JEMStar II
High Accuracy Revenue Meter

FOR GENERATION, TRANSMISSION, AND INDUSTRIAL POWER MEASUREMENT

ROCHESTER
SCIENTIFIC COLUMBUS

HIGH ACCURACY IEC REVENUE METER

AMETEK's JEMStar II has the highest accuracy in the market, provides many communication options and monitors your power quality to make it the ideal choice for any metering application. An impressive color display makes it easy to view power measurements, phasor displays and meter diagnostics. The JEMStar II is easy to use and configure with our intuitive JEMWARE software and the meter display provides a user menu to show and edit configuration details. The JEMStar II has a GB of non-volatile memory to store your metering and power quality data for as long as you want. The meter has a single base model that can be used for simple revenue and billing applications as well as more complex power quality monitoring applications.

High Accuracy

These meters are your cash register and even fractions of a percent accuracy can mean the difference of hundreds of thousands of dollars. The JEMStar II's precision design provides high accuracy with long term stability making it easy to guarantee our 0.05% accuracy for 10 years. Low current accuracy is better than 0.2% RDG at 50 mA.

Meter Security

The JEMStar II includes security features that limit access to the meter. Username and password combinations are required to access your secure data and configuration details. The meter communications are password protected to prevent unauthorized access. Ethernet connections can be restricted to select IP addresses. Audit logs store all access attempts; including meter connection, configuration, firmware changes and data access with username and time/date for each occurrence. The audit log requires permission to view and cannot be modified or deleted from the meter. Alarms are provided when opening the terminal cover and access door.

FEATURES AND BENEFITS

- High accuracy
- Easy to configure and operate
- Advanced communications
- Power quality
- Graphic color display and user menu

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Ease of Use

The JEMStar II is easy to configure with AMETEK's intuitive JEMWARE software that includes a Configuration Wizard which guides you through the necessary set-ups for your metering application. The meter display has a User Menu which displays configuration details without using a PC. Some configuration details can be edited once you provide the necessary password access. The meter includes a built-in USB port that can be used to upload or download meter configurations, upload firmware or retrieve metering data using a simple USB memory stick.

Communications

The JEMStar II can be supplied with up to seven communication ports including:

• Optical port
• (2) Serial ports – RS-232 and RS-485
• Analog or cellular modem port
• (2) Ethernet ports
• WIFI port

Communication ports support a variety of metering protocols including DLMS, IEC-870-5-102, IEC-61850, DNP, Modbus, and JEM binary. All ports can operate simultaneously and independently.

Tracking the port status and protocol selections is simplified with our graphical 'heads-up display' showing which ports are installed and configured, which ones are in use and which ones require attention. The 'heads-up display' can also be viewed remotely on our JEMWARE software.

The dual independent Ethernet ports have separate IP Addresses so that end users can allow access to third parties without breaching their own secure network. Each Ethernet port can be addressed for multiple users and protocols operating simultaneously with permissions given to specified functions.

User Display Menus
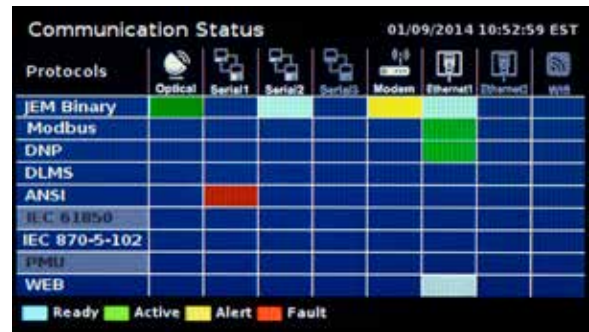

Communications Heads-up Display

Site Monitoring

Metering wiring connections can be checked at the meter via a color phasor diagram and alert you when wiring is mis-connected or phase angles exceed pre-set limits.

