sensemi

+971 (04) 345 1626

info@sensemi.com

www.sensemi.com

UAE : Warehouse 49 & 32, No. 04 – Zone 2, Al Hamra Industrial Free Zone, Ras Al-Khaimah, United Arab Emirates

Azerbaijan: Baku-Guba Road, 32nd km (Opposite Sumgayit Chemical Industrial Park) Sensemi DMCC Branch, Azerbaijan

Headquarters: Office No. 2302, 23rd Floor, Mazaya Business Avenue BB2, Jumeirah Lakes Towers (JLT) Dubai, UAE

NO:062501

sensemi

SOLUTIONS

SED FAMILY

SMART ELECTRICITY METERS

EFFICIENCY, ACCURACY, AND SAFETY.

sensemi
SOLUTIONS

smart metering
solutions.

SINGLE PHASE (SED102)

SMART ELECTRICITY METER

PRODUCT OVERVIEW

The **SED102** Smart Electricity Meter is a single-phase meter designed with high flexibility for input communication. It boasts the capability to simultaneously accommodate up to three modules, comprising two communication modules and one input module.

FRONT VIEW DESCRIPTION:

DISPLAY

The digital display on the front cover provides real-time information such as energy consumption, voltage, and current.

DATA QUERY BUTTON

A button is included for users to query or cycle through different data on the display. This can help users' access additional information or navigate the meter's menu.

OPTICAL COMMUNICATION INTERFACE

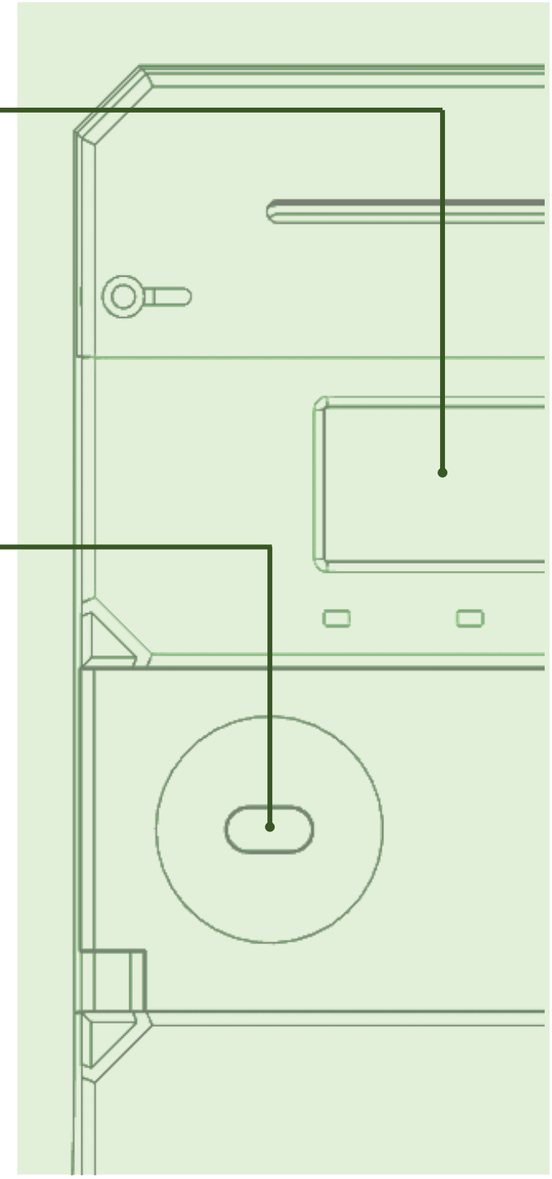
An optical communication interface is present for data exchange. This interface might be used for data reading , configuration and firmware upgrade.

METER INFORMATION

Important meter information is printed on both the front cover and the module door. This could include details like the meter's serial number, model, and other relevant specifications.

PROGRAM BUTTON

There is a sealable demand button that allows for demand reset. The sealable design ensures that the settings remain secure and tamper resistant.



MAJOR APPLICATION

The single-phase SED102 smart electricity meter has several major applications:

Remote Communication and Control:

The meter supports remote communication and control using a CAT.1+2G module. This enables two-way communication with utility providers or other relevant entities.

Digital Medium for Information Exchange:

The meter utilizes digital media for information exchange. This likely involves the use of digital signals or protocols for transmitting and receiving data, enhancing the efficiency and accuracy of communication.

Keypad and Button Input Unit:

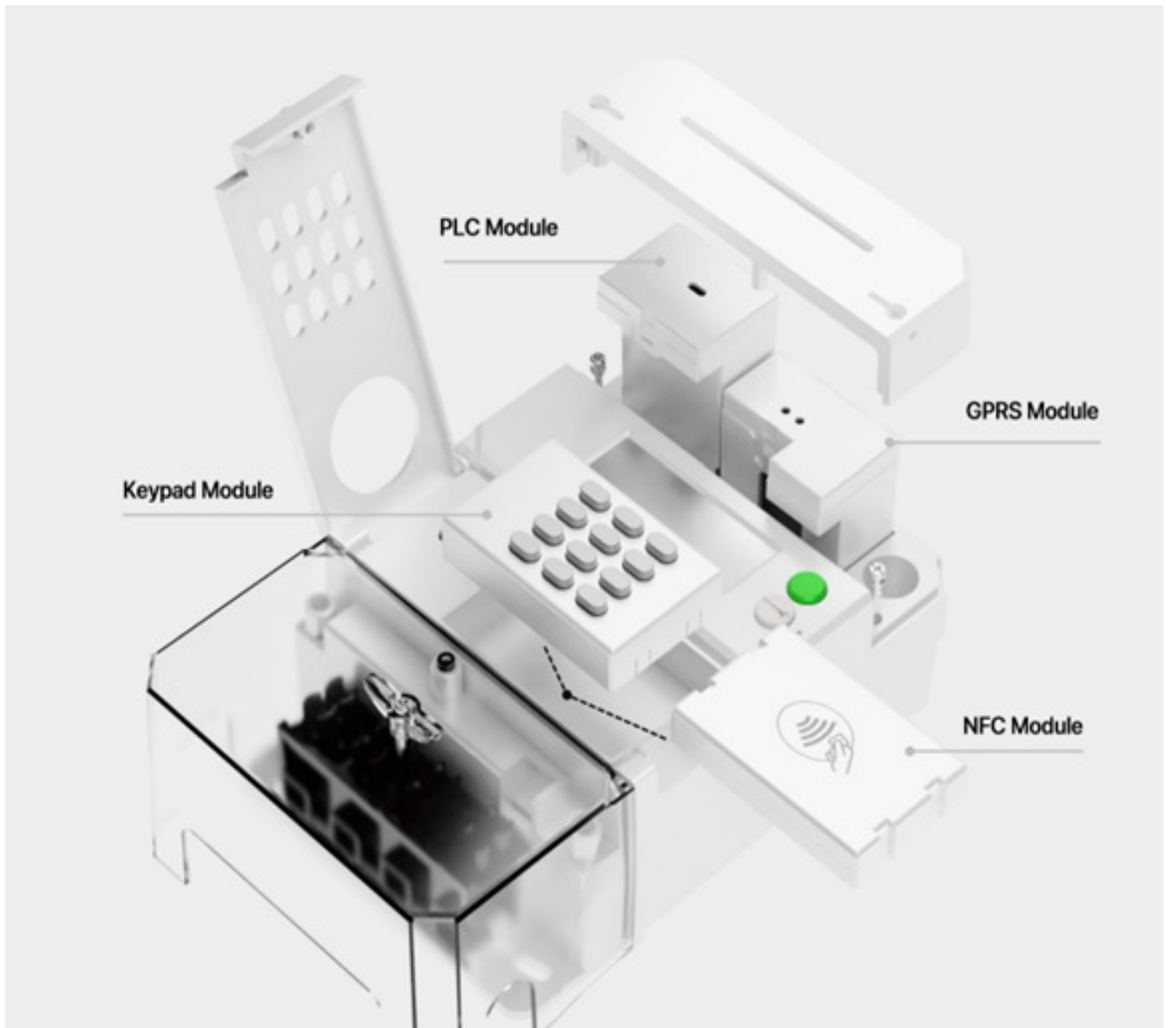
The inclusion of a keypad and button input unit allows for user interaction. Users can input commands, query data, or navigate through the meter's features using the keypad and buttons

Infrared Communication:

Infrared communication capability is included, allowing the meter to communicate with other devices or systems using infrared signals.

