

Mach-Zehnder interferometer K-Clock Box

780-925 nm, 1225-1375 nm



DATASHEET

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Features

- Non-Mechanical High Reliability
- Accurate and Reproducible Position Control
- Fast Scan Speeds

Applications

- Laser Display
- Micromachining
- Laser Tweezers
- Optical Inspection
- Heterodyne Interferometer

The KCLK Series k-Clock Box is a timing device for swept-source Optical Coherence Tomography, designed to linearize the sampling of interferometric signals in k-space ($k=2\pi/\lambda$) rather than time or wavelength. It uses a Mach-Zehnder interferometer (MZI) with a fixed optical path difference (OPD) to generate zero crossings at uniform k-intervals, which are converted into digital pulses that trigger the analog-to-digital converter (ADC) for precise, k-linear data acquisition. The unit includes a fiber coupler network that provides both the k-clock and a power monitor signal to track laser output power and wavelength, with low polarization sensitivity. The spacing between k-clock pulses is determined by the MZI's OPD, with larger OPD yielding higher clock frequencies and denser sampling. Powered via an external ± 12 V, 250 mA supply (included), the KCLK box is essential for OCT systems and other applications requiring k-linear sampling, such as optical frequency domain reflectometry (OFDR) and swept-wavelength interferometry.

Specifications

Parameter		Min	Typical	Max	Unit
Wavelength	model 850	780		925	nm
	model 1300	1225		1375	
Free Spectral Range MZI Output			103.3 ±5%		GHz
Fiber Type	model 850	Nufern 780-HP			
	model 1300	Corning SMF28			
Optical Input, Output		FC/APC pigtail, 50cm long			
Insertion Loss ^[1]	model 850		< 1.5	3.0	dB
	model 1300		< 0.7	1.0	
Detector Material/Type	model 850		Si / PIN		nm
	model 1300		InGaAs / PIN		
Detector Wavelength Range	model 850	320		1000	
	model 1300	800		1700	
Scan Angle	model 850		0.53		A/W
	model 1300		1.0		
Bandwidth (3dB) Power Monitor, MZI-Output			DC - 200		MHz
Conversion Gain Power Monitor ^[2]	model 850		30 ±25%		V/W
	model 1300		60 ±25%		
Conversion Gain MZI Output ^[2]	model 850		30 ±25%		V/W
	model 1300		60 ±25%		
Saturation Power	model 850		100		mW
	model 1300		50		
Max. Input Power (photodiode damage threshold)			250		mW
Electrical Outputs, Impedance			SMA, 50		Ω
DC-offset Electrical Outputs			< ±5		mV
Power Supply			±12V, 250mA		

Notes:

[1]. Includes connector losses of the Input and Output pigtail, measured at center wavelength

[2]. Referred to the output power; high impedance load, half value with 50 Ohm load

* All accuracy data are valid at 23 $\pm$ 5°C and 45 $\pm$ 15% humidity

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link](#):

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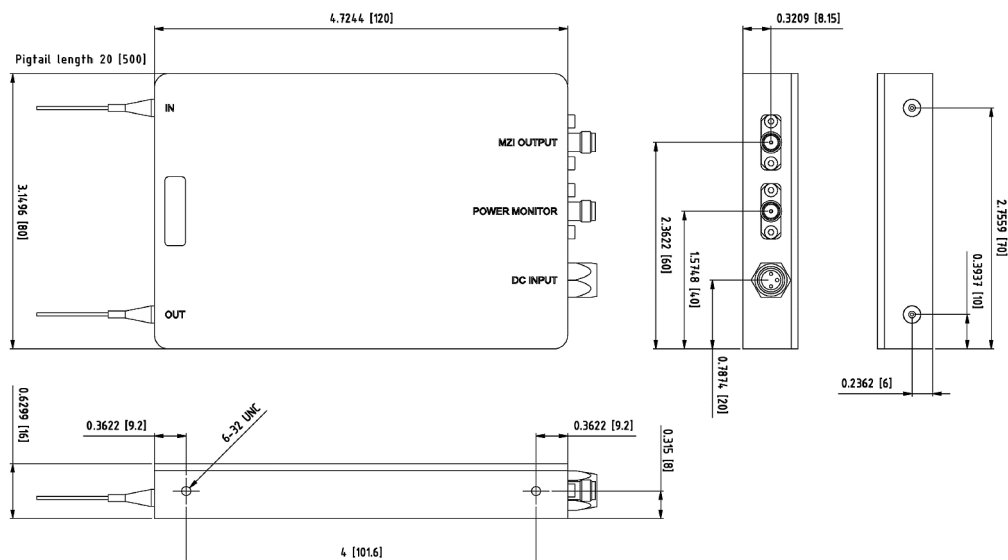
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Mechanical Dimensions (inch [mm])



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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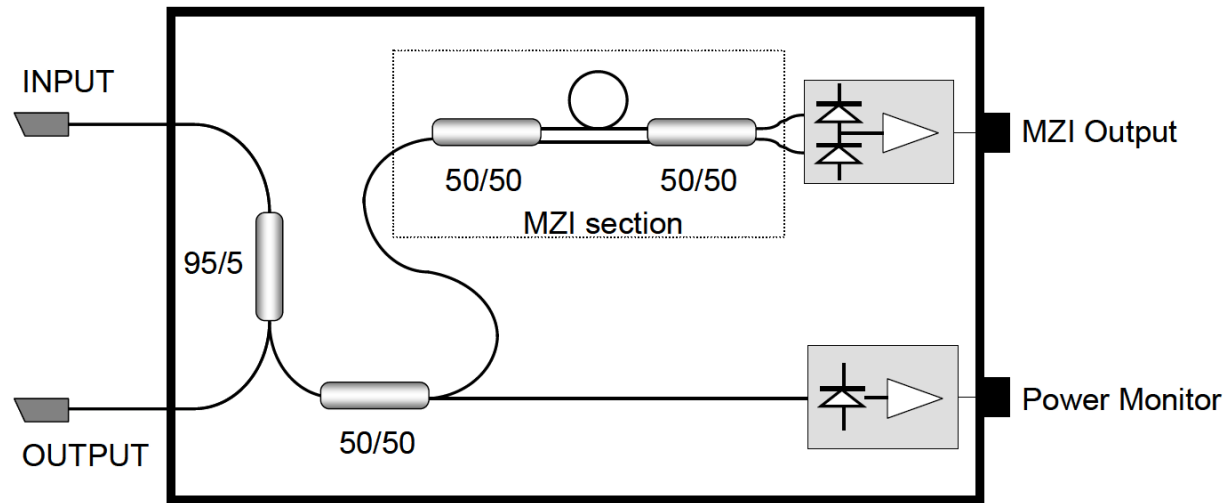
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Functional Block Diagram

The K-Clock Box consists ~50 cm long INPUT and OUTPUT pigtails with FC/APC connectors to be connected to your application.



Ordering Information

	☐	☐	☐	☐	☐	☐	☐
Prefix	Configuration	Wavelength	OPD	Fiber Type	Fiber Cover	Connector	Power Monitor
KCLK-	Standard = 1	1225-1375nm = 1 780-925nm = 2 Special = 0	2mm = 02 5mm = 05 8mm = 08 10mm = 10 13mm = 13 Special = 00	SM28 = 1 780HP = 7	0.9mm Tube = 1	FC/APC = 1	None = 1 Yes = 2 Special = 0

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Typical Response

