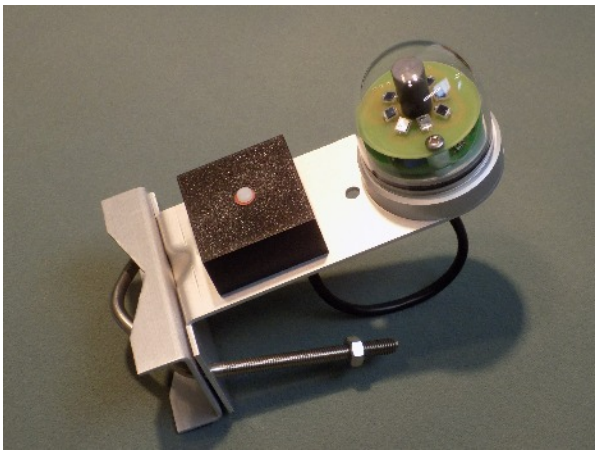
Instromet Weather Systems Ltd

Stand Alone Sun Duration sensor

Hobbyist configuration setup manual.



www.Instromet.co.uk

Document Contents:

1) Introduction.

Thank you for purchasing an Instromet Weather Systems Ltd Stand Alone Sun Duration Sensor, Hobbyist build

This unit's ultimate purpose is to supply the user with a numeric record of the days total sunshine duration period as measured by the external outdoor sensor.

The sensor monitors eight photo-diodes and deems the sun to be shining when an imbalance in their readings is measured, caused by the presence of a shadow being cast by the sensors central pillar upon them.

2) Package Contents.

Within the box you should find the following:

1 x External sun duration sensor
25m of 4 core cable
1 x 12v DC Adaptor
1 x Display inc 3m display cable
1 x control box

3) Contact:

Instromet Weather Systems Ltd.
10b Lyngate Industrial Estate
North Walsham
Norfolk NR28 0AJ

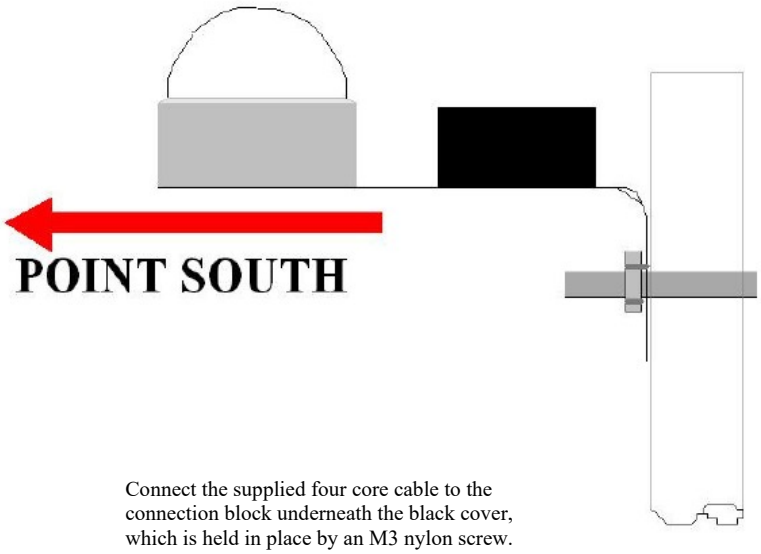
Tel: (01692) 502800
Fax: (01692) 502801
e-mail: sales@instromet.co.uk

Website: www.Instromet.co.uk

4) Outdoor sensor installation

Sensor variation options:

Standard: 480 1000 151/01
IR filtered: 480 1000 158/01



Instromet mast mount kits:

1m mast - 480 1000 094
2m mast - 480 1000 096

Connect the supplied four core cable to the connection block underneath the black cover, which is held in place by an M3 nylon screw.

Connect the cable to the colour coded terminals, observing colour to colour.

Sunshine Sensor

The Sensor is designed to be mounted on a mast of between 25 & 50 mm diameter. The mast should be sited where trees, buildings etc. will not cause a shadow at any time of day throughout the year. It must be borne in mind that the sun rises and sets on the horizon which in mid-summer can be NE & NW (depending on latitude) and only rises to a low angle in mid-winter.
The Sensor is best mounted on the top of a mast above any aerials etc and pointed approximately South (North in the Southern hemisphere) to avoid shadows.
The Sunshine Sensor functions by comparing sunlight to shadow, when the ratio exceeds a predetermined threshold, the sun is deemed to be shining and the counter will count up one every 36 seconds (0.01 hour).

