FO*system*

The FO*system* is a complete set of instruments for convenient fiber optic transmission of different types of analog signals from a variety of sensors. The FO*system* allows easy implementation of fiber optic transmission to solve noise, safety, and signal quality issues in high-voltage measuring environments and other demanding conditions. The signal bandwidth covers DC up to 10 MHz.

Fiber Optics vs. Wiring

Harsh electromagnetic conditions prevalent in high-voltage and high-current laboratories seriously interfere with the use of conventionally wired measuring equipment. Fiber optic cables that are not prone to electromagnetic interference can replace even long BNC cables.

Applying fiber optic isolation with high impulse-current applications allows the ground potential to have dramatically transient changes without affecting the integrity of the signals captured and transmitted.

Fiber Optic Transmitter FOT1/5

System Components

The Power Diagnostix FO*system* comes in three basic variations, for each of three signal types:

- FOS1 for analog transmission of analog signals from DC up to 10 MHz
- FOS2 for digital transmission of analog signals from DC up to 20 kHz
- FOS3 for pulsed digital transmission of slowly changing signals such as temperatures.
- FOS4 for digital transmission of analog signals from DC up to 65 MS/s

All versions consist of transmission units, receiver units, and sturdy fiber optic cable.

The fiber optic transmitter modules (FOT) are small individual modules for installation at sensors or signal sources. The fiber optic receiver modules (FOR) are mounted side-by-side in a 19-inch or half 19-inch rack.

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Operation

The output signal of the signal source or sensor (for example, voltage, dynamic pressure, current, or partial discharge) is fed to the input of the FOT. The transmitter then either modulates the infrared light emitted by the transmitter diode according to the value of the input signal (amplitude modulation, FOS1), or digitizes the signal and transmits a digital telegram. This optical signal is transmitted via the fiber to the receiver, which converts it back to voltages for further processing.

The transmitter is installed in a cast-aluminum enclosure. The FOT is fitted with a NiMH-battery for a minimum operating time of twenty hours (FOT1 and 2), whereas the FOT3 offers up to two years of operation while sending a telegram every five seconds.

Acoustic sensor

Transmitter unit

Receiver (3 channels)

Temperature measurement (including receiver)

Type	Option	FOS1	FOS2	FOS3	FOS4
FOT1	Analog transmitter 0.2 Hz - 5 MHz (-3dB)	X			
FOT2	Digital transmitter 0 - 20 kHz (-3dB)		X		
FOT3A	Transmitter for temperature measurement			X	
FOT3B	Transmitter for voltage and current			X	
FOT4A	Digital transmitter up to 65 MS/s, (30 MHz bandwidth)				X
FOT/S2	Pressure measurement	X			
FOT/S3	Fixed DC coupling	X	X		X
FOT/S4	Switched DC coupling	X	X		
FOT/S6	Remote activation	X			X
FOT/S7	Special input range	X	X		X
FOT/S8	Pressure measurement (Kistler 6203 sensor)	X			
FOT/S9	Displacement measurement	X			
FOT/S10	Bandwidth 10 MHz	X			
FOT/S12	S12, ultrasonic measurement	X			X
DIV10	Pre-divider 1:10 (BNC-BNC)	X	X		X
DIV100	Pre-divider 1:100 (BNC-BNC)	X	X		X
DIV1000	Pre-divider 1:1000 (BNC-BNC)	X	X		X
FOR1	Receiver plugin 0.2 Hz - 5 MHz	X			
FOR2	Receiver plugin 0 - 20 kHz		X		
FOR3	Receiver plugin FOR3			X	
FOR4	Receiver plugin up to 65 MS/s, (30 MHz bandwidth)				X
FOR/E2	DC coupling, track/hold switch	X			
FOR/E3	DC coupling, adjust button	X			
FOR/E5	1.2" width, output on rear side	X	X		
FOR/E6	Bandwidth 10 MHz	X			
FOR/E7	Bandwidth limit 1 MHz, noise reduction	X			
FOR/E8	1-channel remote transmitter	X			
DR42	Desktop rack ½ 19"	X	X	X	X
DR84	Desktop rack 19"	X	X	X	X

Conveniently providing robust fiber optic transmission of analog signals in high-voltage environments, the Power Diagnostix FO*system* solves signal integrity problems and safety issues found with severe electromagnetic conditions and long distances.

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