Labwise

Operating Manual

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Note: Due to our policy of continuous improvements of our products, we reserve the right to modify Labwise at any time. If a feature mentioned in this manual is not found in your version, an update may be available, please contact Grant Instruments or your local distributor.

Table of Contents

1.0   Introduction

Labwise is a PC software application that provides configuration and remote control of Optima^{TM} immersion thermostats. This manual outlines the main functions and settings of Labwise version 2.0 that is suitable for use with GR150, GP200, TX150 & TXF200 models.

Labwise offers RS232 connection for the GR150 and GP200 models. The TX150 and TXF200 can be connected either via RS232 or via USB.

Labwise provides the following features:
- Set temperature adjustment
- Pump speed adjustment
- Configuration of alarms
- Configuration of presets
- Configuration of controlled temperature programs
- Data logging
- Reports

Labwise is supplied on a USB flash drive.

2.0   Installation & connection

2.1.   Minimum system requirements

The following list defines the minimum system requirements for the Labwise PC:
- Microsoft Windows XP, Vista (32/64bit) or Windows 7 (32/64bit)
- Pentium III/Celeron 866 MHz or equivalent
- RAM 256MB
- Screen with min resolution of 1024 x 768 pixels
- 340 MB free hard disk space
- RS232 serial or USB port

2.2.   Unpacking

Standard equipment includes:
- Labwise software on USB flash drive
- RS232 communication lead
- USB communication lead
- Operating manual
- Software installation guide

2.3.   Installation

For detailed installation instructions please see the supplied 'Labwise Installation Guide' supplement.

Before starting the installation:
- Ensure the user installing the software has administrator rights to the PC
- Ensure any current Grant applications are closed
- Uninstall Labwise Vsn 1 (if installed)

Use the following process for installing the software:

1. Insert the USB flash drive into a USB port on the PC.
    The drivers for the USB flash drive should automatically install. Follow any on screen instructions if required.

2. Open the USB flash drive directory and run setup.exe.
   *The software installer will launch. Follow the installation wizard instructions.*

Labwise will be installed and added to the programs menu and a shortcut will be added to the desktop.

2.4.   Connecting to an Optima

The Optima should be connected to the PC either using a RS232 (all models) or a USB (TX150 and TXF200 models only) cable.

1. Connect an Optima immersion thermostat to a free port on the PC.
    Drivers will need to be installed the first time an Optima is connected to a PC via USB (see 2.5 below)

2. Launch the Labwise application.
    Labwise will check the last used COM port and connect to the Optima if available. If no Optima is automatically detected then the following dialog box is displayed with all available COM ports shown. Choose the correct COM port from the list and click "Try Again" to connect. If you are still unable to connect then it may be that the USB drivers are not correctly installed (see section 2.6 for further details)
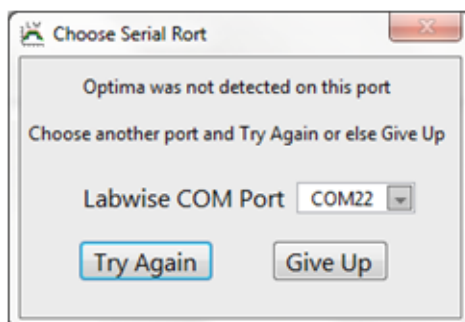
When successfully connected, the main control window will be displayed and show the Optima settings including temperature and pump speed in real time. The graph will show the temperature from when the Optima was connected.

2.5.   Disconnecting an Optima

An Optima SHOULD NOT be disconnected when communications are established as damage could occur to PC or the Optima. If you wish to disconnect, first switch off the Optima and then remove the communication cable.

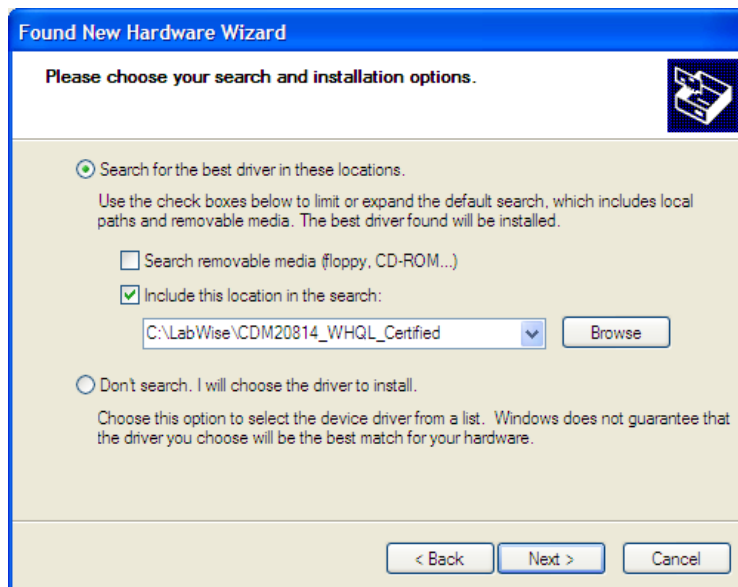## 2.6.   Installing Optima USB drivers (Windows XP)

The Labwise installation process must be completed prior to attempting to install the USB drivers.

Drivers should be installed automatically the first time an Optima is connected via USB to a PC. If this does not happen then the drivers can be installed manually using the following method (Windows XP).

