



CryoWatch PC Software

Operating Manual

IM1040/2

<http://www.mowden.co.uk>

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1. CryoWatch PC Software - Introduction and Key Features.

The CryoWatch PC Software is a Windows PC based software package used in conjunction with a range of Cryogenic Temperature and Level Alarms manufactured by Mowden Controls Ltd.

Currently these are:-

M355CE Temperature Logger/Level Alarm,
M38xCE and M38xCE-T range of Temperature Loggers.



1.1 Key Features

The Key features of the CryoWatch PC Software include: -

- Communicates to M355CE, M38xCE or M38xCE-T Logger via Serial Port or USB
- Tilt Alarm Status and Settings (M38xCE-T only)
- Temperature Alarm Status and Settings (All types)
- Level Alarm Status and Settings (M355CE types only)
- Logging Interval Status and Settings (All Types)
- Download of Log data and store in Printed, PDF or Excel Spreadsheet format.
- Logging Memory Clear / Restore
- Update of Controller Firmware to add new features.
- Setup / Change of Logger Address
- Calibration Data / Battery Status monitoring.
- Logger Date and Time sync to PC Date and Time.

2. M355 and M38xCE / M38xCE-T General Overview of Operation.

2.1 M355 Logger / Level Alarm Overview

The M355 Temperature Logger and Level Alarm is designed to monitor the environment within Cryogenic Storage Containers.

Monitoring is by means of a Thermistor Level Sensor and a Thermocouple temperature sensor. Temperature is displayed on a Liquid Crystal Display.

An Alarm is triggered if the level of Liquid Nitrogen in the storage Vessel falls below the level of the Thermistor Sensor or if the temperature within the vessel exceeds a preset limit.



The M355 also stores a record of temperature for verification of correct storage conditions. The Interval between measurements is adjustable between 1 minute and 30 minutes.

The Logger operates in one of two modes, depending on whether or not it is connected to a PC.

When the PC cable is connected the Logger detects this and switches to 'PC Mode'.

In PC Mode the Logger responds to commands from the PC Software. The PC is used to set the Logger's clock, the logging interval, to start and stop logging, and for downloading the data. The PC also displays the current status of the Logger, i.e. temperature, level, logging status (active/standby) and number of stored records.

When connected to the PC a Status LED indicates when the Logger is receiving messages from the PC.

Pluggable screw terminal connectors are provided for Sensor and Power Connections. A standard miniature thermocouple socket is used for the Thermocouple Connection.

The M355 is powered by internal batteries (3x AA cells) and/or an external DC power supply.

Battery Life is 1 year approx. A warning is given when the battery is approaching the end of its life.

Refer to IM1023 for full details of the operation of the M355CE Loggers.

2.2 M38xCE and M38xCE-T Temperature Logger Overview

M38xCE and M38xCE-T range of Temperature Loggers are designed to monitor and record storage temperatures within Cryogenic Dry Shippers manufactured by Worthington Industries

The Logger and Thermocouple Temperature Sensor are contained within a modified neck plug so avoiding trailing wires or extra boxes which could become damaged or detached in transit.

The M38xCE –T Loggers have the additional feature of a Tilt Switch. If the container is tilted by more than 60 degrees from vertical it is recorded in the log. This can be used to determine whether the container has been shipped correctly.



The following models are available:-

- M380CE-T for CX100
- M382CE-T for CXR100
- M385CE-T for CX500 and CXR500

The Logger operates in one of two modes, depending on whether or not it is connected to a PC.

When the PC cable is connected the Logger detects this and switches to 'PC Mode'.

In PC Mode the Logger responds to commands from the PC Software. The PC is used to set the Logger's clock, the logging interval, to start and stop logging, and for downloading the data. The PC also displays the current status of the Logger, i.e. temperature, logging status (active/standby) and number of stored records.

In PC Mode the Logger is powered from the PC's Serial or USB Port and draws no battery power. While connected to the PC a Status LED indicates when the Logger is receiving messages from the PC.

The M38xCE loggers are powered by an internal Non Rechargeable Lithium Cell. Battery operation is 5 years minimum.

Refer to IM1020 for full details of the operation of the M38xCE and M38xCE-T Loggers.

3. CryoWatch PC Software – Installation

The PC Software is designed to run under Windows 7 or later operating systems.

The recommended minimum spec for the PC is:-

1Gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) PC

Windows 7 or later

5Mb Free Hard Disk space

Microsoft Excel is not required to generate the spreadsheet files

Microsoft Excel or a compatible program is required to read the spreadsheet files.

Double click on *CryoWatchV2_8**.msi* ' file, then follow the on screen instructions to complete the installation.

(Note: - The PC Software revision may change for different versions of PC Software).

4. Connecting the Logger to the PC

4.1 M355CE Connection

The M355CE Logger connects to the PC with either: -

- a) Standard 9-way D-Type Cable (Male to Female).
- b) USB to RS232 Convertor Cable (for example FTDI US232R).

Note: - USB/Serial cables may require a driver to be installed before use.

Plug the cable into either the PC serial port or USB port and Power up the PC. Plug the other end into the 9-way female D-Type connector on the left hand side of the M355CE.

4.2 M38XCE Connection

The M38XCE Logger connects to the PC with either: -

- a) M381CE PC Cable fitted with a 9-way female D connector.
- b) M383CE PC Cable fitted with a USB connector.

