Digital Fault Recorder

BLACKBOXDFR

Don't be left in the dark

ELSPEC

DFR

Fully Featured Digital Fault Recorder

- Continuous Waveform Recordings
- Superior Accuracy
- Class A Power Quality Profiling

The Perfect DFR Solution

The G4DFR is a fully-featured Digital Fault Recorder with continuous recording capabilities that make it possible to analyze short transient events, long term disturbances, as well as, trend input quantities.

- Multi function – DFR, Fault Locator, PQ Monitoring
- 20-Bit continuous acquisition at 50kHz
- Modular design / 9 analog , 16 digital, 6 relays, 16GB per module
- Centralized or decentralized architecture
- More than 1,000 parameters are continuous recording for each analog channel
- Up-to 20 Modules with 500 channels.

PQZIP - Compression Technology

The unique patented PQZIP compression technology enables you to store up to 1000 times more information than typical file formats.

PQZIP allows storage of complete and precise data over extended periods of time.

Unique Features

Sampling Rate

The highest sampling rate at 1,024 samples per cycle to yield superior resolution, plus the ability to easily detect transients.

Real-Time Monitoring

View analog and digital inputs including computed values in real time.

Continuous Recording

Elspec's unique PQZIP patented compression technology allows continual recording of all power parameter at the highest sampling resolution and accuracy.

Communication

- Ethernet (LAN or WAN structure) in accordance with Ethernet 802.3 using a TCP/IP protocol;
- Cellular GPRS modem or direct communication using copper (RS485/422) connections.

Time Synchronization

A unique time synchronization algorithm assures that logged data from fault recorders and protection equipment at different locations is synchronized and displayed on the same time scale with typical 0.1ms resolution. Results: every event from all G4DFR and BLACKBOX devices is accurately analyzed for precise root cause analysis. This is ensured by the use of additional components, such as a GPS-receiver and sync-transceiver.

Powerful Recording System

The combination of the BLACKBOX DFR and the PQSCADA software team up to form a powerful power quality monitoring and disturbance recording system. With Elspec's PQSCADA Enterprise software in automatic mode, unique data collection and archiving capabilities lead to very short analysis times. The various installation possibilities of the PQSCADA in server, client and evaluation mode meet all requirements such as visualization, analysis for parameterization, commissioning, test, automatic data collection, and data archiving.

Full Compliance with IEC 61000-4-30 Class A

Far surpassing the highest standards set by the industry, the BLACKBOX device series complies with standards for: aggregations, time clock uncertainty, flagging, and transient influence quantities.

Advanced PQSCADA

The Power Quality Management Software Suite (Enterprise Edition) empowers the G4K with an unparalleled data recording capability providing the most accurate detection and isolation of PQ anomalies for the diagnosis and effective maintenance of equipment.

Elspec's innovative PQSCADA Power Quality Management Suite software simplifies troubleshooting. This user-friendly system allows for the control, configuration, comparison and analysis of time-synchronized data recorded by any number of BLACKBOX devices within a particular site or across many sites.

Automated Reports

Generate automated reports set to any customized pre-scheduled period. Event data is exportable to either COMTRADE or PQDIF, and all other data to PDF, EXCEL and HTML.

Optional Accessories

G4100 Display

The Elspec G4100 display unit provides full control over all the analyzers, allowing technicians and field operators to fully configure and operate every single analyzer in the network. The G4100 can be used as a hand held monitoring and configuration tool, connectable via a TCP/IP connection.

GPS (Global Positioning System)

The GPS provides an optimal mobile time synchronization solution for accurate time data via satellite signal. In the absence of many other technologies, it synchronizes time at any remote site location.

Multi-Frequency 3.5G Wireless Modem

The Wireless GPRS Modem provides fast mobile communication access and offers the perfect solution in industrial data communication. It is fitted with a SIM Card drawer structure, and it may be connected with any standard RS-422 interface. Data is transmitted at 3.5G, and the modem is fully compatible with GSM/GPRS/EDGE.

IEC 61000-4-30 Class A Test Reports

Upon request, Elspec can provide a comprehensive functionality and calibration test report for each analyzer. Fully automated calibration software is also available for customers in-house use.

Specifications

Real-Time Measurements

Voltage Sampling Rate, Maximum Samples/Cycle	1,024
Voltage Harmonics (Individual, Even, Odd, Total) Up to -	511TH
Type of Analog to Digital Converter	16/20[1] bit

Storage Capacity

Internal Memory	16 GB

Power Quality Analysis

Transient Detection, Microseconds (50Hz/60Hz)	19.5/16.3µs

Applicable Measurement Standards

EN50160, IEEE1159, IEEE519, IEC61000-4-15, IEC61000-4-7, IEC61000-4-30 Class A, IEC62053-22/23 Class 0.2

Control

Comprehensive web server for local and remote real-time monitoring and control

Applicable Safety Standards

EN61010-1:2001 2nd Edition

Applicable Environmental Standards

IEC60068-2-1, 2, 6, 11, 27, 30, 75

Applicable EMC Standards

EN55011 Group 1 Class A, FCC Part 15 Subpart B Class A, EN60439-1 (clauses 7.9.1, 7.9.3, 7.9.4, 7.10.3, 7.10.4), IEC61000-3-3, EN61000-6-2, IEC60255

Voltage

Channels	3 Phase + Neutral
Nominal Full Scale	1000V
Maximum Peak Measurement	8kV
Input Impedance	50MΩ
Uncertainty	0.1% of Nominal

Current

Channels	3 Phase + Neutral
Nominal Full Scale	5A/1A
Maximum Peak Measurement	100A
Burden	0.0001VA@5A
Phase	±0.42°@3A ±0.17°@5A
Uncertainty	0.1% of Nominal

Time

Real Time Clock	20ppm
Synchronization Device	Accuracy
GPS	100-200µs
IRIG B	100-200µs
DCF-77	±15ms
SNTP Server	50-100µs

Frequency

Fundamental Frequency	42.5 Hz to 69 Hz
Frequency Resolution	10 mHz
Frequency Accuracy	±10 mHz

Power Supply

Auxiliary Supply – PoE In	According to 802.3af
Auxiliary DC Supply	48 Vdc
Operating Range	100-260 VAC: 50/60 Hz 100-300 VDC

Communication Protocols

Modbus TCP, Modbus RTU, OPC, DNP3 SMTP Client

RS-485/422

Environmental Conditions

Operation Temperature	-20°C to 70°C(-4°F to 158°F)
Storage Temperature	-40°C to 85°C(-40°F – 185°F)

[1] Effective bits.

Disclaimer: Specifications subject to change without prior notice.

Worldwide Innovator in Power Quality

Since 1988 Elspec has developed, manufactured and marketed proven power quality solutions far exceeding our clients' needs and expectations. Our innovations not only simplify the understanding of the quality of power itself, but are also highly compatible, making it suitable for any business and or application. Elspec's international team of professionals with extensive experience in electrical engineering are ready to provide a tailor-made strategy that will enable a sustainable and efficient use of your electrical energy.

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ELSPEC BLACKBOX

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