

ALM – maintenance hole sensor

Fiber-based passive sensor for remote access detection

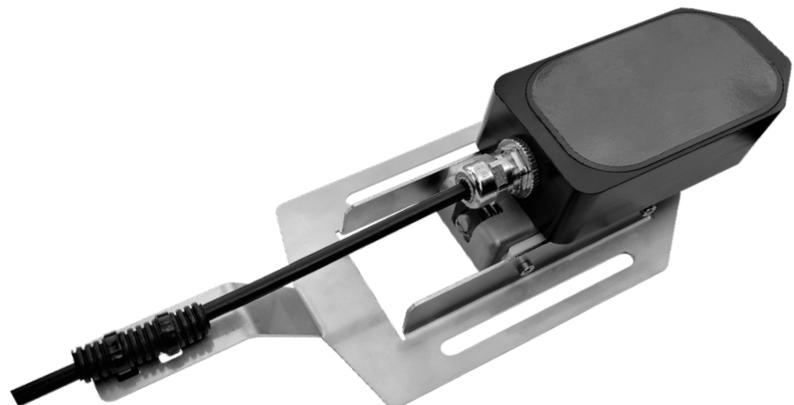
Benefits

- **Passive device**
No power supply required, sensor is operated passively
- **Robust design**
No moving parts on the outside, design is water and dust proof (IP68-compliant)
- **Simplified integration**
No wireless or protocol dependencies or setup needed
- **Improved security**
Passive design eliminates opportunity to “jam” monitoring operations
- **Wide network coverage**
Cascaded sensors supported in links up to 100km, providing end-to-end network coverage
- **Management visibility**
24x7 location monitoring including email and SMS notification support via Adtran’s Ensemble Fiber Director

Overview

Fiber optic connections are the most fragile part of the fiber optic network, and monitoring critical infrastructures has never been as important as it is today. With cybercrime, sabotage, vandalism and even terrorist acts on the rise, operators face new challenges over how to run and secure their networks. As part of our maintenance-free sensor family, our maintenance hole sensor (MHS) offers invaluable support with detecting and locating those threats. It empowers operations teams to react quickly and effectively, mitigating financial and reputational damages by minimizing network downtime.

All products in our maintenance-free sensor family are completely passive and are an extension of our ALM fiber monitoring product solution set. With a completely passive design, our MHS is cost-effective and simple to operate. It has no internal electronics and zero maintenance requirements, reducing opex to a minimum. When the lid of the maintenance hole is closed, the MHS reflects light back to the remotely located ALM monitoring device, enabling it to confirm that the MHS is closed. Whenever the monitored maintenance hole lid is opened, the reflection disappears and the ALM can identify the location of the maintenance hole that was opened, and alert operations. Multiple sensors can be “daisy-chained” together supporting links up to 100km on one fiber link, further simplifying installation, monitoring and operations. The event information provided by the ALM can be viewed on a network management system, such as Adtran’s Ensemble Fiber Director or a number of third-party NMS/GIS systems.



ALM – MAINTENANCE HOLE SENSOR

High-level technical specifications

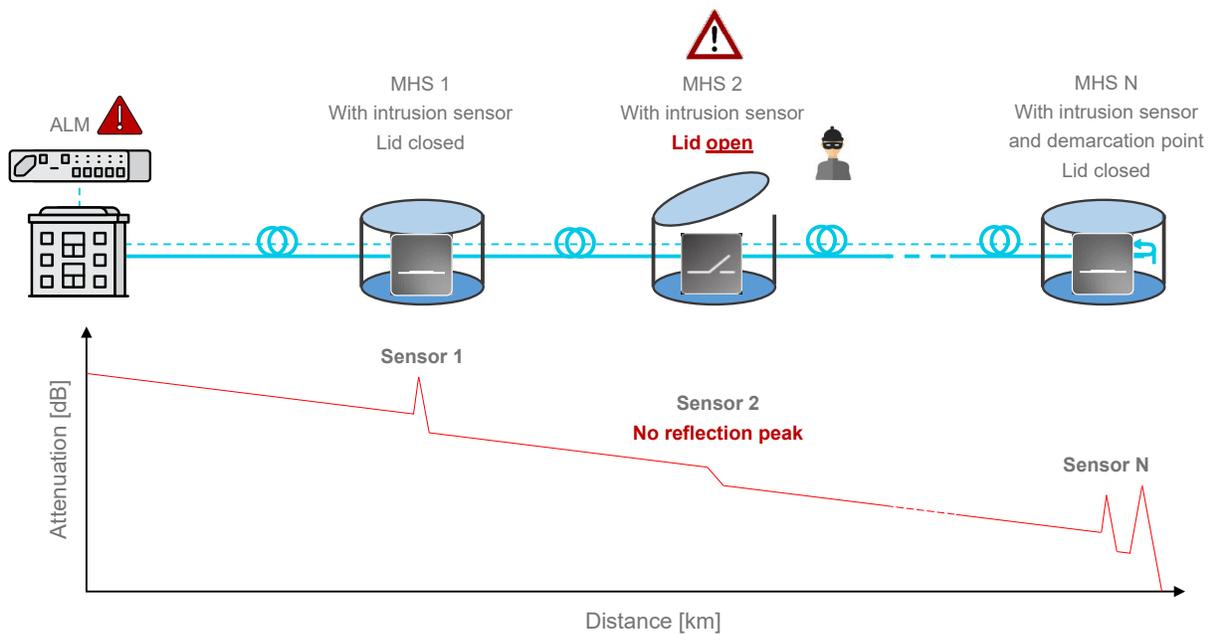
Parameter	Description	Specification	Units
Mechanical specification			
Dimension (WxHxD)	MHS inclusive wall mount	310x118x58	mm
Dimension (WxHxD)	Step protector	200x200x90	mm
Cycle count		20.000	cycles
Optical specification			
Reflect band wavelength		1638-1700	nm
Reflection	In closed state	> -5	dB
	In opened state	< -10	dB
Long-range mode performance	Maximum fiber length	100	km
	Maximum fiber loss (including all sensors on link)	32	dB
	Minimum spacing between sensors	200	m
Short-range mode performance	Maximum fiber length	20	km
	Maximum fiber loss (including all sensors on link)	28	dB
	Minimum spacing between sensors	5	m
Temperature specification			
Temperature range		-20 to +75	°C
Environmental, certification and RoHS compliance			
	Protection class IP68	compliant	
	Directive 2011/65/EU and Delegated Directiv 2015/863	compliant	

