | T3 Phase 32Q Reactive Energy | double | RO | 03H | VArh | |
| 8224 | T3 3Q Reactive Energy | double | RO | 03H | VArh | |
| 8228 | T3 Phase 13Q Reactive Energy | double | RO | 03H | VArh | |
| 8232 | T3 Phase 23Q Reactive Energy | double | RO | 03H | VArh | |
| 8236 | T3 Phase 33Q Reactive Energy | double | RO | 03H | VArh | |
| 8240 | T3 4Q Reactive Energy | double | RO | 03H | VArh | |
| 8244 | T3 Phase 14Q Reactive Energy | double | RO | 03H | VArh | |
| 8248 | T3 Phase 24Q Reactive Energy | double | RO | 03H | VArh | |
| 8252 | T3 Phase 34Q Reactive Energy | double | RO | 03H | VArh | |

Predefined Energy Data

| Address | Parameter | Data Type | W/R | Function | Description | Default |
|---------|------------------------------|-----------|-----|----------|-------------|---------|
| 60000 | Total Import Active Energy | double | RO | 03H | W | |
| 60004 | Total Export Active Energy | double | RO | 03H | VArh | |
| 60008 | Total Import Reactive Energy | double | RO | 03H | W | |
| 60012 | Total Export Reactive Energy | double | RO | 03H | VArh | |

Configuration Activation

| Address | Parameter | Data Type | W/R | Function | Description | Default |
|---------|-----------------|-----------|-----|----------|-------------|---------|
| 15000 | Device Password | uint32_t | W | 10H | 1 - 999999 | 1 |

Serial Communication Settings

| Address | Parameter | Data Type | W/R | Function | Description | Default |
|---------|-----------|-----------|-----|----------|--|---------|
| 10000 | Slave ID | uint32_t | R/W | 03H/10H | 1 - 247 | 1 |
| 10002 | Baudrate | uint32_t | R/W | 03H/10H | 0 - 1200 1 - 2400 2 - 4800 3 - 9600 4 - 19200 5 - 38400 6 - 57600 | 5 |
| 10004 | Parity | uint32_t | R/W | 03H/10H | 0 - NONE 1 - ODD 2 - EVEN | 0 |
| 10006 | Stop Bit | uint32_t | R/W | 03H/10H | 0 - STOP 1 1 - STOP 2 | 0 |
| 10008 | Endiannes | uint32_t | R/W | 03H/10H | 0 - Big Endian 1 - Little Endian 2 - Big Endian Byte Swap 3 - Little Endian Byte Swap | 0 |

| Pulse 1 Output Settings | | | | | | |
|-------------------------|--------------------|-----------|-----|----------|--|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10100 | Pulse 1 Source | uint32_t | R/W | 03H/10H | 0 - Import Active 1 - Export Active 2 - Import Reactive 3 - Export Reactive | 0 |
| 10102 | Pulse 1 Mode | uint32_t | R/W | 03H/10H | 0 - ENERGY 1 - ALARM | 0 |
| 10104 | Pulse 1 Energy | uint32_t | R/W | 03H/10H | 1 - 9(Wh/Varh) | 1 |
| 10106 | Pulse 1 Multiplier | uint32_t | R/W | 03H/10H | 0 - x 0,001 1 - x 0,01 2 - x 0,1 3 - x 1 4 - x 10 5 - x 100 6 - x 1000 | 3 |
| 10108 | Pulse 1 Duration | uint32_t | R/W | 03H/10H | 30-2500(mSec) | 50 |

| Pulse 2 Output Settings | | | | | | |
|-------------------------|--------------------|-----------|-----|----------|--|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10200 | Pulse 2 Source | uint32_t | R/W | 03H/10H | 0 - Import Active 1 - Export Active 2 - Import Reactive 3 - Export Reactive | 2 |
| 10102 | Pulse 2 Mode | uint32_t | R/W | 03H/10H | 0 - ENERGY 1 - ALARM | 0 |
| 10204 | Pulse 2 Energy | uint32_t | R/W | 03H/10H | 1 - 9(Wh/Varh) | 1 |
| 10206 | Pulse 2 Multiplier | uint32_t | R/W | 03H/10H | 0 - x 0,001 1 - x 0,01 2 - x 0,1 3 - x 1 4 - x 10 5 - x 100 6 - x 1000 | 3 |
| 10208 | Pulse 2 Duration | uint32_t | R/W | 03H/10H | 30-2500(mSec) | 50 |

