



SPECTRADYNAMICS, INC



HPDA-100i
HIGH PERFORMANCE DISTRIBUTION AMPLIFIER
OPERATING MANUAL

SPECTRADYNAMICS, INC • 1849 Cherry St. Unit 2. • Louisville, CO 80027
Phone: (303) 665-1852 • Fax: (303) 604-6088
www.spectradynamics.com

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1.0 Introduction

The HPDA-100i is a High Performance Distribution and Isolation Amplifier with performance exceeding that required to distribute state-of-the-art atomic frequency standards. The HPDA-100i is intended to be used with a CMA-13SDI Crate.

The HPDA-100i has typical cross channel isolation and reverse isolation greater than 100 dB. The phase noise of the modules is exceptionally low, typically -148 dBc/Hz @ Fourier frequency of 1 Hz and -174 dBc/Hz @ Fourier frequency greater than 10 kHz. Both the input and output are matched to 50 ohms to obtain better than 25 dB return loss. All outputs are AC coupled and the grounds are DC isolated to reduce the effect of ground loops.

CMA Modules list :

Product Name	Number of inputs	Number of outputs	Description
HPDA-5i	1	5	1-50 MHz Distribution Module
HPDA-100i	1	5	80-120 MHz Distribution Module
CMA-13SDI-PWR	NA	NA	Power Module
CMA-13SDI	NA	NA	System Crate

2.0 Safety and Preparation for Use

The HPDA-100i was designed for indoor use only and is not intended for operation outdoors or in a wet environment. The instrument must be installed in a CMA-13SDI Crate for proper operation.

Inspect the instrument for damage before first use.

2.1 Electrical safety and preparation for use

Voltages capable of causing injury or death are present in this instrument. Use extreme caution whenever the instrument cover is removed.



2.0 Safety and Preparation for Use

2.2 Instrument safety and preparation for use

The HPDA-100i is designed to distribute RF signals with a frequency of 80 to 120 MHz. Input and output levels below +7 dBm will trigger a fault condition which can be monitored from the front panel. The recommended level for the RF input signal is +13 dBm +/- 2 dB.

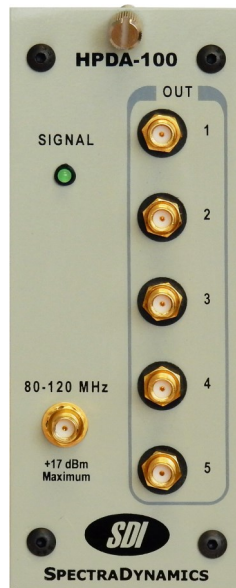
Input signals must be kept below +20 dBm as greater power levels will damage the unit and void all warranties.

The HPDA-100i RF outputs are DC isolated from the chassis ground to prevent ground loops. These outputs are rated to a maximum of 50 V.

Absolute Maximum Ratings

Input RF Power	+20dBm Maximum
Reverse RF Power	+20dBm Maximum
Voltage at the RF Input	50 V Maximum
Voltage at the RF Output	50 V Maximum

3.0 Front Panel



Signal LED

The signal LED will be on if all RF outputs are greater than +7 dBm.

RF signal levels less than +7 dBm will trigger a fault condition and the monitor LED will not light up. However the HPDA-100i will still provide five buffered copies of the RF input signal.

INPUT

A RF Signal within the range of 80 MHz to 120 MHz may be connected to the SMA connector labeled INPUT.

OUTPUTS

Five buffered copies of the RF input signal will be available at the SMA connectors labeled OUTPUTS. Any HPDA-100i output may be used to drive the input of another distribution module.

4.0 Back Panel



CMA Backplane Connector

The HPDA-100i is intended to be used only with a CMA-13SDI crate powered by a CMA-13SDI-PWR power supply module. The pinout for the connector is shown below for reference purposes only.