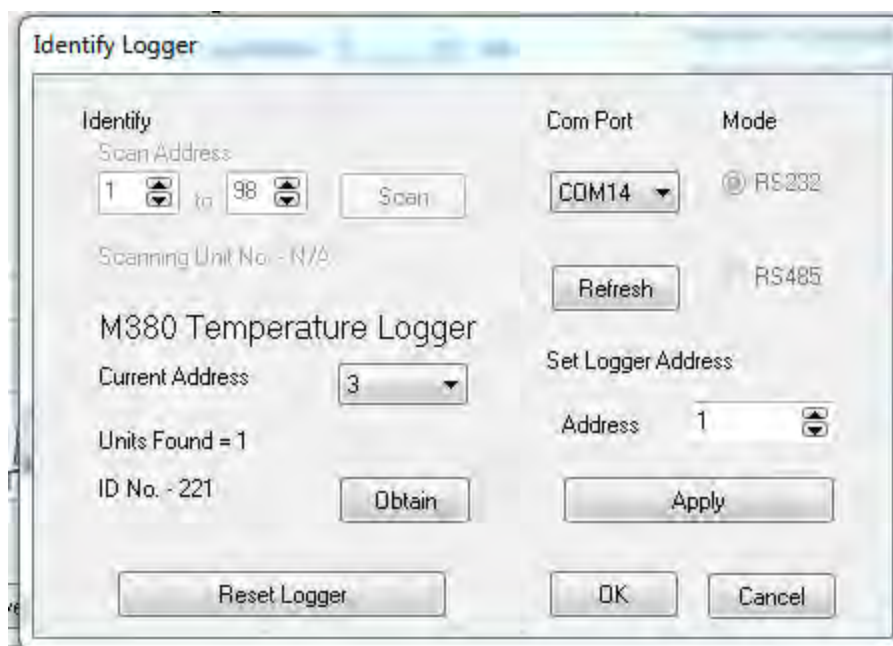
Note: - the M383CE USB cable requires a driver to be installed before use. This is on the CD or can be downloaded from the FTDI web site <http://www.ftdichip.com/Drivers/VCP.htm>

Plug the cable into either the PC serial port (M381CE) or USB port (M383CE) and Power up the PC. Plug the miniature circular connector into the M38XCE Logger. Use the screw locking collar to hold in position.

4.3 Identify Logger

Start the CryoWatch PC Software.

An opening title screen will appear for a few seconds followed by the 'Identify Logger' screen shown below.



If this is the first use of the software it may be necessary to select the required COM Port from the pull-down menu and click on the '*Obtain*' button to identify the Logger. The program should default to this setting on subsequent use of the program.

If the COM Port is correctly set, the Logger Type will be shown (e.g. M380 Temperature Logger, M355 Logger / Level Alarm) and the '*ID No.*' and '*Current Address*' will be displayed.

If the Logger is in '*Standby Mode*' (not logging) it may take up to 15 seconds for the Logger to detect the PC.

On subsequent uses, the user may have to click on '*Obtain*' to get the Logger address. Alternatively, if the Logger is plugged in before the program is started it will attempt to obtain the address automatically.

If a USB to RS232 convertor lead is plugged into the PC after the software has been started, pressing the '*Refresh*' button will update the COM Ports in the pull-down menu.

Click '*OK*' to proceed. The '*Identify Logger*' window will close leaving the '*Main*' window displaying the current status of the Logger.

4.4 Logger Address

All commands sent from the PC to the Logger are prefixed with an address between 01 and 98. The Logger will only respond to commands with the correct address.

Logger Addresses are factory set to 01. If using more than one logger it is useful to assign each a unique address.

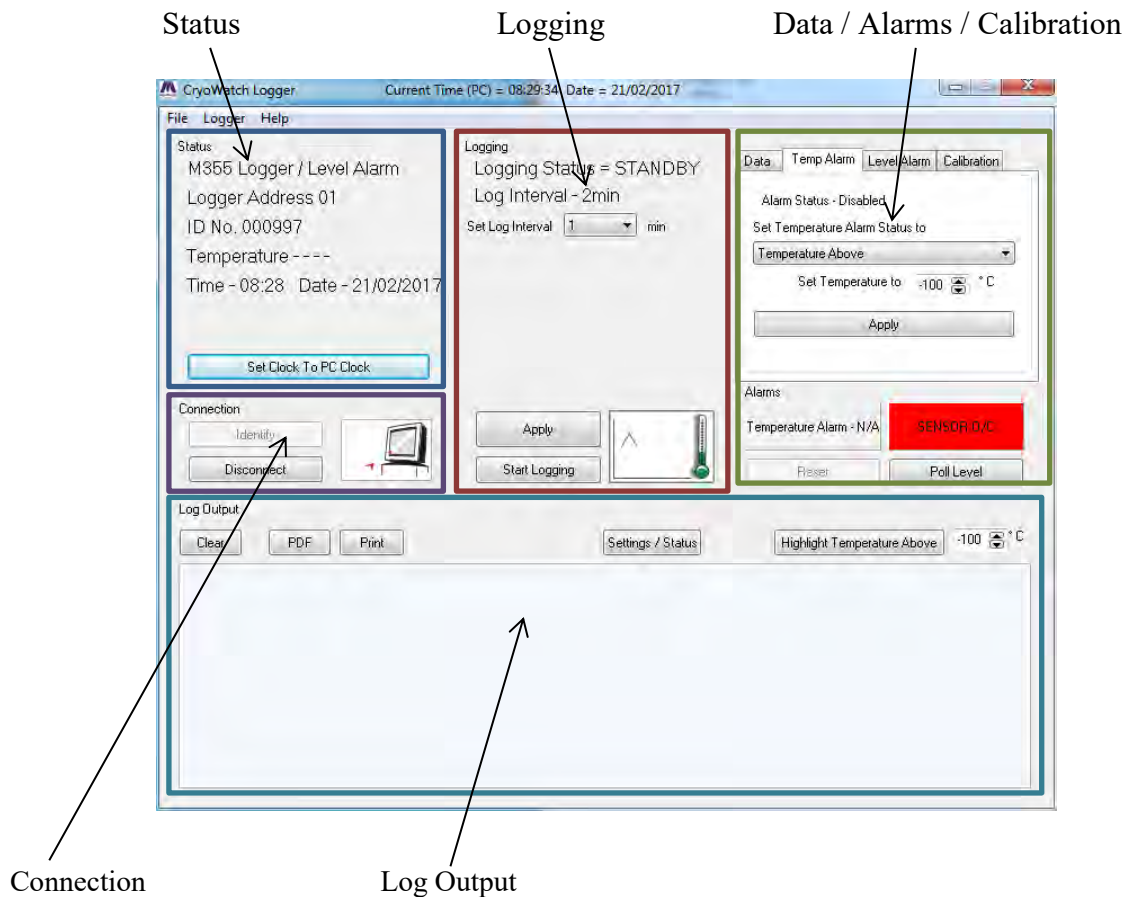
To '*Set the Logger Address*', change the number in the '*Address*' box to the required value and click on the '*Apply*' button. The address should be displayed in the '*Current Address*' box.

