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Selection & Application Guide

9810 High Accuracy Advanced Power Quality and Analysis Meter

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Modular power, energy and advanced power quality meters

The Siemens 9810 series high accuracy and advanced power quality meter combines accurate; 3-phase energy and power measurement with data logging, power quality analysis, e-mail, alarming, Modbus mastering, Transient detection, Pre-Event/Post-Event Waveform capture and extensive I/O capabilities in a highly flexible and modular format.

Typical power and energy management applications using the 9810 Meter


Data centers


Healthcare facilities


Airports and transportations


Pharmaceutical and chemical


Energy industries


Mining, minerals, and metals


Renewable energy facilities


Medium voltage distribution and energy automation


Large Industries and Automotives

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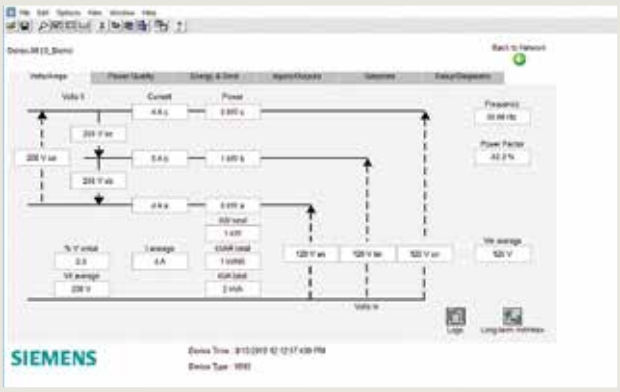
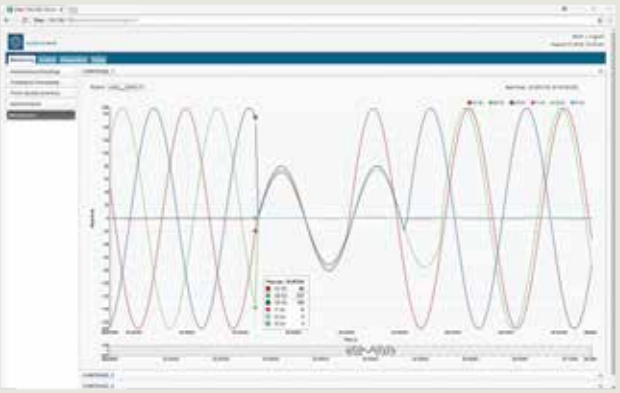
9810 Meter

Features and benefits

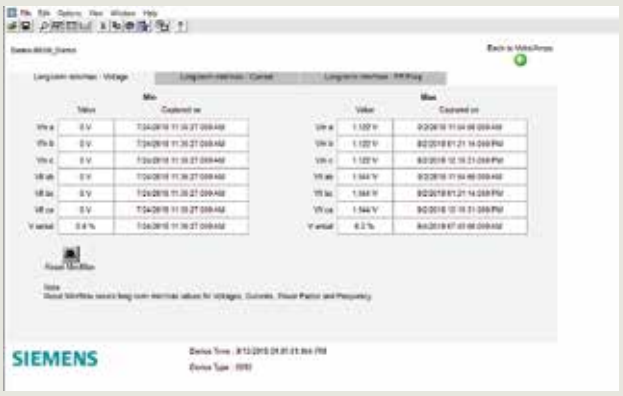


Main real time values

Power quality main screen



Waveform display in Onboard webpage



Min / max

The 9810 Series Meters are ideally suited to local and remote monitoring of low, medium, or high voltage electrical installations in industrial facilities, commercial buildings, utility networks or critical power environments. Facility and operations personnel will benefit in energy-related data while avoiding power quality conditions that can reduce equipment life and productivity.

The 9810 series meter is flexible to install and use, offering remote large high-visibility or smaller displays. A range of expansion modules help match features to the application and support field-upgrading of meters as required. Serial and Ethernet communication enable the meter to be used within a WinPM.Net power management system or with third-party management systems.

Benefits

- Maximize profits by providing high output with the least amount of risk to availability
- Improve availability and reliability of electrical systems and equipment
- Monitor power quality (PQ) for compliance and to prevent problems
- Meters fully supported by WinPM.Net 7.1 or newer
- Down to ± 1 millisecond digital input event logging
- Cybersecurity event logging, Syslog protocol, HTTPS, and full control of each communication port
- Modular and flexible design

Typical applications
Industrial, commercial, and critical power

- Energy savings
  - Measure efficiency, reveal opportunities and verify savings
  - Allocate energy costs to departments or processes
  - Reduce peak demand surcharges
  - Reduce power factor penalties
  - Leverage existing infrastructure capacity and avoid over-building
  - Support proactive maintenance to prolong asset life
- Energy availability and reliability
  - Validate that power quality complies with the energy contract
  - Verify the reliable operation of equipment
  - Improve response to power quality-related problems

For electrical infrastructure

- Energy availability and reliability
  - Improve transmission and distribution network reliability
  - Enhance substation metering to reduce field service time
  - Maximize the use of existing infrastructure
- Power quality
  - Verify compliance with new power quality standards
  - Analyze and isolate the source of power quality problems

9810 Meter

Features and benefits

Panel mount with optional 7 Inch touchscreen or 3.5 Inch display

Cost-effective, modular design

Basic features include a range of high accuracy 3-phase power and energy measurements, 15 minute logged statistical data values of average, minimum and maximum on over 50 measurements, total harmonic distortion (THD), minimum/maximum with date/time stamping on over 200 values, two RS-485 serial communication ports, dual Ethernet ports, eight digital inputs, four KY-type digital outputs, two relay-type outputs, and alarming on critical conditions. The 9810 meter has custom logging and power quality analysis capabilities, while expansion modules offer additional I/O.

Easy flexible installation

Mounting possibilities include; Din Rail mount with or without remote display, or panel mount with or without display. Directly connects to circuits up to 690V AC Line to Line or 480V AC Line to Neutral, eliminating the need for voltage (potential) transformers.