1. Connect a TX150 or TXF200 to a free USB port on the PC.
    The Found New Hardware wizard should start
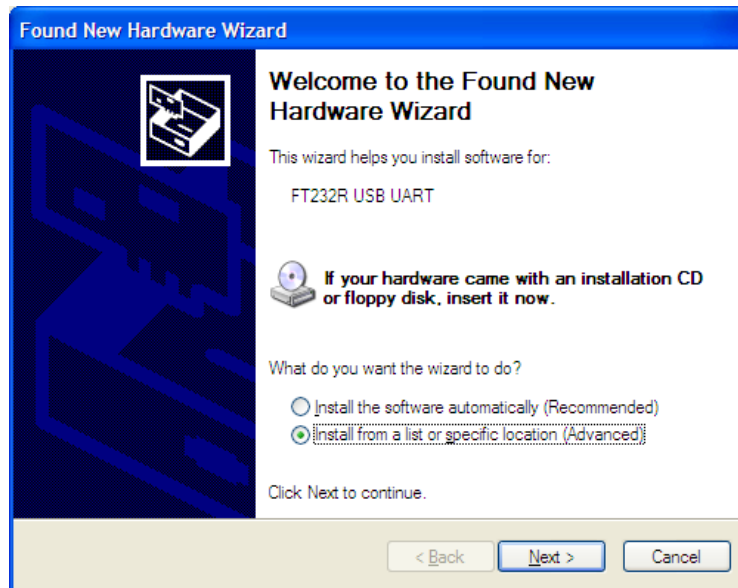
2. Select **Install from a list or specific location (Advanced)** and click **Next**.
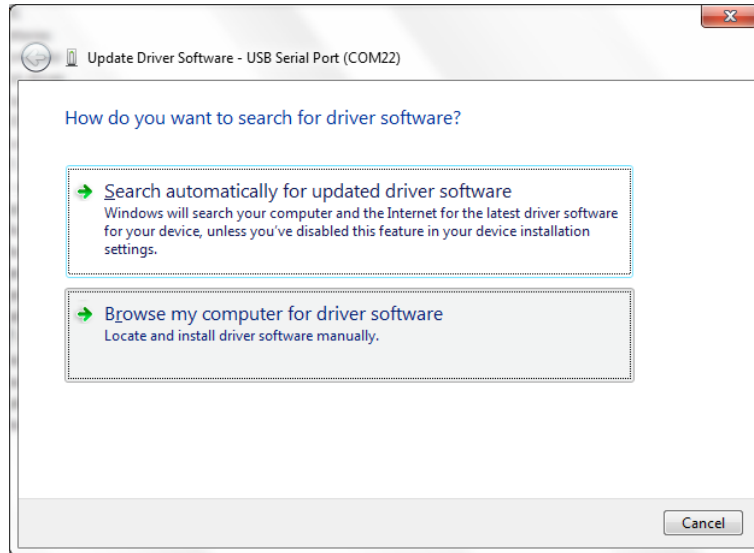

3. Select **Include this location in the search** and browse to "C:\Labwise\CDM20814_WHQL_Certified". Click **Next**.

4. The driver will install. Click **Finish** to complete. The Optima should now be ready to use.

### 2.7. Installing Optima USB drivers (Windows Vista/7)

The Labwise installation process must be completed prior to attempting to install the USB drivers.

Drivers should be installed automatically the first time an Optima is connected via USB to a PC. If this does not happen then the drivers can be installed manually using the following method.

