

Weather Reporter Mark III
Extension Pack Manual
2007 version



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Computers in Education

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Introduction

The complete Weather Reporter package comes ready to install at your site and includes:

Hardware

- a fully assembled automatic weather station with wind vane, anemometer, sensors and rain bucket
- 10 metres of signal cable
- a serial PC lead
- power supply
- fixing brackets (optional)
- 100 metres of signal cable (optional)

Software

- Weather Reporter Reader
- Weather Reporter Viewer
- Web examples with Microsoft ASP and PHP

Curriculum Materials

Teaching support materials for the Weather Reporter in pdf format.

Weather Reporter Extension Pack Manual

- This manual is provided in pdf format.

The materials and manual may be viewed and printed out using Acrobat Reader © Adobe Corporation

The Weather Reporter has been designed and manufactured to high standards by Aardware Design, Surrey. The software and materials have been written by AU Enterprises Ltd, Hatfield.

If technical support is required, contact AU Enterprises Ltd. <mailto:sales@advisory-unit.org.uk>

What the Weather Reporter Does

Once fixed in place, preferably in an exposed position on a building, you have a fully automatic datalogging weather station which will continuously record:

- wind speed
- wind direction
- temperature
- hours of sunshine
- hours of daylight
- rainfall
- pressure
- humidity

It needs minimum maintenance and will continue to give accurate readings comparable with Meteorological Office data in all weathers.

To see the weather you only need to attach the serial lead from the Weather Reporter classroom box to your computer (or server) and run the software provided with the Weather Reporter.

Graphs of the weather can now be displayed on your computer screen.

Saving weather data manually

Detailed weather information is stored in the Weather Reporter mast. You can save the either or both sets of hourly and daily weather data in a file to use later. **The Weather Reporter only needs to be connected to the computer when you want to look at the data or download the data.**

Automatic data transfer

The Weather Reporter needs to be plugged into a computer all the time for automatic data saving and transfer. The Weather Reporter Reader module can be set to save current hourly and daily weather data and to upload this data to your school web site, along with Weather Now screen pictures saved by the Viewer module.

Testing and Installation

Here are the guidelines which must be followed before installation in order to obtain optimum readings from the instruments on the Weather Reporter.

Checking the Weather Reporter system

It is important that the system is checked before it is installed in its final place. The Weather Reporter is manufactured to high standards and is fully tested before it leaves the factory. This check is to make sure that no damage has happened in transit, and that all the connections that you make are working successfully.

Unpack the Weather Reporter

You should have:

- the main Weather Reporter with 10 metres of signal cable
- the anemometer
- the junction box
- serial cable
- power supply and plug
- Weather Reporter CD-ROM with software, curriculum materials and manual
- 100 metres of signal cable (optional)
- fixing brackets (optional)

Weather Reporter software modules.

There are two modules (i.e. two separate programs) with the Weather Reporter. The **Reader** module and the **Viewer** module.

The Reader module:

- Collects data from the Weather Reporter mast;
- Transfers weather data to any network station;
- Allows weather data to be saved automatically on disk or uploaded to your web site;
- Allows graph screens saved by the Viewer to be automatically uploaded onto web site.

The Viewer module:

- accepts weather data from the Reader either on a stand-alone computer, across a network or via the world wide web;
- displays current hourly and daily weather data on graphs;
- displays 'live' current weather updated every 7 seconds;
- displays hourly and daily weather data previously saved in Weather Reporter format (hwd or dwd) or CSV format;
- allows automatic saving of Weather Now screen every 7 seconds;
- allows manual saving of Hourly or Daily data and screen images.

Installing the software

The software is designed to be used on network, but for testing purposes it is best to use a single computer and install both the Reader and the Viewer modules on one machine. Guidance for network installation is on page 24.

Insert the Weather Reporter Extension Pack CD-ROM into the drive. It should autoload and take you through the installation process.

If the CD-ROM does not load automatically, then go to **Start, Run** and **browse** to your CD-ROM drive. Click on **Wrcdinst.exe**, then **OK**.

Assembling the Weather Reporter system

Step 1

Push the anemometer carefully, but firmly, onto the top of the Weather Reporter pole. Do not lift the wind vane. Make sure that the wind vane and the anemometer move freely.

Step 2

Connecting the cables to the Classroom Box

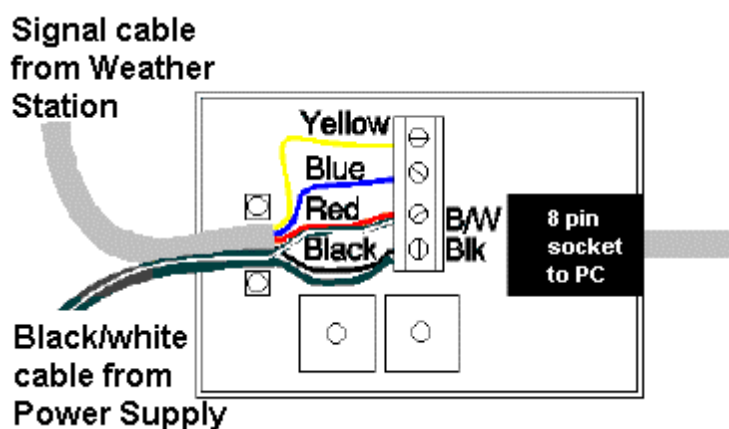
Following the colour codes, attach each separate coloured wire of the signal cable and power supply to the correct terminals in the junction box. The signal cable has four coloured wires; the power supply has a black/white and a black wire.

Twist the black/white power supply wire round the red signal wire and connect to the red terminal.

Twist the black power supply wire round the black signal wire and connect to the black terminal.

Connect the yellow signal wire to the yellow terminal.

Connect the blue signal wire to the blue terminal.



