C O N T H E R M

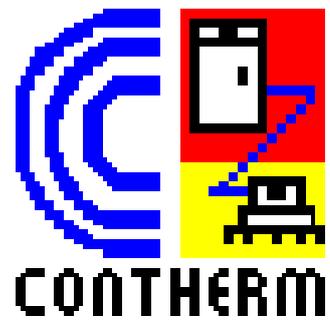### INSTRUCTION   MANUAL

PLCSCOMM

For Windows®

CONTHERM SCIENTIFIC LIMITED
P O BOX 30-605   LOWER HUTT
TEL: (0064-4)   568 8034
FAX: (0064-4)   568 8095

Contents

Basic Requirements

HARDWARE:
IBM Compatible PC:
10G Hard Disk Space.
CDROM Drive
VGA/SVGA   600 x 800 or better colour monitor
1-4 Standard Serial Communication Ports
Mouse. (PS2 Mouse recommended if logging more than 1 cabinet)

SOFTWARE:

Microsoft   Windows 98/Xp/Vista/Win7$^{©}$ operating system.
NB: Some Software releases MAY have an EXPIRY DATE! – Call up the
ABOUT/HELP window to see if this applies to your release.   When the EXPIRY date (if
any) is reached the program will CEASE TO FUNCTION.

LICENSE AGREEMENT

IMPORTANT – READ CAREFULLY: This End-User License Agreement("EULA") is a
legal agreement between you (either an individual or a single entity) and CONTHERM
SCIENTIFIC LTD.   By installing, copying or otherwise using this SOFTWARE
PRODUCT you agree to be bound by the terms of this EULA.   If you do not agree to
the terms of this EULA CONTHERM is unwilling to license this SOFTWARE PRODUCT
to you.   In such event you may NOT use or copy the SOFTWARE PRODUCT and you
should promptly return the unused product for a refund.

SOFTWARE PRODUCT LICENSE

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one time, the software MUST NOT be used by two different people in two different
places at the same time.

LIMITED WARRANTY:
CONTHERM warrants that: This SOFTWARE will perform substantially in accordance
with the accompanying PRODUCT MANUAL(s) for a period of 90 days from the date of
receipt.

EXCLUSION OF LIABILITY/DAMAGES:
The Purchaser is required to remit the purchase price of the unit to the supplier within
the terms of that supplier's condition of sale.   CONTHERM Scientific Company will
accept no liability or shall its agents for consequent damage of any kind (Including,
without limitation, damages for loss of business, business interruption, loss of business
information or other indirect or consequential loss) arising out of the inability to use or
supply this software.

[#] basic
[$] Basic Requirements

Installation

The PLCSCOMM program has been designed to run under the Microsoft Windows® environment. PLCSCOMM may be configured to acquire information from up to four CONTHERM PLCS4/5 or GP cabinets via a maximum of four COM: ports. On most configurations a MAXIMUM of 2 cabinets is able to be used. The program may gather information in the background and save this to an appropriate file on the hard disk drive. Most PC systems come with 2 serial communication ports as standard. COM1: is usually taken up by the mouse and COM2: is usually free. A common problem with using the standard com ports is that the INTERUPT VECTORS are SHARED, e.g. COM1: and COM3: use IRQ4 and COM2: and COM4: use IRQ3. This effectively limits the number of cabinets able to be connected to a maximum of 2..

It is RECOMMENDED therefore that the computer system be used with a PS2 mouse, this leaves BOTH COM1: and COM2: free for use with the PLCSCOMM software. If communication is to be by Modem, the corresponding normal Alternative COM port cannot then be used.

The Contherm Cabinet connects via a male/female DB25 data cable with the male end connecting to the cabinet and the female end connecting to the PC.

INSTALLATION:

The supplied PLCSCOMM program CD should be inserted into a CDROM drive and the SETUP.EXE program executed.

To run the program just click on the PLCSCOMM icon in the CONTHERM program group.

It is strongly recommended that the program be allowed to operate from the CONTHERM directory on the default (Typically drive 'C:') hard drive.

The program is able to run in the background and correctly continue to 'LOG' cabinet readings under most conditions.

When operating the program in the background please remember that the speed of other program operations may be affected.

