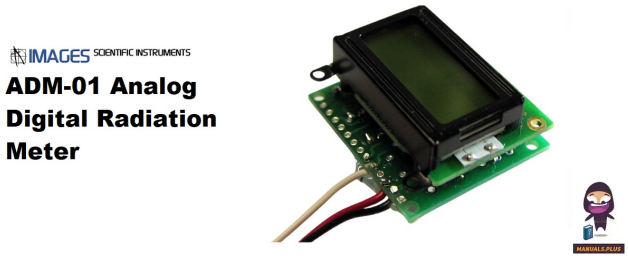
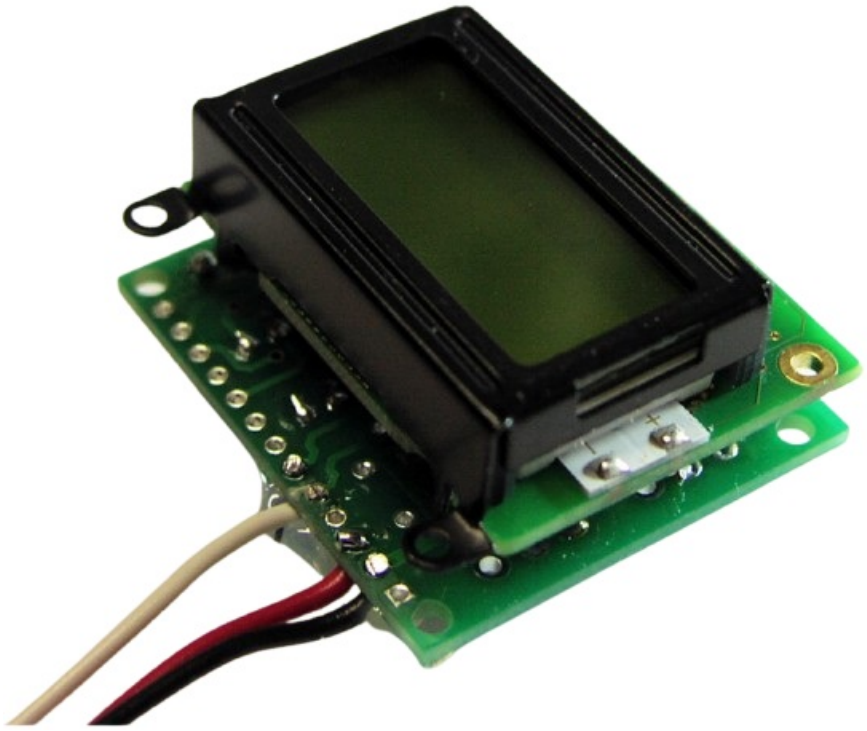


Images Scientific Instruments ADM-01 Analog Digital Radiation Meter User Guide

Contents

IMAGES SCIENTIFIC INSTRUMENTS

Images Scientific Instruments ADM-01 Analog Digital Radiation Meter



Product Information

Specifications

- **Model:** ADM-01
- **Type:** Analog Digital Radiation Meter
- **Power Source:** 7-12V battery or regulated 5V power supply
- **Display:** 8×2 LCD
- **Measurement Units:** CPS, mR/hr, mSv/hr

Product Usage Instructions

- **Powering the Unit**
  The ADM-01 can be powered by a 7-12V battery or a regulated 5V power supply. Connect the power source to the appropriate terminals on the board as per the instructions provided in the manual.
- **Turning On and Off**
  Use the bottom switch on the right side of the board to power on/off the unit. The top switch controls the backlight of the LCD.
- **Selecting Measurement Units**
  To switch between imperial (mR/hr) and metric (mSv/hr) radiation measurements, place a jumper on the two-pin header as shown in Figure 4 of the manual.
- **Reading Display**
  The top line of the display alternates between displaying CPS and approximate radiation level. The second line shows the analog radiation field strength meter providing a visual indication of the current CPS reading.

FAQ

- **Q: How do I change the battery?**

A: To change the battery, carefully open the casing of the unit and replace the existing battery with a new one following the polarity markings.

- **Q: What is the range of CPS values that can be displayed?**
  A: The analog power meter can read CPS values from 1 CPS to 2040 CPS.

The Analog Digital Radiation Meter counts the pulse output of a standard analog Geiger counter to provide a visual readout of the CPS, approximate radiation level (imperial/metric) and analog radiation field strength meter.

