"HEAVY WEATHER" SOFTWARE
For use with your Weather Station and PC

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Appendix 1

A working example on how to save a text file and creating useful graphs on other applications can be found at the end of this manual.

1.0 General Information
This weather station is a high quality, easy to use weather monitoring system that reads, displays and records the weather data from three external sensors. One sensor will take data for temperature and humidity; one for wind and the other for rainfall measurement. Operation of this unit can either be by cable connection or by wireless 433MHz to the base station.

In stalling the "Heavy Weather" program on this CD-ROM will display all the weather data from the base station received from the three external sensors onto your PC. For operation, simply use the PC cable supplied and connect the base station to the PC using the desired COM port on your PC (see Installing the **4.0 Installing PC Software** below).

2.0 System Requirements
To install the "Heavy Weather" software onto your PC, the minimum system requirement is:

- Operating system: Windows 98 or above
- Processor: Pentium 166 MHz or above processor
- RAM: 32MB of Ram or above
- Hard disk: 20MB free space
- CD-ROM drive

3.0 Basic settings of the base station and sensors:
This section describes the set up and settings of the weather station and sensors necessary for operation with the Heavy Weather software. For a complete and detailed explanation of the weather station, **please refer to the main instruction manual enclosed with the purchase of this set.**

3.1 Base station (receiver)
The base station reads the indoor and outdoor weather the data from the thermo-hygro, wind and rain sensors. Together with the radio controlled time, all the data is displayed on the large LCD with LED back-light.

- The base station can be battery operated using 3 x AA, IEC LR6, 1.5V batteries or with the AC/DC adapter provided.

3.2 Thermo-hygro sensor
The thermo-hygro sensor measures the temperature and the humidity of it's surrounding outdoor environment and at the same time, collects the data from the rain and wind sensors before transmitting all the weather data to the base station by wireless 433MHz or by a cable connection.

- Using wireless 433MHz, the thermo-hygro sensor requires 2 x AA, IEC, LR6, 1.5V batteries.
- Using cable connection from the base station to the sensors, power is supplied by either the AC/DC power adaptor (included) or 2 x AA, IEC, LR6, 1.5V batteries.

3.3 Wind sensor
The wind sensor collects both the wind speed and wind direction data at the point of mounting and sends this to the thermo-hygro sensor for transmitting to the base station.

- Install the wind sensor onto an outdoor mast in open space since it is important for the wind sensor to be fully exposed to allow for accurate wind measurements from unhindered wind directions
- For operation, it is necessary to connect the wind sensor to the thermo-hygro sensor for transmission of data and also for operating power.

3.4 Rain sensor
The rain sensor collects rainfall data and displays this on the base station.

- It is recommended to install the rain sensor on a flat surface securely in the open and free from any obstructions (i.e. falling leaves, roof coverings and etc.)
- For operation, it is necessary to connect the rain sensor to the thermo-hygro sensor for transmission of data and also for operating power.

4.0 Installing the PC software
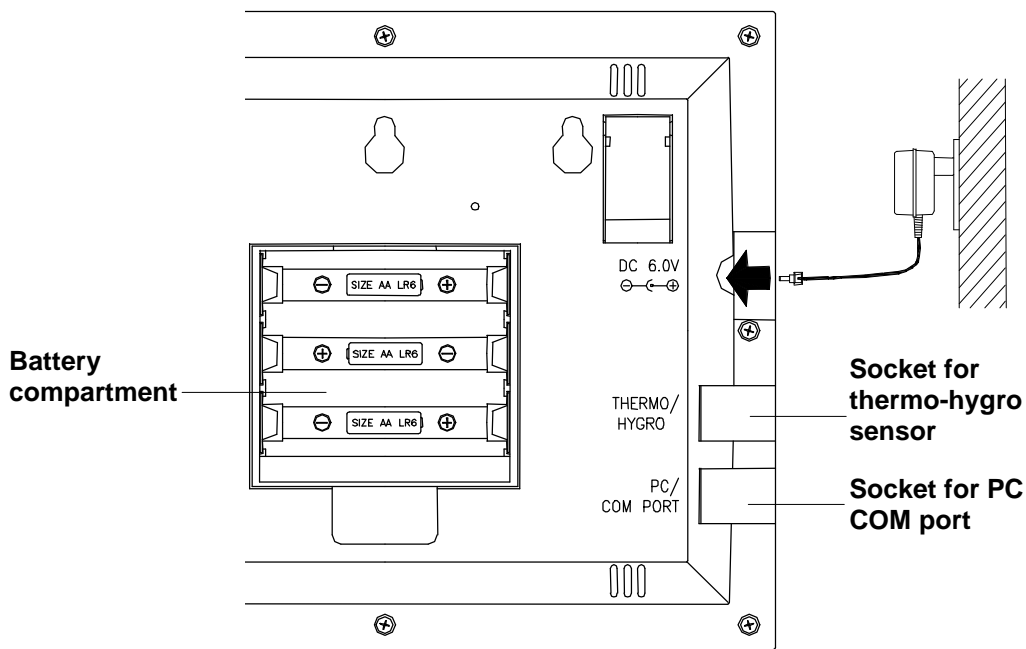
Firstly, the weather station and the outdoor sensors should be connected and checked for function (see main instruction manual for setting up the weather station). After successful checking, install the "Heavy Weather" program as follows:

1) Switch on your PC and insert the Heavy Weather CD-ROM into the disc drive
2) The Heavy Weather window will auto install and open the language installation box
3) Select either English or Deutsch or Français and click the Install button to start installing the program
4) The "Heavy Weather Installation" window will now open so the user can change the directory or confirm the directory automatically set by the installation process (directory will be used for data saving of the weather station)
5) Click the Finish button to confirm and the software will be installed
6) After successfully installing the software, the OK prompt appears for successful installation, click the OK button to complete the process
7) The Heavy Weather directory is opened onto the screen, click to open the "Heavy Weather" icon to run the program or open the program from the shortcut created your desktop
8) Once the Heavy Weather program is open, click the Setup button at the bottom right of the window to select the COM port used for connection between the PC and base station (as shown below) and press the OK button.
9) Now using the 2-meter computer cable (included), connect the base station to the PC COM port. The program will automatically detect the connection between the base station and the PC and will display the weather data in the appropriate boxes.

Note: **In the event the auto-install did not start, double click the install.exe file found in the root directory of the CD-ROM to start the installation of the Heavy Weather software**
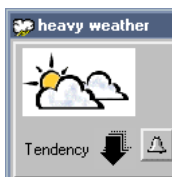
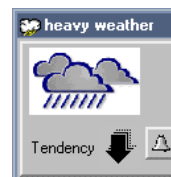## 5.0 Features and displayed weather information

5.1 Weather icons
The three weather icons can appear in the following combinations, provide a weather forecast upon reading of any significant changes in air pressure:
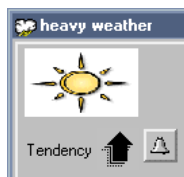
| Sunny | Cloudy with sunny intervals | Rainy |

For every sudden or significant change in air pressure, the weather icons will update accordingly to represent the change in weather. If the icons do not change, then it means either the air pressure has not changed or the change has been too slow for to register a reading. However, if the icon displayed is a sun or raining cloud, there will be no change of icon if the weather gets any better (with sunny icon) or worse (with rainy icon) since the icons are already at their extreme points.

The icons displayed forecasts the weather in to terms of getting better or worse and not necessarily sunny or rainy as each icon may indicate. For example, if the current weather is cloudy and the rainy icon is displayed, it does not mean that forecast is not accurate because it is not raining, it means that the air pressure has dropped and the weather is expected to get worse but not necessarily rain.

Note: **After setting up, readings for weather forecasts should be discarded for the next 12-24 hours. This will allow sufficient time for the unit to operate at a constant altitude and therefore result in a more accurate forecast.**

5.2 Storm Warning
The "lightening" icon next to the weather icon will appear when the storm alarm has been reached to indicate a possible storm according to the user settable air pressure values set in the base station (see storm warning alarm setting below). For storm warning air pressure sensitivity setting on the base, please refer the main instruction manual.

Storm warning icon

5.3 Weather tendency indicator
The weather tendency indicator arrow is located below the weather symbols. It indicates the air pressure development and provides a forecast of the weather to be expected by the decreasing or increasing air pressure. With the tendency arrow pointing upwards, it means that the air pressure is increasing and the weather is expected to improve but if the tendency arrow is pointing downwards, the air pressure is decreasing and the weather is expected to become worse.

5.4 Relative/Absolute Pressure
Absolute air pressure provides the display of the true measured air pressure of the current time and location. This is not programmable and the absolute air pressure range of the weather station is from 300 hPa to 1099 hPa (standard air pressure at an altitude of 9,100 meters is around 300 hPa).

Relative air pressure is the one value that is calculated back to sea level from the local absolute air pressure and can thus be taken as a reference for weather condition and weather development for the entire country. It can be programmed to represent your local surroundings. Since the relative air pressure is also the one value given by various newspapers, TV and radio broadcasting stations in their daily weather forecasts for their respective locations, users can set the relative air pressure of the weather station to this value to represent readings in your area.

The recorded minimum and maximum pressure values within a period are also displayed along with the corresponding dates and times and are automatically updated when a new minimum or maximum values are reached.

5.5 Indoor and Outdoor Temperature/Humidity
The weather data recorded by the thermo-hygro sensor (for outdoor data transmission) and base station (for indoor data) is displayed accordingly to the temperature, humidity section on the screen numerically and graphically (for temperature data only)

The recorded minimum and maximum temperature and humidity values within a period are also displayed along with the corresponding dates and times and are automatically updated when a new minimum or maximum values are reached.

5.6 Dew point
Dew point occurs when the temperature, air pressure and humidity is at such level that the humidity becomes a liquid on a surface. The dew point data is displayed with current, minimum and maximum information.

The recorded minimum and maximum dew point values within a period are also displayed along with the corresponding dates and times and are automatically updated when a new minimum or maximum value is reached.

5.7 Wind chill
The wind chill data recorded by the wind sensor is displayed with current temperature, minimum and maximum temperature recording.

The recorded minimum and maximum wind chill values within a period are also displayed along with the corresponding dates and times and are automatically updated when a new minimum or maximum value is reached.

5.8 Wind speed and direction
The wind data recorded by the wind sensor are received and displayed on the base station and heavy weather program. The wind direction data is simply indicated by letters (for example N=North, NE=North East, E, SE and etc.) or in degrees.

The wind speed unit is user selectable to display the wind speed in km/h, mph, meters-per-second and knots. The bft (Beaufort scale) at the top of the wind section displays the velocity of each wind measurement in the form of a bar for easy reference.

The recorded minimum and maximum wind speed values within a period are also displayed along with the corresponding dates and times and are automatically updated when a new minimum or maximum values are reached.

5.9 Rainfall
Three sets of rain data are recorded by base station and displayed on the on the base station and heavy weather program as total rain, rain in the last 24 hours and rain in the last 1 hour. The information is displayed numerically and graphically for easy reference. The scale in the total rainfall column will automatically increase should the rainfall surpass the initial scale maximum displayed.

The recorded maximum rainfall value for 24 hour and 1 hour within a period is also displayed along with the corresponding date and time and is automatically updated when a new maximum value is reached.

5.10 Weather History
Here the Heavy Weather program automatically records all the weather data from the current period onwards to form a history of the weather events. The recording interval can be set from 1 minute to up to 60 hours in the history section (default setting 1 hour) together with the option of recording a next set of data. The next set of data option can be used for example if the user set the initial recording interval to every 1 hour and required the next set of data for in 5 minutes time, the program would then initiate recording of the weather data in 5 minutes before reverting to the previous setting of 1 hour. However based on the previously given example, due to the mass communication of weather data and high frequency transmission from the sensors to the base station to the PC and back again, it is possible that the next set of data recording i.e. 5 minute interval will be missed and will not in fact be executed in exactly 5 minutes time as will be seen from the history file.

From the main Heavy Weather window, the history section will show the file name used to save the weather data together with the date and time and the total number of sets of data recorded. Each set of data consists of pressure, indoor temperature, indoor humidity, outdoor temperature, outdoor humidity, dew point, wind chill, wind speed, wind direction, total rain, time and date. The user can also select to record a new history file at anytime by changing the history file or revert to any saved history file that had been previously saved. The initial history file name is history.dat. If a previously saved history file is used again, the current recording interval will be regarded as the latest setting and all new data will be recorded into that file (see 8.0 Settings below for working detail). The history file can be displayed in a window parallel in running to the Heavy Weather program. If desired the saved files can be saved as text files and opened in other formats.

Once the PC is switched off, connection to the base station will be lost but the base station will record all weather events for up to 175 records in it's memory bank according the interval set from the PC at the time of power off. For example if the user set a history recording interval of 5 minutes, then the base station will store all the weather data from 5 minute intervals for up to 175 sets of data until the Heavy Weather program is used again. However there are no limitations for the number of history files saved onto the PC providing there is sufficient space available on the hard disk.

Regardless of the interval setting on the software for reading data from the base station onto your PC, when the base station has stored the maximum 175 sets of weather data into it's memory, new sets of data received at the set interval will begin overwriting the oldest records on the base station and it is important to upload the data to your PC before it gets lost. For example if the interval is set to take hourly readings, then the base station will take 175 hourly readings which works out to a little over 7 days meaning that users have this length of time to upload the data to their PC's as to not lose any data.

6.0 Using the Heavy Weather software

6.1 Activating the weather software
Once the weather station is connected to the PC, run the "Heavy Weather" program and it will automatically detect the connection to the base station and start transferring the weather data from on the PC. All the weather data; wind; rain; relative pressure; indoor and outdoor temperature/humidity; dew point and wind chill will almost be simultaneously received and displayed in the relevant sections of the Heavy Weather program.

During High Frequency Reception (reception of data from the outdoor sensors to the base station), the HF icon on bottom right hand corner of the Heavy Weather window will flash in red to indicate that high frequency reception is taking place between the sensors and the base station and the received data will soon be received and displayed by the Heavy Weather program.

