



## Optical Delay Line



Optical Delay Line (ODL) is used for testing and calibrating RADAR systems or communication networks. RF signals are converted into optical signals, transmitted over an optical fiber with a given length (a fixed time delay) and converted back into electrical signal.

ODL is specified also by its operating frequency band: L, S, C, X, Ku or a wideband ODL which covers a part or the full range of frequencies from 10MHz up to 18GHz.

ODL is controlled from the front panel or from remote PC, either through serial communication RS232 or Ethernet.

### Time delay

Negoh-Op produces three groups of ODLs:

1. ODL with a single time delay from 100nsec up to 300  $\mu$ sec delay (20m – 60km of fiber).
2. ODL with 2-8 switchable delays
3. Progressive ODL - by a network of optical switched number of delays can be increased up to 512 states.

Time delay accuracy is 0.01%/ $^{\circ}$ C. For using at outdoor, when high accuracy of the time delay is required, optional temperature compensation can be applied.

### RF and optical components for specific requirements are optional:

1. RF circulator for a single RF input/output
2. RF amplifier or attenuator for controlling the RF level
3. Constant RF gain in a progressive ODL
4. Two signals with delay between, simulating two targets.
5. Addition of Doppler shift to the ODL
6. Stabilization of the RF phase in the ODL

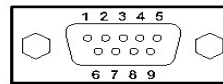


## Product Specifications

Parameter RF	L Band	S Band	C Band	X Band	wide Band	Unit
Frequency Range <sup>[1]</sup>	0.1 – 2.4	0.1-4	0.1-8	8-12	0.1-18	GHz
Delay accuracy <sup>[2]</sup>	1					%
Repeatability and stability over +/-10 °C <sup>[3]</sup>	0.01					%
RF Gain <sup>[4]</sup>	0			-30	-30	dB
Gain Flatness	±1.5 (max) ±0.9 (typ.)	±1.5 (max) ±0.9 (typ.)	±2 (max) ±1.2 (typ.)	±2 (max) ±1.5 (typ.)	±2.5 (max) ±2 (typ.)	dB
1dB compression point	0			15		dBm
Maximum RF input level no damage	+13			+23		dBm
VSWR (S11)	1.7 :1 (typ.)					-
Noise Figure <sup>[5]</sup>	25 (typ.)	35 (typ.)	40 (typ.)	40 (typ.)	45 (typ.)	dB
SFDR	100					dB/Hz <sup>2/3</sup>
Spurious level	< -80					dBm
Added Phase Noise <sup>[6]</sup>	< -140					(dBc/Hz)
Group Delay	0.1					nsec
Input and output impedance	50					Ohm
<b>Mechanical and Environmental</b>						
Rack mount Chassis Dimensions	3U X 19" X 450 (135 X 483X 450)					mm
Mini ODL Dimensions	260 X 160 X 72					
Rack mount Power Supply voltage	90-240					VAC
Mini ODL Power Supply	5 ± 0.25 0.5					VDC A
RF input and output connectors	SMA or N-type					-
Operating temperature range <sup>[6]</sup>	-20 to +70					°C
Storage Temperature range	-40 to +85					°C

- [1] Any frequency band between 0.01GHz to 18 GHz  
 [2] 0.1% Optional  
 [3] Optional can be corrected by software  
 [4] Can be adjusted with pre/post amplifiers to the desired request  
 [5] Can be improved by pre amplifier  
 [6] At 1 KHz

## DB9 Mini ODL connectors



<b>D9-male</b>		
Pin Number	Value	
1+2	+5 VDC	Operating voltage for RFoF Tx and Rx
3	NC	Not Connected
4+5	0	Ground
6,7,8,9	NC	Not connected
<b>D9 -Female</b>		
Pin Number	Value	
1	Tx Led +	Tx Led
2	Tx Led -	Power on/off
3	Rx Led +	Rx Led
4	Rx Led -	Ground
5	Shutdown	At Low voltage or unconnected ODL is active. At high voltage (5Vdc) ODL is shutdown
6,7,8	NC	Not connected