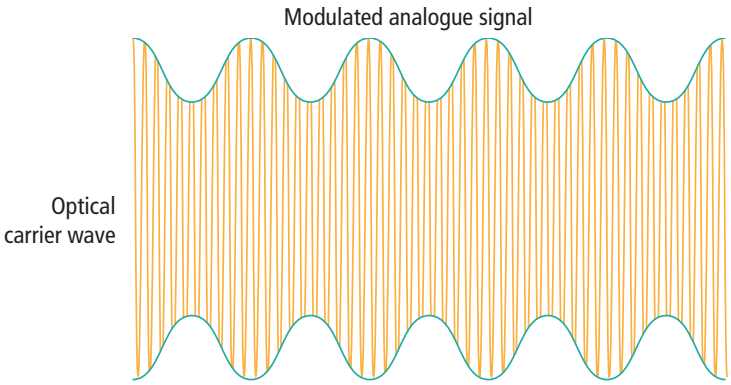
Competence in
Communication
Technologies

Solutions for analogue fibre optic distribution SAT | HFC | FTTH | FTTB

Optical signal transmission

The principle of optical signal transmission is quickly explained in somewhat simplified terms. The analogue RF signals (e.g. DVB-S/S2 or DVB-C with DOCSIS) are modulated onto an optical carrier wave. This optical carrier wave can then be transmitted over long distances using fibre optic cables.