6.2 Main Heavy Weather window
Below are two windows of the Heavy Weather program before and after reception of the weather data from the base station.
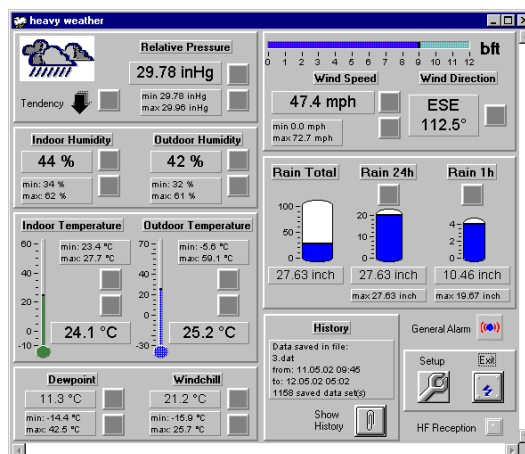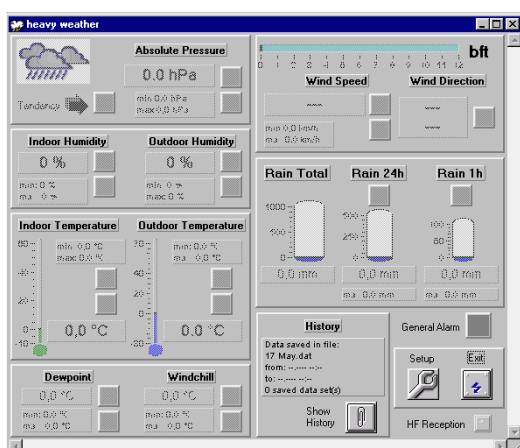
7.0 Basic Settings

Click the "Setup" button located at the bottom to the Heavy Weather window to enter the Settings window to select the basic settings for operation.
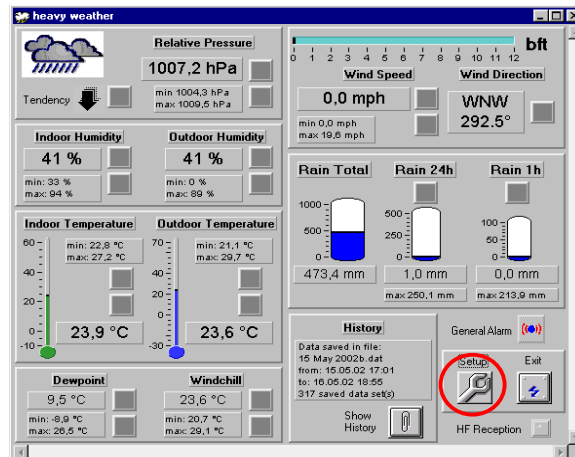

Heavy Weather program main window
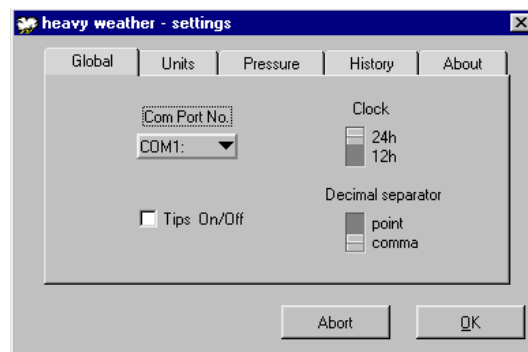
Heavy Weather Settings window
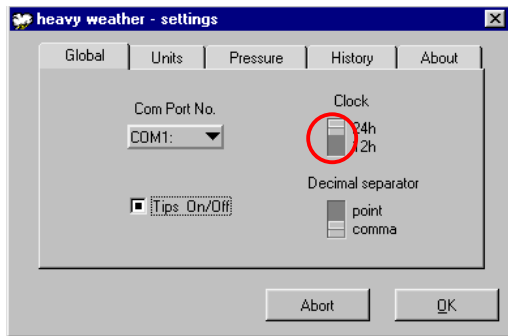
7.1 Heavy Weather Settings - Global tab:

1) The COM Port used for connection from the PC the base station must be selected in order for correct operation
2) Screen tips On/Off can be selected here. If selected On, screen tips will automatically pop-up to familiarize users with the first time operations of the Heavy Weather program when the mouse is dragged specified areas of the main Heavy Weather window
3) Clock setting for 12 or 24 hour is for displaying the time format in the history file and will not effect the time format display in the base station
4) The decimal separator is for users of countries that recognizes the comma or point as the decimal separator. When the decimal point or comma is selected, the data digits on the main Heavy Weather window and history file(s) will be updated accordingly (this option is not available on the base station)
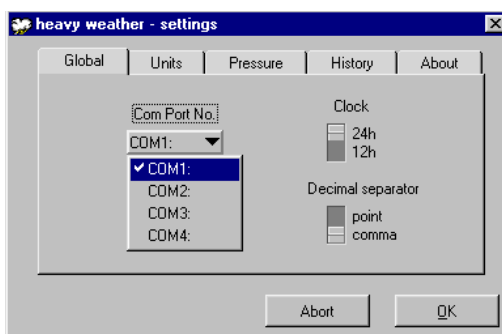
COM Port no. (COM Port: 1-4)
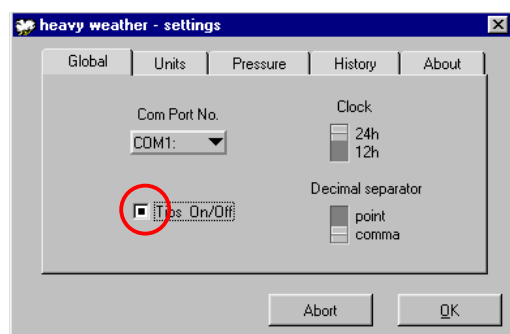
Pop-up screen tips (on/off)

Clock (12/24 hour display mode)
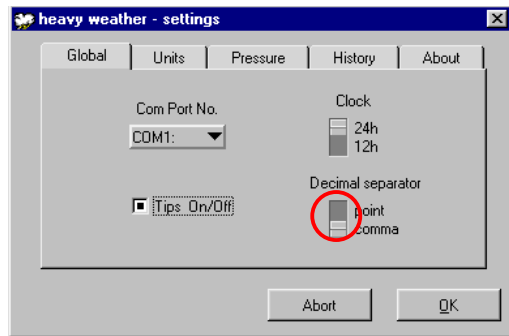
Decimal separator (point/comma)

7.2 Heavy Weather Settings - Units tab:

Here the units of display for the pressure, temperature, rainfall and wind speed can be set according the users preference. Once set, the weather data on the main Heavy Weather window and history file(s) will be updated accordingly. Setting the displayed units from the Heavy Weather program does not affect the units set in the base station.
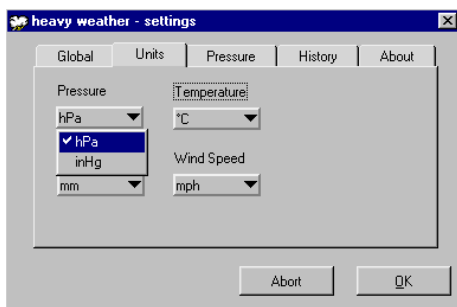
Pressure (hPa/inHg)
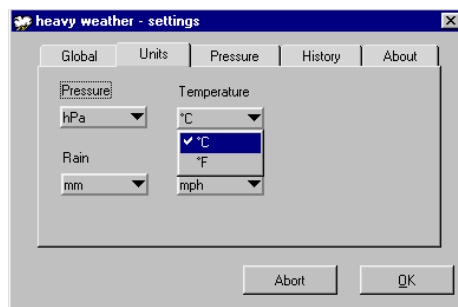
Temperature (ºC/ºF)
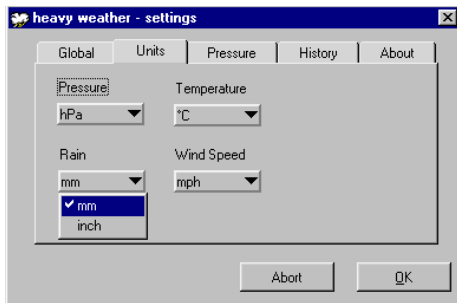
Rain (mm/inch)
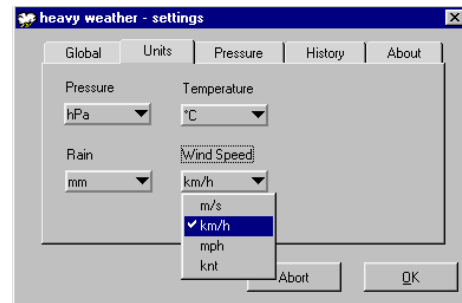
Wind (m/s, km/h, mph, knots)

7.3 Heavy Weather Settings - Pressure tab:

Selected the air pressure display required. The air pressure display unit set on the Heavy Weather program from the PC does not affect the air pressure display unit on the base station
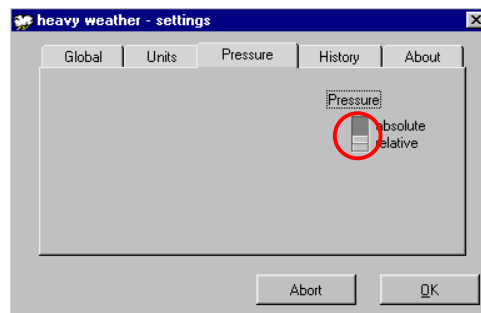
Absolute/Relative Air Pressure

Note: For actual air pressure settings on the base station, please see the main instruction manual

7.4 Heavy Weather Settings - History tab:
Changing history files:
Here the user can change the history file used to save the weather data received from the base station. Simply click the change history file button, select the file to be changed and click OK to confirm the file change. However, the user must create new history files since there must be more than one file saved in order to select a file change

Creating new history files:
1) Click Change History File button to open the Select History File window
2) Type in a new file name and click OK
3) The file will be saved in the Heavy Weather directory that was created during installation of the Heavy Weather software and will automatically point here when the history files are opened again.

Deleting history files:
1) Use the mouse and click once to highlight the file to be deleted and press the delete key on your keyboard to deleted the file(s)
2) After the file(s) are deleted and before exiting the Select History File window, the user must select or create a history file for the weather data otherwise the weather history cannot register and a error prompt will appear for the user to create or select a history file
3) Alternatively, delete the file directly from the Heavy Weather directory
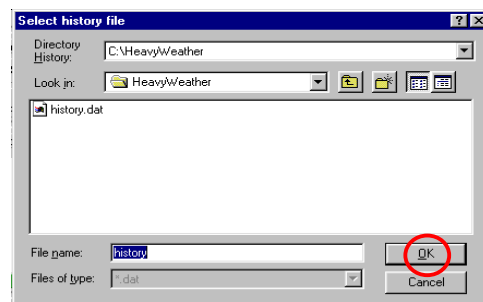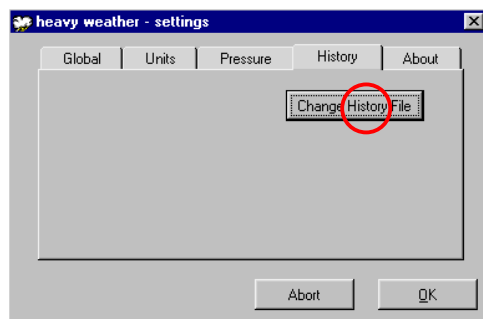
7.5 Changing of the history file from the history window:
As described in features and displayed information above, the weather data is automatically saved from the current period to form a history of the weather events. The illustrations below provide the full setting features of the history file for the Heavy Weather program:
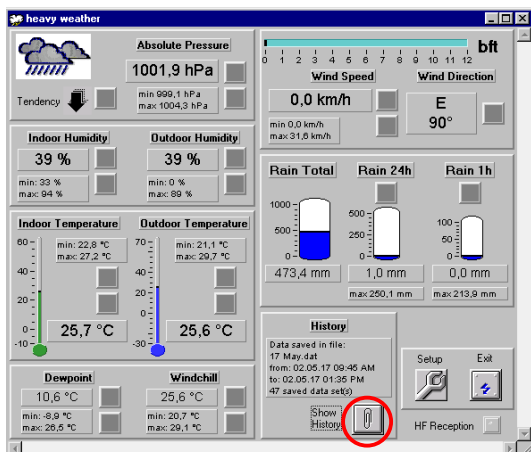
Right click to enter History File

History file

7.5.1 Changing the history file from the history window
1) Click the change history file button to open the select history file window
2) Click the file name to highlight selection or type in the file name and click OK to confirm and return to the history file window

History

|	Abs. Pressure [hPa]	In Temp [°C]	In Humidity [%]	Out Temp [°C]	Out Humidity [%]	Dewpoint [°C]	Windchill [°C]	Wind Speed [km/h]	Wind Direction	Rain [mm]	Time	Date
2	1003,4	25,6	40	25,4	39	10,4	25,4	0,0	W	473,4	09:50 AM	02.05.17
3	1003,4	25,6	40	25,4	38	10,0	25,4	0,0	W	473,4	09:55 AM	02.05.17
4	1003,2	25,5	39	25,3	38	9,9	25,3	0,0	W	473,4	10:00 AM	02.05.17
5	1003,2	25,5	40	25,2	38	9,9	25,2	0,0	W	473,4	10:05 AM	02.05.17
6	1003,3	25,5	40	25,2	37	9,5	25,2	0,0	W	473,4	10:10 AM	02.05.17
7	1003,1	25,5	40	25,2	37	9,5	25,2	0,0	W	473,4	10:15 AM	02.05.17
8	1003,1	25,6	39	25,2	36	9,1	25,2	0,0	ESE	473,4	10:20 AM	02.05.17
9	1003,4	25,7	37	25,2	36	9,1	25,2	0,0	ESE	473,4	10:25 AM	02.05.17
10	1003,4	25,7	38	25,2	37	9,5	25,2	0,0	ESE	473,4	10:30 AM	02.05.17
11	1003,5	25,7	38	25,3	37	9,5	25,3	0,0	E	473,4	10:35 AM	02.05.17
12	1003,8	25,8	37	25,2	37	9,5	25,2	0,0	E	473,4	10:40 AM	02.05.17
13	1003,5	25,9	35	25,3	36	9,1	25,3	0,0	E	473,4	10:45 AM	02.05.17
14	1003,6	25,9	35	25,3	35	8,7	25,3	0,0	E	473,4	10:50 AM	02.05.17
15	1003,5	25,9	35	25,4	36	9,2	25,4	0,0	E	473,4	10:55 AM	02.05.17
16	1003,4	25,9	35	25,3	36	9,1	25,3	0,0	E	473,4	11:00 AM	02.05.17
17	1003,4	25,9	35	25,3	36	9,1	25,3	0,0	E	473,4	11:05 AM	02.05.17
18	1003,5	25,8	37	25,2	37	9,5	25,2	0,0	E	473,4	11:10 AM	02.05.17
19	1003,3	25,8	37	25,3	38	9,9	25,3	0,0	E	473,4	11:15 AM	02.05.17
20	1003,2	25,8	38	25,3	40	10,7	25,3	0,0	E	473,4	11:20 AM	02.05.17
21	1003,1	25,8	39	25,2	40	10,6	25,2	0,0	E	473,4	11:25 AM	02.05.17

Data saved in file:
17 May.dat
from: 02.05.17 09:45 AM
to: 02.05.17 01:35 PM
47 saved data set(s)

Change History File   Save as text   Change Settings   Close

Select history file

Directory History: C:\HeavyWeather

Look in: HeavyWeather

history.dat
history1.dat
history2.dat

File name: history1
Files of type: *.dat

OK   Cancel

7.5.2 Save as text file:
1) Click the save as text button to open the select text file window
2) Enter the file name you wish to save (example weather.txt) and click OK to confirm and return back to the history file window

Open

Directory History: C:\HeavyWeather

Look in: HeavyWeather

File name: *.txt
Files of type: *.txt

OK   Cancel
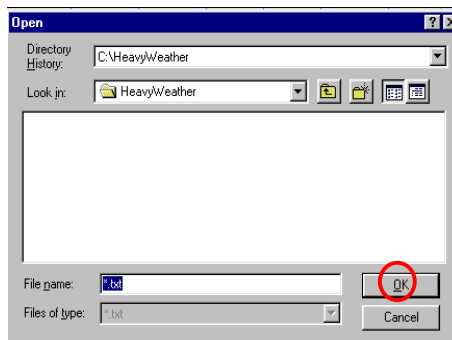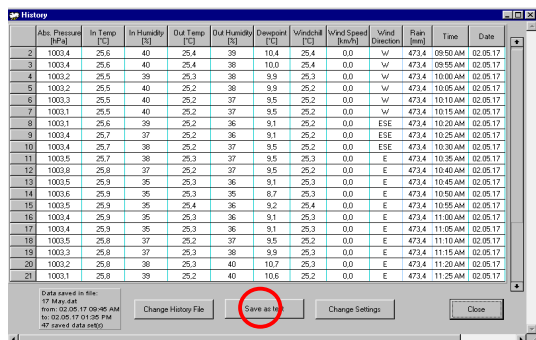
Note: For a detailed explanation on how to save a text file and create useful statistic and graphs for your saved weather history, please see appendix 1 at the end of this instruction manual.