| Digital Input Settings | | | | | | |
|------------------------|----------------|-----------|-----|----------|---------------------------------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10300 | Input 1 Source | uint32_t | R/W | 03H/10H | 0 - Counter 1 - Tariff | 0 |
| 10302 | Input 1 Delay | uint32_t | R/W | 03H/10H | 100-2000(msec) | 200 |
| 10304 | Input 1 Edge | uint32_t | R/W | 03H/10H | 0 - Rising 1 - Falling 2 - Both | 0 |
| 10306 | Input 2 Source | uint32_t | R/W | 03H/10H | 0 - Counter 1 - Tariff | 0 |
| 10308 | Input 2 Delay | uint32_t | R/W | 03H/10H | 100-2000(msec) | 200 |
| 10310 | Input 2 Edge | uint32_t | R/W | 03H/10H | 0 - Rising 1 - Falling 2 - Both | 0 |

| Network Settings | | | | | | |
|------------------|------------------|-----------|-----|----------|--------------------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10400 | CT Primary | float | R/W | 03H/10H | 5-9999(A) | 5 |
| 10402 | CT Secondary | uint32_t | R/W | 03H/10H | 0 - CT / 5 1 - CT / 1 | 1 |
| 10404 | VT Primary | float | R/W | 03H/10H | 100-1000000(V) | 230 |
| 10406 | VT Sekonder | float | R/W | 03H/10H | 100-500(100-500(V)) | 230 |
| 10410 | System Frequency | uint32_t | R/W | 03H/10H | 0 - 50Hz 1 - 60Hz | 0 |
| 10412 | Connection Type | uint32_t | R/W | 03H/10H | 0 - 3P4W 1 - 3P3W | 0 |
| 10414 | Trans. Option | uint32_t | R/W | 03H/10H | 0 - Without Ratio | 1 |

| Demand Settings | | | | | | |
|-----------------|---------------|-----------|-----|----------|---|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10500 | Demand Method | uint32_t | R/W | 03H/10H | 0 - Fixed 1 - Sliding 2 - Rolling | 1 |
| 10502 | Demand Period | uint32_t | R/W | 03H/10H | 1-60(Minute) | 15 |
| 10504 | Sub Interval | uint32_t | R/W | 03H/10H | 1-60(Minute) | 1 |

| Voltage Alarm Settings | | | | | | |
|------------------------|--------------------------|-----------|-----|----------|-------------------------------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10700 | Voltage Low Limit | float | R/W | 03H/10H | 1-500(V) | 0 |
| 10702 | Voltage High Limit | float | R/W | 03H/10H | 1-500(V) | 0 |
| 10704 | Voltage Alarm Delay | uint32_t | R/W | 03H/10H | 1-600(Second) | 10 |
| 10706 | Voltage Alarm Hysteresis | float | R/W | 03H/10H | 0-20(%) | 0 |
| 10708 | Voltage Alarm Output | uint32_t | R/W | 03H/10H | 0 - Off 1 - Pals 1 2 - Pals 2 | 0 |

| Current Alarm Settings | | | | | | |
|------------------------|--------------------------|-----------|-----|----------|--|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10710 | Current Low Limit | float | R/W | 03H/10H | 0.00-6.00(A)(CT) 0.00-100.00(A)(100A) | 0.00 |
| 10712 | Current High Limit | float | R/W | 03H/10H | 0.00-6.00(A)(CT) 0.100-100.00(100A) | 0.00 |
| 10714 | Current Alarm Delay | uint32_t | R/W | 03H/10H | 1-600(Second) | 10 |
| 10716 | Current Alarm Hysteresis | float | R/W | 03H/10H | 0-20(%) | 0 |
| 10718 | Current Alarm Output | uint32_t | R/W | 03H/10H | 0 - Off 1 - Pals 1 2 - Pals 2 | 0 |