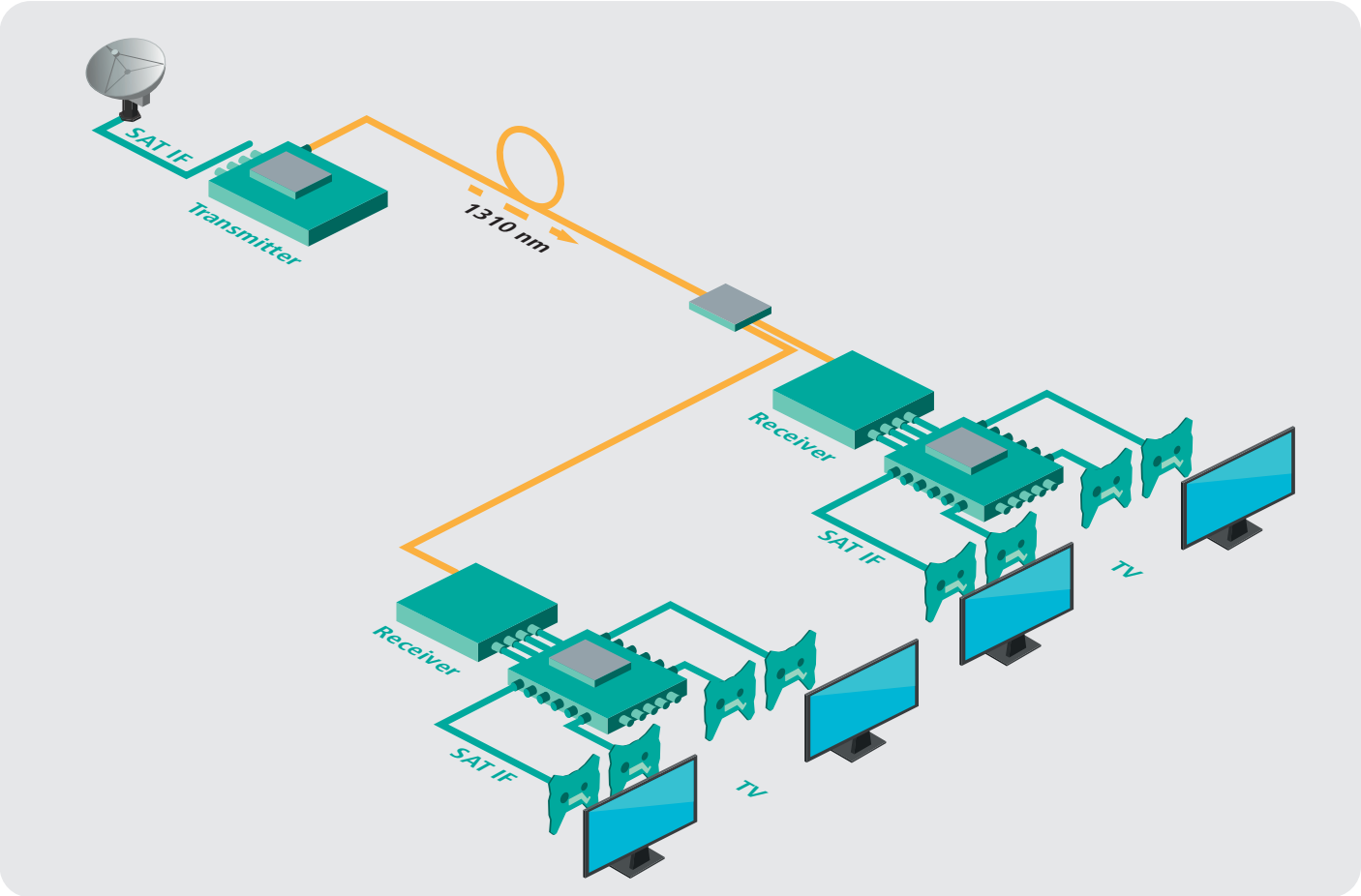


Advantages of fibre optic transmission technology

- ✓ High bandwidth; therefore high performance of the (Internet) connection
- ✓ No interference from electromagnetic interference
- ✓ Very low attenuation; therefore long ranges without intermediate amplification
- ✓ No need for potential equalisation (required in coax networks)
- ✓ Thinner and lighter than copper cable
- ✓ Conserves resources and is climate-friendly

