

VDSL2 Broadband Reach Extender (BRX-VDSL2)



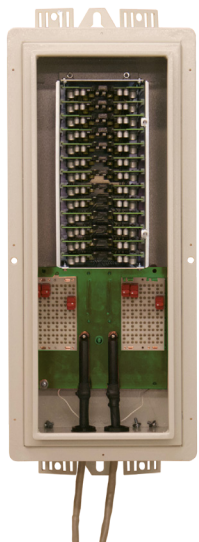
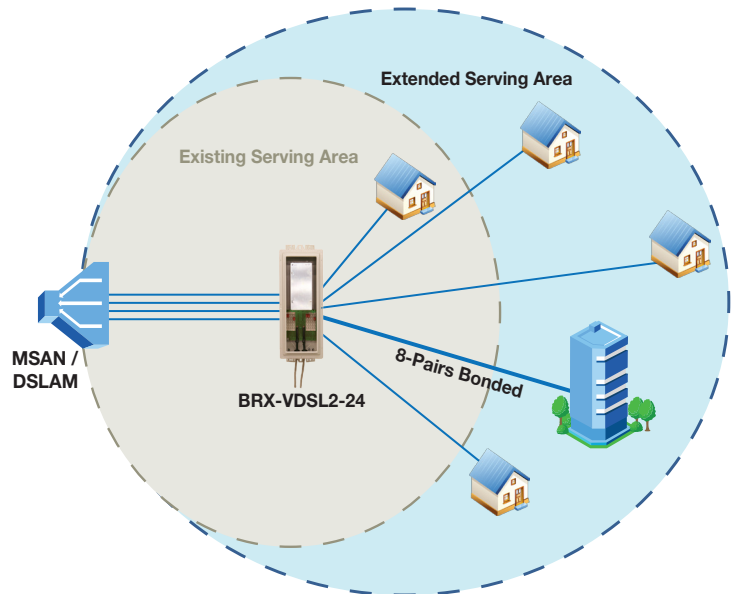
BRX-VDSL2-2

The BRX-VDSL2, the latest addition to the BRX family, **extends the reach of VDSL2 DSLAMs or MSANs** to expand the Customer Serving Area (CSA) by a factor of **at least 100%** for services up to at least 50 Mbps on a single copper pair. Subscribers beyond **4,000 feet (1.2 km)** on a 24 AWG (0.5mm) copper pair will get 50% to 100+% increase in bandwidth.

