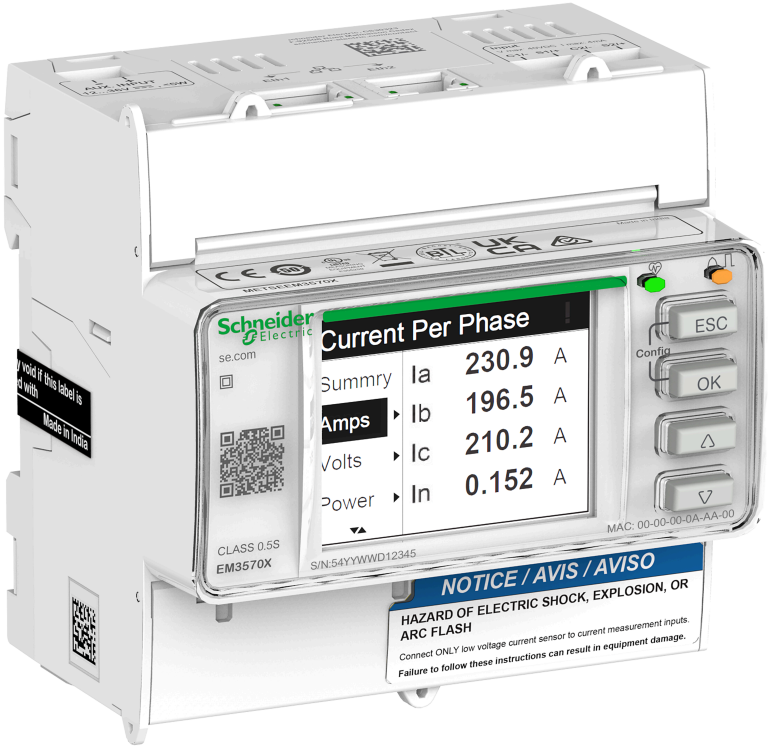
DIN Ethernet

EM3570 series

User manual

7EN02-0443-00
06/2024



Legal Information

The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

The Schneider Electric brand and any trademarks of Schneider Electric SE and its subsidiaries referred to in this document are the property of Schneider Electric SE or its subsidiaries. All other brands may be trademarks of their respective owner.

Schneider Electric does not grant any right or license for commercial use of the document or its content, except for a non-exclusive and personal license to consult it on an "as is" basis.

Schneider Electric reserves the right to make changes or updates with respect to or in the content of this document or the format thereof, at any time without notice.

To the extent permitted by applicable law, no responsibility or liability is assumed by Schneider Electric and its subsidiaries for any errors or omissions in the informational content of this document, as well as any non-intended use or misuse of the content thereof.

Safety information

Important information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that accompany this symbol to avoid possible injury or death.

⚠⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please note

Electrical equipment should be installed, operated, serviced and maintained in restricted access locations only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this equipment. A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Notices

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The user is cautioned that any changes or modifications not expressly approved by Schneider Electric could void the user's authority to operate the equipment.

This digital apparatus complies with CAN ICES-3 (A) /NMB-3(A).

About this manual

This manual discusses features of the EM3570 series DIN Ethernet meter and provides installation and configuration instructions.

Throughout the manual, the term “meter” / “device” / “equipment” / “product” refers to all models of the EM3570 series. All differences between the models, such as a feature specific to one model, are indicated with the appropriate model number or description.

This manual does not provide configuration information for advanced features where an expert user would perform advanced configuration. It also does not include instructions on how to incorporate meter data or perform meter configuration using energy management systems or software.

The most up-to-date documentation about your meter is available for download from www.se.com.

Related documents

Document	Number
EM3570X / EM3570AX instruction sheet	NNZ67212

Table of Contents

Safety precautions

Installation, wiring, testing and service must be performed in accordance with all local and national electrical codes.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate Personal Protective Equipment (PPE) and follow safe electrical work practices. See NFPA 70E, CSA Z462 or other local standards.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this device and the equipment in which it is installed before working on or in the equipment.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Assume communications and I/O wiring are hazardous live until determined otherwise.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested and tagged. Pay particular attention to the design of the power system. Consider all power supply sources, particularly the potential for backfeed.
- Do not exceed the maximum ratings of this device.
- Replace all devices, doors and covers before turning on power to this equipment.
- Never short the secondary of a Voltage Transformer (VT).
- Never open circuit a Current Transformer (CT).
- Always use grounded external CTs for current inputs.
- Do not install CTs or LPCTs in equipment where they exceed 75% of the wiring space of any cross-sectional area in the equipment.
- Do not install CTs or LPCTs or meter in areas where ventilation openings may be blocked or in areas of breaker arc venting.
- Secure CT or LPCT secondary conductors to ensure they do not contact live circuits.
- Do not mount the meter within 2 in (50.8 mm) of any live circuits including the primary conductors, primary terminals and primary lugs.
- Do not allow the meter to contact the panel interior insulation inside the enclosure.
- Do not use water or any liquid material to clean the product. Use a cleaning cloth to remove dirt. If dirt cannot be removed, contact local Technical Support representative.
- Before installation, verify the rating and the characteristics of the supply side over current protection devices. Do not exceed the maximum current or voltage rating of the meter.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

UNINTENDED OPERATION

Do not use the meter for critical control or protection applications where human or equipment safety relies on the operation of the control circuit.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠WARNING

INACCURATE DATA RESULTS

- Do not rely solely on data displayed on the display or in software to determine if this device is functioning correctly or complying with all applicable standards.
- Do not use data displayed on the display or in software as a substitute for proper workplace practices or equipment maintenance.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠WARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change default passwords/passcodes to help prevent unauthorized access to device settings and information.
- Disable unused ports/services and default accounts, where possible, to minimize pathways for malicious attacks.
- Place networked devices behind multiple layers of cyber defenses (such as firewalls, network segmentation, and network intrusion detection and protection).
- Use cybersecurity best practices (for example: least privilege, separation of duties) to help prevent unauthorized exposure, loss, modification of data and logs, interruption of services, or unintended operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Meter overview

Overview of meter functions

The EM3570 series DIN Ethernet meter is electronic with multi-line backlit LCD display. The meter provides accurate 3-phase electrical parameters monitoring with class 0.5 accuracy standard.

The key features of the meters are:

- Bi-directional
- Measurement of active and reactive energy
- Power/current demand, peak demand
- Time-stamped alarms
- Multi Tariffs (up to 4) controlled by internal clock, status inputs or communication
- 2 status inputs and 1 relay output
- Display (current, voltage, and energy measurements)
- Data logging
- Communications via Modbus TCP and BACnet/IP
- Compatible with LVCT or Rogowski Coils

Feature summary

Function		EM3570X	EM3570AX
Measurement input through LVCT		√	—
Measurement input through Rogowski Coil		—	√
Active Energy measurement accuracy class (total and partial kWh)		0.5%	0.5%
Four Quadrant Energy measurements		√	√
Electrical measurements (I, In, V, PQS, PF, Hz, ...)		√	√
Alarms with time stamping		√	√
Data logging		√	√
Multi Tariff	**Controlled by internal clock**	4 tariffs	4 tariffs
	Controlled by status input(s)	4 tariffs	4 tariffs
	Controlled by communications	4 tariffs	4 tariffs
Status inputs	**Programmable (input status, tariff control, input metering, partial reset)**	2 status inputs	2 status inputs
Relay outputs	**Programmable (control mode, behaviour mode)**	1 relay output	1 relay output
Communications	**Modbus TCP**	√	√
	BACnet/IP	√	√

Data display and analysis tools

Meter configuration

Meter configuration can be performed through the HMI display or through the meter webpages or through the ION Setup.

ION Setup is a meter configuration tool that can be downloaded for free at www.se.com.

See the ION Setup online help or in the ION Setup device configuration guide. To download a copy, go to www.se.com and search for ION Setup device configuration guide.

Modbus command interface

Most of the meter's real-time and logged data, as well as basic configuration and setup of meter features, can be accessed and programmed using a Modbus command interface as published in the meter's Modbus register list.

This is an advanced procedure that should only be performed by users with advanced knowledge of Modbus, their meter, and the power system being monitored. For further information on the Modbus command interface, contact Technical Support.

See your meter's Modbus register list at www.se.com for the Modbus mapping information and basic instructions on command interface.

Power Monitoring Expert

EcoStruxure™ Power Monitoring Expert is a complete supervisory software package for power management applications.

The software collects and organizes data gathered from your facility's electrical network and presents it as meaningful, actionable information via an intuitive web interface.

Power Monitoring Expert communicates with devices on the network to provide:

- Real-time monitoring through a multi-user web portal
- Trend graphing and aggregation
- Power quality analysis and compliance monitoring
- Preconfigured and custom reporting

See the EcoStruxure™ Power Monitoring Expert online help for instructions on how to add your device into its system for data collection and analysis.

Cybersecurity

Overview

This chapter contains information about your product's cybersecurity. Network administrators, system integrators and personnel that commission, maintain or dispose of a device should:

- Apply and maintain the device's security capabilities. See Device security capabilities, page 13 for details.
- Review assumptions about protected environments. See Protected environment assumptions, page 14 for details.
- Address potential risks and mitigation strategies. See Potential risks and compensating controls, page 15 for details.
- Follow recommendations to optimize cybersecurity.

Your device has security capabilities that:

- Allow it to be part of a NERC CIP compliant facility. Go to the North American Electric Reliability Corporation website for information on NERC Reliability Standards.
- Align with cybersecurity standards in the IEC 62443 international standard for business IT systems and Industrial Automation and Control Systems (IACS) products. Go to the International Electrotechnical Commission website for information about the IEC 62443 international standard.

To communicate a security topic affecting a Schneider Electric product or solution, go to http://www.se.com/en/work/support/cybersecurity/vulnerability-policy.jsp.

⚠WARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change default passwords/passcodes to help prevent unauthorized access to device settings and information.
- Disable unused ports/services and default accounts, where possible, to minimize pathways for malicious attacks.
- Place networked devices behind multiple layers of cyber defenses (such as firewalls, network segmentation, and network intrusion detection and protection).
- Use cybersecurity best practices (for example: least privilege, separation of duties) to help prevent unauthorized exposure, loss, modification of data and logs, interruption of services, or unintended operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Product defense-in-depth

Use a layered network approach with multiple security and defense controls in your IT and control system to minimize data protection gaps, reduce single-point-of-failure and create a strong cybersecurity posture. The more layers of security in your network, the harder it is to breach defenses, take digital assets or cause disruption.

Device security capabilities

This section describes the security capabilities available with your device.

Information confidentiality

These security capabilities help protect the confidentiality of information through secure protocols that help prevent unauthorized users from reading information in transit.

Physical security

Multiple anti-tamper sealing points are used to help prevent access and leaves evidence of tampering.

Configuration

These security capabilities support the analysis of security events, help protect the device from unauthorized alteration and records configuration changes and user account events:

- Enabling the HMI timeout period in webpages (Refer to Enabling the HMI timeout period, page 46).
- Terminating user account sessions in webpages (Refer to Terminating user account sessions, page 55).
- Configuring the IP network services (Refer to Configuring IP network services, page 48).
- Configuring the IP filtering global access and exception list (Refer to Configuring IP filtering, page 49).

User accounts

These security capabilities help enforce authorizations assigned to users, segregation of duties and least privilege:

- User authentication is used to identify and authenticate software processes and devices managing accounts (Refer to User accounts, page 52).
- User account lockout with number of unsuccessful login attempts (Refer to User account lockout policy, page 16).
- Administrators can override user authorizations by deleting their account (Refer to Deleting user account, page 54).

Protected environment assumptions

- Cybersecurity governance – available and up-to-date guidance on governing the use of information and technology assets in your company.
- Perimeter security – installed devices, and devices that are not in service, are in an access-controlled or monitored location.
- Emergency power – the control system provides the capability to switch to and from an emergency power supply without affecting the existing security state or a documented degraded mode.
- Firmware upgrades – meter upgrades are implemented consistently to the current version of firmware.
- Controls against malware – detection, prevention and recovery controls to help protect against malware are implemented and combined with appropriate user awareness.

- Physical network segmentation – the control system provides the capability to:
  - Physically segment control system networks from non-control system networks.
  - Physically segment critical control system networks from non-critical control system networks.
- Logical isolation of critical networks – the control system provides the capability to logically and physically isolate critical control system networks from non-critical control system networks. For example, using VLANs.
- Independence from non-control system networks – the control system provides network services to control system networks, critical or non-critical, without a connection to non-control system networks.
- Encrypt protocol transmissions over all external connections using an encrypted tunnel, TLS wrapper or a similar solution.
- Zone boundary protection – the control system provides the capability to:
  - Manage connections through managed interfaces consisting of appropriate boundary protection devices, such as: proxies, gateways, routers, firewalls and encrypted tunnels.
  - Use an effective architecture, for example, firewalls protecting application gateways residing in a DMZ.
  - Control system boundary protections at any designated alternate processing sites should provide the same levels of protection as that of the primary site, for example, data centers.
- No public internet connectivity – access from the control system to the internet is not recommended. If a remote site connection is needed, for example, encrypt protocol transmissions.
- Resource availability and redundancy – ability to break the connections between different network segments or use duplicate devices in response to an incident.
- Manage communication loads – the control system provides the capability to manage communication loads to mitigate the effects of information flooding types of DoS (Denial of Service) events.
- Control system backup – available and up-to-date backups for recovery from a control system failure.

Potential risks and compensating controls

Address potential risks using these compensating controls:

Area	Issue	Risk	Compensating controls
Passcode through meter display User accounts	Default settings are often the source of unauthorized access by malicious users.	If you do not change the default password/passcode, unauthorized access can occur.	Change the default password/ passcode to help reduce unauthorized access.
Secure protocols	Ethernet port with Modbus TCP, BACnet/IP, DNS, SNMP, SNTP protocols are unsecure. The device does not have the capability to transmit encrypted data using these protocols.	If a malicious user gained access to your network, they could intercept communications.	For transmitting data over an internal network, physically or logically segment the network. For transmitting data over an external network, encrypt protocol transmissions over all external connections using an encrypted tunnel, TLS wrapper or a similar solution.

Default settings

Area	Setting	Default
Communication protocols	Modbus TCP/IP	Enabled (Read-only)
	BACnet/IP	Enabled (Read-only)
	SNMP	Disabled
	Discovery	Enabled
	HTTPS	Enabled
	SNTP	Disabled
Configuration	Using webpages	Enabled

User accounts and permissions

Recommendations to optimize cybersecurity in a protected environment:

- Assign users only the essential permissions needed to perform their role (Refer to Edit user account details, page 54).
- Revoke user permissions when no longer needed due to role change, transfer or termination.
- Follow user account management tasks as described by your organization or contact your network administrator.

User account lockout policy

After the five consecutive invalid login attempts, the webpage login is locked for 2 minutes. After 2 minutes (expiry), the webpage is unlocked. Alternately you can perform power cycle or soft restart or factory reset to unlock the user account.

NOTE: If you perform factory reset, all user accounts except **Administrator** and **Guest** are deleted and the webpage user account goes back to factory default settings.

Passwords/Passcodes

Recommendations to optimize cybersecurity in a protected environment:

- Document and store passwords/passcodes and user names in a protected location.
- Change the default passwords/passcodes to help reduce unauthorized access (Refer to Configuring the display passcode, page 38 and Changing user account password, page 44). Default account settings are often the source of unauthorized access by malicious users.
- Use complex passwords/passcodes or passphrases between 8 and 16 characters with at least 1 number, 1 capital letter and 1 special character.
- Follow user account management tasks as described by your organization or contact your network administrator, for example, maximum password age or history policies.

Default passwords/passcodes and user accounts

Configuration area	User name	Default passcode/password
Meter display passcode	–	Low: 0000 High: 0010
Webpages	Administrator	MAC address which is unique for each meter **NOTE:** Enter the MAC address of the meter without colon in capital letters (For example: if the MAC address of the meter is 00:80:f4:02:14:38, then password is 0080F4021438).
	Guest	guest

Hardening

Recommendations to optimize cybersecurity in a protected environment:

- Harden the meter according to your company policies and standards.
- Review assumptions about protected environments and address potential risks and mitigation strategies.
- Change the default passwords/passcodes (Refer to Configuring the display passcode, page 38 and Changing user account password, page 44).
- Enable the HMI timeout period in webpages (Refer to Enabling the HMI timeout period, page 46).
- Terminate the user account sessions in webpages (Refer to Terminating user account sessions, page 55).
- Least functionality can be applied to prohibit and restrict the use of unnecessary functions, protocols and/or services.
- Change the communication protocol ports from their default values. This lowers the predictability of port use.
- Disable communication protocol ports when they are not in use. This reduces the attack surface.