When operating the program for the first time you will need to select the TYPE of cabinet you are communicating with, this is done using the 'P' button at the top RHS of the main program screen, each 'click' on this button will toggle the type from 'P'=Precision to 'GP'=General Purpose (SLS etc), the particular COM port must also be selected and at least 1 minute allowed to ensure communication has been established with the cabinet.

A cabinet Description may now also be entered.

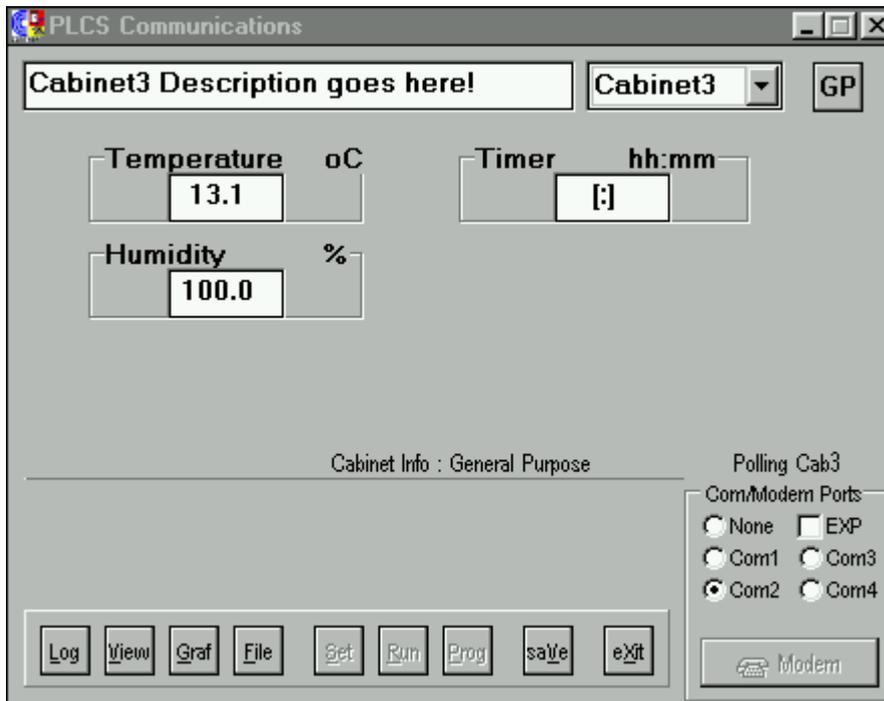SAVE **your settings using the 'Save' button when these are complete.**

Operating Instructions

MAIN PROGRAM SCREEN – GP TYPES

P/GP This button allows the user to select the TYPE of cabinet connected to the current com port. Each time the button is selected the type of cabinet is toggled.
'P' Type – This is used for a PRECISION cabinet E.G 180/190RHS. RLT etc.
'PL' Type – This is used for Plant Growth Cabinets E.G. 620/630 & 645
'GP' Type – This is used for a GENERAL PURPOSE cabinet E.G SLS1400.
'X' Type – This is used for a now obselete PLCS3 controller only.

LOG This button is used to setup the LOGGING operations where the cabinet reading is taken at specified intervals and saved to a disk file.

VIEW This button allows the logfile for the currently displayed cabinet to be viewed. The size of files able to be viewed via this button is limited to 32K Characters.

GRAF This button displays the selected logging file in a graphical format. If no file is selected (or if current has just been viewed) it Graphs the current logging file.

FILE This button opens a file dialog box to enable the user to select any valid logging file to be Graphed.

