



BKtel

Fiber.xSAT

FTTx Satellite TV
Distribution System



FTTx Satellite TV Distribution System

The BKtel Fiber.xSAT is a powerful and cost-effective solution for delivering satellite TV services over fiber optic access (FTTx) networks. Thanks to its extraordinary capacity, Fiber.xSAT is able to broadcast extended satellite TV program bouquets including hundreds of SDTV and HDTV channels to the subscribers via single mode fiber.

Especially Direct-to-Home (DTH) satellite TV providers can now take advantage of modern telecommunication networks. The installation of individual satellite dishes on customer premises (which in many cases is not desired or even prohibited) is not a requirement anymore. Using Fiber.xSAT satellite-TV services can be transmitted transparently to the subscriber together with data and voice services.

Optical Transport System

The Fiber.xSAT system is based on the transmission of (DVB-S) TV signals consisting of multiple independent SAT IF bands (satellite feeds). 1550 nm optical transmitter and amplifier technology enables driving extended networks of up to tens of thousands of subscribers over distances greater than 50 km. Fiber.xSAT is compatible with GPON, GEAPON, EPTP (optical Ethernet point-to-point) and also next generation 10GPON.

Flexible Headend Solutions

The headend SAT IF signals used with the Fiber.xSAT systems can be generated directly from the downlink signals of K_u band or C band satellites. In most cases BKtel can provide a tailored solution derived from economic LNB technology. This considerably reduces equipment and maintenance costs in comparison to CATV headend systems requiring complex channel processing.

Optionally Fiber.xSAT can also integrate Terrestrial TV (DTT, DVB-T or analog) and Digital Audio sources for transmission over the same network, adding a further valuable service to FTTx networks.

Customer Premises Equipment

The signal arriving at customer premises provides the subscriber with the flexibility to use standard DVB-S receiver set-top boxes. Using off-the-shelf standard receiver technology provides a low-cost TV and video distribution solution.