Click '*OK*' to proceed. The '*Identify Logger*' window will close leaving the '*Main*' window displaying the current status of the Logger.

5. M355CE Main Display Functions

The Main Display is refreshed every 2 seconds.

The Main Display window for the M355CE Logger is divided into six areas. The function of each is outlined below.



5.1 Status

The Current Status and Logger Type of the Logger is displayed in this area.

The 'Logger Address' is the address of the unit.

The 'ID No.' is a unique serial number programmed during manufacture.

The 'Temperature' is the current temperature measured by the Logger.

The 'Time' and 'Date' refer to the internal clock in the Logger.

5.1.1 Set Logger Time and Date to PC Clock

The PC clock setting is displayed in the main header bar. The Logger Time and Date can be synchronized with the PC by pressing the 'Set Clock to PC' button.

Note that this button will be greyed out if the PC clock and logger clock show the same time.

5.2 Logging

This area shows the current Logging Status (ACTIVE or STANDBY) and the Log Interval.

5.2.1 Start / Stop Logging

Logging is Started (ACTIVE) and Stopped (STANDBY) by pressing the relevant '*Start Logging*' or '*Stop logging*' button. The 'Graph and Thermometer' icon gives a graphical indication of the Logging Status.

5.2.2 Set the Log Interval

The '*Set Log Interval*' box has a drop down list giving valid settings. Select the required interval and then click the '*Apply*' button. When selecting the Log interval bear in mind the required period for logging and the maximum number of records.

Approximate maximum logging periods for the different log intervals are

5 days @ 1 minute
27 days @ 5 minutes
54 days @ 10 minutes
80 days @ 15 minutes
160 days @ 30 minutes

5.2.3 Logging Operation

Press the '*Start Logging*' button to Start logging. The 'Number of Stored Records' count will increment by one (or two if this is a logging point) and Logging Status will change to 'ACTIVE'.

In ACTIVE mode, a log record of Temperature is stored at preset intervals.

In STANDBY mode, the Temperature and Level are monitored but no record is kept.

With the M355CE unit disconnected from the PC (i.e. remove the PC Cable), the LED on the M355CE unit flashes every 6 seconds to indicate that logging is ACTIVE or at 15 second intervals if the logger is in STANDBY mode.

5.3 Data/Alarm/Calibration Tabs

This window is subdivided under four tabs. The Alarms are shown below the Tab box.

5.3.1 Data Tab

The status of the data store is displayed here. The Number of Stored Records, number of Records to Download and the Maximum Number of Records are show.

5.3.1.1 Clear / Restore / Delete memory

To avoid downloading records which have already been read, click on the '**Delete**' button.

This will change the '*Number Records to Download*' to zero but will leave the '*Number of Stored Records*' unchanged.

The '**Delete**' button marks existing records as having been read. At the next download only records collected after the last Delete command will be output.

To undo the Delete command, click on the '**Restore**' button.

The '**Restore**' button resets the memory to allow all records to be downloaded.

To permanently delete all stored records click on the '**Clear**' button.

This will change the '*Number Records to Download*' and the '*Number of Stored Records*' to zero.

5.3.1.2 Temperature Log Download

The **‘Temperature Log’** button creates a simple report of time against temperature formatted in columns. A header with the Logger ID and address is printed at the start of each day’s records. See section 7. for more details.

5.3.1.3 Spreadsheet Download

The **‘Spreadsheet’** button outputs a comma delimited list in the Log Output area. This may be saved as a Spreadsheet File (.xls), CSV File (.csv) or Text File (.txt). It can also be saved as a PDF or printed. If the output is saved as a Spreadsheet File (.xls), a graph of the Logger Temperature is also generated.

5.3.2 Temperature Alarm Tab and Alarms Area

The Temperature Alarm Tab allows the Temperature Alarm to be Enabled / Disabled and the alarm temperature to be set. The temperature alarm may be set between -50°C and - 150°C (5°C steps).

The **‘Set Temperature Alarm Status’** pull down menu may be used to enable or disable the alarm. After setting the Alarm status and Alarm Temperature click on the Apply button.

5.3.2.1 Temperature Alarm Operation

The Alarms area contains an alarm indicator and a **‘Reset’** button for the Temperature Alarm.

If the Temperature Alarm is Disabled, the alarm indicator and button is greyed out.

If the Temperature Alarm is Enabled and OK, the indicators show **GREEN**.

If an alarm condition has occurred, the indicator changes to **RED**.

The Temperature Alarm may only be reset when the temperature falls below the selected alarm temperature.

If the temperature alarm is enabled the temperature is checked at 1 minute intervals. If it exceeds the preset limit a Temperature Alarm record is stored in the log.

5.3.3 Level Alarm Tab

This tab allows the user to set the time between Level Alarm polls. It also details the last time a poll of the Level occurred.

5.3.3.1 Level Alarm Operation

While the PC is connected the level is checked periodically and displayed.

The level is shown on the indicator as one of the following:-

GREEN	- OK.
YELLOW	- Checking Level.
RED	- Low level or Sensor Fault.

Pressing the **‘Poll Level’** button gets the Level Sensor status.

