

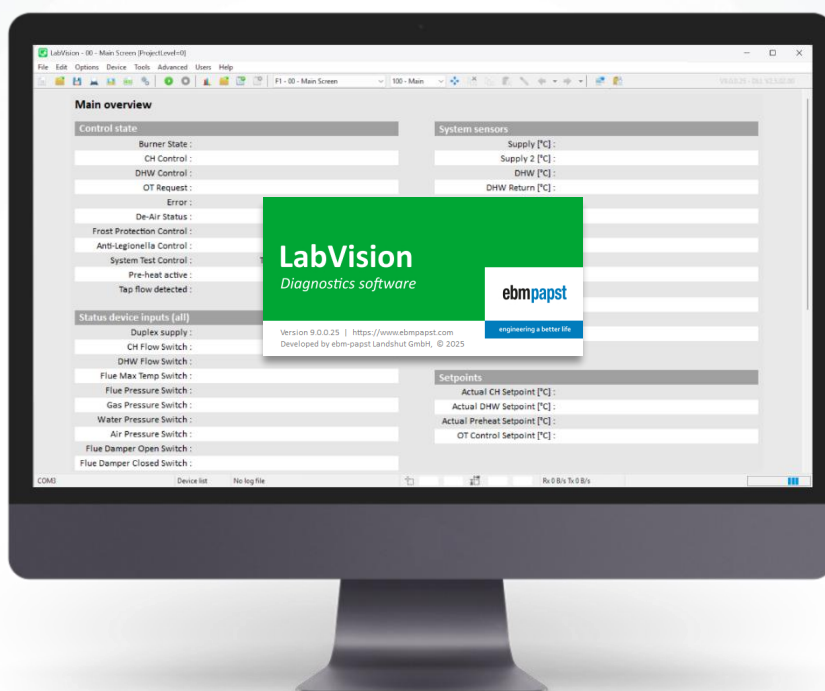
LabVision PC software

User manual

Version 9.0.0.x

ebmpapst

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Version management

Classification:	Confidential
Version number:	1.0.8
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Availability:	This user manual must be available for the target audience (as described in chapter 1) at all times, to ensure the control is used safely. Keep this documentation at an easily accessible location, where it can be viewed at all times.
Application:	When using the control, it is essential that the safety regulations and the relevant operating instructions in connection with other applications, parts and/or other devices are observed. Read all instructions carefully before you start working with the control. Observe the hazard and warning notices to avoid the risk of injury or malfunctioning. These operating instructions are to be considered as part of the control. Safety regulations and installation instructions may be duplicated and distributed to inform about potential dangers and their prevention. ebm-papst is always looking to advance and enhance its products. As a result, products may differ from these operating instructions. The customers R&D Department must verify this before use and take into account any deviations. Subject to change.

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Acronyms

Following is a description of the acronyms used in this document:

Acronym	Description
B/s	Bytes per second
bin	Refers to a compressed binary file (file format type of a parameter-file)
COMx	Communication port, where the 'x' represents the number of the communication port
CPU	Central Processing Unit
CSV	Comma Separated Value
DLL	Dynamic Link Library
GND	Ground
HP	Heat Pump
kB	Kilobyte
LED	Light Emitting Diode
MB	Megabyte
ms	Millisecond(s)
PC	Personal Computer
Px	Pixel(s)
R&D	Research & Development
RAM	Random Access Memory
RS485	Refers to 'Recommended Standard 485' for Modbus communication
RTC	RealTime Clock
Rx – B/s	Received (Rx) Bytes per second (B/s), where 'x' represents the number of received bytes
s	Second(s)
Tx – B/s	Transmitted (Tx) Bytes per second (B/s), where 'x' represents the number of transmitted bytes
USB	Universal Serial Bus

1 General

1.1 Introduction

This manual is intended as general guideline for LabVision version 9.0.0.x. It may be partially applicable for use with other versions, but not all features might be available or function exactly as described.



ATTENTION

Installation and safety instructions

Always read the "Installation, safety and maintenance instructions for AC_DC controls – EUS# 04" carefully before working on or with the product (available on the Web Portal, in 000\Instructions and via the 'Downloads' section on www.ebmpapst.com). Carefully observe the notes and warnings to avoid risk of injury, damage or malfunctioning and act accordingly.

1.1 Target audience

This document is only intended for the R&D department of the customer (appliance manufacturer) but can also be used by ebm-papst representatives and/or project engineers. This document is not to be shared with Installers, end users or any other third parties!



ATTENTION

Written consent

The publication of the contents, or the passing on to third parties, requires the express written consent of ebm-papst Landshut GmbH.

1.2 About LabVision

LabVision software is developed by ebm-papst to provide an easy way to interface with ebm-papst products that communicate via AL-bus or the Echo interface for example. LabVision provides the following main functionalities:

- View appliance parameters
- Adjust appliance parameters
- Visualize parameter values in a graph
- Log parameter values to a csv-file

1.3 System requirements

Ensure the computer used meets the following requirements to run LabVision software:

Item	Requirements
Operating system	Windows 7 or higher.
CPU	Intel® Pentium® or compatible.
RAM	512 MB
Hard drive space	Minimal 20 MB free space.
Display resolution	Minimal 1024x768 px.
USB-A port	At least 1 USB-A port that supports USB 2.0 (or higher).

If the software does not start, please see chapter 8 for troubleshooting.

