

Advisory Unit Weather Reporter FAQ

New or About to purchase

Siting (see also maintenance)

- The recommendation is a south facing aspect, preferably above the top of the building giving free view of sunrise (east), and sunset (west).
- The proximity of building features, chimneys etc will give rise to 'local' weather.
- The supplied cable is 10 metres long. This can be extended to a max. of 100 metres. The P&H module should remain within 10 metres of the power supply at the PC end of the cable.
- The WR comes with a plug in mains power supply providing the required 12v.

Does it require a computer?

- A computer is only required to view/download data stored in the mast.

*** The provided data cable requires a 9 pin serial port, if you do not have a serial port then you can use a USB/Serial convertor. Install this following the manufacturers instructions, but then check which serial port it has installed, this is often COM3 or COM4, use the WR configuration menu to select this port. Contact the Advisory Unit for a recommended and tested USB/Serial convertor.

*** If the software is being used under XP SP2 with the Firewall enabled (recommended) then the WRreader software will have to be added to the Program Exceptions. This is so it can accept incoming requests from the WRviewer software for data.

*** If the WRreader software is being used to upload data to a website you will also have to open port FTP port 21.

For how long is this data stored?

- Data is stored continuously. Old data is overwritten at the end of its 60-hour (hourly) or 58 day life (daily).

Can I save the data automatically?

- Yes- if you are able to leave a computer attached and running the software provided can be configured to save at 24 or 48-hour intervals.

Do I need a new data file each time I save data?

- No - you can save to the same file; the WR software will look at your existing file and merge the new data so as not to duplicate records.
- It is a good idea for instance to save to a new file for each month. July99.hwd would contain the

hourly data for at least the whole of July 1999.

Does the WR work on a network?

- Yes and No! **** The WR hardware can only be attached to one machine; this can view Weather Now and be used to download the hourly and daily data. Once downloaded data can be viewed on any computer with the software, which is provided with a licence entitling you use it as many times as you require on one site.

**** But see the WR Extension pack for Software to work across a network and the Internet, as well as Windows NT, 2000 and XP.

**** On an RM CC3 network with XP SP2 you will need to make two changes to the firewall using Type Manager.

Add a Port Exception :- 21:TCP:*.enabled:WRreaderFTP

Add a Program Exception :- c:\Program Files\Advisory Unit\Weather Reporter Extension Pack\Reader\WRreader.exe

(modify to match the actual path on your installation)

Existing -

I have upgraded to the WR Extension Pack and now I cannot connect to the Weather Station.

- Due to a total rewrite of the software from the previous versions, and the speed of modern machines it is sometimes difficult to 'wake' the weather station up, you can manually adjust a value to take care of this.
- Look in the folder with the Reader software and load the file called wr.ini in to Notepad.
- Read down until you reach a section titled [Other]
- Look for Pre_Read_Delay=xxx (where xxx can be any value from 20 upwards)
- change this value to 1200 save the wr.ini file and restart the reader software
- if it still fails, increase the value again, in steps of 50
- **Do not change any other values without first consulting the Advisory Unit helpline**
(01707 281102)

It doesn't work!

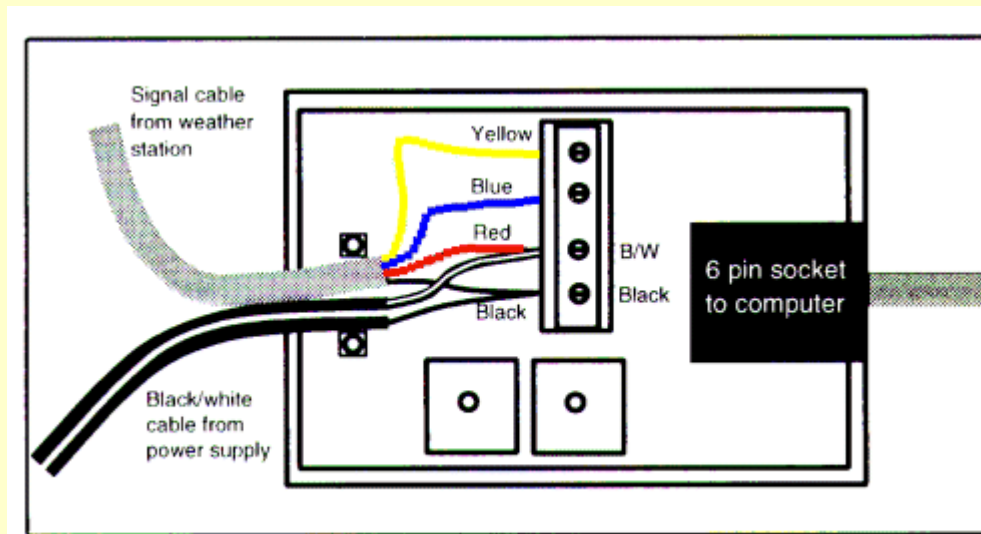
Has anything changed?

