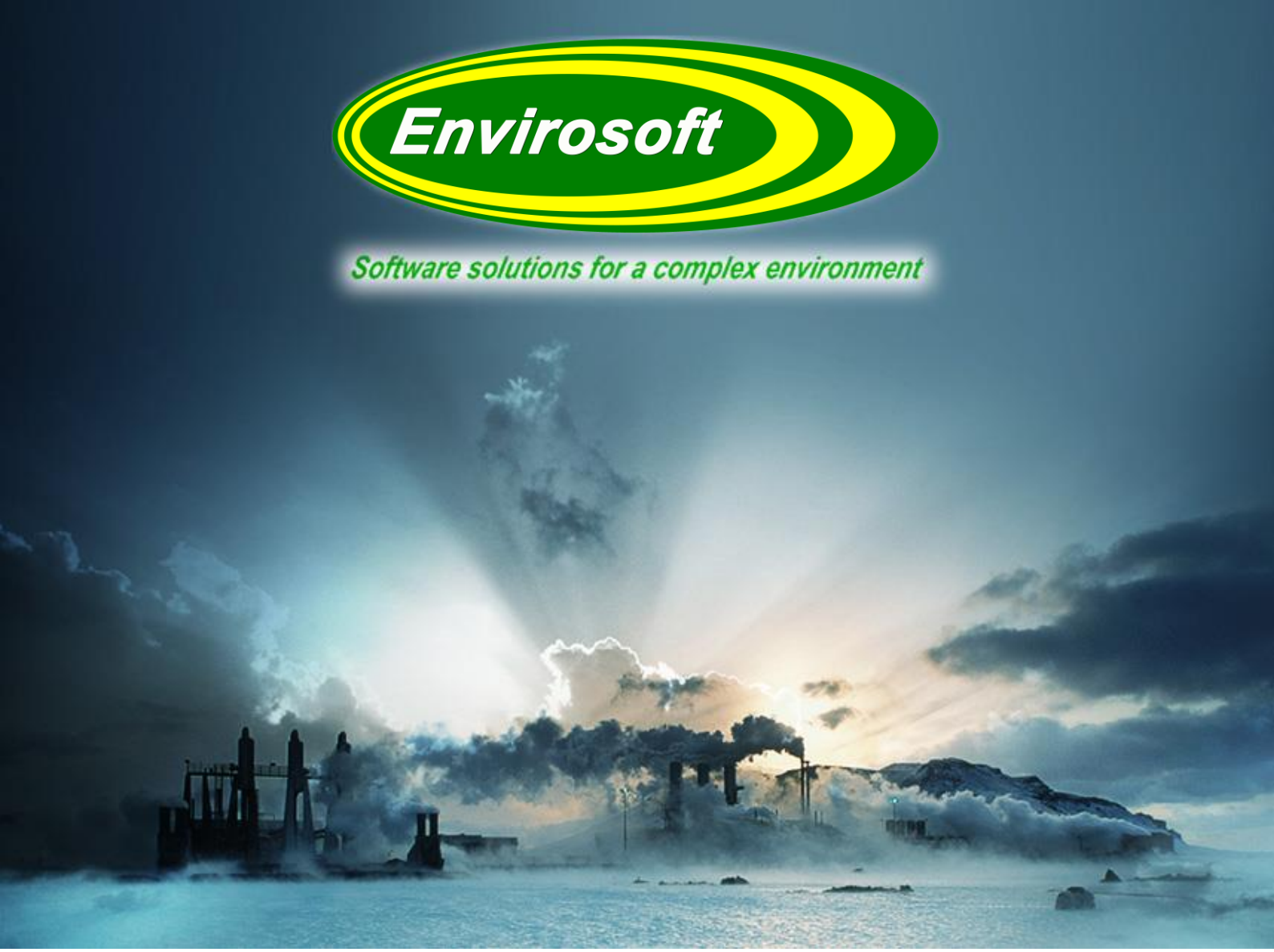

CEMPort Manual
Ver 1.12

DOC ID UM12

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Certificate No: MC080130/04

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1 CONTENTS

2 INTRODUCTION

2.1 CEMPORT

CEMPort is a PC based program, designed to operate under practically all Windows operating systems. Selections and information are available from several pages each accessed as a 'tabbed notebook' Windows style, and operation is performed by using simple mouse instructions.

CEMPort forms part of an Envirosoft Ltd suite of environmental programs and its main function is to summarise emissions data into a format for submission to the authorities or for internal housekeeping or analysis.

Envirosoft Ltd environmental programs are:

Figure 1 Envirosoft Ltd - Environmental Programs

2.2 THE CEMPORT PROGRAM

CEMPort provides generalised report production, i.e. non-specialist reports to summarise the emission data into daily, weekly, quarterly or yearly time periods. It also may be used to export the emission data into a spreadsheet compatible format (e.g. comma separated variable - .CSV) and to check on any excursions above alarm levels.

All averages are available, from raw data (every few seconds) to an annual average. Typical statistical analysis including; maxima, minima, standard deviations, percentiles, operating time, mass release etc.

2.3 THE CEMPORT MANUAL

This manual describes the operation and function of the CEMPort program and explains how to use the program to display the information as required.

For information concerning any of the other CEMSuite programs please refer to the relevant documentation.

3 SOFTWARE INSTALLATION

3.1 PERSONAL COMPUTER REQUIREMENTS

PC Requirements (minimum):

Processor: i5 Intel
Memory: 4GB Ram
Graphics: Intel HD 3000
Display: 1920x1080 pixel resolution. 21" monitor or greater.
Hard Disk: 250 GB
Modem/Dongle: Required for support
Operating system: Windows 7/8/10

The software will operate on PCs with lesser specifications. However, some operations involve lengthy calculations and the time taken to perform them may become tiresome.

3.2 INSTALLATION

Envirosoft will normally pre-install the necessary software. If not, the installation will be carried out on site by an Envirosoft Engineer. However, the software can be provided on CD-ROM. To install from the CD, open Windows explorer, or 'My Computer', select the relevant drive and run the setup program.

Note: If the CD drive has been set for 'Auto insert notification', the installation should start automatically.

Once started, follow the instructions on the screen. The installation program creates files and folders and provides a shortcut to the start the program from the Windows Start button.

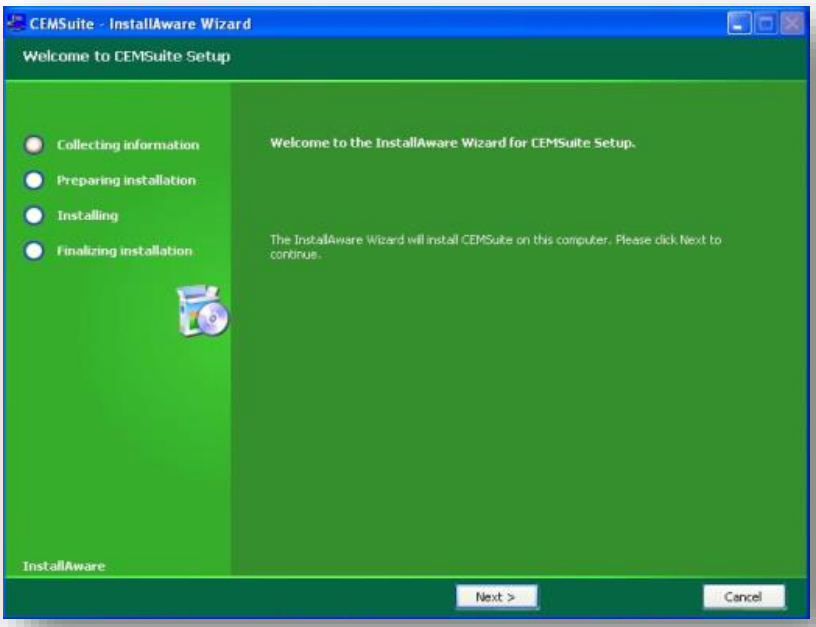

Figure 2 CEMSuite Setup

Installation continued…

Note: Once the installation has completed, the PC's Borland Database Engine will also need to be installed /updated. CEMSuite will start this process automatically.

Figure 3 Borland Database Engine

3.2.1 USB INSTALLATION

The software may be supplied with a USB 'dongle' and will not function without it being present in a USB socket. To install the dongle drivers, use Windows Explorer to locate a sub-directory on the CD-Rom called 'Dongle driver' and open up this sub-directory. Double-click on the file called setupdrv.exe and this will install the dongle drivers. The CEMPort program will now operate normally.

3.3 ASSOCIATED PROGRAMS

3.3.1 CEMSYNC

Envirosoft's program CEMSync should be in operation to copy the historic and live data sets from the DSU(s). This may be seen in the taskbar as the following icon:

Figure 4 CEMSync Icon

The timing of the CEMSync program operations is:

- Between 5 and 10 seconds past each minute: copy the short term live data set from the DSU(s).
- Between 10 and 25 seconds past each minute: process the above data.
- At 20 past midnight, download the historic data for the previous day and completely refresh the rolling 24-hour data set.

3.3.1 CEMSOCKET

Should there be more than one DSU on the CEMSuite system, Envirosoft's program CEMSocket should be in operation on the taskbar; it has the following icon:

Figure 5 CEMSocket Icon

3.3.2 CEMCOMM

CEMComm is a windows based program that operates on the DSU in standard Envirosoft systems (CEMs PC in basic systems) and is designed to communicate with/collect data from analysers and data acquisition modules. CEMComm provides basic data gathering for all Envirosoft systems.

4 PROGRAM OPERATION

4.1 STARTING THE PROGRAM

Figure 6 Desktop Shortcut

Start the program by double-clicking the left-hand mouse button on the CEMPort icon; which should now reside on the PC desktop. Alternatively, it can also be started by pressing the Windows Start button > Programs > Envirosoft > CEMPort.

4.2 INITIAL SCREEN

After the program is started a 'tabbed notebook' style program provides access to the CEMPort data summary and configuration pages.

