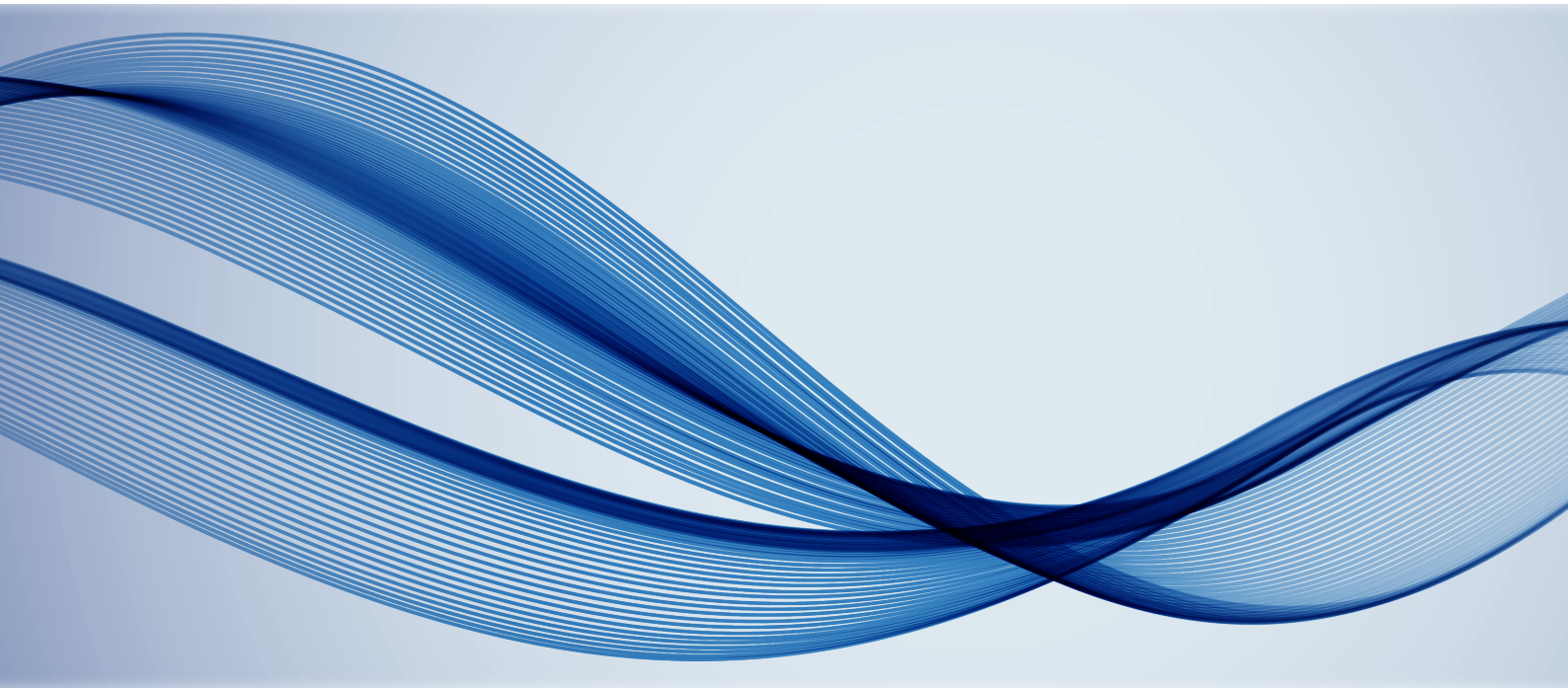




Access platforms, evolved:

The DBx solution from Technetix



To thrive in the competitive, superfast broadband market, operators must keep their networks at the forefront of residential and commercial broadband services. The one thing that is inevitable is change.

The advent of new standards such as DOCSIS 3.1 means that operators can evolve their networks to meet growth. This growth includes the rising network-resilience requirements of high speed Internet and digital television, and the introduction of new services such as the 'Internet of things' (IoT). Overcoming the associated challenges involves making smart network investments at the right time to drive down total cost of ownership (TCO) for the long term.

Maintain

As the products in your existing network become uneconomical to repair or upgrade, Technetix offers replacement products of equal size, power consumption, gain, etc., preventing the need for further associated upgrades.