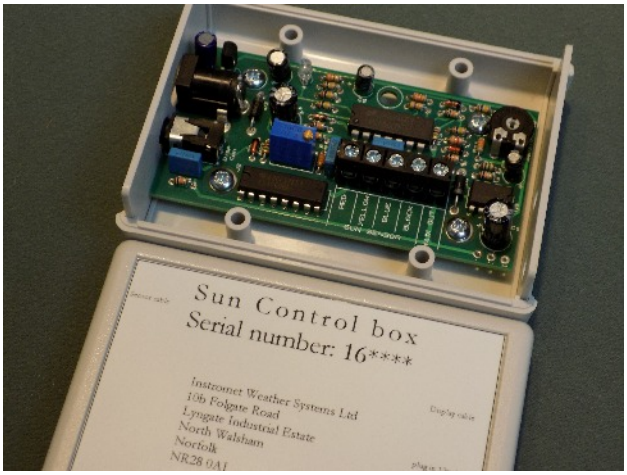
IR Filtered sensor part number: 480 1000 158/01

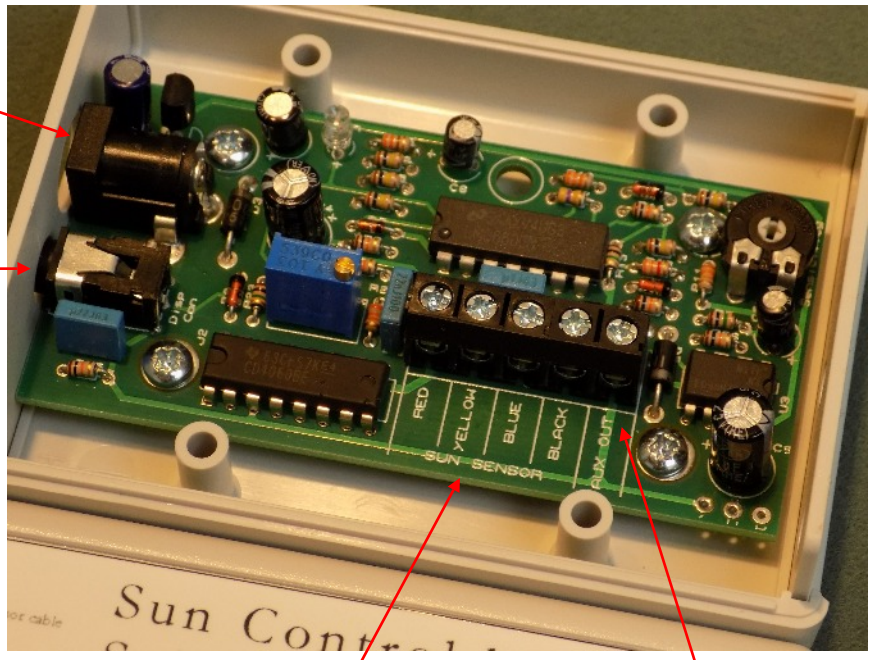
This version of the Instromet sun duration sensor incorporates specially IR filtered photodiodes which only respond to light within the 330 - 720nm spectrum. These there for cut out the chance of any unwanted Infra Red light affecting the sensor output improving the accuracy of the device.

5) Control box features

The control box for our hobbyist version of our Stand alone sun duration sensor has just the right amount of features you'll need to monitor sun duration.

On the outside it has been kept simple for ease of use. On one end you'll find the DC power socket and also a 3.5mm jack socket for connecting to the counter wall display. The other end has holes for the sensor cable entry and another for using the 'Aux' output if required.





The internal features of the control box have just the right amount of features for sun duration measurement.

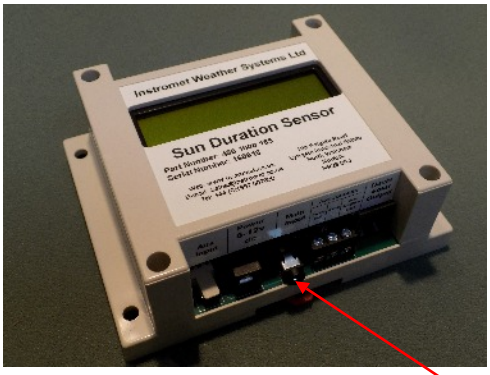
These include connections for the outdoor sensor, Aux output for datalogger / Davis interface connection. (Both sold separately)

6) Wiring diagram

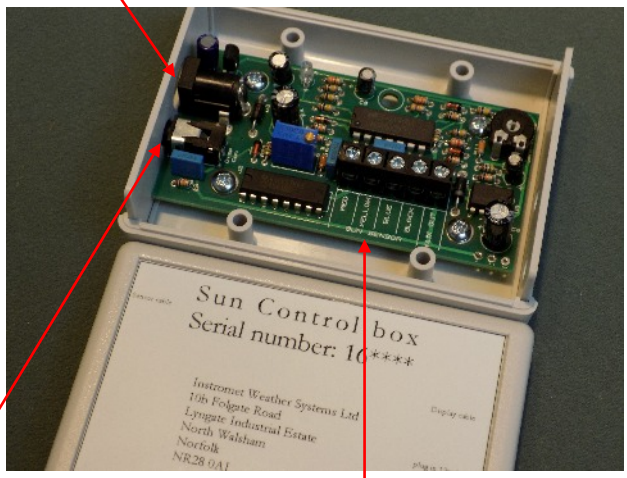
Here we show the main three components of the hobbyist system, outdoor sensor, control box and display.