5.3.4 Calibration Tab

This is for factory adjustment only and is not accessible.

5.4 Connection

This area controls communication between the Logger and the PC.

The '*Identify*' button opens the '*Identify Logger*' window and allows Com Port and Logger address selection / programming.

The '*Connect/Disconnect*' button starts and stops the commands sent (polling) to update the status of the Logger.

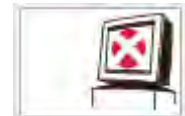
While connected (polling in progress) the status is updated at 3 second intervals.

If the logger is unplugged a warning message appears and all fields in the Status Display are changed to 'N/A' (Not available).

Clicking on the '*Disconnect*' button stops polling and disables the warning message. All fields in the Status Display are changed to 'N/A' (Not available).

The state of the connection is also indicated by the 'PC' icon to the right of the buttons.

Not Polling



Polling M355CE unit



5.5 Log Output

The Log Output area displays data as it is downloaded from the Logger. Data displayed in the window may be viewed, saved in PDF format or printed.

To assist in viewing the data, temperatures above a selected value may be highlighted (see section 7.1).

The '*Settings/Status*' button gives a summary of the current status and some of the key settings including Calibration data and Battery Voltage.

A report will be generated as shown.

```
*****
CryoWatch Logger PC Software    Version V2.8  (Build V2.8.0.1)
Current Time (PC) = 08:23:13  Date = 21/02/2017
connected to: -
M355 Logger / Level Alarm  Address:01  ID No:000997  Firmware V1.8
*****

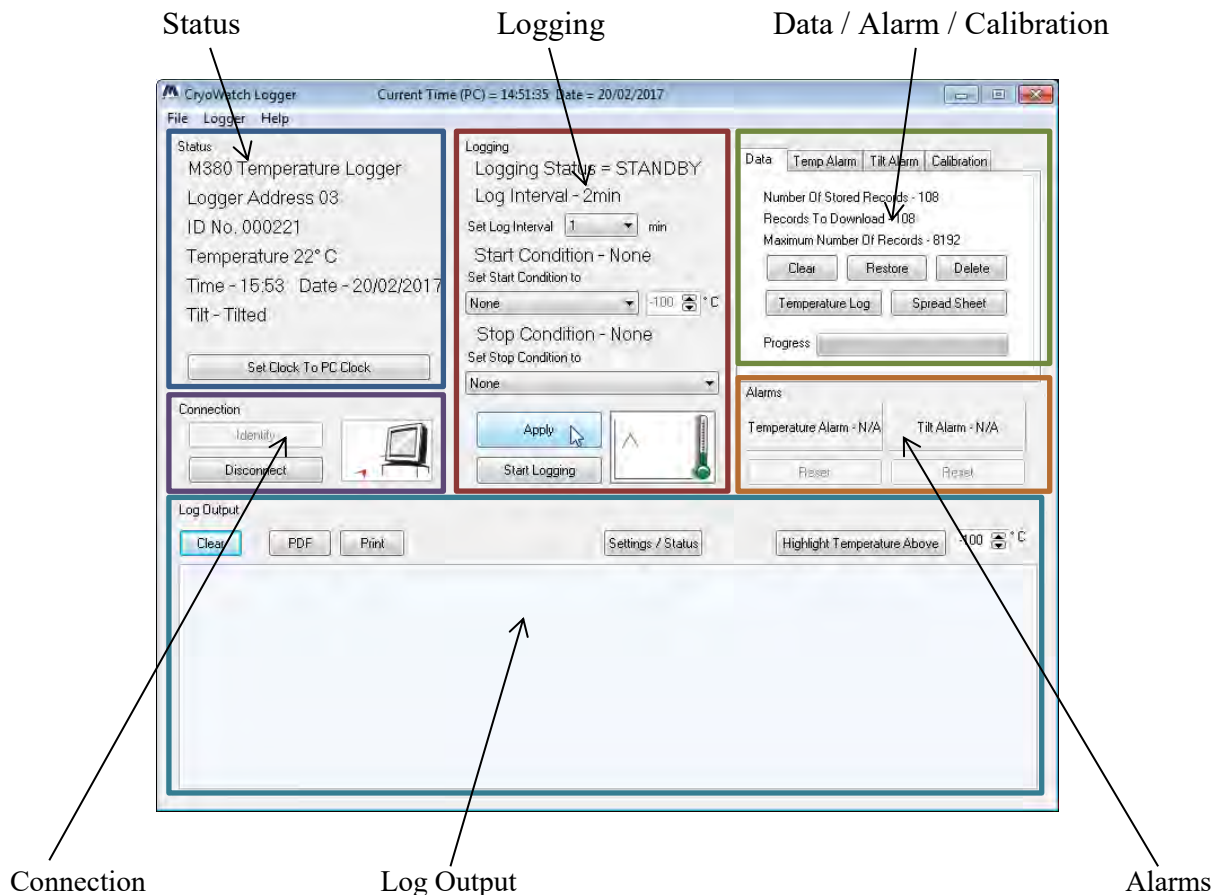
Settings etc for unit No.01
Serial No. 000997
Battery volts = 2450mV
ADC LN2 815
ADC ice 320
ADC reading = 16

Logging status = Standby
thermocouple OK
End of data
```

6. M38xCE and M38xCE-T Main Display Functions

The Main Display is refreshed every 2 seconds.

The Main Display window for the M38xCE and M38xCE-T Logger is divided into six areas. The function of each is outlined below.



6.1 Status

The Current Status and Logger Type of the Logger is displayed in this area.

The 'Logger Address' is the address of the unit.

The 'ID No.' is a unique serial number programmed during manufacture.

The 'Temperature' is the current temperature measured by the Logger.

The 'Time' and 'Date' refer to the internal clock in the Logger.

The position of the Logger is displayed as either 'OK' or 'Tilted'.

