Klemsan



KLEA-6

Energy Analyzer

User Manual

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CHAPTER 1

GENERAL INFORMATION

CHAPTER 1 GENERAL INFORMATION

1.1 Device Specifications and Model Selection

KLEA 6 series devices are energy analyzers designed for measuring basic electrical parameters in 3-phase systems. They feature a 3.5" color (TFT) screen and have dimensions of 96 x 96 x 45 mm.

- RS485 (Modbus RTU) or Ethernet (Modbus TCP) Interfaces
- Modular I/O Structure
- Gateway Function
- 3 Tariffs
- Digital Input/Output
- Alarm Relay Output
- THDV, THDI
- Current and voltage odd harmonics up to the 51st
- 255 alarm records and 255 event records
- Sag & Swell Measurement
- Class 0.2 measurement accuracy
- Up to 16MB internal memory
- 2 different recording methods (Detailed explanation of the methods is given in the relevant section.)

1.2 Proper Use and Safety Requirements

- Installation and connections must be performed by authorized personnel in accordance with the instructions in the user manual. The device should not be operated without proper connection.
- Before connecting the device to the mains, ensure that the power is disconnected.
- Do not disconnect the current transformer connections of the device without short-circuiting the k-l terminals of the current transformer elsewhere. Otherwise, dangerously high voltages will occur at the secondary terminals of the current transformer.
- Use a dry cloth to clean/dust the device. Do not use alcohol, thinner, or abrasive substances.
- The device should only be put into operation after all connections have been made.
- Do not open the device. There are no user-serviceable parts inside.
- The device should be kept away from humid, wet, vibrating, and dusty environments.
- It is recommended to connect a circuit breaker or automatic fuse (2A) between the voltage inputs of the device and the mains.



The manufacturer is not responsible for any undesirable consequences arising from failure to observe the above measures.

1.3 Product Specifications Table

Order Number			606710	606711	606714
Product Name			KLEA-606R	KLEA-606RE	KLEA-616RE
Supply			85-300VAC/DC	85-300VAC/DC	85-300VAC/DC
Dimensions			96x96x45mm	96x96x45mm	96x96x45mm
Current Connection	CT5 CT1		x	x	x
Mounting Type			Panel	Panel	Panel
Terminals			3P4W-3P3W	3P4W-3P3W	3P4W-3P3W
MEASUREMENT	CLASS (IEC 61557-12)		0.2	0.2	0.2
	Power	Active Power	x	x	x
		Reactive Power	x	x	x
		Apparent Power	x	x	x
	Electrical values	Current	x	x	x
		Voltage	x	x	x
		Frequency	x	x	x
	Quality parameters	THDV-THDI	x	x	x
		True Power Factor (pF)	x	x	x
		Displacement Power Factor (cos phi)	x	x	x
	Demand		x	x	x
	Max/Min		x	x	x
Phase-to-phase voltage imbalance			x	x	x
Phase Sequence, Phase Loss			x	x	x
Screen			TFT	TFT	TFT
Counter		Run Hour	x	x	x
		On Hour	x	x	x
		Power Interruption	x	x	x
Alarm		Alarm	x	x	x
Alarm Output			2RO	2RO	2RO
Communication		RS485 (Modbus RTU)	x	x	x
		Ethernet (Modbus TCP)	-	x	x
Gateway Feature			-	-	x
Digital Input			x	x	x
Digital Output			x	x	x
4Q Energy Monitoring			x	x	x
4Q Reactive Energy Monitoring			x	x	x
Number of Main Tariffs			3	3	3
Number of Sub-Tariffs			4	4	4
Number of Harmonics			51	51	51
Protection Class			IP54	IP54	IP54
Sag & Swell			x	x	x

Figure/Table 1 KLEA 6 Models and Specifications

1.4 UI Design

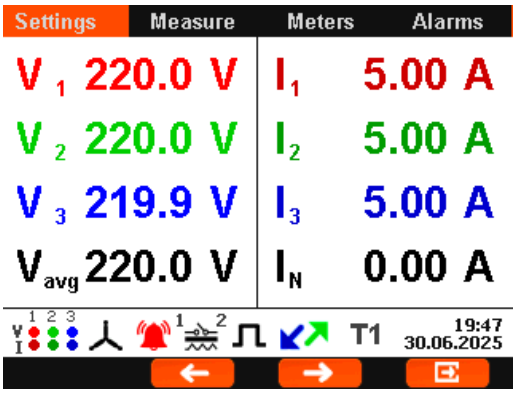


Figure 2 Main Screen Image

The device's default main screen is shown in "Figure 2 Main Screen Image".

By default, the device's main screen displays the currently measured voltage and current values. The user can change the parameters displayed on the main screen via communication.

The buttons at the bottom of the page allow navigation through the menu.



Figure 3 Icons

The icons located just above the keypad inform the user about the device's status. The icons shown in "Figure 3 Icons" are, respectively:

1) The icon indicates whether or not there are phase measurements. For example, the absence of point V1 means that there is no voltage measurement for phase 1.
2) The relevant icon shows the system connection type. In Figure 3, the system has a 3P4W (3-phase 4-wire) connection type.
3) The relevant icon shows the alarm status. When the relevant icon is active, it indicates that the device is in an alarm state.
4) It indicates the relay that is active in the alarm state.
5) The relevant icon indicates whether or not pulse settings have been made. If any pulse output has been set, the relevant icon will be visible on the screen.
6) The relevant icons are used to show communication traffic. The blue arrow indicates data reception, while the green arrow indicates data transmission.
7) The active tariff is displayed.

The keypads vary depending on the menu. Keypad descriptions are as follows:

→ Used for confirmation.

→ Used for cancellation.

→ Used to go back.

→ Used for movement to the right.

→ Used for movement to the left.

→ Used for downward movement.

→ Used for upward movement.

→ Used to enter the selected menu.

→ Used to make changes.

1.5 4-Quadrant Representations

The angle (Ø) difference between voltage and current gives us information about the direction of energy flow. A positive active/reactive power indicates that it is being consumed, while a negative active/reactive power indicates that it is being produced.

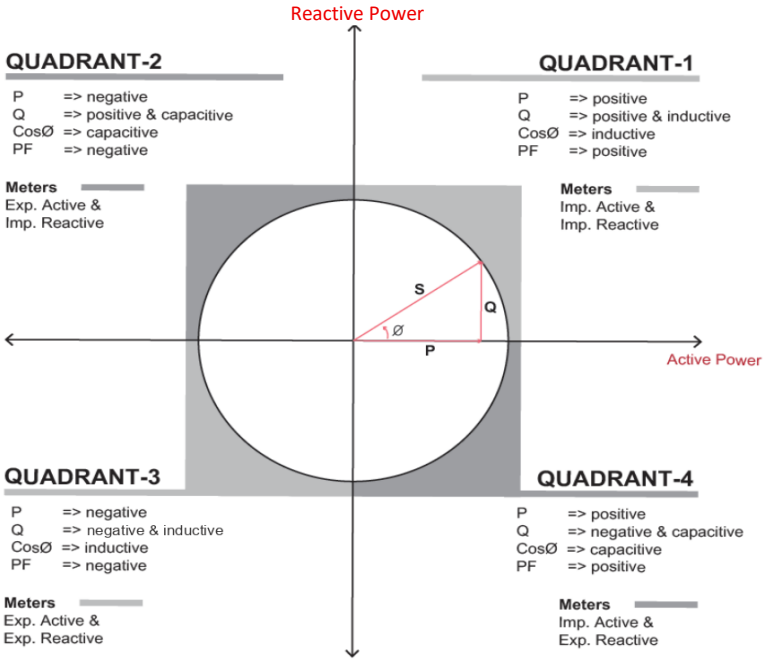


Figure 4 4-Quadrant Representations

The quadrant in which the device is measuring can be determined by looking at the signs of P and Q.

Example:

- P= +10 kW, Q = +5 kVAr → Quadrant 1
- P= -10 kW, Q = +5 kVAr → Quadrant 2
- P= -10 kW, Q = -5 kVAr → Quadrant 3
- P= +10 kW, Q = -5 kVAr → Quadrant 4

CHAPTER 2

INSTALLATION

CHAPTER 2 INSTALLATION

2.1 Installation Preparation

The purchased product may not include all the hardware options listed in the user manual. This is not a concern for electrical installation.

Product installation and connections must be performed by authorized personnel in accordance with the instructions in the user manual.

The device must not be operated unless the connections have been made correctly.

2.2 Placement on Panel

The device is placed vertically into the empty slot on the control panel where it will be used.

After the device is placed in the panel, the clamping bracket is attached and the device is secured to the panel by pushing the bracket towards the panel.

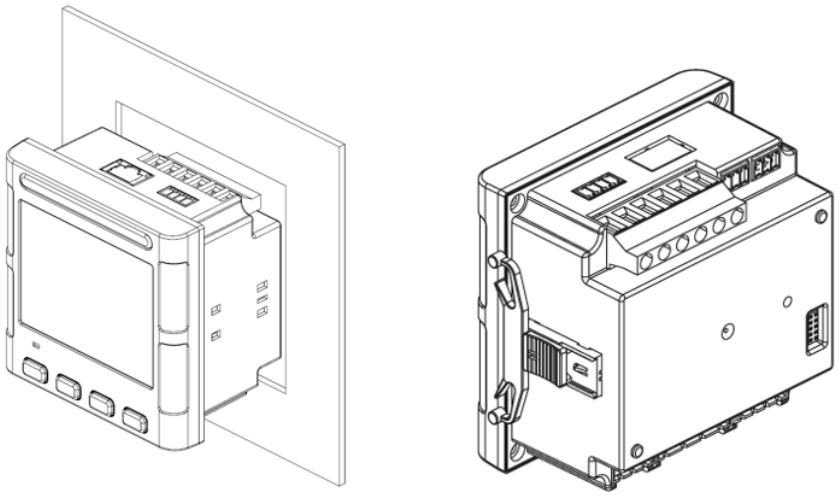


Figure 5 Panel Mounting

Ensure the power is disconnected before connecting the voltage and current terminals to the device.

Do not disconnect the current transformer connections of the device without first short-circuiting the k-l terminals of the current transformer elsewhere or connecting a load with sufficiently low impedance to the k-l terminals. Otherwise, dangerously high voltages may occur at the secondary terminals of the current transformer. The same applies to commissioning.

2.3 Connection Diagrams

2.3.1 3-Phase 4-Wire Connection (3P4W)

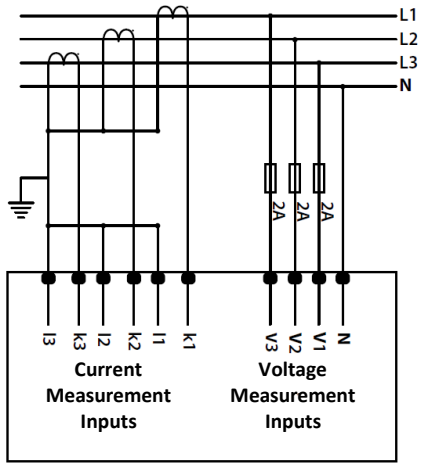


Figure 6 3-Phase 4-Wire Connection (3P4W)

2.3.2 3-Phase 3-Wire Connection (3P3W)

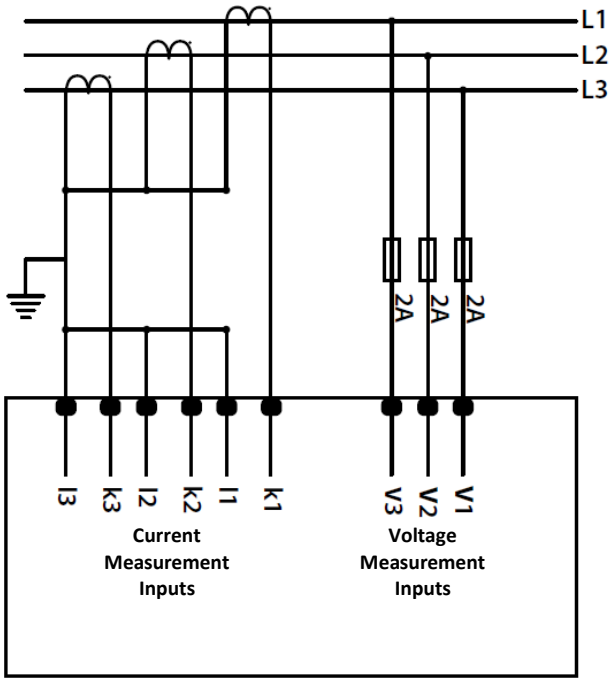


Figure 7 3-Phase 3-Wire Connection (3P3W)

2.3.3 Digital Output Connection

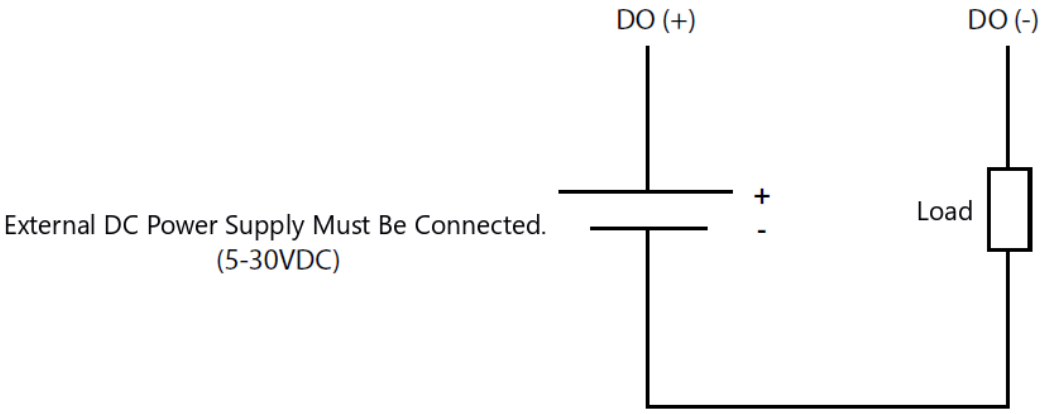


Figure 8 Digital Output Connection

2.4 Dimensions

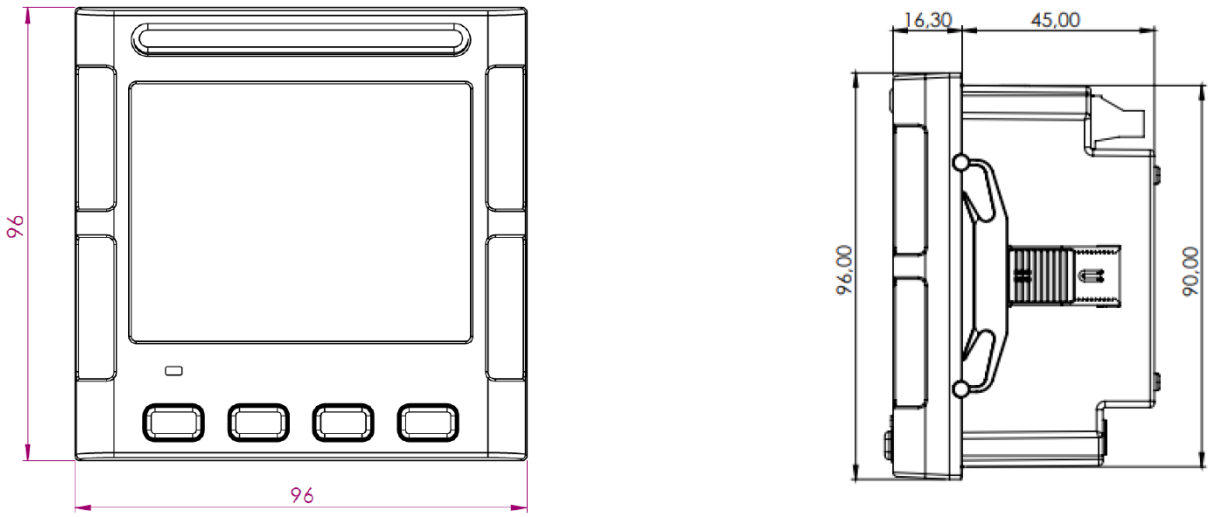


Figure 9 View and Dimensions

CHAPTER 3

MENUS

CHAPTER 3 MENUS

3.1 Initial Setup Settings

When the device is first powered on, it starts with the initial setup screens. The initial setup begins with the "Device Settings" menu and continues through the "Network," "Communication," and "Recording Method" settings screens. After the initial settings are completed, the device will boot up on the main screen and be fully activated.

3.1.1 Device Settings

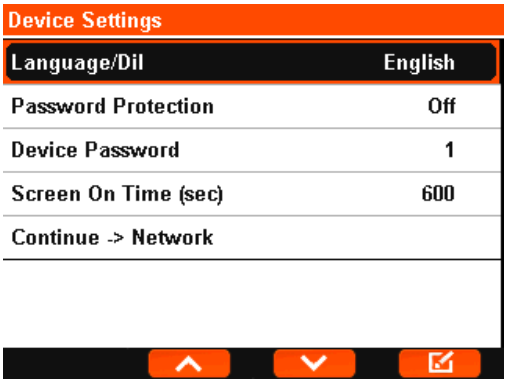


Figure 10 Initial Setup Screen of the Device -1

Under this menu, you can adjust the language, password protection, device password, and screen-on time settings.

- **Language:** Turkish and English language support is available.
- **Password Protection & Device Password:** Password protection activation and password setting for the device are done under this tab.
- **Screen On Time (seconds):** This section determines how many seconds after no button is pressed the screen will turn off.

After making the relevant settings, network settings can be configured by clicking on the "Continue → Network" tab.

3.1.2 Network Settings

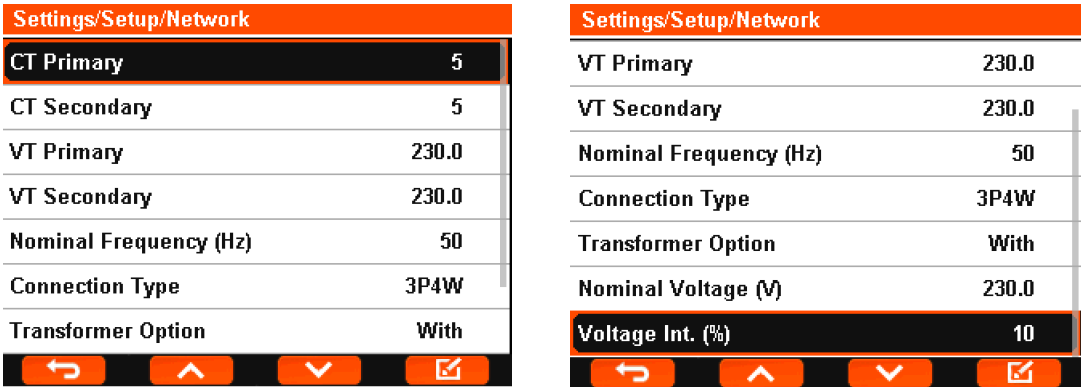


Figure 11 Initial Setup Screen of the Device -2

Under the relevant menu, settings for the network to which the device will be connected are made.

CT Primary: This section is 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: This section is where the secondary value of the current transformers connected to the current inputs is entered. A value of 1 or 5 can be entered.

Current values measured from the current inputs are multiplied by the ratio of the CT Primary and CT Secondary values and displayed on the indicators and Modbus addresses.

VT Primary: This section specifies the primary value of the transformers connected to the voltage inputs. A value between 1.0 and 999999.0 can be entered.

VT Secondary: This section specifies the secondary value of the transformers connected to the voltage inputs. A value between 1.0 and 500.0 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 displayed on the indicators and Modbus addresses.

Nominal Voltage and Frequency: The nominal voltage and frequency of the network (mains) to which the device will be connected are entered under this menu.

Connection Type: The type of connection to be made is selected here. 3-phase 4-wire (3P4W) or 3-phase 3-wire (3P3W) connection types are supported.

Transformer Option: The inclusion of CT and VT ratios in the increase of the index values in the device is determined in this tab.

For example, let the CT ratio, VT ratio, current, and voltage values be as follows.

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

When the transformer option is set to "1", the index increase for phase 1 after one hour will be:

230 x 100 = 23000 (23 kWh).

When the transformer option is set to "0", the index increase after one hour for phase 1 will be:

230 x 1 = 230 Wh.

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

After making the relevant settings, communication settings can be configured by clicking on the "Continue → Communication" tab.

3.1.3 Communication Screen

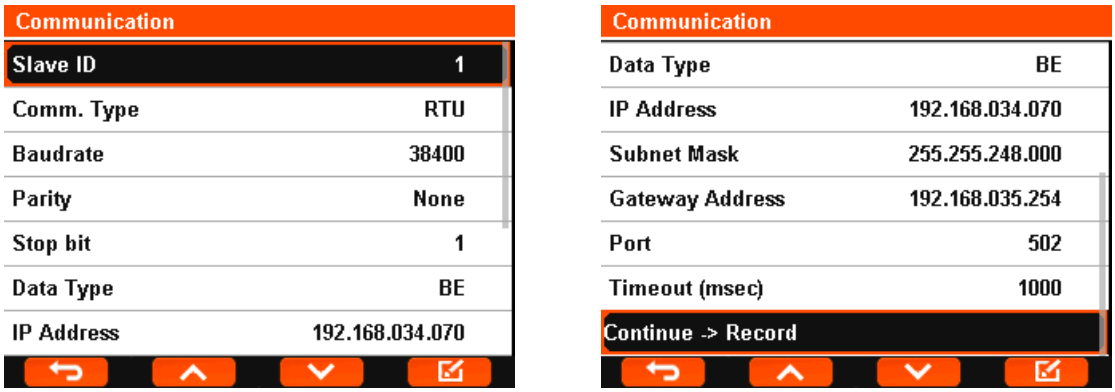


Figure 12 Initial Setup Screen of the Device -3

- Slave ID
  - It can be adjusted between 1 and 247.
- Communication Type
  - Modbus RTU (RTU) or Modbus TCP (TCP) options are supported.
- Baudrate
  - Speeds between 1200 and 57600 are supported.
    - 1200 / 2400 / 4800 / 9600 / 19200/ 38400 / 57600
- Parity
  - Odd parity, even parity, and no parity options are supported.
- Stop Bit
  - Stop bit 1 and Stop bit 2 are supported.
- Data Type
  - This menu is used to select the byte order of the data to be sent. The following order types are supported.
    - BE (Big Endian)
    - LE (Little Endian)
    - BE Swap (Big Endian Byte Swap)
    - LE Swap (Little Endian Byte Swap)
- IP Address
  - The IP address that the device will receive on the local network is entered here.
  - Default value: 192.168.34.70
- Subnet Mask
  - It is used to determine whether two IP addresses are on the same network.
  - Default value: 255.255.248.0
- Gateway
  - It is used for communication between different networks.
  - Default value: 192.168.35.254
- Port
  - The port information for Modbus communication is configured here.
  - Default value: 502
- Timeout (ms)
  - This is the tab where the timeout setting is configured.
  - Default value: 1000 (unit is ms)

After making the relevant settings, recording settings can be configured by clicking the "Continue → Record" tab.

3.1.4 Record

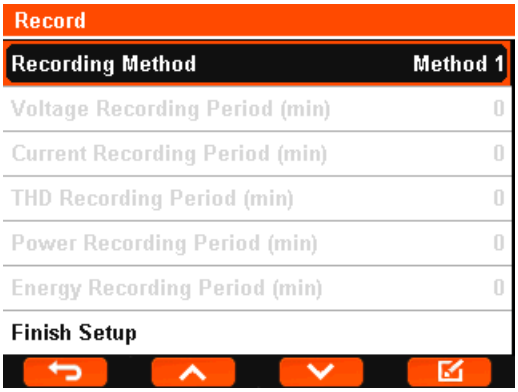


Figure 13 Initial Setup Screen of the Device -4

The user can select a recording method from the menu in the Recording Method tab. If "Method 1" is selected as the recording method, the user cannot edit any parameters belonging to Method 2. Even if a setting exists for Method 2, if "Method 1" is selected as the recording method, the previous values will still not affect Method 1.

Method 1

Parameters and recording periods are fixed. Hourly, Daily, Monthly, Minimum, Maximum, and Average recording parameters:

- Voltage (L-N) values of each phase
- Voltage (L-L) values of each phase
- Current values of each phase
- IN: Neutral current (IN)
- COS Ø values of the phases and the COS Ø value of the system
- Power factor (PF) values of the phases and total power factor (PF)
- Active power (P) values of the phases and total active power (P) value
- Reactive power (Q) values of the phases and total reactive power (Q) value
- Apparent power (S) values of the phases and total apparent power (S) value
- System frequency value
- Total Import Active Energy
- Total Export Active Energy
- Total Import Reactive Energy
- Total Export Reactive Energy

Method 2

The system records the minimum, maximum, and average values of the parameter headings listed below, within the periods specified by the user.

- Method 2 Voltage Recordings
    - Voltage (L-N) values for each phase
    - Voltage (L-L) values for each phase
- Method 2 Current Recordings

- Current values for each phase
- IN: Neutral current (IN)

- Method 2 THD Recordings
  - THDI values for each phase
  - THDV values for each phase
- Method 2 Power Recordings
  - Phase COS Ø values and the system's COS Ø value
  - Phase power factor (PF) values and total power factor (PF)
  - Phase active power (P) values and total active power (P) value
  - Phase reactive power (Q) values and total reactive power (Q) value
  - Phase apparent power (S) values and total apparent power (S) value
- Method 2 Energy Recordings
  - Total Import Active Energy
  - Total Export Active Energy
  - Total Import Reactive Energy
  - Total Export Reactive Energy
  - 4-Quadrant Measurements

After the recording settings are configured, the process continues to the setup completion screen.

3.1.5 Setup Completion Screen

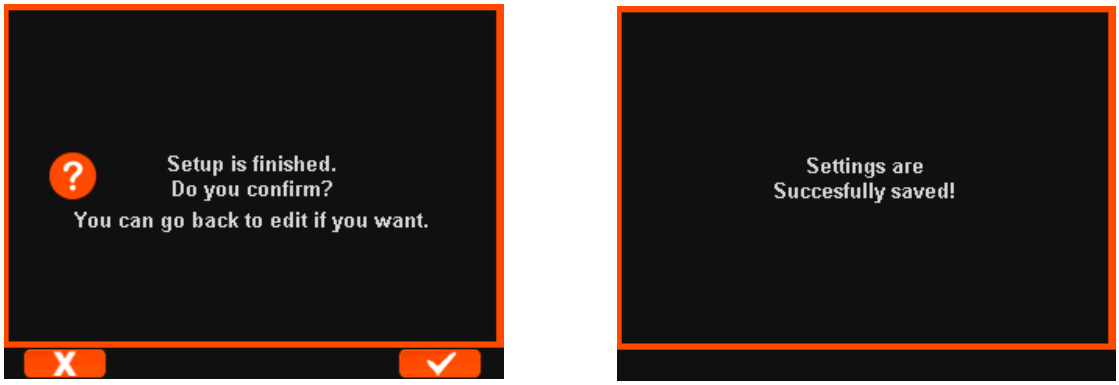


Figure 14 Setup Completion Screen

3.2 Main Screen

3.2.1 Default Main Screen

By default, the device's main screen displays the phase voltages, currents, average voltage, and neutral current.

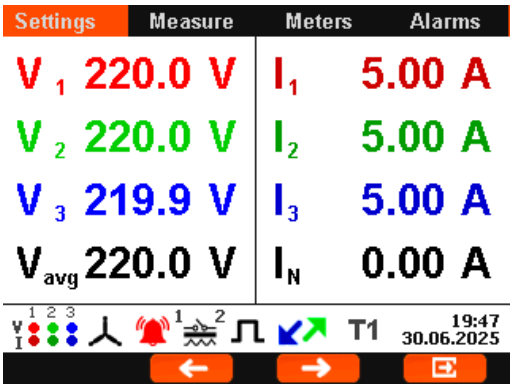


Figure 15 Main Screen

Details are given under heading 1.4 UI Design.

3.2.2 Customized Main Screen

The KLEA 6 series allows for customized main screen designs according to user needs. Customized main screen settings can be configured via Modbus. The main screen transforms into 8 data cells. The user can fix the unit of the desired parameter (Adaptive, kilo, mega, giga).

See 4.18 Customized Main Screen.

In a fixed parameter, if the selected parameter displays a value below the fixed unit, it will remain as selected; however, if the value exceeds the maximum that can be displayed in the fixed unit, the next higher unit will be used.

Example: Let's assume the unit of a power parameter is fixed as kilo (k). However, if the measured parameter is 999999.9 kW, 999.9 MW will be displayed.

Example: Let's assume the unit of a power parameter is fixed as kilo (k). However, if the measured parameter is 0W, 0.0 kW will be displayed on the screen.

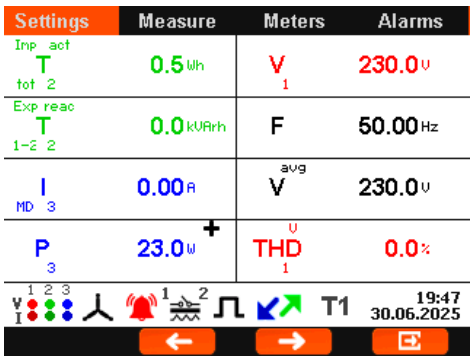


Figure 16 Customized Main Screen

3.3 Settings

The settings tab consists of menus where device setup is performed, password entries are checked, and configuration is done. To access the settings, the device password must be entered if password activation is enabled.

