



Temperature Sensing Cable | os4400

Applications

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- Fire, flooding, and performance monitoring for power transmission and other service tunnels and conduits.
- Fire and condition monitoring in rail and highway tunnels.
- Leak detection and flow assurance for pipelines.
- Mine safety monitoring.

Features

- Lower cost and faster response time than
 Raman and Brillouin systems
- Multiplexing of many sensors on a single fiber makes cabling and installation simpler than electrical solutions.
- Customizable sensor number and spacing.
- Armored fiber cable and rugged sensor package integrated into a single assembly.
- Qualified to same rigorous standards used for comparable electronic gages.
- Calibrated for high absolute accuracy.
- High tensile strength for long life in harsh environments.
- Micron Optics' patented micro-optomechanical technology.

Description

The os4400 Temperature Sensing Cable is a multipoint temperature sensor. Discrete points along a rugged cable are used to simultaneously measure temperature with sub degree Celsius accuracy over a wide range of temperatures.

Several os4400 cables can be multiplexed to cover hundreds of sensing points over kilometers of cable runs. Unlike some other distributed optical measurement techniques, the os4400, coupled with the proper interrogation instrument, provides NIST traceable temperature measurements and fast acquisitions from one to one thousand times per second.

Because the sensing points in one cable are connected in series, installation is less expensive and less cumbersome than wiring dozens of separate electronic gage networks. In side-byside comparisons with conventional thermocouples, the os4400 is equally accurate, while providing for faster response, with no need for calibration, and no EMI issues. The os4400 temperature sensing cable is qualified for use in harsh environments and delivers the many advantages inherent to all Fiber Bragg Grating (FBG) based sensors.

With each temperature sensing cable, Micron Optics provides the appropriate Sensor Information File listing calibration coefficients needed to convert wavelength information into engineering units. Micron Optics' ENLIGHT Sensing Analysis Software provides efficient templates for quickly importing the Sensor Information File to setup, calculate, record, display and transmit data. Installation, qualification and other sensor information is available at: http:// www.micronoptics.com/support_downloads/Sensors/.



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Specifications (B)	os4410 Fast Response		os4420 Standard					
Thermal Properties								
Operating Temperature Range		-40 to 100° C						
Temperature Sensitivity		~10 pm/°C (±1.7 pm/°C)						
Update Rate, Response Time ²	200 ms, 7 seconds		200 ms, 53 seconds					
Accuracy ³	0.6°C Short Term ⁵ , 1.0°C Long Term ⁴							
Physical Properties								
Maximum Sensors per Cable		39						
Distance Between Sensors	0.5 to 10 m - uniform spacing ±0.15m							
Cable Weight	54 g/m							
Cable Bend Radius	- ≥ 380 mm							
Cable Type ⁶	Rugged, sealed polymer jacket, IP69 water resistant to 50 m at 28° C							
Cable Tensile Strength	150N Installed (300N Maximum straight line pull during installation)							
Connectors	FC/APC optional. Also available with protection fittings.							
 Denotes Beta product. For more detail Update rate is a function of interrogato Absolute accuracy of sensor is depended Based on 120°C soak for 1,000 hours. Maximum accuracy error ± 0.6°C with r Number and spacing of stainless steel of See http://www.micronoptics.com/sup 	s see www.micronoptics.com/product_designation. r scan frequency. Response time is time to reach 639 ent on capability of interrogation instrument. to averaging. cable junctions is a funtion of sensor spacing and ov port_downloads/Sensors/ for sensor drawings and i	ohp. % of total temperature drop in wa erall length. nstallation details.	ter (100°C).					
8 10 10	9 4.8 as4410 anly		Dimensions (mm)					
Ordering Information	os44aa-wwww-nn-ss-dd-Xxx-Y	VV (Example: 0544	0-1512-39-02-6 0-5EC-000)					
		yy (Example: 05 Th	19 19 12 99 02 0.0 91 C 0009					
aa: Model wwww: Waw 10 Fast Response Standard: 15 20 Standard	relength (±1nm) of First Sensor Xxx: Cabl 12 to 1588 nm X 2 to UT Unto FC FC// PF Prot	le 1, Length & Connector 20 meters ± 0.25m erminated APC Connector ection Fitting	 Yyy: Cable 2, Length & Connector Y 2 to 20 meters ± 0.25 m 00 Sealed end, no connector UT Unterminated FC FC/APC Connector PF Protection Fitting 					
nn: Number of Sensorsss: Sensor Wa01 to 3901 to 99 nm (velength Spacing dd: Dista 02 nm standard) 0.5 to 10	dd: Distance Between Sensors 0.5 to 10 m - uniform spacing ±0.15m						
X dd/2 dd/2 Sensor 1 Oct1110 Cable	dd x nn dd dd x nn Sensor 2 wwww	Sensor nn wwww + ss	oc1110 Cable wwww + ss x [nn - 1]					
Micron Opti 1852 Centur Atlanta, GA	cs, Inc. phone 404 325 0005 'y Place NE fax 404 325 4082 30345 USA www.micronoptics.com	Copyrig	ht ©2010, Micron Optics, Inc, os4400_1006.a_1006.1					

