

*Operators Manual
RoadRunner
Digital Tachometer*



The RoadRunner is a microprocessor controlled digital tachometer used for monitoring turntable platter speed to 3 decimal places of resolution. The internal time base is a temperature compensated crystal oscillator (TCXO) accurate to 2.5 PPM ($\pm 0.00025\%$) with less than 1.0 PPM aging per year.

The tachometer uses a hall effect sensor and a small magnet attached to the underside of the platter to sense the platter rotation.

 **Note:** The magnet **MUST** pass within $\frac{1}{8}$ " of the sensor to trigger properly. The closer the better (without making contact).

 **Note:** The sensor PCB and magnet **MUST** be firmly attached for proper operation.



Specifications

Physical:

Dimensions: 3.565"L x 2.50"W x 1.1875"H.
Weight: 4 oz.
Case: 1 piece Extruded Aluminium.

Operating Modes:

Standby, Sleep, Normal.

Power Requirements:

DC Supply 9VDC 100 mA nominal; 5mA Sleep

Output:

Display: 6 digit LED direct readout of platter speed in RPM
Resolution: 0.001 RPM
Serial Data: 3.5mm connector 9600N81 DCE
Freq Stability: Crystal Controlled ± 2.5 PPM ($\pm 0.00025\%$)

Options:

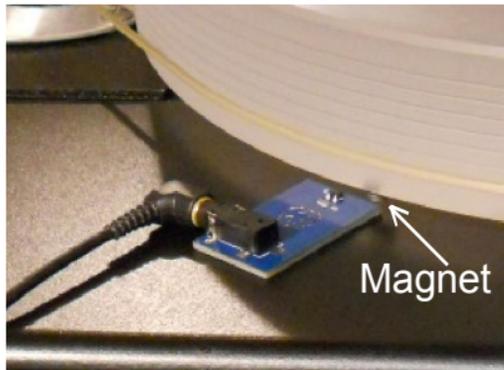
Direct connection to Condor Power Supply Unit provides digital synchronization of platter speed to ± 0.005 RPM.

Operation

Attach the magnet to the underside of the platter near the edge as shown below. Attach the sensor PCB to the plinth so the magnet passes directly over the hall effect sensor (Q1) as shown.

Connect the tachometer to the sensor by plugging the 2.5mm jack into the back of the tachometer (marked “Sensor”) and the 3.5mm right angle jack into the sensor PCB. Plug the wall adapter into an AC socket and connect the other end to the tachometer (marked “9VDC”). Press the On/Off button on the back panel; the display will show 5 dashes.

Verify operation of the sensor by manually rotating the platter until the magnet is directly over the sensor. Whenever the magnet triggers the sensor, the left most LED display will turn on the 6th dash.



Turn on the turntable motor to start the platter rotating. The tachometer will display the RPM reading after 2 complete revolutions and will update the display on every revolution after that.

When the platter stops rotating for more than 2 seconds, the display will again show the 5 dashes. If there is no activity for 5 minutes, the tachometer will go to sleep and blank the display; it will automatically detect activity when the platter begins rotating again and exit sleep mode.

The On/Off switch can also be used to enter sleep mode by pressing and holding the button until the display is blanked.

Operation with Condor Power Supply: The tachometer can be connected directly to the PSU via a 3 wire serial cable in order to synchronize the platter speed. Operation is completely automatic with no user intervention needed. The tachometer outputs the speed reading once per revolution. The PSU compares this reading to the speed on the display and can make micro-fine adjustments to the output frequency to lock the turntable speed to within ± 0.005 RPM. The adjustment is done slowly and evenly over the entire next revolution and is inaudible to the listener (in most cases, the adjustment is < 0.0005 RPM per step). The turntable remains on speed independent of the belt tension, bearing oil viscosity, drag from the needle or any other variables that cause the table to drift over time with speed.

 **Note:** Whenever the PSU is applying a correction to the speed, the decimal point will blink on the PSU's LED display.

Accumulated Playing Time Counter: The RoadRunner tachometer has a built-in accumulated playing time counter. The counter shows the total time the platter has been spinning and can be used to determine when the stylus needs to be re-tipped. The counter can be displayed and reset to zero when the stylus is replaced.

To display the accumulated playing time, disconnect power, press and hold the On/Off button on the rear panel while inserting the power cable. The display will show the firmware version on the LED display (must be v1.10 or higher). Release the button, press and release again to advance to the accumulated time counter. The display will show the total playing time in hours and tenths. To exit without changing the setting, press and release the On/Off button. To reset the counter to zero, press and hold the On/Off button until the display shows 'Clr? n'. Press and release the On/Off button to toggle between Y/N. To reset the counter to zero, press and hold the On/Off button when the display shows 'Y'.