2 Setup

2.1 Preparation

This chapter describes how to setup LabVision on a PC for use with an ebm-papst control (installed inside the customer's appliance or connected to a Simbox). Depending on the communication protocol used by the service port on the control, either an 850US device or USB-to-RS485 converter is required for connecting the control to a PC. For verifying which communication protocol is used by the service port on the control, please see the product documentation (available in the project directory on the Web Portal).

- For Renewable controls with a RS485 service interface, the 'USB-RS85 Service connection cable' is required.
- For ebm-papst controls with a service port that has an AL-bus interface, an 850US device is required.
- Optionally, the 'USB-to-RS485 converter' can be used if the service port has an RS485 interface (including AL-bus over RS485). Note that this is an obsolete product.

Only the USB-RS485 Service connection cable and the 850US device (shown below) are currently available via ebm-papst.



USB-RS485 Service connection cable
(SAP no. 82173.02690)



850US00_3Ra device
(SAP no. 83310.00101)



USB-to-RS485 converter
(obsolete product)

If the *NVMEMParser.dll* is included in the LabVision "PC-connection" zip-file, it might be possible that Microsoft Visual C++ Runtime software is required on the used PC.

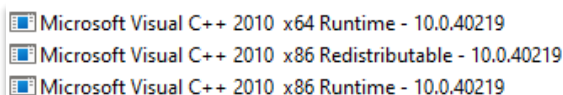


Image for illustrative purpose.

2.2 Driver installation

First ensure which communication interface (See par. 2.1) is needed in the setup before installing a driver. Depending on the necessary communication interface, either continue reading paragraph 2.2.1, 2.2.2 or 2.2.3.

2.2.1 USB-RS485 Service Connection cable

The driver is automatically installed when connecting the cable to a computer with a working internet connection.

If needed for manual installation, the drivers (including installation guides) are also available on the Web Portal (in: 000\Support Tools\Drivers\USB-RS485 Service Connection cable).

2.2.2 850US device

Verify the 850US part number (see the product label on the bottom of the 850US device):

- If an 850US00_3Ra is being used, the driver is installed automatically if the PC has a working internet connection.
- If an 850US00_3R is being used, the driver must be installed manually before connecting it to the PC for the first time. Repeat this action each time the 850US00_3R is connected to a different USB port on the computer.

Drivers for both versions (including installation guides) are available on the Web Portal (in: 000\Support Tools\Drivers).

2.2.3 USB-to-RS485 converter (obsolete product)

The driver is installed automatically if the PC has a working internet connection. For manual installations, the drivers for the USB-to-RS485 converter are available on the Web Portal (in: 000\Support Tools\Drivers\USB-to-RS485 converter).

Windows Version	Driver name	32 Bits	64 Bits
XP	SiLabs CP210x Driver Windows XP - 7 V6.5	Yes	Yes
Vista	SiLabs CP210x Driver Windows XP - 7 V6.5	Yes	Yes
Windows 7	SiLabs CP210x Driver Windows XP - 7 V6.5	Yes	Yes
Windows 8	SiLabs_cp2102_usb_serial_drivers	Yes	Yes
Windows 8.1	SiLabs_cp2102_usb_serial_drivers	Yes	Yes
Windows 10 or 11	SiLabs_cp2102_usb_serial_drivers	Yes	Yes

2.3 Connecting the interface



ATTENTION

Installation and safety instructions

Always read the "Installation, safety and maintenance instructions for AC_DC controls – EUS# 04" carefully before working on or with the product (available on the Web Portal, in 000\Instructions and via the 'Downloads' section on www.ebmpapst.com). Carefully observe the notes and warnings to avoid hazards to persons, things or disturbances and act accordingly.

The following steps describe how to connect the right interface, depending on the type of connection.

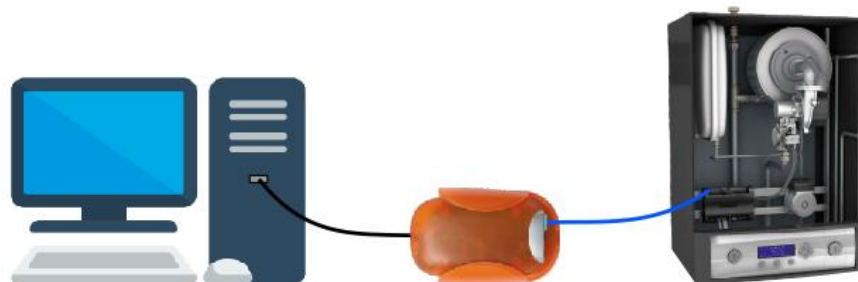
1. First, connect (plug) the relevant communication interface (see par. 2.2) via its USB connector to an available USB port on the computer.

2. Then connect the ebm-papst control to the computer via communication interface:
USB-RS485 Service Connection cable = option a, 850US device = option b, USB-to-RS485 converter = option c.
(See the Product Datasheet or Project specification to locate the Service interface connection on the control)
- a. USB-RS485 Service connection cable: Connect P1 (the 4-pin-terminal on the other side of the cable) to the assigned Service interface connection pins on the control.



Fig. 1: Connection using the USB-RS485 Service Connection cable

- b. 850US device: Connect (wire) the Service interface pins on the control to the Combicon connector (provided with the 850US) and plug the Combicon connector into the other side of the 850US.



c.