This reports the current state of the Tilt Switch and is not an alarm indication. (Older M38xCE loggers do not have this feature).

6.1.1 Set Logger Time and Date to PC Clock

The PC clock setting is displayed in the main header bar. The Logger Time and Date can be synchronized with the PC by pressing the 'Set Clock to PC' button.

Note that this button will be greyed out if the PC clock and logger clock show the same time.

6.2 Logging

This area shows the current Logging Status (ACTIVE or STANDBY), Log Interval, Start Condition and Stop condition.

6.2.1 Start / Stop Logging

Logging is Started (ACTIVE) and Stopped (STANDBY) by pressing the relevant 'Start Logging' or 'Stop logging' button. The 'Graph and Thermometer' icon gives a graphical indication of the Logging Status.

6.2.2 Set the Log Interval

The 'Set Log Interval' box has a drop down list giving valid settings. Select the required interval and then click the 'Apply' button. When selecting the Log interval bear in mind the required period for logging and the maximum number of records.

Approximate maximum logging periods for the different log intervals are

5 days @ 1 minute
27 days @ 5 minutes
54 days @ 10 minutes
80 days @ 15 minutes
160 days @ 30 minutes

6.2.3 Set the Start Logging Condition

The 'Start Condition' box has a drop down list. Options are 'None' and 'Start if Temperature Below'.

If 'None' is selected, Logging is started by clicking on the 'Start Logging' button.

If 'Start if Temperature Below' is selected, the logger remains in STANDBY mode until the preset temperature is reached.

When the temperature falls below the preset value logging will start at the next logging point. Remember to set the Start temperature to a suitable value.

When selection has been made click the 'Apply' button.

6.2.4 Set the Stop Logging Condition

The 'Stop Condition' box has a drop down list. Options are 'None' and 'Stop when Log Full'

If 'None' is selected, Logging is stopped by clicking on the 'Stop Logging' button.

If Logging is not stopped and the log memory becomes full, new records will overwrite the oldest records.

If 'Stop when Log Full' is selected the Logger will revert to STANDBY (Logging Stopped) when the log memory is full.

When selection has been made click the 'Apply' button.

6.2.5 Logging Operation

If the selected start condition is 'None', click the 'Start Logging' button to Start logging. The 'Number of Stored Records' count will increment by one (or two if this is a logging point) and Logging Status will change to 'ACTIVE'.

In ACTIVE mode, a log record of Temperature and Tilt is stored at preset intervals.

In STANDBY mode, the Temperature and Tilt are monitored but no record is kept.

With the M380xCE or M38xCE-T unit disconnected from the PC (i.e. remove the PC Cable), the LED on the unit flashes every 6 seconds to indicate that logging is active.

If the selected start condition is *'Start if Temperature Below'* logging will only begin when the Logger is placed in the cold container.

If connected to the PC the logging status will change to **'ACTIVE'** when the temperature has fallen sufficiently and the next logging point is reached.

If disconnected from the PC the LED will flash at 15 second intervals while the logger is in STANDBY mode. The LED flash will change to 6 second intervals when logging starts.

Note: Click on the **'Disconnect'** button before disconnecting the logger from the PC.

6.3 Data/Alarm/Calibration Tabs

This window is subdivided under four tabs.

6.3.1 Data Tab

The status of the data store is displayed here. The Number of Stored Records, number of Records to Download and the Maximum Number of Records are shown.

6.3.1.1 Clear / Restore / Delete memory

To avoid downloading records which have already been read, click on the **'Delete'** button.

This will change the *'Number Records to Download'* to zero but will leave the *'Number of Stored Records'* unchanged.

The **'Delete'** button marks existing records as having been read. At the next download only records collected after the last Delete command will be output.

To undo the Delete command, click on the **'Restore'** button.

The **'Restore'** button resets the memory to allow all records to be downloaded.

To permanently delete all stored records click on the **'Clear'** button.

This will change the *'Number Records to Download'* and the *'Number of Stored Records'* to zero.

6.3.1.2 Temperature Log Download

The **'Temperature Log'** button creates a simple report of time against temperature formatted in columns. A header with the Logger ID and address is printed at the start of each day's records.

See section 7. for more details.

6.3.1.3 Spreadsheet Download

The **'Spreadsheet'** button outputs a comma delimited list in the Log Output area. This may be saved as a Spreadsheet File (**.xls**), CSV File (**.csv**) or Text File (**.txt**). It can also be saved as a PDF or printed.

If the output is saved as a Spreadsheet File (**.xls**), a graph of the Logger Temperature is also generated.

For the M38xCE unit, the Tilt Switch state is not shown (unit does not have a Tilt Switch).

For M38xCE-T models, the Tilt Switch position is indicated in the Temperature log and spreadsheet output.

If the logger/container is tipped over at a logging point a **'T'** is appended to the temperature reading in the log.

The graphical output has an additional line to indicate the position. (See section 7).

6.3.2 Temperature Alarm Tab

This tab allows the Temperature Alarm to be Enabled / Disabled and the alarm temperature to be set. The temperature alarm only functions when Logging is active.

6.3.2.1 Temperature Alarm Operation

If the temperature alarm is enabled the temperature is checked at 1 minute intervals. If it exceeds the preset limit the LED indication on the M38xCE or M38xCE-T is altered from a single flash to a double flash (100mS gap) and a Temperature Alarm record is stored in the log.

The alarm is 'latching', i.e. it will not be cancelled if the temperature drops again.

The Alarms area contains an alarm indicator and a 'Reset' button for the Temperature Alarm.

If the Temperature Alarm is disabled, the alarm indicator and button is greyed out.

If the Temperature Alarm is enabled and OK, the indicators show GREEN.

If an alarm condition has occurred, the indicator changes to RED.

The Temperature Alarm may only be reset when the temperature falls below the selected alarm temperature.