Upgrade

Once you are ready to proactively upgrade your network, our products will provide extra and enhanced functionality such as additional gain, ingress detection, cost efficient monitoring and electronic set-up.

Prepare

To protect your Access platform for the future, our products enable a cost effective, stepped approach to future enhancements such as a transition to a 1.2 GHz forward path and/or optical upgrades.

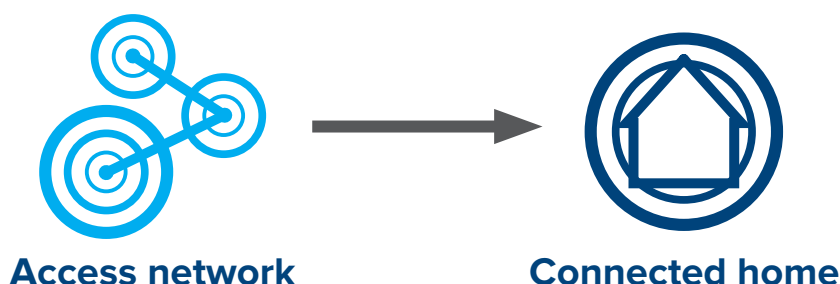
The changing revenue model

In recent years, opportunities for broadband cable operators to protect or improve return on investment (ROI) have become less clear. Gone are the days when analogue TV was delivered to consumers' homes via a 'walled garden' approach – where content travelled directly from a single operator to the subscriber through a shielded network. Back then, the business model appeared clear cut: the operator owned the network and its services, and offerings such as broadcast digital television, video on demand (VoD) and Voice over Internet Protocol (VoIP) were added over time. The steady arrival of new services kept consumers subscribing in a buoyant market, and the direct link between network investment and revenue remained strong.

The introduction of 'data' has since blown networks wide open, making way for a landscape of competitive services to take hold. Over-the-top (OTT) service providers (exploiting existing network infrastructure and prompting revenue sharing with operators) are tempting subscribers away from traditional packages and behaviours. A wider choice of content and greater flexibility around when and how to consume it is available as a result.

Changes in the home

Today's home has more Internet-connected devices and software than ever before. Consumers can tap into multiscreen media and entertainment, home automation services and the IoT at the click of a button. And while optimized downstream performance was once the key priority for operators, the benefits of harvesting the upstream are now sharing the spotlight; consumers want two-way, high-speed Internet access. Broadband data speed and the volume of data transferred will continue to grow exponentially for many years to come.



Visualising the network of the future

The answer is not for operators to lock down the network and remove data from their offering in an attempt to cut out the competition. MSOs must continue to provide data if they are to retain revenue; people will always want 'more'.

To meet demand and stay ahead of the competition, a radical new approach is required.

Secure investments, high ROI

When it comes to evolving your network, complex questions must first be addressed: should you stick with coaxial cable or make the move to fibre? If the latter is relevant to your network, how and when can optics be implemented, and what sort of costs are involved? Decision-makers will be familiar with four crucial elements: CAPEX, OPEX, TCO and ROI; getting these figures right is fundamental.

With so many variables to consider, identifying your path to success can seem like a daunting task. Yet despite the uncertainties, operators can be clear about four requirements from the outset:

1. The need to extract maximum value from current HFC network cabling by using technology to sweat performance with minimal active re-spacing and minimal trench digging.
2. The requirement to evolve and upgrade the network in future at a rate of change driven by varying consumer demand or as standards change. When this change is necessary: the ability to perform these upgrades with minimal labour cost and minimal downtime.
3. The necessity to keep CAPEX, OPEX and TCO low while ensuring that ROI soars.
4. The ability to remotely manage and monitor network performance.



The DBx platform enables MSOs to upgrade equipment and services in a gradual, controlled way – balancing sensible economics and success-based CAPEX strategies with changing industry requirements.

Operators can switch to DOCSIS 3.1 standards today, and plan a stepped approach to CAPEX investment over time.

A revolutionary new approach from Technetix

Technetix has developed a field upgradeable coax-to-fibre solution that helps operators realise these short- and long-term objectives. It starts with a low-cost hardware investment upfront that will reap TCO benefits for years to come.

