

## High Frequency Ka Band Optical Delay Lines



### Key Features:

- Delays 1 nanosec to 500  $\mu$ sec or more
- Supports frequencies – from DC to Ka
- Delay accuracy <0.5%
- Displays Delay, Round-trip Distance, Range, and Altitude
- Customized solution; short delivery time
- High Dynamic Range
- Excellent Phase noise
- USB API for automatic testing

### Options:

- Pre and Post Amplifiers
- Delay expansion
- RF and Optical Bypass
- Fast switching <100  $\mu$ sec
- Amplitude Control
- Dual ODL; 2-way signal transmission
- DC Power

### Monitoring:

- Managed remotely by software or locally through a navigation switch

### ODL Configurations:

- Single Delay ODL
- Multi Delay ODL
- Progressive Variable ODL forming up to 4,096 delay combinations
- Bidirectional ODL
- Multipath ODL
- Mini ODL up to 15  $\mu$ sec

### Applications:

- Radar Calibration testing
- Signal and Phase Noise processing
- Extension of radar range site
- Clutter Canceled
- EW systems
- Altimeter

RFOptic's high-frequency Ka Optical Delay Line (ODL) series provides a high-performance solution for testing and calibrating of radar systems or for RF communication.

The Optical Delay Line (ODL) provides a true time delay of wideband RF signals using low-loss optical fiber. The Input RF signal is converted to an optical signal, delayed by one or more single-mode optical fiber sections, and is converted back into an RF signal at the output.

The ODL can be configured to form up to 4,096 delays using up to 12 predefined time delay values in a single ODL unit.

As listed on the left, RFOptic provides various Optical Delay Line configurations that can support from 1 nanosec up to 500  $\mu$ sec; more than 500  $\mu$ sec can be provided upon request.

Each RFOptic Optical Delay Line operates as a standalone unit with no need for any intervention by the operator. It can be managed remotely by software or locally through a navigation switch and LCD display.

RFOptic's Optical Delay Line solutions offer accurate time delays and an ultra-silent operation.

RFOptic ODL provides investment protection by allowing the addition of external spool(s). Additional options include RF and optical bypass and very fast switching (up to 10  $\mu$ sec), amplitude control, dual ODL (2-way signal transmission), and DC power (for e.g., altimeter applications).

RFOptic's Mini ODL solution offered in a compact, robust enclosure is recommended when a few short delays of up to 15  $\mu$ sec are required.

RFOptic's Optical Delay Lines are used in a wide range of EW applications, such as Radar and altimeter testing, calibration, and simulation.

## High Frequency Ka Band Optical Delay Line

Electrical	Unit	Specifications (Typical)
Frequency Range <sup>[1]</sup>	GHz	2 - 40
Delay Range <sup>[2]</sup>	μsec	0.001 to 500
Delay steps		Up to 4,096 delay steps
Delay Accuracy <sup>[3]</sup>	%	0.5
Delay Repeatability at +/- 5°C variations	%	0.05
Switching time	ms	10
1dB Compression Point	dBm	> 15
SFDR	dB/Hz <sup>2/3</sup>	105
Gain Flatness	dB	±2.5
Maximum Input No damage	dBm	20
Spurious	dBm	-80
Phase Noise at 6 GHz at 10KHz offset	dBc/Hz	-130
VSWR Input / Output	-	2:1
Input / Output impedance	Ohm	50

Optical and Electrical		
Main AC Supply	VAC	220/110
RF Connectors		SMA
Fiber Connectors <sup>[4]</sup>	-	FC/APC
Control – Manual (front panel)		Navigation Switch
Control – Remote (rear panel)		USB

Mechanical and Environmental Parameters		
Operating Temperature	°C	0 to +60
Storage Temperature	°C	-45 to +85
19" Rack Mounting	mm	440*500*133

[1] Other frequencies upon request.

[2] Other ODL upon request.

[3] Down to 1 μsec.

[4] For additional fiber spools.

To order or for more information, please contact your local RFOptic distributor or send an email to [sales@rfoptic.com](mailto:sales@rfoptic.com)