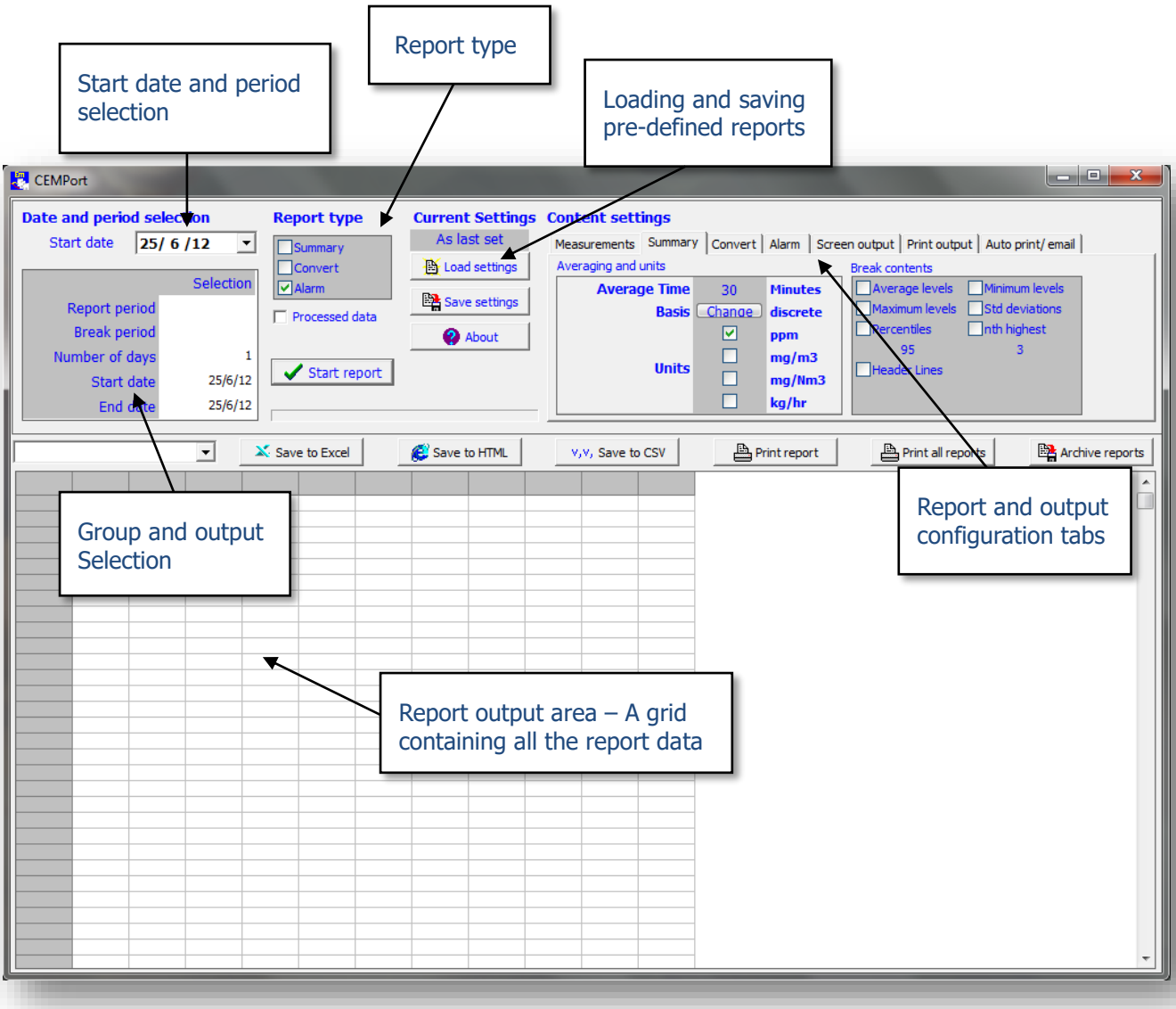

Figure 7 Initial Screen

5 QUICK START GUIDE

CEMPort may be used to summarise the emission data into a variety of formats (Reports). These are discussed later on in the document.

To compile a report on the emission data, the following sequence is used:

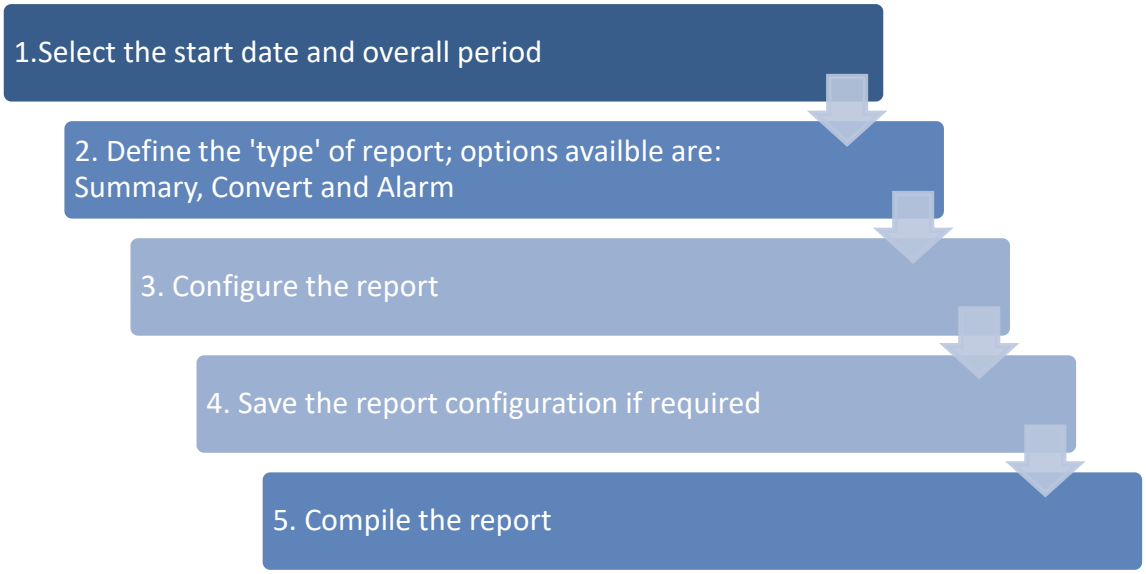

Figure 8 Quick Start Flow

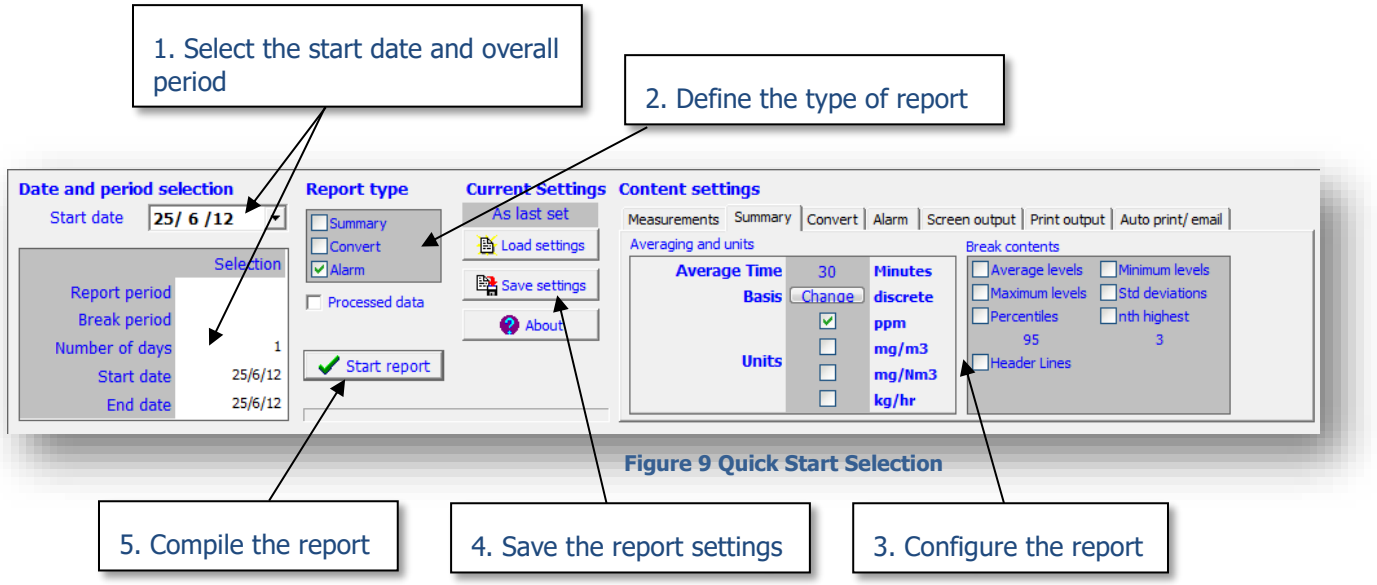

Figure 9 Quick Start Selection

6 COMPILING A REPORT

6.1 START DATE AND BREAK PERIODS

Figure 10 Date Selection

Select the start date for the report by pressing on the triangle to the right of the displayed date (default value is today's date). This will bring up a date selection box and the start date may be selected.

Select the overall report period over which the report is to be conducted, valid options: Day, Week, Month, Quarter or Year

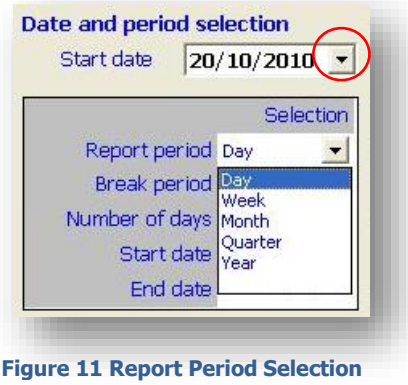

Figure 11 Report Period Selection

Figure 12 Break Period Selection

Select the break period, this allows the operator to break down the report further, day by day, week by week etc. (Only valid for summary and alarm reports)

The program automatically calculates the number of days, start date and end date after the other selections have been made; they cannot be changed.

6.2 TYPE OF REPORT

Three report options are available to summarise the environmental data, these are selected by clicking on the appropriate checkbox as illustrated here. These options are now discussed.

Figure 13 Report Type

Summary Report

- A summary report allows the user to 'summarise' a predefined period of data, enabling overall averages, max and min values, deviations, percentiles, plant availability and downtime to be checked for that period.

Convert Report

- The convert report allows the user to break down a predefined period of data by setting the raw average time from which all other averages are calculated and the frequency in which data (averages) are gathered and plotted.

Alarm Report

- The alarm report can be used to examine all excursions above alarm levels for a predefined period of time.