7.5.3 Recording interval setting from 1 minute up to 60 hours (default setting 1 hour)

1) Click the change settings button to open the change history settings window
2) Select the desired hour and minutes setting in the history period box and click the change button to confirm and return back to the history file window

Change History Settings

History Period:

Hours   Minutes
0   5

Next Data Set in:

Hours   Minutes
0   0

Abort   Change
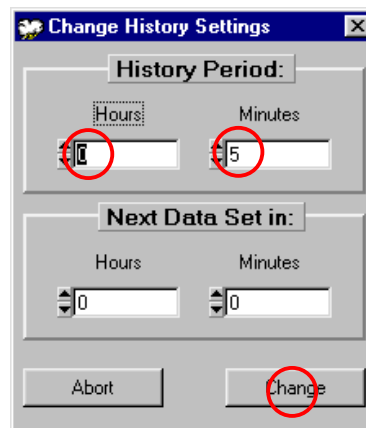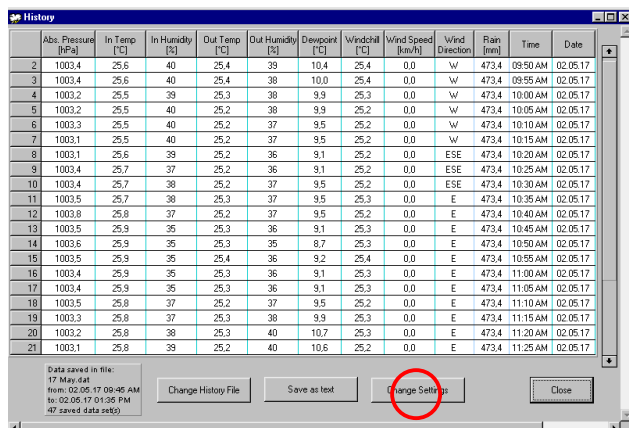
7.5.4 Setting of interval for reading the next set of weather data from 1 minute up to 60 hours

1) Click the change settings button to open the change history settings window
2) Select the desired hour and minutes setting in the next data set in and click the change button to confirm and return back to the history file window
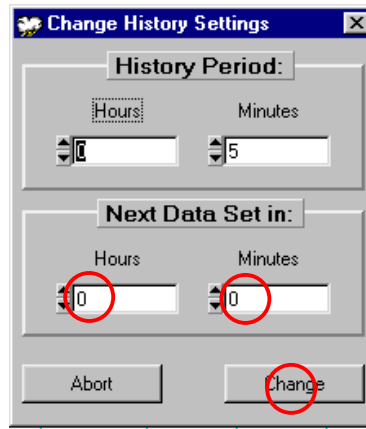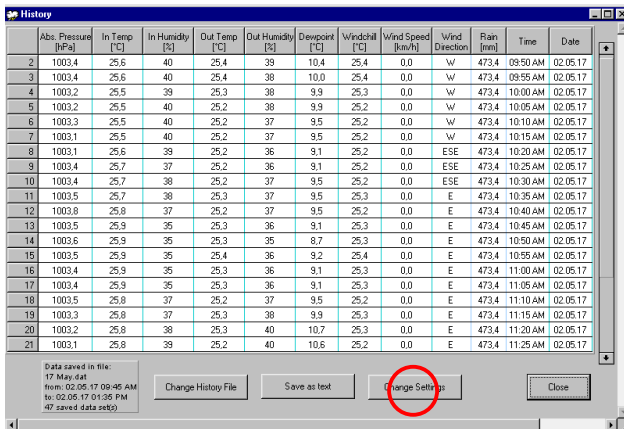
Note: To return to the main Heavy Weather window, click the close button in the history file or the window can be minimized

8.0 Alarms setting
The Weather Station has a total 13 alarm modes:
1. Time alarm
2. Storm warning alarm
3. Indoor temperature alarm (high) and Indoor temperature alarm (low)
4. Outdoor temperature alarm (high) and Outdoor temperature alarm (low)
5. Indoor humidity alarm (high) and Indoor humidity alarm (low)
6. Outdoor humidity alarm (high) and Outdoor humidity alarm (low)
7. Wind chill alarm (high) and Wind chill alarm (low)
8. Dew point alarm (high) and Dew point alarm (low)
9. Rainfall 24h alarm
10. Rainfall 1h alarm
11. Pressure alarm (high) and Pressure alarm (low)
12. Wind speed alarm (high) and Wind speed alarm (low)
13. Wind direction alarm

"Heavy Weather" program allows the programming of a multitude of alarm capabilities at various weather conditions. For alarm setting capabilities, see table below.

Item	Alarm	Low Alarm	High Alarm
Time alarm			
Storm warning alarm	●		
Indoor temperature alarm		●	●
Indoor humidity alarm		●	●
Outdoor temperature alarm		●	●
Outdoor humidity alarm		●	●
Rainfall 24 hour	●		
Rainfall 1 hour	●		
Dew point alarm		●	●
Pressure alarm		●	●
Wind chill alarm		●	●
Wind velocity alarm		●	●
Wind direction alarm	●		

Set each alarm as follows:

8.1 Storm Warning alarm - setting

1) Place your cursor over the tendency alarm box and right click the mouse open the storm warning alarm window
2) Click the alarm active box to set the storm alarm
3) Click the set button to confirm
4) The storm alarm is now set and will activate when the inHg level set into the base station is reached (for setting the storm warning from the base station or for setting the inHg thresholds for weather forecast sensitivity, see main instruction manual).
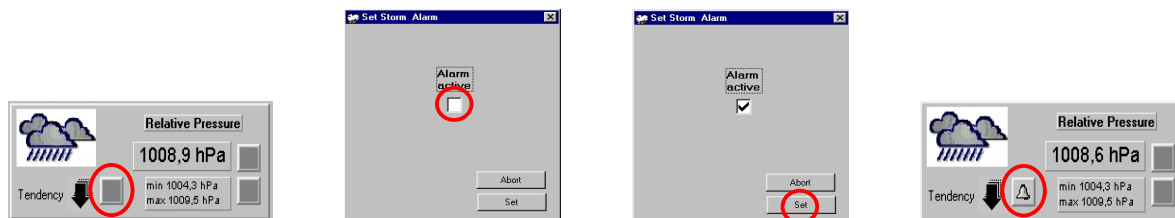
8.2 Relative or Absolute Pressure High Alarm Setting

1) Place your cursor over the relative or absolute pressure high alarm box and right click the mouse to open the relative or absolute pressure alarm high window
2) Drag the cursor over the sliding scale to set the desired inHg pressure high or enter the inHg quantity in the box provided
3) Click the alarm active box to set the relative or absolute pressure high alarm
4) Click the set button to confirm
5) The relative or absolute pressure alarm high alarm is now set and will activate when the set inHg level is reached (for setting relative or absolute pressure high alarm setting from the base station, see main instruction manual).
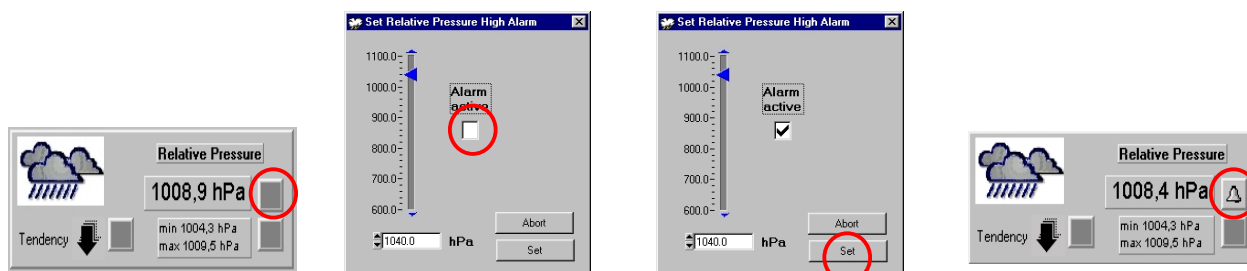
8.3 Absolute or Relative Pressure Low Alarm Setting

1) Place your cursor over the absolute or relative pressure low alarm box and right click the mouse to open the relative or absolute pressure low alarm window
2) Drag the cursor over the sliding scale to set the desired inHg pressure low or enter the inHg in the box provided
3) Click the alarm active box to set the absolute or relative pressure low alarm
4) Click the set button to confirm
5) The absolute or relative pressure low alarm is now set and will activate when the set inHg level is reached (for setting the absolute or relative pressure low alarm setting from the base station, see main instruction manual).
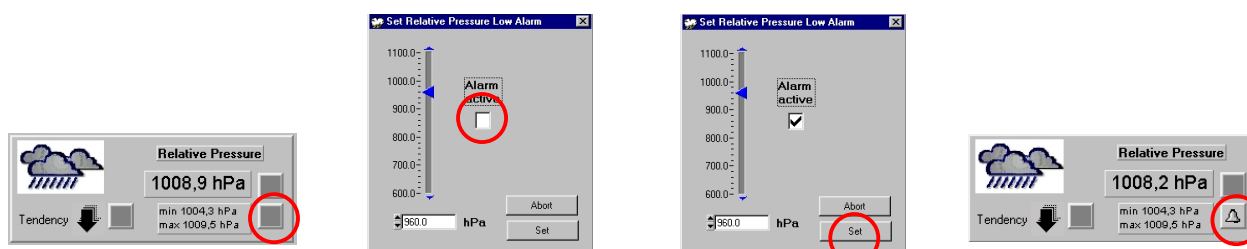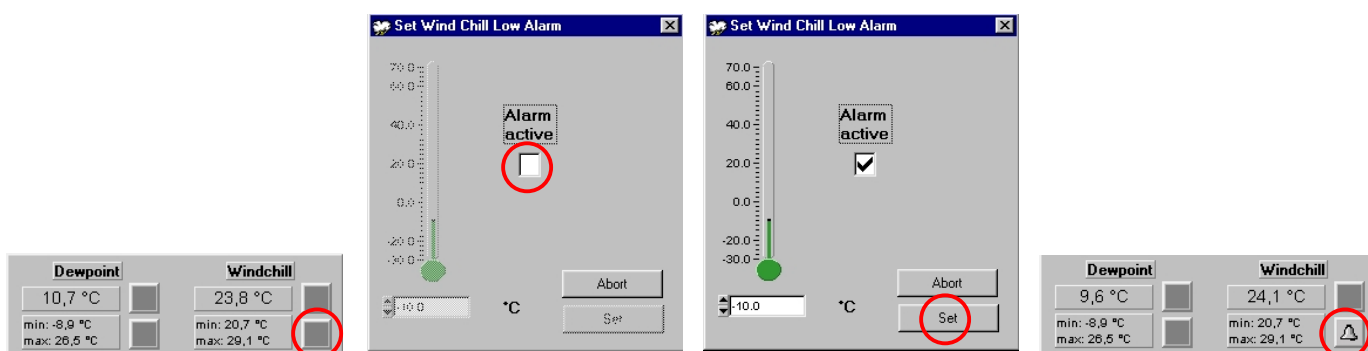
8.4 Indoor Humidity High Alarm Setting

1) Place your cursor over the indoor humidity high alarm box and right click the mouse to open the indoor humidity high alarm window
2) Drag the cursor over the sliding scale to set the desired indoor humidity high or enter the humidity in the box provided
3) Click the alarm active box to set the indoor humidity high alarm
4) Click the set button to confirm
5) The indoor humidity high alarm is now set and will activate when the set indoor humidity level is reached (for setting the indoor humidity high alarm setting from the base station, see main instruction manual).
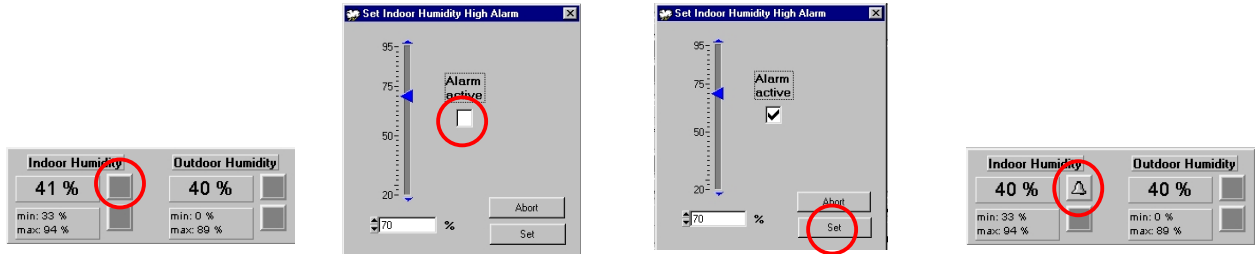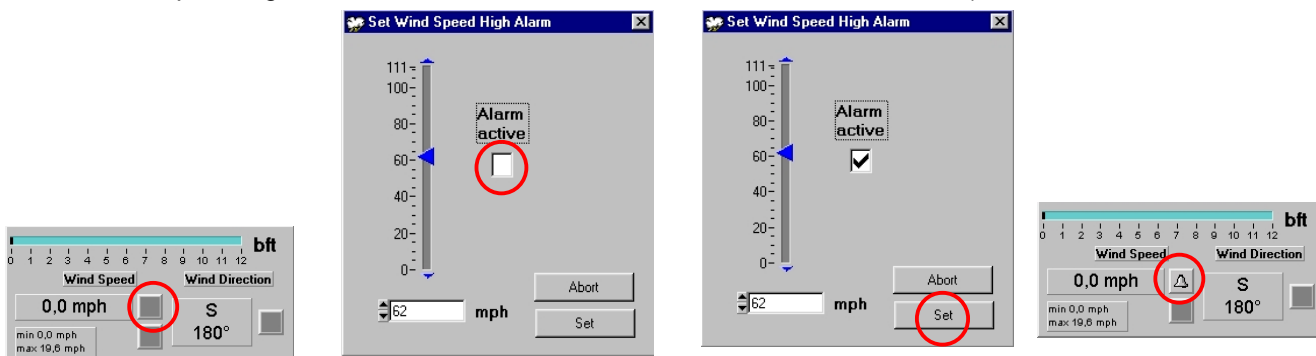

8.5 Indoor Humidity Low Alarm Setting

1) Place your cursor over the indoor humidity low alarm box and right click the mouse to open the indoor humidity low alarm window
2) Drag the cursor over the sliding scale to set the desired indoor humidity low or enter the humidity in the box provided
3) Click the alarm active box to set the indoor humidity low alarm
4) Click the set button to confirm
5) The indoor humidity low alarm is now set and will activate when the set humidity level is reached (for setting the indoor humidity low alarm setting from the base station, see main instruction manual).
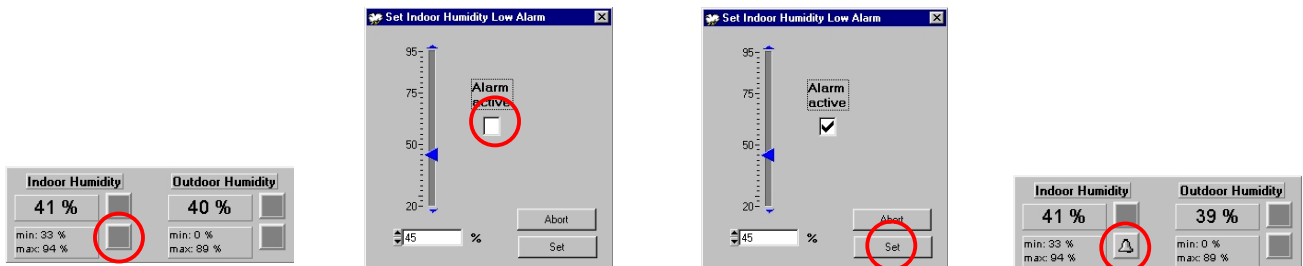

