

## Low Frequency L Band Optical Delay Lines



### Key Features:

- Delays 1 nanosec to 500  $\mu$ sec or more
- Supports frequencies – from DC to L
- Delay accuracy <0.5%
- Customized solution; short delivery time
- High Dynamic Range
- Excellent Phase noise

### Options:

- Pre and Post RF 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 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 Canceler
- EW systems
- Altimeter

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

The Optical Delay Line (ODL) provides 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 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 all 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 with 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 display), and DC power (for e.g., altimeter applications).

RFOptic's Mini ODL solution offered in a compact robust enclosure is recommended when few short delays 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, simulation.

| Electrical                                 | Unit                 | Specifications (Typical) |
|--|----------------------|--------------------------|
| Frequency Range <sup>[1]</sup>             | GHz                  | 0.1 - 2.5                |
| 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 OC variations | %                    | 0.05                     |
| Switching time                             | ms                   | 10                       |
| 1dB Compression Point                      | dB                   | > 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                        | dBm                  | 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 fibers 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)