SAVE This button allows the current settings to be SAVED to the 'CABINET.DAT' file so that the descriptions, com port etc will not have to be set up each time the program is run.
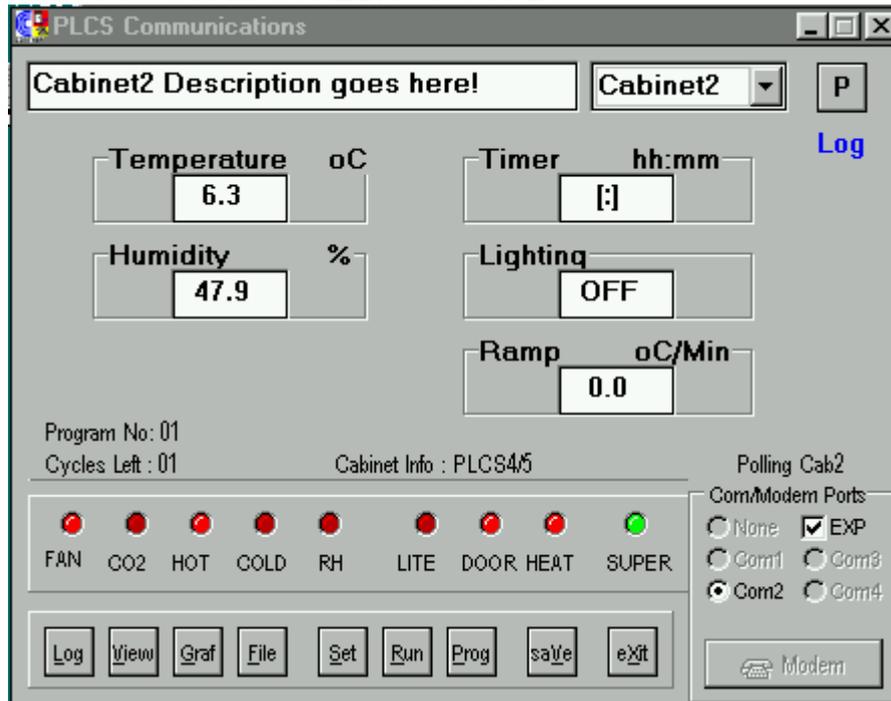
EXIT This button closes the PLCSCOMM program.

Com/Modem Ports This panel of selections enables the user to select the desired serial communication port to be used with this cabinet. Unavailable port selections are 'greyed' out. If the 'None' option is selected the cabinet is DISCONNECTED from any com port. A Modem cannot be used with a GP cabinet. The **EXP** option connects through a special **EXPANSION BOX**.

Operate
$ Operating Instructions

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GRAF This button displays the selected logging file in a graphical format. If no file is selected (or if current has just been viewed) it displays the current logging file.

FILE This button opens a file dialog box to enable the user to select any valid logging file to be Graphed.

SAVE This button allows the current settings to be SAVED to the 'CABINET.DAT' file so that the descriptions, com port etc will not have to be set up each time the program is run. If used WHILE connected to a cabinet by Modem, the last used Modem INITIALISATION string and TELEPHONE number will also be saved.

EXIT This button closes the PLCSCOMM program. If connected via Modem ensure that the Modem has correctly disconnected from the telephone line.

Com/ Modem Ports This panel of selections enables the user to select the desired serial communication port to be used with this cabinet. If the 'None' option is selected the cabinet is DISCONNECTED from any com port or Modem. To make a connection to the cabinet by **MODEM** (Assumes an INTERNAL or EXTERNAL modem is fitted and setup at both the PC end and the cabinet end) press the **MODEM** button and enter the desired telephone number when prompted. Note that if an INTERNAL modem is used at COM3 then COM1: cannot be used at the same time, the same thing applies for COM4: and COM2:.

If the **EXP** box is checked the PC may connect with up to 20 cabinets via a special **EXPANSION BOX** connected to COM2:.

A Modem INITIALISATION string may be entered by selecting the '**NONE**' com port and then the MODEM button. This should only be carried out with the modem not on line. The INITIALISATION string can be saved by pressing the SAVE button when the modem IS connected to to cabinet. This will also save the last used telephone number. Only ONE cabinet may be connected via Modem at any time.