8.6 Outdoor Humidity High Alarm Setting

1) Place your cursor over the outdoor humidity high alarm box and right click the mouse to open the outdoor humidity high alarm window
2) Drag the cursor over the sliding scale to set the desired outdoor humidity high or enter the humidity in the box provided
3) Click the alarm active box to set the outdoor humidity high alarm
4) Click the set button to confirm
5) The outdoor humidity high alarm is now set and will activate when the set outdoor humidity level is reached (for setting the outdoor humidity high alarm setting from the base station, see main instruction manual).
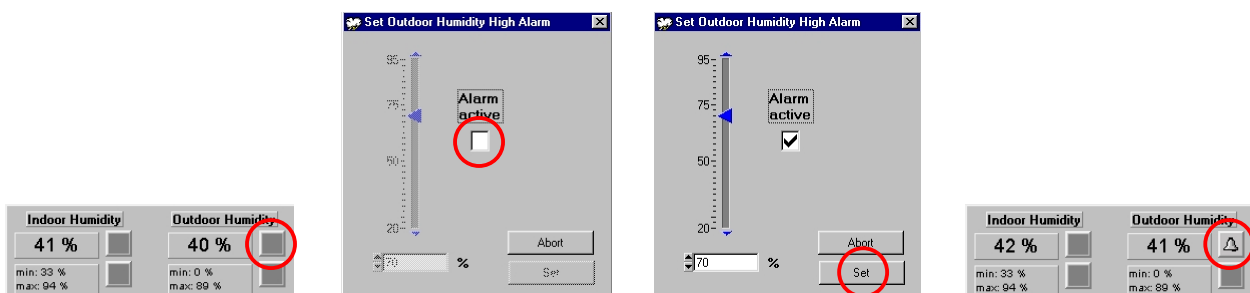
8.7 Outdoor Humidity Low Alarm Setting

1) Place your cursor over the outdoor humidity low alarm box and right click the mouse to open the outdoor humidity low alarm window
2) Drag the cursor over the sliding scale to set the desired indoor humidity low or enter the humidity in the box provided
3) Click the alarm active box to set the outdoor humidity low alarm
4) Click the set button to confirm
5) The outdoor humidity low alarm is now set and will activate when the set humidity level is reached (for setting the outdoor humidity low alarm setting from the base station, see main instruction manual).
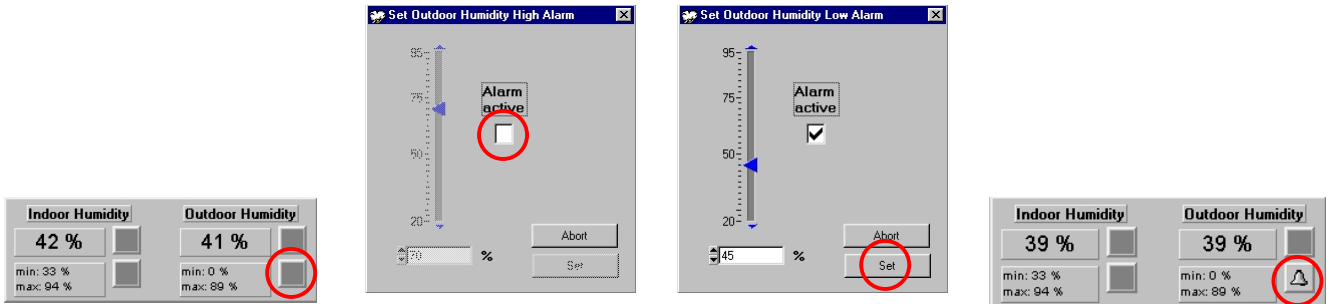
8.8 Indoor Temperature High Alarm Setting

1) Place your cursor over the Indoor temperature high alarm box and right click the mouse to open the indoor temperature high alarm window
2) Drag the cursor over the sliding scale to set the desired indoor temperature high or enter the temperature in the box provided
3) Click the alarm active box to set the indoor temperature high alarm
4) Click the set button to confirm
5) The indoor temperature high alarm is now set and will activate when the set indoor temperature level is reached (for setting the indoor temperature high alarm from the base station, see main instruction manual).
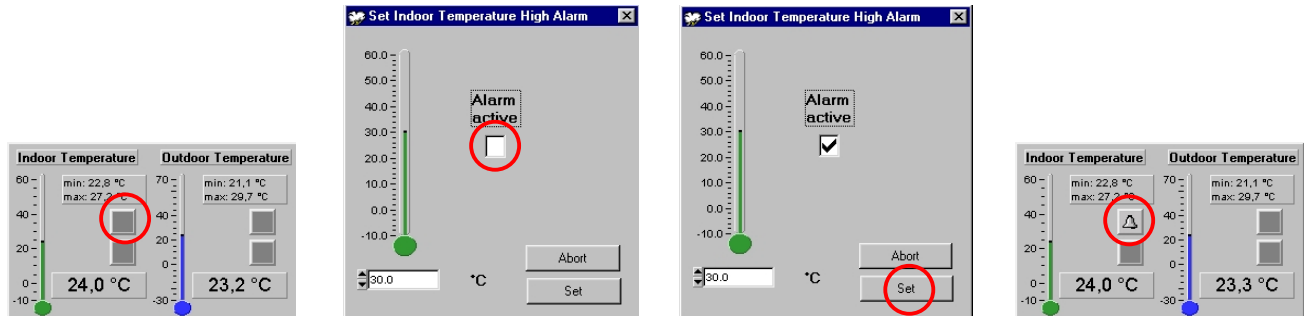
8.9 Indoor Temperature Low Alarm Setting

1) Place your cursor over the Indoor temperature low alarm box and right click the mouse to open the indoor temperature high alarm window
2) Drag the cursor over the sliding scale to set the desired indoor temperature low or enter the temperature in the box provided
3) Click the alarm active box to set the indoor temperature low alarm
4) Click the set button to confirm
5) The indoor temperature low alarm is now set and will activate when the set indoor temperature level is reached (for setting the indoor temperature low alarm from the base station, see main instruction manual).
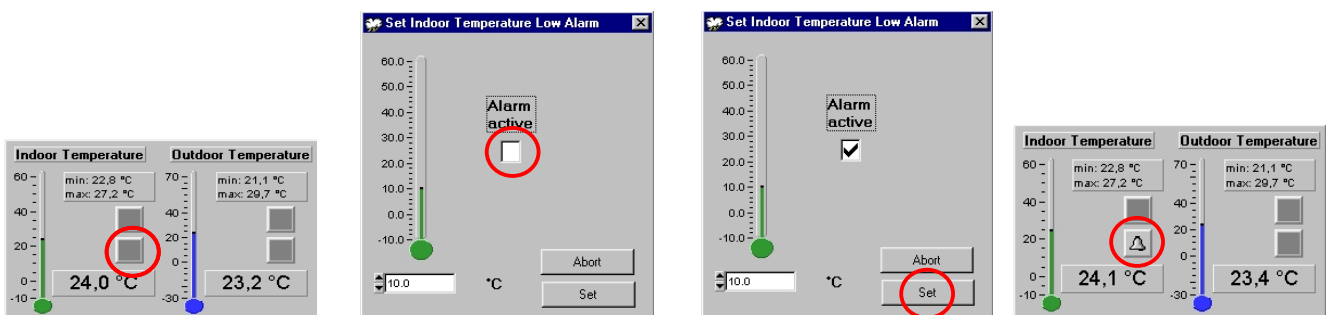
8.10 Outdoor Temperature High Alarm Setting

1) Place your cursor over the outdoor temperature high alarm box and right click the mouse to open the outdoor temperature high alarm window
2) Drag the cursor over the sliding scale to set the desired outdoor temperature high or enter the temperature in the box provided
3) Click the alarm active box to set the outdoor temperature high alarm
4) Click the set button to confirm
5) The outdoor temperature high alarm is now set and will activate when the set outdoor temperature level is reached (for setting the outdoor temperature high alarm from the base station, see main instruction manual).
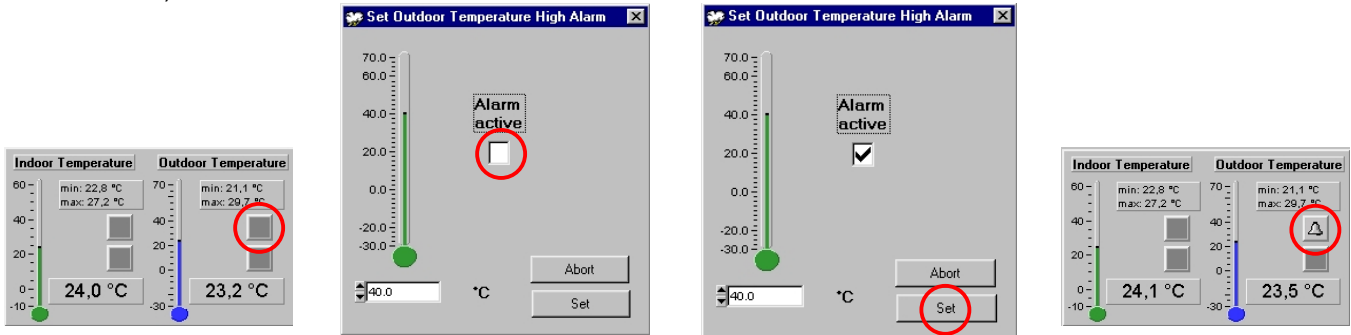
8.11 Outdoor Temperature Low Alarm Setting

1) Place your cursor over the outdoor temperature low alarm box and right click the mouse to open the outdoor temperature low alarm window
2) Drag the cursor over the sliding scale to set the desired outdoor temperature low or enter the temperature in the box provided
3) Click the alarm active box to set the outdoor temperature low alarm
4) Click the set button to confirm
5) The outdoor temperature low alarm is now set and will activate when the set outdoor temperature level is reached (for setting the outdoor temperature low alarm from the base station, see main instruction manual).
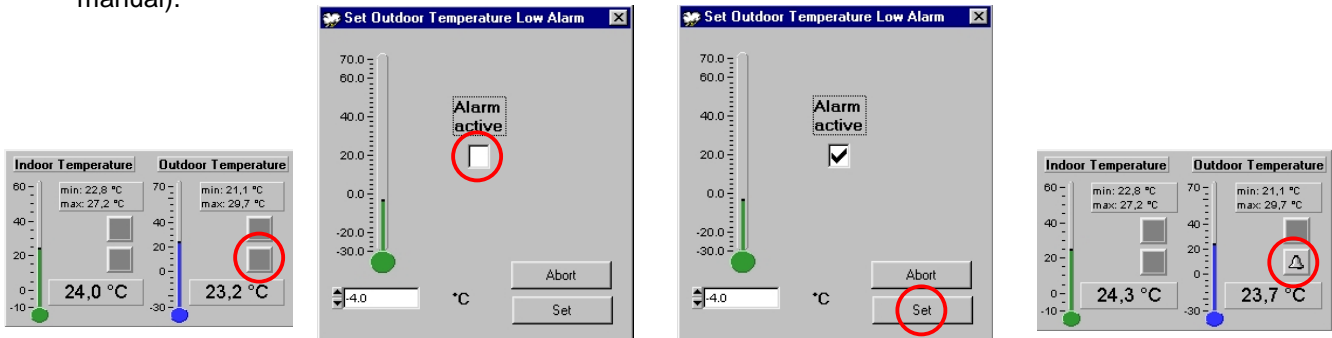
8.12 Dew Point High Alarm Setting

1) Place your cursor over the dew point high alarm box and right click the mouse to open the dew point high alarm window
2) Drag the cursor over the sliding scale to set the desired dew point temperature or enter the temperature in the box provided
3) Click the alarm active box to set the dew point high alarm
4) Click the set button to confirm
5) The dew point high alarm is now set and will activate when the set dew point temperature level is reached (for setting the dew point high alarm from the base station, see main instruction manual).
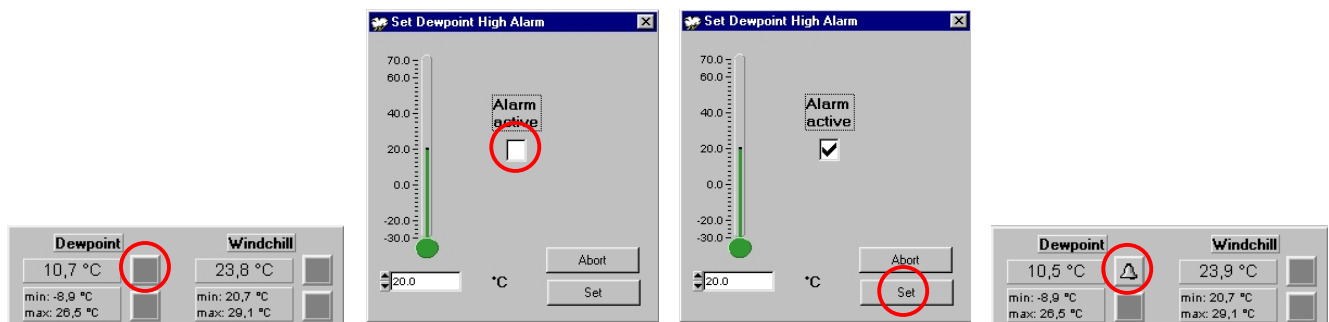
8.13 Dew Point Low Alarm Setting
1) Place your cursor over the dew point low alarm box and right click the mouse to open the dew point low alarm window
2) Drag the cursor over the sliding scale to set the desired dew point temperature or enter the temperature in the box provided
3) Click the alarm active box to set the dew point low alarm
4) Click the set button to confirm
5) The dew point low alarm is now set and will activate when the set dew point temperature level is reached (for setting the dew point low alarm from the base station, see main instruction manual).
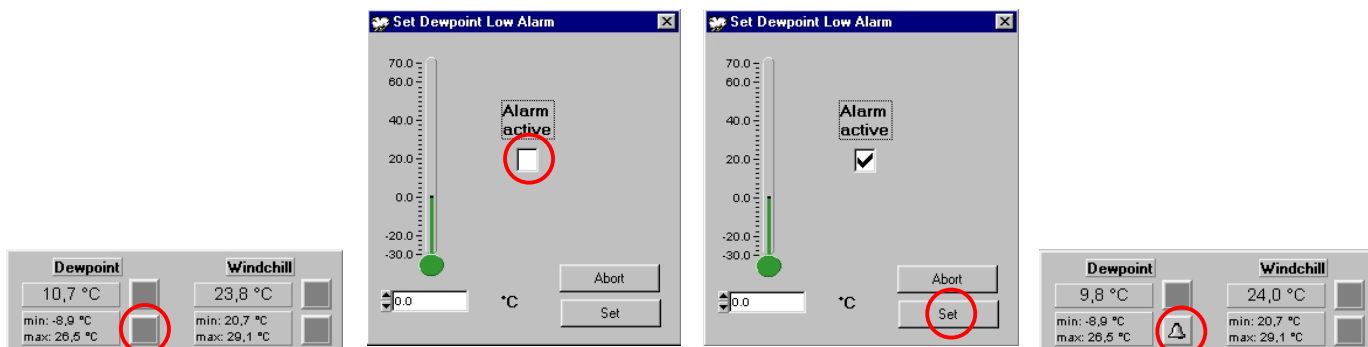
8.14 Wind Chill High Alarm Setting
1) Place your cursor over the wind chill high alarm box and right click the mouse to open the wind chill high alarm window
2) Drag the cursor over the sliding scale to set the desired wind chill temperature or enter the temperature in the box provided
3) Click the alarm active box to set the wind chill high alarm
4) Click the set button to confirm
5) The wind chill high alarm is now set and will activate when the set wind chill temperature level is reached (for setting the wind chill high alarm from the base station, see main instruction manual).
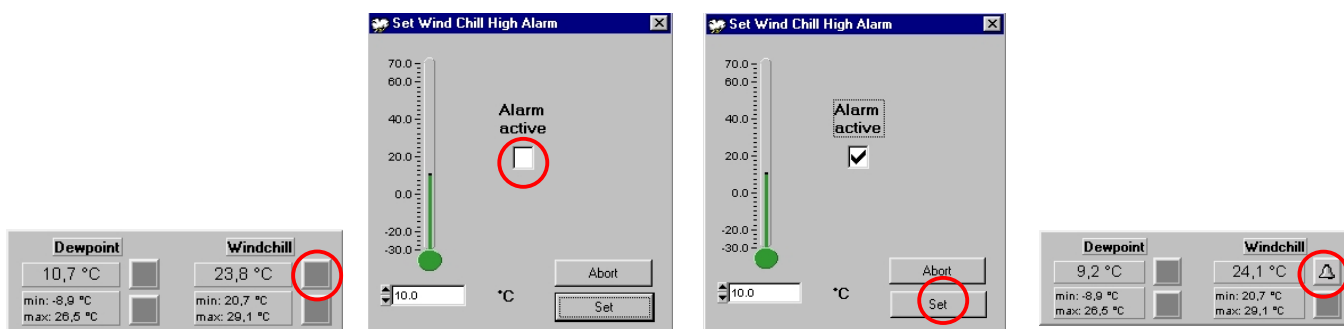
8.15 Wind Chill Low Alarm Setting
1) Place your cursor over the wind chill low alarm box and right click the mouse to open the wind chill low alarm window
2) Drag the cursor over the sliding scale to set the desired wind chill temperature or enter the temperature in the box provided
3) Click the alarm active box to set the wind chill low alarm
4) Click the set button to confirm
5) The wind chill low alarm is now set and will activate when the set wind chill temperature level is reached (for setting the wind chill low alarm from the base station, see main instruction manual).

