

Reach Extension

BTI 7000 Series



BTI offers a comprehensive portfolio of reach extension modules designed to allow even greater service reach. BTI's optical amplifiers and dispersion compensation modules are designed extend the reach of optical signals by compensating for complex effects such as power loss, Optical Signal-to-Noise Ratio (OSNR) degradation, and Chromatic Dispersion. These modules are the optical network building blocks needed to extend service connectivity without the need to electrically regenerate the signal. This portfolio capability enables the BTI 7000 Series to address large metro and regional network applications.

Reach Extension Family

Erbium-Doped Fiber Amplifier (EDFA) modules boost optical signals to reduce the effect of optical power attenuation, amplifying signals in the DWDM wavelength spectrum (1528nm to 1563nm). BTI offers S-Series (single channel/sub-band amplifiers, for low to moderate channel count applications), as well as O-Series (DWDM amplifiers, for high channel count applications) amplification families. BTI's amplifiers come in 4 different formats:

- Booster amplifiers: typically deployed at the output of a mux at the head end of an optical link
- Line-amplifiers: designed to increase the power level of a signal at intermediate sites along an optical link.
- Line amplifiers with mid-stage access: which allow for easy integration with dispersion compensation modules (DCM) without increasing span loss.
- Pre-amplifiers: typically found at the receiver end of an optical link

Dispersion Compensation Modules correct the effects of chromatic dispersion, enabling increased reach of optical signals. DCMs are available in two different types:

- Fiber Bragg Grating (FBG) based modules provide reduced insertion loss when compensating ITU-T 100GHz grid wavelengths.
- Dispersion Compensating Fiber (DCF) based modules are wavelength agnostic and provide compensation to any signal in the C-Band, including broadband 1550nm signals.

Features

Ultra Compact and Integrated Reach Extension Capabilities

All of BTI's reach extension modules are designed to fit conveniently into the BTI 7060 or 7030 chassis. DCMs can be placed in the BTI 7020 passive chassis or the active chassis (7030/7060). Each one of BTI's reach extension modules takes up only a single slot on a BTI chassis. This ultra compact design allows for easy reach extension even when space is at a premium.

Complete Amplification Portfolio

Pre, post, and line amplifier modules are available to deliver the complete amplification architecture for metro/regional applications ensuring consistent and reliable signal quality. 2 families (S-series and O-series) of amplifiers are available, for low to moderate or high channel count applications. All amplifiers are equipped with an optical power monitor tap.

Reduce Electrical Regeneration Requirements

Electrically regenerating a signal requires a number of costly components which very quickly increase the cost of a network deployment. Keeping signals in the optical layer allows for significant cost savings and greater operational efficiency.

Adjustable Gain and Power Control Modes on Amplifiers

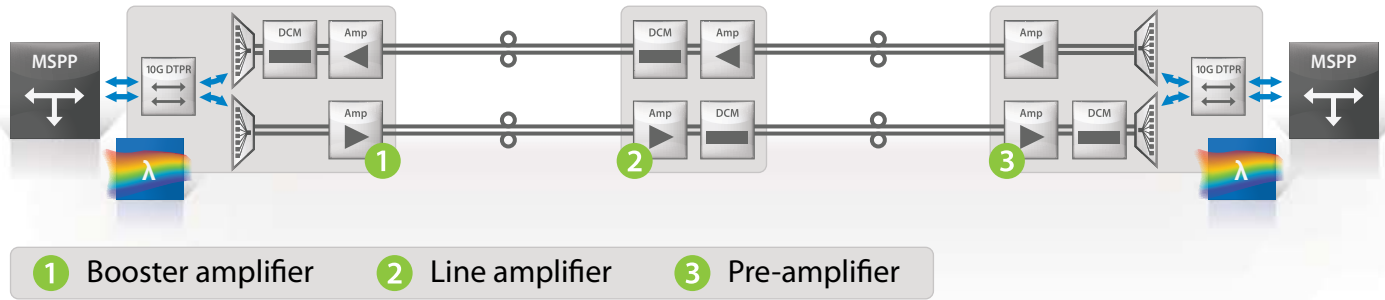
BTI's amplifiers offer advanced features like adjustable gain, adjustable power and low channel ripple. They can be used in constant power mode for single channel operation, or in constant gain mode for multi-channel deployments. Line amplifiers are variable gain to compensate for different span losses.

2 Families of Dispersion Compensation

Modules (DCMs) Offer Flexibility

Standard DCMs support any wideband signal at any wavelength inside the C-band independently of the ITU-T grid used. A wide range of compensating distances

is available to adjust the dispersion compensation to the specific link requirements. FBG DCMs use Fiber Bragg Grating (FBG) technology to provide reduced insertion loss for specific wavelength configurations. Greater reach and lower cost is achieved than with standard Dispersion Compensating Fiber modules.



Portfolio Summary

Optical Amplifiers	PEC Code	Constant Gain	Adjustable Gain	Constant Power	Power Monitor Port
DWDM C-Band Pre-Amplifier (OPA)	BP1A01DA	■		■	■
DWDM C-Band Booster Amplifier (OBA)	BP1A02DA	■		■	■
DWDM Optical Line Amplifier (OLA)	BP1A03AA	■	■		
DWDM Optical Line Amplifier with Mid-Stage Access (OLAM)	BP1A04BA	■	■	■	
Single-Channel/Sub-Band Booster Amplifier (SBA)	BP1A05BB	■		■	■
Single-Channel/Sub-Band Pre-Amplifier (SPA)	BP1A05PB	■		■	■

Dispersion Compensation Modules	PEC Code	Dispersion (ps/nm)	Insertion Loss (IL) (dB)	PMD* (ps)	PDL† (dB)
SMF DCM 20 KM	BP1A10CH	-340 ±2%	1.5<IL< 2.7	<0.44	<0.1
SMF DCM 40 KM	BP1A10CC	-680 ±2%	2.8<IL< 4.0	<0.55	<0.1
SMF DCM 60 KM	BP1A10CA	-1020 ±2%	4.2<IL<6.3	<0.58	<0.1
SMF DCM 80 KM	BP1A10CB	-1345 ±2%	5.5<IL<8.0	<0.67	<0.1
SMF ITU-T DCM 40 KM†	BP1A10AA	- 635 ±5%	≤5.5	<0.7	<0.3
SMF ITU-T DCM 60 KM†	BP1A10AB	- 950 ±5%	≤5.5	<1.0	<0.3
SMF ITU-T DCM 80 KM†	BP1A10AC	- 1270 ±5%	≤5.5	<1.5	<0.3

* Polarization Mode Dispersion

† Polarization Dependant Loss

‡ Fiber-Bragg-Grating-based modules provide reduced insertion loss and lower cost when compensating ITU-T 100GHz grid wavelengths