Sat TV over Fiber
Satellite Master Antenna TV
Fiber to the Home

Greatway Technology Co., Ltd.
Satellite to Home: DBS and DTH

- DBS: Direct Broadcasting Satellite
- DTH: Direct to Home
- Satellite Frequency: Ku Band (10.7GHz~12.75GHz)
- Satellite Dish Diameter: 0.5~1 meter
- LNB output port: Single or Twin or Quad/Quattro
- LNB Output Frequency: L-Band (950~2150MHz)
- RF Carriers in each L-Band: < 24
- HD and SD video: 200+ channels
Satellite to Home: equipments at each home

• Satellite Dish Diameter: 0.5~1 meter
• LNB installed on the satellite dish
• Coaxial Cable
• L-Band RF Splitter or Multiswitch if multi-terminals
• Digital satellite receiver (one for each TV)
Satellite to Home: Challenges

- Satellites used for television signals are at geostationary orbit 37000Km above the earth’s equator.
- Satellite antenna must face the satellite, a problem to apartments at the opposite side of a building.
- Coaxial Cable limits the distance between satellite antenna and satellite receiver.
Quad LNB and Quattro LNB

A Quad LNB gives 4 independent LNB feeds which can receive switching signals from 4 digital tuners and allows the full range of tuning options to be used. These being Horizontal, Vertical, High Band and Low Band. The LNB outputs are switched by the satellite receiver, with a 22Hz tone and a switching voltage which makes it like a universal LNB with four outputs. A quad LNB is ideal where a maximum of four satellite feeds is required and there is not much possibility of expansion.

A Quattro LNB also provides four outputs, each with a single band specific to that output. The band available at each output is fixed at the time of manufacture, and it is not possible to switch the band with a tone or switching voltage.

A Quattro LNB is normally used to feed a large distribution system. A single dish with a Quattro LNB fitted and a multi-switch is able to feed anything between 4 and 100 locations and can provide any of the input signals at each output, depending on a tone sent up the cable by the receiver at each location.
Quattro LNB and Satellite Mutliswitch

The outputs on a multi-switch are able to be controlled with a 22Hz tone and switching voltages in the same way that the outputs from normal universal LNB can be such as changing band and polarization. The satellite receivers in each of the locations behave as though they are connected to their own dedicated dish and LNB, but really they are just connected to a multi-switch output. Quattro LNBs are considered to have a better lifetime than quad LNBs as they are not being continually switched.
SMATV (Satellite Master Antenna TV)

- SMATV: a system for relaying broadcast television signals, embodying a master receiving antenna with distribution by cable to a small group of dwellings, such as a block of flats. Including:
  - Satellite Quatro LNB
  - Terrestrial TV Master Antenna
  - Distribution: master antenna to multiswitch first, then to multi-terminals, supporting HD video
  - Coaxial Cable connection
  - No Ethernet
SMATV System

Multiswitch distributes the SMATV signals to multi terminals. The serving area radius is limited, about 150 meters with repeaters.
Why using fiber in SMATV system

- Coaxial cable loss: 19dB/100m@862MHz and 31dB/100m@2150MHz. SMATV system subscribers are limited.
- Fiber loss: 0.4dB/Km@1310nm and 0.3dB/Km@1550nm for all the RF bandwidth. Satellite RF signals can be easily delivered 30Km over fiber.
- Master Antenna can be converted into one 1550nm optical transmitter to fiber. With fiber amplifier, one transmitter can serve 32 or 320 or 3200 or 32000 or more optical receivers in the community.
- Each optical receiver is a virtual antenna for a few SMATV coaxial subscribers.
- GPON ethernet is available on the same fiber.
Local Terrestrial TV can be added easily

Terrestrial TV RF Input

GLB3500-MT
Terrestrial TV RF can be distributed to satellite subscribers over the same fiber, offering local TV contents.

Optical Output To Fiber

LNB RF Output to Optical transmitter, 13V or 18V DC to LNB
GPON ethernet available along with SMATV fiber to the home

GPON gigabit Ethernet services are available from SMATV fiber to the home terminal.