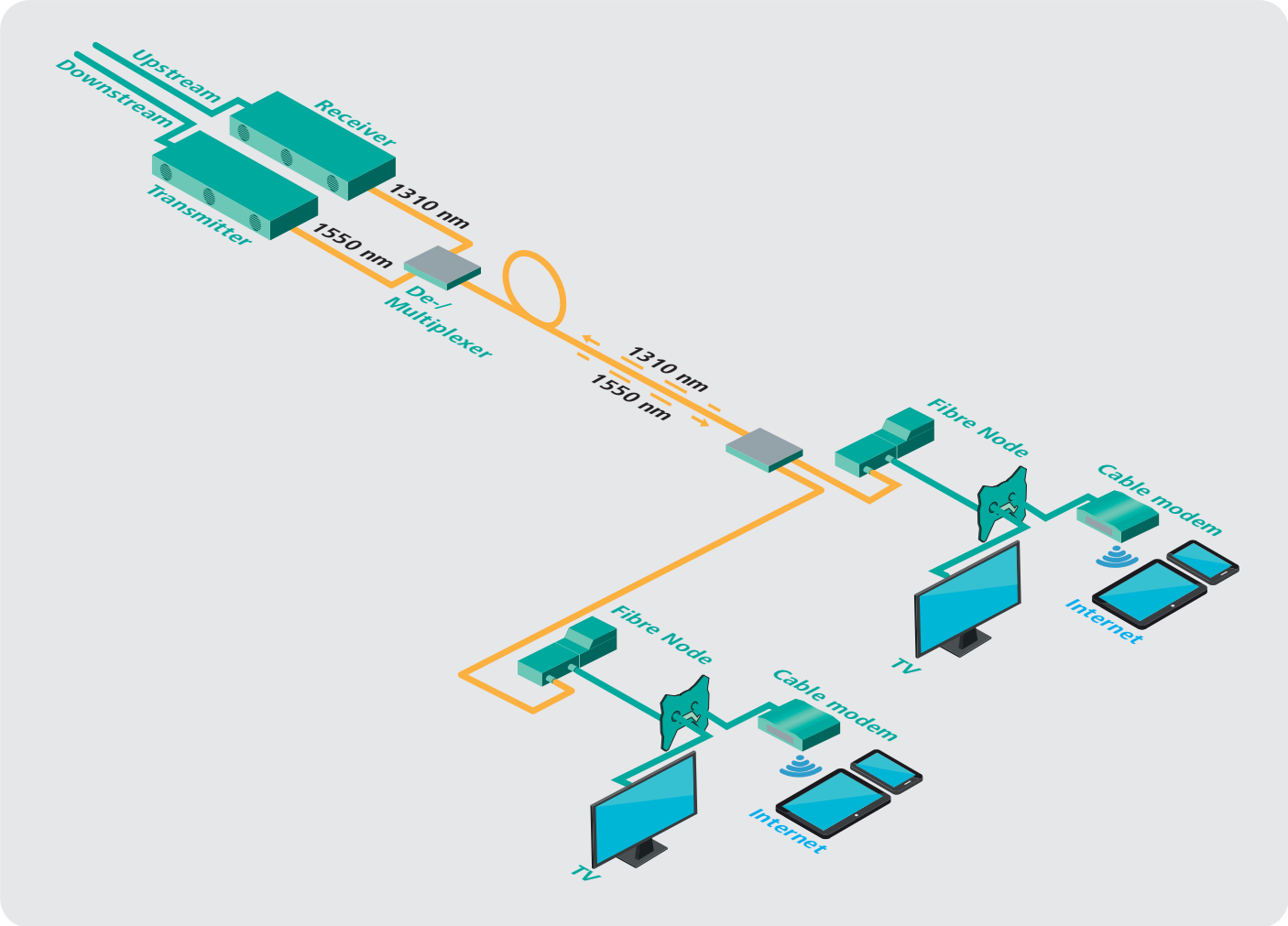
Optical SAT IF distribution

For optical SAT IF distribution, the four satellite polarisations (VL, VH, HL, HH) provided by the Quattro LNBs are converted into optical wave signals by an optical transmitter and then converted back again by an optical receiver. Only the forward path needs to be considered for optical SAT IF distribution.



Optical transmission of DVB-C and DOCSIS

For the optical transmission of DVB-C and DOCSIS signals, two paths, the forward and the return path (downstream and