Ka-Band Optical Delay Line 0.17µs to 20.645µs, 5ns step (ODL)

Standard 3U ODL

Key Features:

- Progressive Variable delay ODL
- Delays from 0.17µs to 20.645µs with 2^{12}, 5ns steps
- Wideband 1 - 40GHz coverage, L band to Ka-Band
- Delay accuracy 0.5%
- Displays Delay, Round-trip Distance, Range, and Altitude
- Gain control over all delay states
- Standard solution with short delivery time
- Delay switching speed <10ms (8ms typical)
- Ethernet control API for automatic testing
- Webserver graphic interface, SNMP, and REST API
- Front panel control LCD display and Nav. switch.
- 3U 19” rack mountable solution

Options:

- Extended frequency range 0.1GHz to 40GHz
- Pre and Post RF Amplifiers
- Delay range expansion and finer delay steps
- RF and Optical Bypass
- Faster delay switching <100µs, or <1µs
- Bidirectional ODL; 2-way signal transmission
- Doppler modulation
- USB with API interface and software or Remote management featuring Webserver, SNMP, and REST API

Applications:

- Radar Calibration testing
- Extension of radar range site
- Clutter Cancelation
- EW systems
- Altimeters and proximity fuse testing and calibration

RFOptic's Optical Delay Line (ODL) series provides high-performance solutions for testing and calibrating of radar systems or for RF communications. The series consists of low-frequency models covering 1MHz to 6GHz, which address the L, S, and C bands and high-frequency models covering 100MHz to 67GHz addressing the L, S, C, X, Ku, K, Ka, and V bands. Mini Optical Delay Lines as well Altimeter Optical Daly Lines are available to address OEM and special applications.

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. Amplification is designed in as needed to achieve the necessary RF performance.

ODLs are customized and typically used in Lab or production line settings. They can have a fixed delay or configured to form up to 2^{23} delays using up to 23 predefined time delay values in a single ODL. RFOptic provides various Optical Delay Line configurations that can support delays from 1ns up to 1000µs or more. ODL’s can be controlled remotely by software or manually through a navigation switch and LCD display.

RFOptic ODLs can be configured to support external delay fiber spool(s) . Other options include RF and optical bypass, fast delay state switching <100µs, very fast switching, <1µs, amplitude control, bidirectional ODL (2-way signal transmission), and DC power.

RFOptic’s Optical Delay Lines are used in a wide range of applications including EW, Radar and altimeter testing, calibration, and target simulation with optional Doppler modulation to simulate target movement.

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Unidirectional 40GHz Optical Delay Line – Standard configuration

P/N: ODL-40G-S930 ERP P/N: SYSA00893

Parameter	Specifications (Typical)	Unit	Notes
Frequency Range [1]	1 - 40	GHz	Option 0.1 - 40GHz
ODL Internal Delay (Zero state delay)	170 ± 20	ns	The Zero state delay, **adds** to all delay combinations
Main delay segments [1,2]	5,10, 20, 40, 80, 160, 320, 640, 1280, 2560, 5120, 10240	ns	0.17µs to 20.645µs with 5ns steps
Delay steps	2^{12} = 4096	-	12 segments, 4096 delay states
Delay Range [2]	0.17 to 20.645	µs	
Delay Accuracy [3]	± 1 ± 2 0.5	ns ns %	For the segments 5ns to 40ns For the 80ns to 320ns All others
Delay Repeatability at +/- 5°C variations	0.05	%	
Bypass options	None	-	
ODL system Gain (average)	3 ± 3	dB	
Gain variation between delay states	± 3	dB	Gain control
Gain Flatness	± 3	dB	Full band
1dB Input Compression Point [4]	10	dBm	
Delay switching time	< 10	ms	
VSWR Input / Output	2:1	-	
Maximum Input No damage	16	dBm	No damage limit
Spurious	-80	dBc	
Input / Output impedance	50	Ohm	
Configuration and Environmental			
Power	220/110, 50/60	VAC, Hz	
RF Connectors	2.92mm	-	
Display and Control (front panel)	LCD display and Navigation Switch	-	
Delay display modes	Time Delay, Altitude/Range (1-way) or Distance (2-way)		
Remote Control	RJ45, Ethernet port	-	HTML webserver, REST, SNMP
Operating Temperature	0 to +60	°C	
Storage Temperature	-45 to +85	°C	
Dimensions	19” 3U (440 x 500 x 133mm)	-	19” Rack Mounting

[1] Other frequencies and custom delay steps are available upon request.
[2] The ODL zero state delay is augmented to the minimum step and adds to all delay states. Total true delay value is displayed.
[3] Optional delay accuracies of 0.25% and 0.1% are available upon request.
[4] At 20GHz

To customize, please complete our online ODL/ALT ODL design RFQ form to receive a quotation.

