

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

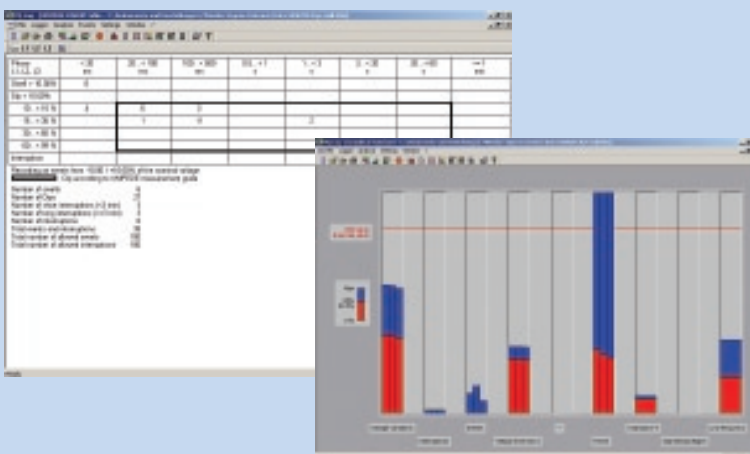


**View graphs and generate reports with Fluke PQ Log software**

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 potential future issues. Harmonics can be presented also as time plots.

## Specifications

### General

|                               |  |
|-------------------------------|--|
| <b>Intrinsic error</b>        | Refers to the reference conditions and is guaranteed for two years |
| <b>Warranty</b>               | 2 years  |
| <b>Recalibration interval</b> | 2 years recommended  |
| <b>Quality system</b>         | developed, designed, and manufactured according to DIN ISO 9001    |
| <b>Reference conditions</b>   | 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

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

### EMC

|                 |                         |
|-----------------|-------------------------|
| <b>Emission</b> | IEC/EN 61326-1, EN55022 |
| <b>Immunity</b> | IEC/EN 61326-1          |

## Voltage and current measurement

### Input voltage

|   |  |
|---|--|
| <b>Input range <math>V_1</math> P-N</b> | max 480 V ac   |
| <b>Input range <math>V_1</math> P-P</b> | max 830 V ac   |
| <b>Max. overload voltage</b>            | 1.2 $V_1$  |
| <b>Input range selection</b>            | By job programming   |
| <b>Connections</b>                      | P-P or P-N, 1- or 3-phase  |
| <b>Nominal voltage <math>V_N</math></b> | ≤ 999 kV with PTs and ratio  |
| <b>Input resistance</b>                 | App. 820 kΩ per chan. Lx-N Single phase (L1 or A, L2 or B, L3 or C connected): app. 300 kΩ |
| <b>Intrinsic uncertainty</b>            | 0.1 % of $V_1$   |
| <b>Voltage transformer</b>              | Ratio: < 999 kV / $V_1$  |
| <b>Ratio selection</b>                  | By job programming   |

### Current input with Flexi-Set

|   |  |
|---|--|
| <b>Input ranges <math>I_1</math> (L1 or A, L2 or B, L3 or C, N)</b> | 15 A/150 A/1500 A/3000 A ac  |
| <b>Measuring range</b>  | 0.75 A to 3000 A ac  |
| <b>Intrinsic uncertainty</b>  | < 2 % of $I_1$   |
| <b>Position influence</b>   | Max. ± 2 % of measured value – for distance conductor to meas. head > 30 mm          |
| <b>Stray field influence</b>  | < ± 2 A ac for $I_{ext} = 500$ A ac and distance to measuring head > 200 mm          |
| <b>Temperature coefficient</b>                                      | < 0.05 %/K   |
| <b>Current transformer</b>  | Ratio ≤ 999 kA/ $I_1$  |
| <b>Ratio selection</b>  | By job programming   |
| <b>Connection</b>   | 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

|   |                                      |
|---|--------------------------------------|
| <b>Input ranges <math>I_1</math> (L1 or A, L2 or B, L3 or C, N)</b> | 0.5 V nominal (for $I_1$ ) 1.4 Vpeak |
| <b>Intrinsic uncertainty</b>  | < 0.3 % of $I_1$                     |
| <b>Max. overload</b>  | 10 V ac                              |
| <b>Input resistance</b>   | App. 8.2 kΩ                          |
| <b>Current transformer</b>  | Ratio ≤ 999 kA/ $I_1$                |
| <b>Ratio selection</b>  | By job programming                   |

|                             |   |
|-----------------------------|---|
| <b>Power configurations</b> | Delta, 2-Element Delta, Wye, Single Phase, Split Single Phase |
|-----------------------------|---|

## Logger

### Power supply

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

|  |   |
|--|---|
| <b>Display, indicators</b>               | LEDs for status and voltage levels<br>Fluke 1745: LC-display with backlight for voltage, current, active power, phase sequence.         |
| <b>Memory</b>                            | Capacity 8 MB Flash-EPR0M   |
| <b>Intervals</b>                         | A function > 12,000 intervals for > 85 days with 10 min intervals<br>P function > 30,000 intervals for > 212 days with 10 min intervals |
| <b>Events</b>                            | > 13,000  |
| <b>Memory model</b>                      | Linear or circular  |
| <b>Interface</b>                         | USB and RS 232, 9600 to 115,000 Baud, automatic Baud rate selection, 3-wire communication   |
| <b>Dimensions</b>                        | Fluke 1745: 282 mm x 216 mm x 74 mm (115 in x 88 in x 33 in)<br>Fluke 1743/44: 170 mm x 125 mm x 55 mm (69 in x 51 in x 22 in)          |
| <b>Weight</b>                            | Fluke 1745: approx. 3 kg (6.5lb)<br>Fluke 1743/44: approx. 2 kg (435 lb)  |
| <b>Measurement</b>                       |   |
| <b>A/D converter</b>                     | 16 bit, sample rate: 10.24 kHz  |
| <b>Anti-aliasing filter</b>              | FIR-Filter, $f_c = 4.9$ kHz   |
| <b>Frequency response</b>                | Uncertainty < 1 % of $V_m$ for 40 Hz to 2500 Hz   |
| <b>Interval length</b>                   | 1, 3, 5, 10, 30 s, 1, 5, 10, 15, 60 minutes   |
| <b>Averaging time for Min/max values</b> | 1/2, 1 mains period, 200 ms, 1, 3, 5 s  |
| <b>Time base</b>                         | 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<br>1 A/10 A + N   | 3-phase+N current clamps with 2 ranges 1 A/10 A, 2 m cable   | < ± 0.5% of rdg<br>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<br>600 V CAT III |
| MBX CLAMP<br>5 A/50 A + N   | 3-phase+N current clamps with 2 ranges 5 A/50 A, 2m cable    | < ± 0.5 % of rdg<br>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<br>600 V CAT III |
| MBX CLAMP<br>20 A/200 A + N | 3-phase+N current clamps with 2 ranges 20 A/200 A, 2 m cable | < ± 0.5 % of rdg<br>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<br>600 V CAT III |

### Misc accessories

|                        |                                     |
|------------------------|-------------------------------------|
| <b>MBX 300 POLESET</b> | Pole mounting kit for 1743 and 1744 |
| <b>C435</b>            | 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](mailto:fpqsupport@fluke.com).

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