| Active Power Alarm Settings | | | | | | |
|-----------------------------|-------------------------------|-----------|-----|----------|-------------------------------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10720 | Active Power Low Limit | float | R/W | 03H/10H | 0-1800(W)(CT) 0-30000(100A) | 0 |
| 10722 | Active Power High Limit | float | R/W | 03H/10H | 0-1800(W)(CT) 0-30000(100A) | 0 |
| 10724 | Active Power Alarm Delay | uint32_t | R/W | 03H/10H | 1-600(Second) | 10 |
| 10726 | Active Power Alarm Hysteresis | float | R/W | 03H/10H | 0-20(%) | 0 |
| 10728 | Active Power Alarm Output | uint32_t | R/W | 03H/10H | 0 - Off 1 - Pals 1 2 - Pals 2 | 0 |

| Reactive Power Alarm Settings | | | | | | |
|-------------------------------|---------------------------------|-----------|-----|----------|----------------------------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10730 | Reactive Power Low Limit | float | R/W | 03H/10H | 0-3000(VAr)(CT) 0-30000(100A) | 0 |
| 10732 | Reactive Power High Limit | float | R/W | 03H/10H | 0-3000(VAr)(CT) 0-30000(100A) | 0 |
| 10734 | Reactive Power Alarm Delay | uint32_t | R/W | 03H/10H | 1-600(Second) | 5 |
| 10736 | Reactive Power Alarm Hysteresis | float | R/W | 03H/10H | 0-20(%) | 5 |
| 10738 | Reactive Power Alarm Output | uint32_t | R/W | 03H/10H | 0 - Off 1- Pulse 2- Pulse | 0 |

| Apparent Power Alarm Settings | | | | | | |
|-------------------------------|---------------------------------|-----------|-----|----------|---------------------------------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10740 | Apparent Power Low Limit | float | R/W | 03H/10H | 0-3000(VA)(CT) 0-30000(100A) | 0 |
| 10742 | Apparent Power High Limit | float | R/W | 03H/10H | 0-3000(VA)(CT) 0-30000(100A) | 0 |
| 10744 | Apparent Power Alarm Delay | uint32_t | R/W | 03H/10H | 1-600(Second) | 5 |
| 10746 | Apparent Power Alarm Hysteresis | float | R/W | 03H/10H | 0-20(%) | 5 |
| 10748 | Apparent Power Alarm Output | uint32_t | R/W | 03H/10H | 0 - Off 1 - Pulse 1 2 - Pulse 2 | 0 |

| Power Factor Alarm Settings | | | | | | |
|-----------------------------|-------------------------------|-----------|-----|----------|-------------------------------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10750 | Power Factor Low Limit | float | R/W | 03H/10H | 0.00-1.00 | 0.00 |
| 10752 | Power Factor High Limit | float | R/W | 03H/10H | 0.00-1.00 | 0.00 |
| 10754 | Power Factor Alarm Delay | uint32_t | R/W | 03H/10H | 1-600(Second) | 10 |
| 10756 | Power Factor Alarm Hysteresis | float | R/W | 03H/10H | 0-20(%) | 0 |
| 10758 | Power Factor Alarm Output | uint32_t | R/W | 03H/10H | 0 - Off 1 - Pals 1 2 - Pals 2 | 0 |

| Frequency Alarm Settings | | | | | | |
|--------------------------|----------------------------|-----------|-----|----------|-------------------------------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 10760 | Frequency Low Limit | float | R/W | 03H/10H | 45.0-65.0(Hz) | 50.0 |
| 10762 | Frequency High Limit | float | R/W | 03H/10H | 45.0-65.0(Hz) | 50.0 |
| 10764 | Frequency Alarm Delay | uint32_t | R/W | 03H/10H | 1-600(Second) | 10 |
| 10766 | Frequency Alarm Hysteresis | float | R/W | 03H/10H | 0-20(%) | 0 |
| 10768 | Frequency Alarm Output | uint32_t | R/W | 03H/10H | 0 - Off 1 - Pals 1 2 - Pals 2 | 0 |

| Energy Data (Predefine) | | | | | | |
|-------------------------|------------------------------|-----------|-----|----------|-------------|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 50000 | Total Import Active Energy | double | RO | 03H/10H | W | 0 |
| 50004 | Total Export Active Energy | double | RO | 03H/10H | VArh | 0 |
| 50008 | Total Import Reactive Energy | double | RO | 03H/10H | W | 0 |
| 50012 | Total Export Reactive Energy | double | RO | 03H/10H | VArh | 0 |

