



**SPECTRADYNAMICS, INC.**



**PULSE DISTRIBUTION AMPLIFIER  
PD10-RM-B  
OPERATING MANUAL**

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## Description



The PD10-RM-B is a TTL pulse distribution amplifier that accepts one input and provides ten outputs. The outputs are designed to drive low impedance loads and long 50 or 75-ohm cables. The propagation delay through the amplifier is typically 10 ns. The channel-to-channel delay differences are less than 1 ns. The small propagation delay characteristics and low temperature coefficient of delay are essential for the distribution of high quality timing signals. The instrument is available in a 1.72" X 19" X 14" rack mountable enclosure.

## Safety and Preparation for Use



### **CAUTION!**

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 may be setup to operate on 100-120 or 220-240 VAC and a line frequency of 50 to 60 Hz. **The setup voltage for this PD10-RM-B is specified on page 4.**

### **Fuse**

A 0.50 Ampere 250V slow-blow fuse is used for 100-120 VAC operation.  
A 0.25 Ampere 250V slow-blow fuse is used for 220-240 VAC operation.  
Only replace fuses with the same type and specifications.

### **Line Cord**

The instrument has a detachable, three wire power cord for connection to a grounded 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.

### **Service**

Do not attempt to service or adjust the instrument unless another person, capable of providing first aid or resuscitation, is present. Contact SDI for any questions or repairs.

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## The Front Panel



### **AC Power LED**

The AC POWER LED will turn on when AC power is applied to unit and the unit is operating properly.

### **DC Power LED**

If the PD10-RM-B was manufactured with the battery backup option the DC POWER LED should be on when DC power is applied and the unit is operating properly. If the PD10-RM-B is not equipped with the battery backup option, the DC POWER LED will not be connected but will still be on the front panel.

### **1 PPS LED**

The 1 PPS LED will flash on the falling edge of the 1 PPS output signal.

## The Back Panel



### AC POWER ENTRY MODULE

The PD10-RM-B is configured to operate on:

100-120 VAC

220-240 VAC

### DC POWER ENTRY MODULE

**Optional** Battery Backup Connector for +24 VDC Backup power source.

### SMA INPUT

1 PPS input. The input signal should conform to TTL levels.

### SMA OUTPUTS

Distribution amplifier outputs. The ten outputs are designed to drive 50 ohm cables. The outputs provide a 2 Volt peak-to-peak signal into a 50 ohm load.

# Battery Backup Module



## Description

*If you acquired the optional battery backup module for your PD10-RM-B you will be able to power your instrument with an external +24 VDC power source.* In case of loss of the main AC power this module will automatically power the unit. The switch from AC to DC supply operation is affected by a Schottky diode network and charge storage capacitors to ensure glitch free operation. The +24 VDC power source connector is located on the back panel of the instrument. The +24 VDC ground is not connected to the instrument case ground internally, however both ground connections are available at the DC power connector and may be connected together at this point.

## DC Voltage

The +24 VDC may be used as backup power to prevent loss of signal during power outages. The DC power supply should be able to provide +24 VDC at 2A. For optimum performance the following specifications should be used for the power supply.

DC Supply	+24 VDC, 2 A
Line regulation	+/- 0.05% for a 10% line change
Load regulation	+/- 0.05% for a 50% load change
Output ripple	< 5mV peak-to-peak
DC Fuse	2.0 Ampere 250V slow-blow

## Fuse

A 2.0 Ampere 250V slow-blow fuse is used for +24 VDC operation.  
Replace fuses with the same type and specifications

## Service

Do not attempt to service or adjust the instrument unless another person, capable of providing first aid or resuscitation, is present. Contact SDI for any questions or repairs.

## Operation

To operate the unit on DC power, locate the DC power entry connector on the rear panel and connect the power cable. When DC power is applied to the unit, the LED located on the front panel labeled DC POWER should light up. **Connection of the +24 VDC supply is optional.**

## DC Connector



**WARNING!**

**DO NOT APPLY AC VOLTAGE TO THIS UNIT THROUGH THE 6 PIN CONNECTOR ON THE REAR OF THE UNIT!**

**Failure to follow these directions will cause injury or death to personnel, cause irreparable damage to the instrument and void all warranties.**

**WARNING!**

**DO NOT REVERSE THE POLARITY OF THE SUPPLY VOLTAGE!**

**Reversing the polarity of the power supply will cause damage to the unit and void all warranties.**

**WARNING!**

**The chassis of the instrument is internally connected to DC ground.**

The +24 VDC connector is wired as follows:

Pin 1 NC

Pin 2 NC

Pin 3 NC

Pin 4 +24 VDC GND return

Pin 5 +24 VDC power

Pin 6 Chassis GND / Earth GND





**This unit is designed to operate only with the specified voltage on page 4. For conversion to a different voltage of operation contact SDI.**

To operate the unit, locate the AC power entry module on the rear of the enclosure. Make sure that the line voltage selection is correct and connect the power cord. Plug the unit into an appropriate power outlet. The AC POWER LED on the front panel will turn on. If you acquired the unit with battery backup option, you may connect the DC connector as well and plug it into a +24 VDC, 2 A outlet. Attach a cable with the signal to be distributed to the rear panel connector labeled INPUT. The 1PPS LED on the front panel will flash on the falling edge of each output pulse.

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 is less than 1 ns.

### **Absolute Maximum Ratings**

High-Level Input Voltage	7 VDC Maximum
Low-Level Input Voltage	-1.2 VDC Minimum
DC Voltage Applied at Output	7 VDC Maximum
Storage Temperature	-10 to +75 °C
Operation Environment	0 to +50 °C
Rack Mount Chassis	1U H, 19" W, 14" D

# Specifications



PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Rise time	10 - 90 %	-	3	4	ns
Fall time	10 - 90 %	-	3	4	ns
Propagation delay	50 ohm load	-	10	12	ns
Differential delay	Channel - Channel	-	200	500	ps
Impedance	input	-	50	-	Ohms
	output	-	10	-	
Input High Level	Input signal into 50 ohm load	2	-	5	V
Input Low Level	Input signal into 50 ohm load	-0.7	-	0.8	
Output High Level	50 ohm load	2	2.4	-	V
Output Low Level	50 ohm load	-	0.4	0.5	
Temperature-delay	0 - 50 °C	-	3	5	ps/°C
Coefficient	25 - 35 °C	-	3	-	

The rise and fall times were tested with a TTL input signal at 100 kHz.

## Warranty



The PD10-RM-B 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 PD10-RM-B 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.

