

**GENERIC SPECIFICATION FOR MULTIFUNCTION, DATA-LOGGING,
POWER AND ENERGY SUB-METER WITH WIFI AND ETHERNET
SHARK® 200-S SUB-METER**

2. PRODUCT

2.1 ENERGY METERS

- A. The meter shall be UL listed.
- B. Energy meter shall be designed for Multifunction Electrical Measurement on 3 phase power systems.
 - 1. Meter shall support 3-Element Wye, 2.5 Element Wye, 2 Element Delta, 4 wire Delta systems.
 - 2. Surge withstand shall conform to IEEE C37.90.1 and ANSI C62.41 (6 kV)
 - 3. The meter shall be user programmable for voltage range to any CT or PT ratio.
 - 4. Meter shall have a burden of not more than 0.36VA per phase Max at 600V, 0.014VA at 120 Volts.
 - 5. Meter shall have a burden of not more than 0.005VA per phase Max at 11 Amps.
 - 6. The meter shall accept a voltage input range from 20 up to 576 Volts Line to Neutral, and a range from 0 up to 721 Volts Line to Line.
 - 7. Meter shall accept a current reading of up to 10 Amps continuous. Start up current for a 5 Amp input shall be no greater than 0.005 Amps.
 - 8. Meter shall come standard with one solid state KYZ pulse output for remote energy pulse counting.
- C. Energy meter shall allow all wiring through the front of the unit, so that the unit can be surface-mounted.
 - 1. Fault Current Withstand shall be 100 Amps for 10 seconds at 23°C.
 - 2. All inputs and outputs shall be galvanically isolated and tested to 2500 Volts AC.
 - 3. The meter shall accept current inputs of class 10: (0 to 10) A, 5 Amp Nominal, and class 2 (0 to 2) A Secondary, 1A Nominal.
- D. The meter shall have an accuracy of +/- 0.1% or better for Volts L-N and Amps, and 0.2% for Volts L-L and power and energy functions. The meter shall meet the accuracy requirements of IEC687 (Class 0.2%) and ANSI C12.20 (Class 0.2%).
 - 1. The meter shall provide true RMS measurements of voltage, - phase to neutral and phase-to-phase; and current, per phase and neutral.
 - 2. The meter shall calculate RMS readings, sampling at over 400 samples per cycle on all channels measured readings.
 - 3. The meter shall utilize 24 bit Analog to Digital conversion.

- E. The meter shall include a three-line, bright red, .56" LED display.
 - 1. The meter must display a % of Load Bar on the front panel to provide an analog feel. The % Load bar shall have not less than 10 segments.
 - 2. The sub-meter must have a programmable display, which allows for the following programming functions including automatic scroll, screen selection programming, and energy scaling.

- F. Sub-meter shall be a traceable revenue sub-meter, which shall contain a utility grade test pulse, allowing power providers to verify and confirm that the sub-meter is performing to its rated accuracy.

- G. The meter shall include 2 independent communications ports with advanced features.
 - 1. Port 1 shall provide an optical IrDA port (through the faceplate) which shall allow the unit to be set up and programmed using a remote laptop without need for a communication cable.
 - 2. Port 2 shall be selectable for RS485 communication, for 10/100BaseT Ethernet or for 802.11 Wireless Ethernet.
 - 3. When in serial mode, the meter shall speak Modbus ASCII, Modbus RTU, or DNP 3.0 protocol up to 57.6K baud.
 - 4. When in Ethernet mode, the meter shall provide an 802.11 WIFI or an RJ45 Ethernet connection which shall allow the unit to be assigned an IP address and communicate Modbus protocol over Ethernet TCP/IP.

- H. The meter shall provide user configured fixed window or rolling window demand. This shall allow the user to set up the particular utility demand profile.
 - 1. Readings for kW, kVAR, kVA and PF shall be calculated using utility demand features.
 - 2. All other parameters shall offer max and min capability over the user selectable averaging period.
 - 3. Voltage shall provide an instantaneous max and min reading displaying the highest surge and lowest sag seen by the meter.
 - 4. The Meter shall provide upgrade rate of 6 cycles for Watts, Var and VA. All other parameters shall be 60 cycles.

- I. The meter shall support power supply of 90 to 400 Volts AC and 100 to 370 Volts DC. Universal AC/DC Supply shall be available and shall have burden of 16VA Max.

- J. The meter shall provide Limits Alarms and Control Capability as follows:
 - 1. Limits can be set for any measured parameter.
 - 2. Up to 16 limits per parameter can be set.
 - 3. Limits shall be based on % of Full Scale settings.

K. The meter shall have 2 Megabytes data-logging capability. The meter shall have a real-time clock that allows for time stamping of all the data in the meter when log events are created. The meter shall have five logs:

1. The meter shall have three historical logs for trending profiles. Each log shall be capable of being programmed with up to 64 parameters. The user shall have the ability to allocate memory between the three historical logs in order to increase or decrease the memory allotted to each of the logs.
2. The meter shall have a log for Limits Alarms. The Limits log shall provide magnitude and duration of an event, time-stamp, and log value. The log must be capable of recording to 2048 events.
3. The meter shall have a log for System Events. The System Events log shall record the following occurrences with a time-stamp: Demand Resets, Password Requests, System Startup, Energy Resets, Log Resets, Log Reads, Programmable Settings Changes.

L. The meter shall have a standard 4-year warranty.

M. Energy meter shall be able to be stored in (-20 to +70) degrees C.

1. Operating temperature shall be (-20 to +70) degrees C.
2. NEMA 12 faceplate rating shall be available for the energy meter.

N. The following options shall be available for ordering:

Model	Frequency	Current Input	V-Switch™ Pack	Communication Format
Shark@200-S Sub-meter	-50: 50 Hz system	-10 (5 Amp Secondary)	-V33: Multifunction meter with 2 Megabytes Data-logging	-485: RS485
	-60: 60 Hz system	-2 (1 Amp Secondary)		-WiFi: Wireless or LAN-based Ethernet

O. Acceptable product is Electro Industries/GaugeTech, Model Shark@ 200-S sub-meter.

1. Add the following suffixes for added options:
 - a. **9PINC**: RS232 Cable
 - b. **CAB6490**: USB to IrDA Adapter
 - c. **Unicom 2500**: RS485 to RS232 Converter
 - d. **Unicom 2500-F**: RS485 to RS232 to Fiber Optic Converter
 - e. **Modem Manager, Model #, MM1**: RS485 to RS232 Converter for Modem Communication
 - f. **Certificate of Calibration, Part #, Ccal**: This provides Certificate of Calibration with NIST traceable test data.

g. **COMEXT3**: Communicator EXT 3.0 for Windows

2. For specification information, contact:

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