upstream) must be taken into account. Two devices are therefore required here, namely an optical transmitter and an optical receiver. These work with different, non-interfering wavelengths (e.g. 1550/1310 nm).

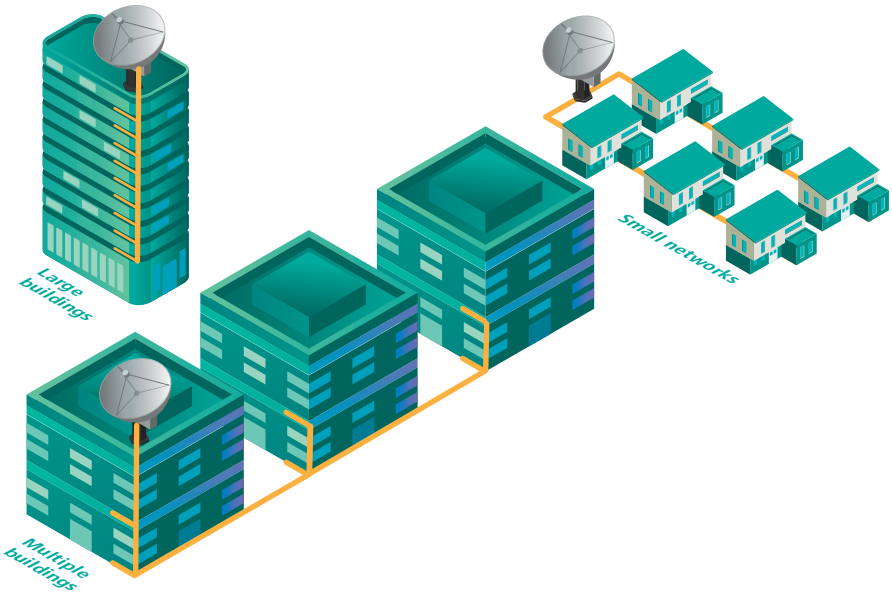


At the subscriber side, optical nodes perform the conversion of data and TV services from the downstream signal back into RF. Additionally, these optical nodes facilitate the transmission of upstream signals from the connected cable modems back to the receiver located at the headend.