Features

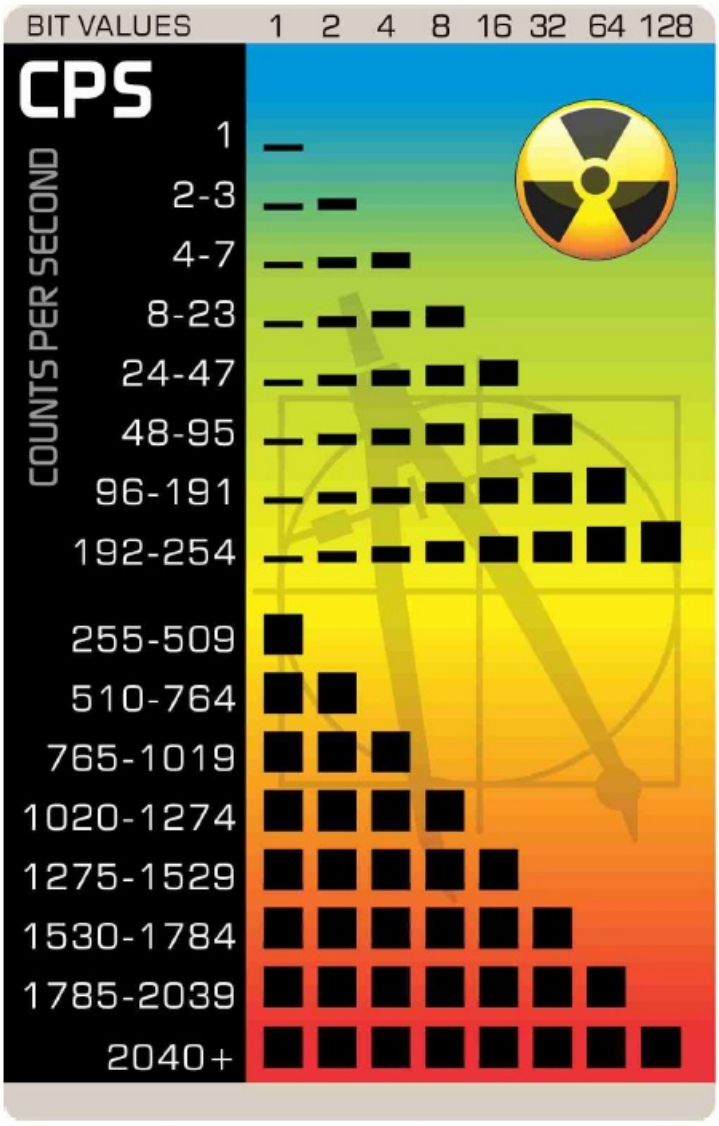
- 7-12VDC or 5VDC power supply input
- Counts TTL pulses from Analog Geiger Counter
- Outputs Digital Counts Per Second (CPS) value
- Outputs radiation level (imperial / metric)
- LCD Backlight
- Available as a kit or assembled
- The Analog Digital meter alternates the first line of its display between Counts Per Second (CPS) and then approximate radiation level in either imperial measurements (mR/hr) or metric measurements (mSv/hr). The top line of the display alternates its display every second. The 2nd LCD line is an analog radiation field strength meter that provides a quick visual indication of the current CPS reading. Figure 1 displays the reading in CPS, while Figure 2 shows the approximate radiation level.
- To fit nicely on the 8-character display line the imperial measurement of mR/hr is abbreviated to mR. Likewise, the metric measurement of mSv/hr is abbreviated to mS.
- The second line of the 8×2 LCD is a dedicated analog power meter to read a reasonable approximation of CPS from 1 CPS to 2040 CPS.

Figure 1

Figure 2

- The LCD alternates between display the mR/hr value and CPS. The CPS value used for the power meter display portion is updated on each display screen.
- The following table illustrates the relationship between the analog power graphic and the CPS value.

Using the Analog Digital Meter



- Images Analog Digital Meter allows you to add a digital display to your ana-log Geiger counter. The default display will provide readings in CPS and mR/hr.
- The ADM-01 has two switches on the right-hand side of the board. The bottom switch is the power switch. The top switch allows you to turn the backlight on the LCD on and off.

Powering the unit

- The ADM-01 may be powered by a 7-12V (transistor) battery or by a regulat-ed 5 volt power supply. When powered by the 7-9 volt battery the ADM-01 board may source 5 volts 50 mA of 5V current, off its 5V in/out line. Units that are purchased assembled are set up for 5VDC.
- The PCB connection pads, are .100 spaced and you can connect to the board using female /male headers or 22ga. wires depending upon your application. In this example we are connecting to the ADM-01 using wires.
- In our example we are powering the ADM-01 board using a 5 volt power sup-ply (red wire), Ground (GND black wire) and the B0 (white wire) soldered on the PCB as shown below in figure 4. For additional wiring options see page 9.