Enabling/Disabling communication protocols and changing port numbers

Configuring SNTP

See Configuring date/time, page 45 for instructions.

Configuring IP network services

See Configuring IP network services, page 48 for instructions.

Configuring IP filtering

See Configuring IP filtering, page 49 for instructions.

Configuring SNMP

See Configuring SNMP, page 50 for instructions.

Configuring system log

See Configuring system log, page 51 for instructions.

Configuring advanced Ethernet settings

See Configuring advanced Ethernet settings, page 52 for instructions.

Reporting a security incident or vulnerability

To report suspicious activity or a cybersecurity incident, go to the Schneider Electric Report an Incident website.

To report a security vulnerability affecting your product or solution, go to the Schneider Electric Report a Vulnerability website.

Firmware upgrades

When meter firmware is upgraded - security configuration remains the same until changed, including user names and passwords/passcodes. It is recommended to review security configuration after an upgrade to analyze privileges for new or changed device features and revoke or apply them according to your company policies and standards.

Secure disposal guidelines

Use the *Secure disposal checklist* when disposing a meter to help prevent potential disclosure of data.

Secure disposal checklist

- **Record activities**: Document disposal actions according to your company policies and standards to keep a record of activities.
- **Decommission related rules and sanitize records**:
  - Follow decommission and sanitization tasks as described by your organization or contact your network administrator.
  - Decommission network and security rules, e.g. a firewall rule that could be used to get past the firewall.
  - Perform records tracking sanitization tasks to remove records in related systems, e.g. monitoring SNMP servers.
- **Disposal and reuse**: See Disposal and reuse, page 18 for more information.

Disposal and reuse

Before removing the device from its intended environment, follow the *Secure disposal guidelines* in this document.

Follow device removal tasks described by your organization or contact your network administrator to determine a responsible method of disposal.

Dispose the device according to the legislation of the country. Some regulatory organizations include:

- The United States Environmental Protection Agency (EPA) for guidance on the sustainable management of electronics.
  - The EPA provides an Electronic Product Environmental Assessment Tool (EPEAT) that helps assess the environmental attributes of electronics.
- The European Waste Electrical & Electronic Equipment Directive (WEEE Directive) is the Community directive on Waste Electrical and Electronic Equipment.
- The European Restriction of Hazardous Substances Directive (RoHS) directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

NOTICE
UNAUTHORIZED OR UNINTENDED ACCESS TO CONFIDENTIAL DATA • Store devices that are not in service in an access-controlled or monitored location. • Physically destroy devices that are decommissioned. **Failure to follow these instructions can result in unauthorized or unintended access to sensitive or secure customer data.**

Device disposal

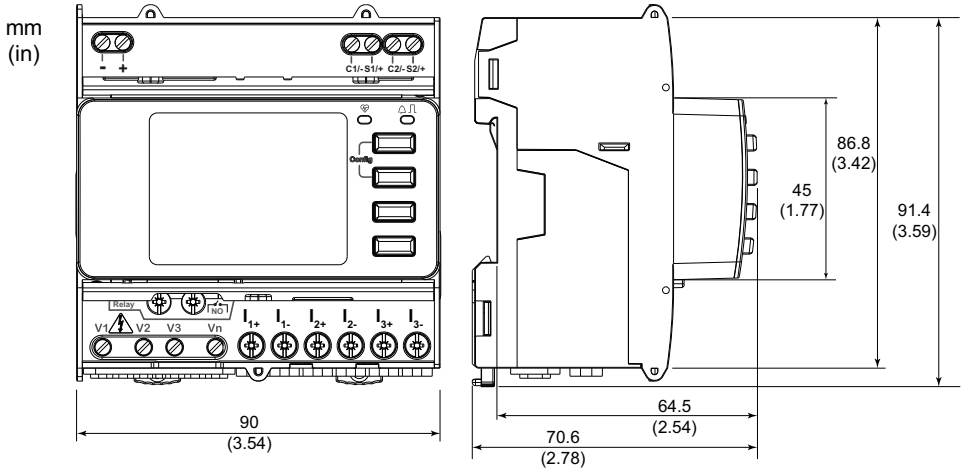
It is recommended that the entire device is physically destroyed. Destroying the device helps prevent potential disclosure of data contained in the device that was not removed.

Device reuse

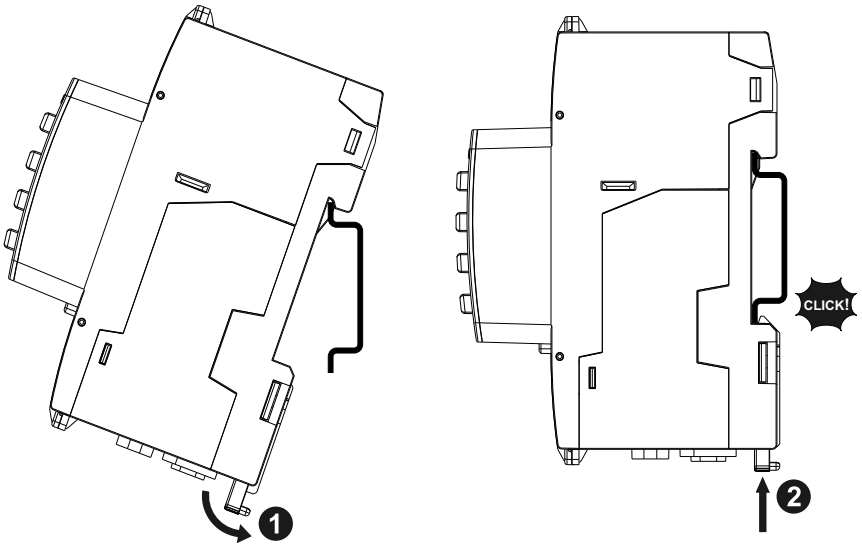
Store the device in a location that is access controlled or monitored if there is potential for reuse.

Hardware reference

Dimensions

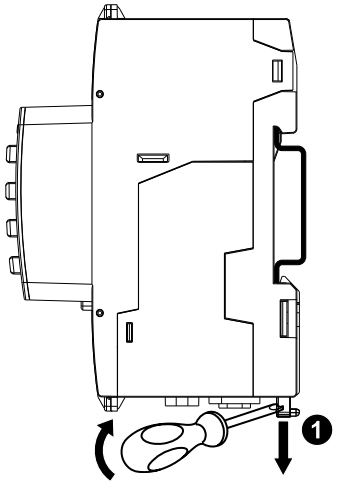


Mounting

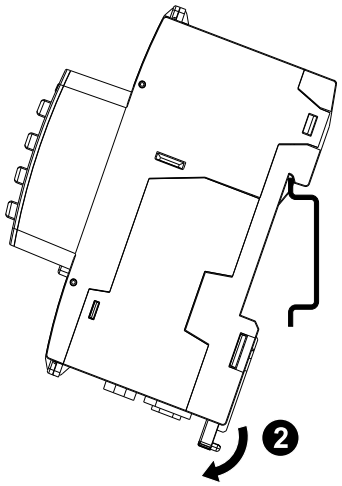


Dismounting

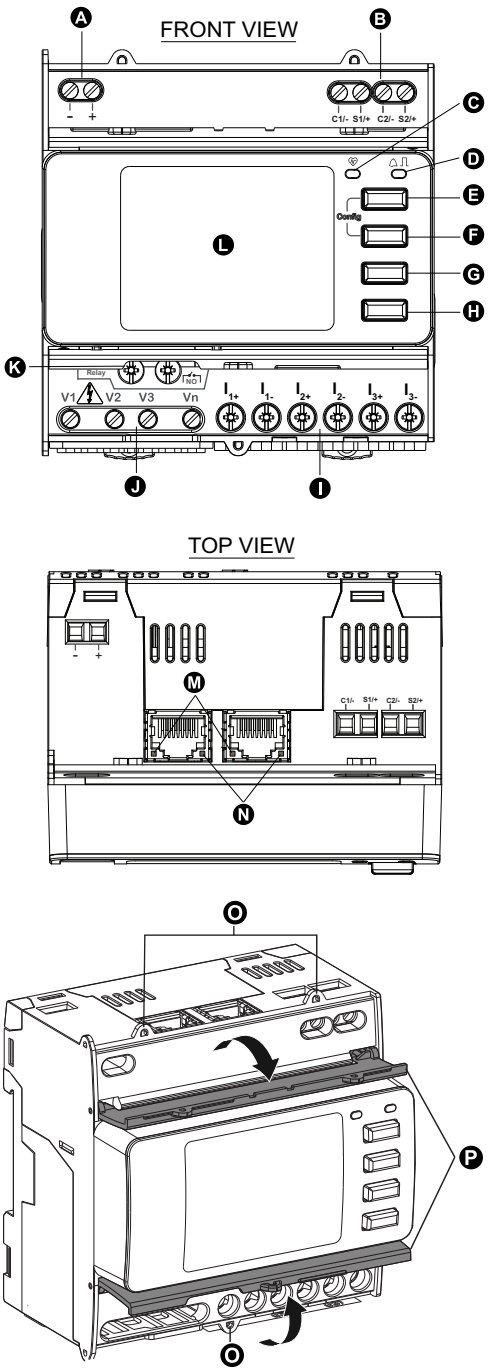
1. Use a flat-tip screwdriver (≤ 6.5 mm / 0.25 in) to lower the locking mechanism and release the meter.



2. Lift the meter out and up to free it from the DIN rail.



Meter description



A	Control power input (-, +)
B	Status inputs (C1/-, S1/+, C2/-, S2/+)
C	Operation LED (Green)
D	Alarm / Energy pulse LED (Orange)
E	Cancellation button
F	Confirmation button
G	Up button
H	Down button
I	Current inputs (I_{1+}, I_{1-}, I_{2+}, I_{2-}, I_{3+}, I_{3-})
J	Voltage inputs (V1, V2, V3, Vn)
K	Relay output (NO (⌐˙¬))
L	Display with white backlight
M	Ethernet port Link/Activity LED (Green)
N	Ethernet port Speed LED (Green) (100 Mbps = Green / 10 Mbps = Off)
O	Three sealing points
P	Two sealable covers

NOTE: The sealable covers must be installed and sealed to the sealing points with the steel cable. Use steel cable with 1.6 mm (1/16 in) diameter and 152.4 mm (6 in) adjustable length for sealing.

LED indicators

Alarm / energy pulse LED

The alarm / energy pulse LED can be configured for alarm notification or energy pulsing.

When configured for alarm notification, this LED flashes (1 s ON and 1 s OFF) when the alarm is active. The LED provides a visual indication of an active alarm condition.

When configured for energy pulsing, this LED flashes at a rate proportional to the amount of energy consumed.

Operation LED

The operation LED blinks at a slow, steady rate to indicate that the meter is operational.

This LED cannot be configured for other purposes.

NOTE: The operation LED that remains ON and does not flash indicate a problem with the meter. In this case, restart the meter. If the LED still does not flash, contact Technical Support.

Ethernet communication LEDs

The meter has two LEDs per port for Ethernet communication.

The Link/Activity LED flashes to indicate the meter is communicating through the Ethernet port. The Speed LED is ON when the speed is more than 100 Mbps (Green = 100 Mbps / Off = 10 Mbps).

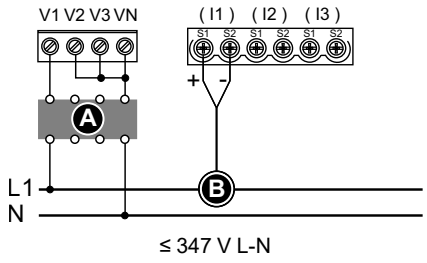
Wiring

Power system wiring

NOTE: The current terminals of the meter must be shorted if it is not connected to external LVCS (LVCT / Rogowski coil).

