

HGV1.HGV4 FTTdp SYSTEMS



IP-68 ENCLOSURE FOR OUTDOOR HARSH INSTALLATIONS IN PITS, MANHOLES AND POLES

HNT4 4-port VDSL2 DPU DISTRIBUTION POINT UNIT

FOUR SEPARATED 2-pair COPPER CABLES TO CONNECT CO-SIDE AND CUSTOMER SIDE

IP-68 GPON FIBER CONNECTOR

UNPOWERED LINE IS PASS THROUGH

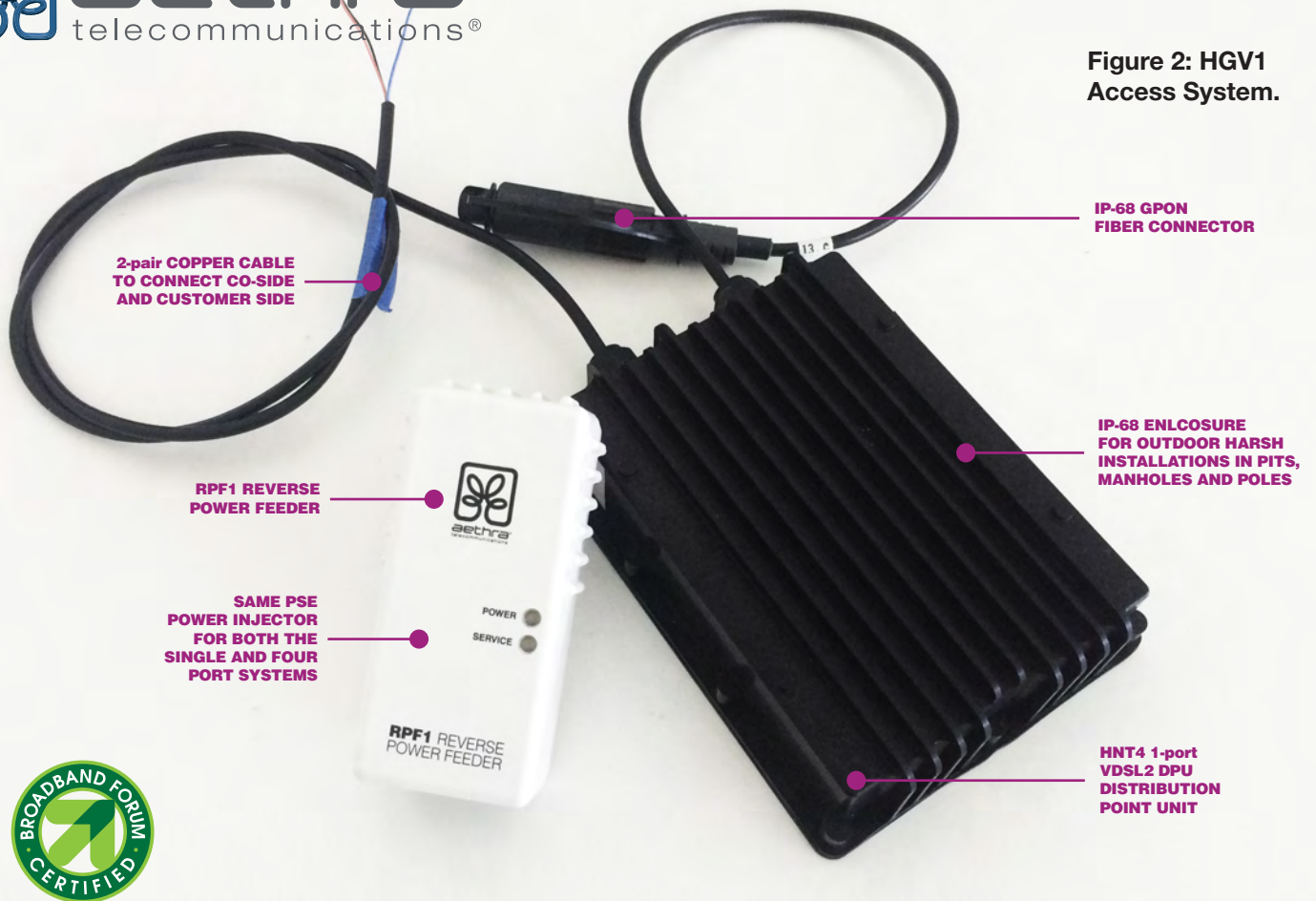
Figure 1: HGV4 Access System.

ONE SINGLE RPF1 POWER INJECTOR IS ABLE TO POWER THE FULL SYSTEM

RPF1 REVERSE POWER FEEDER

POWER LED SERVICE LED

Figure 2: HGV1 Access System.