High-Visibility COLOUR touch display

Large 7 Inch capacitive touch display offers multi-phase measurements, summary screens, harmonics chart, phasor diagram display, intuitive navigation and selectable languages. Optional 3.5 Inch display offers multi-phase measurements, summary screens, harmonics chart, phasor diagram, and selectable languages.

Display characteristics	
3.5 inch pushbutton display	320 x 240 (1/4 VGA) colour LCD, configurable screens, 5 buttons and 2 LEG indicators (alarm and meter status)
7 inch touchscreen display	800 x 400 pixels, 177.8 mm colour LCD +/- 85 degree view angle, sunlight readable, dual capacitive touch, usable when wet or through Class 0 lineman gloves, impact resistant to 5 joules, IP65 rating
Languages	English, French, Spanish, Russian, Portuguese, German, Italian, Chinese
Notations	IEC, IEEE
The user interactive menu includes	
Alarms	Active alarms, historic alarms (50+ alarms)
Basic reading	Voltage, current, frequency, power summary
Power	Power summary, demand, power factor
Energy	Energy total, delivered, received
Events	Timestamped verbose event log
Power quality	EN 50160, IEEE 519, harmonics, phasor diagrams
Inputs/Outputs	Digital unputs, digital outputs, relay outputs, analog inputs, analog outputs
Nameplate	Model, serial and FW version
Custom screens	Build your own metrics
Setup menu	Meter setup, communications setup, display setup, date/time/clock setup, alarm setup, language setup, time of use setup, resets, password setup

DIN-rail mounted meter with expansion I/O modules

High accuracy measurements

IEC 62053-22 class 0.1S and ANSI C12.20 0.1 real energy accuracy for sub-billing and cost allocation. For reactive energy Class 0.5S (IEC62053-24).

Power quality analysis

Reveal and understand power quality conditions with the 9810 meter capabilities:

- Sag and Swell detection
- Transient detection
- Waveform capture –1024 samples per cycle (Pre and Post)
- Disturbance Direction and Detection (DDD)
- Trending and forecasting
- Flicker
- Compliant PQ standards
  - IEC 61000-4-30 Class A, Edition 3
  - IEC 62586-1, and IEC 62586-2
  - EN50160
  - IEEE 519:2014

Extensive data logging, trending and forecasting

Non-volatile on-board logging of min/max values, energy and demand, maintenance data, alarms, and any measured parameters. Trending and short-term forecasting of energy, demand, and measured parameters.

Custom alarming with time stamping

Triggers alarms on over 50 definable power or I/O conditions. Use boolean logic to combine multiple alarms.

Expandable I/O

A wide choice of standard or optional digital and analog inputs and outputs for pulse counting, demand metering of other utilities (pulse inputs from water, air, gas, electricity or steam meters), equipment status/position monitoring, demand synchronization, triggering conditional energy metering, equipment control or interfacing.

Serial and Ethernet Communications

Use the 2X RS-485 ports on the base meter unit for Modbus RTU communications or the Dual Ethernet ports for daisy-chaining via Ethernet. The Ethernet port will allow up to 8 supervisory systems to link to the meter at the same time and provide email-alarms and Modbus master functionality.