Selecting Imperial or Metric Readings

Selecting Imperial (mR/hr) or Metric (mSv/hr) Radiation

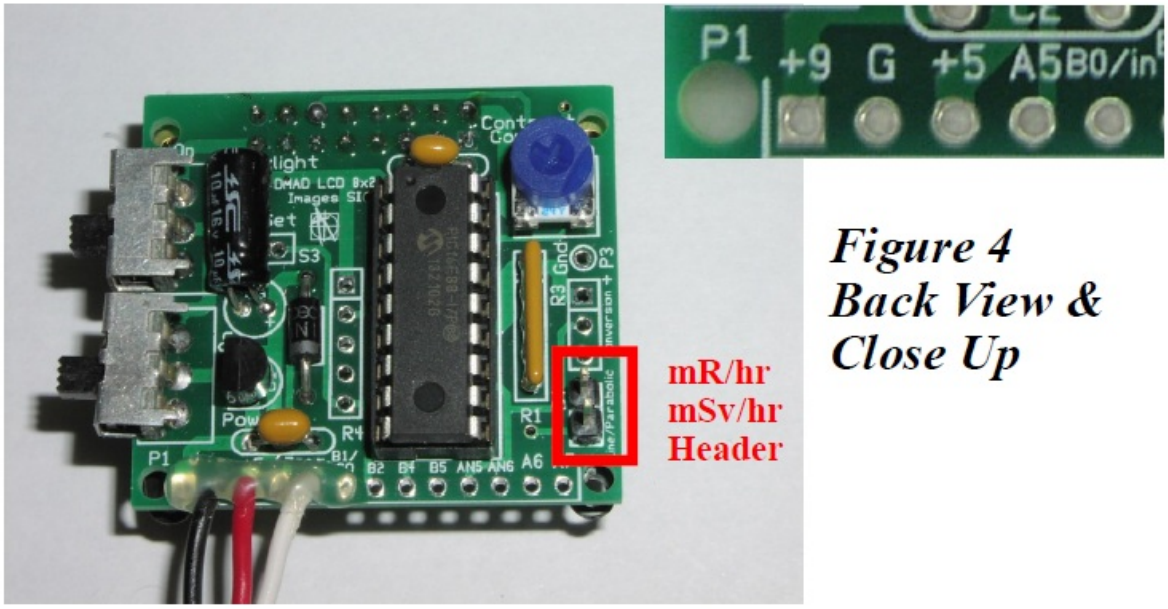


Figure 4
Back View & Close Up

Measurement:
Figure 4 also shows a two-pin header, outlined using a red box. Placing a jump-er on this two-pin header will change the radiation reading from imperial mR/hr to metric mSv/hr radiation measurement

