Elcometer 320

en

Climate Monitoring System

Operating Instructions

This product meets the Electromagnetic Compatibility Directive and the Low Voltage Directive.

A copy of this Instruction Manual is available for download on our Website via www.elcometer.com.

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Thank you for your purchase of this Elcometer 320 Climate Monitoring System. Welcome to Elcometer.

Elcometer are world leaders in the design, manufacture and supply of inspection equipment for coatings and concrete. Our products cover all aspects of coating inspection, from development through application to post application inspection.

With the purchase of this product you now have access to the worldwide service and support network of Elcometer. For more information visit our website at www.elcometer.com

1 ABOUT THIS GAUGE

The Elcometer 320 Climate Monitoring System allows the user to observe the climatic conditions throughout their entire paint shop or factory over an existing network. The Elcometer 320 Climate Monitoring System uses Elcometer's market leading Elcometer 319 handheld Dewmeter® gauge backed with specifically designed hardware and software to provide a user with the most complete solution to ensure that conditions within an industrial coating setting are at their optimum level.

1.1 SYSTEM FEATURES

- Autonomous data collection
- Ready to connect to a local network
- Automatic daily reporting
- Minimal maintenance or intervention required

1.2 WHAT THE BOX CONTAINS

- Elcometer 319 Top Gauge
- Light and audible alarm system with power supply
- Elcometer 320 Climate Monitoring System Base Unit and power supply
- Flash Card
- Connection cables
- Elcomonitor Log and Elcomonitor View Software
- Bluetooth USB dongle

Your gauge is packed in a cardboard package. Please ensure that this packaging is disposed of in an environmentally sensitive manner. Please consult your local Environmental Authority for further guidance.

To maximise the benefits of your new Elcometer 320 Climate Monitoring System please take some time to read these Operating Instructions. Do not hesitate to contact Elcometer or your Elcometer supplier if you have any questions.

2 HARDWARE SET-UP

Begin by inserting the Flash Memory card into the Elcometer 320 Climate Monitoring System Base Unit. This card contains all of the software required to make the components work together and should be present in the machine before it is switched on. Secondly, plug the Bluetooth USB dongle into a free USB port on the Elcometer 320 Climate Monitoring System Base Unit. This will allow a connection to the Elcometer 320 Climate Monitoring System in the event of a network problem.

The light system requires its own power socket and connection to the base unit via the socket marked “COM1”. The Elcometer 319 gauge has a USB port underneath a rubber flap on the base of the gauge. It may be connected by any of the other available USB ports on the base unit and is powered from this; batteries are not required for the gauge to function as part of the Elcometer 320 Climate Monitoring System. Finally, connect the Elcometer 320 Climate Monitoring System Base Unit to your network with a suitable Ethernet cable and the Climate Station is ready. The on switch for the device is located on the back of the Elcometer 320 Climate Monitoring System Base Unit.

The Elcometer 319 gauge may be used with an external temperature sensor if required. A K-type connector is located beneath a rubber flap on the top of the gauge. Connect a sensor here and the gauge will automatically switch from using the integrated surface temperature sensor to the external one. Note that the integrated surface temperature sensor will be disabled and no measurements will be gathered from it.

3 SOFTWARE SET-UP

3.1 INTRODUCTION

The Elcometer 320 Climate Monitoring System is provided with two pieces of software; Elcomonitor Log and Elcomonitor View. Both pieces of software need to be present on the network in order for the system to function. The software can be run in a client/server configuration on multiple machines or as a standalone installation on one PC. If using the client/server configuration the Elcomonitor Log application should be installed on a Windows 2003 or later server and the Elcomonitor View application should be installed on Windows XP or later PCs. This configuration allows multiple view applications to be run on separate workstations simultaneously.

If using the standalone installation the log application should be started up first followed by the view and in all situations the log application must be running for the system to work.

