FLUKE

Fluke 1750 Three-Phase Power Recorder

Never miss capturing a disturbance—with the exclusive threshold-free measurement system, it's automatic.

Capture every measurement, every event, on every cycle, all the time with the Fluke 1750 Power Recorder. Outstanding accuracy and resolution provide complete visibility into your installation or distribution system.

- **Power quality that meets the standard:** All measurements comply with IEC61000-4-30 standards for correct evaluation of all measured values including voltage, current, power, harmonics, flicker etc.
- **Ethernet interface:** Included Windows 10 tablet allows for quick setup and verification with waveform displays, meter screens, and phasor diagrams.
- **Quick and reliable configuration:** Windows 10 tablet "front panel interface" provides the ability to verify setup without a laptop along with a window into what the instrument is recording.
- **Threshold-free setup:** Apply thresholds after data is collected with Fluke Power Analyze Software so there is no need to worry about missed information due to incorrect set-up.
- **Captures everything:** Cross-channel and current triggering capture every measurement, on every channel, every time.
- **Intuitive PC software:** Easily analyze data and generate reports. Automated EN50160 reporting and compliance running directly on the supplied Windows 10 tablet.
- **Plug and play:** Set up in minutes with self-identifying current probes and single-lead voltage connections.
- **No need to reconnect wires:** Swap channels internally with the Windows 10 front panel or PC when connections are not correct.
- **Measure every parameter:** voltage and current on three phases, neutral, and ground.
- **5 MHz, 8000 Vpk waveform capture:** Get a detailed picture of even the shortest events.
- **Quickly retrieve data:** With included SD memory card or via the 100BaseT ethernet connection.

600 V CAT IV 1000 V CAT III CE

LONG-TERM ANALYSIS:
Uncover hard-to-find or intermittent issues; monitor critical equipment, capturing power quality events to correlate with equipment malfunction

POWER QUALITY SURVEYS:
Quantify power quality throughout a facility, documenting results with professional reports.

QUALITY OF SERVICE COMPLIANCE:
Validate incoming power quality at the service entrance.

EQUIPMENT INSTALLATION/ COMMISSIONING:
Benchmark power system prior to install to insure quality of service.

Easy to use

The recorder automatically detects, scales, and powers current probes without needing batteries or external power supplies. Requiring only single-lead voltage connections enables safe and quick setups. Once power is applied the instrument automatically begins recording and LEDs give you assurance that the recorder is powered up and signals are within range—no more uncertainty that data is being recorded. The Fluke 1750 has an exclusive capture algorithm which makes certain all events are captured without the tedious setups and blind spots associated with threshold driven equipment.

The Windows tablet provided with /ET versions interfaces via Ethernet cable to the recorder, allowing quick setup and verification with waveform displays, meter screens, and phasor diagrams. Analysis can be performed in the field using the Fluke Power Analyze software running on the Windows tablet (laptops can also be used when desired).
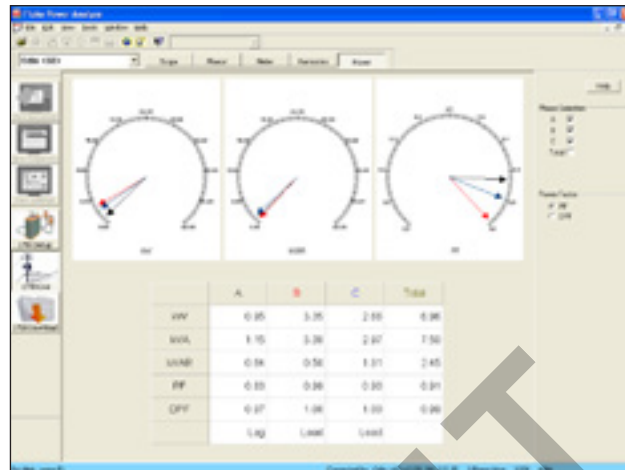

