Colby Instruments

XR-100

Programmable Delay Line Instrument

The XR-100 is designed to give you our broadest signal delay range as well as fast switching speeds

Recommended when you need higher signal power requirements or automated production environments

Overview

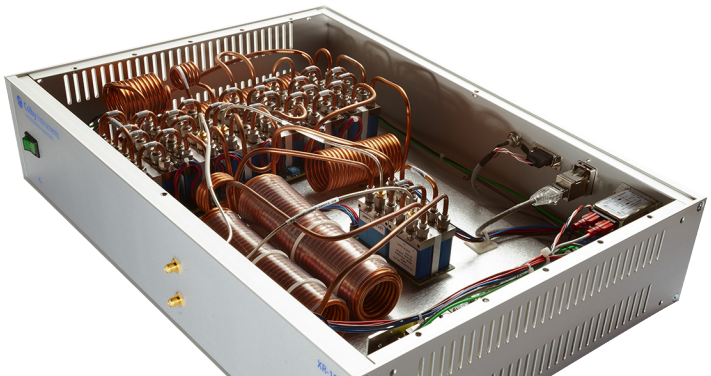
Rather than utilizing the trombone technology featured in our XT series, the XR-100 is made entirely from precision-cut phase-matched semi-rigid coaxial cables and aerospace-grade microvave relays for higher power requirement and comes in a selection of common step-size and delay-range-limit combinations. This same technology also results in fast switching speeds, making the XR-100 ideal for automated production environments.

Features/Benefits

- Easy to setup and use
- Proven reliability, accuracy, and repeatability
- Easily automate or replace manual processes
- Phase shift RF/microwave signals
- Total delay range as high as 200 ns
- Full wideband passive delay from 0-18 GHz
- Step resolution as small as 5.0 ps
- 5m MTBF rating on delay extension relay
- Power handling to 50W CW

Custom Delay

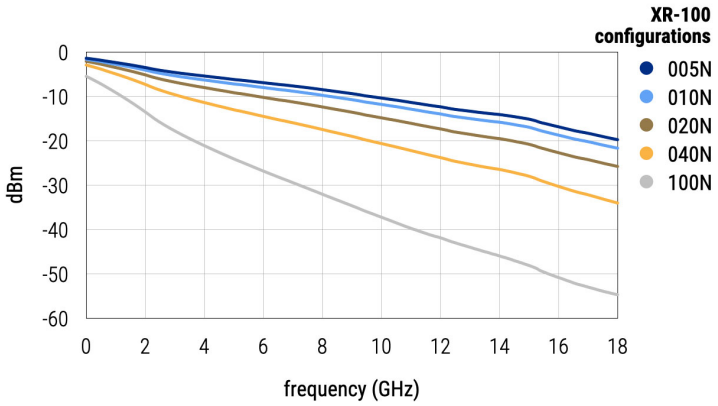
Delay is provided by precisely cut, phase-matched, low-loss, semi rigid coaxial cable and aerospace-grade RF/microwave relays. Instrument control is via industry-standard protocols including Ethernet TCP/IP and RS-232 interfaces. Replace manual phase shifter applications or automate production line and testing applications with programmable delay or phase shift.



Typical Instrument Data Report

An insertion (S21) and return loss (S11) report is generated for each instrument at time of manufacture[1].

Typical insertion loss for all XR-100 configurations at max delay



Options

MT-100A Microterminal (LCD panel and numeric keypad) offers manual entry of desired delay.

[1] Customer receives actual measured insertion (S21) and return loss (S11) data report for each device manufactured.

Colby Product Comparison Chart

XT SERIES
Our most precise programmable delay line instruments using Colby's patented trombone technology.

XR SERIES
Featuring a selection of common step sizes that gives you the broadest signal delay range among all our products.

XS SERIES
Our XS series utilizes solid-state PIN diode technology to give you the fastest switching speeds within a limited signal bandwidth.

	XT-100	XT-200	XR-100	XS-100
Technology Type	Trombone, Trombone + Relay	Trombone	Relays	Solid state PIN diodes
Number of Channels	1	2	1	1
Signal Input Range	0 - 18 GHz	0 - 18 GHz	0 - 18 GHz	100 mhz to 3.5 GHz
Min. Step Resolution	0.25 ps	0.25 ps	5 ps, 10 ps, or 1 ns	1 ps or 5 ps
Max Delay Range	625 ps, 2.50 ns, 5.00 ns, 10.0 ns, 20.0 ns, 50.0 ns, 80.0 ns, 100.0 ns	312.5, 625.0 ps per channel	up to 50.95 ns, 101.91 ns, or 200.0 ns	5.12 ns or 10.23 ns
Phase Shift Step Resolution	0.18 ° per 1 GHz	0.18 ° per 1 GHz	1.8° , 3.60°, and 360° per 1 GHz	9 ° per 1 GHz
Total Phase Shift at 1 GHz	225°, 900°, 1800°, 3600°, 7200°, 18000°, 28800°, 36000°	112.5°, 225°		1842 ° or 3686 °
Total Phase Shift at 5 GHz	1125°,4500°, 9000°, 18000°, 36000°, 90000°, 144000°, 180000°	562.5°, 1125°		n/a
Switching Speed*	250 ms - 6500 ms	250 ms - 6500 ms	< 100 ms	< 50 ms
Ext. Trigger	no	no	no	yes
Ethernet TCP/IP	yes	yes	yes	yes
Serial RS-232	yes	yes	yes	yes
Web Browser UI	yes	yes	yes	yes
Microwave Relay Rated	5m MTBF	n/a	5m MTBF	n/a
Recommended Service Interval	500,000 operations or 1 year [2][3]	500,000 operations or 1 year [2][3]	1 year	n/a
Min. frequency for 360° phase shift coverage	1.6 GHz, 400 MHz, 200 MHz, 100 MHz, 50 MHz, 20 MHz, 12.5 MHz, 10 MHZ	3.2 GHz, 1.6 GHz	1/4	
Dimensions	12" L x 16 3/4" W x 3 1/2" H (2U)	12" L x 16 3/4" W x 3 1/2" H (2U)	12" L x 16 3/4" W x 3 1/2" H (2U)	12.0" L x 16.5" W x 1.75" H (1U)
Weight	4.1 kg (9.0 lbs.) to 5.0 kg (11 lbs.)	5.4 kg (12 lbs.)	5.6 kg (12.5 lbs.) to 6.1 kg (13.5 lbs.)	2.7 kg (6.0 lbs.)

* depending on network latency
[2] Rated lifetime is specified for maximum switching current of 100 ma. Higher currents for increased power handling can be switched (up to 100W CW max.), but the rated lifetime will be lower.
[3] All connection interfaces should be inspected/serviced to ensure instrument is operating at its published performance specifications.

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