

# BTN100 1

## 1 GHz OPTICAL NODE STARLINE® SERIES



**The BTN100 optical node complements evolving fiber-deep networks by providing operators with a low cost amplifier to node drop in conversion with flexibility and high performance.**

Motorola's 1 GHz STARLINE® BT® series optical node, model BTN100, leads the industry in features and performance and is designed to meet the needs of today's expanding broadband communication networks. This optical node provides the perfect solution for system operators who need to deploy fiber deeper into their architecture with the flexibility to expand later. The BTN100 node can be deployed as a low-cost, four output stand alone fiber deep node or to convert an existing BT® amplifier to an optical node. The base of the BTN100 node is the same as the BT100 amplifier and allows operators to leave the hard line coax cable installed when segmenting at an amplifier location.

### Key Features

The BTN100 Optical Node allows operators to utilize existing BT amplifier locations. Once converted, the BTN100 allows operators to seamlessly set up output drive levels of the amplifier for minimal installation downtime. The BTN is a lower-cost solution to the SG4000 with a limited feature set. Operators who need the simplicity of a single receiver and transmitter with four high-level outputs should look at using the BTN100 node. The BTN100 has a variety of optical return path transmitters with powers ranging from 400  $\mu$ W Isolated Fabry-Perot to 2.0 mW Course Wave Division Multiplexed transmitters. The BTN100 node allows for segmentation between the two output ports in the return path. Forward and Return redundancy is also available with or without a status monitor. The status monitor is DOCSIS compatible. There are no configuration boards in the forward path; all changes and upgrading are configured through RF cable connections and jumper settings. In the return path, there is a single return path configuration board that is used with a simple path to migrate from a single transmitter to a dual transmitter solution without having to change any plug-in modules. All BTN100 optical nodes will fit into the existing BT amplifier and SG2000 installed base, but will require replacement of the entire lid.

### Amplifier and Backward Compatibility

All BTN100 optical nodes will fit into the existing BT amplifier and SG2000 installed base, but will require replacement of the entire lid.

### Forward Path

High gain levels are capable of achieving +55 dBmV minimum virtual output level at 1 GHz with a -3 dBm optical input received power with 4% OMI per channel. Replacing a BT amplifier with +44 dBmV at 550 MHz output level is easily achieved with the BT Node.

To further ensure system flexibility, installation ease, and maintenance, the node is engineered for compatibility with standard accessories, such as attenuators, automotive fuses, and FTEC crowbar circuits.

The BTN100 uses modular diplex filters, which can be changed for a different frequency split as required. The node is available with S-split filters for a 5-40 MHz return and a 52-1003 MHz forward band. K-splits (5-42 MHz/54-1003 MHz), J-splits (5-55 MHz/70-1003 MHz), A-splits (5-65 MHz/85-1003 MHz), and N-split (5-85 MHz/104-1003 MHz) are also available. These same filters can be used for all US-style Motorola RF distribution amplifiers (models BLE, MB, and BT) and nodes (BLN and MBN).

### Lid Modules

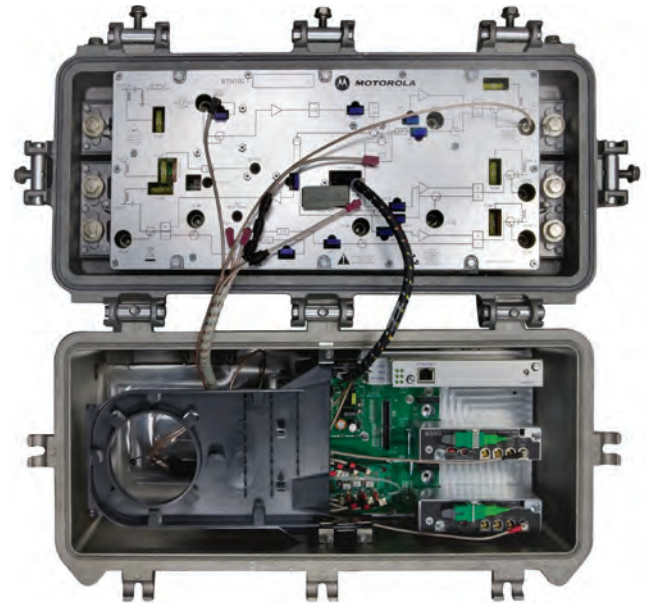
The receivers and transmitters are the same as the MBN100 Node. The power supply is the same power supply used in the BT amplifier platform. The DOCSIS transponder is also the same transponder that is used in the SG4000 and MBN100 Node platform.

