

# Reliable Power Meters Multipoint Power Recorder®

High-speed capability for permanent installation

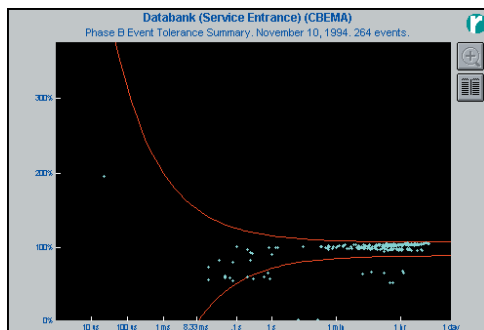
## Technical Data

### What is Full Disclosure Technology?

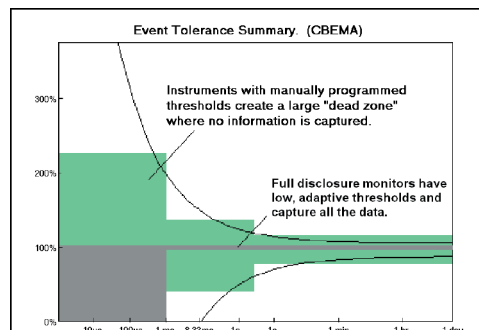
Full Disclosure Technology is built into all Fluke and RPM three-phase power quality instruments. This technology makes the Multipoint Power Recorder a unique, professional instrument that increases your ability to maintain and troubleshoot your plant's power quality.

Full Disclosure Technology uses patented sampling hardware and algorithms to record everything your loads see.

- The sampling system processes every cycle on all channels, recording min/max values and looking for sags, swells or waveform faults.
- The system can store 6000 events (up to 96,000 with Multi-session option). You can see everything from sub-cycle events to long-term outages with clear detail.
- Records power parameters, rms voltage, rms current, harmonics **and** monitors for power quality events — on all channels simultaneously without having to reconfigure.
- No need to set thresholds. You won't be disappointed by missed events or a memory full of noise.
- Because there are no thresholds to set, Full Disclosure Technology system records any changes in measurements, even the ones that are **almost** out of tolerance.



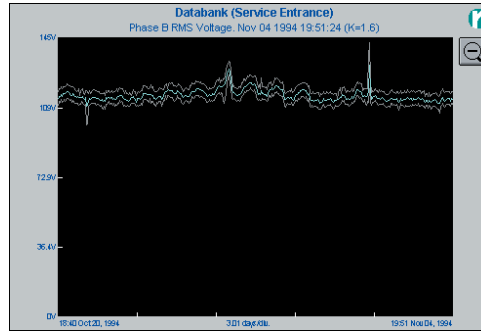
Full Disclosure Technology lets you plot events on any power tolerance curve. CBEMA, ITIC, and ANSI curves are included, or create your own.



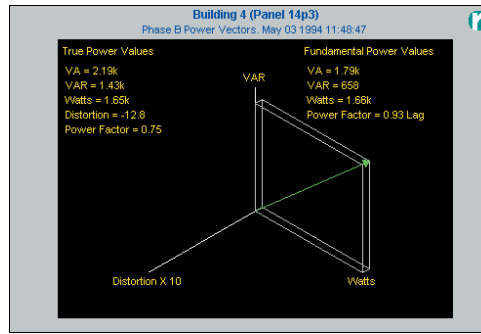
Full Disclosure Technology captures thousands of voltage events and related current information, without having to set thresholds.

Designed for permanent installations, Multipoint performs just like the portable Insite Power Recorder, simultaneously measuring all power quality parameters, as well as power consumption harmonics. The system consists of a detachable acquisition unit and a base that manages connections to your power system.

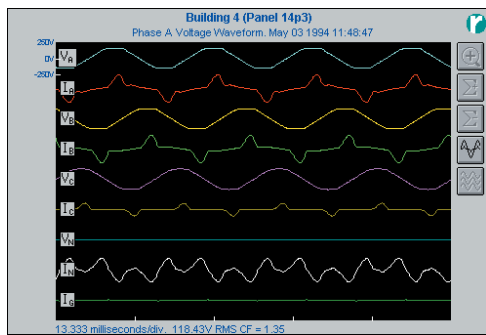
- 4 voltage channels - three phases plus neutral-to-ground.
- 5 current channels allow you to monitor neutral and ground current in addition to phases
- Acquisition unit detaches from base with four screws, for easy calibration or maintenance of the measurement hardware.
- Measure and record Volts, Amps, frequency, Watts, VA's, VAR's, power factor, demand and harmonics using 128 samples per cycle – on every cycle
- Capture up to 6,000 voltage events with simultaneous current, in each monitoring session
- Ethernet interface makes downloads fast and easy
- Models 1941 and 1948 are designed to connect to industry-standard 5- amp CT's
- Models 1942 and 1949 are designed for use with clamp on CT's or Flexi™ CT's
- Multi-session option allows for 16 sessions, effectively multiplying event capture capability to 96,000 events
- Models 1948 and 1949 feature a 2 MS/s sampling system for capturing and viewing high-speed transients