No intervention can be made to the device unless the password is entered.

When the password is enabled, the settings tab appears as shown below. The password must be entered to access the settings. No intervention can be made to the device unless the password is entered.

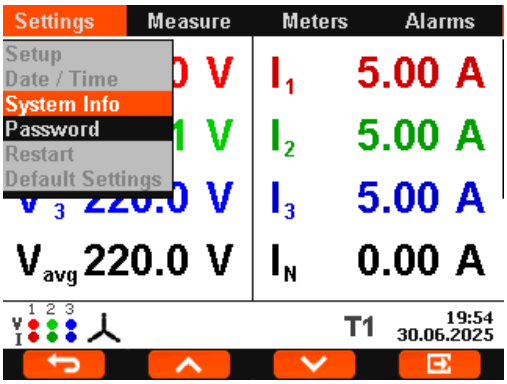


Figure 17 Password Protection On

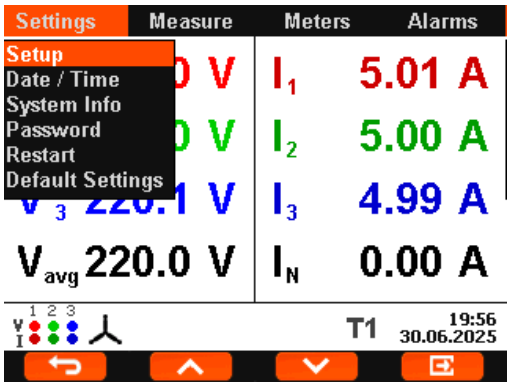


Figure 18 Password Protection Off

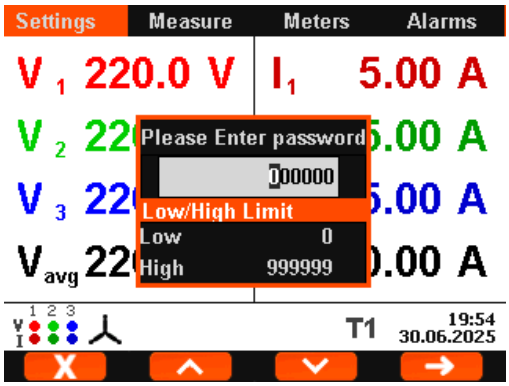


Figure 19 Password Entry Screen

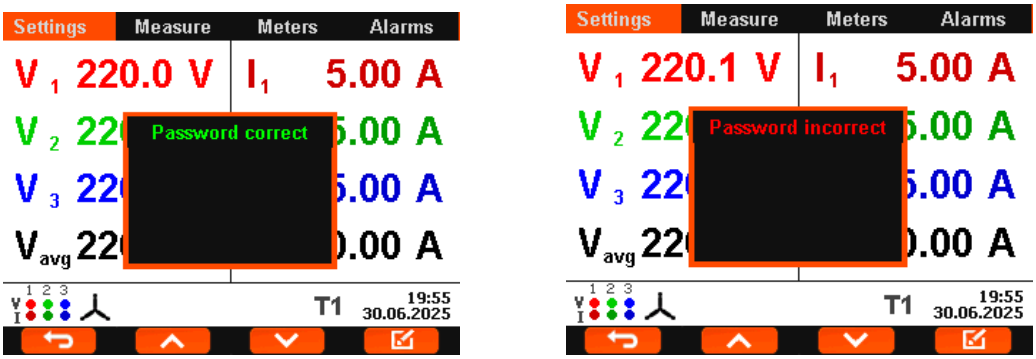


Figure 20 Password Entry

3.3.1 Setup

This menu is used to configure the device's settings.

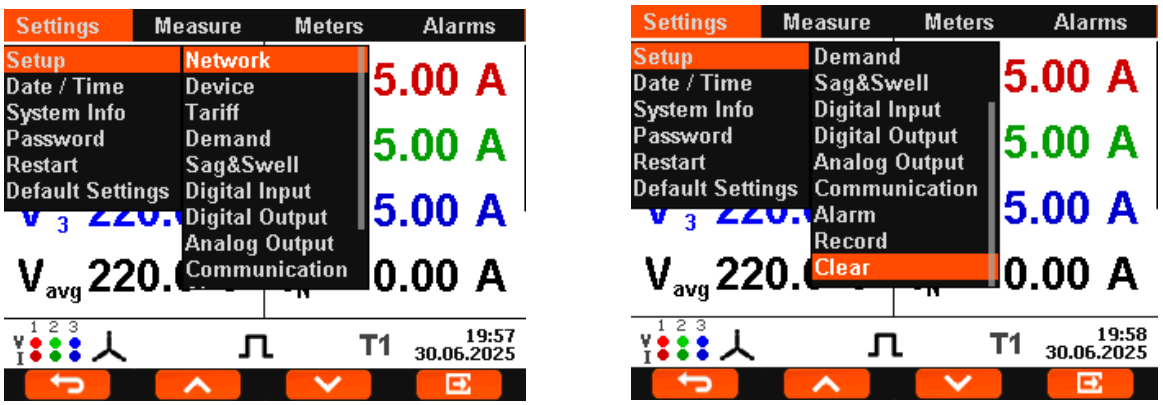


Figure 21 Setup Submenus

3.3.1.1 Network Settings

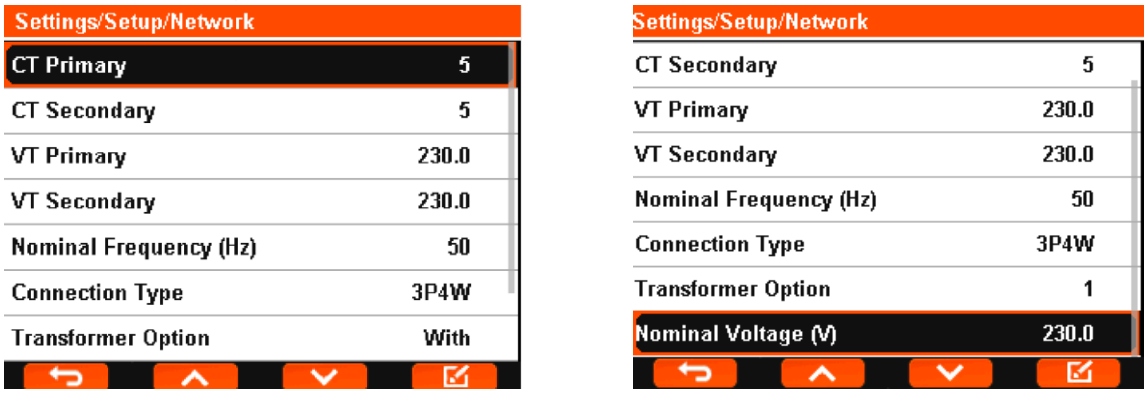


Figure 22 Network Settings-1

This menu is used to configure the settings for the network the device will be connected to. These are detailed under section 3.1.2 Network Settings.

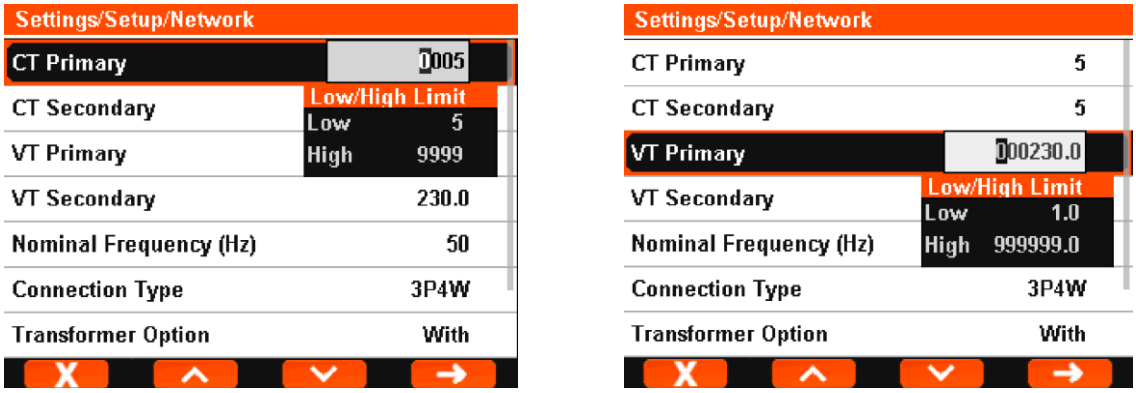


Figure 23 Network Settings-2

- On this page, the Low and High limits will appear below the parameter to be changed.
- Pressing the cancel button (X) while on the first digit will cancel the changes.
- Pressing the right arrow key while on the first digit will move to the next digit. This allows you to navigate between digits using the left and right arrow keys.
- The desired digit value can be increased or decreased using the up and down arrow keys.
- When you reach the units digit, the right arrow key will turn into a confirmation box.
- Pressing the confirmation button will save the changes made to the parameter.

- A similar screen appears for the VT Primary setting. In this case, the difference is that the user can also enter values after the decimal point. Similarly, pressing the right arrow key moves to the confirmation box.

3.3.1.2 Device Settings

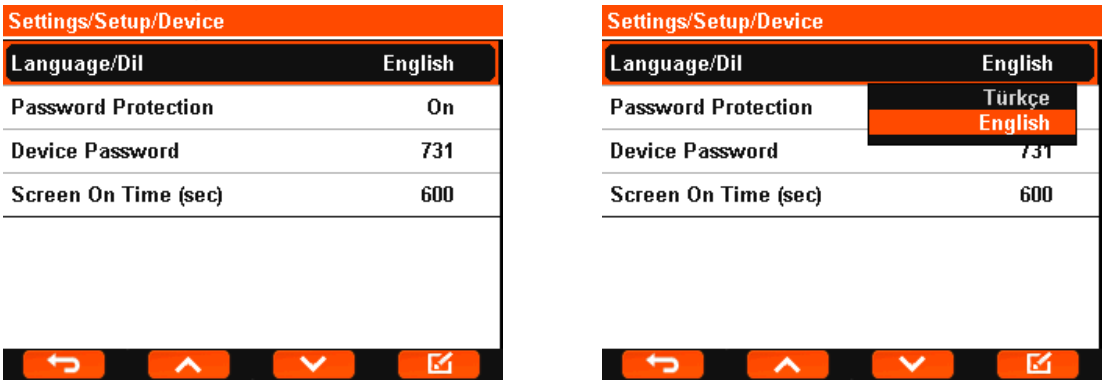


Figure 24 Device Settings

This menu allows you to configure the device's language, password protection, password, and screen time settings. These are detailed under section 3.1.1 Device Settings.

3.3.1.3 Tariff Settings

The devices optionally have 2 tariffs, T1 and T2; in addition, the T1 tariff optionally has 4 sub-tariffs: T1-1, T1-2, T1-3 and T1-4.

Sub-tariff configurations are made under this tab.

The values calculated under tariff T1 are the sum of tariffs T1-1, T1-2, T1-3, and T1-4.

- T1-1 = 10 kWh
- T1-2 = 15 kWh
- T1-3 = 20 kWh
- T1-4 = 25 kWh (assumed values).
- The value shown in the T1 tariff will then be 70 kWh.

Sub-tariff changes can be made on the devices with 10 different time-based settings. According to these 10 settings, from the start time set for a tariff, the counter of that newly set tariff becomes active.

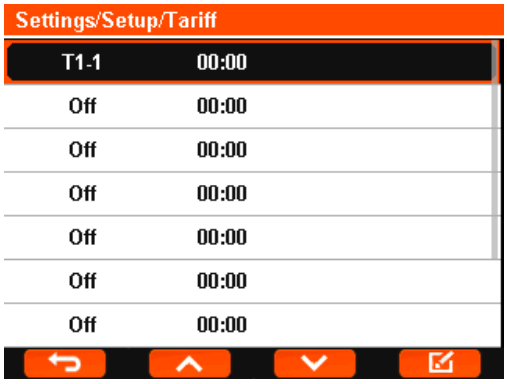


Figure 25 Tariff Settings-1

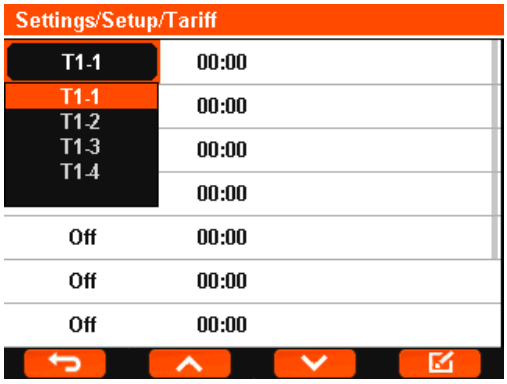


Figure 26 Tariff Settings-2

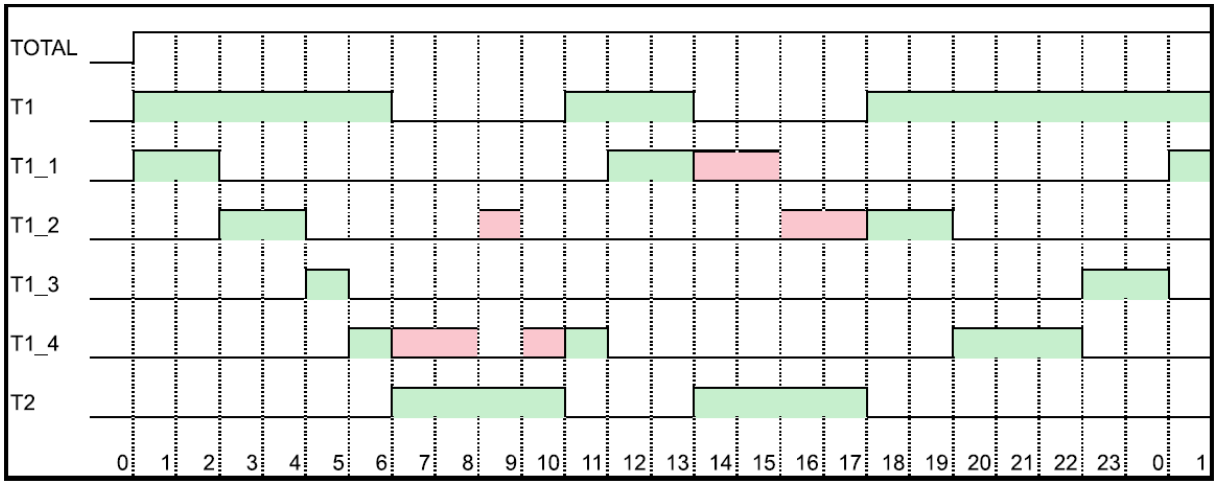
The first sub-tariff setting cannot be set to Off.

- The sub-tariff is shown on the left, and the start time from which energy is counted on that sub-tariff is shown on the right.
- The time format is HH:MM.
- To set up a sub-tariff, the user must first go to the desired empty tab and press the Edit button, as shown in Figure 25.
- After pressing the Edit button, the user can navigate through the sub-tariff selection and time tabs again using the right and left arrow keys, as shown in Figure 26.
- To set up a sub-tariff, the user must press Edit again on the selected sub-tariff column.

If the following settings are applied as examples of sub-tariff settings:

Settings	Tariff	Start Time
#1	T1-1	00:00
#2	T1-2	02:00
#3	T1-3	04:00
#4	T1-4	05:00
#5	T1-2	08:30
#6	T1-4	09:00
#7	T1-1	11:00
#8	T1-2	15:00
#9	T1-4	19:30
#10	T1-3	22:00

The activation status of the tariffs will be as shown in the table below. In the table, areas highlighted in red indicate the time-dependent activation status of T1 tariffs; however, where T2 tariffs are present, T1 tariffs will not be active. In the areas highlighted in green, the relevant T1 tariffs count.



3.3.1.4 Demand Settings

In the Demand menu, the demand calculation method and period are entered. The device has 3 different demand calculation methods: fixed, sliding, and rolling. Demand values are recorded with time information.

Fixed Method: Calculated by taking the average of the power values measured during the set demand period.

Sliding Method: Demand values are calculated in time blocks determined according to the set time. Time blocks are the seconds equivalent of the demand time intervals set in minutes. That is, the demand measurements of a device with a 15-minute demand period are updated every 15 seconds. The device updates the demand value at the end of the time interval.

Rolling Method: Demand values are calculated at the set sub-time intervals. If the Rolling method is selected for demand calculation, the "Sub Interval" must also be defined. The period must be evenly divisible by the sub-interval. If a sub-interval that does not divide the period evenly is set, the sub-interval value will be calculated as 1 minute. The device updates the demand value at the end of the time interval.

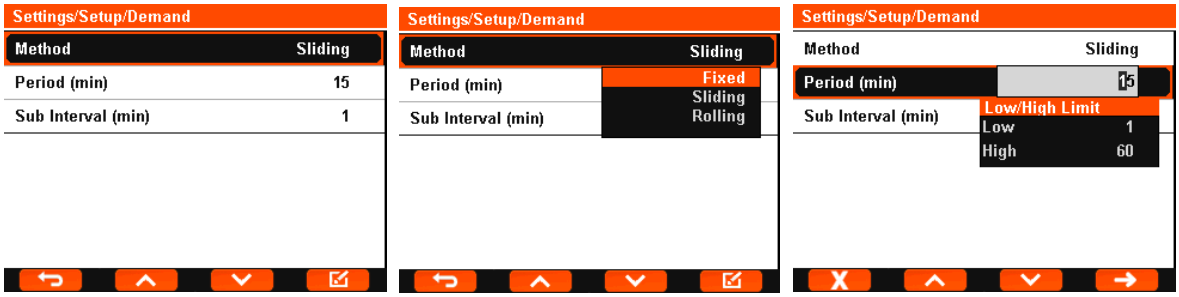


Figure 27 Demand Settings

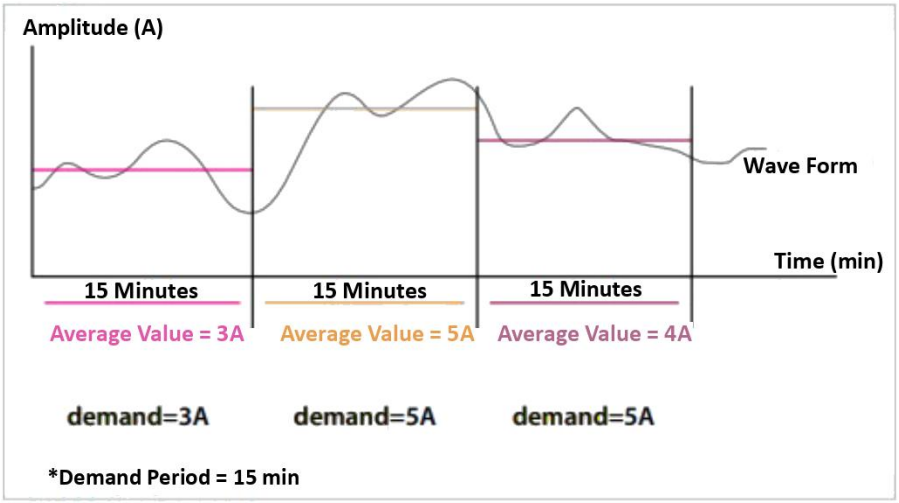


Figure 28 Example of Demand Calculation

The default values are as follows.

- Method: Sliding
- Period: 15 min.
- Sub Interval: 1 min. (This is irrelevant since the method used in demand calculation is Sliding.)

3.3.1.5 Sag & Swell Settings

Sag and Swell are terms used to describe voltage fluctuations in electric power systems. They are also described as the momentary deviation of the voltage level from the nominal value. However, their direction and duration differ.

Sag: The voltage drops below the nominal value for a short period of time.

Swell: The voltage rises above the nominal value for a short period of time.

The voltage interruption limit can be set by the user between 5% and 20%. When the measured voltage falls below this defined limit, the system creates and records a voltage interruption event.

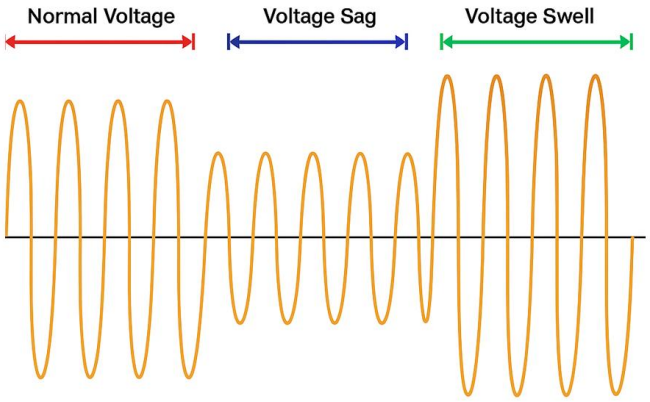


Figure 29 Sag & Swell

KLEA 6 performs detection based on the nominal voltage level entered by the user and the limits visualized in Figure 30.

Sag Status: Determines whether or not a sag calculation is desired. If it is set to Disabled, it means that a sag calculation will not be performed.

Sag Limit: The limit at which a sag condition is determined to have occurred.

Sag Hysteresis: This parameter determines when the condition ends based on the amount of deviation from the nominal voltage after a sag condition has occurred.

Swell Status: Determines whether or not a swell calculation is desired. If it is set to Disabled, it means that a swell calculation will not be performed.

Swell Limit: The limit at which a swell condition is determined to have occurred.

Swell Hysteresis: This parameter determines when the condition ends based on the amount of deviation from the nominal voltage after a swell condition has occurred.

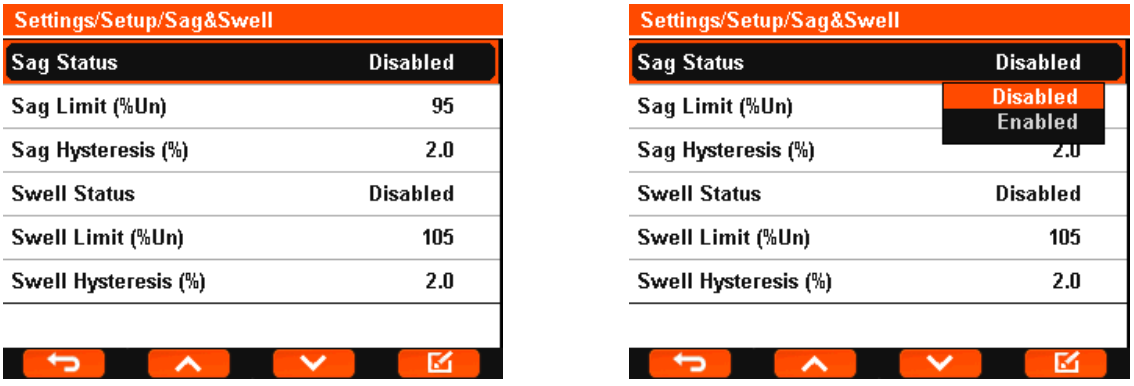


Figure 30 Sag & Swell Configuration-1

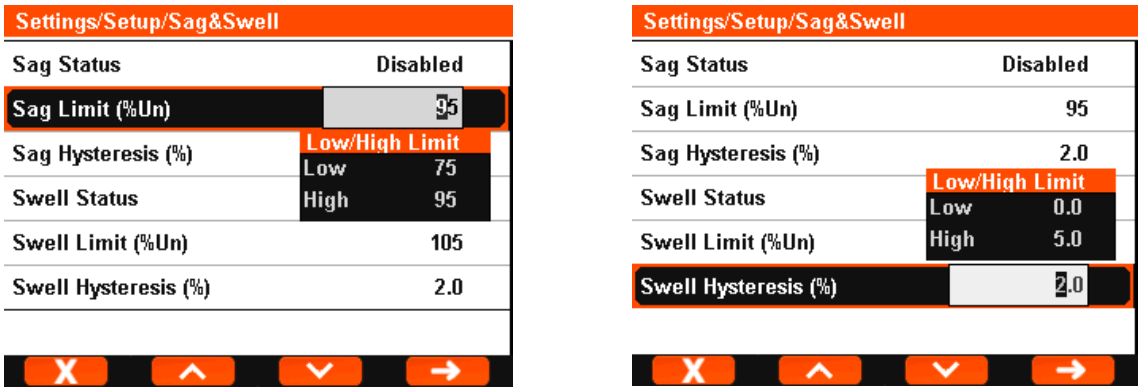


Figure 31 Sag & Swell Configuration-2

3.3.1.6 Digital Input Settings

In devices with digital input, this section allows you to configure the input's operating mode, delay time, and detection edge settings.

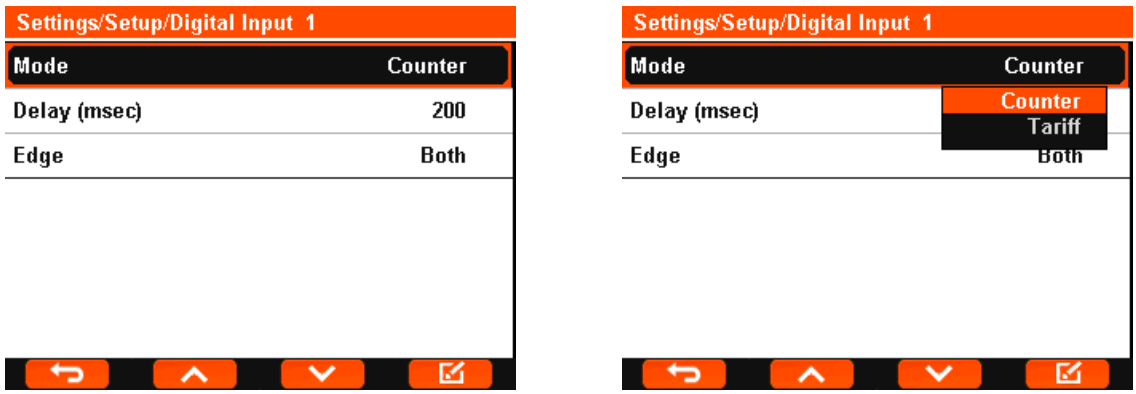


Figure 32 Digital Input Setting

Digital Input Mode: The operating mode for digital input is selected here. There are two different operating modes: 2nd and 3rd tariff activation and input counter.

If the mode is set to tariff activation for both inputs:

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

Two different tariffs cannot be active on the same device simultaneously. If one tariff is active and you try to activate another, the device will count only on tariff 1 (T1).

If the mode is set as an input counter, it counts the position changes of the corresponding input depending on the selected detection edge.

- If the detection edge is selected as rising edge, the counter increments by 1 each time the dry contact connected to the digital input closes.
- If the detection edge is selected as falling edge, the counter increments by 1 each time the dry contact connected to the digital input opens.
- If the detection edge is selected as both edges, the counter increments by 1 each time the dry contact connected to the digital input closes and each time it opens.

Delay (ms): This is the waiting time used to determine the position of a digital input. If the input remains in the same position after the set detection delay time, it is determined whether the input is

active or passive. Its primary purpose is to filter out factors such as contact bouncing or noise that may occur in the digital input.

Edge: This menu selects at which transition (edge) the digital input is detected as active or passive. This menu is valid for the "Counter" option in digital input mode. For tariff activation, rising-edge detection always applies.

3.3.1.7 Digital Output Settings

The devices have 2 optional digital outputs. These digital outputs are used to generate an output based on the counted energy value or the input counter.

Source: When the OK button is pressed on this tab, the following options will appear. Any of these options can be assigned as the output mode. The user should use the up and down arrow keys to select the desired option and press the OK button.

- Off
- T1 kWh
- T1 kWh Exp.
- T1 kVArh Imp.
- T1 kVArh Exp.
- T1_1 kWh
- T1_1 kWh Exp.
- T1_1 kVArh Imp.
- T1_1 kVArh Exp.
- T1_2 kWh
- T1_2 kWh Exp.
- T1_2 kVArh Imp.
- T1_2 kVArh Exp.
- T1_3 kWh
- T1_3 kWh Exp.
- T1_3 kVArh Imp.
- T1_3 kVArh Exp.
- T2 kWh
- T2 kWh Exp.
- T2 kVArh Imp.
- T2 kVArh Exp.
- Digital input

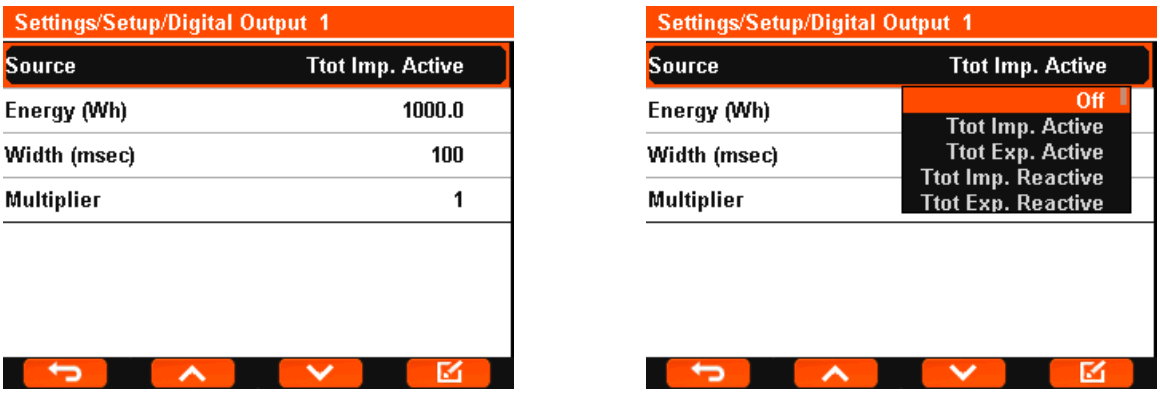


Figure 33 Digital Output Setting-1

Energy: The counter type entered in the Source menu will output a pulse from the corresponding output each time it counts by the magnitude specified in the "Energy" setting.