LOGGING SETUP SCREEN
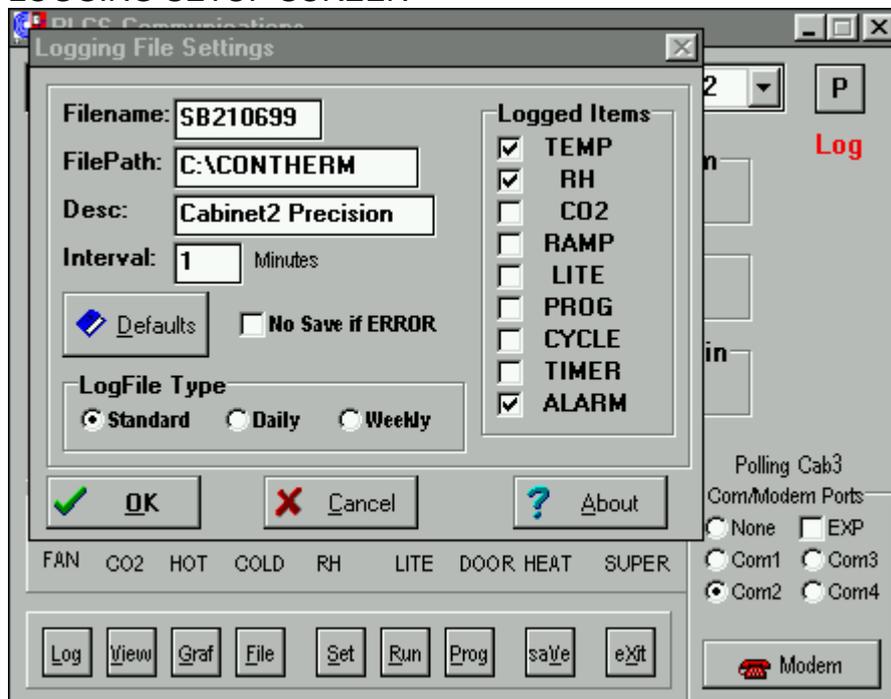
BUTTONS:

DEFAULTS This button sets the logging options to the default values.

FILENAME   This is the name for the Logging file. (8 Characters max)
The default settings attempt to differentiate the files between Standard ('S'), Daily ('D') and
Weekly ('W') files. The second letter of the filename represents the cabinet number 'A'=cabinet1, 'B'=cabinet2 etc.   Alternatively any unique filename may be used.

FILEPATH   The directory on the disk where the logging file will reside. If wishing to save to a Floppy disk specify the path as 'A:'=Diskette 'A' or 'B:'=Diskette B.

DESC Any desired description to aid in identifying which cabinet this file belongs to.

INTERVAL   The time (in minutes) between logging readings. From 0 (No logging OR Stop Logging) to 240 (4 Hours).

NO SAVE if ERROR   Tick this box if any fault reading (' ERR') is NOT to be recorded in the logging file – useful if importing the logging file (.CSV) into a spreadsheet.

LOGFILE TYPE   Allows the user to specify three different settings

STANDARD This creates one long logging file.

DAILY   This creates a NEW logging file at the start of EACH day

WEEKLY   This creates a NEW logging file on Day1 of EACH week

The suggested file names allow a unique name for each logging cabinet and help to easily identify the DATE on which the logging file was created. The file format is of type '.CSV' (Comma Delimited Variables) which can easily be imported into a spreadsheet for editing/graphing purposes. The supplied 'VIEW' button only allows files sizes up to 32Kb (A full day logging at 1 minute intervals creates a file of about 40Kb) and thus the suggested minimum logging interval for a Daily file is 2 minutes. If logging more than 1 'GP' type cabinet the suggested minimum logging interval is 5 minutes.

LOGGED ITEMS The Items checked are logged to the file, items 'greyed out' are unavailable to be logged.   Temperature MUST always be logged.
OK   This button accepts the selected information and allows the logging file to be Created, Stopped etc.
CANCEL   This button exits the logging setup screen without making any changes to the current conditions.
ABOUT   This button displays a new screen with additional information about the program (Serial Number and version).

