

# CHP Max Headend Optics Platform

CHP-GFRX, CHP-GFRXF  
1 GHz Redundant Forward Path Receivers

## FEATURES

- Optimize headend and hub efficiencies with industry leading density and low power consumption of 10 receivers per 2RU chassis
- Optional optical path resiliency and hardware redundancy for increased network availability
- Hot-swappable capability reduces system downtime
- Front or rear fiber connector options simplify installation and cable management
- Configure, monitor, and manage with CORView™ Element Management System



## PRODUCT OVERVIEW

Designed to accept an optical forward path signal from a CHP Forward Path Transmitter, ARRIS CHP Max5000® 1 GHz Redundant Forward Receivers are an integral part of the CHP Max5000 platform. CHP Max5000 converges headend, hub, and digital transport onto one scalable 2RU system, allowing service providers to accelerate deployment of video on demand, high speed data, telephony, and other advanced services. 1 GHz Redundant Receivers are available in rear fiber (CHP-GFRX) and front fiber (CHP-GFRXF) options.



The CHP Max5000® 1 GHz Redundant Forward Receiver can operate as either a standalone receiver, or operators can configure it as a redundant receiver with the addition of a second module and a Redundant Communications Link Cable (RCL2). The latter configuration provides optical path resiliency and hardware redundancy to maintain uninterrupted service availability in the event of optical path or hardware failure. If the optical path or a hardware component does fail, the automatic switchover time is approximately 50ms. In addition, the CHP Max5000 platform allows operators to set the optical input and RF output thresholds for switching to the redundant module. Operators can locate redundant modules in the same CHP chassis or in a different rack located within the maximum RCL2 length of 6 meters (20 feet). The system generates a major alarm if either the optical input power or RF output power exceeds a user-defined major high limit or drops below a user-defined major low limit.

The CHP Max5000 1 GHz Redundant Forward Receiver is designed for both O-Band and C-Band network architectures and has an input power range from -10 to 4 dBm. It provides a high RF output of up to 1002 MHz with a noise contribution of less than 8 pA/Hz0.5, which eliminates the need for additional RF amplification when combining multiple circuits.

The receiver’s front panel includes module and channel status LEDs and up and down gain adjustment buttons, which can be locked out by the local Craft Management Graphical User Interface for security purposes.

**Features**

- Optical input range of -10 to 4 dBm at the receiver
- RF output level adjustment per channel via front-panel pushbutton or via CMM or SMM
- High RF output of 41 dBmV/channel with 0 dBm input reduces the need for an external RF amplifier
- Front-panel RF test point for convenient monitoring
- Local or remote monitoring
- Downloadable firmware upgrades

**RELATED PRODUCTS**

CHP Chassis	Optical Patch Cords
Power Supplies	Optical Passives
Management Module	Installation Services

**SPECIFICATIONS**

**Optical**

Input Wavelength Range	1200 to 1620nm
Optical Input Power Range <sup>1</sup>	-10 to 4dBm
Optical Test Point Monitor	1.0 ± 10% mW/V

**RF**

RF Output Bandwidth	42 to 1002MHz
RF Output Power Level <sup>2,3</sup>	41dBmV/channel
Output Return Loss	≥ 16dB
Flatness, peak-to-valley	±0.75dB with respect to gain slope
Gain Slope	±1.0dB
RF Gain Adjustment Range	0 to 16 in 0.2dB steps
RF Output Stability	±1.0dB referenced at 25°C
RF Output Test Point	-20 ± 0.5dB

**Performance**

Equivalent Input Noise			
Optical Input to RF Output Isolation			
Spurious Signals			
Redundant Switching Time			
GFRX Distortion Contribution <sup>4</sup>	Broadband <sup>5,6</sup>	Broadband <sup>5,6</sup>	Splitband <sup>6,7</sup>
Optical Input/RF Rx Output Level	-3 to 0dBm/≤38dBmV	0 to 3dBm/≤41dBmV	-3 to 3dBm/≤41dBmV
CTB	< -85dBc	< -78dBc	< -85dBc
CSO	< -69dBc	< -64dBc	< -65dBc
CIN <sup>8</sup>	>75dB	>62dB	—
CNR	TX spec plus Equivalent Input Noise (EIN) contribution. CNR increases or decreases proportionally over an optical input range of -3 to 3dBm.		

