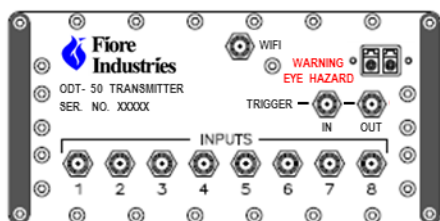


Data Sheet: 1251B (October 2017) **[Preliminary]**

Wideband Digitizing Optical Data Link Model ODS-5000 80 Hz – 3.0 GHz

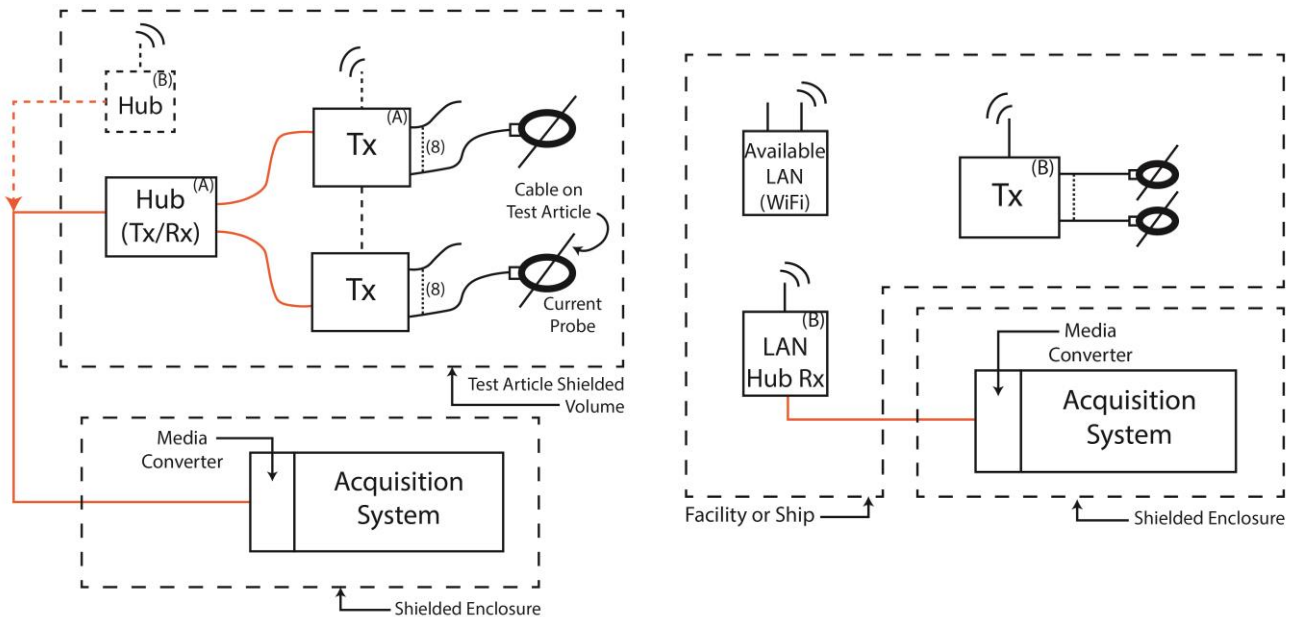
Combining the best state-of-the-art modular digitizing technologies from the Commercial Marketplace (USA) and System Integration Capabilities from Fiore Industries (USA), the ODS-5000 is the newest model in a range of wideband fiber optic data links, developed for use in EMP/EMC/HPM and lightning-strike test applications. The ODS-5000 supports digitizing data acquisition at the point of data capture (test point) using modular, high-speed digitizing technologies, concurrent channel acquisition (up to 4 simultaneous input channels), deep memory (8 Mpoint/input), and gain range from -55 to +50 dB (in 1 dB steps), with full remote control (as with the ODS-2200). Now produced exclusively by Fiore Industries, Inc. for the US and Non-Domestic Markets, utilizing the latest developments in modular ADC design, coupled with a rich remote control environment, the ODS-5000 is a unique product for supporting Electromagnetic Effects testing in harsh or Threat-level environments. The ODS-5000 provides low noise, wideband signal transmission from 80 Hz to 3.0 GHz (wider bandwidths are available). The ODS-5000 is designed to support test requirements involving current, voltage, and field measurements, both 50 ohm and high impedance, with differential mode versions available, and integrated measurements (using B-dot and D-dot sensors together with Fiore's in-line passive integrators, the FPI Series, in conjunction with the 1 MOhm input buffer). The relatively small size of the optical transmitter facilitates obtaining measurements in confined spaces and the remote control functionality enhances operations where facility testing time must be minimized.

