

Data Sheet: 1250C (November 2017)

## Wideband Optical Data Link Model ODS-2200 80 Hz – 2.4 GHz



System shown includes single-station battery charger

Fiber spool  
for  $\geq 100\text{m}$   
lengths

Combining the best state-of-the-art optical link technologies from Opcom Research (UK) and System Integration Capabilities from Fiore Industries (USA), the ODS-2200 is the newest model in a range of wideband analog fiber optic data links, developed for use in EMP/EMC/HPM and lightning-strike test applications. Now produced exclusively by Fiore Industries, Inc. for the US market, utilizing the latest developments in analog design and optical link technology from Opcom Research, the ODS-2200 provides low noise, wideband signal transmission from 80 Hz to 2.4 GHz. The system is designed to support test requirements involving current, voltage, and field measurements, both 50 ohm and high impedance, 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-2200 consists of optical transmitters, battery packs, receiver chassis, and high speed optical fibers. Models are available with one-to-four (desktop, pictured above; chassis includes a rear-mounted, dual-station battery charger) and one-to-eight (rackmount) channels per receiver chassis. Simultaneously-controllable, multiple receiver chassis configurations are supported. Each receiver channel has a dedicated optical transmitter (ODT-22) which is capable of monitoring 8 separate test points, selectable one-at-a-time by remote control, with variable gain remotely selectable from -55 to +50 dB, in 1 dB steps. The ODT-22 transmitters and battery packs are shielded against EM environments to more than  $100 \text{ kV/m}$  and capable of operating without performance degradation over a wide temperature range (-20°C to +55°C). The ODS-2200 system includes battery packs and chargers that are backwards-compatible with the ODS-1800 battery and charger hardware. The ODS-2200 battery chargers are available in multi-station rackmount & desktop configurations, as well as, a small, low-cost desktop, single-battery-pack charging unit (shown above). A system (consisting of one or more complete channels) is delivered with a PC-compatible, Optical Controller Application, which also provides a remote control interface (accessible via TCP/IP).

**ODS-2200 Optical Link Component Performance Specifications**

Parameter	Conditions	Value
Transmitter signal inputs	1-of-8 selection (unselected inputs internally terminated in 50 Ohm)	50 Ohm, 8-way input
Cross-Talk/Isolation	All 8 inputs	>60 dB, dc to 3 GHz
Hi Z switchable input buffer	remotely selectable for any input	50/1M Ohm, 8-way input
In-line Passive Integrator (available separately for use with the ODT-22)	attachable to any input	Time Constants available from: 0.1 $\mu$ sec up to 10 $\mu$ sec
3dB bandwidth	maximum lower	80 Hz
	typical lower	60 Hz
	minimum upper	2200 MHz
	typical upper	2400 MHz
Output signal level	full scale into 50 Ohm (at <0.2dB gain compression) (+4 dBm at < 1.0 dB gain compression)	0 dBm
		107 dBuV
		632 mVp-p
Full scale input signal range (50 Ohm inputs)	105dB gain range, switchable in 1dB steps (maximum CW input power 0.5W; +27 dBm, or $\pm$ 5 Vdc)	-50 dBm up to +55 dBm
		57 dBuV up to 162 dBuV
		1 mVpeak up to 178 Vpeak
System gain	Remotely selectable in 1dB steps	-55 dB up to +50 dB
SNR (p-p signal/rms noise)	typical (measured in a noise bandwidth of 2200 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 – 2.0 GHz	$\pm$ 1 dB maximum
Receiver AGC dynamic range	typical	6 dB optical power
Calibration Signals	Transmitter Internal, remotely selectable	Low Freq: 50 kHz
		Hi Freq: 50 MHz fast risetime (harmonics to > 1.6 GHz)

**Environmental & Power Specifications for ODS-2200 Components**

Parameter	Condition	Value
Operational temperature, ODT-22	Transmitter with B-22 Battery Pack installed	-20 to +55°C, 0 to 95% relative humidity (non-condensing)
	Receiver Chassis	0°C to 45°C, 0 to 95% relative humidity (non-condensing)
Storage temperature, ODT-22	Transmitter without B-22 Battery Pack installed	-30°C to +70°C
	Receiver Module (standalone, not installed in Chassis)	-30°C to +70°C
EMI Hardening (ODT-22)	Transmitter with B-22 Battery Pack installed	Shielded to >100kV/m, with no operational degradation
Power consumption (Transmitter)	Optical link <b>On</b> , fully charged B-22 Battery Pack (3.4 Ah @ 7.4 volts)	<80 mA (over temperature), >36 hours typical operation with optical link ON, before link cut-off
	optical link <b>Off</b> (Standby), fully-charged B-22 Battery Pack (3.4 Ah @ 7.4 volts)	<1 mA (over temperature), >2600 hours before battery cut-off
Battery Pack, B-22 (automated battery voltage protection monitoring)	operation	-20 to +55°C (non-condensing)
	storage	-30°C to +70°C
Power consumption (ODR-22F/G Receiver Chassis w/8 Rx Modules)	120/240 Vac, 50-60 Hz Input (auto-sensing)	< 20 Watts
		.5 A @ 120 Vac/.25 A @ 240 Vac