6.3 SUMMARY REPORT DETAILS

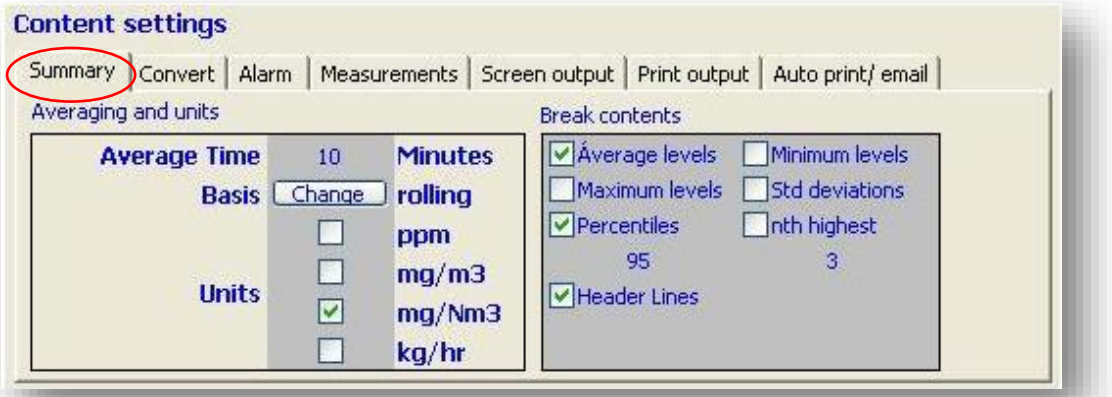

Figure 14 Summary Report Tab

Selections relevant to the Summary report are made from the appropriate selection page. From here, the averaging time and basis, the units of measurement and the contents for each minor break period may be changed. These are now discussed.

6.3.1 AVERAGE TIME

The raw average time from which all other averages, maxima and percentiles are calculated. That is, in the example shown, the overall average produced for the period and break period will be from the 10-minute rolling average.

To set the required average time, select the number currently displayed. Delete, edit or use the up and down arrows to select a new average time.

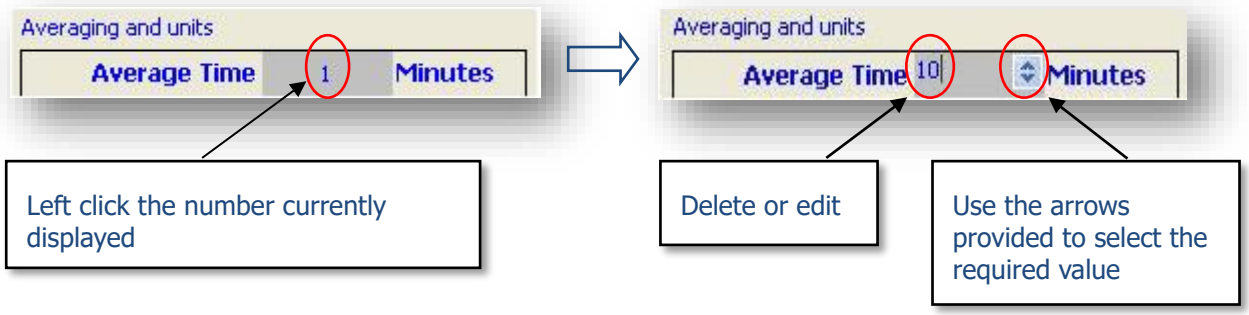

Figure 15 Average Time Selection

Once the right value has been selected, click the mouse in a free area of the screen to save the new average time.

6.3.2 AVERAGE BASIS

Two average basis are provided: rolling and block. Data is stored every minute on the minute by the system. A day average, therefore, will consist of 1440 points (24 x 60). If 'rolling' is selected, the average and maxima will be driven from all of these points; if 'block' is selected, however, each average (10 minutes as defined above) will be treated individually, so in this example, only 144 points will be used; those readings at 09, 19, 29 minutes etc. past each hour.

To set the required basis, click the 'Change' button located next to Basis.

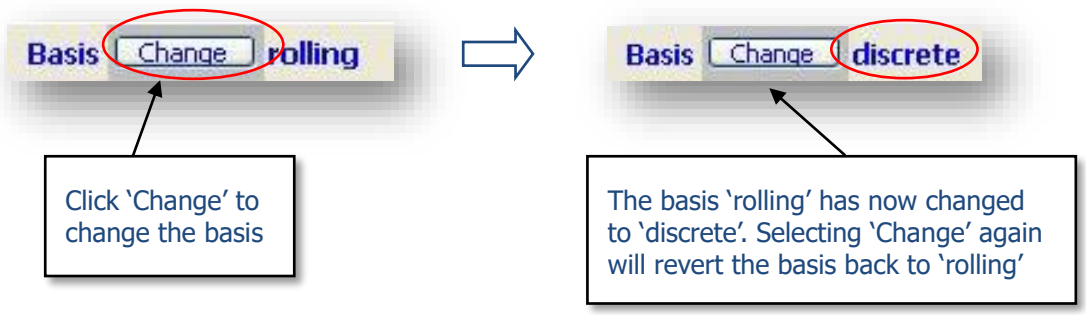

Figure 16 Average Basis Selection

6.3.3 UNITS

The unit selection will determine the measurement displayed on the summary report. Four options are available; **ppm, mg/m3**, **mg/Nm3** and **kg/hr**.

Typically, most reporting is conducted in units of mg/m3 normalised to reference conditions – referred to as mg/Nm3.

To select the required unit, tick the relevant checkbox.

Figure 17 Unit Selection

6.3.4 BREAK CONTENTS

For each break period within the overall report period, the average, maxima and percentile data are available and may be selected as required. The percentile level is also selected from this screen.

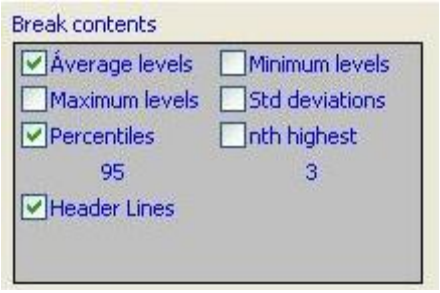

Figure 18 Break Contents

To add or remove the break contents edit each individual option accordingly by clicking on the checkbox.

6.3.5 CREATING THE REPORT

Once the required settings have been finalised click 'Start Report' to generate a Summary report.

