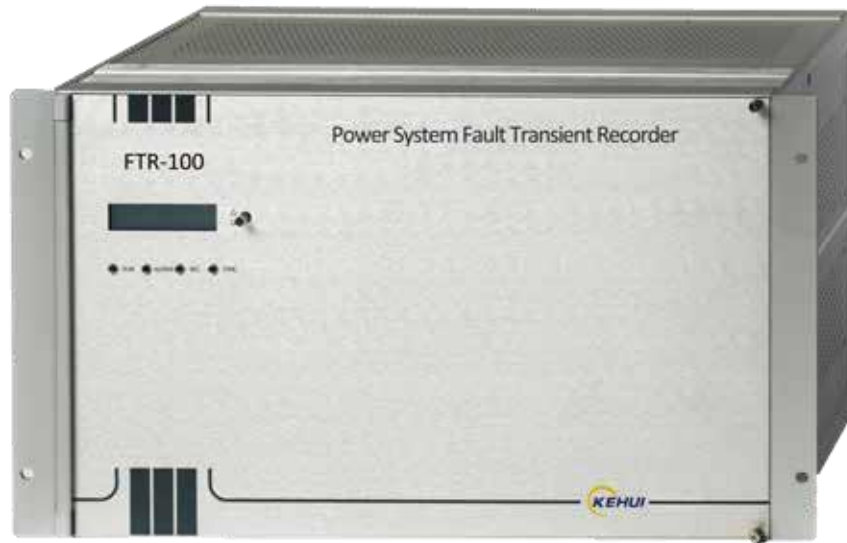




FTR-100 Power System Transient Recorder

Power system digital fault recorders (DFR) automatically and accurately record the pre-fault and post-fault electrical quantities when a disturbance occurs. Through analysis of the waveforms and the events, the reason behind the disturbance can be determined and the correct operation of the protection can be verified. The FTR-100 power system transient recorder provides transient, steady state and continuous recording of the primary equipment and is applicable to both conventional and digital substations.

Features

- Efficient data management for triggered and continuous records
- Intuitive event enquiry facilitated by a calendar interface which classifies and identifies the time of the events
- Data integrity ensured through the use of Redundant Array
- Powerful FTR management software with an integral Comtrade viewer for data retrieval, data storage and data analysis.
- Analysis of conventional analogue and digital signals or process/station bus data from digital substations
- 2TB of non-volatile data storage available on integrated hard drive

Technical Specifications

Item	Technical Specification
Monitoring and Recording capacity	Analogue Inputs recording : - Up to 96 analogue signals, including AC voltage, AC current, DC voltage and DC current - Up to 192 digital status (On/Off) signals Sample Values (SV) and GOOSE Inputs recording : - Up to 32 configurable MUs (merging units), selectable SV recording channels up to 128 - Configurable GOOSE inputs no less than 64, selectable GOOSE inputs no less than 512 - GOOSE inputs used for triggering are up to 512 - Wet or dry contacts signal up to 384 Message Recording : - Number of MUs with recordable messages up to 128 - GOOSE control blocks with recordable messages up to 128 - MMS messaging can accept 512 IP pairs
Continuous recording capability	Continuous recording time: 7 days - Selectable SV channels for continuous recording up to 128 - Selectable GOOSE signals for continuous recording up to 512
SV messages continuous recording capability	24 hours
GOOSE raw message and MMS raw message continuous recording capability	15 days
MMS interface	2x optical and 2x electrical 1000M Ethernet ports
SV/GOOSE interface	24x100M or 6x1000M Ethernet interface
Recording information type	MMS message, SV message, GOOSE message, PTP message, AC and DC analogue values, dry or wet contact ON/OFF signals
Time synchronization	Support IRIG-B time code, support PPS, PPM optical signals, electrical signal time sync or passive electrical signal time sync, support PTP time sync
Time Sync accuracy	Time sync accuracy: $\leq \pm 4\mu s$; Internal Clock accuracy: $\leq \pm 500\mu s/24h$
Power supply	AC 220V, tolerance -20%~20%; DC 110V/ 220V, tolerance -20%~20%
Data Storage management	Storage speed > 70MB/s, maximum storage capacity 2TB
Timing accuracy	Message receiving timing accuracy < 60ns

Item	Technical Specification
Digital sampling interface timing error	<1us
Status signal resolution	<1ms
Integrity of recorded data	Can record system conditions 5s after power-off
Communication protocol	Support process bus IEC61850-9-1, IEC61850-9-2 and IEC61850 GOOSE; support station bus IEC61850 MMS protocol
Recording method	2s pre-fault, 10s post-fault, has continuous recording capability
Power consumption	Less than 50W
Sampling error	GOOSE message and SV synchronization deviation <1ms Analogue signal and SV synchronization error <0.3us Analogue signal sampling resolution <0.5%, phase error <1°
Trigger error	Analogue channel change trigger error <10% Analogue channel threshold error <5% Change of frequency trigger error <0.05Hz Oscillation trigger / harmonic trigger error <5% Sequence component threshold trigger / over-excitation trigger /reverse power trigger / differential current trigger error <10%
Large short-circuit current recoding capability	Instantaneous magnitude error <10%
Distance to fault error	<3%
Optical Ethernet interface receiving sensitivity	100Mbps: -31dBm to -14dBm 1000Mbps: -21dBm to -14dBm

Electromagnetic Compatibility	Reference standards
1MHz Burst High Frequency Disturbance test	GB/T 14598.13-2008
Immunity to static discharge	GB/T 14598.14-2010
Immunity from Radiated Electromagnetic Energy	GB/T 14598.9-2010
Electrical fast transient or burst	GB/T 14598.10-2012
Surge withstand capability	GB/T 14598.18-2012
Immunity to Conducted Disturbances Induced by Radio Frequency Test	GB/T 14598.17-2005
Power frequency magnetic field immunity	GB/T 17626.8-2006
Impulse magnetic field immunity	GB/T 17626.9-2011
Damped oscillatory magnetic field immunity	GB/T 17626.10-1998
Conducted emissions	GB/T 14598.16-2002
Radiated emissions	GB/T 14598.16-2002
Auxiliary supply voltage drop, short-time interruption, voltage fluctuation and voltage ripple	GB/T 14598.11-2011

Delivery includes:

- FTR-100 Power System Transient Fault Recorder
- Remote Acquisition Unit (where ordered separately)
- ReplayD Software
- Manual

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