

Actual Product May Vary from Demo Picture

## Applications

- Radar Calibration and Testing
- Phase Shift Discriminators
- Signal Processing
- Electronic Warfare (EW) Systems
- Radar Warning Receivers
- Clutter Canceller

## Features

- Up to 2000  $\mu$ sec Delays
- Extremely Low Signal Phase Shift vs. Time & Temperature
- 0.05 - 60 GHz Bandwidth
- Flat RF Frequency Response
- Minimal Triple-Transit Echoes
- Modular Design Supports Different Time Delay Adjustments and RF Requirements
- Low Link Losses
- Very Low Temperature Sensitivity
- RF Amplified and Unamplified Versions Available
- Time Delay can be Configured/Controlled and Monitored Remotely via SNMP
- Proprietary Application Programmable Interface (API software) Allows Automatic (via Computer) Time Delays Setting
- AC Surge Protector

EMCORE's variable (progressive) Fiber Optic Delay Line System (DLS) offer superior performance for radar range calibration, ground-based system tests, radar warning receivers, timing control, path delay simulation, clutter canceller and phase shift discriminators. Delay lengths of up to 2,000  $\mu$ sec are available along with a wide range of RF and optical performance options and packages.



The DLS provides convenient RF input / outputs that connect to an internal F/O transmitter, optical fiber, optical amplifiers (EDFAs), optical switches and F/O receiver. Internally, the RF signal is converted to an optical signal and transmitted over a fiber optic link to the receiver and provides the required signal delay time. Frequency range, delay length, and link performance requirements can be tailored over a wide range of performance levels to meet specific requirements. These options include RF amplification in the transmitter and receiver, as well as optical amplification for longer delays. The DLS can be designed with either standard single mode or dispersion shifted fibers. Dispersion compensation fibers are also available.

EMCORE's DLS offers compelling size, weight and performance advantages over traditional coax or waveguide solutions with the technical advantage of EMCORE's DLS delivering extremely low signal phase shift over temperature and time. This very important feature has been achieved by using special mechanical design and fiber spools packaging. The system is supplied as a complete solution with all modules mounted in 19" racks that use standard AC power. Packaging options include various rack configurations and temperature stabilized optical fiber.

## Specifications

**Specifications (Guaranteed @ +25 °C +/- 5 °C)**

**Typical RF Characteristics (measured with Optiva OTS-2 Series Tx, Rx and EDFAs)**

Parameter	Value	Unit	Comments	
RF Frequency Range	0.05 - 60	GHz	TBD*	
Time Delay Range	0 to 2000	$\mu$ sec	> 2000 $\mu$ sec is possible	
Time Delay Tolerance	$\leq \pm 2$	%	TBD* (depends on time delay)	
Time Delay Adjustment Step	4	$\mu$ sec	TBD*	
Phase Stability vs. Time	$\Delta\phi < 1^\circ$ per 10 sec	Degrees ( $^\circ$ )	Typical for 400 $\mu$ sec DLS, 10 GHz	
Phase Stability vs Temperature	$< 0.0005$	mrad / m / $^\circ$ K		
RF Input Level	0 to +14	dBm	Typical (up to 18 GHz)	
Deviation from Linear Phase	$\leq 5^\circ$	Degrees ( $^\circ$ )		
Amplitude Linearity	$\leq \pm 0.5$	dB		
Link Gain (@ RF in = 0 dBm)	-16 to -10	dB		
VSWR (@ 9 GHz)	$\leq 1.22$	dB		
Spur Level	$\leq -60$	dBc		
Input 1 dB Compression Point	$\geq +14$	dBm		
2nd Harmonic (@ RF <sub>in</sub> = 0 dBm)	$\leq -45$	dBc		
Input Third Order Intercept	$> +25$	dBm		
Noise Figure	$< 70$	dB		
RF Connectors (Depending on Frequency)	2.92 / 1.85	mm		
				Typical (TBD)*

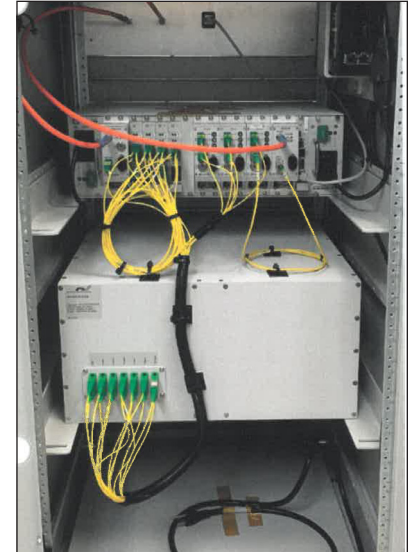
\*Typical Values can be tailored to meet specific customer requirements.

## General Characteristics

Parameter	Value	Unit	Comments
Weight	TBD (depends on fiber spools quantity)	Lbs.	(> 25)*
Size	TBD (depends on fiber spools quantity)	19", >12U rack	Height depends on number of spools (delay time)*
AC Input	110 or 220	VAC	
Operating Temperature Range	+20 to +30	°C	N/A
Storage Temperature Range	0 to +50	°C	N/A

\*Typical Values can be tailored to meet specific customer requirements.

EMCORE designs and builds fiber optic delay lines to address a wide range of applications, performance levels and packaging configurations. Our extensive experience in high performance RF and microwave photonics provides EMCORE with a breadth of capabilities unmatched in the industry. For a comprehensive review of your specifications and application, please contact EMCORE directly.



## Laser Safety

### Class IIIb Laser Product

FDA/CDRH Class IIIB laser product. All transmitter versions are Class IIIB laser products per CDRH, 21 CFR 2040 Laser Safety Requirements. All versions are Class 3B laser products IEC\*60825-1:1993.

Maximum Output Optical Power = 14 dBm

\*Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

\*IEC is a registered trademark of the International Electrotechnical Commission.