Step 3

Setting up the system

- Install the Weather Reporter software on your computer and have ready the Weather Reporter System with the cables connected.
- Plug in the power supply of the Weather Reporter into the mains and switch on. The Weather Reporter is now recording.
- Plug the serial lead into the classroom box, and the other end into the serial socket of the computer.
- Turn the Weather Reporter pole until the cross bars are pointing north/south and the rain gauge is facing west.

Step 4

Checking the sensors

Load the Reader module (see Step 9) and then the Viewer module. As you are testing the system on one computer ignore the message to enter the Reader address by pressing the Enter key.

The Weather Now screen displays the weather as it is happening. Any changes are recorded on the bars within about 7 seconds.

Temperature

Rest your thumb over the temperature sensor which is recessed into the end of the cross arm. The temperature should rise.

Wind speed

Spin the anemometer and watch the wind speed bar alter.

Wind direction

Rotate the wind vane. If the Weather Station is correctly orientated it will indicate the direction from which the wind is blowing. If the wind does not register, make sure that the anemometer is pressed firmly into place and that the wind vane turns freely.

Rain

Slowly trickle some water into the rain gauge. It will fall through and activate the tipping bucket mechanism. Listen for clicks as the bucket tips. The rain measurement is cumulative, so do not expect the reading to go down when you have finished pouring water.

Sunshine

This takes a long time to test, as the number of sunshine hours is recorded. (not indoors)

Pressure and Humidity

You can configure the pressure and humidity later when the Weather Reporter is installed.

Everything OK? Then install the Weather Reporter on site.

Siting the Weather Reporter

The Weather Reporter mast should be installed in a prominent position on a building. The sensors must be above the parapet of a flat roof, or attached to a (redundant) chimney. This will be well away from casual interference. The mast should be accessible, as it will need to be checked from time to time.

In order to gain the maximum possible readings for sunshine, daylight and rainfall, it should be sited in an exposed position away from any other overshadowing buildings or tall trees. Take care to site the Weather Reporter in a position that is not going to suffer too much from man-made changes in weather. For instance, there have been cases where the Weather Reporter has been sited above heating outlets.

The site must not be too far away from your internal power point. Ten metres of signal cable are provided, but more is available if necessary. However, the maximum cable run is 100 metres.

According to your site, you may need an extra pole or brackets. The Weather Reporter is designed to be compatible with standard TV aerial mounting accessories.

Installing the Weather Reporter on site

It is important that the system has been tested before installing it in place. It is also convenient to be able to reach the Weather Reporter without too much difficulty should any maintenance be necessary.

Step 1

Fixing the pole

Clamp the Weather Station pole firmly to mounting brackets or pole according to the chosen site.

Step 2

Orientating the Weather Station

Make sure that the cross bars are pointing north/south with the rain gauge facing west.

Step 3

Checking the Weather Station

When the system has been installed check that:

- the bucket on the rain gauge tips freely (listen to the tips when water is poured through)
- the anemometer rotates freely. If it has not been seated correctly there is a danger that it will lift off. *If by any chance this happens, immediately cover the exposed top of the mast with a plastic bag to exclude moisture from the electronics in the mast.*
- the wind vane rotates freely and is fully depressed onto its bearings.

Step 4

Running the cable

Run the signal cable from the Weather Reporter into the building through a suitable aperture such as an air brick or window frame. This cable must be fixed at intervals if necessary.

Step 5

Connecting the signal cable to the classroom box

Connect the end of the signal cable to the connecting block inside the junction box attached to the power supply. Following the colour code carefully attach each separate coloured wire of the signal cable to the correct terminal. (See page 7 for details.) Double check that each wire has been correctly attached.

Step 6

Starting the Weather Reporter system

Plug the power supply into a mains socket and switch on. The Weather Reporter will now start recording. The provided power supply runs at 14 volts.

NEVER SWITCH THE MAINS PLUG OFF!!

Data is only collected whilst the power is on, but stored data will not be lost during a temporary power failure.

Step 7

Connecting the Weather Reporter to your computer

Plug one end of the serial cable into the serial port (sometimes labelled RS232) of your computer and the other end into the socket on the junction box. Some computers have two serial ports, but you can choose which one to use. If you are running the Weather Reporter on a network it may be connected to the server or to a station. If you have a computer with USB ports instead of serial you can use a USB/Serial adaptor.

Step 8

Configuring the Weather Reporter

This allows information to be sent to the Weather Reporter mast to set up the station. This option is only available when the Weather Reporter Reader is not downloading data from the weather station, but requires the serial lead to be plugged in so that there is a connection between the computer and the weather station. So click the **Disconnect** button if it is visible on the menu bar.

The options available are:

Port

This is the connection between the weather station and the computer via the serial lead from the classroom box. The most common setting is COM1, but if you have a serial mouse that is plugged into this port, then the weather station should be connected to the COM2 serial port. To change the serial port, load the wr.ini file and alter the serial port number then save the new setting.

Date and time

The date and time are read from the computer, so make sure that they are set correctly. Click on the box to send the current date and time to the weather mast.

GMT or BST

Choose either Greenwich Mean Time or British Summer Time.

Pressure calibration

The pressure sensor is the only device that needs setting up on site. All the other sensors

are calibrated during manufacture. You need to find out the pressure at your site when the weather station has been installed on the roof. To do this consult this web site:

www.bbc.co.uk/weather

Enter the school's post code to get the forecast, which includes current pressure in millibars. Type this figure into the pressure calibration box. If on a network, you must have write access to wr.ini which is in the same directory as the Reader software.

Total reset

This adjusts the system to the new settings, and removes all the previous ones.

Step 8

Getting data from the Weather Reporter

When you have finished configuring the Weather Reporter, click on the Connect button to get data from the weather mast, you should see a progress bar for Daily and Hourly data. Then load the Viewer module.