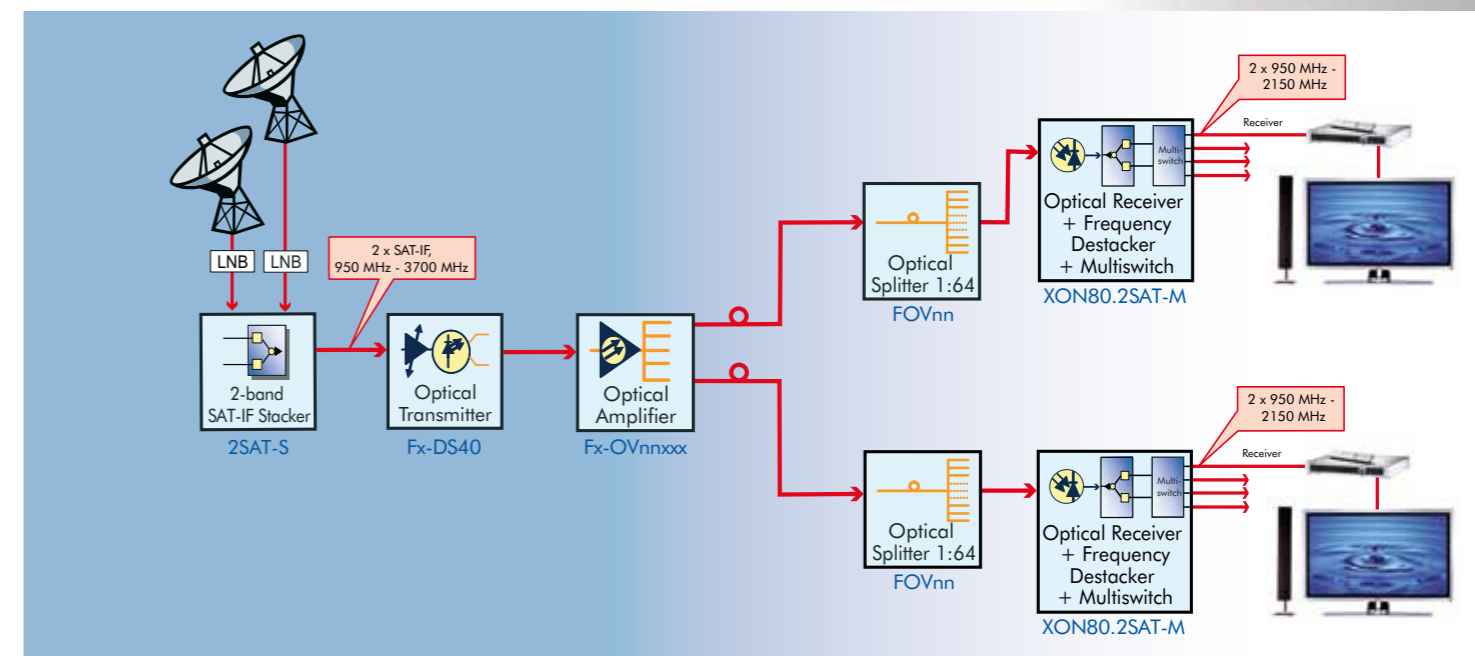
Features

- ◆ Transparent fiber optic transmission of DVB-S SAT IF signals
- ◆ Simultaneous transmission of multiple SAT IF feeds to subscribers
- ◆ 1550 nm transmitter and amplifier technology enables realization of extended fiber optic networks
- ◆ Suitable for point-to-multipoint and point-to-point FTTx networks
- ◆ Low-cost headend equipment
- ◆ Terrestrial TV (DTT, DVD-T or analog) transmission optional
- ◆ Standard DVB-S/DTT/DVB-T receiver set-top boxes can be used
- ◆ Multiswitch included in the customer premises converter unit if desired (up to 4 DVB-S receiver set-top boxes can be connected)

Fiber.2SAT: General Multifeed Satellite TV-Solution

The Fiber.2SAT system provides an optical transport solution for 2 L band signals (950 MHz ... 2150 MHz). The feeds can be generated by independent satellite sources and are aggregated by 2SAT-S (Dual L band frequency stacker unit). Using state-of-the-art optical transmission and amplification technology the RF signal is transmitted over the fiber network before finally being fed into an optical receiver at the subscriber premises and converted for conventional coaxial cable distribution.

For transmission of more than 2 L band signals over one FTTx network, the Fiber.2SAT system can be extended using DWDM (Dense Wavelength Division Multiplexing) technology. In this way the system is expanded to as many L band signals as required (e.g. 2xFiber.2SAT = 4 L band feeds, 3xFiber.2SAT = 6 L band feeds).



Fiber.2SAT: General Multifeed Satellite-TV Solution

2SAT-S

Dual L Band Frequency Stacker

Application

- Stacking of 2 L band signals (950 ... 2150 MHz) in the frequency range from 950 ... 3700 MHz
- Use as headend for optical transmission system of satellite IF signals (BKtel Fiber.2SAT)

Features

- Upconversion of one L band (950 ... 2150 MHz) to the frequency range from 2500 ... 3700 MHz and multiplexing with second L band signal in the baseband (950 ... 2150 MHz)



Fx-DS40

Optical Transmitter

Application

- Electrical-to-optical conversion of SAT IF signals
- The 1550 nm versions enable the use of optical amplifiers (EDFAs, YEDFAs) as boosters or repeaters



Features

- Bandwidth SAT: 950 ... 3700 MHz / Terrestrial: 223 ... 860 Mhz
- SBS suppression with high SBS threshold
- All-electronic adjustment of gain, output power, and OMI (Optical Modulation Index)
- ALC (Automatic Load Control)
- Dual, hot-plug-in power supply modules for 100 ... 240 VAC or $\pm 36 \dots \pm 72$ VDC
- Web and SNMP Interface
- LC display and LED status indication
- Very thin (only 1 U) design for mounting into 19", ETSI or JIS racks

XON80.2SAT-M

Ultra Broadband Optical Receiver Module + Destacker + Multiswitch

Application

- Optical receiver and frequency destacking module for stacked Satellite TV signals in BKtel Fiber.2SAT optical transmission system
- Use as optical receiver unit for Satellite TV video overlay in FTTH networks

Features

- Optical-to-electrical conversion and frequency destacking of multiplexed SAT IF signals
- Suitable for 2 L band signals (950 ... 2150 MHz)
- 2 x 2 multiswitch included