The DBx digital broadband optical/RF amplifier platform is a flexible Access solution that enables networks to meet the growing demand for high-capacity applications.

The DBx can replace legacy vendor equipment while offering scalability to meet future needs. Operators can switch to DOCSIS 3.1 standards today, and plan a stepped approach to CAPEX investment over time. The platform enables MSOs to upgrade equipment and services in a gradual, controlled way – balancing sensible economics and success-based CAPEX strategies with changing industry requirements.

The DBx platform

The DBx platform from Technetix is an adaptable solution designed and developed by experts in the field to address future uncertainty through its modular approach.

The solution complies with global standards, and is ready to meet the needs of MSOs of all sizes when it comes to network configuration with minimum manpower.

The DBx range consists of three Access platforms varying in size, power, output and facilities to suit individual network requirements.



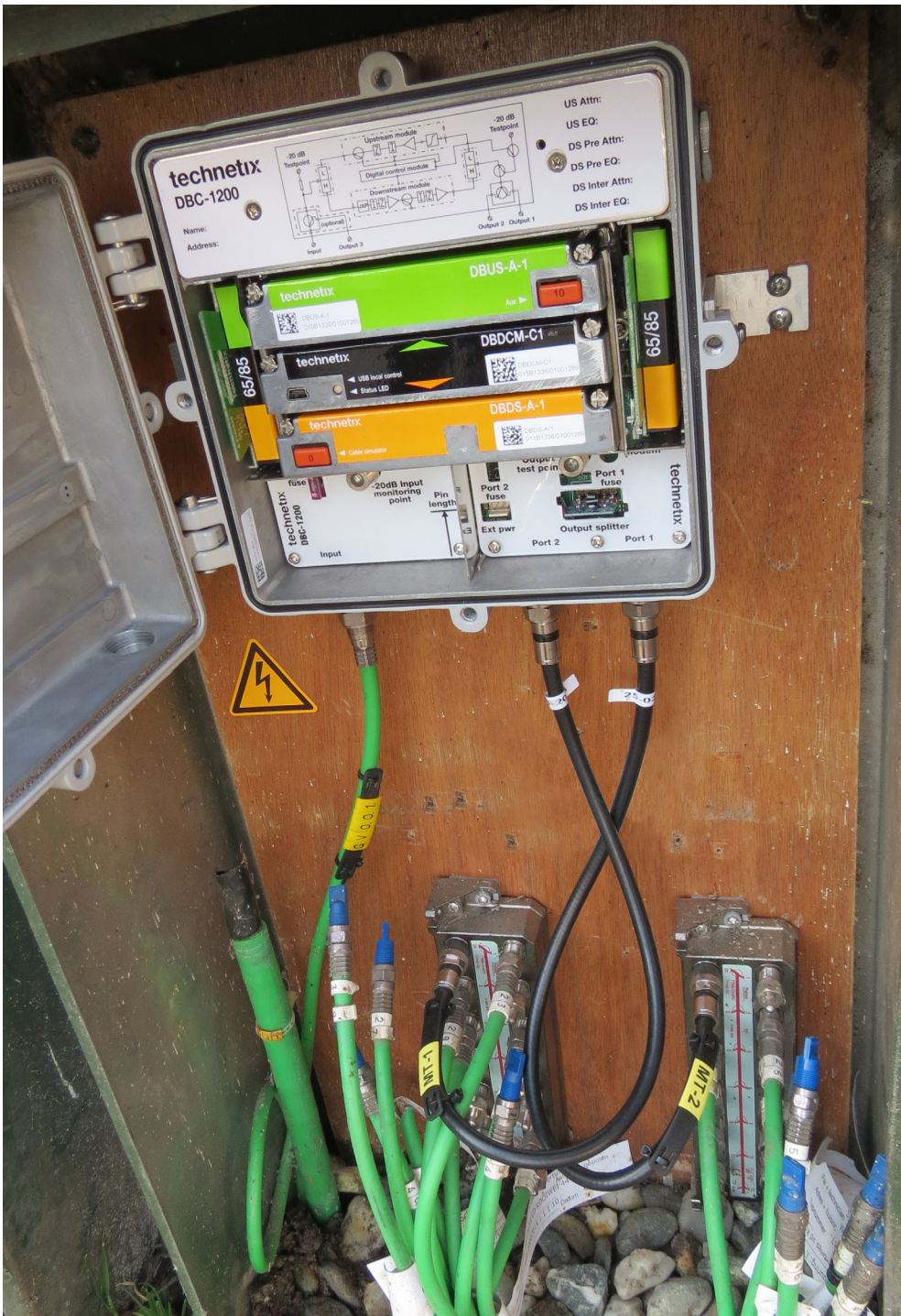
The Digital Broadband Compact (DBC) is a configurable one active output node/RF amplifier.