8.16 Wind Speed High Alarm Setting

1) Place your cursor over the wind speed high alarm box and right click the mouse to open the wind speed high alarm window
2) Drag the cursor over the sliding scale to set the desired wind speed or enter the wind speed in the box provided
3) Click the alarm active box to set the wind speed high alarm
4) Click the set button to confirm
5) The wind speed high alarm is now set and will activate when the set wind speed is reached (for setting the wind speed high alarm from the base station, see main instruction manual).

8.17 Wind Speed Low Alarm Setting

1) Place your cursor over the wind speed low alarm box and right click the mouse to open the wind speed low alarm window
2) Drag the cursor over the sliding scale to set the desired wind speed or enter the wind speed in the box provided
3) Click the alarm active box to set the wind speed low alarm
4) Click the set button to confirm
5) The wind speed low alarm is now set and will activate when the set wind speed is reached (for setting the wind speed low alarm from the base station, see main instruction manual).
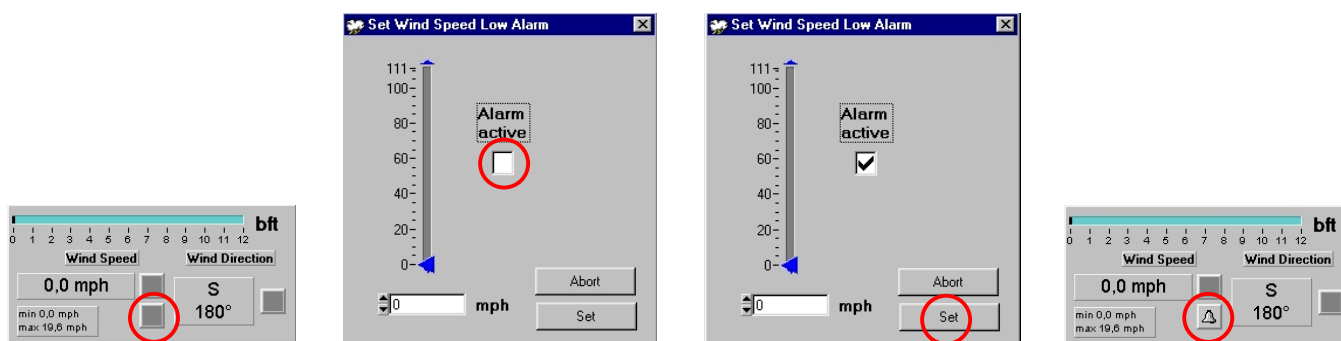
8.18 Wind Direction Alarm Setting

1) Place your cursor over the wind direction alarm box and right click the mouse to open the wind direction alarm window
2) Click on the wind direction(s) required for activating the wind direction alarm (the example below uses North East, East and South East direction settings, if these wind directions are reached, then the alarm will activate)
3) Click the alarm active box to set the alarm
4) Click the set button to confirm
5) The wind direction alarm is now set and will activate when the set wind direction is reached (for setting the wind direction alarm from the base station, see main instruction manual).
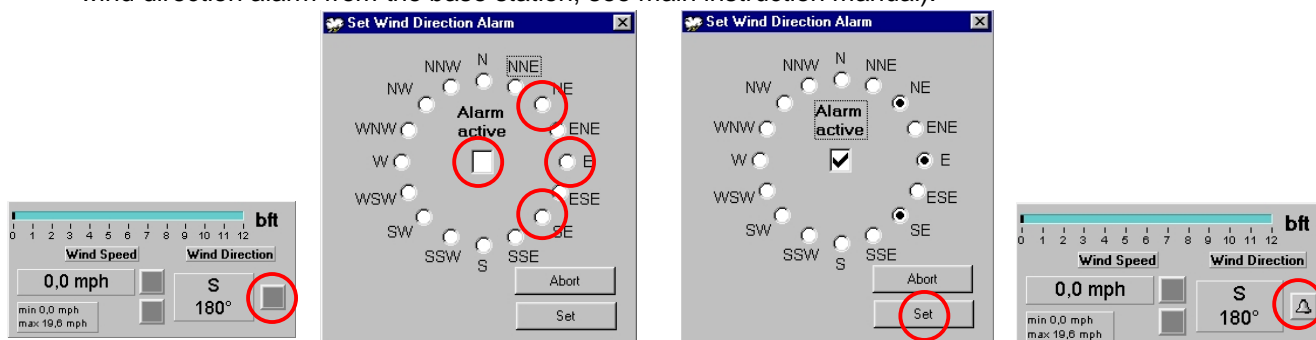
8.19 Rainfall 24 Hour Alarm Setting

1) Place your cursor over the rain 24 hour alarm box and right click the mouse to open the rain 24 hour alarm window
2) Drag the cursor over the sliding scale to set the desired rainfall level or enter the rainfall in the box provided
3) Click the alarm active box to set the alarm
4) Click the set button to confirm
5) The rainfall 24 hour alarm is now set and will activate when the set rainfall level is reached within a 24 hour period (for setting the rainfall 24 hour alarm from the base station, see main instruction manual).
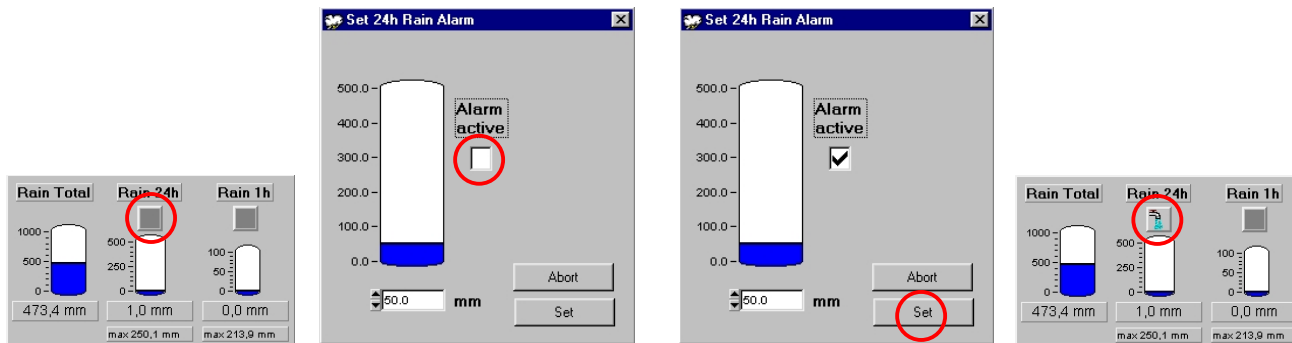
8.20 Rainfall 1 Hour Alarm Setting

1) Place your cursor over the rain 1 hour alarm box and right click the mouse to open the rain 1 hour alarm window
2) Drag the cursor over the sliding scale to set the desired rainfall level or enter the rainfall in the box provided
3) Click the alarm active box to set the alarm
4) Click the set button to confirm
5) The rainfall 1 hour alarm is now set and will activate when the set rainfall level is reached within a 1 hour period (for setting the rainfall 1 hour alarm from the base station, see main instruction manual).
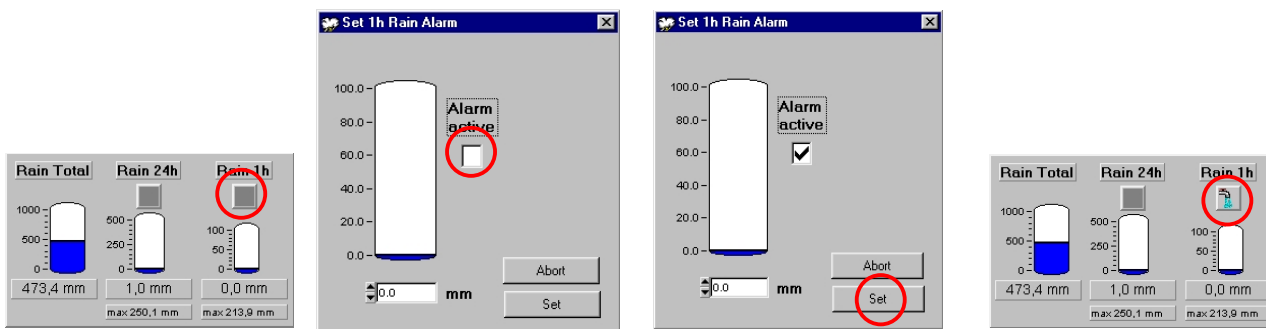
Note: The alarm bell icon may not appear immediately on the Heavy Weather program since it may take few seconds for the program to calculate and confirm the setting

Once the alarm is entered into the Heavy Weather program, the information will be transferred to the base station. In some situations, the alarm icon may not appear immediately on the base station's LCD but will appear after a short delay due the constant data communication between all the sensors, base station and the PC.

8.21 General Alarm Icon

The general alarm icon will light up when any weather condition has been met for the weather alarm settings. This notifies the user that a set weather alarm condition has been reached. To cancel and prepare the general alarm icon for the next weather event simply right click the mouse to enter clear general alarm window and press the clear button.

8.22 Weather Alarm Notes:

To compensate for fluctuation of the weather data, which may cause the weather alarms to sound constantly if the received data from the sensors is close to user set level, a hysteresis function has been implemented for each weather alarm. For example, if the temperature high alarm is set to +25° C and the current temperature value moves to +25.5° C, the alarm will be activated. When the temperature drops to +24.9° C or below and thereafter again increases to beyond +25° C, the alarm bell icon will blink, but no alarm will be sounded. The temperature has to drop to below +24° C (with a preset hysteresis of 1° C) so that the alarm can be produced. This function will compensates for the need of constant and unnecessary alarm sounds

Hysteresis values created are given in the following table:

Condition	Hysteresis
Temperature	1ºC
Humidity	3% RH
Air pressure	1 mBar
Rainfall 24h	5.0mm
Rainfall 1h	0.5mm
Wind	10km/h

Important!

If any alarm has been programmed through the Heavy Weather program to the base station, the alarm status will remain in the PC if there is no connection between the base station and the PC or if the base station did not read the alarm setting before the PC is switched off.

In any power reset, for example a change of batteries, the base station will not save any alarm status into its memory bank. All previously set data will be lost and the alarm status is cancelled for both the receiver and PC since the Heavy Weather program will read new data from the base receiver.

9.0 Resetting recorded values

The following recorded values can be reset. Once executed, the records will be reset to their current respective readings:

- Absolute or relative air pressure
- Indoor and outdoor humidity
- Indoor and outdoor temperature
- Dew point
- Wind chill
- Wind speed
- Rainfall in past 24 hours
- Rainfall in the last 1 hour:

9.1 Resetting the min/max absolute or relative air pressure

1) Right click the min/max button to open the pressure min/max details window
2) Click clear min/max details button to return to the Heavy Weather window
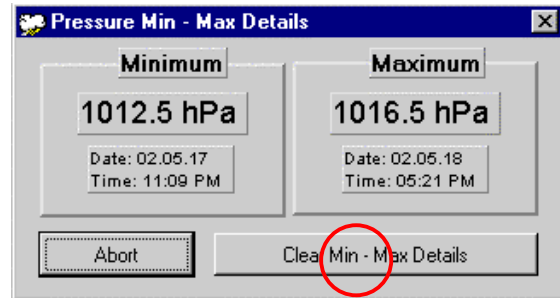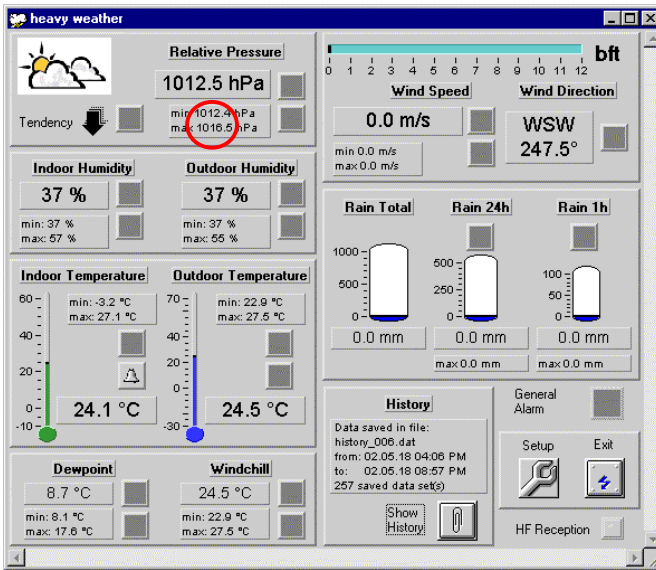
9.2 Resetting the min/max indoor humidity

1) Right click the min/max button to open the indoor humidity min/max details window
2) Click clear min/max details button to return to the Heavy Weather window
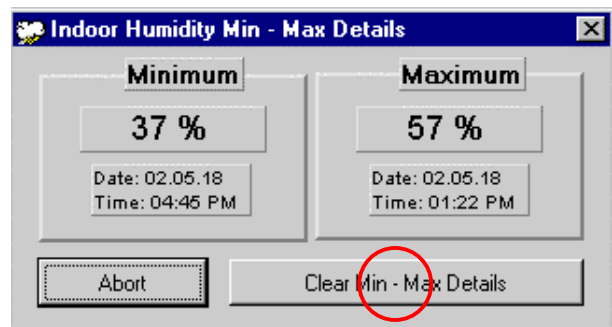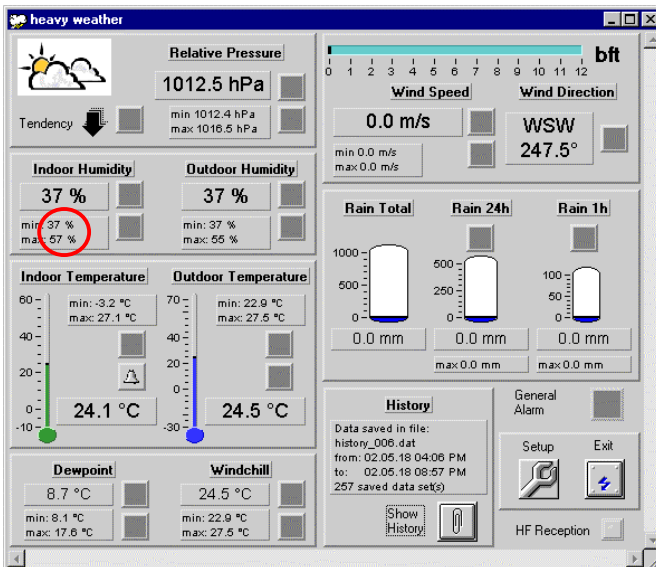
9.3 Resetting the min/max outdoor humidity