## Return Path

Recommended input to the BTN100 node is the same as the BT100 amplifier at +28 dBmV. Five models of transmitters are available for the BTN100 Node:

1310 nm	IFPT	400 $\mu$ W	Isolated Fabry-Perot Transmitter (-4 dBm)
1310 nm	EIFPT	1 mW	Enhanced Isolated Fabry-Perot Transmitter (0 dBm)
1310 nm	DFBT	1 mW	Distributed Feedback Transmitter (0 dBm)
1310 nm	DFBT3	2 mW	Distributed Feedback Transmitter (+3 dBm)
1270 nm – 1610 nm	DFBT3	2 mW	Course Wavelength Division Multiplexed (CWDM) Distributed Feedback Transmitter (+3 dBm)

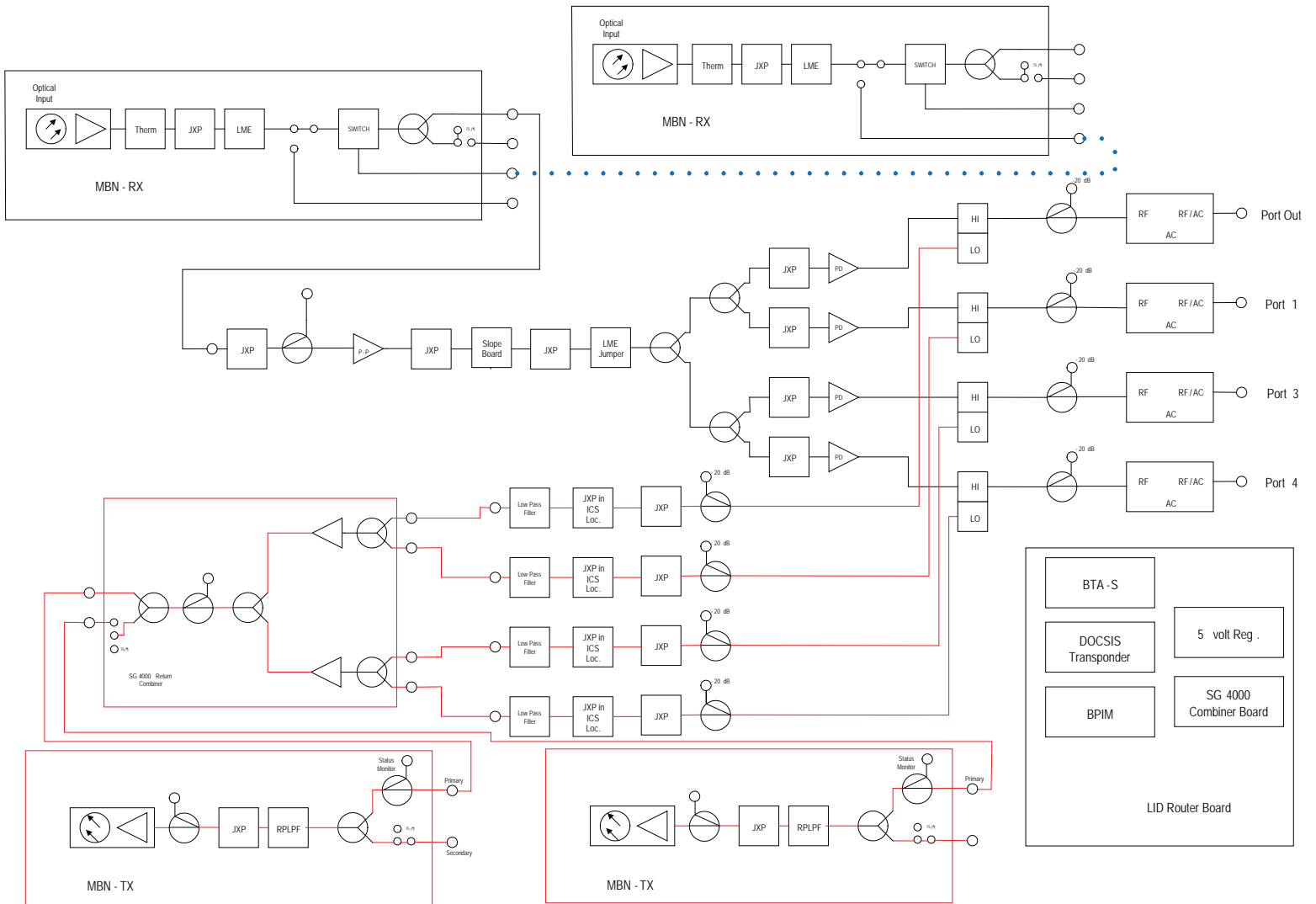
Ingress Control Switching (ICS) is also available. This pin diode attenuator circuit can pass signal (ON), lower levels by 6 dB with a controlled slew rate for minimum bit errors, or turn the path completely OFF by dropping levels greater than 38 dB. The DOCSIS transponder is required to operate the Ingress Control Switch from a remote location. The VPIM embedded accessory allows for operators to switch manually at the node location.