Schematic

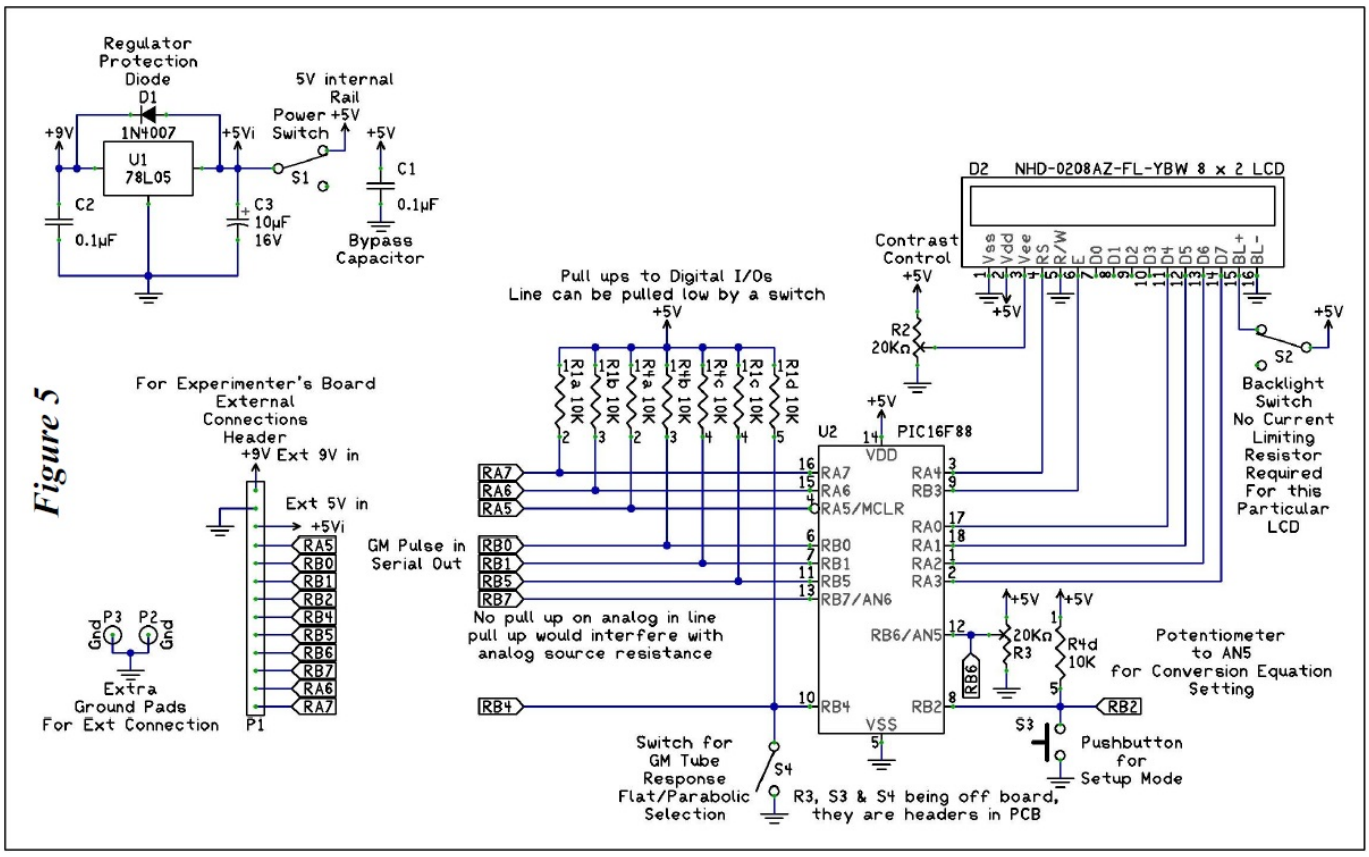


Figure 5

Circuit Construction

Figure 5 shows the schematic for the Analog Digital Radiation Meter (ADM-01). Figure 6 is the blank PCB. All components are mounted and soldered to the top silkscreened side of the board unless otherwise noted.

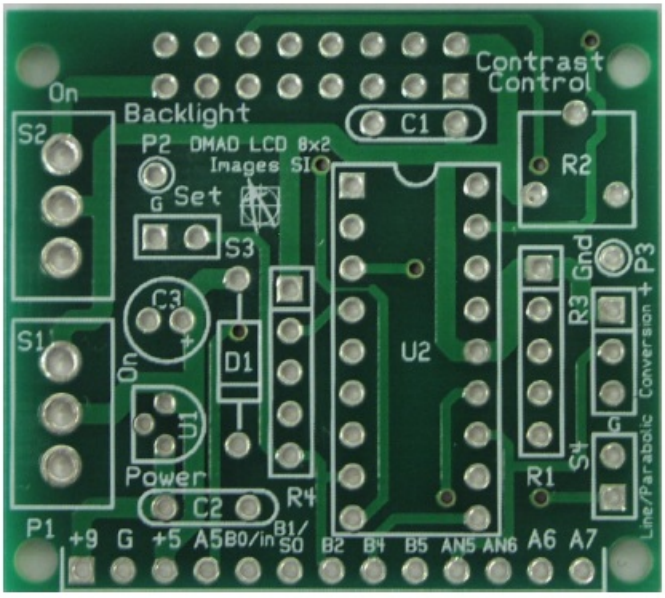


Figure 6

- To begin mount and solder the 5-pin 10K resistor pack (R1). Pin 5 (the last pin when reading the text on the resistor) should go in the top hole of R1 on the PCB. Mount and solder the 20K potentiometer at R2. Next mount and solder the two. 1uf 50V capacitors (C1 & C2), followed by C3, the 10uf 16V capaci-tor. Depending on the casing of the unit, this capacitor may need to be bent flat before soldering, as shown in the completed circuit, Figure 7 on the next page.
- Now mount and solder the 1N4007 diode, D1. Be sure to align the markings on the diode with the silkscreened outline on the pcb. Next mount and solder the voltage regulator, 78L05 at U1, again, making sure to align it with the printed silkscreen outline.
- Mount and solder the 18-pin IC socket at U2. Align the notch on the IC socket with the notch on the silkscreened outline. This will aid in the proper installa-tion of the microcontroller. Next mount and solder the two right-angle slide switches, S1 & S2. S4 is a 2-pin header. Adding a jumper to this header allows one to switch the unit from mR/hr to mSv/hr.
- The two 8-pin headers should be mounted and soldered to the underside of the PCB at D2, as shown in Figure 7 on the right. Place the LCD down onto the headers and solder into place.