Fig. 2: Connection using the 850US device

- d. USB-to-RS485 converter: Connect the A/+ wire (from the control) to the T+ on the converter. Then connect the B/- wire (on the control) to the T- on the converter. Finally connect the GND wire (only if available on the service interface connection) to the GND on the converter:

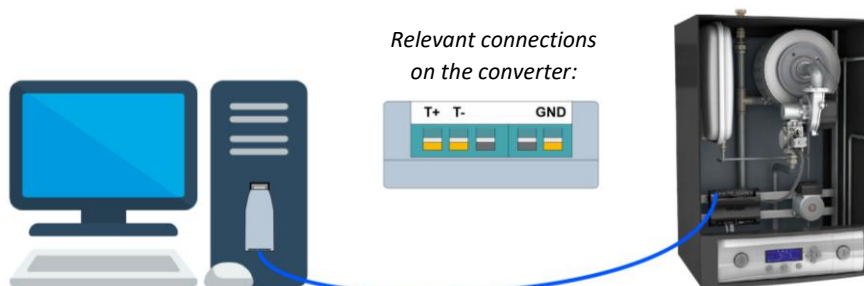


Fig. 3: Connection using the USB-to-RS485 converter

2.4 Download and run LabVision

Each product package is delivered with a unique (compatible) LabVision software version; available in the project directory on the Web Portal (in the 'PC-connection' directory in the root of each product version).

For example, the LabVision zip-file for a Commercial Plus package can be found on the Web Portal in:

XYZ\Commercial Plus\900_production\900_50\PC-connection (where "XYZ" stands for the customer's project number).

The PC-connection directory contains a zip-file called *LabVisionCP_X.X.X.X.zip* ("X.X.X.X" stands for the version numbers).

Ensure to use the LabVision from the folder that matches the software in the ebm-papst control(s).

For example, if the control is programmed with rev. 900_50 software, use the LabVision from the 900_50 folder in the project directory. Download the zip-file to a location on the computer and continue with the next section.

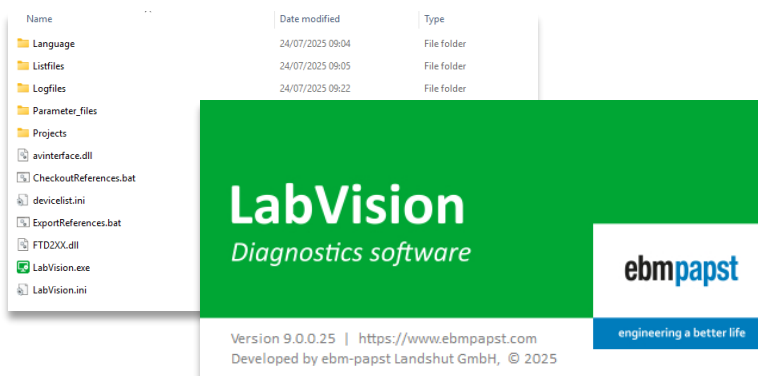
Extract the LabVision zip-file

Go to the Downloads section (via Windows Explorer on the PC); right-click the downloaded zip-file and click "Extract all...".

Extract the archive to a new empty folder locally (on the PC's hard drive), for example the Documents folder.

Run LabVision

Navigate to the directory where the zip-file has been extracted to, enter the extracted LabVision folder and double-click 'LabVision.exe' to start the software. If LabVision does not start, please see chapter 7 (Troubleshooting).



Starting LabVision (splash screen shown on the right)



Project screen visible after startup of LabVision

LabVision will always open with the project screen that was last active during the previous session (not applicable when running the software for the first time).

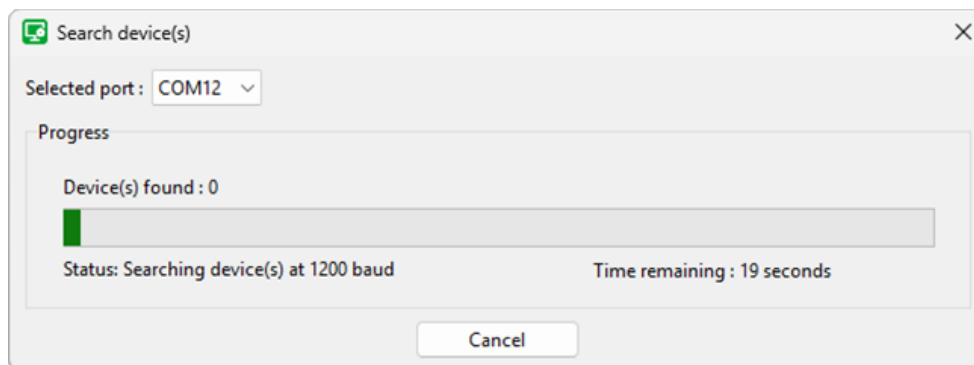
3 Search device(s) window

This chapter describes the 'Search device(s)' window, which opened directly when starting LabVision. This window searches for connected device(s) and will load the corresponding project screen(s) in the project-selector drop-down box as soon as a device has been found.

1. When the communication interface is connected correctly, its COM port number will be displayed on top of the window (next to 'Selected port:') and it will automatically start scanning for connected device(s).