- For instance has the software been moved to a new computer?

- Was the cable from the WR classroom box removed and replaced?
- If so is it back in the same socket?
- Try looking in the set-up /configure menu to see which port the software thinks the WR is attached to.
- Try the WR cable in another serial port if the computer has more than one.

It's the hardware!

Check simple things first.



Connecting the wires in the Classroom Box

- Is the power supply working?
 - A simple test is to touch the casing and feel its temperature - they generally run fairly warm (some would say hot). Stone cold means it is dead.
 - If a P&H module is installed then voltage is more critical, either rewire to by-pass the P&H module and try again, and if a voltmeter is available remove the top from the classroom box (safe inside only v. low voltage) by unscrewing the four tiny lid retaining screws. Inside is a small Printed Circuit Board (PCB) this has a four way screw terminal block fixed to it.
 - Follow the wires from the power supply, they should be attached to two adjacent terminals, with other red and black wires attached. Test across these two - expect at least 12 volts (dc). Anything lower will stop the P&H working. Without P&H the mast will work down to about 7 volts.
- (Consult) Replacement Power Supplies are available.
- If the voltage looks OK, do a visual check of the wiring from the classroom right up to the mast. It is surprising what can happen up a school wall and on a roof.
 - Try a restart. Turn off the power supply. Leave for a minute. Turn back on. Rerun the software, go to the configure menu and tick the box to send the current time and date.

When I change the Port in set-up I get a message on the lines of 'port in use'. What does this mean?

- Exactly what it says - you have attempted to select a COM port not available to you, usually because the mouse is plugged in to it.

I make changes to the colours, set-up etc in the Windows WR software but they are not saved, what am I doing wrong?

- Nothing - this information is saved in a file called WR.INI, if this file has been protected by the person who installed the software or set up the machine you may not be able to change the settings without first consulting them.
- The WR.INI file is normally stored in the same directory as the WR program, if it is not there look in the Windows directory.
- Normally from Windows Explorer you can select the file and look at its properties, it should not be 'read only' if you are going to change it.
- I cannot see the Configuration menu.
- See above for the location of WR.INI. Load this file in to Notepad and look for the entry 'Hide Configuration=YES' change the YES to NO. Close Notepad saving the file. You should now have the menu next time you start the WR software.

Can I set the sensor default value?

- Only the Pressure Sensor requires setting, this can be done once the WR is installed and working, obtain a local pressure reading (Try the BBC weather site) . Run the WR software and go the configure menu, type in the appropriate value. The WR software obtains a reading from the Pressure module and compares the two values writing back to the WR.INI file.
- On a Network you will have to be an Administrator in order that this value is written to a normally read only area of the network.

I can see gaps in my data?

- These are caused by a shutdown of the WR processor and will be shown as a physical gap in the displayed graph and two consecutive time (hourly) or date (daily) stamps. This is done to make it clear when viewing the data that the data at this point is invalid.

When I view the hourly / daily readings I can see a higher / lower daily reading for temperature than that shown by the hourly data.?

- This can be quite correct, hourly readings are just that - a 'snapshot' of events around the hour, whilst daily readings are continuously monitored maximum and minimum and may well differ by a few degrees.

Can I adjust the readings?

- Apart from setting the default pressure no. You can of course save to a CSV file and alter the data in any way you like within a spreadsheet, possibly proving how long and hot that wet summer really was.
- It is important to remember that the WR is not a Stephenson screen, but like that can be affected by local conditions. Local ground level readings will always be different to those collected 20 feet up in the air on top of a reflective roof.
- Collecting readings using the WR and comparing with those from other sources is an important educational exercise (compare and contrast!)

Maintenance.

Rain - if no readings are obtained it is possible that there is a blockage in the funnel.

Go to the WR armed with a water container and a thin wire (paperclip unwound).

Pour water in whilst gently prodding down the funnel to effect a clearance.

Be gentle, the stainless steel wire on which the mechanism pivots can be bent at this stage and will destroy your chances of making it tip reliably.

It should be possible to hear the 'see-saw' tipping as you pour water in, and the water coming out should be in small spurts rather than a continuous rush.



If this fails the plug in the bottom of the rain water collector can be removed to allow access.

Try moving the see-saw by hand, it sometimes gets held up by spider's webs. If the funnel has rotted but moving the mechanism by hand works it is possible to obtain replacement funnels complete with rubber teat on the end to control the flow of water.

The light (infrared) sensor can be cleaned with a cloth; it should look like a small black plastic cube sticking out of the metal cross-arm.



