

ATOMWIDE WEATHER STATIONS

The United Kingdom is a nation of people obsessed with the weather, and the study of climate is a fascinating activity with relevance in many areas of the National Curriculum, including geography, maths and science. The Atomwide Networked Weather Station takes advantage of the latest data-gathering technology to monitor a wide range of weather variables and send their values across the Internet to a central database - without the need for a dedicated PC.

Key features:

- Real-time monitoring of weather variables including temperature, humidity, air pressure, rainfall and wind
- Growing community of participating schools, LAs and RBCs throughout the UK
- National Education Network-approved resource
- Archive of data allows climate trends and patterns to be analysed
- Simple installation - no complex wiring or dedicated PC required
- Developing collection of associated curriculum resources
- Professional, highly accurate sensor technology



The Atomwide Networked Weather Station is based around a Vantage Pro2 Plus™ integrated sensor suite, produced by Davis Instruments. This unit monitors a multitude of weather variables including temperature, humidity, barometric pressure, solar radiation, ultra-violet radiation, rainfall, and wind speed/direction, so provides a wealth of useful data - even including a forecast for the coming days!

Installing the sensor suite is straight-forward, as it is powered by an in-built solar panel, and sends the data which it collects back to a base station using a radio link. Consequently no wires are required - just attach the unit to a wall, roof or pole with the solar panel pointing south, and the job's done. The base station, which should be located within 100m of the sensor suite, consists of a receiver and a custom-designed network interface. Simply plug the base station into a power socket and Ethernet outlet, and the system will initialise, collect a network address via DHCP, then start sending weather reports to the central database every minute. Since all data is sent using standard HTTP requests, no special firewall configuration is required for operation.

The central database can be queried through an easy-to-use web interface to see the current status of active weather stations, compare conditions at different sites, or present graphs and tables of archive data.

- Solar power and radio communications mean no wiring is needed between sensors and base station
- Standard Internet connection takes data stream from base station to central database
- Latest weather readings from all networked stations are available via public web site
- Shibboleth®-protected secure area provides access to additional resources including complete data archive
- Easy generation of tables and graphs comparing one weather variable at multiple sites, or several variables at one site



With information accumulating in the weather database every minute of every day, it is clearly important that comprehensive facilities exist for displaying, processing and exporting statistics, so that they can be viewed and analysed. These services are provided by the web site <http://weather.atomwide.com/> which is regularly enhanced in response to user and customer feedback.

The front page of the site offers an at-a-glance view of the current conditions at any site which has an active weather station, along with the day's minimum and maximum values for certain variables, and a webcam feed from the location (subject to availability). Alternatively, the map view indicates the relative positions of active weather stations, and highlights key values such as temperature, pressure and wind speed.

For users with a Shibboleth®-enabled user account, access is available to a secure area where all accumulated weather data can be analysed. These pages allow the trend of one weather variable to be compared amongst multiple sites, or multiple variables to be tracked for a single site. In this way, it is possible to see - for example - the progress of weather fronts as they pass across the country, or the relationship between temperature and solar radiation. Naturally, full control is provided over the date range being considered by each query.

The results of the analysis can be displayed either as a graph (which can be saved out of a web browser in the usual way) or a table (which can be exported as an Excel spreadsheet for further processing and/or integration into other work).

Clearly, as the installed base of networked weather stations grows, so the scope and value of the collected data is increasing, providing an ever-more comprehensive insight into weather across the United Kingdom. In tandem with the creation of an active community of users, exchanging ideas and projects, this solution has the potential to engage and excite both pupils and staff alike with practical, real-world, educational applications.



Specifications are subject to change. E&OE. Revision 3

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