Follow these directions to correctly assemble the system.

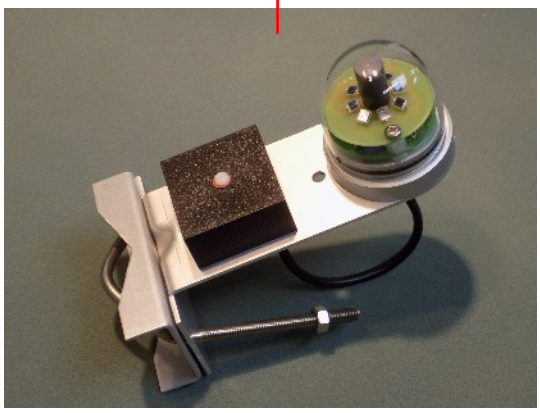
12v DC adaptor, connect to control box via the lower external socket.



Connect the display to the control box via the supplied 3m cable.



Connect the outdoor sensor to the terminals marked ‘sun sensor’



Connect the outdoor sensor to the four terminals marked ‘sun sensor’ using the supplied 25m four core cable, ensuring the colour coding is observed across all three items (cable, sensor & control box)

Other peripheral devices can be connected to the control box, but these instructions demonstrate the connection of the basic system.

7) Display mounting

The display can be mounted in one of two ways.

Either via the holes in its base, which are 105mm apart and 5mm in diameter

Or

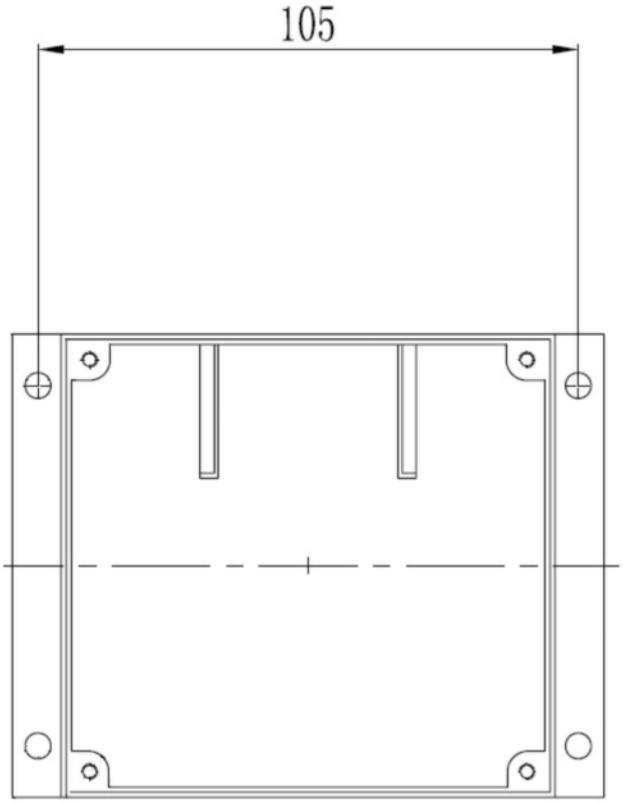
The display can be DIN rail mounted.

Instromet is able to offer DIN rail in 50cm and 100cm lengths. This option is ideal if you are considering expanding the system with others in the Instromet stand alone range, allowing them all to be mounted together uniformly.

DIN rail part numbers:

50cm - 30532/02

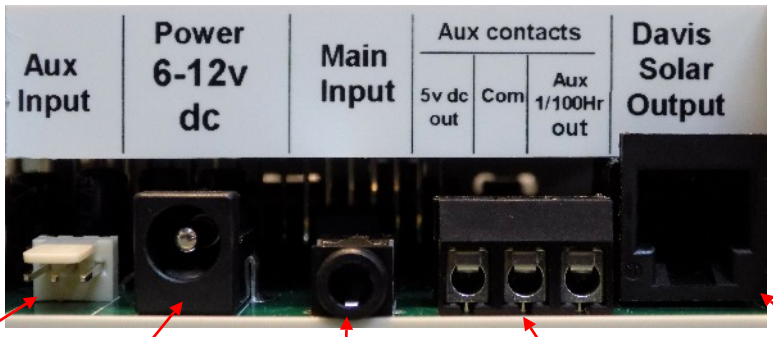
100cm - 30532/01



8) Display connections.