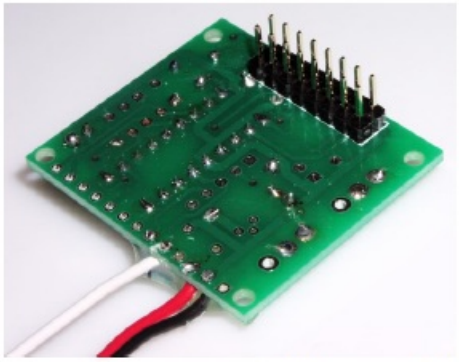


Figure 7

- Insert the preprogrammed 16F88 microcontroller into the IC socket. Be sure to line up the notch in the chip with the notch in the socket.
- You need to think about how you want to connect the ADM-01 to your circuit and what power supply you want to use. The ADM-01 is a versatile development board for the 16F88 PIC microcontroller. Figure 8 below illustrates the lines available to the user. In this application, we are using it as an Analog-Digital-Meter and we

only need to use three lines.

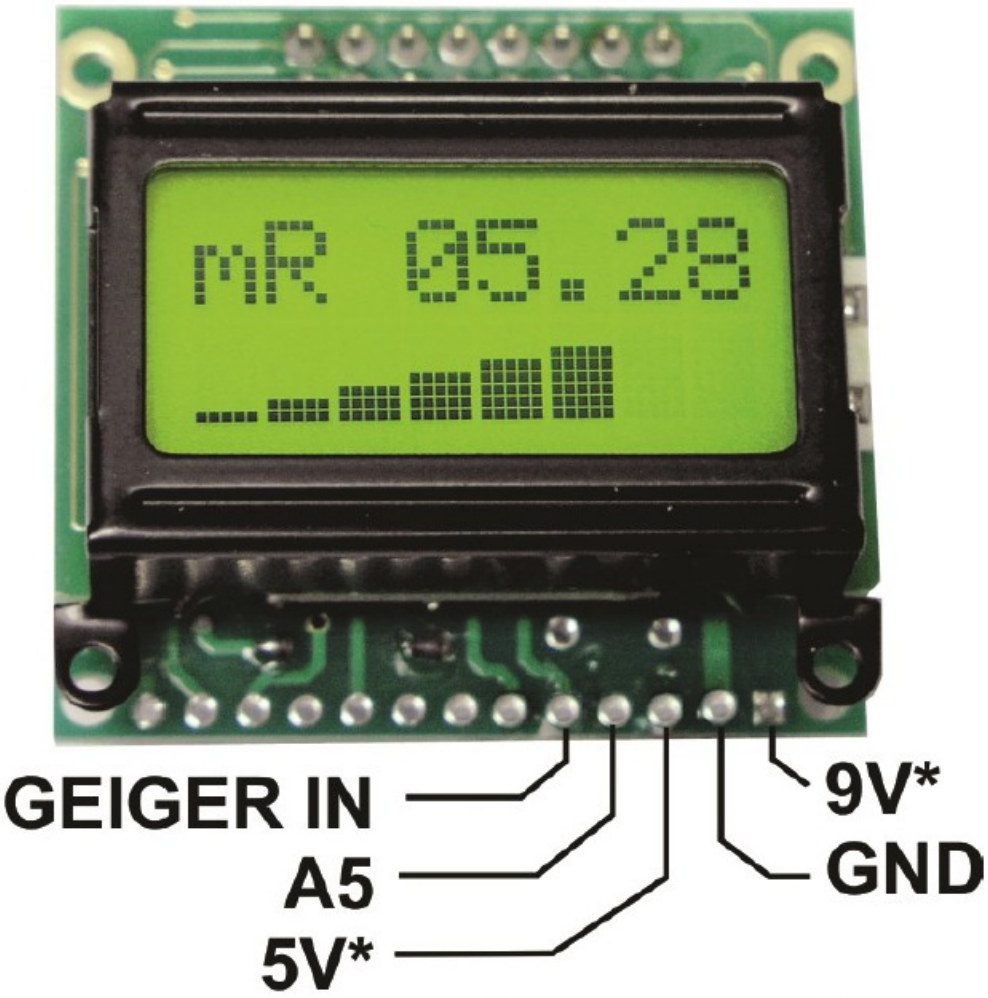


Figure 8 Front View

You are now ready to connect the Analog Digital Radiation meter to an ana-log Geiger counter. Connect the white wire to the pulse output of the Geiger counter. Make sure both the Geiger counter and ADM-01 meter share a common ground. Various wiring diagrams are included on the following pages.

Mounting the Meter

The mounting outline measurements for the ADM-01 are shown in Figure 9. These measurements are taken in millimeters.