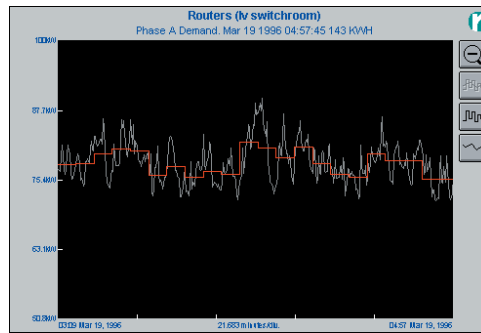
Trend windows give you an overview of power parameters – fast. Measurements are processed for every cycle. Min, max and average values are plotted so you can quickly see the worst-case.



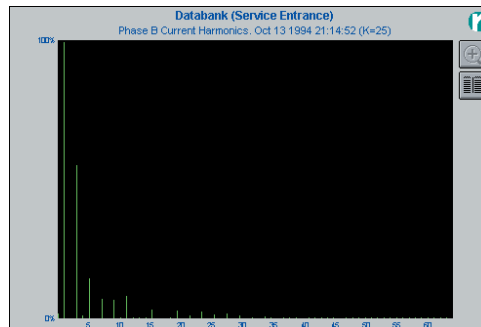
Real-time meters and vector diagrams display Watts, VA, VAR, power factor and displacement power factor.



Real-time waveform displays show up to 9 channels (4 voltage, 5 current) including ground and neutral current.

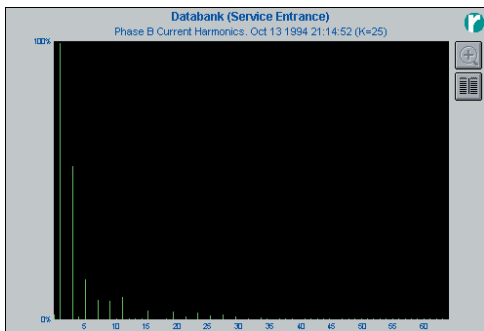


Track demand using averaging intervals from 5 minutes to 1 hour.



Display harmonics up to the 63rd as a spectrum or a table.

Standard Multipoint	Measurement Features
Basic Functions	<ul style="list-style-type: none"> <li>• Logging RMS voltage and RMS current on all channels</li> <li>• Phasor diagrams</li> <li>• Frequency trends</li> <li>• Real-time oscilloscope display of voltage and current on all channels</li> </ul>
1652 Power Consumption (included)	<ul style="list-style-type: none"> <li>• Watts and demand trends</li> <li>• KWH, individual phases and total</li> <li>• VA and VAR trends</li> <li>• Power Factor trends, true and displacement</li> <li>• Oscilloscope display of power meters for each phase</li> </ul>
1653 Harmonics (included)	<ul style="list-style-type: none"> <li>• Voltage and current THD trends</li> <li>• Voltage and current imbalance</li> <li>• Harmonic spectrum, phase, magnitude to 63rd harmonic</li> <li>• Tracking of individual harmonics</li> </ul>
1651 Power Quality (included)	<ul style="list-style-type: none"> <li>• Voltage waveshape faults as short as 130 μs duration, 1000 V peak</li> <li>• Voltage sags/swells</li> <li>• Simultaneous current corresponding to correlated with voltage events</li> <li>• Power tolerance curves</li> </ul>
1658 High Speed Power Quality (included in 1948 and 1949)	<ul style="list-style-type: none"> <li>• Voltage and current waveshape faults</li> <li>• Voltage and current sags/swells</li> <li>• Power tolerance curves</li> <li>• Transients as short as 500 ns duration, 6400 V peak; with peak detect or detailed waveform graphs</li> </ul>
1956 External CT (included in 1942 and 1949)	<ul style="list-style-type: none"> <li>• Allows use of external RPM current transformers</li> </ul>
Multipoint Options	
1662 Multi-Session Option	<ul style="list-style-type: none"> <li>• Allows a recorder to store up to 16 measurement sessions</li> <li>• Each session can consist of up to 6000 events, increasing the event storage to 96,000</li> </ul>
1663 TCP/IP Option	<ul style="list-style-type: none"> <li>• Enables Ethernet-equipped instruments to communicate via Internet</li> </ul>



With Multipoint high-speed models 1958 and 1948 gather detail on impulses as short as 500 ns.

### 1950 Multipoint Base

Each 194X acquisition system requires a base unit. The 1950 base provides connection points to your power system. The 194x Acquisition unit can be removed for maintenance or calibration, without disturbing the distribution system. For systems using fixed, 5A CT's the base provides terminals for voltage and current. For systems using clamp-on CT's, the base provides voltage terminals.