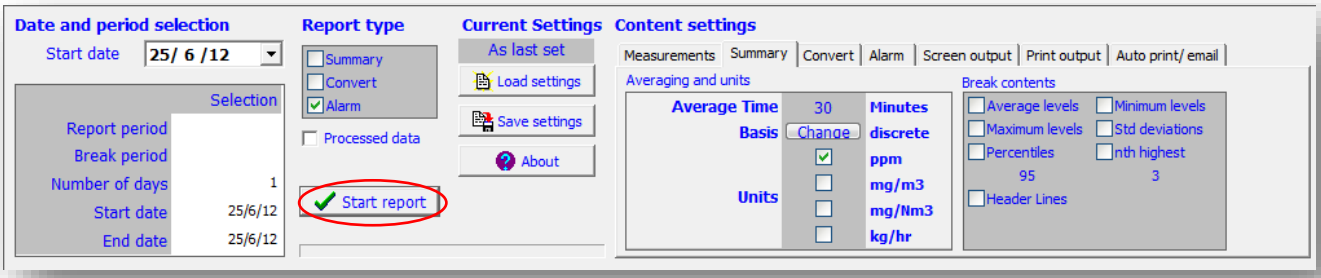

Figure 19 Create Summary Report

6.3.6 SUMMARY REPORT OUTPUT

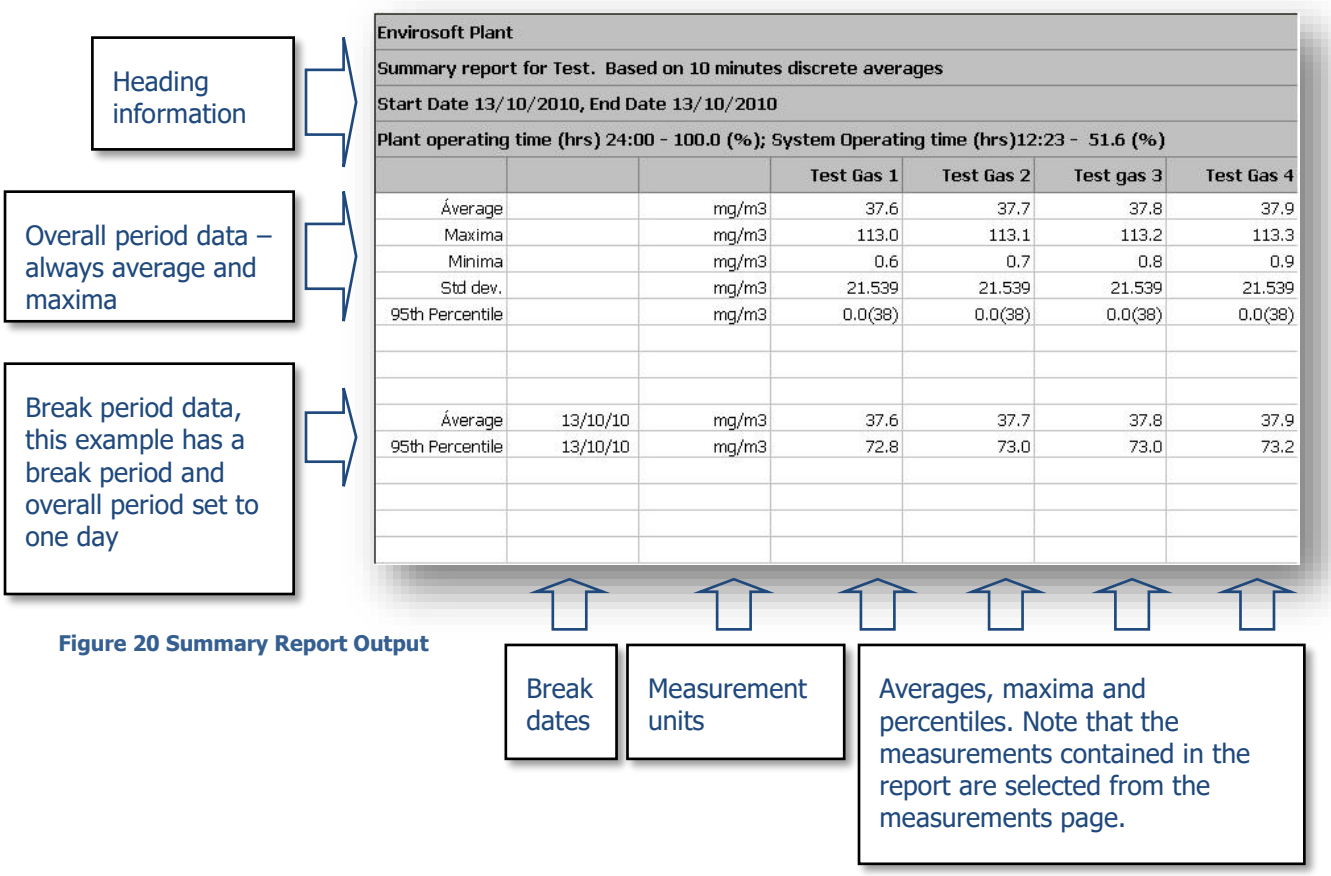

Figure 20 Summary Report Output

6.4 CONVERT REPORT DETAILS

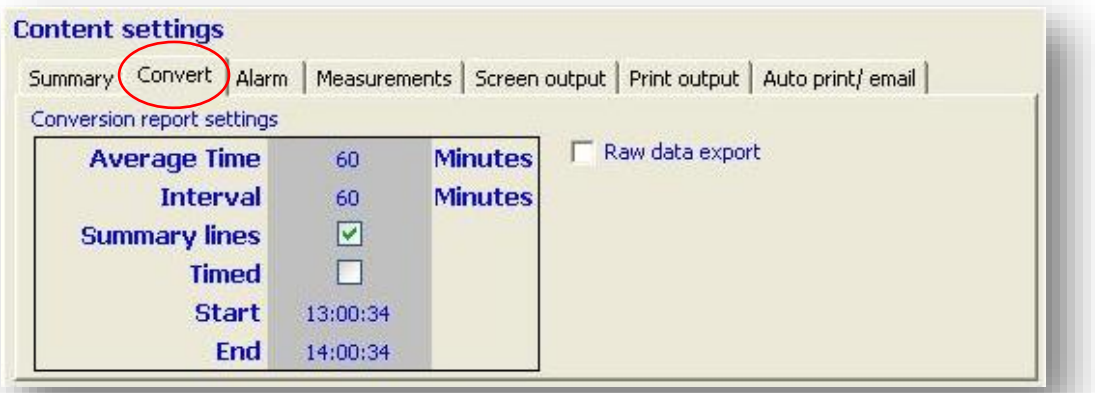

Figure 21 Convert Report Tab

The average time and interval may be selected here. For the example shown, a 60-minute average will be plotted every 60 minutes and the overall average provided.

6.4.1 AVERAGE TIME

The raw average time from which all other averages are calculated. Calculating the overall average for the period selected.

For instructions detailing how to change the Average Time see page 14.

6.4.2 INTERVAL

The frequency in which data (averages) are gathered and plotted. In the example below a new line of data will be gathered and plotted on the Output grid every 60 minutes.

To set the required Interval, select the number currently displayed. Delete, edit or use the up and down arrows to select a new average time.

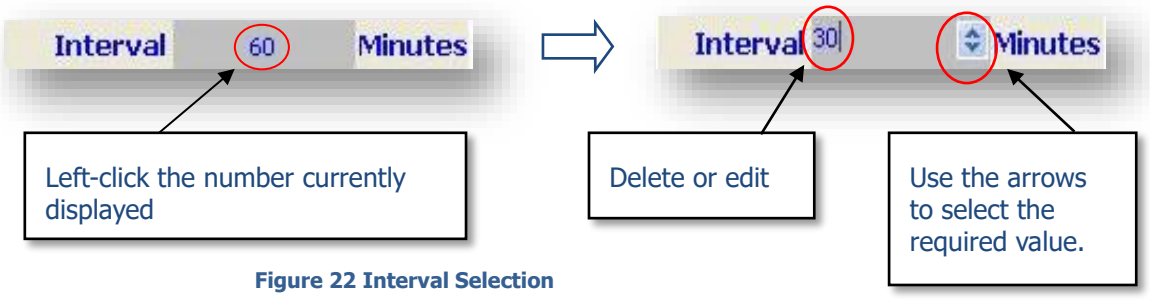

Figure 22 Interval Selection

Once the right value has been selected, click the mouse in a free area of the screen to save the new average time.

6.4.3 SUMMARY LINES

Adds summary lines to the end of the report. These include; Average, Maxima, Minima and Std dev.

To add or remove the Summary Lines edit the Summary Lines checkbox accordingly.

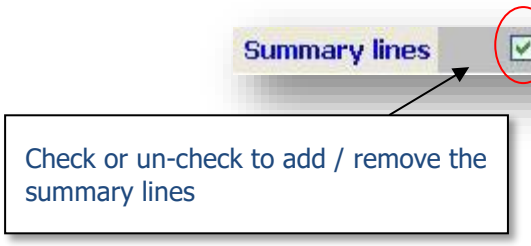

Figure 25 Summary Line Selection

Without Summary Lines:

Test, Áverage = 30 Minutes

	Test Gas 1	Test Gas 2	Test gas 3	Test Gas 4	
Date/ time	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	Plant
10/10/10. 00:29	1.6	1.8	1.8	2.0	ON
10/10/10. 00:59	4.6	4.8	4.8	5.0	ON
10/10/10. 01:29	7.6	7.8	7.8	8.0	ON
10/10/10. 01:59	10.6	10.8	10.8	11.0	ON
10/10/10. 02:29	13.6	13.8	13.8	14.0	ON
10/10/10. 02:59	16.6	16.8	16.8	17.0	ON
10/10/10. 03:29	19.6	19.8	19.8	20.0	ON
10/10/10. 03:59	22.6	22.8	22.8	23.0	ON
10/10/10. 04:29	25.6	25.8	25.8	26.0	ON
10/10/10. 04:59	28.6	28.8	28.8	29.0	ON

Figure 25 Without Summary Lines

With Summary Lines:

Test, Áverage = 30 Minutes

	Test Gas 1	Test Gas 2	Test gas 3	Test Gas 4	
Date/ time	mg/Nm3	mg/Nm3	mg/Nm3	mg/Nm3	Plant
10/10/10. 00:29	1.6	1.8	1.8	2.0	ON
10/10/10. 00:59	4.6	4.8	4.8	5.0	ON
10/10/10. 01:29	7.6	7.8	7.8	8.0	ON
10/10/10. 01:59	10.6	10.8	10.8	11.0	ON
10/10/10. 02:29	13.6	13.8	13.8	14.0	ON
10/10/10. 02:59	16.6	16.8	16.8	17.0	ON
10/10/10. 03:29	19.6	19.8	19.8	20.0	ON
10/10/10. 03:59	22.6	22.8	22.8	23.0	ON
10/10/10. 04:29	25.6	25.8	25.8	26.0	ON
10/10/10. 04:59	28.6	28.8	28.8	29.0	ON
Average	15.1	15.3	15.3	15.5	
Maxima	28.6	28.8	28.8	29.0	
Minima	1.6	1.8	1.8	2.0	
Std dev.	8.617	8.617	8.617	8.617	

Figure 25 With Summary Lines

Summary lines added

6.4.4 TIMED

Allows the selection of specific time periods to be reported. Using the 'Start' and 'End' times to determine the times reported.

To enable a timed period to be reported, place a tick in the timed checkbox. Select the current start time displayed and delete, edit or use the up and down arrows to select a new Start time.

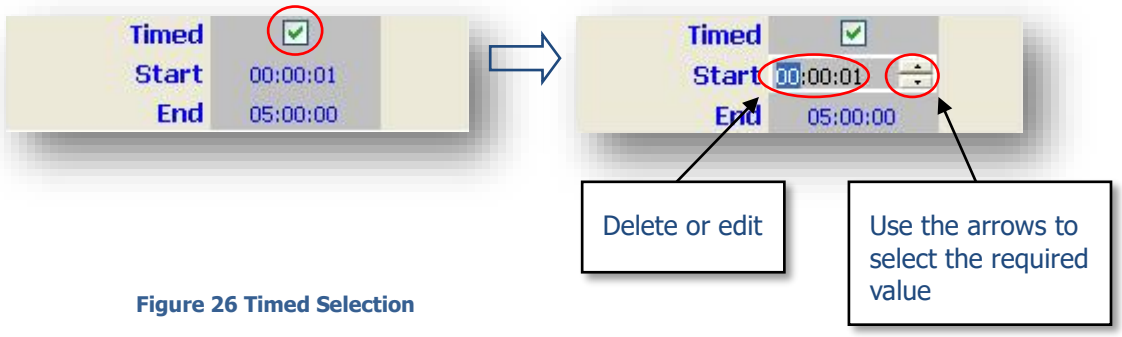

Figure 26 Timed Selection

Once the right value has been selected, click the mouse in a free area of the screen to save the new required time.

To select the End time follow the same procedure above.

6.4.5 CREATING THE REPORT

Once the required settings have been finalised click 'Start report' to generate a Convert report.

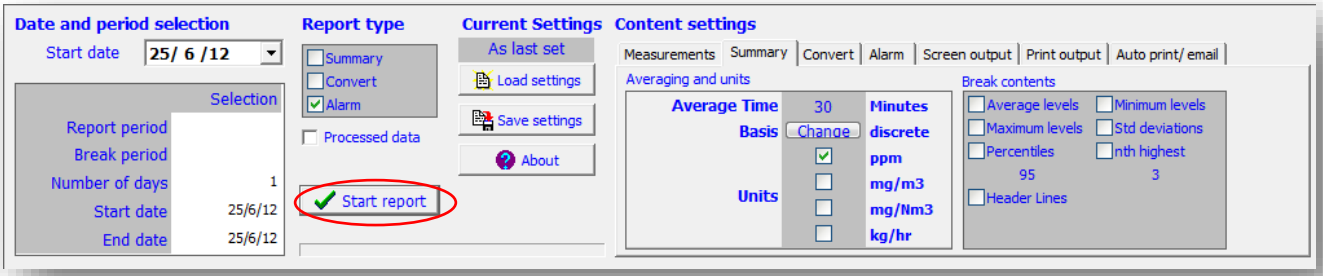

Figure 27 Create Convert Report

6.4.6 CONVERT REPORT OUTPUT

Heading information

Time intervals, this example has a 60 minute interval

Summary

Plant Status

Test, Áverage = 60 Minutes					
	Test Gas 1	Test Gas 2	Test gas 3	Test Gas 4	
Date/ time	ppm	ppm	ppm	ppm	Plant
13/10/10, 00:59	3.2	3.4	3.4	3.6	ON
13/10/10, 01:59	9.2	9.4	9.4	9.6	ON
13/10/10, 02:59	15.2	15.4	15.4	15.6	ON
13/10/10, 03:59	21.2	21.4	21.4	21.6	ON
13/10/10, 04:59	27.2	27.4	27.4	27.6	ON
13/10/10, 05:59	33.2	33.4	33.4	33.6	ON
13/10/10, 06:59	39.2	39.4	39.4	39.6	ON
13/10/10, 07:59	45.2	45.4	45.4	45.6	ON
13/10/10, 08:59	51.2	51.4	51.4	51.6	ON
13/10/10, 09:59	57.2	57.4	57.4	57.6	ON
13/10/10, 10:59	63.2	63.4	63.4	63.6	ON
13/10/10, 11:59	69.2	69.4	69.4	69.6	ON
13/10/10, 12:59	73.4!	73.5!	73.6!	73.7!	
13/10/10, 13:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 14:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 15:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 16:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 17:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 18:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 19:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 20:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 21:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 22:59	0.0!	0.0!	0.0!	0.0!	
13/10/10, 23:59	0.0!	0.0!	0.0!	0.0!	
Áverage	36.2	36.4	36.4	36.6	
Maxima	69.2	69.4	69.4	69.6	
Minima	3.2	3.4	3.4	3.6	
Std dev.	20.712	20.712	20.712	20.712	

Figure 28 Convert Report Output

In the example above the '!' mark at 12:59 onwards indicates that the average is not complete and will not be used for the overall average below. See the averaging section for further details.

