

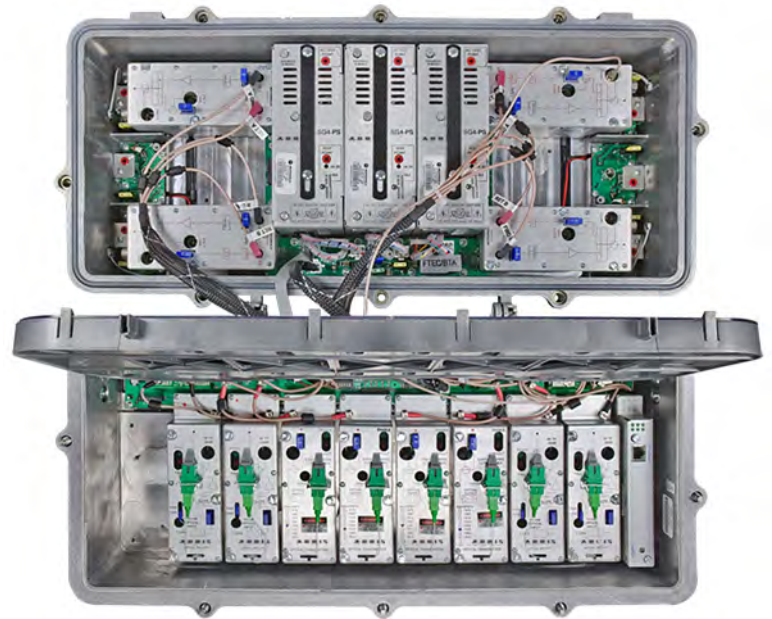
SG4000

4X4 SEGMENTABLE NODE,
OPTICAL NODE SERIES



FEATURES

- Enables bandwidth expansion via downstream and upstream segmentation
- Modular design for maximum flexibility
- GaN technology delivers higher output and enhanced reliability for fiber deep designs
- SFP based 85 MHz digital return expands upstream bandwidth
- 10 Gbps Carrier Ethernet services
- Supports CWDM, DWDM, and CORWave® multiwavelength technologies
- One of the most widely deployed optical nodes, trusted by operators around the world to deliver advanced voice, video, and data services



PRODUCT OVERVIEW

The ARRIS SG4000 modular optical node provides an unprecedented level of performance and flexibility. The SG4000 utilizes Gallium Nitride (GaN) technology for increased output levels and reliability. With provisions for up to nine optics modules in the lid and six RF modules in the base, the SG4000 scales from its most basic version to full 4x4 capability without any loss of initial investment. The node enables incremental and independent forward and return path segmentation to address network growth.



Forward Path

The SG4000 1 GHz optical receiver series includes both a standard gain and a high gain version to optimize fiber architectures. Both feature integrated JXP attenuation locations, as well as optical and RF test points, for easy alignment and set-up. The node can be configured with up to four receivers in segmented 2X or 4X configurations, or in redundant 1R or 2R configurations.

Unique RF configuration boards plug in to the housing lid router board to direct signal flow within the node. This flexibility allows the node to support custom applications such as Local Channel Insertion.

The SG4000 features independent RF modules that provide excellent port-to-port isolation and are the foundation for total segmentation. The hot swappable modules improve reliability by allowing un-affected ports to remain in service while maintenance is performed. Bandwidth upgrades are accomplished by changing the RF module to a higher duplex split.

Return Path

The SG4000 features a wide range of return transmitter technologies to support higher modulation schemes and DOCSIS 3.0 bonded channels. Cost effective analog CWDM DFBT analog transmitters facilitate fundamental node segmentation.

The newest 85 MHz Digital Return transmitters utilize 2X Time Domain Multiplexing (TDM) and pluggable Small Form Pluggable (SFP) optics to maximize segmentation and wavelength aggregation. An analog DWDM transmitter is also available with 5–200 MHz RF bandwidth for maximum wavelength aggregation.

Unique RF configuration boards plug in to the housing lid router board to direct signal flow within the node. This flexibility allows the node to support custom applications such as Local Channel Insertion.

Advanced Applications

The SG4000 supports the migration from traditional Hybrid Fiber Coax (HFC) networks to more progressive fiber deep architectures. A full suite of advanced application modules—which can be configured in many of the same residential HFC node enclosures or as a stand-alone installation dedicated for Commercial Services—are available:

- High-power Erbium-Doped Fiber Amplifiers (EDFA) provide a practical and cost-effective alternative to remote hubs or Optical Transport Network (OTN) terminals. The new OA509N21 features a single 21 dBm output and is gain flattened to support multiwavelength solutions across a single fiber.
- The SG4-OSW Optical Switch automatically switches between primary and secondary signal sources during a loss or degradation of signal for either the forward or return path. The switch allows operators to increase the reliability of their fiber networks, maintaining critical Service Level Agreement (SLA) performance.
- The ENS-3060 is a remotely managed, multi-port Ethernet node switch that delivers advanced voice, video, and data business services over fiber-based Ethernet networks. Utilizing the appropriate system design and ARRIS optical passives and SFPs, cable operators can now add business services customer traffic onto fibers that currently service their residential traffic, providing them with a way to transition seamlessly to MEF-certified Ethernet services.