1. Connect a TX150 or TXF200 to a free USB port on the PC.
   The Found New Hardware wizard should start

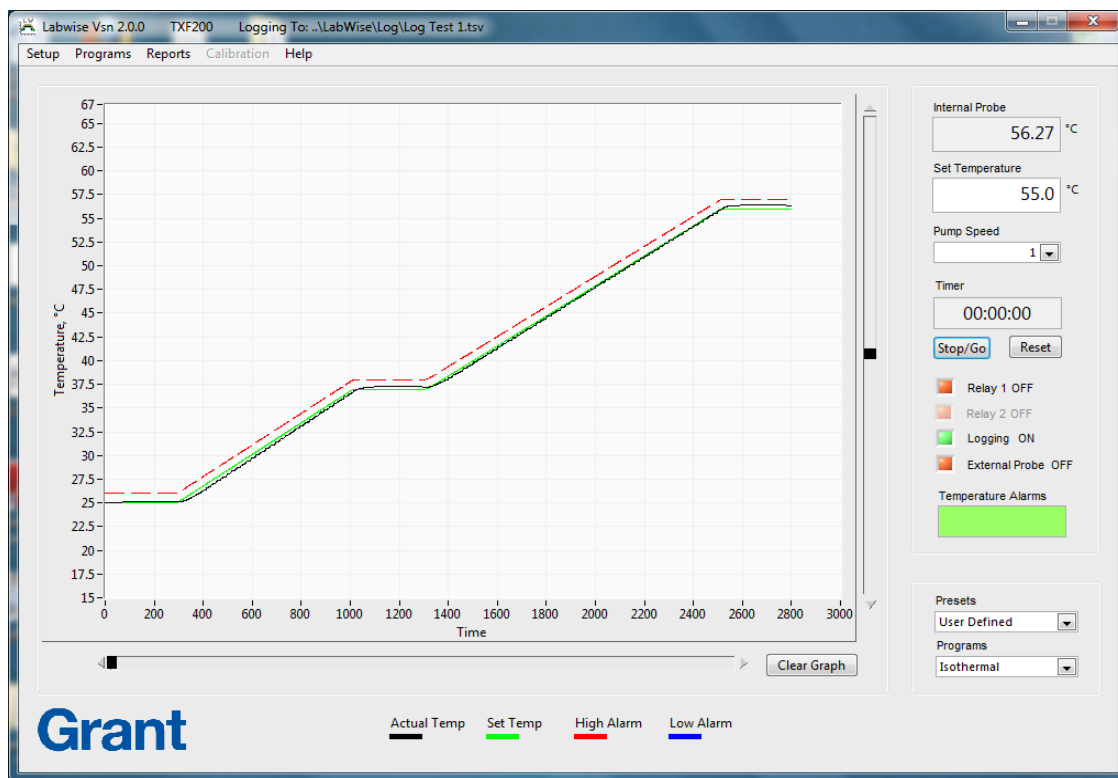2. Select **Browse my computer for driver software**.
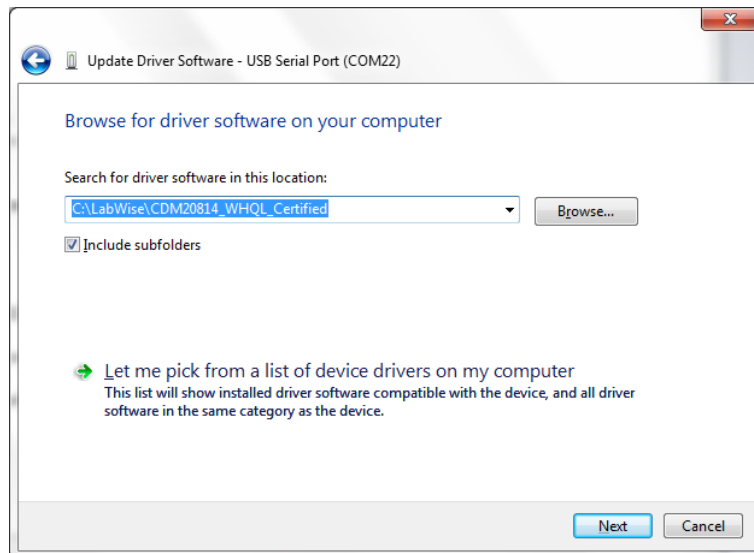
3. Browse to "C:\Labwise\CDM20814_WHQL_Certified". Click **Next**.

4. The driver will install. Click **Finish** to complete. The Optima should now be ready to use.

3.0   Main control window

3.1.   Overview

Labwise opens the main control window at start up. This window shows real time information when an Optima is connected.

3.2.   Real time graph

The real time graph plots set temperature (green line) and measured temperature (black line). If a high alarm (red line) or a low alarm (blue line) are configured then these will also be displayed as dashed lines. The graph will update continuously.

Horizontal (time axis) and vertical (temperature range) scrollbars are provided next to the real time graph. The scrollbars provide dynamic rescaling of the time and temperature axes to allow zooming in and out to show the data more clearly.

3.3.   Optima status information

The numerical values of the set temperature, measured temperature (either by the internal or the external probe) and pump speed are continuously displayed. Set temperature can be changed by updating the value and pressing tab to confirm. The pump speed can be changed using the drop down menu (GP200 and TXF200 only).

In normal operation the timer corresponds to the Optima timer. The control buttons allow the timer to be controlled via Labwise. If a program is running then the timer changes to show the current segment number and the current segment time remaining.

There are four checkbox indicator/controls:
- Relay 1
- Relay 2 (only enabled for the GP200)
- Logging
- External probe

The relay checkboxes are for indication only and show the state of the relays. The logging and external probe checkboxes are controls and can be used to switch the associate feature on or off. The indicators are red if the feature is switched off and green when switched on.

When the logging checkbox is clicked the indicator changes to green. The default settings open a dialog box and prompt for a log filename. Other log filenames and the default directory can be configured – see section 3.6. After confirming the log filename, a prompt will appear to allow comments to be added to the log file. Logging only starts when both of the log filename and comments have been confirmed. Data is recorded as a tab separated values (.tsv) in the defined log directory. Logging can be stopped at any time by toggling the logging checkbox back to red.

The Optima can allow control via an external temperature probe. These are available from Grant Instruments or your local distributor. The external probe can be activated using the "External Probe" checkbox. If a probe is not present or faulty then an appropriate error message will be displayed. The default operation uses the internal temperature probe.

The temperature alarms box indicates when any high or low temperature alarm limit is exceeded. The box should be green in normal operation. If an alarm is detected then the box will turn red and a short alarm message will be shown. See section 3.5.3 for configuring alarms.

3.4. Running presets or programs

Presets and programs can be run using the drop down option boxes on the main control window.

Note that both presets and programs will start as soon as they are selected from the drop down menu.

A preset consists of a set temperature and pump speed (TXF200 only) that can be configured for convenience. Selecting a preset from the drop down menu will cause the set temperature and pump speed to be updated immediately to the preset values.

To move away from a preset temperature and pump speed, select "User defined" from the drop down menu or manually change the set temperature or pump speed.

A list of the programs stored in the connected Optima is shown on the programs drop down menu. Selecting a program from the drop down menu will cause it to start immediately. When a program starts the timer changes to show information about the segment. On the completion of a program, the Optima will either return to the original temperature, hold at the final temperature or repeat depending on the program definition.