To reset the alarm connect the PC and use the 'Reset' button next to the Temperature Alarm Indicator (or switch Logging to 'STANDBY').

It is suggested that the 'Start if Temperature Below' option is set if the Temperature Alarm is used. This will prevent false alarms during the initial cooling period.

6.3.3 Tilt Alarm Tab

This tab allows the Tilt Alarm to be Enabled / Disabled (M38xCE-T only).

To allow for normal handling and to avoid nuisance alarms a timer is included. While the Tilt Switch is activated the timer will run down. The alarm will only be activated when the timer has run down to zero. The timer may be set between 0 and 4 hours in 5 minute steps.

On M38xCE loggers without the Tilt Switch the Tilt Alarm tab reports that the switch is not fitted.

6.3.3.1 Tilt Alarm Operation

The Tilt Alarm is only available on the M38xCE-T. It is not available on the M38xCE.

If it is required to monitor the position of the container in transit the Tilt Alarm should be enabled. The timer should be set to a suitable value to avoid an alarm being generated by normal handling procedures.

6.3.4 Calibration Tab

This is for factory adjustment only and is not accessible.

6.4 Connection

This area controls communication between the Logger and the PC.

The '*Identify*' button opens the '*Identify Logger*' window and allows Com Port and Logger address selection / programming.

The '*Connect/Disconnect*' button starts and stops the commands sent (polling) to update the status of the Logger.

While connected (polling in progress) the status is updated at 3 second intervals.

If the logger is unplugged a warning message appears and all fields in the Status Display are changed to 'N/A' (Not available).

Clicking on the '*Disconnect*' button stops polling and disables the warning message. All fields in the Status Display are changed to 'N/A' (Not available).

The state of the connection is also indicated by the 'PC' icon to the right of the buttons.

Not Polling



Polling M380CE unit



6.5 Alarms

This area contains an alarm indicator and a '*Reset*' button for the Temperature and Tilt Alarms.

If the Alarm(s) are disabled or the Logger is in STANDBY mode, the alarm indicators and buttons are greyed out.

If the Alarm(s) are enabled and Logging is enabled the indicators show **GREEN**.

If an alarm condition has occurred, the relevant indicator changes to **RED**.

The Temperature Alarm may only be reset when the temperature falls below the selected alarm temperature.

6.6 Log Output

The Log Output area displays data as it is downloaded from the Logger. Data displayed in the window may be viewed, saved in PDF format or printed.

To assist in viewing the data, temperatures above a selected value may be highlighted (see section 7.1).

The '*Settings/Status*' button gives a summary of the current status and some of the key settings including Calibration data and Battery Voltage.

A report will be generated as shown.

```
*****
CryoWatch Logger PC Software      Version V2.8  (Build V2.8.0.1)
Current Time (PC) = 14:57:27  Date = 20/02/2017
connected to: -
M380 Temperature Logger  Address:03  ID No:000221  Firmware V1.7
*****

Settings etc for unit No.03
Serial No. 000221
Battery volts = 3535mV
ADC LN2 820
ADC ice 324
ADC reading = 243
Temperature = +22
current_ambient_adc = 291

Logging status = Standby
Start Temp = -0
Alarm Temp = -100
thermocouple OK
End of data
```

Note that the battery voltage will fall as ambient temperature drops.
It is best to test the battery voltage after the Logger has been fitted to the Dry Shipper and allowed to cool for a minimum of one hour.

The report displayed in the window may be viewed, saved in PDF format or printed.

7. Downloading, Viewing and Saving Data from the Logger

Connect to the Logger and identify as described in Section 4.

It is recommended that logging is stopped when downloading data from the Logger.

7.1 Downloading the Temperature Log

To assist in viewing the Log, temperature readings above a preset temperature are highlighted in RED in the text box. Before downloading, select a temperature appropriate to the stored product in the '*Highlight Temperature Above*' box.

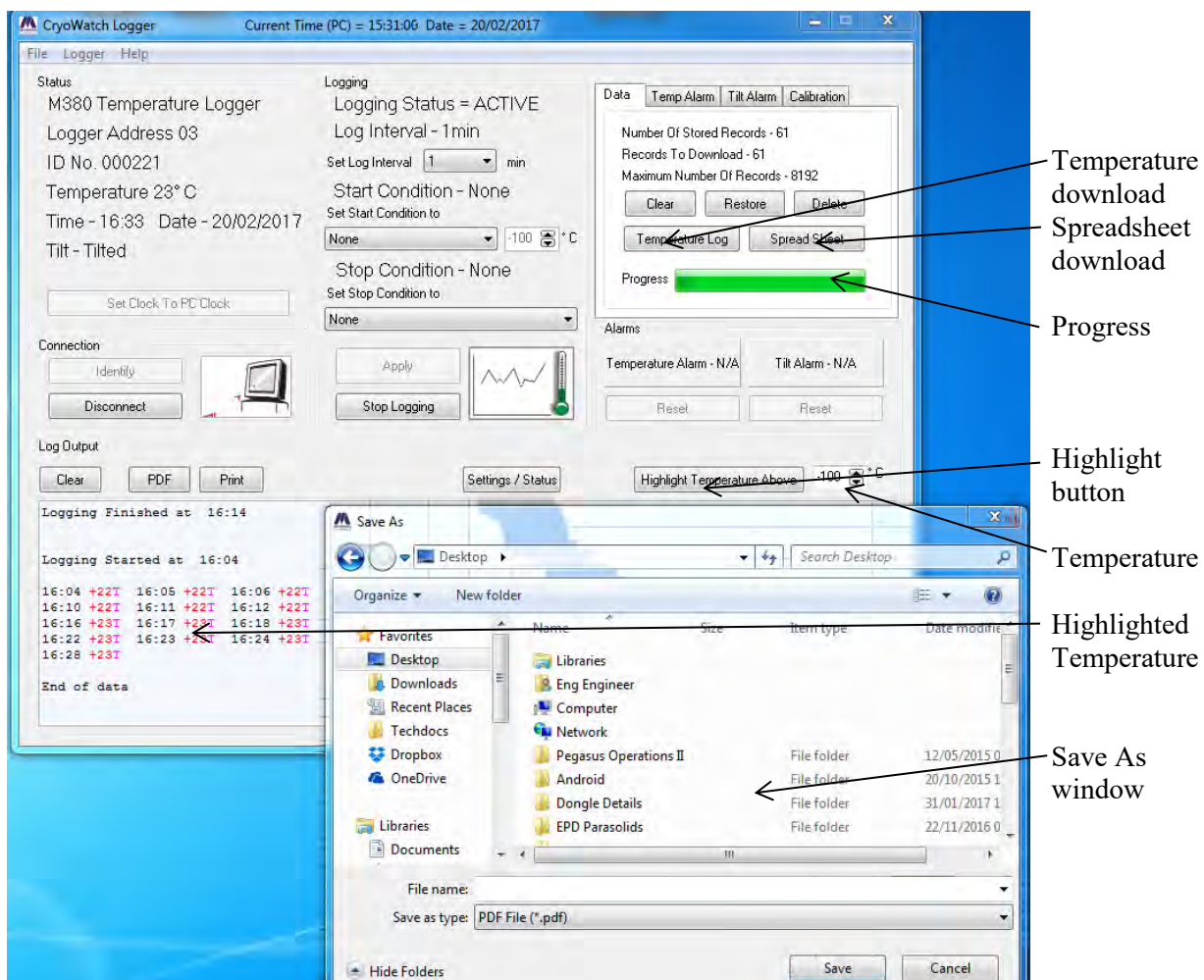
Click on the '*Temperature Log*' button in the Data Tab.