9810 Meter

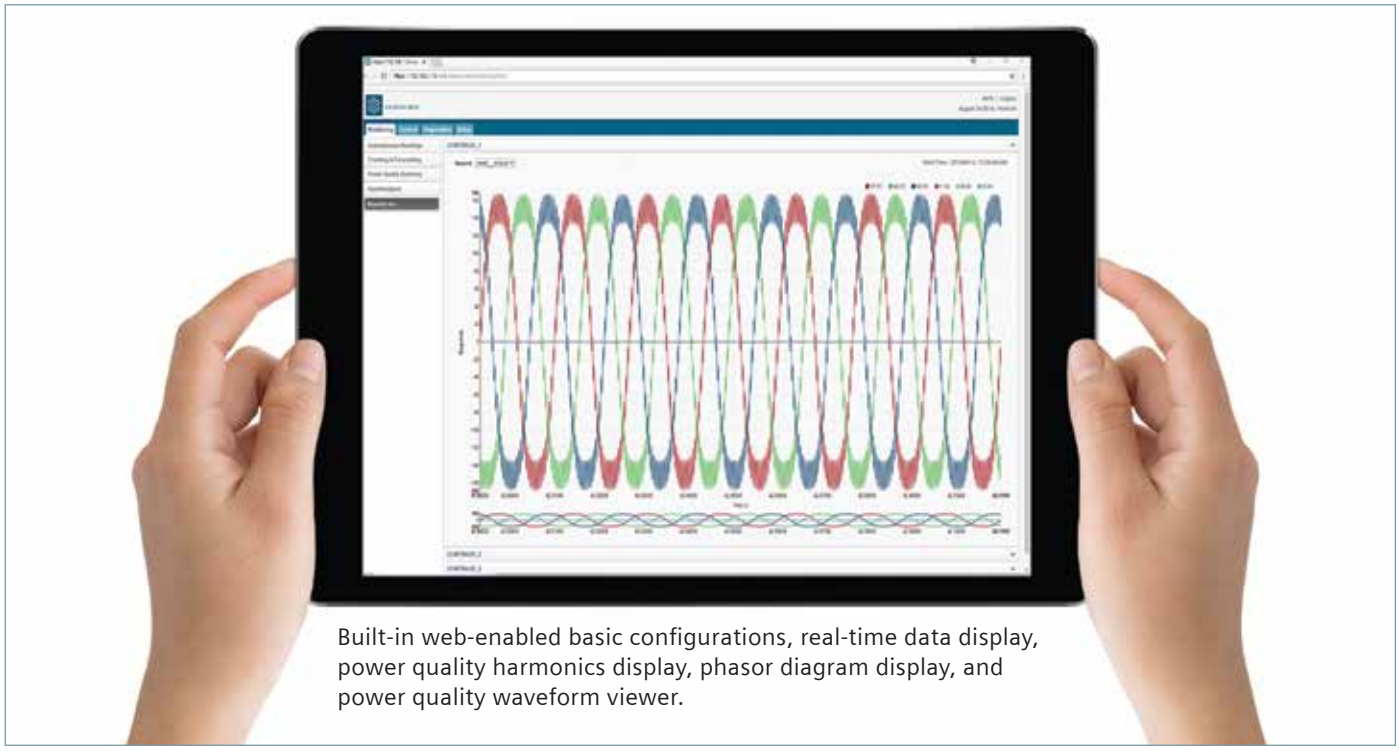
Measurements

PQ compliance reporting and basic PQ analysis

- Monitors and logs parameters in support of international PQ standards,
- Generates onboard PQ compliance reports accessible via onboard web pages:
  - Basic event summary and pass/fail reports, such as EN 50160 for power frequency, supply voltage magnitude, supply voltage dips, short and long interruptions, temporary over voltages, voltage unbalance and harmonic voltage.
  - ITIC (CBEMA) and SEMI curves, with alarm categorization to support further analyses.
  - NEMA Motor Derating curve.
  - Basic meter provides EN 50160 but can be configured to provide IEEE 519.
  - Harmonic analysis: THD on voltage and current, per phase, min/max, custom alarming.
  - Individual harmonic magnitudes and angles on voltage and current, up to the 63rd harmonic.
- Built-In web-enabled waveform viewer
- High resolution waveform capture: triggered manually or by alarm, captured waveforms available directly from the meter via FTP in a COMTRADE format.
- Disturbance detection and capture: sag/swell on any current and voltage channel, alarm on disturbance event, waveform capture with per-event information.
- Unique Disturbance Direction Detection indication of the captured disturbance occurring upstream or downstream of the meter; time stamped results provided in the event log, with degree of certainty of disturbance direction.
- Transient capture of events 20 microseconds or longer in duration on any voltage channel with waveform capture and per-event information.

Used with WinPM.Net software, the 9810 provides detailed PQ and Energy reporting across an entire distribution network:

- EN 50160 report.
- IEC 61000-4-30 report.
- PQ compliance summary.
- IEEE 519 harmonic compliance report.
- Energy reports for consumption analysis and cost management.
- WAGES dashboards and reports.
- WinPM.Net Power Events Analysis, including alarm management, sequence of events, and root cause analysis.
- Display of waveforms and PQ data from all connected meters.
- Onboard data and event logging.
- 2 GB of standard non-volatile memory dedicated to capture billing data, events, and waveforms.



Built-in web-enabled basic configurations, real-time data display, power quality harmonics display, phasor diagram display, and power quality waveform viewer.

