

Digital Return System

SG4-DRT-2X-85 and
MBN-DRT-2X-85 Transmitters

GX2-DRR-2X-85 and
CHP-D2RRX-85 Receivers

FEATURES

- Allows return bandwidth expansion up to 85 MHz
- Easy node segmentation with 2X RF TDM
- Simplified logistics with Small Form Pluggable (SFP) optics
- Tailors to network demands with 1310, CWDM, or DWDM
- Improved density reclaims valuable chassis space
- Integrated monitoring without the need for a transponder
- Interchangeable receivers and SG4 and MBN digital transmitters for maximum flexibility in both new and legacy installations
- Plug and play installation and operation



PRODUCT OVERVIEW

ARRIS digital return solutions are aimed at optimizing operator's networks, making it easy to manage subscriber growth, bandwidth expansion, and higher modulation schemes. Digital return technology offers inherent advantages over analog return, including performance that is independent of link distance and ease of set-up.

The ARRIS design advantage includes 12-bit A/D sampling and our proprietary companding algorithm that increases link dynamic range. This allows the same transmission data rate as a 10-bit system with better system performance, supporting DOCSIS® 3.0 channel bonding and 256 QAM modulation.

NOTE: GX2-DRR-2X-85 is an obsolete receiver. The CHP-D2RRX-85 Receiver is still active and is required to receive and translate signal from the SG4-DRT-2X-85 and MBN-DRT-2X-85 Transmitters from the nodes. Please consult with your sales representative for the best approach to new designs.

SG4-DRT-2X-85

The SG4-DRT-2X-85 digital return transmitter delivers enhanced performance, density and flexibility when deployed in 42, 65, or 85 MHz return systems. The transmitter is ready to accept a full data payload, making it ideal for operators looking to expand their return path by reclaiming forward spectrum, as no adjustments are required at the transmitter when increasing the RF input bandwidth.

The transmitter accepts two independent RF inputs within the node and uses 2X Time Domain Multiplexing to enable segmentation and instant capacity improvement. Two transmitters provide 4X return capabilities in the SG4000 optical node. Wavelength aggregation onto a single fiber can be achieved within the node using ruggedized optical passives. When using DWDM SFPs, the system is further scalable up to 40 wavelengths on a single fiber with additional muxes and demuxes within the network. The dual-density module allows operators to reclaim module slot space within the node that can be used to deploy advanced services that generate additional revenue.

The transmitter features high-speed 4.25 Gbps pluggable SFP optics that are available in 1310, CWDM, or DWDM models. Customers have their preference when ordering the transmitter, either as a blank host module or as a kit, complete with the SFP of their choice. This flexibility has benefits across the organization, enabling installation across a wide range of network design topologies, requiring less space for field sparing and simplifying warehouse stocking logistics.



MBN-DRT-2X-85



The MBN-DRT-2X-85 digital return transmitter extends the ARRIS advantage across the broader ARRIS optical node portfolio, to include the MBN100.

The MBN100 1x2 GaN node can be deployed as a compact, fiber deep node or used in cascade reductions to convert an existing Mini-Bridger amplifier into an optical node. The base of the MBN100 node is the same as the Mini-Bridger amplifier, allowing operators to save time by leaving the hard-line coax cable installed when segmenting at an amplifier location. The MBN-DRT-2X-85 transmitter simplifies return segmentation and provides the ability to correct unbalanced legs.

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Ask us about the complete Access Technologies Solutions portfolio:

Nodes-Transmitters

SFP

Small Form Pluggable, MSA compliant optics are available in a selection of technologies designed to satisfy a wide range of network requirements. ARRIS provides these 4.25 Gbps, industrial temperature-rated SFP transmitters to ensure the overall link performance is maintained.

For short links less than 10 km, a low-power 1310 nm SFP is available that delivers a lower-cost solution than analog return transmitters on a per RF stream basis.

To take advantage of longer links up to 40 km, CWDM SFPs are available in 16 wavelengths. With the addition of ruggedized optical passives, multiple wavelengths can be aggregated for fiber savings.

For greater distances up to 80 km, DWDM SFPs are available in 40 ITU wavelengths to maximize wavelength aggregation and design flexibility. Optical amplification can be utilized to extend distances as required by network designs.