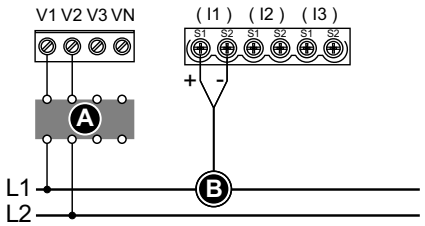
1PH

1PH2W L-N



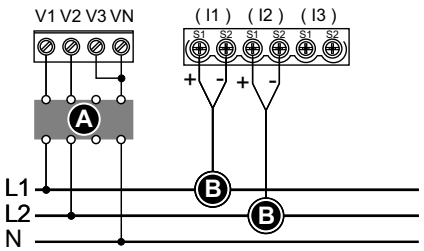
≤ 347 V L-N

1PH2W L-L



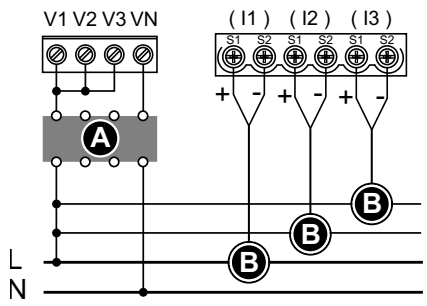
≤ 600 V L-L

1PH3W L-L-N



≤ 347 V L-N
≤ 600 V L-L

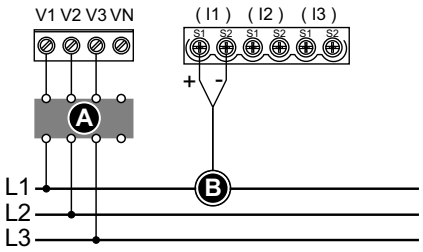
1PH4W multi L-N 3LVCS



≤ 347 V L-N

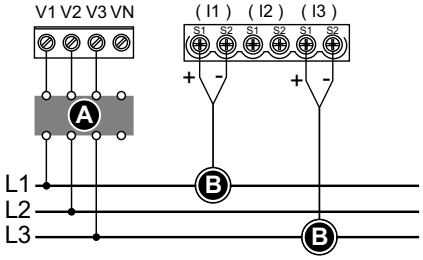
3PH3W

1LVCS♦



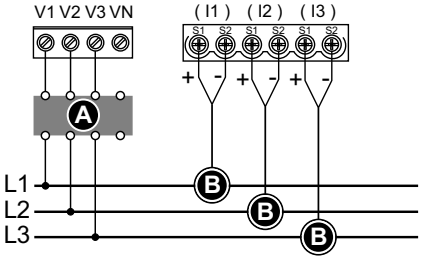
≤ 600 V L-L

2LVCS



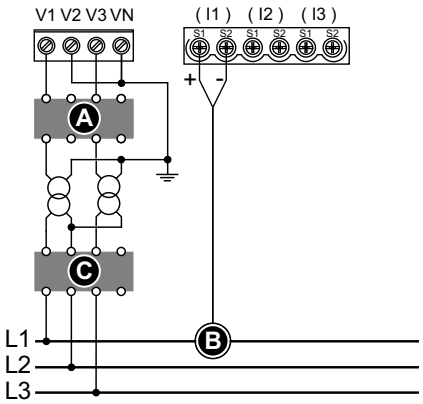
≤ 600 V L-L

3LVCS

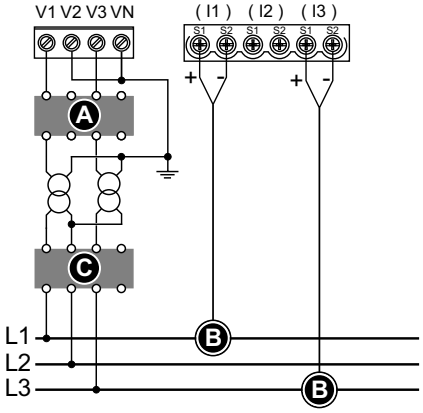


≤ 600 V L-L

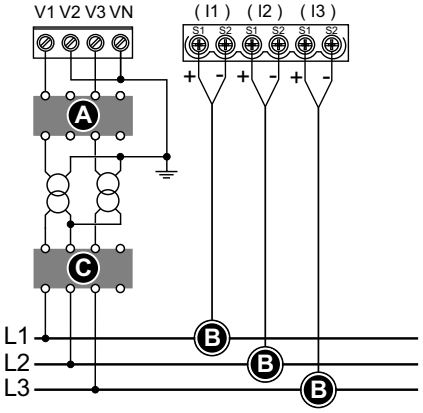
2VT, 1LVCS♦



2VT, 2LVCS

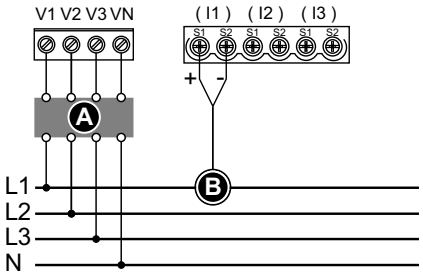


2VT, 3LVCS



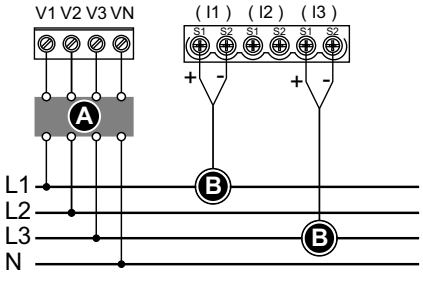
3PH4W

1LVCS♦



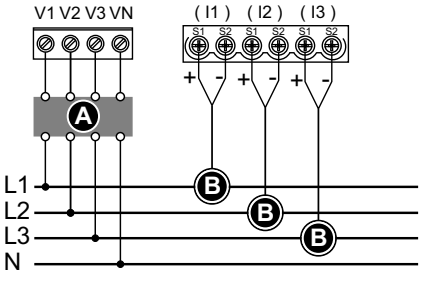
≤ 347 V L-N

2LVCS

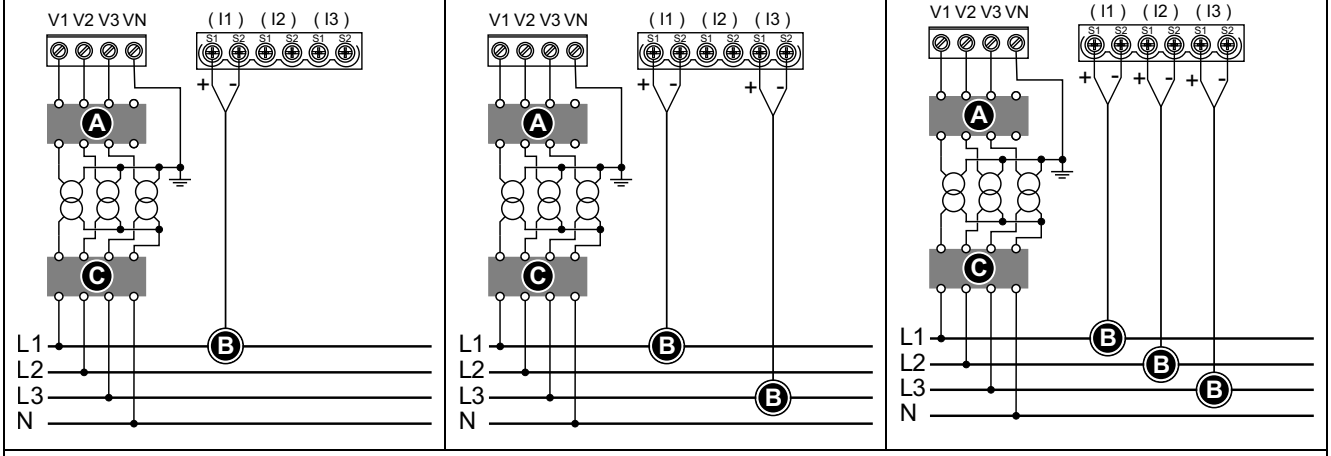


≤ 347 V L-N

3LVCS



≤ 347 V L-N



A 250 mA fuses and disconnect switch

B LVCS with insulation rated for the installation voltage and the installation / measurement category

NOTE: LVCS refers to both LVCT and Rogowski coil.

C VT primary fuses and disconnect switch

♦ indicates wiring for a balanced system

\+ indicates white wire

– indicates black wire

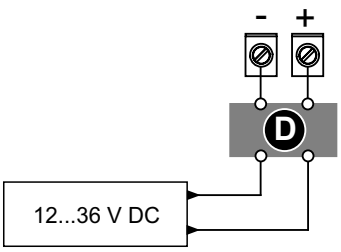
Clearly label the device's disconnect circuit mechanism and install it within easy reach of the operator.

Fuses / circuit breakers must be:

- Installed in accordance with all local and national electrical codes and standards.
- Rated for the installation voltage, available fault current, and sized for connected loads.

Fuse for neutral is required if the source neutral is not grounded.

Control power wiring



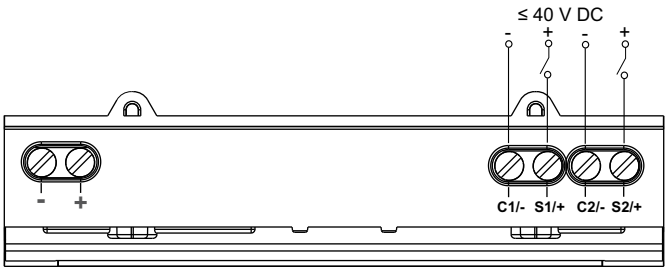
D 1 A fuse

The low-voltage DC power connections + and − are polarized. These connections are internally reverse polarity protected.

Always use a fuse on +. Fuse - when connecting to a floating DC source.

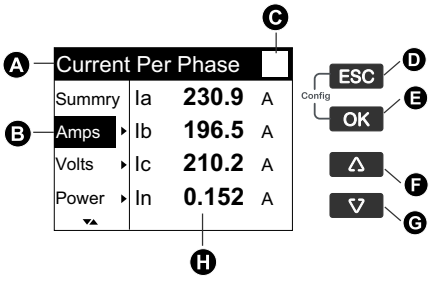
The fuses / circuit breakers must be rated for the installation voltage and sized for the available fault current.

Status input wiring



Front panel display

Display screen overview



A	Screen title
B	List of screens
C	Configuration mode icon ( ) or Error / Alert icon ( ) notification area
D	Cancel and go back to parent screen, Summary screen (display mode) or Setup screen (configuration mode)
E	Select a menu item or confirm an entry
F	Navigate up, select a setting from a list or increase a number in a numeric setting
G	Navigate down, select a setting from a list or decrease a number in a numeric setting
H	Values or settings

Status information

The two LEDs on the front panel indicate the current status of the meter: the green operation LED and the orange alarm / energy pulse LED.

The icons in the following table indicate the LED state:

	= OFF	= Flashing	= ON
Operation LED	Diagnostic code error (Refer to Diagnostic codes, page 64)	Meter is operational	Diagnostic code error (Refer to Diagnostic codes, page 64)
Alarm LED	No alarm	Active or inactive unacknowledged alarm	Abnormal behaviour of LED. Contact Technical Support
Energy pulsing LED	Not counting	Energy pulse counting	Over-counting due to incorrect configuration or overload

Backlight and error / alert icon

The backlight (display screen) and error / alert icon on the top right corner of the display screen indicate the meter status.

Backlight	Error / Alert icon	Description
OFF	–	Device not powered ON or device is OFF
ON/Dim	OFF	LCD in power saving mode.
ON/Normal	OFF	Normal working status.
Flashing	Flashing	Alarm / Diagnosis is active.

Backlight	Error / Alert icon	Description
ON/Dim	Flashing	Alarm / Diagnosis is active for 3 hours, LCD in power saving mode.
Flashing	–	Device physical location (Refer to Enabling the device physical location, page 60). The backlight flashes at a faster rate for 15 s. **NOTE:** • If the backlight flashes due to Alarm/Diagnostic error, the backlight will continue to flash even after 15 s. • Any button press on the meter indicates that the device is identified and the backlight stops flashing.

Configuring

Configuring via HMI

Modifying parameters

There are two methods for modifying a parameter, depending on the type of parameter:

- Selecting a value in a list (for example, selecting 1PH2W L-N from a list of available power systems), or
- Modifying a numerical value, digit by digit (for example, entering a value for the date, time or VT primary).

NOTE: Before you modify any parameters, ensure that you are familiar with the HMI functionality and navigation structure of your device in configuration mode.

Selecting a value from a list

1. Use the ▽ or △ button to scroll through the parameter values until you reach the desired value.
2. Press OK to confirm the new parameter value.

Modifying a numerical value

1. Use the ▽ or △ button to modify the selected digit.
2. Press OK to confirm the new parameter value and to shift to the next digit. Modify the next digit, if needed, or press OK.
3. Continue to move through the digits until you reach the last digit then press OK again to confirm the new parameter value.

   If you enter an invalid setting and press OK cursor stays in the field for that parameter until you enter a valid value.

Cancelling an entry

To cancel the current entry, press the ESC button. The change is cancelled and the screen reverts to the previous display.

Clock setting

You must reset the time to account for any time change (for example, to switch the time from standard time to daylight savings time).

Clock behaviour

You are prompted to set the date and time when the meter is powered up first time. Press ESC to skip this step if you do not want to set the clock (you can enter configuration mode and set the date and time later, if required).

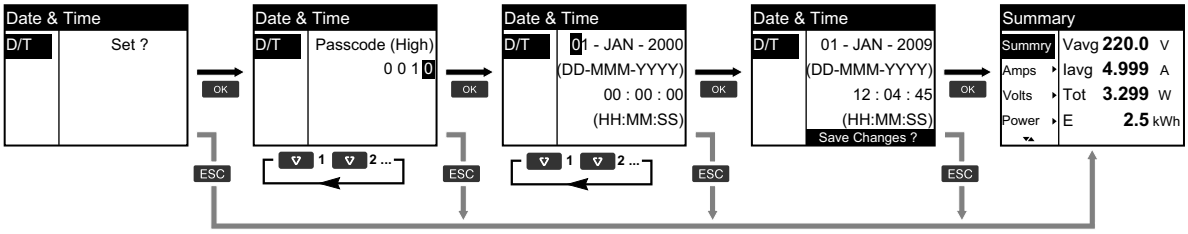
Date/time format

The date is displayed in the following format: DD-MMM-YYYY.

The time is displayed using the 24-hour clock in the following format: hh:mm:ss.

Setting the clock using the display

The following image illustrates how to set the clock when you initially power up the meter or when you reset the configuration to default . To set the clock during normal operation, refer to the **Configuration mode menu tree** for you meter.



1. Press OK when you are prompted to set the date and time when the meter is powered up.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ or △ button to set the date in **DD-MMM-YYYY** format and time in **HH:MM:SS** format.
4. Press OK to save your changes to the meter.

Configuration mode

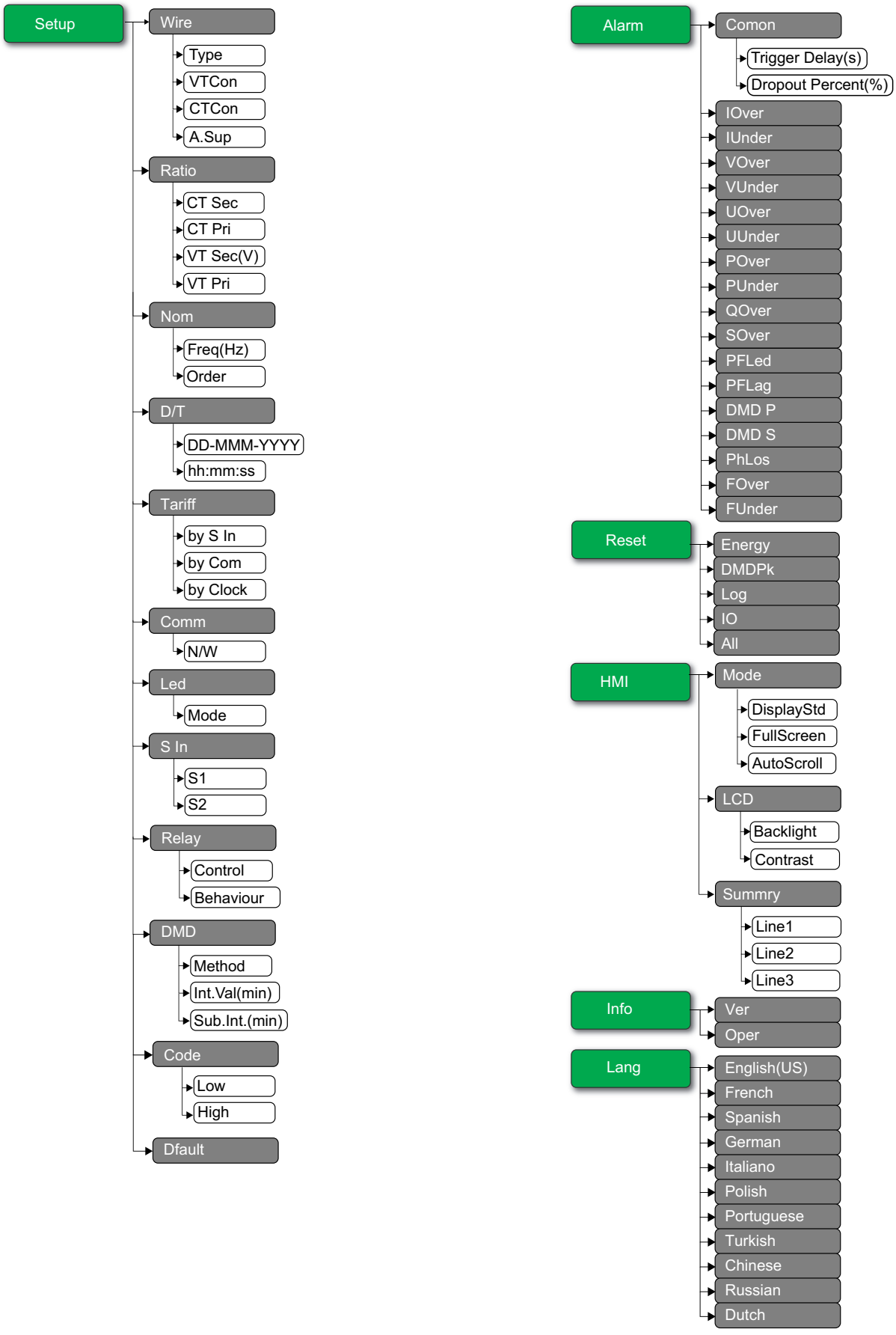
Overview

You can configure the meter parameters only in configuration mode.