To stop a program and return to the normal operating mode, select "Isothermal" from the drop down menu.

3.5. Bath setup

The key settings on the Optima can be changed by selecting **Bath** from the **Setup** option on the main control window menu.
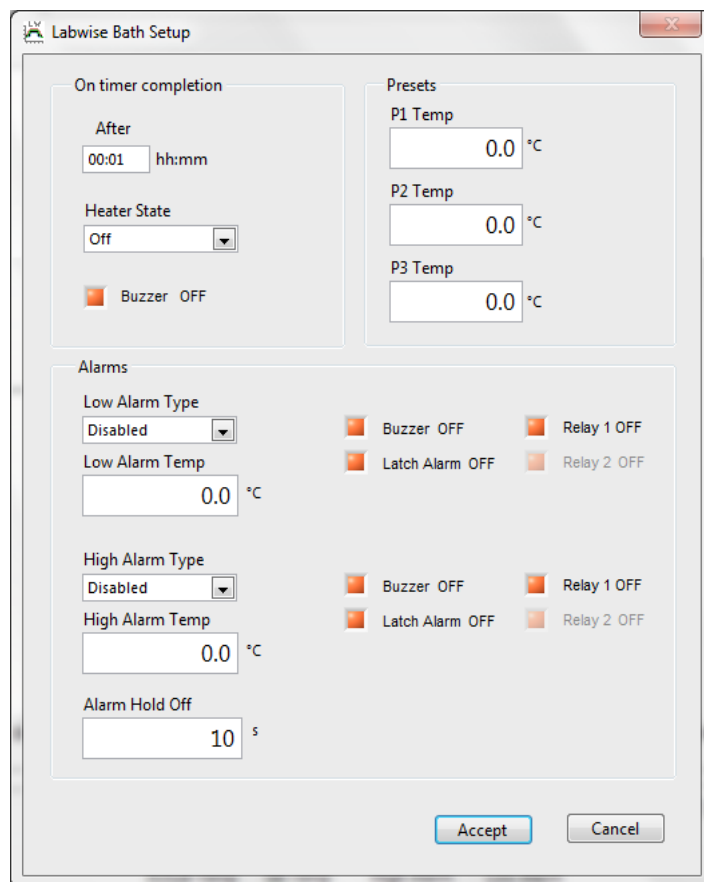
3.5.1. On timer completion
This section allows the timer period to be set and defines the behaviour when the countdown timer reaches zero. This behaviour is only applicable to the GR150 and GP200 models.

3.5.2. Presets
This section allows the set temperature and pump speed to be configured for the three presets. Pump speed configuration is only available with the TXF200 model.

3.5.3. Alarms
This section allows alarms to be set during normal operation. A high and/or low alarm can be set up. There are three types of alarm:
- Disabled – No alarm
- Fixed – Alarm triggered at a fixed temperature
- Deviation – Alarm triggered when the deviation from the set temperature is exceeded

The alarm temperature defines either a fixed temperature or a deviation temperature depending on the alarm type. The checkboxes define the actions taken if an alarm is triggered. The **Buzzer** and **Relay 1** can be switched on and latched if a persistent alarm is required. **Relay 2** is only available with a GP200. **Alarm Hold Off** specifies the time before the alarm actions are retriggered once an alarm has been acknowledged. Alarms can be acknowledged by clicking on the temperature alarms box. The TX150/TXF200 user manual has further information on the implementation and behaviour of the alarms.

3.6. Logging setup

The data logging settings can be changed by selecting **Logging** from the **Setup** option on the main control window menu. The log file directory and logging interval are user configurable.

There are three options for the log file name configuration depending on test requirements:
- Prompt the for a filename when the logging is started
- Generate a log file name automatically based on a date and time
- Generate a log file name based on a user defined prefix and an incremental number
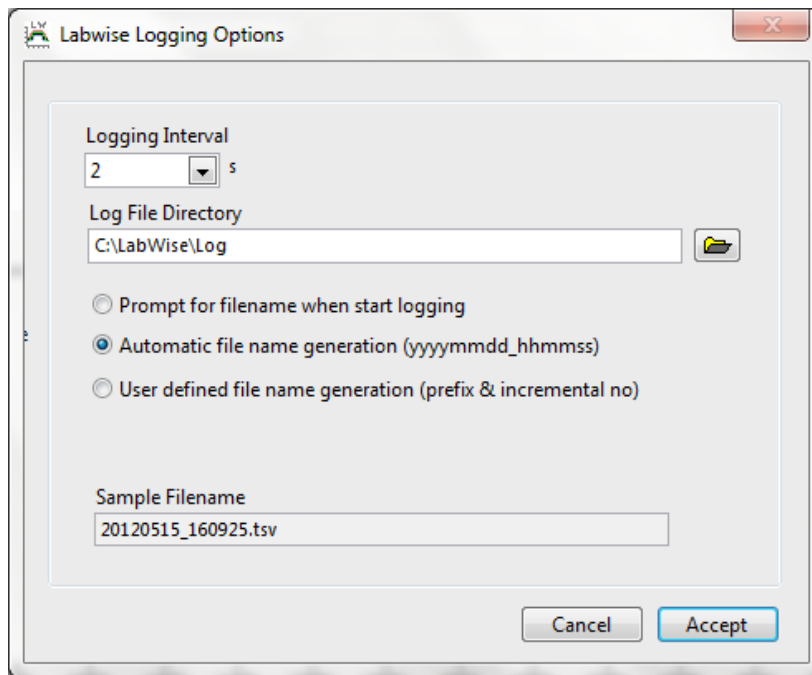
3.7. COM setup

