



SPECTRADYNAMICS, INC



**HPDA-100RM-A
HIGH PERFORMANCE DISTRIBUTION AMPLIFIER
OPERATING MANUAL**

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1.0 Introduction

The HPDA-100RM-A is a High Performance Distribution and Isolation Amplifier with performance exceeding that required to distribute state-of-the-art atomic frequency standards.

The HPDA-100RM-A contains one signal distribution module. This module provides five isolated outputs and an output level monitor LED located on the front panel. All the output power levels are monitored and compared to a preset threshold of +7dBm. If the signal level on any output drops below this threshold, the monitor LED will turn off indicating a fault condition.

Other HPDA-100RM Options:

| Product Name | No. of Inputs | No. of Outputs | AC Operation | DC Operation |
|---------------|---------------|----------------|--------------|--------------|
| HPDA-100i | 1 | 5 | | √ |
| HPDA-100RM-A | 1 | 5 | √ | |
| HPDA-100RM-B | 3 | 15 | √ | |
| HPDA-100RM-B1 | 1 | 10 | √ | |
| HPDA-100RM-B2 | 2 | 10 | √ | |
| HPDA-100RM-C | 3 | 15 | √ | √ |
| HPDA-100RM-D | 3 | 15 | | √ |

2.0 Safety and Preparation for Use

The HPDA-100RM-A was designed for indoor use only and is not intended for operation outdoors or in a wet environment. The instrument may be mounted in a standard 19-inch instrumentation rack or may be used on a laboratory bench.

Inspect the instrument and power cords 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.

Line Voltage

This instrument is designed to operate with a 100 to 240 VAC, 47 to 63 Hz power source.

Fuse

A 2.0 Ampere 250V 5X10mm slow-blow fuse is used for 100-240 VAC operation. Only replace fuse with the same type and specifications.

AC Power

The instrument has a detachable three wire power cord for connection to a grounded AC power source. The enclosure of the unit is directly connected to the outlet ground to protect against electrical shock. Always use an outlet with a protective ground and do not disable this safety mechanism. Detaching the AC power cord is the only option of disconnecting the unit from the AC mains supply. Make sure you have access to the rear panel or provide an external accessible AC disconnect means for the HPDA-100RM-A.



2.0 Safety and Preparation for Use

2.2 Instrument safety and preparation for use

The HPDA-100RM-A 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 .

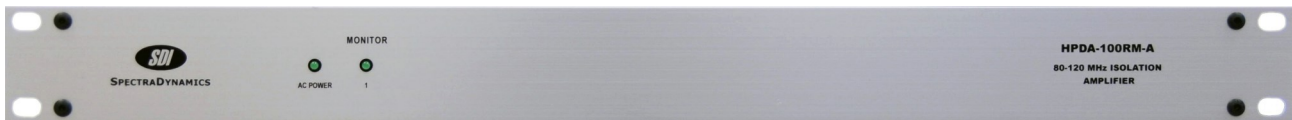
Input signals must be kept below +20 dBm as greater power levels will damage the unit and void all warranties.

The HPDA-100RM-A 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



AC Power LED

The AC Power LED turns on when AC power is applied to unit.

Monitor LED

The monitor LED will be on if all RF outputs of the corresponding module 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-100RM-A will still provide five buffered copies of the RF input signal.

4.0 Back Panel



AC Power

The HPDA-100RM-A is configured to operate on 100 to 240 VAC.

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-100RM-A output may be used to drive the input of another distribution module.

5.0 Installation

5.1 Connecting power

The HPDA-100RM-A ships with a standard North American or European IEC power cord. The instrument may be mounted in a standard 19-inch instrument rack or may be operated on a laboratory bench.

Locate the AC POWER entry module on the rear of the enclosure and connect the power cord.



6.0 Operation

Plug the power cord into an appropriate AC power outlet.

Once AC power is supplied to the HPDA-100RM-A, the LED on the front panel labeled AC will turn on.

The HPDA-100RM-A 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 back panel labeled INPUT. If the RF signal has a power level greater than +7dBm, the monitor 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 back 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

AC Power LED does not turn on.

Disconnect the power cord and remove the top cover. Check the main AC power fuse and power cord. If the fuse is blown replace with same type and rating. Please contact SDI if the fuse blows again or if the event that caused the fuse to blow is not known.

Monitor 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 signal distribution module.

The Monitor 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-100RM-A.

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.

Rackmount chassis 1U H, 19" W, 14" D
 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-100RM-A 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-100RM-A 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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