7 Inch display showing Summary Data, Harmonics, Mastering down stream device real-time data 3WL and 3VA

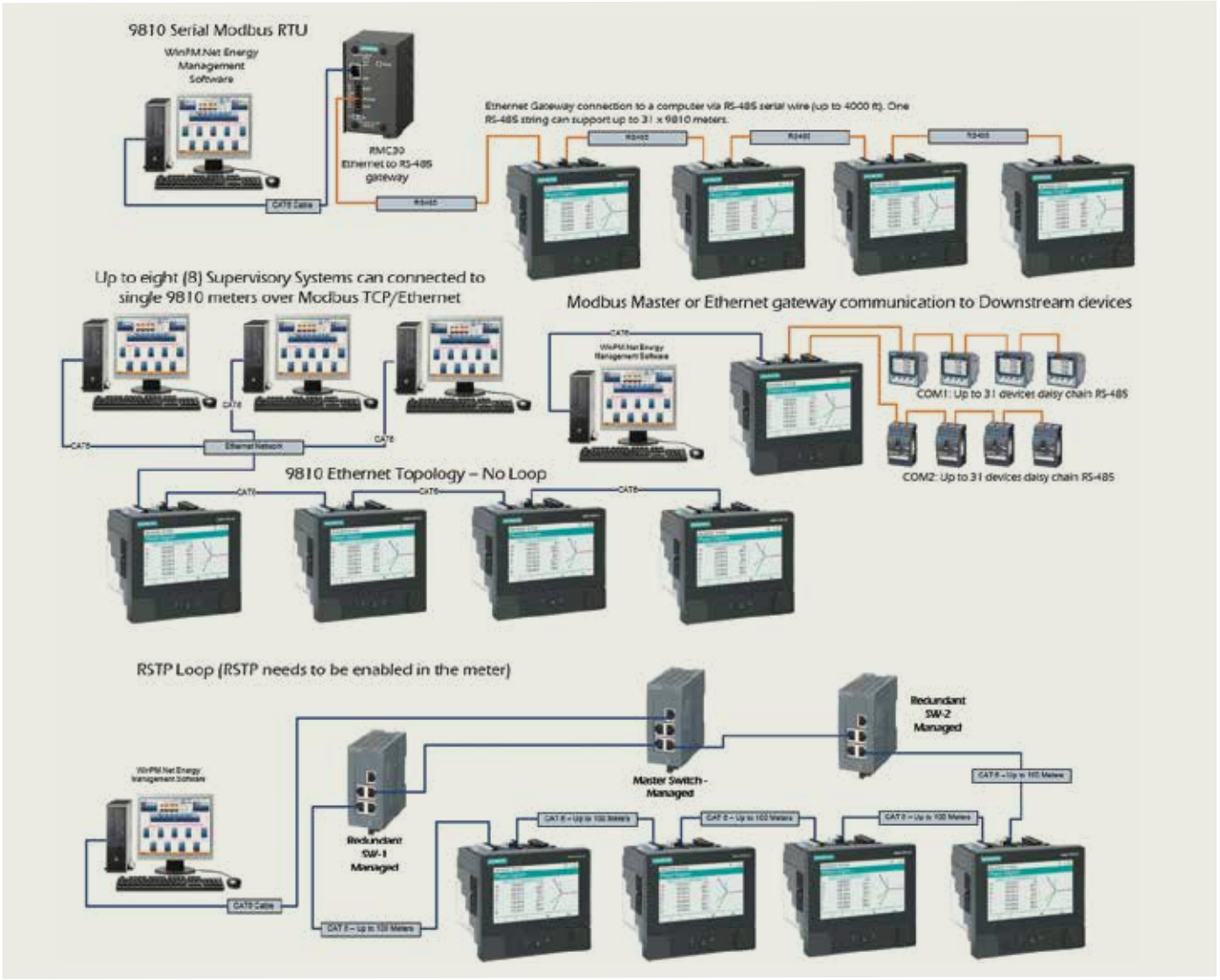
Touch display

The unique, capacitive touch display can be easily read in extreme lighting conditions or viewing angles. An intuitive navigation with self-guided menus make the meter easy to use. Multilingual operation can be user-configured for English, Spanish, French, Italian, German, Portuguese, Chinese, and Russian.

The large 6-line display offers summary screens that simultaneously presents up to 4 concurrent values, including power and energy values, I/O conditions or alarm status.

For example, all three voltage or current phases plus neutral can be quickly reviewed at one time. Bar chart displays graphically represent system loading and I/O conditions. Historical and active alarms are displayed with time stamping. Active alarms can be Colour coded for quick indication of alarm severity.

The 9810 displays can also be customized to show any metering point or imported data point from Modbus RTU/TCP connected devices, making this a unique central display for critical information.



9810 Power Quality Meter communication examples

9810 Meter

Installation

Installation – Mounting options

The 9810 meter has several mounting options which are:

- Din Rail mount, Din Rail mount with remote display panel mounted through a round cutout (30 mm)
- Panel mount using an optional back-to-back adapter which is affixed to the panel with 4 screws
- Panel mount with display using an optional back-to-back adapter which is affixed to the panel with 4 screws and round 30 mm cutout.

Meters with the optional integrated display can be door panel mounted when voltage connections are within the local regulation limits. When voltage exceeds regulation limits, the meter unit can be mounted inside the electrical cabinet with an optional remote display connecting via a display adapter and cable.

Circuit and control power connections

Compatible with low and high voltage 4-wire wye and 3-wire delta systems. Direct connect inputs up to 690 V AC line-to-line or use voltage (potential) transformers for higher voltage systems. All models offer a universal AC or DC power supply.

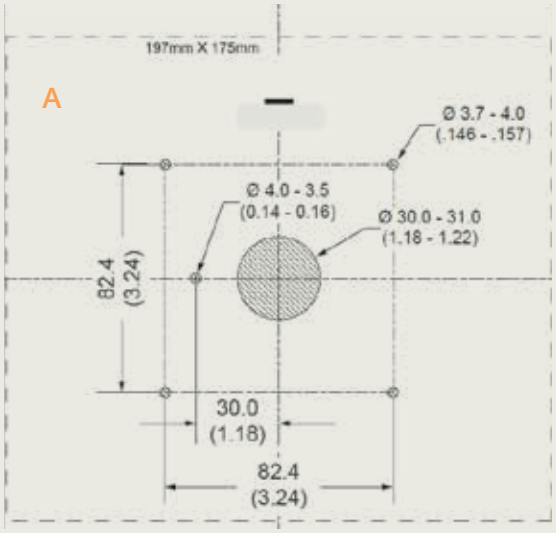
Electrical Characteristics

Type of measurement		True rms to 1024 samples per cycle
Measurement accuracy	Current and voltage	Class 0.1 as per IEC 61557-12
	Active power	Class 0.1 as per IEC 61557-12
	Power factor	Class 0.5 as per IEC 61557-12
	Frequency	Class 0.02 as per IEC 61557-12
	Active energy	Class 0.1S IEC 62053-22 (In=5A) Class 0.1 IEC 61557-12, ANSI C12.20 Class 0.1
	Reactive energy	Class 0.5S IEC 62053-24
Data update rate		1/2 cycle or 1 second
Input-voltage characteristics	Specified accuracy voltage	57 VLN/100 VLL TO 400 VLN/690 VLL
	Impedance	5MΩ per phase
	Specified accuracy frequency	42 to 69Hz (50/60Hz nominal)
	Limit range of operation -frequency	20 to 450Hz
Input-current characteristics	Rated nominal current	1A (0.1S), 5A (0.1S), 20A (0.1ANSI)
	Specified accuracy current range	Starting Current: 1mA (No Accuracy) Accurate Range: 10mA-20A
	Permissible overload	500A rms for 1s
	Impedance	0.0003Ω per phase
	Burden	0.01 VA max at 5A
Power supply	AC	90-480V AC ±10% (50/60Hz ± 10%), 90-120V AC ±10% (400Hz)
	DC	110-480V DC ±15%
	Ride-through time	100 ms (6 cycles at 60Hz) typical, 120V AC 400 ms (24 cycles at 60Hz) typical, 240V AC 1200 ms (72 cycles at 60Hz) typical, 480V AC
	Burden	Meter Only: 16.5W/38 VA max at 480V AC (50/60 Hz) Fully optioned meter: 40W/80 VA max at 480V AC (50/60 Hz)
Input/outputs	Meter Base Only	8 form A digital inputs (30V AC/60V DC) 4 form A (KY) solid state digital output (30V AC/60V, 75mA) 2 form C relay outputs (8 A at 250 V AC/ 5 A at 24 V DC)
	Optional	Digital - 6 form A digital inputs (30V AC/60V DC) 8 A at 250V AC or 5A at 24V DC)
		Analog - 4 analog inputs (4-20mA, 0-30V DC) +2 analog outputs (4-20mA 0-10V DC)