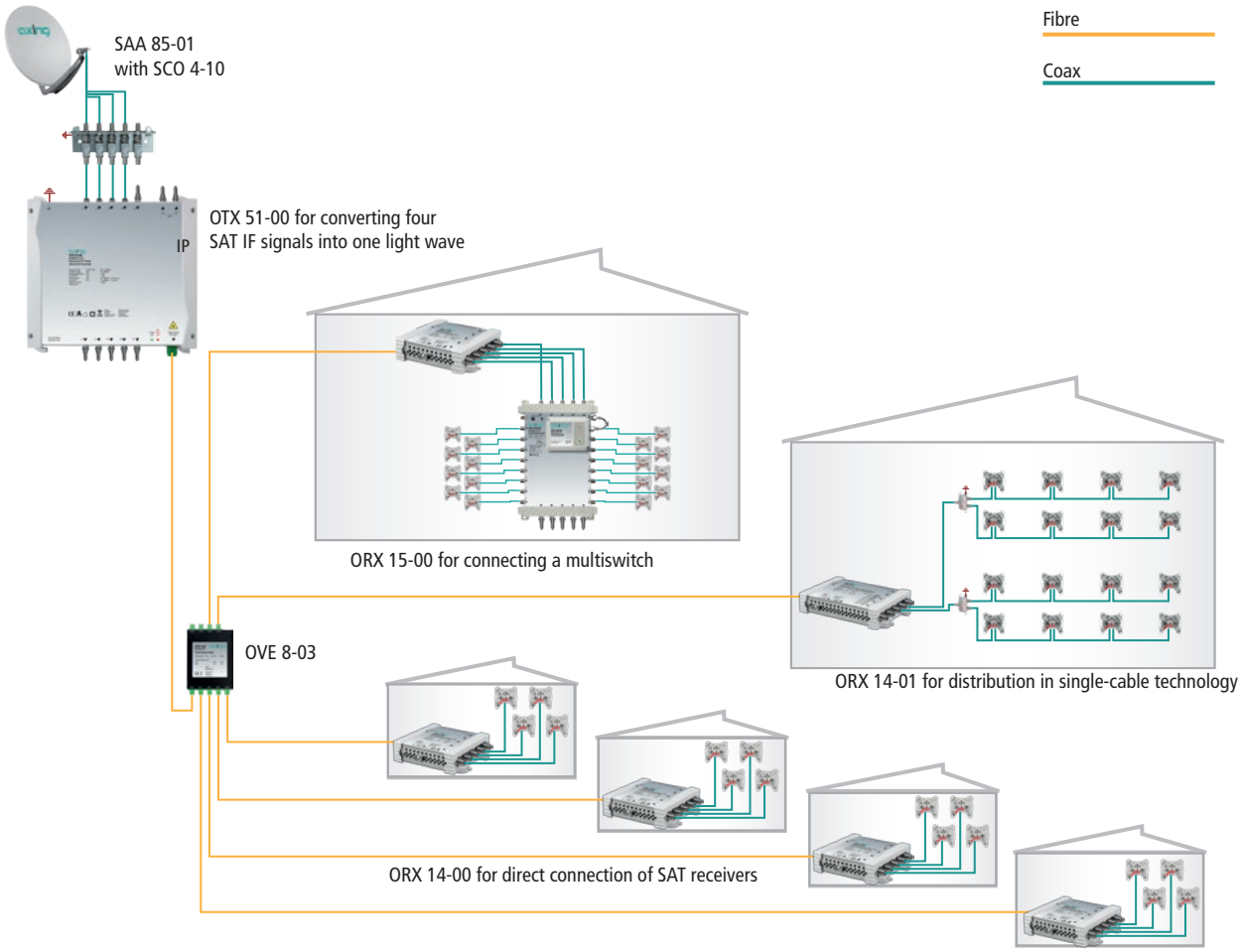
Terms used in this brochure

Transmitter:	Converts RF-Signals into optical signals (light waves)
Receiver:	Converts optical signals into RF-Signals
De-/Multiplexer:	Enables two (or more) lightwave signals to be transmitted via a single optical fibre.
Fibre Nodes:	Converts optical signals to electrical signals (RF) for distribution over coaxial cables and vice versa in fiber optic networks.
DOCSIS:	Data Over Cable Service Interface Specification (Internet via broadband cable)
SC/APC:	Standardised connection type for fibre optic cables that AXING uses for analogue fibre optic distributions.
FTTH:	Fibre to the Home
FTTB:	Fibre to the Building

Optical SAT IF distribution FTTB | FTTH



A transmitter, several receivers and a wide range of accessories such as optical splitters, cables and attenuators are used for the optical transmission of satellite signals. The RF signals are converted into optical light wave signals. These are distributed from the output of the transmitter via optical splitters and optical cables over long distances to optical receivers without noise or distortion. The receivers convert the optical signals back into SAT signals. Receivers are available for connection to SAT receivers (Quad), single-cable receivers (SCR/CSS) or multi-switches (Quattro).



Components for optical SAT IF distribution

Optical transmitter

OTX 51-00
OTX05100

Optical transmitter
- ✓ For optical transmission of satellite signals and max. 16 channels/ carriers (DVB-C, DAB+, DVB-T/T2, FM)
- ✓ Converts incoming RF signals into optical signals
- ✓ Automatic gain control
- ✓ 1 optical output (SC/APC)
- ✓ 5 cascade RF outputs

7611682006919

Optical receivers

ORX 14-00
ORX01400

Optical receiver | Quad
- ✓ For receiving optical signals
- ✓ Converts optical signals into four independent subscriber outputs (SAT + TERR)
- ✓ For connection of four end devices (receivers)
- ✓ Power supply via receiver or external power supply unit (not included in delivery)

7611682008111

ORX 14-01
ORX01401

Optical receiver | Single cable /SCR/CSS))
- ✓ For receiving optical signals
- ✓ Converts optical signals into 2 outputs with 16 user bands each
- ✓ Single cable I and II compatible (according to EN 50607 and EN 50494)
- ✓ In addition, 2 legacy outputs are available
- ✓ Power supply via external power supply unit (not included)