The ODS-5000 also supports multiple modes of inter-transmitter and transmitter-to-acquisition system communications via industry-standard network (via fiber) and Wifi connections. The ODS-5000 can also be configured to connect into an existing Wifi network to use this network for data transfer and transmitter control. The basic system consists of an optical fiber (running TCP/IP network protocols) connected from a (presumably shielded) acquisition system to a transmitter (or network router/extender), then transmitters are interconnected via fibers to form a network over which data and control communications are transferred to/from the acquisition system. This configuration eliminates the extensive fiber network required by analog optical links. Further reduction of and possibly elimination of fiber connections can be accomplished using the "all-Wifi" configuration. Two possible configurations for deployment of the ODS-5000 are shown below.

The ODS-5000 consists of optical transmitters (ODT-50), battery packs, optical media converters, high speed optical fibers, and multi-station battery chargers. Each optical transmitter contains 8-inputs, with the capability to acquire data from four inputs simultaneously, increasing the system throughput by a

factor of four over the single-input selection approach used in other optical data systems. The ODT-50 transmitters and battery packs are shielded against EM environments to more than 100 kV/m and capable of operating without performance degradation over a wide temperature range (-20°C to +55°C). The ODS-5000 supports a variety of triggering modes, including trigger by channel, external triggering (at each transmitter), and trigger daisy-chaining between transmitters with one transmitter being the primary trigger source. The ODS-5000 system includes battery packs and chargers that are not backwards-compatible with the ODS-1800 & 2200 battery and charger hardware. The ODS-5000 battery chargers are available in multi-station rackmount configurations, as well as, a small, low-cost desktop, single-battery-pack charging unit. A system (consisting of one or more complete channels) as delivered for a single channel, requires a PC to run the PC-compatible, Optical Controller Application, which also provides a remote control interface, a communications fiber, a media converter interface (for the controller PC), a battery pack, and charger.

Configurations for ODS-5000 Deployment for EME Testing



ODS-5000 Optical Link Component Performance Specifications

Parameter	Conditions	Value
Transmitter RF signal inputs	1-of-8 selection (unselected inputs internally terminated in 50 Ohm) or 4 concurrently-selected	50 Ohm, 8-way or 2x4 way input
Cross-Talk/Isolation	All 8 inputs	>60 dB, dc to 3 GHz
In-line Passive Integrator (available separately for use with the ODT-50)	attachable to any input	Time Constants available from: 0.1 µsec up to 10 µsec
3dB bandwidth	maximum lower	80 Hz
	typical lower	60 Hz
	minimum upper	3000 MHz
	typical upper	3300 MHz
Full scale input signal range (50 Ohm inputs)	105dB gain range, switchable in 1dB steps (maximum CW input power 0.5W; +27 dBm, or ±5 Vdc)	-50 dBm up to +55 dBm
		57 dBuV up to 162 dBuV
		1 mV _{peak} up to 178 V _{peak}
System gain (Transmitter)	Remotely selectable in 1dB steps	-55 dB up to +50 dB
SNR (p-p signal/rms noise)	typical (measured in a noise bandwidth of 3000 MHz)	> 48 dB
Equivalent Input Noise	at maximum input sensitivity	-168 dBm/Hz
Receiver output noise floor	typical (for system gains between -55dB and +33dB)	-135 dBm/Hz
Bandpass flatness	100 Hz – 3.0 GHz	± 1 dB maximum
Calibration Signals	Transmitter Internal, remotely selectable	Low Freq: 50 kHz
		Hi Freq: 50 MHz fast risetime (harmonics to > 1.6 GHz)
Trigger Input/Output	50 ohms/50 ohms	3-5 Volts/5 Volts
Transmitter Wifi	Protocols Supported, a/b/g/n	Dual Band, 2.4 Ghz/5GHz
Transmitter Network (Optical)	TCP/IP	1 GBit/sec

Environmental & Power Specifications for ODS-5000 Components

Parameter	Condition	Value
Operational temperature, ODT-50	Transmitter with B-50 Battery Pack installed	-20 to +55°C, 0 to 95% relative humidity (non-condensing)
Storage temperature, ODT-50	Transmitter without B-50 Battery Pack installed	-30°C to +70°C
EMI Hardening (ODT-50)	Transmitter with B-50 Battery Pack installed	Shielded to >100kV/m, with no operational degradation
Power consumption (Transmitter) ^[1]	Optical link On , fully charged B-50 Battery Pack, Li-Ion (51Ah @ 12 volts)	<5000 mA (over temperature), >8 hours typical continuous operation with optical link ON, before link cut-off ^[1]
	optical link Off (Standby), fully-charged B-50 Battery Pack, Li-Ion (51 Ah @ 12 volts)	<1 mA (over temperature), >2600 hours before battery cut-off
Battery Pack, B-50 (automated battery voltage protection monitoring)	operation	-20 to +55°C (non-condensing)
	storage	-30°C to +70°C

[1] Control system for transmitter and acquisition system applications includes power management functions; battery life for transient testing depends on transmitter **On** time and duty cycle.