View measurements real-time.
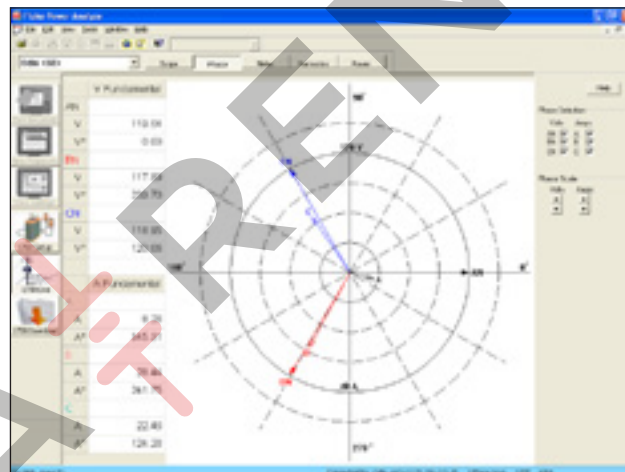
Configurations are simple with wiring diagrams to guide you.
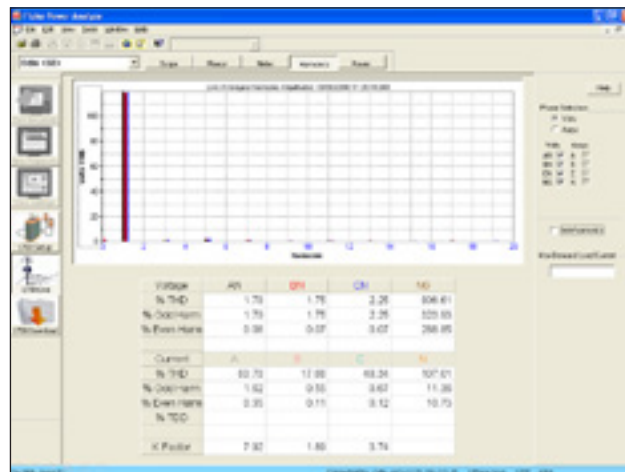
Analysis can be performed in the field using the Fluke Power Analyze software running on the Windows tablet.

Comprehensive power system data

Every cycle on every channel is simultaneously sampled providing complete analysis of power quality, harmonics, power and energy. Cross-channel current and voltage triggering captures event data on all input channels simultaneously, no matter which channel triggered the event. When periodic analysis of the waveform may be needed, the Snapshot mode captures waveforms at user-defined intervals. Even dc signals can be recorded!
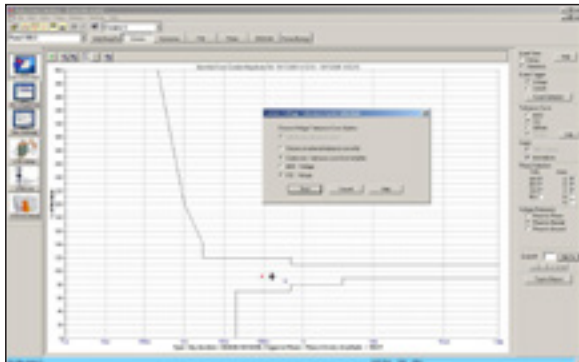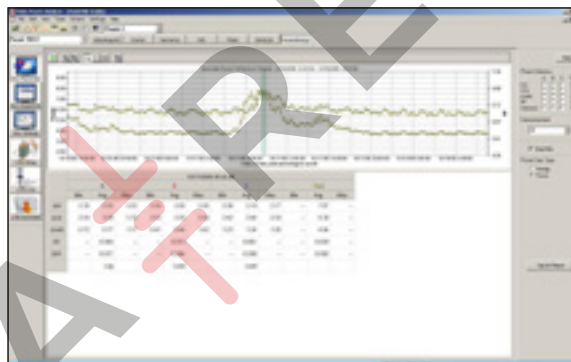
Events can be displayed against a variety of tolerance curves.
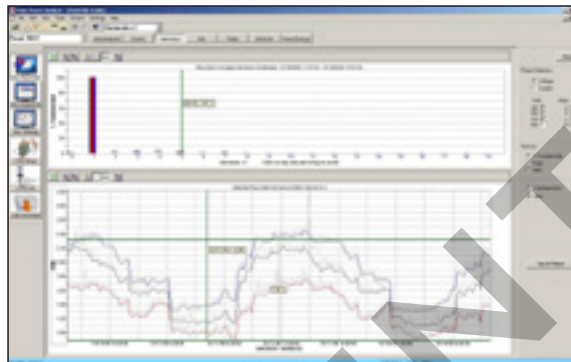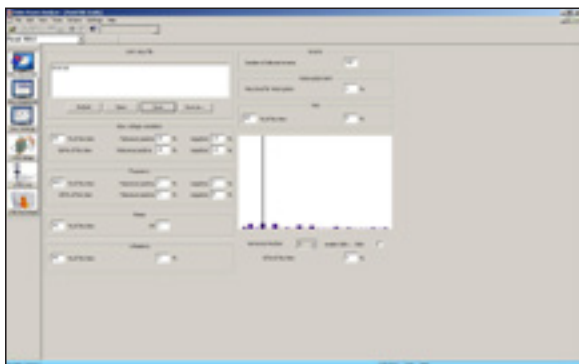
Full FFT on each channel to the 50th harmonic.
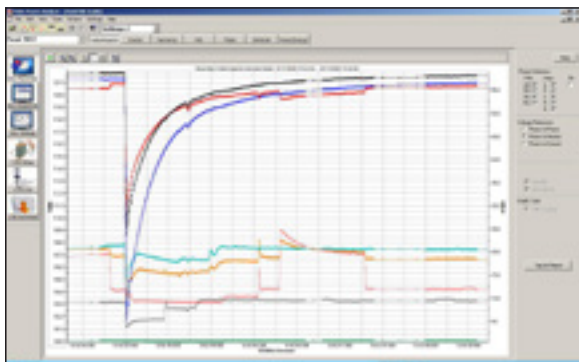
Display multiple parameters simultaneously on one graph.