Mechanical Characteristics

Weight		DIN rail mounted Model 1.5 kg IO modules 0.140 kg 7" Touchscreen display: 0.861 kg 3.5" Display: 0.300 kg
IP degree of protection		IP 65, UL type 12: Panel mount and touchscreen display, front. IP 30: Panel mount rear, DIN rail mount, I/O modules.
Dimensions	Panel mount model: Colour remote display (2 options): 197 x 175 x 27.5 mm touchscreen 96 x 96 x 27 mm pushbutton	160 x 160 x 135.3 mm
	DIN model	160 x 160 x 135.3 mm
	IO modules	90.5 x 90.5 x 22 mm
	Touchscreen Display(s)	192 mm and 96 mm
Environmental conditions		
Operating temperature		-25°C TO + 70°C
Remote Display Unit		-25°C TO + 60°C
Storage temperature		-40°C TO + 85°C)
Humidity rating		5% to 95% non-condensing
Installation category		III
Operating altitude (maximun)		3000m above sea level

A



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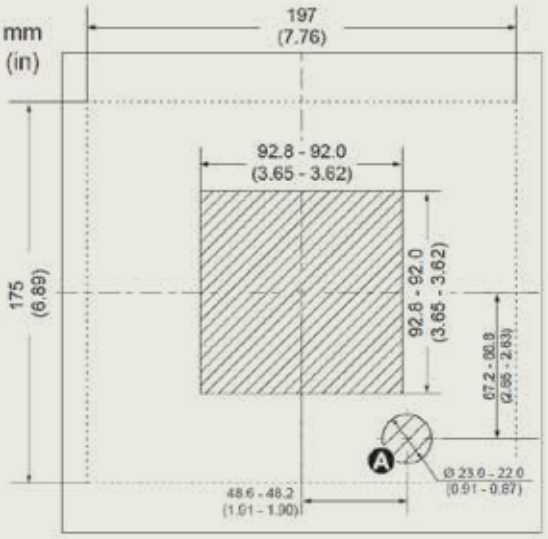

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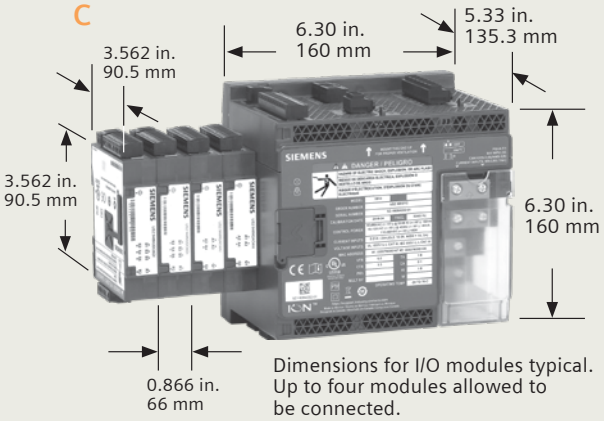
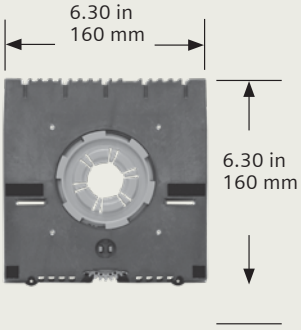


Dimensions for I/O modules typical. Up to four modules allowed to be connected.

D



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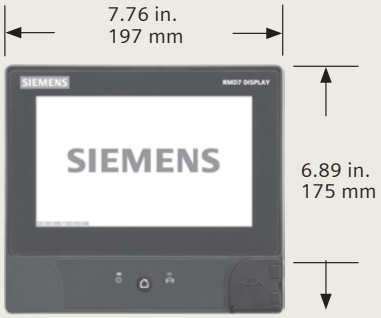

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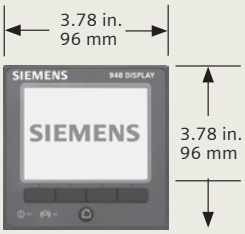


Dimensions:

A. Back-to-back adapter cutout dimensions

B. 96mm mounting adapter cutout

C. Din rail mounted meter with 4 I/O modules

D. Back-to-back adapter used to panel mount display and meter

E. Large 7in touchscreen capacitive display

F. 3.5in pushbutton display

9810 Meter

Functions

Alarm and control functions

Over 50 definable alarm conditions with 1 second response time can be used to log critical events or to perform control functions. Trigger on over or under conditions on any measured parameters, phase unbalance, digital input changes and more.

Multiple alarms can be defined, with each alarm individually configured with pickup setpoint, dropout setpoint and delay. Each alarm can be assigned one of four priority classes. Assign multiple alarms to a single quantity to create alarm levels. Assign different actions based on the severity level of the alarm. Use alarms to trigger waveform recording, data logging or to control digital outputs.

Customizable Programmable logic with the 9810 meter is powerful and allows users to control conditions of alarming, logging, or data control as well as equipment control impacting their bottom line.

Communications

Multiple simultaneously operating communication ports allow the meters to be used as part of a power and energy management system and interface with other automation systems. Captured waveforms, alarms, billing data, and more can be uploaded to WinPM.Net 7.1 or later for viewing and analysis.

- Standard RS-485 port (on meter unit): 2-wire connection, up to 115.2 kbaud, Modbus RTU, SEAbus, ION, and DNP3 protocol.
- Secure Web interface with HTTPS and TLS 1.2 with support for user-provided certificates.
- Dynamic Host Configuration Protocol (DHCP) IPv4 & IPv6 - DHCP is a network protocol that enables a server to automatically provide an IP address and other related information for a device.
- A dual port 10/100 Base-TX; Supporting IPv4 and IPv6, ION TCP, Modbus TCP/IP, DNP3, DLMS, and IEC 61850 communications. Full-function embedded web server provides standard web browser access to meter data, and the ability to email on an alarm from the host meter. Two RS-485 ports, 2-wire, Modbus (RTU) master port providing Ethernet-to-serial line gateway or Modbus master functionality.
- Auto device discovery with Device Profile for Web Services (DPWS).

