



# ***MBN100 1 GHz Optical Node STARLINE® Series***





## The MBN100 complements evolving fiber-deep networks by providing operators with an amplifier to node drop in conversion with flexibility and high performance.

Motorola's 1 GHz STARLINE® Mini-Bridger® series optical node, model MBN100, 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 MBN100 node can be deployed as a stand alone compact sized fiber deep node or to convert an existing Minibridger® amplifier to an optical node. The base of the MBN100 node is the same as the MB100 amplifier and can allow operators to leave the hard line coax cable installed when segmenting at an amplifier location.

### Key Features

The MBN100 Optical Node allows operators to utilize existing MB amplifier locations. Once converted the MBN100 allows operators to seamlessly set up output drive levels of the amplifier for minimal installation downtime. The MBN100 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 MBN100 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; all changes and upgrading are configured through RF cable connections and jumper settings.

### Amplifier and Backward Compatibility

The MBN100 electronics package can be made backward compatible with the 10-Amp MB\*/\* housing by installing the MB-15A Kit or the MB-15A Kit II. These kits contain 50 mil gold plated platform assemblies. This makes it possible for the node to carry 15 Amperes continuous through the input or output ports. All MBN100 optical nodes will fit into the existing MB amplifier 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 MiniBridger amplifier with +44 dBmV at 550 MHz output level is easily achieved with the with the Minibridger 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 MBN100 uses modular duplex 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 are used for all US-style Motorola RF distribution amplifiers (models BLE, MB, and BT) and nodes (SG1000 and SG4000).

### Benefits include:

- 1003 MHz Enhanced Gallium Arsenide power doubling technology
- Two high level outputs
- Split or Directional Coupler passive 3rd output
- 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

## Return Path

Recommended input to the MBN100 node is the same as the MB100 amplifier at +28 dBmV. Five models of transmitters are available for the MBN100 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	2 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) DFB Transmitter (+3 dBm)

Also available is Ingress Control Switching (ICS). This pin diode attenuator circuit can pass signal (ON), lower levels by 6 dB with a controlled slew rate for minimum bit errors, or turning the path completely OFF by dropping the 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.

## Lid Modules

The receivers and transmitters are unique to the Minibridger Node. The power supply is the same power supply used in the SG4000 node platform. The DOCSIS transponder is also the same transponder that is used in the SG4000 Node platform. The VPIM module is unique to the Minibridger Node.

## Model Availability

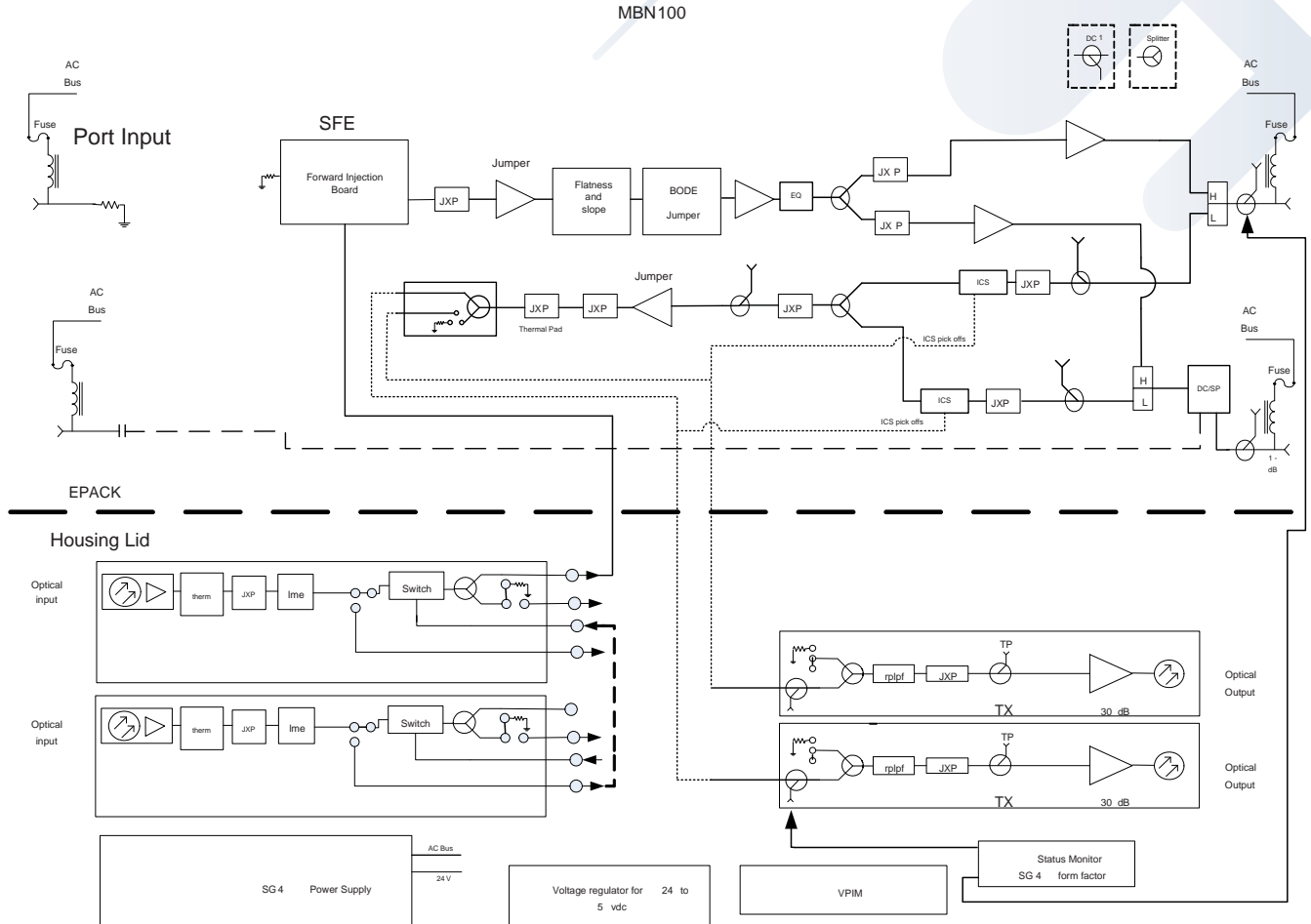
To reduce customer costs and to accommodate customer specific needs, the STARLINE MBN100 can be ordered in a variety of different models. Please refer to the MBN100 ordering information below for options.



