AgriMet Weather Station

August 2015

Table of Contents

1 System Configuration

The AgriMet Weather Station has been designed to meet the need for a reliable weather station which is suitable for a range of agricultural applications.

The system is built up using the following components:
- ➢ Three piece aluminium pole set (3.6m)
- ➢ A753 addWAVE remote telemetry unit
- ➢ 460mA (4.8W) solar panel
- ➢ SDI-TRH combination air temperature and relative humidity sensor with radiation screen
- ➢ SDI_WS-WD wind speed and wind direction sensors with holders
- ➢ RG rain gauge.

As an option the following sensors may also be added:
- ➢ SDI-SR Lite solar radiation sensor
- ➢ SDI-LWS leaf wetness sensor
- ➢ SDI-TRHBP barometric pressure sensor

The station is designed to transfer data over the mobile phone network and should thus be installed in locations with mobile phone coverage on either the standard GSM or NextG networks.

2 Deploying the Station

2.1 Tools required for installation

To install the station you will require the following tools:

➢ Tarpaulin
➢ Large hammer (2kg)
➢ 8mm nut driver for hose clamps
➢ 13mm flat open ended spanner for exhaust clamp nuts
➢ 150mm side cutters (to trim cable ties to length)
➢ Spirit level
➢ Compass (and from maps, knowledge of correction from true to magnetic north for the site)
➢ Post hole digger and 25kg bag of pre-mix concrete (concreted base pole installation only).

2.2 Mounting Method

The completed station will be mounted on an aluminium pole set. Two versions of the pole set are available, one with a driven base pole, the other with a star picket. In either case the base pole / star picket can be driven into the ground or set in concrete. If you wish to use the latter technique, purchase a bag of pre-mix concrete prior to installation.

2.3 Unpacking

Check the contents of your package. You should have received:

➢ 1 off A753 addWAVE SDI telemetry unit
➢ 1 off 460 mA solar panel
➢ 1 off aluminium pole set
➢ Sensors as ordered.

2.4 Pre-Installation

Choose site for installation:

➢ This should be on flat ground and be as representative of conditions on the site as possible

➢ The site should have a clearance of 10 times the height of any up-wind obstacles and 5 times the height of any down-wind obstacles.

Unpack the station:
➢ Remove the station from its packing and lay it on the ground on the tarpaulin
➢ Unpack the pole set and identify the components:
   • Base pole:
      Aluminium base pole: a 0.6m length of aluminium tube with a pointed tip at the bottom
      Star picket base pole: a 0.9m galvanised star picket with two off exhaust clamps and 2 stainless steel wing nuts
   • Centre section: a 1.4m length of tube with a tapered section at the bottom and a set of slots cut into the top
   • Top pole: a 1.4m length of tube with a tapered section at the bottom and a plain top.

Mark poles at sensor heights
➢ Lay out the base pole components on the ground
➢ Mark the poles at the heights for the various sensors
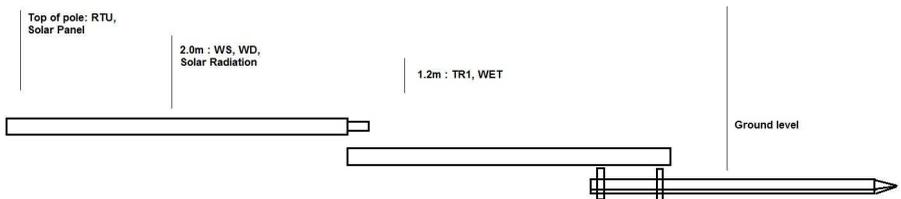
2.5 Install base pole
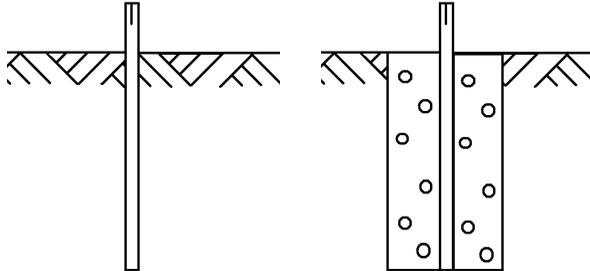
2.5.1 Aluminium base pole