DLMS/COSEM Specification:

The meter adheres to the DLMS/COSEM (Device Language Message Specification/Companion Specification for Energy Metering) standard. This specification facilitates interoperability and allows the meter to connect seamlessly with the master station or other devices that also comply with the standard.



Protective PCB Board:

The electric meter's PCB (Printed Circuit Board) is coated with protective paint. This protective layer serves as a barrier against moisture, dust, and pests, ensuring the durability and reliability of the meter in various environmental conditions. The SED102 smart electricity meter offers a range of advanced features for communication, control, and measurement, making it suitable for modern energy management systems. These capabilities contribute to more efficient energy usage, billing, and overall utility operations.

Load Switch and other auxiliary equipment:

The load switch may enable remote control of electrical loads, contributing to demand response and load management strategies.

Measurement Unit:

The meter includes a measurement unit responsible for accurately measuring electricity consumption. This unit ensures precise data collection for billing and monitoring purposes.

Display Unit:

A display unit is integrated into the meter, providing real-time information about energy consumption, voltage, and current. Users can easily access and monitor their electricity usage

Real-Time Clock Unit:

The meter incorporates a real-time clock unit, enabling it to timestamp data and events accurately. This feature is crucial for time-of-use billing and tracking consumption patterns over specific time periods.

FEATURES

The characteristics of the single-phase SME102 smart electricity meter are as follows:

Plug-In Remote Communication Module:

The meter supports a plug-in remote communication module, allowing for flexible communication options and easy upgrades

Plug-In Input Module (Keypad/NFC):

It features a plug-in input module, supporting either a keypad or Near Field Communication (NFC) technology for user interaction and data input.

DLMS/COSEM Specification:

The meter complies with the DLMS/COSEM (Device Language Message Specification / Companion Specification for Energy Metering) standard. This ensures full interoperability with head-end systems and other compliant devices, enabling standardized data exchange, remote configuration, and secure communication across smart utility networks.

Software Upgrade locally or remotely:

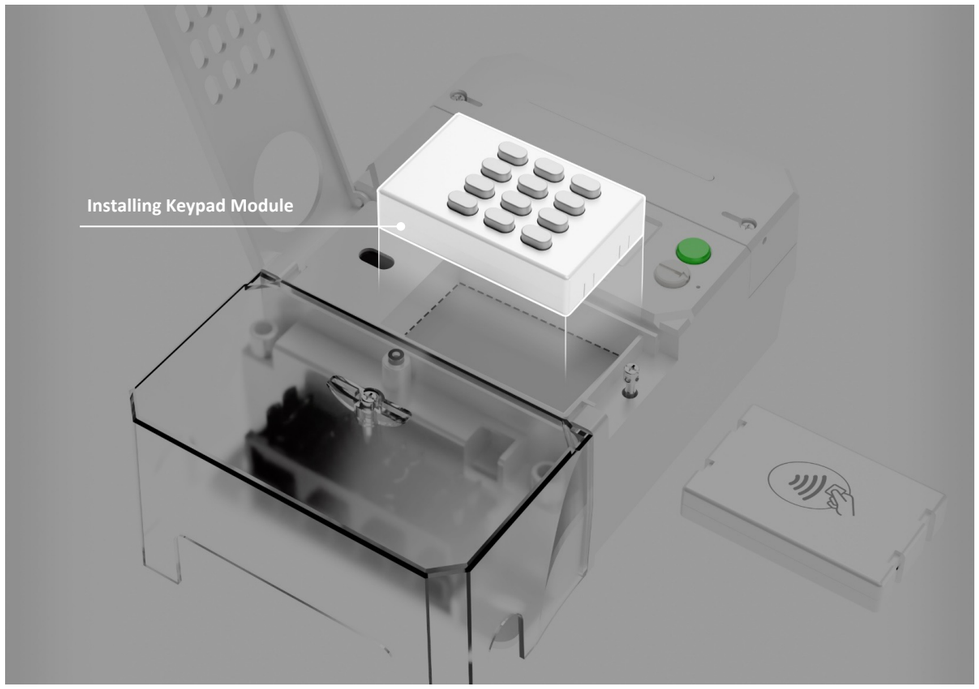
The meter supports software upgrades, which can be performed either locally or remotely. This ensures that the meter can stay up-to-date with the latest features and security enhancements.

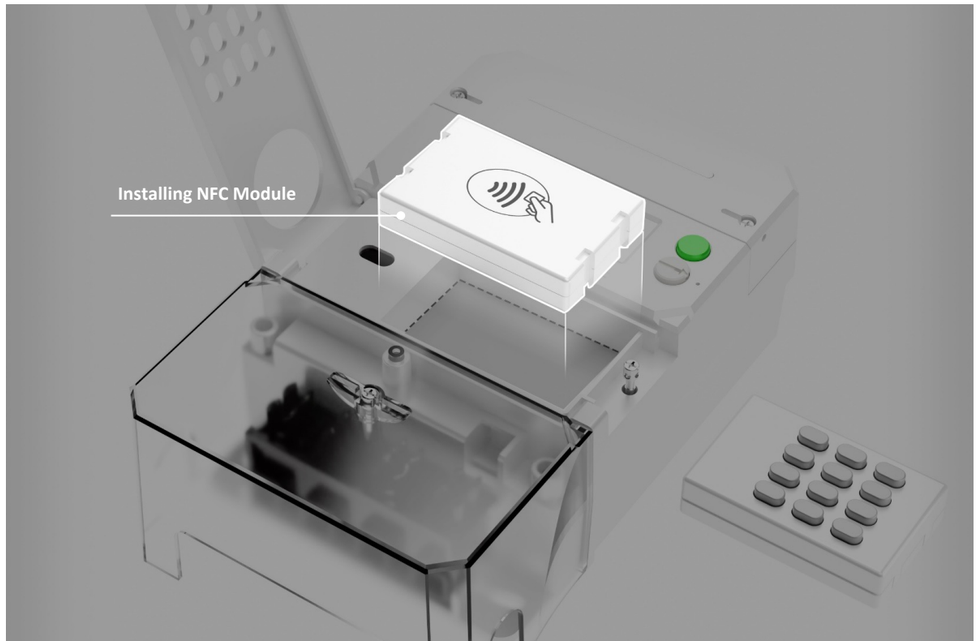
Communication Data Encryption:

Communication data encryption is implemented to ensure highly reliable and secure communication between the meter and external systems.

Internal Magnetic Latching Relay:

An internal large capacity magnetic latching relay is included, supporting load control through parameter configuration or communication commands. This allows for efficient management of electrical loads.





STS Standard:

The meter complies with the STS (Standard Transfer Specification) standard, which is often used for secure and standardized token-based prepayment systems. These characteristics collectively contribute to the functionality, reliability, and versatility of the SED102 smart electricity meter in various applications, offering advanced features for both users and utility providers.

