Instromet Weather Systems Ltd

Stand Alone Rainfall sensor

Part number: 480 1000 186

www.Instromet.co.uk

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1) Introduction.

Thank you for purchasing an Instromet Weather Systems Ltd Stand Alone Rainfall Sensor.

This unit's purpose is to supply the user with a numeric record of the total rainfall measured by the external outdoor sensor.
The sensor counts droplets of rainfall via an infra red beam. With every 100 droplets passing through the beam equalling 1mm of rainfall

2) Package Contents.

Within the box you should find the following:

1 x External rainfall sensor
25m of 4 core cable
1 x 12v DC Adaptor
1 x Display

3) Contact:

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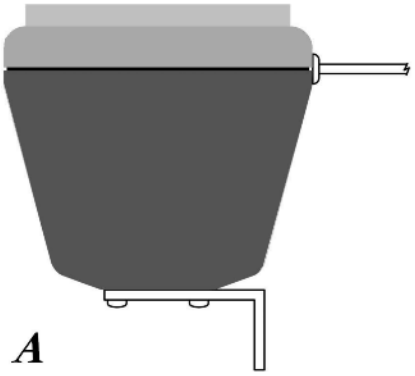
RAIN SENSOR INSTALLATION INSTRUCTIONS

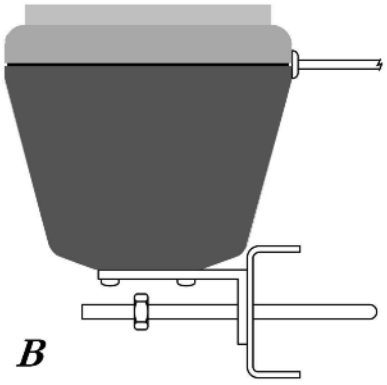
The rain sensor should, ideally, be situated at a distance of twice the height of local obstructions and mounted 30cm (12”) above ground level. This requirement can often be difficult or impossible to achieve due to surrounding bushes, tress etc. For most practical purposes accuracy will not be greatly impaired if the site is only a distance equal to the height of the obstructions.
It is important that the sensor is reasonably accessible as, from time to time, the filter will require cleaning.
Very often the top of a fence post provides an excellent site so long as it is firm, clear of bushes and trees above.
It is wise to avoid mounting on or near buildings which can cause wind turbulence and create dust.
Avoid also mounting near to transmitter aerials which can certain circumstances cause interference.

4) Outdoor sensor Installation



A) Rain sensor for post mounting (standard)

B) Rain sensor for mast mounting (additional kit required: 480 1000 125)



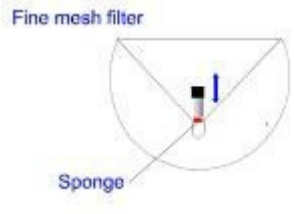
Screw the mounting bracket to a ***firm and rigid*** post, fence or wall ensuring that the funnel opening is absolutely horizontal. Ensure also there is at least ***5mm clearance*** between the ***bottom of the bowl and any surface below.***
To avoid the possibility of water running down the cable and into the sensor, it is important that the cable drops away from the bowl. Leave some slack in the cable beneath the sensor to facilitate cleaning.
Now lay out the cable to the control box avoiding close proximity to power and transmitter cables. Be very careful not to nick the cable when being clipped to walls etc. If the cable is to be buried, then run cable through plastic hose etc to avoid vermin biting through cable.

5) Outdoor sensor maintenance

From time to time dust and other foreign bodies will accumulate on the funnel filters.

To Clean;- carefully withdraw filter and sponge and clean under a tap.

Important – avoid touching the stainless steel mesh filter with bare fingers as this will deposit grease which may impair the flow of water.