Install the base pole

Fig 2: Base pole installation options

➢ Driven Base Pole:
- Locate the base pole and installation dolly
- Place the dolly in the top section of the pole and secure it with one of the hose clamps supplied with the unit
- Using the hammer, drive the base pole into the ground, stopping regularly to check with the spirit level that the pole is vertical. Stop when there is 100mm above ground level. Note that in tight ground this will be easier if you auger a hole first using a 25 to 30 mm auger
- Undo the hose clamp and remove the installation dolly

➢ Concreted base pole:
- Using the post hole digger, auger a hole to a depth of 0.8m into the ground
- Set the base pole in the hole and pour in the concrete – you can make a wet mix or, if the soil is wet, use a dry mix and allow it to absorb water from the surrounding ground. Check with the spirit level to ensure that the base pole stays level.

2.5.2 Star picket base pole

The top and third holes in the base pole have been clearance drilled to accept the exhaust clamp bolts. If you wish to use different holes, drill them out to suit.
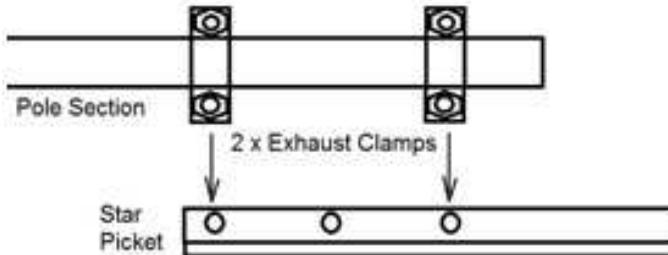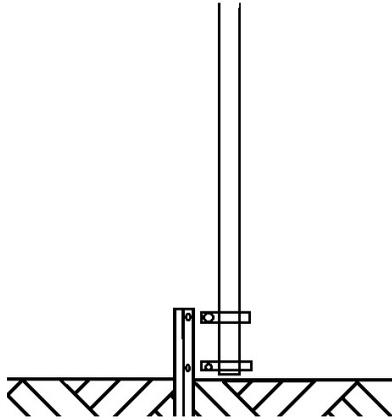

Set up the hose clamps:
- ➢ Lay the star picket and centre pole on the ground alongside one another
- ➢ Slide the two exhaust clamps up over the centre pole section and line them up with the first and third holes on the star picket
- ➢ Push the u-bolt thread through the star picket and loosely fit the wing nut to the end of the thread
- ➢ Using a slim-line open ended spanner, tighten up the two nuts on the exhaust clamps (if you do not have a slim spanner, tighten the nuts finger tight, then carefully remove the wing nut – ensuring the clamps do not move – and tighten the nuts)

Install the star picket:
- ➢ Drive the star picket into the ground, leaving 600mm above the surface
- ➢ As you drive it in, check regularly with a spirit level to ensure it remains vertical.

➢

2.6 Install RTU

Mount the RTU and solar panel:
- ➢ Identify the pole which you will be using as the top section
- ➢ Remove the A755 and solar panel from their packaging and secure them back to back on the top pole using the hose clamp found in the carton
 - • Set the top of the A755 level with the top of the pole
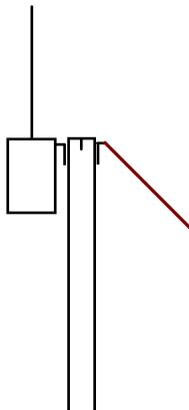
2.7 Install Sensors

