



# GPONDoctor 9500

## *Portable XGS-PON Analyser*

**GPONDoctor 9500 is a portable passive chipset-less analyser for XGS-PON FTTH protocols.** It connects to the network's distribution fiber and captures downstream and upstream bit-level data, interpreting all control information at PLOAM and OMCI levels.

Applications of the GPONDoctor analyser include troubleshooting, XGS-PON certification and interoperability analysis, making it ideal for operators and installers of XGS-PON services as well as equipment manufacturers.

GPON Doctor 9500 is a self contained test solution based on a high performance hardware capture card, portable battery powered chassis and powerful software application.

The hardware capture card has been specifically designed using state-of-the-art optical modules and processing capability. Able to operate at any point of the XGS-PON network, the analyser is capable of capturing XGS-PON traffic for extended periods.

Optionally the GPON Doctor 9500 is

able to extract and decrypt Ethernet traffic such as Video or VoIP real-time from GEM ports.

The analysis software interprets captured data allowing the user to trace all control frames. It is able to create an estimate of the topology of the XGS-PON network: ONT and OLT state machines, established data channels, exchanged configuration, E/R OMCI diagrams, analysis and bandwidth graphs for each ONT per T-CONT.

GPON Doctor 9500 platform uses the Windows 10 Pro operating system allowing tools such as Wire-shark to analyse services running over XGS-PON. With an easy to use and intuitive GUI users can quickly learn how to operate the analyser with the minimum of training.



## Capture + Analyse + Evaluate in just 1 click

From the captured data GPONDoctor 9500 deduces the network topology and applies a set of rules to certify whether the ITU-T G.9807.1 /G.987.2 recommendation is met. Its automatic adaptive synchronisation and calibration and intuitive interface make it easy to use from day one.

## Accurate detection of problems in a GPON network

Evaluates and detects problems in XGS-PON networks, highlighting offending devices and the cause of failure.

## Service regeneration and QoS assessment

GPONDoctor 9500 allows users to regenerate services on an XGS-PON network is possible. For example, you can extract and reassemble multicast video in real-time to be displayed on the GPONDoctor screen. This feature is perfect for evaluating the QoS and QoE of services configured over a PON.

## Real-time XGS-PON capture

GPONDoctor captures OMCI and XGS-TC/GTC messages over the fiber in real time to facilitate the monitoring of negotiation processes and configurations, showing in real time the status of ONTs, XGEM ports and T-CONTs.

## Real-time user traffic extraction (Ethernet)

Extracts and decrypts user traffic in real time to the 10GbE SFP+ interface for monitoring using an external analyser and/or other tools. The decoding hardware fully implements automatic



AES decryption combined with FEC encryption.

## OMCI entity/relationship diagrams and bandwidth analysis

Displays a detailed OMCI entity/relationship diagram including alarms and errors, bandwidth allocation diagrams by ONT and TCONT, and optional diagrams of the time evolution of bandwidth allocation.

## Chipset-Less Implementation

Custom hardware capture design for independent capture of proprietary implementation of any GPON equipment manufacturer.

## Autonomous laptop

Portable ruggedised equipment, weighing less than 2 kg and with a double high-capacity LiPo battery that allows autonomy, at full operation, of approximately 1 hour.

## New optional features (licensed):

- 1) Upstream and Downstream optical power measurement and display
- 2) Online error detection and reporting

# GPONDoctor 9500 technical data

## Application Examples

<ul style="list-style-type: none"> <li>Incident identification in a XGS-PON network</li> </ul>	<ul style="list-style-type: none"> <li>Troubleshooting interoperability between different XGS-PON manufacturers in an operator's network.</li> </ul>
<ul style="list-style-type: none"> <li>Diagnosis and analysis of incidents and operation in a XGS-PON network</li> </ul>	<ul style="list-style-type: none"> <li>Evaluation of protocol compliance in the development of XGS-PON OLTs/ONTs</li> </ul>
<ul style="list-style-type: none"> <li>Analysis of protocols running over XGS-PON using Ethernet port</li> </ul>	<ul style="list-style-type: none"> <li>GPON 9807.x interoperability test</li> </ul>
<ul style="list-style-type: none"> <li>Fundamental tool in the deployment of a new XGS-PON network, equipment development and certifications</li> </ul>	<ul style="list-style-type: none"> <li>Know the status of the network and all its devices (ONTs).</li> </ul>

## Technical Characteristics

<ul style="list-style-type: none"> <li>Captures OAM + PLOAM control data and OMCI messages</li> </ul>	<ul style="list-style-type: none"> <li>Capture in time real Messages PLOAM + OMCI + negotiation</li> </ul>
<ul style="list-style-type: none"> <li>Low attenuation (&lt;1.5 dB) internal signal extraction module, perfect for field tests or laboratory analysis</li> </ul>	<ul style="list-style-type: none"> <li>Ruggedised portable equipment (MIL-810F). Reduced weight: &lt;2 kg</li> </ul>
<ul style="list-style-type: none"> <li>Dual LiPo battery power: ~2 hours autonomy (~1 hour at full capacity)</li> </ul>	<ul style="list-style-type: none"> <li>Long duration captures (~30 minutes)</li> </ul>
<ul style="list-style-type: none"> <li>Determines network topology: ONTs, OLTs</li> </ul>	<ul style="list-style-type: none"> <li>Determines the status/value of OMCI entities in the ONT and VLAN filtering.</li> </ul>
<ul style="list-style-type: none"> <li>Evaluates the degree of compliance with the ITU-G.9807.x standard, generating a list of incompatibilities and violations of the specifications</li> </ul>	<ul style="list-style-type: none"> <li>Bandwidth analysis by T-CONT for each ONT</li> </ul>
<ul style="list-style-type: none"> <li>Real-time capture of upper layer Ethernet traffic. Regeneration and monitoring of services in real time: multicast video, voice, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Windows 10 Pro operating system</li> </ul>
<ul style="list-style-type: none"> <li>GPONDoctor Dimensions: 311 x 232 x 100 mm and &lt;2 kg / &lt;9 Kg with transport case</li> </ul>	<ul style="list-style-type: none"> <li>Automated behaviour: capture, analyse and evaluate in one click</li> </ul>

## Interfaces

Touch screen 11.6" HD High Definition Colour (1366 x 768)	Gigabit Ethernet capture and management module: QinQ transparent/configurable
802.11ac WiFi interface, both for sniffing and IP management	10 Gigabit Ethernet real-time extraction port over XGS-PON: SFP+ connection for external network protocol analysers
2 x USB 2.0 for easy export of capture, trace and report data	XGS-PON capture/extraction interfaces: <ul style="list-style-type: none"> <li>XGS-PON ONT SFP+ SC/UPC TX1270/RX1577 nm (9,953 Gbps)</li> <li>XGS-PON OLT SFP+ SC/UPC TX1577/RX1270 nm (9,953 Gbps)</li> </ul>

## Ordering Information

Accessories included: extraction splitter, optical modules, set of attenuators (4, 8 and 15 dB), SC/UPC-SCAPC patch cords

