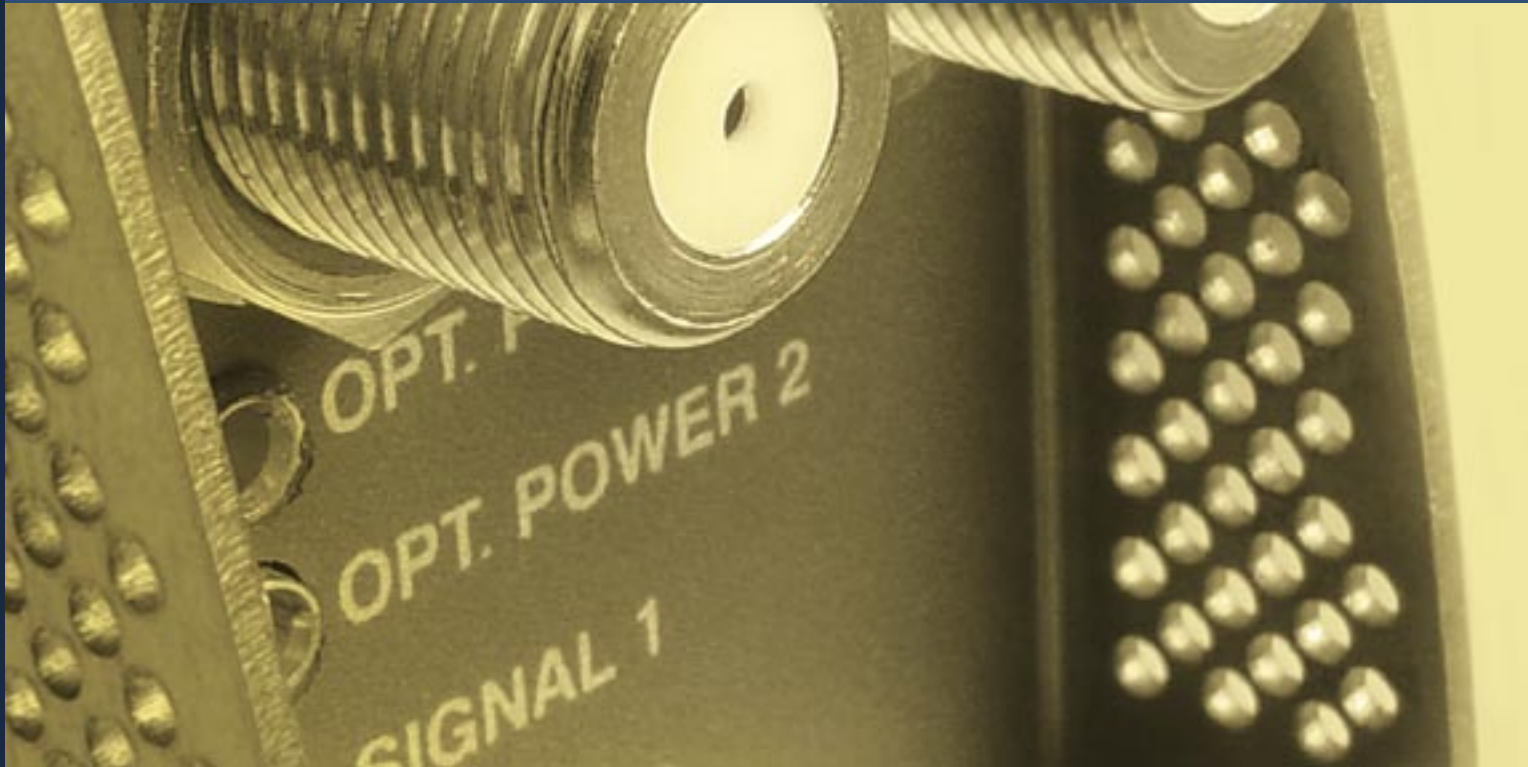# Optical Headend Platform

Teleste

HDO

The new HDO platform has a small form factor, but is far from the small in functionality. This has been realized without a sacrifice in reliability. The easiness of installation, alignment and maintenance has been one of the leading design principles.

HDO

The continuous growth of targeted services such as high speed Internet and VOD generates a need for further network segmentation. The HDO platform is designed to meet this challenge. Thanks to its impressive performance and flexibility the HDO platform offers an attractive solution to any HFC network need.

High Module Density - Up to 12 application modules in a single chassis (2RU) offers best density on the market.

