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Fluke 1740 Series

Three-Phase Power Quality Loggers *Memobox*

Technical Data

Assess power quality and conduct long-term studies with ease

Compact and rugged, the Fluke 1740 Series three-phase power quality loggers are everyday instruments for technicians who troubleshoot and analyze power distribution systems. Capable of simultaneously logging up to 500 parameters for up to 85 days and capturing events, the Fluke 1740 Series helps uncover intermittent and hard-to-find power quality issues. The included PQ Log software quickly assesses the quality of power at the service entrance, substation, or at the load, according to the latest EN50160 standard.



- **Plug and play:** Setup in minutes with automatic current probe detection and powering
- **Installs inside the cabinet:** Compact, fully-insulated housing and accessories fit easily in tight spaces, next to live power
- **Determines the root cause:** Included PQ Log software quickly analyzes trends, creates statistical summaries, and generates detailed graphs and tables
- **Monitors power for the long-term:** Data can be downloaded during recording without interruption
- **Measure voltage with premium accuracy:** IEC61000-4-30 Class-A compliant voltage accuracy (0.1 %)
- **Quickly validate quality of power:** Assess power quality according to EN50160 power quality standard, with statistical overview
- **Rugged and reliable:** Designed for everyday field use, with no moving parts and durable, insulated case, with two year warranty

Applications

Disturbance analysis — Uncover root cause of equipment malfunction for later mitigation and predictive maintenance

Quality of service compliance — Validate incoming power quality at the service entrance

Power quality studies — Assess baseline power quality to validate compatibility with critical systems, before installation

Load studies — Verify electrical system capacity before adding loads

Energy and power quality assessment — Validate performance of facility improvements by quantifying energy consumption, power factor, and general power quality, before and after, improvements

Plug and play

All three 1740 Series loggers feature easy plug and play setup, for immediate use. The current probes are connected to the logger with a single plug. The instrument automatically detects, scales, and powers the probes using line power from the measured voltages. All accessories are individually calibrated and can be shared with multiple Fluke 1740 series loggers. Once it is connected, logging begins with the touch of a single button!

Electrical shock protection

The Fluke 1740 loggers feature double insulated enclosures and accessories to help prevent electrical shock when coming into contact with blanket bus bars, terminals, or cables. They are also designed to meet the stringent safety standards for use in 600 V CAT III and 300 V CAT IV environments.

Loggers for every application

The portable Fluke 1740 Series power quality loggers are designed for easy installation and use, anywhere in low- and medium-voltage applications. There are three models to choose from to meet your basic or advanced power logging needs:

Fluke 1743: IP65 water-proof model for logging the most common power parameters including V, A, W, VA, VAR, PF, energy, flicker, voltage events, and THD.

Fluke 1744: Includes the same features as the Fluke 1743. In addition to common power parameters, the Fluke 1744 also measures voltage and current harmonics, interharmonics, mains signaling, unbalance, and frequency.

Fluke 1745: Advanced IP50 power quality logger with the same measurement capability as the 1744, plus real-time LCD and five hour UPS.

Power quality logger selection table

	1745	1744	1743
Measurement of common power parameters: V, A, W, VA, VAR, PF, energy, flicker, voltage events, and THD	•	•	•
Measurement of voltage and current harmonics to the 50th, unbalance, and mains signaling	•	•	
Dust/water resistance	IP50	IP65 water proof	
Display	LED + LCD	LED	LED
UPS ride-through	5 hrs	3 s	3 s
Dimensions (HxWxD)	282 mm x 216 mm x 74 mm (11.5 in x 8.8 in x 3 in)	170 mm x 125 mm x 55 mm (6.9 in x 5.1 in x 2.2 in)	

Measure all power quality and power parameters

The Fluke 1745 and Fluke 1744 log over 500 different parameters for each averaging period. This allows you to analyze power quality in detail and to correlate intermittent events, helping to identify the root cause of disturbances. For basic power logging, the Fluke 1743 captures all relevant power parameters.

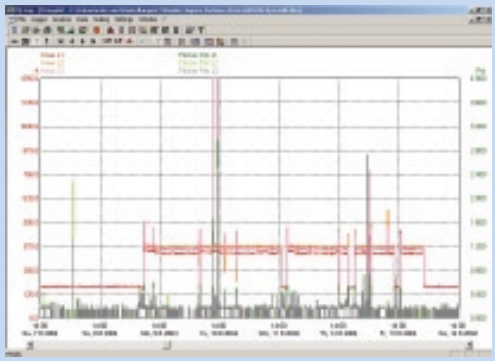
Calculates current harmonics

Fluke 1745 and Fluke 1744 loggers can calculate the limits of current harmonics to predict overload of the grid according to the standards VSE, VEOE, VDN, among others. This powerful predictive maintenance feature enables current harmonics to be observed before a distortion appears in the voltage.