The COM port assigned to the Optima can be changed by selecting **COM** from the **Setup** option on the main control window menu.
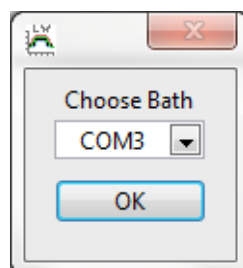
This option can be used to configure the COM port:
- If an Optima is connected after Labwise is launched
- If the comms cable is moved to a different port
- If moving between different Optima units connected to the PC

It is possible to have multiple Optima units connected to a PC BUT Labwise is only able to monitor one device at a time.

4.0 Programs

4.1. Overview

A program allows the temperature and pump speed of the Optima to be controlled with time. A program includes a global set of configurable alarms and a series of segments that are executed in order. An unlimited number of programs can be created and saved on the PC even if an Optima is not connected. However, the number and length of programs that can be stored on the Optima is dependent on the model:

- GR150 – One program with upto 30 segments
- GP200 – Five programs each with upto 30 segments
- TX150 – One program with upto 30 segments
- TXF200 – 10 programs each with upto 100 segments

Segments are defined by a duration and a target temperature. These values can be used to create "ramp", "dwell" and "step" segments. Cooling "ramps" can be programmed but the Optima must be used with a suitable refrigeration system to ensure the temperature can be followed accurately.

4.2. Program editor window

The Program editor window allows programs to be created, saved and edited. It also allows programs to be uploaded to the Optima and downloaded from the Optima. The Program editor can be launched by selecting **Programs** from the main control window menu.
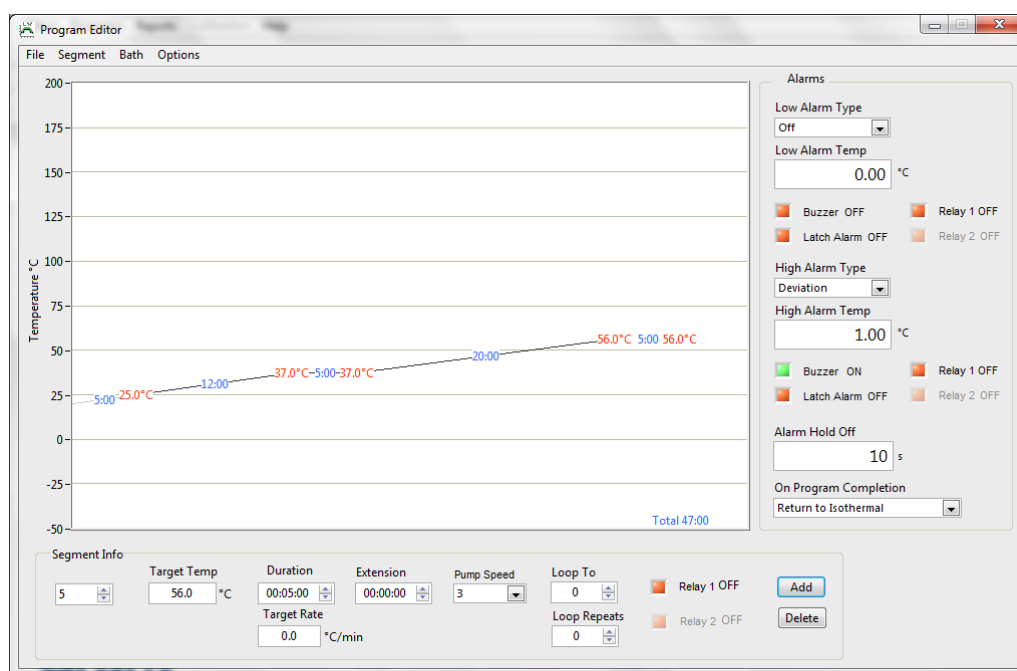
Labwise automatically detects the Optima model if one is connected. If an Optima is not connected then the model you wish to create a program for should be selected.

4.3. Creating a new program

A new program can be created by selecting **New** from the **File** option on the program window menu. A single segment program of duration 10s and set temperature of 0C is created. The program parameters are all set to the default values.
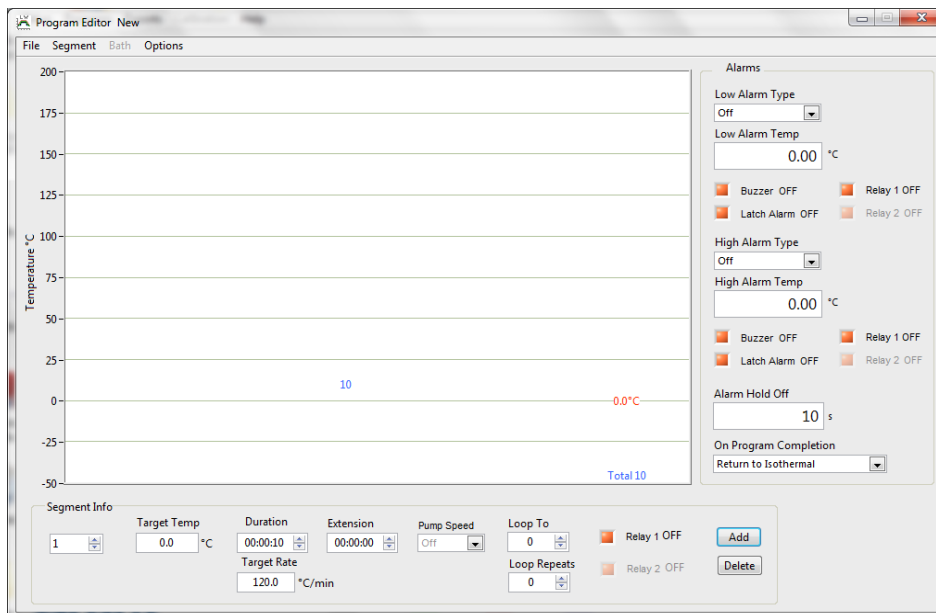
4.3.1. Creating program segments