1) Right click the min/max button to open the outdoor humidity min/max details window
2) Click clear min/max details button to return to the Heavy Weather window
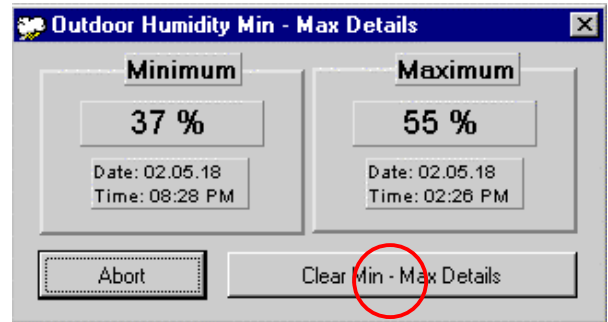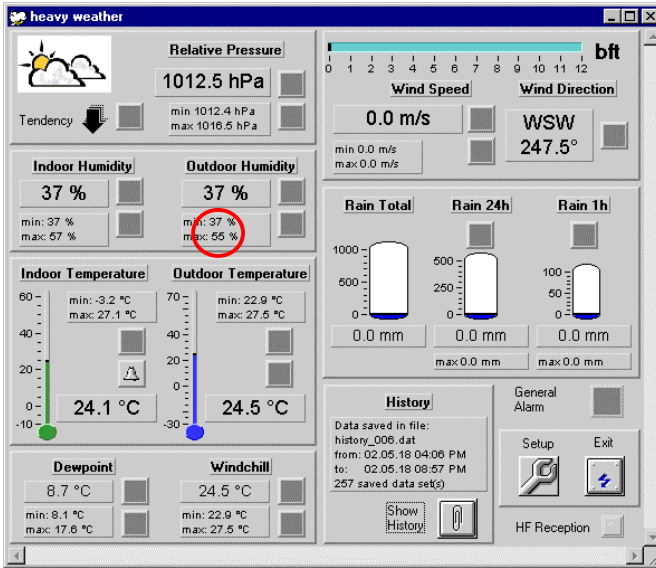
9.4 Resetting the min/max indoor temperature

1) Right click the min/max button to open the indoor temperature min/max details window
2) Click clear min/max details button to return to the Heavy Weather window
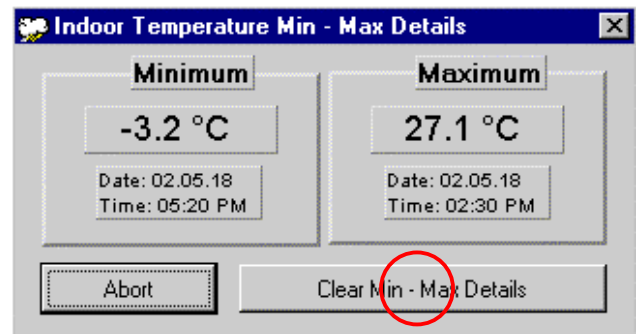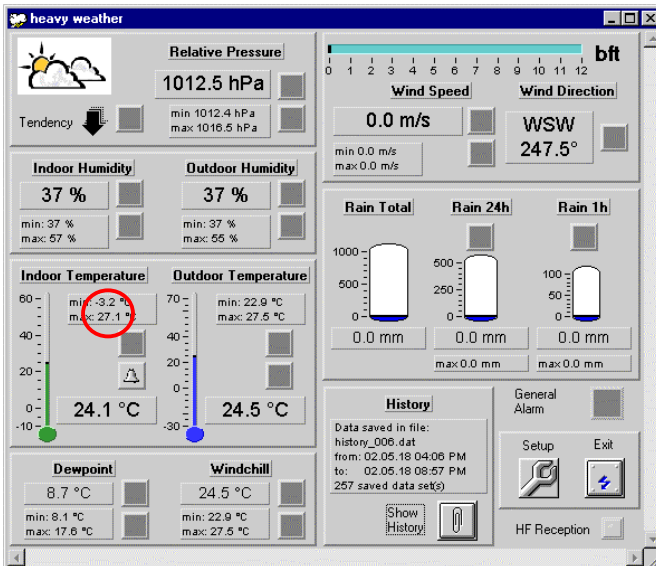
9.5 Resetting the min/max outdoor temperature

1) Right click the min/max button to open the outdoor temperature min/max details window
2) Click clear min/max details button to return to the Heavy Weather window
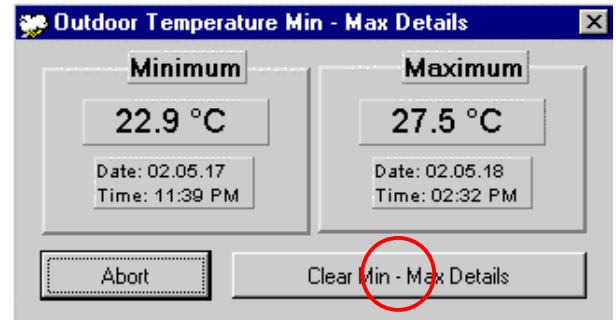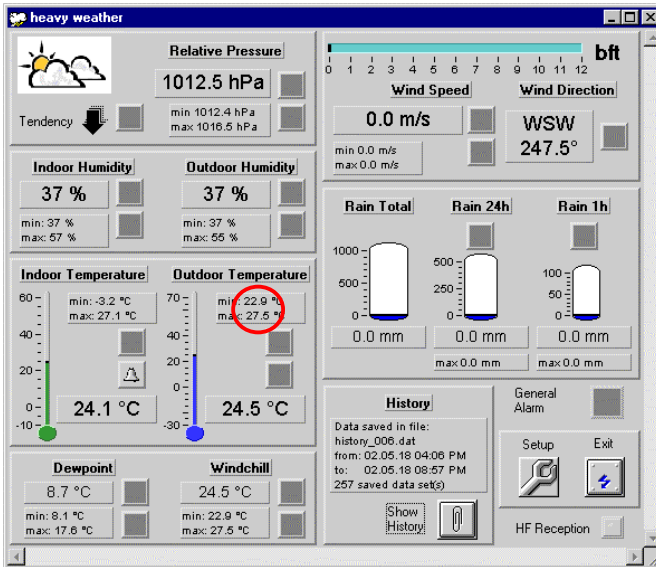
9.6 Resetting the min/max dew point

1) Right click the min/max button to open the dew point min/max details window
2) Click clear min/max details button to return to the Heavy Weather window
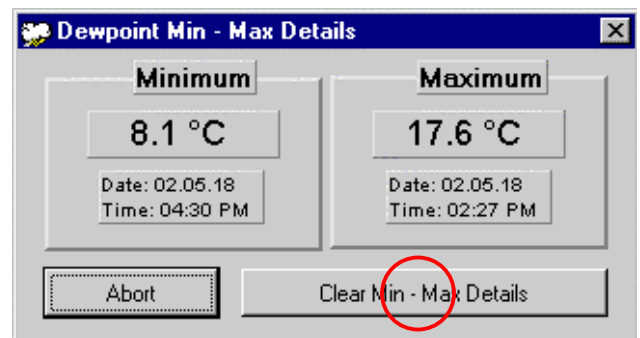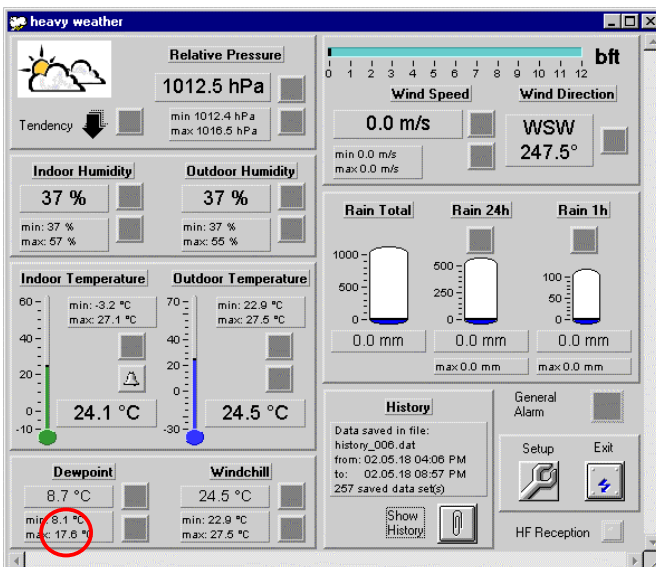
9.7 Resetting the min/max wind chill

1) Right click the min/max button to open the wind chill min/max details window
2) Click clear min/max details button to return to the Heavy Weather window
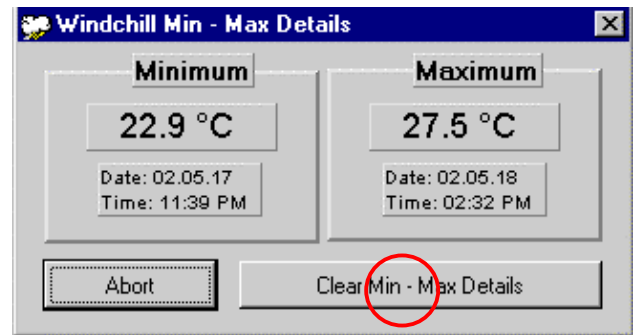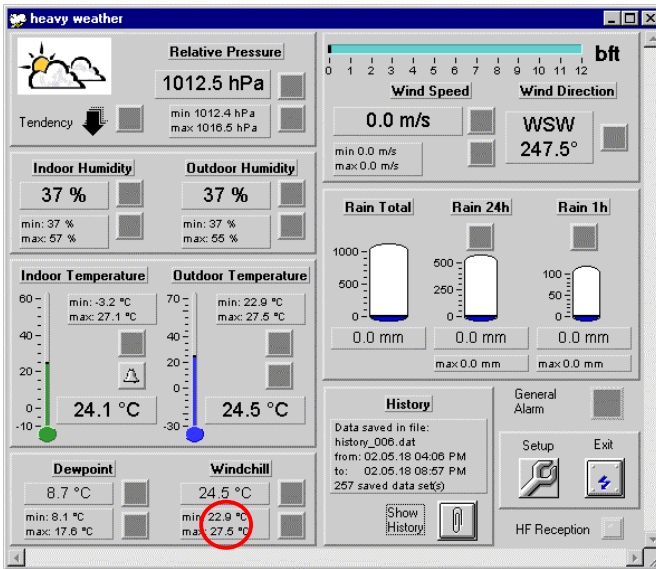
9.8 Resetting the min/max wind speed

1) Right click the min/max button to open the wind speed min/max details window
2) Click clear min/max details button to return to the Heavy Weather window
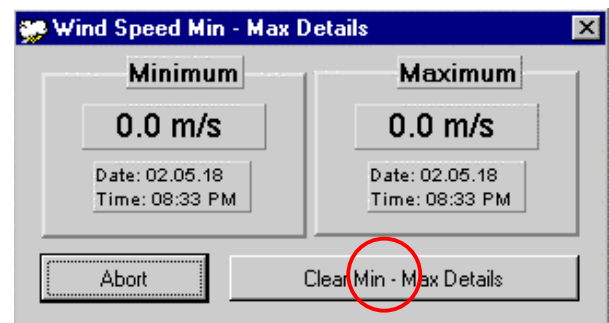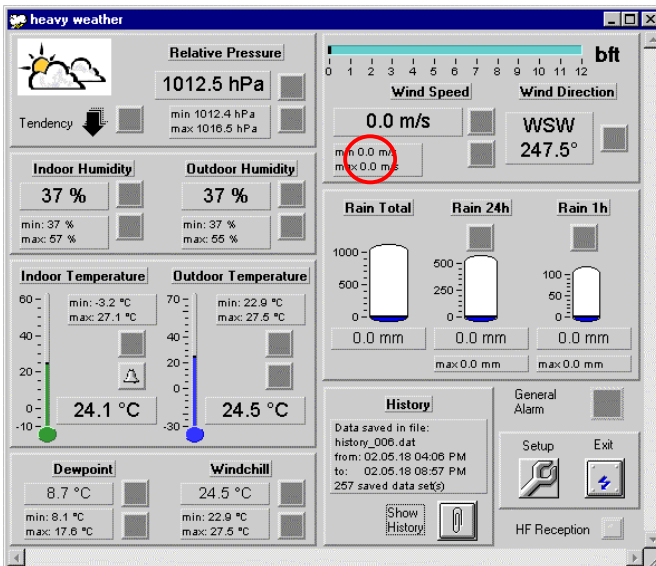
9.9 Resetting the rain counter for the rain total

1) Right click the total rain count button to open the clear total window
2) Click clear rain counter button to return to the Heavy Weather window
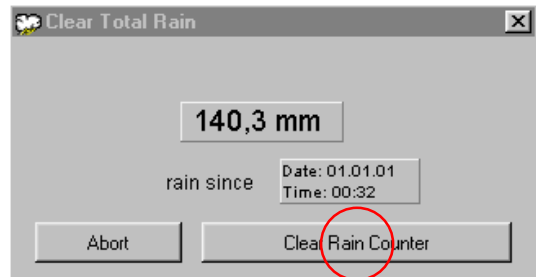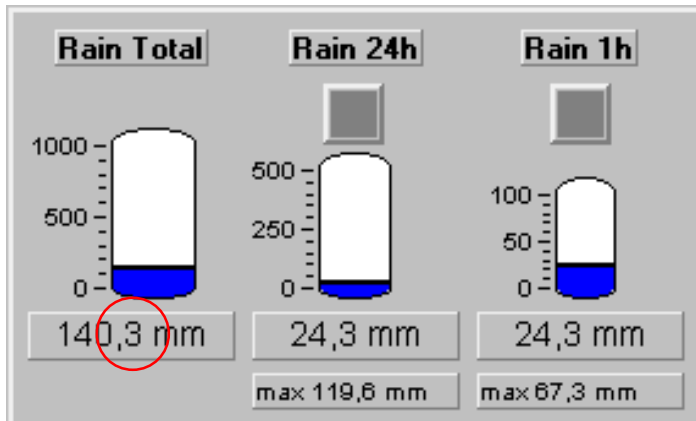
9.10 Resetting the rain counter for the rain 24 hour

1) Right click the rain 24 hour count button to open the clear rain 24 hour window
2) Click clear rain counter button to return to the Heavy Weather window
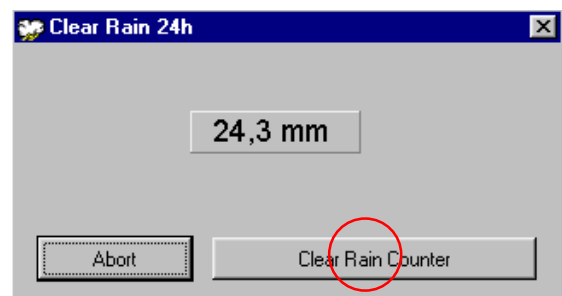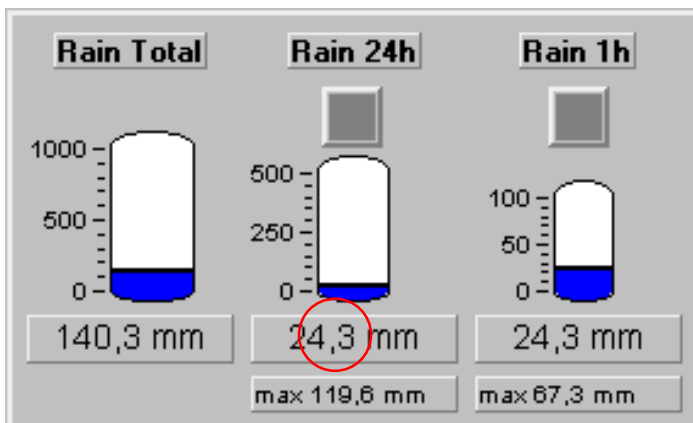
9.11 Resetting the rain counter for the rain 1 hour