8601 Washington St NE, Suite B
Albuquerque, NM 87113
Tel: 505-255-9797
Website: www.fiore-ind.com

Transmitter & Battery Pack input/output and physical specifications

Input/Output Connectors	
Connector	Type
Transmitter Control/Data Input/Output Connector Type (optical – Digital Data), Duplex Connector	LC/APC* (Single-mode)
Transmitter Signal Input Connector Type (RF – Analog Data)	SMA(F)
Transmitter Trigger Input/Output Connector Type (RF – Analog)	SMA(F)
Transmitter Wifi Input Connector Type	SMA(F)
Optical Media Converter Input Connector Type (optical – Digital Data)	LC/APC (Single-mode)

* Secondary optical connector available for daisy-chaining transmitters together.

Physical Dimensions	
Component	Value
Transmitter (Model ODT-50 including installed battery **)	L: 5.74” (146 mm) W: 4.75” (121 mm) H: 3.25” (83 mm) Weight: 2.2 kg (4.8 lbs)
Battery Pack (Model B-50)	L: 5.74” (146 mm) W: 2.37” (60 mm) H: 3.25” (83 mm)
Battery Charger Chassis, 4-station (Model BC-50R)	L: 11.7” (298 mm) W: 19” (483 mm) H: 6.97” (177 mm)
Battery Charger single-station (Model BC-50S)	L: 5.74” (146 mm) W: 2.37” (60 mm) H: 3.25” (83 mm)
Optical Fiber System, Model FS-5000 A/B/C/D/E/F/G/H Simplex Fiber: one Single-Mode (Digital Data), Two-section Reel provided for lengths >100m.	

** Installation of battery pack increases the transmitter size.

Summary of ODS-5000 Model Numbers with component names

ODS-5000 Model Number	Item Name/Description
ODT-50	Digitizing Optical Transmitter, 8-RF Input ^[1]
B-50	Battery Pack, 12 V, Li-Ion, 51 Ah
BC-50S	Battery Charger, Desktop, 1-Station
BC-50R	Battery Charger Chassis, Rackmount (4-charger stations)
FS-5000A	Optical Fiber System, Simplex Single-mode, 10 meter ^{[2][3]}
FS-5000B	Optical Fiber System, Simplex Single-mode, 30 meter ^{[2][3]}
FS-5000C	Optical Fiber System, Duplex Single-mode, 50 meter ^{[2][3]}
FS-5000D	Optical Fiber System, Duplex Single-mode, 100 meter (with reel) ^{[2][3]}
FS-5000E	Optical Fiber System, Duplex Single-mode, 200 meter (with reel) ^{[2][3]}
FS-5000F	Optical Fiber System, Duplex Single-mode, 300 meter (with reel) ^{[2][3]}
FS-5000G	Optical Fiber System, Duplex Single-mode, 500 meter (with reel) ^{[2][3]}
OC-5000	Optical Controller & Software ^[4]

- Notes:**
- [1] Specify at time of purchase, desired interconnection configuration for testing deployment; system provided with optical media converter.
 - [2] Specify length of fiber desired at time of purchase; standard lengths with model and part numbers are 10m, 30m, 45m, 100m, 200m , 300m, 400m, & 500m. Custom lengths are available. Contact Fiore Industries, Inc. for custom length pricing.
 - [3] Customers requiring interconnection of multiple fiber segments via optical patch panels can order Optical Patch Panels from Fiore Industries.
 - [4] Hardware controller optional; Controller Software application available at no charge on CD.

Support for system integration and custom data acquisition applications development, involving the ODS-5000, are available from Fiore Industries, Inc. For pricing and delivery of ODS-5000 components or integrated systems support, please contact Fiore Industries, Inc. (info@fiore-ind.com).



8601 Washington St NE, Suite B
Albuquerque, NM 87113
Tel: 505-255-9797
Website: www.fiore-ind.com