Management Options

Monitoring and controlling the SG4000 is achieved with the optional DOCSIS transponder. The transponder utilizes SCTE-HMS standards for fiber node monitoring and provides easy access to information and control through standard SNMP MIBs. An intuitive web page allows operators to remotely access the transponder via its IP address and provides a graphical view of the node, its installed modules and parameter status.

Alternately, the new 85 MHz Digital Return platform conveys transmitter module and node powering status to the headend via either the GX2 or CHP digital return receiver. Operators can monitor and view status information from the GX2 or CHP management modules using CORView™ or their preferred Element Management System.

SPECIFICATIONS			
	Units	Standard Slope	Ultra Slope
Optical Receiver			
Optical Wavelength	nm	1310 ± 20 nm, 1550 ± 30 nm	
Optical Input Power Range	dBm	-3.0 to +2.0 continuous	
Optical Connector Type		SC/APC	
Optical Return Loss	dB	45 min.	
RF			
Operational Bandwidth ¹⁷	MHz	104 to 1002 MHz	
Flatness ¹	dB	±0.75	
Output Linear Tilt	dB	14.0 ± 1.0	18.0 ± 1.0
Level Stability ²	dB	± 1.5	
RF Output Test Points ⁷	dB	-20 ± 1.0	
RF Output Impedence ⁴	Ohms	75	
RF Output Return Loss ⁸	dB	16	
Station Performance			
Reference Frequency	MHz	1002/550/104	
Reference Output Level 79 analog chs/450 MHz QAM dBmV ³	dBmV	55/48/41	60/51/43
Distortion Performance			
Composite Triple Beat (CTB) ^{5, 13}	dBc	-67	-62
Composite Second Order (CSO) ^{5, 6, 13}	dBc	-64	-60
Carrier to Composite Noise (CCN)	dBc	50.5	50.0
Reference Frequency	MHz	1002/54	
Reference Output Level 948 MHz QAM ³	dBmV	55/41	60/42
Distortion Performance			
NPR ^{13, 15}		44	--
MER ^{13, 16}		41	--
AC Input Current @90 VAC ^{10, 12} @44 VAC ^{10, 12}	Ampere		3.57 5.82
Hum Modulation ⁹	dBc	-60	
Port-to-Port Isolation ¹¹	dB	65	
AC Bypass Current (all ports)	Ampere	15	

SPECIFICATIONS CONTINUED

	Units	SG4000	MPN
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Mechanical/Environmental			
Dimensions	inches mm	22.8 L x 11 W x 10.6 D 579.12 L x 279.40 W x 269.24 D	17.9 L x 15.8 W x 7.9 D 454.66 L x 401.32 W x 200.66 D
Weight	lb kg	48 21.77	37.4 16.96
Mounting		Aerial	Pedestal
Protection Class		IP68	
Operating Temperature Range	°C °F	-40 to +60 -40 to 140	

- Notes:**
1. Operating passband of station
 2. Over the stated Operating temperature range
 3. @ 0 dBm optical input power, 20 km optical link, 0 dBm optical input, GX2 transmitter
 4. Specified at the housing cable entry facility.
 5. Measured with CW carriers and spectrum analyzer over specified temperature range. References are typical across the band of interest. *
 6. Refers only to beat clusters that fall 0.75 MHz and 1.25 MHz above the subject picture carrier.
 7. Test points should be used with GFAL adapter.
 8. Match measurement at the station input and output, cable- entry facilities, at the specified passbands for operational gain.
 9. Measured with the AC bypass current for a passband of 11 MHz to 1002 MHz
 10. Measured at the power connector.
 11. F_{min} to 1002 MHz
 12. Stated in RMS continuous.
 13. Typical performance over the stated temperature range in a cascade.
 14. Stated specification and performances are referenced with the use of ARRIS accessories. The noted parameters will not be supported when third party accessories are employed.
 15. NPR (Noise Power Ratio) is measured at the at center frequency of the band of interest with a full noise load
 16. MER (Modulation Error Ratio) is measured with a BER/MER analyzer and a source using an J.83, Annex C datastream.
 17. Roll-off from 105 MHz to 102 MHz is < 1.0 dB. Groupd Delay from 103.25 MHz to 105.25 MHz is < 10 ns.

Specifications are compliant with the test methods as stated in NCTA Recommended Practices for Measurements on Cable. All specifications are stated as worst-case over temperature unless otherwise noted.

RELATED PRODUCTS

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

Note: Specifications are subject to change without notice.

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