Programs are constructed from a sequence of segments. Segments can be conveniently added or deleted using the buttons in the segment info box. It is also possible to insert and delete segments using the segment menu option.

The currently selected segment is indicated in the **Segment Info** box. The segment flashes in the graphical display and indicates the **Target Temp** and the **Duration** of the segment.

A segment has the following configurable parameters. Some of the parameters are explained further below:
- Target temperature
- Duration
- Extension
- Pump speed (GP200 & TXF200 only)
- Loop to and repeats
- Relay 1 state
- Relay 2 state (GP200 only)

4.3.1.1. Segment duration
The duration is the time between the start of the segment and the start of the next segment. The duration can be entered in seconds (e.g. 600 =10 mins), or in the form 10:00 minutes or 1:10:00 hours by highlighting the existing entry and overtyping a new value using a colon as separator.

The **Target Temp** and **Duration** may be approximately set by positioning the cursor on the trace over the temperature value for the segment and left-clicking and dragging the segment end point to a new position using the mouse.

4.3.1.2. Extension
The **Extension** is a time period in addition to the **Duration**. A segment with an **Extension** period set will remain active (e.g. heating) until the temperature is achieved OR the **Extension** period ends. This is useful if the controller cannot reach the **Target Temp** within the **Duration** period. The program enters a hold mode until the **Target Temp** is reached when the program will then proceed with the next segment. If the **Target Temp** is still not reached after the **Extension** period then the program will proceed as if the **Target Temp** has been reached. The **Extension** time is entered in the same way as for **Duration**.

4.3.1.3. Relay operation
If relay operation is required, e.g. for switching a cooler on/off, select **Relay 1** and/or **Relay 2** (GP200 only). The relay output is via the connectors on the back of the control unit. Relay operation may be set individually for each program segment.

4.3.1.4. Loops
A selected segment or group of segments may be repeated within the program using the **Loop To** function. The final segment of the sequence to be repeated should be selected, the **Loop To** value then set to be the segment number that forms the first segment of the loop. The **Loop Repeats** set the number of times the loop should be repeated. A loop is identified on the programming screen as a green arc linking the selected program segments. The number of loop repeats is also indicated on the arc. Nested loops are possible but should be programmed and tested to ensure the temperature changes as expected.
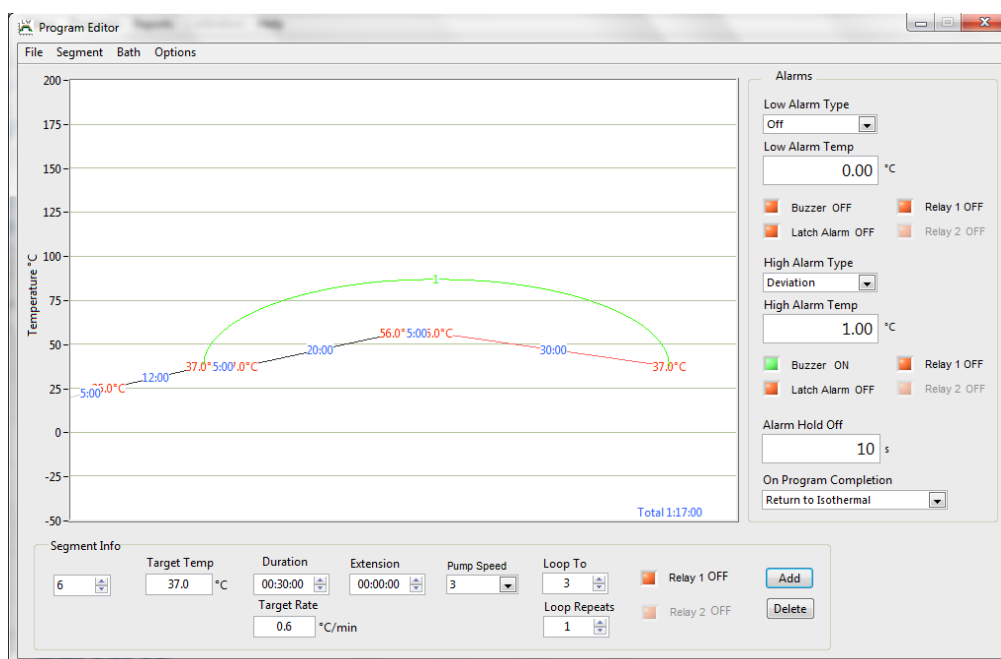
4.3.2. Setting program alarms

