
ACT M200 Multifunction Data-Logging and Waveform Recording Power Meter / Transducer

Basic Features:

- 0.2% Class Revenue Certifiable Energy and Demand Metering
- Meets ANSI C12.20 and IEC 687 (0.2% Class)
- Multifunction Measurement
- 3 Line .56 inch LED display % of Load Bar for Analog Perception
- Standard RS485 (Modbus and DNP 3.0)
- Ultra Compact

Advanced Features:

- Up to 4 Meg Flash for Historical Data Logging
- Extremely Configurable
- Field Upgradeable I/O
- 100BaseT Ethernet
- V-Switch™ Technology (V1 TO V6)
- 512 Sample per Cycle Waveform Recorder

Applications

- Utility Metering
- Substations
- Power Generation
- Submetering
- Commercial Metering
- Industrial Metering
- Campus Metering
- Analog Meter Replacement
- Voltage Recording



ACT 200-60-10-V2
With CT Option

V-Switch™ Measurement Upgrade Packs

The M200 meter is equipped with EIG's exclusive V-Switch™ Upgrade technology. This technology allows users to upgrade and add features by using communication commands as needed, even after the meter is installed. Upgrades are only a phone call away.

V-Switches Include the Following Features:

Feature	V1	V2	V3	V4	V5	V6
Multifunction Measurement with I/O Expansion	✓	✓	✓	✓	✓	✓
2 Megabytes Data-Logging		✓	✓	✓		
3 Megabytes Data-Logging					✓	
4 Megabytes Data-Logging						✓
Harmonic Analysis			✓	✓	✓	✓
Limit and Control Functions				✓	✓	✓
64 Sample per Cycle Waveform Recorder					✓	
512 Sample per Cycle Waveform Recorder						✓

Accuracy

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	0.1%	0-9999 Amps or kAmps
+/- 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	+/- 0.03 Hz	45 to 65 Hz
%THD	+/- 2.0%	1 to 99.99%
% Load Bar	+/- 1 Segment	(0.005 to 6) A

Note: Applies to 3 element WYE and 2 element Delta connections. See full accuracy specifications in Shark® 200 Meter User Manual. Neutral current 2% accuracy.

Extensive Data-Logging Capability (V2 or V3 Option)

The ACT M 200 meter offers the capability of having 2 megabytes of data-logging to be used for historical trends, limit alarms, I/O changes and sequence of events. The unit has a real-time clock that allows for time stamping of all the data in the instrument when log events are created.

Historical Logs

- 3 Assignable Historical Logs
- Independently Program Trending Profiles
- Up to 64 Parameters per Log

System Events Log

- Record for anti-tampering purposes:
- Demand Resets
 - Password Requests
 - System Startup
 - Energy Resets
 - Log Resets
 - Log Reads
 - Programmable Settings Changes

I/O Change Log

Limits Alarms and Control Capability

Limit Events

- Any measured parameter
- Up to 16 Limits
- Based on % of full scale settings
- Manual relay control via software
- Relay set delays and reset delays

Basic Power Quality, True Harmonic Analysis (V3 Option)

Harmonic Analysis to the 40th Order

The ACT M 200 meter provides basic power quality, providing harmonic recording to the 40th order for voltage and current harmonic magnitudes. The unit

- Provides a Time Stamped Log of any Relay Output
- Provides Time Stamped Log of Input Status Changes
- 2048 Events Available

will also provide above and below limits for voltage, frequency, imbalance and other parameters giving a depiction of the quality of the power system being measured.

Limit/Alarm Log

- Provides Magnitude and Duration of an Event
- Includes Time Stamps and Alarm Value
- 2048 Events Available



High Performance Power Quality Analysis

Simultaneous Voltage and Current Waveform Recorder:

The unit records up to 512 samples per cycle for a voltage sag or swell or a current fault event. The unit provides the following pre-event and post-event recording capability. Waveform records are programmable to the desired sampling rate. V5 provides up to 3 Megabytes storage and V6 provides a total of 4 Megabytes.

The meter's advanced DSP design allows Power Quality triggers to be based on a 1 cycle updated RMS. Up to 170 events can be stored until the memory fills. The meter stores waveform data in a first-in/first-out circular buffer to insure data is always recording.

Waveform Scope

The unit uniquely offers a waveform scope to view the real time waveform for voltage and current. Waveform scope allows the meter to be used as a basic oscilloscope throughout a power system.



Independent CBEMA Log Plotting

The meter stores an independent CBEMA log for magnitude and duration of voltage events. This allows a user to quickly view total surges, total sags and duration without retrieving waveform data.

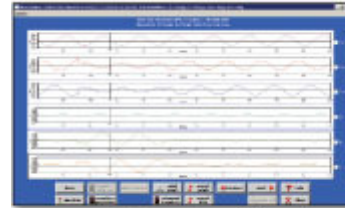
Harmonic Recording to the 40th Order

The ACT M200 meter provides advanced harmonic analysis to the 40th order for each voltage and current channel in real time. Using the stored waveforms, harmonic analysis is available to the 255th order. The harmonics algorithm uses sophisticated active anti-aliasing filtering to provide true and accurate harmonics even when higher level harmonic conditions are present.