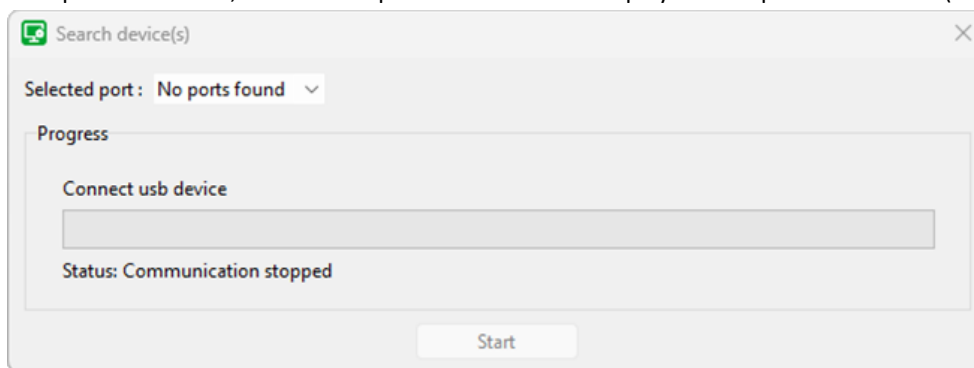
Wait until this operation finishes: **do not use LabVision while this operation is busy!**

The values on the project screen will not be updated during this procedure.



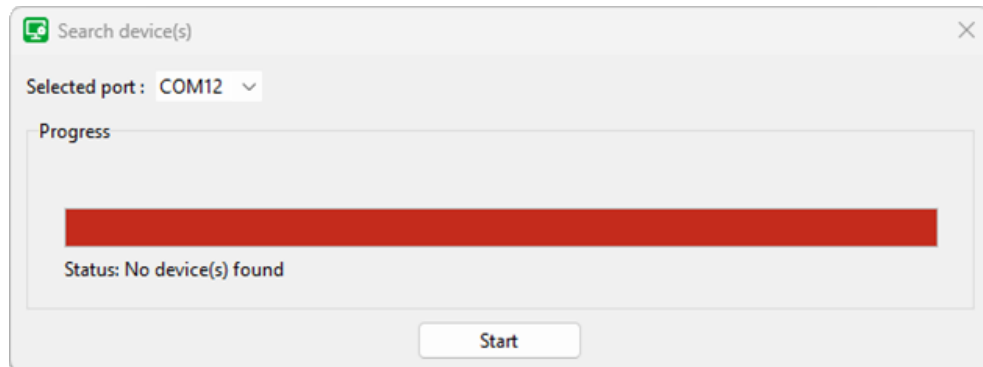
Not that if multiple communication interfaces are connected (or another device is connected that also uses a COM port) the additional COM port will appear in the drop-down box next to 'Selected port', which can then be used for selecting a different COM port.

2. If no ports are found, the text 'No ports found' will be displayed on top of the window (next to 'Selected port'):



If no port is found, please ensure that the communication interface is connected correctly to the computer as well as the device(s). Also ensure the necessary drivers are installed (see par. 2.2).

3. When no device(s) are found, the status bar will appear red and the status text indicates no device(s) are found.



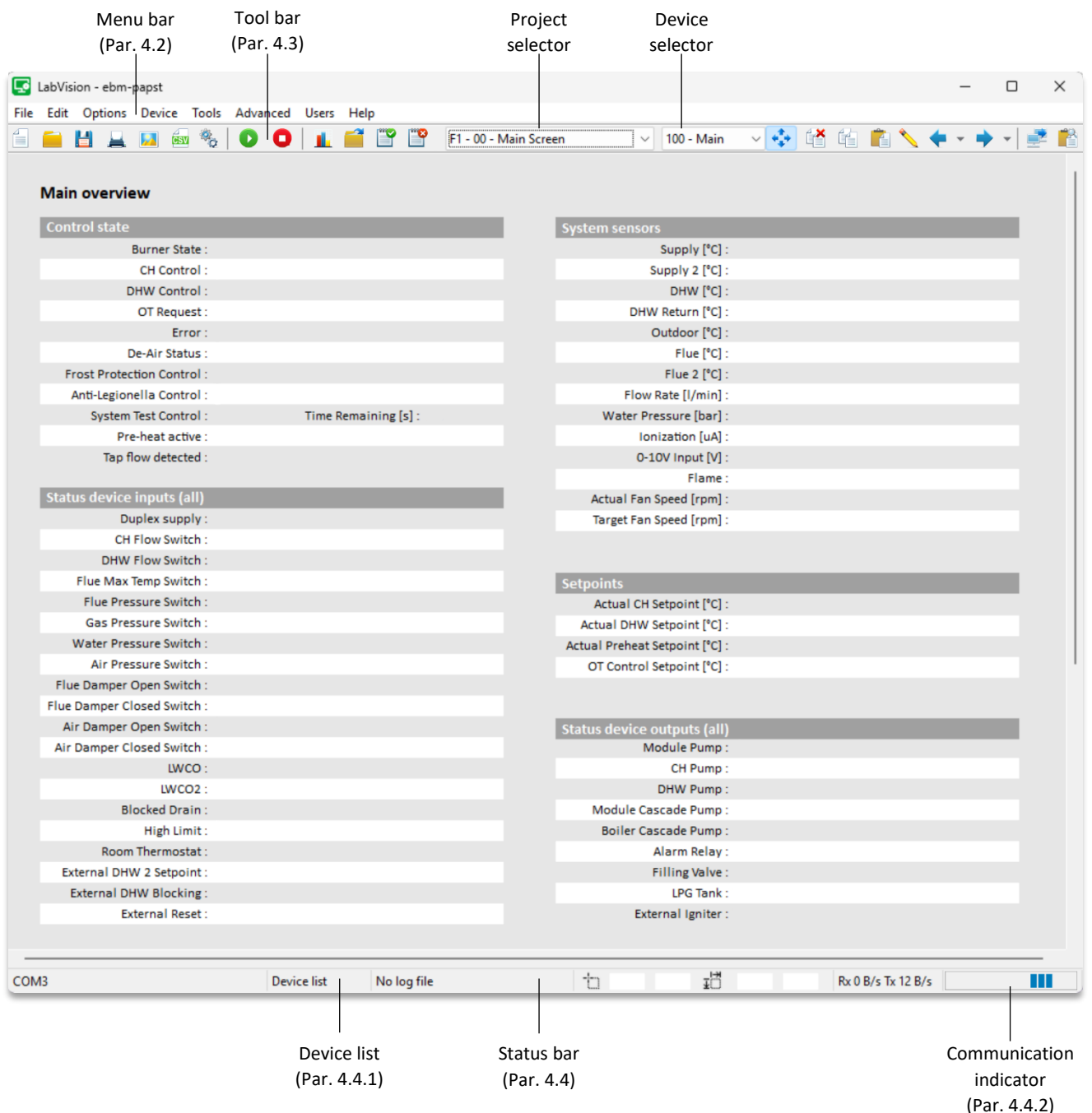
If no device is found, please ensure that the communication interface is connected correctly to the computer as well as the device(s). Also ensure all necessary drivers are installed (see par. 2.2).