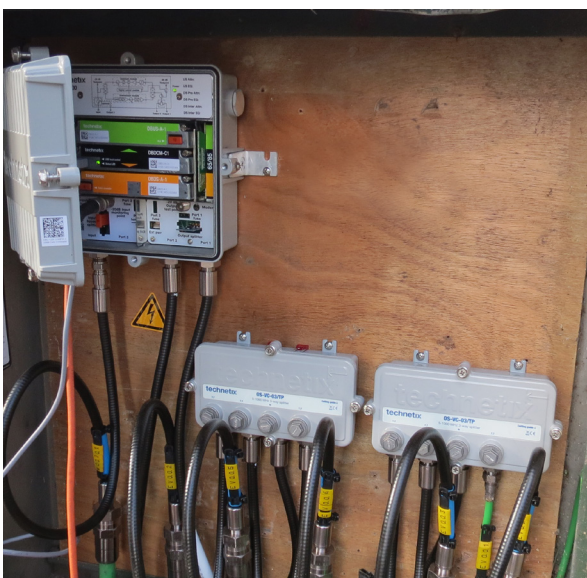
The Digital Broadband Distribution (DBD) is a configurable two active output node/RF amplifier.



The Digital Broadband Edge (DBE) is a configurable three/four active output node/RF amplifier.



Technetix works in partnership with broadband cable network operators to truly understand their needs, and to provide intelligent solutions that help them deliver reliable, innovative services to their customers.