Width: This menu is where the pulse width of the corresponding output is adjusted. The user adjusts the pulse width between 50 ms and 2500 ms using the up and down arrow keys.

Multiplier: The multiplier coefficient is set for the "Digital Input" option in the "Output 1->Source" settings tab. If Source->Digital Input is not selected in the "Output 1" setting, the multiplier coefficient will be irrelevant. When the "Digital Input 1 Counter" reaches the multiplier coefficient, the "Digital Output 1" hardware outputs a pulse of the set width from the DO+ and DO- terminals.

The user adjusts the multiplier coefficient between 1 and 10000 using the up and down arrow keys.

In short, this setting is used to map the input counter to the digital output with a specific multiplier.

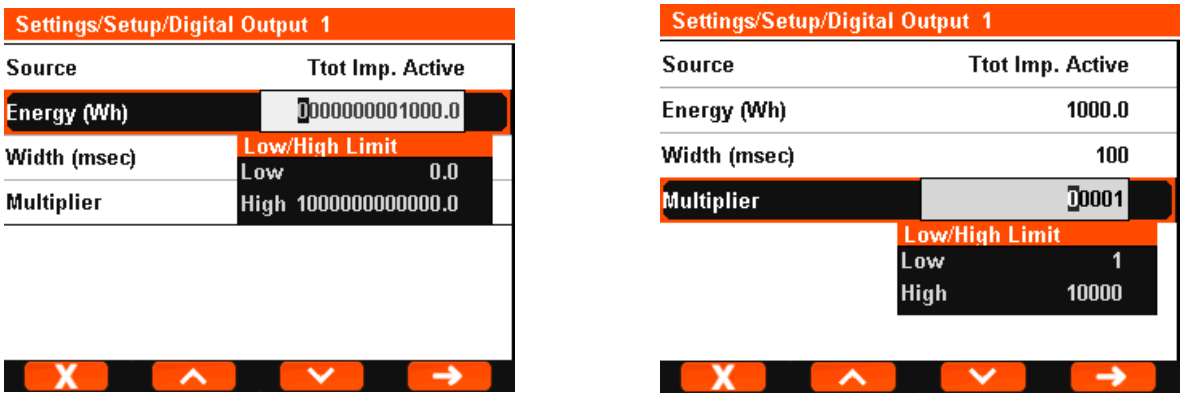


Figure 34 Digital Output Setting-2

Example:

- **Digital Output:** Output 1
- **Mode:** T1 kWh
- **Energy:** 2
- **Width:** 100 ms

Assume that the energy consumed (T1 kWh) value for Tariff 1 is 1.1 kWh before configuring the digital output settings. Each time the T1 kWh value increases by 2 kWh, a 100 ms pulse will be seen on the DO1- and DO1+ outputs. This pulse will be seen at values of 3.1 kWh, 5.1 kWh, 7.1 kWh…

Example:

- **Digital Output:** Output 1
- **Mode:** Digital input
- **Energy:** When the mode setting is digital input, the Energy tab is not used.
- **Width:** 100 ms
- **Multiplier:** 100

The Digital Input 1 operating mode must be selected as "Counter" beforehand. In this case, when Counter 1 reaches 100 and its multiples, a 100 ms wide pulse will be seen on the DO1- and DO1+ outputs. Assuming the Digital Input 1 counter value is 35 with the above settings, Output 1 will produce pulses when the Digital Input 1 counter reaches values of 135, 235, 335, 435, etc.

3.3.1.8 Communication Settings

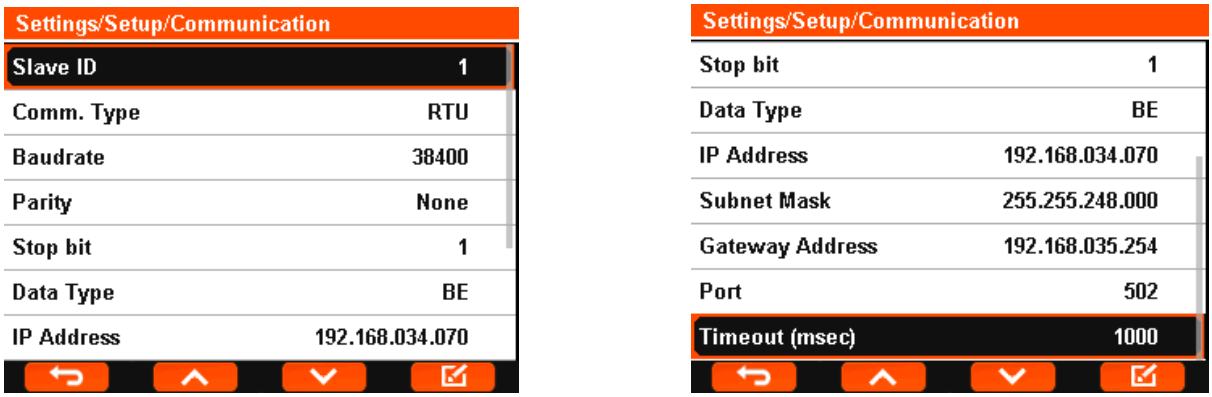


Figure 35 Communication Settings-1

This menu is used to configure the device's communication interface settings. These are detailed under section 3.1.3 Communication Screen.

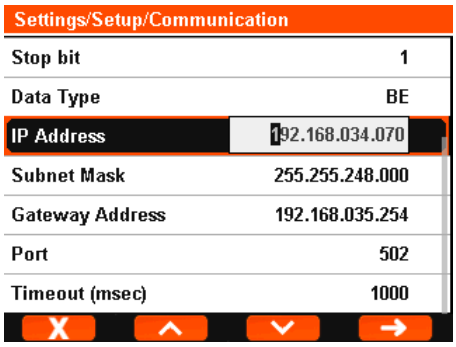


Figure 36 Communication Settings-2

3.3.1.9 Alarm Settings

Under this menu, alarm limits, hysteresis values, delay times, and relay assignment settings for devices with relay output are configured for the parameters shown in Figure 37.

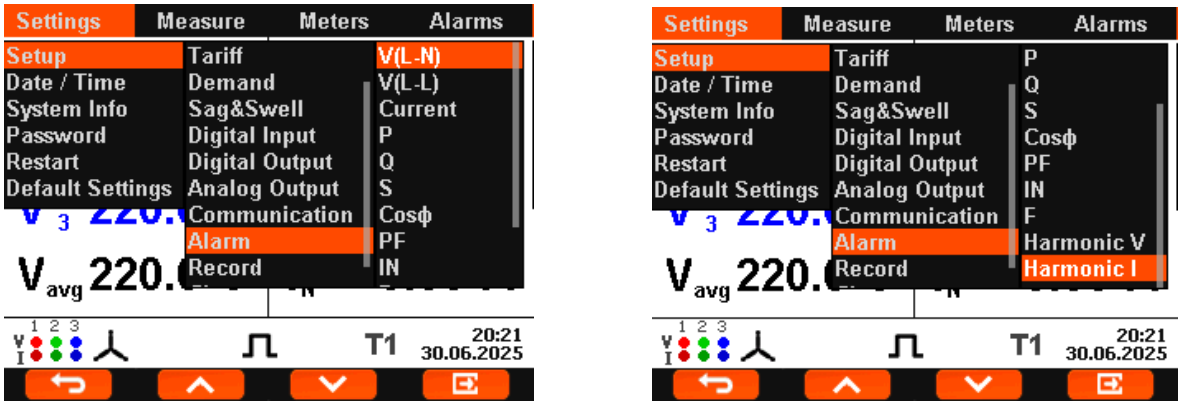


Figure 37 Alarm Settings-1

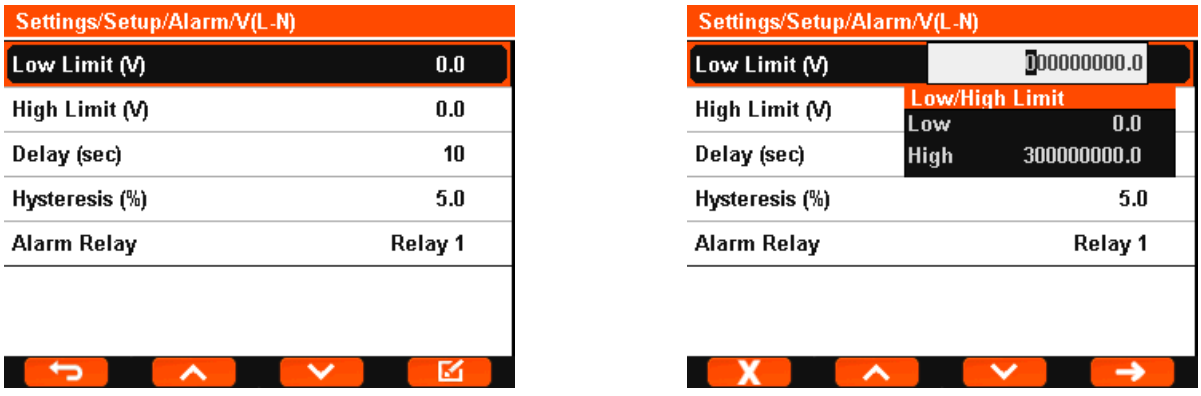


Figure 38 Alarm Settings-2

Low Limit: This tab is where the Low limit value for the alarm is entered.

High Limit: This tab is where the High limit value for the alarm is entered.

Delay (sec): This is the delay time indicating how long after an alarm condition occurs or disappears the device will take action for the relevant alarm parameter.

Hysteresis (%): This is the tolerance value.

Alarm Relay: Used to set whether or not a relay is activated when an alarm occurs.

- Disabled: The relay will not activate in an alarm situation.
- Relay 1: In case of an alarm, relay 1 is activated.
- Relay 2: In case of an alarm, relay 2 is activated.

The user should use the up and down arrow keys to navigate to the desired setting and then press the OK button.

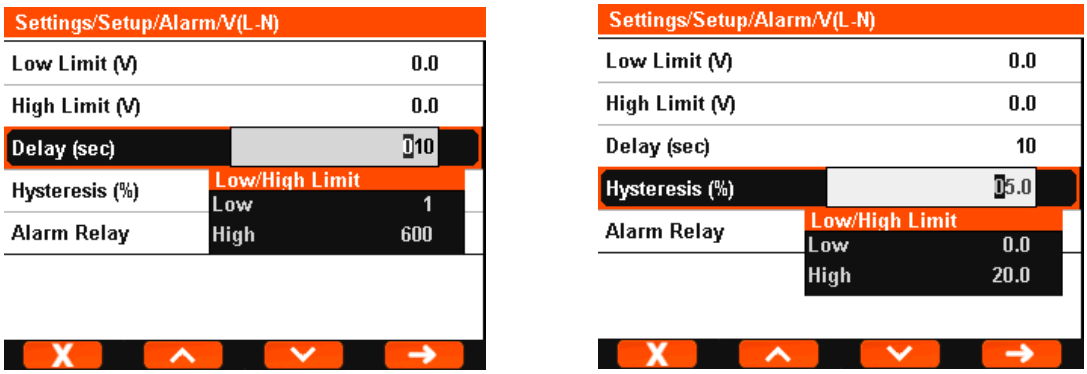


Figure 39 Alarm Settings-3

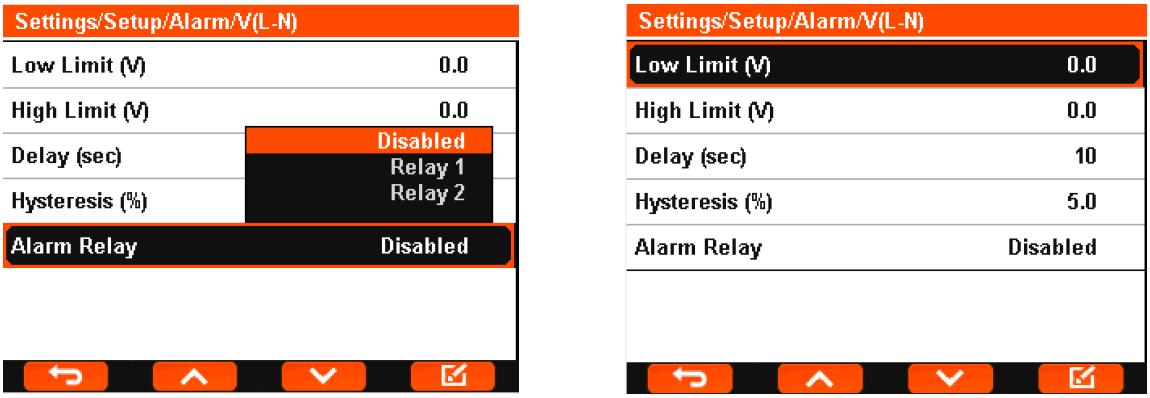


Figure 40 Alarm Settings-4

Example: For the figure below:

- An alarm is triggered at point A.
- The alarm is deactivated at point B.
- An alarm is triggered at point C.
- The alarm is deactivated at point D.

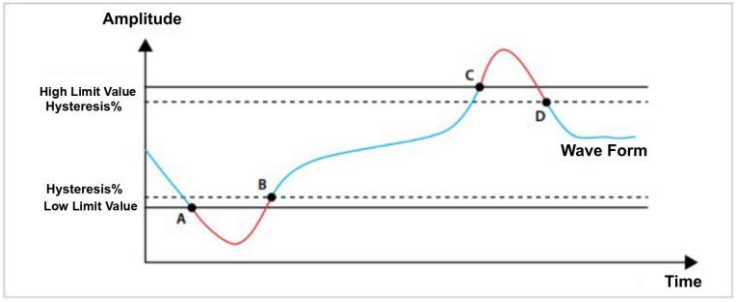


Figure 41 Alarm Example

If the high and low limit values are equal, the alarm is disabled.

The menu for harmonic alarm settings differs from other alarm menus, as shown in Figure 42. To set the desired harmonic level for the alarm, use the up and down arrow keys and press the OK button.

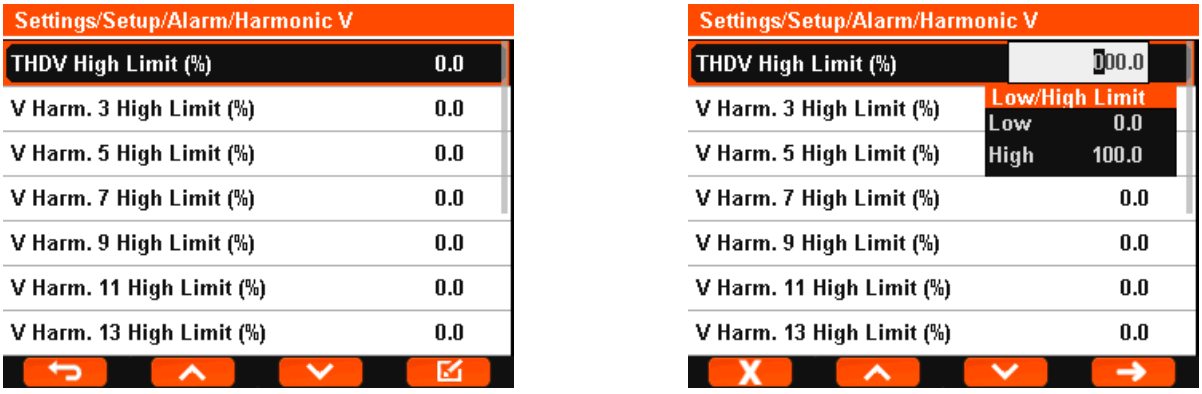


Figure 42 Harmonic Settings

3.3.1.10 Record Settings

This menu is used to configure the device's recording algorithm settings. These are detailed under section 3.1.4 Record.

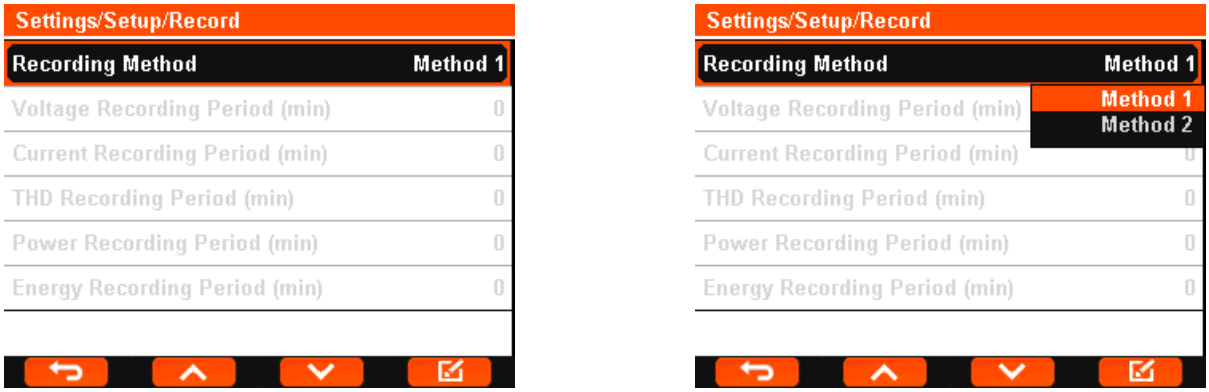


Figure 43 Record Settings-1

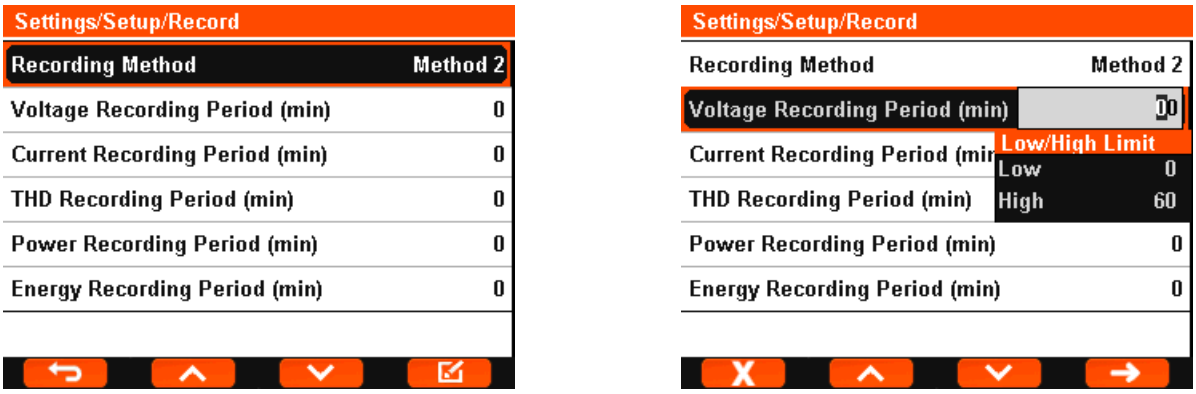


Figure 44 Record Settings-2

3.3.1.11 Clear

The following parameters can be deleted under this menu.

- Energy
- Demand
- DI Counter
- Run Hour Counter
- Alarm
- Events
- Records
- Min/Max
- All

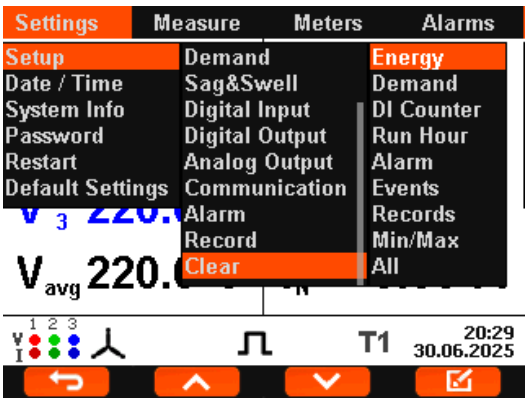


Figure 45 Clear Menu-1

When the Clear option is selected and the OK button is pressed, submenus will appear. Use the up and down arrow keys to navigate to the parameter you wish to delete and then press the OK button.

After pressing the OK button, the menus that will appear on the screen according to the parameters you wish to delete are shown in the images below.

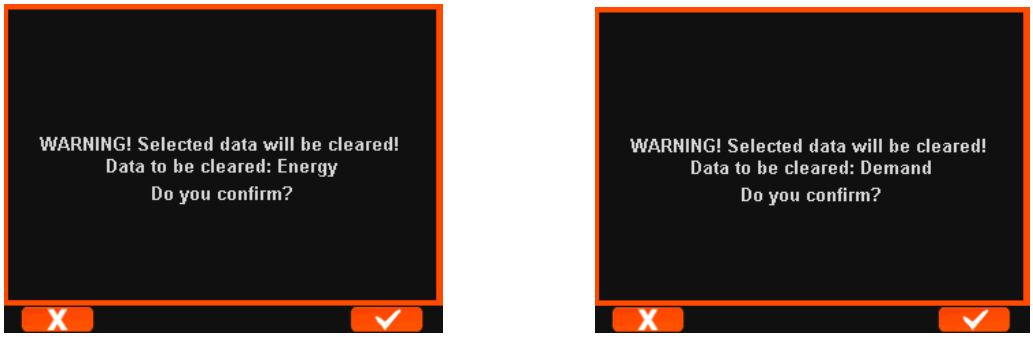


Figure 46 Clear Menu-2



Figure 47 Clear Menu-3

3.3.2 Date & Time

The device's date and time information is set under this menu.

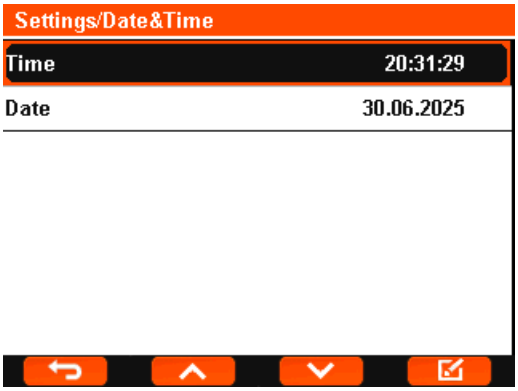


Figure 48 Date & Time-1

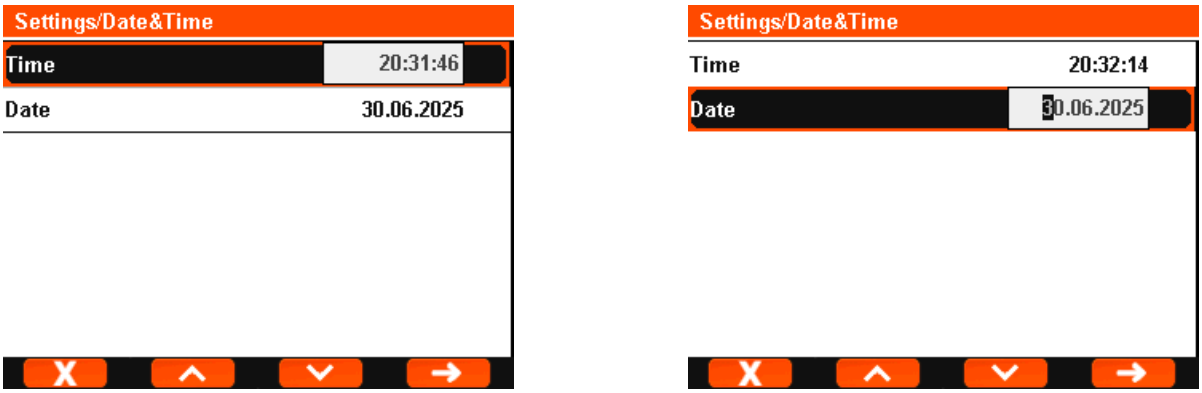


Figure 49 Date & Time-2

3.3.3 System Information

The system info menu includes model, serial number, firmware version, PCB version, manufacturing date, MAC address, and Modbus version information.

The appearance is general and may vary depending on the model.



Figure 50 System Information

3.3.4 Password Entry

This is the menu where the password defined for the device is entered. Device settings will be activated upon password entry. The default password is 0001. Password settings can be made under the 3.3.1.2 Device Settings menu.

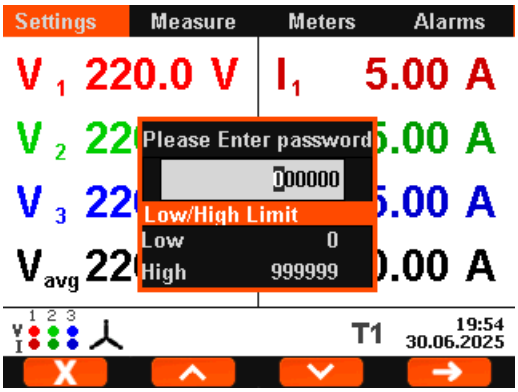


Figure 51 Password Entry-1

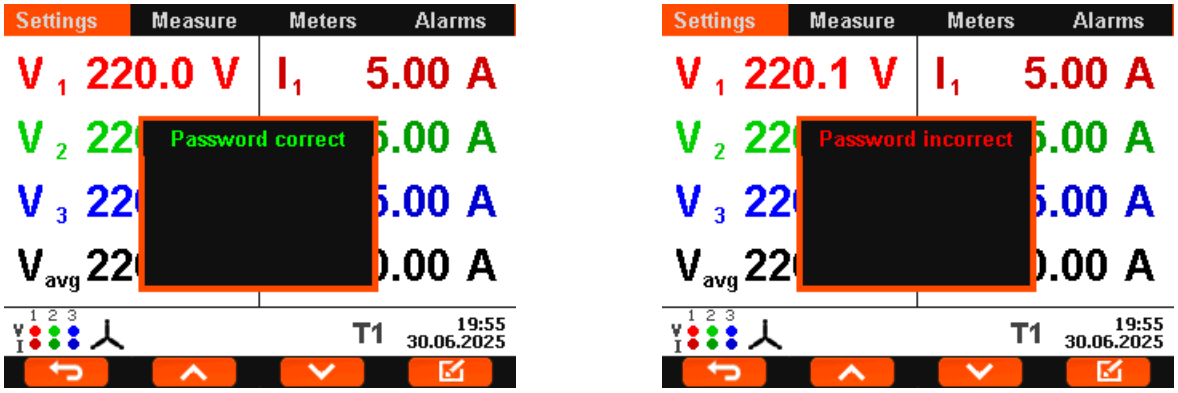


Figure 52 Password Entry-2

3.3.5 Restart

The device can be restarted from this menu. Restarting the device will not result in any changes or data loss.

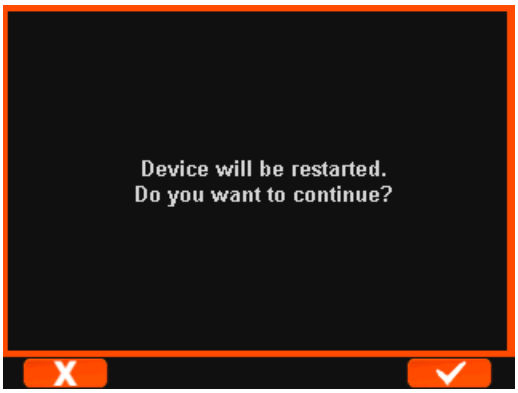


Figure 53 Restart

3.3.6 Default Settings

This is used to restore the device to its factory settings.

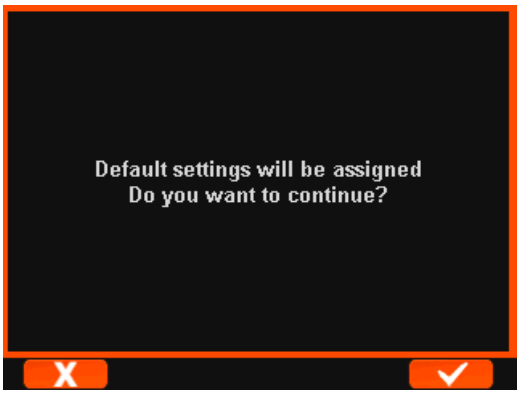


Figure 54 Default Settings

3.4 Measurements

The Measure menu includes options for instantaneous measurements, demand data, phasor diagram, signals, harmonics, and 4Q Diagram.

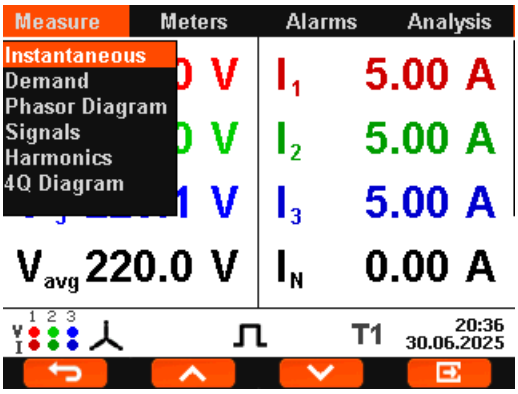


Figure 55 Measurements

3.4.1 Instantaneous Measurements

This menu contains the values being measured in real time by the device.