LOGGING: When any cabinet connected to the PC is setup for logging the word 'Log' will appear at regular intervals on the main screen, when the actual logging sequence is started the colour of this word will be RED, this will also be the case if the currently displayed cabinet is NOT being logged but other cabinets are.   The cabinet currently being communicated with is indicated by the words 'Polling Cab X' just above the Comm Port selection panel.   When running the program in the background it should be minimised.
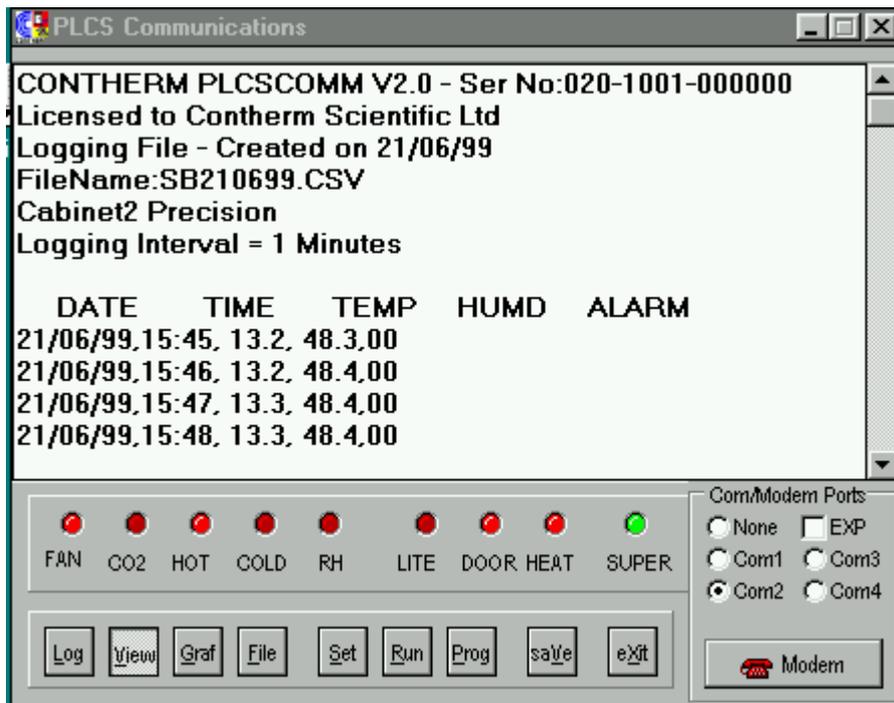

ABOUT PLCSCOMM   SCREEN

BUTTONS

Click on the 'OK' button to exit the About screen.