Wind speed and direction
➢ The wind speed and direction sensors should be mounted on the holders and set at a height of 2m above ground level
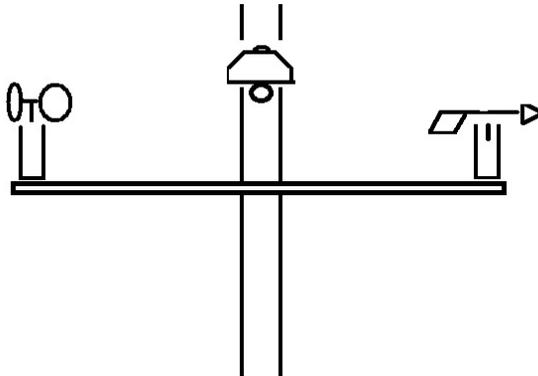
➢ Carefully unpack the two sensors from their boxes
➢ Fit two hose clamps over the top of the pole and insert the WS on the east side and the WD on the west
➢ Tighten the clamps to the point where the just start to lock
➢ Adjust the two holders so the arms are in a straight line and finish tightening the hose clamps
➢ Align the wind direction sensor so that the mark on the body faces true north
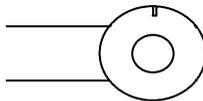
➢ Slide the u-brackets up over the pole and, after aligning the bracket in the correct orientation, tighten the clamp nuts.

Solar Radiation (where fitted):
➢ solar radiation sensors should be installed at a nominal height of 2m above ground level

➢ as the wind speed and direction sensors are installed at this height, the solar radiation sensor should be mounted 200m below that and with the sensor facing north.
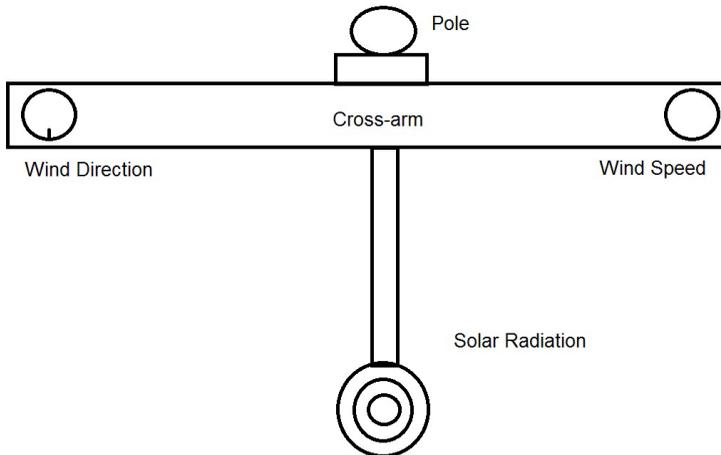

Air Temperature & Relative Humidity
➢ The SDI-TRH sensor is nominally installed at a height of 1.2 m above ground level
➢ Follow the assembly instructions in the SDI-TRH sensor manual to assemble the radiation screen
➢ Mount the screen to the post using the u-bracket and the supplied screws

Leaf Wetness
- ➤ The leaf wetness sensor should be installed at the typical canopy height
- ➤ You may need to move the sensor up and down as the crop grows
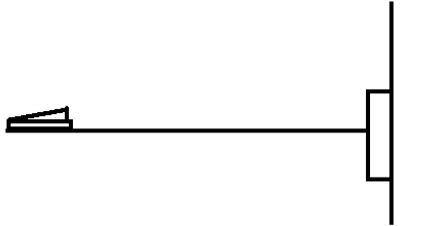
Assemble the station
- ➤ Fit the tapered end of the centre pole section into the top of the base pole and secure it into position using a hose clamp
- ➤ Fit the tapered section of the top pole section into the top of the centre pole, place a hose clamp around the join and tighten the hose clamp until you feel some resistance (but so the pole section can still rotate)
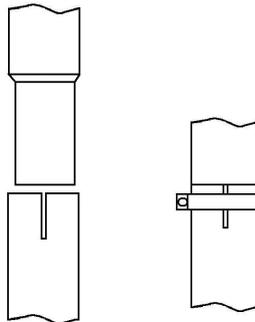
- ➤ Rotate the top pole section so that the solar panel (and hence North orientation on the sensor) point to true north and tighten the hose clamps

➢ Using the cable ties supplied with the station, tie the surplus cables neatly to the pole.

Start the station logging:
➢ Plug the 5 pin male Binder plug from the solar panel into the socket marked POWER on the bottom right corner of the A755 telemetry unit
  • The A755 will connect to the GSM/GPRS network and begin transferring data
➢ Contact your distributor to confirm that the unit is operational
➢ For details on how to access the data refer to the Remote Access for addVANTAGE Pro 6 manual.

NOTE: The unit will not record any data unless the solar panel is plugged in.