As soon as the connected device(s) is found, the corresponding project screens (which apply to the connected device) are loaded, and will be available in the drop-down project-selector drop-down box (see par. 4.1 and 0).

4 Main user interface

This chapter describes the main LabVision user interface.

4.1 Overview



User interface overview

4.2 Menu bar

The Menu bar holds the following items:

(Sub) Menu item				Description
File	Open			Opens a dialog to open a project file.
	Save			Save the opened project file.
	Print			Print a screenshot of the project file that is currently open.
	Exit			Close LabVision software.
Options	Communication	Start		Starts communication with control.
		Stop		Stops communication with control.
		Preferences		Opens the connections Preferences window.
	Units	Temperature	Celsius [°C]	Select to display all temperatures in degrees Celsius.
			Fahrenheit [°F]	Select to display all temperatures in degrees Fahrenheit.
		Pressure	bar	Select to display all pressure parameters in bar.
			psi	Select to display all pressure parameters in psi.
		Flow	L/min	Select to display all flow rates in liters per minute.
			Gal/min (US)	Select to display all flow rates in gallons per minute.
	Preferences			Opens the Preferences window, also see chapter 6.
Device	Read parameter-set			Opens the dialog to create a parameter-file (.bin-file) of the connected appliance. See paragraph 7.1.
	Read internal data log ¹			Opens the dialog to readout the internal data log of the device and export it to a csv-file. See paragraph 7.2.
	Read internal error log ¹			Opens the dialog to readout the internal error log of the device and export it to a csv-file. See paragraph 7.3.
	Clear history ¹			Opens the dialog to clear the error history of the connected appliance.
	Reset lockout error ¹			Opens dialog to reset any active lockout error of the appliance.
	Reboot device ¹			Opens dialog to reboot any connected (and supported) device.
Tools	Show/Hide graph window			Shows or hide the Graph window.
	Load logfile in graph window			Opens a dialog to load a log-file into the Graph window.
	Start logging			Start logging (logging options available Preferences).
	Stop logging			Stop logging.
	Communication monitor			Opens the AL-bus communication monitor to show all frames sent/received by LabVision on the bus.
	Show/hide Device list			Show or hide the 'Device list' in the Status bar.
Users	Login user			Opens the Login window. Depending on user level, additional features and project levels may become available.
Help	Legal Notices			Displays information about 3 rd party libraries used by LabVision.
	Change log			Displays the LabVision change log.
	About...			Display the splash screen. Click on the splash screen to close it.

¹ Option only available if the connected device supports these commands.

4.3 Tool bar

The Tool bar has the following icons and items (from left to right).



Availability of icons

Certain icons might not be available (visible) due to user-level restrictions or project-specific settings.

Icon	Function	Description
	New project file	Create a new project file.
	Open project file	Opens a dialog to open a project file.
	Save to project file	Save the opened project file.
	Print screenshot	Print a screenshot of the opened project file.
	Save screenshot	Save a screenshot of the opened project file.
	Export all values to csv	Export all parameters and values from the screen to a csv-file (see par. 4.10).
	Open Preferences	Opens the Preferences window.
	Start communication	Start communication with the AL-bus (and the control).
	Stop communication	Stop communication with the AL-bus (and the control).
	Reset lockout error ¹	Resets any active lockout error when supported by control.
	Open graph window	Opens the Graph window.
	Open logfile	Opens a dialog to load a log-file into the Graph window.
	Start logging	Start logging (logging options are available in the Preferences window).
	Stop logging	Stop logging.
	Project selector	Drop-down box for selecting a different project screen.
	Device selector	Drop-down box for selecting a different device. ²
	Move watches	
	Cut watch	
	Copy watch	
	Paste watch	
	Format painter	
	Undo	
	Redo	
	Communication monitor	
	Watches list	
	User: Default - 0 User login	Shows which user is logged in, click to open the login dialog.

¹ Only available if the connected appliance supports this function.

² Only available on applicable project screens.