Step 9

Checking the Weather Reporter system

Load the Viewer module and select the Weather Now screen. Check that the screen updates after a short wait and that it continues to update every 7 seconds. The data may not look correct until the Weather mast has been running for a few hours in order to create maximum and minimum values.

Congratulations! You now have a fully functional Weather Reporter that will record day and night for years to come.

Using the Weather Reporter

Getting started on single computer

Load the Reader and the Viewer modules. When asked for a Server Address, just press the enter key to move on. The Weather Reporter should be connected to the serial port if you want to see current data.

Getting started on a network station

Load the Viewer module. The Reader module should be running on the server or another computer, and the Weather Reporter plugged onto this computer if you want to see current weather data.

There is guidance for network managers on setting up a network station to receive 'live' weather data on Page 24.

The main toolbar in the Viewer

'Live' weather (Weather Now), current hourly and daily data can be loaded into separate windows using the buttons on this toolbar. The data is downloaded from the Weather Reporter most by the Reader module. You can also load a file of hourly or daily weather data that has previously been saved from the Weather Reporter. Any of the current screens can be printed out.



Collect and display
Weather Now



Collect and display
graphs of current daily
weather



Collect and display
graphs of current hourly
weather



Open a file of
weather data

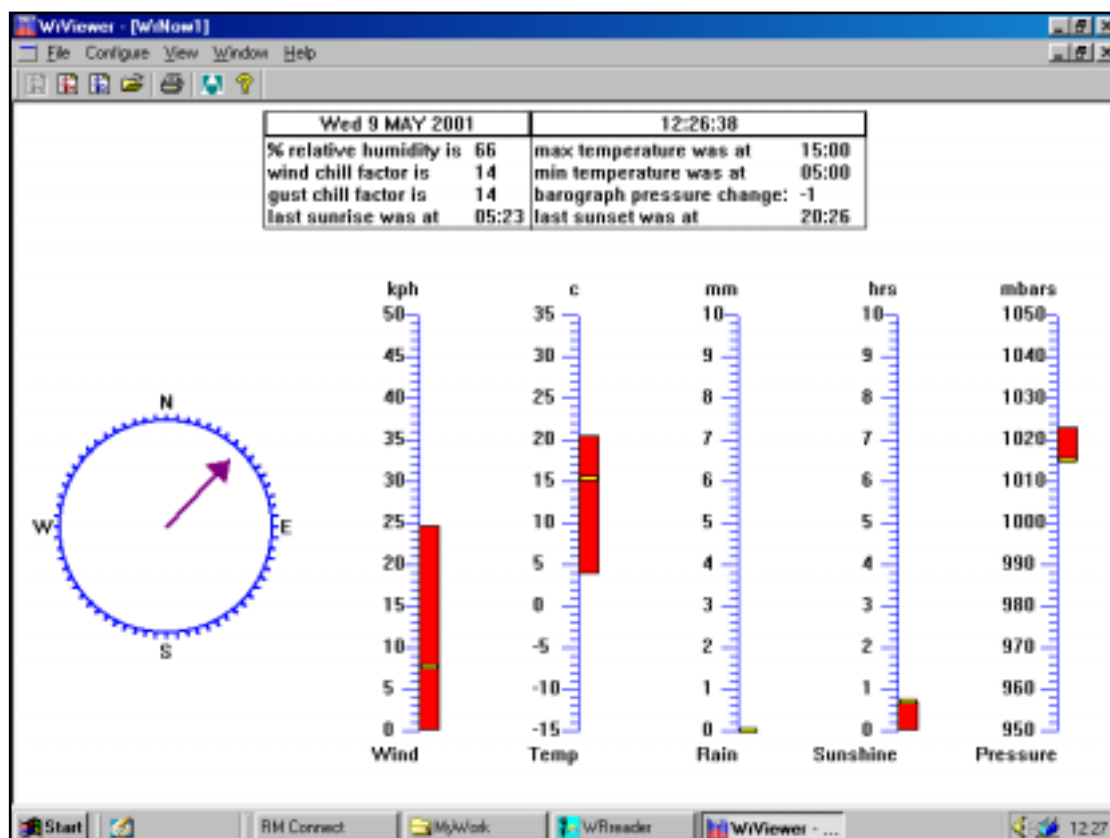


Print the weather graphs



View Weather Now data

Click on the Weather Now button to display this screen. Weather Now is only available when the Weather Reporter is connected to the computer with the Reader running. Weather information is downloaded to the network station and is updated approximately every 7 seconds as the weather changes.



The Weather Now screen

Weather Now scale bars

- wind direction on a compass rose
- temperature in degrees Celsius
- sunshine hours since sunrise
- wind speed in kilometres per hour
- rainfall in millimetres since midnight
- pressure in millibars

The shaded areas on each scale indicate the maximum and minimum values over the last 24 hour period. The short horizontal line indicates the current weather.

These readings are shown in figures: date and time; relative humidity; wind chill; gust chill; time of maximum and minimum temperature in the last 24 hours; pressure change over the last hour; latest sunrise and sunset times.



Collect and display current hourly weather

Click on the Hourly data button to download the current hourly data from the Reader Module. The data is shown on graphs and is a summary of the data collected and stored within the Weather Reporter for each hour over the last 1,488 hours. Each item can be displayed as a line or bar graph.

Displaying hourly data

Click on the buttons to show the graphs.



Temperature in degrees Celsius



Wind speed in kilometres per hour



Rainfall in millimetres



Wind gusts in kilometres per hour









Pressure in millibars



Relative Humidity as a percentage

The current scale is always shown on the left of the graph. To remove a graph, click the button again.

