

Ku-Band Redundant Line Driver Systems

LRK1 Series

Introduction

Redundant Line Driver Amplifier (LDA) systems minimize system down time due to LDA failure by providing a spare LDA and an automatic means of switching to the spare upon failure of the primary LDA. A 1:1 system provides one spare LDA for one primary LDA. A 1:2 system provides one spare LDA for either of the two primary LDAs.

Used to overcome cable losses, the systems are designed for installation at satellite earth stations in standard 19-inch EIA equipment racks. The systems are designed to house LD-13S Series C-Band LDAs.

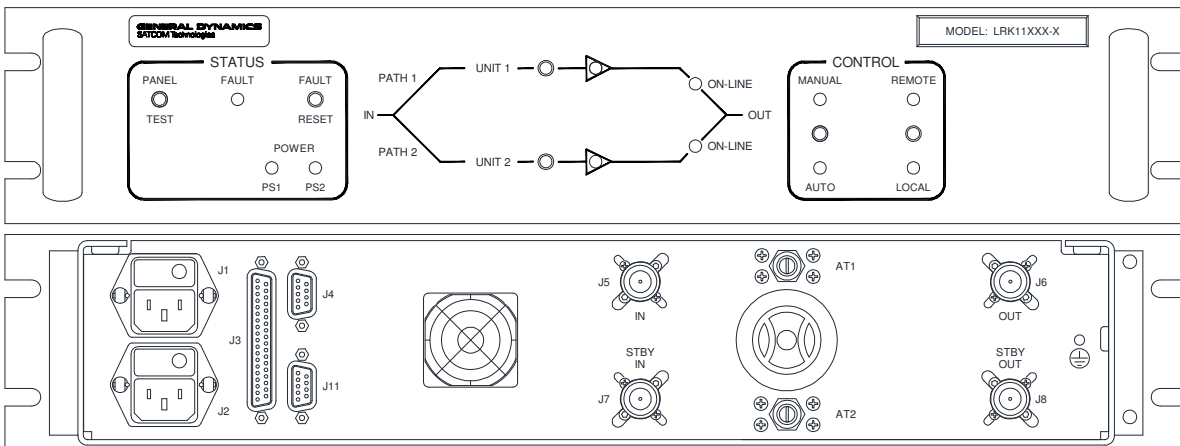
Features

- Standard 19" rack panel, 3.5" high
- Dual redundant power supplies
- Worldwide AC input capability
- Amplifier bias current monitoring to detect faults
- Manual or automatic operation
- Manual override switch control on rear panel
- Serial I/O
- Offline I/O with isolators
- Cooling fan
- Gain matching of amplifiers to ± 1 dB

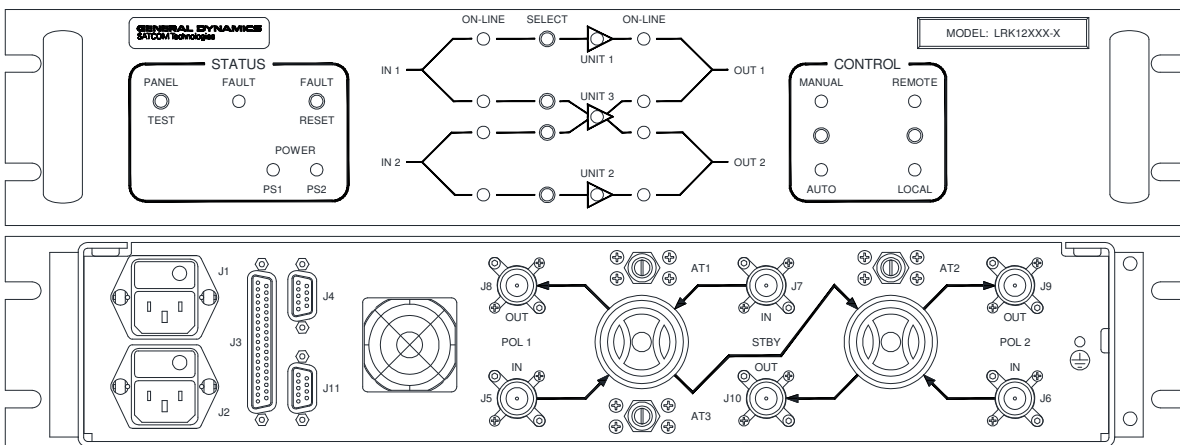
Options

- Variable attenuators located either at the output of each LDA or at each system path output

