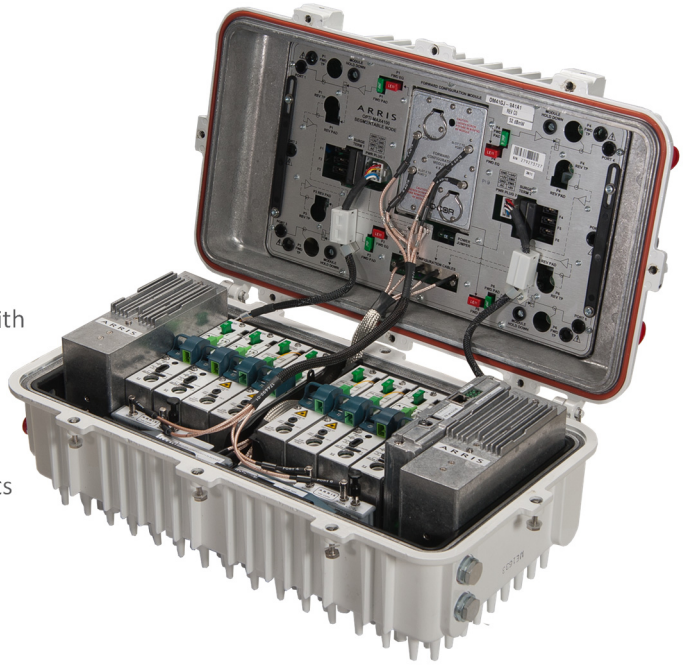
Opti Max™ Optical Node Series

OM4100
4x4 Fully Segmentable Node



FEATURES

- Enables bandwidth expansion via downstream and upstream segmentation
- Shared optics modules and accessories with OM2741 2x2 optical node leveraging sparing and training
- Premium low noise receiver with wide optical range enables designs with lower inputs while still maintaining maximum typical RF output levels
- Optical AGC accommodates optical network changes without compromising subscriber experience
- SFP based digital return maximizes service group flexibility and supports aggregation
- Digital EMS obviates the need for dedicated network management hardware
- One of the most widely deployed optical nodes, trusted by operators around the world to deliver advanced voice, video, and data services

PRODUCT OVERVIEW

Cable operators are looking for new subscriber revenue and higher average revenue per subscriber without major CAPEX. ARRIS offers a suite of products and solutions that help operators seamlessly and easily stay in line with future goals, add new services, and strongly position against the competition.

Opti Max™ 4100 4x4 Segmentable Node

Generate New Revenue Through Increased Capacity

Cable operators need optimal performance in their network architectures to support expanded service offerings such as HDTV, Video on Demand (VOD), VoIP, and high speed data/internet. The ARRIS Opti Max™ OM4100, a 4 output segmentable node, uses industry leading technology and design to facilitate full 4x4 segmentation in a modular, pay-as-you grow platform for optical to RF (RF to optical in the upstream) signal conversion.

Full 4x4 segmentation capability in the downstream and upstream path provides the ability to reduce service group sizes by up to 75% for increased capacity and more targeted services, without having to run new trunk fiber or install additional nodes. The OM4100's optional premium high gain receiver with on-board automatic gain control (AGC), coupled with GaN technology, operates at a lower optical input level, allowing operators to place nodes deeper into the network for expanded footprint.

Protect Network Investment With Modular Expansion

The OM4100 modular design provides a high level of scalability, which enables operators to deploy minimal configurations today and expand in the future as subscriber demands increase. Expansion options include migration from a 1x1 node to full downstream and upstream 2x2 and 4x4 segmentation. Operators can achieve scalability simply by adding in additional upstream transmitters and downstream receivers along with simple plug-in segmentation modules.

The OM4100 supports Coarse Wavelength Division Multiplexing (CWDM), Dense Wavelength Division Multiplexing (DWDM), and CORWave® multiwavelength technologies to efficiently use existing fiber architecture and avoid the cost and time of installing additional fiber in the plant.

Meet Any Network Requirement with Scalable Options

Digital return options with environmentally hardened SFP transmitters provide consistent performance regardless of link budget and support future migration to more complex digital encoding schemes. Multiplexing two data streams onto a single fiber utilizing digital return saves CAPEX and expands upstream bandwidth capacity. The high-gain receiver's on-board AGC setting ensures that RF outputs will remain consistent over a range of varying optical input levels to the receiver, eliminating costly 'over-design' in redundant networks or sacrificing performance on the primary link to achieve identical optical levels at the receiver location. In addition, the OM4100 is frequency split upgradable to meet future bandsplit requirements.

OPTIONS
Supports 1x1 and 2x2 analog redundancy options
Supports 1x1, 2x2, and 4x4 digital redundancy options
Redundant powering option
DOCSIS® transponder
Value Max transponder with HMS or AM protocols
CORView™ EMS
Field Hardened EDFAs
Custom Fitted Optical Passive Options
Local Injection Capability
Optical Switch