3.2 THE ELCOMONITOR LOG APPLICATION

Begin by installing the Log Application onto your PC and following the on screen wizard. Once this is complete, open the application.
The main screen will list all of the Climate Stations that the application has made a connection to via Bluetooth or over a network. It will initially be empty as no stations have been added yet.

Search for Climate Stations via Bluetooth

If your PC is Bluetooth enabled you may connect to a Climate Station with this method when in range. The 

button opens a wizard that allows you to find stations in range. The search process may take a few minutes. Once complete, the application will indicate the stations located (if any) and checking the box next to them will add them to the log. Click the Finish button to close the wizard
If the wizard is unable to find the Bluetooth Climate Station try again. Repeated failures may indicate that the station is out of range.

Search for Networked Climate Stations

The application can search for Climate Stations hardwired to the same network with the 

button. The wizard will search a range of IP addresses on a network and attempt to locate a Climate Station at each address. This process will take several minutes to complete. Any new stations the wizard has found

will be displayed after the search has finished and these can be added to the log by checking the boxes and pressing “Finish” on the wizard.

Manually Adding Climate Stations

If the search wizard is unable to locate some Climate Stations these may be added manually using the 

button. A wizard will prompt for the host name or IP address of the station. The host name is a unique label that is attached to every device on a network. Often this is the same as the “computer name” that you can edit manually in windows. Every computer on a network also features a unique IP address, which is what the network uses to route data to individual devices. Once the information is entered the application will attempt to connect to the station at this address. If successful, the station will be added to the log.

The main log screen will now be populated with the Climate Stations that have been added and the application will attempt to connect to them and periodically request data. Information is displayed on screen about when the last measurement set was downloaded from each station.

Additional Settings

The log software generates a daily report at 12:15am every day for the previous day’s data. To specify the folder in which they are placed click the “Settings” tab and browse for the desired location. Leaving this area blank will disable report creation.

Also available on this screen is a facility to protect the database with passwords for administrators and users as well as a choice of units for the specific humidity reading. Finally, a logo can be placed in the top

right corner of the automatically generated report. Pressing the browse button allows you to locate any compatible .jpg or .bmp image file in windows explorer.

Renaming a Station

Stations can be renamed into something more meaningful. Select the “Stations” tab, highlight the relevant station and click the 

button. A window prompting for a new name will appear.

Starting and Stopping Stations

Individual Climate Stations can be started and stopped remotely using the 

button. Stopping a station stops all climate data from being logged and hides the data in the Elcomonitor View software. Stopped Stations may be restarted at any time with the 

button.

3.3 THE ELCOMONITOR VIEW APPLICATION

The Elcomonitor View software allows remote monitoring of the individual Climate Stations. All of the readings the Climate Stations are taking are displayed here along with any warnings and notifications.
Install the Elcomonitor View software on any PC where you need to view the climatic conditions at each of the Climate Stations. Ensure that the Elcomonitor Log application is running on the computer you have chosen as the server before you continue.

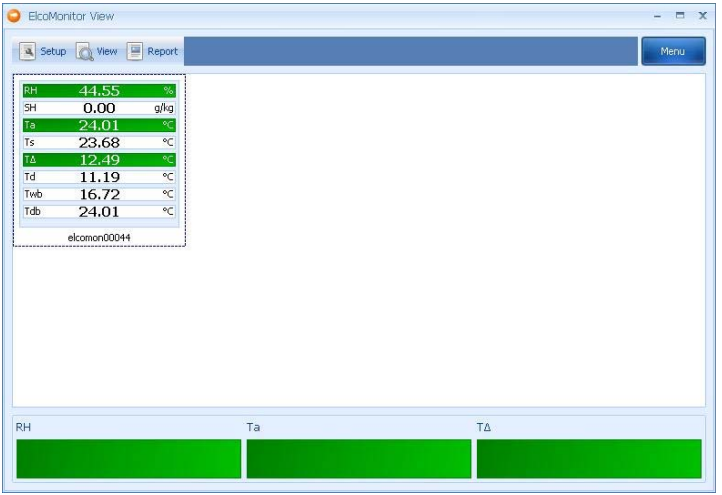
When started for the first time, the software will request the address of the computer running the Elcomonitor Log application. If this is the same as the computer on which you are installing the view application on then leave this as “localhost”. The program will now start and you will be presented with a dialog box requesting what level of access is required for a choice of either “Administrator” or “User”. The features offered to both are as follows.