The following parameters can be configured in configuration mode:

- Wiring type
- CT and VT ratio
- Nominal frequency
- Date/Time
- Multi-tariffs
- Communication network settings (partially configured)
- LED settings
- Status inputs
- Relay output
- Demand
- Passcode (High and Low)
- Alarms
- Reset default settings
- Front panel display
- Language settings

Configuration mode menu tree



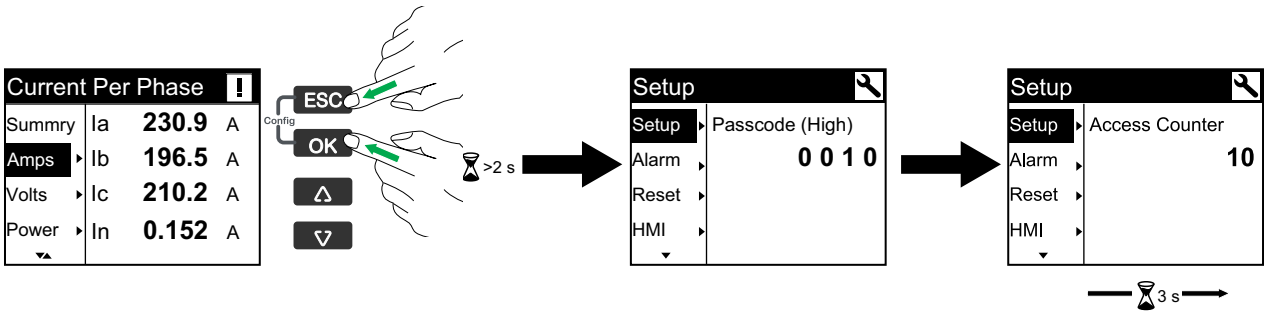
Default configuration mode settings

Menu	Default settings	
Wire	Type: 3PH4W VTCon: Direct Con CTCon: Ia, Ib, Ic A.Sup: 1.0	
Ratio	EM3570X	CT Sec: 1000mV CT Pri: 100
	EM3570AX	CT Sec: Rcoil CT Pri: 5000
Nom	Freq(Hz): 60 Order: A-B-C	
D/T	01-JAN-2000 00:00:00	
Tariff	by S In: Disable by Com: Disable by Clock: Disable	
Comm	N/W • Bacnet: Enable • WebApp: Enable • Modbus: Enable	
Led	Mode: OFF	
S In	S1 Mode: Input Status S2 Mode: Input Status	
Relay	Control: External Behaviour: Normal	
DMD	Method: Fixed Int.Val(min): 15	
Code	Low: 0000 High: 0010	

Menu	Default settings
Alarm	**Comon** • **Trigger Delay(s)**: **3** • **Dropout Percent(%)**: **0** **IOver**: **Disable** **IUnder**: **Disable** **VOver**: **Disable** **VUnder**: **Disable** **UOver**: **Disable** **UUnder**: **Disable** **POver**: **Disable** **PUnder**: **Disable** **QOver**: **Disable** **SOver**: **Disable** **PFLed**: **Disable** **PFLag**: **Disable** **DMD P**: **Disable** **DMD S**: **Disable** **PhLos**: **Disable** **FOver**: **Disable** **FUnder**: **Disable**
HMI	**Mode** • **DisplayStd**: **IEEE** • **FullScreen**: **Enable** • **AutoScroll**: **Disable** **LCD** • **Backlight**: **4** • **Contrast**: **5** **Summry** • **Line1**: **Vavg** • **Line2**: **Iavg** • **Line3**: **Ptot**
Lang	**English(US)**

Entering configuration mode

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Enter the meter passcode. The **Access Counter** screen displays, indicating the number of times the configuration mode has been accessed.



Configuring the meter power system wiring

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **Wire** and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting	Options	Description
Type	**3PH4W** **1PH4W LN** **1PH2W LN** **1PH2W LL** **1PH3W LLN** **3PH3W**	Select the power system type the meter is wired to.
VTCon	3PH4W • **Direct Con** • **Wye(3VT)** 1PH4W LN • **Direct Con** 1PH2W LN • **Direct Con** 1PH2W LL • **Direct Con** 1PH3W LLN • **Direct Con** 3PH3W • **Direct Con** • **Delta(2VT)**	Select how many voltage transformers (VT) are connected to the electrical power system.
CTCon	The titles listed are for the HMI mode in IEEE, with the corresponding titles in IEC mode in square brackets [ ]. 3PH4W • **Ia [I1]** • **Ia [I1], Ic [I3]** • **Ia [I1], Ib [I2], Ic [I3]** 1PH4W LN • **Ia [I1], Ib [I2]** • **Ia [I1], Ib [I2], Ic [I3]** 1PH2W LN • **Ia [I1]** 1PH2W LL • **Ia [I1]** 1PH3W LLN • **Ia [I1], Ib [I2]** 3PH3W • **Ia [I1]** • **Ia [I1], Ic [I3]** • **Ia [I1], Ib [I2], Ic [I3]**	Define how many current transducers (CT) are connected to the meter and which terminals they are connected to.
A.Sup	**0.1** to **1.0**	Select the values to set the suppression current.

Configuring the CT and VT ratio

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **Ratio** and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting		Options	Description
EM3570X	**CT Sec**	**1000** **333**	Select the size of the CT secondary, in millivolts.
	CT Pri	**1** to **32767**	Enter the size of the CT primary, in Amps.
EM3570AX	**CT Sec**	**Rcoil**	CT ratio secondary **NOTE:** The CT ratio secondary is read-only.
	CT Pri	**5000**	CT ratio primary **NOTE:** The CT ratio primary is read-only.
VT Sec		**100** **110** **115** **120**	Select the size of the VT secondary, in Volts.
VT Pri		**1** to **1000000**	Enter the size of the VT primary, in Volts.

Configuring the nominal frequency

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **Nom** and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting	Options	Description
Freq(Hz)	**50** **60**	Select the frequency of the electrical power system, in Hz.
Order	**A-B-C** **C-B-A**	Select the order of the frequency.

Configuring the date and time

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **D/T** and press OK.

4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting	Options	Description
DD-MMM-YYYY	–	Set the current date using the specified format.
hh:mm:ss	–	Set the time using the 24-hour format.

Configuring the tariff

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **Tariff** and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting	Options	Description
by S In	**Disable** **1 S In** **2 S In**	The status input is associated with the tariff function. A signal to the status input changes the active tariff. **NOTE:** • If you change **S In** mode to other operation modes (input status, input metering, or energy reset) while multi-tariff control mode is in **S In** control mode, the multi-tariff function is automatically disabled. • If you change multi-tariff control mode to other control modes (communication or internal RTC) while **S In** is configured for multi-tariff function, the **S In** operation mode automatically changes to input status.
by Com	**Disable** **Enable**	The active tariff is controlled by communications. In the communication control mode, the tariff switching is triggered by command.
by Clock	**Disable** **Day** **Week**	The tariff switching is triggered by the real-time clock. The configuration includes the selection of schedule mode. Set the time when each tariff period starts, using the 24 hour clock format (00:00 to 23:59). The start time of the next tariff is the end time of the current tariff. For example, T2 start equals the end of T1. Refer to Real-time clock (RTC) control mode, page 66

Configuring the communication

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **Comm** and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting		Options	Description
N/W	**Bacnet**	**Enable** **Disable**	Enable or disable the network settings. **NOTE:** The **IP Address** and **Subnet** are read-only.
	WebApp	**Enable** **Disable**	

Setting		Options	Description
	Modbus	**Enable** **Disable**	

Configuring the LED mode

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **Led** and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting	Options	Description
Mode	**OFF**	Off disables the LED completely.
	Alarm	Alarm sets the LED for alarm notification. When configured for alarming, the LED also flashes (with 1 s ON and 1 s OFF) to indicate the meter has detected an alarm condition.
	Energy • **Pulses per K__h** ◦ **1** to **9999999** • **Chan** ◦ **ActImpExp** ◦ **ReaImpExp** ◦ **AppImpExp**	Energy sets the LED for energy pulsing. When configured for energy pulsing, the LED emits pulses that are then used to determine the accuracy of the meter’s energy measurements. This setting is ignored when the LED mode is set to Alarm. • Pulses per K__h: This setting defines how many pulses are sent to the LED for every 1 kWh, 1 kVARh or 1 kVAh accumulated energy. • Channel: Select which accumulated energy channel to monitor and use for energy pulsing.

Configuring the status input

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **S In** and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.

5. Press OK to save your changes to the meter.

<table>
<tr><th colspan="2">Setting</th><th>Options</th><th>Description</th></tr>
<tr><td rowspan="2">S1</td><td rowspan="3">Mode</td><td>Input Status</td><td>Use for simple ON/OFF status inputs. The status inputs can be OF or SD signals of a circuit breaker.</td></tr>
<tr><td>Tariff Control</td><td>You can control the tariff either through communications, the internal clock or by 1 or 2 tariff inputs. Tariff control through the tariff inputs is performed by applying a proper combination of ON or OFF signal to the inputs. Each combination of ON or OFF signal results in the meter registering the energy in a particular tariff register.
<table>
<tr><th>S2</th><th>S1</th><th>Active tariff</th></tr>
<tr><td>0</td><td>0</td><td>Tariff 1</td></tr>
<tr><td>0</td><td>1</td><td>Tariff 2</td></tr>
<tr><td>1</td><td>0</td><td>Tariff 3</td></tr>
<tr><td>1</td><td>1</td><td>Tariff 4</td></tr>
</table>
NOTE: To select tariff control for S2, the S1 should be set to tariff control mode. If S1 is not set to tariff control mode, the tariff control option will not be available for S2.</td></tr>
<tr><td>S2</td><td>Input Metering
• Pulse(imp/unit): 1 to 1000</td><td>You can configure the meter in input metering modes to collect the pulses for WAGES application. To activate this function, set the input metering pulse frequency (pulse/unit). The meter counts the number of pulses and calculates the number of units. Pulse width or pulse stop less than 10 ms is invalid for pulse counting.</td></tr>
<tr><td></td><td>Partial Reset</td><td>Energy reset function resets energy by tariff. Reset is activated by an ON signal lasting for over 10 ms.</td></tr>
</table>

Configuring the relay output

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **Relay** and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting	Options	Description
Control	**External**	The relay output is controlled remotely either through software or by a PLC using commands sent through communications.
	Alarm	The relay output is associated with the alarm system. The meter sends a pulse to the relay output port when the alarm is triggered.
Behaviour	**Normal**	This mode applies when control mode is set to External or Alarm. In the event of trigger for External mode, the relay output remains in the closed state until an open command is sent by the computer or PLC. In the event of trigger for Alarm mode, the relay output remains in the closed state until the drop out point is crossed.
	Timed • **Time(s)**: **1** to **9999**	The relay output remains ON for the period defined by the on-time setup register.
	Coil	This mode applies when control mode is set to External or Alarm. The output turns on when the “energize” command is received and turns off when the “coil hold release” command is received. In the event of a control power loss, the output remembers and returns to the state it was in when control power was lost.

Configuring the demand method

NOTE: Refer to Demand calculation methods, page 67

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **DMD** and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

<table>
<tr><th>Setting</th><th colspan="2">Options</th><th>Description</th></tr>
<tr><td rowspan="3">Method</td><td>Sliding</td><td>Int.Val(min)
• 10
• 15
• 20
• 30
• 60</td><td>Select an interval from the range 10, 15, 20, 30, 60 minutes. For demand intervals less than 15 minutes, the value is updated every 15 seconds. For demand intervals of 15 minutes and greater, the demand value is updated every 60 seconds. The meter displays the demand value for the last completed interval.</td></tr>
<tr><td>Rolling</td><td>Int.Val(min)
• 10
• 15
• 20
• 30
• 60
Sub Int.(min)
<table><tr><th>Int.Val (min)</th><th>Sub Int. (min)</th></tr><tr><td>10</td><td>1, 2, 5, 10</td></tr><tr><td>15</td><td>1, 3, 5, 15</td></tr><tr><td>20</td><td>1, 2, 4, 5, 10, 20</td></tr><tr><td>30</td><td>1, 2, 3, 5, 6, 10, 15, 30</td></tr><tr><td>60</td><td>1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60</td></tr></table></td><td>Select an interval and a subinterval. Demand is updated at the end of each subinterval. The meter displays the demand value for the last completed interval.
NOTE: The subinterval must divide evenly into the interval (for example, three 5-minute (5 x 60 seconds) subintervals for a 15-minute interval).</td></tr>
<tr><td>Fixed</td><td>Int.Val(min)
• 10
• 15
• 20
• 30
• 60</td><td>Select an interval from the range 10, 15, 20, 30, 60 minutes. The meter calculates and updates the demand at the end of each fixed interval.</td></tr>
</table>

Configuring the display passcode

NOTICE
LOSS OF ACCESS Record your device's user and passcode information in a secure location. **Failure to follow these instructions can result in data loss and loss of access to the device.**

NOTICE
LOSS OF DATA OR PRODUCT CONFIGURATION Do not let unauthorized personnel gain physical access to the device. **Failure to follow these instructions can result in data loss and loss of access to the device.**

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **Code** and press OK.
4. Select **Low** or use the ▽ button to select **High** and press OK button to edit the passcode.
5. Use the ▽ or △ button to modify the selected digit.
6. Press OK to confirm the new value and to shift to the next digit. Modify the next digit, if needed, or press OK.
7. Continue to move through the digits until you reach the last digit then press OK again to confirm the new setting.

   If you enter an invalid setting and press OK cursor stays in the field until you enter a valid value.

Setting	Options	Description
Low	**0** to **9999**	Set the low passcode for accessing the alarms and resets.
High	**10** to **9999**	Set the high passcode for accessing the setup and clock.

Resetting to default values

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ or △ button to enter the meter **Passcode (High)** (Default is “0010”) and press OK.
3. Use the ▽ button to scroll to **Dfault** and press OK.
4. Press OK to reboot (reset to default).

   NOTE: The webpage password resets to default but the HMI passcode does not reset to default.

Configuring the alarm parameters

The active alarm list holds 20 events at a time. The list works as a circular buffer, replacing old events as new events over 20 are entered into the active alarms list. The information in the active alarms list is volatile and re-initializes when the meter resets.

The alarm history log holds 20 events. The log also works as a circular buffer, replacing old events with new event. The information in the alarm history log is non-volatile and is retained when the meter resets.

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ button to scroll to **Alarm** and press OK.
3. Use the ▽ or △ button to enter the meter **Passcode (Low)** (Default is “0000”) and press OK.

4. Use the ▽ or △ button to scroll through the settings and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting	Options		Description
Comon	**Trigger Delay(s)**	**0** to **999999**	Set the trigger delay in seconds and drop out percent (%) for all the alarm parameters.
	Dropout Percent(%)	**0** to **99**	
IOver	**Disable**	—	Enable or disable the over current alarm.
	Enable • **Pick Up Point(A)**	**0** to **9999999**	
IUnder	**Disable**	—	Enable or disable the under current alarm.
	Enable • **Pick Up Point(A)**	**0** to **9999999**	
VOver	**Disable**	—	Enable or disable the over voltage alarm of V L-N.
	Enable • **Pick Up Point(V)**	**0** to **9999999**	
VUnder	**Disable**	—	Enable or disable the under voltage alarm of V L-N.
	Enable • **Pick Up Point(V)**	**0** to **9999999**	
UOver	**Disable**	—	Enable or disable the over voltage alarm of V L-L.
	Enable • **Pick Up Point(V)**	**0** to **9999999**	
UUnder	**Disable**	—	Enable or disable the under voltage alarm of V L-L.
	Enable • **Pick Up Point(V)**	**0** to **9999999**	
POver	**Disable**	—	Enable or disable the over power active alarm.
	Enable • **Pick Up Point(kW)**	**-9999999** to **+9999999**	
PUnder	**Disable**	—	Enable or disable the under power active alarm.
	Enable • **Pick Up Point(kW)**	**-9999999** to **+9999999**	
QOver	**Disable**	—	Enable or disable the over power reactive alarm.
	Enable • **Pick Up Point (kVAR)**	**-9999999** to **+9999999**	
SOver	**Disable**	—	Enable or disable the over power apparent alarm.
	Enable • **Pick Up Point (kVA)**	**-9999999** to **+9999999**	
PFLed	**Disable**	—	Enable or disable the leading power factor alarm.
	Enable • **Pick Up Point** • **Lead/Lag**	• **-1** to **+1** • **Lead** • **Lag**	
PFLag	**Disable**	—	Enable or disable the lagging power factor alarm.
	Enable • **Pick Up Point** • **Lead/Lag**	• **-1** to **+1** • **Lead** • **Lag**	

Setting	Options		Description
DMD P	**Disable**	—	Enable or disable the active power demand alarm.
	Enable • **Pick Up Point(kW)**	**0** to **9999999**	
DMD S	**Disable**	—	Enable or disable the apparent power demand alarm.
	Enable • **Pick Up Point (kVA)**	**0** to **9999999**	
PhLos	**Disable**	—	Enable or disable the phase loss alarm.
	Enable • **Pick Up Point(V)**	**0** to **9999999**	
FOver	**Disable**	—	Enable or disable the over frequency alarm.
	Enable • **Pick Up Point(Hz)**	**0** to **9999999**	
FUnder	**Disable**	—	Enable or disable the under frequency alarm.
	Enable • **Pick Up Point(Hz)**	**0** to **9999999**	

Resetting the energy, peak demand, data log and IO counters

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ button to scroll to **Reset** and press OK.
3. Use the ▽ or △ button to enter the meter **Passcode (Low)** (Default is “0000”) and press OK.
4. Use the ▽ or △ button to scroll through the settings and press OK.
5. Press OK to save your changes to the meter.

