

COMPACT DIN RAIL MOUNTED ENERGY AND POWER QUALITY METER

Features

- Compact DIN rail mounted meter designed for small footprint applications
- Meets ANSI C12.20 0.2 Accuracy Class
- Power quality features include waveform recording at 512 samples/cycle and harmonic analysis
- Extensive memory for usage trending
- System Events log and passwords for security
- Modbus, BACnet/IP, or DNP3 for easy software integration
- RS485 serial or RJ45 Ethernet port; standard USB front panel port
- Use with EIG's EnergyPQA.com[®] system for energy management and power quality analytics
- Supports 0.333 V CTs and Rogowski Coil CTs

Applications

Machine level monitoring

В

G SHARK ST40

RXUUTX

- Power quality metering
- Energy management
- Commercial submetering
- Cost allocation and sub-billing
- Industrial metering
- Medical equipment monitoring
- Solar/wind/micro-turbine power generation metering
- Installations where space is limited
- Compatible with MV90 and SCADA applications





Introduction

The ST40 is one of the smallest energy and power quality meters in the world. It was designed specifically for DIN rail installation where space is at a premium. It provides 0.2% class energy accuracy and advanced power quality features, including recording PQ waveform events at up to 512 samples per cycle and harmonic readings to the 40th order.

The ST40 meter has extensive memory for storing load profiles, system events, limits, and alarms. It has either RS485 or Ethernet communication, supporting Modbus or Bacnet/IP protocols, that brings data back to existing software or directly to EIG's EnergyPQA.com® AI driven energy management system for energy analytics and predictions. The meter is also compatible with MV90 and many different power monitoring software systems.

The ST40's voltage measurement range is up to 576 V L-N. Current inputs can be ordered for industry standard 5 A and 1 A current transformers; or for 0.333 V and Rogowski coil CTs, for use with submetering applications. It has a separate power input connection and utilizes an extended range power supply with voltage up to 300 V AC, eliminating the need for a separate control power transformer. The ST40 is ideal for machine level monitoring, solar, wind, and other applications with limited installation space.

Advanced Revenue Meter

- ANSI C12.20 0.2 Accuracy Class.
- Traceable watt-hour test pulse.
- Utility Block and Rolling average demand.
- Historical load profiling.
- Transformer and Line Loss compensation.
- CT/PT compensation.
- Line frequency time sync.
- Sealable voltage and current inputs.

Measured Parameters	Accuracy %	Display Range
Voltage L-N	0.1%	0-9999 Scalable V or kV
Voltage L-L	0.2%	0-9999 V or kV Scalable
Current	0.2%	0-9999 A or kA
+/- Watts	0.2%	0-9999 Watts, kWatts, MWatts
+/-Wh	0.2%	5 to 8 Digits, Programmable
+/-VARs	0.2%	0-9999 VARs, kVARs, MVARs
+/-VARh	0.2%	5 to 8 Digits, Programmable
VA	0.2%	0-9999 VA, KVA, MVA
VAh	0.2%	5 to 8 Digits, Programmable
PF	0.2%	+/- 0.5 to 1.0
Frequency	+/- 0.01 Hz	(45 to 65) Hz
THD	+/- 2.0%	1 to 99.99%

Note: Applies to 3 element WYE and 2 element Delta connections. See full accuracy specifications in the ST40 meter's User manual. Neutral current 2% accuracy.

Extensive Datalogging Capability(V2 and Higher)

Historical Logs

- Three assignable historical logs.
- Independently programmed trending profiles.
- Up to 64 parameters per log.
- Real time clock for timestamping.



System Events Log

To protect critical billing information, the meter records and logs the following with a timestamp:

- Demand resets.
- Password requests.
- System startup.
- Energy resets.
- Critical data repairs.
- Log resets.
- Log reads.
- Programmable settings changes.

Limit Alarms (V4 Option)

Limit Events

- Up to eight limits.
- Voltage imbalance.
- Current imbalance.

Power Quality Log

- Provides magnitude and duration of an event.
- Includes timestamp and alarm value.
- 2048 events available.

Power Quality Analysis

Waveform Recording

The ST40 meter records at up to 512 samples per cycle for a voltage sag/swell or a current fault event. The unit provides preand post-event recording capability.

	Samples Per Cycle	Pre-Event Cycles	Post-Event Cycles	Max Waveforms per Event
	32	16	48	128
V5	64	8	24	64
	128	4	12	32
Ve	256	2	6	16
VO	512	1	3	8
Note:	Sampling rate ba	sed on 60 Hz s	systems. For 50 H	Hz systems, multiply
by 1.2				

The meter's advanced DSP design allows power quality triggers to be based on a 1/2 cycle updated RMS. Store up to 170 events in the meter's FIFO buffer.

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View Waveforms of Power Quality Events

Independent CBEMA or SEMI F47 Log Plotting

The meter stores an independent CBEMA or SEMI F47 log for magnitude and duration of voltage events. This lets you quickly view total surges, total sags, and duration, without retrieving waveform data.

Harmonic Recording to the 40th Order

The ST40 meter provides advanced real time harmonic analysis to the 40th order for each voltage and current channel. Using the stored waveforms, harmonic analysis is available to the 255th order.

Upgradable V-Switch™ Technology

The ST40 meter's V-Switch[™] capability enables meter upgrades, even after installation.

