hybrid

A NEW VISION ON FTTH

Element Masque

Protection cover

The Hybrid product family marks the embodiment of a new vision on FTTH. It seperates the service layer from the network layer, resulting in a modular, cost-effective and flexible home gateway solution matching all types of FTTH networks.

The Element Masque is a plastic protection cover for all Hybrid Element products. It covers and protects the Hybrid interface connector on the Element and makes the design of the product more attractive. The Masque can be printed with customized operator branding

The Element Masque can be replaced with a Live! Titanium Residential Gateway at any moment.*

Features

- Finishing cover for all Hybrid Element products

- Protects Hybrid interface

- Easily replacable with any Live! Titanium*

- Optional customized operator branding

*only applicable to Element products that include a Hybrid interface connector

General specifications

- Dimensions (H x W x D)   241x104x13mm
- Weight   65 g
- Operating condition   0 - 70 °C
- Storage condition   0 - 70 °C

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ELEMENT Point-to-Point

Element-NT Network Terminator

The Hybrid product family marks the embodiment of a new vision for FTTH. It separates the service layer from the network layer, resulting in a modular, cost-effective and flexible home gateway solution matching all types of FTTH networks.

The Element-NT network terminator provides a managed demarcation point for the operators network. Based on a full Gigabit interface, it translates the optical signal into tangible services through the click-on Live! residential gateway, and up to two devices connected via standard RJ45 connectors.

The Element-NT series is designed for Point-to-Point Ethernet networks.

Features

- Cost-effective network terminator

- Supports Gigabit and 100Mbps fiber uplinks

- Provides Ethernet connectivity for up to three devices

- Powers Universe-CATV & Hybrid Live!

- Management via SNMP, DHCP/TFTP or GAPS

- Optional Element Masque to cover Element, smoothen the design and enable customer branding

- Fully compatible with all Hybrid Live! service modules, through the Hybrid Interface

- Direct wall-mounting optional

network demarcation

The Element-NT forms a cost-effective managed network demarcation point. It offers termination of the FTTH transport layer and multiple paths to the service layer. Services can be activated by simply connecting a Hybrid Live! module, or connecting a residential gateway or other devices via standard Ethernet interfaces.

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Features & specifications

Status LEDs

- ⏻ Power
- ⇄ Fiber uplink status
- ⎁ CATV status

LAN interface

- Two 10/100/1000Base-T RJ45 Interfaces

WAN interface

- Compliant with IEEE 802.3 Clause 59 (1000BASE-BX10-U)
- Compatible with IEEE 802.3 Clause 58 (100BASE-BX10-U)
- Single mode fiber (ITU-T G.652)
- SC/PC connector
- Full duplex transmission
- TX 1310 nm
- RX 1480 - 1580 nm
- 10 km range
- > 12 dB power budget
- Class 1 laser product
- Transmit power -3 ... -9 dBm
- Receive power -3 ... -21 dBm

Hybrid interface

- Gigabit Ethernet electrical interface
- Supports any Hybrid Live! module

Layer 2 features

- Wirespeed forwarding
- Managed Quality of Service
- Port enable
- External per port rate shaping and limiting
- Up to 64 VLANs
- Q-in-Q
- Link state forwarding

CATV Control

- Powering for Universe-CATV unit
- Remotely enable CATV
- Remote monitoring of CATV input signal

Management

- Genexis Automatic Provisioning System (GAPS)
- Passive IEEE802.3ah operation
- SNMP statistics
- DHCP/TFTP
- IEEE 802.3ah OAM in passive mode:
  - Discovery
  - Loopback
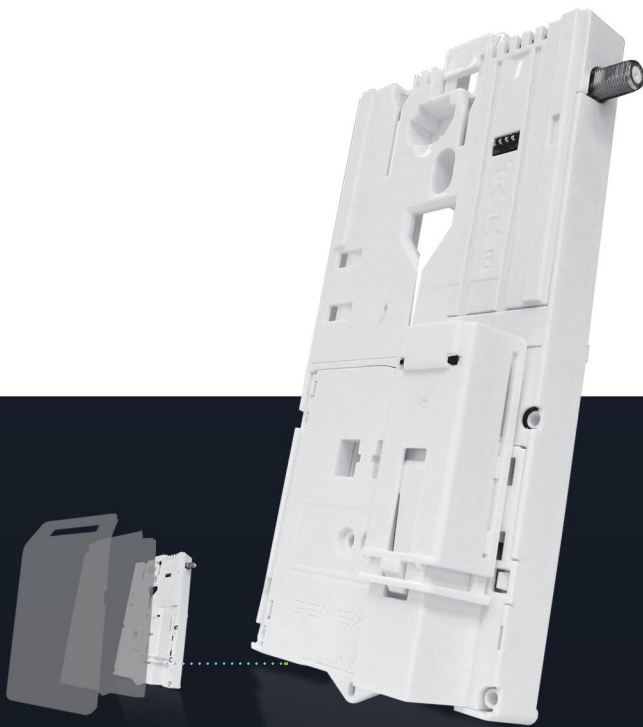 - Fault notification (dying gasp)