Full-featured power meter display for each channel and totals.

Thresholds for the EN50160 report are easily customized.
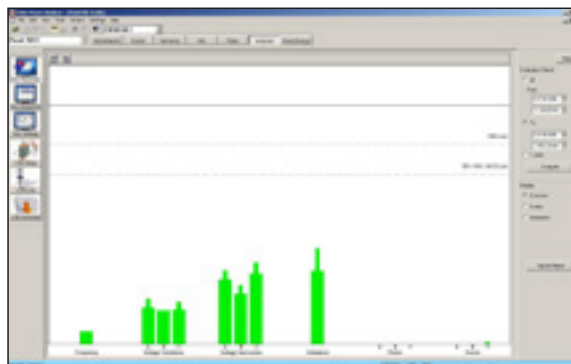
EN50160 report delivers an easy to read pass or fail chart along with drill down data.

Powerful data management

Data is automatically stored on the internal flash memory that can store records for over a month without compression or overwriting. Data is retrieved via one of two quick and easy options: download the data onto the included SD memory card without using your laptop, or transfer directly to your computer via Ethernet, using TCP/IP protocol.

Voice, data, and picture annotations can be made via the tablet to flag important points in the data stream. Imagine being able to flag in your recorded data when a transfer switch was operated, or load changes were made.

All the latest power quality standards are built-in

IEC 61000-4-30 compliant measurement systems provide the confidence that all parameters are measured and calculated consistently with international standards. Automated EN50160 compliance reporting for rapid Pass/Fail testing.

600 V CAT IV and 1000 V CAT III safety rating

Designed to help protect you and your equipment, the Fluke 1750 Three-Phase Power Recorder and accessories are all certified to meet the stringent safety standards for use in 600 V CAT IV and 1000 V CAT III environments. They are the first tools of their kind to carry the CAT IV rating and, therefore, can be used for most power connections and for all outlets in a low-voltage power distribution system.

View data the way you want

The new Fluke Power Analyze software revolutionizes your ability to analyze data. No need to worry about thresholds—with Fluke Power Analyze, thresholds can be modified after the data is recorded! And the easy-to-use user interface will display voltage as a phase-to-phase or phase-to-neutral reading.

The Widows tablet supplied with /ET models runs the full Power Analyzer software for easy in-field analysis.