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

SPECIFICATIONS

General Node Specifications

Characteristics	Specifications	
Number of Active RF/AC Ports	4	
Number of AC Only Ports	2	
Housing Passband, MHz	1002	
Port Impedance, Ω	75	
AC Current Passing, A (All Ports)	15	
Operating Temperature Range, °C	–40 to 60	
Operating/Storage Humidity Range	5 to 95%, non-condensing	
Forward Path Optical		
Optical Input Wavelength, nm	1290 to 1600	
Optical Input Range, dBm[1]	–3 to 3	
Equivalent Input Noise (HG Rx), pA/Hz[0.5]	5.0	
Forward Path RF		
Operating Passband, MHz[2]	54, 85 or 105 to 1002	
Output Level @ 1002 MHz, >3% OMI, dBmV, min.[3]	Std Rx@ –3 dBminput	High Gain Rx @ –6 dBm input
GaAs RF Module	53.5	53.5 Max. output 56.5 dBmV @ 1 GHz analog equiv.
GaN RF Module	54.5	54.5 Max. output 58 dBmV @ 1 GHz analog equiv.
Enhanced GaN RF Module	53.5	53.5 Max. output 60 dBmV @ 1 GHz analog equiv.
Level Stability, dB, max.	± 1 5	
Gain Slope, dB4	17.0 ± 1.0	
Flatness @ Gain Slope[2]	± 1.5	
Return Loss, dB, min. (All RF Ports)	16.0	
Port to Port Isolation, dB, typ.	70/60 (870/1002 MHz)	
Test Points		
Forward Output, dB	–20 ± 0. 5 (54 to 550 MHz), –20 ± 0.75 (551 to 1002 MHz)	
Receiver Input Optical Level	1V/mW ± 10%	
79 NTSC Channel Performance[5,6]	**GaAs**	**GaN**
Frequency, MHz	1002/870/550/54	1002/870/550/54
Output Level, dBmV[3]	53.5/51.2/45.4/36.5	56/53.5/48/39
Carrier to Noise Ratio, 4 MHz, 75 Ω, dB	58.5, 0 dBm input	60, 0 dBm input
Composite Triple Beat, –dBc	73	73
Composite 2IM, –dBc	67	70
Cross Modulation, per NCTA std., –dB	70	67
Composite Intermodulation Noise (CIN), dB[7]	62.5	60
Composite Intermodulation Noise (CIN), dB[8]	68.5	65
30 NTSC Channel Performance[9]	**GaAs**	**GaN**
Frequency, MHz	1002/870/247/54	1002/870/247/54
Output Level, dBmV[3]	53.5/51.2/40/36.5	56/53.5/42.5/39
Carrier to Noise Ratio, 4 MHz, 75 Ω, dB	58.5, 0 dBm input	60, 0 dBm input
Composite Triple Beat, –dBc	80	80
Composite 2IM, –dBc	79	80
Composite Intermodulation Noise dB[10]	60	58
154 256-QAM Channel Performance[11]	**GaAs**	**GaN**
Frequency, MHz	1002/870/550/54	1002/870/550/54
Output Level, dBmV[3]	53.5/51.2/45.4/36.5	56/53.5/48/39
Carrier to Noise Ratio, 4 MHz, 75 Ω, dB	58.5, 0 dBm input	60, 0 dBm input
Digital Output, dBmV	47.5/45.2/39.4/30.5	50/47.5/42/33
Composite Intermodulation Noise (CIN), dB[12]	59	58

SPECIFICATIONS CONTINUED

General Node Specifications

Characteristics	Specifications
Chrominance to Luminance Delay	
Channel 2, ns max./3.58 MHz	15
Channel 3, ns max./3.58 MHz	10
Channel 4 ns max /3 58 MHz	7
Channel 5, ns max./3.58 MHz	4
Hum Modulation (Time Domain @ 15 A)	
54 to 750 MHz, dB	60
751 to 1002 MHz, dB	55
Gain Control, plug-in PADs	NPB-000 to NPB-200 (0–20 dB)
Equalization, 1 GHz and 870 MHz	GEQL-000 (0 dB), GEQL-020 to GEQL-130 (2–13 dB)
Return Path RF	
Operating Passband, MHz	5 to 42, 65 or 85
Optimum RF Input Level, dBmV/6 MHz	12, 10, 9 (42, 65 or 85 MHz loading)
Gain Slope, dB	± 1.0
Flatness @ Gain Slope, dB	± 1.0
Return Loss, dB (All RF Ports)	16.0
Port to Port Isolation, dB, typ.	70
Test Points	
RF Input Directional dB	–20 ± 0 5
Transmitter Output Optical Power	1V/mW ± 10%
Group Delay	
5.5 to 7 MHz, ns, max.	62
38.5 to 40 MHz, ns, max.	20
Hum Modulation (Time Domain @ 15 A)	
5 to 10 MHz, dB	50
11 to 42 MHz, dB	60
Gain Control plug-in PADs	NPB 000 to NPB 200 (0 20 dB)
NOTES:	Specification Document Number 1500166 Rev R, 1507099 Rev E, 1508405 Rev B

1. Circuit resiliency to 5 dBm.
2. Maximum Roll-off of 1 dB at 51.5 MHz.
3. At the specified operational tilt, the maximum GaAs/GaN/Enhanced GaN output level for 870 MHz or 1002 MHz loading is 56.5/58.0/60.0 dBmV at the highest frequency.
4. 11dB EQ typically installed at each RF port at the factory to achieve 17.0 dB of tilt.
5. The distortion values listed are for the Node only. To obtain a particular link performance, combine the listed Node performance values with the applicable transmitter performance values.
6. Analog channels occupying the 54 to 550 MHz frequency range with digitally compressed channels or equivalent broadband noise to 1002 MHz at levels 6dB below equivalent video channels.
7. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 1002 MHz at levels 6dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 54-550 MHz frequency spectrum.
8. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 870MHz at levels 6dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 54-550MHz frequency spectrum.
9. Analog channels occupying the 54 to 250 MHz frequency range with 256-QAM channels to 1002 MHz at –6 dBc below equivalent video channels.
10. Systems operating with digitally compressed channels from 250 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 54-250 MHz frequency spectrum.
11. 256-QAM channels occupy 54 to 1002 MHz with 3 channels replaced by analog channels for CCNR measurement.
12. Systems operating with digitally compressed channels from 54 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise relative to any remaining analog channels.

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.

OM4100_DS_30SEP14 (rev 9-2014)