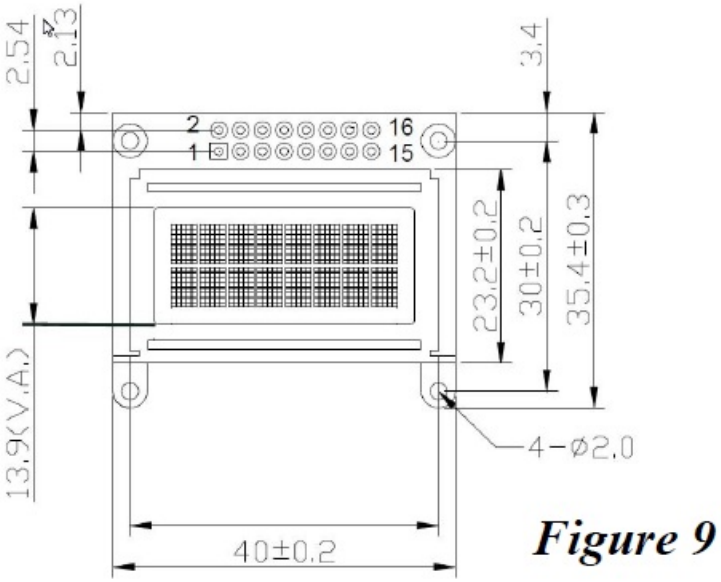


Figure 9

Parts List

ADM-01 Parts List

- (1) PCB-73
- (2) CAP-.1uf-50V C1 C2
- (1) CAP-10uf-16V C3
- (1) RES -10K-5pin R1
- (1) POT-20K-Top R2
- (1) 1N4007 D1
- (1) 78L05 U1
- (1) PIC16F88 U2
- (1) ICS-18
- (2) SW-27
- (1) LCD-01-8×2
- (2) SMH-08
- (1) SMH-02
- (1) Jumper
- (1) Manual

Misc. Materials – 3 feet of stranded wire (each in a different color).

Wiring Diagrams

Wiring Options for ADM-01 Analog/Digital Meter

The following images show a variety of wiring options available for our Analog Digital Meter.

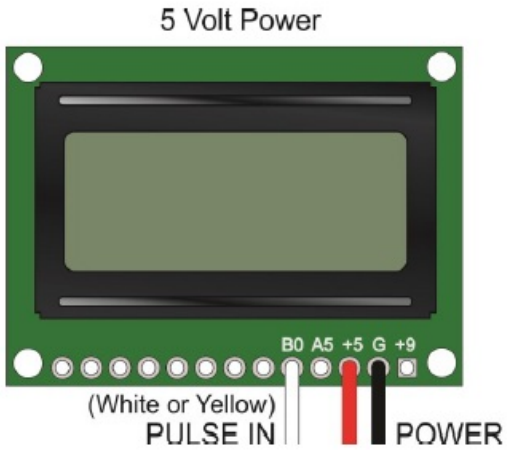


Figure 10

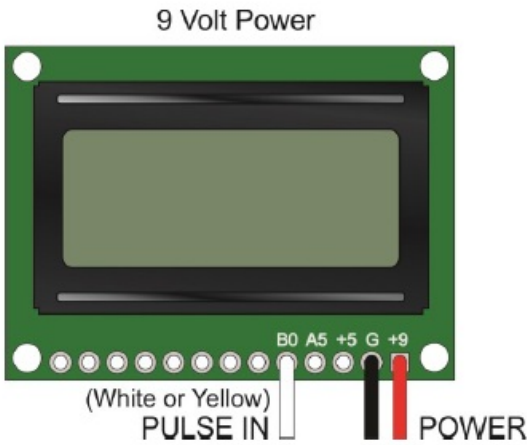


Figure 11

Figure 10 outlines wiring connections for supplying the unit with 5V power. Figure 11 outlines the wiring for 9V.