- **VLN:** Phase-to-neutral voltage of each phase and the average phase-to-neutral voltage
- **VLL:** Phase-to-phase voltages and average phase-to-phase voltage values
- **I:** Phase currents and total current values
- **IN:** Neutral current
- **COS Ø:** COS Ø values for the phases and the system
- **PF:** Power factor values for the phases and the total
- **P:** Active power values for the phases and the total
- **Q:** Reactive power values for the phases and the total
- **S:** Apparent power values for the phases and the total
- **F:** System frequency value
- **THDV:** THDV values for the phases and the total
- **THDI:** THDI values for the phases and the total
- **PWR:** Total active, reactive, and apparent power values
- **UNB:** Current and voltage imbalance values

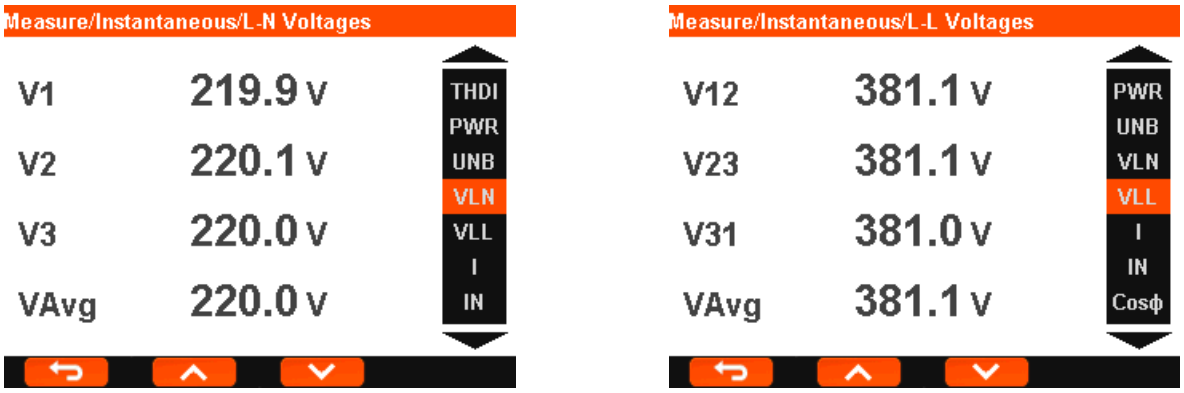


Figure 56 Instantaneous Measurements-1

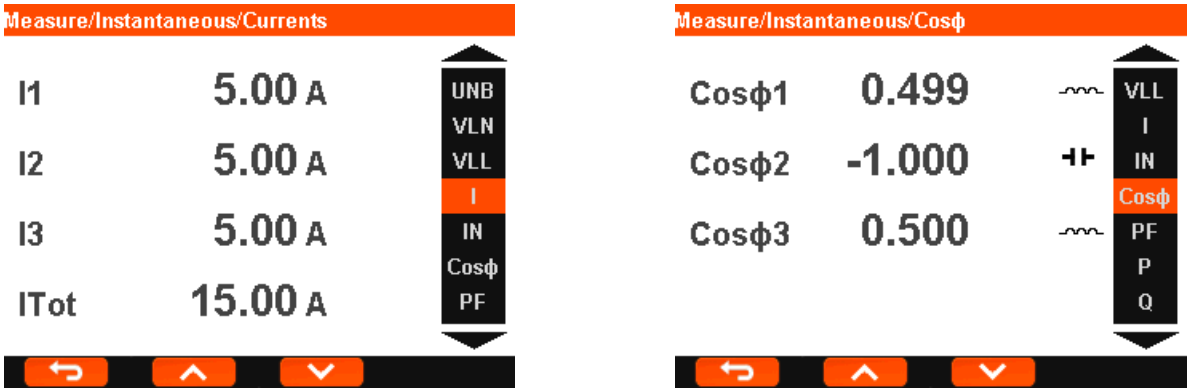


Figure 57 Instantaneous Measurements-2

3.4.2 Demand Measurements

The Demand menu displays the average values of currents and powers over the configured demand period and the maximum values of these averages.

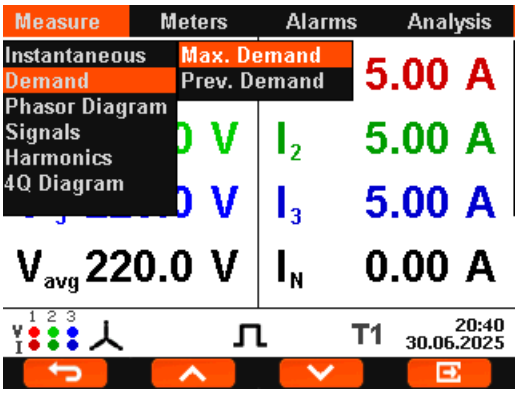


Figure 58 Demand Measurements

3.4.2.1 Max. Demand

The Max. Demand menu displays the maximum demand values recorded from the time the device was first powered on until now.

- 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)

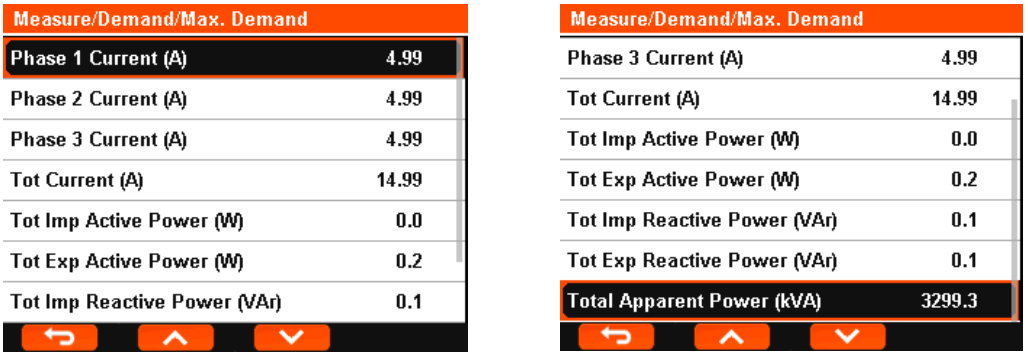


Figure 59 Max. Demand

3.4.2.2 Previous Demand

The "Prev. Demand" menu displays the demand values for the following parameters at the end of the previous demand period.

- 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)

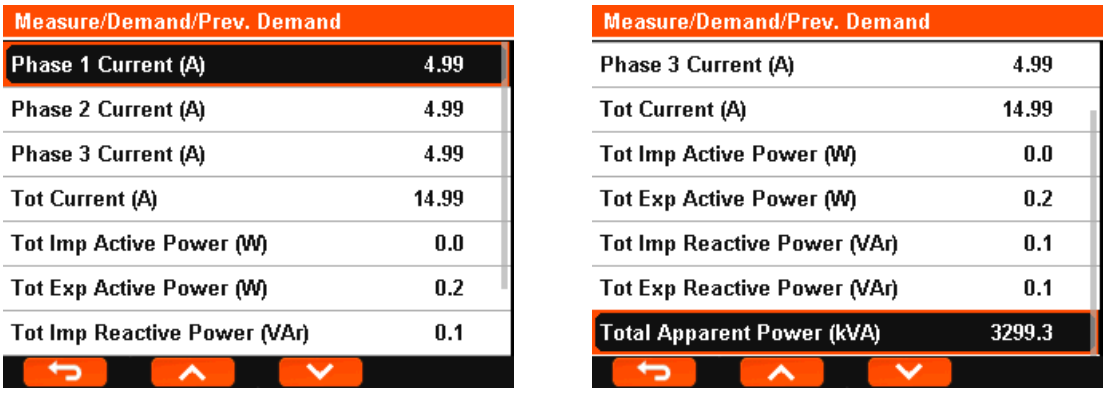


Figure 60 Previous Demand

For example, the graph below shows the averages of the current signal and the demand values for a 15-minute demand period.

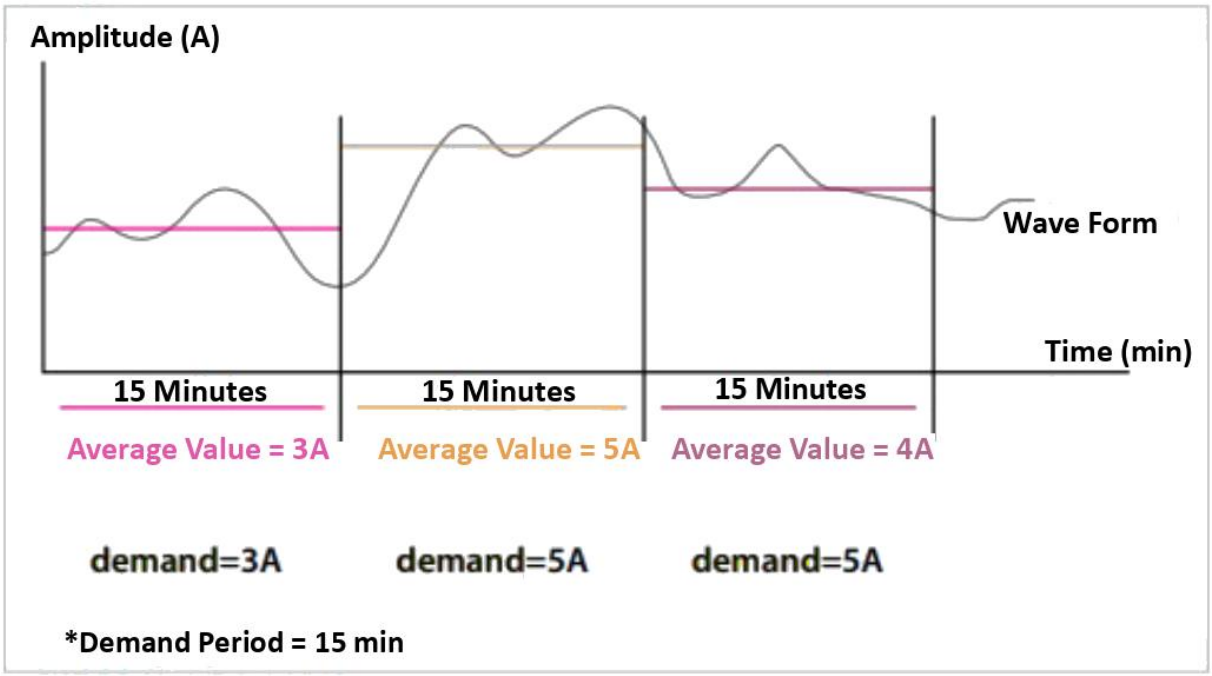


Figure 61 Example Demand

3.4.3 Phasor Diagram

The phasor diagram menu screen displays the diagram along with the following information.

- 3V: Displays phase-to-neutral voltage values for 3 phases.
- 3U: Displays phase-to-phase voltage values.
- 3A: Displays current values for 3 phases.
- Angle values between V1-V2, V2-V3, and V3-V1 are displayed.
- Angle values between V1-I1, V2-I2, and V3-I3 are displayed.
- L1: Displays measurement values for V1-I1.
- L2: Displays measurement values for V2-I2.
- L3: Displays measurement values for V3-I3.

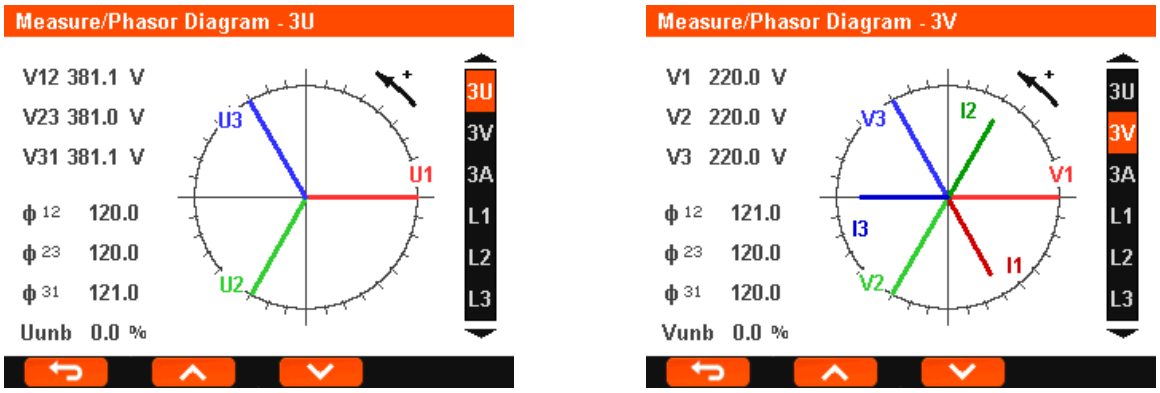


Figure 62 Phasor Diagram-1

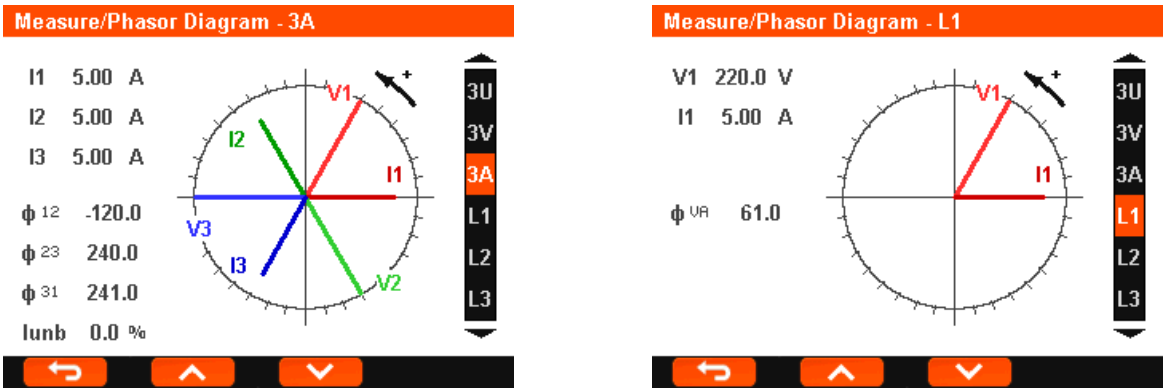


Figure 63 Phasor Diagram-2

NOTE: If the device's connection type is 3P3W, the 3V, 3A, L1, L2, and L3 menus will not be displayed.

3.4.4 Signals

In this menu, voltage and current signal shapes are displayed on the screen. On the right side of the screen, the following information is listed:

- Phase voltage and current values
- Instantaneous frequency value
- Angle difference between current and voltage
- THDV and THDI values

You can navigate between voltage and current signal pages using the left and right arrow keys.

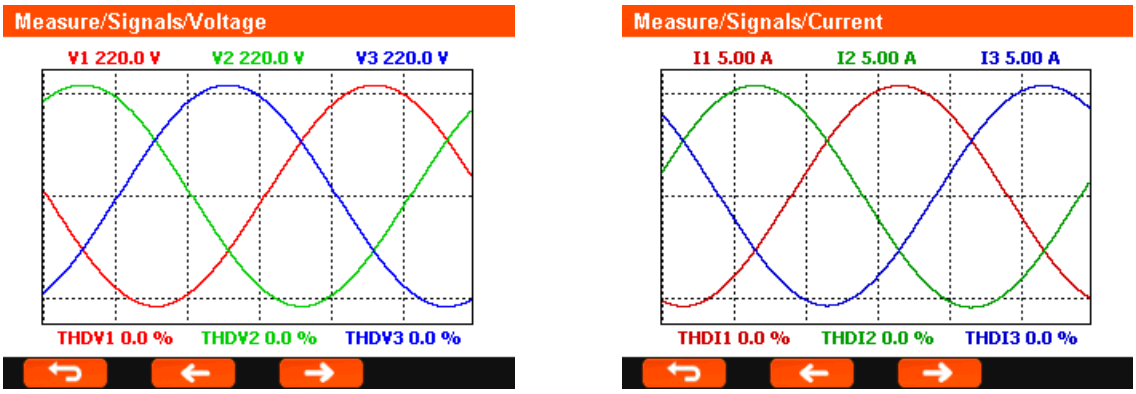


Figure 64 Signals

3.4.5 Harmonics

In addition to total harmonic distortion data, odd harmonics up to the 51st order are measured/calculated for current and voltage in the devices. Current and voltage harmonics are displayed both tabularly and graphically.

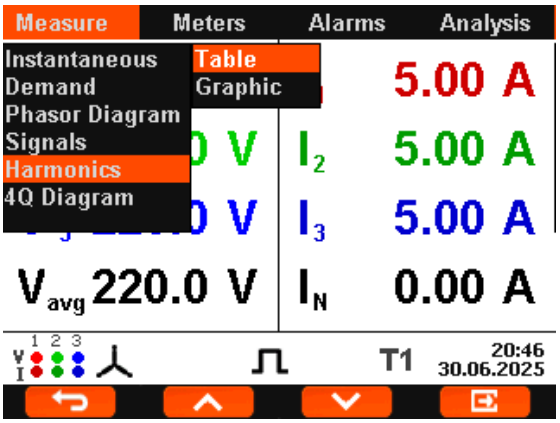
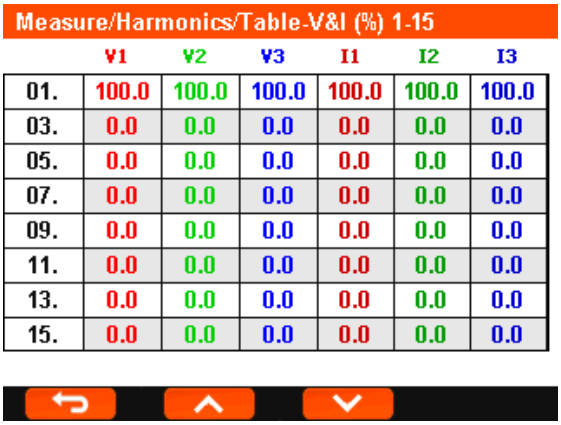


Figure 65 Harmonics-1



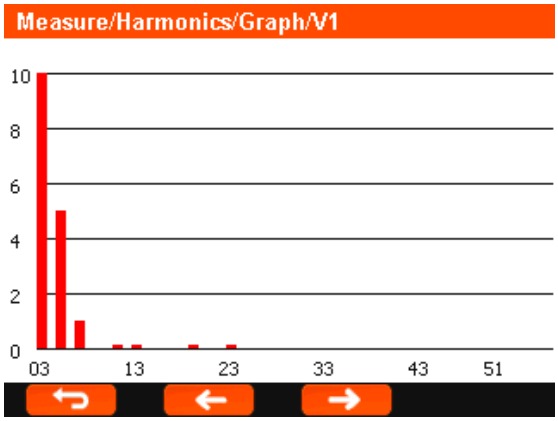
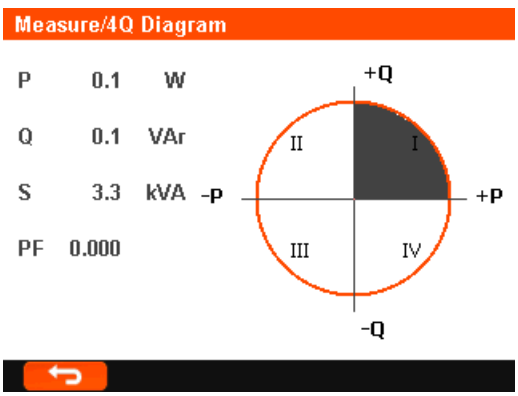


Figure 66 Harmonics-2

3.4.6 4-Quadrant Diagram

The parameters displayed in the 4-Quadrant Diagram menu are as follows:

- P: Total active power of 3 phases
- Q: Total reactive power of 3 phases
- S: Total apparent power of 3 phases
- PF: System Power Factor



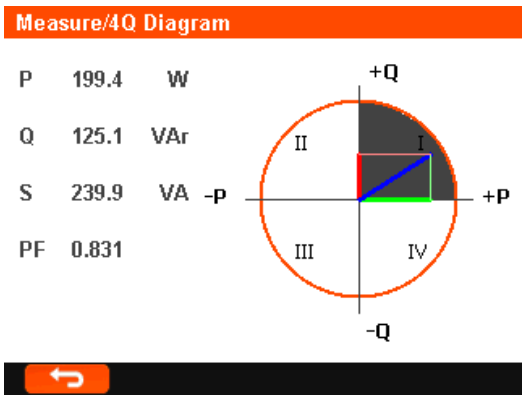


Figure 67 4-Quadrant Diagram

3.5 Meters

The meters menu displays the total and tariff indexes. The device has 3 main tariffs (T1 / T2 / T3) and 4 sub-tariffs (T1-1 / T1-2 / T1-3 / T1-4).

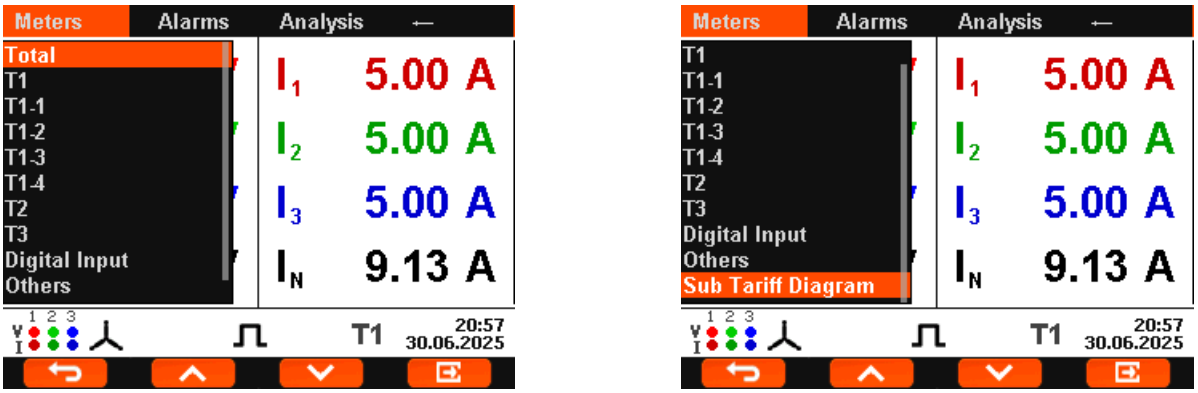


Figure 68 Meters-1

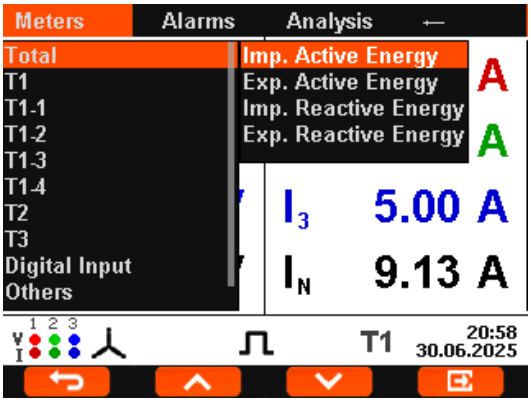


Figure 69 Meters-2

3.5.1 Total

The Total menu is where the total index values of all tariffs are monitored.

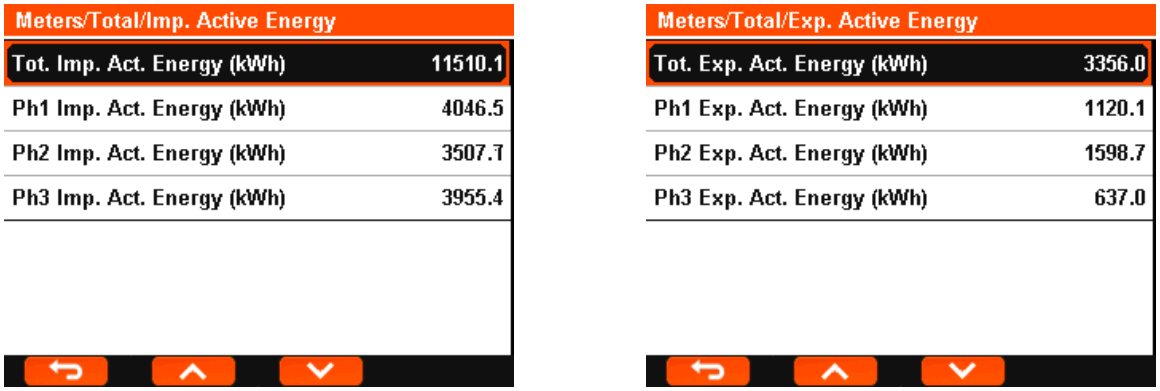


Figure 70 Total Energy-1

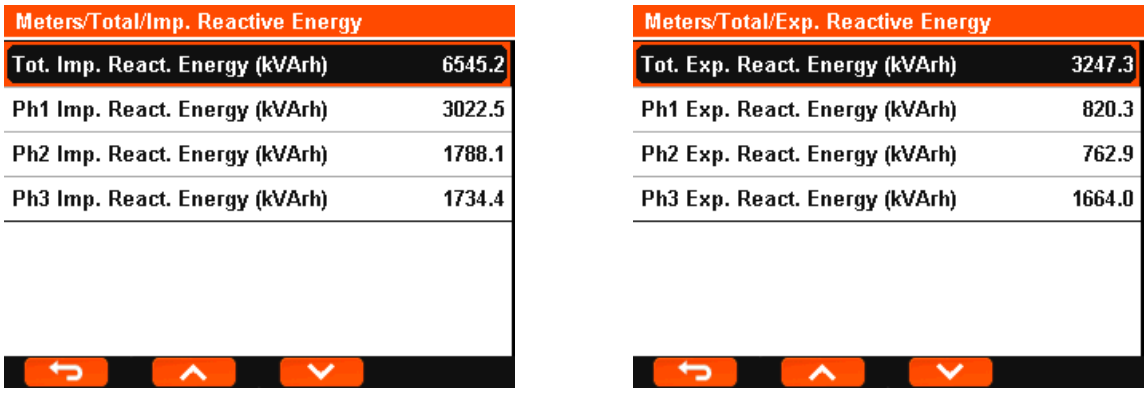


Figure 71 Total Energy-2

3.5.2 T1

This menu displays the index values for the T1 tariff.

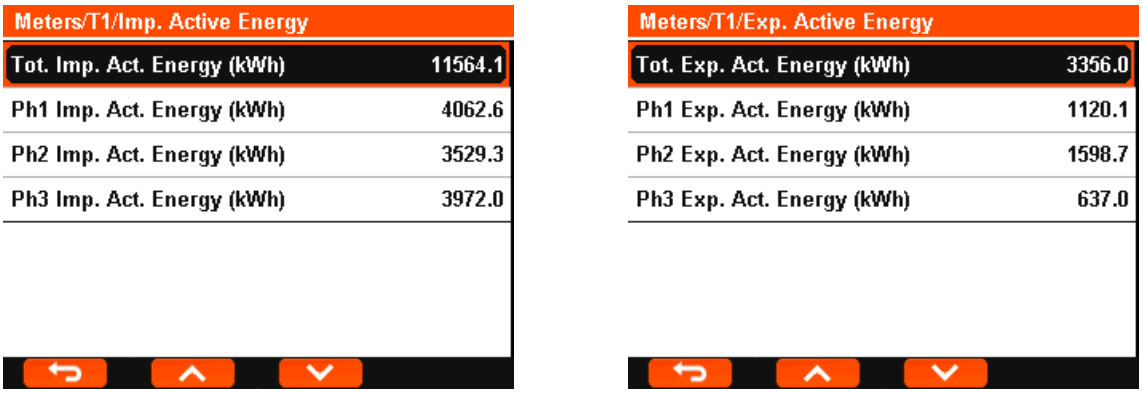


Figure 72 T1 Energy-1

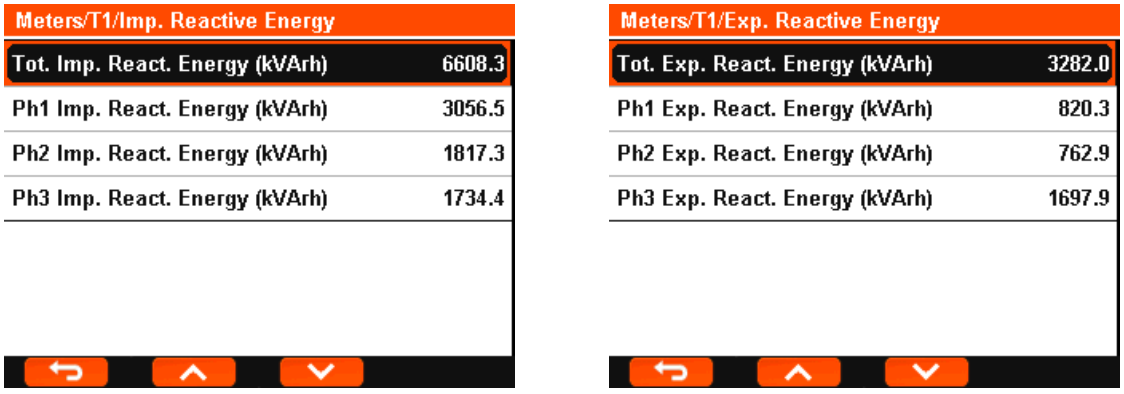


Figure 73 T1 Energy-2

3.5.3 T1-1

This menu displays the index values for the T1-1 sub-tariff.