The JEMStar II can be configured with alarm triggers on any power measurement or digital I/O. Triggered events are always available for remote retrieval and triggers can activate power quality recording or alarm an output contact.
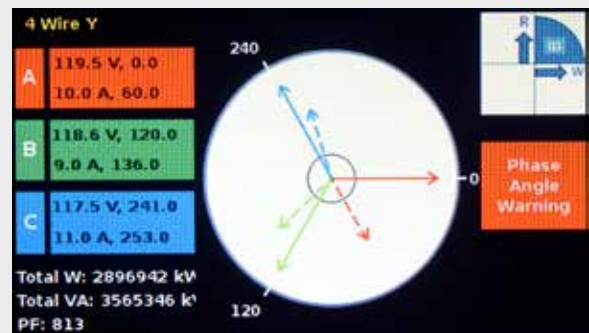
Phasor Diagram

Power Quality

The JEMStar II comes equipped with Sag/Swell/Outage recordings that store the time, date, duration and site conditions. For advanced power quality analysis, there is an option to record high speed RMS measurements and waveform data from pre-selected triggers. Waveform data is selectable from 1kHz to 32kHz recording rates with durations lasting up to 16 seconds. Harmonic measurements to the 128th with individual harmonics up to the 64th recorded for magnitude and phase angle. Power quality data resides in the meter via PQDIF file format and can be automatically exported for easy analysis with our analysis software or third party applications. Power quality data can also be recorded and displayed in various standard formats.

Metering Features and Functions

The JEMStar II has 50 normal and 50 alternate registers that can be shown on the graphical display, listing 1-4 measurements per display screen. The meter can be provided with two independent load profile groups, each with 16 channels at intervals of 1 to 60 minutes. Measurements can be stored in scalable counts or 32 bit engineering units. For additional measurement logging, the meter can record up to 400 different power measurements with recording intervals selectable from 150/180 cycles to 120 minutes.

Logs can be used for short or long term trending of energy values, min/max/avg power measurements and harmonics up to the 64th. The meter comes with a 1GB of non-volatile memory for storing Load Profile, Measurement Logs and Power Quality Data, providing ample space for all.

Input/Output Capability

The JEMStar II can be equipped with an internal eight channel digital I/O module. Each digital I/O channel can be selected as either an input or output and has a built-in isolated supply to provide power for inputs.

Flexible Design

The JEMStar II is equipped with a wide range current and voltage input that can be supplied in a universal form to handle any three phase Delta or WYE application. The meter can be easily field upgraded for many options, including power quality recording, making it a universal fit for any application.

Time Synchronization

The meter clock can be synchronized from its own high accuracy temperature compensated source or externally synchronized to the AC frequency and NTP inputs depending on your application requirements.

Power Quality Recordings

Sag/Swell/Outage (standard)	• Record event time, date, duration • Record Phase that triggered • Record min/max/avg V, A, Pf, THD
High Speed RMS (optional)	• Record voltage and current per phase • 120Hz recording rate • Configurable trigger: pre and post event recording, max 60 second recording per event
Waveform Capture (optional)	• Record voltage and current per phase • 16 samples/cycle recording rate: max 960 cycle recording per event • 128 samples/cycle recording rate: max 240 cycles recording per event • 512 samples/cycle recording rate: max 30 cycles recording per event • Configurable trigger: pre and post event recording
Harmonic Recording (optional)	• Record individual voltage and current harmonic per phase up to 64th • Record magnitude and phase angle
Flicker Measurement (optional)	• Pst and Plt • Pinst (instantaneous)
Measurement Log (optional)	• 8 logs of 50 measurements each • Recording interval: 150/180 cycles to 120 Minutes • Min/Max/Avg measurements
Trigger Selections (used for alarm logging and PQ recording)	• Sag/Swell • Transient Trigger • Rapid Voltage Change • Interruptions • THD, TDD, Flicker • Phase loss, Phase Rotation • Any instantaneous measurement (over/under) • Digital Inputs

SPECIFICATIONS

METER FORMS
• Meter Forms: 5, 9, 45, Universal

INPUTS

Voltage
• 55-300 VAC auto-ranging
• Burden*: 0.5 VA @ 300V
  * Does not include auxiliary power requirements.