Program alarms are used only when a program is running. They are global program parameters and affect all segments. There are three types of alarm:

- Disabled – No alarm
- Fixed – Alarm triggered at a fixed temperature
- Deviation – Alarm triggered when the deviation from the set temperature is exceeded

The alarm temperature defines either a fixed temperature or a deviation temperature depending on the alarm type. The checkboxes define the actions taken if an alarm is triggered. The **Buzzer** and **Relay 1** can be switched on and latched if a persistent alarm is required. **Relay 2** is only available with a GP200. **Alarm Hold Off** specifies the time before the alarm actions are retriggered once an alarm has been acknowledged. Alarms can be acknowledged by clicking on the temperature alarms box. The TX150/TXF200 user manual has further information on the implementation and behaviour of the alarms. The **On Program Completion** defines the behaviour after a program ends.

4.3.3. Uploading a program to the Optima

When a program has been created on the PC it must be saved and uploaded to the Optima before it can be run. Use the following method to upload the program:

1. Select **File**, **Save** from the program editor window.

2. Assign a file name to the program in the file save dialog box. The program will be identified in the controller by the first 11 characters of the file name.

3. Select **Bath**, **Send Program to Bath** and select the program slot that the program is to be stored in the controller. If all slots are full it is necessary to delete a program from the controller before the new program can be uploaded.
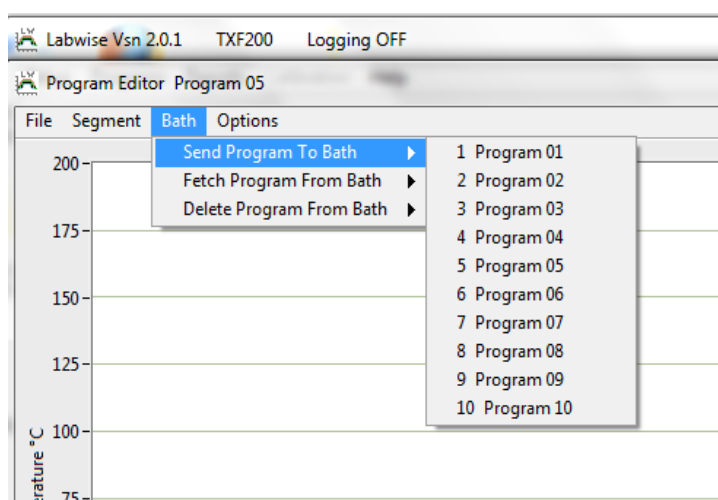
4.4.   Edit a program

### 4.4.1. Edit a program previously saved to disk

Programs that had been saved to the PC can be opened and edited if required. Select **File**, **Open** and select a file for editing. Editing a program uses the same procedures as described for creating a new program. Use **File**, **Save** to save the edited program file specifying a different file name if required.

Note: Editing a program is always done on the PC. If changes are made to a program then they will need to be uploaded back to the Optima to take effect.

4.4.2. Edit a program installed in the Optima

A program that is stored in the Optima can be edited on the PC. Use the following method to download and edit the program:

1. Select **Bath**, **Fetch Program From Bath** and select the program slot that holds the program you wish to download.
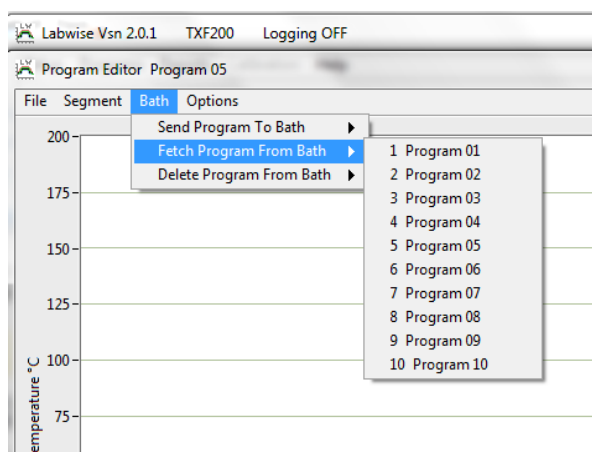

The program will be shown in the program editor window. Editing a program uses the same procedures as described for creating a new program. Use **File**, **Save** to save the edited program file specifying a different file name if required.

4.5. Deleting a program installed in the Optima

A program that is stored in the Optima can be deleted to free up a slot for a different program.