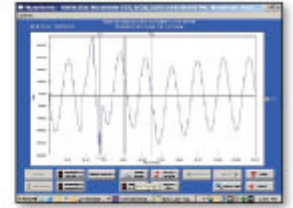
Optional Waveform Recorder

	Samples per Cycle	Pre Event Cycles	Post Event Cycles	Max Waveform per Event	Number of Stored Events
V5	16	32	96	256	85
	32	16	48	128	85
	64	8	24	64	85
V6	128	4	12	32	170
	256	2	6	16	170
	512	1	3	8	170

Note: Sampling rate based on 60hz. 50hz systems, divide sample rate by 0.83.



6 Channels of Waveforms



Waveform Zoomed

Standard Communication

Back Mounted Serial Port with KYZ Pulse

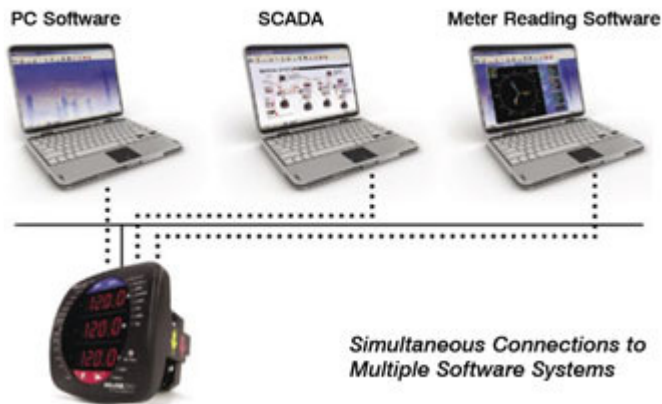
- RS485 - This port allows RS485 communication using Modbus or DNP3.0 Protocols. Baud rates are from 9600 to 57.6k.
- KYZ Pulse - In addition to the RS485, the meter also includes a KYZ pulse mapped to absolute energy.

Front Mounted IrDA Communication

Uniquely, the ACT M200 meter also has an optical IrDA port, allowing the unit to be set up and programmed using a PDA or remote laptop without need for a communication cable.

100BaseT Ethernet Capability (INP100S)

Simultaneous Data Connections



Data-logging Meter/Transducer

The optional Ethernet card gives the unit 10/100BaseT Ethernet capability, and allows it to speak with 12 simultaneous sockets of Modbus TCP.

Ordering Information

All fields must be filled in to create a valid part number.

Model	Frequency	Current Input	V-Switch Pack	Power Supply	I/O Slot 1*	I/O Slot 2*	Mounting (Shark® 200 only)
Option Numbers:	-	-	-	-	-	-	-
Example: ACT M200	-60	-10	-V2	-D2	-INP100S	-X	-X
ACT M200	-50 50 Hz System -60 60 Hz System	-10 10 Amp Secondary -2 2 Amp Secondary	-V1 Multifunction Meter Only -V2 Standard Data-Logging Memory -V3 Power Quality Harmonics -V4 Limits & Control -V5 64 Samples/cycle Waveform Recording -V6 512 Samples/cycle Waveform Recording	-D2 90-265V AC/DC	-X None -RO1S 2 Relays / 2 Status -PO1S 4 Pulses / 4 Status -1mAOS 4 channel Analog Output 0-1 (bidirectional) -20mAOS 4 Channel Analog Output 4-20mA -FOSTS Fiber Optic Output ST Terminated -FOVPS Fiber Optic Output VPIN Terminated -INP100S 100BaseT Ethernet	-X None -RO1S 2 Relays / 2 Status -PO1S 4 Pulses / 4 Status -1mAOS 4 channel Analog Output 0-1 (bidirectional) -20mAOS 4 Channel Analog Output 4-20mA -FOSTS Fiber Optic Output ST Terminated -FOVPS Fiber Optic Output VPIN Terminated -INP100S 100BaseT Ethernet	-X ANSI Mounting -DIN DIN Mounting Brackets -RACK 19" Rack Brackets

Additional Accessories

Communication Converters

- 9PINC - RS232 Cable
- CAB6490 - USB to IrDA Adapter
- Unicom 2500 - RS485 to RS232 Converter
- Unicom 2500-F - RS485 to RS232 to Fiber Optic Converter
- Modem Manager, Model #, MM1 - RS485 to RS232 Converter for Modem Communication
- IrDA232 - IrDA to RS232 Adapter for Remote Read

Compliance Documents

Certificate of Calibration, Part #: CCal - This provides Certificate of Calibration with NIST traceable Test Data.

Current Transformer Kits

- CT200K - 200/5 Ratio .94" Window 3 CTs
- CT400K - 400/5 Ratio, 1.25" Window, 3 CTs
- CT800K - 800/5 Ratio, 2.06" Window, 3 CTs
- CT2000K - 2000/5 Ratio, 3.00" Window, 3 CTs

CT Specifications:

Frequency: 50 to 400Hz;
Insulation: 600 Volts, 10kV BIL
Flexible Leads: UL 1015 105°C,
CSA Approved, 24" Long, #16AWG

Software Option Numbers

COMEXT3 - CommunicatorEXT 3.0 for Windows®

* Consult factory application engineer for additional transformer ratios, types or window sizes.

* I/O cards can be ordered separately using the above part numbers.