Power Quality Loggers

- **Fluke 1736 Three-Phase Power Quality Loggers**

  The Fluke 1736 Three-Phase Power Loggers built with Fluke Connect® mobile app and desktop software compatibility give you the data you need to make critical power quality and energy decisions in real-time.

1. Fluke 1736 Three-Phase Power Quality Loggers

➢ **Key Features**

The Fluke 1736 and 1738 Three-phase Power Quality Loggers are versatile, three-phase Fluke Connect-compatible power loggers for conducting energy, load and power quality studies.

- **Key measurements**: Automatically capture and log voltage, current, power, harmonics and associated power quality values, and capture dips, swells, and inrush currents with event waveform snapshots and high-resolution RMS profiles
- **Convenient instrument powering**: Power instrument directly from the measured circuit
- **Energy Analyze Plus application software**: Download and analyze every detail of energy consumption and power quality state of health with our automated reporting and use the integrated power quality health summary to get an at-a-glance understanding of system health

Specifications

Accuracy

Parameter		Range	Resolution	Intrinsic Accuracy at Reference Conditions (% of Reading +% of Full Scale)
Voltage		1000 V	0.1 V	±(0.2% + 0.01%)
Current: Direct input	i17xx-flex 1500 12"	150 A	0.1 A	±(1% + 0.02%)
		1500 A	1 A	±(1% + 0.02%)
		300 A	1 A	±(1% + 0.03%)

	i17xx-flex 3000 24"	3000 A	10 A	±(1% + 0.03%)	
	i17xx-flex 6000 36"	600 A	1 A	±(1.5% + 0.03%)	
		6000 A	10 A	±(1.5% + 0.03%)	
	i40s-EL clamp	4 A	1 mA	±(0.7% + 0.02%)	
		40 A	10 mA	±(0.7% + 0.02%)	
Frequency		42.5 Hz to 69 Hz	0.01 Hz	±(0.1%)	
Auxillary input		±10 V dc	0.1 mV	±(0.2% + 0.02%)	
Voltage min/max		1000 V	0.1 V	±(1% + 0.1%)	
Current min/max		Defined by accessory	Defined by accessory	±(5% + 0.2%)	
THD on voltage		1000%	0.1%	±0.5	
THD on current		1000%	0.1%	±0.5	
Voltage harmonics 2nd to 50th		1000 V	0.1 V	≥ 10 V: ±5% of reading	
				< 10 V: ±0.5V	
Current harmonics 2nd to 50th		Defined by accessory	Defined by accessory	≥ 3% of current range: ±5% of reading	
				< 3% of current range: ±0.15% of range	
Unbalance		100%	0.1%	±0.2	

Intrinsic Uncertainty ±(% of reading +% of range)[1]

Parameter	Influence quantity	iFlex1500-12	iFlex3000-24	iFlex6000-36	i40S-EL

		150 A / 1500 A	300 A / 3000 A	600 A / 6000 A	4 A / 40 A
Active Power P	PF ≥ 0.99	1.2% + 0.005%	1.2% + 0.0075%	1.7% + 0.0075%	1.2% + 0.005%
Active Energy E_a	PF ≥ 0.99	1.2% + 0.005%	1.2% + 0.0075%	1.7% + 0.0075%	1.2% + 0.005%
Apparent power S	0 ≤ PF ≤ 1	1.2% + 0.005%	1.2% + 0.0075%	1.7% + 0.0075%	1.2% + 0.005%
Apparent Energy E_{ap}	0 ≤ PF ≤ 1	1.2% + 0.005%	1.2% + 0.0075%	1.7% + 0.0075%	1.2% + 0.005%
Reactive power Q	0 ≤ PF ≤ 1	2.5% of measured apparent power			
Reactive Energy E_r	0 ≤ PF ≤ 1	2.5% of measured apparent power			
Power Factor PF	-	±0.025			
Displacement Power Factor	-	±0.025			
DBF/cosϕ	-	±0.025			
Additional uncertainty in% of range[1]	V_{P-N}>250 V	0.015%	0.0225%	0.0225%	0.015%

[1]Range = 1000 V x Irange
Reference conditions:

- Environmental: 23 °C ±5 °C, instrument operating for at least 30 minutes, no external electrical/magnetic field, RH <65%
- Input conditions: Cosϕ/PF=1, Sinusoidal signal f=50 Hz/60 Hz, power supply 120 V/230 V ±10%.
- Current and power specifications: Input voltage 1 ph: 120 V/230 V or 3 ph wye/delta: 230 V/400 V Input current: I > 10% of Irange
- Primary conductor of clamps or Rogowski coil in center position
- Temperature coefficient: Add 0.1 x specified accuracy for each degree C above 28 °C or below 18 °C

Electrical Specifications	
Power Supply	
Voltage range	100 V to 500 V using safety plug input when powering from the measurement circuit
	100 V to 240 V using standard power cord (IEC 60320 C7)
Power consumption	Maximum 50 VA (max. 15 VA when powered using IEC 60320 input)
Efficiency	≥ 68.2% (in accordance with energy efficiency regulations)
Maximum no-load consumption	< 0.3 W only when powered using IEC 60320 input
Mains power frequency	50/60 Hz ±15%
Battery	Li-ion 3.7 V, 9.25 Wh, customer-replaceable
On-battery runtime	Four hours in standard operating mode, up to 5.5 hours in power saving mode
Charging time	< 6 hours
Data Acquisition	
Resolution	16-bit synchronous sampling
Sampling frequency	10.24 kHz at 50/60 Hz, synchronized to mains frequency
Input signal frequency	50/60 Hz (42.5 to 69 Hz)
Circuit types	1-φ, 1-φ IT, Split phase, 3-φ delta, 3-φ wye, 3-φ wye IT, 3-φ wye balanced, 3-φ Aron/Blondel (2-element delta), 3-φ delta open leg, Currents only (load studies)
Data storage	Internal flash memory (not user replaceable)
Memory size	Typical 10 logging sessions of 8 weeks with 1-minute intervals and 500 events[1]

[1]The number of possible logging sessions and logging period depends on user requirements.	
Basic Interval	
Measured parameters	Voltage, current, aux, frequency, THD V, THD A, power, power factor, fundamental power, DPF, energy
Averaging interval	User selectable: 1 sec, 5 sec, 10 sec, 30 sec, 1 min, 5 min, 10 min, 15 min, 30 min
Averaging time min/max values	Voltage, Current: Full cycle RMS updated every half cycle (URMS1/2 according to IEC61000-4-30 Aux, Power: 200ms
Demand Interval (Energy Meter Mode)	
Measured parameters	Energy (Wh, varh, VAh), PF, maximum demand, cost of energy
Interval	User selectable: 5 min, 10 min, 15 min, 20 min, 30 min, off
Power Quality Measurements	
Measured parameter	Voltage, frequency, unbalance, voltage harmonics, THD V, current, harmonics, THD A, TDD
Averaging interval	10 min
Individual harmonics	2nd to 50th harmonic
Total harmonic distortion	Calculated on 50 harmonics
Events	Voltage: dips, swells, interruptions, current: inrush current
Triggered recordings	Full cycle RMS updated every half cycle of voltage and current (Urms1/2 according to IEC61000-4-30)
	Waveform of voltage and current (1738)
Standards Compliance	
Harmonics	IEC 61000-4-7: Class 1
	IEEE 519 (short time harmonics)

Power quality	IEC 61000-4-30 Class S, IEC62586-1 (PQI-S device)
Power	IEEE 1459
Power quality compliance	EN50160 (for measured parameters)
Interfaces	
USB-A	File transfer via USB flash drive, firmware updates Max. current: 120 mA
WiFi	File transfer and remote control via direct connection or WiFi infrastructure
Bluetooth	Read auxiliary measurement data from Fluke Connect® 3000 series modules (requires 1738 or 1736 upgrade option)
USB-mini	Data download device to PC
Voltage Inputs	
Number of inputs	4 (3 phases and neutral)
Maximum input voltage	1000 Vrms, CF 1.7
Input impedance	10 MΩ
Bandwidth (-3 dB)	42.5 Hz - 3.5 kHz
Scaling	1:1 and variable
Measurement category	1000 V CAT III/600 V CAT IV
Current Inputs	
Number of inputs	4, mode selected automatically for attached sensor
Input voltage	Clamp input: 500 mVrms/50 mVrms; CF 2.8
Rogowski coil input	150 mVrms/15 mVrms at 50 Hz, 180 mVrms/18 mVrms at 60 Hz; CF 4; all at nominal probe range