HGV1-HGV4 Access System

HGV1 and HGV4 Access Systema are Reverse Powered FTTP Fiber-to-the-Distribution-Point GPON-VDSL2 systems, composed of two parts:

- the HNT1-HNT4 Distribution Point Units to be installed at the distribution point (with HNT1 being the 1-port version and HNT4 being the 4-port version)
- the RPF1 to be installed in the home of the customer.

The HNT1-HNT4 DPUs are installed at the Distribution Point connecting the GPON fiber, the optional copper cables coming from the central office and the copper cable going to the home of the customer.

HNT1-HNT4 Distribution Point Units powering and self migration system

The HNT1-HNT4 DPUs are powered by the RPF1 Reverse Power Feeder present in the home of the customer.

While the RPF1 is disconnected and the line is un-powered, galvanic continuity to the central office is guaranteed in order to permit service continuity to the user before the RPF1 connection and easy migration to and from other services.

Each user is fully independent so it is possible to have a combination of legacy and “FTTdp-migrated” users on the same DPU.

VDSL2 Performances

Support for VDSL2 profile 17a and 30a Annex P:

- 300Mbps aggregated w/ profile 30a
- 150Mbps aggregated w/ profile 17a
- SRA
- US / DS Retransmission

RPF1 Reverse Power Feeder

The RPF1 Reverse Power Feeder has to be connected to the power socket in the home of the customer. In the bottom there are two RJ sockets:

- **RJ12 CONNECTOR**, to connect the master socket using the provided RJ12-RJ11 cable;
- **RJ11 CONNECTOR**, to connect the VDSL2 modem.

RPF1 service LED information

The RPF1 reverse power feeder includes a “SERVICE” LED which can offer additional information on service status.

POWER LED	SERVICE LED	CONDITION
GREEN BLINK	RED BLINK	Foreign Voltage on the Line
GREEN BLINK	RED FIXED	Off hook phone or short circuit present
RED BLINK	RED BLINK	DPU not found / Relays did not switch
RED FIXED	RED FIXED	DPU R _{SIGNATURE} recognized but DPU does not power up
GREEN BLINK	OFF	Starting the detection phase / If persists, open circuit
GREEN BLINK	GREEN BLINK	Handshaking procedure in progress (disconnecting PSTN if present, etc etc)
GREEN FIXED	GREEN FIXED	Powering

Table 1: RPF1 LED indicators.

HNT1-HNT4 TECHNICAL SPECIFICATIONS

Physical Interfaces

- 1-port xDSL + power to the home of the customer with spring connector (for HNT1)
- 1-port POTS / xDSL input for service migration with spring connector (for HNT1)
- 4-port xDSL + power to the home of the customer with spring connector (for HNT4)
- 4-port POTS / xDSL input for service migration with spring connector (for HNT4)
- 1-port GPON fiber with SC/APC connector
 - Class of optical G-PON interface according to ITU G984.2 / G984.2 Amd1 /G984.2 Amd2: B+

VDSL2 Interface

- VDSL2 interface
 - ITU-T G.993.2
 - Profiles: 8a, 8b, 8c, 8d, 12a, 12b, 17a, 30a

GPON Interface

- GPON interface

- ITU-T G.984.1
- ITU-T G.984.2
- ITU-T G.984.3
- ITU-T G.984.4 / G.988
- Up to 256 GEM PORT-IDs with GEM Port ID range 0 - 4095
- Downstream AES decryption
- Supports Dynamic Bandwidth Assignment (DBA) with up to 32 Traffic-Containers (T-CONTs)
- DBA reporting modes
- Upstream GEM fragmentation with a fragmentation level of two per T-CONT.
- T-CONT per CoS, T-CONT per user, and T-CONT per user per CoS traffic forwarding concepts
- Downstream GEM re-assembly
- GPON Physical Layer OAM (PLOAM).
- Ethernet Bridging with L2 - L3 classification engine
- Simultaneous L2 and L3 IPv4 and IPv6 unicast/multicast packet forwarding
- VLAN processing according to IEEE 802.1Q, BBF TR-156, and G.988
 - VLAN processing per MBP and per

Ethertype

- Supports VLAN tag insertion, removal, translation, edit, copy, and swap functions on the two topmost VLANs.
- VLAN tagging is performed before or after packet filtering/switching.
- Up to 128 Extended VLAN tagging instances with up to 1024 VLAN filter rules and 1024 VLAN treatment rules
- 1K VLAN table entries
- VLAN filtering according to VLAN Tagging Filter Data ME performed on outer VLAN
- Class of Service assignment based on p-bits, PCP/DEI bits, DSCP field, IP Protocol field, and L4 experimental bits
 - Performs L3 DSCP to L2 p-bit mapping.
 - Marking/remarking of IEEE 802.1Q VLAN priority
- Packet filtering according to BBF TR 156 filtering requirements