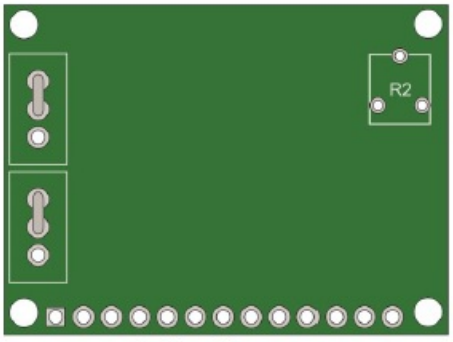


Figure 12

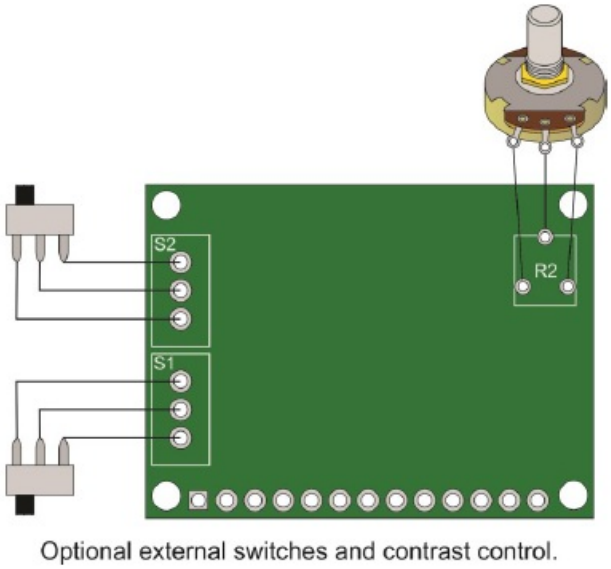


Figure 13

- Jumping the switch controls, as in Figure 12, would supply the unit with constant power and backlight. Power is supplied by either 5 or 9 volts, and is constant when your Geiger counter is turned on.
- Figure 13 outlines how to wire the unit if you choose to use external switches and/or contrast control.

The following images shows power and pulse connections to GCK/GCA-01.