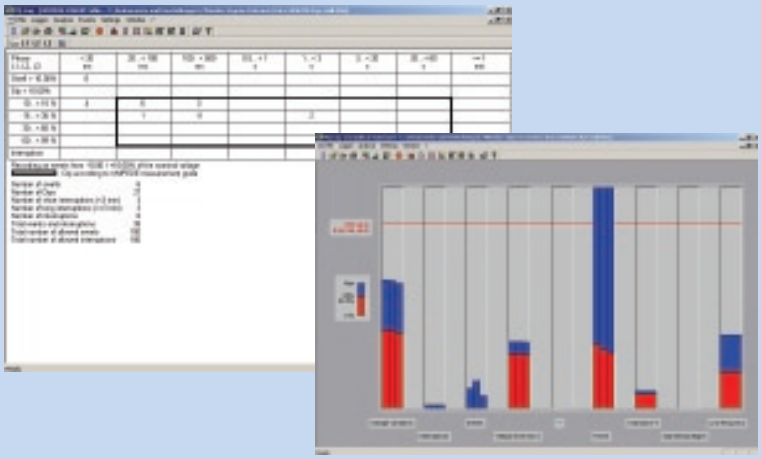


View graphs and generate reports with Fluke PQ Log software

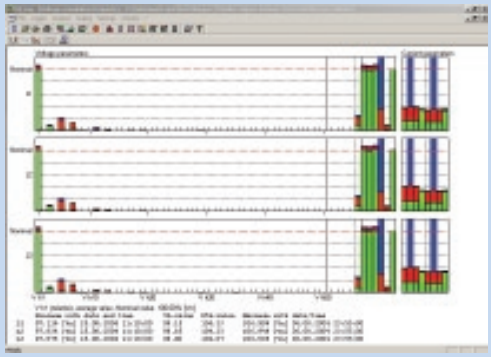
With its easy-to-use interface, the included PQ Log software assists you with logger setup, enables you to verify actual measurement values quickly using the online function, and downloads data from the logger to a connected PC operating on standard Windows® operating systems. You can view the logged data in graphical and tabular form, export it to a spreadsheet, or generate a professional report with the Report Writer function.



For root cause analysis, different measurements such as flicker, voltage and THD can be shown in the same time plot, helping to quickly identify the cause of a disturbance.



Statistical summaries like EN50160 and DISDIP table provide a quick, comprehensive summary. The EN50160 overview display provides a simple display of 8 power quality parameters on one dashboard, according to the latest international power quality standard.



Statistical analysis of Voltage and Current harmonics over a given time period. Red bar graphs indicate issues with the grid. Other colors are warnings for pontential future issues. Harmonics can be presented also as time plots.

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Specifications

General

Intrinsic error	Refers to the reference conditions and is guaranteed for two years
Warranty	2 years
Recalibration interval	2 years recommended
Quality system	developed, designed, and manufactured according to DIN ISO 9001
Reference conditions	23 °C ± 2 K; 74 °F ± 2 K , Vm = 230 V ± 10 %
	50 Hz ± 0.1 Hz or 60 Hz ± 0.1 Hz
	phase sequence L1, L2, L3
	interval length: 10 minutes
	Wye connection (L1, L2, L3 to N)
	Power supply: 88 V to 265 V ac

Ambient conditions

Working temperature range	–10 °C to 55 °C (14 °F to 131 °F)
Storage temperature range	–20 °C to 60 °C (–4 °F to 140 °F)
Reference temperature range	23 °C ± 2 K (74 °F ± 2 K)
Relative humidity	Fluke 1745: Class B2 acc. IEC 60654–1
	Fluke 1744/43: Class C2 acc. IEC 60654–1
Housing	robust, fully insulated housing and accessories
Environmental protection	Fluke 1745: IP50 as per EN60529
	Fluke 1744/43: IP65 as per EN60529
Safety	IEC/EN 61010–1 600 V CAT III
	300 V CAT IV, pollution degree 2
	double insulation
Type test voltage	5.2 kV rms, 50 Hz/60 Hz, 5 s

EMC

Emission	IEC/EN 61326–1, EN55022
Immunity	IEC/EN 61326–1

Voltage and current measurement

Input voltage

Input range V_I P-N	max 480 V ac
Input range V_I P-P	max 830 V ac
Max. overload voltage	1.2 V_I
Input range selection	By job programming
Connections	P-P or P-N, 1- or 3-phase
Nominal voltage V_N	≤ 999 kV with PTs and ratio
Input resistance	App. 820 kΩ per chan. Lx-N Single phase (L1 or A, L2 or B, L3 or C connected): app. 300 kΩ
Intrinsic uncertainty	0.1 % of V_I
Voltage transformer	Ratio: < 999 kV / V_I
Ratio selection	By job programming

Current input with Flexi-Set

Input ranges I_I (L1 or A, L2 or B, L3 or C, N)	15 A/150 A/1500 A/3000 A ac
Measuring range	0.75 A to 3000 A ac
Intrinsic uncertainty	< 2 % of I_I
Position influence	Max. ± 2 % of measured value – for distance conductor to meas. head > 30 mm
Stray field influence	< ± 2 A ac for I_{ext} = 500 A ac and distance to measuring head > 200 mm
Temperature coefficient	< 0.05 %/K
Current transformer	Ratio ≤ 999 kA/I_I
Ratio selection	By job programming
Connection	3-phase, 3-phase +N, 2 phase L1 or A and L3 or C (2 W-meter-method) 7 pole connector

