

Power over Fiber Smart Monitoring System

POF-WL240 Series



Product Description: Switchgear is critical for the distribution of power within the electric grid, as well as to industrial facilities. In order to provide stable power, it is crucial to keep switchgear operating continuously. Long term operation of switchgear components in high temperature and/or high humidity conditions can result in degradation of insulation as well as other components, increasing the chance of arc flash events, explosion, and fire. Switchgear failure can cause power outages, enormous equipment damage, as well as injury to personnel. Therefore, knowing the switchgear's status by continuous monitoring of bus bar temperature, ambient temperature, humidity, and other conditions such as partial discharge, will help equipment operators identify and perform preventive maintenance, reducing the risk of equipment damage and personnel injury.

The PoF Smart Monitoring System represents a new generation of continuous monitoring systems for switchgear and other critical electrical assets, enabled by the adoption of power over fiber (PoF) technology. A laser data module (LDM) delivers laser light through a non-conductive fiber patch cord (FPC), where the transmitted laser light is converted to electricity within a sensor module to power internal sensors. The POF-WL240 series sensor modules, which can be mounted directly onto bus bars, offer continuous monitoring of bus bar partial discharge, temperature, and humidity by taking sensor readings and then transmitting the sensor data to the LDM via the FPC. The LDM then shares the sensor data with the equipment operator's monitoring software.

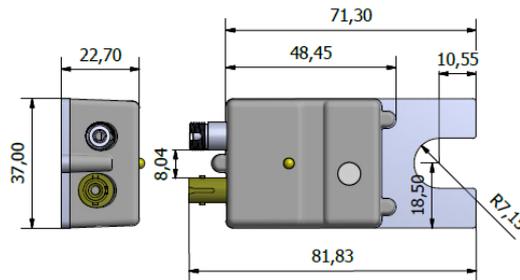
The PoF Smart Monitoring System's non-conductive FPC provides very high voltage and electrical noise isolation ensuring sensor reading data integrity and accuracy. These features make it possible for the POF-WL240 series sensor modules to be placed directly on electrically noisy bus bars, therefore providing valuable monitoring data of switchgear.

Key Features

- Power over Fiber (PoF) technology
- Monitor temperature and humidity on bus bar
- Monitor partial discharge and temperature on bus bar
- Identify precise location of partial discharge events and hot spots
- Multi-function single sensor module
- No sensor module range limitation or alignment constraints
- No low voltage wiring in high voltage compartment
- Excellent noise immunity capability
- Multiple sensor module system solutions

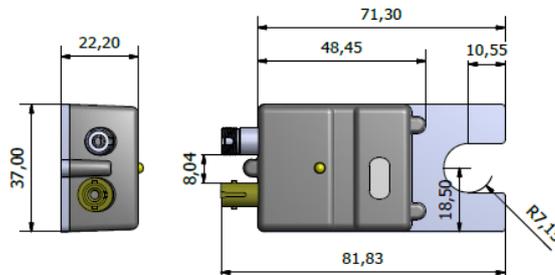
WL240-TH (temperature and humidity sensor module)

Temperature Range	- 20 °C ~ 120 °C
Temperature Accuracy	± 0.5 °C
Humidity Range	0% ~ 100%
Humidity Accuracy	± 3%
Operating Environment	- 20 °C ~ 120 °C, 0% ~ 100% RH (no condensation)



WL240-TPD (temperature and partial discharge sensor module)

Temperature Range	- 20 °C ~ 120 °C
Temperature Accuracy	± 0.5 °C
UV Power Range	0.20 ~ 45.80 nW, or custom power range options
Visible Light Power Range	0.40 ~ 101.80 nW, or custom power range options
Operating Environment	- 20 °C ~ 120 °C, 0% ~ 100% RH (no condensation)

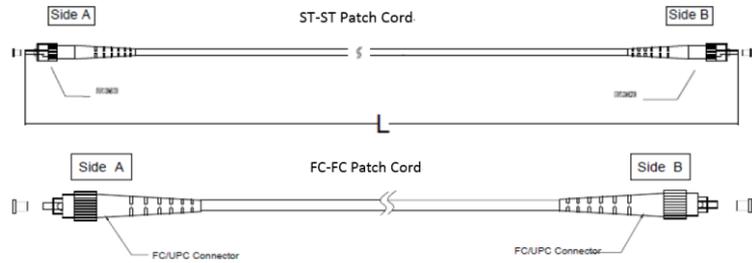


Note:

External sensor head, which allows more flexible access to different locations under test is coming soon. Both sensor module and sensor head could be attached firmly to the monitoring surface to avoid any danger from components coming loose.

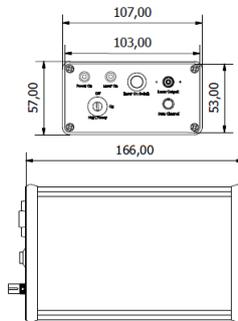
Fiber Patch Cords (FPCs)

Connectors	One FPC with FC connectors for laser power One FPC with ST connectors for data transfer
Length	2m, 6m, 20m, or custom length options
Operating Environment	- 20 °C ~ 120 °C, 0% ~ 100% RH (no condensation)



LDM – Laser Data Module

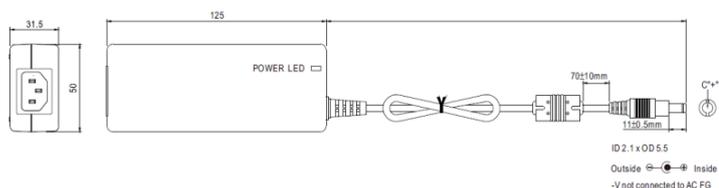
Laser Wavelength – PoF	976 nm
Laser Output Power – PoF	1.25 W
LED Wavelength – Data	850 nm
LED Output Power – Data	45 μW
Interface Type	RS-485
Transmission Rate	115200 bps
Standard Power	AC 100V ~ 240V; CE Safety EN 60950-1 certified power adaptor
Operating Environment	- 20 °C ~ 70 °C, 10% ~ 95% RH (no condensation)



Supplied Power Adaptor

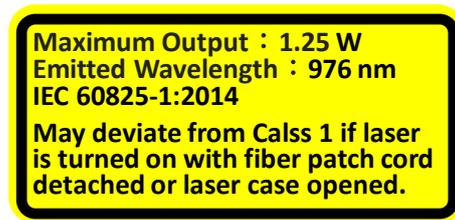
Power Input	AC 100V ~ 240V, 50 ~ 60 Hz
Output Voltage	5V
Output Current	6A
Connector Diameter	φ2.1mm
Operating Environment	- 30 °C ~ 70 °C, 20% ~ 90% RH (no condensation)

Note: CE Safety EN 60950-1 certified.



Laser Safety

When operated with all components properly assembled, the PoF Smart Monitoring System is considered a closed system and is thus classified as a Class 1 laser product, according to IEC 60825-1:2014 / DIN EN 60825-1:2015-07. The PoF Smart Monitoring System is classified as a Class 1 laser product as long as the laser data module (LDM) is turned on only after checking all connections, confirming the laser case is securely closed, and the integrity of the fiber patch cord (FPC) as advised in the assembly instructions has been confirmed. However, this classification of Class 1 does not cover the danger arising from an accidental disconnection of the FPC, damage to the FPC before or during operation, or improper assembly, all of which may result in exposure to higher Class 4 levels.



Certifications



This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to laser Notice 50 dated June 14, 2007 for a complete laser product.

This unit complies with IEC 60825-1:2014 for general Product Safety for Laser Products.



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