Setting	Options	Description
Energy	—	Reset the energy parameters.
DMDPk	—	Reset the peak demand values.
Log	—	Reset the data logged values.
IO	—	Reset the status input counters, relay counters, and input metering counters.
All	—	Reset all the energy parameters, peak demand values, data logged values and IO counters.

Configuring the HMI parameters

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ button to scroll to **HMI** and press OK.
3. Use the ▽ button to scroll through the settings and press OK.
4. Use the ▽ or △ button to scroll through the options and press OK to confirm the new setting.
5. Press OK to save your changes to the meter.

Setting		Options	Description
Mode	**DisplayStd**	**IEC** **IEEE**	Select IEC or IEEE standard.

Setting		Options	Description
	FullScreen	**Enable**	Enable or disable the full screen mode.
	AutoScroll	**Disable**	Enable or disable the auto scroll mode.
LCD	**Backlight**	**1** to **7**	Increase or decrease the value to adjust the backlight settings.
	Contrast	**1** to **9**	Increase or decrease the value to adjust the contrast settings.
Summry	**Line1**	**Vavg** **Uavg** **Iavg** **In** **Ptot** **Qtot** **Stot** **PFtot** **Freq** **Pdmd** **Sdmd**	Configure the Line1 parameters to display on summary page.
	Line2		Configure the Line2 parameters to display on summary page.
	Line3		Configure the Line3 parameters to display on summary page.

Viewing the meter information

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ button to scroll to **Info** and press OK.
3. Use the ▽ button to scroll through the parameter and press OK.

Parameter	Options	Description
Ver	—	Firmware version in xxx.yyy.zzz format.
Oper	—	Operation time of the meter in xxxx Days xx Hrs format.

Configuring the language settings

1. Press and hold OK and ESC at the same time for 2 seconds.
2. Use the ▽ button to scroll to **Lang** and press OK.
3. Use the ▽ or △ button to scroll through the options and press OK.
4. Press OK to save your changes to the meter.

Setting	Options	Description
Lang	**English(US)** **French** **Spanish** **German** **Italiano** **Polish** **Portuguese** **Turkish** **Chinese** **Russian** **Dutch**	Select the language you want the meter to display.

Configuring via webpages

Webpages overview

The meter's Ethernet connection allows you to access the meter so you can view data and perform configuration using a web browser.

NOTE: The recommended browsers to use for viewing the webpages are Microsoft Edge, Google Chrome, Mozilla Firefox, and Apple Safari.

⚠WARNING

INACCURATE DATA RESULTS

- Do not rely solely on data displayed on the display or in software to determine if this device is functioning correctly or complying with all applicable standards.
- Do not use data displayed on the display or in software as a substitute for proper workplace practices or equipment maintenance.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Accessing the meter webpages using device IP address

NOTE:

- The webpages are accessed through the meter's Ethernet port so it must be configured properly.
- It is mandatory to change the default password when you access the webpages for the first time. You cannot browse through the webpages without the default password change.
- The password must contain between 8 and 16 characters with at least 1 number, 1 capital letter and 1 special character.

1. Open the web browser and type the IP in the address field based on the following modes and press **Enter**:
   a. DHCP mode (Default): Use the IP address which is automatically assigned.
   b. Other than DHCP mode: Use the default IP [169.254.YY.ZZ] based on the MAC address (first time access) or the IP address set by the user.

      NOTE:

      - YY.ZZ are the last 2 bytes of the meter's MAC address. For example, a meter with MAC address 00-B0-D0-86-BB-F7 (hexadecimal) or 0-176-208-134-187-247 (decimal), set the IP address as 169.254.187.247.
      - For the meter with the MAC address 00-B0-D0-86-02-12 (hexadecimal) or 0-176-208-134-02-18 (decimal), set the IP address as 169.254.2.18.

2. Select the **Language** option from the drop-down list for the meter webpages.
   - English
   - French
   - Russian
   - German
   - Spanish
   - Italian
   - Chinese
   - Portuguese
3. Enter the **User Name** (default: **Administrator**) and **Password** (default: MAC address which is unique for each meter).

   NOTE: Enter the MAC address of the meter without colon in capital letters (For example: if the MAC address of the meter is 00:80:f4:02:14:38, then password is 0080F4021438).
4. Click **Login**.
5. Use the main tabs and sub tabs to select and display the meter's various webpages.

   NOTE: If the user session is inactive for a period of 10 minutes or more, the session gets timed-out and you need to re-login to access the webpages.
6. Click **Logout** to exit the meter webpages.

Changing user account password

NOTE: When you change your user account password, the user sessions get terminated and you need to re-login to access the webpages.

NOTICE
LOSS OF ACCESS Record your device's user and password information in a secure location. **Failure to follow these instructions can result in data loss and loss of access to the device.**

NOTICE
LOSS OF DATA OR PRODUCT CONFIGURATION Do not let unauthorized personnel gain physical access to the device. **Failure to follow these instructions can result in data loss and loss of access to the device.**

1. Click the user account on the top right corner of the webpage.
2. Click **Change Password** button.

   The **Password Modification** window opens.
3. Enter the **Old Password**, new **Password** and **Confirm Password**.

   NOTE: The password must contain between 8 and 16 characters with at least 1 number, 1 capital letter and 1 special character.
4. Click **Apply Changes** to save your new password.

Maintenance tab

Firmware upgrade

NOTE: Meter firmware includes a digital signature which helps ensure authenticity.

1. Click **Maintenance > Upgrade > Firmware**.
2. In the **Firmware Upgrade** section, click **Browse** button.

   The **Choose File Open** dialog box opens.
3. Select the **.sedp** file from the firmware release folder.
4. Click **Upgrade** button.

   The pop-up message **Do you want to apply the firmware upgrade now? The product will be restarted and all users will be disconnected from the application** opens.
5. Click **Yes** to apply the firmware upgrade.

   NOTE: The device will check the firmware compatibility before upgrade. The device will reject the package if all the files in the package are of lower version.

   The firmware upgrade process of the meter can take up to 20 minutes.

   After successful firmware upgrade, the meter restart can take up to 40 s.

   If the firmware upgrade is not successful, the meter displays error message. Try the firmware upgrade process again. If firmware upgrade process fails on multiple attempts, contact Technical Support representative.

Settings tab

Assigning user application name

NOTE: When you change the user application name, the user sessions get terminated and you need to re-login to access the webpages.

1. Click **Settings > General > Identification**.
2. Enter the device name in the **User Application Name** box.
3. Click **Apply Changes** to save your changes to the meter.

Configuring date/time

1. Click **Settings > General > Date/Time**.
2. Modify the parameters as required.

3. Click **Apply Changes** to save your changes to the meter.

Parameter			Values	Description
Date/Time	**Manual**	**Date**	**yyyy/mm/dd**	Enter the date in yyyy/mm/dd format.
		Time	**hh:mm:ss**	Enter the time in hh:mm:ss format.
	Network Synchronization • **SNTP**	• **Poll Interval**	**1 to 63**	Set the poll interval in hours to specify how often the meter synchronizes over SNTP.
		• **Primary SNTP Server**	–	Enter the server name or IP address.
		• **Secondary SNTP Server**	–	Enter the server name or IP address.
Time Zone Settings	**Time Zone Offset**		**UTC, UTC±H**	Select UTC to display the current time in UTC. **NOTE:** You must either enable automatic daylight savings time adjustment or manually update this setting to account for daylight savings time.
	Enable	**Daylight Saving Time Begins**	Frequency • **First** • **Second** • **Third** • **Fourth** • **Last** Day • **Monday** to **Sunday** Month • **January** to **December** Time • **00:00 to 23.00**	Enter the frequency of start date and time for daylight savings.
		Daylight Saving Time Ends		Enter the frequency of end date and time for daylight savings.

Enabling the HMI timeout period

You can configure the HMI configuration mode inactive session.

NOTE: If you are inactive for a certain period after entering the settings page in HMI (configuration mode), the screen gets locked automatically and the device will show the default **Summary** page.

1. Click **Settings > General > HMI**.
2. Enter the **HMI Timeout Period** in minutes.
3. Click **Apply Changes** to save your changes to the meter.

Parameter	Values	Description
HMI Timeout Period	**2 to 20** (**Default: 15**)	Enter the HMI configuration mode inactive session in minutes.

Configuring Ethernet (Dual port)

1. Click **Settings > Communication > Ethernet Configuration (Dual Port)**.
2. Modify the parameters as required.

3. Click **Apply Changes**.

   The warning message displays.

   NOTE: Make sure that you read and understand the message. Click **Reboot** to apply the changes or click **No** to retain the existing settings.

Parameter		Values	Description
Ethernet	**MAC Address**	–	A unique media access control address.
	Frame Format	• **Ethernet II** • **802.3** • **Auto**	Used to select the format for data sent over an Ethernet connection.
Ethernet Port 1 Control	**Speed and Mode**	• **10 Mbit/s - Half Duplex** • **10 Mbit/s - Full Duplex** • **100 Mbit/s - Half Duplex** • **100 Mbit/s - Full Duplex** • **Auto-negotiation**	Allows to select different speed and transmission mode. For the auto-negotiation option, the meter automatically negotiates the physical Ethernet connection speed and transmission mode for Ethernet port 1.
Ethernet Port 2 Control	**Speed and Mode**	• **10 Mbit/s - Half Duplex** • **10 Mbit/s - Full Duplex** • **100 Mbit/s - Half Duplex** • **100 Mbit/s - Full Duplex** • **Auto-negotiation**	Allows to select different speed and transmission mode. For the auto-negotiation option, the meter automatically negotiates the physical Ethernet connection speed and transmission mode for Ethernet port 2.
Broadcast Storm Protection	**Enable**	–	Enables the broadcast storm protection.
	Protection Level	• **Highest** • **High** • **Medium high** • **Medium low** • **Low** • **Lowest**	Defines the storm protection level. The meter limits the amount of information it broadcasts or rebroadcasts (based on this setting) to reduce collisions or network traffic. **NOTE:** If the level is changed, you are prompted to restart the device to implement changes.

Configuring IP

NOTE: When the IP is changed, it takes 30 s for communication to restart with the new IP.

1. Click **Settings > Communication > IP Configuration**.
2. Modify the parameters as required.

3. Click **Apply Changes**.

   The warning message displays.

   NOTE: Make sure that you read and understand the message. Click **Reboot** to apply the changes or click **No** to retain the existing settings.

Parameter			Description
IPV4	**Automatic**	• **DHCP** • **BOOTP**	Select the mode for assigning IPv4 parameters. Obtain IPv4 parameters automatically using BOOTP or DHCP. **NOTE:** By default, the meter is set to DHCP mode. You need to access the webpages to change the default DHCP mode to other mode (Refer to Accessing the meter webpages using device IP address, page 43).
	Manual	**IPv4 Address**	Enter the static IP address.
		Subnet Mask	Enter the Ethernet IP subnet mask address of your network.
		Default Gateway	Enter the gateway (router) IP address used for Wide Area Network (WAN) communication.
IPV6		**Enable**	Defines the IPv6 configuration.
		IPv6 Link-local Address	Displays the IP address in IPv6 format. You can use this IP address to open the meter webpages.
DNS	**Obtain DNS Servers Automatically via DHCP/ BOOTP**		Defines the dynamic behaviour of the DNS server address configuration. Used to obtain the IP address from the DNS server automatically. **NOTE:** Domain Name System (DNS) is the naming system for computers and devices connected to a local area network (LAN) or the Internet.
	Manual	**Primary DNS Server**	Defines the IPv4 address of the primary DNS server.
		Secondary DNS Server	Defines the IPv4 address of the secondary DNS server. Used to perform a DNS resolution when the resolution fails with the primary DNS server.

Configuring IP network services

1. Click **Settings > Communication > IP Network Services**.
2. Modify the parameters as required.

3. Click **Apply Changes**.

   The warning message displays.

   NOTE: Make sure that you read and understand the message. Click **Yes** to apply the changes or click **No** to retain the existing settings.

Parameter		Values	Description
HTTP/Web	**Port**	**1 to 65534** **(Default: 80)**	Set the port number of the HTTP/Web server.
HTTPS	**Port**	**1 to 65534** **(Default: 443)**	Set the port number of the HTTPS server. **NOTE:** HTTPS is enabled by default.
Modbus TCP	**Enable**	**1 to 65534** **(Default: 502)**	Enable or disable the Modbus/TCP service.
	Port		
Discovery	**Enable**	**1 to 65534** **(Default: 5357)**	Enable or disable the DPWS service.
	Silent Mode		Enable and disable the silent mode and also to set the port number.
	Port		
DNS	**Port**	**1 to 65534** **(Default: 53)**	Set the port number of the DNS server.
BACnet/IP Settings	**Enable**	–	Enable or disable the BACnet/IP communication with the meter. **NOTE:** Check the firewall settings if device is not discovering in BACnet tool.
	Port	**1024 to 65534** **(Default: 47808)**	Set the port number the meter uses for BACnet/IP communication.
	Device ID	**1 to 4194302** **(Default: 123)**	Set the ID of the meter on your BACnet network. The ID must be unique on the network.
	BBMD Enable	–	Enable or disable the registration of a meter as a foreign device.
	BBMD Port	**1024 to 65534** **(Default: 47808)**	Set the port number that is used for communications with the BBMD.
	BBMD IP	–	Set the IP address of the BACnet/IP BBMD device, if use a BBMD on the network. Contact your local network administrator for parameter values.
	BBMD TTL(sec)	**0 to 65534** **(Default: 0)**	Set the duration/time (in seconds) the BBMD keeps an entry for this device in its foreign device table.
SNMP	**Enable**	–	Enable or disable the SNMP service.
	Listening Port	**1 to 65534** **(Default: 161)**	Set the listening and notification ports.
	Notification Port	**1 to 65534** **(Default: 162)**	

Configuring IP filtering

IP filtering activates IP address filtering and assigns designated level of access for IP clients connected to meter.

NOTE: By default, **Enable IP Filtering** option is enabled (read-only access).

1. Click **Settings > Communication > IP Filtering**.
2. In the **IP Filtering Exception List** section, click **Add Exception**.

3. In the **IP Address / Range** box, enter the IP address and select the access from the **Access Level** drop-down list.
4. Click **Add**.
5. Click **Apply Changes** to save your changes to the meter.

Parameter			Description
IP Filtering		**Enable IP Filtering**	Enable IP address filtering and assign the designated level of access.
IP Filtering Global Access List	**Edit IP Filtering Rules**	**IP Address / Range**	The IPv4 or IPv6 address fields are editable, except for the anonymous IP address field, which is indicated by asterisks. **NOTE:** If IP filtering is enabled, anonymous IP addresses can only have read-only or no access; they cannot have full access.
		Access Level • **None** • **Read-Only**	Define the access level for the corresponding IP addresses.
IP Filtering Exception List	**Add IP Filtering Rules**	**IP Address / Range**	Assign list of user-defined IP addresses to connected devices. **NOTE:** The maximum number of allowed IP address is 10.
		Access Level • **None** • **Read-Only** • **Read-Write**	Define the access level for the corresponding IP addresses.

Configuring SNMP

The meter supports SNMP allowing a network administrator to access the meter remotely with an SNMP manager and view the networking status and diagnostics of the meter in the MIB-II format.

NOTE: You can configure the **SNMP** parameters only when you enable the **SNMP** in the **IP Network Services** section (Refer to Configuring IP network services, page 48).

1. Click **Settings > Communication > SNMP**.
2. Modify the parameters as required.

3. Click **Apply Changes** to save your changes to the meter.

Parameter		Description
System Objects	**System Location**	Enter the system location.
	System Contact	Enter the name of SNMP administrator.
	Automatic Configuration of System Name	Selects the system name automatically.
	Manual Configuration of System Name	Enter a descriptive name in **System Name** tab.
Community Names	**Get Community Name**	Enter the community names used for SNMP requests. **NOTE:** It is highly recommended to set a community name that best meets your security guidelines. The community Name must contain between 8 and 16 characters with at least 1 uppercase, 1 lowercase and 1 special character.
	Set Community Name	
	Trap Community Name	
Enabled Traps	**Cold Start Trap**	Generates a trap when the meter is powered ON.
	Warm Start Trap	Generates a trap when SNMP is enabled.
	Link Down Trap	Generates a trap when an Ethernet port communication link is disconnected.
	Link Up Trap	Generates a trap when an Ethernet port communication link is reconnected.
	Authentication Failure Trap	Generates a trap when an SNMP manager is accessing the meter with incorrect authentication.
SNMP Managers	**Manager #1**	Enter the name or IP address of SNMP Manager #1.
	Manager #2	Enter the name or IP address of SNMP Manager #2.