Current input for clamp

Input ranges I_I (L1 or A, L2 or B, L3 or C, N)	0.5 V nominal (for I_I) 1.4 Vpeak
Intrinsic uncertainty	< 0.3 % of I_I
Max. overload	10 V ac
Input resistance	App. 8.2 kΩ
Current transformer	Ratio ≤ 999 kA/I_I
Ration selection	By job programming

Power configurations	Delta, 2-Element Delta, Wye, Single Phase, Split Single Phase

Logger

Power supply

Functional Range	88 V to 660 V absolute, 50 Hz/60 Hz 100 V to 350 V dc Internal fuse: 630 mA T
Power consumption	5 Watts
Ride through	Fluke 1745: Internal battery for typ. > 5 hours ride through with intelligent power management Fluke 1743/44: 3 sec Capacitor
Fuse	Power supply fuse can be replaced in service facility only. Supply can be connected in parallel to measuring inputs (up to 660 V)

Display, indicators	LEDs for status and voltage levels Fluke 1745: LC-display with backlight for voltage, current, active power, phase sequence.
Memory	Capacity 8 MB Flash-EPROM
Intervals	A function > 12,000 intervals for > 85 days with 10 min intervals P function > 30,000 intervals for > 212 days with 10 min intervals
Events	> 13,000
Memory model	Linear or circular
Interface	USB and RS 232, 9600 to 115,000 Baud, automatic Baud rate selection, 3-wire communication
Dimensions	Fluke 1745: 282 mm x 216 mm x 74 mm (115 in x 88 in x 33 in)
	Fluke 1743/44: 170 mm x 125 mm x 55 mm (69 in x 51 in x 22 in)
Weight	Fluke 1745: approx. 3 kg (6.5lb)
	Fluke 1743/44: approx. 2 kg (435 lb)
Measurement	
A/D converter	16 bit, sample rate: 10.24 kHz
Anti-aliasing filter	FIR-Filter, $f_c = 4.9$ kHz
Frequency response	Uncertainty < 1 % of Vm for 40 Hz to 2500 Hz
Interval length	1, 3, 5, 10, 30 s, 1, 5, 10, 15, 60 minutes
Averaging time for Min/max values	½, 1 mains period, 200 ms, 1 , 3 , 5 s
Time base	Resolution: 10 ms (at 50 Hz), deviation: 2 s/day at 23 °C ± 2 °C (74 °F ± 2 °F)

Optional accessories

Current probes

Model	Clamp Set	Uncertainty	Jaw Opening	Category Rating
MBX CLAMP 1 A/10 A + N	3-phase+N current clamps with 2 ranges 1 A/10 A, 2 m cable	< ± 0.5% of rdg Phase angle error < 1 °	< 15 mm (0.59 in) diameter or 15 x 17 (0.59 in x 0.67 in) mm bush bars	300 V CAT IV 600 V CAT III
MBX CLAMP 5 A/50 A + N	3-phase+N current clamps with 2 ranges 5 A/50 A, 2m cable	< ± 0.5 % of rdg Phase angle error < 1 °	< 15 mm (0.59 in) diameter or 15 x 17 (0.59 in x 0.67 in) mm bush bars	300 V CAT IV 600 V CAT III
MBX CLAMP 20 A/200 A + N	3-phase+N current clamps with 2 ranges 20 A/200 A, 2 m cable	< ± 0.5 % of rdg Phase angle error < 1 °	< 15 mm (0.59 in) diameter or 15 x 17 (0.59 in x 0.67 in) mm bush bars	300 V CAT IV 600 V CAT III

Misc accessories

MBX 300 POLESET	Pole mounting kit for 1743 and 1744
C435	Water-tight hard case with rollers



Fluke 1744/43



Fluke 1745

All instruments include

- 4 Flexible probes 15/150/1500/3000 A with 2 m cable
- PQ Log software
- RS232 interface cable and RS232-USB adapter
- 4 black dolphin clips
- Test leads for voltages and power supply
- Color localization kit
- Carrying bag
- Test certificate with measurement values
- Printed English manual
- Multi-language manual CD

Ordering information

FLUKE-1743 Power Quality Logger – Memobox
FLUKE-1744 Power Quality Logger – Memobox
FLUKE-1745 Power Quality Logger – Memobox

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.™*

Fluke Corporation
PO Box 9090, Everett, WA USA 98206

Fluke Europe B.V.
PO Box 1186, 5602 BD
Eindhoven, The Netherlands

For more information call:
In the U.S.A. (800) 443-5853 or
Fax (425) 446-5116
In Europe/M-East/Africa +31 (0) 40 2675 200 or
Fax +31 (0) 40 2675 222
In Canada (800) 36-FLUKE or
Fax (905) 890-6866
From other countries +1 (425) 446-5500 or
Fax +1 (425) 446-5116
Web access: http://www.fluke.com

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