Organising the graphs

Drag the vertical line across the graph (or use these   buttons) to show the data for each hour. The up and down buttons or   Page Up and Page Down to reposition the last graph on the screen. Press the  and  buttons to resize the last graph.

Printing the graphs

Click on the **Print** button on the **Viewer** toolbar for a copy of the active screen. Choose **File**, **Print Setup** and **File Preview** on the **Viewer** menu to alter the printer and check the printout.

Changing the graphs of hourly data

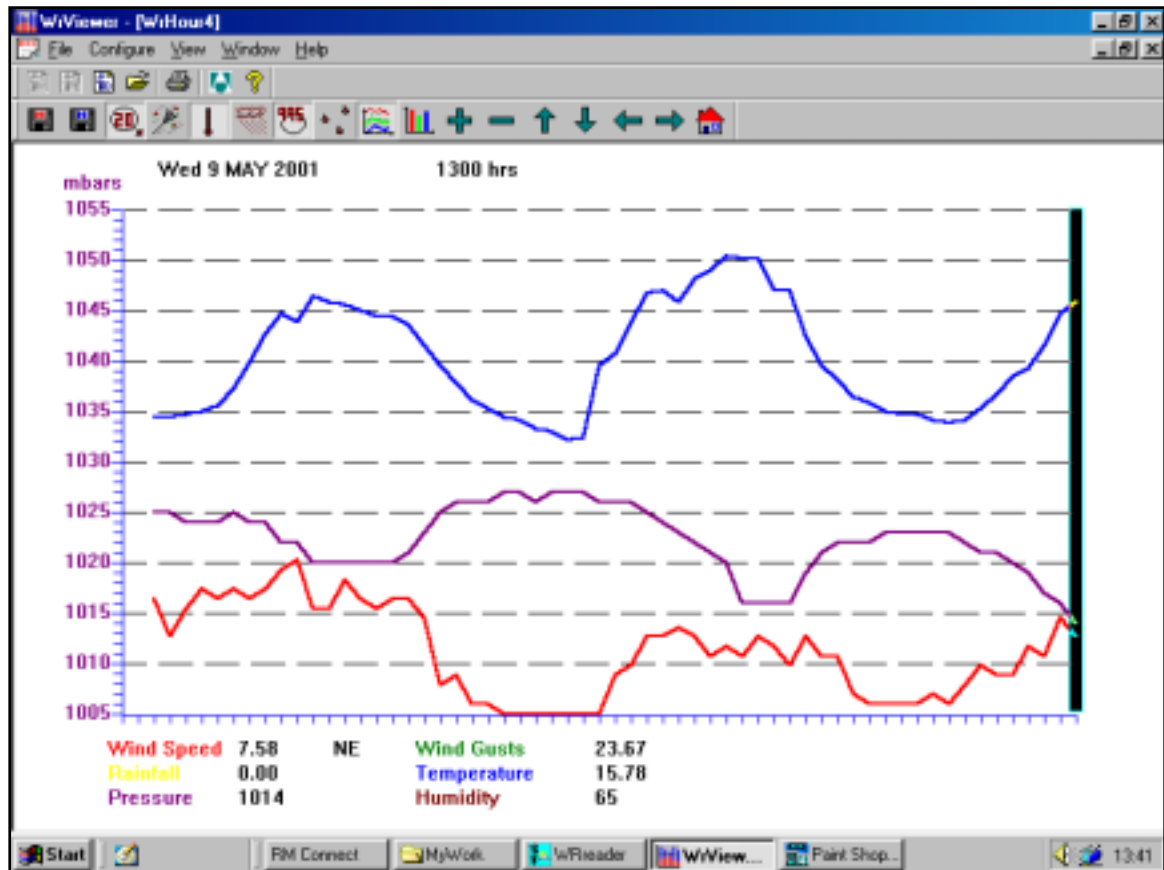
Any number of graphs may be shown on the screen at a time, but there are restrictions on the type of graph. For instance, it is only possible to show two types of weather in bar graphs at any one time, all the other graphs are shown in a line graph.



Line graph



Bar graph



Hourly weather data with temperature, wind speed and pressure

How each sensor records hourly data

- **Wind Speed** is the maximum of the 10 minute average over the last hour.
- **Wind Gusts.** This is the maximum five second gust measured over the last hour.
- The **wind direction** is one of eight points from which the wind was blowing on the hour.
- **Rain.** The line graph shows how much rain in millimetres has fallen since midnight. When the line is horizontal, this means that no rain has fallen during that hour. The rain gauge is reset at midnight every day.
- The **temperature** in degrees Celsius is recorded on the hour.
- The barometric **pressure** in millibars is recorded on the hour.
- The **Relative Humidity** is recorded on the hour as a percentage.



Collect and display current daily weather

Daily weather data summaries are stored in the Weather Reporter. Each day starts at midnight. Click on the Daily button to collect weather data from the Weather Reporter and display it as weather graphs for the previous 62 days.



Wind Maximum gust and average wind speed in kilometres per hour.



Temperature Maximum and minimum temperatures in degrees Celsius.



Rainfall Total rainfall in millimetres per day.



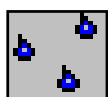
Sunrise/sunset Times on a 24 hour scale.



Sunshine hours Total number of hours per day.





Pressure in millibars .



Humidity as a percentage
Relative Humidity.

Showing data for a day on the graph

Click on the vertical line at the right of the graph, and hold down the mouse button to drag the line to the position required. You can also use the arrow   keys to move across the graph. The date is shown above the graph, and the weather summary for the chosen day is displayed below the graph.

Changing the graphs of daily data

Only two graphs may be shown on the screen at a time, and you can choose the type of the current graph on the screen by clicking on the line or bar graph button.