Modules are designed for **plug-and-play** operation.

Single function modules support easy upgrading and economical maintenance.

FEATURES AND BENEFITS

- High density platform
- Optical connection selectable either front or back
- Normalised input level in the forward transmitter
- Supports various standard monitoring interfaces like SNMP and web browser
- Distributed and centralised powering approaches are possible
- Receivers' backup switching without any additional controller unit
- A/B switching in dual return receiver
- Forward path spectrum analyser function that enables plug and play installation

HDO Platform

In the installation environment where the HDO platform is used the foot print is usually crucial and therefore the system has been designed to fulfil these high requirements. The basic design principle has been to help operators to build a segmented network effectively taking into account operational challenges in the headends and hubs.

The HDO chassis itself is 2 rack units high and is fully stackable due to horizontal airflow. The chassis can be installed into a 19-inch cabin and has a depth of 440 mm, therefore it fits perfectly to standard 600 mm deep cabins. There are 12 universal slots for HDO modules in the 2 U high chassis. This means that the HDO platform has the highest density in the market and it fits perfectly in segmented HFC networks.
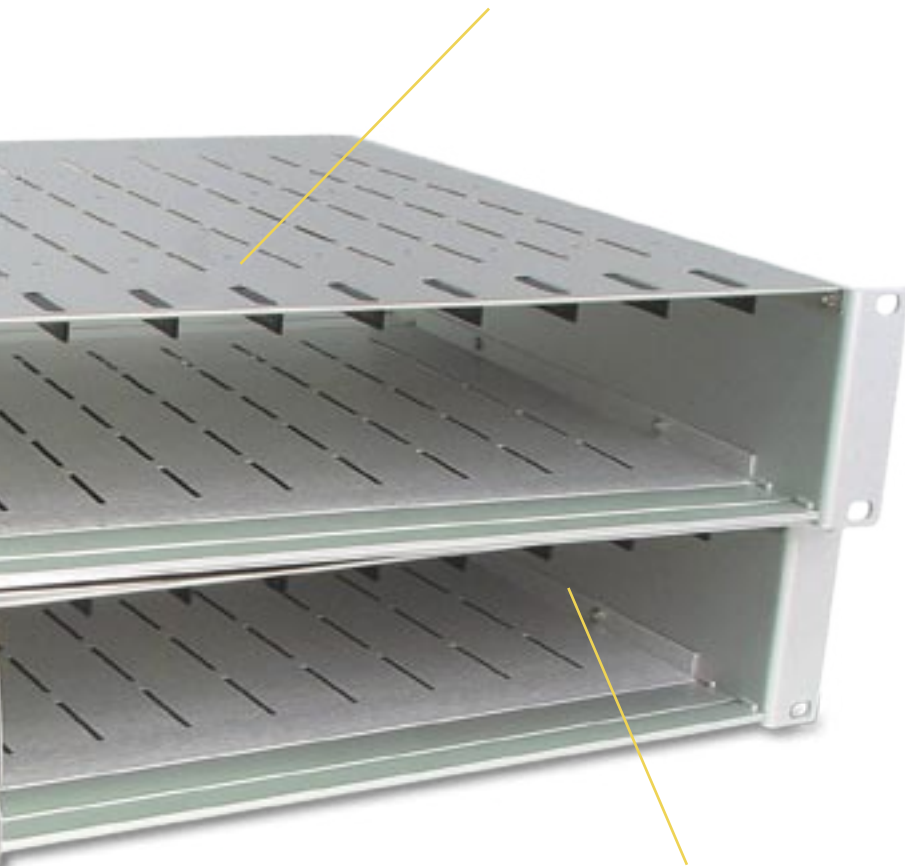
To make the platform more flexible and the cabling easier the location of fibre connections can be selected to be either at the front or at the rear of the optical modules.

HDO 1310 nm Forward Transmitter

HDO forward path transmitter has separate inputs for broadcast and narrowcast with high isolation. The input levels of the transmitters have been normalised, which means that with the same input signal the same Optical Modulation Index (OMI) will be achieved with the same input attenuator and equaliser settings in all transmitters. The transmitter supports three different ways to adjust the transmission parameters. 1. Automatic power control (APC) automatically adjusts the laser loading according to the internal broadband detection unit. 2. Manual operation. 3. Automated pilot based adjustment with optional spectrum analyser where both OMI and slope are adjusted automatically.