1:1 FRONT AND REAR PANELS:



1:2 FRONT AND REAR PANELS:



Operating Modes

- *Automatic Mode*

In Automatic mode, if a failure is detected in an on-line amplifier, the standby amplifier is switched on line. Typical switchover time is 100 milliseconds. For 1:2 systems, in the case that both on-line amplifiers fail, priority is selectable to either Pol 1 or Pol 2. For either 1:1 or 1:2 systems, the unit will not automatically switch to a defective amplifier.

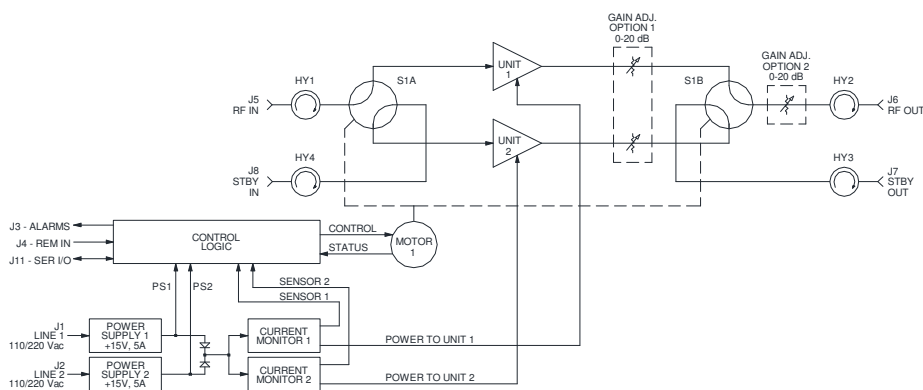
- *Manual Mode*

The amplifiers can also be manually switched from the front panel or remotely. In Manual mode, automatic switching will not occur upon fault detection, although the monitor and alarm circuits still function.

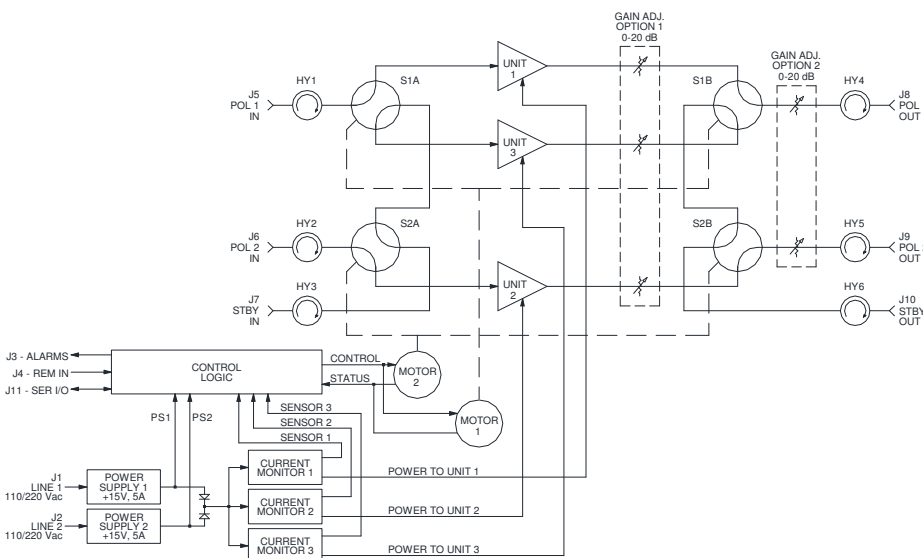
Local or Remote Control

The systems include provision for remote status monitoring and operation. Typical uses are for sending status information to a centralized monitor and control system or for remotely controlling the system from a nearby building. All Local front panel features can be remotely controlled and monitored, except for the Remote/Local switch. In Remote mode, the front panel controls are inoperative, but the indicators continue to reflect the current operating state of the system. Remote status outputs are Form 'C' dry relay contacts capable of switching up to 100 Vdc at 100 mA. Remote control inputs are opto-isolator coupled for noise and common mode ground loop rejection.

