



### CONTROL UNIT

**\*HUB MOUNTED AMPLIFIER/SWITCH(S) PLATE ASSEMBLY\***  
**\*1:1 or 1:2 CONTROL UNIT – SHELTER MOUNTED\***  
**\*INTERCONNECT CABLE – CONTROLLER TO PLATE ASSEMBLY\***

The 1:1 and 1:2 Redundant Low Noise Amplifier (LNA) Systems are designed to ensure continuous operation with minimum disruption of signal transmission.

A fault condition in the online LNA, or an operator generated command, will switch the standby LNA to the online position and remove the online LNA from the signal path.

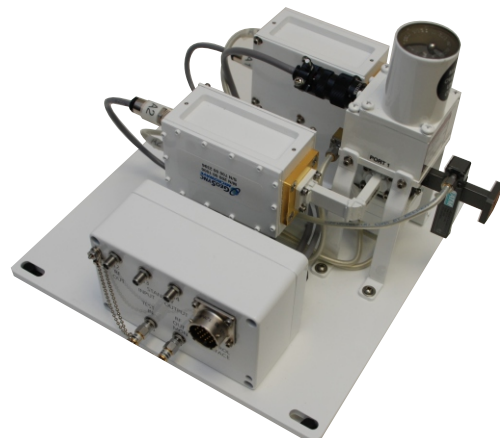
The Redundant LNA System consists of an outdoor amplifier/switch assembly which mounts at the antenna hub, rack-mounted indoor local control unit and interconnection control cable.

### FEATURES

- Low noise temperature
- Fault tolerant design
- Fully redundant, hot swappable power supplies
- Remote control via RS485/RS422 (user selectable) and Ethernet
- Automatic/manual control from both local and remote mode
- Remote status reporting
- Offline input/output access
- Amplifier current fault detection
- Weather resistant amplifier/switch plate assembly
- Time-stamped alarm and system event history
- Front panel LNA bias display

### OPTIONS

- Transmit reject filter
- Input/output signal monitors
- Higher gain
- Increased output power



**TYPICAL Ka BAND 1:1 ASSEMBLY**  
 (Shown with options 73-1, 2)

Frequency (GHz)	Band Abbreviation	Available Amplifier Noise Temperature at +25°C (Maximum)	Interface Input/Output
1-2	100200	60*	SMA/SMA
1.5-1.6	150160	33	SMA/SMA
2.2-2.3	220230	33	SMA/SMA
3.4-4.2	340420	30	CPR-229G/N
3.4-4.8	340480	35*	CPR-229G/N
4.5-4.8	450480	35	CPR-229G/N
7.1-8.4	710840	50*	CPR-112G/SMA
7.25-7.75	725775	45	CPR-112G/SMA
8-8.4	800840	50	CPR-112G/SMA
10.7-12.75	107128	65	WR-75/SMA
10.95-12.75	109128	65	WR-75/SMA
17-22	170220	140*	WR-42/2.92 mm
17.7-21.2	177212	100*	WR-42/2.92 mm
17.7-22.0	177220	130*	WR-42/2.92 mm

\* References 14 dB minimum input return loss specification.

Low Noise Amplifier System Model Numbers -  
AR (Controller Code)-(Frequency Band Abbreviation)-(Amplifier Noise Temperature):

Controller Code: 1 = 1:1 Controller  
2 = 1:2 Controller

Please note that each Low Noise Amplifier System is supplied with:

- One (1) Redundant Amplifier/Switch Assembly (Prefix AR1P or AR2P)
- One (1) Local Control and Monitoring Unit (Prefix AR1C or AR2C)
- One (1) 100 foot interconnection control cable (other lengths optional)

Examples:

1:1 System, 10.95-12.75 GHz with 65°K amplifier noise temperature: AR1-109128-65  
Supplied with:

- AR1C-109128-65 Rack Mounted Local Control and Monitoring Unit
- AR1P-109128-65 Outdoor Mounted Amplifier Plate Assembly

1:2 System, 3.4-4.2 GHz with 30°K amplifier noise temperature: AR2-340420-30  
Supplied with:

- AR2C-34042-30 Rack Mounted Local Control and Monitoring Unit
- AR2P-34042-30 Outdoor Mounted Amplifier Plate Assembly

