



## WISTOM Optical Layer Monitor

Non-intrusive, real-time monitoring of power, wavelength and OSNR for DWDM channels in up to sixteen fibers simultaneously

*WISTOM is a high performance optical layer monitor, combining the features of an optical spectrum analyzer and a fast optical channel monitor, aimed at long haul and metropolitan DWDM network supervision.*

The WISTOM In-Fiber Intelligence™ combines optical channel monitoring (OCM) and optical performance monitoring (OPM) creating a real-time optical layer monitoring (OLM) capability. This enables proactive optical signal surveillance in the all-optical domain.

Due to WISTOM's high optical resolution, dense DWDM channel spacing can be managed over the full spectrum. Improved tuning and detection schemes, involving precision scanning techniques, ensure high measurement accuracy and reliability. WISTOM monitors the spectral characteristics over the C-band.

Any channel deviating from normal conditions is reported within milliseconds. Spectral characteristics, such as central wavelength and OSNR of each channel are monitored and reported. The long term drift of these parameters can be tracked and analyzed, thus providing input for network tuning and resource allocations.

WISTOM gives service providers the opportunity to resolve channel specific problems, in some cases even before a degrading channel suffers critical data loss. This translates into less costly network downtime and the ability to avoid violation of service level agreements (SLAs).

The unique measurement performance of WISTOM also enables diversified billing models and intricate SLA supervision.

### Key features

- Non-intrusive, In-Fiber signal monitoring
- Fast scan of entire DWDM spectrum in real-time
- Excellent power and wavelength accuracy
- Integrated optical switch for multi-fiber monitoring
- Full-featured API for effective application integration
- SNMP for effective network management integration
- Highly adaptable, modular SW platform
- Robust assembly with no moving parts ensures reliability
- Numerous customization alternatives for high interoperability

### Applications

- Optical layer monitoring for the entire network
- Key values and customized reports verifies QoS and SLAs
- Long-term trend analysis
- Effective fault localization
- Proactive instead of reactive fault management

## Benefits at a glance

- WISTOM replaces both OCM and OPM units.
- WISTOM is grid-transparent. Thus, DWDM schemes with different channel spacing and various modulation rates can easily be addressed.
- Due to fast channel alert functionality, WISTOM is suitable for protection switching applications.
- The integrated optical switch reduces the supervision cost per fiber.
- WISTOM's adaptable product platform allows for versatile hosting and deployment options.
- All-optical layer performance monitoring significantly reduces the need for expensive OEO conversion.
- Concurrent monitoring of all channels in full spectrum reduces the channel specific monitoring cost.
- Non-intrusive monitoring minimizes signal interference.
- Network performance optimization and channel allocation decisions are improved by using WISTOM's multi channel OLM data.
- Dynamic channel power equalization in add/drop network nodes is facilitated due to WISTOM's high-performance channel power measurements.
- Simple installation procedures facilitate quick system deployment.
- Re-configuration and upgrade can be made remotely and "on-the-fly" due to an adaptable, embedded modular SW platform.

### GENERAL

Wavelength range	C-band
Channel power input range	-10 to -40 dBm
Channel spacing	25 GHz
Monitored channels	2048
Scan time	40 $\mu$ s
Sample points	14336
Scanning filter bandwidth (FWHM)	5 GHz
Return loss	-40 dB

### OPTICAL PERFORMANCE MONITORING (OPM)

OPM analysis: $P_c$ , $\lambda_c$ , OSNR <sub>c</sub> and FWHM <sub>c</sub>	Yes
OPM alerts: $P_c$ , $\lambda_c$ and OSNR <sub>c</sub>	4, 4, 2 levels/ch
Power accuracy	$\pm 0.5$ dB
Wavelength accuracy	$\pm 20$ pm
OSNR accuracy	$\pm 0.5$ dB
OSNR dynamic range @ 50 GHz	30 dB
Response time (typ.)	50 ms

### OPTICAL CHANNEL MONITORING (OCM)

OCM alerts: $P_c$	4 levels/ch
Response time (typ.)	1 ms

### OPTICAL INTERFACE

Optical connectors option	SC, FC, LC, PC/APC
Number of inputs	1, 2, 4, 8, 16

### COMMUNICATION INTERFACES

Serial interface	RS-232
Network interface	Ethernet 100base-T
WIP (WISTOM Interface Port)	96 I/O, Custom
Digital ports for high-speed status data	4 I/O, Custom

### SUPPORTED PROTOCOLS AND APPLICATIONS

SNMP	Yes
API over TCP/IP	Yes
MMI via Telnet	Yes
MMI via Serial port	Yes
Software and firmware upgrade via TCP/IP	Yes

Other protocols and applications are available as customizations.

### ENVIRONMENTAL

Qualification	NEBS Level 3
Operating temperature	-5 to +60 °C
Operating humidity (non cond.)	5 to 85 %
Storage temperature	-40 to +70 °C
Storage humidity	0 to 95 %
EMC	FCC Class A

### Power Supply

Power requirements Shelf	90-240 VAC / -48 VDC
Power consumption Shelf	15 W
Power requirements Embedded	+5 VDC, $\pm 12$ VDC
Power consumption Embedded	12 W

### Physical

Dimensions WISTOM Shelf (19" x 1 U)	420 x 254 x 44 mm <sup>3</sup>
Dimensions WISTOM Embedded (PCB)	220 x 183 x 19 mm <sup>3</sup>