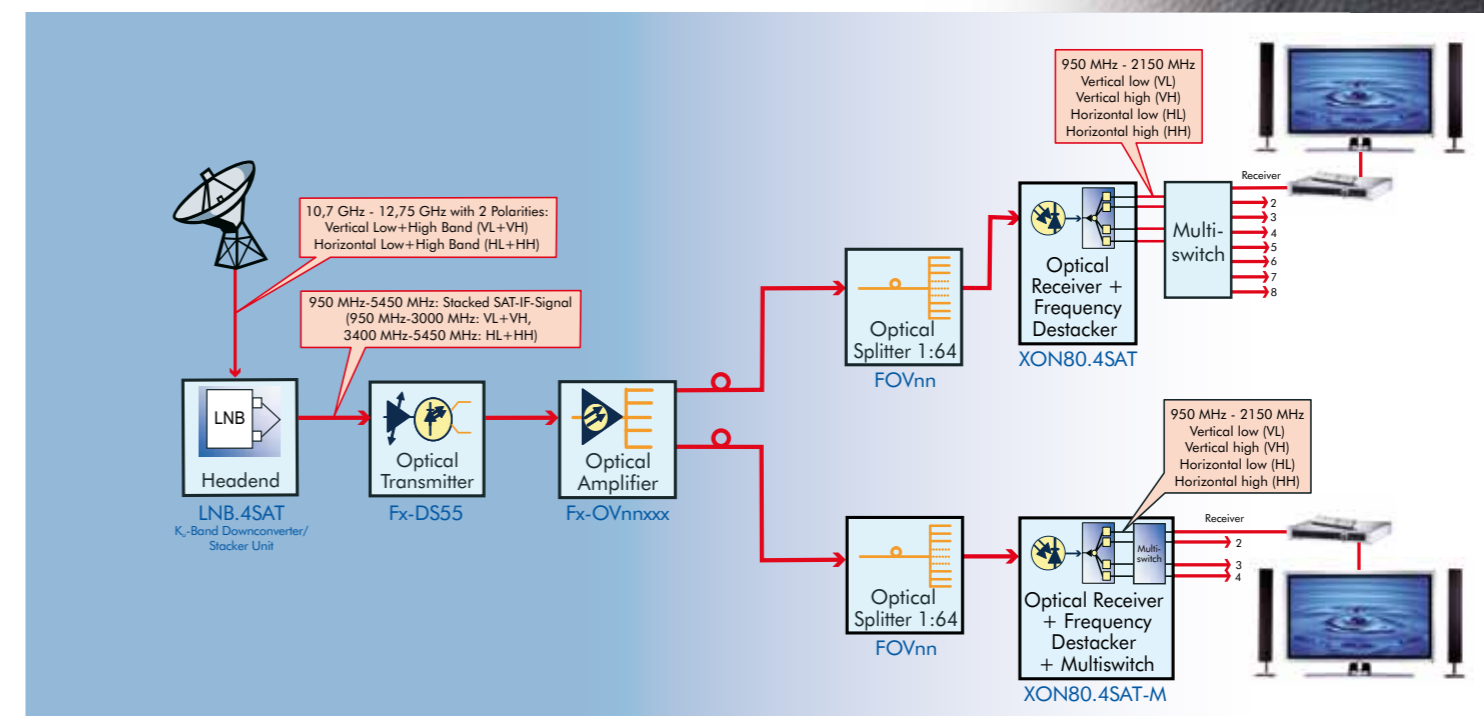


Fiber.4SAT: Cost-Effective Solution for K_u Band Satellites

The Fiber.4SAT is a cost-effective solution which can be applied when a single K_u band satellite (or a set of K_u band satellites at the same orbital position) is the source of the SAT TV feeds. An LNB installed at the headend antenna converts the satellite downlink signal to a wideband RF output consisting of all four K_u sub-band signals (vertical low, vertical high, horizontal low, horizontal high band), stacked into the frequency range from 950 to 5450 MHz. As with the Fiber.2SAT system, the application of state-of-the-art optical transmitter and amplifier technology allows distribution of the SAT-TV signal in extended FTTH networks.

The subscriber can use standard satellite set-top boxes not requiring any modification or re-programming.

Transmission of 100 DVB-S2 transponders ensures that up to 3000 SDTV or 600 HDTV channels are simultaneously available at the subscriber's outlet. This equates to off-loading up to 10 Gbit/s of data from the IP backbone for future IPTV delivery.



Fiber.4SAT: Cost-Effective Solution for K_v Band Satellites

LNB.4SAT

Universal Satellite-TV LNB-headend + Integrated Frequency Stacker

Application

- ◆ Headend for the generation of multiplexed (stacked) Satellite IF signals

Features

- ◆ Downconversion of K_v Band DVB-S signals into SAT IF and stacking into one combined RF signal in the frequency range 950 ... 5450 MHz
- ◆ Power supply via optical transmitter Fx-DS55



Fx-DS55

Optical Transmitter

Application

- ◆ Electrical-to-optical conversion of SAT IF signals
- ◆ The 1550 nm versions enable the use of optical amplifiers (EDFAs, YEDFAs) as boosters or repeaters



Features

- ◆ Bandwidth SAT: 950 ... 5450 MHz / Terrestrial 223 ... 860 Mhz
- ◆ SBS suppression with high SBS threshold

- ◆ All-electronic adjustment of gain, output power, and OMI (Optical Modulation Index)
- ◆ Dual, hot-plug-in power supply modules for 100 ... 240 VAC or ± 36 ... ± 72 VDC

- ◆ Automatic load control (ALC)
- ◆ Web and SNMP Interface
- ◆ LC display and LED status indication
- ◆ Very thin (only 1 U) design for mounting into 19", ETSI or JIS racks