6.5 ALARM REPORT DETAILS

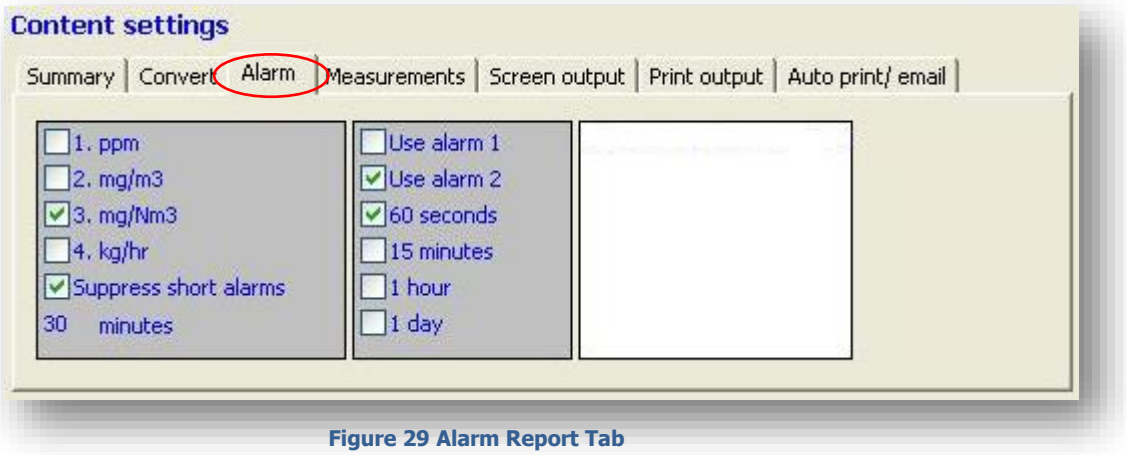

Figure 29 Alarm Report Tab

The alarm report may be used to examine all excursions above alarm levels. The alarm levels available are those that have been defined in the CEMForm program.

6.5.1 MEASURAND SELECTION

To create an Alarm Report first select the units of measurement to display by checking the required tick box.

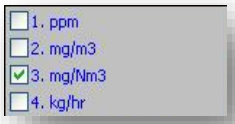

Figure 30 Measurand Selection

It is possible to 'Suppress short alarms'. This allows the user to filter the alarms that would be selected. To suppress short alarms place a tick into the checkbox.

Figure 31 Suppress Short Alarms

Then select the shortest alarm period you wish to display. For example, if you wanted to filter out any alarms that lasted less than 30 minutes, change the value to '30'.

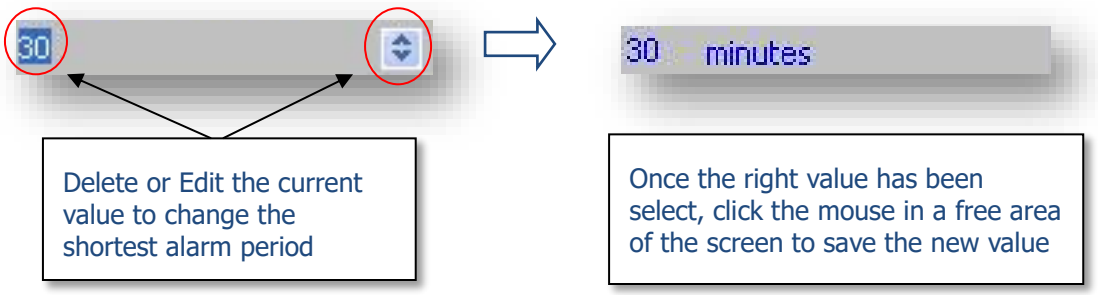

Figure 32 Shortest Alarm Period Selection

Next, choose which alarm to use. The alarm levels are those that have been defined in the CEMForm program.

Figure 33 Select Alarm

Figure 34 Averages for Display

Finally select the averages for the display. Options are 60 seconds, 10 minutes, 1 hour or 1 day.

Any alarms which match the selection will appear in the right-hand list area.

6.5.2 CREATING THE REPORT

Once the required settings have been finalised click 'Start Report' to generate an Alarm report.

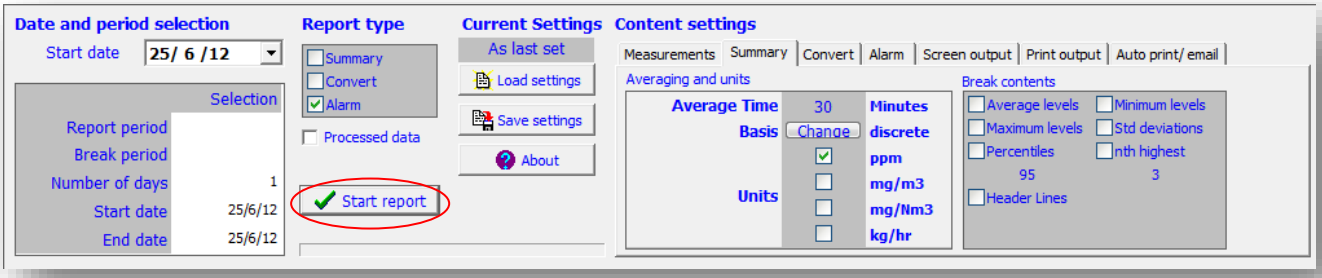

Figure 35 Create Alarm Report

On completion, all excursions above the alarm limits will be shown in the report area.

6.5.3 ALARM REPORT OUTPUT

Heading and Plant information

Total alarm time and percentage (See below*)

Individual alarm details

Envirosoft Plant
Alarm report for Test. Based on 1 min rolling average
Start Date 01/01/2010, End Date 31/01/2010
Plant operating time (hrs) 158:18 - 21.3 (%); System Operating time (hrs) 384:00 - 51.6 (%)

		NOx (mg/Nm3)		CO (mg/Nm3)		NH3 (mg/Nm3)	
		Álarm 2 - 120mg/Nm3					
		h:m	%	h:m	%	h:m	%
Overall period	Alarm 1						
Overall period	Alarm 2	28:40	35.1				
01/01/10	Alarm 2	00:00	-				
02/01/10	Alarm 2	00:00	-				
03/01/10	Alarm 2	00:00	-				
04/01/10	Alarm 2	04:38	5.6				
05/01/10	Alarm 2	02:25	1.8				
06/01/10	Alarm 2	03:13	3.6				
07/01/10	Alarm 2	01:10	0.4				
08/01/10	Alarm 2	04:13	5.0				
09/01/10	Alarm 2	04:03	4.0				
10/01/10	Alarm 2	00:50	0.6				
11/01/10	Alarm 2	02:13	2.4				
12/01/10	Alarm 2	02:59	3.4				
13/01/10	Alarm 2	01:27	1.0				
14/01/10	Alarm 2	00:00	0.0				
15/01/10	Alarm 2	00:00	0.0				
16/01/10	Alarm 2	00:00	-				

Figure 36 Alarm Report Output

*The total time for which the alarm was present and the percentage that this was as a relation to the plant operating time are shown.

6.6 PROCESSED DATA OPTIONS

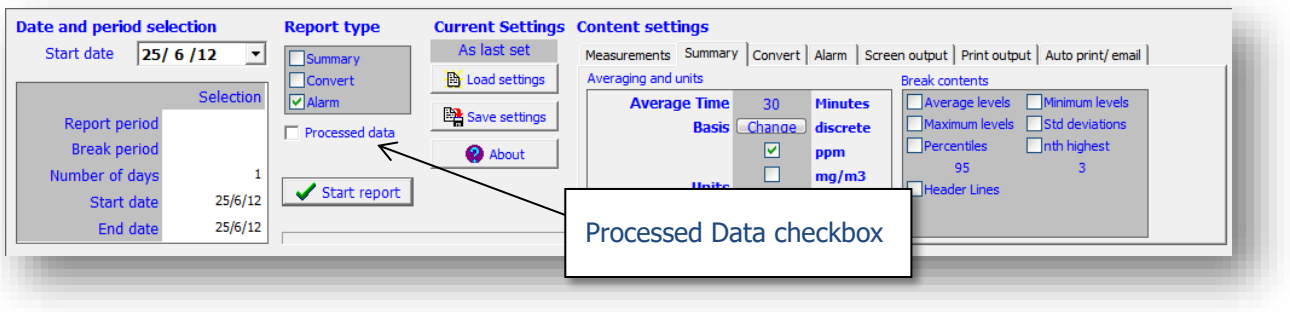

Figure 38 Processed Data Options

The operator has the option to generate reports using data that has already been processed. This can be done by checking the 'Processed data' check box, highlighted above. Once selected, the units of measurement will adjust accordingly.

Note: The 'averaging and units' options for generating a summary report and the 'conversion report settings' for convert reports will be hidden when processed data is selected.

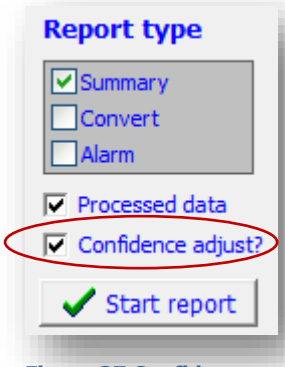

Figure 37 Confidence Adjusted Data

With Processed data checked the operator also has the additional option to report confidence adjusted data.

7 MEASUREMENT SELECTION

The measurement page allows the user to select the measurements required for all of the reports. Check the relevant check box against the desired groups, measurements and units.