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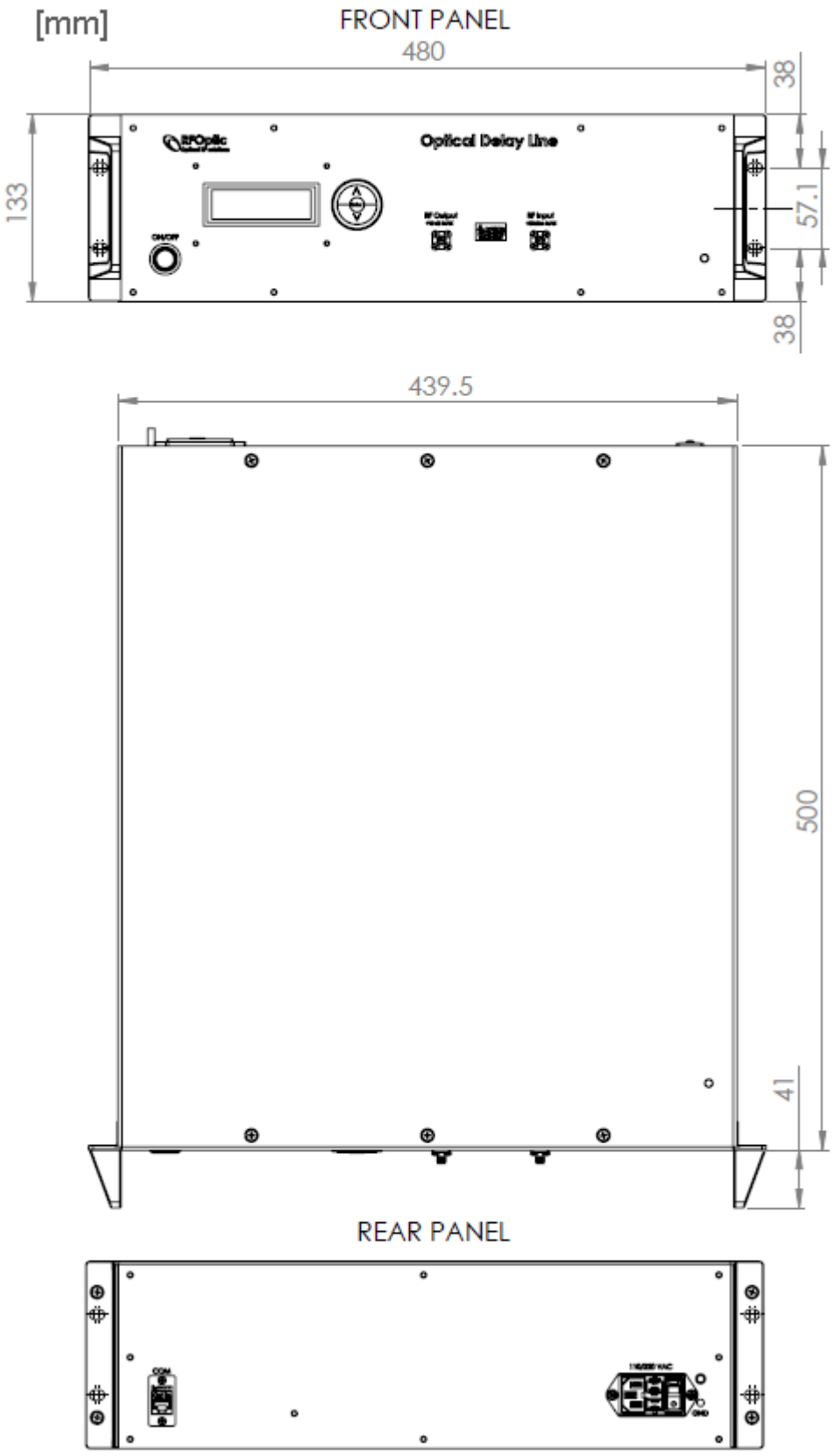
Unidirectional Optical Delay Line – Outline dimensions



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