Active Energy Accuracy:

The meter has a high level of accuracy for active energy measurement, complying with Class 1 standards as per IEC 62053-21.

Wide Range of Current Measurement:

The meter offers a wide range of current measurement, covering starting current to the maximum current, with accurate readings.

Data Display:

It provides data display functionality, including information presented on the meter's LCD display. Users can access real-time data about energy consumption, voltage, current, and more.

Grid Parameter Detection:

The meter can detect grid parameters in real-time, including power, voltage, current, power factor, etc. This information is crucial for monitoring and managing the electrical grid.

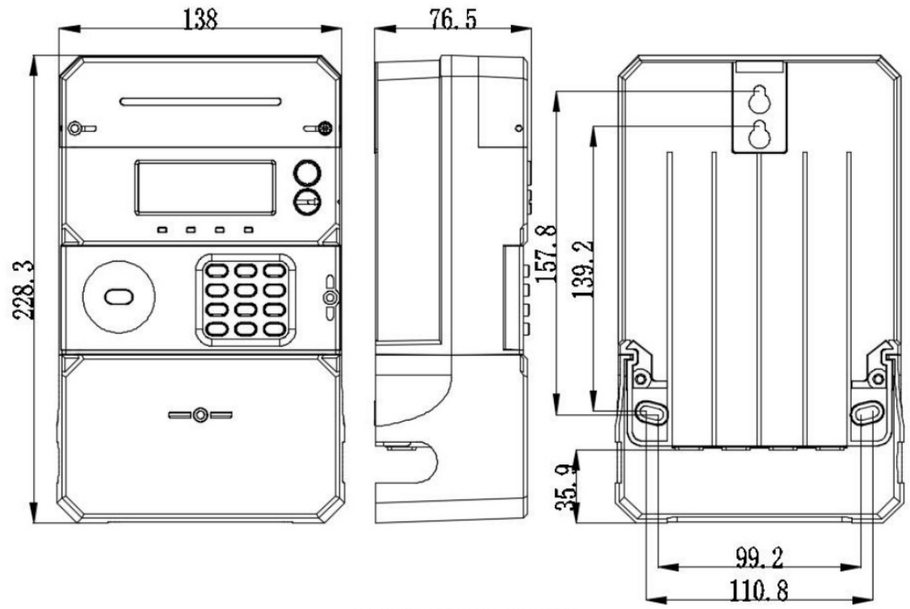
Changeable Battery:

The meter supports a changeable battery, ensuring that the display remains functional even in the absence of power. This is important for continuous monitoring and data retrieval.

Real-Time Clock:

A real-time clock is integrated into the meter, providing accurate timestamping for data and events

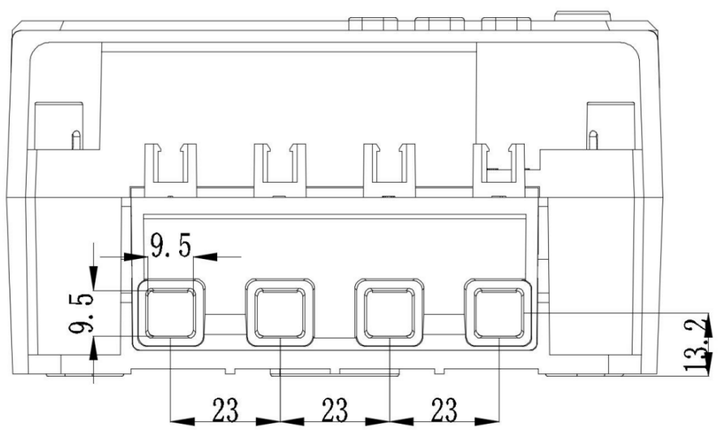
DIMENSIONS



*ALL UNITS ARE IN MM (MILIMETER)

TERMINAL

The meter is for front projection mounting. The terminal holes and screws are moving cage type.

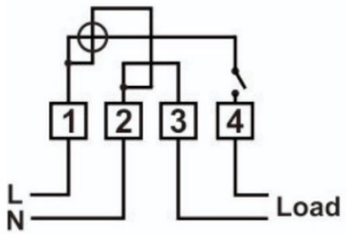


STANDARDS

IEC Standard	Description
IEC62053-21	Static meters for active energy (class 1)
IEC62053-23	Static meters for reactive energy (class 2)
IEC 62052-11	Electricity metering equipment (a.c.) – General requirements, tests and test conditions –Part 11: Metering equipment
IEC62053-31	Pulse output devices for electromechanical and electronic meters
IEC60695-2-11	Specifies a test method on an end product. It is intended to simulate the effects of thermal stresses produced by an electrically heated source to represent a fire hazard. This test method is used to check that, under defined test conditions, an end product exposed to an electrically heated source has either a limited ability to ignite or, if it ignites, a limited ability to propagate flame.
IEC 62056-21	Electricity metering – data exchange for meter reading, tariff and load control – Part 21Direct local data exchange
IEC62056-42	Electricity metering – Data exchange for meter reading, tariff and load control – Part 42:Physical layer services and procedures for connection-oriented asynchronous data exchange
IEC62056-6-1	Electricity measurement – meter reading, tariff control and load control data exchange: OBIS
IEC62056-6-2	Electricity measurement – meter reading, tariff control and load control data exchange: Interface
IEC62056-46	Electricity measurement – meter reading, tariff control and load control data exchange: HDLC protocol data link layer
IEC62056-5-3	Electricity measurement – meter reading, tariff control and load control data exchange: COSEM application layer
IEC62056-4-7	Electricity measurement – meter reading, tariff control and load control data exchange: IPv4network COSEM transmit
IEC62055-31	Payment systems - Part 31: Particular requirements - Static payment meters for active energy (classes 1 and 2)
IEC62055-41	Electricity metering – Payment systems –Part 41:Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems
IEC62055-51	Electricity metering – payment systems - Part 51: Standard Transfer Specification – Physical Layer Protocol for one-way numeric and magnetic card token carriers

CONNECTION

The wiring diagram is laser printed on the terminal cover of the meter. This provides users with clear guidance on how to connect the meter according to their specific requirements. The Material used for the Microcontroller Unit (MCU) enclosure has good dielectric and mechanical strength with the minimum thickness of 2.0mm, ensuring durability and robustness.



The material used in the MCU enclosure complies with the IEC 60695-2-11 standard, which involves the glow wire test. This standard assesses the fire hazard of electrical equipment by exposing it to a simulated ignition source. These specifications reflect a focus on safety, durability, and compliance with industry standards for the materials used in the construction of the smart electricity meter. The inclusion of the wiring diagram on the terminal cover makes the installation process user friendly and efficient, allowing customers to follow clear instructions for proper connection.