1:1 System Block Diagram



1:2 System Block Diagram



Parameter	Notes	Min.	Nom./Typ.†	Max.	Units
Frequency Range	Band "E"	10.95		12.75	GHz
	Band "R"	10.70		12.75	GHz
	Band "M"	14.00		14.50	GHz
	Band "V"	13.75		14.50	GHz
System Gain	LDx-13S22x amplifiers	18	21		dB
	LDx-13S32x amplifiers	28	31		dB
	LDx-13S42x amplifiers	38	41		dB
Gain Flatness	Full band			±0.75	dB
	With attenuators (Option)			±1.5	dB
Gain Slope	Per 40 MHz			±0.25	dB
	With attenuators (Option)			±0.30	dB
Gain Match	Between LDAs			1	dB
Noise Figure	At +23 °C		5.5	6.0	dB
Power Output at 1 dB compression	LDx-13Sxx2 amplifiers	+13	+15		dBm
	LDx-13Sxx3 amplifiers	+18	+20		dBm
Third Order Intercept Output, OIP ₃	LDx-13Sxx2 amplifiers	+23	+25		dBm
	LDx-13Sxx3 amplifiers	+28	+30		dBm
Group Delay per 40 MHz	Linear			0.03	ns/MHz
	Parabolic			0.003	ns/MHz ²
	Ripple			1.0	ns p-p
Maximum Input Power	Damage threshold			+10	dBm
VSWR	Input (50 ohms)		1.20	1.25	:1
	Output (50 ohms)		1.20	1.25	:1
Connectors	RF input and output Remote input Alarm output Serial I/O (RS-232/-422/-485)		Type N Female (50 ohms) 9-pin D Male 37-pin D Male 9-pin D Female		
Operating Modes			Manual or Automatic		
Alarm Output	Form 'C' contacts		100 Vdc / 100 mA		
Remote Inputs	Control inputs		Contact closure to ground; withstand 5 V, sink 5 mA		
Power Requirements	Voltage (autoranging)		90–135 or 175–264		Vac
	Frequency	47		63	Hz
	Power		50		W
Size			19 x 3.5 x 24 483 x 89 x 610		inches mm
Temperature Range	Operating	0		+50	°C

* Specifications shown are for LD-13S Series LDAs. See product data sheet 16838.

† When there is only one value on a line, the Nom./Typ. column is a nominal value; otherwise it is a typical value. Typical values are intended to illustrate typical performance, but are not guaranteed.

**Part Number/Ordering Information,
Ku-Band Redundant LDA Systems**

LRK1 -

System Type:	1:1	1				
	1:2	2				
LDA Options:						
Frequency	10.95–12.75 GHz		E			
	10.70–12.75 GHz		R			
	14.00–14.50 GHz		M			
	13.75–14.50 GHz		V			
Gain	18 dB min.			2		
	28 dB min.			3		
	38 dB min.			4		
P ₁ dB	+13 dBm min.				1	
	+18 dBm min.				2	
System Options:						
Variable Attenuators	None (standard)					X
	1 per individual amplifier					1
	1 per system path output					2

Examples:

Order Number

- 1:1 system with 10.95–12.75 GHz LDAs, 18 dB gain
+13 dBm P₁ dB, no system options **LRK11E21-X**
- 1:2 system with 10.70–12.75 GHz LDAs, 38 dB gain
+18 dBm P₁ dB, 1 attenuator/amplifier (3 total) **LRK12R42-1**
- 1:2 system with 14.00–14.50 GHz LDAs, 28 dB gain
+18 dBm P₁ dB, 1 attenuator/system output path (2 total) **LRK12M32-2**

Other Products

- Solid-State Power Amplifiers and SSPA Systems
- Solid-State Power BUCs and SSPB Systems
- Low Noise Amplifiers and LNA Systems
- Low Noise Block Converters and LNB Systems
- Block Up and Block Down Converters
- Synthesized Converters
- Line Drive Amplifiers
- Power Supply Monitors
- Redundant Control Panels for SSPAs, SSPBs, and LNAs

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