Software integration

Integration with the WinPM.Net system software allows for automatic retrieval of the meters real-time and on-board data logs. Modbus compatibility and register-based logged data supports integration and data access by building automation, SCADA and other third-party systems.

Special features

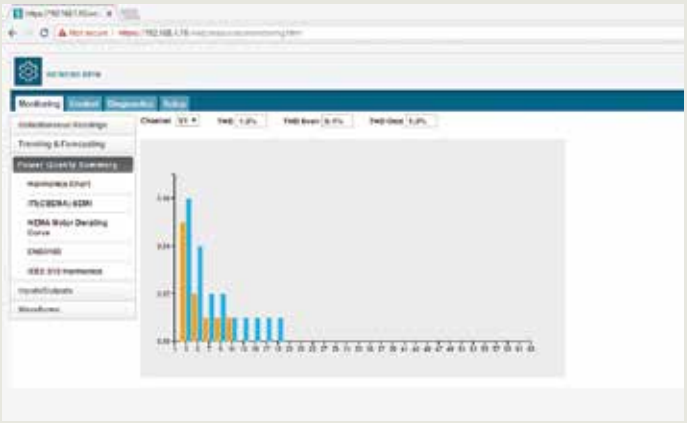
Hour counter: load running time in days, hours and minutes. Upgradeable Firmware – Your meters can be upgraded with the latest firmware. Contact your local Siemens representative for details.

Measurement Features Guide		9810
General	Use on LV, MV, and HV systems	✓
	Current accuracy (5A Nominal)	0.1 % reading
	Voltage accuracy (57 V LN/100 V LL to 400 V LN/690 V LL)	0.1 % reading
	Active energy accuracy	0.1 Class
	Number of samples/cycle or sample frequency	1024
Instantaneous RMS Values	Current, voltage, frequency	✓
	Active, reactive, apparent power Total and per phase	✓
	Power factor Total and per phase	✓
	Current measurement range (autoranging)	0.01 - 20A
Energy Values	Active, reactive, apparent energy	✓
	Settable accumulation modes	✓
Demand Values	Current - Present and max. values	✓
	Active, reactive, apparent power Present and max. values	✓
	Predicted active, reactive, apparent power	✓
	Synchronisation of the measurement window	✓
	Setting of calculation mode - Block, sliding	✓
Power Quality Measurements	Harmonic distortion - Current and voltage	✓
	Individual harmonics	63
	Waveform capture	✓
	Detection of voltage swells and sags	✓
	Fast acquisition - 1/2 cycle data	✓
	EN 50160 compliance checking	✓
	Customizable data outputs (using logic and math functions)	✓
Data Recording	Min/max of instantaneous values	✓
	Data logs	✓
	Event logs	✓
	Trending/forecasting	✓
	SER (Sequence of event recording)	✓
	Time stamping	✓
	GPS synchronisation (+/- 1 ms)	✓
	Memory (Gigabytes)	2
Display and I/O	Front panel display	✓
	Wiring self-test	✓
	Pulse output	✓
	Digital or analog inputs(max)	32 DI/16 AI
	Digital or analog outputs (max, including pulse output)	4 DO/10 RLY/8 AO
Communication	RS 485 port	2
	Ethernet port	2
	Serial port (Modbus, ION, DNP3)	✓
	Ethernet port (Modbus/TCP, ION TCP, DNP3 TCP, DHCP, DNS, IPv4, IPv6, DLMS, DPWS, IEC 61850)	✓
	Ethernet gateway	✓
	Concurrent Connections over Ethernet:	8
	Alarm notification via email	✓
	HTTP web server	✓
	SNMP with custom MIB and traps for alarms	✓
	SMTP email	✓
	NTP time synchronization	✓
	FTP file transfer	✓

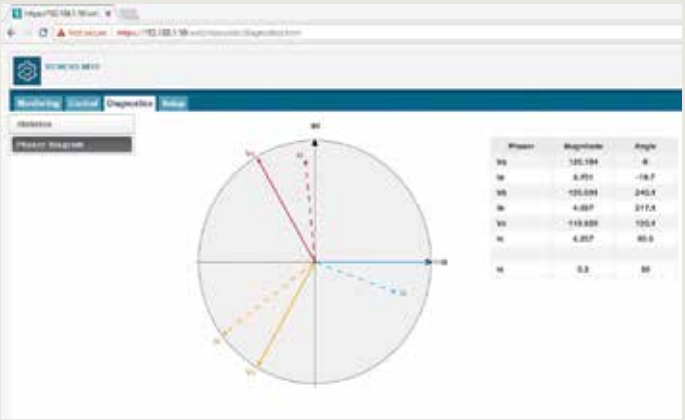
9810 Built-In Web Pages

The 9810 comes with many standard HTML web pages showing the meters data, but additional custom web pages can be designed to display other Modbus serial or Modbus TCP connected devices like power meters, trip units, flow meter information, and more!