XON80.4SAT / XON80.4SAT-T

Ultra Broadband Optical Receiver Module + Destacker

Features

- ◆ Optical-to-electrical conversion and destacking of K_v band SAT IF multiplex signals comprising 4 digital SAT IF signals* (XON80.4SAT)

- ◆ Optional DAB/DTT(DVB-T) support (XON80.4SAT-T)
- ◆ Automatic gain control (AGC)



XON80.4SAT-M / XON80.4SAT-MT

Ultra Broadband Optical Receiver Module + Destacker + Multiswitch

Features

- ◆ Optical-to-electrical conversion and destacking of K_v Band SAT IF multiplex signals comprising 4 digital SAT-IF signals*

- ◆ 4x4 Multiswitch included (XON80.4SAT-M)
- ◆ Optional DAB/DTT(DVB-T) support (XON80.4SAT-MT)



* VL: 950 ... 1900 MHz, VH: 1100 ... 2150 MHz, HL: 950 ... 1900 MHz, HH: 1100 ... 2100 MHz

Optical Amplifier and Transmission Technology

Fx-OVnnxxx

Very High Power Optical Amplifier (YEDFA)

Application

- ◆ Amplification of SAT-IF Signals in FTTx networks, 1545 ... 1565 nm
- ◆ Preamplifier and booster amplifier in one 19" device
- ◆ Usable in combination with Optical Transmitter (Fx-DS40 / Fx-DS55)
- ◆ Adjustable output power
- ◆ Constant Output Power Mode and Constant Gain Mode



Available Versions

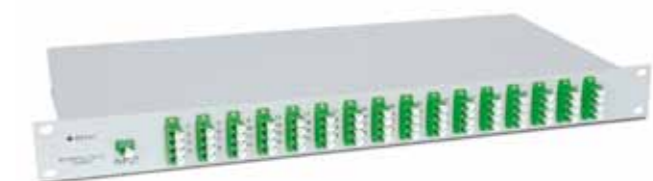
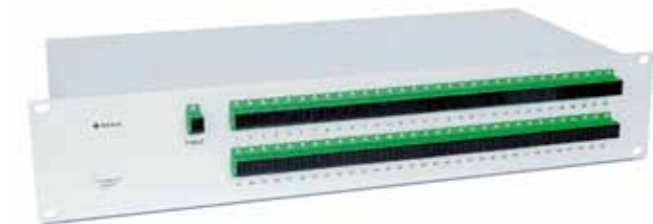
- ◆ 16 x 14.5 dBm (SC/APC or LC/APC) in 1 U
- ◆ 16 x 16.5 dBm (SC/APC or LC/APC) in 1 U
- ◆ 32 x 16.5 dBm (LC/APC) in 1 U
- ◆ 8 x 20 dBm (LC/APC) in 1 U
- ◆ 16 x 20 dBm (LC/APC) in 1 U

FOVnnn-PLC

Optical Splitter

Application

- ◆ 64 output ports in 2 U
- ◆ SC/APC
- ◆ Insertion loss < 19.7 dB
- ◆ Uniformity < 1.5 dB
- ◆ 64 output ports in 1 U
- ◆ LC/APC
- ◆ Insertion loss < 19.7 dB
- ◆ Uniformity < 1 dB



Headquater:

BKtel communications GmbH

Benzstrasse 4

41836 Hückelhoven-Baal

Germany

Phone: +49 (0) 24 33 / 91 22-0

Fax: +49 (0) 24 33 / 91 22-99

Office Kornwestheim:

Bahnhofstrasse 82

70806 Kornwestheim

Germany

Phone: +49 (0) 71 54 / 1 59 90-0

Fax: +49 (0) 71 54 / 1 59 90-77

Representations:

BKtel communications Beijing Ltd.

and BKtel communications GmbH

Beijing Representation Office

Rm. 0711, Sinolife Tower

56 Xizhimen North Avenue

Haidian District, Beijing,

100082 China

Phone: +86 10 8229 3065

Fax: +86 10 8229 3224

BKtel Pacific Rim (Japan) Inc.

Katsukou Building 5F

1-2-8, Hourai-cho, Naka-ku,

Yokohama, Kanagawa 231-0048,

Japan

Phone: +81 45 350 5447

Fax: +81 45 350 5460

BKtel local agents:

France:

André Balva

balva@bktel.com

Spain:

Rafael Leon Linde

leon@bktel.com

South East Asia:

Roland Wuerth

wuerth@bktel.com

USA:

Harj Ghuman

ghuman@bktel.com

Australia / New Zealand:

John Nixon

nixon@bktel.com

United Arab Emirates:

Ünal Güzel

guez@bktel.com

Internet: <http://www.bktel.com>

Email: info@bktel.com