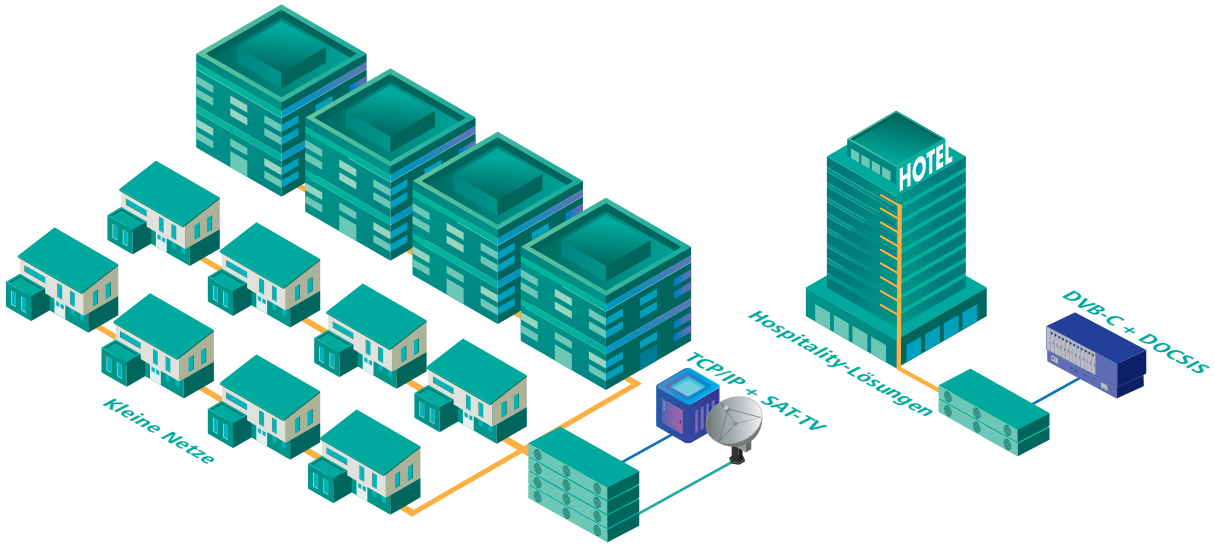
7611682008128

ORX 15-00
ORX01500

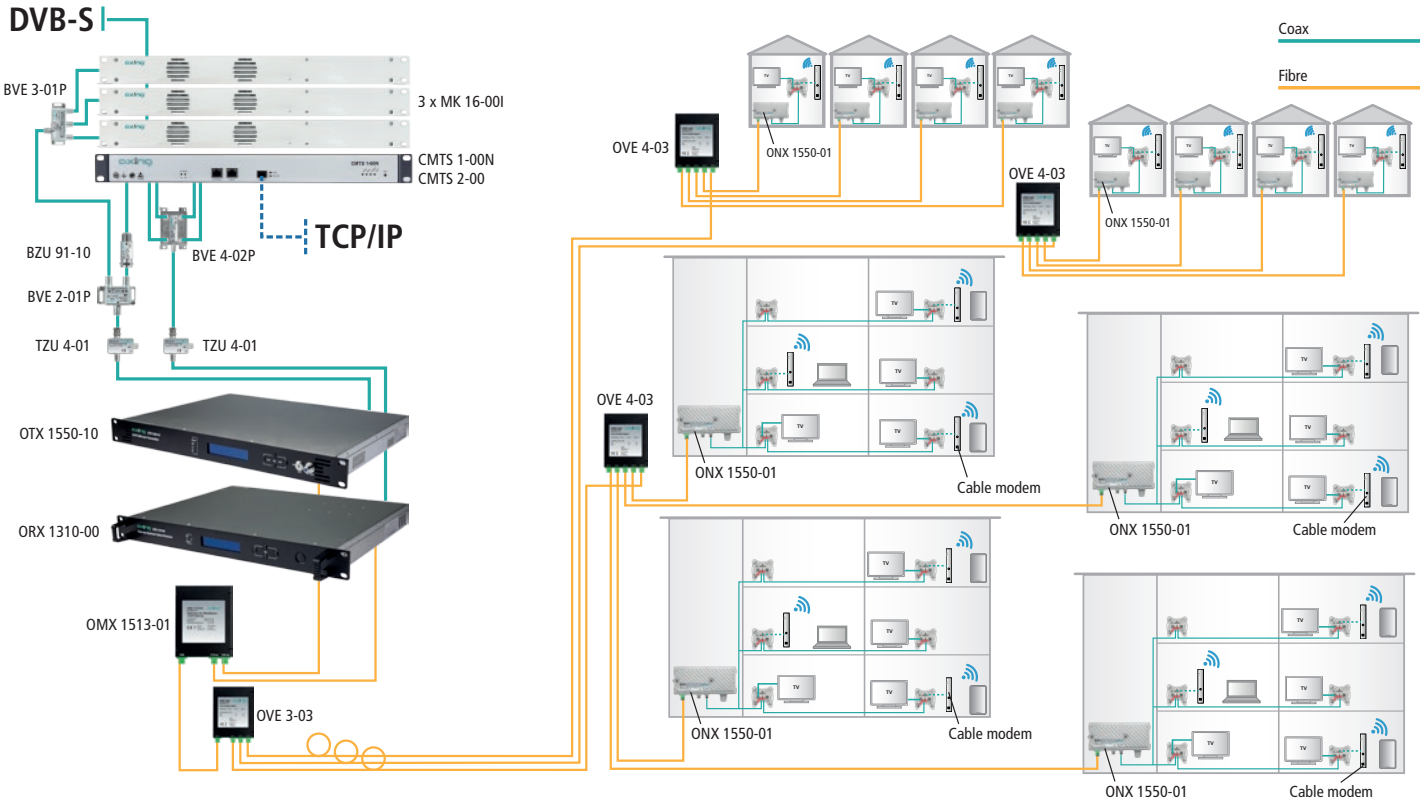
Optical receiver | Quattro
- ✓ For the reception of optical signals
- ✓ Converts optical signals into SAT IF (with fixed satellite polarisation planes) and CATV signals
- ✓ To connect to a multiswitch
- ✓ Power supply via multiswitch

