

## 24-Port G.993.2 Standards-based 100/100Mbps VDSL2 IP-DSLAM

- ✓ *Compact, 1U space efficient design with 24-Ports of VDSL2 (up to 30a) and optional integrated splitters*
- ✓ *Backward compatible with legacy ADSL / ADSL2+ modems*
- ✓ *Downstream Power Back-off (DPBO) minimizes interference with adjacent DSL services in the same binder group*
- ✓ *Dual GigE Uplinks (2 SFP + 2 Built-In GE Uplink Ports) with Link Aggregation*
- ✓ *VLAN/Bridge Forwarding with QoS and Security Features*
- ✓ *Stacking Support with In-band Management*
- ✓ *Hardened for Outside Plant Deployment (DC models)*



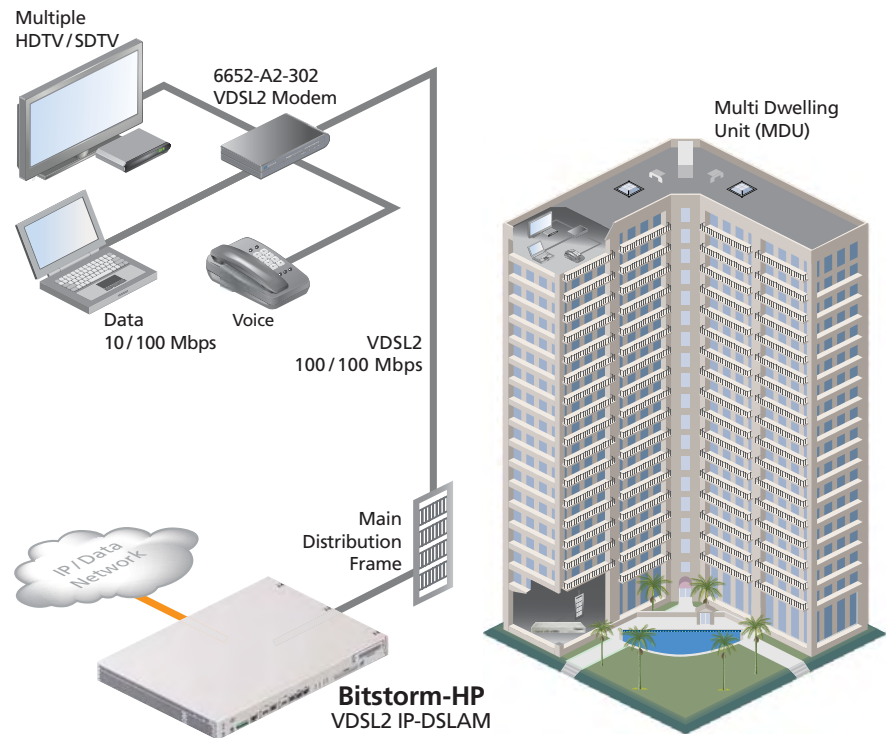
The Bitstorm-HP family of products are 24-port VDSL2 IP-DSLAMs, featuring a hardened, high performance design with efficient power and space considerations. Designed as a 1U high product, the Bitstorm-HP is ideal for deployment in space constrained indoor MDU or external cabinet locations to take advantage of short, last-mile loops which are ideal for VDSL2 rate/reach performance.

The Bitstorm-HP family uses the latest VDSL2 silicon technology from Ikanos, and can support all eight (8) VDSL2 profiles (up to 30a) to deliver up to 100/100Mbps Up/Down line-rate when paired with a Zhone's VDSL2 CPE (6652-A2). The lower cost Bitstorm-HP-150 models support up to Profile 17a, delivering line rates up to 100Mbps Down / 50Mbps Up. All Bitstorm HP models fully interoperate with Zhone's VDSL2 6652-A2 (30a, Bridge/Router) and 6652-A1 (17a, Smart Bridge) modems. The Bitstorm-HP family is also backward compatible with ADSL/ADSL2+ when connected to industry-standard ADSL2+ modems, thus providing an easy migration path for users running legacy ADSL services, while providing expanded revenue opportunities when deploying new high-speed VDSL2 services.