Note: *Should you be unsure about the IP address of the server it is displayed in the “About” menu of the Log application.*

	Administrator	***User***
View Station State	•	•
Generate Report	•	•
Setup Station	•	
Setup Filter on Station	•	

Stations

Stations are displayed in an alphabetically sorted grid with the individual climatic parameters selected by the user. Measurements that have had limits defined are shown colour coded red, yellow or green in the measurement panel as well as along the bottom of the screen.

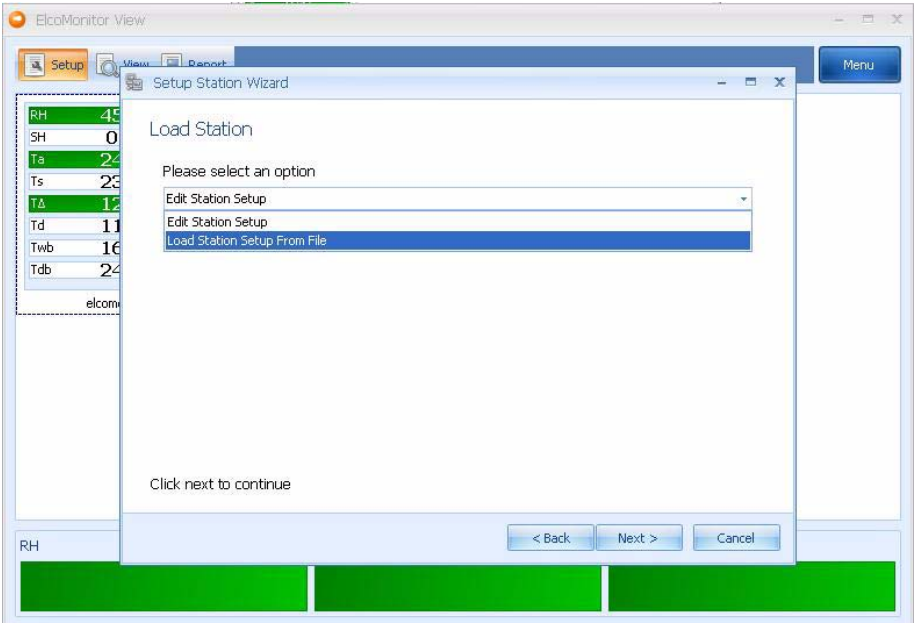


When a station is selected the following buttons are available on the toolbar.

Climate Station Setup (Administrators Only)

The view application allows you to set each of the Climate Stations up remotely. Limits on can be defined here that control the signal light and alarm at each Climate Station. Begin by selecting a Climate Station and then navigate to “Setup” in the toolbar. The wizard that will be displayed allows you to edit the current setup or load a one from a previous saved setup file.

To load previously saved setups select the option when prompted.