7611682006926

Optical transmission of DVB-C and DOCSIS FTTB | FTTH



Designed for small to medium-sized setups in hospitality, campuses or HFC networks, RF Over Fiber technologies for the transmission of DVB-C and DOCSIS stand out as effective solutions providing a scalable and future proof topology.



In the example, TV signals are provided by AXING headend (I.e. DVB S/S2 to DVB-C) and AXING CMTS feeds IP services into the coaxial cable network.

Downstream: Both the DOCSIS and the TV channels are converted into fibre optic signals by the OTX 1550-10, multiplexed via the OMX 1513-01 and distributed to the buildings via the OVE 3/4-03 (FTTB/FFTH). In the buildings, the ONX 1550-01 fibre nodes convert the light wave signal back into RF.

Upstream: The signals from the cable modems are converted into light waves by the fibre nodes, demultiplexed by the OMX 1513-01 and received by the ORX 1310-00 optical 4-port upstream receiver and converted back into RF. These upstream channels are then distributed to the CMTS, which represents the connection to the Internet backbone.

Components for optical CATV and DOCSIS distribution

NEW NEU 23

OTX 1550-10
OTX155010

Optical CATV transmitter | 1550 nm | 47 ... 1006 MHz

- ✓ Converts incoming RF signals into optical signals
- ✓ Frequency range 47 ... 1006 MHz
- ✓ Two inputs with 50 dB isolation for high-quality RF feed-in
- ✓ Optical wavelength 1550 nm
- ✓ Optical output power 10 dBm
- ✓ Electronic compensation of fibre dispersion
- ✓ Transmission distance up to 50 km
- ✓ Optical connection SC/APC
- ✓ Two redundant power supplies
- ✓ 19" housing, 1RU

7611682009774

NEW NEU 24

OMX 1513-01
OMX151301

Optical de-/multiplexer 1310/1550 nm

- ✓ Multiplex signals with 1310 nm and 1550 nm on one optical fibre
- ✓ Demultiplex signals with 1310 nm and 1550 nm from one optical fibre to two outputs
- ✓ Low insertion loss
- ✓ High isolation

7611682400182

NEW NEU 24

ORX 1310-00
ORX131000

Four-way Upstream Optical Receiver | 1310 nm | 5 ... 204 MHz

- ✓ Converts optical signals into RF signals
- ✓ Optical wavelength 1310 nm
- ✓ Optical input level range –22 ... 0 dBm
- ✓ AGC in the range –10 ... 0 dBm
- ✓ Optical connection SC/APC
- ✓ Output frequency range 5 ... 204 MHz
- ✓ Output level 100 dBµV
- ✓ Two redundant power supply units
- ✓ 19" housing, 1RU