VIEW LOGFILE SCREEN

This screen shows a view of the currently logging file for the displayed cabinet.
The maximum file size able to be displayed via this button is 32Kb.
To close this window Click on the Depressed 'VIEW' button.
The logging file contains a header displaying the Serial Number of the PLCSCOMM Software and its licensed user, the date the file was created, the current filename, cabinet description and the logging interval.
A new line of data is recorded at each expiration of the set logging interval.
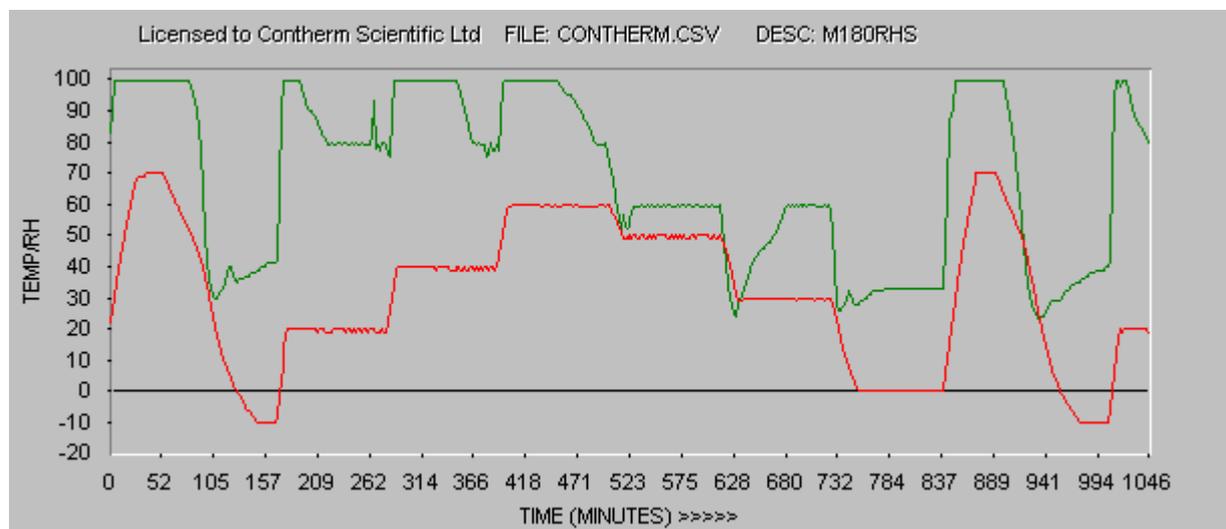
This screen shows a standard line graph for a typical logging file. The graph is produced by clicking on the 'GRAF' button. To select a previous logging file, use the 'FILE' button before graphing.
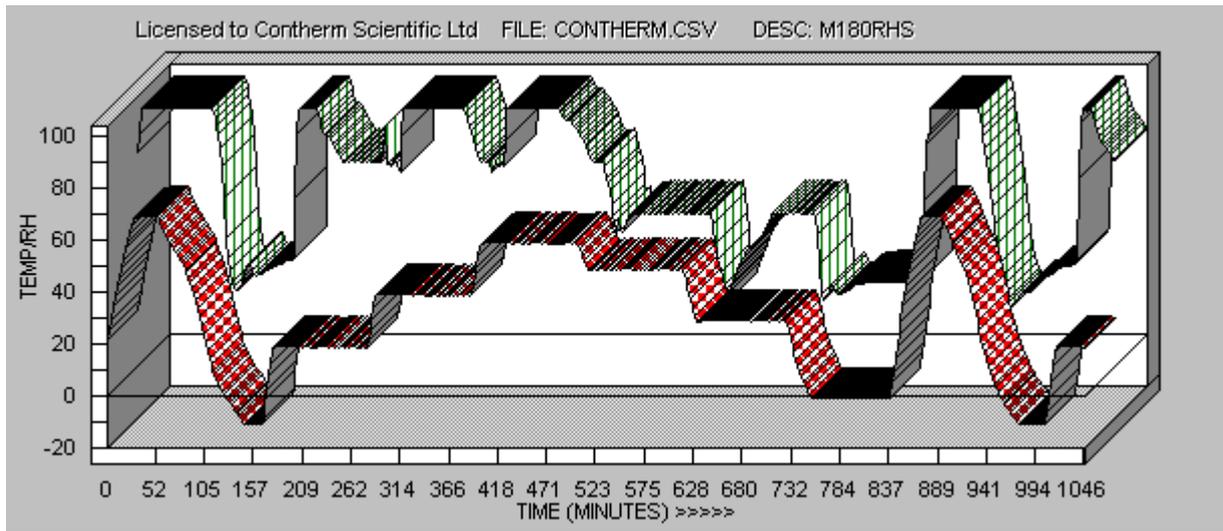
This graph shows a 3D version of the same file. This is produced by clicking the '3D' button on the Graph toolbar. A small section of the file may be graphed by noting the number of minutes corresponding with the starting point of interest and the mintes for the ending point of interest, close the graph screen and then re-graph using the minutes noted above when asked for the 'MIN' and 'MAX' graphing settings.
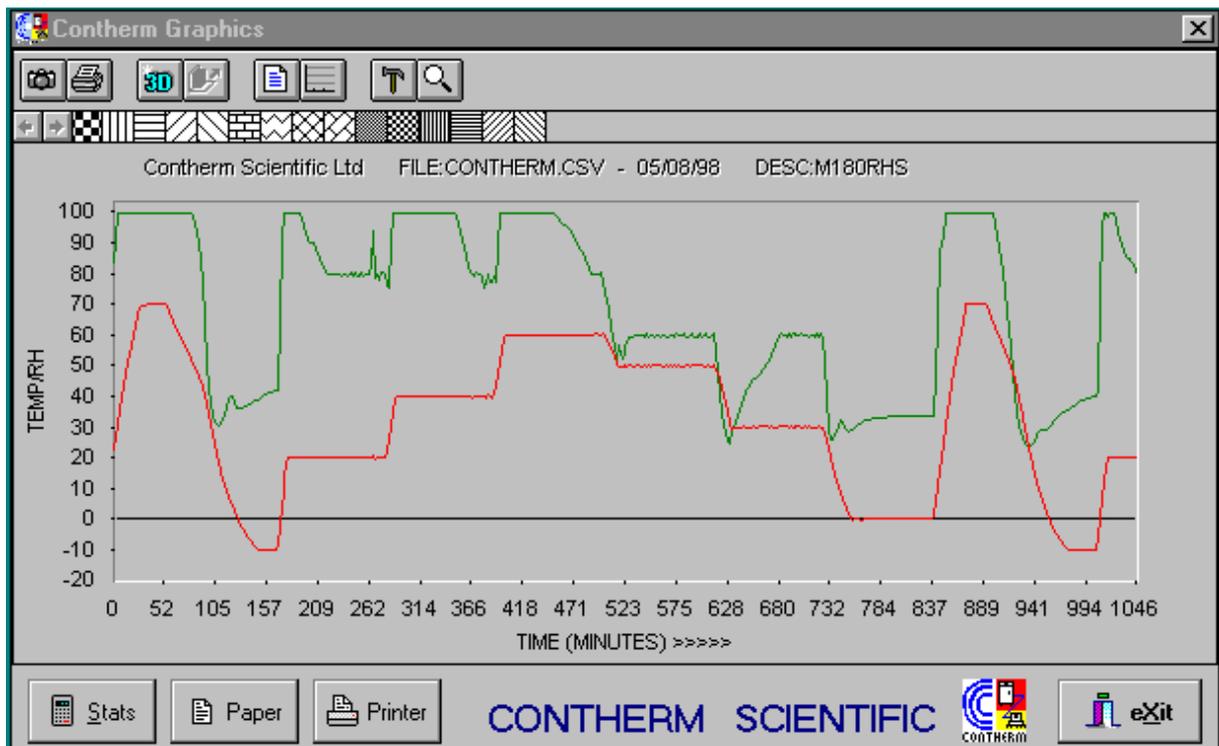
The above display shows the ConGraph Program ADD-IN   with the 'CONTHERM.CSV' test logging file loaded.
The top **TOOLBAR** allows the user to change varous properties on the graph,   use the mouse 'Right-Click' to see a short description of each buttons function. The Graph may be **PRINTED** or **COPIED** to the clipboard for importation into another application.