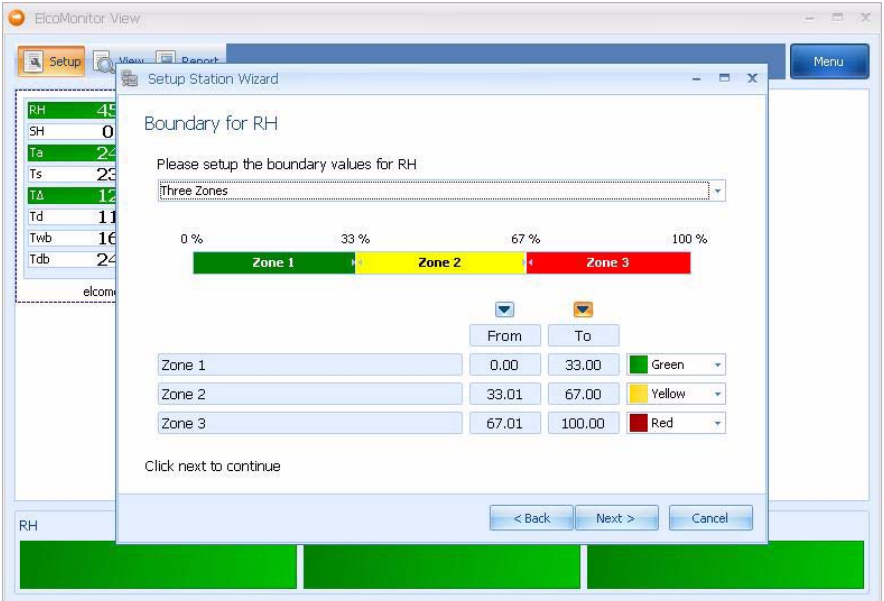

ElcoMonitor View
Setup
Menu
Setup Station Wizard
Load Station
Please select an option
Edit Station Setup
Edit Station Setup
Load Station Setup From File
Click next to continue
< Back
Next >
Cancel
RH
SH
Ta
Ts
TA
Td
Twb
Tdb

Then browse to the file location and complete the wizard. All settings will be applied the next time the server makes contact with the Climate Station.

If the option to edit the station setup is selected instead, the wizard will continue and request which parameters you wish to monitor (these are the parameters that appear in the main Elcomonitor View window) check or uncheck the desired boxes.

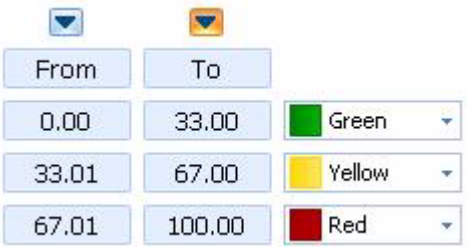
The following screens allow you to apply tolerance bands to the parameters that can control the signal light. These tolerance bands will also colour selected parameters on the Elcomonitor View main screen.

The tolerances may be split into two or three zones depending on your requirement. The two zone tolerance band option uses red and green colours whilst the three zone band uses red, yellow and green. If you do not wish to set tolerances for each measurement select “No Zones”.


ElcoMonitor View
Setup
Menu
Setup Station Wizard
Boundary for RH
Please setup the boundary values for RH
Three Zones
0 %
33 %
67 %
100 %
Zone 1
Zone 2
Zone 3
From
To
Zone 1
0.00
33.00
Green
Zone 2
33.01
67.00
Yellow
Zone 3
67.01
100.00
Red
Click next to continue
< Back
Next >
Cancel
RH
SH
Ta
Ts
TΔ
Td
Twb
Tdb

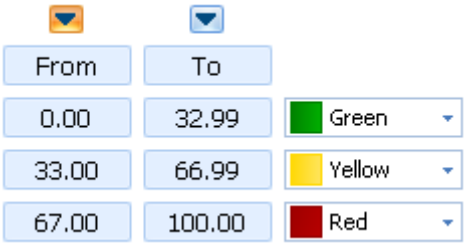
You can change the range of each colour band by using the mouse to drag the boundary between the two colours.

The absolute range of each zone is shown below the coloured bar.



Different combinations of colours may be used. For example you may wish to have a red band at very low temperatures, followed by a green band and then another red for when the temperature was too high. The colours of the individual bands are available in the drop down boxes.

The downward arrows above “From” and “To” allow the user to choose which side of the limit a change in zone occurs at. In the example above, the limits are set so the state changes once slightly above the limit. When the other arrow is clicked, the reverse is true (see below).



Proceeding through the wizard by pressing next will go through all of the different measurement types and allow the user to set tolerances for each of the parameters in this way.