The stand alone sun display is jammed packed full of features and connectivity options and forms the main hub of the stand alone system.

Below is an explanation of the connections found along the lower edge of the display.



Aux Input:

For connecting to our small sun control pcb.

Not required in the Pro system configuration.

Power input:

Used for powering the display when used within the Davis solar enclosure.

Not required in the Pro system configuration.

Main input:

3.5mm Jack used for connecting to the Pro control box. Connection carries power and signal inputs.

Aux Contacts:

For connecting peripheral equipment, such as our sun datalogger.

Davis Solar output:

For connecting to the Davis solar input via RJ11. Output is an incremental voltage with 1.67mv per sun count / step inline with the 5% tolerance of the Davis input.

9) Display features / controls

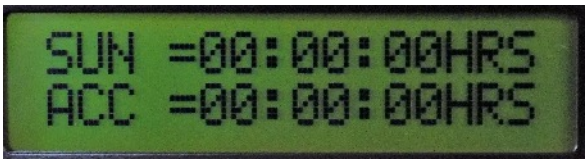
The stand alone sun sensor display utilises three main screens which constantly switch between themselves.

The first screen is the Time / Date screen the second is the counter display screen and the third screen shows the first and last times sun was received by the outdoor sensor.

Time / Date screen

Counter display screen

Hrs : Mins : Secs



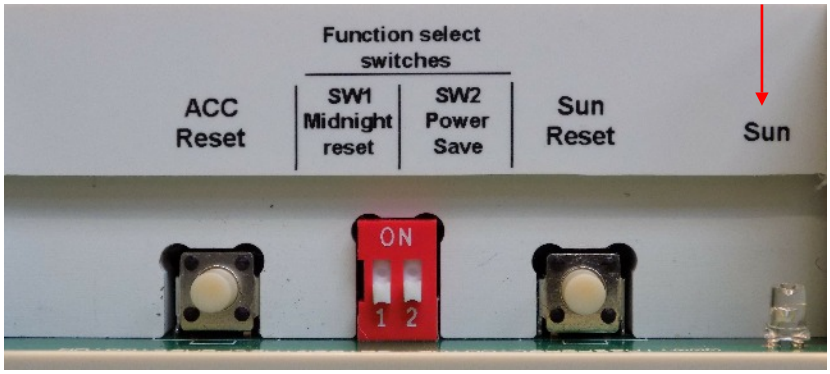
First & Last screen

'SUN'

LED to indicate when sunshine is being received

Display controls.

In order to control the three aforementioned screens and other functions, the display uses four main adjustment points on its upper most surface as shown here.



10) Display operation

Time / Date.

In order to set the time / date, the use of the two buttons marked 'ACC' and 'Sun' reset will be required.

Firstly while the time / date is being displayed, depress the 'ACC Reset' button to enter 'set mode'. When 'set mode' is entered the first parameter (hours) will start to flash. While the parameter is flashing, press the 'Sun reset' button to advance to the correct reading. Once the correct reading is reached for the selected parameter, press the 'ACC reset' button to advance to the next parameter to be set.

Once the time / date setting procedure is complete, leave the display until the flashing parameters stop and normal display operation commences once more.

Sun / ACC counters.

The two main display counters will increment each time a pulse is recorded from the outdoor sensor. Although both counters will increment in unison both can be reset separately. This can allow for potentially both daily and monthly figures to be recorded. To reset the displays, just hold down the relevant reset button for the counter you wish to reset for approximately five seconds until the counter returns back to zero.

SW2 Power Save

When 'SW2 Power Save' is switched to 'on', the display is switched off to save power. This is particularly useful when the display is mounted within the Davis solar enclosure to help lessen the battery draw.

SW1 Midnight reset

As the switch label implies, this function automatically resets the 'Sun' reading at midnight each day. The 'ACC' reading is not affected.

10) Troubleshooting guide

Despite careful consideration when installing the unit if any strange phenomenon's occur then the below may help.

1) Display dead

Check the 12v DC power adaptor plug is firmly connected to the control box power input.
Also check that the DC Adaptor is firmly connected and that the power is switched on at the wall.
All being well, a red power LED should be illuminated within the control box to show the presence of power.
Check that the 3m display cable is firmly connected at both ends to the display and control box.

2) Power is on and the 'Sun' LED is illuminated but the display is dead?

Check that 'SW2' power save switch is not in the on position.

3) No count is being recorded on the display. – Check if the 'Sun' LED is illuminated - if not:

Check that the outdoor sensor sensor cable is firmly connected to its terminal block beneath its black cover on the sensor bracket. Also check the sensor cable connections within the control box. Remake if necessary.
Check that the sun is actually out and not obscured by cloud cover.

If the above doesn't help or if you experience anything different, then please contact our service department on the number in the front of this installation guide for advice.