- Wire-speed L2 and L3 multicast filtering as defined in BBF TR-156, and G.988
 - IGMP transparent snooping as defined in IGMPv2/MLDv1 and IGMPv3/MLDv2
 - Snooping of PPPoE encapsulated IGMP traffic per VLAN
 - Supports per multicast group VLANs (1:1 and N:1)
 - Supports source filtered and any-source multicast filtering
 - L2 and IPv4 multicast and unicast address filter table with 1K entries
 - IP source address filtering with include/exclude list of sources
 - Enables multiple multicast GEM Ports on a single bridge or multiple bridges
 - Upstream IGMP message rate limitation per UNI and VLAN membership

- LAN port mirroring or dual-cast forwarding supported

Management & Configuration

- OMC1 management of the ONT portion according to BBF.247
- Password Protected Access
 - 2 login levels + configurable privilege access right
 - AAA and local authentication
 - TACACS+
- Local Management
 - Console port
- Extensive CLI
- Remote Management
 - CLI (internal Telnet Server)
 - HTTP (embedded WEB Server)
 - HTTPS (embedded Secure HTTP WEB Server)
 - SNMP Agent (v1, v2c, v3)
 - SSH
 - Syslog
 - Network Performance Monitor
 - Ping MIB
 - TR-069*
- Firmware upgrades: Local and Remote (TFTP & FTP client embedded)

Dimensions

- 150mm x 120mm x 40mm (HNT1)
- 150mm x 240mm x 40mm (HNT4)

Operating Voltage

- Reverse Power Feeding ETSI TR 101 548 v1.1.1 Range Option 1 (short range)

RPF1 TECHNICAL SPECIFICATIONS

LED Indicators

- SERVICE
- POWER

Physical Interfaces

- 1-port xDSL + power to the DPU with RJ12 connector
- 1-port xDSL to the modem with RJ11 connector

Dimensions

- 110mm x 55mm x 39mm

Operating Voltage

- 100 – 240 Vac 50/60 Hz 0.3 – 0.15 A

FULL SYSTEM TECHNICAL SPECIFICATIONS

ETSI TR 101 548 v1.1.1

- Range Option 1 (short range)
- The following options are supported for startup protocol:
 - Aethra Telecommunications® tone based active handshaking
 - Passive handshaking based on 802.3af (upon request)

BBF.247 Certification

- HNT1 is BBF.247 Certified
- HNT4 is BBF.247 Ready

Broadband Forum TR-301

- Exchange / CO power separation from Reverse Power Feeding
 - Automatic activation and disconnection of copper from the CO upon detection of Reverse Power Feeding
 - Unpowered line maintains copper continuity with the CO

Environment

- Industrial temperature range
- IP-68 enclosure (HNT1 and HNT4)
- Humidity 10% ÷ 93 % (without condensation)

Compliance & Approvals

- Storage:
 - CEI 50-3, EN 60068-2-1 Test Ab (IEC 60068-2-1), EN 60068-2-2 Test Bb (IEC 60068-2-2), IEC 60068-2-14 Test Nb, IEC 60068-2-18, IEC 60068-2-30 Test Db - Variant 1, IEC 60068-2-27 Test Ea, IEC 60068-2-64 Test Fdb (CEI 50-6/9), ETSI EN 300 019-2-1 T 1.3
- Transportation:
 - CEI 50-3, EN 60068-2-1 Test Ab (IEC 60068-2-1), EN 60068-2-2 Test Bb (IEC 60068-2-2), IEC 60068-2-14 Test Nb IEC 60068-2-18, IEC 60068-2-30 Test Db - Variant 1, IEC 60068-2-29 Test Eb, IEC 60068-2-32 Test Ed - Method 1, IEC 60068-2-64 Test Fdb (CEI 50-6/9), ETSI EN 300 019-2-2 T 2.3
- Operating conditions:
 - CEI 50-3, EN 60068-2-1 Test Ab (IEC 60068-2-1), EN 60068-2-2 Test Bb (IEC 60068-2-2), IEC 60068-2-14 Test Nb IEC 60068-2-18, IEC 60068-2-30 Test Db - Variant 1, IEC 60068-2-56 Test Cb, IEC 60068-2-27 Test Ea, IEC 60068-2-31 Test Ec, IEC 60068-2-64 Test Fdb (CEI 50-6/9), ETSI EN 300 019-2-3 T 3.2
- EMC:
 - EN 55022, EN 55024, EN 61000-3-2, EN 61000-3-3, ETSI EN 300 386
- Protections:
 - ITU-T-K.44, ITU-T-K.21
- Safety:
 - EN 60950-1 (IEC 60950-1)

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