After all of the parameters have had their tolerances set the parameter that will be displayed on the signal tower and activate the audible alarm must be selected. Any parameter that has had limits set may be selected.

Parameters may also be defined in the wizard that will override the normal operation of the signal tower if it enters a red tolerance zone. This will cause the red light on the tower to flash and the alarm to sound. The flashing light will persist until the parameter has reached a yellow or green state. The signal tower will then show the condition of the usual parameter as normal.

At the same time as the signal tower changes colour, a new event will be displayed in the Elcomonitor View software. This will pop up each time one of the parameters has shifted into another zone or when a station is powered up to alert the user if they need to change anything.

Further options allow control over the time the audible alarm sounds for and how often the measurements are refreshed in the panel.

Hysteresis

Hysteresis prevents the signal lamp from changing colour on small changes close to the zone boundary. This prevents the signal lamp from flickering between different colours when the measurement fluctuates close to the zone boundary. For example, if the zone boundary was at 30C and the actual air temperature was 29.5C, local air currents could easily cause the reading to drift over 30C which could trigger an alarm. The measurement would quickly return to normal and the alarm cancelled, but it would be disruptive should this occur repeatedly.

Hysteresis prevents this by forcing the software to wait until the measurement crosses a certain threshold before the light colour is changed preventing frequent zone changes and confusion.

Saving to Station

The final page of the wizard allows the user to save the configuration to the station or save the configuration to the station and a file. This is useful if the user needs to set up several Climate Stations with the same settings.

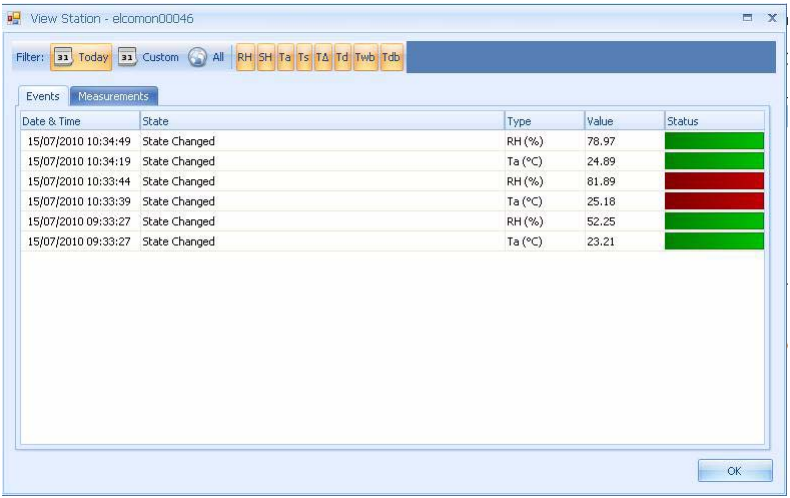
3.4 ELCOMONITOR VIEW TOOLS

Selecting a station and clicking 

accesses the view tool. Here the user can view a log of past events or measurements depending on the tab selected. Events can be filtered by type by selecting or deselecting from the toolbar 

and also by time period.

custom time period allows the user to enter dates between which events of measurements will be shown.


View Station - elcomon00046
Filter:
Today
Custom
All
RH
SH
Ta
Ts
TΔ
Td
Twb
Tdb
Events
Measurements
Date & Time
State
Type
Value
Status
15/07/2010 10:34:49
State Changed
RH (%)
78.97
15/07/2010 10:34:19
State Changed
Ta (°C)
24.89
15/07/2010 10:33:44
State Changed
RH (%)
81.89
15/07/2010 10:33:39
State Changed
Ta (°C)
25.18
15/07/2010 09:33:27
State Changed
RH (%)
52.25
15/07/2010 09:33:27
State Changed
Ta (°C)
23.21
OK

Report Generation

The Elcometer 320 Climate Monitoring System will produce a report each day as required for all Climate Stations. The user can also generate reports at any time and for any station(s) with the 

button. A wizard will be displayed to gather the required information. Once a period of time is entered the user has the option to either print to paper or to a pdf file for viewing and archiving.