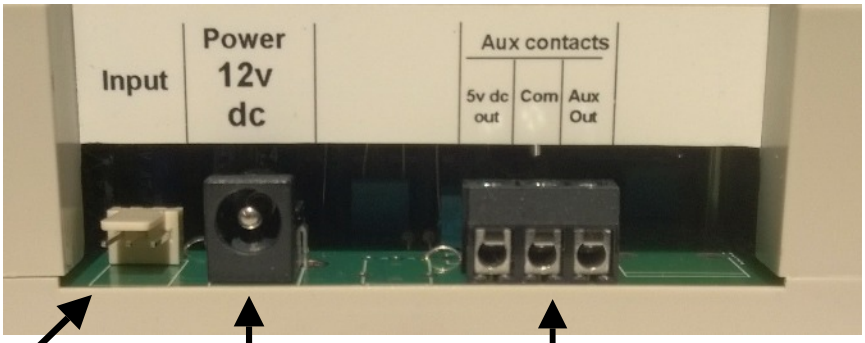


6) Wiring diagram

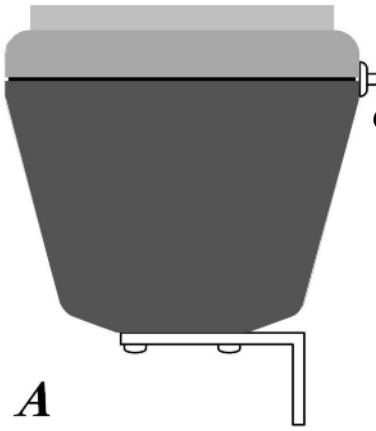
The Instromet stand alone rainfall sensor is quite simple to connect together.

Just connect the outdoor sensor to the terminal marked ‘Input’ via the three way plug on the sensor cable, and then just connect the 12v DC adaptor to the power connector.

The display should then illuminate and be ready for operation.



A = Outdoor sensor



Connect to input

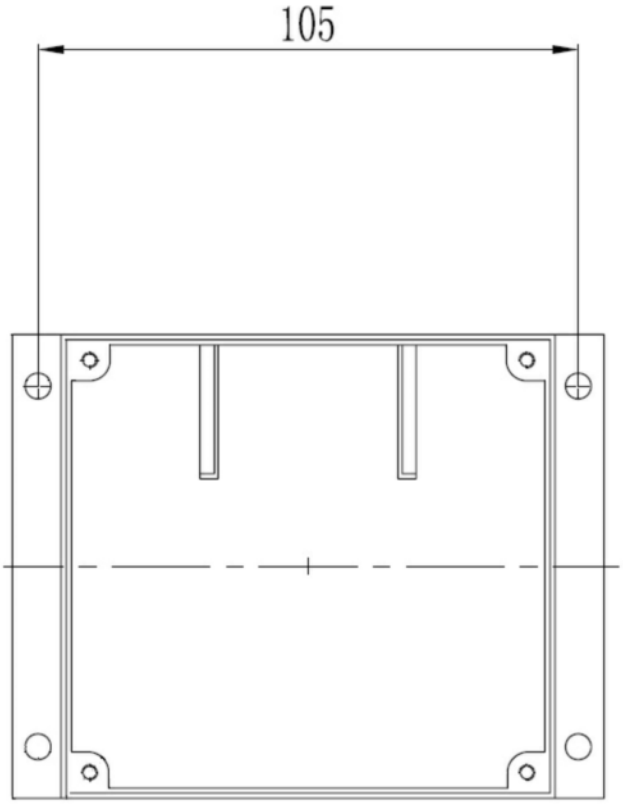
12v DC Plug in power supply 500mA PSU Supplied

Aux contacts for use with external logging equipment.

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

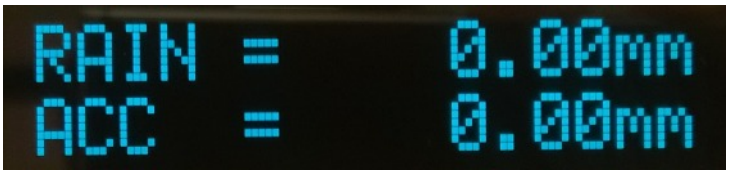
8) Display features / controls

The Instromet stand alone rainfall sensor utilises two main screens which constantly switch between themselves.

The first screen is the Time / Date screen and the second is the counter display screen.

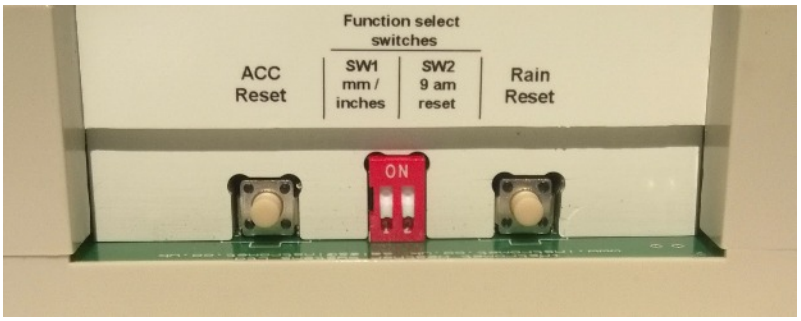
Time / Date screen

Counter display screen



Display controls.