Auxiliary Terminal Description and Electrical Characteristics

5 6 RS485	RS485

TECHNICAL PARAMETERS

Parameter	Specification
Reference voltage	230V
Working voltage	0.6Un~1.2Un
Reference current	5A
Maximum current	100A
Accuracy class	Class 1 (Active) ; Class 2 (Reactive)
Pulse constant	Active: 1000 imp/kWh ; Reactive:1000 imp/kvarh
Frequency	50Hz±5%
Temperature	Working temperature range:-40℃～+70℃ Store temperature:-40℃～+70℃
Humidity	≤95%
Altitude	3000m

Parameter	Specification
Atmospheric pressure	63kPa-106kPa
Relay	Maximum switch current: up to 120A Short circuit <= 10ms: 3600A Mechanical life: >= 100000 OPS Electric life: >= 10000 OPS
Wiring	LNNL Connection for overhead and underground system
Voltage circuit consumption	≤ 1W and 5 VA @ 230V
Current circuit consumption	2VA @ 5A, 50Hz, 30° C
Starting current	4‰ Ib
Protection degree	IP54
Display format	LCD supports 8 digits Auto scroll mode, manual display mode , power off display mode
Button	The upper button is used for manual display The lower button (sealed) is used for Demand reset
Keyboard	12 keys with audible feedback, meter still IP54 Compliant
PCB Board	Conformal coated
Average Service life	≥15 years (Except for the battery, the average life of battery is not less than 10 years)
RTC Accuracy	0.5s/day at reference temperature, comply with IEC 62054-21
Communication interface (optional)	Optical: read and configure the meter locally Remote communication: RS485 / CAT.1+2G
Backup-power supply	Internal battery or Extend Replacement Battery. Support RTC, LCD with backlight during AC power off.
Measurement	One elements
Electrostatic Discharge Immunity	Contact Discharge ：10KV Air Discharge ：16KV
HF Electromagnetic Field Immunity	80 MHz to 2 GHz @10V/m with load; 80 MHz to 2 GHz @30V/mnoload
Fast Transient Burst	4kV
Radio Interference Test	Equipment of CISPR 22 Class B
Immunity to conducted disturbances induced by radio-frequency fields	150kHz－80MHz 10V/M
Surge/Voltage Immunity	6KV
Impulse Voltage	8KV

MECHANICAL STRUCTURE

Material Used:

- The meter base and cover are made of non-metallic material.
- The material is non-hygroscopic (does not absorb moisture).
- It is UV stabilized, which means it can withstand exposure to sunlight without significant degradation.
- The material is flame retardant, offering safety in the event of a fire.
- It is polished, providing a smooth and aesthetically pleasing surface.
- The material has high impact-resilience, indicating its ability to absorb and withstand impacts without breaking.
- It has low dirt absorption properties, making it easier to clean and maintain. The material used for the terminal block is capable of passing the ISO 75-1 standard. ISO 75-1 is a standard for testing the temperature behavior of plastics.

NON-METALIC

NON-HYGROSCOPIC

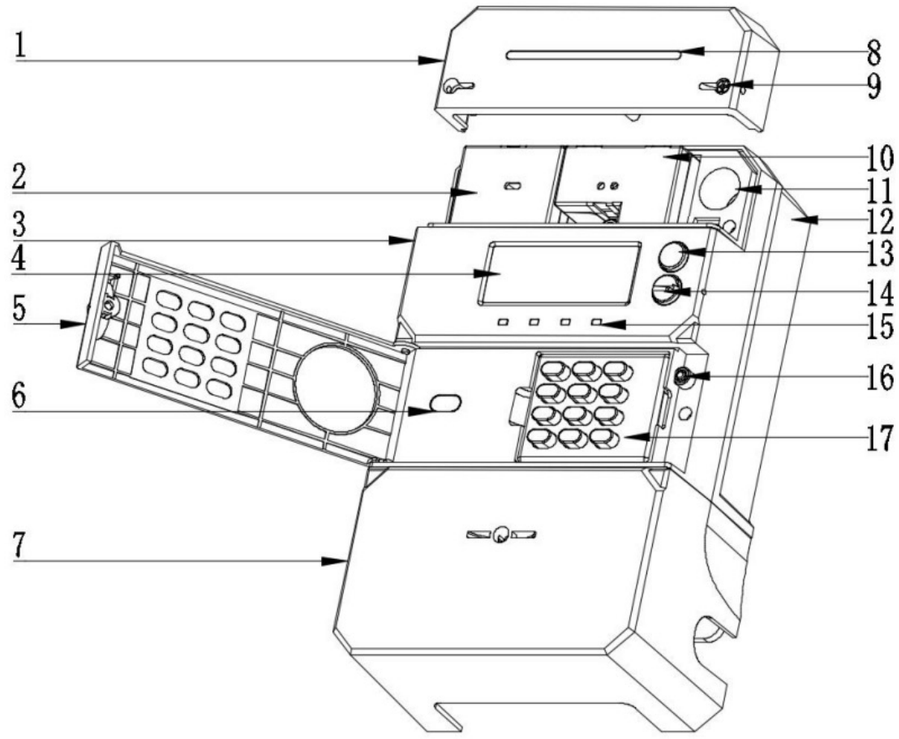
UV STABILIZED

FLAME RETARDANT

ISO 75-1

CASE COMPONENTS

The case includes various components that are visible from the outside.



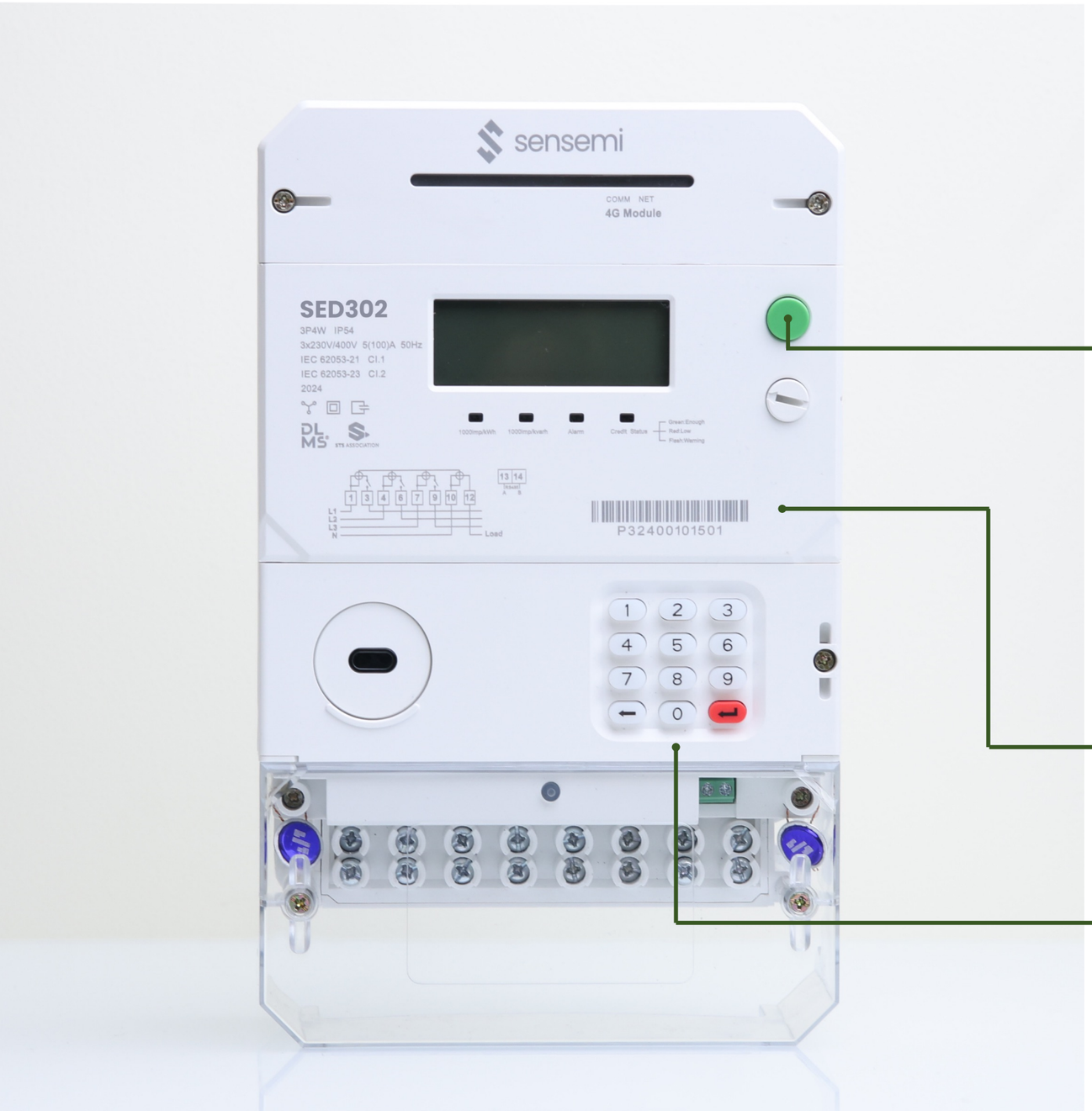
1	Module cover	2	Replaceable PLC module	3	Top cover
4	LCD	5	Module cover 2	6	Optical port
7	Terminal cover	8	Module LED	9	Module cover screw
10	Replaceable CAT.1+2G module	11	Replaceable battery	12	Meter base
13	Display button	14	Demand reset button	15	Meter LED
16	Module cover open	17	keypad		

sensemi
SOLUTIONS

smart metering
solutions.