**Transmitter, Receiver, & Battery Pack input/output and physical specifications**

Input/Output Connectors		Physical Dimensions	
Connector	Type	Component	Value
Transmitter Output Connector Type (optical – Analog Data)	LC/APC* (Single-mode)	Transmitter (Model ODT-22 including installed battery **)	L: 4.74” (120 mm) W: 5.35” (136 mm) H: 2.64” (67 mm) Weight: 1.8 kg (4 lbs)
Transmitter Input/Output Connector Type (optical – Digital Control Data)	LC/APC* (Single-mode)	Battery Pack (Model B-22)	L: 1.02” (26 mm) W: 3.55” (90 mm) H: 2.12” (54 mm)
Transmitter Input Connector Type (RF – Analog Data)	SMA(F)	Receiver Module (Model ODR-22M)	L: 3.62” (92 mm) W: 0.80” (20 mm) H: 3.31” (84 mm)
Receiver Input Connector Type (optical – Analog Data)	LC/APC* (Single-mode)	Receiver Chassis (Model ODR-22F)	L: 11.7” (311 mm) W: 19” (483 mm) H: 5.25” (133 mm)
Receiver Input/Output Connector Type (optical – Digital Control Data)	LC/APC* (Single-mode)	Receiver Chassis (Model ODR-22G)	L: 11.7” (298 mm) W: 19” (483 mm) H: 5.25” (133 mm)
Receiver Module Output Connector Type (RF – Analog Data)	SMA(F) (Receiver Chassis output is N-type Female)	Receiver Chassis (Model ODR-22H) 1-4 ch. Capacity w/2 station charger ***	L: 12.25” (311 mm) W: 10.25” (260 mm) H: 5.75” (146 mm)
Receiver Chassis ODR-22F (Rackmount version)	Optical Inputs <b>(Rear Panel)</b> LC/APC & LC/APC	Battery Charger Chassis, 8-station (Model BC-22R) ***	L: 11.7” (298 mm) W: 19” (483 mm) H: 6.97” (177 mm)
	RF Outputs <b>(Front Panel)</b> N-type Female	Battery Charger Chassis, four-station (Model BC-22D) ***	L: 12.25” (311 mm) W: 10.25” (260 mm) H: 5.25” (146 mm)
Receiver Chassis ODR-22G (Rackmount version)	Optical Inputs <b>(Front Panel)</b> LC/APC & LC/APC	Battery Charger, Single-Station (Model BC-22S)	L: 3.54” (90 mm) W: 4.72” (120 mm) H: 4.63” (118 mm)
	RF Outputs <b>(Front Panel)</b> N-type Female	Optical Fiber System, Model FS-2200A/B/C/D/E/F/G/H Duplex Fiber: both Single-Mode (Data & Control). Two-section Reel provided for lengths ≥100m.	
Receiver Chassis ODR-22H (Desktop version)	Optical Inputs <b>(Front Panel)</b> LC/APC & LC/APC	* Optical inputs are duplex LC bulkhead connector	
	RF Outputs <b>(Front Panel)</b> N-type Female	** Installation of battery pack does not change transmitter size	

\*\*\* Transmitter is compatible with ODT-18 & 22 Battery Packs; BC-22R & D chargers will not charge the BP-18 battery pack due to magnetic latching system. BC-22S will charge the BP-18 batteries.

A summary of ODS-2200 Model Numbers with component names is provided below.



ODS-2200 Model Number	Item Name/Description
ODR-22F	Optical Receiver Chassis, Rackmount, RF Outputs Front, Optical Connections Rear (1-8 channel capacity) <sup>[1]</sup>
ODR-22G	Optical Receiver Chassis, Rackmount (1-8 channel capacity) <sup>[1]</sup>
ODR-22H	Optical Receiver Chassis, Desktop (1-4 channel capacity, with Integral 2-Station Battery Charger)
ODR-22M	Optical Receiver Module
ODT-22	Optical Transmitter, 8-RF Input
B-22	Battery Pack, 7.4 V (for ODT-22)
BC-22S	Battery Charger, Desktop, 1-Station
BC-22D	Battery Charger Chassis, Desktop, 4-Station
BC-22R	Battery Charger Chassis, Rackmount (6-charger stations)
FS-2200A	Optical Fiber System, Duplex Single-mode, 10 meter <sup>[2][3]</sup>
FS-2200B	Optical Fiber System, Duplex Single-mode, 30 meter <sup>[2][3]</sup>
FS-2200C	Optical Fiber System, Duplex Single-mode, 50 meter <sup>[2][3]</sup>
FS-2200D	Optical Fiber System, Duplex Single-mode, 100 meter (with reel) <sup>[2][3]</sup>
FS-2200E	Optical Fiber System, Duplex Single-mode, 200 meter (with reel) <sup>[2][3]</sup>
FS-2200F	Optical Fiber System, Duplex Single-mode, 300 meter (with reel) <sup>[2][3]</sup>
FS-2200G	Optical Fiber System, Duplex Single-mode, 500 meter (with reel) <sup>[2][3]</sup>
OC-2200	Optical Controller & Software <sup>[4]</sup>

- Notes:**
- [1] Specify at time of purchase, number of receiver channels to be installed.
  - [2] Specify length of fiber desired at time of purchase; standard lengths with model and part numbers are 10m, 30m, 50m, 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-2200, are available from Fiore Industries, Inc. For pricing and delivery of ODS-2200 components or integrated systems support, please contact Fiore Industries, Inc. ([info@fiore-ind.com](mailto:info@fiore-ind.com)).



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