### Software completes the system

There are two software packages available for the Multipoint Power Recorder. Both packages provide seamless communication, with graphical display of power system parameters and the ability to manage power survey data.

#### Power analyzer system software

- Offers optional Report Writer Software
- Offers Alarming and Polling Option

#### Scenario software

- Includes facilities for comparing trends from multiple databases
- Calculates a Power Quality Index - a single figure of merit that characterizes the overall performance of a power system. The Power Quality Index allows you to trend system performance over time and determine whether a system is improving or degrading.

## Specifications

Number of channels: 9 (4 voltage, 5 current)

Function	Range	Resolution	Accuracy ± (% of reading + floor)
Voltage (phases)	100 mV - 600 V rms 1000 V peak	14 bits, 90 millivolts	± (1.5 % + 0.5 V)
Voltage (neutral)	10 mV- 70 V rms 100 V peak	14 bits, 90 millivolts	± (1.5 % + 0.5 V)
External Current (1942 & 1949)	Depends upon CT	14 bits	± (0.5 % + 0.1 % of probe range + probe accuracy)
Internal Current (1941 & 1948)	20 A maximum	14 bits	± (1 % + 0.04 A)
Nominal fundamental frequency	50/60 Hz ± 0.1 Hz		

Voltage and current sampling: 128 samples per cycle, phase-locked on 50 / 60 Hz

Voltage and current sampling rate: 6.4 / 7.7 kS/s depending upon line frequency

Voltage and current rms measurements: Processed for every full cycle

Power measurements: W, VA, VAR, PF, dPF, THD, harmonics processed for very full cycle

### Waveform fault measurements (1941 & 1942)

Function	Range	Resolution	Accuracy ± (% of reading + floor)
Sampling rate	6.4 / 7.7 kS/s depending upon line frequency		
Impulse voltage	100 - 1000 V peak	10 bits, 12 volts	± (5 % +36 V) over entire range

### Impulse measurements (1948 & 1949)

Function	Range	Resolution	Accuracy ± (% of reading + floor)
Sampling rate	2 MHz		
Impulse voltage	100 - 6400 V peak	10 bits, 12 volts	± (5 % +36 V) over entire range

Event memory: 6,000 simultaneous voltage and current events; Multi-session increases storage to 96,000

Communication: 10-base T Ethernet, RJ 45 connector, Optional TC/PIP Stack enables communication via Internet

### Electrical

Operating voltages: 85-264 V AC, 47 - 440 Hz

Power consumption: 40 watts

Backup power: Rechargeable NiCad pack maintains operation after power loss for 5 minutes, allowing the monitor to record outage, reclosure attempts, and to resume monitoring upon restoration of power. Real time clock is backed up using a lithium battery with 10-year life.

### Mechanical

Size: 12.39" x 11.56" x 6" (31.47 cm x 29.36 cm x 15.24 cm)

Weight: 9 lbs.

Operating temperature: 0 ° - 50 °C (32 ° - 122 °F), 90 % RH non-condensing

### Standards

UL3111

IEC 868

### Included accessories

All units include user manual

Warranty: 1 year

### Configuration

Installable Options								
Model Number	Sampling System	Current Transformer Type	PQ Measurements	Power Consumption	Harmonics	Impulse Waveform	Multi-Session Software	TCP/IP Stack
1941	Standard	5-A fixed	Included	Included	Included	Option	Option	Option
1948	High-speed	External clamp-on	Included	Included	Included	Included	Option	Option
1942	Standard	5-A fixed	Included	Included	Included	Option	Option	Option
1949	High-speed	External clamp-on	Included	Included	Included	Included	Option	Option

### Accessories

<b>1230</b>	Metal Cabinet
<b>5000/RPM</b>	Power Analysis Software with User Manual
<b>5100/RPM</b>	Professional Report Writer Software (requires 5000/RPM)
<b>5400/RPM</b>	Scenario Analysis Software
<b>5500/RPM</b>	Master Polling And Annunciation Software (requires 5000/RPM)
<b>5502/RPM</b>	Sub-Polling And Annunciation Software (requires 5000/RPM and 5500/RPM)
<b>Accessories for Multipoint models with external CT Option</b>	
<b>3014R</b>	40 Amp Clamp
<b>3100R</b>	1000 Amp Clamp
<b>3110/RPM</b>	24-inch 100 Amp Flexi-Ct (tm)
<b>3112/RPM</b>	48-inch 100 Amp Flexi-Ct
<b>3120R</b>	200 Amp Current Clamp
<b>3210/RPM</b>	24-inch 1000 Amp Flexi-Ct
<b>3212/RPM</b>	48-inch 1000 Amp Flexi-Ct
<b>3300R</b>	3000 Amp Clamp
<b>3310/RPM</b>	24-inch 5000 Amp Flexi-Ct
<b>3312/RPM</b>	48-inch 5000 Amp Flexi-Ct

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