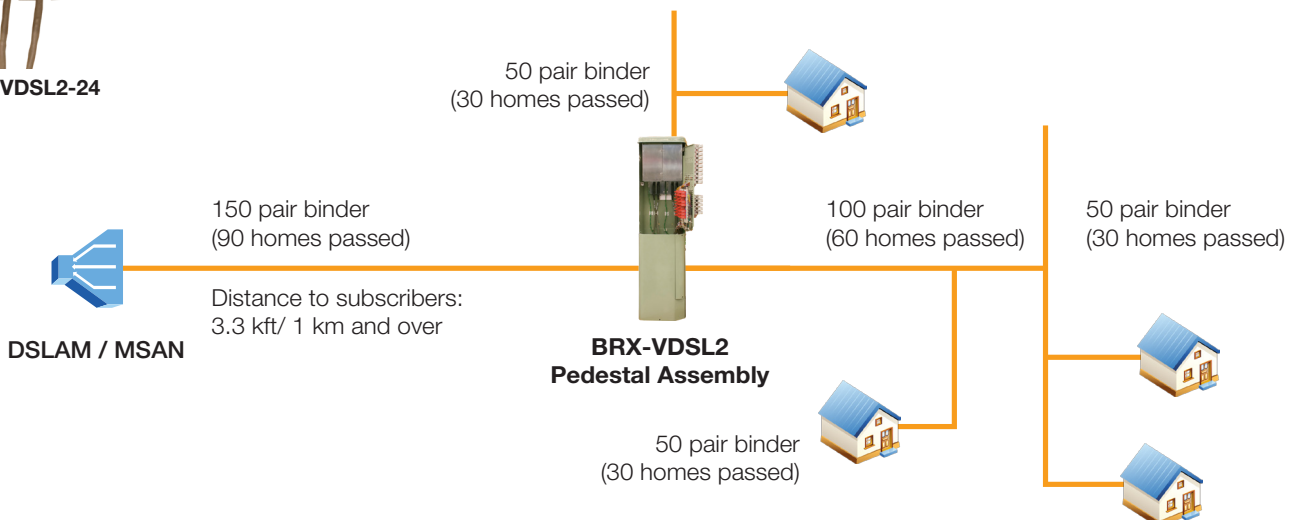


BRX-VDSL2-8

The BRX-VDSL2 increases the bandwidth to residential and business customers and can be coupled with 2-pair and 8-pair bonding technologies for even higher bandwidth. It delivers a fiber-like user experience so customers can enjoy top quality video streaming with multiple HD feeds and still have enough bandwidth to simultaneously surf the web and use other applications. The increase in the available bandwidth capacity on existing last mile infrastructure results in higher ARPU, lower attrition and increased customer satisfaction at a low cost.



BRX-VDSL2-24



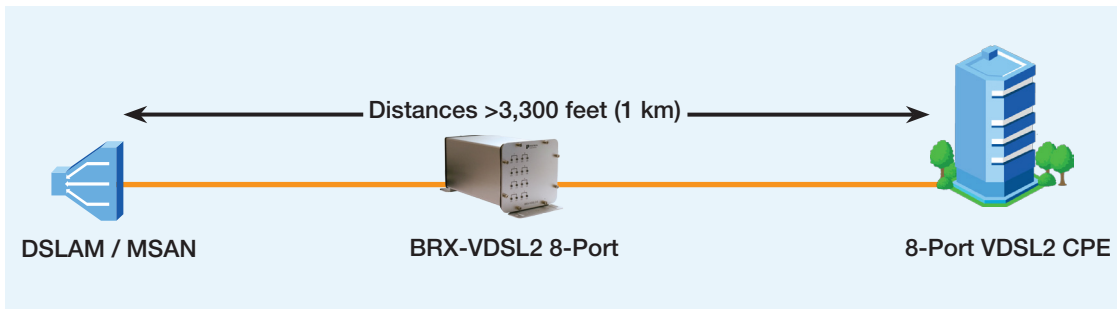
Typical Residential Application

The BRX-VDSL2 is a performance and distance (reach) enhancement solution for VDSL2 loops served by a DSLAM / MSAN. It is installed between the DSLAM and the subscribers, typically around 2,000 to 4,000 feet (600 to 1,200 meters) from the DSLAM. It improves the overall performance by a factor of 1.4 to 3 times.

Typical Business Applications

There are a growing number of both symmetric and asymmetric applications where operators are bonding 2, 4 and even 8 pairs of VDSL2 (using a CPE like Positron's FS-GIGA) to deliver over 100 Mbps symmetrical bandwidth over long distances (up to 3,000 feet or 0.9 km) and several hundred Mbps over even longer distances in asymmetric mode (see table on next page). Examples of such applications are Business High Speed Internet (HSI), Managed Business Ethernet, MTUs / MDUs, Small Cell Backhaul, and DSLAM / MSAN Backhaul.

By inserting a BRX-VDSL2-8 device in the copper loops, it is now possible to **increase the reach (CSA coverage area) and/or the performance by an additional 100% or more**. For example, it is now possible to deliver 100 Mbps symmetrical service to business customers located up to 4,300 feet (1.3 km) from the DSLAM / MSAN and a 50 Mbps symmetrical service up to 6,000 feet (1.8 km).



Other Benefits of the BRX-VDSL2

100% Transparent Support for Vectoring and Pair Bonding

The BRX-VDSL2 is fully transparent to Vectoring and pair-bonding applications. Installing a BRX-VDSL2 on a copper pair makes it possible to extend the benefit of vectoring up to 6,000 feet (1.8 km) from the DSLAM. Bonding two pairs together enables the delivery of 50 Mbps service to customers located over 8,500 feet (2.6 km) from the DSLAM and 100 Mbps to customers at about 6,000 feet (1.8 km).

More than Signal Amplification

In addition to delivering a significant increase in performance, field testing has shown that the BRX-VDSL2 will help mitigate some of the common problems impacting the performance in the Outside Plant (OSP). As it amplifies the VDSL2 signal, it filters out some of the accumulated noise on the copper pair which **improves the signal-to-noise ratio (SNR) up to 14 dB**. It also mitigates the impact of bridge taps, including those resulting from inadequate in-house wiring.