Downloading will begin and the output will appear in the text box.

Depending on the number of records this could take a few minutes. When downloading is complete the message 'End of Data' will appear in the Log Output text box.

The highlighted temperatures shown in the download can be altered by adjusting the temperature setting and clicking on the '*Highlight Temperatures Above*' button.

To save the downloaded data click on the '*PDF*' button. A '*Save As*' window will appear and the file can be saved. Alternatively, the Temperature Log data may be printed using the '*Print*' button.



7.2 Downloading in Spreadsheet format

Click on the 'Spreadsheet' button. Downloading will begin and the output will appear in the text box. Depending on the number of records this could take a few minutes.

When downloading is complete, an automatic prompt to save as an **.xls** file will appear. Browse to find the required folder for storage or create a new folder in a suitable location.

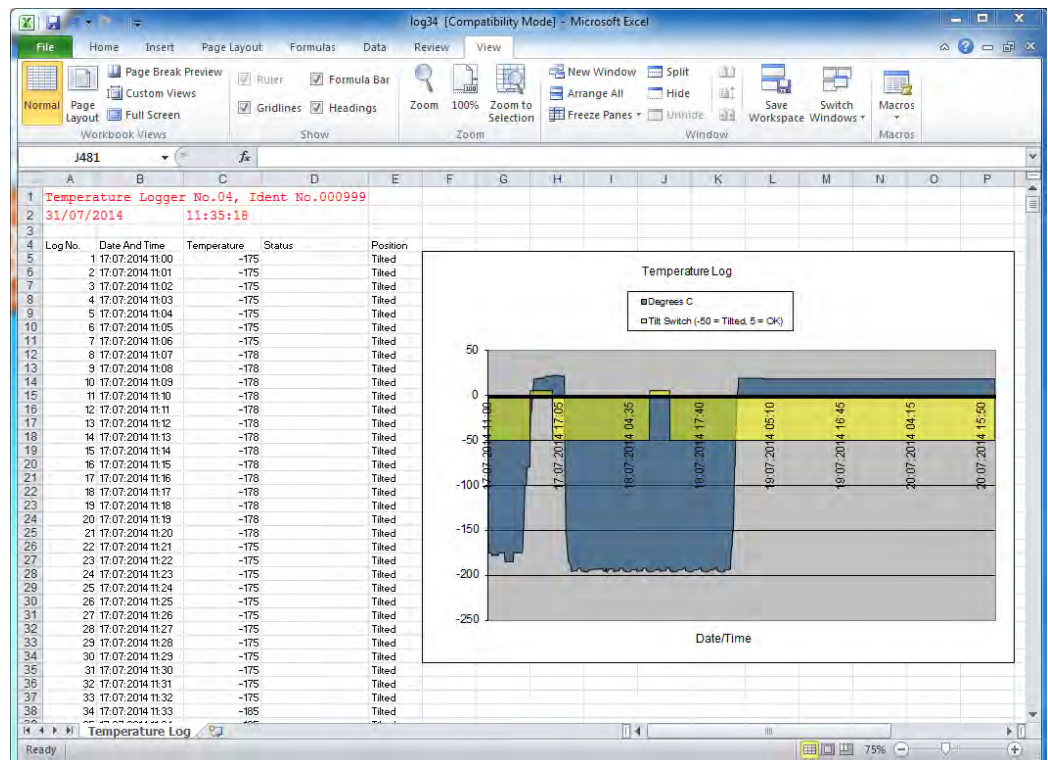
If preferred the spreadsheet data may be saved as a PDF file. In this case click on the 'Cancel' button to exit from the 'Save Spreadsheet Window' and click on the 'PDF' button and proceed as in 7.1.

Alternatively, the spreadsheet data may be printed using the 'Print Log' button.

7.3 Viewing Temperature Log files and Excel Spreadsheet files.

To view and edit a saved Temperature Log simply open the PDF file with a PDF viewer program.

Opening an Excel **.xls** file will display the data in a spreadsheet and automatically generate a graph as shown below.



For the M355CE unit, the Tilt Switch state is not shown.

For the M38xCE unit, the Tilt Switch state is not shown.