Configuring system log

This page allows the user to set a system log server to receive the various log events on a specific interval.

You can choose the category and severity of events to be received.

NOTE: By default, all the **Security** events will be sent to the server if the service is enabled.

1. Click **Settings > Communication > System Log**.
2. Modify the parameters as required.

3. Click **Apply Changes** to save your changes to the meter.

Parameter		Values	Description
System Log Service	**Enable**	–	Enable or disable the system log service.
System Log Server settings	**System Log server Address**	–	Enter the server name or IP address.
	Connection Mode	**TCP/TLS** **TCP** **UDP**	Select the mode.
	System Log Server Port	**1 to 65534**	Enter the system log server port number.
System Log Export Settings	**Export Interval**	**0 to 3600** **(Default: 60)**	Enter the interval duration for exporting the log data in seconds.
	Export Filters	**Category**: • **Application** • **Security** • **System** • **Other** • **All**	Select the category of the events. **NOTE:** The events with category **Security** are always transferred irrespective of the selection in severity filters.
		Severity: • **Alert** • **Critical** • **Debug** • **Emergency** • **Error** • **Information** • **Notice** • **Warning** • **All**	Select the severity of the event.
System Log Test		–	Test connection

Configuring advanced Ethernet settings

1. Click **Settings > Communication > Advanced Ethernet Settings**.
2. Modify the advanced Ethernet parameters as required.
3. Click **Apply Changes** to save your changes to the meter or click **Default** to retain the factory settings.

Parameter	Values	Description
Time To Live	**1 to 255**	The maximum number of hops (in other words, devices such as routers) that a TCP packet is allowed to pass through before it is discarded.
Enable TCP Keep Alive	–	Enable or disable the TCP keep alive transmissions. If disabled, the keep alive packets do not get sent and the connection remains open until it gets closed.
Time	**1 to 65000**	A timer (in seconds) that detects when a connected device on an idle connection becomes unavailable due to events such as a reboot or shutdown.
ARP Cache Timeout	**1 to 65000**	The length of time (in minutes) that ARP entries are kept in the ARP cache.

User accounts

The meter users are assigned user names and passwords. Each user is assigned with a role to access the webpages by the administrator.

There are two pre-defined user accounts:

- **Administrator** (default password is MAC address which is unique for each meter)

  NOTE: Enter the MAC address of the meter without colon in capital letters (For example: if the MAC address of the meter is 00:80:f4:02:14:38, then password is 0080F4021438).

- **Guest** (default password is **guest**)

⚠WARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change default passwords at first use to help prevent unauthorized access to device settings, controls, and information.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

In a continuous effort to encourage users on the awareness about the cybersecurity best practices and the meters more cyber secure in their applications, the users are forced to change the default factory-set password to a complex password.

Roles

Webpages access permissions are based on roles. You must be an administrator to assign user access roles.

User account	Password	Role	Access
Administrator	MAC address which is unique for each meter **NOTE:** Enter the MAC address of the meter without colon in capital letters (For example: if the MAC address of the meter is 00:80: f4:02:14:38, then password is 0080F4021438).	**Administrator**	Full access to all webpages and its features with read/write permission. **NOTE:** During first time login, you are forced to change the default password for system security.
Guest	**guest**	**Guest**	Access only to **Monitoring** tab and **Device Identification** page in the **Diagnostics** tab. **NOTE:** During first time login, you are forced to change the default password for system security.

Adding user accounts for webpages

In addition to the **two default** user accounts, you can create up to **10** user accounts.

NOTE: If the **Username** or **Password** credentials of the **Administrator** user account are lost, you can reset using another **Administrator** user account.

NOTE: For same user account access, the meter supports a maximum of **three** concurrent connections (sessions) and for different user account access, the meter supports a maximum of **five** concurrent connections (sessions).

1. Click **Settings > User Management > User Accounts**.
2. In the **User Accounts** section, click **Add User**.

   The **Add User** section opens.
3. Enter the **Username**, **Password** details and assign the user a **Role**.

4. Click **Apply Changes** to save your changes to the meter.

Parameter	Description
Username	Enter a name (1 to 15 characters) for a new user. **NOTE:** Username is case-sensitive and can contain special characters.
Password	Enter a password (8 to 16 characters) for a new user. **NOTE:** The password must contain between 8 and 16 characters with at least 1 number, 1 capital letter and 1 special character.
Confirm Password	Confirm the password.
Role • **Administrator** • **Guest**	Assign a role for the user.

Deleting user account

NOTE: You must have **Administrator** role access to delete the user accounts.

1. Click **Settings > User Management > User Accounts**.
2. In the **User Accounts** section, click icon.
   The **User Deletion** dialog box opens.
3. Click **Yes** to delete the user account.

Edit user account details

NOTE: You must have **Administrator** role access to change the user account password and assign role to the user:

1. **User account password reset:**
   a. Click **Settings > User Management > User Accounts**.
   b. In the **User Accounts** section, click icon.
      The **Edit User** section opens.
   c. Enter the **New Password** and **Confirm Password** details.
      NOTE: The password must contain between 8 and 16 characters with at least 1 number, 1 capital letter and 1 special character.
   d. Click **Apply Changes** to save your changes to the meter.
2. **Assigning user role:**
   NOTE: To assign role to the user, you must also reset the password.
   a. Click **Settings > User Management > User Accounts**.
   b. In the **User Accounts** section, click icon.
      The **Edit User** section opens.
   c. From the drop-down list, assign the **Role** to the user.
   d. Enter the **New Password** and **Confirm Password** details.
      NOTE: The password must contain between 8 and 16 characters with at least 1 number, 1 capital letter and 1 special character.
   e. Click **Apply Changes** to save your changes to the meter.

Terminating user account sessions

NOTE: You must have **Administrator** role access to terminate the user account sessions.

1. Click **Settings > User Management > User Accounts**.
2. In the **User Accounts** section, click  icon.

   The **Terminate User Sessions** dialog box opens with the warning message "**Are you sure you want to terminate sessions ? This will terminate all active sessions for the user**".
3. Read the warning message and click **Yes** to terminate the user account sessions.

Operating

Operating via HMI

Display mode

Overview

The display mode allows you to view or monitor the measured parameters.

Some of the parameters in the display mode are as follows:

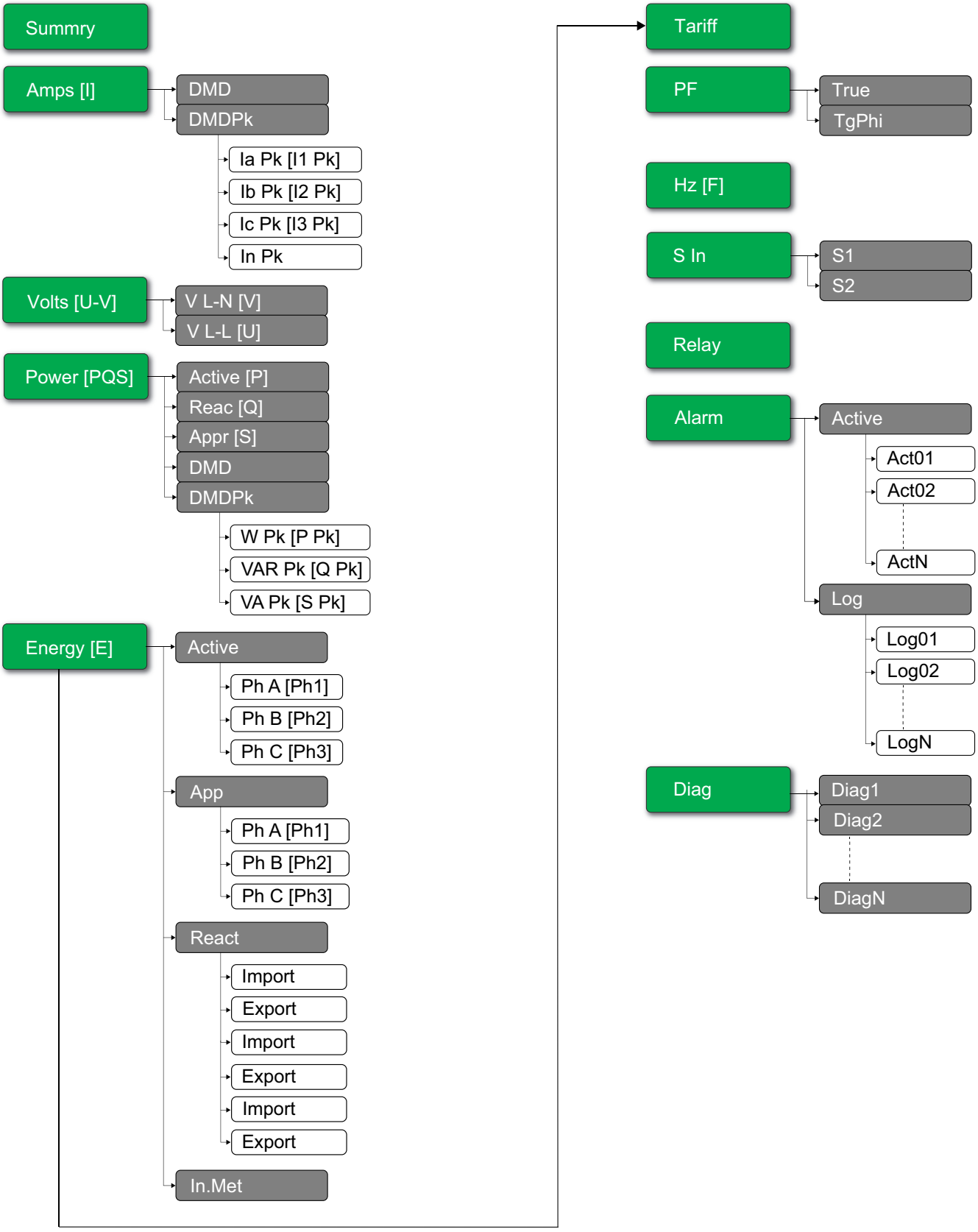
- Summary page
- Current per phase
- Voltage L-N, L-L
- Active, reactive, apparent power and demand
- Active, apparent, reactive energy and input metering
- Tariff
- Power factor
- Frequency
- Status inputs
- Relay status
- Active alarms with timestamps
- Diagnosis

Entering the display mode

- If full screen mode is enabled, press any key to switch from full screen mode to display mode.
- If full screen mode is disabled, press ESC to switch from configuration mode (**Setup** page) to display mode.

Display mode menu tree

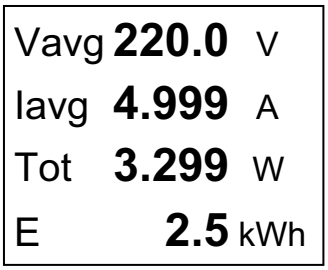
The titles listed are for the HMI mode in IEEE, with the corresponding titles in IEC mode in square brackets [ ].



Full screen mode

Overview

The main title and the sub menu in full screen mode are hidden and the values are expanded to full screen.

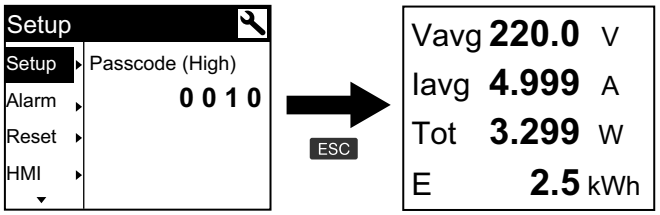


The full screen mode is enabled by default. You can modify full screen enable/disable and auto scroll enable/disable.

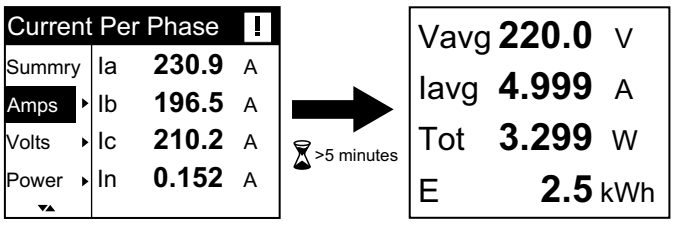
Full screen	Auto scroll	Description
Enable	Disable	Fixed summary page at full screen mode.
Enable	Enable	Auto scrolling pages at full screen mode. The interval between any 2 scrolling pages is the value specified in seconds. Range: 1 to 99 Default: 10
Disable	–	Full screen mode disabled.

Entering the full screen mode

- If full screen mode is enabled, press ESC to switch from configuration mode (**Setup** page) to full screen mode.

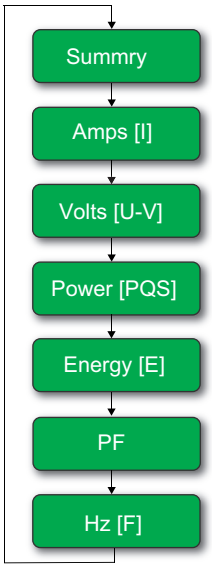


- Display mode automatically switches to full screen mode if there is no key press for five minutes.



Auto scroll mode menu tree

The titles listed are for the HMI mode in IEEE, with the corresponding titles in IEC mode in square brackets [ ].



Operating via webpages

Monitoring tab

Interpreting basic readings data

Click **Monitoring > General Monitoring > Basic Readings**.

Data	Parameters	Description
Basic	**Load Current(A)** **Power** **Power Factor Total** **Voltage(V)** **Frequency(Hz)**	Present basic parameter values.
Demand	**Demand Current (A)** **Demand Power**	Present and peak demand parameters along with date time at peak and date time of the last reset.
Energy	**Energy**	Accumulated energy values along with date time of the last reset.

Interpreting active alarms data

1. Click **Monitoring > General Monitoring > Active Alarms**.
2. Click **Update** button to refresh the active alarms page.

Parameter	Description
Event Type	List of active (unacknowledged) or inactive (acknowledge) alarm events and a description of the event type.

Interpreting inputs/outputs data

Click **Monitoring > General Monitoring > Inputs/Outputs**.

Parameter	Description
Inputs	Current status of the status inputs.
Outputs	Current status of the relay output.

Interpreting data log

The **Data Log** window allows you to view and download the records of the data log parameters (Datalog_1 to Datalog_16) configured via BACnet objects or Modbus TCP register.

1. Click **Monitoring > General Monitoring > Data Log**.
2. From the **Data Log** drop-down list, select the data log parameters (Datalog_1 to Datalog_16).
   a. Click **View** to interpret the last 20 records of the data log parameters along with the **Date/Time** and their **Value**.
   b. Click **Update** to refresh the records of the data log parameters.
   c. Click **Download** to export the data log parameters to **.csv** format.

Diagnostics tab

Viewing device identification details

Click **Diagnostics > General > Device Identification** to view the information about your meter.

Parameter	Description
User Application Name	Device name that is assigned by the user (Refer to Assigning user application name, page 45).
Product Range	Name of the device type.
Product Model	Device model number.
Serial Number	Device serial number.
Firmware Revision	Current firmware version.
Unique Identifier	Combination of MAC address and the time.
MAC Address	Unique MAC address.
IPv4 Address	Addressing scheme to specify the source and destination addresses.
IPv6 Link-local Address	Address used to communicate on the local network.
Manufacture Date	Date when the device was manufactured.

Enabling the device physical location

You need to enable the device physical location feature using the webpages to locate your meter on the panel.

1. Click **Diagnostics > General > Device Identification**.

2. In the **Device Physical Location** section, click **ON** to turn the **Identify Device** toggle key.

   The backlight flashes at a faster rate for 15 s.

   NOTE:

   - If the backlight flashes due to Alarm/Diagnostic error, the backlight will continue to flash even after 15 s.
   - Any button press on the meter indicates that the device is identified and the backlight stops flashing.

Interpreting date and time

Click **Diagnostics > General > Date/Time**.

Parameter	Description
Date (yyyy/mm/dd)	Current date.
Time(hh:mm:ss)	Current time.
Uptime	Run time after the system power-up.