THREE PHASE (SED302)

SMART ELECTRICITY METER



PRODUCT OVERVIEW

The **SED302** Smart Electricity Meter is a three-phase meter designed for versatile communication and advanced energy monitoring. It supports up to three modules simultaneously, including two communication modules and one input module, enabling seamless integration with smart grid systems.

FRONT VIEW DESCRIPTION:

DISPLAY

The meter features an LCD display with 8 characters and up to 2 decimal points, providing real-time information on energy consumption, voltage, and current. The backlight is white for easy readability.

DATA QUERY BUTTON

Compliant display and demand button are available to allow users to interact with the meter, query data, and navigate menus. Additionally, sound feedback is provided when buttons are pressed.

OPTICAL COMMUNICATION INTERFACE

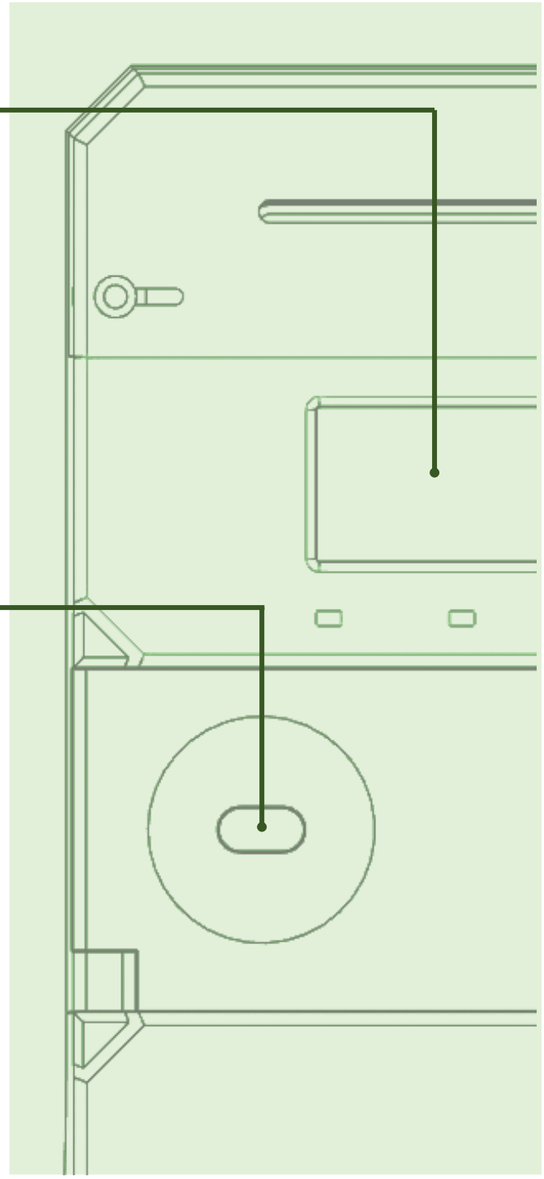
An optical communication interface is present for data exchange. This interface might be used for data reading , configuration and firmware upgrade.

METER INFORMATION

Essential information, such as the serial number and model details, is provided on the front and module covers, aiding identification and usage.

STS KEYPAD

The meter includes a keypad used for querying data information and recharge.



sensemi
SOLUTIONS

smart metering
solutions.

MAJOR APPLICATION

Remote Communication and Control:

Equipped with RS485 and wireless communication (CAT.1+2G) with a short antenna, it supports two-way communication, enhancing control and data collection capabilities.

DLMS/COSEM Protocol Compliance

The meter complies with DLMS/COSEM standards, ensuring compatibility and interoperability with other smart metering systems.

Load Profiles and Billing:

It records load profiles at 15-minute intervals for up to 100 days and supports monthly billing data storage for 12 months, providing detailed consumption records. Billing is reset automatically at the beginning of each month, with configurable settings.

Real-Time Clock Unit:

The meter has a real-time clock unit with an accuracy of less than 0.5 seconds per day, maintaining precise time for billing and event logging.

Hardware and Structure

Power and Backup:

A supercapacitor supports the "last gasp" function for sending final data during power outages, and internal/external batteries provide reliable backup power.

Cover and Terminal Materials:

The meter housing, including the cover, terminal cover, and terminal block, is made of polycarbonate (PC), with a white color for the main body and a transparent terminal cover. The terminal materials are copper, with nickel coating, and zinc-coated iron screws to ensure durability.

Dust and Water Protection:

The meter is rated with IP54 protection, providing resistance against dust and water, ensuring durability in various environmental conditions.

Sealing and Tamper Protection

The meter is equipped with multiple seal positions (top cover, terminal cover, module covers, MD button) to prevent tampering. The sealing material is aluminum caps by default

The Three Phase (SED302) Smart Electricity Meter offers advanced measurement, billing, and communication features for efficient energy usage, monitoring, and management, making it suitable for modern energy infrastructures.

sensemi SOLUTIONS

smart metering solutions.

BASIC PARAMETER

Accuracy	Active	IEC Class 1
	Reactive	IEC Class 2
Structure	Structure Type	BS
	Wiring connection	L1L1L2L2L3L3NN(3P4W)
Voltage	Nominal voltage Un	3*230/400V-3P4W
	Operating range	0.6Un--1.2Un
Current	Basic current I b	5A
	Max current Imax	100A
	Active I start	0.4%Ib(IEC Class1 Direct)
	Reactive I start	0.5%Ib(IEC Class 2 Direct)
Frequency	Nominal frequency Fn	50Hz
	Operating range	50Hz±5%
Meter constant	Active (imp/kWh)	1000
	Reactive (imp/kVarh)	1000

OUTPUT UNITS

Display	Type	LCD
	Value display character number	8
	Max decimal	2
	Backlight	White
LED	Active pulse	Red
	Reactive pulse	Red
	Alarm	Red
	Credit(2 color)	Red&Green
Latch Relay	Pole number	3 Pole
	Maximum Switching Current	120A
Beep		Comply

COMMUNICATION

Local communication	RS485		Comply
	Optical port(with iron)		Comply
AMI communication	Wireless	Module type	CAT.1+2G
		Antenna	Short
UIU communication	PLC		/