TRANSMITTER/SFP SPECIFICATIONS			
	SG4-DRT-2X-85	MBN-DRT-2X-85	
Optical			
Wavelength Stability		Not specified	
1310		± 6.5 nm	
CWDM		± 0.1 nm	
DWDM			
SFP Optical Output Power		Min.	Max.
1310		-5 dBm	0 dBm
CWDM		-1 dBm	5 dBm
DWDM		4 dBm	—
Optical Connector Type		LC/UPC	
RF			
Operational Bandwidth		5 to 85 MHz	
Recommended Total RF input power ²	+23 dBmV	+19 dBmV	
Number of Input Channels		2	
RF Input Connectors		SMB	
RF Input Return Loss		16 dB min.	
RF Input Impedance		75 ohms	
General			
Dimensions	6.5 in L x 2.0 in W x 2.2 in D (16.5 cm x 5.0 cm x 5.6 cm)	4.0 in L X 2.4 in W X 3.2 in D (10.1 cm x 6.1 cm x 8.1 cm)	
Weight		1.0 lb	
Node Operating Temperature Range		-40° to + 60°C -0° to + 140°F	
24 VDC Current, Maximum		260 mA max.	

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CHP-D2RRX-85

The CHP-D2RRX-85 dual digital return path receiver module contains two independent receiver circuits in a single slot CHP module, enabling up to 20 receivers, or 40 RF streams in a fully-loaded CHP chassis. With four RF outputs, a single DRR module supports a fully-segmented node increasing the efficiency of node splits. It is compatible with the SG4 and MBN Digital Return Transmitters only, not the Opti Max series of Digital Return Transmitters.

The receiver utilizes Avalanche Photo Diode (APD) technology, enabling very high receiver sensitivity to extend link reach. When shorter links are utilized, it's important to optically attenuate the input power to remain below -10 dBm.

Additional benefits of the next-generation digital return system is the integrated status monitoring provided by the transmitter modules without the need of a separate DOCSIS transponder. Key parameters such as node powering, module current, temperature, and wavelength are communicated to the receiver via overhead bits in the digital return data stream.

The CHP Management Module (SMM-2), combined with the CORView EMS platform, manages the device through standard SNMP/CLI interfaces and sophisticated Graphical User Interfaces.



GX2-DRR-2X

The GX2-DRR-2X-85 dual digital return path receiver module contains two independent receiver circuits in a single slot GX2 module, enabling up to 32 receivers, or 64 RF streams in a fully-loaded GX2 chassis. With four RF outputs, a single DRR module supports a fully-segmented node increasing the efficiency of node splits. It is compatible with the SG4 and MBN Digital Return Transmitters.

The receivers utilize Avalanche Photo Diode (APD) technology, enabling very high receiver sensitivity to extend link reach. When shorter links are utilized, it's important to optically attenuate the input power to remain below -8 dBm.

A key feature of the GX2-DRR-2X-85 is its ability to be configured to operate at multiple data rates. This allows operators to upgrade hub and headend receivers to take advantage of the increased density without the need to visit legacy node locations running Motorola's predecessor 65 MHz digital return system.

Additional benefits of the next-generation digital return system is the integrated status monitoring provided by the transmitter modules without the need of a separate DOCSIS transponder. Key parameters such as node powering, module current, temperature, and wavelength are communicated to the receiver status menu on the GX2 Shelf Display Unit.

Additionally, a PC interface is available through an Ethernet port on the front panel of the GX2-CM100B control module. Using a standard Web browser, the Graphical User Interface (GUI) provides a point-and-click method of configuring modules in the OmniStar GX2 chassis.

For higher-level management, you can easily connect the OmniStar GX2 to a remote Element Management System (EMS) or Network Management System (NMS) using the standard Simple Network Management Protocol (SNMP) interface provided through an Ethernet port on the rear panel of the GX2-CM100B control module.