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



9) Display operation

Time / Date.

In order to set the time / date, the use of the two buttons marked ‘ACC’ and ‘Rain’ 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 ‘Rain 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.

Rain / 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 9am Reset

When ‘SW2 9am Reset’ is switched to ‘on’, the ‘Rain’ counter will automatically reset back to zero at 9am each morning ready to start the fresh days rainfall record. When using this function, great care will need to be taken in making a note of the daily totals to ensure records are kept up to date.

SW1 mm / inches

As the switch label implies, this function switches the two counter readings between ‘mm’ (metric) and ‘inches’ (imperial)

10) Troubleshooting guide

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

1) Display dead – Check the 12v DC power adaptor plug is firmly connected to the display power input.
Also check that the DC Adaptor is firmly connected and that the power is switched on at the wall.

2) No count is being recorded on the display. – Check that the rain sensor cable is firmly connected to the display input connector, if not then no count will be shown.

Rain Sensor
The Instromet Rain Gauge will provide superb performance and super sensitivity with a resolution of only 0.01 mm. Unfortunately this sensitivity comes at a small price – the need for regular cleaning of the funnel and filters. The frequency of this cleansing will to a large extent depend on the locality of the site. In very dusty areas, in times of predominantly dry weather, the gauge may well have to be cleaned once a month whereas cleaner areas may only require attention twice a year.

1. Cleaning the gauge
Before any tests are carried out the gauge must be checked for cleanliness.
Remove the sensor from the wall/post bracket **Beware;-** the funnel may have filled with water so there is a danger of spillage!
The wire gauze can be eased out carefully between thumb and forefinger. This will reveal a filter sponge filter. The sponge can be removed, preferably, with a pair of tweezers or small screwdriver.
At this point it would be advisable to wash the funnel and filters out with warm water and detergent, a small brush will be useful here.
It should now be possible to see a very small hole (1 mm diameter) in the centre of the funnel bottom. If not clear a piece of wire (eg a paper clip straightened out or a medium sized sewing needle) should be pushed through any mire that may have stuck to the bottom.
Once all is clean and water will pass through the gauge replace the filters and remount the gauge on its bracket. Check again that water passes through by emptying a teaspoon full of water into the funnel. It may take a minute or two but water should eventually drip out of the bottom.

2. Testing the gauge
Be sure to reset the Rainfall counter to zero before each test
Assuming that water has passed through satisfactorily as above, the unit can now be tested for accuracy.
What is required is to drip 5 ml of water into the funnel over a period of approximately one minute to simulate the rate of normal rainfall. Introducing large amounts of rainfall in one go will result in inaccurate results.
5ml of water introduced should produce a reading of 1.00 mm (±5%)
A 5 or 10 mm syringe is ideal as a measuring device as the water can be measured accurately and dispensed slowly. Alternatively, although less accurate, a 5ml medicine spoon will do the same job although controlling the rate at which the water is dispensed will be difficult.
3 Fault Finding
If the testing above results in no readings being recorded then the following procedures will assist in locating the source of the problem.
Reset the counter.
With a short piece of wire, connect to the Yellow wire in the three way plug, then short circuit several times to the Red terminal that also leads to the Rain gauge. This should result in a count on the display. If not; repeat the test ensuring that the power is on and if still no success the problem will lie in the display or cable/connections leading from the display. If the display counter has now advanced from zero then the cause of the problem will be due to either the integrity of the cable, connections, or the rain gauge itself.

To test the cable it must first be disconnected from the gauge. Remove the two securing screws from the underside of the aluminium bracket and then separate the two halves around the equator. Identify and unplug the cable from the printed circuit board.
Ensure the power is on and Reset the counter.
Using a short piece of wire (a paper clip suitably bent will suffice) short out several times the **Yellow and Red wires on the cable**. The wire link can be pushed into the appropriate holes on the connector if fitted. This should result in a count of several digits on the Rain display. If not, the cable is suspect and needs to be thoroughly checked. If the cable is buried beware of rodents who may have bitten through it. If a count is recorded then the problem is almost certainly the gauge itself. Inspect the printed circuit board for signs of corrosion. If nothing obvious is observed then introduce a small amount of water into the funnel and watch to see if it emerges in discreet droplets – be sure to keep the funnel top horizontal while carrying out this test. If the water does not emerge correctly try cleaning unit again. If all else fails to get the unit functioning then please contact the Instromet service department for advice.

(Contact details can be found on the contents page of this document)