The Bitstorm-HP family delivers very high-speed line-rate performance and supports triple play services implemented on a powerful Network Processor. The Bitstorm-HP is designed with separate control and data paths to allow high bit-rate services while supporting advanced L2/L3 features such as - DHCP (Option-82), IGMP Snooping/Proxy, IP/ARP Spoofing, Forced MAC Forwarding, QoS and Security/Filtering in either Bridged or VLAN Switched operating modes.

The Bitstorm-HP also supports configurable, Downstream Power Back-off (DPBO) capabilities for both ADSL and VDSL2. Sometimes used in remote cabinet applications, DPBO equips service providers with the ability to adjust the transmit power levels of each port to be at the same level as would be expected to be found at the same point in the cable if the signal had been injected at the central office exchange. This advanced functionality can be used to ensure that the ADSL2/VDSL2 services from the Bitstorm-HP do not adversely impact other DSL services that may exist in the same outside plant binder group.

Available with optional, built-in POTS splitters (600 or 900 ohm) as well as DC or AC powering options, the Bitstorm-HP features an intuitive Web Graphical Interface for device configuration and management and can also be managed using Secure Shell (SSH), Telnet (CLI) or SNMPv1/v2.



The Bitstorm-HP is ideally suited for deployment in Multi Dwelling Units (MDU) for the delivery of bandwidth intensive services such as HDTV, Video Conferencing, Interactive Gaming and symmetric E-Line business services. The Bitstorm-HP models support dual Gigabit Ethernet uplinks which can be aggregated using a standards-based line aggregation protocol (LACP 802.3ad). This allows deep-fiber deployment and interface with Ethernet Metro switches.

Operators providing business services can utilize feature-rich traffic management and security functions to provide guaranteed service levels and prevent malicious user behavior. Some of the supported features include: Prevent traffic flooding between line bridge ports; configurable rate-limit per bridge port per VLAN; IGMP broadcast limit per line port; MAC address spoofing; IP/ARP spoofing; IP-Allow filter based on DHCP snooping; Forced destination MAC address forwarding.

## Technical Specifications

### Dimensions

- 1.75" x 17" x 10.4" (HxWxD)
- 44mm x 432mm x 265mm (HxWxD)

### Power

- Source:
  - DC: 42V to -56V; Dual A+B feeds
  - AC: 100V - 240V (50~60Hz)
- Power:
  - 75 watts (nominal)
  - 90 watts (max)

### Interfaces

- 24-ports VDSL2
- Backward compatible with ADSL / ADSL2+
- Two (2) 100/1000Mbps Ethernet Combo Ports - Electrical or Optical (SFP)
- Management Ethernet
- Serial Console

### Standards Support

- VDSL2 ITU-T G.993.2
- Profile 8a/8b/8c/8d/12a/12b/17a/30a
- ADSL and ADSL2+ Backward Compatible
- 802.1q VLAN, 802.1p VLAN Priority
- VLAN Q-in-Q
- Spanning Tree Protocol (IEEE 802.1d/w)
- Link Aggregation (IEEE 802.3ad)
- DHCP (Option 82)
- RFC 4562: Forced MAC Forwarding

### Protocol Support

- PPPoE Intermediate Agent (DSL-Forum)
- IGMP Snooping/Proxy
- Ethernet RMON
- VDSL/ADSL Performance Counters
- 15-min 1-day counters for history record

### Management

- Web-based Graphical User Interface
- Telnet CLI and SSH
- RFC 1213 SNMP MIB II
- RFC 1493 Bridge MIB
- RFC 1643 Ethernet MIB
- RFC 2674 Q MIB
- RFC 1757 RMON MIB, group 1,2,3,9
- ADSL MIB
- VDSL MIB

### Regulatory Compliance

- ITU-T K.20, K.21
- ETSI 300-019, 300-386
- EN 60950
- ROHS Compliance
- Conform to CE requirements

### Operating Requirements

- Operating (DC): -40°C to 65°C
- Operating (AC): -10°C to 50°C
- Storage: -40°C to 80°C
- Relative Humidity: Up to 95% (non-condensing)