The **Stats** button will display the Maximum and Minimum readings for the displayed range.

If a point on the graph is selected and then 'Double-Clicked' the values for the selected point will be displayed.
The Lower buttons function as follows:

Paper: This displays the format that will be used to draw the displayed graph on the printing device, note in particular if the graph is to be printed in the 'Portrait' or 'Landscape' orientation.   To change the printing orientation use the '**Printer**' button.

Printer: This allows the user to CHANGE the printing format from 'Portrait' to 'Landscape' and also select the desired output device. **NB:** ANY changes here will then be the **DEFAULT** for the selected device! – After printing the graph you may wish to return the printer to its normal settings for other programs.   To actually print the graph use the 'PRINT' button on the **TOOLBAR**.

The CONGRAPH program runs INDEPENDANTLY from the PLCSCOMM program and should be CLOSED as soon as operations with the desired graph are completed.
The operation of the CONGRAPH program relies on the presence of some Visual Basic Controls (VBX).

Troubleshooting

The main source of problems is likely to result from the connection of the cabinet to the PC and in the selection / interaction of the desired communication ports.

A Special cable is required between the Contherm cabinet and the cabinet end external modem. The cable is a shielded cable with at least the shield and 3 other wires. At the cabinet end use pins 2,3 and 7(GND) with the shield wire connected to the 25pin connector case. At the External modem end use pins 3,2,7(GND) and connect the shield wire to the 25PIN connector case, also loop pins 4,5,6,8 & 20 together. NB: the wires to pins 2&3 CROSSOVER between the connectors.

A special **EXPANSION BOX** which enables the user to log upto 20 Contherm cabinets via COM2: is also available.   This box effectivly expands the COM2: serial port into a basic 5 port box with further options to add cabinets in lots of five.   The **EXP** button selects this option if supplied.