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RECEIVER SPECIFICATIONS

	GX2-DRR-2X-85	CHP-D2RRX-85
Optical		
Input Wavelength Range	1200 to 1620 nm	1200 to 1620 nm
Optical Input Range	-20 to -8 dBm ³	-20 to -10 dBm ³
Optical Connector Type	SC/APC	
RF		
RF Output Bandpass	5 to 85 MHz	
Output Level	+51 dBmV max ⁴	+53 dBmV max ⁴
Number of Output Channels	4	
Output Return Loss	16 dB min.	
Output and Test Point Impedance	75 ohms	
RF Output Test Point	-20 ± 0.5 dB	
RF Connector Types		
Output	F-type (using G-to-F adaptor on chassis)	F-type
Test Points	F-type	
Link Specifications		
Peak Noise-Power Ratio (NPR), typical/min	50/48 dB	
Dynamic Range, typical @ ≥ 40 NPR, typical/min ¹	16/15 dB	
BER Dynamic Range, @ ≤ 10 ⁻⁶ BER	26 dB (64-QAM)	
RF Link Gain, 6 dB input attenuation at TX, max gain at RX ⁵	23 dB	25 dB
Link Flatness, typical/min	± 0.75/± 1.0	
General		
Dimensions	5.9 in H x 1.0 in W x 15 in D (15 cm x 2.5 cm x 38 cm)	3.44 in H x 1.25 in W x 18.5 in D (8.44 cm x 3.18 cm x 46.99 cm)
Weight	2.0 lbs. (0.91 kgs)	3.0 lbs (1.35 kg)
Operating Temperature Range	0° to +50°C (32° to +122°F)	0° to +50°C (32° to +122°F)
Mounting Shelf	GX2-HSG	CHP

NOTES:

All parameters meet the specified requirements over the entire operating temperature range unless otherwise noted.

1. Typical SG4000 NPR performance at 25 ± 5°C. Measured with GX2-DRR-2X receiver. MBN DRT ~2 dB less
2. All transmitters operate with a nominal 28 dBmV total power at the node housing input.
3. 256 QAM Pre-FEC BER < 10⁻¹² (Extrapolated)
4. With minimum attenuation setting.
5. Measured from input of SG4000 node to DRR output, with JXP6 installed

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Ask us about the complete Access Technologies Solutions portfolio:

Nodes-Transmitters

Fiber-Deep

DOCSIS® 3.1

Node Segmentation

HPON™/RFOG

FTTx

ORDERING INFORMATION

Part Number	Model Name	Description
Host Transmitters		
586029-001-00	SG4-DRT-2X-85	SG4-DRT-2X-85, SG4000/MPN, Host Module, 5-85 MHz, 2X TDM, ready to accept SFP, includes LC/UPC to SC/APC fiber jumper
586036-001-00	MBN-DRT-2X-85	MBN-DRT-2X-85, MBN/BTN/VSN, Host Module, 5-85 MHz, 2X TDM, ready to accept SFP, includes LC/UPC to SC/APC fiber jumper
SFP 1310 10 km		
1509443-001 ¹	SFP-4.25G-LC-1310/0.16MW	SFP, Transmitter, 4.25 Gbps, 1310 nm, LC/UPC, 0.16mW
SFP CWDM 40 km 16 Wavelengths Available		
1509444-TAB ²	SFP- 4.25G-LC-XXXX/1.0MW	SFP, Transmitter, 4.25 Gbps, sixteen CWDM wavelengths from 1271 nm to 1611 nm, LC/UPC, 1.0 mW
SFP DWDM 80 km 40 ITU Wavelengths Available		
1509445-TAB ³	SFP- 4.25G-LC-CHXX/1.0MW	SFP, Transmitter, 4.25 Gbps, ITU channel 20-59, LC/UPC, 1.0 mW
GX2-DRR-2X-85 Receiver		
586032-001-00 (EOL)	GX2-DRR-2X-85	GX2-DRR-2X-85, Digital Return Receiver, dual optical inputs, four RF outputs, 5-85 MHz
CHP-D2RRX-85 Receiver		
803193	CHP-D2RRX-85-XQ-S	CHP-D2RRX-85, Digital Return Receiver, dual optical inputs, four RF outputs, 5-85 MHz

NOTES:

1. Replaces legacy Motorola p/n 58627-001-00.
2. Replaces legacy Motorola p/n 586019-TAB-00.
3. Replaces legacy Motorola p/n 586020-TAB-00.

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RELATED PRODUCTS

Digital Return Transmitter	Optical Patch Cords
SFPs	Optical Passives
Fiber Service Cable	Installation Services

Customer Care

Contact Customer Care for product information and sales:

- United States: 866-36-ARRIS
- International: +1-678-473-5656

Note: Specifications are subject to change without notice.

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