Interpreting Ethernet data

Click **Diagnostics > Communication > Ethernet**.

Ethernet Global Statistics

Parameter	Description
Frames Received OK	Number of frames received.
Frames Transmitted OK	Number of frames transmitted.
Reception Errors	Number of errors frame during reception.
Transmission Errors	Number of errors frame during transmission.

Ethernet Port 1 Statistics And Ethernet Port 2 Statistics

Parameter	Description
Link Speed	Operational speed (10 Mbps or 100 Mbit/s).
Duplex Mode	Current mode of operation (Full duplex or Half duplex).

Procedure to reset Ethernet global statistics

1. Click **Diagnostics > Communication > Ethernet**.
2. In the **Ethernet Global Statistics** section, click **Reset**.

   Resets the cumulative diagnostic data to 0.

Interpreting IP network services data

Click **Diagnostics > Communication > IP Network Services**.

Modbus TCP Port data

Parameter	Description
Port Status	Status of the connected Ethernet port.
Opened TCP Connections	Number of active connections. **NOTE:** The maximum number of TCP connections supported is 32.
Received Messages	Number of messages received.
Transmitted Messages	Number of messages transmitted.

Modbus TCP Port Connections data

Parameter	Description
Remote IP	Remote IP address.
Remote Port	Remote port number.
Local Port	Local port number.
Transmitted Messages	Number of messages transmitted.
Received Messages	Number of messages received.
Sent Errors	Number of error messages sent.

Procedure to reset Modbus TCP messages

1. Click **Diagnostics > Communication > IP Network Services**.
2. In the **Modbus TCP Port Connections** section, click **Reset**.
   Resets the transmitted messages, received messages, and sent errors to 0.

Interpreting system data

Click **Diagnostics > Communication > System**.

Parameter	Description
CPU	Status of the CPU: • Nominal • Degraded • Out of service
Boot Memory	Healthiness of the boot memory: • Nominal • Degraded • Out of service
EEPROM	Healthiness of EEPROM: • Nominal • Degraded • Out of service
File System	Healthiness of the file system: • Nominal • Degraded • Out of service
Ethernet PHY1	Healthiness of PHY1 hardware: • Nominal • Degraded • Out of service

Parameter	Description
Ethernet PHY2	Healthiness of PHY2 hardware: • Nominal • Degraded • Out of service
DDR	Healthiness of the execution memory: • Nominal • Degraded • Out of service

Maintenance and troubleshooting

Overview

The meter does not contain any user-serviceable parts. If the meter requires service, contact Technical Support representative.

NOTICE
RISK OF DAMAGE TO THE METER • Do not open the meter case. • Do not attempt to repair any components of the meter. **Failure to follow these instructions can result in equipment damage.**

Do not open the meter. Opening the meter voids the warranty.

LED indicators troubleshooting

Problem	Probable cause	Possible solution
Operation LED remains ON and does not flash	Internal hardware problem	Perform a hard reset: turn off control power to the meter, then re-apply power. If the problem persists, contact Technical Support.
Energy pulsing LED remains ON and does not flash (1 s OFF and 1 s ON)	Overrun state	Over counting due to wrong configuration or overload.

Diagnostic codes

If the combination of the backlight and the error / alert icon indicates an error or an abnormal situation, navigate to the diagnostics screen and find the diagnostics code. If the problem persists after following the instructions in the table, please contact Technical Support.

Diagnostic code	Description	Possible solution
–	LCD display not visible.	Check and adjust LCD contrast / backlight setting.
–	Push buttons do not function.	Restart the meter by powering off and powering on again.
101, 102	Metering stops due to internal error. Total energy consumption is displayed.	Enter the configuration mode and implement **Reset Config**.
201	Metering continues. Mismatch between frequency settings and frequency measurements.	Correct frequency settings according to the nominal frequency of the power system.
202	Metering continues. Mismatch between wiring settings and wiring inputs.	Correct wiring settings according to wiring inputs.
203	Metering continues. Phase sequence reversed.	Check wire connections and correct wiring settings, if needed.
205	Metering continues. Date and time have been reset due to loss of power.	Set date and time.
206	Metering continues. Pulse is missing due to overload on energy pulse output.	Check the energy pulse output settings.
207	Metering continues. Abnormal internal clock function.	Restart the meter by powering off and powering on again then reset the date and time.

Diagnostic code	Description	Possible solution
301	Internal communication error	Check for proper Ethernet cable connection. If the diagnostic code persists for more than 2 minutes, contact Technical Support.
303	IP conflict	Check the duplicate IP in the network and assign unique IP for each meter.
304	IP not set (default IP)	Assign the meter with unique IP.
–	Unavailability of webpages due to multiple user account logins	Wait for 10 s to re-login.

References

Multi-tariff

Overview

The meter provides multi-tariff energy accumulation. It supports up to 4 tariffs.

The tariff switching has the following 3 types of control modes:

- Status input
- Communication
- Internal real-time clock (RTC)

You can configure the control mode by using the display (all the 3 modes) or by using communication (not for RTC).

The following table presents the available options to change the multi-tariff control modes:

From	To
0 = Disabled	Comm mode, 1 S In mode and 2 S In mode
1 = Comm mode	Disabled
2 = 1 S In mode	2 S In mode
3 = 2 S In mode	1 S In mode
4 = RTC mode	Comm mode

Status input control mode

In the **S In** control mode, the tariff switching is triggered by the change in input status of **S In**.

Communication control mode

The active tariff is controlled by communications. In the communication control mode, the tariff switching is triggered by command.

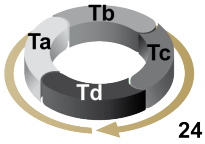
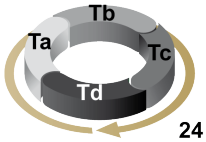
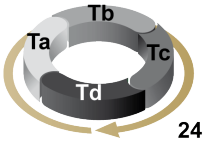
Real-time clock (RTC) control mode

In RTC control mode, the tariff switching is triggered by the real-time clock.

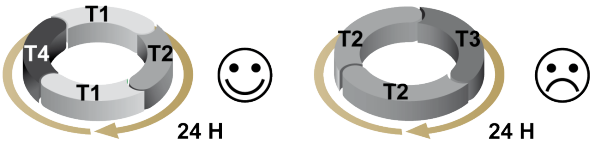
You can configure RTC control mode by using the display. The configuration includes the selection of schedule mode and the setup of 1 or 2 schedulers depending on the schedule modes.

The 2 schedule modes for RTC trigger are:

- **Day mode**: weekdays and weekend share the same peak and peak-off duration and only 1 scheduler should be set.
- **Week mode**: the tariff management of weekdays and weekends are controlled separately, and 2 schedulers should be set.

	Weekdays	Weekend
Day mode		
Week mode		

A scheduler supports a maximum of 4 time segments (Ta, Tb, Tc, and Td) for maximum 4 tariffs (T1, T2, T3, and T4). You can assign Ta, Tb, Tc, or Td to any tariff if any adjacent time segment has a different tariff. A valid scheduler always starts from Ta segment, and skipping time segments is not allowed.



In the setup of a schedule, you should define the tariff switching time for each target tariff. In the application, when the set switching time is reached, the tariff switches automatically.

Demand

Demand calculation methods

Power demand is the energy accumulated during a specified period divided by the length of the period. Current demand is calculated using arithmetical integration of the current rms values during a time period, divided by the length of the period. How the meter performs this calculation depends on the selected method. To be compatible with electric utility billing practices, the meter provides the block interval power/current demand calculations. The default demand calculation is set to a fixed block with a 15-minute interval.

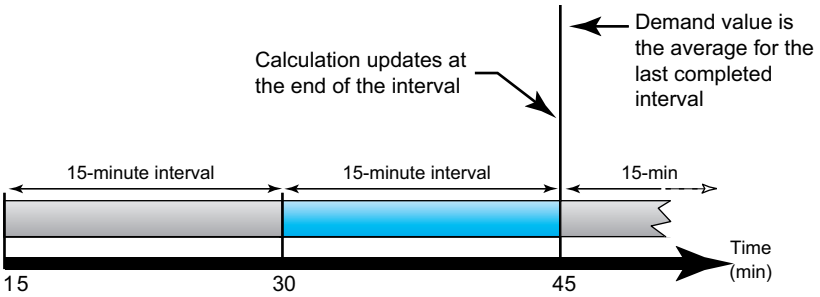
In the block interval demand method, select a block of time that the meter uses for the demand calculation. You can choose how the meter handles the block of time (interval). 3 different modes are possible:

- **Fixed block** - Select an interval from the range 10, 15, 20, 30, 60 minutes. The meter calculates and updates the demand at the end of each fixed interval.
- **Sliding block** - Select an interval from the range 10, 15, 20, 30, 60 minutes. For demand intervals less than 15 minutes, the value is updated every 15 seconds. For demand intervals of 15 minutes and greater, the demand value is updated every 60 seconds. The meter displays the demand value for the last completed interval.
- **Rolling block** - Select an interval and a subinterval. Demand is updated at the end of each subinterval. The meter displays the demand value for the last completed interval.

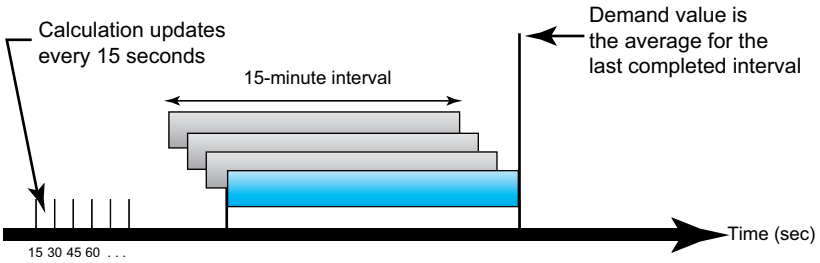
  NOTE: The subinterval must divide evenly into the interval (for example, three 5-minute (5 x 60 seconds) subintervals for a 15-minute interval).

The following figures illustrate the 3 ways to calculate demand power using the block method. For illustration purposes, the interval is set to 15 minutes.

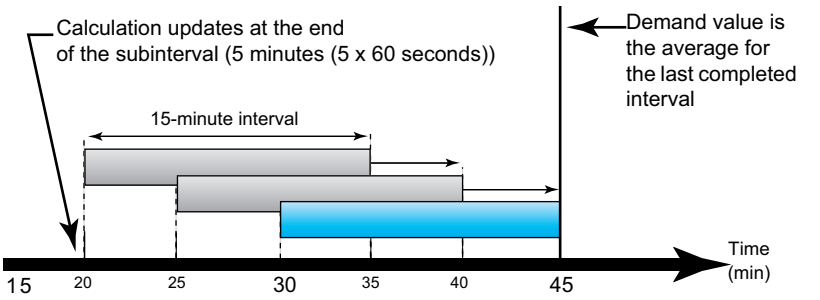
Timed Fixed Block



Timed Sliding Block



Timed Rolling Block



Peak demand

In non-volatile memory, the meter maintains a maximum operating demand values called peak demand. The peak is the highest value (absolute value) for each of these readings since the last reset.

You can reset peak demand values from the meter display. You should reset peak demand after changes to basic meter setup such as CT ratio or power system configuration.

Power, energy and power factor

Power (PQS)

A typical AC electrical system load has both resistive and reactive (inductive or capacitive) components. Resistive loads consume real power (P) and reactive loads consume reactive power (Q).

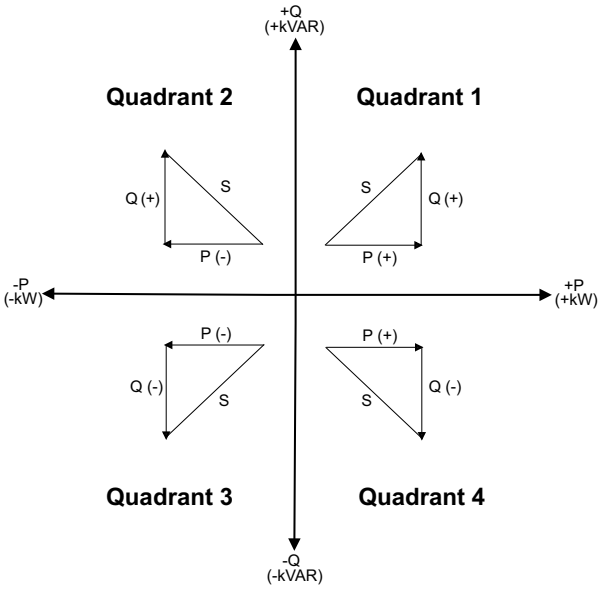
Apparent power (S) is the vector sum of real power (P) and reactive power (Q):

$S = \sqrt{P^2 + Q^2}$

Real power is measured in watt (W or kW), reactive power is measured in var (VAR or kVAR) and apparent power is measured in volt-amp (VA or kVA).

Power and the PQ coordinate system

The meter uses the values of real power (P) and reactive power (Q) on the PQ coordinate system to calculate apparent power.



Power flow

Positive power flow P(+) and Q(+) means power is flowing from the power source towards the load. Negative power flow P(-) and Q(-) means power is flowing from the load towards the power source.

Energy delivered (imported) / energy received (exported)

The meter interprets energy delivered (imported) or received (exported) according to the direction of real power (P) flow.

Energy delivered (imported) means positive real power flow (+P) and energy received (exported) means negative real power flow (-P).

Quadrant	Real (P) power flow	Energy delivered (imported) or received (exported)
Quadrant 1	Positive (+)	Energy delivered (imported)
Quadrant 2	Negative (-)	Energy received (exported)
Quadrant 3	Negative (-)	Energy received (exported)
Quadrant 4	Positive (+)	Energy delivered (imported)

Power factor (PF)

Power factor (PF) is the ratio of real power (P) to apparent power (S).

PF is provided as a number between -1 and 1 or as a percentage from -100% to 100%, where the sign is determined by the convention.

$$PF = \frac{P}{S}$$

A purely resistive load has no reactive components, so its power factor is 1 (PF = 1, or unity power factor). Inductive or capacitive loads introduce a reactive power (Q) component to the circuit which causes the PF to become closer to zero.

True PF

True power factor includes harmonic content.

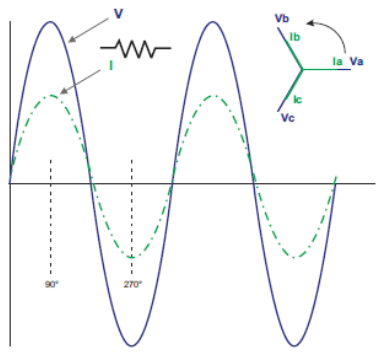
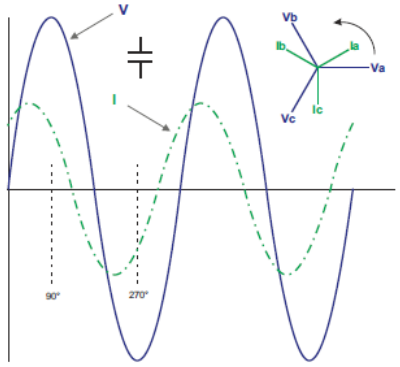
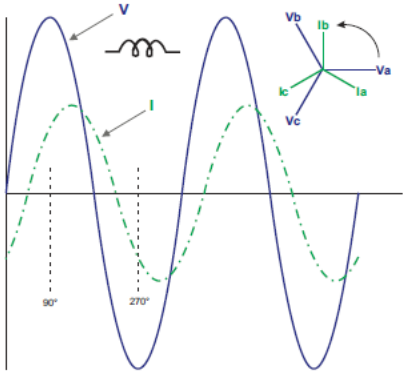
PF lead / lag convention

The meter correlates leading power factor (PF lead) or lagging power factor (PF lag) with whether the current waveform is leading or lagging the voltage waveform.