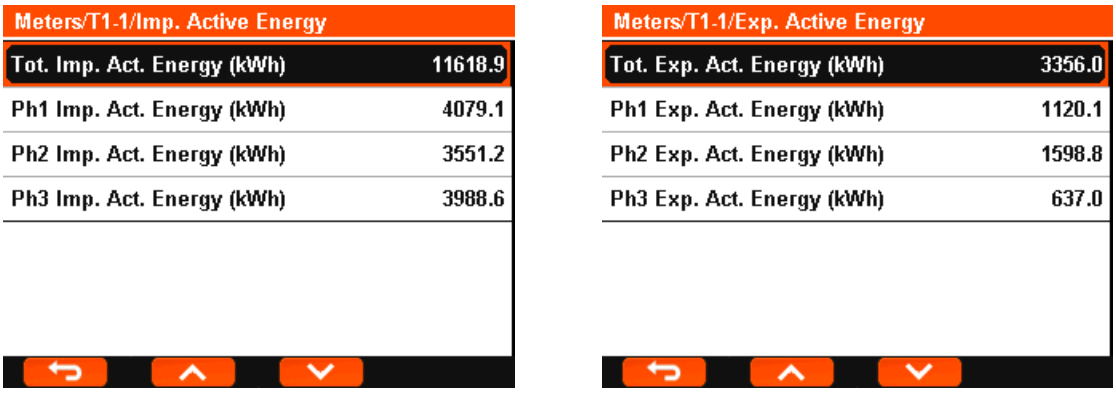


Figure 74 T1-1 Energy-1

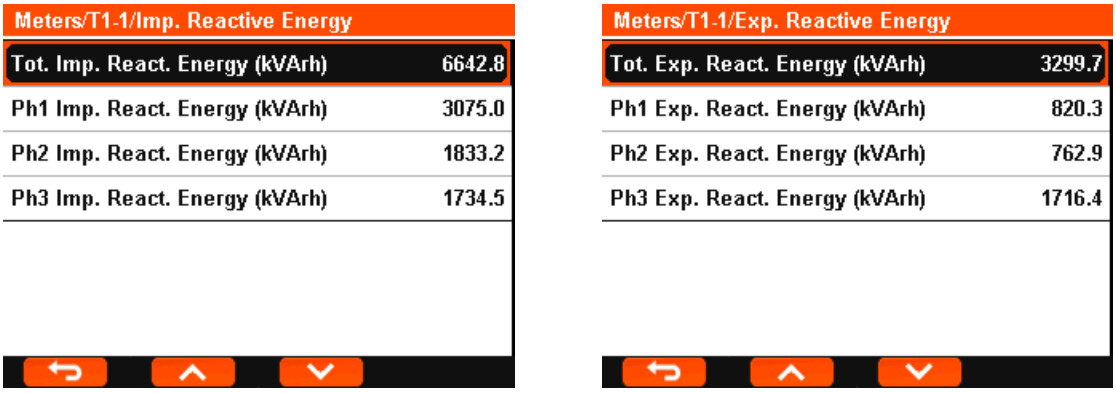


Figure 75 T1-1 Energy-2

3.5.4 T1-2

This menu displays the index values for the T1-2 tariff, which is a sub-tariff of the T1 tariff. The menu structure is the same as T1-1. See T1-1.

3.5.5 T1-3

This menu displays the index values for tariff T1-3, which is a sub-tariff of tariff T1. The menu structure is the same as T1-1. See T1-1.

3.5.6 T1-4

This menu displays the index values for tariff T1-4, which is a sub-tariff of tariff T1. The menu structure is the same as T1-1. See T1-1.

3.5.7 T2

This menu displays the index values for the T2 tariff. See T1.

3.5.8 T3

This menu displays the index values for the T3 tariff. See T1.

3.5.9 Digital Input

The counter values of the digital inputs configured as counters are displayed under this menu. The digital inputs are dry contacts; activation requires a short circuit between the relevant digital input and GND.

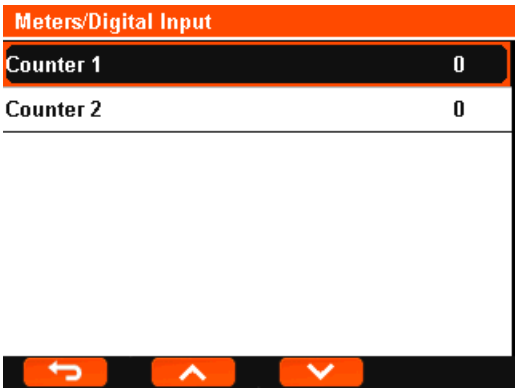


Figure 76 Digital Input

3.5.10 Other Meters

This menu includes the Run Hour counter, the On Hour counter, and the Power Interruption counter.

Run Hour: Counts the time during which energy is measured by the device. The unit is hours.

On Hour: Counts the total time the device has been powered on. The unit is hours.

Power Interruption: Counts how many times the device's power has been interrupted. The counter increases by 1 with each power outage.



Figure 77 Other Meters

Only the Run Hour counter can be reset by the user.

3.5.11 Sub-Tariff Diagram

Based on the sub-tariff settings made in the 3.3.1.3 Tariff Settings menu, a 24-hour time diagram is displayed in this menu. The active sub-tariff and the time when the next sub-tariff will be activated can be seen in this menu.

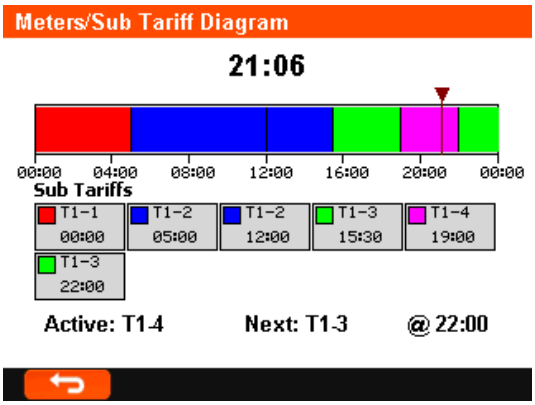


Figure 78 Sub-Tariff Diagram

3.6 Alarms

Alarms generated on the device are monitored via the Alarms menu. It has three submenus: Active Alarms, Alarm Logs, and Event Logs.

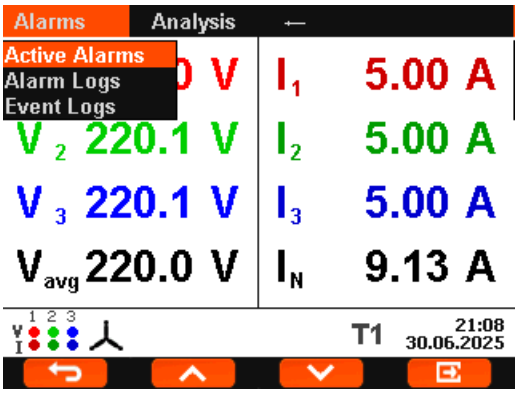


Figure 79 Alarms

3.6.1 Active Alarms

This menu visualizes whether the parameter for which an alarm has been set is currently in alarm, and under what circumstances the alarm has been triggered.

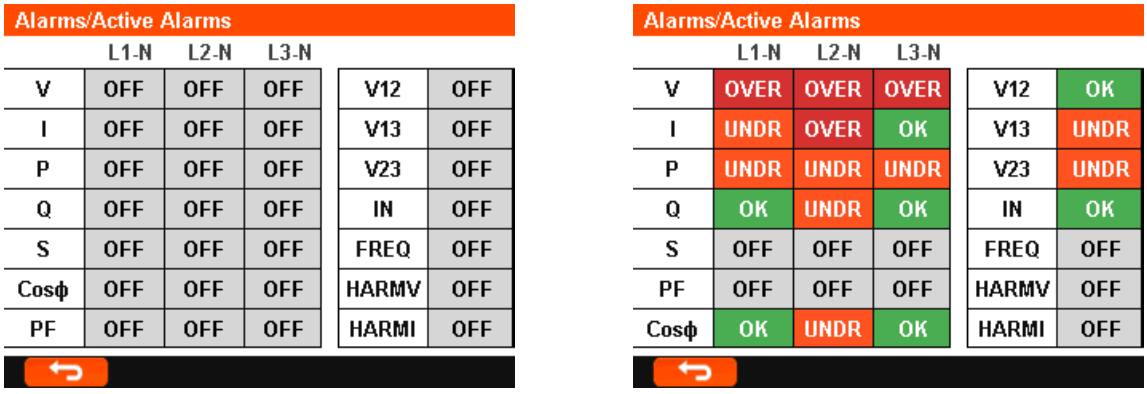


Figure 80 Active Alarms

The sections marked "OFF" do not have an alarm assigned.

"OVER" indicates that the high limit has been exceeded.

"UNDR" indicates that the value has fallen below the low limit.

Sections marked "OK" indicate that an alarm has been assigned and that there is no alarm status currently present.

3.6.2 Alarm Logs

This menu displays the source, event, and time of each alarm when the device goes into an alarm state. The device can store 255 alarm records, and when the recording space is full, the oldest data is deleted before recording continues.

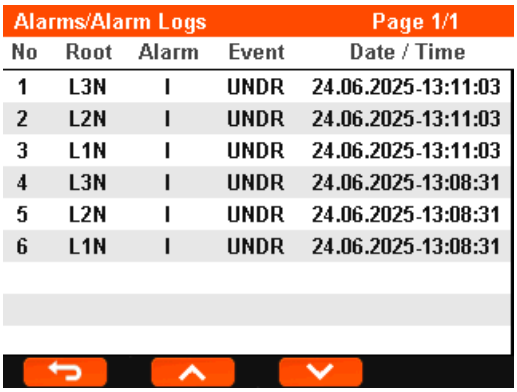


Figure 81 Alarm Logs

3.6.3 Event Logs

This menu displays the source, type, and time of the events listed below when they occur. The device stores 255 event logs, and when the logging area is full, the oldest data is deleted before recording continues.

- Sag & Swell
- Ethernet Communication Interruption
- Setting Change
- Power Interruption
- Clearing of Minimum and Maximum Values
- Clearing of Energy Values
- Clearing of Digital Input Counters
- Clearing Run Hour
- Clearing Alarm Logs
- Clearing Demand
- Clearing Event Logs
- Clearing Log Records
- Restarting the Device
- Changing Date/Time
- Voltage Interruption Limit

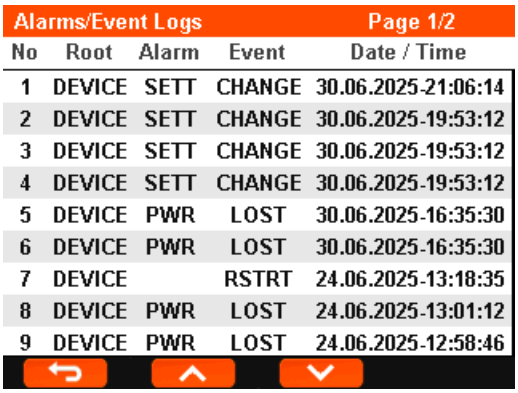


Figure 82 Event Logs

3.7 Analysis

On the analysis screen, the minimum, maximum, average, and hourly/daily/monthly analyses of a given parameter can be viewed from these tabs.

Energy parameters are only analyzed hourly/daily and monthly. Minimum, maximum, and average values are not available.

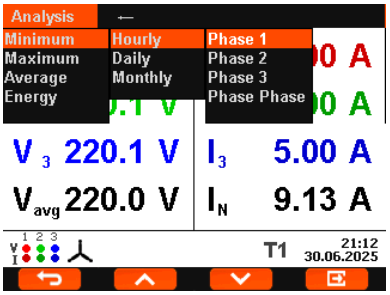


Figure 83 Analysis

3.7.1 Minimum

This menu displays the minimum values for phase-to-neutral and phase-to-phase parameters. The following parameters are shown in this menu.

- V
- I
- P(W)
- Q(VAR)
- S(VA)
- COS Ø
- PF
- F

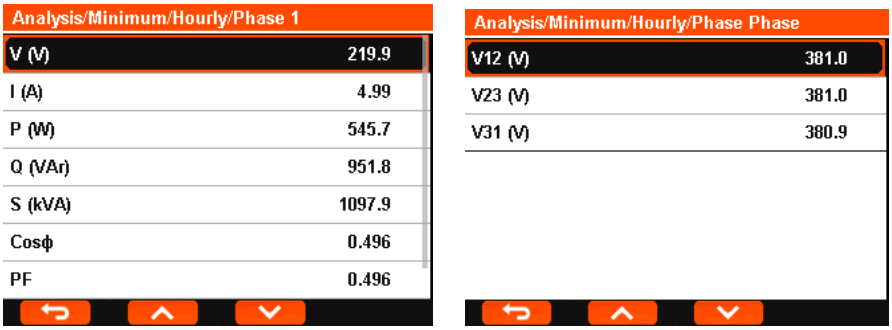


Figure 84 Analysis - Minimum Data

3.7.2 Maximum

This menu displays the maximum values for phase-to-neutral and phase-to-phase parameters. The following parameters are shown in this menu.

- V
- I

- P(W)
- Q(VAR)
- S(VA)
- COS Ø
- PF
- F

3.7.3 Average

This menu displays the average values of phase-to-neutral and phase-to-phase parameters. The following parameters are shown in this menu.

- V
- I
- P(W)
- Q(VAR)
- S(VA)
- COS Ø
- PF
- F

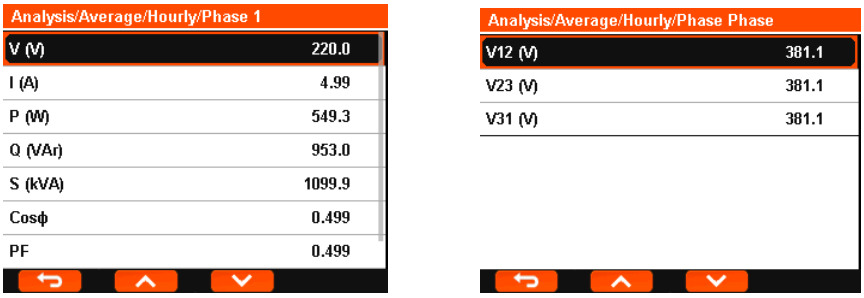


Figure 85 Analysis - Average Data

3.7.4 Energy

This menu displays hourly, daily, and monthly data for the following parameters related to total energy indices.

- Total Imp. Active Energy (kWh)
- Total Exp. Active Energy (kWh)
- Total Imp. Reactive Energy (kVArh)
- Total Exp. Reactive Energy (kVArh)

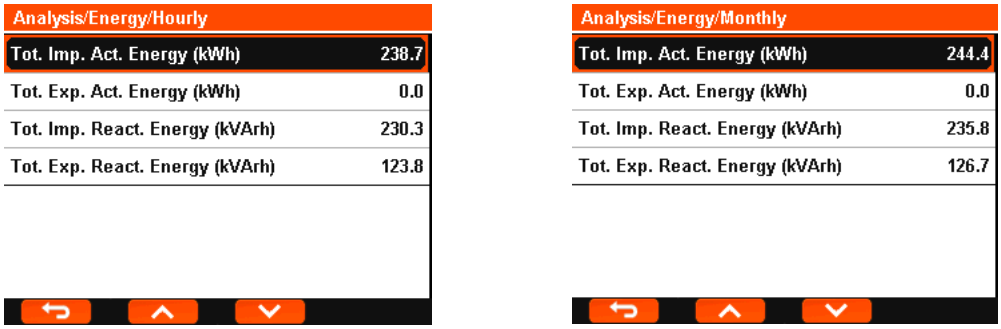


Figure 86 Analysis - Energy Data

CHAPTER 4

COMMUNICATION

CHAPTER 4 COMMUNICATION

Communication is provided via an isolated RS485 interface or an optional Ethernet port. For serial communication, the “d+, gnd, and d-” terminals are available. These terminals are connected to the RS485 line as follows: the d+ cable to the d+ terminal; the d- cable to the d- terminal; and the gnd cable to the gnd terminal. An Ethernet socket is available for TCP protocol queries.

The following functions are supported on the device:

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

10H function: This function writes to the writeable addresses in the Modbus table.

Definitions:

R/W: The value at this address can be read or written.

RO: The value at this address can only be read.

WO: Only writing can be done to this address.

4.1 Three-Phase Data

Three-Phase Data						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
0	Average Phase-to-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-to-Phase Voltage V12	float	RO	03H	V	
18	Phase-to-Phase Voltage V23	float	RO	03H	V	
20	Phase-to-Phase Voltage V31	float	RO	03H	V	
22	Average Phase-to-Phase Voltage	float	RO	03H	V	
24	Phase Sequence	int32t	RO	03H	-	

4.2 Phase Data

Phase Data						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
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	-	

4.3 THD Data

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

4.4 Harmonic Data

Harmonic Data						
Address	Parameter	Data Type	W/R	Function	Description	Default Value
600	V Harmonic 1 Ph 1	float	RO	03H	%	
602	V Harmonic 3 Ph 1	float	RO	03H	%	
604	V Harmonic 5 Ph 1	float	RO	03H	%	
606	V Harmonic 7 Ph 1	float	RO	03H	%	
608	V Harmonic 9 Ph 1	float	RO	03H	%	
610	V Harmonic 11 Ph 1	float	RO	03H	%	
612	V Harmonic 13 Ph 1	float	RO	03H	%	
614	V Harmonic 15 Ph 1	float	RO	03H	%	
616	V Harmonic 17 Ph 1	float	RO	03H	%	
618	V Harmonic 19 Ph 1	float	RO	03H	%	
620	V Harmonic 21 Ph 1	float	RO	03H	%	
622	V Harmonic 23 Ph 1	float	RO	03H	%	
624	V Harmonic 25 Ph 1	float	RO	03H	%	
626	V Harmonic 27 Ph 1	float	RO	03H	%	
628	V Harmonic 29 Ph 1	float	RO	03H	%	
630	V Harmonic 31 Ph 1	float	RO	03H	%	
632	V Harmonic 33 Ph 1	float	RO	03H	%	
634	V Harmonic 35 Ph 1	float	RO	03H	%	
636	V Harmonic 37 Ph 1	float	RO	03H	%	
638	V Harmonic 39 Ph 1	float	RO	03H	%	
640	V Harmonic 41 Ph 1	float	RO	03H	%	
642	V Harmonic 43 Ph 1	float	RO	03H	%	
644	V Harmonic 45 Ph 1	float	RO	03H	%	
646	V Harmonic 47 Ph 1	float	RO	03H	%	
648	V Harmonic 49 Ph 1	float	RO	03H	%	
650	V Harmonic 51 Ph 1	float	RO	03H	%	
652	V Harmonic 1 Ph 2	float	RO	03H	%	
654	V Harmonic 3 Ph 2	float	RO	03H	%	
656	V Harmonic 5 Ph 2	float	RO	03H	%	
658	V Harmonic 7 Ph 2	float	RO	03H	%	
660	V Harmonic 9 Ph 2	float	RO	03H	%	

662	V Harmonic 11 Ph 2	float	RO	03H	%	
664	V Harmonic 13 Ph 2	float	RO	03H	%	
666	V Harmonic 15 Ph 2	float	RO	03H	%	
668	V Harmonic 17 Ph 2	float	RO	03H	%	
670	V Harmonic 19 Ph 2	float	RO	03H	%	
672	V Harmonic 21 Ph 2	float	RO	03H	%	
674	V Harmonic 23 Ph 2	float	RO	03H	%	
676	V Harmonic 25 Ph 2	float	RO	03H	%	
678	V Harmonic 27 Ph 2	float	RO	03H	%	
680	V Harmonic 29 Ph 2	float	RO	03H	%	
682	V Harmonic 31 Ph 2	float	RO	03H	%	
684	V Harmonic 33 Ph 2	float	RO	03H	%	
686	V Harmonic 35 Ph 2	float	RO	03H	%	
688	V Harmonic 37 Ph 2	float	RO	03H	%	
690	V Harmonic 39 Ph 2	float	RO	03H	%	
692	V Harmonic 41 Ph 2	float	RO	03H	%	
694	V Harmonic 43 Ph 2	float	RO	03H	%	
696	V Harmonic 45 Ph 2	float	RO	03H	%	
698	V Harmonic 47 Ph 2	float	RO	03H	%	
700	V Harmonic 49 Ph 2	float	RO	03H	%	
702	V Harmonic 51 Ph 2	float	RO	03H	%	
704	V Harmonic 1 Ph 3	float	RO	03H	%	
706	V Harmonic 3 Ph 3	float	RO	03H	%	
708	V Harmonic 5 Ph 3	float	RO	03H	%	
710	V Harmonic 7 Ph 3	float	RO	03H	%	
712	V Harmonic 9 Ph 3	float	RO	03H	%	
714	V Harmonic 11 Ph 3	float	RO	03H	%	
716	V Harmonic 13 Ph 3	float	RO	03H	%	
718	V Harmonic 15 Ph 3	float	RO	03H	%	
720	V Harmonic 17 Ph 3	float	RO	03H	%	
722	V Harmonic 19 Ph 3	float	RO	03H	%	
724	V Harmonic 21 Ph 3	float	RO	03H	%	
726	V Harmonic 23 Ph 3	float	RO	03H	%	
728	V Harmonic 25 Ph 3	float	RO	03H	%	
730	V Harmonic 27 Ph 3	float	RO	03H	%	
732	V Harmonic 29 Ph 3	float	RO	03H	%	
734	V Harmonic 31 Ph 3	float	RO	03H	%	
736	V Harmonic 33 Ph 3	float	RO	03H	%	
738	V Harmonic 35 Ph 3	float	RO	03H	%	
740	V Harmonic 37 Ph 3	float	RO	03H	%	
742	V Harmonic 39 Ph 3	float	RO	03H	%	
744	V Harmonic 41 Ph 3	float	RO	03H	%	
746	V Harmonic 43 Ph 3	float	RO	03H	%	

748	V Harmonic 45 Ph 3	float	RO	03H	%	
750	V Harmonic 47 Ph 3	float	RO	03H	%	
752	V Harmonic 49 Ph 3	float	RO	03H	%	
754	V Harmonic 51 Ph 3	float	RO	03H	%	
756	I Harmonic 1 Ph 1	float	RO	03H	%	
758	I Harmonic 3 Ph 1	float	RO	03H	%	
760	I Harmonic 5 Ph 1	float	RO	03H	%	
762	I Harmonic 7 Ph 1	float	RO	03H	%	
764	I Harmonic 9 Ph 1	float	RO	03H	%	
766	I Harmonic 11 Ph 1	float	RO	03H	%	
768	I Harmonic 13 Ph 1	float	RO	03H	%	
770	I Harmonic 15 Ph 1	float	RO	03H	%	
772	I Harmonic 17 Ph 1	float	RO	03H	%	
774	I Harmonic 19 Ph 1	float	RO	03H	%	
776	I Harmonic 21 Ph 1	float	RO	03H	%	
778	I Harmonic 23 Ph 1	float	RO	03H	%	
780	I Harmonic 25 Ph 1	float	RO	03H	%	
782	I Harmonic 27 Ph 1	float	RO	03H	%	
784	I Harmonic 29 Ph 1	float	RO	03H	%	
786	I Harmonic 31 Ph 1	float	RO	03H	%	
788	I Harmonic 33 Ph 1	float	RO	03H	%	
790	I Harmonic 35 Ph 1	float	RO	03H	%	
792	I Harmonic 37 Ph 1	float	RO	03H	%	
794	I Harmonic 39 Ph 1	float	RO	03H	%	
796	I Harmonic 41 Ph 1	float	RO	03H	%	
798	I Harmonic 43 Ph 1	float	RO	03H	%	
800	I Harmonic 45 Ph 1	float	RO	03H	%	
802	I Harmonic 47 Ph 1	float	RO	03H	%	
804	I Harmonic 49 Ph 1	float	RO	03H	%	
806	I Harmonic 51 Ph 1	float	RO	03H	%	
808	I Harmonic 1 Ph 2	float	RO	03H	%	
810	I Harmonic 3 Ph 2	float	RO	03H	%	
812	I Harmonic 5 Ph 2	float	RO	03H	%	
814	I Harmonic 7 Ph 2	float	RO	03H	%	
816	I Harmonic 9 Ph 2	float	RO	03H	%	
818	I Harmonic 11 Ph 2	float	RO	03H	%	
820	I Harmonic 13 Ph 2	float	RO	03H	%	
822	I Harmonic 15 Ph 2	float	RO	03H	%	
824	I Harmonic 17 Ph 2	float	RO	03H	%	
826	I Harmonic 19 Ph 2	float	RO	03H	%	
828	I Harmonic 21 Ph 2	float	RO	03H	%	
830	I Harmonic 23 Ph 2	float	RO	03H	%	
832	I Harmonic 25 Ph 2	float	RO	03H	%	

834	I Harmonic 27 Ph 2	float	RO	03H	%	
836	I Harmonic 29 Ph 2	float	RO	03H	%	
838	I Harmonic 31 Ph 2	float	RO	03H	%	
840	I Harmonic 33 Ph 2	float	RO	03H	%	
842	I Harmonic 35 Ph 2	float	RO	03H	%	
844	I Harmonic 37 Ph 2	float	RO	03H	%	
846	I Harmonic 39 Ph 2	float	RO	03H	%	
848	I Harmonic 41 Ph 2	float	RO	03H	%	
850	I Harmonic 43 Ph 2	float	RO	03H	%	
852	I Harmonic 45 Ph 2	float	RO	03H	%	
854	I Harmonic 47 Ph 2	float	RO	03H	%	
856	I Harmonic 49 Ph 2	float	RO	03H	%	
858	I Harmonic 51 Ph 2	float	RO	03H	%	
860	I Harmonic 1 Ph 3	float	RO	03H	%	
862	I Harmonic 3 Ph 3	float	RO	03H	%	
864	I Harmonic 5 Ph 3	float	RO	03H	%	
866	I Harmonic 7 Ph 3	float	RO	03H	%	
868	I Harmonic 9 Ph 3	float	RO	03H	%	
870	I Harmonic 11 Ph 3	float	RO	03H	%	
872	I Harmonic 13 Ph 3	float	RO	03H	%	
874	I Harmonic 15 Ph 3	float	RO	03H	%	
876	I Harmonic 17 Ph 3	float	RO	03H	%	
878	I Harmonic 19 Ph 3	float	RO	03H	%	
880	I Harmonic 21 Ph 3	float	RO	03H	%	
882	I Harmonic 23 Ph 3	float	RO	03H	%	
884	I Harmonic 25 Ph 3	float	RO	03H	%	
886	I Harmonic 27 Ph 3	float	RO	03H	%	
888	I Harmonic 29 Ph 3	float	RO	03H	%	
890	I Harmonic 31 Ph 3	float	RO	03H	%	
892	I Harmonic 33 Ph 3	float	RO	03H	%	
894	I Harmonic 35 Ph 3	float	RO	03H	%	
896	I Harmonic 37 Ph 3	float	RO	03H	%	
898	I Harmonic 39 Ph 3	float	RO	03H	%	
900	I Harmonic 41 Ph 3	float	RO	03H	%	
902	I Harmonic 43 Ph 3	float	RO	03H	%	
904	I Harmonic 45 Ph 3	float	RO	03H	%	
906	I Harmonic 47 Ph 3	float	RO	03H	%	
908	I Harmonic 49 Ph 3	float	RO	03H	%	
910	I Harmonic 51 Ph 3	float	RO	03H	%	

4.5 Energy Data

Energy Data						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
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	
1132	Phase 1 T2 Import Active Energy	double	RO	03H	Wh	
1136	Phase 2 T2 Import Active Energy	double	RO	03H	Wh	
1140	Phase 3 T2 Import Active Energy	double	RO	03H	Wh	
1144	Total T2 Export Active Energy	double	RO	03H	Wh	
1148	Phase 1 T2 Export Active Energy	double	RO	03H	Wh	
1152	Phase 2 T2 Export Active Energy	double	RO	03H	Wh	
1156	Phase 3 T2 Export Active Energy	double	RO	03H	Wh	

1160	Total T2 Import Reactive Energy	double	RO	03H	VArh	
1164	Phase 1 T2 Import Reactive Energy	double	RO	03H	VArh	
1168	Phase 2 T2 Import Reactive Energy	double	RO	03H	VArh	
1172	Phase 3 T2 Import Reactive Energy	double	RO	03H	VArh	
1176	Total T2 Export Reactive Energy	double	RO	03H	VArh	
1180	Phase 1 T2 Export Reactive Energy	double	RO	03H	VArh	
1184	Phase 2 T2 Export Reactive Energy	double	RO	03H	VArh	
1188	Phase 3 T2 Export Reactive Energy	double	RO	03H	VArh	
1192	Total T1-1 Import Active Energy	double	RO	03H	Wh	
1196	Phase 1 T1-1 Import Active Energy	double	RO	03H	Wh	
1200	Phase 2 T1-1 Import Active Energy	double	RO	03H	Wh	
1204	Phase 3 T1-1 Import Active Energy	double	RO	03H	Wh	
1208	Total T1-1 Export Active Energy	double	RO	03H	Wh	
1212	Phase 1 T1-1 Export Active Energy	double	RO	03H	Wh	
1216	Phase 2 T1-1 Export Active Energy	double	RO	03H	Wh	
1220	Phase 3 T1-1 Export Active Energy	double	RO	03H	Wh	
1224	Total T1-1 Import Reactive Energy	double	RO	03H	VArh	
1228	Phase 1 T1-1 Import Reactive Energy	double	RO	03H	VArh	
1232	Phase 2 T1-1 Import Reactive Energy	double	RO	03H	VArh	
1236	Phase 3 T1-1 Import Reactive Energy	double	RO	03H	VArh	
1240	Total T1-1 Export Reactive Energy	double	RO	03H	VArh	
1244	Phase 1 T1-1 Export Reactive Energy	double	RO	03H	VArh	
1248	Phase 2 T1-1 Export Reactive Energy	double	RO	03H	VArh	
1252	Phase 3 T1-1 Export Reactive Energy	double	RO	03H	VArh	
1256	Total T1-2 Import Active Energy	double	RO	03H	Wh	
1260	Phase 1 T1-2 Import Active Energy	double	RO	03H	Wh	
1264	Phase 2 T1-2 Import Active Energy	double	RO	03H	Wh	
1268	Phase 3 T1-2 Import Active Energy	double	RO	03H	Wh	
1272	Total T1-2 Export Active Energy	double	RO	03H	Wh	
1276	Phase 1 T1-2 Export Active Energy	double	RO	03H	Wh	
1280	Phase 2 T1-2 Export Active Energy	double	RO	03H	Wh	
1284	Phase 3 T1-2 Export Active Energy	double	RO	03H	Wh	
1288	Total T1-2 Import Reactive Energy	double	RO	03H	VArh	
1292	Phase 1 T1-2 Import Reactive Energy	double	RO	03H	VArh	
1296	Phase 2 T1-2 Import Reactive Energy	double	RO	03H	VArh	
1300	Phase 3 T1-2 Import Reactive Energy	double	RO	03H	VArh	
1304	Total T1-2 Export Reactive Energy	double	RO	03H	VArh	
1308	Phase 1 T1-2 Export Reactive Energy	double	RO	03H	VArh	
1312	Phase 2 T1-2 Export Reactive Energy	double	RO	03H	VArh	
1316	Phase 3 T1-2 Export Reactive Energy	double	RO	03H	VArh	
1320	Total T1-3 Import Active Energy	double	RO	03H	Wh	
1324	Phase 1 T1-3 Import Active Energy	double	RO	03H	Wh	
1328	Phase 2 T1-3 Import Active Energy	double	RO	03H	Wh	