Apply thresholds to data after collection using a variety of standard or customized templates.
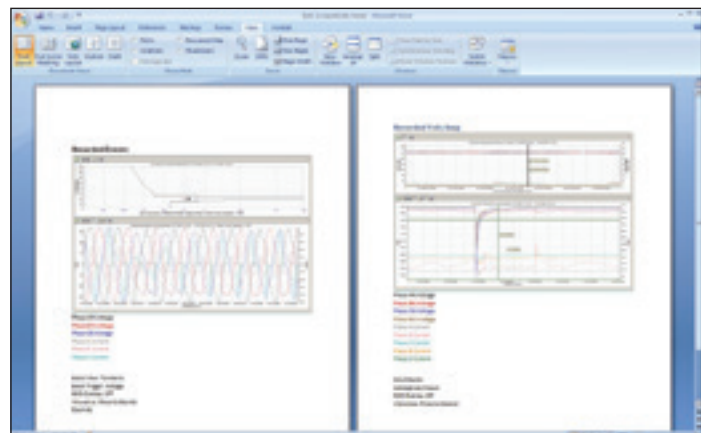
Simplified report writer feature included in Fluke Power Analyze.

Specifications for the System: Recorder and Power Analyze Software

General	
Power quality measurement standards	
Conformance	IEC 61999-1-4 Class 1, IEC 61000-4-30 (Class A or Class S depending on measurement function), IEEE519, IEEE1159, IEEE1459 and EN50160
Clock/calendar	Leap years, 24-hour clock
Real-time clock accuracy	Not more than ± 1 s/day
Internal memory capacity for data	At least 2 GB
Maximum recording period	At least 31 days
Measurement time control	Automatic
Maximum number of events	Limited only by the size of the internal memory
Power requirements	100 to 240 V rms ± 10 %, 47-63 Hz, 40 W
Operating time during interruptions (internal UPS operation)	5 minutes per interruption, 60 minutes total operating time without recharging
Dimensions	215 mm x 310 mm x 35 mm (8.5 in x 12.2 in x 3.5 in)
Mass (weight)	6.3 kg (14 lb)
Input	
Measurement types	One Phase Plus Neutral, One Phase IT No Neutral, One Phase Split Phase, Three Phase Wye, Three Phase Delta, Three Phase IT, Three Phase High Leg, Three Phase Open Leg, 2 Element Delta, 21/2 Element Wye
Input channels	Voltage: 4 channels, ac/dc Current: 5 channels
Voltage channels	Input resistance: 2 MΩ Input capacitance: < 20 pF
Current input characteristics	2 V rms = full scale, 1 MΩ Input Impedance for ferro CTs, low impedance for Flexi-CTs
Measuring method	Simultaneous digital sampling of voltage and current. Digital PLL synchronized sampling, internal frequency reference used during voltage drops.
Synchronization and sampling	
PLL-synchronization source	The PLL synchronizes to the A–N voltage for wye power types, and to the A–B voltage for delta power types. All listed power types can be characterized as either wye or delta.
PLL lock range	42.5 to 69 Hz
Sampling frequency	Voltage and current: 256 samples/cycle Inter-harmonics per IEC 61000-4-7: 2560 points/10 cycles (50 Hz), 3072 points/12 cycles (60 Hz) Transient Voltage: 5 MHz
A/D resolution	Voltage and current: 24 bits Transient voltage: 14 bits
Voltage and current measurements	
Voltage measurement range	AC voltage: 1000 V rms ± 10 % over range DC voltage: ± 1000 V + 10 % over range
Voltage crest factor	3 or less
Current measurement range	Depends on current probe used
Current crest factor	4 or less
Voltage and current measurement accuracy	
RMS voltage	
Measurement type	True-rms calculated continuously: every cycle, every 1/2 cycle, and every 10 or 12 cycles at 50 or 60 Hz respectively, as required by IEC 61000-4-30.
Measurement uncertainty	AC: ± 0.2 % reading ± 0.1 % full scale, above 50 V rms DC: ± 0.5 % reading ± 0.2 % full scale, above 50 V dc
RMS current	
Measurement type	True rms calculated continuously: every cycle, every 1/2 cycle, and every 10 or 12 cycles at 50 or 60 Hz respectively, as required by standards
Measurement uncertainty	Ferromagnetic Clamps: ± (0.1 % full scale + 0.2 % reading + current sensor accuracy), valid for 5 % to 100 % of current sensor range
	Flexible Current Probes: ± (0.1 % full scale + 0.5 % reading + current sensor accuracy), valid for 5 % to 100 % of current sensor range