Note: Deleting a program from the Optima is permanent and cannot be retrieved. If the program may be needed in the future it should be saved to the PC before deletion.
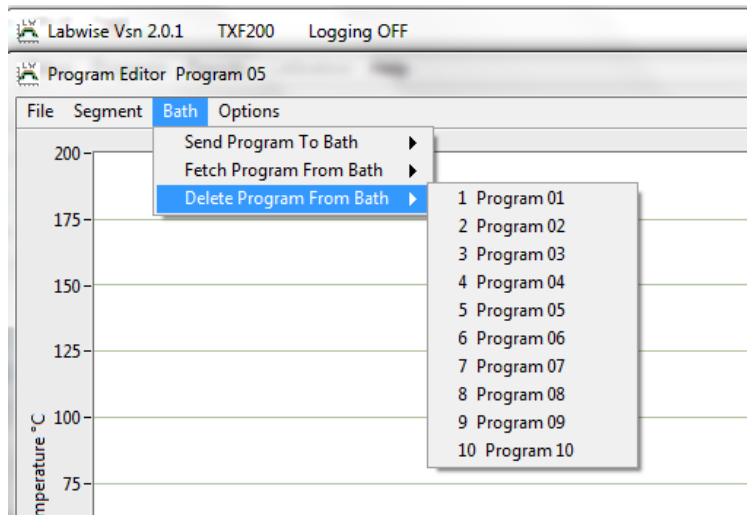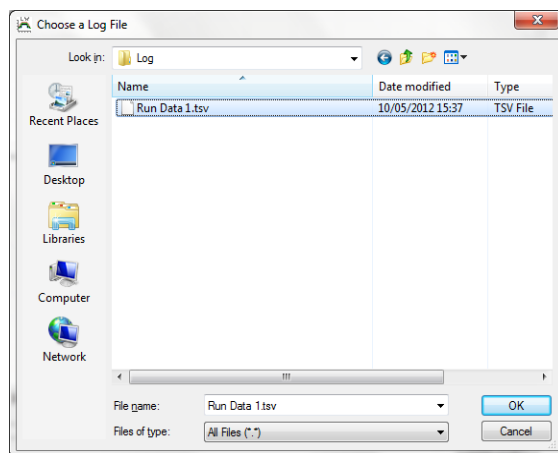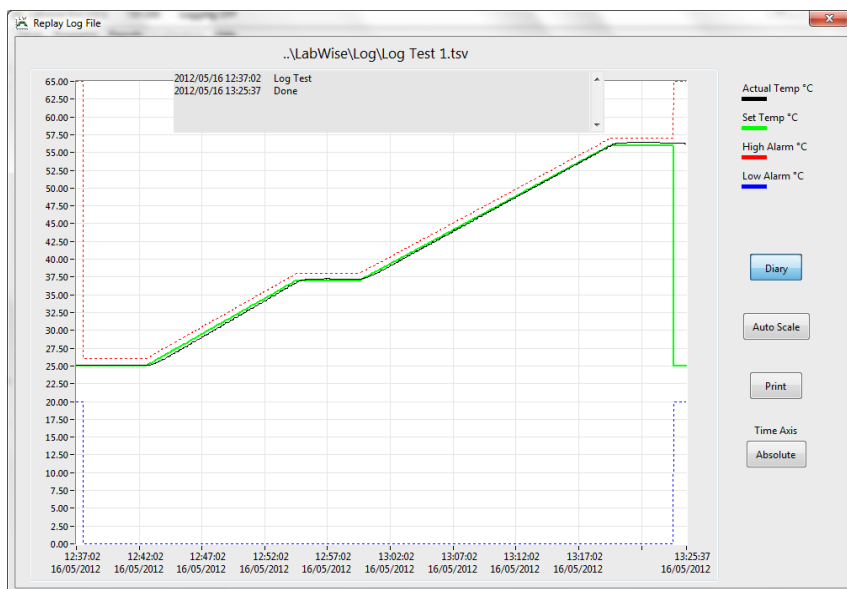
5.0   Creating reports

5.1.   Creating a report

The **Reports** option allows data logs to be viewed and printed if required. The default directory for log files is C:\Labwise\log.

1. Select **Reports** from the main control window menu
    A file browsing dialog box will appear.

2. Browse to the log file and click **Open**
   *The log file data will be displayed on the graph*

The **Diary** button can be used to show or hide any text comments that were added when the log file was started or stopped. The **Autoscale** and **Time Axis** buttons allow the graph data to be presented in the most convenient form for printing.

6.0 Calibration (GR150 & GP200 only)

6.1. Performing a single point calibration

A single point calibration can be performed using Labwise. This feature is only available with the GR150 and GP200. A temperature offset can be applied such that the temperature displayed by the Optima can be aligned with that taken by an independent temperature probe.

1. Select **Calibration** from the main control window menu
   The following dialog box will appear.
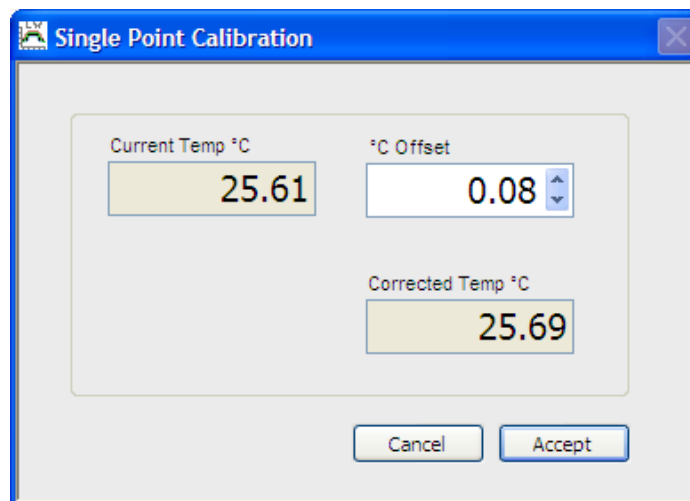
2. Adjust the **ºC Offset** such that the **Corrected Temp ºC** matches the independent temperature probe reading.
   *The **Current Temp** is the temperature measured by the Optima. The **Corrected Temp** will be the indicated temperature if the offset is applied.*

3. Click the **Accept** button to apply the offset.

7.0   Technical Support

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