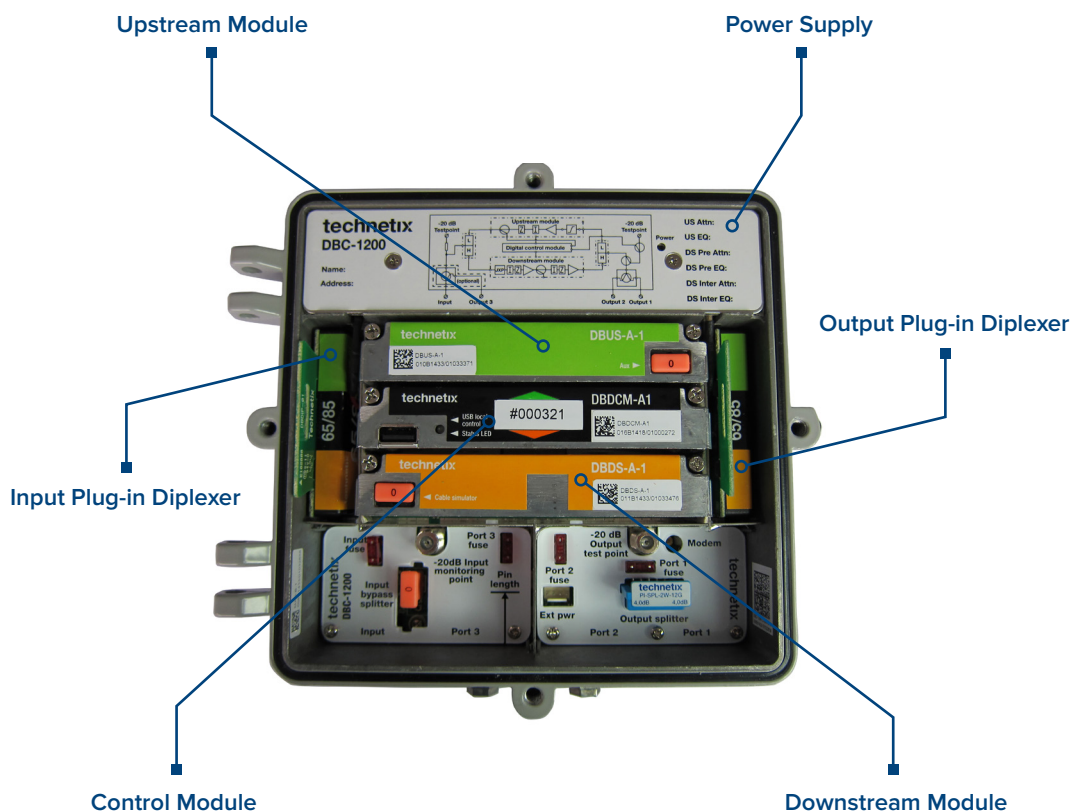
DBx amplifier modules

A range of interchangeable modules can be added to each of the DBx platforms to ensure they continue to meet current requirements.

The DBx platform is field upgradeable in two ways:

1. Swappable modules allow the technician to conveniently increase upstream or downstream bandwidth capacity.
2. Cassette-style upstream and downstream fibre modules enable the technician to economically convert an RF amplifier into an optical node.

Operators requiring 'deep fibre' or 'Fibre to the Last Amplifier' must consider the DBx platform. All RF amplifiers can be upgraded to fibre in the network, achieving 1 x 1, 1 x 2, 2 x 2, 3 x 3 or 4 x 4 optical nodes, depending on the model (DBC, DBD or DBE).



DBC-1200 Amplifier

The upstream module provides return path gain and has a local or remotely controlled electronically adjustable tilt and attenuation circuit.

The downstream module provides forward path gain. It has an electronically controlled pre-stage attenuator and tilt, and an inter-stage attenuator and tilt with 0.5 dB steps.

The plug-in diplex filter sets the frequency split between the forward and return path signals. Technetix' comprehensive diplexer range provides ease of frequency or band split at 42/54 MHz, 65/85 MHz, 85/102 MHz, 85/105 MHz and 204/258 MHz.

The control module provides the control and monitoring functions of the fibre node or amplifier. It allows for electronic control of the attenuator and equaliser during amplifier alignment, via remote access.

The control module can be replaced with Technetix' Frequency Shift Keying FSK module to provide remote control and diagnostic functionality for ease of ingress noise detection in the network. When integrated with Technetix' Ingress Detection Switching (IDS) technology, the technician can quickly determine whether noise is present – locating the source down to the nearest individual amplifier.

Combining Technetix IDS technology when implementing the DBx platform ultimately ensures a continual reduction in operators' costs. Reducing the time it takes to isolate and rectify ingress in a 'find and fix' process helps prevent signal disruptions across the network.

The FSK module integrates Automatic Gain Control (AGC) and Automatic Level and Slope Control (ALSC) – convenient features that enable the amplifier to adjust network levels based on pre-configured algorithms to ensure peak performance.

The power supply unit can be hot swapped out without downtime, protecting continuity of service to cable end-users. This is achieved by providing a local powering option when the amplifier's primary power supply is being replaced.

Conveniently increase bandwidth capacity

All DBx amplifiers offer up to 1.2 GHz downstream bandwidth and up to 204 MHz upstream bandwidth.

Operators requiring 1 GHz downstream bandwidth today can upgrade to 1.2 GHz in future merely by swapping the downstream module, without the need to change the entire amplifier.

Modules take seconds to replace meaning installation is simplified, service interruptions are negligible and labour is significantly reduced.

All amplifiers are designed to accommodate standardised upstream and downstream modules that allow for quick and easy adjustment of key parameters in the Access network. And because each module can fit interchangeably in each of the amplifiers in the range, spares stockholding is kept to a minimum. This in turn keeps costs low.

Economically convert coax to fibre

The DBx platform provides operators with the opportunity to economically implement 'deep fibre' or 'Fibre to the Last Amplifier' (FtLA) in their network. Cassette-style fibre modules convert RF amplifiers into optical nodes in seconds; the upgrade is quick and easy.

Why strip out existing infrastructure to add entirely new products every time network requirements change, when simply replacing the modules inside one durable platform can achieve the same results quicker, and at a fraction of the cost?