Feature	V1	V2	V 3	V4	V5	V6
Multifunction Measurement	1	1	1	1	1	1
Basic Datalogging		1	1	1		
Intermediate Datalogging					1	
Advanced Datalogging						1
Harmonic Analysis			1	1	1	1
TLC and CT/PT Compensation	1	1	1	1	1	1
Limit Functions				1	1	1
64 Samples per Cycle Waveform Recorder					1	
512 Samples per Cycle Waveform Recorder						1

Integration with EnergyPQA.com[®] Energy Management System

The meter integrates with EIG's EnergyPQA.com® AI driven energy management system. This cloud based system supports energy usage comparisons between meters and facilities, letting you easily identify energy inefficiency with its AI predictions. The system also provides deep insights into power quality.





Voltage Inputs

- Classes 10 and 2 Current Input Models -Absolute Range: (20-576) V L-N, (0-721) VI-I
- Classes 10 and 2 per UL 61010-1: 300 V ٠ Max L-N, 600 V Max L-L
- mV Option per UL 61010-1: 600 V L-N, 600 V L-L Input Withstand Capability – Meets IEEE
- C37.90.1 (Surge Withstand Capability) Programmable Voltage Range to Any PT
- Ratio
- Supports: 3 Element WYE, 2.5 Element WYE, 2 Element Delta, 4 Wire Delta Systems • Burden
- Input Impedance: 4 MΩ per Phase
- 0.36 VA/Phase Max at 600 Volts, 0.014 . VA at 120 Volts
- 2.08) mm²

- Class 10: (0.005 to 10) A, 5 A

Secondary

- Fault Current Withstand (at 23 °C): 100 A for 10 Seconds
- Continuous Current Withstand: 20 A
- Programmable Current to Any CT Ratio Burden 0.005 VA per Phase Max at 11 A
 - mV Option: 0.333 V
 - Input Impedance: 2 MQ
 - Maximum Voltage: 5 V
 - Pickup Current: 0.1% of Nominal Class 10: 5 mA
 - Class 2: 1 mA
 - mV Option: 0.004 V
- Isolation
- I/Os Isolation from Power Line Rated Connections: 2500 V AC (Hi-Pot Tested)

Environmental Rating Storage: (-20 to +70) °C

- Operating: (-20 to +70) °C (UL Evaluated . to 65 °C)
- Humidity: to 95% RH Non-Condensing
- Protection: IP 30 (Front and Back)
- Sensing Method
- True RMS

- Sampling at over 400 Samples / Cycle on All Channels of Measured Readings, Simultaneously
- Harmonics Resolution to 40th Order Waveform Recording at up to 512 Samples/ Cvcle

Update Rate

- Watts, VAR and VA Every 6 Cycles All Other Parameters - Every 60 Cycles
- Power Supply

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(90 - 300) V AC VA Rating: 10 VA Max; 8 VA Nominal Standard Communication

- 2 Com Ports
 - . RS485 Serial Port
 - Micro USB
- Com Port Baud Rate: (1200 57600)
- Com Port Address: 1-247
- Parity Setting: Odd, Even, None
- Serial Modbus ASCII/RTU DNP3 (RS485 Only)

Optional Communication

INP10 Option: Modbus over Ethernet or INP10B Option: BACnet/IP over Ethernet



ST40 SIDE DIMENSIONS

RJ45 Ethernet Replaces RS485 Port

Basic Unit: H 4.60"x W 4.89"x L 2.44"

• DIN Rail: Top Hat W 1.38" x H 0.30" (3.50

• Note: For 2.5 element programmed units,

Note: For 1A (Class 2) Nominal, degrade

degrade accuracy by an addi-tional 0.5%

accuracy to 0.5% of reading for watts and

ANSI C12.20 2015 0.2 CL and ANSI C12.1

· Certified to UL/IEC 61010-1 and CSAC22.2

No. 61010-1, UL File:E250818*

energy; all other values two times rated

cm x .75 cm); Slotted Steel 3.00" (7.62 cm)

Dimensions and Shipping

Weight: 2 lbs /.91 kg

Meter Accuracy

See Page 2

of reading.

accuracy.

• IEC 62053-22 0.2S

*Third party lab tested.

Compliance

CF Marked

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For mechanical drawings and installation wiring, please download the User Manual from: https://www.electroind.com/products/st40-compact-din-rail-energy-meter-with-power-quality/

	Model	Frequency Range	Current Input*	V-Switch™ Pack	Communication
ption Numbers:		-	-		
xample:	ST40	- 60	- 10	- V1 -	RS485
	ST40 (DIN Rail Meter)	60 60 Hz System	10 5 A Nominal CT Secondary	V1 Multifunction Meter Only	RS485 RS485 Serial Port
		50 50 Hz System	2 1 A Nominal CT Secondary	V2 Standard Datalogging Memory	INP10 RJ45 Ethernet Port
			mV 0.333 V	V3 Power Quality Harmonics	INP10B RJ45 BACnet/IP Port
				V4 Limits & Control	
				V5 64 Samples/Cycle Waveform Recording	
				V6 512 Samples/Cycle Waveform Recording	

* 1 A, 5 A, 0.333 V CTs, and mV Rogowski Coil CTs can be ordered from ElG's website: www.electroind.com/shop

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Input Wire Gauge: AWG#14-26/(0.129 -

Current Inputs

Nominal CT Secondary • Class 2: (0.001 to 2) A, 1 A Nominal CT