Range	1 A to 150 A/10 A to 1500 A with thin flexible current probe i17XX-flex1500 12"
	3 A to 300 A/30 A to 3000 A with thin flexible current probe i17XX-flex3000 24"
	6 A to 600 A/60 A to 6000 A with thin flexible current probe i17XX-flex6000 36"
	40 mA to 4 A/0.4 A to 40 A with 40 A clamp i40s-EL
Bandwidth (-3 dB)	42.5 Hz - 3.5 kHz
Scaling	1:1 and variable
Auxiliary Inputs	
Number of inputs	2
Input range	0 to ±10 V dc, 1reading/s
Scale factor	Format: mx + b (gain and offset) user configurable
Displayed units	User configurable (7 characters, for example, °C, psi, or m/s)
Wireless Connection	
Number of inputs	2
Supported modules	Fluke Connect® 3000 series
Acquisition	1 reading/s
Environmental Specifications	
Operating temperature	-10 °C to +50 °C (14 °F to 122 °F)
Storage temperature	-20 °C to +60 °C (-4 °F to 140 °F), with battery: -20 °C to +50 °C (-4 °F to 122 °F)
Operating humidity	10 °C to 30 °C (50 °F to 86 °F) max. 95% RH
	30 °C to 40 °C (86 °F to 104 °F) max. 75% RH

	40 °C to 50 °C (104 °F to 122 °F) max. 45% RH
Operating altitude	2000 m (up to 4000 m derate to 1000 V CAT II/600 V CAT III/300 V CAT IV)
Storage altitude	12,000m
Enclosure	IP50 in accordance with EN60529
Vibration	MIL-T-28800E, Type 3, Class III, Style B
Safety	IEC 61010-1
	IEC Mains Input: Overvoltage Category II, Pollution Degree 2
	Voltage Terminals: Overvoltage Category IV, Pollution Degree 2
	IEC 61010-2-031: CAT IV 600 V / CAT III 1000 V
Electromagnetic compatibility	EN 61326-1: Industrial CISPR 11: Group 1, Class A
	Korea (KCC): Class A Equipment (industrial broadcasting and communication equipment)
	USA (FCC): 47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103
Temperature coefficient	0.1 x accuracy specification/°C
General Specifications	
Color LCD display	4.3-inch active matrix TFT, 480 pixels x 272 pixels, resistive touch panel
Warranty	Instrument and power supply: Two-years (battery not included)
	Accessories: one-year
	Calibration cycle: two-years

Dimensions	Instrument: 19.8 cm x 16.7 cm x 5.5 cm (7.8 in x 6.6 in x 2.2 in)
	Power supply: 13.0 cm x 13.0 cm x 4.5 cm (5.1 in x 5.1 in x 1.8 in)
	Instrument with power supply attached: 19.8 cm x 16.7 cm x 9 cm (7.8 in x 6.6 in x 3.5 in)
Weight	Instrument: 1.1 kg (2.5 lb)
	Power supply: 400 g (0.9 lb)
Tamper protection	Kensington lock slot
i17xx-flex 1500 12" Flexible Current Probe Specifications	
Measuring range	1 to 150 A ac/10 to 1500 A ac
Nondestructive current	100 kA (50/60 Hz)
Intrinsic error at reference condition*	±0.7% of reading
Accuracy 173x + iFlex	±(1% of reading + 0.02% of range)
Temperature coefficient over operating temperature range	0.05% of reading/°C 0.09% of reading/°F
Working voltage	1000 V CAT III, 600 V CAT IV
Probe cable length	305 mm (12 in)
Probe cable diameter	7.5 mm (0.3 in)
Minimum bending radius	38 mm (1.5 in)
Output cable length	2 m (6.6 ft)
Weight	115 g
Probe cable material	TPR

Coupling material	POM + ABS/PC
Output cable	TPR/PVC
Operating temperature	-20 °C to +70 °C (-4 °F to 158 °F) temperature of conductor under test shall not exceed 80 °C (176 °F)
Temperature, non-operating	-40 °C to +80 °C (-40 °F to 176 °F)
Relative humidity, operating	15% to 85% non-condensing
IP rating	IEC 60529:IP50
Warranty	One-year

* Reference condition:

- Environmental: 23 °C ±5 °C, no external electrical/magnetic field, RH 65%
- Primary conductor in center position