## RF SPECIFICATIONS

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Gain .....	50 dB minimum (higher gain optional)
Gain Flatness .....	0.4 dB/40 MHz, 1.0 dB peak-to-peak/RF bands up to 500 MHz, 1.5 dB peak-to-peak/RF bands up to 800 MHz, 2.0 dB peak-to-peak/RF bands greater than 800 MHz
Gain Slope .....	0.2 dB/10 MHz maximum
Gain Stability .....	±0.2 dB/24 hours (constant temperature) 5 dB maximum/-40 to +60°C (higher stability optional)
Power Output (1 dB Compression).....	+10 dBm minimum (higher output power optional)
AM/PM Conversion.....	0.5°/dB maximum to 0 dBm output
Group Delay (±18 MHz) -	
Linear .....	0.02 ns/MHz maximum
Parabolic .....	0.001 ns/MHz <sup>2</sup> maximum
Ripple .....	0.1 ns peak-to-peak maximum
Spurious Outputs .....	Below thermal noise
Isolation .....	50 dB minimum
Input Return Loss (amplifier).....	19 dB minimum *14 dB minimum (refer to table)
Output Return Loss .....	20 dB minimum
Input/Output Impedance .....	50 ohms
Switchover Time .....	100 ms maximum
Non-damage Input Power.....	+10 dBm maximum
Typical Transmit Densensitivity Threshold -	
C-band .....	-20 dBm (-30 dBm with Option 11-5)
X-band .....	-50 dBm (-60 dBm with Option 11-5)
Ku-band .....	-20 dBm (-30 dBm with Option 11-5)
Ka-band .....	-50 dBm (-60 dBm with Option 11-5)

## LOCAL CONTROL UNIT PRIMARY POWER REQUIREMENTS

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Voltage.....	90-250 VAC
Frequency.....	47-63 Hz
Power Consumption .....	20 W typical, 50 W peak during switchover

## SUMMARY ALARM

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Contact closure/open for DC voltage and/or amplifier alarm.  
Status alarm readout on remote control bus.

## PHYSICAL

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Primary Power Input .....	IEC-320
Summary Alarm Interface Mating Connector.....	DEM-9P
Remote Interface Connector .....	DEM-9S for RS485 and RS422, RJ4 female for Ethernet
Switch/Amplifier Weight -	
1:1 Units .....	Below 10 GHz, 15 lbs, Above 10 GHz, 10 lbs nominal
1:2 Units .....	Below 10 GHz, 25 lbs, Above 10 GHz, 20 lbs nominal
Chassis Dimensions (Local Control Unit) .....	19" x 1.75" panel height x 20" maximum

## ENVIRONMENTAL

### Operating -

- Ambient Temperature (Controller) .....0 to 50°C
- Ambient Temperature (Amplifier Assembly) ....-40 to +60°C (For other ranges, consult factory)
- Atmospheric Pressure .....Up to 10,000 feet

### Non-operating -

- Ambient Temperature .....-50 to +70°C
- Atmospheric Pressure .....Up to 40,000 feet
- Shock and Vibration .....Normal handling by commercial carriers

## OPTIONS

Note: System noise temperature will increase and return loss will degrade for any additional component located before the amplifier. This applies to Options 11-1 and 11-3.

### 11-1. Test Input Inject Couplers -

- Below 3.4 GHz .....Coaxial coupler 40 dB nominal coupling level
- Above 3.4 GHz .....Crossguide coupler 40 dB nominal coupling level

### 11-2. Output Test Coupler .....20 dB nominal coupling level

### 11-3. Transmit Reject Filter -

Receive Band Frequency (GHz)	Receive Band Insertion Loss (dB)	Transmit Band Frequency (GHz)	Transmit Band Rejection (dB)
3.4-4.2	0.04	5.825-6.725	60
3.62-4.205	0.04	5.825-6.425	55
4.5-4.8	0.15	6.70-7.05	55
7.25-7.75	0.50	7.9-8.4	64
10.7-12.75	0.15	13.75-14.5	60
10.95-12.75	0.10	14.0-14.5	70
17.7-21.2	0.25	27.0-31.0	70

11-4 (x). Local control unit to amplifier/switch assembly cable length, where (x) is the length of the cable in feet. Available from 10 to 400 feet in 10 foot increments. 100 foot cable supplied as standard.

- 11-5. Increased Gain .....60 dB minimum gain
- 11-6. Increased Output Power .....+20 dBm output power at 1 dB compression
- 11-7. Increased Gain Stability .....3 dB peak-to-peak maximum/-40 to +60°C
- 11-8. Remote Control .....RS422/RS485 (supplied as standard)