For 38xCE-T units, the Tilt Switch state is indicated on the graph as follows:-

Normal +5°C

Tilted/Tipped over, -50°C

The graph may be edited if required to display the data in a different way. Right clicking the mouse over the chart area will give a menu of options. The graph may be printed separately from the data if required.

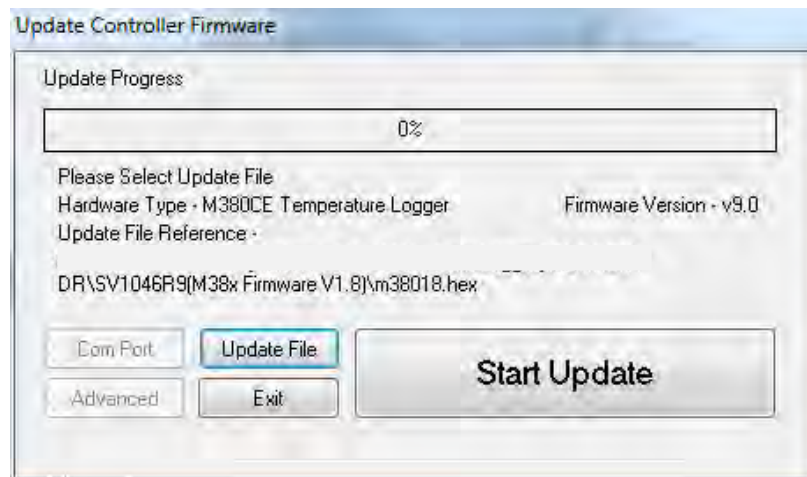
8. Updating Firmware

Updated Firmware may be issued during the life of these Loggers. These updates will be to correct problems or add extra features, and will be distributed by e-mail or on a CD.

The following procedure is used to update the Logger Firmware:

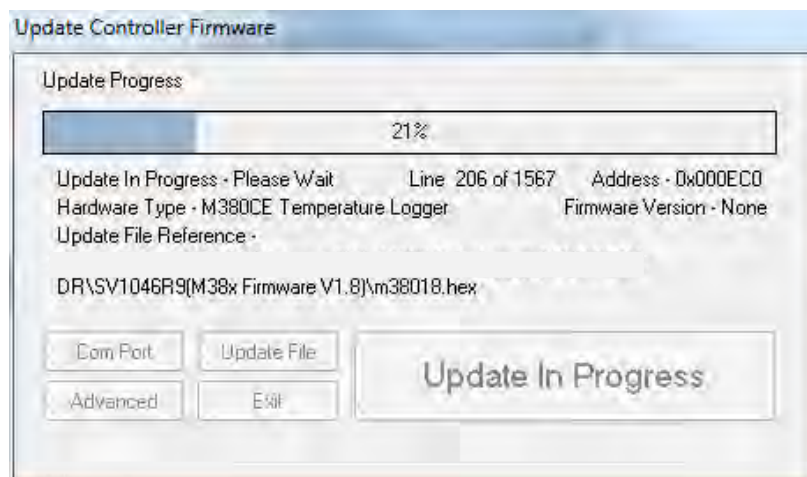
Connect the logger and start the CryoWatch software as described in Section 4.

From the Menu bar select 'Logger' then 'Update Firmware'.
The following screen will appear.



Click on the 'Update File' button and open the required **.hex** file.
Depending on where the file is located you may need to browse through the file structure to set the correct path. This path will be saved as the default.

Highlight the **.hex** file and open it. Then click on the 'Update' button.



Progress is indicated by a bar graph and will take about a minute.
When the update is complete the bar graph will turn Green. Press the 'Exit' button to go back to the 'Main' window.

9. Additional Notes

9.1 Calibration

The Logger calibration is factory set. If in doubt the Logger should be returned to the dealer for checking. Calibration software is not included as standard but may be available on request.

To check the calibration a calibrated thermocouple thermometer is required.

First check for 0°C by resting the sensor plate in a tray of melting ice. Monitor the temperature using the PC Software.

Attach the calibrated thermocouple to one of the screws on the sensor plate and place the logger in a cold container.

When the temperature has stabilized check that the thermometer reading matches the temperature displayed on the PC.

9.2 Connection problems.

If problems are experienced communicating with the Logger or a malfunction is suspected the following action is recommended.

- 1) With the Logger connected to the PC, click on the *'Identify'* button in the *'Identify Logger'* window.
- 2) On the *'Identify Logger'* window click on the *'Reset Temperature Logger'* button. The LED should flash three times in quick succession.
- 3) Close the CryoWatch Software program.
Restart the program and use the *'Identify'* functions to reconnect to the Logger.

Appendix A – IM1040 Revision Status

REV	DATE	REVISION DETAILS	BY	CHKD	APPD
1	10/03/16	First Issued for combined software. M38xCE and M38xCE-T details from IM1020 M355CE details from IM1023 (EQMS-2729)	RA 10/03/2016	GHL 14/03/16	AS 18/03/16
2	20/02/17 (EQMS 5627)	Firmware revised to V2.8 Temperature output can only be done in PDF or Printed. Spreadsheet output can be Excel (.xls), CSV (.csv), Text (.txt) format, PDF or Printed. 1.1) Text and Word format saving ref removed. 3) CryoWatch version now CryoWatchV2_8**.msi 5) and 6) New screen shot images. 5.3.1.3) and 6.3.1.3) Spreadsheet now has .csv and .txt output option. 5.4) 6.6) Update interval is now 3 seconds. 5.5) 6.6) New picture. 5.5) 6.6) 7.1) 7.2) Removed reference to .txt or word file save format 6.2.4) New records overwrite oldest ones when log full. Added. 6.2.5) Click 'Disconnect' before unplugging logger from PC added. 9) Contact Dealer for calibration added.	RA 20/02/2017	GHL 10/3/2017	AS 13/03/17