

ALM Series

Improve network availability and reduce opex costs with 24x7 proactive fiber monitoring

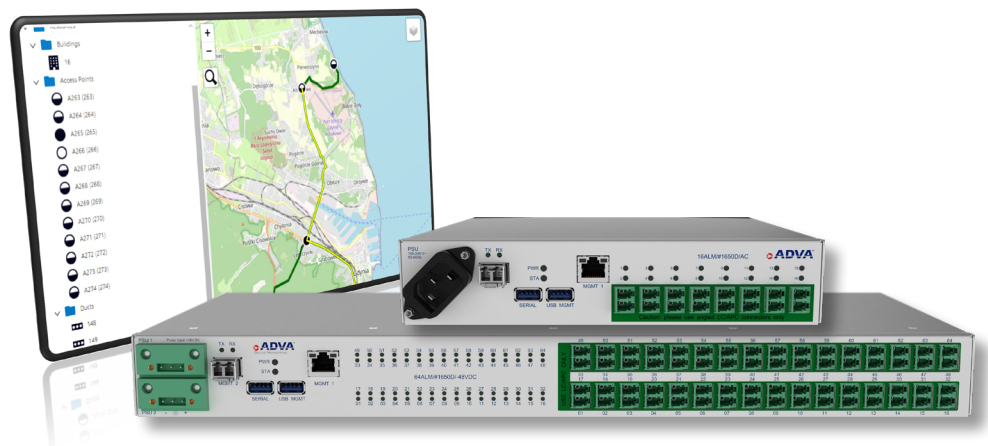
Benefits

- Improved service quality**
 Real-time information on fiber integrity for fast failure detection and short repair cycles
- Non-intrusive monitoring**
 Inherent compatibility of demarcation reflectors with any user data protocol as well as multi-wavelength transmission systems
- Streamlined operations**
 In-service fiber monitoring for immediate separation between failures of active devices and problems with the fiber plant
- Universal solution**
 Monitoring of point-to-point and point-to-multipoint (PON) networks for active and dark fiber applications
- PON network monitoring**
 Detailed access network fiber information from the OLT, to the splitter, and individual ONTs supporting all PON generations (GPON, XG-PON)
- High port density monitoring**
 For highly dense installations; up to 800 ports can be monitored in a single location
- Intuitive management interface**
 Integrated with market-leading geographic information systems (GIS) to quickly and easily localize fiber issues

Overview

In recent decades, optical fiber has become the predominant choice for operators to run their services across. But with the rapid expansion of fiber networks, many have found that ensuring fast and accurate fiber fault location is now a major challenge. Our ALM addresses these requirements by providing fiber health information in a matter of seconds.

In the digital age, when people expect to be able to work efficiently from anywhere in the world, fiber operators are under constant pressure to deliver more bandwidth with better service level agreements (SLAs). Trends such as fiber deep make it possible to transform our homes into home offices, creating value for both employees and enterprises. In this complex environment, any disruption to the fiber quality poses a serious inconvenience. Our ALM is an in-service fiber monitoring solution that allows operators get real-time insight into the quality of their fiber infrastructure. In the event of abnormal attenuation, fiber break or a tapping attempt, the user is immediately notified about the issue with the exact geographic location of the event via the Adtran Ensemble Fiber Director, embedded GUI interface or third-party GIS. What's more, with a very small footprint, power consumption, and self-calibration capabilities, our ALM doesn't require any regular maintenance.



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High-level technical specifications

Fiber link monitoring

- Two ALM variants for supervision of 16 (16ALM) or 64 fibers (64ALM) per ALM device
- High-density options via extension units for 96 and 384 port increments up to a total of 800 ports
- In-service monitoring at an ITU-T standardized wavelength at 1650nm
- Suitable for dark and lit fiber infrastructure

Demarcation reflector

- Optional demarcation for the remote site for active fiber and dark fiber applications
- No power and no additional space required
- Industry-leading solution for premium accuracy

Deep PON assurance

- Monitor any PON network from the OLT to the ONT without the need to install a passive reflector
- Detailed fiber asset health information beyond traditional PON status information

Management capabilities

- Ensemble management suite for full network visibility
- Embedded web GUI
- Integrated with market-leading GIS solutions
- Robust and reliable protocols for remote control (SNMP, NETCONF, REST)

Operational advantages

- Passive cooling requires no regular maintenance (e.g., air filter replacements)
- Self-calibration scheme without the need to decommission the unit
- RF tone generation for fiber identification

Optical performance

- Up to 320km distance range for access, metro and core applications
- High dynamic range over the complete temperature range

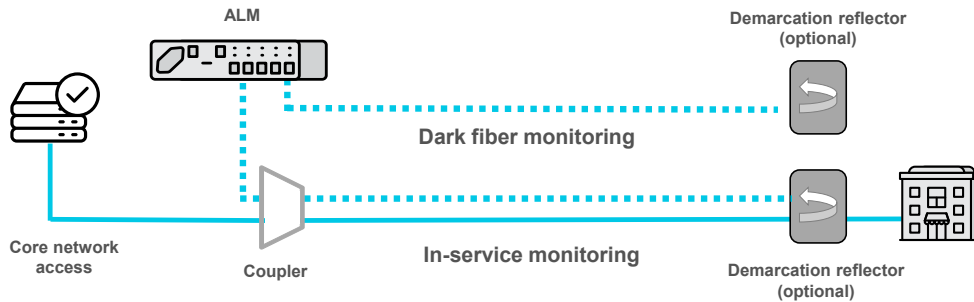
Operational requirements

- Power consumption <13W (AC or DC)
- Fanless operation
- Wide operating temperature range (-5°C to 55°C)
- 96 and 384 port high-density options in one half RU space
- Ultra-compact ETSI solution: up to 64 ports per 1RU chassis