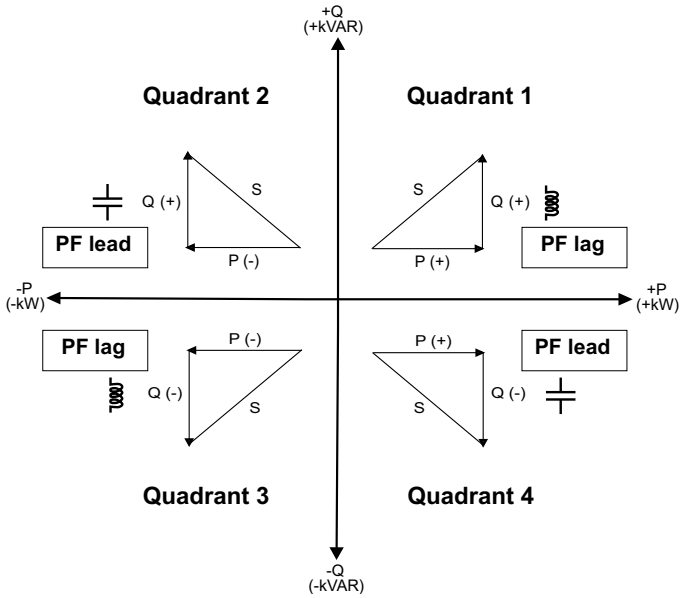
Current phase shift from voltage

For purely resistive loads the current waveform is in phase with the voltage waveform. For capacitive loads, current leads voltage. For inductive loads, current lags voltage.

Current lead / lag and load type

Current and voltage in phase (resistive)	Current leads voltage (capacitive)	Current lags voltage (inductive)
		

Power and PF lead / lag



PF lead / lag summary

NOTE: The lagging or leading distinction does **NOT** equate to a positive or negative value. Rather, lagging corresponds to an inductive load, while leading corresponds to a capacitive load.

Quadrant	Current phase shift	load type	
Quadrant 1	Current lags voltage	Inductive	PF lag
Quadrant 2	Current leads voltage	Capacitive	PF lead
Quadrant 3	Current lags voltage	Inductive	PF lag
Quadrant 4	Current leads voltage	Capacitive	PF lead

PF sign convention

The PF sign can be positive or negative, and is defined by the conventions used by the IEEE or IEC standards.

You can set the PF sign convention by changing the HMI mode to either IEC or IEEE.

PF sign convention: IEC

The PF sign is solely dependent on the direction of real power (P) flow, and is independent of the load being inductive or capacitive.

The PF is positive for normal (positive) real power (P) flow, that is when real power (P) flows into a load, i.e. energy is being consumed by the load.

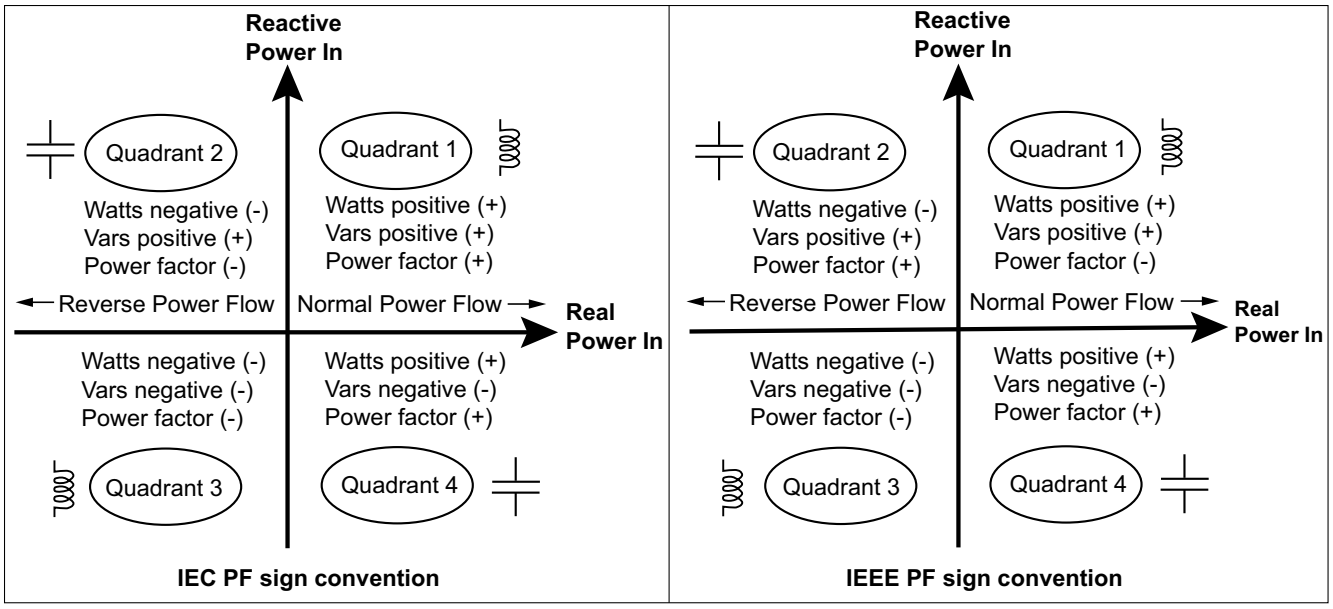
The PF is negative for reverse (negative) real power (P) flow, that is when real power (P) flows out of the load, i.e. energy is being generated by the load.

- Quadrant 1 and 4: Positive real power (+kW), the PF sign is positive (+).
- Quadrant 2 and 3: Negative real power (-kW), the PF sign is negative (-).

PF sign convention: IEEE

The PF sign is solely dependent on the nature of the load (that is capacitive or inductive). In this case, it is independent on the direction of real power (P) flow.

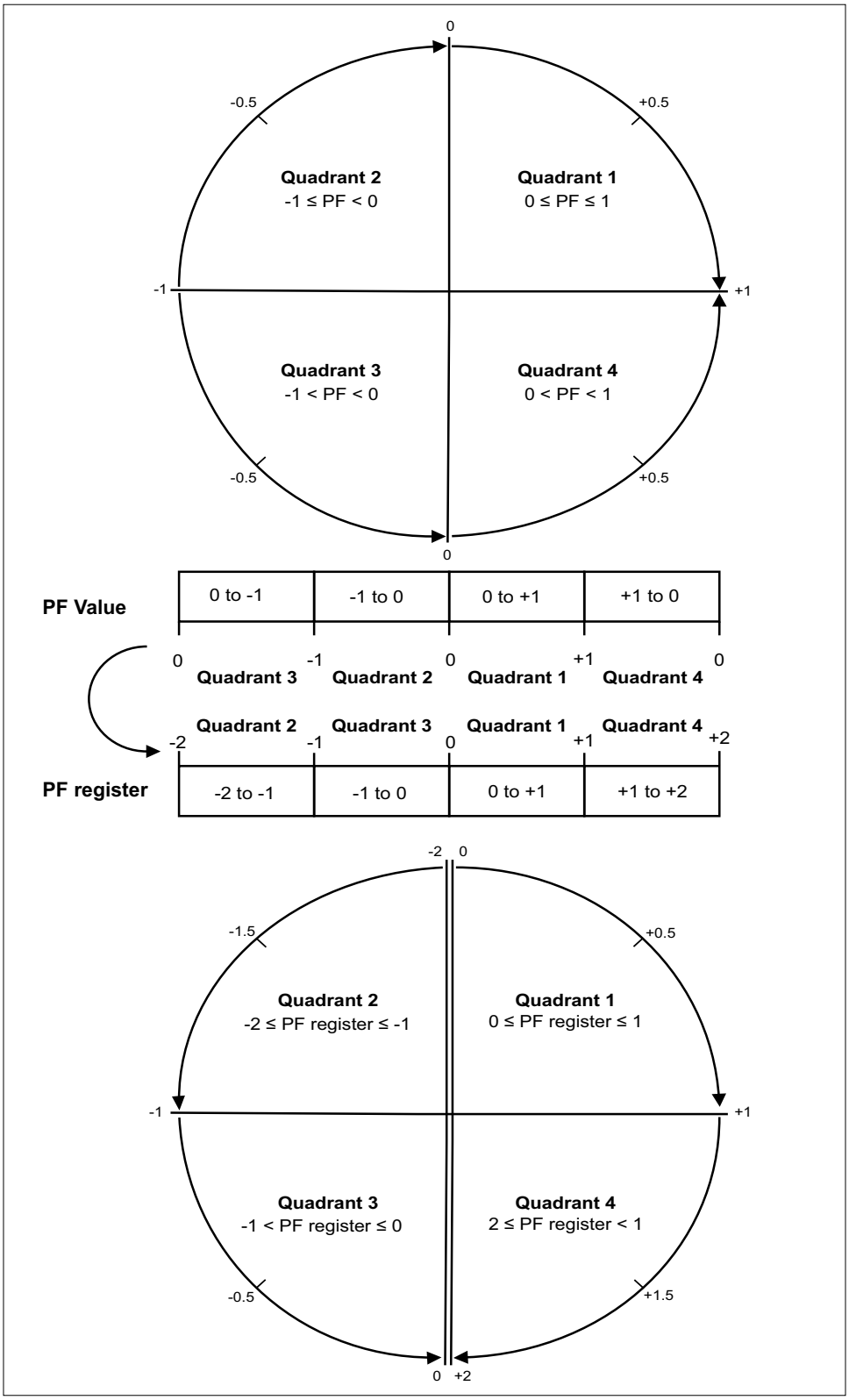
- For a capacitive load (PF leading, quadrant 2 and 4), the PF sign is positive (+).
- For an inductive load (PF lagging, quadrant 1 and 3), the PF sign is negative (-).



Power factor register format

The meter performs a simple algorithm to the PF value then stores it in the PF register.

Each power factor value (PF value) occupies one floating point register for power factor (PF register). The meter and software interpret the PF register for all reporting or data entry fields according to the following diagram:



The PF value is calculated from the PF register value using the following formulae:

Quadrant	PF range	PF register range	PF formula
Quadrant 1	0 to +1	0 to +1	PF value = PF register value
Quadrant 2	-1 to 0	-2 to -1	PF value = (-2) - (PF register value)
Quadrant 3	0 to -1	-1 to 0	PF value = PF register value
Quadrant 4	+1 to 0	+1 to +2	PF value = (+2) - (PF register value)

Data logging

The meter supports data logging feature that records 16 parameters for 36 months with 15-minute interval (default). The data log can be configured via Modbus TCP or BACnet.

By default, the data logging feature is enabled for selected values. You can also configure the meter to record other parameters such as received energy, input metering accumulations and demand values.

Configuration

NOTE: *The configuration settings in the Modbus has impact on the BACnet trend feature configuration and vice versa.*

Configuring parameters via Modbus TCP

You can configure the data log parameters (Parameter 1 to Parameter 16) through Modbus TCP register.

Configuring parameters via BACnet

You can configure the data log parameters (Parameter 1 to Parameter 16) through BACnet trend log objects.

Reading data

Reading logged data via Modbus TCP

You can access or retrieve the logged data or records using file read function code 20 (0x14) in Modbus.

Reading logged data via BACnet

You can access the logged data with corresponding timestamps through the Log_Buffer property of the Trend_Log object using the BACnet ReadRange service. The meter supports “by Position”, “by Sequence Number” and “by Time” modes of the ReadRange service.

Reading logged data via webpage

You can view and download the records of the data log parameters (Datalog_1 to Datalog_16) configured via BACnet trend log objects or Modbus TCP register list through webpage (Refer to Interpreting data log, page 60).

Specifications

Mechanical characteristics

IP degree of protection	Display: IP40 Meter body: IP20
Display resolution	126 x 94 pixel
Display dimensions	43 x 34.6 mm
Display data update rate	1 s

Electrical characteristics

Control power

DC	12 to 36 V
Burden	< 5 W
Wire	6 mm^2 (10 AWG)
Wire strip length	8 mm (0.31 in)
Torque	0.8 N·m (7.08 in·lb)
Recommended wire material	Copper wire with a minimum temperature rating of 105 °C (221 °F)

Voltage input

Range	90 V L-N to 347 V L-N / 600 V L-L
Frequency	50 Hz / 60 Hz ± 10%
Burden	0.2 VA
Impedance	5 MΩ
Measurement category	III
Wire	4 mm^2 (12 AWG)
Wire strip length	8 mm (0.31 in)
Torque	0.5 N·m (4.42 in·lb)
Recommended wire material	Copper wire with a minimum temperature rating of 105 °C (221 °F)

Current input

LVCT	Scaling: 1 to 32767 A Input range (LVCT output): 0.333 V (0.4 V max) or 1 V nominal (1.1 V max) (CTs must be rated for use with Class 1 voltage inputs)
R-Coil	Use METSECTR-series Rogowski Coils (50 to 5000 A) (CTs must be rated for use with Class 1 voltage inputs)
Wire	6 mm^2 (10 AWG)
Wire strip length	8 mm (0.31 in)
Torque	0.8 N·m (7.08 in·lb)
Recommended wire material	Copper wire with a minimum temperature rating of 105 °C (221 °F)

Status input

Number	2
Type	Type 1 opto-coupler inputs (IEC 61131-2)
Maximum input voltage	40 V DC
Maximum input current	4 mA
Voltage OFF	0 to 5 V DC
Voltage ON	11 to 40 V DC
Nominal voltage	24 V DC
Minimum pulse width	20 ms
Wire	1.5 mm^2 (16 AWG)
Wire strip length	6 mm (0.23 in)
Torque	0.5 N·m (4.42 in·lb)
Recommended wire material	Copper wire with a minimum temperature rating of 105 °C (221 °F)

Relay output

Number	1
Type	SPST-NO
Maximum output frequency	0.5 Hz (1 s ON / 1 s OFF)
Response time	10 ms
Maximum load current	5 A at 250 V AC 5 A at 30 V DC
Wire	1.5 mm^2 (16 AWG)
Wire strip length	6 mm (0.23 in)
Torque	0.8 N·m (7.08 in·lb)
Recommended wire material	Copper wire with a minimum temperature rating of 105 °C (221 °F)

Measurement accuracy

BS/ EN/ IEC 61557-12: PMD/[SD|SS]/K70/0.5

Measurement type	Class of accuracy	Error
Active energy	Class 0.5 as per BS/ EN/ IEC 61557-12	±0.5%
Active power	Class 0.5 as per BS/ EN/ IEC 61557-12	±0.5%
Reactive energy	Class 2 as per BS/ EN/ IEC 61557-12	±2%
Reactive power	Class 2 as per BS/ EN/ IEC 61557-12	±2%
Apparent energy	Class 0.5 as per BS/ EN/ IEC 61557-12	±0.5%
Apparent power	Class 0.5 as per BS/ EN/ IEC 61557-12	±0.5%
Frequency	Class 0.5 as per BS/ EN/ IEC 61557-12	±0.5%
Phase current	Class 0.5 as per BS/ EN/ IEC 61557-12	±0.5%
Calculated neutral current	Class 0.5 as per BS/ EN/ IEC 61557-12	±0.5%
Voltage	Class 0.5 as per BS/ EN/ IEC 61557-12	±0.5%
Power factor	Class 0.5 as per BS/ EN/ IEC 61557-12	±0.005 count

Operational characteristics

Meter start-up time for communication interface or measurement readings	20 s after power supply is applied

Standards

CE / UKCA	BS/ EN/ IEC 61557-12 BS/ EN/ IEC 61326-1 BS/ EN/ IEC 61010-1 BS/ EN/ IEC 61010-2-30
UL	UL/ EN 61010-1 UL/ EN 61010-2-030 UL2808
Safety	BS/ EN/ IEC 61010-1 UL/ EN 61010-1 BS/ EN/ IEC/ UL 61010-2-30 CSA C22.2 NO 61010-1-12 CSA C22.2 No. 61010-2-030

Environmental characteristics

Operating temperature	-25 to 70 °C (-13 to 158 °F)
Storage temperature	-40 to 85 °C (-40 to 185 °F)
Humidity range	5% to 95% RH non-condensing
Pollution degree	2
Protective class	II
Altitude	≤ 3000 m (9842 ft) above sea level
Electromagnetic environmental class	E2
Mechanical environmental class	M1
Mounting location	For indoor use in a stationary panel Must be permanently connected and fixed
Product life	> 15 years, 45 °C (113 °F) 60% RH

RTC backup battery

Battery backup time	3 years without control power

Schneider Electric
35 rue Joseph Monier
92500 Rueil Malmaison
France

+ 33 (0) 1 41 29 70 00

www.se.com

As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

7EN02-0443-00