### Benefits include:

- 1003 MHz Enhanced Gallium Arsenide power doubling technology
- Four high-level outputs
- Segmented Return path
- Forward and Return Path redundancy
- Up to two optical receivers
- Up to two optical transmitters
- Multiple duplex filter options
- N-split (5-85/104–1003 MHz) availability
- DOCSIS transponder interface provided
- Hot swap modules
- User friendly fiber management
- Ease-of-use ergonomics
- RoHS compliant
- 15 Ampere AC capability
- Optional return path ingress control
- 1310nm 0.4 mW to CWDM 2.0 mW transmitters available

# BTN100 Block Diagram



## Ordering Information

To reduce customer costs and to accommodate customer specific needs, the STARLINE BTN100 can be ordered in a variety of different models. Please refer to the BTN100 ordering information below for options.

Part Number	Model	Description
842000-001-00	BTN100/SK4/SSX/ENN	BT Node 1 GHz with 5-42 / 54–1003 MHz K-split, 4-output, Single Receiver, DFBT3 1550 nm 2 mW Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
842000-002-00	BTN100/SK4/SSX/CNN	BT Node 1 GHz with 5-42 / 54–1003 MHz K-split, 4-output, Single Receiver, DFBT 1310 nm 1 mW Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
842000-003-00	BTN100/SS4/SSX/CNN	BT Node 1 GHz with 5-40 / 52–1003 MHz S-split, 4-output, Single Receiver, DFBT 1310 nm 1 mW Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
842000-004-00	BTN100/SS4/SSX/ENN	BT Node 1 GHz with 5-40 / 52–1003 MHz S-split, 4-output, Single Receiver, DFBT3 1550 nm 2 mW Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
842000-005-00	BTN100/SS4/SSN/NNN	BT Node 1 GHz with 5-40 / 52–1003 MHz S-split, 4-output, Single Receiver, No Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
842000-006-00	BTN100/SK4/SSN/NNN	BT Node 1 GHz with 5-42 / 54–1003 MHz K-split, 4-output, Single Receiver, No Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
842000-007-00	BTN100/SJ4/SSN/NNN	BT Node 1 GHz with 5-55 / 70–1003 MHz J-split, 4-output, Single Receiver, No Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
842000-008-00	BTN100/SA4/SSN/NNN	BT Node 1 GHz with 5-65 / 85–1003 MHz A-split, 4-output, Single Receiver, No Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
842000-009-00	BTN100/SN4/SSN/NNN	BT Node 1 GHz with 5-85 / 104–1003 MHz N-split, 4-output, Single Receiver, No Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
558747-001-00	MBN-IFPT/SC-R	MBN100 isolated Fabry-Perot 0.4 mw (-4 dBm) 1310 nm transmitter, SC/APC, RoHS compliant, finished good
558748-001-00	MBN-EIFPT/SC-R	MBN100 enhanced isolated Fabry-Perot 1.0 mw (0 dBm) 1310 nm transmitter, SC/APC, RoHS compliant, finished good
558799-001-00	MBN-DFBT/SC-R	MBN100 distributed feedback 1.0 mw (0 dBm) 1310 nm transmitter, SC/APC, RoHS compliant, finished good
558800-001-00	MBN-DFBT3/SC-R	MBN100 distributed feedback 2.0 mw (3 dBm) transmitter, SC/APC, RoHS compliant, finished good
558802-XXX-00	MBN-DFBT3-{XXXX}-CWD/SC-R-R	MBN100 distributed feedback 2.0 mw (3 dBm) {wavelength value} nm transmitter, SC/APC, RoHS compliant, finished good
558803-001-00	MBN-RX/SC-R	MBN-R optical receiver, 1 GHz, SC/APC connectorization, RoHS compliant, finished good
531186-XXX-00	JXP-*B-R	Plug-in attenuator/pad (values 0 to 26 dB, in 1 dB steps)
559648-XXX-00	MBN-LME-100-(X)-R	MBN-LME-100-(X)-R, equalizer, MBN-equalizer, 1 GHz, linear mid-stage equalizer, (X)dB, RoHS compliant, finished good
503855-016-00	SG4-100-RET-COMB-RED-R	Return combined redundant, RoHS compliant, finished good
928150-002-00	Service cable	Fiber Service Cable, SC/APC, 42' breakout, Finished Good