Pin	Function
5,13	+24VDC Return
4,12	+24VDC
7	Module Status

5.0 Installation

5.1 Installing the Module

The HPDA-100i must be installed in a CMA-13SDI crate. To install the module slide the module into an empty module slot on the CMA-13SDI crate and secure using the thumb screw on the front panel. The CMA-13SDI crate must have at least 1 CMA-13SDI-DPWR power supply module installed in a power slot for power to be applied to the HPDA-100i module. If power supply redundancy is required, up to 2 CMA-13SDI-PWR modules may be installed.

6.0 Operation

The HPDA-100i is designed to distribute signals from 80 MHz to 120 MHz. The RF input has a 50-ohm input impedance. Provide a signal within the mentioned frequency range to the SMA connector on the front panel labeled INPUT. If the RF signal has a power level greater than +7dBm, the status LED located on the front panel will light up.

Five buffered copies of the RF signal provided will be available on the SMA connectors located on the front panel labeled OUTPUTS. All outputs are AC coupled and the grounds are DC isolated to reduce the effect of ground loops. Make sure that the amplifier ground does not float to a potential greater than 50 VDC from the chassis ground. An output ground potential greater than 50 VDC will damage the amplifier and could cause injury or death to personnel.

7.0 Troubleshooting

Do not attempt to service or adjust the instrument unless another person, capable of providing first aid or resuscitation, is present. If there are problems that cannot be resolved by the troubleshooting steps below please contact technical support.

Technical Support

Tel: +1 (303) 665-1852 , Fax: +1 (303) 604-6088

support@spectradynamics.com, www.spectradynamics.com

Status LED is off.

Check to see if the RF signal provided to the instrument is greater than +7 dBm.

Check to see if a signal is present at all outputs of the HPDA-100i module.

The status LED will remain off with a power level under +7dBm, but will still provide five copies of the RF input signal. If the instrument is providing the copies of the input signal you may continue using the HPDA-100i.

If the power level of the RF signal provided is greater than +7dBm and the Monitor LED remains off, the instrument will have to be returned for repair.

8.0 Specifications

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Power Level	1 dB compression	15	16	-	dBm
Bandwidth	+/- 1 dB	80-120	-	-	MHz
Gain	@ 100 MHz	-	0.2	0.5	dB
Impedance	Input	-	50	-	Ohms
	Output	-	50	-	
Return Loss	Input (S11) 100MHz	-	-22	-20	dB
	Output (S22) 100MHz	-	-30	-25	
Distortion	+13 dBm	-	-43	-40	dBc
	+17 dBm	-	-40	-	
Isolation	Output to output	95	100	-	dB
	Output to input	105	110	-	
Phase Noise	10 Hz	-	-158	-155	dBc/Hz
	100 Hz	-	-165	-162	
	1 kHz	-	-171	-168	
	10 kHz	-	-174	-171	

*All tests done at 100 MHz and +13 dBm input unless otherwise specified.

Storage temperature -10 to +75 °C
 Operation environment 0 to +50 °C
 Humidity 5% to 95% Non-condensing

9.0 Warranty and Service

The HPDA-100i is warranted to be free of defects under normal operating conditions, as specified, for one year from date of original shipment from SpectraDynamics, Inc. (SDI). SDI's obligation and liability under this warranty is expressly limited to repairing or replacing, at SDI's option, any product not meeting the said specifications. This warranty shall be in effect for one (1) year from the date a HPDA-100i is sold by SDI. SDI makes no other warranty, express or implied, and makes no warranty of the fitness for any particular purpose. SDI's obligation under this warranty shall not include any transportation charges or costs of installation or any liability for direct, indirect, or consequential damages or delay. Any improper use, operation beyond capacity, substitution of parts not approved by SDI, or any alteration or repair by others in such manner as in SDI's reasonable judgement affects the product materially and adversely shall void this warranty. No employee or representative of SDI is authorized to change this warranty in any way or grant any other warranty.

Service

Do not attempt to service or adjust the instrument unless another person, capable of providing first aid or resuscitation, is present. Please remember that any alteration or repair may void the warranty. Contact SDI with any questions or to request an RMA if a repair is needed.

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USA

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