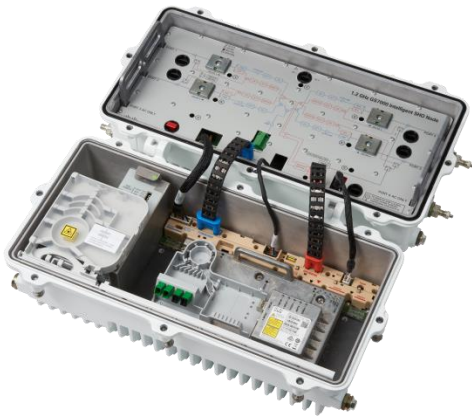


# Cisco GS7000 1218-MHz Fiber Deep Intelligent Node



## Product description

The Cisco GS7000 Intelligent Node is the latest addition to the 1218-MHz GS7000 Node platform family. This node leverages the recent technological advances of the GS7000 platform and introduces significant operational efficiencies through remote setup and troubleshooting. The Cisco GS7000 Intelligent Node will utilize the cloud-based Cisco Intelligent Node Manager to communicate with the network core for setup as a network element.

The Cisco<sup>®</sup> GS7000 1218-MHz 4-Port Fiber Deep Intelligent Node deployed with the Cisco Smart PHY Model 120 1x2 iRPD (Remote PHY Device) module has the following Intelligent Node Features

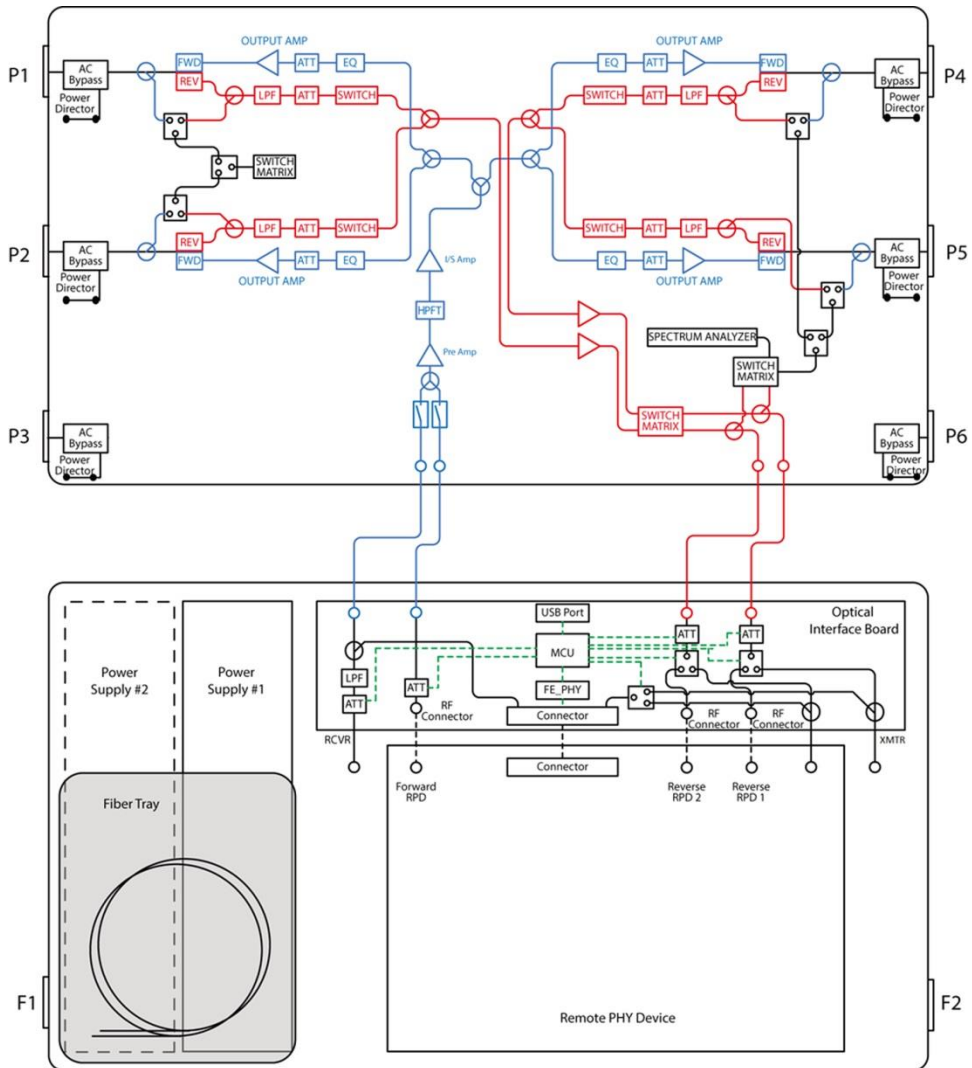
- Highest Output capable Gallium Nitride (GaN) gain stages
- Compatible with Cisco Model 120 1X2 Smart PHY module for Intelligent Node
- Integrated, software controlled electronic accessories (attenuator pads, equalizers, signal directors) for node setup and balancing
- Local node setup, control, and troubleshooting via a smart device (iPhone or Android) and the Cisco Intelligent Node app
- Individual port forward and reverse spectrum capture reduces the need for additional expensive network test equipment. Spectrum is displayed on the LCM Smart Device or remote terminal
- Individual port power saving mode available. The intelligent node is capable of reduced power consumption at each port and complete shutdown of unused ports
- Independent local or remote port setup for output power and tilt
- Remote node access via Cisco Intelligent Node manager for node setup, monitoring, and troubleshooting
- Fiber entry ports on both ends of housing lid
- Fiber management tray and harness for easy access to fiber connections