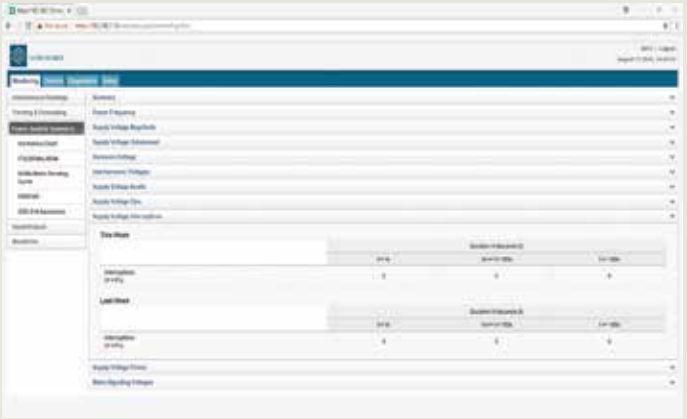
Realtime web page



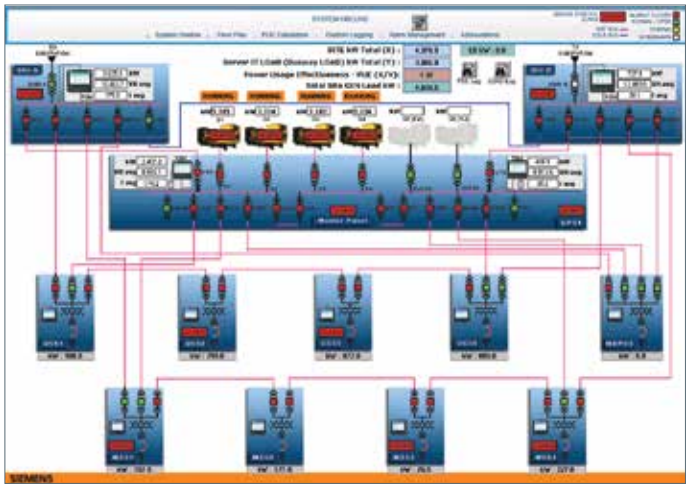
Harmonics web page



Phasor web page



Power Quality web page



Example screen from WinPM.Net software showing electrical system diagram with multiple real-time metering points

New! Enhanced waveform display through Power Event Analysis & Power Quality Incident summary

9810 Meter

Applications and benefits

- Maximize profits by providing high output with the least amount of risk to availability.
- Improve availability and reliability of electrical systems and equipment.
- Monitor power quality (PQ) for compliance and to prevent problems.
- Meters fully supported by WinPM.Net Power Monitoring Software.

Main characteristics

- Precision metering.
- IEC 61557-12 PMD/SD/K70/0.2 PMD/SS/K70/0.2 and 3000m (performance measuring and monitoring functions).
- Class 0.1S accuracy IEC 62053-22, ANSI C12.20 Class 0.1 (active energy).
- Industry leading Class 0.5S accuracy for reactive energy (IEC 62053-24).
- Cycle-by-cycle RMS measurements updated every ½ cycle.
- Full 'multi-utility' WAGES metering support.
- Net metering.
- Anti-tamper protection seals.
- PQ compliance reporting and basic PQ analysis.
- Monitors and logs parameters in support of international PQ standards.
  - IEC 61000-4-30 Class A
  - IEC 62586 PQI-S

Digital and analog inputs and outputs

Digital output relays can act in response to internal alarms, external digital input status changes, or commands over communications. Digital inputs can be used to trigger alarms, trigger logging, and synchronize to a demand pulse or control conditional energy accumulation. Both models offer five channels for metering of water, air, gas, electricity or steam utilities through the digital input pulse counting and consumption/ demand calculation capabilities of the meter. Pulses from multiple inputs can be summed through a single channel communications. Up to 32 total digital inputs can be logged in the 9810 with ± 1 millisecond time stamping for critical information like detailed sequence of event recording.

9810 Power Quality Meter integrated with SM@RTGear

9810 Standard I/O's and Expansion I/O's specifications

Type	Input/ Output	Specifications
Standard (Meter Unit)	4 digital outputs	Form A, (KY) Max. voltage : 30 V AC /60 V DC, Max. Current : 75 mA
	2 relay outputs	Form C, Max. voltage : 250 V AC / 24 V DC, Max. Current : 8 A at 250 V AC or 5A at 24V DC , 20k cycles (resistive)
	8 digital input	Refrence voltage 40 V, Max. voltage : 30 V AC /60 V DC
9810 (US2:948M2DO6DI)	2 digital elay outputs	6 to 240V AC or 6 to 30V DC, 2 A rms, 5 A maximum for 10 second/hour
	6 digital inputs	20 to 150V AC/DC, 2 mA max., 24V internal supply: 20 to 34V DC, 10 mA maximum (feeds 6 inputs)
9810 US2:948M2AO4AI)	Analog I/O module (4 analog inputs & 2 analog outputs)	
	4 analog inputs (4-20mA; 0-30 V). 2 analog outputs (4-20mA; 0-10 V) for interfacing with building management sensors and systems	

Rear view of meter unit with 4x expansion I/O attached

Bottom view of 9810 meter unit, showing dual Ethernet port and RS-485 communication port connectors, digital outputs and 4x expansion I/O modules

9810 Meter

I/O modules

Environment:

- -25 °C to Max. temp (-13 °F to Max. temp) operating temperature
- Maximum operating temperature is based on the quantity and type of attached option modules

Max. temp	Digital	Analog
70 °C (158 °F)	0 - 4	0.1
70 °C (158 °F)	0	2
60 °C (140 °F)	1.2	2 - 4

- 5% to 95% RH non-condensing
- Maximum dewpoint 37 °C (99 °F)
- -40 to 85 °C (-40 to 185 °F) storage temperature
- Pollution degree 2
- < 3000 m (9843 ft) above sea level
- IP30
- Not suitable for wet locations
- For indoor use only

Digital I/Os

Analog I/Os

Digital input:

- Type: Externally excited
- Reference voltage: 40 V
- Maximum voltage: 30 V AC / 60 V DC
- ON state: 11 to 30 V AC / 11 to 60 V DC
- OFF state: 0 to 5 V AC / 0 to 5 V DC

Whetting source:

- Output voltage: 16 V DC
- Output current: 20 mA
- Maximum load: 9 digital inputs (6 option module, 3 meter base)

Digital output:

- Type: Form C mechanical
- Maximum voltage: 250 V AC / 30 V DC
- Maximum current: 8 A @ 250 V AC or 5 A @ 24 V DC, 20k cycles (resistive)

Analog Input:

- Voltage/current range: 0 - 30 V DC, 4 - 20 mA
- Accuracy: 0.3% full scale
- Maximum input voltage: 30 V DC
- Maximum input current: 24 mA
- Temperature drift: 200 ppm/K max
- Input impedance: < 300 Ω (current mode) > 500 kΩ (voltage mode)
- Inputs are functionally isolated (input to input)

Analog Output:

- Voltage/current range: 0 - 10 V DC, 4 - 20 mA
- Accuracy: 0.3% full scale
- Temperature drift: 200 ppm/K max
- Protected for short circuit (voltage mode) and open circuit (current mode)
- Burden: > 10 kΩ (voltage mode), < 600 Ω (current mode)
- Type: Externally excited
- Reference voltage: 40 V
- Maximum voltage: 30 V AC / 60 V DC
- ON state: 11 to 30 V AC / 11 to 60 V DC
- OFF state: 0 to 5 V AC / 0 to 5 V DC

Ordering information

Please contact your local sales representative for ordering information.

Visit www.usa.siemens.com/pds for more information on other Power Monitoring products, applications and system solutions.

Part Number	Description
Meter	
US2:9810RC	9810 with 7" display (either din rail or panel mount)
US2:9810TC	9810 without display
Accessories	
US2:9810R7DISP	Large 7" display
US2:948DISP96	Small 3.5" display + 3M cable
US2:948DCAB10	Remote display cable 10 M
US2:9810PMRDHWK	Remote display hardware kit
Expansion Modules:	
US2:948M2DO6DI	I/O Module-Digital (6IN/2OUT)
US2:948M2AO4AI	I/AI Module-Analog (4IN/2OUT)
Miscellaneous:	
US2:9810PMHWK	9810 Hardware Kit
US2:9810BBADAPTER	9810 Back to Back adapter

Electromagnetic compatibility	
Product standards	IEC 62052-11 and IEC 61326-1 and IEC 61000-6-5
Immunity to electrostatic discharge	IEC 61000-4-2
Immunity to rediated fields	IEC 61000-4-3
Immunity to fast transients	IEC 61000-4-4
Immunity to surges	IEC 61000-4-5
Immunity to conducted disturbances	IEC 61000-4-6
Immunity to power frequency magnetic fields	IEC 61000-4-8
Immunity to conducted disturbances, 2-150kHz	CLC/TR 50579
Immunity to voltage dips and interruptions	IEC 61000-4-11
Immunity to ring waves	IEC 61000-4-12
Conducted and radiated emissions	EN 55011 and EN 55032 Class B, FCC part 15 Class B, ICES-003 Class B
Surge withstand Capability (SWC)	IEEE/ANSI C37.90.1
Damped oscillatory wave immunity	IEC 61000-4-18

Safety	
Safety Construction	IEC/EN 61010-1 ed.3, CAT III, 400 VLN / 690 V LL UL 61010-1 ed.3 and CSA-C22.2 No. 61010-1 ed.3, CAT III, 347 V LN / 600 V LL IEC/EN 62052-11, protective class II
Communication	
Ethernet to serial line gateway	Communicates directly with up to 62 serial devices through the two serial ports..
Web server	Customizable pages, new page creation capabilities, HTML/XML compatible.
Serial port RS485	Baud rates of 2400 to 115200, pluggable screw terminal connector.
Ethernet port(s)	2x 10/100Base-TX, RJ45 connector, CAT5/5e/6/6e cable.
Protocol	Modbus, ION, DNP3, IEC 61850, HTTP, HTTPS, DLMS, FTP, SNMP, SMTP, DPWS, RSTP, PTP, NTP/SNTP, GPS, Syslog, DHCP protocols.
Firmware Characteristics	
High-speed data recording	Down to 1/2 cycle interval burst recording, stores detailed characteristics of disturbances or from external equipment.
Harmonic distortion	Up to 63rd harmonic for all voltage and current inputs.
Sag/swell detection	Analyze severity/potential impact of sags and swells: magnitude and duration data |suitable for plotting on voltage tolerance curves per phase triggers for waveform recording, control.
Disturbance direction detection	Determine the location of a disturbance more quickly and accurately by determining the direction of the disturbance relative to the meter. Analysis results are captured in the event
Instantaneous	High accuracy of standard speed (1s) and high-speed (1/2 cycle) measurements, including true rms per phase and total for: voltage, current, active power (kW),reactive power (kvar), apparent power (kVA), power factor, frequency, voltage and current unbalance, phase reversal.
Load profiling	Channel assignments (1600 channels via 100 data recorders) configurable for any measurable parameter, including historical trend recording of energy, demand, voltage, current, power quality, or any measured parameter. Trigger recorders based on time interval, calendar schedule, alarm/event condition, or manually.
Trend curves	Historical trends and future forecasts to better manage demand, circuit loading, and other parameters. Provides average, min, max and standard deviation every hour for last 24 hours, every day for last month, every week for last 8 weeks and every month for last 12 months.
Waveform captures	Simultaneous capture of all voltage and current channels sub-cycle disturbance capture, maximum cycles is 100,000 (16 samples/cycle x 96 cycles, max 1024 samples/cycle.
Alarms	Threshold alarms: adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm, user-defined or automatic alarm threshold settings, user-defined priority levels (optional automatic alarm setting).
Detection and capture of transients	As short as 20 µs at 50 Hz (17µs at 60 Hz)
Time of Use (TOU)	6 seasons; 3 different day types: weekend, weekday, and holiday; up to 8 tariffs per day type.

The contents of this 9810 Selection and Application Guide Manual shall not become part of or modify any prior or existing agreement, commitment, or relationship. The sales contract contains the entire obligation of Siemens respecting the products. The warranty contained in the contract between the parties is the sole warranty of Siemens. Any statements contained herein do not create new warranties or modify the existing warranty.

The information provided in this flyer contains merely general descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

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Printed in Canada.

Order No: EM-LP-1631