SMATV PON subscribers can enjoy:
- Local TV
- Satellite Video
- IPTV or OTT
- Gigabit Ethernet
Inserting SMATV (Satellite Master Antenna TV) over GPON/GEPON

Proposed by Greatway Technology

GWA3530 high power 1550nm amplifier has one 1550nm input, 16 OLT inputs and 16 com ports, inserting L-Band and Terrestrial TV over thousands of GPON/GEPON subscribers.
Twin L-Band over one fiber to Home GLB3500-2WT

GLB3500-2WT converts twin LNB LHCP, RHCP L-Band RF and Terrestrial TV RF into 1550nm optical signal for fiber distribution.
SMATV fiber to the home
GLB3500-4T optical transmitter converts Quattro LNB RF and Terrestrial TV RF into 1550nm optical signal for fiber distribution.
GLB3500-4T optical transmitter next to the master antenna and one GWA3530 optical amplifier can feed thousands of GLB3500-4R optical receivers in 20Km fiber distance.
Satellite L-Band RF over GPON/GEAPON

GLB3500 L-Band RF transmitter converts 1/2/4 LNB RF into fiber optic 1550nm output. Built-in 1310nm/1490nm/1550nm WDM enables L-Band RF to be distributed over 1x32 GPON/GEAPON network.

Dish

LNB powered by L-Band RF Transmitter

Sat Multiswitch
Two LNB inputs
Four IRD ports

Sat L-Band Fiber to the Home
Sat Multiswitch to each room
IRD to each TV in the room

WDM-PON
WDM-PON enables 8 GPON or 8 GEAPON to be delivered over one SM fiber for up to 50Km by means of CWDM or DWDM technology.

GLB3500 L-Band Transmitter
50Km Fiber

1x32 Fiber Splitter
2Km

WDM-PON Master unit
19” 1RU and 19” 5RU available

1490/1310nm

1550nm
1490nm
1310nm

GONU1100W
Fiber to the Home
Offer both Sat L-Band RF and ONU Ethernet

GFH3500-W
RF receiver with WDM to ONU

GFH3500 LHCP/RHCP
L-Band RF Receiver
-14dBm@1550nm
SMATV PON: Inserting Satellite TV over a GPON Community

www.greatwaytech.com

GLB3500-4T optical transmitter converts SMATV Quattro LNB and TV RF into 1550nm output to fiber

GWA3530 1550nm Amplifier has 8 OLT inputs and 8 com ports for 1550nm and 1310nm/1490nm

Community

Original GPON Ethernet Service

Added elements for inserted SMATV Services

2Km-18Km

8 core Fiber Cable to the community

GPON OLT Center

<2Km

GLB3500-4R Optical Receiver acting as Virtual Quattro LNB -14dBm@1550nm

1550nm

1490nm

1310nm

<2Km

5x4 Multiswitch 5 inputs, 4 Outputs

1x64 Fiber Splitter

<2Km

SMATV Fiber to the Home Sat Multiswitch to terminal Sat Receiver to each TV

<2Km

GLB3500-4WR Optical receiver with WDM to ONT

GONT1000W

Fiber to the Home Offer both SMATV RF and Ethernet: local video, sat video and IPTV

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GLB3500-4R optical receiver acts as a virtual Quattro LNB, working with satellite multiswitch, offering local TV and satellite signals to any terminal in the home.

1550nm Optical Input from the PON

GPON ONT (1490nm/1310nm) Ethernet (Optional)

SMATV over PON home terminals GLB3500-4R

Ethernet (Optional)
Products related to Satellite fiber to Home

GPON OLT GOLT2000 and GPON ONT GONT1000

High power 1550nm optical amplifier GWA3530

One GWA3530 optical amplifier has 32 outputs. Each output can deliver SMATV signals to 64 subscribers in 20Km fiber distance. One GWA3530 feeds 2048 optical receivers.
Greatway Technology  www.greatwaytech.com
Satellite L-Band fiber to home family

Single L-Band fiber transmission
GLB3300MT optical transmitter and GLB3300MR optical receiver

Single L-Band and Terrestrial TV fiber transmission
GLB3500MT optical transmitter and GLB3500MR optical receiver
GFH1002-K optical receiver with WDM if supporting GPON ONT is demanded

Twin L-Band and Terrestrial TV fiber transmission
GLB3500-2T optical transmitter and GLB3500-2R optical receiver
GLB3500-2WR optical receiver with WDM if supporting GPON ONT is demanded

Quattro L-Band and Terrestrial TV fiber transmission
GLB3500-4T optical transmitter and GLB3500-4R optical receiver
GLB3500-4WR optical receiver with WDM if supporting GPON ONT is demanded
Thanks!

Greatway Technology Co., Ltd.
Design House and Factory
RF over Fiber transmission products
Web: www.greatwaytech.com