General specifications

Mechanical and environmental
- Dimensions (H x W x D)   223x104x45mm
- Weight   200 g
- Power supply voltage   12 Vdc ± 10%
- Operating condition   0 - 40 °C
  10% - 80% relative humidity non condensing
- Storage condition   0 - 70 °C
  10% - 95% relative humidity non condensing

Configuration overview

Model	WAN Fiber(Mbps)	Hybrid Interface slots	LAN interfaces	Universe CATV power
Element-P1132	100/1000	1x	2x	yes

hybrid

Universe
Fiber Termination

The Universe Fiber Termination Unit is the foundation for all of the Genexis Hybrid products. It has been designed to enable a swift installation and to fully utilize the capabilities of fiber. It reduces installation cost and makes it easy for the end-user. The Universe is the most versatile and complete Fiber Termination Unit on the market.

Compatibility

The Fiber Termination Unit is compatible with the Genexis Hybrid modules for data, voice and CATV services. The Universe comprises a single slot based on the universal fiber termination unit standard.

Features

- Compact wall-mount Fiber Termination Unit, compatible with the full Hybrid product portfolio

- Intelligent fiber management system

- Terminates up to 4 fibers

- Hot-pluggable modular CATV receiver, powered via the Hybrid Element

- Daisy-chain two Universe FTUs to enable double-slot support

- Patented technology

Termination of multiple fibers

Two fibers can be terminated, providing two optical interfaces that can be connected to two active modules directly. Two additional fibers can be terminated and patched outside the fiber termination unit.

Universe CATV module

The Genexis Universe CATV module is a modular CATV receiver which slides into the Universe. The module is completely 'hot-pluggable', which means it can be installed or de-installed with an active module already mounted on the Universe. This enables customer self-installation of the CATV module and additional flexibility for the service provider.

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Features & specifications

Features

- Indoor wall-mount fiber termination unit for Genexis Hybrid active modules
- Ability to slide-in the Universe CATV module (hot-pluggable)
- Terminate up to 4 fibers:
    - 1 optical interface compatible with Universal Fiber Termination Unit standard
    - 1 optical interface towards Universe-CATV receiver
    - 2 patchable fibers via mountable duplex LC (or simplex SC) adapter
- Two cable entry points: bottom and top
- Multiple options to fit gas block connector
- Detachable fiber management cassette
- Cable can be mounted on back-plate or directly in fiber cassette
- Pull relief for the fiber ducts/cables and fibers
- Two types of splice holders provided
- Fiber management unit sealable with screw and sealing sticker to prevent un-authorized access
- Optional blind cover for passive installation only
- Integrated dust caps in CATV-slide and blind cover to protect fiber connector against dust and dirt
- Safety lid to guarantee eye-safety
- Open network termination interface enables easy installation of active modules
- Installed active modules sealable by separate tags for both optical interfaces
- Option to daisy-chain two Universe Fiber Termination Units
- Pre-installed fiber pigtails (optional)
- Pre-installed WDM-filter for data and CATV on a single fiber (optional)

WDM-filter (optional)

- Data channel wavelenghts:
    - 1260 - 1360 nm upstream data
    - 1480 - 1500 nm downstream data
- CATV channel wavelenght:
    - 1545-1560 nm
- Insertion loss data channel *: < 1.5 dB
- Insertion loss CATV channel *: < 1.0 dB
- Isolation data channel: > 30 dB
- Isolation CATV channel: > 40 dB
- Directivity: > 50 dB
- Return loss **: > 45 dB

Insertion loss includes connectors, wave-lenght-, time-, and polarization dependent loss

*** Return loss specified without connectors*

General specifications

Mechanical and environmental
- Dimensions (H x W x D)
  incl. dummy cover   210x105x45mm
- Dimensions incl. Element and Live!
       241x104x75mm
- Weight
    - excl. dummy cover   170 g
    - incl. dummy cover   240 g
- Operating condition   0 - 70 °C
- Storage condition   0 - 70 °C