- The DBC amplifier upgrades to 1 x 1 optical node
- The DBD amplifier upgrades to 1 x 2 and 2 x 2 optical nodes
- The DBE amplifier upgrades to 1 x 3, 2 x 3, 3 x 3 or 4 x 4 optical nodes



Overcoming today's cable infrastructure challenge means maintaining performance to satisfy end-user demand, and/or upgrading equipment to prepare for the future – all the while driving down TCO.

Don't buy an RF amplifier today and an optical node tomorrow; make the most of your CAPEX by upgrading your amplifier to an optical node.

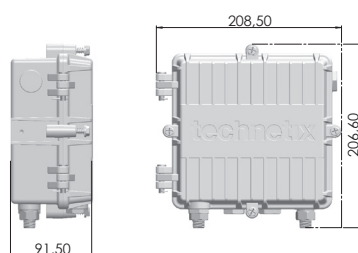
DBx platform key parameters*

		Specification			Units
Parameter		DBC 1200	DBD 1200	DBE 1200	
Frequency range	Forward Path (up to)	85 to 1218	85 to 1218	85 to 1218	MHz
	Reverse Path (up to)	5 to 204	5 to 204	5 to 204	MHz
Return loss		18	18	18	dB
Gain		32, 38 or 44	32, 38 or 44	32, 38 or 44	dB
Flatness		± 0.5	± 0.5	± 0.5	dB
Number of active outputs		1	2	3 or 4	
Plug-in diplexer band splits available		42/54	42/54	42/54	MHz
		65/85	65/85	65/85	MHz
		85/102	85/102	85/102	MHz
		85/105	85/105	85/105	MHz
		204/258	204/258	204/258	MHz
Input gain control (electronic) pre-stage		20	20	20	dB
Input gain control (electronic) inter-stage		0 - 20	0 - 20	0 - 20	dB
Input EQ control (electronic) pre-stage		0 - 15	0 - 15	0 - 15	dB
Input EQ control (electronic) inter-stage		0 - 15	0 - 15	0 - 15	dB
Noise Figure		6	6	6	dB
General					
Power consumption		16,5	27	50 (typ)	Watts
Supply voltage		30 to 90 block/trapezium	30 to 90 block/trapezium	30 to 90 block/trapezium	VAC
Hum modulation		:-70 dBc at 7A	:-70 dBc at 10A	:-70 dBc at 10A	
Input/output connectors		PG11 or 5/8" KS	PG11 or 5/8" KS	PG11 or 5/8" KS	
Test point connectors		F-Female	F-Female	F-Male	

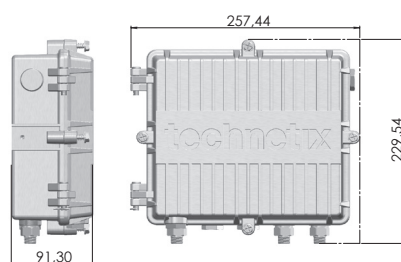
* Full detailed specification sheets are available for the entire DBx range.

DBx amplifiers are available in styles suitable for cabinet installations and strand mount, aerial installations. The platform can be integrated into 'star' or 'cascade'-style networks.

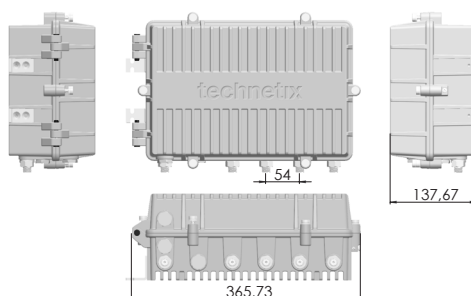
Cabinet versions



DBC-1200 Amplifier

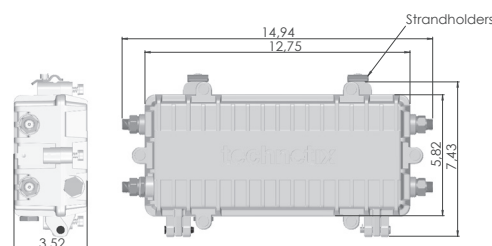


DBD-1200 Amplifier

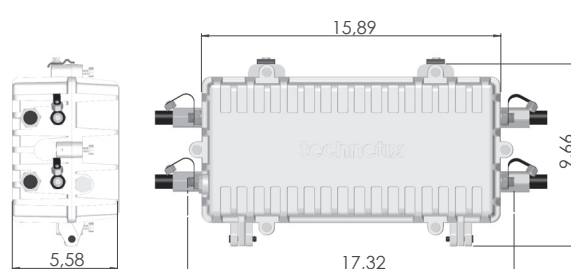


DBE-1200 Amplifier

Strand mount versions



DBC-1200S Amplifier



DBE-1200S Amplifier

When it comes to set-up, the DBx platform does not require hardware plug-in. Amplifier configuration and alignment is software controlled via laptop access or Android device. Total cost of ownership is therefore improved by a reduction in installation, upgrade and repair times and a decrease in the amount of accessories required by the technician.