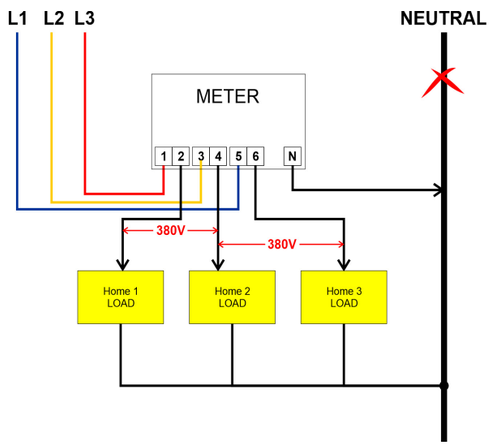
REFERENCE STANDARD

IEC	IEC 62053-21 IEC 62053-23 IEC 62052-11
Protocol	DLMS/COSEM

INPUT UNITS

Key &Detection	Display button	Comply
	Billing button	Comply
	STS keypad	Comply
	Meter cover	Comply
	Terminal cover	Comply
	Module cover	Comply
	Module cover 2	Comply
	Magnetic	Comply
	Others	display button and demand reset button require sound feedback

CONNCETIONS



STRUCTURE

Cover	Material	PC
	Color	White
Base cover	Material	PC
	Color	White
Terminal cover	Material	PC
	Color	Transparent
	Type	Extended
Terminal block	Block material	PC
	Color	White
	Wiring clamping type	Clamp cage
	Terminal material	Copper
	Terminal material coating	Nickel
	Clamping screw material	Iron(Default)
	Clamping screw coating	Zinc
Dust and water protection		IP54(Default)
missing dimension		266.5 x 168 x 84.5
Sealing	Type	Screw(Default)
	Seals material	plastic
	Seals fixed position1	Top cover
	Seals fixed position2	Terminal cover
	Seals fixed position3	Module cover （CAT.1+2G module cover）
	Seals fixed position3	Module cover 2（keypad or nfc module cover）
	Seals fixed position4	MD button

REGISTER

Energy	Active energy	Comply
	Reactive energy	Comply
	Apparent energy	/
Demand	Calc method	Slide
	Period	15 min
	Number Of Interval	3
	Active energy	Comply
	Reactive energy	Comply
	Apparent energy	/
Instantaneous value	Voltage	Comply
	Current	Comply
	Active power	Comply
	Reactive power	Comply
	Apparent power	Comply
	Frequency	Comply
	Power factor	Comply

OTHERS HARDWARE

RTC	Accuracy	< 0.5s/d
Subsidiary power	Super capacitor	Comply (for last gasp)
	Internal battery	Comply
	External replaced battery	Comply
Measurement elements	Phase line	CT
	Neutral line	Shunt, meter need to be able to detect neutral missing as right image

LOAD PROFILE

Monthly billing	Billing count	Last 12th
	Billing time	The default billing time is 00:00:00 of the 1th day in each month.
	Billing data	1. Date and Time 2. Active Energy import total +A (1.8.0) 3. Active Energy export total -A (2.8.0) 4. Reactive Energy import total +R (3.8.0) 5. Reactive Energy export total -R (4.8.0) 6. Active Energy in kWh for the current billing period 7. Reactive Energy in Varh fot the current billing period 8. Remaining balance 9. Charging Amount of Current month 10. Current month consumption amount 11. Active maximum power 12. Reactive maximum power
Daily billing	Billing count	62
	Billing time	The default billing time is 00:00 of each day.
	Billing data	1.Date and Time 2. Active Energy import total +A (1.8.0) 3. Active Energy export total -A (2.8.0) 4. Reactive Energy import total +R (3.8.0) 5. Reactive Energy export total -R (4.8.0)3.Available credit 6.Current month consumption Amount
Load profile	Capture period	15 min
	Entries	100 days
	Capture objects (Energy)	1. Date and Time 2. Time status 3. Active demand 4. Reactive demand 5. Import Active energy Wh 6. Import Reactive energy Varh 7. Active Energy import (1.8.0) 8. Reactive Energy import (3.8.0)
	Capture objects (Quality)	1. Date and Time 2. Average active power 3. Average reactive power 4. Voltage A/B/C 5. Current A/B/C 6. Power factor A/B/C 7. Average Frequency

Limiter	Enable	Comply
	monitor object	active power import/current active power import by default
	Threshold value	22KW, configurable
	Othres	details check sheet 'limiter'
Over voltage	Enable	Comply
	Threshold value	Over voltage threshold :250V, configurable restore threshold: 240V, configurable
Over current	Enable	/
	Threshold value	/
No credit	Enable	Comply
Factory settings	Enable	/
Power off	Enable	/
Tamper	Enable	Comply
	tamper item	1. Meter cover open, configurable 2. Terminal cover open, configurable 3. Magnetic field, configurable When relay is open because above 3 tamper, relay can be closed via dlms command directly 00 01 01 00 5E 62 45 FF 02 00 12 00 00 and this status can be read by meter software

sensemi
SOLUTIONS

smart metering
solutions.

THREE PHASE CT (SM306)

SMART CT METER

PRODUCT OVERVIEW

The Three-Phase Smart CT Meter is a high-accuracy metering device designed for utility-scale energy monitoring. It features dual plug-and-play communication modules, real-time data logging, and advanced anti-tamper detection, ensuring reliable performance and secure operation. With remote communication capabilities and compliance with DLMS/COSEM protocols, it enables seamless integration into smart grid systems.

PRODUCT FEATURES

- **Dual plug-and-play communication modules.**
- **Large LCD display for real-time meter monitoring.**
- **Non-volatile memory for data retention without a backup battery.**
- **Support for local and remote firmware upgrades.**

STANDARDS AND COMPLIANCE

- **IEC 62052-11:**
  General requirements, tests, and test conditions for electricity metering equipment (a.c).
- **IEC 62053-22:**
  Specific requirements for static meters for AC active energy (classes 0.1S, 0.2S, and 0.5S).
- **IEC 62053-24:**
  Specific requirements for static meters measuring fundamental component reactive energy (classes 0.5S, 1S, 1, 2, and 3).
- **DLMS/COSEM:**
  Device Language Message Specification and Companion Specification for Energy Metering.

Operating Voltage	3×57.7/100~3×240/415V
Voltage Range	0.8Un~1.2Un
Current rating	1(10)A
Starting current	Active Energy: 0.2% of Ib Reactive Energy:0.4% of Ib
Frequency	50Hz±5%
Accuracy Class	Active Energy: CL 0.5S 10000 imp/kWh Reactive Energy: CL 1.0 10000 imp/kvarh

sensemi SOLUTIONS

smart metering solutions.

KEY FUNCTIONS

MEASUREMENTS

- kWh/kvarh (import, export, and absolute)
- Maximum kW/kvar demand (import, export)
- Cumulative kW/kvar demand (import, export)
- Per-phase instantaneous values: voltage, current, phase angle
- Total and per-phase instantaneous values: active power, reactive power, power factor
- Current date and time display
- Frequency measurement
- Optional neutral line current measurement

TARIFF FUNCTIONS

- Time of Use (TOU) measurement for import/export energies (kWh/kvarh) and import/export demands (kW/kvar), supporting up to 4 tariffs, 12 seasons, 12 weeks, 16 switches, and 100 special days.
- Up to 32 energy tariff and 32 demand tariff registers.
- Battery or supercapacitor to maintain clock and calendar functionality.

LCD DISPLAY

- 10-digits LCD with three decimal points for power and demand, and two decimal points for energy; decimal points are programmable.
- LCD size exceeds 24 cm^2, with digit height of 12mm.

LOAD PROFILES

• Records up to 100 days of 15-minute load profiles with 16 channels, on a FIFO basis.

• Configurable load profile intervals from 1 to 60 minutes.

BILLING

- Automatic monthly billing reset at 00:00:00 midnight on the 1st of each month, with configurable settings.
- Manual billing reset via demand reset button.
- Remote billing reset from the AMI central system.
- Storage of up to 12 months of billing data in the meter's memory.

