

OVERVIEW

The following is a set of instructions to guide you through programming and wiring a PMA series detector to a Campbell CR10 datalogger. This example uses an outdoor UVB detector with temperature compensation algorithm, model PMA1102

The PMA series detectors require a ±5V power supply. A power supply inverter is available from Solar Light Co. (Part number PMA2010). This inverter requires a positive voltage from 5 to 12V DC and will produce a ±5V supply for the detector. Current requirements may vary, be sure to check your detector's current requirement on the product specification sheet.

CONNECTING A PMA1102 TO CAMPBELL CR10 DATALOGGER

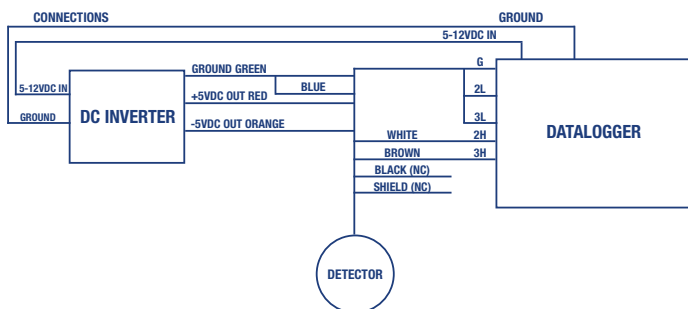


Figure 1

PMA series detector connected to a Campbell CR10 datalogger using a PMA2010 inverter box. The inverter box is only required if a -5V supply is not available.

PROGRAMMING

The following programming example is a guideline. Before deploying, careful testing must be done by each user to determine if all functions of their program are functioning properly.

*...1...Table 1 Programs

01...1...Sec Execution Interval

SECTION 1.0

Measure CR10 Battery Voltage.

01...P...10 Battery Voltage

01...10 Loc[BatryVolt]

SECTION 2.0

The Multiplier (M) will equal the calibration factor provided by Solar Light Co. Typical values are 25 to 50 MEDs/Hr/V or 0.025 to 0.050 MEDs/Hr/V.

The offset (O) will equal the dark value multiplied by -1. The offset will also be supplied by Solar Light Co. Typical values are between -3mV and +3mV.

02...P...2 Volt (DIFF)

01...1...Rep

02...25...2500mV 60Hz Rejection Range

03...2...IN Chan

04...1...Loc[MED/Hr]

05...M...Multi User Entered Value

06...O...Offset User Entered Value

SECTION 3.0

Measure PMA1102 Temperature Sensor

08...P...2 Volt (DIFF)

01...1...Rep

02...25...2500mV 60Hz Rejection Range

03...3...IN Chan

04...2...Loc[PMA_Temp]

05...0.1...Multi

06...-500...Offset

SECTION 4.0

This section applies a temperature effect correction factor of 1.0% per °C using the following formula.

$$SUV_{corr} = \frac{SUV_{meas}}{1 + (T_{det} - 25) \times 0.01}$$

where SUV_{meas} is [MED/Hr] prior to correction, SUV_{corr} is [MED/Hr] after correction, and T_{det} is "PMA_Temp."

09...P...34 Z=X+F

01...2...X Loc PMA_Temp

02...-25...F User Input: Temp in °C at

03...3...Z Loc [TcorFactr] Calibration *-1

10...P...37 Z=X+F
01...3...X Loc TcorFactr
02...0.01...F
03...3...Z Loc [TcorFactr]

11...P...34 Z=X+F
01...3...X Loc TcorFactr
02...1...F
03...3...Z Loc [TcorFactr]

12...P...38 Z=X/Y
01...1...X Loc MED/Hr
02...3...Y Loc TcorFactr
03...1...Z Loc [MED/Hr]

SECTION 5.0

Calculate kW/m² from MEDs/Hr. The conversion factor from Solar Light CO. is 58.3E-6 kW/m² / MED/Hr. This is performed in two steps.

13...P...34 Z=X*F
01...1...X Loc MED/Hr
02...5.85...F
03...11...Z Loc [kW/m²]

14...P...37 Z=X*F
01...11...X Loc [kW/m²]
02...0.00001...F
03...11...Z Loc [kW/m²]

SECTION 6.0

Calculate MEDs and KJ/m²

15...P...30 Z=F
01...2.7778
.....F (Execution Interval in Seconds / 3600)
02...4...Exponent of 10
03...6...Z Loc [HrsLapsed]

16...P...36 Z=X*Y
01...1...X Loc [MED/Hr]
02...6...Y Loc [HrsLapsed]
03...7...Z Loc [MEDs]

17...P...37 Z=X*F

01...11...X Loc [kW/m²]
02...1...F (Execution Interval in Seconds)
03...12...Z Loc [kJ/m²]

SECTION 7.0

Output hourly averages [MED/Hr/kW/m²] and totals [MEDs, kJ/m²]

18...P...92 If Time Is
01...0...Minutes (Seconds) Into A
02...60...Minute or Second Interval
03...10...Set High Flag 0 (Output)

19...P...77 Real Time
01...220...Day, Hour-Minute

20...P...71 Average
01...1...Rep
02...1...Loc [MED/Hr]

21...P...71 Average
01...1...Rep
02...11...Loc [kW/m²]

22...P...72 Totalize
01...1...Rep
02...7...Loc [MEDs]

23...P...72 Totalize
01...1...Rep
02...12...Loc [kJ/m²]