PARTOW Technologies LLC

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Micro-ring resonator Electro-optic E-field sensor

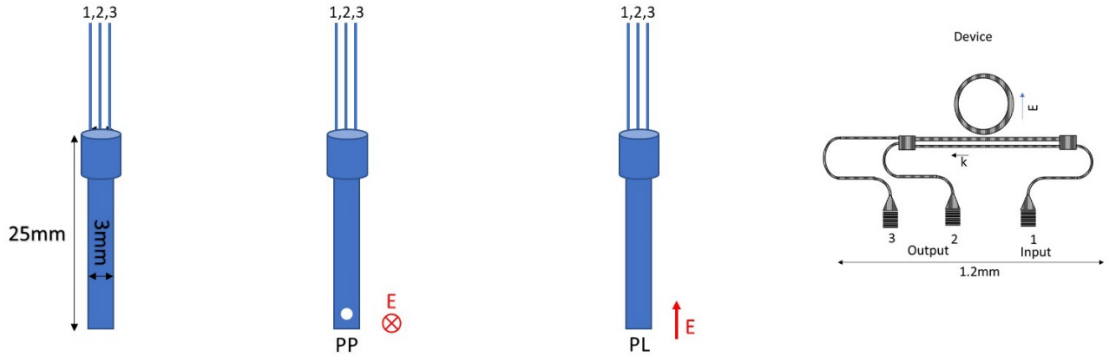
Description

Partow E-field sensor products uses electro-optic micro-ring resonators made from lithium niobate thin films for sensing of electric fields. The sensors can achieve very high spatial resolution and can operated form near DC frequencies up to 2.5GHz. The sensors are made from all dielectric materials. Hence it does not perturb measurand electric field. Also, since fiber optic cables are used these sensors are immune to electromagnetic interference and can be used in highly noisy environments. The readout system is based on a tunable laser and a detector which is separately available. The sensor consists of the sensor element which is in a cylindrical housing and one fiber which is connected to a laser source and two additional fibers that will connect to detectors. The sensor operates at an eye safe wavelength of 1550nm. The sensor produces a voltage proportional to measurand electric field. An oscilloscope, digitizer board, lock in amplifier or spectrum analyzer instrument need to be connected to system output to measure the electric field.

Microring resonator sensor element, P/N MR-2.5GHz-300-XX-B

Parameter	*Value*	*Optional information*
Dynamic range	***0.1V/m-0.5MV/m***	
Sensitivity	***100 mV/(m. Hz $^{0.5}$)***	***Sensitivity for f>10kHz***
Response Gain	***50 (V/m)/(mV)***	***Measured at low frequency using standard controller unit***
Selectivity (Orthogonal components rejection)	***>30 (dB)***	
Optical insertion loss of the sensor	***-12 (dB)***	
E-filed direction **XX**	***PP or PL***	***PP: E field Perpendicular to fiber PL: E field Parallel to fiber***
-3dB sensor bandwidth	***2.5(GHz)***	
Spatial Resolution	***300 (μm)***	***Can be reduced***
Packaged sensor size	***3(mm)x25(mm)***	***Can be reduced down to 1mm***
Fiber pigtail	***1(m)***	
Fiber type, Connector	***PM, FC/APC***	

1m To FC/APC connector



Max sensitivity E Field direction for PP type sensor is shown by a white dot on the sensor head

Max sensitivity E Field direction for PL type sensor is parallel to fiber axis

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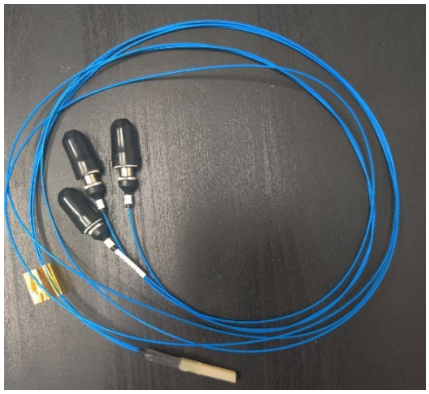
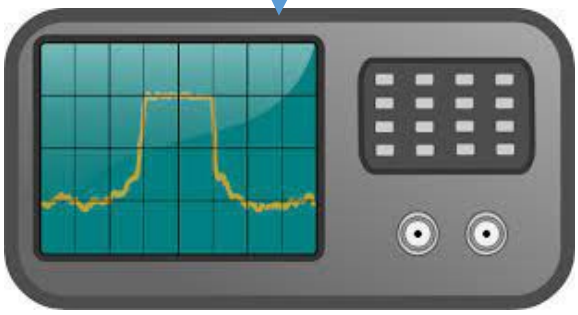
Measurement setup for Micro-ring resonators



Controller unit

Micro-ring resonator sensor element



Spectrum analyzer, oscilloscope, or other data acquisition system (not provided by Partow)

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