4 MAINTENANCE AND STORAGE

The Elcometer 320 Climate Monitoring System is designed to be switched on and active for a long time and should not require any maintenance. In the unlikely event of a fault please contact Elcometer technical support for advice.
Regular calibration checks over the life of the Elcometer 319 gauge are a requirement of quality management procedures, e.g. ISO 9000, and other similar standards. For checks and certification contact Elcometer or your Elcometer supplier. The rest of the system does not require any specific calibration or measurement.

5 TECHNICAL SPECIFICATIONS

Measured Parameters

• Surface temperature (built-in probe)	Ts
• External temperature (external probe)	Ts
• Air temperature	Ta
• Relative humidity	RH

Calculated Parameters

- Dewpoint temperature Td (calculated from Ta and RH)
- Delta T TΔ (= Ts - Td)
- Dry bulb temperature Tdb (= Ta)
- Wet bulb temperature Twb (calculated from Ta and RH, see note below)
- Specific humidity SH (calculated from Ta and RH)

Note: *The formula used for calculation of Twb and SH uses a fixed value of air pressure set at 1.0 atmosphere (1013 mbar). The accuracy of the Twb and SH will vary at other values of atmospheric pressure. This variation may be greater than ±1°C for Twb and ±1%/10mb for SH.*

Operating Range

The ranges listed below refer to the maximum range that the gauge is capable of displaying

- Surface temperature (built-in probe) Ts -20°C to 80°C (-4°F to 176°F)
- External temperature (Elcometer external probe) Ts -40°C to 200°C (-40°F to 392°F)
- Air temperature Ta -20°C to 80°C (-4°F to 176°F)
- Relative humidity RH 0 % to 100 % RH
- Specific humidity SH 0 g/kg to 325 g/kg (0 gr/lb to 2275 gr/lb)
- Gauge LCD display -20°C to 80°C (-4°F to 176°F)

Accuracy

• Surface temperature (built-in probe)	Ts ±0.5°C (±1°F)
• External temperature (Elcometer external probe)	Ts ±2.0°C (±4°F)
• Air temperature	Ta ±0.5°C (±1°F)
• Relative humidity	RH ±3%
• Specific humidity	SH ±8%

Resolution

• Surface temperature (built-in probe)	Ts 0.1°C (0.1°F)
• External temperature (Elcometer external probe)	Ts 0.1°C (0.1°F)
• Air temperature	Ta 0.1°C (0.1°F)
• Relative humidity	RH 0.1%
• Specific humidity	SH 0.1 g/kg (0.1gr/lb)

6 SPARE PARTS AND ACCESSORIES

The following spare parts and accessories are available from your local Elcometer supplier or direct from Elcometer:

External Temperature Probe - Surface Mount, Magnetic	T31920162
USB Cable	T99921325
Spare USB Bluetooth Transmitter/Receiver	T99920130

7 RELATED EQUIPMENT

In addition to the Elcometer 320 Climate Monitoring System, Elcometer produces a wide range of other coating testing equipment.

Users of the Elcometer 320 Climate Monitoring System may also benefit from the following Elcometer products:

- Elcometer Surface Profile Gauges and Testers
- Elcometer Surface Cleanliness Test Kits
- Elcometer Moisture Meters
- Elcometer Wet Film and Dry Film Thickness Gauges
- Elcometer Material Thickness Gauges
- Elcometer ElcoShip IMO PSPC Inspection Software

Other Bluetooth products within the Elcometer product range include:

- Elcometer 456 Dry Film Thickness Gauges
- Elcometer 224 Digital Surface Profile Gauge

These gauges can be connected to compatible PDAs and mobile phones using ElcoMaster Mobile and ElcoShip Mobile Software.

For further information contact Elcometer, your local Elcometer supplier, or visit www.elcometer.com or www.elcoship.com