ALM fiber monitoring solution

Applications in your network

The illustration shows how multiple MHS can be cascaded on a fiber optical cable

- The ALM monitoring device is located at the central office and continuously monitors the optical link
- Each maintenance hole lid location is equipped with a MHS that generates a reflection peak
- In the event that a lid is opened or closed, the ALM will generate an alarm, identifying which of the sensors experienced a change of status

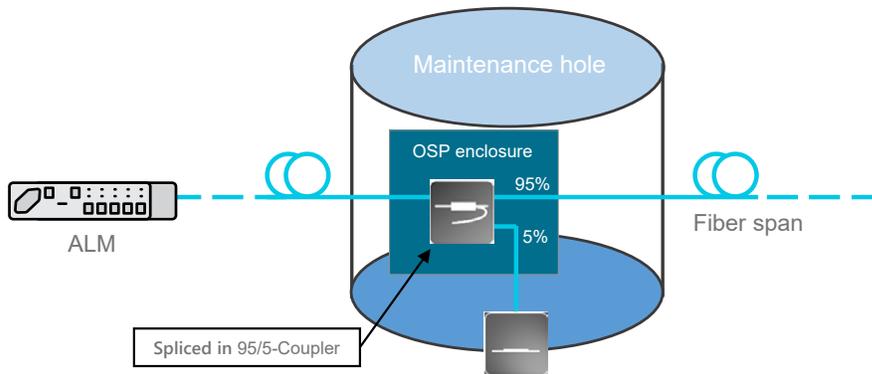


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Installation and ordering

Installation notes

For practical reasons, the MHS does not contain an integrated coupler. Coupling out from the monitored fiber to the location of the maintenance hole lid or MHS requires an additional 95/5-coupler which is usually spliced in and installed in an OSP enclosure located close to a maintenance hole. For ordering information of the 95/5 coupler, please refer to the “Ordering information” table below. The MHS is delivered with a 7 meter fiber-optical cable which in most cases is sufficient to connect it to the 5%-port of the 95/5-coupler installed within the OSP enclosure. Please contact a local sales representative for Adtran products in case you require a customized length or solution.



The MHS is provided in two variants, 25mm and 35mm, both of which include the wall mounting hardware bracket. The 25mm and 35mm options refer to the distance from the wall which the sensor is mounted to engage with the lid. Consult your vendor’s specifications to determine which model applies.

The optional step protection is offered in two variants to match the sensor mounting 25mm and 35mm sensor options. The step protector is used to protect the sensor when the lid is removed to avoid accidental damage.

Ordering information

Product code	Product name	Product description
1043709878-01	FAS/ALM/MHS-WALL-IP68-35	Maintenance hole sensor, 7m fiber, wall mount bracket included, 35mm activation distance
1043709886-01	FAS/ALM/MHS-WALL-IP68-25	Maintenance hole sensor, 7m fiber, wall mount bracket included, 25mm activation distance
1043709887-01	FAS/ALM/MHS-STEP-35	Step protection bracket for use with FAS/ALM/MHS/WALL-IP68-35 ONLY
1043709888-01	FAS/ALM/MHS-STEP-25	Step protection bracket for use with FAS/ALM/MHS/WALL-IP68-25 ONLY
1043739868-01	J-Y/SM/95-5/NC/0200	95/5-Coupler, 2m fiber, no connectors



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