Transient voltage (impulse)

Measurement type	Waveshape sampling
Full scale	8000 V pk
Sample resolution	200 nS
Measurement uncertainty	± 5 % reading ± 20 V (test parameters: 1000 V dc, 1000 V rms, 100 kHz)

Dip (sag) and swell measurements

Voltage swell (rms swell)

Measurement type	True rms (one cycle calculation by overlapping each half cycle—voltage between lines is measured for 3P3W lines and phase voltage is measured for 3P4W lines)
Displayed data	Amplitude and duration of swell
Measurement uncertainty	Same as rms voltage

Voltage dip (rms sag)

Measurement type	True rms (one cycle calculation by overlapping each half cycle—voltage between lines is measured for 3P3W lines and phase voltage is measured for 3P4W lines)
Displayed data	Amplitude and duration of dip or interruption
Measurement uncertainty	Same as rms voltage

Voltage dropout (interruption)

Measurement type	Same as voltage dip

Power Measurements

Calculated per IEEE1459 for best performance when distortion is present

Measurement type	True rms calculated continuously: every cycle, and every 10 or 12 cycles at 50 or 60 Hz respectively, as required by standards
Measurement accuracy	± (voltage uncertainty + current uncertainty + current probe uncertainty)

Frequency

Measurement range	42.5 Hz to 69 Hz
Measurement source	Same as PLL synchronization source
Measurement accuracy	± 10 mHz (10 % to 110 % of range, with sine wave)

Power factor

Measurement range	0.000 to 1.000
Measurement accuracy	± 1 digit from the calculation of each measured value (± 3 digits for total)

Displacement power factor

Measurement method	Calculated from the phase difference between voltage fundamental and current fundamental
Measurement range	− 1.000 (leading) to + 1.000 (lagging)
Measurement accuracy	± 0.5 % reading ± 2 % full scale ± 1 digit

Voltage unbalance and phase sequence

Measurement method	Positive sequence voltage divided by negative sequence voltage, per IEC 61000-4-30

Harmonic voltage and current

Analysis window	rectangular
Analysis order	1st to 50th order
Measurement accuracy	Voltage / Current: 1st to 20th orders: ± 0.5 % reading ± 0.2 % full scale, 21st to 50th orders: ± 1 % reading ± 0.3 % full scale (current sensor accuracy must be included for current and power)
Measurement method	IEC 61000-4-7

Inter-harmonic voltage and current (intermediate harmonics)

Analysis window	rectangular
Analysis orders	1.5 to 49.5th order
Measurement method	IEC 61000-4-7

Voltage flicker

Measurement method	as per EN 61000-4-15:2003: 10 min (Pst), 2 h (Plt)

External interface specifications

LAN interface

Connector	RJ-45
Speed and type	10/100 Base-T, auto MDIX
Communications protocol	TCP/IP over ethernet

Environmental and safety specifications	
Operating environment	Indoors or in covered area outdoors, up to 2000 m altitude (for compliance to IEC61010 standard)
Storage temperature and humidity	–20 °C to 50 °C, 80 % RH max, non-condensing
Operating temperature and humidity	0 °C to 40 °C, 80 % RH max, non-condensing
Maximum rated working voltage	
Voltage terminals	1100 V rms
Voltage durability	5550 V rms ac for 1 minute, between voltage input terminals, voltage input terminals and current probes, and voltage input terminals and case (50/60 Hz, 1 mA sense current)
Enclosure protection	IP30 (per EN 60529)
Standards conformance	
EMC	EN 61326-1:1997+A1:1998 Class A EN 61000-3-2:1995+A1:1998+A2:1998 EN 61000-3-3:1995
Safety	EN 61010-1 2nd Edition; 2000 **Voltage input unit:** Contamination Level 2, Overvoltage Category 1000 V CAT III, 600 V CAT IV (anticipated overvoltage: 8000 V)

Optional accessories

Fluke power quality current transformers and flexible current probes are specially designed to work seamlessly with Fluke power monitors (1750 and 1650). All clamp-on and flexi-CT's are matched to take full advantage of your instrument's ability to set scale factors for accurate readings.