- Primary and (optional) redundant power supplies with passive load sharing
- Single or dual AC power supply configuration available. Split AC power input available with dual AC Power Supply configuration
- Spring-loaded seizure assemblies to allow coaxial connectors to be installed or removed without removing amplifier chassis
- Enhanced node security via a software-controlled lockout feature
- Element management via the Remote PHY device
- Easy forward and reverse RF split changes

### Node block diagram

Figure 1 provides block diagrams of node forward and reverse paths.

**Figure 1.** Cisco GS7000 intelligent node block diagram



## RF performance specifications

Tables 1 and 2 summarize RF station performance characteristics for the GS7000 Intelligent Node.

Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE and ANSI standards (where applicable), using standard frequency assignments.

**Table 1.** GS7000 RF section general station performance

GS7000 General Station Performance 5-42/54 Split	Units	Forward	Reverse	Notes
Pass band	MHz	54 to 1218	5 to 42	
Input and output port return loss	dB	16	16	
Hum modulation at 12A	dB	65 (54 to 870 MHz) 60 (870 to 1218 MHz)	60 (5 to 25 MHz) 70 (25 to 42 MHz)	
Hum modulation at 15A	dB	65 (54 to 870 MHz) 60 (870 to 1218 MHz)	60 (5 to 25 MHz) 65 (25 to 42 MHz)	

GS7000 General Station Performance 5-85/102 Split	Units	Forward	Reverse	Notes
Pass band	MHz	105 to 1218	5 to 85	
Input and output port return loss	dB	16	16	
Hum modulation at 12A	dB	65 (105 to 870 MHz) 60 (870 to 1218 MHz)	60 (5 to 25 MHz) 70 (56 to 85 MHz)	
Hum modulation at 15A	dB	65 (105 to 870 MHz) 60 (870 to 1218 MHz)	60 (5 to 25 MHz) 65 (25 to 85 MHz)	

GS7000 General Station Performance 5-204/258 Split	Units	Forward	Reverse	Notes
Pass band	MHz	258 to 1218	5 to 204	
Input and output port return loss	dB	16	16	
Hum modulation at 12A	dB	65 (258 to 870 MHz) 60 (870 to 1218 MHz)	60 (5 to 25 MHz) 70 (25 to 204 MHz)	
Hum modulation at 15A	dB	65 (258 to 870 MHz) 60 (870 to 1218 MHz)	60 (5 to 25 MHz) 65 (25 to 204 MHz)	

Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE and ANSI standards (where applicable), using standard frequency assignments.