Technetix provides the tools for a successful, next generation Access platform

Introducing the DBx platform into your network is simple. Leveraging its modularity to secure a better return on investment keeps you in control of TCO.

From a technical perspective, the DBx platform provides more spectrum. This means operators can generate revenue by adding new services or increasing bandwidth to offer premium or tiered services to cable end-users.

This can be achieved with the following approach:

1. Implement the DBx platform today, upgrading your HFC plant to DOCSIS 3.1 – but leaving current services untouched.
2. Enable the network to transmit more data. Replacing the plug-in diplex filters increases upstream capacity with DOCSIS 3.1. (This takes seconds, saving time and money.) Gradually, operators can easily adapt their network to meet the growing demand for more and faster data. And because the DBx platform is already in place, the need to strip out legacy hardware at this stage is avoided; only the diplexers inside the amplifier are changed.
3. Convert the RF amplifier to an optical node. Inside the unit, downstream and upstream RF modules can be replaced with optical modules in a matter of seconds.



The DBx platform is an amplifier/node solution that takes into account an operator's architectural requirements. It provides cost effective, stepped and flexible growth paths.

**A leading-edge solution
for strategic bandwidth
expansion and reduced
total cost of ownership.**

DBx platform features and benefits

- The DBx platform offers software controlled set-up and alignment via laptop access or Android device (i.e., smartphone and tablet), making installation quick and simple.
- Modules are interchangeable across the platform, reducing spares stockholding.
- Modules are replaced with ease, resulting in reduced maintenance costs.
- Modules are replaced in seconds, meaning service interruptions are negligible.
- Optical modules are plugged in effortlessly, simplifying the RF-to-fibre upgrade.
- Power consumption is low, reducing operators' utility bills.
- DOCSIS 3.1 compliance renders the network 'future-ready'.
- Remote software control saves the technician time and reduces their carbon footprint, keeping labour costs low.
- Technetix' FSK module and IDS technology detects network ingress quickly, enabling service continuity and reduced operational costs.



Upstream Module



Control Module



Downstream Module

Planned additions to the DBx platform

The Technetix transponder

Technetix' DOCSIS 3.0 transponder will enable two-way network communication, providing monitoring and control capabilities for DBx amplifiers and nodes.

The transponder delivers services via a Web interface using the Technetix Network Management System (TNMS). Alternatively, it can be integrated into operators' existing management platforms using Automated Provisioning Interfaces (API).

With the transponder, the amplifier can be operated locally or remotely, allowing for quick diagnosis and control of its parameters and associated HFC devices.

The unit is temperature hardened and suitable for use in outdoor amplifiers and nodes. This true plug-in module automatically registers with the network on connection without the risk of service interruption.

In addition, Technetix' connectivity tray provides a convenient fibre management solution to keep optical nodes neat and tidy in the network.

Check back with Technetix to see how we keep the DBx product line up to date.



The DBx platform from Technetix is a service enabler that creates flexibility in the Access network.

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Technetix: a trusted partner

Technetix works in partnership with broadband cable network operators to truly understand their needs and to provide intelligent, customized solutions that help them deliver reliable, innovative services to their customers.

Our Headend solutions are designed for density and modularity, giving maximum flexibility, freeing up critical headend space and making future upgrades simple and cost effective. Our Access Network solutions enhance signal quality: reducing operator callouts and minimizing maintenance costs. Our Connected Home solutions enable high quality signals to be received at multiple points within a home: reducing or eliminating operator installation and maintenance costs.

An industry leader since 1990, Technetix is the tried, tested and trusted supplier to over 1,800 customers, operating out of 20 countries and selling into 75.

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