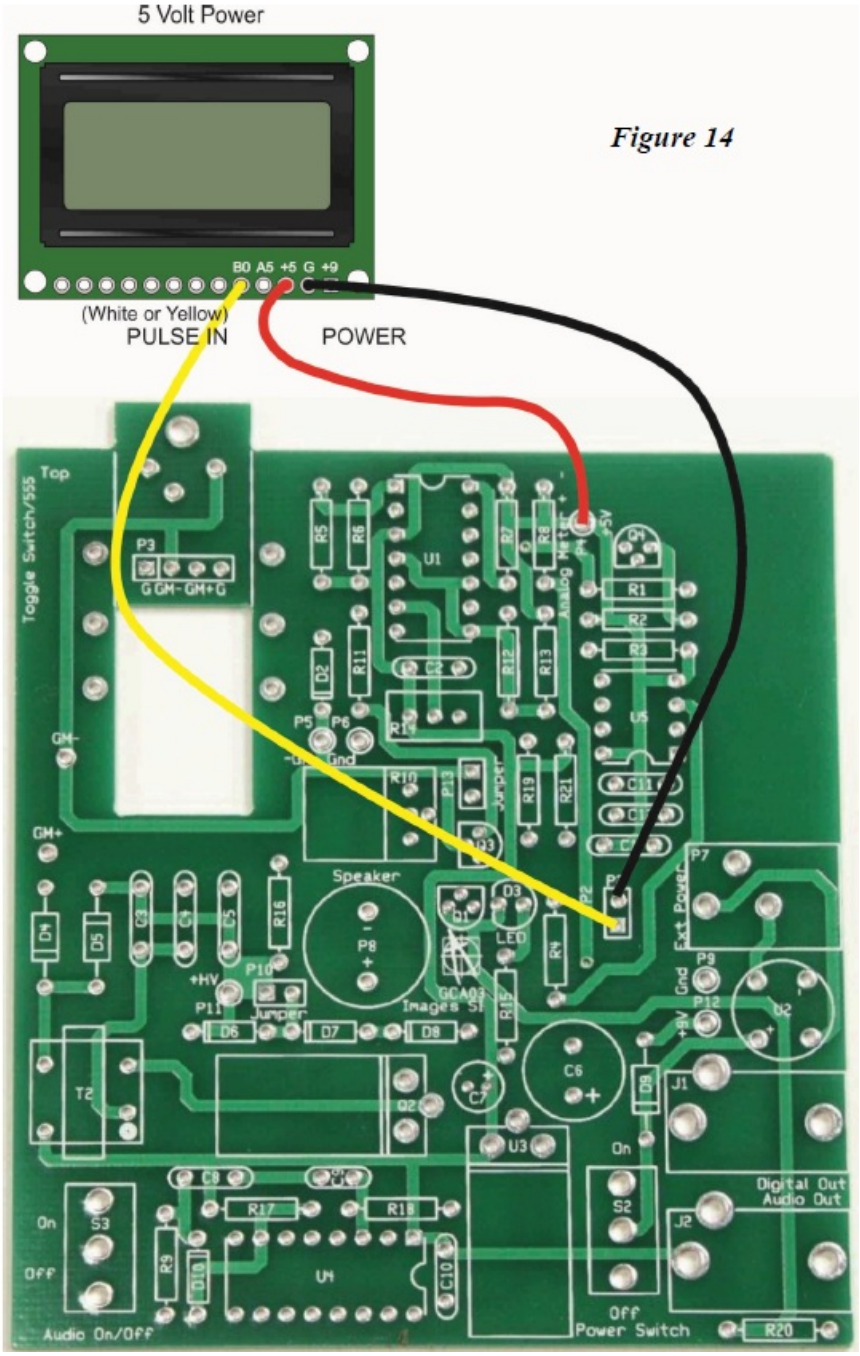
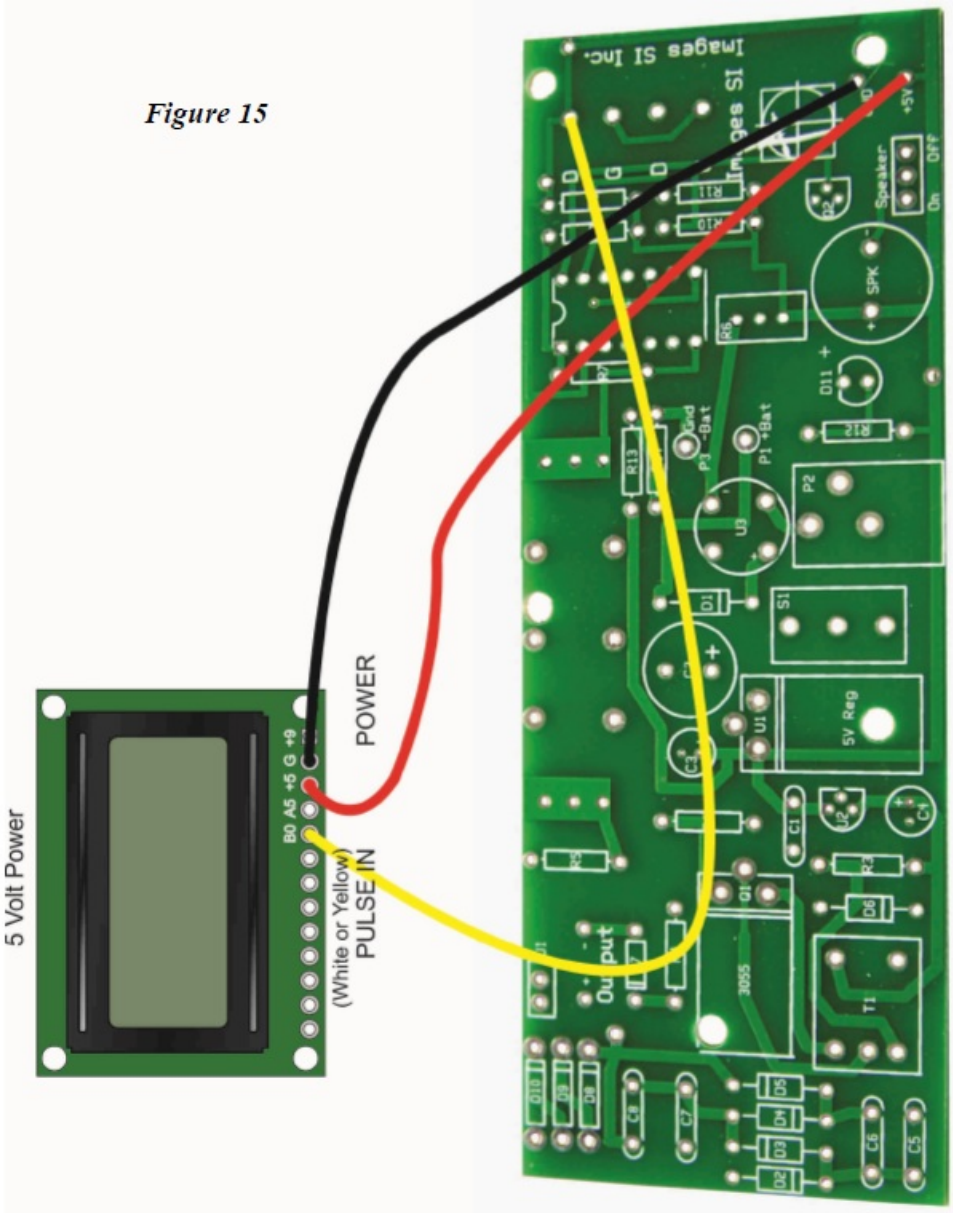


Figure 14

The following images shows power and pulse connections to GCK-02.



Images Scientific Instruments Inc.

- 109 Woods of Arden Road Staten Island NY 10312
- 718.966.3694 Tel
- 718.966.3695 Fax
- www.imagesco.com.

Documents / Resources

	[Images Scientific Instruments ADM-01 Analog Digital Radiation Meter](#) [pdf] User Guide ADM-01, ADM-01 Analog Digital Radiation Meter, Analog Digital Radiation Meter, Digital Radiation Meter, Radiation Meter, Meter

References

- Images Scientific Instruments Inc
- User Manual