Current
• 1 amp: ANSI class 2
• 5 amps: ANSI class 10
• 10 amps: ANSI class 20
• Burden: 0.5 VA maximum
• Overload: 1.5x rated class current continuous
• Starting current: 0.002 A
• Frequency range: 45-55 Hz, 55-65 Hz

AUXILIARY POWER
• Self power via all three phases: 55-300VAC
• Ext. Aux Power: 55-300 VAC or 90-300 VDC
• Auto switching between self and aux power

Auxiliary Power Burden
• 25 VA maximum

ACCURACY

Watt Hour
• 0.05% reading (0.02% typical)

Volts, Amps
• 0.04% reading

MEASUREMENTS
• Bi-directional, 4 quadrant
• Energy, instantaneous: per phase values
• Min/Max/Avg values
• Demand: peak, present, past, thermal and coincident
• TOU: 8 rates/day, 4 season
• TLC, LLC: per phase, delivered and received, transformer factors or % loss

Measurement Logging (optional)
• 8 groups x 50 channels
• Recording interval: 150/180 cycle to 120 minute
• Max 203 days of storage of 400ch@ 10 minute recording interval

REGISTERS
• 50 normal, 50 alternate, 50 test

LOAD PROFILE
• 16 channels storage
• 1-60 minute intervals
• Values stored in scalable counts or 32 bit engineering units
• Optional second independent 16ch LP Group
• Max 365 days storage of: 32ch@ 15 minute recording intervals

TIME SYNC
• Internal clock: 0.5 sec/day accuracy
• 50/60HZ line frequency
• External time sync options: NTP

OPTIONAL I/O

Internal I/O
• Digital I/O: 8 channel selectable as input or output. Isolated power supply for digital inputs

Digital Input Rating
• Form A or KYZ
• Maximum voltage 40 VDC

Digital Output Rating
• Form A or KYZ
• Maximum open-circuit voltage: 200V DC or peak AC
• Maximum switching current: 50 mA

COMMUNICATIONS

7 Com Ports Available

Port 1: Optical (Standard)
• Type 2 – 19,200 baud

Port 2: Not used

Port 3: RS-232/485 Serial (opt)
• User selectable: RS-232/485
• User configurable: 300 to 38400 baud

Port 4: RS-232/485 Serial (opt)
• User selectable: RS-232/485
• User configurable: 300 to 38400 baud

Port 5: Internal Analog Modem (opt)
• 56K baud
• With optional phone home on power fail
• With optional RS-485 communication repeater

Port 5: Internal Cellular Modem (future)
• GSM/GPRS

Port 6: Ethernet (opt)
• 100 BaseT, unshielded twisted pair
• DHCP or fixed IP address
• Up to 12 simultaneous connections
• WEB server, email notification

Port 7: Ethernet (opt)
• 100 BaseT, unshielded twisted pair
• DHCP or fixed IP address
• Up to 12 simultaneous connections
• WEB server, email notification

Port 8: WIFI (future)
• Fixed IP address
• Up to 12 simultaneous connections

USB Port:
• Compatible w/ USB flash drives
• Upload/download configuration
• Upgrade firmware
• Retrieve meter data

Communication Protocols
• DLMS (opt)
• IEC-870-5-102
• Modbus RTU, Modbus TCP/IP (master and slave)
• DNP 3.0
• IEC 61850 (opt)
• JEM binary

METER DISPLAY
• 4.3" color graphic LCD
• Registers, phasor diagram, diagnostics
• User menu configuration

MECHANICAL

Case Styles
• IEC

Size and Weight
• IEC: 7.5 pounds (3.4 kg)

ENVIRONMENT

Operating Temperature
• -22º to 185ºF (-30º to 85ºC)

Storage Temperature
• -40º to 185ºF (-40º to 85ºC)

Humidity
• 5 to 95% relative humidity, non-condensing

ELECTRICAL STANDARDS

Fast Transient
• IEC 61000-4-4

Radiated/Conducted Emissions
• IEC 61000-4-3, IEC-61000 4-6

Surge Immunity
• IEC 61000-4-5

Electrostatic Discharge
• IEC 61000-4-2

Surge Withstand (SWC)
• IEEE Standard C37.90.1

METERING
• IEC 62052-11, 21
• IEC 62053-22, 61
• FCC Part 68, FCC Part 15

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