1332	Phase 3 T1-3 Import Active Energy	double	RO	03H	Wh	
1336	Total T1-3 Export Active Energy	double	RO	03H	Wh	
1340	Phase 1 T1-3 Export Active Energy	double	RO	03H	Wh	
1344	Phase 2 T1-3 Export Active Energy	double	RO	03H	Wh	
1348	Phase 3 T1-3 Export Active Energy	double	RO	03H	Wh	
1352	Total T1-3 Import Reactive Energy	double	RO	03H	VArh	
1356	Phase 1 T1-3 Import Reactive Energy	double	RO	03H	VArh	
1360	Phase 2 T1-3 Import Reactive Energy	double	RO	03H	VArh	
1364	Phase 3 T1-3 Import Reactive Energy	double	RO	03H	VArh	
1368	Total T1-3 Export Reactive Energy	double	RO	03H	VArh	
1372	Phase 1 T1-3 Export Reactive Energy	double	RO	03H	VArh	
1376	Phase 2 T1-3 Export Reactive Energy	double	RO	03H	VArh	
1380	Phase 3 T1-3 Export Reactive Energy	double	RO	03H	VArh	
1384	Total T1-4 Import Active Energy	double	RO	03H	Wh	
1388	Phase 1 T1-4 Import Active Energy	double	RO	03H	Wh	
1392	Phase 2 T1-4 Import Active Energy	double	RO	03H	Wh	
1396	Phase 3 T1-4 Import Active Energy	double	RO	03H	Wh	
1400	Total T1-4 Export Active Energy	double	RO	03H	Wh	
1404	Phase 1 T1-4 Export Active Energy	double	RO	03H	Wh	
1408	Phase 2 T1-4 Export Active Energy	double	RO	03H	Wh	
1412	Phase 3 T1-4 Export Active Energy	double	RO	03H	Wh	
1416	Total T1-4 Import Reactive Energy	double	RO	03H	VArh	
1420	Phase 1 T1-4 Import Reactive Energy	double	RO	03H	VArh	
1424	Phase 2 T1-4 Import Reactive Energy	double	RO	03H	VArh	
1428	Phase 3 T1-4 Import Reactive Energy	double	RO	03H	VArh	
1432	Total T1-4 Export Reactive Energy	double	RO	03H	VArh	
1436	Phase 1 T1-4 Export Reactive Energy	double	RO	03H	VArh	
1440	Phase 2 T1-4 Export Reactive Energy	double	RO	03H	VArh	
1444	Phase 3 T1-4 Export Reactive Energy	double	RO	03H	VArh	
1448	Total T3 Import Active Energy	double	RO	03H	Wh	
1452	Phase 1 T3 Import Active Energy	double	RO	03H	Wh	
1456	Phase 2 T3 Import Active Energy	double	RO	03H	Wh	
1460	Phase 3 T3 Import Active Energy	double	RO	03H	Wh	
1464	Total T3 Export Active Energy	double	RO	03H	Wh	
1468	Phase 1 T3 Export Active Energy	double	RO	03H	Wh	
1472	Phase 2 T3 Export Active Energy	double	RO	03H	Wh	
1476	Phase 3 T3 Export Active Energy	double	RO	03H	Wh	
1480	Total T3 Import Reactive Energy	double	RO	03H	VArh	
1484	Phase 1 T3 Import Reactive Energy	double	RO	03H	VArh	
1488	Phase 2 T3 Import Reactive Energy	double	RO	03H	VArh	
1492	Phase 3 T3 Import Reactive Energy	double	RO	03H	VArh	
1496	Total T3 Export Reactive Energy	double	RO	03H	VArh	
1500	Phase 1 T3 Export Reactive Energy	double	RO	03H	VArh	

1504	Phase 2 T3 Export Reactive Energy	double	RO	03H	VArh	
1508	Phase 3 T3 Export Reactive Energy	double	RO	03H	VArh	

4.6 Demand Data

Demand Data						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
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	A	
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	A	
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: Maximum demand data measured by the device.*

4.7 Min. / Max. Data

Min/Max Data						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
4000	Minimum Phase 1 Voltage	float	RO	03H	V	
4002	Minimum Phase 2 Voltage	float	RO	03H	V	
4004	Minimum Phase 3 Voltage	float	RO	03H	V	
4006	Minimum Phase 1-2 Voltage	float	RO	03H	V	
4008	Minimum Phase 2-3 Voltage	float	RO	03H	V	
4010	Minimum Phase 3-1 Voltage	float	RO	03H	V	
4012	Minimum Phase 1 Current	float	RO	03H	A	
4014	Minimum Phase 2 Current	float	RO	03H	A	
4016	Minimum Phase 3 Current	float	RO	03H	A	
4018	Minimum Phase 1 Import Active Power	float	RO	03H	W	
4020	Minimum Phase 2 Import Active Power	float	RO	03H	W	

4022	Minimum Phase 3 Import Active Power	float	RO	03H	W	
4024	Minimum Phase 1 Export Active Power	float	RO	03H	W	
4026	Minimum Phase 2 Export Active Power	float	RO	03H	W	
4028	Minimum Phase 3 Export Active Power	float	RO	03H	W	
4030	Minimum Phase 1 Import Reactive Power	float	RO	03H	VAr	
4032	Minimum Phase 2 Import Reactive Power	float	RO	03H	VAr	
4034	Minimum Phase 3 Import Reactive Power	float	RO	03H	VAr	
4036	Minimum Phase 1 Export Reactive Power	float	RO	03H	VAr	
4038	Minimum Phase 2 Export Reactive Power	float	RO	03H	VAr	
4040	Minimum Phase 3 Export Reactive Power	float	RO	03H	VAr	
4042	Minimum Phase 1 Apparent Power	float	RO	03H	VA	
4044	Minimum Phase 2 Apparent Power	float	RO	03H	VA	
4046	Minimum Phase 3 Apparent Power	float	RO	03H	VA	
4048	Minimum Phase 1 Import Power Factor	float	RO	03H	-	
4050	Minimum Phase 2 Import Power Factor	float	RO	03H	-	
4052	Minimum Phase 3 Import Power Factor	float	RO	03H	-	
4054	Minimum Phase 1 Export Power Factor	float	RO	03H	-	
4056	Minimum Phase 2 Export Power Factor	float	RO	03H	-	
4058	Minimum Phase 3 Export Power Factor	float	RO	03H	-	
4060	Minimum Average Phase-to-Neutral Voltage	float	RO	03H	V	
4062	Minimum Average Phase-to-Phase Voltage	float	RO	03H	V	
4064	Minimum Total Current	float	RO	03H	A	
4066	Minimum Total Import Active Power	float	RO	03H	W	
4068	Minimum Total Export Active Power	float	RO	03H	W	
4070	Minimum Total Import Reactive Power	float	RO	03H	VAr	
4072	Minimum Total Export Reactive Power	float	RO	03H	VAr	
4074	Minimum Total Apparent Power	float	RO	03H	VA	
4076	Minimum Total Import Power Factor	float	RO	03H	-	
4078	Minimum Total Export Power Factor	float	RO	03H	-	
4080	Minimum Neutral Current	float	RO	03H	A	
4082	Minimum Frequency	float	RO	03H	Hz	
4084	Maximum Phase 1 Voltage	float	RO	03H	V	
4086	Maximum Phase 2 Voltage	float	RO	03H	V	
4088	Maximum Phase 3 Voltage	float	RO	03H	V	
4090	Maximum Phase 1-2 Voltage	float	RO	03H	V	
4092	Maximum Phase 2-3 Voltage	float	RO	03H	V	
4094	Maximum Phase 3-1 Voltage	float	RO	03H	V	
4096	Maximum Phase 1 Current	float	RO	03H	A	
4098	Maximum Phase 2 Current	float	RO	03H	A	
4100	Maximum Phase 3 Current	float	RO	03H	A	
4102	Maximum Phase 1 Import Active Power	float	RO	03H	W	
4104	Maximum Phase 2 Import Active Power	float	RO	03H	W	
4106	Maximum Phase 3 Import Active Power	float	RO	03H	W	

4108	Maximum Phase 1 Export Active Power	float	RO	03H	W	
4110	Maximum Phase 2 Export Active Power	float	RO	03H	W	
4112	Maximum Phase 3 Export Active Power	float	RO	03H	W	
4114	Maximum Phase 1 Import Reactive Power	float	RO	03H	VAr	
4116	Maximum Phase 2 Import Reactive Power	float	RO	03H	VAr	
4118	Maximum Phase 3 Import Reactive Power	float	RO	03H	VAr	
4120	Maximum Phase 1 Export Reactive Power	float	RO	03H	VAr	
4122	Maximum Phase 2 Export Reactive Power	float	RO	03H	VAr	
4124	Maximum Phase 3 Export Reactive Power	float	RO	03H	VAr	
4126	Maximum Phase 1 Apparent Power	float	RO	03H	VA	
4128	Maximum Phase 2 Apparent Power	float	RO	03H	VA	
4130	Maximum Phase 3 Apparent Power	float	RO	03H	VA	
4132	Maximum Phase 1 Import Power Factor	float	RO	03H	-	
4134	Maximum Phase 2 Import Power Factor	float	RO	03H	-	
4136	Maximum Phase 3 Import Power Factor	float	RO	03H	-	
4138	Maximum Phase 1 Export Power Factor	float	RO	03H	-	
4140	Maximum Phase 2 Export Power Factor	float	RO	03H	-	
4142	Maximum Phase 3 Export Power Factor	float	RO	03H	-	
4144	Maximum Average Phase-to-Neutral Voltage	float	RO	03H	V	
4146	Maximum Average Phase-to-Phase Voltage	float	RO	03H	V	
4148	Maximum Total Current	float	RO	03H	A	
4150	Maximum Total Import Active Power	float	RO	03H	W	
4152	Maximum Total Export Active Power	float	RO	03H	W	
4154	Maximum Total Import Reactive Power	float	RO	03H	VAr	
4156	Maximum Total Export Reactive Power	float	RO	03H	VAr	
4158	Maximum Total Apparent Power	float	RO	03H	VA	
4160	Maximum Total Import Power Factor	float	RO	03H	-	
4162	Maximum Total Export Power Factor	float	RO	03H	-	
4164	Maximum Neutral Current	float	RO	03H	A	
4166	Maximum Frequency	float	RO	03H	Hz	

4.8 Digital Input Counters

Digital Input Counters						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
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	

4.9 General Counters

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

4.10 Unbalance Data

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

4.11 4Q Energy Data

4-Quadrant Reactive Energy Data						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
8000	Total Reactive Energy in Q1	double	RO	03H	VArh	
8004	Total Phase 1 Reactive Energy in Q1	double	RO	03H	VArh	
8008	Total Phase 2 Reactive Energy in Q1	double	RO	03H	VArh	
8012	Total Phase 3 Reactive Energy in Q1	double	RO	03H	VArh	
8016	Total Reactive Energy in Q2	double	RO	03H	VArh	
8020	Total Phase 1 Reactive Energy in Q2	double	RO	03H	VArh	
8024	Total Phase 2 Reactive Energy in Q2	double	RO	03H	VArh	
8028	Total Phase 3 Reactive Energy in Q2	double	RO	03H	VArh	
8032	Total Reactive Energy in Q3	double	RO	03H	VArh	
8036	Total Phase 1 Reactive Energy in Q3	double	RO	03H	VArh	
8040	Total Phase 2 Reactive Energy in Q3	double	RO	03H	VArh	
8044	Total Phase 3 Reactive Energy in Q3	double	RO	03H	VArh	
8048	Total Reactive Energy in Q4	double	RO	03H	VArh	
8052	Total Phase 1 Reactive Energy in Q4	double	RO	03H	VArh	
8056	Total Phase 2 Reactive Energy in Q4	double	RO	03H	VArh	
8060	Total Phase 3 Reactive Energy in Q4	double	RO	03H	VArh	
8064	T1 Q1 Reactive Energy	double	RO	03H	VArh	
8068	T1 Phase 1 Q1 Reactive Energy	double	RO	03H	VArh	
8072	T1 Phase 2 Q1 Reactive Energy	double	RO	03H	VArh	
8076	T1 Phase 3 Q1 Reactive Energy	double	RO	03H	VArh	
8080	T1 Q2 Reactive Energy	double	RO	03H	VArh	
8084	T1 Phase 1 Q2 Reactive Energy	double	RO	03H	VArh	
8088	T1 Phase 2 Q2 Reactive Energy	double	RO	03H	VArh	
8092	T1 Phase 3 Q2 Reactive Energy	double	RO	03H	VArh	
8096	T1 Q3 Reactive Energy	double	RO	03H	VArh	
8100	T1 Phase 1 Q3 Reactive Energy	double	RO	03H	VArh	

8104	T1 Phase 2 Q3 Reactive Energy	double	RO	03H	VArh	
8108	T1 Phase 3 Q3 Reactive Energy	double	RO	03H	VArh	
8112	T1 Q4 Reactive Energy	double	RO	03H	VArh	
8116	T1 Phase 1 Q4 Reactive Energy	double	RO	03H	VArh	
8120	T1 Phase 2 Q4 Reactive Energy	double	RO	03H	VArh	
8124	T1 Phase 3 Q4 Reactive Energy	double	RO	03H	VArh	
8128	T2 Q1 Reactive Energy	double	RO	03H	VArh	
8132	T2 Phase 1 Q1 Reactive Energy	double	RO	03H	VArh	
8136	T2 Phase 2 Q1 Reactive Energy	double	RO	03H	VArh	
8140	T2 Phase 3 Q1 Reactive Energy	double	RO	03H	VArh	
8144	T2 Q2 Reactive Energy	double	RO	03H	VArh	
8148	T2 Phase 1 Q2 Reactive Energy	double	RO	03H	VArh	
8152	T2 Phase 2 Q2 Reactive Energy	double	RO	03H	VArh	
8156	T2 Phase 3 Q2 Reactive Energy	double	RO	03H	VArh	
8160	T2 Q3 Reactive Energy	double	RO	03H	VArh	
8164	T2 Phase 1 Q3 Reactive Energy	double	RO	03H	VArh	
8168	T2 Phase 2 Q3 Reactive Energy	double	RO	03H	VArh	
8172	T2 Phase 3 Q3 Reactive Energy	double	RO	03H	VArh	
8176	T2 Q4 Reactive Energy	double	RO	03H	VArh	
8180	T2 Phase 1 Q4 Reactive Energy	double	RO	03H	VArh	
8184	T2 Phase 2 Q4 Reactive Energy	double	RO	03H	VArh	
8188	T2 Phase 3 Q4 Reactive Energy	double	RO	03H	VArh	
8192	T3 Q1 Reactive Energy	double	RO	03H	VArh	
8196	T3 Phase 1 Q1 Reactive Energy	double	RO	03H	VArh	
8200	T3 Phase 2 Q1 Reactive Energy	double	RO	03H	VArh	
8204	T3 Phase 3 Q1 Reactive Energy	double	RO	03H	VArh	
8208	T3 Q2 Reactive Energy	double	RO	03H	VArh	
8212	T3 Phase 1 Q2 Reactive Energy	double	RO	03H	VArh	
8216	T3 Phase 2 Q2 Reactive Energy	double	RO	03H	VArh	
8220	T3 Phase 3 Q2 Reactive Energy	double	RO	03H	VArh	
8224	T3 Q3 Reactive Energy	double	RO	03H	VArh	
8228	T3 Phase 1 Q3 Reactive Energy	double	RO	03H	VArh	
8232	T3 Phase 2 Q3 Reactive Energy	double	RO	03H	VArh	
8236	T3 Phase 3 Q3 Reactive Energy	double	RO	03H	VArh	
8240	T3 Q4 Reactive Energy	double	RO	03H	VArh	
8244	T3 Phase 1 Q4 Reactive Energy	double	RO	03H	VArh	
8248	T3 Phase 2 Q4 Reactive Energy	double	RO	03H	VArh	
8252	T3 Phase 3 Q4 Reactive Energy	double	RO	03H	VArh	

4.12 Preset Total Energy Data

Preset Total Energy Data

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

IP Address, Subnet Mask, and Gateway Address parameters are written and read as 32 bits. For example, when you want to write the default IP address, “192.168.34.70”, to the device, you should follow these steps: The value “192.168.34.70” is divided into 4 parts of 8 bits each. 192 is separated as 0xC0, 168 as 0xA8, 34 as 0x22, and 70 as 0x46. The decimal equivalent of the resulting 32-bit number 0xC0A82246, which is 3232244294, should be written to the relevant register.

4.13 Configuration

4.13.1 Configuration Activation

Configuration Activation						
Address	Parameter	Data Type	W/R	Function	Description	Default Value
15000	Device Password	uint32_t	W	10H	1 - 9999999	1

To write any data to the device via communication, the password set on the device must be entered into the "Configuration Activation" field at 15000.

4.13.2 Serial Communication Configuration

Serial Communication Configuration						
Address	Parameter	Data Type	W/R	Function	Description	Default Value
10000	Baudrate	uint32_t	R/W	03H/10H	0 - 1200 1 - 2400 2 - 4800 3 - 9600 4 - 19200 5 - 38400 6 - 57600	5
10002	Parity	uint32_t	R/W	03H/10H	0 - NONE 1 - ODD 2 - EVEN	0
10004	Stop Bit	uint32_t	R/W	03H/10H	0 - STOP 1 1 - STOP 2	0
10006	Endiennes	uint32_t	R/W	03H/10H	0 - BE 1 - LE 2 - BE SWAP 3 - LE SWAP	0

4.13.3 General Communication Configuration

General Communication Configuration						
Address	Parameter	Data Type	W/R	Function	Description	Default Value

10900	Slave ID	uint32_t	R/W	03H/10H	1-247	1
10902	Communication Interface	uint32_T	R/W	03H/10H	0: RTU 1: TCP	0

4.13.4 Ethernet Communication Configuration

Ethernet Communication Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
11000	IP Address	uint32_t	R/W	03H/10H	0 - 4294967295	3232244294
11002	Subnet Mask	uint32_t	R/W	03H/10H	0 - 4294967295	4294965248
11004	Gateway Address	uint32_t	R/W	03H/10H	0 - 4294967295	3232244734
11006	Port	uint32_t	R/W	03H/10H	0 - 65535	502
11008	Timeout	uint32_t	R/W	03H/10H	500 – 50000 ms	1000

4.13.5 Sag & Swell Configuration

Sag & Swell Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
11200	Sag Status	uint32_t	R/W	03H/10H	0-OFF 1-ON	0
11202	Sag Limit	uint32_t	R/W	03H/10H	75-95(%Un)	95
11204	Sag Hysteresis	uint32_t	R/W	03H/10H	0-5(%)	5
11206	Swell Status	uint32_t	R/W	03H/10H	0-OFF 1-ON	0
11208	Swell Limit	uint32_t	R/W	03H/10H	105-140(%Un)	105
11210	Swell Hysteresis	uint32_t	R/W	03H/10H	0-5(%)	5

4.13.6 Digital Output 1 Configuration

Digital Output 1 Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10100	Output 1 Source	uint32_t	R/W	03H/10H	0: OFF 1: Total Imp. Active Energy 2: Total Exp. Active Energy 3: Total Imp. Reactive Energy 4: Total Exp. Reactive Energy 5: T1 Imp. Active Energy 6: T1 Exp. Active Energy 7: T1 Imp. Reactive Energy 8: T1 Exp. Reactive Energy 9: T1.1 Imp. Active Energy 10: T1.1 Exp. Active Energy 11: T1.1 Imp. Reactive Energy 12: T1.1 Exp. Reactive Energy 13: T1.2 Imp. Active Energy 14: T1.2 Exp. Active Energy 15: T1.2 Imp. Reactive Energy 16: T1.2 Exp. Reactive Energy	1

					17: T1.3 Imp. Active Energy 18: T1.3 Exp. Active Energy 19: T1.3 Imp. Reactive Energy 20: T1.3 Exp. Reactive Energy 21: T1.4 Imp. Active Energy 22: T1.4 Exp. Active Energy 23: T1.4 Imp. Reactive Energy 24: T1.4 Exp. Reactive Energy 25: T2 Imp. Active Energy 26: T2 Exp. Active Energy 27: T2 Imp. Reactive Energy 28: T2 Exp. Reactive Energy 29: T3 Imp. Active Energy 30: T3 Exp. Active Energy 31: T3 Imp. Reactive Energy 32: T3 Exp. Reactive Energy 33: Digital Input 1 34: Digital Input 2	
10102	Output 1 Energy	double	R/W	03H/10H	0- 1000000000000.0 (Wh/Varh)	1000
10106	Output 1 Width	uint32_t	R/W	03H/10H	30-2500(ms)	100
10108	Output 1 Multiplier	uint32_t	R/W	03H/10H	1-10000	1

4.13.7 Digital Output 2 Configuration

Digital Output 2 Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10200	Output 2 Source	uint32_t	R/W	03H/10H	0: OFF 1: Total Imp. Active Energy 2: Total Exp. Active Energy 3: Total Imp. Reactive Energy 4: Total Exp. Reactive Energy 5: T1 Imp. Active Energy 6: T1 Exp. Active Energy 7: T1 Imp. Reactive Energy 8: T1 Exp. Reactive Energy 9: T1.1 Imp. Active Energy 10: T1.1 Exp. Active Energy 11: T1.1 Imp. Reactive Energy 12: T1.1 Exp. Reactive Energy 13: T1.2 Imp. Active Energy 14: T1.2 Exp. Active Energy 15: T1.2 Imp. Reactive Energy 16: T1.2 Exp. Reactive Energy 17: T1.3 Imp. Active Energy 18: T1.3 Exp. Active Energy 19: T1.3 Imp. Reactive Energy 20: T1.3 Exp. Reactive Energy 21: T1.4 Imp. Active Energy	1

					22: T1.4 Exp. Active Energy 23: T1.4 Imp. Reactive Energy 24: T1.4 Exp. Reactive Energy 25: T2 Imp. Active Energy 26: T2 Exp. Active Energy 27: T2 Imp. Reactive Energy 28: T2 Exp. Reactive Energy 29: T3 Imp. Active Energy 30: T3 Exp. Active Energy 31: T3 Imp. Reactive Energy 32: T3 Exp. Reactive Energy 33: Digital Input 1 34: Digital Input 2	
10202	Output 2 Energy	double	R/W	03H/10H	0- 1000000000000.0 (Wh/Varh)	1000
10206	Output 2 Width	uint32_t	R/W	03H/10H	30-2500(ms)	100
10208	Output 2 Multiplier	uint32_t	R/W	03H/10H	1-10000	1

4.13.8 Digital Input Configuration

Digital Input Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
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(ms)	200
10304	Input 1 Edge	uint32_t	R/W	03H/10H	0- Rising 1- Falling 2- Both edges	2
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(ms)	200
10310	Input 2 Edge	uint32_t	R/W	03H/10H	0- Rising 1- Falling 2- Both edges	2

4.13.9 Network Configuration

Network Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10400	CT Primary	uint32_t	R/W	03H/10H	5-9999(A)	5
10402	CT Secondary	uint32_t	R/W	03H/10H	0- CT / 5 1- CT / 1	0
10404	VT Primary	float	R/W	03H/10H	100-999999(V)	230
10406	VT Secondary	float	R/W	03H/10H	100-500(V)	230
10408	System Frequency	uint32_t	R/W	03H/10H	0- 50Hz 1- 60Hz	0
10410	Connection Type	uint32_t	R/W	03H/10H	0- 3P4W	0

					1- 3P3W	
10412	Transformer Option	uint32_t	R/W	03H/10H	0- Unmultiplied 1- Multiplied	1
10414	Nominal Voltage	uint32_t	R/W	03H/10H	0- 100V 1- 110V 2- 115V 3- 120V 4- 127V 5- 220V 6- 230V 7- 240V	6 --> 230V
10416	Voltage Interruption Threshold	uint32_t	R/W	03H/10H	5-20V	10

4.13.10 Demand Configuration

Demand Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
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

4.13.11 Sub-Tariff Configuration

Sub-Tariff Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10600	Sub-Tariff-1	uint32_t	R/W	03H/10H	1- T1_1 2- T1_2 3- T1_3 4- T1_4	1
10602	Hours	uint32_t	R/W	03H/10H	0-23	0
10604	Minute	uint32_t	R/W	03H/10H	0-59	0
10606	Sub-Tariff-2	uint32_t	R/W	03H/10H	0- Passive 1- T1_1 2- T1_2 3- T1_3 4- T1_4	0
10608	Hours	uint32_t	R/W	03H/10H	0-23	0
10610	Minute	uint32_t	R/W	03H/10H	0-59	0
10612	Sub-Tariff-3	uint32_t	R/W	03H/10H	0- Passive 1- T1_1 2- T1_2 3- T1_3 4- T1_4	0

10614	Hours	uint32_t	R/W	03H/10H	0-23	0
10616	Minute	uint32_t	R/W	03H/10H	0-59	0
10618	Sub-Tariff-4	uint32_t	R/W	03H/10H	0- Passive 1- T1_1 2- T1_2 3- T1_3 4- T1_4	0
10620	Hours	uint32_t	R/W	03H/10H	0-23	0
10622	Minute	uint32_t	R/W	03H/10H	0-59	0
10624	Sub-Tariff-5	uint32_t	R/W	03H/10H	0- Passive 1- T1_1 2- T1_2 3- T1_3 4- T1_4	0
10626	Hours	uint32_t	R/W	03H/10H	0-23	0
10628	Minute	uint32_t	R/W	03H/10H	0-59	0
10630	Sub-Tariff-6	uint32_t	R/W	03H/10H	0- Passive 1- T1_1 2- T1_2 3- T1_3 4- T1_4	0
10632	Hours	uint32_t	R/W	03H/10H	0-23	0
10634	Minute	uint32_t	R/W	03H/10H	0-59	0
10636	Sub-Tariff-7	uint32_t	R/W	03H/10H	0- Passive 1- T1_1 2- T1_2 3- T1_3 4- T1_4	0
10638	Hours	uint32_t	R/W	03H/10H	0-23	0
10640	Minute	uint32_t	R/W	03H/10H	0-59	0
10642	Sub-Tariff-8	uint32_t	R/W	03H/10H	0- Passive 1- T1_1 2- T1_2 3- T1_3 4- T1_4	0
10644	Hours	uint32_t	R/W	03H/10H	0-23	0
10646	Minute	uint32_t	R/W	03H/10H	0-59	0
10648	Sub-Tariff-9	uint32_t	R/W	03H/10H	0- Passive 1- T1_1 2- T1_2 3- T1_3 4- T1_4	0
10650	Hours	uint32_t	R/W	03H/10H	0-23	0
10652	Minute	uint32_t	R/W	03H/10H	0-59	0

10654	Sub-Tariff-10	uint32_t	R/W	03H/10H	0- Passive 1- T1_1 2- T1_2 3- T1_3 4- T1_4	0
10656	Hours	uint32_t	R/W	03H/10H	0-23	0
10658	Minute	uint32_t	R/W	03H/10H	0-59	0

4.13.12 Alarm Configuration

Phase-to-Neutral Voltage Alarm Configuration						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10700	Phase-Neutral Voltage Low Limit	float	R/W	03H/10H	0,0-300.000.000,0 (V)	0,0
10702	Phase-Neutral Voltage High Limit	float	R/W	03H/10H	0,0-300.000.000,0 (V)	0,0
10704	Phase-Neutral Voltage Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10706	Phase-Neutral Voltage Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0
10708	Phase-Neutral Voltage Alarm Output	uint32_t	R/W	03H/10H	0 - Off 1- R1 2- R2	0