## Typical Plant power supply current needed for a Minibridger Node

Node Configuration			
AC Input	1 x 1	1 x 2	1R x 1R w/SM, VPIM
	Amps	Amps	Amps
@90 VAC	0.956	1.047	1.121
@75 VAC	1.063	1.185	1.254
@60 VAC	1.182	1.341	1.438
@53 VAC	1.274	1.444	1.542
@45 VAC	1.398	1.571	1.713
@38 VAC	1.546	1.767	1.886

## MBN100 Block Diagram



Note: The ICS pick offs can be used for return path segmentation. When buying a configured node with a single transmitter the ICS pick offs are installed and both cables will go to that single transmitter. For easy upgrade to segmentation, you do not have to remove the cover in this configuration; you simply remove the second cable from the single transmitter and use that for your input to the second segmented transmitter. When you purchase a node without a transmitter, the SRE board is installed with easy access for installing a single or redundant pair of transmitters without having to remove the cover.

## Ordering Information

Part Number	Model	Description
822000-001-00	MBN100/SS2/SXN/NNN	Minibridger Node 1 GHz with 5-40 / 52-1003 MHz S-split, 2-output, Single Receiver, No Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
822000-002-00	MBN100/SK2/SXN/NNN	Minibridger Node 1 GHz with 5-42 / 54-1003 MHz K-split, 2-output, Single Receiver, No Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
822000-003-00	MBN100/SN2/SXN/NNN	Minibridger Node 1 GHz with 5-85 / 104-1003 MHz N-split, 2-output, Single Receiver, No Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
822000-004-00	MBN100/SS2/SXN/CNN	Minibridger Node 1 GHz with 5-40 / 52-1003 MHz S-split, 2-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
822000-005-00	MBN100/SK2/SXN/ENN	Minibridger Node 1 GHz with 5-42 / 54-1003 MHz K-split, 2-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
822000-006-00	MBN100/SS2/SXN/ENN	Minibridger Node 1 GHz with 5-40 / 52-1003 MHz S-split, 2-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
822000-007-00	MBN100/SA2/SXN/NNN	Minibridger Node 1 GHz with 5-65 / 85-1003 MHz A-split, 2-output, Single Receiver, No Transmitter, 14.5 dB internal slope, high gain return, 20A fuses, FTEC surge protector, full station – RoHS Compliant
822000-008-00	MBN100/SJ2/SXN/NNN	Minibridger Node 1 GHz with 5-55 / 70-1003 MHz J-split, 2-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}-CWDM/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 reciever, 1 GHz, SC/APC connectorization, RoHS compliant, finished good
558807-001-00	MBN-VPIM	Vertical embedded plug-in module for MBN100 node, provides redundant reciever and ICS operation. Includes SIC, finished good
531186-XXX-00	JXP-*B-R	Plug-in attenuator/pad (values 0 to 26 dB, in 1 dB steps)
558819-001-00	MBN-ICS-RF-R	MBN-ICS-RF-R, board, ICS Return Path RF output board (ICS Pick offs), finished good
558820-001-00	MBN-FEQ-INJ-R	MBN-FEQ-INJ-R, board, FEQ forward RF input board with test point, finished good
558821-001-00	MBN-BODE-JUMPER-R	MBN-BODE-JUMPER-R, board, bode bypass board, finished good
558822-001-00	MBN-HYBRID-JUMPER-R	MBN-HYBRID-JUMPER-R, board, hybrid bypass board, finished good
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
558809-001-00	MBN-HSG-LID	MBN-HSG-LID, MBN100 spare lid assembly, with router board and fiber tray, finished good
558805-001-00	MBN-PIC	MBN-PIC, cable, power interface cable for MBN100 node, finished good
532244-001-00	SG4-PS-R	SG4-PS-R, power supply, 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 are available
Level Stability	$\pm 1.5$ dB over operating temperature range
RF Output Test Points	-20 $\pm$ 1.0 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 Consumption	70 W maximum
Hum Modulation @ 15 A	(-55 dBc, 5 to 10 MHz) (-60 dBc, 11 MHz to $F_{maxret}$ ) (-65 dBc, $F_{minfwd}$ to 870 MHz) (-60 dBc, 871 to 1003 MHz)
Return Path Isolation	60 dB, port-to-port
AC Bypass Current	15 A
<i>Measured with 79 channels NTSC at 48 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</i>	
Composite Triple Beat (CTB)	-68 dBc
Composite Second Order (CSO)	-64 dBc
Carrier to Composite Noise (CCN)	-50.5 dB

### MECHANICAL/ENVIRONMENTAL

Dimensions	15.4 in L x 9.6 in W x 8.5 in D (39.1 cm x 24.4 CM x 21.6 CM)
Weight	22 lbs (9.97 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	52 Watts typical (from 38 VAC to 90 VAC)
1 x 2	58 Watts typical (from 38 VAC to 90 VAC)
1R x 1R	63 Watts typical (from 38 VAC to 90 VAC)



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[www.motorola.com/broadband](http://www.motorola.com/broadband)

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