| Device Flags | | | | | | |
|--------------|---------------------|-----------|-----|----------|--|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 45000 | Error Flags | uint32_t | R | 10H | 0x00000001 - Pulse 1 Error 0x00000002 - Pulse 2 Error 0x00000004 - Rotation Error 0x00000008 - Current Error | |
| 45100 | Alarm Flags | uint32_t | R | 10H | 0x00000001 - V Min Alarm 0x00000002 - I Min Alarm 0x00000004 - P Min Alarm 0x00000008 - Q Min Alarm 0x00000010 - S Min Alarm 0x00000020 - PF Min Alarm 0x00000040 - F Min Alarm 0x00010000 - V Max Alarm 0x00020000 - I Max Alarm 0x00040000 - P Max Alarm 0x00080000 - Q Max Alarm 0x00100000 - S Max Alarm 0x00200000 - PF Max Alarm 0x00400000 - F Max Alarm | |
| 30000 | Digital Input Flags | uint32_t | R | 10H | 0x00000001 - Input 1 0x00000002 - Input 2 | |

| Command List | | | | | | |
|--------------|------------------|-----------|-----|----------|---|---------|
| Address | Parameter | Data Type | W/R | Function | Description | Default |
| 31000 | General Commands | uint16_t | W | 06H | 1000-Save Config 1100-Return To Default 1200-Restart 1300-Clear Demand 1400-Clear Min/Max 1500-Clear Energy 1600-Clear Input Counter 1700-Activate Tariff 1 1800-Activate Tariff 2 1900-Activate Tariff 3 2000-Clear Run Hour | |

EMD 4

PART 5
FACTORY DEFAULT
SETTINGS

| Network Settings (Devices with CT Connection) | | | |
|---|-----------------|------|----------------------|
| Parameter | Factory Default | Unit | Setting Range |
| CT Primary | 5 | - | 5-9999 |
| CT Secondary | 5 | - | 1/5 |
| VT Primary | 230 | - | 100-1000000 |
| VT Secondary | 230 | - | 100-500 |
| System Frequency | 50 | Hz | 50/60 |
| Connection Type | 3P4W | - | 3P4W / 3P3W |
| Trans. Option | With Ratio | - | With / Without Ratio |

 There is no "Network Settings" for direct connected devices. Only "3P4W" connection type is supported.

| Communication Settings | | | |
|------------------------|-----------------|------|--|
| Parameter | Factory Default | Unit | Setting Range |
| Slave ID | 1 | - | 1-247 |
| Baudrate | 38400 | - | 1200 / 4800 / 9600 / 19200 / 38400 / 57600 |
| Parite | Yok | - | None / Odd / Even |
| Stop Bit | 1 | - | 1-2 |
| Veri Tipi | BE | - | BE / LE / BE SWAP / LE SWAP |

| Digital Input Settings | | | |
|------------------------|-----------------|------|-------------------------|
| Parameter | Factory Default | Unit | Setting Range |
| Digital Input 1 | | | |
| Source | Counter | - | Tariff / Input Counter |
| Delay | 200 | msec | 100-2000 |
| Edge | Both | - | Rising / Falling / Both |
| Digital Input 2 | | | |
| Source | Counter | - | Tariff / Input Counter |
| Delay | 200 | msec | 100-2000 |
| Edge | Both | - | Rising / Falling / Both |

| Pulse Output Settings | | | |
|-----------------------|-----------------------|------|---|
| Parameter | Factory Default | Unit | Setting Range |
| Pulse Output 1 | | | |
| Source | Import Active Energy | - | I. Active / I. Reactive / E. Active / E. Reactive |
| Mode | Energy | - | Energy / Alarm |
| Value | 2 | - | 01-09 |
| Multiplier | 1 | - | 1 10 (MUL10) 100 (MUL100) 1000 (MUL1000) 1/1000 (DIV1000) 1/100 (DIV100) 1/10 (DIV10) |
| Duration | 50 | msec | 30-2500 |
| Pulse Output 2 | | | |
| Source | Import Reaktif Enerji | - | I. Active / I. Reactive / E. Active / E. Reactive |
| Mode | Energy | - | Energy / Alarm |
| Value | 2 | - | 01-09 |
| Multiplier | 1 | - | 1 10 (MUL10) 100 (MUL100) 1000 (MUL1000) 1/1000 (DIV1000) 1/100 (DIV100) 1/10 (DIV10) |
| Duration | 50 | msec | 30-2500 |