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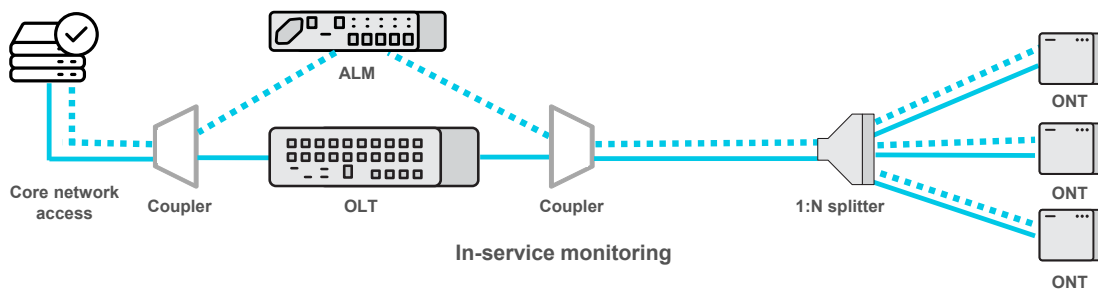
Applications in your network

Point-to-point network monitoring



- Proactive fiber monitoring
- Support for KMZ files to enhance operations with geographic coordinates
- Built-in SOR viewer in the web browser environment
- Support for various point-to-point topologies, including ring architectures
- Dark and lit fiber monitoring capabilities, independent of traffic services
- Passive demarcation with powerless operation
- Remote access to passive fiber sensors for monitoring of unpowered sites

PON access network monitoring



- Proactive fiber monitoring with long-term performance measurement of passive plant elements
- Fiber monitoring solution compatible with any PON standard and rate
- Support for fiber buildout certification services in passive plant construction phase
- Built-in SOR viewer in the web browser environment
- Full visibility of the passive network elements

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Product specifications

ALM16 / ALM64 - General information

Parameter	Specification	Units
Dimensions	Height	1 RU
	Width	42 or 84 HP
	Depth	215 mm
Power (typical / maximum)	10 / 13	W
Power supply options	AC or DC (-72 to -36V)	
MTBF at 30°C ambient temperature	>20	years

Extension unit 96 / 384 - General information

Parameter	Specification	Units
Dimensions	Height	1 RU
	Width	42 or 84 HP
	Depth	207 mm
Power source	USB powered by ALM Unit	
MTBF at 30°C ambient temperature	>20	years

Environmental specifications

Parameter	Specification	Units
ALM temperature operating range(*)	-5 to 55	°C
Storage temperature range	-40 to 85	°C
Relative humidity (non-condensing)	85	%

(*) Passive components available for I-temp operation -40 to 85 °C

OTDR specifications

Parameter	Specification	Units
Number of ports	16 or 64	ports
Laser safety	Class 1	
RF tone frequencies	270, 330, 1k, 2k	Hz
Dynamic range(**)	OTDR core	41 dB
	module	39(***) dB
Wavelength	1650	nm
Pulse width	5 to 20,000	ns
Number of data points	up to 256,000	points
Distance range	unidirectional	up to 160 km
	bidirectional	up to 320 km
Sampling resolution	0.1 to 1.6	meter
Event dead zone	0.8	meter
Attenuation dead zone	4	meters
Distance accuracy	± (0.8 + sampling resolution + 9.5 x 10 ⁻⁶ x distance)	meter
Optical switch lifetime	1 x 10 ⁹	cycles
Scanning time per port	2-5	s
Extension unit insertion loss	2.8	dB (max)
	1.5	dB (typical)

(**) Specification over the complete temperature range. No separation from the noise floor required in the network design

(***) Depending on pulse width and resolution

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Equipment management

Management method	Supported protocols
Embedded GUI	HTTP, HTTPS
Northbound interfaces	SNMP v1, v2c, v3, NETCONF, REST API
Command line	SSH
Remote authentication	RADIUS, TACACS+
Geographic data	Embedded KML/KMZ reader Adtran Ensemble Fiber Director Third-party GIS systems

Certification and RoHS compliance

Description	Compliance
NEBS level 3	Compliant
ETSI EN 300019-1-3	Compliant
Protection class IP20	Compliant
CE, FCC, NRTL, VCCI	Compliant

Ordering information

Product code	Product name	Product description
1043709841-03	16ALM/#1650D/AC	ALM 16 ports with LC/APC connectors, AC powered
1043709842-03	16ALM/#1650D/-48VDC	ALM 16 ports with LC/APC connectors, -48V DC powered
1043709846-02	64ALM/#1650D/AC	ALM 64 ports with LC/APC connectors, AC powered
1043709847-02	64ALM/#1650D/-48VDC	ALM 64 ports with LC/APC connector, -48V DC powered
1043709849-01	ALM/EXT/96LA/2LA	ALM extension unit with 96 LC/APC connectors, no power supply required
1043709848-01	ALM/EXT/16MPO24/8LA	ALM extension unit with 384 MPO connectors, no power supply required