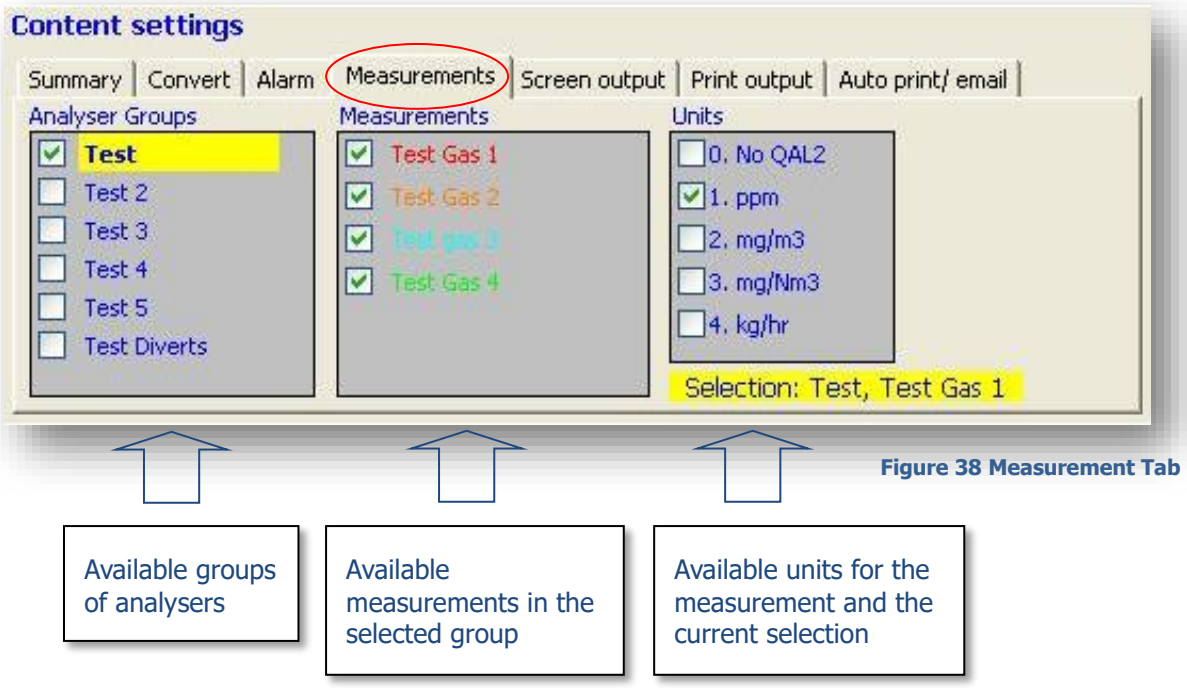

Figure 38 Measurement Tab

It is recommended to work from left to right, i.e. select the group required first, then the measurement of each group and finally the units for each measurement.

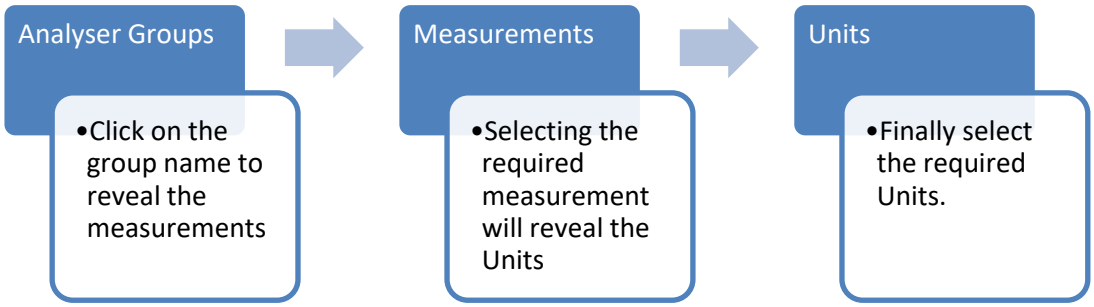

Figure 39 Measurement Selection Flow

Click on the name of each analyser/group to select the next level of selection, i.e. click on the group name (Test) to reveal and select the required measurements. Then click on the measurement name (Test Gas 1) before selecting the desired units.

Note: All report types will include the selected groups and measurements but only the convert report will use the selected units for the measurements; the other reports have a global setting for the measurement units within their own configuration screens.

After selecting the desired groups, measurements and units, make sure that they are as desired by compiling a report and then saving the report.

8 SCREEN, PRINT AND EMAIL SETTINGS

Two pages are available to change the way the report appears on the screen and how it will appear once printed.

8.1 SCREEN OUTPUT SETTINGS

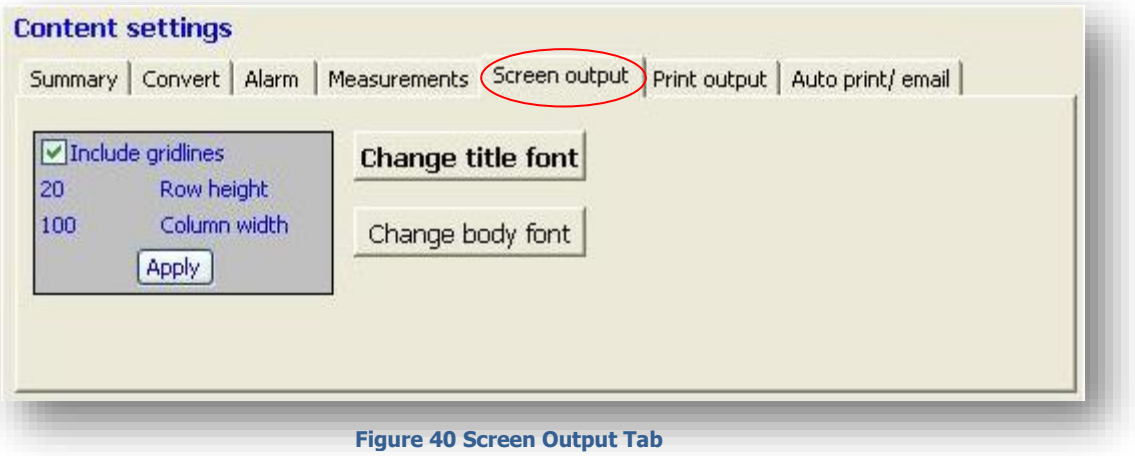

Figure 40 Screen Output Tab

The options available are:

- To include / exclude the grid lines shown on the report.
- Modify the row height and column width of the report
- Change the font of the title and body

8.1.1 GRID LINES

To include / exclude Grid Lines edit the grid lines checkbox accordingly:

With Grid Lines:

Envirosoft Plant						
Summary report for Test. Based on 10 minutes discrete averages						
Start Date 01/09/2010, End Date 01/09/2010						
Plant operating time (hrs) 24:00 - 100.0 (%); System Operating time (hrs)24:00 - 100.0 (%)						
			Test Gas 1	Test Gas 2	Test gas 3	Test Gas 4
Average		mg/Nm3	72.0	72.1	72.2	72.3
Maxima		mg/Nm3	143.4	143.6	143.6	143.8
Minima		mg/Nm3	0.6	0.6	0.8	0.8
Std dev.		mg/Nm3	41.279	41.279	41.279	41.279
95th Percentile		mg/Nm3	0.0(73)	0.0(73)	0.0(73)	0.0(73)
Maxima	01/09/10	mg/Nm3	143.4	143.6	143.6	143.8
95th Percentile	01/09/10	mg/Nm3	135.6	135.8	135.8	136.0
Minima	01/09/10	mg/Nm3	0.6	0.6	0.8	0.8
Std dev.	01/09/10	mg/Nm3	41.279	41.279	41.279	41.279
3rd highest	01/09/10	mg/Nm3	141.6	141.6	141.8	141.8

Figure 41 With Grid Lines

Without Grid Lines:

Envirosoft Plant						
Summary report for Test. Based on 10 minutes discrete averages						
Start Date 01/09/2010, End Date 01/09/2010						
Plant operating time (hrs) 24:00 - 100.0 (%); System Operating time (hrs)24:00 - 100.0 (%)						
			Test Gas 1	Test Gas 2	Test gas 3	Test Gas 4
Average		mg/Nm3	72.0	72.1	72.2	72.3
Maxima		mg/Nm3	143.4	143.6	143.6	143.8
Minima		mg/Nm3	0.6	0.6	0.8	0.8
Std dev.		mg/Nm3	41.279	41.279	41.279	41.279
95th Percentile		mg/Nm3	0.0(73)	0.0(73)	0.0(73)	0.0(73)
Maxima	01/09/10	mg/Nm3	143.4	143.6	143.6	143.8
95th Percentile	01/09/10	mg/Nm3	135.6	135.8	135.8	136.0
Minima	01/09/10	mg/Nm3	0.6	0.6	0.8	0.8
Std dev.	01/09/10	mg/Nm3	41.279	41.279	41.279	41.279
3rd highest	01/09/10	mg/Nm3	141.6	141.6	141.8	141.8

Figure 42 Without Grid Lines

8.1.2 ROW HEIGHT / COLUMN WIDTH

To change the row height or column width, select the appropriate value to alter by left clicking the value. You can then edit / delete or use the up and down arrows to change the value. Once the row height and column width have been selected press the 'Apply' button to save any changes made.

Note: After changing the row height or column width, move the mouse pointer away from the selection before pressing the apply button.

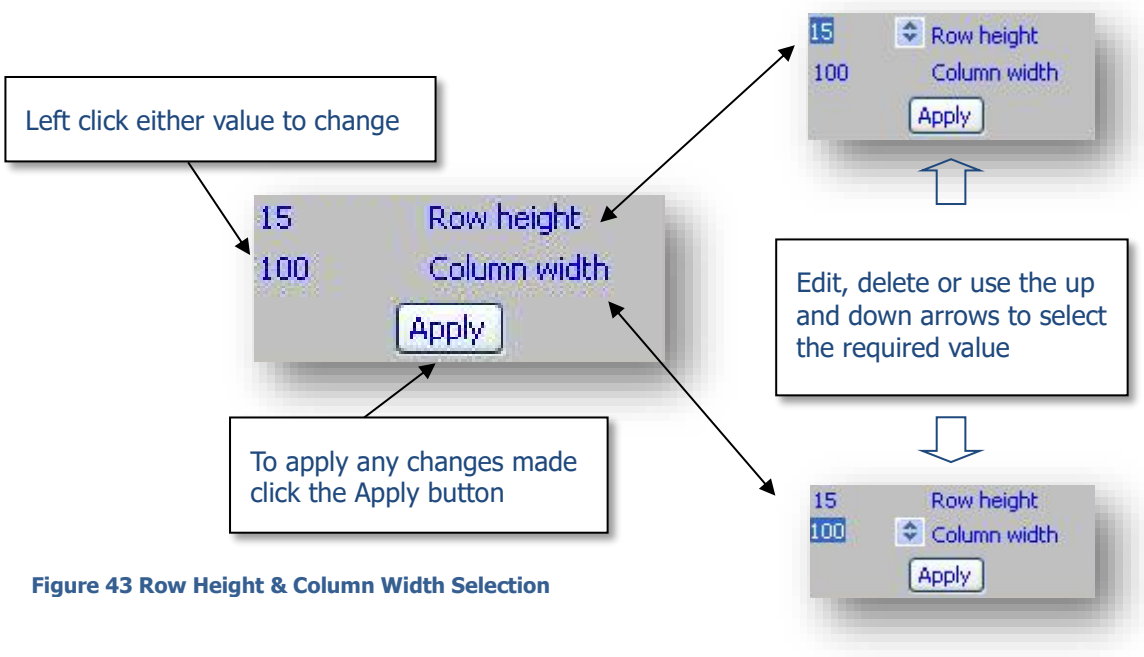

Figure 43 Row Height & Column Width Selection

8.1.3 FONT

Both the title font and body font change be changed as desired.