## Ordering Information

## Bitstorm-HP VDSL2 17a IP-DSLAM Models

BITSTORM-HP2-150-AC-EU	24-PORT VDSL2 (IKNS), 5-BAND (17A), VERT. T/R, EURO AC, WITHOUT SPLITTERS, REV 2 FANS
BITSTORM-HP2-150-AC-NA	24-PORT VDSL2 (IKNS), 5-BAND (17A), VERT. T/R, NA AC, WITHOUT SPLITTERS, REV 2 FANS
BITSTORM-HP-150-DC	24-PORT VDSL2 (IKNS), 5-BAND (17A), VERT. T/R, -48V DC, WITHOUT SPLITTERS
BITSTORM-HP2-151-AC-EU	24-PORT VDSL2 (IKNS), 5-BAND (17A), VERT. T/R, EURO AC, 600 OHM SPLITTERS, REV 2 FANS
BITSTORM-HP2-151-DC	24-PORT VDSL2 (IKNS), 5-BAND (17A), VERT. T/R, -48V DC, 600 OHM SPLITTERS, REV 2 FANS
BITSTORM-HP-152-AC-NA	24-PORT VDSL2 (IKNS), 5-BAND (17A), VERT. T/R, NA AC, 900 OHM SPLITTERS
BITSTORM-HP-152-DC	24-PORT VDSL2 (IKNS), 5-BAND (17A), VERT. T/R, -48V DC, 900 OHM SPLITTERS

## Bitstorm-HP VDSL2 30a IP-DSLAM Models

BITSTORM-HP2-160-AC-EU	24-PORT VDSL2 (IKNS), 6-BAND (30A), HORIZ. T/R, EURO AC, NO SPLITTERS, REV 2 FANS
BITSTORM-HP-160-AC-NA	24-PORT VDSL2 (IKNS), 6-BAND (30A), HORIZ. T/R, NA AC, NO SPLITTERS
BITSTORM-HP-160-DC	24-PORT VDSL2 (IKNS), 6-BAND (30A), HORIZ. T/R, DC, NO SPLITTERS
BITSTORM-HP-161-AC-EU	24-PORT VDSL2 (IKNS), 6-BAND (30A), HORIZ. T/R, EURO AC, 600 OHM SPLITTERS
BITSTORM-HP2-161-DC	24-PORT VDSL2 (IKNS), 6-BAND (30A), HORIZ. T/R, DC, 600 OHM SPLITTERS, REV 2 FANS
BITSTORM-HP2-162-AC-NA	24-PORT VDSL2 (IKNS), 6-BAND (30A), HORIZ. T/R, NA AC, 900 OHM SPLITTERS, REV 2 FANS
BITSTORM-HP-162-DC	24-PORT VDSL2 (IKNS), 6-BAND (30A), HORIZ. T/R, DC, 900 OHM SPLITTERS

## VDSL2 BRIDGE/ROUTER MODEMS

6652-A1-200	VDSL2+ CPE, 4-PORT BRIDGE, CPE4 (17A), NA PLUG
6652-A1-302	VDSL2+ CPE, 4-PORT BRIDGE, CPE4 (17A), EU PLUG
6652-A2-200	VDSL2+ CPE, 4-PORT BRIDGE/ROUTER, CPE5 (30A), NA PLUG
6652-A2-302	VDSL2+ CPE, 4-PORT BRIDGE/ROUTER, CPE5 (30A), EU PLUG
6652-A2-600	VDSL2+ CPE, 4-PORT BRIDGE/ROUTER, CPE5 (30A), JAPAN

## Fiber SFP

SFP-GE-LX-1310-DLC	LONG-REACH (10KM) OPTICAL GIGABIT ETHERNET
SFP-GE-SX-850-DLC	SHORT-REACH (500M) OPTICAL GIGABIT ETHERNET

## VDSL2 30a Cable [for LINE Interface on Bitstorm-HP-16x models]

HP-160-VDSL2-CABLE-RJ21-15FT	CONVERSION CABLE HORIZONTAL T/R to VERTICAL T/R, 15-Feet, RJ21 (MALE)-to-RJ21(MALE)
HP-160-VDSL2-CABLE-RJ21F-15FT	CONVERSION CABLE HORIZONTAL T/R to VERTICAL T/R, 15-Feet, RJ21 (MALE)-to-RJ21 (FEAMLE)
HP-160-VDSL2-CABLE-OPEN-15FT	CONVERSION CABLE HORIZONTAL T/R to VERTICAL T/R, 15-Feet, RJ21 (MALE)-to-Stub

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