**Table 2.** Forward and Reverse Station Performance

Forward Station Performance All Splits	Units		Notes
Amplifier type	-	GaN	
Operational gain (minimum)	dB	42	1
Frequency response...			1
102 to 1002 MHz	dB	±0.75	
1003 to 1218 MHz	dB	±1.0	
Internal tilt (±1 dB)	dB	21	1, 2
Noise figure at:			
54 MHz	dB	15.5	1
1218 MHz		17.0	

Forward Station Performance All Splits		Units		Notes
Reference output levels at (analog equivalent):	1218 MHz	dBmV	64	
	1002 MHz		59.9	
	870 MHz		57.4	
	750 MHz		55.2	
	650 MHz		53.3	
	550 MHz		51.4	
	258 MHz		45.9	
	105 MHz		43	
	54 MHz		42	
Reference output tilt	54 to 1218 MHz	dB	22	2, 3
	102 to 1218 MHz		21	
	258 to 1218 MHz		18.1	
Tilt Adjustability Range		dB	12 to 22	
Output Spectrum Capture Accuracy		dB	±1.0	
CIN (78 Channel Analog plus digital) (All QAM)		dB	56	
			50	

Reverse Station Performance	Units	Reverse	Notes	
Amplifier type	-	GaAs FET		
Operational gain (minimum)	dB	0	4	
Frequency response (5-85 MHz)	dB	±0.5	4	
		(5-204 MHz)		+/-0.75
Internal tilt (+/-1 dB)	dB	0	4	
Input Attenuation Adjustability Range	dB	0 to 10dB		
Path-to-path isolation	dB	70 (5 to 85 MHz)	4	
Output Attenuation Adjustability Range	dB	0 to 10 dB		
Noise Figure	dB		4	
		4x1		15.5
		4x2		12.5
Reverse Signal Spectrum Capture Accuracy	dB	±2.0		

Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE/ANSI standards (where applicable), using standard frequency assignments.

**Notes:**

1. Forward performance is for the station from the output of the optical receiver or RPD to the node RF output port (including OIB).
2. The reference output tilt and internal tilt are both linear tilt.
3. The forward reference output tilt specified is set by linear I/S equalization in conjunction with the internal tilt of the launch amplifier.
4. Reverse performance is for the station from the reverse input port to the input of the RPD module, with 0 dB reverse input attenuation.
5. Forward Noise Figure is measured with the OIB attenuator set at 0 dB.

## Other specifications

Tables 3 through 6 list other specifications for the GS7000 Intelligent Node.

**Table 3.** Station delay characteristics

Station Delay Characteristics 42/54 Split			
Forward (Group Delay)		Reverse (Group Delay in 1.5-MHz Bandwidth)	
Frequency (MHz)	Delay (nS)	Frequency (MHz)	Delay (nS)
55.25 to 58.83	21	5.0 to 6.5	46
61.25 to 64.83	9	6.5 to 8.0	22
67.25 to 70.83	6	8.0 to 9.5	15
77.25 to 80.83	4	37.5 to 39.0	14
		39.0 to 40.5	19
		40.5 to 42.0	30

Station Delay Characteristics 85/102 Split			
Forward (Group Delay)		Reverse (Group Delay in 1.5-MHz Bandwidth)	
Frequency (MHz)	Delay (nS)	Frequency (MHz)	Delay (nS)
109.275 – 112.855	10	5.0 to 6.5	40
115.275 – 118.855	6	6.5 to 8.0	20
121.2625 – 124.8425	5	8.0 to 9.5	10
127.2625 – 130.8425	4	80.5 to 82.0	7
		82.0 to 83.5	9
		83.5 to 85.0	12

Station Delay Characteristics 204/258 Split			
Forward (Group Delay)		Reverse (Group Delay in 1.5-MHz Bandwidth)	
Frequency (MHz)	Delay (nS)	Frequency (MHz)	Delay (nS)
259.2625 – 262.8425	6	5.0 to 6.5	40
265.2625 – 268.8425	3	6.5 to 8.0	20
271.2625 – 274.8425	2	8.0 to 9.5	12
277.2625 – 280.8425	4	119.5 to 201.0	6
		201.0 to 202.5	5
		202.5 to 204.0	5