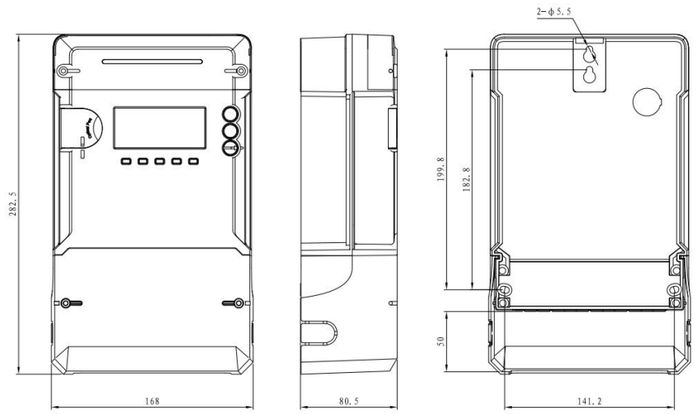
POWER QUALITY

- Voltage unbalance detection.
- Current reverse detection.
- Over-voltage and under-voltage detection with configurable time thresholds.
- Long and short outage detection with configurable time thresholds.
- Over-current detection with configurable time thresholds.
- All power quality events are recorded in the meter's memory.

- Supports both scrolling and manual modes for displaying items, accessible via a push button.

ANTI-TAMPER FEATURES

- Detection of tampering events such as meter cover, terminal, and module cover opening, external magnetic fields, bypassing, etc.
- Tamper alarms displayed on the LCD and LED indicators.
- All tamper events are logged in the meter's memory and reported remotely to the AMI central system



COMMUNICATION

- Full compliance with DLMS/COSEM and IEC 62056-21 standards for optical ports.
- Plug-and-play modules for PLC (G3, BPLC, HPLC), RF, 2G, 3G, and 4G communication.
- RF/2G/3G/4G module with a supercapacitor capable of sending a "last gasp" message to the AMI central system.

TECHNICAL SPECIFICATIONS

EMC	Electrostatic discharges(Contact discharges)	8kV
	Electrostatic discharges(Air discharges)	15kV
	Fast transient burst test	4kV
	Surge immunity test	6kV
	Electromagnetic RF field (80MHz to 2000MHz)	10V/m(with current), 30V/m(without current)
Environment	Temperature Range: -40 °C ~ +70 °C Humidity: Up to 95%	

Connection	L1V1L1L2V2L2L3V3L3NN
Real-time Clock Accuracy	0.5s/Day

Protective class	II
Degree of protection	IP54
Relay	Auxiliary relay:5A/250VAC

sensemi
SOLUTIONS

smart metering
solutions.

THREE PHASE CT/VT (SM307)

SMART CT/VT METER

PRODUCT OVERVIEW

The Three-Phase Smart CT/VT Meter is a versatile and highly efficient solution for precise energy measurement in high-voltage applications. It supports multiple tariffs, load profiling, and real-time power quality monitoring, ensuring optimized utility operations. With dual communication modules and advanced anti-tamper features, it provides secure, remote access for enhanced grid management.

PRODUCT FEATURES

- **Dual plug-and-play communication modules.**
- **Large LCD display for real-time meter monitoring.**
- **Non-volatile memory for data retention without a backup battery.**
- **Support for local and remote firmware upgrades.**

STANDARDS AND COMPLIANCE

- **IEC 62052-11:**
  Electricity metering equipment (a.c.) – General requirements, tests, and test conditions – Part 11: Metering equipment.
- **IEC 62053-22:**
  Electricity metering equipment – Particular requirements, Part 22: Static meters for AC active energy (Classes 0.1S, 0.2S, and 0.5S).
- **IEC 62053-24:**
  Electricity metering equipment – Particular requirements, Part 24: Static meters for fundamental component reactive energy (Classes 0.5S, 1S, 1, 2, and 3).
- **DLMS/COSEM:**
  Device Language Message Specification/Companion Specification for Energy Metering.

Operating Voltage	3×110V
Voltage Range	0.8Un~1.2Un
Current rating	1(10)A
Starting current	Active Energy: 0.2% of Ib Reactive Energy:0.4% of Ib
Frequency	50Hz±5%
Accuracy Class	Active Energy: CL 0.5S 10000 imp/kWh Reactive Energy: CL 1.0 10000 imp/kvarh

sensemi SOLUTIONS

smart metering solutions.

KEY FUNCTIONS

MEASUREMENTS

- kWh/kvarh (import, export, and absolute).
- Maximum kW/kvar demand (import, export).
- Cumulative kW/kvar demand (import, export).
- Instantaneous per-phase values for voltage, current, and phase angle.
- Total and per-phase instantaneous values for active power, reactive power, and power factor.
- Real-time date and time display.
- Frequency measurement.

TARIFF FUNCTIONS

- Time of Use (TOU) measurement for import/export energies (kWh/kvarh) and import/export demands (kW/kvar), supporting up to 4 tariffs, 12 seasons, 12 weeks, 16 switches, and 100 special days.
- Up to 32 energy tariff and 32 demand tariff registers.
- Battery or supercapacitor to maintain clock and calendar functionality.

LCD DISPLAY

- 10-digits LCD with three decimal points for power and demand, and two decimal points for energy; decimal points are programmable.
- LCD size exceeds 24 cm^2, with digit height of 12mm.

LOAD PROFILES

- Records up to 100 days of 15-minute load profiles with 16 channels, on a FIFO basis.
- Configurable load profile intervals from 1 to 60 minutes.

BILLING

- Automatic monthly billing reset at 00:00:00 midnight on the 1st of each month, with configurable settings.
- Manual billing reset via demand reset button.
- Remote billing reset from the AMI central system.
- Storage of up to 12 months of billing data in the meter's memory.

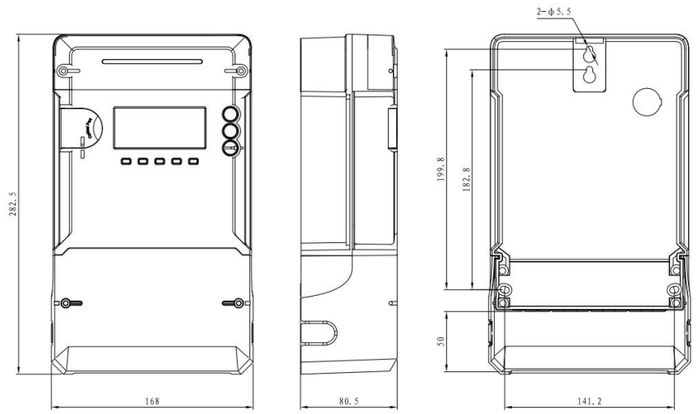
POWER QUALITY

- Voltage unbalance detection.
- Current reverse detection.
- Over-voltage and under-voltage detection with configurable time thresholds.
- Long and short outage detection with configurable time thresholds.
- Over-current detection with configurable time thresholds.
- All power quality events are recorded in the meter's memory.

- Supports both scrolling and manual modes for displaying items, accessible via a push button.

ANTI-TAMPER FEATURES

- Detection of tampering events such as meter cover, terminal, and module cover opening, external magnetic fields, bypassing, etc.
- Tamper alarms displayed on the LCD and LED indicators.
- All tamper events are logged in the meter's memory and reported remotely to the AMI central system



COMMUNICATION

- Full compliance with DLMS/COSEM and IEC 62056-21 standards for optical ports.
- Plug-and-play modules for PLC (G3, BPLC, HPLC), RF, 2G, 3G, and 4G communication.
- RF/2G/3G/4G module with a supercapacitor capable of sending a "last gasp" message to the AMI central system.