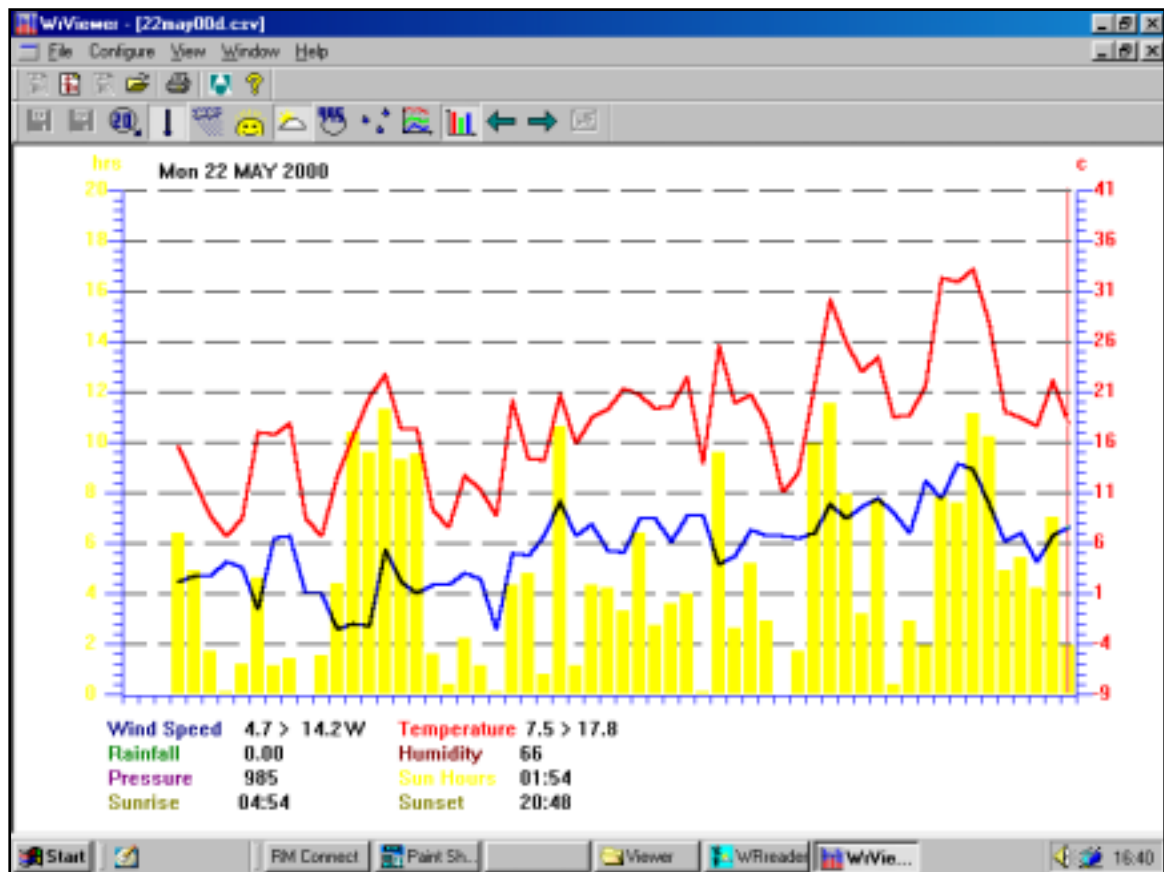
Line graph



Bar graph

Printing the graphs

Choose **File, Print** or click on the **Print** button on the Viewer toolbar for a copy of the graph.



Daily weather with maximum and minimum temperature and sunshine hours.

How each sensor records daily data

- **Wind.** The upper line or bar is the maximum of 10 minute averages over the last 24 hours. The lower line or bar is the maximum 10 minute average between 08.00 and 09.00 hours. .
- **Rain.** Each bar shows the total rainfall in millimetres over the 24 hours from midnight. The lower bar rainfall to 18.00 hours.
- **Temperature.** Maximum and minimum temperatures are shown. The temperature is continuously monitored and the daily maximum and minimum values over the 24 hours from midnight are taken from these readings.
- **Sunshine hours.** This is the number of hours that the sun was above a certain threshold of light intensity each day. Unlike the other readings it is reset at midnight.
- **Sunrise and Sunset.** This is displayed on a 24 hour scale. The lower division on the bar shows when the sun rose, the higher division shows when the sun set. The height of this bar shows the amount of daylight hours. The system accounts for differences in light intensity between summer and winter.
- **Pressure.** Barometric pressure in millibars is shown.
- **Humidity.** The Relative Humidity is recorded as a percentage.

Save weather data manually

Weather data may be saved manually from the Viewer module.

Data formats

Weather data can be saved in three formats:

- **Weather Reporter hourly data.** These files have the file extension **.HWD** (Hourly Weather Data)
- **Weather Reporter daily data,** with the file extension **.DWD** (Daily Weather Data).
- **CSV** (Comma Separated Values) datafiles. These files of hourly and daily data have a **.CSV** extension and may be loaded into spreadsheets, such as Excel, or into databases that accept this format such as Information Workshop or MS Works.

Saving weather data - Manual method

1. *Link to the Weather Reporter mast and the Reader module*

- Make sure that the Weather Reporter serial cable is linked to the computer with the Reader module, and that the Reader module is running. This allows weather data to be transferred to a network station. If you are using a stand alone computer, load and run the Reader module.
- Load the Weather Reporter Viewer module.

2. *Save Hourly Weather data*



- Click the button that collects and displays Hourly weather data on the Main Toolbar.
- When the data has appeared on the screen, click on the button for saving Hourly Weather.
- When the Save Weather Data dialogue box appears on the screen, enter the filename in the chosen drive and directory, and select the format that you need, either **hwd** or **csv**.