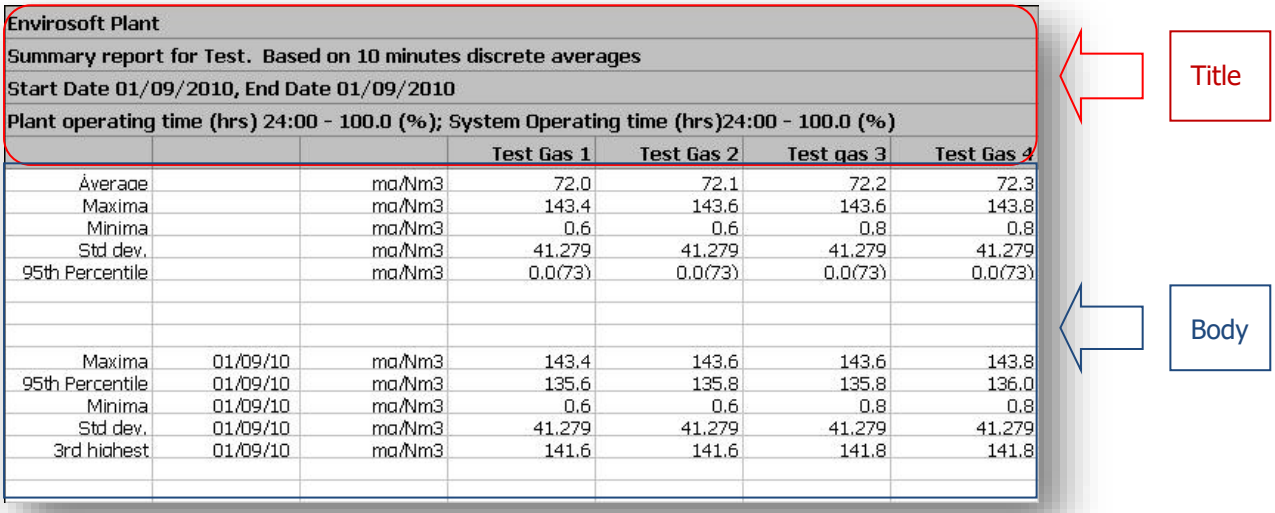

Figure 44 Title & Body

To change either the title font or the body font select the appropriate button.

Figure 45 Change Title / Body Font

When 'Change title font' or 'Change body font' has been selected the Font box will appear on screen allowing you edit various font details.

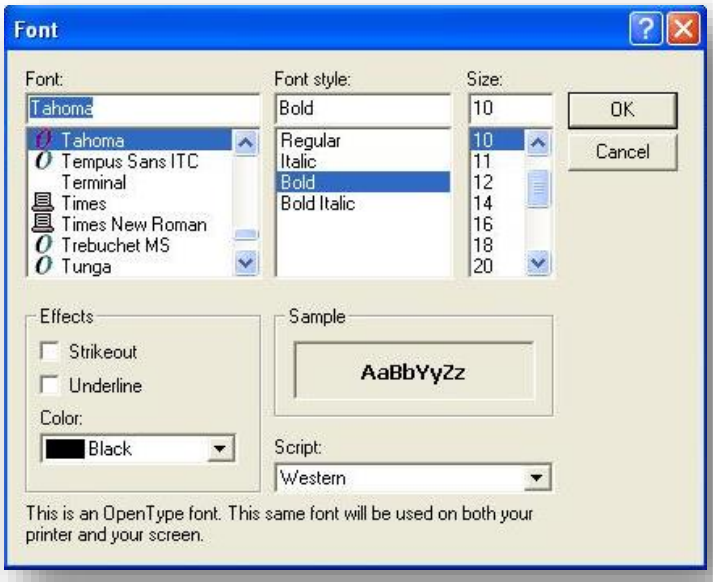

Figure 46 Font Selection

Once changes have been made, select 'OK' to save and apply those changes to the report.

8.2 PRINT OUTPUT SETTINGS

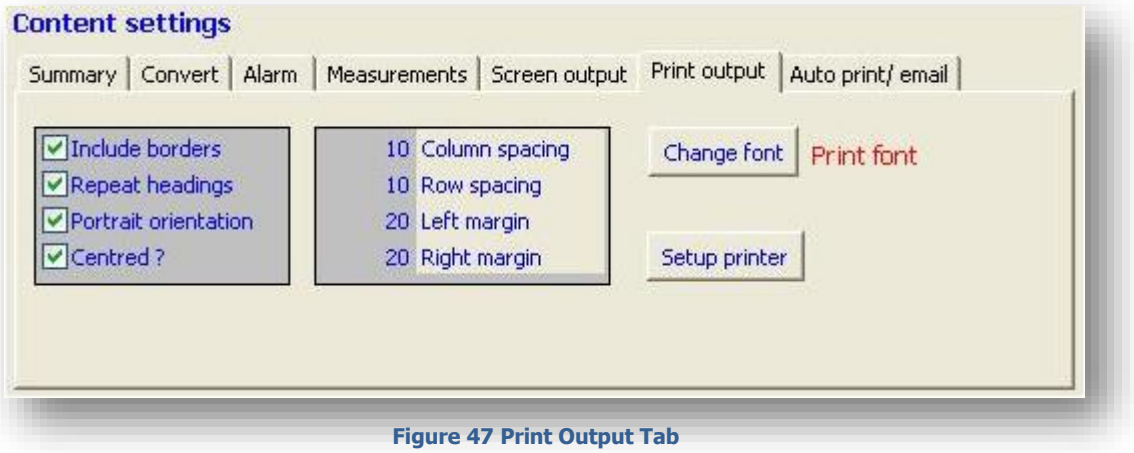

Figure 47 Print Output Tab

The print output options allow the user to:

- Add borders.
- Repeat the headings (for multi-page documents).
- Switch the orientation from landscape to portrait.
- Centre the report on the printout.

Also, the column and row spacing can be adjusted and the left and right margins altered.

Finally, the text font of the printout can also be changed and the printer selected and configured.

8.3 AUTOMATIC PRINTING AND EMAILING

To use the automatic print or email options the following sequence should be followed:

1. Select the type of report required with the desired period and break settings.
2. Configure the report as required.
3. Confirm that the result is as desired, then save the report with a memorable name (e.g. 'TestReport')
4. Add an email address as required.
5. Select the saved report (e.g. 'TestReport') by pressing the 'Auto report' button.
6. Check the 'Auto report' box at the top and whether the report is to be emailed, printed or both. (The 'Dispersion' option should only be used on systems where the CEMPact software is in operation).
7. Select the date and time for the completion, email and print.
8. Select the interval – valid selections are either 1 or 7 days.
9. Close and restart the program and check that the settings have been saved.

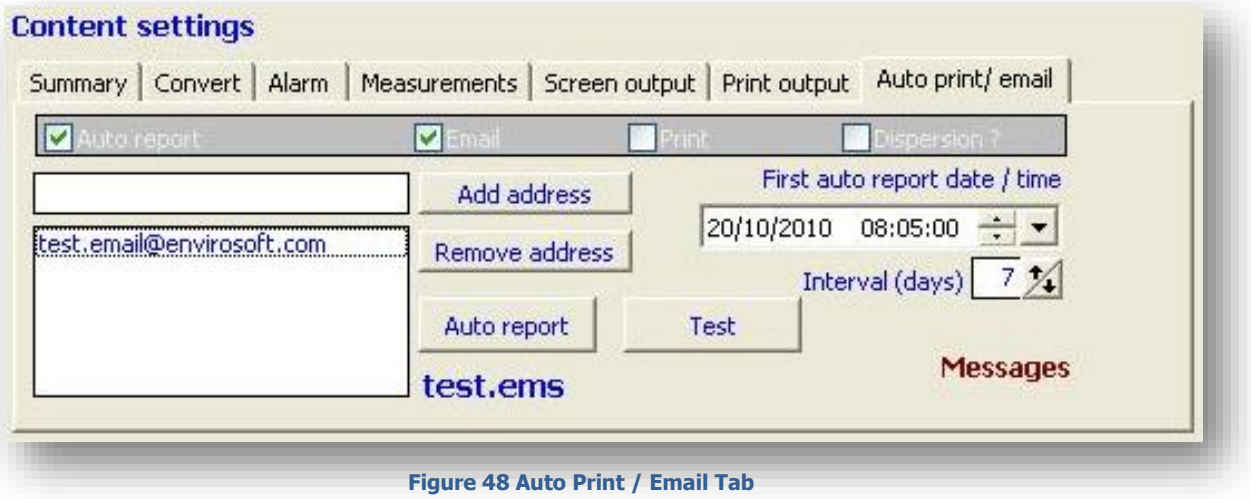

Figure 48 Auto Print / Email Tab

After the auto report has been complied the next auto report date will be incremented by the interval. That is, should a one-day interval be selected, each day the report will be compiled for the previous day at the same time. In a similar fashion, should 7 days be selected then the report will be compiled on the same day each week for the previous day's data, not including the current day.

Note: It is recommended that the email option is only used where the computer forms part of a site network and is effectively permanently connected to the internet via a mail server. Please contact Envirosoft should this option be required without such a connection.

9 EXPORTING REPORTS

After a report has been compiled, the user may examine the results for each group of analysers by using the drop down selection.

Note: For the summary report, an 'All groups' option is available.

Whatever report is displayed it may be exported to:

- An Excel Workbook.
- An HTML file (for internet pages).
- An CSV (comma separated variable) file.

A valid file name will be required and the default folder for all reports is the 'Reports' sub-folder.

Pressing the 'Print report' button will send the displayed report to the printer; pressing the 'Print all reports' button will send reports for all selected groups to the printer.

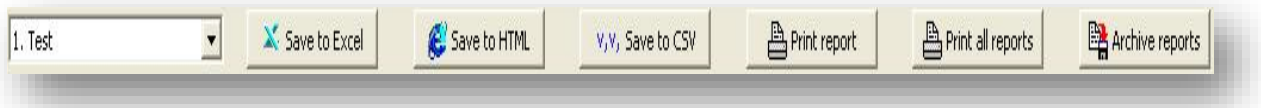

Figure 49 Export Reports

10 SAVING AND LOADING

Figure 50 Save / Load Settings

It may take some time to configure the report features as required and many sites will use a selection of reports with different periods, breaks and measurements etc.