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Micron Opt	tics - ENLIGHT	- CA-12.	.moi (1.0.29	9								
Acquisit	ion Sens	ors	Charts	Image	Save	Alerts	Setting	s Help	P		2 Hz	CA-1
FBG CH 1	СН 2 СН 3 © О	СН	4									
	ID	Avg.	Min	Current	Max	<u>^</u>		1				
48.94	FBG B1	1	1511.000	1512.027	1513.000		→ <u>↓</u> ←	11111	********	**********	***********	
20	FBG B2	1	1513.000	1514.157	1515.000		-21)-				
-	FBG_B3	1	1515.000	1515.945	1517.000							- 0.0
	FBG_B4	1	1517.000	1518.120	1519.000		-4	9-				NU.
	FBG_B5	1	1519.000	1519.982	1521.000		S.					No.
100	FBG_B6	1	1521.000	1522.144	1523.000		-6	•				
	FBG_B7	1	1523.000	1523.991	1525.000	A	verage _					
	FBG_B8	1	1525.000	1525.932	1527.000		10 -8	1540 454		4540 45	4500 45	K
-	FBG_B9	1	1527.000	1528.057	1529.000			1510 154	20	1540 15	50 1580 15	an
而倫	FBG_B10	1	1529.000	1529.920	1531.000		Set All			0.01 nm		1
	FBG_B11	1	1531.000	1531.731	1533.000					0.011111		<u> </u>
	EBG 812	1	1533.000	1533 932	1535.000			Mi	inimum	Step Size	Maximum	
Sensors-												
de a	ID			Rela	ntive T	Range I	Min. Alar	n Min.	Current	Alarm Max.	Range Max. 🛛 🔼	.1
X	Sensor 121			с -		-105.08	39 -40	.000	23.961	100.000	117.664	VX
34	Sensor122			с -		-125.29	2 -40	.000	23.574	100.000	105.510	
	Sensor123			с.		-93.41	5 -40	.000	23.467	100.000	124.408	
	Sensor124			с -		-119.73	38 _40	.000	23.294	100.000	108.372	NO1
-	V Sensor 125			C -		-98.55	2 -40	.000	23.461	100.000	120.847	-
++	Sensor126			с -		-122.33	30 -40	.000	23.817	100.000	106.480	Ser.
101	 Sensor127 			с -		-99.00	8 -40	.000	23.985	100.000	120.169	150
	Sensor128			с -		-90.84	3 _40	.000	23.634	100.000	124.989 =	
dia to	Sensor129					-109.03	3 -40	.000	23.600	100.000	113.743	
1	Sensor121	0				-89.56	0 40	.000	23.143	100.000	125.378	
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ENLIGHT screenshot of os4420-1512-39-02-2.0-3FC-3FC temperature sensing cable.



Shipping and installation reel Dimensions 0.92 m x 0.27 m