TECHNICAL SPECIFICATIONS

EMC	Electrostatic discharges(Contact discharges)	8kV
	Electrostatic discharges(Air discharges)	15kV
	Fast transient burst test	4kV
	Surge immunity test	6kV
	Electromagnetic RF field (80MHz to 2000MHz)	10V/m(with current), 30V/m(without current)
Environment	Temperature Range: -40 °C ~ +70 °C Humidity: Up to 95%	

Connection	L1V1L1L2V2L2L3V3L3NN
Real-time Clock Accuracy	0.5s/Day

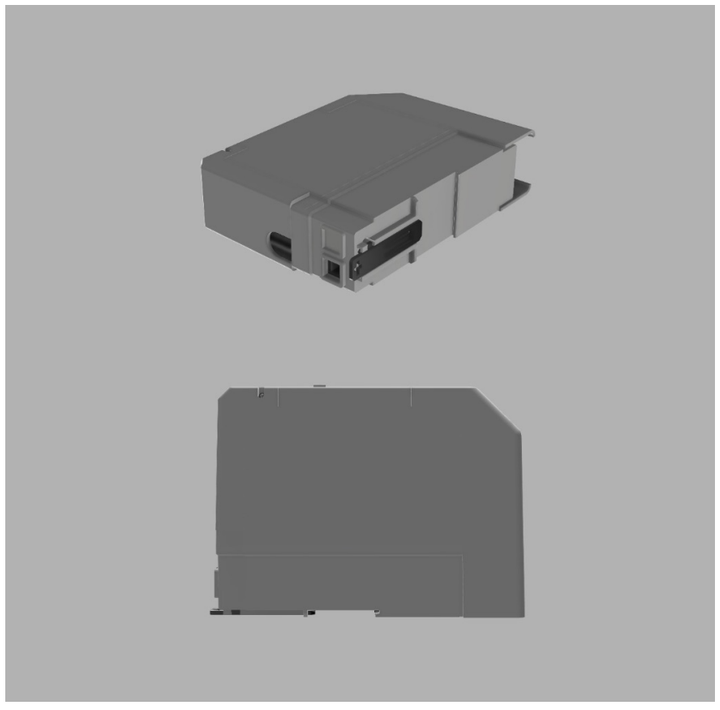
Protective class	II
Degree of protection	IP54
Relay	Auxiliary relay:5A/250VAC

sensemi
SOLUTIONS

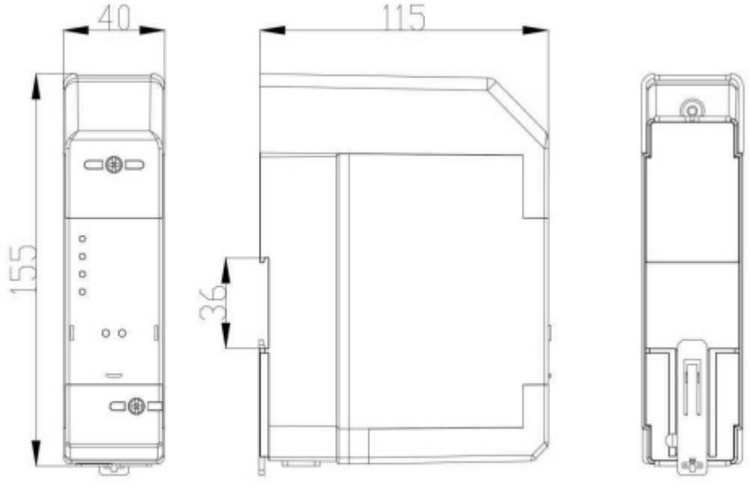
smart metering
solutions.

SINGLE PHASE DIN RAIL

SM120B2 SINGLE PHASE DIN RAIL SMART ELECTRICITY METER



DIMENSIONS



*ALL UNITS ARE IN MM (MILIMETER)

PRODUCT OVERVIEW

The SM120B2 is a versatile single-phase DIN Rail smart meter, designed for power grid monitoring, load control, and tamper detection. It features an advanced anti-tamper solution that helps utilities boost revenue and reduce line losses. Compliant with DLMS and FID2 open standards, the SM120B2 is an intelligent choice for residential customers.

PRODUCT FEATURES

- **Top-in, bottom-out design.**
- **Non-volatile memory for data storage without battery usage.**
- **Replaceable internal and external batteries for clock maintenance.**
- **Internal latching relay for disconnect control Data reading**
- **Capability during power outages.**
- **Anti-tamper design for enhanced security.**

TECHNICAL SPECIFICATIONS

Operating Voltage	230V
Voltage Range	0.6Un~1.2Un
Current rating	5(100)A
Starting current	0.4% of Ib
Frequency	50Hz±5%
Accuracy Class	Active Energy: CL 1.0 1000 imp/kWh Reactive Energy: CL 2.0 1000 imp/kvarh

STANDARDS AND COMPLIANCE

- Adheres to IEC standards (IEC 62052-11, IEC 62053-21, IEC 62053-23).
- Complies with interoperability standards (DLMS, FID2).

MAIN FUNCTIONS

MEASUREMENTS

- kWh (import, export, net, absolute).
- Kvarh (import, export).
- Kvah (import, export).
- Instantaneous values for voltage, phase line current, neutral line current.
- Instantaneous values for active power, reactive power, power factor.
- Current date and time.
- Phase angle measurement.
- Frequency measurement.

TARIFF FUNCTIONS

- Time of Use (TOU) measurement with up to 4 tariffs, 8 days, 12 seasons, 12 weeks, 16 switches, and 100 special days.
- Supports active and passive tariffs that can be updated at any time.
- Internal and external batteries maintain clock and calendar during power outages.

ANTI-TAMPER FEATURES

- Detection of meter cover tampering, terminal cover tampering, external magnetic fields, current reversal, unauthorized communication, and more.
- Tamper alarm displayed via LED.
- All tamper events are recorded in the meter memory.

LOAD PROFILES

- Records up to 100 days of 15-minute load profiles with 16 channels on a FIFO basis.
- Configurable load profile interval from 1 to 60 minutes.
- Records 5 load profiles, including Load Profile 1, Load Profile 2, Average Values Profile, Min. Values Profile, and Max. Values Profile.

BILLING

- Automatic monthly billing reset at 00:00:00 on the 1st day of each month (configurable).
- Local and remote billing reset via software.
- Storage of up to 17 months of data in meter memory.

DISCONNECT/RECONNECT SWITCH

- 1-pole 120A internal latching relay.
- Capable of 100,000 off-load cycles.
- Maximum switch voltage of up to 250V.
- Disconnection and reconnection based on tariff table, maximum current (fuse supervision), and maximum demand/allowed current (limiter).
- Scheduled disconnection and reconnection.
- Local or remote disconnection and reconnection requests.

POWER QUALITY

- Detection of over-voltage and under-voltage with configurable time thresholds.
- Long and short outage detection with configurable time thresholds.
- Phase loss and over-current detection with configurable time thresholds.
- All power quality events are recorded in the meter memory

COMMUNICATION

- Full compliance with IEC 62056-21 optical port standards.
- RS485 communication.
- Optional external 4G communication via RS485.

TECHNICAL SPECIFICATIONS

Real-time Clock Accuracy	≤0.5 (sec/day (IEC 62054-21)
Maximum withstand voltage	500V
Consumption	Current (1 VA), Voltage (1.5 W, 2.5 VA)
Insulation class	Double insulation
Temperature Range	Operating: -40 ℃ ~ +70 ℃ Storage: -40 ℃ ~ +85 ℃D
Degree of protection	IP51