3. *Name Hourly Weather data files*

We recommend that you follow this convention for naming Weather Reporter data files. For example,

12MAR95H.HWD or 12MAR95H.CSV

The first two digits are the day, the next three characters represent the month, the next two digits the year, and H stands for hourly data.

Hint: Always save the data in both formats - you may need them.

4. Save daily weather data



- Click the button that collects and displays Daily weather data on the Main Toolbar.
- When the data has appeared on the screen, click on the button for saving Daily Weather.
- When the Save Weather Data dialogue box appears on the screen, enter the filename in the chosen drive and directory, and select the format that you need, either **dwd** or **csv**.

5. Name daily weather data files

A similar convention is recommended for naming Weather Reporter daily data files. For example, **12MAR95D.HWD** or **12MAR95D.CSV**

The first two digits are the day, the next three characters represent the month, the next two digits the year, and D stands for daily data.

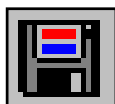
Add data to an existing weather file

If the same filename as a previous set of data is chosen when saving data, then the new data will be added to the old file. If there is a time gap between the old and new data, then a space will be left in the displayed graphs. If there is an overlap in the times of the old and new data, the saved file will not show the overlap and continuous data will be displayed.

Saving weather now, hourly or daily weather graph images



- Select Configure and Autosaving. Choose which type of file (either png or gif formats) and give the file a suitable name and destination path. Use the Browse button if unsure of this.
- Note that Weather Now will autosave about every seven seconds. It is this file that the Reader Module can upload to a web site. If Hourly and Daily are enabled then the buttons mentioned below become active.
- Use the buttons on the Hourly or Daily screens for saving an image of the weather graph.



Save an hourly weather graph image



Save a daily weather graph image

Note: Hourly and daily images are saved manually, the Weather Now image is updated every time new data is received (about every 7 seconds).

Open a file of Weather data

- Choose the **File, Open** button on the Main Toolbar.
- Select the weather file you require: either hourly (**hwd**), daily (**dwd**) or Comma Separated Values (**csv**), which can be hourly or daily data.
- The data will be loaded and shown on the screen. Choose the weather to display.

Weather Reporter Hourly and Daily CSV files

Hourly weather data

A typical hourly weather datafile consists of 60 rows and 11 columns. When loaded into a spreadsheet it has headings which explain the data in the columns. The headings are:

TIME	Time the data was collected
DATE	Date the data was collected
TEMPMAX	Temperature in degrees Celsius
WINDMAX	Maximum 5 second gust (kph)
WINDAVE	Maximum 10 minute average (kph)
BEAUMAX	Maximum 5 second gust (Beaufort)
BEAUAVE	10 minute average (Beaufort)
DIRECT	Wind direction
RAINFALL	Rainfall in mm
PRESSURE	Pressure in mBars
HUMIDITY	Relative Humidity

Daily weather data

A typical daily weather datafile has 58 rows and 15 columns. Headings saved with the data appear in spreadsheets or databases. Certain database programs require information about the headings (fields) to be entered separately into the Editor. The headings are:

TIME	Time the data was collected
DATE	Date the data was collected
TEMPMAX	Maximum temperature in degrees Celsius
TEMPMIN	Minimum temperature in degrees Celsius
WIND	10 minute average between 0800 and 0900 (kph)
WINDMAX	Maximum 10 minute average before 0900 (kph)
BEAUWIND	10 minute average between 0800 and 0900 (Beaufort)
BEAUMAX	Maximum 10 minute average before 0900 (Beaufort)
DIRECT	Wind direction
RAINFALL	Rainfall in mm
SUNSHINE	Sunshine hours
SUNRISE	Sunrise (hours)
SUNSET	Sunset (hours)
PRESSURE	Pressure in mBars
HUMIDITY	Relative Humidity

Technical guide to the Weather Reporter

For those who want to know how the Weather Reporter works.

All data collected by the Weather Station sensors is processed by an 8035 microcontroller and stored in the non-volatile RAM. The firmware in the PROM linked to the 8035 microcontroller monitors and logs data generated by all the following devices. The microcontroller and PROM are also responsible for the communication to the computer via the bi-directional serial link.

Wind speed

The anemometer is mounted above the wind vane. As the anemometer revolves, an optical sensor generates a digital signal for each rotation. The data is converted into kilometres per hour with an accuracy of +/- 5%.

Wind direction

The direction of wind is detected on a grey code disk. As the wind vane rotates three optical sensors read the disk and generate a three bit binary pattern. Each pattern represents one of the eight wind directions.

Temperature

This is sensed using an integrated circuit. The voltage generated is a function of temperature. The analogue to digital converter on the main circuit board inside the pole converts this to a binary code which is read and stored by the microprocessor.

The sensor detects temperatures from -30° to +50° Celsius at an accuracy of 0.5 degrees.

Rainfall

This is measured by a mechanical tipping bucket and the optical sensor reads the position of the bucket. The tipping bucket is similar to a pair of balance scales but each scale pan is specially shaped to be a water collection chamber. Unlike conventional scales, the centre of gravity of the unit is above the pivot line. Rainwater is collected by a funnel and transferred to the higher chamber. As the chamber fills with water the centre of gravity of the unit moves towards the pivot. When sufficient water has collected the centre of gravity passes the pivot and the unit tips into the other position. The bucket shape is arranged so that the collected water will empty freely from the bucket when it flips to the lower position. Because the unit is symmetrical about the pivot line, the other bucket now starts to collect water and the process is repeated. The number of bucket tips gives an indication of the quantity of rainfall. The digital signal is passed to the microprocessor.

The rainfall capacity is 60 millimetres in a 24 hour period at an accuracy of +/- 0.25 millimetres.