All the adjustments are electrical and done over a management interface and therefore no plug-in attenuators are needed. All this makes the system installation and control easy and comfortable.

International EMC and environmental conformance.

Forward path transmitter and receiver modules can be equipped with a revolutionary integrated spectrum analyser function. The analyser can measure accurately each channel's level - no matter whether they are PAL or QAM modulated. For each channel it is possible to set individually low and high alarm limits, that is a significant benefit in monitoring, for instance, unmanned hubs. The forward path transmitter equipped with the spectrum analyser provides true plug and play installation.

High integration grade offers a space effective solution.

'Mouse-over' marker makes the use of the analyser easy and convenient if sweep results need to be studied in more detail. The measuring results can be saved also in numerical format to a Excel table.

HDO Dual Return Receiver

The HDO Return Path Dual Receiver with its wide input and adjustment range and high gain is designed to support network segmenting in a large or small scale. The dual receiver features back-up with internal A/B switching for fibre failures. It also supports A/B switching based on an external RF coupler for device failures. No external controller is needed for the switching.

HDO Forward Receiver

HDO forward path receiver is ideal for hubs to provide high quality signal output for cascaded links. Its wide output level range makes it easy to integrate the platform to an existing network. It supports A/B switching based on an external RF coupler for fibre cut and device failures. No external controller is needed for the switching.

The receiver can be equipped with a spectrum analyser and the analyser is designed especially for ALSC (Automatic Level and Slope Control) and signal monitoring purposes.

HDO Power Supply

The powering of the platform can be done using either a distributed or centralised approach.

On a distributed approach there is a power supply unit in each of the chassis in the system providing power to other modules in the same chassis. The chassis's can be daisy chained for back-up and load sharing purposes; in the case of power supply failure other power supplies will provide the power to the modules in the chassis containing the broken power supply. The load sharing between the supplies is based on voltage sensing and works accurately and reliably. There is no limitation on the number of power supplies in one chassis.

A centralised power supply can be used just as well, to allow full utilisation of module slots.

HDO Controller

The HDO controller provides a gateway to access the HDO platform by different configuration and monitoring tools. HDO platform supports Teleste's element management system (EMS), SNMP based management systems and a Web based user interface. The controller enables connection to the system remotely. Locally the modules can be accessed via a monitoring bus.

The controller module allows several interesting operation features. e.g. mass configuring, broadcast software update, automatic configuration of the replacement module and management modem for field modules.

Compact and modular design enables effective installation and scalability.

DC voltage test points are provided for optical input power measurements.

Cooling **fan** is easy to remove and replace without signal interruption.

RF test points are located on the front of the modules.

The modules are equipped with **fibre connectors** that can be located either on the front panel or the rear panel.

Forced cooling through the unit allows high power density.

Optical connectors on rear panel

Optical connectors on front panel

TECHNICAL SPECIFICATIONS

HDX002 Chassis		
Form factor	2U	19″ rack-mount
Power consumption	0 W	
Height	88 mm	
Width	483 mm	
Depth	440 mm	
Weight	2.0 kg	no modules
Modules	12	per subrack
Subracks	16	per segment
Operating temperature	0...+45 °C	
Operating relative humidity	0...85 %	
EMC compatibility	EN 50083-2	

HDP230 Power Supply	
Voltage requirements	195...264 V AC, 47...63 Hz
Output power (maximum)	200 W
1. Output voltage / current	+6.3 V DC / 8 A
2. Output voltage / current	+25 V DC / 8 A
Efficiency (minimum)	80 %

- passive PFC (Power Factor Correction)

- automatic current share in n+1 back-up mode

- enhanced reliability with two cooling fans

HDO902 Forward Transmitter		
Power consumption	17 W	
Peak wavelength	1310 nm	
Optical output power	+2...+15 dBm	nominal value
RF input level	76...85 dBµV	

- two performance categories	- high isolation narrowcast input
- APC (Automatic Power Control)	- optional spectrum analyser function

HDO802 Forward Receiver	
Power consumption	14 W
Optical input power	-5...+3 dBm
RF output level	105 dBµV

- optional spectrum analyser function

HDO202 Dual Return Receiver	
Power consumption	9 W
Frequency range	5...300 MHz
Optical input power	-20...+3 dBm
RF output level	$2 \times P_{opt}$ + 124 dBµV

- A/B back-up switching function

HDO modules general	
Dimensions (h x w x d)	2U x 7 HP x 440 mm
Operating temperature	0...+45 °C

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