4.4 Status bar

The Status bar supplies quick status information of the application and contains the following elements:

Icon	Description
xxxxxxx	Visible if the AL-bus protocol is used. The number ("xxxxxxx") represents the number of the device (see par. 6.1).
COMx	Visible if the AL-bus protocol is used. The x in "COMx" represents the number of the communication port (see par. 6.1).
Echo is auto-search	Visible if the Echo-protocol is used (instead of AL-bus).
Device list	Button for showing the checksums of all devices on this project screen.
Logfile	The name of the log-file that is loaded or used is shown on this location in the Status bar.
Rx – B/s Tx – B/s	Shows the data transfer speed between the PC and the control: - Rx – B/s: <u>R</u>eceived (Rx) <u>B</u>ytes per <u>s</u>econd (B/s) - Tx – B/s: <u>T</u>ransmitted (Tx) <u>B</u>ytes per <u>s</u>econd (B/s)
	Communication indicator, colors displayed depend on the communication status (see par. 4.4.2).

4.4.1 Device list

If you press the Device list button (inside the Status bar) the following overlay appears, which contains all the devices used in the selected project screen and the applicable software checksums. The device that is currently requesting data from the bus is indicated with a [T] after the bus address.

Bus address	Device name	Checksum	x
15[T]	This PC	9.0.0.25	
100	Main	9DAB D44B	
Device list No log file			

Device list menu (example)

4.4.2 Communication indicator

The communication indicator bar on the bottom of the project screen indicates if LabVision is communicating; if all parameters are read and if LabVision is busy logging data. The communication status is also displayed as a mouse over popup on the Status bar.

- If the blue bars are moving horizontally (from left or right), LabVision is currently communicating.
- If the blue bars are not moving, check the communication-options in the Preferences window; select the correct communication device; check the AL-bus cables and ensure the appliance is turned on.

The color combination of the communication indicator and rectangles display the connection status:

Color combination	Description
	AL-bus is initializing, please wait.
	AL-bus is initialized but not all parameters on the screen are read by LabVision, please wait.
	The normal communication state: the communication protocol is initialized and all parameters on screen are read.
	LabVision is busy logging data to a file.

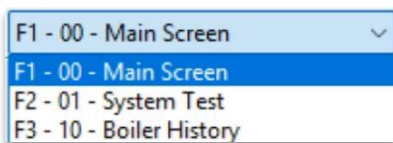
**Visibility of communication indicator**

The communication indicator is not visible when the window is too narrow.

4.5 Project screen

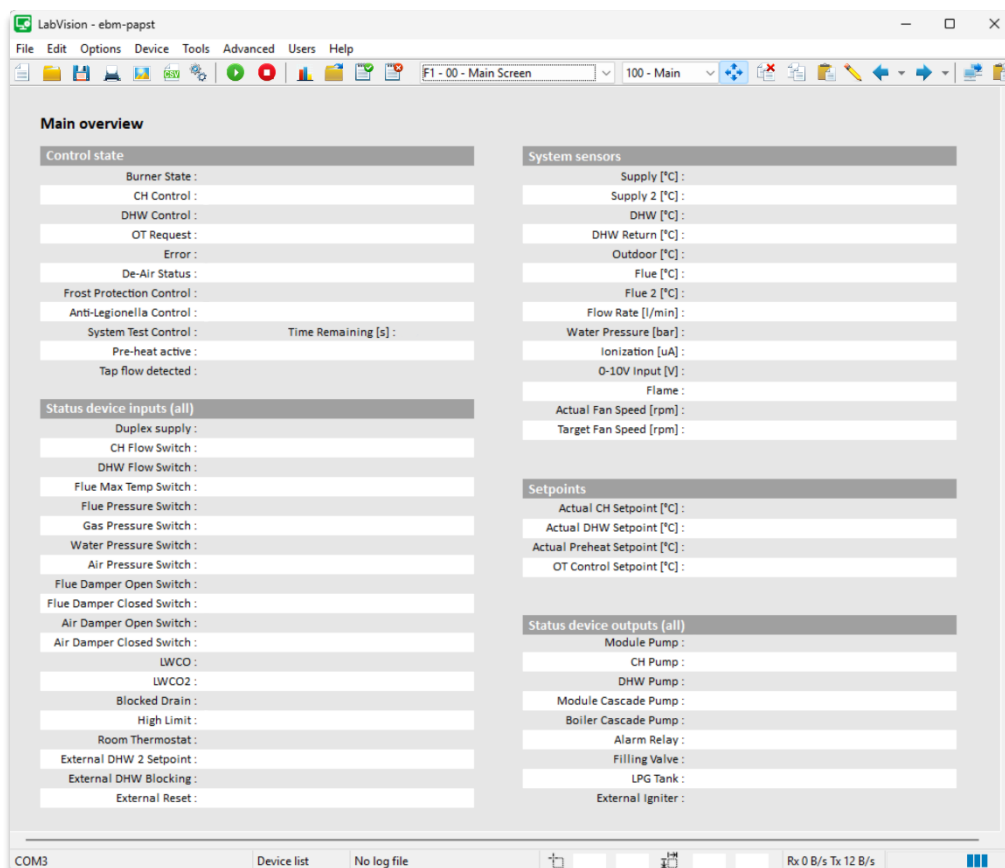
The main part of the LabVision interface consists of a specific set of project screens that are tailored to each control and customer project. A project screen holds a set of variables (settable or read-only).

The Project selector (a drop-down box in the Tool bar) can be used to select different project screens (availability of certain project screens depends on user level and on the type of control).