Emission and safety regulations

- CE approved
- Safety: IEC EN 60950
- Laser safety:
    - IEC EN 60825-1: Class 1 laser product
    - IEC EN 60825-2: Hazard level 1
- Emission: EN 55022, Class B
- Immunity: EN 55024

Configuration overview

Model	Blind cover	WDM-filter	pre-installed pigtails
Universe-110	-	-	-
Universe-112	yes	-	-
Universe-130	-	yes	-
Universe-140	-	-	yes
Universe-142	yes	-	yes

Universe-CATV
Optical CATV receiver

The Hybrid product family marks the embodiment of a new vision on FTTH. It seperates the service layer from the network layer, resulting in a modular, cost-effective and flexible home gateway solution matching all types of FTTH networks.

The Universe-CATV optical CATV receiver offers a fully hot-pluggable CATV solution for your Hybrid configuration. It has been developed to enable service providers to offer conventional analog and digital video/radio broadcasting services in FTTH applications where the end-user does not need to replace its home equipment.

Features

- Hot-pluggable with Universe FTU

- Fully end-customer installable

- Remote enabling/disabling via Hybrid Live! residential gateway

- Remote monitoring of the optical input signal

- World's most sensitive receiver, significantly lowering head-end cost

- Multi-dwelling unit available

Receiver module

The Universe-CATV is designed to receive optical RF signals and convert these to user-ready coaxial signals without loss of quality. The Universe-CATV supports conventional analog TV/radio signals, as well as Digital Video Broadcasting (DVB) signals.

Industry standard F-connector

Since CATV signals are broadcast signals, the end-users in-house coaxial network can be connected directly to the F-connector output of the Universe-CATV module. It's available for both single-dwelling and multi-dwelling purposes.

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User interfaces

1 Optical interface SC/APC
1 Electrical interface coaxial F-connector

Optical interface

- Single mode fiber (ITU-T G.652 / G.657a)
- SC/APC connector
- Receiver wavelength 1270 – 1610 nm
- Maximum optical input 0 dBm
- Minimum optical input -10 dBm
- Recommended input range -10 – -5 dBm
- Target optical input -7 dBm
- Threshold for valid input signal -12 dBm
  (for LED indicator and remote monitoring)
- Optical return loss > 45 dB

Electrical inferface

- Coaxial connector F-female (IEC 169-24)
- RF impedance coaxial connector 75 Ω
- RF frequency range 47 – 862 MHz
- Flatness and tilt ± 1 dB
- Return loss output ≥ 18 dB
  (40 MHz / -1.5 dB/oct)
- C/N 46 dB @ -10 dBm input, OMI 5%/ch
- CSO -60 dBc typical for f > 100 MHz
  (-4 dBm optical input)
- CTB -60 dBc typical
  (-4 dBm optical input)

For Universe-CATV-c
RF output level 66 – 86 dBµV typical
(-10 dBm to 0 dBm, OMI 5%/ch)
   - 66 dBµV typical @ -10 dBm input
   - 72 dBµV typical @ -7 dBm input
   - 76 dBµV typical @ -5 dBm input

For Universe-CATV-a
RF output level 80 – 100 dBµV typical
(-10 dBm to 0 dBm, OMI 5%/ch)
   - 80 dBµV typical @ -10 dBm input
   - 86 dBµV typical @ -7 dBm input
   - 90 dBµV typical @ -5 dBm input

Powering, control and monitoring

- Powered by Hybrid Element
- Local monitoring if input signal is valid (LED indicator)
- Remote enabling/disabling
  (only in combination with a managed Live! or Element)
- Remote monitoring if input signal is valid
  (only in combination with a managed Live! or Element)

General specifications

Mechanical and environmental
- Dimensions (H x W x D)
  - Universe-CATV   50x117x17 mm
  - Incl. drawer   52x136x20 mm
  - Full Hybrid solution   241x104x75mm
- Weight
  - Universe-CATV   80 g
- Power   12 Vdc ± 10%
  (provided by Hybrid Element)
- Power dissipation   1.2 W typ.
- Operating condition   0 - 35 °C
- Storage condition   0 - 70 °C

Emission and safety regulations

- CE approved
- Safety: IEC EN 60950
- Laser safety:
  - IEC EN 60825-1: Class 1 laser product
  - IEC EN 60825-2: Hazard level 1
- Emission: EN 55022, Class B
- Immunity: EN 55024