SPECTRADYNAMICS, INC

PD-15RMi-C
PULSE DISTRIBUTION AMPLIFIER
OPERATING MANUAL

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PD-15RMi-C Pulse Distribution Amplifier Operating Manual

PD-15RMi-C R01-2016/LA

Contents

1.0 Description

The PD-15RMi-C is a TTL Pulse Distribution Amplifier that provides distribution for 1 PPS signals.

The PD-15RMi-C has three inputs which drive three distribution modules. Each module supplies five buffered outputs designed to drive low impedance loads and long 50 or 75 ohm cables. The outputs provide a 3.7 volt peak-to-peak signal into a 50 ohm load. The channel-to-channel delay differences are typically 100 ps. The distribution modules have typically 3 ps/ºC temperature coefficient of propagation delay that is essential for the distribution of high quality timing signals.

This instrument is designed to be powered by a 100 to 240 VAC mains source or by a +12 to +36 VDC power source. If both AC and DC sources are powering the instrument, the DC source will be used as backup power in case of AC power outages. The instrument is designed to automatically switch from AC to DC supply operation using a Schottky diode network and charge storage capacitors to avoid any glitches and ensure uninterrupted continuous operation.

Pulse Distribution Options:

Product Name	Number of inputs	Number of outputs	Description	OPTIONAL DC Operation
PD-15RMi-A	1	5	1U, 19" Full rack enclosure SMA connectors on back panel DC24 battery backup module	√
PD-15RMi-C1	1	10	1U, 19" Full rack enclosure SMA connectors on back panel DC24 battery backup module	√
PD-15RMi-C2	2	10	1U, 19" Full rack enclosure SMA connectors on back panel DC24 battery backup module	√
PD-15RMi-C3	1	15	1U, 19" Full rack enclosure SMA connectors on back panel DC24 battery backup module	√

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. This instrument was designed for indoor use only.

Line Voltage
This instrument is designed to operate with a 100 to 240 VAC, 47 to 63 Hz power source. DC operation with +12 to +36 VDC, + 2 Amperes is also possible.

Fuse
A 1.0 Ampere 250V slow-blow fuse is used for 100-240 VAC operation.
A 2.5 Ampere 250V slow-blow fuse is used for +12 to +36 VDC operation.
Only replace fuses 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 your PD-15RMi-C.

DC Power
If the instrument was acquired with the DC power module, the DC connector on the back panel has the following configuration:
Pin 1 NC
Pin 2 NC
Pin 3 NC
Pin 4 +12 to +36 VDC power return
Pin 5 +12 to +36 VDC power
Pin 6 Chassis GND /Earth GND

Verify that the connector from your DC power supply has the pin configuration mentioned above. Do not apply AC voltage to the DC power connector. Failure to do so may cause injury or death to personnel, cause damage to the instrument and void all warranties.

Please note that the power return (pin 4) is NOT connected to the instrument case ground internally, however both ground connections pin 4) and pin 6) are available at the DC power connector and may be connected together at this point.

2.2 Instrument Safety and Preparation for Use

1 PPS Signals

The 1 PPS signals to be distributed should conform to TTL specifications. Make sure you Only apply TTL level (0 to 5V) signals to the 1PPS INPUT Connector. Do not apply negative voltages as they will damage the pulse distribution amplifier.

Absolute Maximum Ratings

Voltage at 1 PPS input	-0.7 VDC to +5.5 VDC
Reverse Voltage at 1 PPS output	-0.7 VDC to +5.5 VDC
DC Supply Voltage	+ 36 VDC
Storage Temperature	-10 to +75 ºC
Operation Environment	0 to +50 ºC

3.0 Front Panel

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

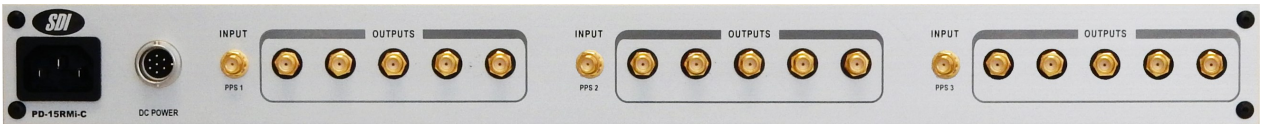
DC Power
The DC Power LED is on when DC power is applied to unit.

PPS 1
The PPS LED will flash on the falling edge of the 1PPS output signal from the first pulse distribution module.

PPS 2
The PPS LED will flash on the falling edge of the 1PPS output signal from the second pulse distribution module.

PPS 3
The PPS LED will flash on the falling edge of the 1PPS output signal from the third pulse distribution module.

4.0 Back Panel



AC POWER

The PD-15RMi-C is configured to operate on 100 to 240 VAC.

DC POWER

This instrument may also operate on DC power from +12 to +36 VDC as the main power supply. When the PD-15RMi-C is set up to operate with both AC and DC power sources at the same time the DC power source is used as backup power in case of AC power outages.

INPUT

Provide a 1 PPS signal to be distributed to the connector label INPUT. The input signal should conform to TTL levels.

OUTPUTS

The pulse distribution module outputs are designed to drive a 50-ohm load. Five buffered copies of the input signals are distributed per module.

5.0 Installation

Connecting power

The PD-15RMi-C 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. You may also connect a DC connector on the rear panel with the pin configuration mentioned on page 2.

6.0 Operation

Plug the AC power cord into an appropriate outlet, you may also connect an appropriate DC power supply to the DC power connector.

Once AC power is supplied to the PD-15RMi-C, the LED on the front panel labeled AC POWER will turn on. If you also applied DC voltage, the monitor LED labeled DC POWER will light up.

1 PPS Signal Distribution

Attach an SMA cable with the signal to be distributed to any of the connectors label INPUT on the front panel. The PPS LED on the front panel of the corresponding module will flash on the falling edge of each output pulse and five buffered outputs will be available at the front panel SMA connectors labeled OUTPUTS.

Although the device was designed to distribute precision one pulse per second signals, it may be used to distribute pulses up to a frequency of 100 MHz. The propagation delay is under 12 ns, and the channel-to-channel delay difference are typically 100 ps.

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.

DC Power LED does not turn on when the unit contains a DC back up module.
Disconnect AC and DC power cords and remove the top cover. Check the main DC 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.

PPS LED's do not flash.
Make sure that the provided signal to the instrument conforms with TTL levels.
If the input signal is correct and the LED remains off, the instrument will have to be returned for repair.

8.0 Specifications

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Rise time	10 - 90 %	-	0.8	0.9	ns
Fall time	10 - 90 %	-	0.8	0.9	ns
Propagation delay	50 ohm load	-	10	12	ns
Differential delay	Channel - Channel	-	100	200	ps
Impedance	input output	- -	50 50	- -	Ohms
Input High Level Input Low Level	Input signal into 50 ohm load Input signal into 50 ohm load	2 -0.7	2.4 0.14	5 0.8	V
Output High Level Output Low Level	50 ohm load 50 ohm load	2.4 -	2.7 0.1	2.8 0.2	V
Frequency Range	50% duty cycle	0	100	105	MHz
Temperature-delay Coefficient	0 - 50 ºC	-	3	5	ps/ºC

9.0 Warranty and Service

Warranty

The PD-15RMi-C is warranted to be free of defects under normal operating conditions, as specified, for one year from date of 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 PD-15RMi-C 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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