7611682009941

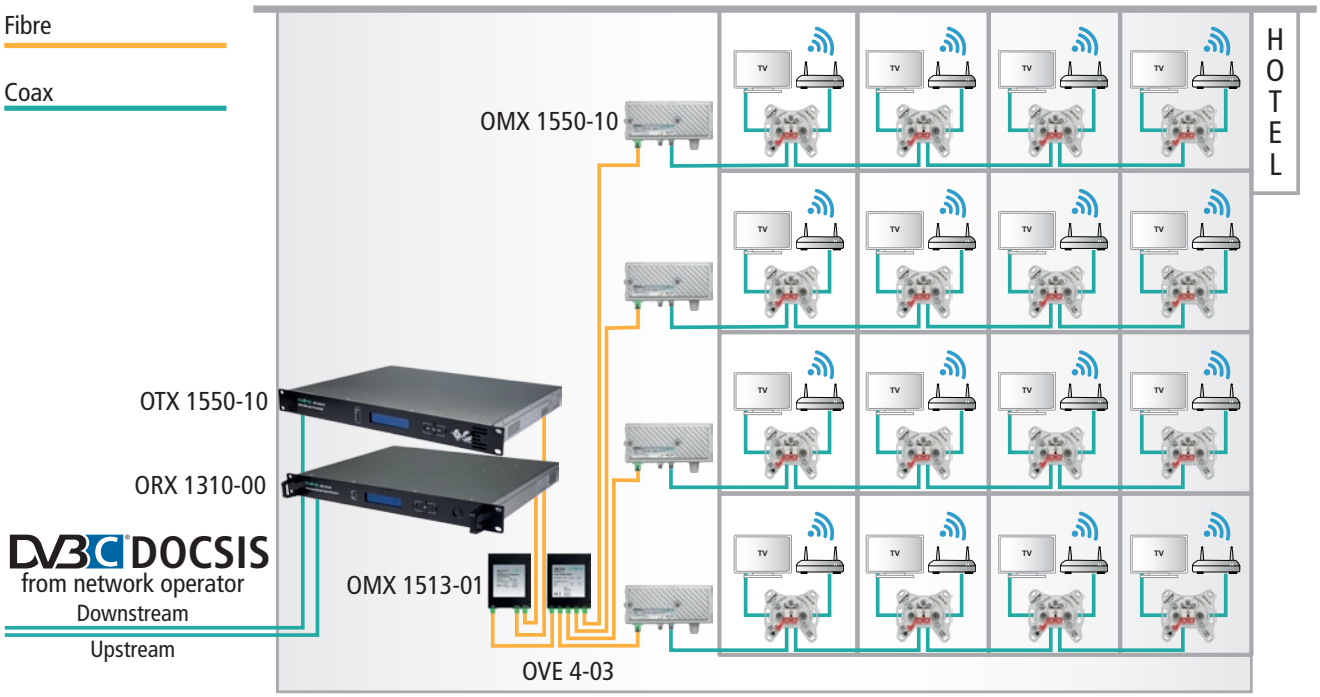
KLASSE A CLASS

ONX 1550-01
ONX155001

Micro Fibre Node | 1550/1310 nm | 85…1218 MHz/5…65 MHz

- ✓ For FTTH/FTTB applications in RFoG networks
- ✓ Low noise optical receiver
- ✓ Constant RF output level for the wide optical operating range, OLC function
- ✓ Adjustable interstage equalization
- ✓ Adjustable upstream attenuation
- ✓ DFB Laser (CW mode/Burst mode)
- ✓ Local power supply
- ✓ Al-die-cast housing
- ✓ Testports for up- and downstream

7611682006841



Distribution worldwide

Global Partnerships, Local Excellence – Join the Axing Network

Your Opportunity: Are you seeking to become a local distributor for cutting-edge TV and broadband solutions in your region? Connect with Ünal Isler or Zaher Al-Hayek, our dedicated regional sales managers, to explore how we can collaborate and bring innovative solutions to your market.

Your contact partners

MENA
Zaher Al-Hayek
AXING Middle East
Mobile 00971 55 1389 000
E-Mail z.alhayek@axing.com

Rest of the World
Ünal Isler
International Senior Sales Manager
Mobile +49 160 7013393
E-Mail u.isler@axing.com

Existing distributors