Daylight and sunshine hours

Sunshine is detected by a PIN diode operating in photovoltaic mode. The signal from the diode is amplified and passed to an analogue to digital converter. The digital signal produced is then used by the microprocessor to determine sunrise and sunset time and also to measure sunshine hours.

Sunrise and sunset are measured to an accuracy of +/- 15 minutes.

Hourly data logging

There is an hourly rolling hourly buffer which stores data for 1,488 hours:

- maximum 5 second gust speed, measured over the hour.
- maximum 10 minute average, measured over the hour.
- wind direction measured at hourly intervals.
- temperature is recorded on the hour.
- rainfall is cumulative since midnight and automatically reset at this time each day.

Daily data logging

There is a daily rolling buffer which stores data for 62 days:

- maximum wind speed is taken from a 10 minute maximum average over the day and there is a 10 minute maximum average taken between 0800 and 0900 GMT every day.
- sunrise and sunset is shown in hours and minutes.
- sunshine hours are totalled in hours and minutes.
- temperature is monitored continuously throughout the day and the maxima and minima are recorded from these readings.
- rainfall is totalled throughout the day and automatically reset to zero at midnight.

Setting up the Weather Reporter system on a network

Use the supplied CD to install all the software to a public drive. The software is 'self contained' and installs no Windows files.

Installing the Reader module

WRreader.exe uses WR.INI to hold information about the weather mast, frequency of uploading, file names etc. It is the module which runs continuously, communicating with the Weather mast and passing data on request to WRviewer modules. In order to configure anything you will need read / write access to the WR.INI file. The network administrator may wish to set up a special user who can access this file.

Installing the Viewer module

WRviewer.exe uses WRCOLORS.INI to hold information about the colours to use for the graphs, file names for saving of images, and IP address of the WRreader machine. In order to configure anything you will need read / write access to the WRCOLORS.INI file.

On a network you may wish to give users their own copy of this file, if you rename the installed copy on the public drive, the WRviewer module will search local drives and then the Users home drive to find their personal copy.

Autosaving weather data

The WRreader module needs to be run by a User with read / write access to a suitable area for Autosaving of files. As mentioned above this could be a specially created user.

Images files saved by the WRviewer module also need to be save to a similar (or the same) area if they are to be uploaded to a web site.

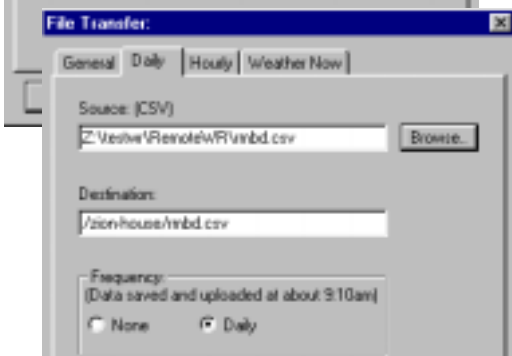


File Transfer to a web site

The WRreader module can upload the autosaved data or image files to your web site. In order to do this you must understand how files would normally be transferred to your web site using FTP.

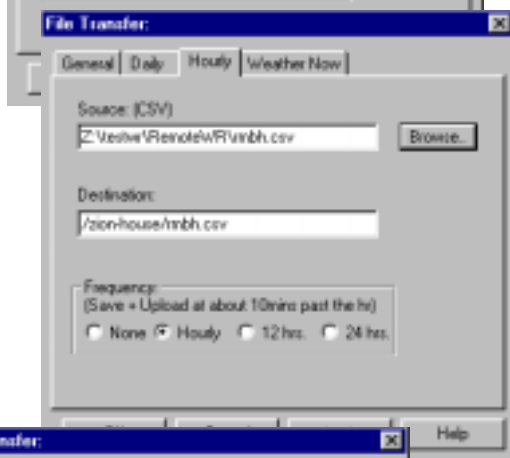


If you are not clear what to fill in on these boxes you need to ask your Internet Service Provider, or whoever normally updates your web pages.



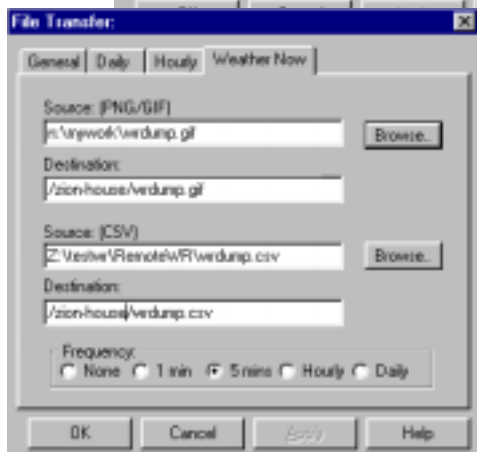
The Source file in this case is the one saved by the Wreader module at about 9:10 every morning.

Note that you could rename the file in the destination box if required.



The Source file in this case is the one saved by the WRreader module at hourly intervals.

Note that you can select to update the web site once an hour, every 12 hours, or every day. Your choice may depend on whether you have a dial-up connection, ISDN or broadband (or who is paying the bill).



Weather Now transfers the image file saved by the WRviewer module, and the csv data associated with the last seven second period.

Note that you can select to update the web site once a minute, every five minutes, hourly, or every day. Your choice may depend on whether you have a dial-up connection, ISDN or broadband (or who is paying the bill).