## Specifications

### OPTICAL RECEIVER

Optical Wavelength	1290 – 1600 nm
Optical Input Power Range	-3.0 to +2.0 dBm continuous
Optical Connector Type	SC/APC
Optical Input Return Loss	45 dB minimum

### RF

Operational Bandwidth	$F_{min}$ to 1003 MHz
Flatness	$\pm 0.75$ dB $F_{min}$ to 1003 MHz
Output Slope	8, 10, 12, 14.5, 16, and 18 dB
Level Stability	$\pm 1.5$ dB over operating temperature range
RF Output Test Points	-20 $\pm$ 0.5 dB (internal)
RF Output Impedance	75 $\Omega$
RF Output Return Loss	16 dB minimum

### STATION PERFORMANCE

Output Level	55 dBmV @ 1003 MHz with -3 dBm optical input power
Power Consumption	70 W maximum
Hum Modulation @ 15 A	-55 dBc, 5 to 10 MHz -60 dBc, 11 MHz to $F_{maxret}$ -60 dBc, $F_{min fwd}$ to 870 MHz -60 dBc, 871 to 1003 MHz
Return Path Isolation	60 dB, port-to-port
AC Bypass Current	15 A
Measured with 79 channels NTSC at 44 dBmV @ 547.25 MHz with digital loading 6 dB below analog, 550 to 1003 MHz, 20 km optical link, 0 dBm optical input power, GX2 transmitter	
Composite Triple Beat (CTB)	-68 dBc
Composite Second Order (CSO)	-64 dBc
Carrier to Composite Noise (CCN)	-50.5 dB

### MECHANICAL/ENVIRONMENTAL

Dimensions	21.6 in L x 10.6 in W x 11.0 in D (54.86 cm x 26.92 cm x 27.94 cm)
Weight	36.0 lbs (16.31 kg)
Mounting	Aerial or pedestal
International Protection Rating	IP68
RF Connector Types	SCTE-compliant housing, accepts 1.6" 5/8 stinger
Operating Temperature Range	-40 °F to 140 °F (-40 °C to 60 °C)

### SYSTEM POWER CONSUMPTION

1 X 1	65 Watts typical (from 38 VAC to 90 VAC)
1 X 2	71 Watts typical (from 38 VAC to 90 VAC)
1R X 1R	73 Watts typical (from 38 VAC to 90 VAC)

*All specifications stated as worst-case over temperature unless otherwise noted.*

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