Phase-to-Phase Voltage Alarm Configuration						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10710	Phase-to-Phase Voltage Low Limit	float	R/W	03H/10H	0,0-300.000.000,0(V)	0,0
10712	Phase-to-Phase Voltage High Limit	float	R/W	03H/10H	0,0-300.000.000,0(V) (5?)	0,0
10714	Phase-to-Phase Voltage Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10716	Phase-to-Phase Voltage Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0
10718	Phase-to-Phase Voltage Alarm Output	uint32_t	R/W	03H/10H	0 - Off 1- R1 2- R2	0

Current Alarm Configuration						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10720	Low Current Limit	float	R/W	03H/10H	0,01-60.000,00(A)	0,0
10722	High Current Limit	float	R/W	03H/10H	0,01-60.000,00(A)	0,0
10724	Current Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10726	Current Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0

10728	Current Alarm Output	uint32_t	R/W	03H/10H	0 - Off 1- R1 2- R2	0

Active Power Alarm Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10730	Active Power Low Limit	float	R/W	03H/10H	0,0-1.8xE+13(W)	0,0
10732	Active Power High Limit	float	R/W	03H/10H	0,0-1.8xE+13(W)	0,0
10734	Active Power Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10736	Active Power Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0
10738	Active Power Alarm Output	uint32_t	R/W	03H/10H	0 - Off 1- R1 2- R2	0

Reactive Power Alarm Configuration						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10740	Reactive Power Low Limit	float	R/W	03H/10H	0,0-1.8xE+13(VAr)	0,0
10742	Reactive Power High Limit	float	R/W	03H/10H	0,0-1.8xE+13(VAr)	0,0
10744	Reactive Power Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10746	Reactive Power Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0
10748	Reactive Power Alarm Output	uint32_t	R/W	03H/10H	0 - Off 1- R1 2- R2	0

Apparent Power Alarm Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10750	Apparent Power Low Limit	float	R/W	03H/10H	0,0-1.8xE+13(VA)	0,0
10752	Apparent Power High Limit	float	R/W	03H/10H	0,0-1.8xE+13(VA)	0,0
10754	Apparent Power Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10756	Apparent Power Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0
10758	Apparent Power Alarm Output	uint32_t	R/W	03H/10H	0 - Off 1- R1 2- R2	0

Cos Ø Alarm Configuration						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10760	Cos Ø Low Limit	float	R/W	03H/10H	0,000-1,000	0,000
10762	Cos Ø High Limit	float	R/W	03H/10H	0,000-1,000	0,000
10764	Cos Ø Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10766	Cos Ø Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0

10768	Cos Ø Alarm Output	uint32_t	R/W	03H/10H	0- Off 1- R1 2- R2	0

Power Factor Alarm Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10770	Power Factor Low Limit	float	R/W	03H/10H	0,000-1,000	0,000
10772	Power Factor High Limit	float	R/W	03H/10H	0,000-1,000	0,000
10774	Power Factor Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10776	Power Factor Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0
10778	Power Factor Alarm Output	uint32_t	R/W	03H/10H	0- Off 1- R1 2- R2	0

Neutral Current Alarm Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10780	Neutral Current Low Limit	float	R/W	03H/10H	0,01-180.000,00(A)	0,0
10782	Neutral Current High Limit	float	R/W	03H/10H	0,01-180.000,00(A)	0,0
10784	Neutral Current Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10786	Neutral Current Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0
10788	Neutral Current Alarm Output	uint32_t	R/W	03H/10H	0 - Off 1- R1 2- R2	0

Frequency Alarm Configuration						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10790	Frequency Low Limit	float	R/W	03H/10H	45,0-65,0(Hz)	50,0
10792	Frequency High Limit	float	R/W	03H/10H	45,0-65,0(Hz)	50,0
10794	Frequency Alarm Delay	uint32_t	R/W	03H/10H	1-600(Second)	10
10796	Frequency Alarm Hysteresis	float	R/W	03H/10H	0,0-20,0(%)	5,0
10798	Frequency Alarm Output	uint32_t	R/W	03H/10H	0- Off 1- R1 2- R2	0

Voltage Harmonics Alarm Configuration						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10800	THD Voltage High Limit	float	R/W	03H/10H	0-100(%)	0
10802	V Harmonic 3 High Limit	float	R/W	03H/10H	0-100(%)	0
10804	V Harmonic 5 High Limit	float	R/W	03H/10H	0-100(%)	0
10806	V Harmonic 7 High Limit	float	R/W	03H/10H	0-100(%)	0
10808	V Harmonic 9 High Limit	float	R/W	03H/10H	0-100(%)	0

10810	V Harmonic 11 High Limit	float	R/W	03H/10H	0-100(%)	0
10812	V Harmonic 13 High Limit	float	R/W	03H/10H	0-100(%)	0
10814	V Harmonic 15 High Limit	float	R/W	03H/10H	0-100(%)	0
10816	V Harmonic 17 High Limit	float	R/W	03H/10H	0-100(%)	0
10818	V Harmonic 19 High Limit	float	R/W	03H/10H	0-100(%)	0
10820	V Harmonic 21 High Limit	float	R/W	03H/10H	0-100(%)	0
10822	Delay	uint32_t	R/W	03H/10H	1-600(Second)	1
10824	Voltage Harmonics Alarm Output	uint32_t	R/W	03H/10H	0 - Off 1 - R1 2 - R2	0

Current Harmonics Alarm Configuration						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
10830	THD Current High Limit	float	R/W	03H/10H	0-100(%)	0
10832	I Harmonic 3 High Limit	float	R/W	03H/10H	0-100(%)	0
10834	I Harmonic 5 High Limit	float	R/W	03H/10H	0-100(%)	0
10836	I Harmonic 7 High Limit	float	R/W	03H/10H	0-100(%)	0
10838	I Harmonic 9 High Limit	float	R/W	03H/10H	0-100(%)	0
10840	I Harmonic 11 High Limit	float	R/W	03H/10H	0-100(%)	0
10842	I Harmonic 13 High Limit	float	R/W	03H/10H	0-100(%)	0
10844	I Harmonic 15 High Limit	float	R/W	03H/10H	0-100(%)	0
10846	I Harmonic 17 High Limit	float	R/W	03H/10H	0-100(%)	0
10848	I Harmonic 19 High Limit	float	R/W	03H/10H	0-100(%)	0
10850	I Harmonic 21 High Limit	float	R/W	03H/10H	0-100(%)	0
10852	Delay	uint32_t	R/W	03H/10H	1-600(Second)	1
10854	Current Harmonics Alarm Output	uint32_t	R/W	03H/10H	0 - Off 1 - R1 2 - R2	0

4.13.13 Log Configuration

Log Configuration						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
11300	Method	uint32_t	R/W	03H/10H	0 – Method 1 1 – Method 2	0
11302	Voltage Data Recording Period	uint32_t	R/W	03H/10H	0-60 (Minute)	0
11304	Current Data Recording Period	uint32_t	R/W	03H/10H	0-60 (Minute)	0
11306	THD Data Recording Period	uint32_t	R/W	03H/10H	0-60 (Minute)	0
11308	Power Data Recording Period	uint32_t	R/W	03H/10H	0-60 (Minute)	0
11310	Energy Data Recording Period	uint32_t	R/W	03H/10H	0-60 (Minute)	0

Method 1: Records minimum, maximum, and average values for the following parameters in hourly/daily/monthly periods.

- VPH1
- VPH2
- VPH3
- VLL12
- VLL23
- VLL31
- P1
- P2
- P3
- Q1
- Q2
- Q3
- S1
- S2
- S3
- PF System
- Cos Ø System
- F

The total values of the following energy parameters are recorded.

- Total Imp. Active Energy
- Total Imp. Reactive Energy
- Total Exp. Active Energy
- Total Exp. Reactive Energy

Method 2: This method records the minimum, maximum, and average values of parameter headers between addresses 11302 and 11310 at user-defined intervals.

- **Method 2 Voltage Records**
  - Avg. Voltage PH1
  - Avg. Voltage PH2
  - Avg. Voltage PH3
  - Avg. Voltage L1L2
  - Avg. Voltage L2L3
  - Avg. Voltage L3L1
  - Avg. Frequency
  - Max. Voltage PH1
  - Max. Voltage PH2
  - Max. Voltage PH3
  - Max. Voltage L1L2
  - Max. Voltage L2L3
  - Max. Voltage L3L1
  - Max. Frequency
  - Min. Voltage PH1
  - Min. Voltage PH2
  - Min. Voltage PH3
  - Min. Voltage L1L2
  - Min. Voltage L2L3
  - Min. Voltage L3L1
  - Min. Frequency
- **Method 2 Current Records**
  - Avg. Current RMS
  - Avg. Current I1
  - Avg. Current I2
  - Avg. Current I3
  - Avg. Current IN
  - Max. Current RMS
  - Max. Current I1
  - Max. Current I2
  - Max. Current I3
  - Max. Current IN
  - Min. Current RMS
  - Min. Current I1
  - Min. Current I2
  - Min. Current I3
  - Min. Current IN
- **Method 2 THD Records**
  - Avg. THD VL1
  - Avg. THD VL2
  - Avg. THD VL3
  - Avg. THD VLL12
  - Avg. THD VLL23
  - Avg. THD VLL31
  - Avg. THD I1
  - Avg. THD I2

- Avg. THD I3
- Max. THD VL1
- Max. THD VL2
- Max. THD VL3
- Max. THD VLL12
- Max. THD VLL23
- Max. THD VLL31
- Max. THD I1
- Max. THD I2
- Max. THD I3
- Min. THD VL1
- Min. THD VL2
- Min. THD VL3
- Min. THD VLL12
- Min. THD VLL23
- Min. THD VLL31
- Min. THD I1
- Min. THD I2
- Min. THD I3

- **Method 2 Power Records**
  - Avg. RMS Active Power
  - Avg. RMS Reactive Power
  - Avg. Cos Ø 1
  - Avg. Cos Ø 2
  - Avg. Cos Ø 3
  - Avg. RMS Power Factor
  - Avg. Power Factor PH1
  - Avg. Power FactorPH2
  - Avg. Power FactorPH3
  - Avg. Frequency
  - Max. RMS Active Power
  - Max. RMS Reactive Power
  - Max. Cos Ø 1
  - Max. Cos Ø 2
  - Max. Cos Ø 3
  - Max. RMS Power Factor
  - Max. Power Factor PH1
  - Max. Power Factor PH2
  - Max. Power Factor PH3
  - Max. Frequency
  - Min. RMS Active Power
  - Min. RMS Reactive Power
  - Min. Cos Ø 1
  - Min. Cos Ø 2
  - Min. Cos Ø 3
  - Min. RMS Power Factor
  - Min. Power Factor PH1
  - Min. Power Factor PH2
  - Min. Power Factor PH3
  - Min. Frequency
- **Method 2 Energy Records**
  - Tot. Imp. Active Energy
  - Tot. Exp. Active Energy
  - Tot. Imp. Reactive Energy
  - Tot. Exp. Reactive Energy
  - Tot. Exp. Q1 Reactive Energy
  - Tot Exp. Q3 Reactive Energy
  - Tot Imp. Q1 Reactive Energy
  - Tot Imp. Q2 Reactive Energy

4.13.14 Energy Preset Value Assignment Configuration

Energy Preset Value Data						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
50000	Total Import Active Energy	double	RO	03H/10H	Wh	0
50004	Total Export Active Energy	double	RO	03H/10H	VArh	0
50008	Total Import Reactive Energy	double	RO	03H/10H	Wh	0
50012	Total Export Reactive Energy	double	RO	03H/10H	VArh	0

4.14 RTC

RTC Configuration						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
33000	Hour	uint16_t	R/W	03/10H	0-23	
33001	Minute	uint16_t	R/W	03/10H	0-59	

33002	Second	uint16_t	R/W	03/10H	0-59	
33003	Day	uint16_t	R/W	03/10H	1-31	
33004	Month	uint16_t	R/W	03/10H	1-12	
33005	Year	uint16_t	R/W	03/10H	2000- 2099	

4.15 Device Flags

Device Flags						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
45000	Error Flags	uint32_t	R	03H	0x00000001 – Pulse 1 Error 0x00000002 – Pulse 2 Error 0x00000004 – Current Error 0x00000008 – Phase Seq. Error	
45100	Alarm Flags	uint32_t	R	03H	0x00000001 – VLN Min. Alarm 0x00000002 – VLL Min. Alarm 0x00000004 – I Min. Alarm 0x00000008 – P Min. Alarm 0x00000010 – Q Min. Alarm 0x00000020 – S Min. Alarm 0x00000040 – Cos Ø Min. Alarm 0x00000080 – PF Min. Alarm 0x00000100 – IN Min. Alarm 0x00000200 – F Min. Alarm 0x00010000 – VLN Max. Alarm 0x00020000 – VLL Max. Alarm 0x00040000 – I Max. Alarm 0x00080000 – P Max. Alarm 0x00100000 – Q Max. Alarm 0x00200000 – S Max. Alarm 0x00400000 – Cos Ø Max. Alarm 0x00800000 – PF Max. Alarm 0x01000000 – IN Max. Alarm 0x02000000 – F Max. Alarm 0x04000000-Harm V Max. Alarm 0x08000000- Harm I Max. Alarm	
45200	Digital Input Flags	uint32_t	R	03H	0x00000001 – Input 1 0x00000002 – Input 2	

4.16 General Command List

Command List						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
20000	General Commands	uint16_t	W	06H	1000 - Save Settings 1100 - Reset to Default 1200 - Restart 1300 - Clear Demand Data	

					1400 - Clear Min./Max. Data 1500 - Clear Energy Data 1600 - Clear Input Counters Data 1700 - Activate Tariff 1 1800 - Activate Tariff 2 1900 - Activate Tariff 3 2000 - Clear Run Hour Counter 2100 - Clear Alarm Logs 2200 - Clear Event Logs 2300 - Clear Data Logs 2400 - Clear All	

4.17 Records

If the relevant record table is queried again within the specified timeout period, the next record is read. If the query is sent after the timeout period has elapsed, the most recent record is read.

Record Reading Timeout						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
20050	Record Reading Timeout	uint32_t	R/W	03H/10H	10..60 sn	10 sn

Number of Records in Memory						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
21080	Event Record Count	uint32_t	R	03H		
22080	Alarm Record Count	uint32_t	R	03H		
23080	Energy Data Record Count	uint32_t	R	03H		
24080	Current Data Record Count	uint32_t	R	03H		
25080	Voltage Data Record Count	uint32_t	R	03H		
26080	Power Data Record Count	uint32_t	R	03H		
27080	THD Data Record Count	uint32_t	R	03H		

4.17.1 Event Logs

Event Logs						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
21000	Type	uint32_t	R	03H	0- Voltage LN 1- Voltage LL 2- Current 3- Active Power 4- Reactive Power 5- Apparent Power 6- Cosphi 7- PF 8- Neutral Current 9- Frequency 10- Harmonic V 11- Harmonic I 12- Settings	

					13- Ethernet 14- Drop 15- Rise 16- Power 17- Time 18- Energy 19- Min Max 20- Demand 21- Digital Input Counters 22- Operating Hours 23- Alarm 24- Event 25- Record 26- Reserved	
21002	Source	uint32_t	R	03H	0- Phase 1-N 1- Phase 2-N 2- Phase 3-N 3- Phase 1-2 4- Phase 1-3 5- Phase 2-3 6- Device 7- Reserved	
21004	Parameter	uint32_t	R	03H	0- Over 1- Under 2- Loss 3- Modified 4- Clear 5- Restart 6- Reserved	
21006	Timestamp	int64_t	R	03H		
21010	Reserved	char[16]	R	03H		

4.17.2 Alarm Logs

Alarm Logs						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
22000	Type	uint32_t	R	03H	0- Voltage LN 1- Voltage LL 2- Current 3- Active Power 4- Reactive Power 5- Apparent Power 6- Cosphi 7- PF 8- Neutral Current 9- Frequency 10- Harmonic V 11- Harmonic I 12- Settings 13- Ethernet 14- Drop 15- Rise 16- Power 17- Time 18- Energy 19- Min Max 20- Demand	

					21- Digital Input Counters 22- Operating Hours 23- Alarm 24- Event 25- Record 26- Reserved	
22002	Source	uint32_t	R	03H	0- Phase 1-N 1- Phase 2-N 2- Phase 3-N 3- Phase 1-2 4- Phase 1-3 5- Phase 2-3 6- Device 7- Reserved	
22004	Parameter	uint32_t	R	03H	0- Over 1- Under 2- Loss 3- Modified 4- Clear 5- Restart 6- Reserved	
22006	Timestamp	int64_t	R	03H		
22010	Reserved	char[16]	R	03H		

4.17.3 Method 1 Records

4.17.3.1 Hourly Records

Hourly Log Records - Method 1						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
28000	Start Time	uint32_t	R	03H		
28002	End Time	uint32_t	R	03H		
28004	Min. Voltage PH1	float	R	03H		
28006	Min. Current PH1	float	R	03H		
28008	Min. Cos Ø PH1	float	R	03H		
28010	Min. Frequency PH1	float	R	03H		
28012	Min. Active Power PH1	float	R	03H		
28014	Min. Reactive Power PH1	float	R	03H		
28016	Min. Apparent Power PH1	float	R	03H		
28018	Min. Power Factor PH1	float	R	03H		
28020	Max. Voltage PH1	float	R	03H		
28022	Max. Current PH1	float	R	03H		
28024	Max. Cos Ø PH1	float	R	03H		
28026	Max. Frequency	float	R	03H		
28028	Max. Active Power PH1	float	R	03H		
28030	Max. Reactive Power PH1	float	R	03H		
28032	Max. Apparent Power PH1	float	R	03H		
28034	Max. Power Factor PH1	float	R	03H		
28036	Avg. Voltage PH1	float	R	03H		
28038	Avg. Current PH1	float	R	03H		

28040	Avg. Cos Ø PH1	float	R	03H		
28042	Avg. Frequency PH1	float	R	03H		
28044	Avg. Active Power PH1	float	R	03H		
28046	Avg. Reactive Power PH1	float	R	03H		
28048	Avg. Apparent Power PH1	float	R	03H		
28050	Avg. Power Factor PH1	float	R	03H		
28052	Instantaneous Voltage PH1	float	R	03H		
28054	Instantaneous Current PH1	float	R	03H		
28056	Instantaneous Cos Ø PH1	float	R	03H		
28058	Instantaneous Frequency PH1	float	R	03H		
28060	Instantaneous Active Power PH1	float	R	03H		
28062	Instantaneous Reactive Power PH1	float	R	03H		
28064	Instantaneous Apparent Power PH1	float	R	03H		
28066	Instantaneous Power Factor PH1	float	R	03H		
28068	Min. Voltage PH2	float	R	03H		
28070	Min. Current PH2	float	R	03H		
28072	Min. Cos Ø PH2	float	R	03H		
28074	Min. Frequency PH2	float	R	03H		
28076	Min. Active Power PH2	float	R	03H		
28078	Min. Reactive Power PH2	float	R	03H		
28080	Min. Apparent Power PH2	float	R	03H		
28082	Min. Power Factor PH2	float	R	03H		
28084	Max. Voltage PH2	float	R	03H		
28086	Max. Current PH2	float	R	03H		
28088	Max. Cos Ø PH2	float	R	03H		
28090	Max. Frequency	float	R	03H		
28092	Max. Active Power PH2	float	R	03H		
28094	Max. Reactive Power PH2	float	R	03H		
28096	Max. Apparent Power PH2	float	R	03H		
28098	Max. Power Factor PH2	float	R	03H		
28100	Avg. Voltage PH2	float	R	03H		
28102	Avg. Current PH2	float	R	03H		
28104	Avg. Cos Ø PH2	float	R	03H		
28106	Avg. Frequency PH2	float	R	03H		
28108	Avg. Active Power PH2	float	R	03H		
28110	Avg. Reactive Power PH2	float	R	03H		
28112	Avg. Apparent Power PH2	float	R	03H		
28114	Avg. Power Factor PH2	float	R	03H		
28116	Instantaneous Voltage PH2	float	R	03H		
28118	Instantaneous Current PH2	float	R	03H		
28120	Instantaneous Cos Ø PH2	float	R	03H		
28122	Instantaneous Frequency PH2	float	R	03H		
28124	Instantaneous Active Power PH2	float	R	03H		

28126	Instantaneous Reactive Power PH2	float	R	03H		
28128	Instantaneous Apparent Power PH2	float	R	03H		
28130	Instantaneous Power Factor PH2	float	R	03H		
28132	Min. Voltage PH3	float	R	03H		
28134	Min. Current PH3	float	R	03H		
28136	Min. Cos Ø PH3	float	R	03H		
28138	Min. Frequency	float	R	03H		
28140	Min. Active Power PH3	float	R	03H		
28142	Min. Reactive Power PH3	float	R	03H		
28144	Min. Apparent Power PH3	float	R	03H		
28146	Min. Power Factor PH3	float	R	03H		
28148	Max. Voltage PH3	float	R	03H		
28150	Max. Current PH3	float	R	03H		
28152	Max. Cos Ø PH3	float	R	03H		
28154	Max. Frequency	float	R	03H		
28156	Max. Active Power PH3	float	R	03H		
28158	Max. Reactive Power PH3	float	R	03H		
28160	Max. Apparent Power PH3	float	R	03H		
28162	Max. Power Factor PH3	float	R	03H		
28164	Avg. Voltage PH3	float	R	03H		
28166	Avg. Current PH3	float	R	03H		
28168	Avg. Cos Ø PH3	float	R	03H		
28170	Avg. Frequency PH3	float	R	03H		
28172	Avg. Active Power PH3	float	R	03H		
28174	Avg. Reactive Power PH3	float	R	03H		
28176	Avg. Apparent Power PH3	float	R	03H		
28178	Avg. Power Factor PH3	float	R	03H		
28180	Instantaneous Voltage PH3	float	R	03H		
28182	Instantaneous Current PH3	float	R	03H		
28184	Instantaneous Cos Ø PH3	float	R	03H		
28186	Instantaneous Frequency	float	R	03H		
28188	Instantaneous Active Power PH3	float	R	03H		
28190	Instantaneous Reactive Power PH3	float	R	03H		
28192	Instantaneous Apparent Power PH3	float	R	03H		
28194	Instant Power Factor PH3	float	R	03H		
28196	Min. VLL12	float	R	03H		
28198	Min. VLL23	float	R	03H		
28200	Min. VLL31	float	R	03H		
28202	Min. Frequency	float	R	03H		
28204	Max. VLL12	float	R	03H		
28206	Max. VLL23	float	R	03H		
28208	Max. VLL31	float	R	03H		
28210	Max. Frequency	float	R	03H		

28212	Avg. VLL12	float	R	03H		
28214	Avg. VLL23	float	R	03H		
28216	Avg. VLL31	float	R	03H		
28218	Avg. Frequency	float	R	03H		
28220	Instant VLL12	float	R	03H		
28222	Instant VLL23	float	R	03H		
28224	Instant VLL31	float	R	03H		
28226	Instant Frequency	float	R	03H		
28228	Total Imp. Active Power	float	R	03H		
28230	Total Exp. Active Power	float	R	03H		
28232	Total Imp. Reactive Power	float	R	03H		
28234	Total Exp. Reactive Power	float	R	03H		

4.17.3.2 Daily Records

Daily Log Records						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
29000	Start Time	uint32_t	R	03H		
29002	End Time	uint32_t	R	03H		
29004	Min. Voltage PH1	float	R	03H		
29006	Min. Current PH1	float	R	03H		
29008	Min. Cos Ø PH1	float	R	03H		
29010	Min. Frequency PH1	float	R	03H		
29012	Min. Active Power PH1	float	R	03H		
29014	Min. Reactive Power PH1	float	R	03H		
29016	Min. Apparent Power PH1	float	R	03H		
29018	Min. Power Factor PH1	float	R	03H		
29020	Max. Voltage PH1	float	R	03H		
29022	Max. Current PH1	float	R	03H		
29024	Max. Cos Ø PH1	float	R	03H		
29026	Max. Frequency	float	R	03H		
29028	Max. Active Power PH1	float	R	03H		
29030	Max. Reactive Power PH1	float	R	03H		
29032	Max. Apparent Power PH1	float	R	03H		
29034	Max. Power Factor PH1	float	R	03H		
29036	Avg. Voltage PH1	float	R	03H		
29038	Avg. Current PH1	float	R	03H		
29040	Avg. Cos Ø PH1	float	R	03H		
29042	Avg. Frequency PH1	float	R	03H		
29044	Avg. Active Power PH1	float	R	03H		
29046	Avg. Reactive Power PH1	float	R	03H		
29048	Avg. Apparent Power PH1	float	R	03H		
29050	Avg. Power Factor PH1	float	R	03H		
29052	Instantaneous Voltage PH1	float	R	03H		

29054	Instantaneous Current PH1	float	R	03H		
29056	Instantaneous Cos Ø PH1	float	R	03H		
29058	Instantaneous Frequency PH1	float	R	03H		
29060	Instantaneous Active Power PH1	float	R	03H		
29062	Instantaneous Reactive Power PH1	float	R	03H		
29064	Instantaneous Apparent Power PH1	float	R	03H		
29066	Instantaneous Power Factor PH1	float	R	03H		
29068	Min. Voltage PH2	float	R	03H		
29070	Min. Current PH2	float	R	03H		
29072	Min. Cos Ø PH2	float	R	03H		
29074	Min. Frequency PH2	float	R	03H		
29076	Min. Active Power PH2	float	R	03H		
29078	Min. Reactive Power PH2	float	R	03H		
29080	Min. Apparent Power PH2	float	R	03H		
29082	Min. Power Factor PH2	float	R	03H		
29084	Max. Voltage PH2	float	R	03H		
29086	Max. Current PH2	float	R	03H		
29088	Max. Cos Ø PH2	float	R	03H		
29090	Max. Frequency	float	R	03H		
29092	Max. Active Power PH2	float	R	03H		
29094	Max. Reactive Power PH2	float	R	03H		
29096	Max. Apparent Power PH2	float	R	03H		
29098	Max. Power Factor PH2	float	R	03H		
29100	Avg. Voltage PH2	float	R	03H		
29102	Avg. Current PH2	float	R	03H		
29104	Avg. Cos Ø PH2	float	R	03H		
29106	Avg. Frequency PH2	float	R	03H		
29108	Avg. Active Power PH2	float	R	03H		
29110	Avg. Reactive Power PH2	float	R	03H		
29112	Avg. Apparent Power PH2	float	R	03H		
29114	Avg. Power Factor PH2	float	R	03H		
29116	Instantaneous Voltage PH2	float	R	03H		
29118	Instantaneous Current PH2	float	R	03H		
29120	Instantaneous Cos Ø PH2	float	R	03H		
29122	Instant Frequency PH2	float	R	03H		
29124	Instant Active Power PH2	float	R	03H		
29126	Instant Reactive Power PH2	float	R	03H		
29128	Instant Apparent Power PH2	float	R	03H		
29130	Instant Power Factor PH2	float	R	03H		
29132	Min. Voltage PH3	float	R	03H		
29134	Min. Current PH3	float	R	03H		
29136	Min. Cos Ø PH3	float	R	03H		
29138	Min. Frequency	float	R	03H		

29140	Min. Active Power PH3	float	R	03H		
29142	Min. Reactive Power PH3	float	R	03H		
29144	Min. Apparent Power PH3	float	R	03H		
29146	Min. Power Factor PH3	float	R	03H		
29148	Max. Voltage PH3	float	R	03H		
29150	Max. Current PH3	float	R	03H		
29152	Max. Cos Ø PH3	float	R	03H		
29154	Max. Frequency	float	R	03H		
29156	Max. Active Power PH3	float	R	03H		
29158	Max. Reactive Power PH3	float	R	03H		
29160	Max. Apparent Power PH3	float	R	03H		
29162	Max. Power Factor PH3	float	R	03H		
29164	Avg. Voltage PH3	float	R	03H		
29166	Avg. Current PH3	float	R	03H		
29168	Avg. Cos Ø PH3	float	R	03H		
29170	Avg. Frequency PH3	float	R	03H		
29172	Avg. Active Power PH3	float	R	03H		
29174	Avg. Reactive Power PH3	float	R	03H		
29176	Avg. Apparent Power PH3	float	R	03H		
29178	Avg. Power Factor PH3	float	R	03H		
29180	Instantaneous Voltage PH3	float	R	03H		
29182	Instantaneous Current PH3	float	R	03H		
29184	Instantaneous Cos Ø PH3	float	R	03H		
29186	Instantaneous Frequency	float	R	03H		
29188	Instantaneous Active Power PH3	float	R	03H		
29190	Instantaneous Reactive Power PH3	float	R	03H		
29192	Instantaneous Apparent Power PH3	float	R	03H		
29194	Instantaneous Power Factor PH3	float	R	03H		
29196	Min. VLL12	float	R	03H		
29198	Min. VLL23	float	R	03H		
29200	Min. VLL31	float	R	03H		
29202	Min. Frequency	float	R	03H		
29204	Max. VLL12	float	R	03H		
29206	Max. VLL23	float	R	03H		
29208	Max. VLL31	float	R	03H		
29210	Max. Frequency	float	R	03H		
29212	Avg. VLL12	float	R	03H		
29214	Avg. VLL23	float	R	03H		
29216	Avg. VLL31	float	R	03H		
29218	Avg. Frequency	float	R	03H		
29220	Instantaneous VLL12	float	R	03H		
29222	Instantaneous VLL23	float	R	03H		
29224	Instantaneous VLL31	float	R	03H		