**Power**

Power Consumption, max.	10.5 Watts
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**Mechanical**

Dimensions (W x H x D)	1.25 x 3.4 x 18.5in. (3.2 x 8.7 x 47.0cm)
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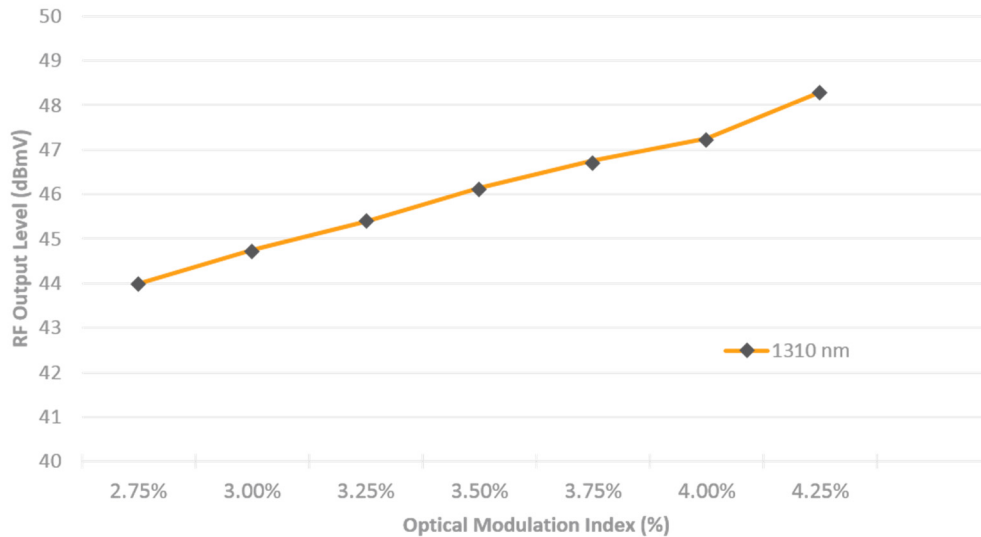
**Environmental**

Operating Temperature	0 to 50°C (32 to 122°F)
Operating Humidity, noncondensing	10 to 90%

**Notes:**

1. Typical optical input power operating range is -3 to 3dBm.
2. RF output level is 41dBmV per channel at 0dBm optical input and 3.9% OMI. Maximum RF output level for system use is 41dBmV/channel. Do not exceed 41dBmV/channel RF output level from the GFRX.
3. Graph shows minimum forward receiver output level for the stated transmitter optical modulation index per channel, with receiver optical input set to +3dBm and internal attenuator set to 0dBm. To determine RF output levels at other optical input power levels, subtract (or add) 2 dB of RF level for every decrease (or increase) of 1dB in optical input power.
4. Performance listed indicates "receiver only" non-linear distortion performance. This performance is back calculated using transmitter specifications and actual performance to a reference optical receiver, in conjunction with the GFRX.
5. 79 NTSC channels loaded from 55 to 550 MHz plus 450MHz simulated digital loading from 550 to 1002 MHz at -6dBc below equivalent analog channels.
6. Reference transmitter used for 79 NTSC + 450 MHz digital loading is CHP-GFXV series. Reference transmitter used for 40 Analog NTSC loading is CHP-XMOD MU/ML series.
7. 40 NTSC loading occupying lower or upper frequency spectrum in the 55 to 550MHz range.
8. Composite Intermodulation Noise (CIN). Defined as the ratio of the carrier to the noise-like signals generated by the non-linearity of a broadband transmission system carrying a combination of analog and digital signals. These distortion products are analogous to the CSO and CTB products generated by the analog carriers, but due to the pseudo-random nature of the digital modulation signals, appear as noise like interference. Reference test procedure ANSI/SCTE 17 2001 (Test procedure for Carrier to Noise) for CIN measurement standards.

## OMI Performance



### Ordering Information

#### 1 GHz Redundant Forward Receiver

				<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>		<b>6</b>
C	H	P	-	G	F	R	X	F	-	S

<b>1-4</b>	<b>Module Type</b>
GFRX	Redundant 1 GHz forward receiver
<b>5</b>	<b>Fiber Orientation</b>
F	Front    Blank = Rear
<b>6</b>	<b>Connector Type</b>
S	SC/APC

Note: The Redundant Communications Link Cable (P/N CHP-RCL2-xx) is required when configuring a CHP forward path receiver as a redundant receiver with the addition of a second receiver module.

#### Redundancy Cable

									<b>1</b>	<b>2</b>
C	H	P	-	R	C	L	2	-	x	x

<b>1-2</b>	<b>Length of Redundancy Cable</b>
E0	Two inch redundancy cable
01	One foot redundancy cable
05	Five foot redundancy cable
10	Ten foot redundancy cable
20	Twenty foot redundancy cable
a) European installations must only use the CHP-RCL2-EO redundant cable	

Note: Specifications are subject to change without notice.

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## Customer Care

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