Assorted Packaging, Flexible Mounting and Powering Options

The BRX-VDSL2 is available in weatherproof (IP-65) form factors of 1, 2, 8, 24 and 48 pairs. It is designed to be easily installed at existing splicing points in the copper outside plant (OSP). They can be easily mounted on a pole or on the outside of an existing cabinet. The BRX-VDSL2 card shelves are designed to be easily mounted inside most splicing pedestal models in use in the outside plant (OSP). The cards can be powered by the -48V POTS sealing current on the lines, or via a local or express-power pair.

Specifications / Features

Feature	Description
xDSL Standards	ITU-T G.993.2 VDSL2 ITU-T G.993.5 (G.vector) ITU-T G.997.1 (G.ploam) ITU-T G.998.4 (G.INP) ITU-T G.992.5 ADSL2+ Annex A ITU-T G.992.3 ADSL2 Annex A ITU-T G.992.1 ADSL Annex A
Reach Improvement	Extends up to 100% VDSL2 and ADSL/ ADSL2/ ADSL2+ broadband coverage
Rate Improvement	Improve effective bandwidth by a factor up to three (3) for VDSL2 and by a factor of two (2) to five (5) for ADSL/ ADSL2/ ADSL2+ loops depending on length
PSD Mask Compliance	Compliant with ANSI T1.413 and ETSI TS 101 830-1
Signal to Noise Ratio	Improves the Signal to Noise Ratio (SNR) up to 14 dB
Power Draw	Maximum power consumption is 400 mW per pair @ 48 V
Enclosure	Flexible IP-65 design allows more subscribers to be added as needed Available in 1, 2, 8, 24 and 48 pair configurations
Over-current Protection	8/20 µsec, 10 kA (1 operation) 10/700 µsec, 6 kV, 300A (50 operations)
Regulatory Compliance	Tested to IP68, UL/CSA and FCC part 15 Class A WEEE and ROHS compliant
Operating Temperature	-40 to +65 °C
Relative Humidity	5% to 95%, non-condensing
Dimensions	BRX-VDSL2-M: 8" x 5" (200 mm x 125 mm) BRX-VDSL2-1: 9.25" x 5.5" x 1.5" (235 mm x 140 mm x 38 mm) BRX-VDSL2-2: 9.25" x 5.5" x 1.5" (235 mm x 140 mm x 38 mm) BRX-VDSL2-8: 11.5" x 5.5" x 4.7" (285 mm x 140 mm x 118 mm) BRX-VDSL2-24: 24.8" x 9" x 10.1" (630 mm x 229 mm x 257 mm)
Installation Location	Installed adjacent to a splice point or at cross connect cabinet in the Outside Plant (OSP)
Auto-Provisioning	Automatic gain control with no software or hardware configuration needed It self-adjusts to optimize the bandwidth based on loop length and line conditions
Number of Ports per Module	Each BRX-VDSL2-M has two (2) independent copper pairs, 100% transparent to vectoring and pair bonding (if used)

Ordering Part Numbers and Description for Most Popular Configurations

Part Number	Description
BRX-VDSL2-M	Two-pair card (for use in the 8, 24 and 48 pair BRX-VDSL2 IP-65 enclosures). Embedded primary lightning protection for each pair. No need for external gas tube protection
BRX-VDSL2-1	BRX-VDSL2 single pair module with primary lightning protection factory installed in an IP-65 enclosure
BRX-VDSL2-2	BRX-VDSL2 two-pair module with primary lightning protection factory installed in an IP-65 enclosure
BRX-VDSL2-8	4 x BRX-VDSL2 two-pair cards (total 8 pairs) with primary lightning protection factory installed in an 8-pair IP-65 enclosure
BRX-VDSL2-24	12 x BRX-VDSL2 two-pair cards (total 24 pairs) with primary lightning protection factory installed in a 24-pair IP-65 enclosure
BRX-VDSL2-24-1SXPF	Emerson CAD-12 pedestal factory installed with one (1) BRX-VDSL2-24S shelf loaded with 12 x BRX-VDSL2-M for a total of 24 pairs
BRX-VDSL2-48-1SXPF	Emerson CAD-12 pedestal factory installed with two (2) BRX-VDSL2-24S shelves loaded with a total of 24 x BRX-VDSL2-M for a total of 48 pairs