Project selector

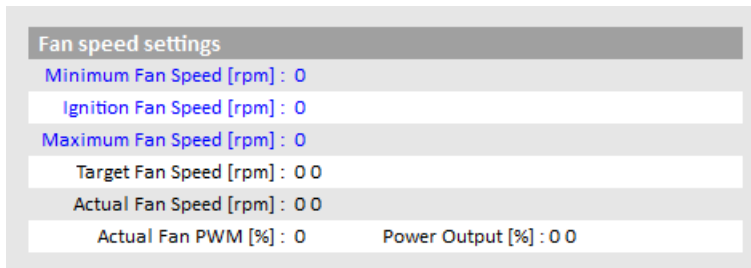
The following example shows the 'F1 – 00 – Main Screen' project screen. It shows the general status for the device '100 - Main'. The project screen(s) that come with the control may look different as they are specific for each product package. See the 900 Manual or applicable Project Specifications for more information about (parameters) settings.



Project screen example

Each project screen consists of separate groups of parameters. The values of these parameters (if connected correctly) are updated live via the connected control. Login to view or edit parameters or project screens that require a higher user level.

Certain parameters are settable (displayed in a bright blue font-color, see the figure below).



Example of settable- (blue font) and non-settable (black font) parameters)

If you double-click settable parameters, a dialog appears for adjusting the parameter-value. The window displayed depends on the available actions for the type of parameter (edit or select a value):

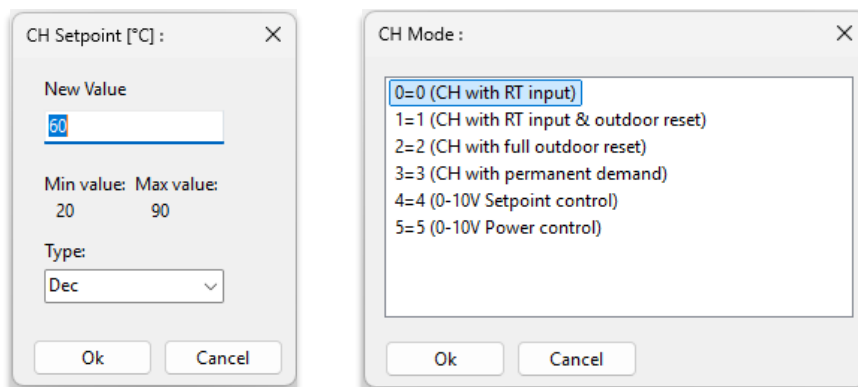
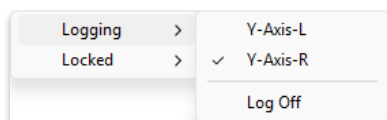


Fig. 1 Edit value (left), Select value (right)

Once a new value is entered/selected click the OK button; the new value is then sent to the appliance and will be displayed as soon as the appliance has received and set the new value.

4.6 Right click parameter menu

Right-click on a parameter to access a submenu with options for that particular parameter.



Parameter right click menu

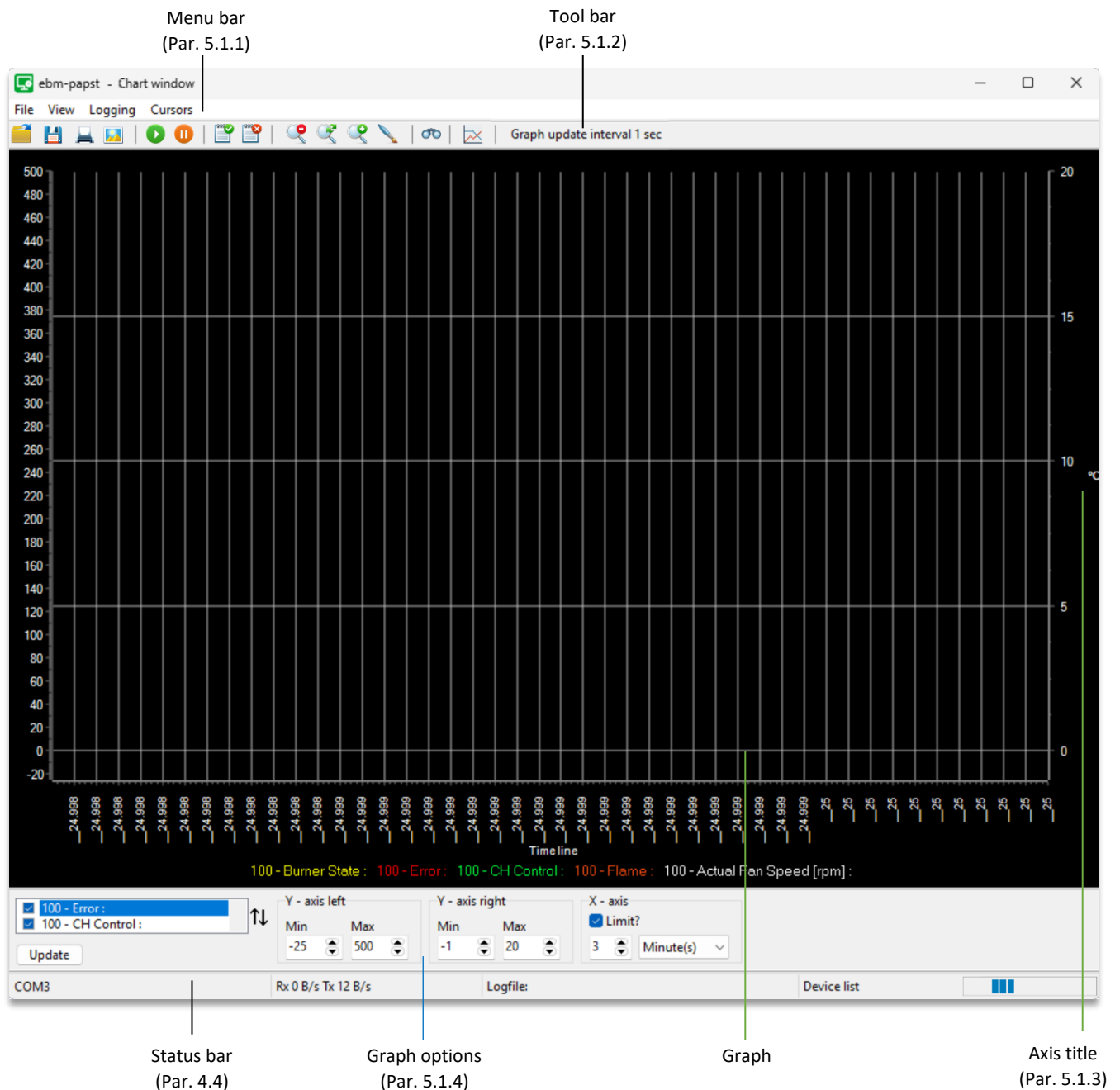
Menu item	Sub menu item	Description
Logging	Y-Axis-L	Plot the parameter to the Left Y-axis inside the Graph window and include this parameter when starting a log.
	Y-Axis-R	Plot the parameter to the Right Y-axis inside the Graph window and include this parameter when starting a log.
	Log off	Do not log or show this parameter inside the Graph window and do not include this parameter when starting a log.
Locked		Lock or unlock this parameter. Locked parameters are not requested from the device. Lock unnecessary parameters to enhance the update speed of all parameters.