1) Right click the rain count 1 hour button to open the clear rain 1hour window
2) Click clear rain counter button to return to the Heavy Weather window
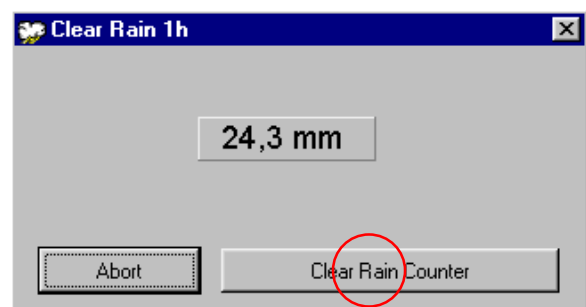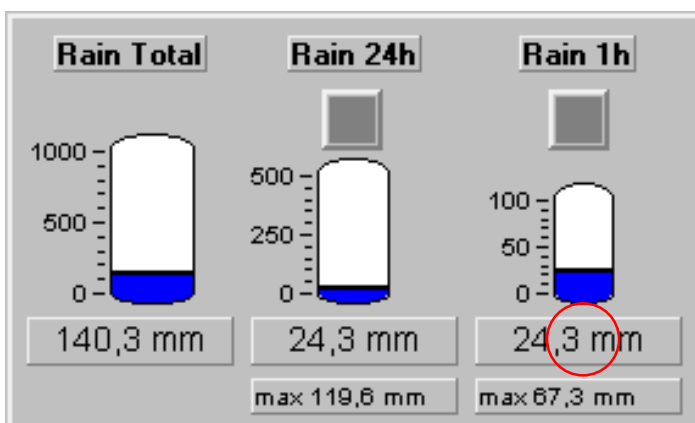
9.12 Resetting the maximum records for rain 24 hours

1) Right click the max button to open the rain 24h max details window
2) Click clear max details button to return to the Heavy Weather window
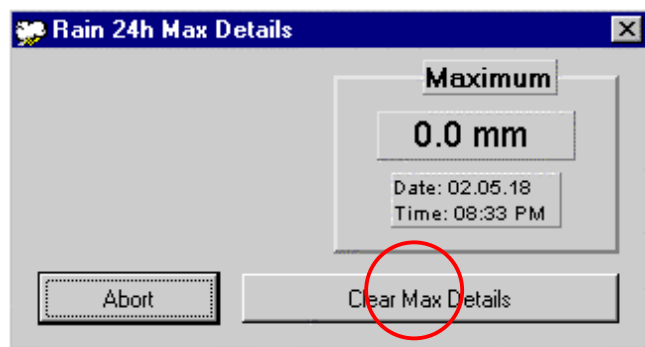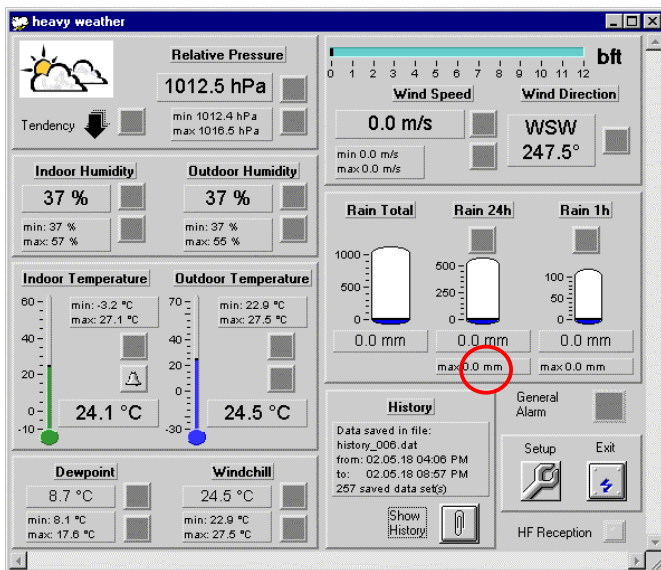
9.13 Resetting the maximum records for rain in the past 1 hour

1) Right click the max button to open the rain 1h max details window
2) Click clear max details button to return to the Heavy Weather window
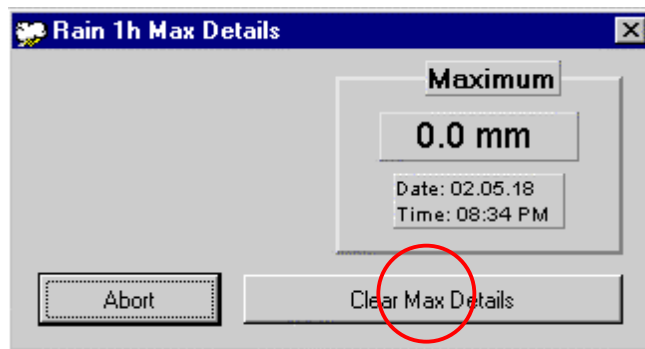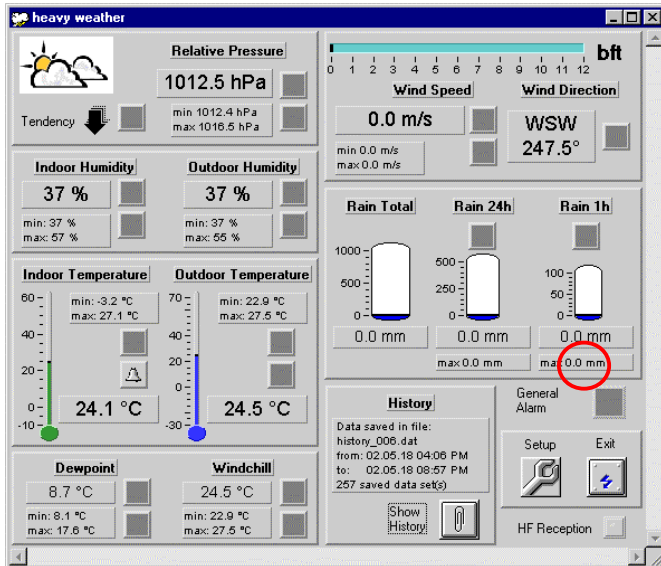
Note: The reset values will flash and may not register on the heavy weather display immediate because the program is still reading the current data from the base station. Due to the masses of data communication between the external sensors, base station and the PC including the high frequency reception, makes a delay of this kind normal. Please note that values cannot be set or reset until the program has executed the current command. Resetting the records on the Heavy Weather program also resets the same-recorded data on the base station.

10.0 Exiting the Heavy Weather program
To close the "Heavy Weather" software, simply click on the "Exit" icon
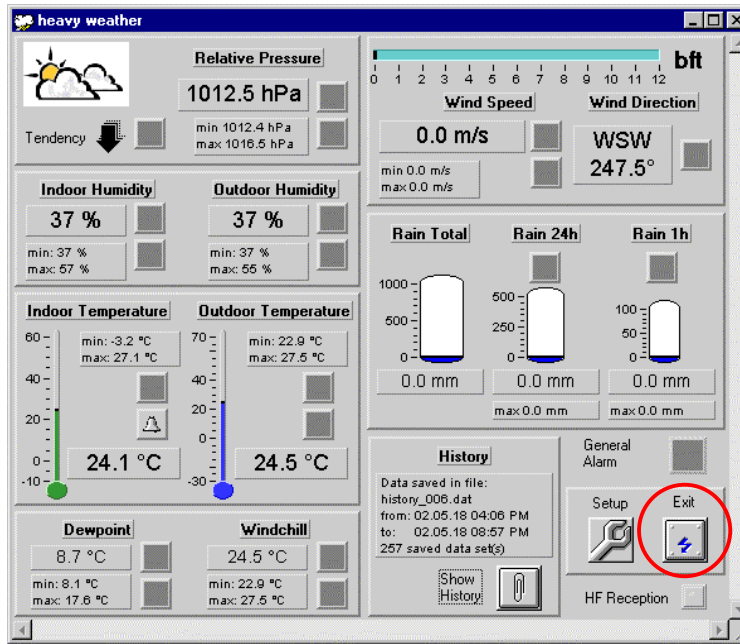
11.0 Technical Data
The following information provides an overview of the technical data of the weather station.

Outdoor data

Transmission Distance in Open Field	:	25 meters max.
Outdoor Temperature Range	:	-29.9º C to +69.9º C (show "OFL" if outside range)
Resolution	:	0.1º C
Measuring Range Rel. Humidity	:	20% to 95% (if the relative humidity is less than 20% or greater than 95%, it will display 19% or 96%)
Resolution	:	1%
Rain Volume Display	:	0 to 999.9mm (1h and 24h rainfall) 0 to 2499mm (Total rainfall)
Resolution	:	0.1mm
Wind Speed	:	0 to 180km/h or 1 to 50m/s
Resolution	:	0.1m/s
Wind Direction	:	Graphic resolution 22.5 Degrees, Numerical Resolution, Letter format

433MHz transmission:

Measuring interval thermo-hygro sensor	:	32 sec (if wind factor<10m/s) or 128sec (if wind factor>10m/s) 10 minutes (if the base station fails to receive any data after 5 attempts in a row; all outdoor data readings will display "---", except for the rain value)

With wire data transmission:

Measuring interval thermo-hygro sensor	:	8 seconds

Indoor data

Pressure/ temperature	:	4 times per minute
Indoor Temperature Range	:	-9.9º C to 59.9º C (shows "OFL" if outside range)
Resolution	:	0.1º C
Measuring Range Rel. Humidity	:	20% to 95% (if the relative humidity is less than 20% or greater than 95%, it will display 19% or 96%)
Resolution	:	1%
Measuring Range Air Pressure	**:**	300 hPa to 1099 hPa
Resolution	**:**	0.1 hPa

Relative humidity checking interval	:	every 30 seconds
Alarm duration	:	2 minutes (approx.)

Power consumption
Base Station

Batteries	:	3 x AA, IEC LR6, 1.5V (Alkaline recommended)
or AC power	:	Input 230V AC 50HZ (use the provided AC/DC adapter only)
Thermo-hygro sensor	:	2 x AA, IEC LR6, 1.5V (or can draw power from the adaptor if used)
Battery life using 433MHz:	:	approximately 12 months (alkaline batteries recommended)
Battery life using cable connection	:	approximately 6 months (alkaline batteries recommended)

Dimensions (L x W x H):

Base Station:	:	170 x 35 x 138mm (2 meter cable for connection to the PC)
Thermo-hygro sensor	:	71.5 x 73 x 136mm (10 meter cable for connection to base station)
Rain sensor	:	140 x 70 x 137mm (plus 10 meter cable connects to thermo-hygro sensor)
Wind sensor	:	291 x 60 x 197mm (plus 10 meter cable connects to thermo hygro sensor)

12.0 Operating Range

Under optimum conditions in an open field a range of up to 82ft wireless transmission is possible, i.e. when there is 'visual' contact between the sensors and base station. Walls and reinforced concrete constructions can be passed through, but they do reduce the operating distance accordingly. A reduced operating range may be due to the following reasons:

- High frequency interference from other sources.
- Buildings of all types and trees.
- Especially in the case of the wind sensor, metal roofs or roof insulation with foil sealed glass wool can reduce the range.
- Transmitter and receiver clearance from conductive surfaces or objects that give radiation characteristic and thus the range
- Neighboring using units operating on the same frequencies may affect the receiver.
- Poorly screened PCs may affect the receiver and reduce the reception ranges

13.0 Understanding Displayed Weather Data

When the transfer of the updated weather information occurs or the user has entered new settings (for example setting high and low alarms) from the base station to the PC, there may be a very small time delay until the data is updated to the PC. For this reason new data may not be displayed immediately onto your PC even though it has been changed on the base station. The base station experiences this same short time delay when new data settings are entered from the PC before the base station can recognize and shows this on the LCD.

During the high frequency reception periods from the outdoor sensors to the base station, any data transfer from the base station to the PC or vice versa will experience a longer time delay due to the mass amounts of weather information being simultaneously received and transmitted from the sensors to the base station which is why any data changes made by the user may not register immediately. Time delay of data reception and transfer is normal so when newly entered data does not immediately register from the base station to the PC or vice versa it is due to the frequent communication between all the sensors and base station and the PC.

Furthermore, due the constant weather information updating from the sensors to the base station, the data displayed on the PC may not be the updated information received by the base station since the data may not have been transferred to the PC yet. Therefore users may experience different sets of data shown on the base station and the Heavy Weather program until such time the data is updated to the PC. The Heavy Weather program only displays the information received by the base station and does not receive any data directly from the sensors.

14.0 Problems and Solutions

Problem & cause	Remedy
Distance between transmitters and receiver too long.	*Reduce distance between transmitters and receiver to receive signal*
High shielding materials between the units (thick walls, steel, concrete, isolating aluminum foil and etc.)	*Find a different location for sensors and/or receiver. See also Item* ***'Transmission Range'*** *below.*
Interference from other sources (e.g. wireless radio, headset, speaker, etc. operating on the same frequency)	*Find a different location for the sensors and/or base station. Neighbors using electrical devices operating on the 433MHz signal frequency can also cause interference with reception*
No Reception after adding extension cables	*Find a new location for the sensors and/or base station. Recommend not adding more than 10 meter extension cables between units to the existing cable lengths as this will increase the chance data reception problems.*
Reception then no reception - loss of transmission signal from the sensor to the base station	*Press and hold the PLUS(+) key for 2 seconds to synchronize the base station to the sensors for weather data reception. If still no signal, then change the sensor batteries and synchronize the units again.*
Poor contrast LCD or no reception or low batteries in sensors or receiver.	*Check the LCD contrast setting or change batteries (check low battery indicator on the LCD)*

The following is a working example of how to save text files and create charts on other applications.

1. Using the Heavy Weather program, open the History window and save the weather data from the desired history file as a text file by clicking on the Save as text button, enter a text file name and click OK.

