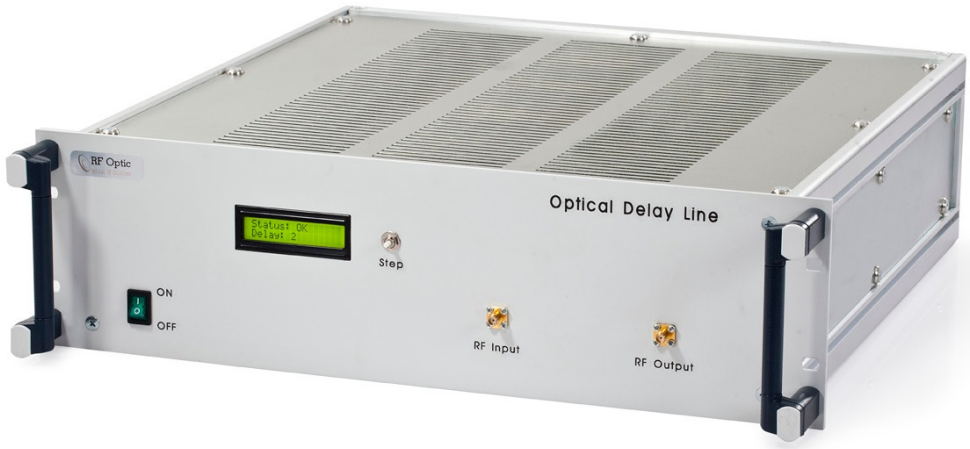
RF Optic
Optical RF Solutions

Optical Delay Line | Progressive



Applications:	Key features:
Radar Calibration & Testing	Delays: 0.1-128 µsec Progressive *
Signal & Phase Noise Processing	Frequency Range: 0.1-8 | 15 | 18GHz
Extension of radar range site	Delay accuracy: 1%
Clutter Canceler	Remote Control: RS-232 or Ethernet
EW Systems-Jammers	High Dynamic Range
Path Delay Simulation	Excellent Phase Noise
	Excellent Group Delay Variation

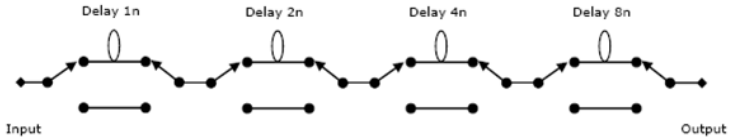
* Example: 7 state Progressive delay can provide: 1,2,3,4…….127 µsec delays in one system.

RFOptic's optical delay line ODL series provide a high performance solution for testing and calibration of radar systems or for RF Communication. The ODL converts analog RF signals at different frequency ranges to optical signals and back, utilizing direct or indirect modulation ODL architecture. The RF input signal is converted into an optical modulated signal, which is then transmitted into a single mode fiber, creating a fixed time delay defined by the fiber length. After passing the fiber, the optical signal is converted back into an electrical RF signal, which is identical to the input RF signal.

The ODL is operated as a standalone unit with no need for any intervention by the operator-it can be also controlled externally from a PC through RS232 or Ethernet interfaces. RFOptic's ODL unit is a compact solution, which provides superb performance including accurate time delay, low spurious emission level, and with ultra silent operation.

Progressive Delay Configuration includes cascaded 2:2 optical matrixes with in-between various delays. The cascaded matrix selects the desired combination of delays to define the desired delay line. With such configuration the user may select any of the 16 combinations of possible delay values (see figure below). RFOptic supports Progressive Delay Configuration up to 256 states.

For some applications, RFOptic offers low cost ODL solution up to 5GHz based on direct modulation.



Progressive Delay Configuration

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Table below describes the typical specifications ODL .			
Parameter	**Unit**	**Specifications**	**Note**
RF			
Frequency range [1]	GHz	L,C,S,X,Ku	
Delay time [2,3,4,5]	µsec	Up to 8 progressive optical delay line configuration.	providing up to 256 states. example: 0.1.2.3.4…256µsec
Delay accuracy [6]	%	1	Minimum accuracy of 25 ns
Delay repeatability	%	<0.01	at +/- 5 °C variations
System RF gain [7,8]	dB	-30	Without the Delay Line loss and the progressive number of states. Gain control to a ~0 dB fixed gain is optional.
Noise Figure at 10GHz [7]	dB	40	Without the Delay Line loss
Group Delay Variation	psec	± 100	
1dB input Compression point	dBm	> 15	
Max input RF power	dBm	+23	
Spurious [9]	dBc	<-100	
Phase noise (at 10kHz offset)	dBc	<-100	
RF Flatness (not including amplifier) [10]	dB	± 2.0 | 2.5 | 3.0	for 0.1 - 8 | 15 | 18 GHz Bands
VSWR	-	2:1	
Impedance	Ohm	50	
Mechanical			
1550 nm laser CW optical power	mW	≤ 20	
Communication [11]	-	RS-232	
RF connectors	-	SMA	N type is available
Main AC supply	VAC	220/110	DC version is available
19” Rack mounting [12]	mm3	440 x 450 x 133	See mechanical drawing
Operating Temperature	°C	-20 ÷ +60	
Storage	°C	(-40) ÷ +85	

(1) L, S, C, X, Ku versions are optional.

(2) RF bypass is optional.

(3) Dispersion compensator unit for long delay / high frequency is optional.

(4) 0.1% accuracy is optional for long delay line.

(5) Not including delay line loss which is about 1dB per 10 µsec delay.

(6) Pre-Amp may be added to improve the noise figure by about 15dB.
Post-Amp may be added to improve the system ODL system gain.

(7) ODL Gain Control to a fix value is optional.

(8) Excluding in-band harmonics.

(9) TTL or Ethernet are optional.

(10) Full BIT is optional (using signal detection at the receiver).