EMD 4

PART 6
TECHNICAL
SPECIFICATIONS

| Technical Specifications | |
|--|---------------------------|
| Supply | |
| Voltage | 85..300V AC/DC |
| Frequency | 45..65 Hz |
| Measurement Inputs | |
| Voltage | 1..300V RMS (L-N) |
| Current | 0.01..6A / 0.25..100A |
| Frequency | 45..65 Hz |
| Digital Inputs (Optionally 2 pcs) | |
| Input Type | Dry Contact |
| Pulse Outputs (Optionally 2 pcs) | |
| Voltage | 5..30V DC |
| Current | 50mA |
| Insulation | 3750V RMS |
| Demand Period | |
| Demand Period | 1-60 minutes (adjustable) |
| Environmental Conditions | |
| Operating Temperature | -25°C..+70°C |
| Storage Temperature | -30°C..+80°C |
| Humidity | Max %95, no condensation |
| Dimensions | |
| Width | 72 mm |
| Height | 90 mm |
| Depth | 70 mm |
| Protection Class | |
| Front | IP54 |
| Back | IP20 |
| Power Consumption | |
| Power Consumption | <3VA |

| Connection Data | | | |
|---|--|---------------------|-----------|
| Connection method | | Screw connection | |
| Conductor cross section solid min. | | 1,5 mm ² | |
| Conductor cross section solid max. | | 35 mm ² | |
| Conductor cross section AWG/kcmil min. | | 16 AWG | |
| Conductor cross section AWG/kcmil max. | | 2 AWG | |
| Conductor cross section stranded min. | | 1,5 mm ² | |
| Conductor cross section stranded max. | | 35 mm ² | |
| Conductor cross section stranded sleeve min. | | 1,5 mm ² | |
| Conductor cross section stranded sleeve max. | | 25 mm ² | |
| 2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min. | | 1,5 mm ² | |
| 2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max. | | 10 mm ² | |
| Minimum stripping length | | 12 mm | |
| Maximum stripping length | | 14 mm | |
| Internal cylindrical gage | | B8 | |
| Tightening torque, min | | 2,0 Nm | |
| Tightening torque max | | 3,0 Nm | |
| Screwdriver | | | |
| | | IKT5(1,0x5,5) | 561050 10 |

| Measurement Accuracy | | | | |
|----------------------|-----------------------------------|---|--|-------------------------------------|
| Symbol | Measurement Type | Performance Class According to IEC 61557-12 | Measuring Range | Other Complementary Characteristics |
| P | Total Active Power | 0,5 | 1 % $I_n \leq I \leq I_{max}$ 0,5 Ind to 0,8 Cap | |
| Q | Total Reactive Power | 1 | 2 % $I_n \leq I \leq I_{max}$ 0,25 Ind to 0,25 Cap | |
| S | Total Apparent Power | 1 | 2% $I_n \leq I \leq I_{max}$ | |
| EA | Total Active Energy | 0,5 | 0 to 9999 MWh | IEC 62053-22 Class 1 |
| ER | Total Reactive Energy | 1 | 0 to 9999 MVarh | IEC 62053-23 Class 2 |
| f | Frequency | 0,2 | 45 - 65 Hz | |
| I | Phase Current | 0,5 | 10 % $I_n \leq I \leq I_{max}$ | |
| IN | Neutral Current (Calculated) | 0,5 | 10 % $I_n \leq I \leq I_{max}$ | |
| U | Voltage | 0,5 | $U_{min} \leq U \leq U_{max}$ | |
| PF | Power Factor | 0,2 | 0,5 Ind to 0,8 Cap | |
| THDV | Total Harmonic Distortion Voltage | 1 | 0 % to 20 % | |
| THDI | Total Harmonic Distortion Current | 1 | 0 % to 100 % | |

Klemsan



Yurtiçi ve yurtdışı tüm şubeler için QR kodu okutunuz.

MERKEZ - FABRİKA

Kızılözüm Caddesi No:15
35700 Kemalpaşa - İzmir

T: +90 232 877 08 00
F: +90 232 877 08 06

info@klemsan.com.tr
www.klemsan.com.tr

Revizyon No: 09122024