2. Then open the text file that you have just saved (in Heavy Weather directory or your specific directory) using a spreadsheet program like Excel.
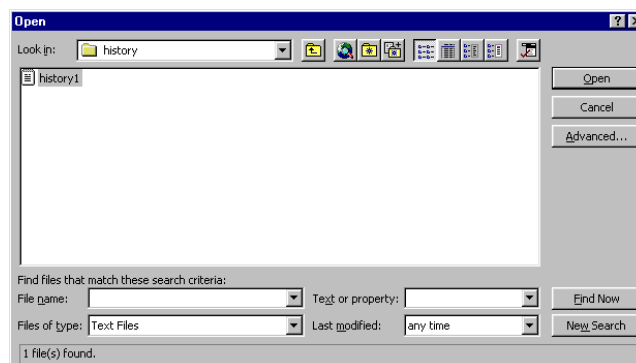
3. The text import wizard window will open. Choose delimited as the separator for each data column and click the next button.
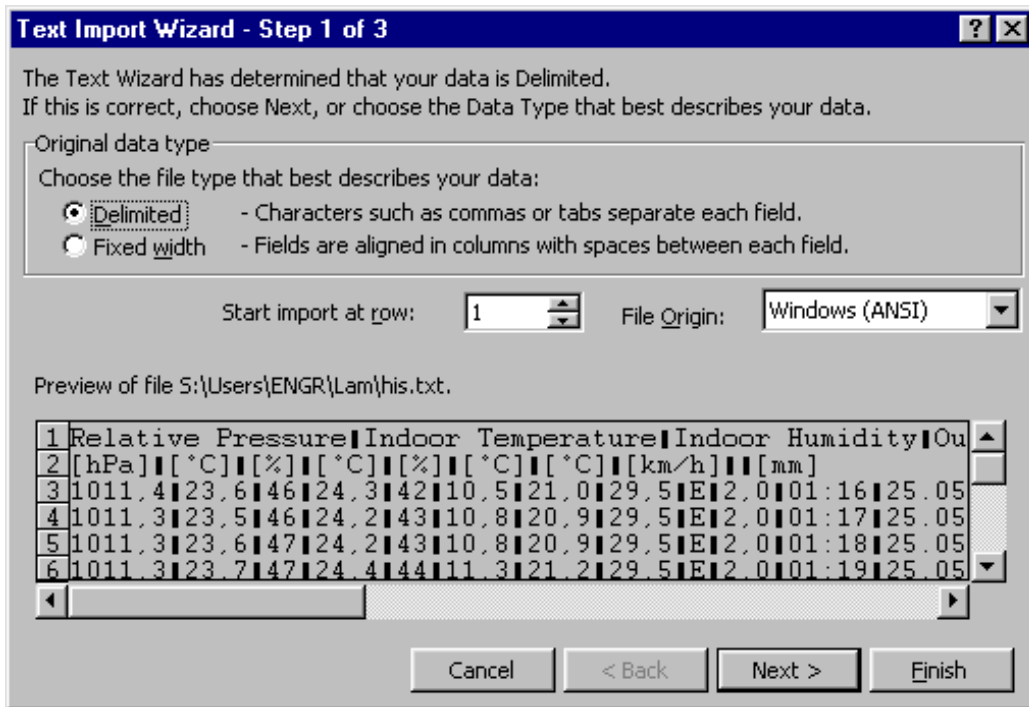
4. The Heavy Weather program uses "tab" to separate data, so you should choose "tab" as delimiter in the Excel program and click the next button
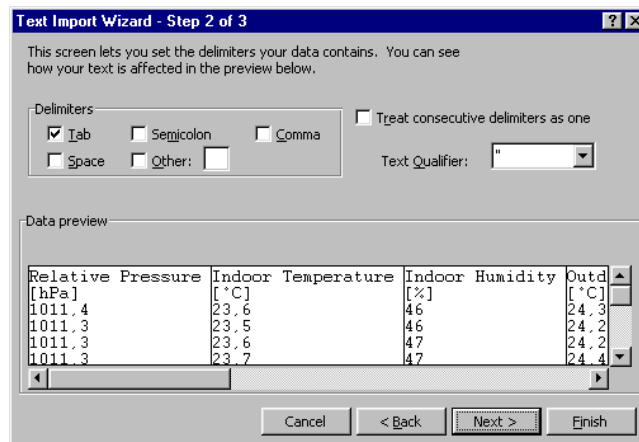
5. Next, select the appropriate data type (such as text or numbers) for each column of data. The default setting General and this is usable and click the Finish button
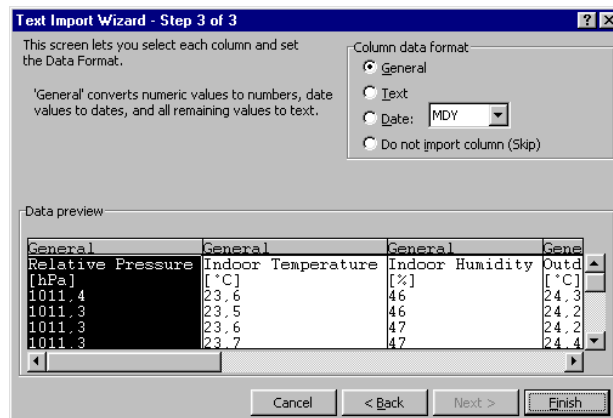
6. The data is then imported into the Excel ready for the user to plot a graph. In this example we will use the indoor temperature.

7. Next, the user has to create a valid time column as X-axis. In this example we have typed a date which can be recognize by Excel manually in the cell M3, "2002/5/25 1:30"

8. Since the weather data in this example is generated with a 1-minute interval, we can use a formula to generate the time column, we type "+M3+1/(24*60)" in the cell M4. This means adding 1 minute with respect to cell M3 in cell M4 for the next set of data. Since Excel uses 1 day as a unit for time, we add 1/(24 x 60) = 1 minute with respect to the cell above.

9. Then we copy this formula to all cells in column K. The time axis is now complete.

Before plotting weather graph, please check that the decimal separator of the weather data is comma or point. If comma is used (preferred by some European users), Excel will not be able to read the weather data directly. Excel will define the data with comma as text format and thus will not be suitable for graph plotting as co-ordinates. There are two solutions to solve this problem. First and most the simplest way is to go into Heavy Weather software and change the decimal separator to point in setup menu and then save the text file again. Second, follow below procedures to change the decimal separator from comma to point from Excel.

A) Use the indoor temperature as the example. Go into to a new cell (for example, N3), type "=VALUE(SUBSTITUTE(B3,",",".""))" . Then an Excel readable indoor temperature reading is created

B) Then we copy this formula to all cells in column N. A set of valid indoor temperature readings are ready for graph plotting

10. Next step is to make the plotting. From Excel, select Insert from the pull down menu then select Chart. You will see the below screen. Then select XY as the chart type and click next
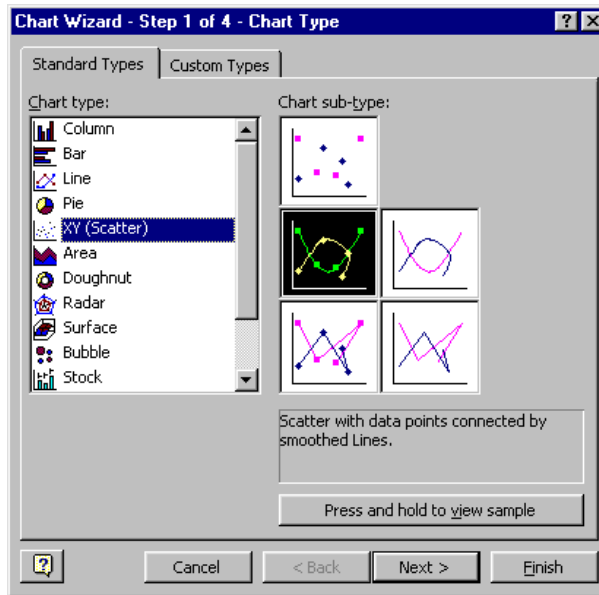
11. The Chart Source Data window is now open then select "Series" tab and click Next
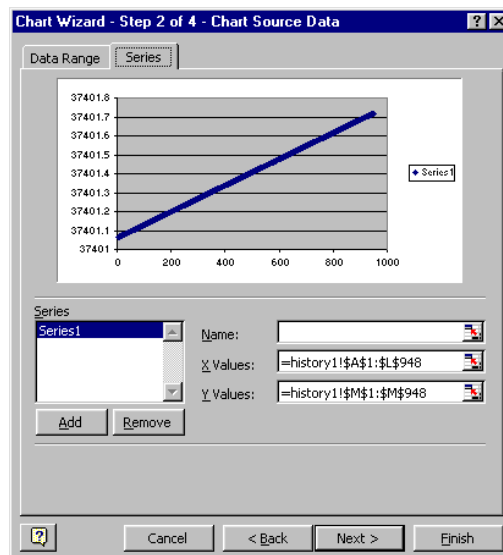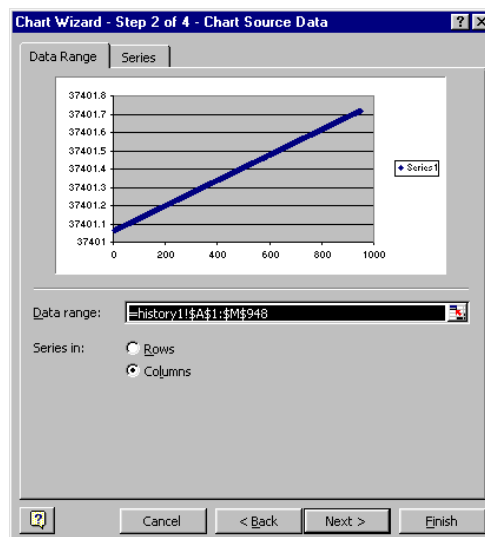
12. Next, select the X-axis data by clicking the right-most icon in the "X Values :" And then, Choose the appropriate data range. In this example, we select the time column we just made as the X-axis, since it is located in a sheet named history1 and is from cell M3 to M62 (plot a graph between 1:30 to 2:29. The "=history1!$M$3:$M$62" is now written in the box.

Chart Wizard - Step 2 of 4 - Chart Source Data - X Values: ? ✕
=history1!$M$3:$M$62

13. Next select the weather data as Y-Axis, we choose the indoor temperature as Y-Axis, so we have the following screen.
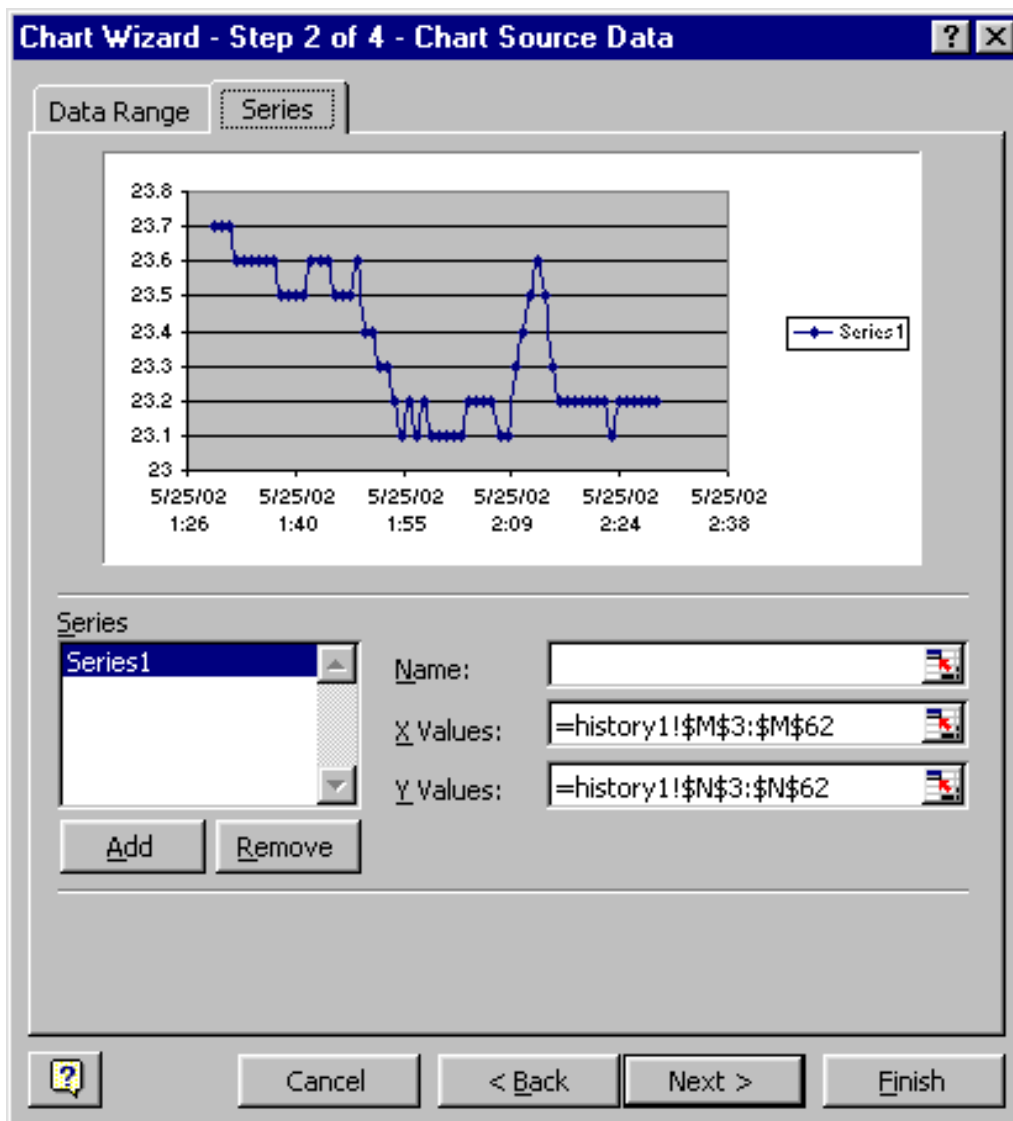   A) When decimal separator is comma Choose column N.

Chart Wizard - Step 2 of 4 - Chart Source Data - Values: ? ✕
=history1!$N$3:$N$62

    B) When decimal separator is point. Choose column B.

Source Data - Values: ? ✕
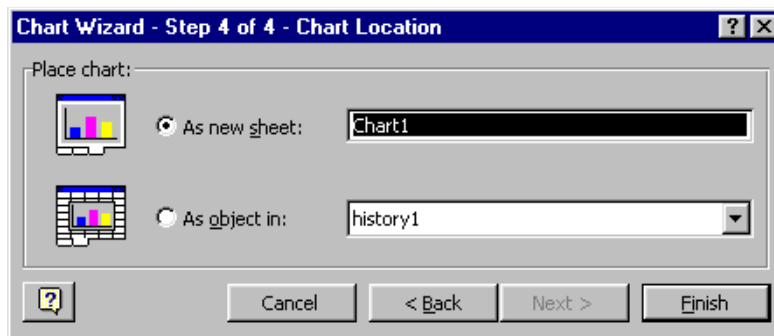=history1!$B$3:$B$62

14. As shown below, both the X and Y axis data range are selected. The variation of temperature within 1:30 to 2:29 can now be seen.

15. Click next to enter the below screen to dress up the chart, you can customize the Titles / Axes / Gridlines / Legend / Data Labels.
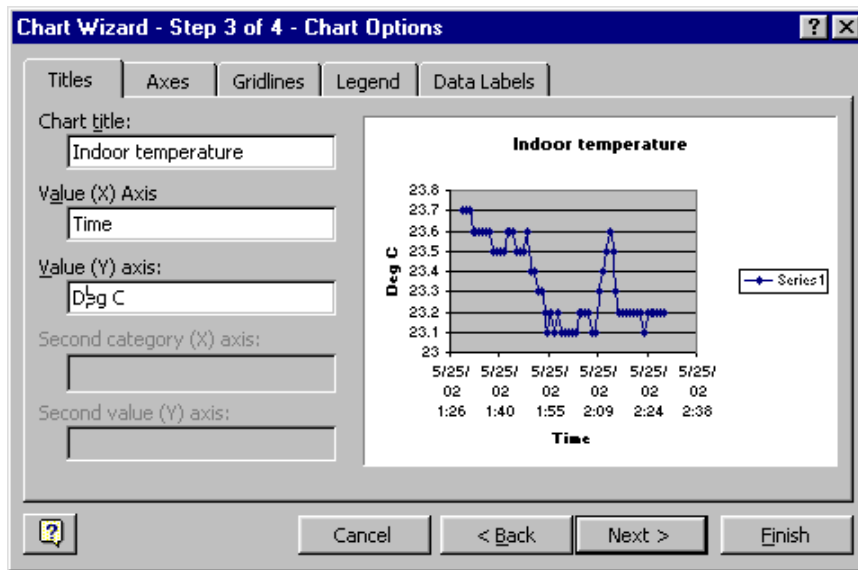
17. Click next, then select whether you want a separate sheet or a chart inside the data sheet.

18. Click finish to see the chart. In this chart, the variation of indoor temperature within 1 hour (1:30 to 2:39) is plotted.