**Table 4.** Electrical data

Electrical	Units					Notes
Maximum AC through current (continuous)	Amps	15				
Maximum AC through current (surge)	Amps	25				
Component DC Power Consumption (Typical)		At +24.5 VDC	At +8.5 VDC	At +5.5 VDC	At -6 VDC	
Launch amplifier with reverse amplifier	Amps	3.77	0.14	-	-	
Optical Interface Board (OIB)				0.23		
Remote PHY Module	Amps	1.83	-	0.02	-	
Power supply DC current rating	Amps	6.2	1.0	1.3	0.8	

**Table 5.** Station powering data

Station Powering Data												
GS7000 Node	I DC (Amps at 24 VDC)		AC Voltage									
			90	85	80	75	70	65	60	55	50	45
Launch Amp including OIB and Remote PHY Module (maximum output power)	7.54	AC current (A)	2.16	2.16	2.28	2.44	2.61	2.80	3.05	3.36	3.75	4.23
		Power (W)	160.6	160.1	160.0	159.9	160.0	160.1	160.4	160.9	161.7	162.1

AC currents specified are based on measurements made with a typical CATV type ferro-resonant AC power supply (quasi-square wave).

The DC supply has a fixed under voltage lockout of 33V AC.

**Table 6.** Environmental and mechanical specifications

Environmental	Units	
Operating temperature range	Degrees	-40 to 140°F (-40 to 60°C)
Relative humidity range	Percent	5 to 95%
Mechanical		
Housing Dimensions	Weight	
L x H x D: 21.3 x 11.6 x 11.1 in. (541 x 295 x 282 mm)	Station with 1 Remote PHY module, 1 power supply: 49.8 lb. (22.6 kg)	

## Ordering information

The GS7000 Intelligent Node is available in the forward/reverse splits shown in Table 7. You can also select the desired RPD from Table 7 as well. Other complementary and spare components can be found in Table 8. Consult with your account representative, customer service representative, or system engineer to determine the best configuration for your particular application.

**Table 7.** Cisco GS7000 1.2-GHz intelligent node configurations

Cisco GS7000 1.2-GHz Node Configurations	Part Number for Ordering
<b>Node and RPD</b>	
GS7K 1.2GHz SHO 42/54, TPA, STDFBRTRY, 1 PS, No Rx	GS7KI4XXXX
GS7K 1.2GHz SHO 85/102, TPA, STDFBRTRY, 1 PS, No Rx	GS7KI8XXXX
GS7K 1.2GHz SHO 204/258, TPA, STDFBRTRY, 1 PS, No Rx	GS7KI2XXXX
Intelligent Node Compatible Smart PHY 120 RPD	IRPD-1X2=
Intelligent Node Compatible Smart PHY 120 RPD with SCTE 55-1 and 2 OOB	IRPD-1X2-PKY=

**Table 8.** Cisco GS7000 intelligent node additional components

Cisco GS7000 Additional Components	Part Number for Ordering
<b>Launch Amp, Housing and OIB</b>	
GS7K iNode Launch Amp 42/54 MHz	GS7KI-LA-1.2-4254=
GS7K iNode Launch Amp 85/102 MHz	GS7KI-LA-1.2-8502=
GS7K iNode Launch Amp 204/258 MHz	GS7KI-LA-1.2-0458=
GS7K iNode 1.2 GHz Housing with OIB and Standard Fiber Tray	GS7KI-HSG-1.2G=
GS7K iNode 1.2 GHz LID with OIB and Standard Fiber Tray	GS7KI-LID=

Cisco GS7000 Additional Components	Part Number for Ordering
GS7K iNode 1.2 GHz OIB	GS7KI-OIB=
<b>Optical Fiber Tray Kit</b>	
Brackets for passives used in Expanded Fiber Tray	4027000
Expanded Fiber Tray, without brackets, SCA	4057377
SC APC bulkheads (PKG of 10)	4027740
<b>Power Supply</b>	
GS7000 1.2 GHz Power Supply	GS7K-PS-1.2G=
<b>Frequency Split Kit</b>	
GS7K iNode 1.2 GHz SHO Split Kit 42/54 MHz (QTY=10)	GS7KI-SKT-42=
GS7K iNode 1.2 GHz SHO Split Kit 85/102 MHz (QTY=10)	GS7KI-SKT-85=
GS7K iNode 1.2 GHz SHO Split Kit 204/258 MHz (QTY=10)	GS7KI-SKT-204=

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