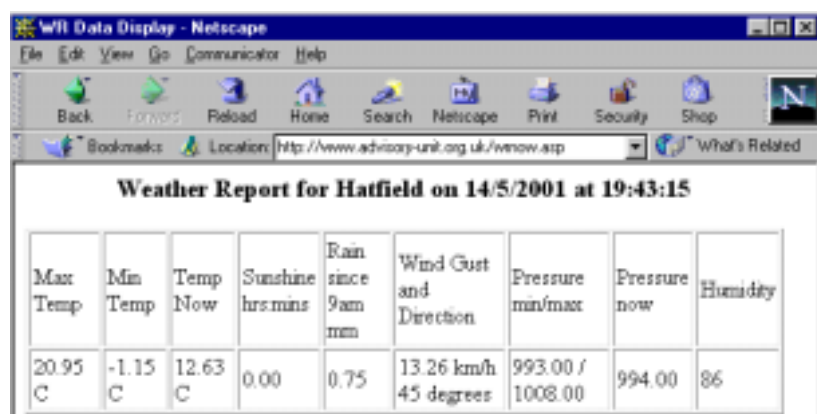
Update your web pages with Weather Reporter data

Three sample ASP pages to run on an NT web server, and an HTML page for viewing images, are provided as samples for you to start exploring Weather Data on the Web. There are also sample PHP pages for Apache or similar Linux-based servers provided on the disk. Their layout and workings are the same as for the ASP pages.

A sample web site using these pages is available at:

<http://www.advisory-unit.org.uk/remotedemo.html>

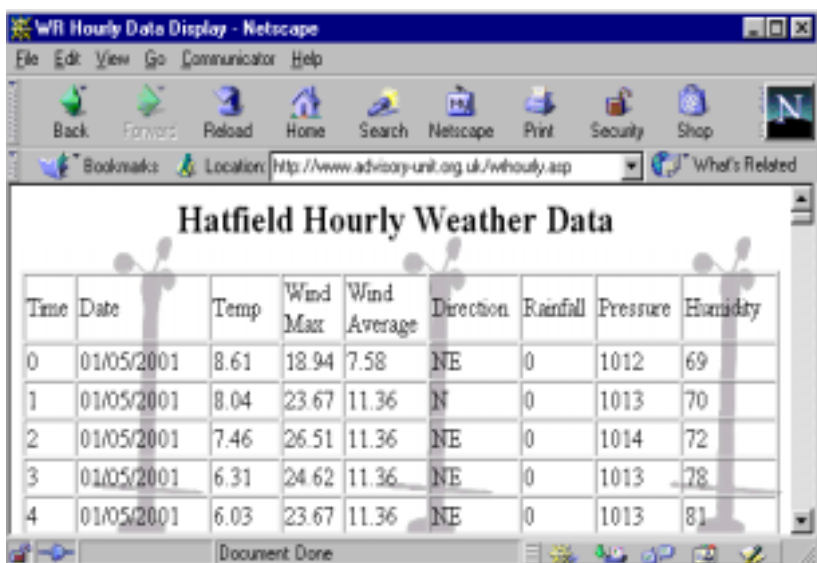
The smallest ASP page (wrnow.asp) reads the uploaded data from Weather Now csv file and produces a table which is sent back to the user's web browser.



Max Temp	Min Temp	Temp Now	Sunshine hrs:mins	Rain since 9am mm	Wind Gust and Direction	Pressure min/max	Pressure now	Humidity
20.95 C	-1.15 C	12.63 C	0.00	0.75	13.26 km/h 45 degrees	993.00 / 1008.00	994.00	86

The other two asp pages (wrhourly, wrdaily) create larger tables from the hourly or daily csv files.

The ASP files are commented so that you can load them in to an editor (Notepad will do) and work out what is going on. When looking at the code in the ASP files you may find it helpful to load the appropriate csv data file in to Excel, or Notepad to look at the data structure.



Time	Date	Temp	Wind Max	Wind Average	Direction	Rainfall	Pressure	Humidity
0	01/05/2001	8.61	18.94	7.58	NE	0	1012	69
1	01/05/2001	8.04	23.67	11.36	N	0	1013	70
2	01/05/2001	7.46	26.51	11.36	NE	0	1014	72
3	01/05/2001	6.31	24.62	11.36	NE	0	1013	78
4	01/05/2001	6.03	23.67	11.36	NE	0	1013	81

If you are new to ASP pages you need to understand that they cannot be 'loaded' as a normal web page into a browser, they must be processed first. The resulting code is read by your browser. To test ASP pages locally you can install PWS (personal web server) from the Windows 98 (or later) CD.

Weather Reporter FAQ

If 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 Configure menu in the WR reader module 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.

Is it the hardware?

Check simple things first.

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 is dead.

Replacement Power Supplies are available - please consult the Advisory Unit.

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 into it.

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

Nothing - this information is saved in a file called WRCOLORS.INI in the WRviewer module. 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.

Can I set the sensor default values?

The only sensor that requires setting on site is the Pressure sensor.

On a Network you will have to be an Administrator to write to the WR.INI file of the WRreader module.

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 the actual maximum and minimum and may well differ by a few degrees.

Can I adjust the readings?

Apart from setting the default pressure value, 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!)

The Viewer seems to hang up sometimes

If this happens, just close the Viewer and reload it. The connection with the Viewer will resume automatically.

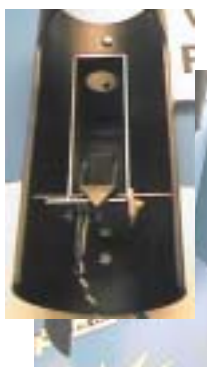
Maintenance

Rainfall

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, remove the plug in the bottom of the rain water collector to allow access.

Try moving the seesaw 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.

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. It looks like a small black plastic cube sticking out of the metal cross-arm.

It is not possible test the light sensor without special equipment. The sensor can be cleaned with a cloth;

Wind vane and Anemometer

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 windvane 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 in the WR viewer module and watching whilst rotating the vane to a known position. Spinning the anemometer will cause the wind speed level to fluctuate on this display.

There may be more updates to the FAQ on the Advisory Unit's web site at www.advisory-unit.org.uk

or you can always email sales@advisory-unit.org.uk for more advice.