29226	Instantaneous Frequency	float	R	03H		
29228	Total Imp. Active Power	float	R	03H		
29230	Total Exp. Active Power	float	R	03H		
29232	Total Imp. Reactive Power	float	R	03H		
29234	Total Exp. Reactive Power	float	R	03H		

4.17.3.3 Monthly Records

Monthly Log Records						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
30000	Start Time	uint32_t	R	03H		
30002	End Time	uint32_t	R	03H		
30004	Min. Voltage PH1	float	R	03H		
30006	Min. Current PH1	float	R	03H		
30008	Min. Cos Ø PH1	float	R	03H		
30010	Min. Frequency PH1	float	R	03H		
30012	Min. Active Power PH1	float	R	03H		
30014	Min. Reactive Power PH1	float	R	03H		
30016	Min. Apparent Power PH1	float	R	03H		
30018	Min. Power Factor PH1	float	R	03H		
30020	Max. Voltage PH1	float	R	03H		
30022	Max. Current PH1	float	R	03H		
30024	Max. Cos Ø PH1	float	R	03H		
30026	Max. Frequency	float	R	03H		
30028	Max. Active Power PH1	float	R	03H		
30030	Max. Reactive Power PH1	float	R	03H		
30032	Max. Apparent Power PH1	float	R	03H		
30034	Max. Power Factor PH1	float	R	03H		
30036	Avg. Voltage PH1	float	R	03H		
30038	Avg. Current PH1	float	R	03H		
30040	Avg. Cos Ø PH1	float	R	03H		
30042	Avg. Frequency PH1	float	R	03H		
30044	Avg. Active Power PH1	float	R	03H		
30046	Avg. Reactive Power PH1	float	R	03H		
30048	Avg. Apparent Power PH1	float	R	03H		
30050	Avg. Power Factor PH1	float	R	03H		
30052	Instantaneous Voltage PH1	float	R	03H		
30054	Instantaneous Current PH1	float	R	03H		
30056	Instantaneous Cos Ø PH1	float	R	03H		
30058	Instantaneous Frequency PH1	float	R	03H		
30060	Instantaneous Active Power PH1	float	R	03H		
30062	Instantaneous Reactive Power PH1	float	R	03H		
30064	Instantaneous Apparent Power PH1	float	R	03H		
30066	Instantaneous Power Factor PH1	float	R	03H		

30068	Min. Voltage PH2	float	R	03H		
30070	Min. Current PH2	float	R	03H		
30072	Min. Cos Ø PH2	float	R	03H		
30074	Min. Frequency PH2	float	R	03H		
30076	Min. Active Power PH2	float	R	03H		
30078	Min. Reactive Power PH2	float	R	03H		
30080	Min. Apparent Power PH2	float	R	03H		
30082	Min. Power Factor PH2	float	R	03H		
30084	Max. Voltage PH2	float	R	03H		
30086	Max. Current PH2	float	R	03H		
30088	Max. Cos Ø PH2	float	R	03H		
30090	Max. Frequency	float	R	03H		
30092	Max. Active Power PH2	float	R	03H		
30094	Max. Reactive Power PH2	float	R	03H		
30096	Max. Apparent Power PH2	float	R	03H		
30098	Max. Power Factor PH2	float	R	03H		
30100	Avg. Voltage PH2	float	R	03H		
30102	Avg. Current PH2	float	R	03H		
30104	Avg. Cos Ø PH2	float	R	03H		
30106	Avg. Frequency PH2	float	R	03H		
30108	Avg. Active Power PH2	float	R	03H		
30110	Avg. Reactive Power PH2	float	R	03H		
30112	Avg. Apparent Power PH2	float	R	03H		
30114	Avg. Power Factor PH2	float	R	03H		
30116	Instantaneous Voltage PH2	float	R	03H		
30118	Instantaneous Current PH2	float	R	03H		
30120	Instantaneous Cos Ø PH2	float	R	03H		
30122	Instantaneous Frequency PH2	float	R	03H		
30124	Instantaneous Active Power PH2	float	R	03H		
30126	Instantaneous Reactive Power PH2	float	R	03H		
30128	Instantaneous Apparent Power PH2	float	R	03H		
30130	Instantaneous Power Factor PH2	float	R	03H		
30132	Min. Voltage PH3	float	R	03H		
30134	Min. Current PH3	float	R	03H		
30136	Min. Cos Ø PH3	float	R	03H		
30138	Min. Frequency	float	R	03H		
30140	Min. Active Power PH3	float	R	03H		
30142	Min. Reactive Power PH3	float	R	03H		
30144	Min. Apparent Power PH3	float	R	03H		
30146	Min. Power Factor PH3	float	R	03H		
30148	Max. Voltage PH3	float	R	03H		
30150	Max. Current PH3	float	R	03H		
30152	Max. Cos Ø PH3	float	R	03H		

30154	Max. Frequency	float	R	03H		
30156	Max. Active Power PH3	float	R	03H		
30158	Max. Reactive Power PH3	float	R	03H		
30160	Max. Apparent Power PH3	float	R	03H		
30162	Max. Power Factor PH3	float	R	03H		
30164	Avg. Voltage PH3	float	R	03H		
30166	Avg. Current PH3	float	R	03H		
30168	Avg. Cos Ø PH3	float	R	03H		
30170	Avg. Frequency PH3	float	R	03H		
30172	Avg. Active Power PH3	float	R	03H		
30174	Avg. Reactive Power PH3	float	R	03H		
30176	Avg. Apparent Power PH3	float	R	03H		
30178	Avg. Power Factor PH3	float	R	03H		
30180	Instantaneous Voltage PH3	float	R	03H		
30182	Instantaneous Current PH3	float	R	03H		
30184	Instantaneous Cos Ø PH3	float	R	03H		
30186	Instantaneous Frequency	float	R	03H		
30188	Instantaneous Active Power PH3	float	R	03H		
30190	Instantaneous Reactive Power PH3	float	R	03H		
30192	Instantaneous Apparent Power PH3	float	R	03H		
30194	Instantaneous Power Factor PH3	float	R	03H		
30196	Min. VLL12	float	R	03H		
30198	Min. VLL23	float	R	03H		
30200	Min. VLL31	float	R	03H		
30202	Min. Frequency	float	R	03H		
30204	Max. VLL12	float	R	03H		
30206	Max. VLL23	float	R	03H		
30208	Max. VLL31	float	R	03H		
30210	Max. Frequency	float	R	03H		
30212	Avg. VLL12	float	R	03H		
30214	Avg. VLL23	float	R	03H		
30216	Avg. VLL31	float	R	03H		
30218	Avg. Frequency	float	R	03H		
30220	Instantaneous VLL12	float	R	03H		
30222	Instant VLL23	float	R	03H		
30224	Instant VLL31	float	R	03H		
30226	Instant Frequency	float	R	03H		
30228	Total Imp. Active Power	float	R	03H		
30230	Total Exp. Active Power	float	R	03H		
30232	Total Imp. Reactive Power	float	R	03H		
30234	Total Exp. Reactive Power	float	R	03H		

4.17.4 Method 2 Records

4.17.4.1 Energy Records

Energy Data Records						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
23000	Start Time	uint32_t	R	03H	Time Start	
23002	End Time	uint32_t	R	03H	Time Stop	
23004	Total Imp. Active Energy	double	R	03H		
23008	Total Exp. Active Energy	double	R	03H		
23012	Total Imp. Reactive Energy	double	R	03H		
23016	Total Exp. Reactive Energy	double	R	03H		
23020	Total Exp. Q1 Reactive Energy	double	R	03H		
23024	Total Exp. Q2 Reactive Energy	double	R	03H		
23028	Total Imp. Q3 Reactive Energy	double	R	03H		
23032	Total Imp. Q4 Reactive Energy	double	R	03H		

4.17.4.2 Current Records

Current Data Records						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
24000	Start Time	uint32_t	R	03H	Time Start	
24002	End Time	uint32_t	R	03H	Time Stop	
24004	Avg. Current RMS	float	R	03H		
24006	Avg. Current I1	float	R	03H		
24008	Avg. Current I2	float	R	03H		
24010	Avg. Current I3	float	R	03H		
24012	Avg. Current IN	float	R	03H		
24014	Max. Current RMS	float	R	03H		
24016	Max. Current I1	float	R	03H		
24018	Max. Current I2	float	R	03H		
24020	Max. Current I3	float	R	03H		
24022	Max. Current IN	float	R	03H		
24024	Min. Current RMS	float	R	03H		
24026	Min. Current I1	float	R	03H		
24028	Min. Current I2	float	R	03H		
24030	Min. Current I3	float	R	03H		
24032	Min. Current IN	float	R	03H		

4.17.4.3 Voltage Records

Voltage Data Records						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
25000	Start Time	uint32_t	R	03H	Time Start	
25002	End Time	uint32_t	R	03H	Time Stop	
25004	Avg. Voltage RMS	float	R	03H		
25006	Avg. Voltage PH1	float	R	03H		

25008	Avg. Voltage PH2	float	R	03H		
25010	Avg. Voltage PH3	float	R	03H		
25012	Avg. Voltage LLAvg	float	R	03H		
25014	Avg. Voltage L1L2	float	R	03H		
25016	Avg. Voltage L2L3	float	R	03H		
25018	Avg. Voltage L3L1	float	R	03H		
25020	Avg. Frequency	float	R	03H		
25022	Max. Voltage RMS	float	R	03H		
25024	Max. Voltage PH1	float	R	03H		
25026	Max. Voltage PH2	float	R	03H		
25028	Max. Voltage PH3	float	R	03H		
25030	Max. Voltage LLAvg	float	R	03H		
25032	Max. Voltage L1L2	float	R	03H		
25034	Max. Voltage L2L3	float	R	03H		
25036	Max. Voltage L3L1	float	R	03H		
25038	Max. Frequency	float	R	03H		
25040	Min. Voltage RMS	float	R	03H		
25042	Min. Voltage PH1	float	R	03H		
25044	Min. Voltage PH2	float	R	03H		
25046	Min. Voltage PH3	float	R	03H		
25048	Min. Voltage LLAvg	float	R	03H		
25050	Min. Voltage L1L2	float	R	03H		
25052	Min. Voltage L2L3	float	R	03H		
25054	Min. Voltage L3L1	float	R	03H		
25056	Min. Frequency	float	R	03H		

4.17.4.4 Power Records

Power Data Records						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
26000	Start Time	uint32_t	R	03H	Time Start	
26002	End Time	uint32_t	R	03H	Time Stop	
26004	Avg. RMS Active Power	float	R	03H		
26006	Avg. RMS Reactive Power	float	R	03H		
26008	Avg. CosΦ 1	float	R	03H		
26010	Avg. CosΦ 2	float	R	03H		
26012	Avg. CosΦ 3	float	R	03H		
26014	Avg. RMS Power Factor	float	R	03H		
26016	Avg. Power Factor PH1	float	R	03H		
26018	Avg. PowerFactor PH2	float	R	03H		
26020	Avg. Power Factor PH3	float	R	03H		
26022	Avg. Frequency	float	R	03H		
26024	Avg. Apparent Power	float	R	03H		
26026	Max. RMS Active Power	float	R	03H		
26028	Max. RMS Reactive Power	float	R	03H		

26030	Max. CosΦ 1	float	R	03H		
26032	Max. CosΦ 2	float	R	03H		
26034	Max. CosΦ 3	float	R	03H		
26036	Max. RMS Power Factor	float	R	03H		
26038	Max. Power Factor PH1	float	R	03H		
26040	Max. PowerFactor PH2	float	R	03H		
26042	Max. Power Factor PH3	float	R	03H		
26044	Max. Frequency	float	R	03H		
26046	Max. Apparent Power	float	R	03H		
26048	Min. RMS Active Power	float	R	03H		
26050	Min. RMS Reactive Power	float	R	03H		
26052	Min. CosΦ 1	float	R	03H		
26054	Min. CosΦ 2	float	R	03H		
26056	Min. CosΦ 3	float	R	03H		
26058	Min. RMS Power Factor	float	R	03H		
26060	Min. Power Factor PH1	float	R	03H		
26062	Min. PowerFactor PH2	float	R	03H		
26064	Min. Power Factor PH3	float	R	03H		
26066	Min. Frequency	float	R	03H		
26068	Min. Apparent Power	float	R	03H		

4.17.4.5 THD Records

THD Data Records						
Address	Parameter	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
27000	Start Time	uint32_t	R	03H	Time Start	
27002	End Time	uint32_t	R	03H	Time Stop	
27004	Avg. Total Harmonic Distortion VL1	float	R	03H		
27006	Avg. Total Harmonic Distortion VL2	float	R	03H		
27008	Avg. Total Harmonic Distortion VL3	float	R	03H		
27010	Avg. Total Harmonic Distortion I1	float	R	03H		
27012	Avg. Total Harmonic Distortion I2	float	R	03H		
27014	Avg. Total Harmonic Distortion I3	float	R	03H		
27016	Max. Total Harmonic Distortion VL1	float	R	03H		
27018	Max. Total Harmonic Distortion VL2	float	R	03H		
27020	Max. Total Harmonic Distortion VL3	float	R	03H		
27022	Max. Total Harmonic Distortion I1	float	R	03H		
27024	Max. Total Harmonic Distortion I2	float	R	03H		
27026	Max. Total Harmonic Distortion I3	float	R	03H		
27028	Min. Total Harmonic Distortion VL1	float	R	03H		
27030	Min. Total Harmonic Distortion VL2	float	R	03H		
27032	Min. Total Harmonic Distortion VL3	float	R	03H		
27034	Min. Total Harmonic Distortion I1	float	R	03H		
27036	Min. Total Harmonic Distortion I2	float	R	03H		
27038	Min. Total Harmonic Distortion I3	float	R	03H		

4.18 Customized Main Screen

4.18.1 Customized Main Screen Configuration

Customized Main Screen						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
44000	Data Cell 1- Parameter	uint16_t	R/W	03H/10H	Table - Main Screen Parameters	**0 - None**
44001	Data Cell 1- Unit	uint16_t	R/W	03H/10H	0 – Adaptive 1 – Kilo 2 – Mega 3 – Giga	0
44002	Data Cell 2- Parameter	uint16_t	R/W	03H/10H	Table - Main Screen Parameters	**0 - None**
44003	Data Cell 2- Unit	uint16_t	R/W	03H/10H	0 – Adaptive 1 – Kilo 2 – Mega 3 – Giga	0
44004	Data Cell 3- Parameter	uint16_t	R/W	03H/10H	Table - Main Screen Parameters	**0 - None**
44005	Data Cell 3- Unit	uint16_t	R/W	03H/10H	0 – Adaptive 1 – Kilo 2 – Mega 3 – Giga	0
44006	Data Cell 4- Parameter	uint16_t	R/W	03H/10H	Table - Main Screen Parameters	**0 - None**
44007	Data Cell 4- Unit	uint16_t	R/W	03H/10H	0 – Adaptive 1 – Kilo 2 – Mega 3 – Giga	0
44008	Data Cell 5- Parameter	uint16_t	R/W	03H/10H	Table - Main Screen Parameters	**0 - None**
44009	Data Cell 5- Unit	uint16_t	R/W	03H/10H	0 – Adaptive 1 – Kilo 2 – Mega 3 – Giga	0
44010	Data Cell 6- Parameter	uint16_t	R/W	03H/10H	Table - Main Screen Parameters	**0 - None**
44011	Data Cell 6- Unit	uint16_t	R/W	03H/10H	0 – Adaptive 1 – Kilo 2 – Mega 3 – Giga	0
44012	Data Cell 7- Parameter	uint16_t	R/W	03H/10H	Table - Main Screen Parameters	**0 - None**
44013	Data Cell 7- Unit	uint16_t	R/W	03H/10H	0 – Adaptive 1 – Kilo 2 – Mega 3 – Giga	0
44014	Data Cell 8- Parameter	uint16_t	R/W	03H/10H	Table - Main Screen Parameters	**0 - None**
44015	Data Cell 8- Unit	uint16_t	R/W	03H/10H	0 – Adaptive 1 – Kilo	0

					2 – Mega 3 – Giga	

Customized Main Screen Activation*						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
44020	Customized Main Screen Activation	uint32_t	R/W	03H/10H	0 - Passive 1 - Active	0

*After the customized screen is activated via address **44020**, the screen is initially displayed empty. You can customize the screen as desired by selecting the screen parameters and units at addresses **44000–44015**. In addition, the screen guide lines can be enabled via address **15006**.

Table - Main Screen Parameters					
Index	Parameter	Index	Parameter	Index	Parameter
0	Empty	81	Import PF3 Max.	161	T1-2 Tot. Ph1 Exp. Act. Energy
1	V1	82	Export PF1 Min.	162	T1-2 Tot. Ph1 Exp. Reactive Energy
2	V2	83	Export PF2 Min.	163	T1-2 Tot. Ph2 Imp. Act. Energy
3	V3	84	Export PF3 Min.	164	T1-2 Tot. Ph2 Imp. Reactive Energy
4	VLN Avg.	85	Export PF1 Max.	165	T1-2 Tot. Ph2 Exp. Act. Energy
5	VLL 12	86	Export PF2 Max.	166	T1-2 Tot. Ph2 Exp. Reactive Energy
6	VLL 23	87	Export PF3 Max.	167	T1-2 Tot. Ph3 Imp. Act. Energy
7	VLL 31	88	Cos Ø 1	168	T1-2 Tot. Ph3 Imp. Reactive Energy
8	VLL Avg.	89	Cos Ø 2	169	T1-2 Tot. Ph3 Exp. Act. Energy
9	V1 Min.	90	Cos Ø 3	170	T1-2 Tot. Ph3 Exp. Reactive Energy
10	V2 Min.	91	Cos Ø Tot	171	T1-3 Tot.Imp. Act. Energy
11	V3 Min.	92	Cos Ø 1 Min.	172	T1-3 Tot.Imp. Reactive Energy
12	V1 Max.	93	Cos Ø 2 Min.	173	T1-3 Tot.Exp. Act. Energy
13	V2 Max.	94	Cos Ø 3 Min.	174	T1-3 Tot.Exp. Reactive Energy
14	V3 Max.	95	Cos Ø 1 Max.	175	T1-3 Tot. Ph1 Imp. Act. Energy
15	I1	96	Cos Ø 2 Max.	176	T1-3 Tot. Ph1 Imp. Reactive Energy
16	I2	97	Cos Ø 3 Max.	177	T1-3 Tot. Ph1 Exp. Act. Energy
17	I3	98	Max. Demand I1	178	T1-3 Tot. Ph1 Exp. Reactive Energy
18	I Avg.	99	Max. Demand I2	179	T1-3 Tot. Ph2 Imp. Act. Energy
19	I Tot.	100	Max. Demand I3	180	T1-3 Tot. Ph2 Imp. Reactive Energy
20	IN	101	Max. Demand I Tot	181	T1-3 Tot. Ph2 Exp. Active Energy
21	I1 Min.	102	Max. Demand Imp. P Tot.	182	T1-3 Total Phase 2 Exp. Reactive Energy
22	I2 Min.	103	Max. Demand Exp. P Tot.	183	T1-3 Total Phase 3 Imp. Active Energy
23	I3 Min.	104	Max. Demand Imp. Q Tot.	184	T1-3 Total Phase 3 Imp. Reactive Energy
24	I1 Max.	105	Max. Demand Exp. Q Tot.	185	T1-3 Total Phase 3 Exp. Active Energy
25	I2 Max.	106	Max. Demand S Tot.	186	T1-3 Total Phase 3 Exp. Reactive Energy
26	I3 Max.	107	Tot. Imp. Active Energy	187	T1-4 Total Imp. Active Energy
27	F	108	Tot. Imp. Reactive Energy	188	T1-4 Total Imp. Reactive Energy

28	F Min.	109	Tot. Exp. Active Energy	189	T1-4 Total Exp. Active Energy
29	F Max.	110	Tot. Exp. Reactive Energy	190	T1-4 Total Exp. Reactive Energy
30	P1	111	Tot. Phase1 Imp. Active Energy	191	T1-4 Total Phase 1 Imp. Active Energy
31	P2	112	Tot. Phase1 Imp. Reactive Energy	192	T1-4 Total Phase 1 Imp. Reactive Energy
32	P3	113	Tot. Phase1 Exp. Active Energy	193	T1-4 Total Phase 1 Exp. Active Energy
33	P Tot.	114	Tot. Phase1 Exp. Reactive Energy	194	T1-4 Total Phase 1 Exp. Reactive Energy
34	P1 Import Min.	115	Tot. Phase2 Imp. Active Energy	195	T1-4 Total Phase 2 Imp. Active Energy
35	P2 Import Min.	116	Tot. Phase2 Imp. Reactive Energy	196	T1-4 Total Phase 2 Imp. Reactive Energy
36	P3 Import Min.	117	Tot. Phase2 Exp. Active Energy	197	T1-4 Total Phase 2 Exp. Active Energy
37	P1 Export Min.	118	Tot. Phase2 Exp. Reactive Energy	198	T1-4 Total Phase 2 Exp. Reactive Energy
38	P2 Export Min.	119	Tot. Phase3 Imp. Active Energy	199	T1-4 Total Phase 3 Imp. Active Energy
39	P3 Export Min.	120	Tot. Phase3 Imp. Reactive Energy	200	T1-4 Total Phase 3 Imp. Reactive Energy
40	P1 Import Max.	121	Tot. Phase3 Exp. Active Energy	201	T1-4 Total Phase 3 Exp. Active Energy
41	P2 Import Max.	122	Tot. Phase3 Exp. Reactive Energy	202	T1-4 Total Phase 3 Exp. Reactive Energy
42	P3 Import Max.	123	T1 Total Imp. Active Energy	203	T2 Total Imp. Active Energy
43	P1 Export Max.	124	T1 Total Imp. Reactive Energy	204	T2 Total Imp. Reactive Energy
44	P2 Export Max.	125	T1 Total Exp. Active Energy	205	T2 Total Exp. Active Energy
45	P3 Export Max.	126	T1 Total Exp. Reactive Energy	206	T2 Total Exp. Reactive Energy
46	Q1	127	T1 Total Phase 1 Imp. Active Energy	207	T2 Total Phase 1 Imp. Active Energy
47	Q2	128	T1 Total Phase 1 Imp. Reactive Energy	208	T2 Total Phase 1 Imp. Reactive Energy
48	Q3	129	T1 Total Phase 1 Exp. Active Energy	209	T2 Total Phase 1 Exp. Active Energy
49	Q Tot	130	T1 Total Phase 1 Exp. Reactive Energy	210	T2 Total Phase 1 Exp. Reactive Energy
50	Q1 Import Min.	131	T1 Total Phase 2 Imp. Active Energy	211	T2 Total Phase 2 Imp. Active Energy
51	Q2 Import Min.	132	T1 Total Phase 2 Imp. Reactive Energy	212	T2 Total Phase 2 Imp. Reactive Energy
52	Q3 Import Min.	133	T1 Total Phase 2 Exp. Active Energy	213	T2 Total Phase 2 Exp. Active Energy
53	Q1 Export Min.	134	T1 Total Phase 2 Exp. Reactive Energy	214	T2 Total Phase 2 Exp. Reactive Energy
54	Q2 Export Min.	135	T1 Total Phase 3 Imp. Active Energy	215	T2 Total Phase 3 Imp. Active Energy
55	Q3 Export Min.	136	T1 Total Phase 3 Imp. Reactive Energy	216	T2 Total Phase 3 Imp. Reactive Energy
56	Q1 Import Max.	137	T1 Total Phase 3 Exp. Active Energy	217	T2 Total Phase 3 Exp. Active Energy
57	Q2 Import Max.	138	T1 Total Phase 3 Exp. Reactive Energy	218	T2 Total Phase 3 Exp. Reactive Energy
58	Q3 Import Max.	139	T1-1 Total Imp. Active Energy	219	T3 Total Imp. Active Energy
59	Q1 Export Max.	140	T1-1 Total Imp. Reactive Energy	220	T3 Total Imp. Reactive Energy
60	Q2 Export Max.	141	T1-1 Total Exp. Active Energy	221	T3 Total Exp. Active Energy
61	Q3 Export Max.	142	T1-1 Total Exp. Reactive Energy	222	T3 Total Exp. Reactive Energy
62	S1	143	T1-1 Total Phase 1 Imp. Active Energy	223	T3 Total Phase 1 Imp. Active Energy
63	S2	144	T1-1 Total Phase 1 Imp. Reactive Energy	224	T3 Total Phase 1 Imp. Reactive Energy

64	S3	145	T1-1 Tot. Phase1 Exp. Active Energy	225	T3 Tot.Phase1 Exp. Active Energy
65	S Tot	146	T1-1 Tot. Phase1 Exp. Reactive Energy	226	T3 Tot.Phase1 Exp. Reactive Energy
66	S1 Min.	147	T1-1 Tot. Phase2 Imp. Active Energy	227	T3 Tot.Phase2 Imp. Active Energy
67	S2 Min.	148	T1-1 Tot. Phase2 Imp. Reactive Energy	228	T3 Tot.Phase2 Imp. Reactive Energy
68	S3 Min.	149	T1-1 Tot. Phase2 Exp Active Energy	229	T3 Tot.Phase2 Exp. Active Energy
69	S1 Max.	150	T1-1 Tot. Phase2 Exp. Reactive Energy	230	T3 Tot.Phase2 Exp. Reactive Energy
70	S2 Max.	151	T1-1 Tot. Phase3 Imp Active Energy	231	T3 Tot.Phase3 Imp. Active Energy
71	S3 Max.	152	T1-1 Tot. Phase3 Imp. Reactive Energy	232	T3 Tot.Phase3 Imp. Reactive Energy
72	PF1	153	T1-1 Tot. Phase3 Exp. Active Energy	233	T3 Tot.Phase3 Exp Active Energy
73	PF2	154	T1-1 Tot. Phase3 Exp. Reactive Energy	234	T3 Tot.Phase3 Exp. Reactive Energy
74	PF3	155	T1-2 Total Imp. Active Energy	235	THD V1
75	PF Tot	156	T1-2 Total Imp. Reactive Energy	236	THD V2
76	Import PF1 Min.	157	T1-2 Total Exp. Active Energy	237	THD V3
77	Import PF2 Min.	158	T1-2 Total Exp. Reactive Energy	238	THD I1
78	Import PF3 Min.	159	T1-2 Total Phase 1 Imp. Active Energy	239	THD I2
79	Import PF1 Max.	160	T1-2 Total Phase 1 Imp. Reactive Energy	240	THD I3
80	Import PF2 Max.				

4.18.2 Customized Main Screen Guidelines

Customized Main Screen Guide Line Activation						
Address	**Parameter**	**Data Type**	**W/R**	**Function**	**Description**	**Default Value**
15006	Guide Line Activation	uint32_t	R/W	03H/10H	0 – Off 1- On	1-On

CHAPTER 5

TECHNICAL SPECIFICATIONS

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TECHNICAL SPECIFICATIONS	
Supply	
Voltage	85..300V AC/DC
Frequency	45..65 Hz
Measurement Inputs	
Voltage	1..300V RMS (L-N)
Current	0.005..6A RMS
Frequency	45..65 Hz
Relay Outputs (Optional, 2 pcs)	
Max. Switching Current	5A
Max. Switching Voltage	250 VAC
Max. Switching Power	1250 VA
Digital Input (Optional, 2 pcs)	
Input Type	Dry Contact
Digital Output (Optional, 2 pcs)	
Voltage	5..30V DC
Current	50mA
Insulation	3750V RMS
Ethernet Interface	
Port	10/100Base-TX (RJ45)
Performance	14480 pps to 10Mbps /144800 pps to 100Mbps
Overvoltage Category	
OVC III	
Demand	
Period	1-60 min (adjustable)
Environmental Conditions	
Operating Temperature	-25°C..+70°C
Storage Temperature	-30°C..+80°C
Humidity	Max. 95%, non-condensing
Dimensions	
Width	96 mm
Height	96 mm
Depth	45 mm
Protection Class	
Front Cover	IP54
Back Cover	IP20
Power Consumption	
Power Consumption	<3VA

MEASUREMENT ACCURACY

Symbol	Measurement Type	Class according to IEC 61557-12	Measurement Range	Other Applicable Standards
P	Total active power	0.2 (X5 CT) 0.5 (X1 CT)	10 % In ≤ I ≤ I max 0.5 Ind to 0.8 Cap	---
Q_V	Total reactive power	1	5 % In ≤ I ≤ I max 0.25 Ind to 0.25 Cap	---
S_A	Total apparent power	0.2 (X5 CT) 0.5 (X1 CT)	10 % In ≤ I ≤ I max 0.5 Ind to 0.8 Cap	---
E_A	Total active energy	0.2 (X5 CT) 0.5 (X1 CT)	0 to 49999999999	IEC 62053-22 Class 0.2S
E_rV	Total reactive energy	2	0 to 49999999999	IEC 62053-22 Class 2
F	Frequency	0.05	45 – 65 Hz	---
I	Phase current	0.2 (X5 CT) 0.5 (X1 CT)	20 % In ≤ I ≤ I max	---
I_{Nc}	Neutral current (calculated)	0.5	20 % In ≤ I ≤ I max	---
U	Voltage	0.2	Umin ≤ U ≤ U max	---
PF_A	Power factor	0.2 (X5 CT) 0.5 (X1 CT)	0.5 Ind to 0.8 Cap	---
THDV	Voltage total harmonic distortion	1	0 % to 20 %	---
THDI	Current total harmonic distortion	2	0 % to 100 %	---

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