If the Wind-vane and Anemometer require attention you can push the anemometer off its bearings by pushing upwards against it with your thumbs. This will expose the printed circuit board, and show the top of the wind-vane. The printed white circles on the top of the wind-vane can be cleaned using a cotton bud. Ensure that it is fully seated on its bearing, leaving a few millimetres between the painted surface and the sensors on the underside of the circuit board.

Clean the inside of the anemometer, it is half-white and half-black.

Re-assemble carefully ensuring that the wind-vane is not lifted whilst you push the anemometer back onto its bearing.

If you have a helper you can check the wind-vane by loading the *Weather Now* option and watching whilst rotating the vane to known positions. Spinning the anemometer will also show on this display.



Without special equipment it is not possible to test the light sensor. This is an Infrared collector whose output is used to detect sunrise/set by a change in the IR radiation above or below a threshold level.

An article on Weather data collecting Guidelines for optimal siting of sensors

Temperature

The international standard height for measurements of air temperature is at 1250mm or about four feet above ground level. Temperature can vary by a surprisingly large amount with height above the ground under certain weather conditions, and it is essential that the 1250mm sensor height is used for comparability with official figures. Ground level or soil temperatures should be measured with separate sensors if required. The sensor must also be protected from both direct sunlight and rainfall if wildly erroneous temperature values are to be avoided, which is usually achieved by placing the sensor inside the familiar white louvered housing of the Stephenson Screen. Temperature probes from the main AWS makers are available with their own integral screens, which are usually smaller and less expensive than the standard Stephenson model. The sensor should also be positioned away from any nearby potential sources of heat such as buildings and brick walls, in a position where free circulation of air can occur, and over a natural surface - grass is recommended (other surfaces such as concrete can cause significant error). As with all sensors, the more accurate your observations are required to be, the more care must be taken over exact siting of the sensors.

Humidity

The humidity sensor is usually mounted alongside the temperature sensor in most commercial AWS systems and does not therefore have its own independent siting criteria. Where a separate sensor is used, the same guidelines as for temperature sensor siting are recommended. NB Humidity is not measurable to high accuracy (typically $\pm 5\%$) by standard electronic sensors and is often limited in practice to the low 90s (%) as a maximum reading.

Wind speed and direction

Wind speed and direction are dramatically affected near to ground level by all physical obstructions, for example undulating countryside and hills, buildings, walls, trees etc etc. Even in a flat, unobstructed location, wind speed is markedly reduced close to ground level simply by the frictional effect of the ground surface. For these reasons, the official sensor height for recording wind speed is 10m above ground level in a clear unobstructed location. In practice, it is often impossible for the non professional weather observer to achieve anything like a suitable exposure of the wind sensor, unless they live in a very rural location or e.g. on a farm or a school with large playing fields. The recommendation is therefore simply to place the anemometer as high as possible given the domestic circumstances and to accept that the readings will almost certainly be significantly lower than would be measured by 'official' observations at the same location. The sensor readings will still be valuable as part of the continuing record of weather at that site, but will not be directly comparable with official records of for example maximum wind speed and gusts during a gale. Often the exposure will be worse from a certain direction and the obvious advice is to aim for maximum exposure of the sensor to the commonest wind directions. Note that height above obstructions rather than height per se is the criterion. An anemometer placed at roof level on a house will often misread because of wind swirling around the roof structure. The sensor

should be placed as high above the roof structure as it safely and economically can be, to avoid potentially turbulent air below.

Rainfall

Rain rarely falls vertically, but is usually blown to a greater or lesser degree in the wind. For consistent and accurate measurements it's therefore important that the rain gauge is located in an open area, for example a large lawn, where nearby objects such as buildings, walls and trees won't deflect the entry of wind-blown rain into the gauge. Rain shadow effects can be surprisingly large and the standard recommendation is that the gauge be positioned at a distance corresponding to two to four times the height of any nearby obstruction. Where this is difficult to achieve, providing good exposure to the most common directions of wind/rainfall should be the priority. Gauges should be positioned in a flat area, away from any obstructions such as fences which might cause air turbulence and consequent non-uniform deposition of rain droplets. It is recommended that the rain gauge be placed at ground level (i.e. not on a roof), but with the rim of the gauge at least 300mm above the ground surface. Most rain gauges for automatic weather stations are of the swinging bucket type, which must be installed in an accurately horizontal plane for correct operation.

Pressure

Since barometric pressure does not vary across a local area at uniform altitude, pressure is generally measured by a sensor inside the AWS console and not by an external sensor. Consequently, there are no major concerns about siting the pressure sensor, other than to be aware that its accuracy is only specified over a limited temperature range. Note that pressure reduces by about 1mb for every additional 32 feet of elevation and it is therefore essential to know the altitude accurately of the AWS base location. Pressure is also relatively easy to check and to calibrate.