#$

Programming
PROGRAMMING SCREEN
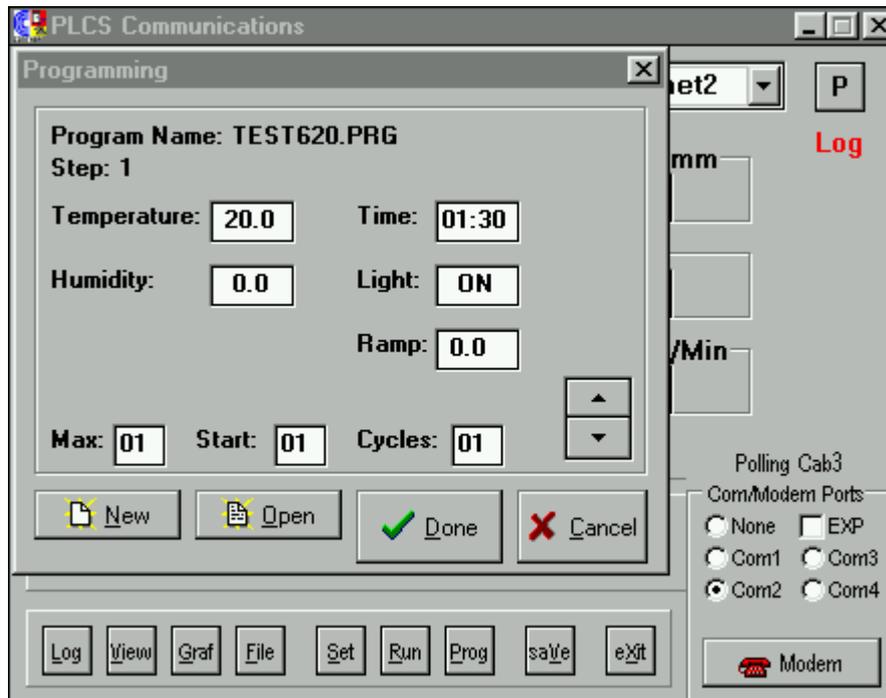
This window appears when the 'PROG' button on the main window   is clicked.
A PROGRAM file contains a number of program STEPS to download to the chamber,
the chamber will then attempt to control at these settings and times.

BUTTONS:

- **NEW**   This button allows the user to create a NEW program file.   The program file has the extension '.PRG'.
- **OPEN**   This allows the user to retrieve an EXISTING program file to be used on this cabinet.   Once 'OPENED' the STEPS may be viewed/Edited by using the 'UP' and 'DOWN' scroll buttons.
- **DONE**   This selection SAVES any program changes and EXITS the programming window – to USE the file with the selected cabinet the 'RUN' button must be activated on the main window.
- **CANCEL** This selection closes the programming window without updating the program file.

CREATING A PROGRAM FILE

Use either NEW or OPEN to start or add to a program file – a file DIALOG box will appear to allow the user to select the FILENAME and where the file is to reside.

# Prog
$ programming

The user may enter the required values into the program parameter boxes, the values must be legal values just as may be entered in the cabinet control panel, in particular the **TIME** value **MUST** be in the format **00:00** with a colon':' to separate the hours and minutes.

Use the 'UP' and 'DOWN arrows to move between steps or to ADD a step.
The 'TAB' button may be used to quickly move between entry windows.

When the desired program is complete enter/edit values in the MAX, START and CYCLES boxes to finalise the operating parameters.

MAX = The maximum number of program steps if running from the cabinet (Maximum allowed = 9).
START = The program number to start operating from.
CYCLES = The number of program 'loops' to perform.

Use the 'SAVE button to record and setup the settings.

RUNNING THE PROGRAM FILE

After having created or selected the desired programming file the settings may be used in TWO ways:

A)   Run the program from the cabinet controller – (Recommended!)
Using this method the program file settings are DOWNLOADED to the cabinet control system (A maximum of 9 programs) and the control system is setup to run the settings starting from the selected program and for the desired number of cycles.   This is the preferred method as full control is RETAINED by the cabinet control system.

B)   Run the program from the user's computer.
Using this method the program file settings are RETAINED by the user's computer.   The selected program step is DOWNLOADED to the cabinet and set to run for a continuous period ([:]) , when the desired time has ELAPSED the computer will contact the cabinet and send the NEXT program step.   Using this method up to 99 steps may be programmed.   If the computer crashes or is prevented from contacting the cabinet the cabinet WILL CONTINUE to operate at the last received settings.   This method is not as robust as the cabinet control method, especially when running multiple cabinets.