To enable a report set-up to be stored and loaded, use the 'Load' and 'Save' settings to store the report configuration – a valid filename is required and will automatically be given the EMS file extension.

These files are stored in the 'reports' sub-folder.

Should the CEMPort program be shut down, the current configuration is stored and then reloaded when the program is restarted. During this file save the configuration is saved to a special file – 'LastExit.EM1'.

All report configurations are stored except for the auto-report / email section; these are only stored on program shut down and do not for part of the configuration storage routines.

11 PERCENTILE REPORTING

There are two methods of determining whether an emission has exceeded a percentile level:

- Conduct an alarm report to examine the percentage of time for which the alarm has been exceeded
- Conduct a summary report to examine the nnth percentile level.

Option 1 will produce a percentage of time that should be below that permissible.
Option 2 will produce an emission level that should be below a defined limit – normally quoted as a 93rd or 95th percentile level.

12 CALCULATION PRINCIPLES

12.1 UNITS

Throughout the program, four measurement units are available and may be selected for reporting as required. Different measurements will have slightly different units for each of the four positions. The most common are detailed below, for particular applications different measurements will use other calculations:

Gas measurements (ppm)
A. ppm: as measured by the analyser
B. mg/m^3: corrected for molecular weight, but uncorrected for STP, i.e., as the gas exists at the duct conditions. This measurement is used for the calculation of mass emission using the gas velocity in the duct.
C. mg/Nm^3: as b. But now corrected for all relevant normalisation parameters.
D. kg/hr: calculated from b and the gas flow:

kg/hr = b (mg/m^3) x m^3/s (flow) x 3600 (seconds in an hour) / 1,000,000 (mg in a kg)

Dust measurements (Opacity)
A. Opacity (%): as measured by the analyser.
B. mg/m^3: opacity converted to extinction, and then multiplied by a dust `conversion factor. This measurement is used for the calculation of mass emission using the gas velocity in the duct.
C. mg/Nm^3: as b. But now corrected for all relevant normalisation parameters.
D. kg/hr: calculated from b and the gas flow – see calculations above.

Dust measurements (Tribo-electric)
A. Tribo-electric output (%): as measured by the analyser.
B. mg/m3: output (a) multiplied by a dust conversion factor.
C. mg/Nm3: as b. But now corrected for all relevant normalisation parameters.
D. kg/hr: calculated from b and the gas flow – see calculations above.

Flow measurements (Gas velocity)
A. Raw velocity measurement, as measured by the analyser.
B. m3/s: output (a) multiplied by the cross-sectional area of the duct at the flow measurement position.
C. Nm3/s: as b, but now uncorrected for all relevant normalisation parameters (reverse of density) – see below.
D. c is repeated.

12.2 NORMALISATION

Most requirements state that emissions should be reported in terms mg/m3 at reference conditions, where the reference conditions are:

Temperature – 273K (0ºC)
Oxygen – A typical level for the process, e.g.: 3% oil and gas, 6% coal, 11% waste, 15% gas turbines etc.
Pressure – 101.3 kPa (1 bar)
Water vapour – Dry.

CEMPort conducts this conversion automatically within the program and uses the following equations:

Temperature correction:
Measured temperature (K) / 273

Oxygen correction:
(21 – reference O2 level) / (21 – measured O_2 level (dry))

Pressure correction:
101.3 / measured pressure (kPa)

Water vapour correction:
1 / ((100 – H_2O%)/100)

Note: for typical gas measurements, analysers usually provide measurements already corrected to STP (standard temperature and pressure).

12.3 AVERAGING

Two averaging bases are provided, a rolling average and a block average. Maxima levels will usually be a little lower when using a block average – times between the averages are ignored. Average levels will be very similar between the two. Data during plant off periods (see below) or invalid data are not used when calculating the average values. Furthermore, there must be 2/3 of valid data for any given averaging time, i.e., for a one-hour average, there must be 40 minutes of valid data while the plant was in operation for the averaged data to be considered as valid.

Rolling Average:
A rolling average considers the average on a minute-by-minute basis; for each and every minute, the average is calculated from the preceding data for the selected average time. No matter what average time is used, CEMPort will consider 1440 averages for each day (1440 minutes in one day) for the maxima and overall average calculations.

Block Average:
Each block average is considered individually for the period; should a 1-hour average be selected, then the day will consist of 24 block averages and the times in between each hour are not used.

12.4 PLANT STATUS

To prevent periods where the plant is shut down diluting the reported emission levels, CEMPort does not use measurements during these periods – they are ignored and will not generate any alarms or form part of any averages. The plant status off condition may be determined from various sources; the most common being oxygen – should the oxygen level rise above a particular threshold (say 18%) then the program assumes that the plant is shut down. Other sources may be temperature (falling below a threshold) or a contact signal from a fan or pump.

12.5 MAXIMA

CEMPort reports maxima levels after a degree of averaging; it does not quote the instantaneous levels. For a summary report, this averaging is set from the 'Averaging time' selection. Should the averages be calculated as a 'block' rather than a 'rolling' average the levels from each average are considered individually – not on a minute-by-minute basis.

12.6 PERCENTILES

Percentiles are often required as a means of determining, not only the maximum emission levels but for how long the higher levels were present. They may be thought of as the level below which the emissions were recorded for the percentage of time selected. So, a 97th percentile level is the level below which the emissions were recorded for 97% of the time, and above this level for 3% of the time.

Within a summary report, CEMPort determines the percentile levels by ordering the block averages (see averaging) greatest to lowest over the reporting break period – it does not conduct it over the entire reporting period. So if there were 144 block averages for the break period (10-minute average), the 97th percentile level would be the140th highest measurement (0.97 * 144).

A different method of examining the percentile levels is to use an 'Alarm' report. Here CEMPort analyses the time for which an alarm was exceeded over the entire reporting period, and presents the data not only at this time but also as a percentage of plant operating time. So, should a percentile limit be placed for a particular average, then the alarm report may be used to check that this level was exceeded for less than the percentile requirement.

13 APPENDIX A - FILE SAVE PARAMETERS (EMS FILES)

The report configurations are saved automatically by the program when CEMPort is shut down, or when requested by the operator to a selectable saved filename, which may be reloaded as required. It is not expected that the operator will edit these files directly, but for completeness, an example is provided here. The EMS files are in the same format as Windows INI files.

The auto report and email options at the end of the file are not stored for requested file saves; they are only stored after the program has been shut down.

```
[General]
Overall Period=Day
Break Period=Day
Report type=0

[Summary report]
Summary average=10
Summary units 1=0
Summary units 2=0
Summary units 3=1
Summary units 4=0
Average type=1
Break averages=0
Break maxima=0
Header lines=0
Percentiles=1
Percentile level=95
Overall period=0
Break period=0

[Convert report]
Convert average=60
Convert interval=60
Overall average=1

[Alarm report]
Units=3
Suppress short alarms=0
Suppress short alarm time=30
Alarm1=1
Alarm2=1
Average=3

[Groups]
1=1
2=1
3=1
4=1
5=1
6=0
7=0
```

[Channels]
G1C1=1
G1C2=1
G1C3=1
G1C4=0… etc

[Units]
G1C1U1=1
G1C1U2=1
G1C1U3=1
G1C1U4=0
G1C3U3=1… etc

[Print options]
Include borders=1
Repeat headings=1
Portrait ?=0
Centred ?=1
Column spacing=75
Row spacing=0
Left margin=500
Right margin=20
Print font=Tahoma
Print size=8
Print colour=0

[Screen options]
Row height=16
Column width=100
Gridlines=1
title font=Tahoma
title font size=9
title font colour=8388608
body font=Tahoma
body font size=8
body font colour=8421376
title font bold=1
Body font bold=0

[Auto report]
Address 0=richard@Envirosoft.co.uk
Address 1=
Address 2=
Date=37805
Hour=16
Minute=27
SMTP address=smtp.freeserve.net
Report type=C:\CEMSuite\Reports\Auto report.ems
Interval=1
Active=0
Email=0
Print=1
Attach dispersion=1

14 APPENDIX B – GLOSSARY OF TERMS

AMS: Automated Measuring System (see CEM)
AST: Annual Surveillance Test refer CEN standard EN14181
CEM/S: Continuous emission monitoring system – the equipment for the sampling, analysis and data reduction of gaseous emissions measurements on a continuous basis.
Drift: Monotonic change of the calibration function over a period of unattended operation, which results in a change of the measured value.
EA: Environmental Agency responsible for England and Wales.
ELV: Emission Limit Value.
HWI: Hazardous Waste Incinerator, refer WID.
ISO: International Standards Organisation – Multinational organisation that develops and publishes measurement criteria and performance standard.
LAU: Environmental Agency Local Authority Unit.
Measurand: Particular quantity subject to measurement.
MID: Method Implementation Document – developed by EA and STA on how to apply standards in the UK.
Precision: Closeness of agreement between results obtained from the AMS.
QA: Quality Assurance.
QAL: Quality Assurance Level.
QAL1: Quality assurance level 1 – AMS as tested to the requirements CEN standard EN15267 or MCERTS CEM system.
QAL2: Quality assurance level 2 – Calibration of an AMS in accordance with CEN standard EN14181.
QAL3: Quality assurance level 3 – Ongoing performance of an AMS in accordance with CEN standard EN14181.
Reference Material: Material simulating a measurand of known concentration of the input parameter and traceable to national standards.
SRM: Standard Reference Method.
SSP: Site Specific Protocol
SD: Standard Deviation.
Sams: Standard deviation for the for the automated measurement system.
Variability: Standard deviation of the differences of parallel measurements between the SRM and AMS.
TC: Technical committee as referred to in standards organisations e.g. CEN.
TE: Technical Endorsement as referred to in MCERTS performance standard for personnel.
WID: Waste Incineration Directive.

15 INDEX

15.1 LIST OF FIGURES / PICTURES

16 PROGRAM INFORMATION

16.1 MANUAL REVISION HISTORY

Revision Number	Date	Summary of Changes	Author
1.06	29/06/10	Format Change	D Volgin
1.07	01/11/10	Re-write & format update	P Swindell
1.08	08/12/11	MCERTS Version	P Swindell
1.09	18/05/13	Minor Update	P Swindell
1.10	23/06/14	MCERTS Update / Minor changes	P Swindell
1.11	16/11/16	Format change	P Swindell
1.12	15/02/18	General Update (Name change etc)	P Swindell

16.2 APPROVALS

This document requires the following approvals:

Name	Title
R. Grant	Managing Director
P.Swindell	QA Coordinator