Cases

1750/CASE Transit Case
Rugged water tight transit case with rollers

CS1750/1760
Soft carrying case for Fluke 1750 and 1760

Miscellaneous

1750/MC
Additional SD Memory Card for Fluke 1750

Fluke-1750 Tablet
Windows 10 controller

1750/SEAT-L
• Fluke Power Analyze–Additional seat license
• One additional license for installation on one additional PC

1750/SITE-L
• Fluke Power Analyze–Additional seat license
• Site license for installation on unlimited PCs

ST1760
Standard ethernet cable

Model no.	CT type	Current range	Accuracy	Frequency response	Jaw opening
i5S-PR	Clamp-On	0.01 A to 5 A	1 % RDG ± 0.5 % FS	5 kHz	1.5 cm (0.6 in) dia.
i40S-PR	Clamp-On	0.1 A to 40 A	1 % RDG ± 0.1 % FS	5 kHz	1.5 cm (0.6 in) dia.
3140R	Clamp-On	2 A to 400 A	2 % RDG ± 0.04 A	20 kHz	3.2 cm (1.25 in) dia.
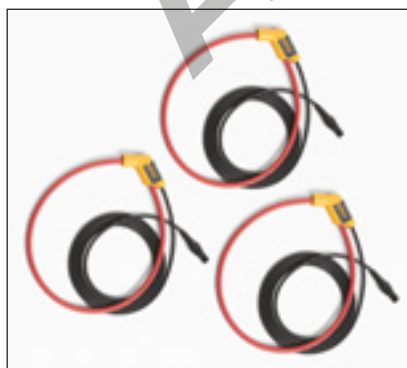
Model no.	CT type	Current range	Accuracy	Frequency response	Probe length
3210-PR TF-II	Flexi-CT	20 A to 1000 A	1 % rdg ± 0.15 % FS	7 kHz	60 cm (24 in)
3310-PR -TF-II	Flexi-CT	100 A to 5000 A	1 % rdg ± 0.15 % FS	7 kHz	60 cm (24 in)
3312-PR TF-II	Flexi-CT	100 A to 5000 A	1 % rdg ± 0.15 % FS	7 kHz	120 cm (48 in)

Ordering information

Fluke-1750-TF
Three-Phase Power Recorder

Included
1750 acquisition unit , Windows 10 tablet "front panel interface" and charger power plug adapters, 4 x 3210-PR-TF-II 1,000A Fluke 1750 Thin Flex-II 61cm (24in), 5 test leads and clips, SD memory card, Fluke Power Analyze software, Power cord with international plug set, Ethernet cable, Color localization set, Printed Getting Started manual, Product CD with software and users manual PDF, and Soft carrying case.

Fluke-1750-TF/ET
Three-Phase Power Recorder

Included
4 x 3120 flexible current probes

Fluke-1750/ET
Three-Phase Power Recorder

Included
Items above, excluding 4 x 3120 flexible current probes, but including 4 x 400A current clamps (type 3140R).

Fluke-1750/B/ET
Three-Phase Basic Power Recorder

Included
Items above but excluding 4 x 3120 flexible current probes and 4 x 400A current clamps.

Models not including the Windows 10 tablet:

Fluke-1750-TF/NT

Fluke-1750/NT

Fluke-1750/B/NT

Fluke offers a full suite of power quality test tools to locate, predict, prevent and troubleshoot power problems.

• Handheld troubleshooters for instant analysis
• Ready-to-use power loggers
• Comprehensive power quality recorders
• Power calibrators and standards backed by Fluke metrology expertise

The Fluke power quality set of products offers the highest level of performance and maintains the Fluke promise of rugged and reliable test tools.

To learn more, contact Power Quality customer support, in Seattle, WA, USA at **1-888-257-9897** or e-mail **fpqsupport@fluke.com**.

Fluke. *Keeping your world up and running.*®.