5 Graph window

Parameters (and their historical values) can also be viewed inside a graph, which is available in the Graph window (access the Graph window via the graph-icon on the Tool bar, or via the Menu bar (via *Tools > Show/Hide graph window*)).

5.1 User interface

The Graph window has the following user interface:



Graph window user interface

5.1.1 Menu bar

The Menu bar in the Graph window has the following menu options:

Menu option	Sub option	Description
File	Save settings	Save the current Graph settings to the current loaded project screen.
	Open logfile	Load a log-file into the Graph window.
	Print	Print the displayed graph.
	Exit	Close the Graph window (LabVision keeps running).
View	Clear chart	Clear all data from the graph and deselect every watch that is displayed. LabVision will ask if you want to save the current graph settings before the watch is cleared.
	Restart Chart	Clear the Graph window and keep the selected parameters.
	Create Screenshot	Create and save a screenshot to your local hard drive.
	Zoom in ¹	Zoom in on the graph.
	Zoom out ¹	Zoom out on the graph.
	Reset zoom ¹	Reset the zoom level to default.
	Background color	Select the desired background color of the graph (the default background color is black).
Logging	New log	Create a new log-file.
	Start logging	Start logging (logging options are available in the Preferences window).
	Stop logging	Stop logging.
Cursors	Show	Show the cursors Tool bar.
	Bring to screen	Show the selected cursors on the graph.

¹ Graph updating needs to be paused for the zoom functionality to work.

5.1.2 Tool bar

The Tool bar inside the Graph window provides the following options:

Icon	Name	Description
	Load logfile	Load a log-file into the Graph window.
	Save graph settings	Save the current graph settings to the current project screen.
	Print graph ¹	Print a screenshot of the current visible graph.
	Save screenshot ¹	Save a screenshot of the current visible graph to the hard drive.
	Resume updating graph	Resume updating of the Graph window.
	Pause updating graph	Pause the updating of the Graph window.
	Start logging	Starts the logging to the log-file that is previously setup.
	Stop logging	Stop logging.
	Restart Chart	Clear the Graph window and keep the selected parameters
	Zoom out ²	Zoom out on the graph.
	Reset zoom ²	Reset the zoom level to default.
	Zoom in ²	Zoom in on the graph.
	Paint brush	Set the desired background color.
	Show/hide cursors Tool bar	Show or hide the cursors Tool bar.
	Graph gridlines density	Toggles between the following gridline densities: Medium – Low – None – High.
Graph update interval [xx] sec.		Indicates the Graph update interval in seconds.

¹ **Important:** During printing all colors are inverted to save ink. This is not applicable to the 'Save screenshot' function, which can be printed separately!

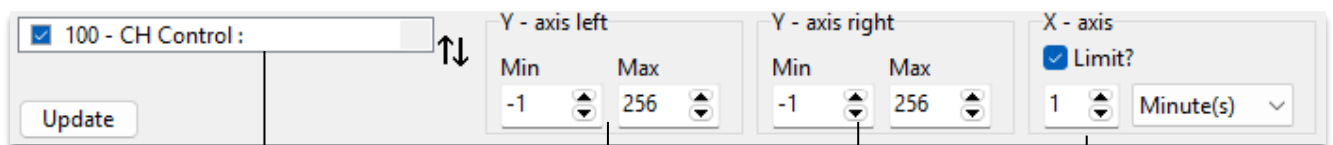
² Graph updating needs to be paused for the zoom functionality to work.

5.1.3 Axis title

On double click on the left of right you can change Axis title.

5.1.4 Graph options

Below the graph the following settings-options are available:



Parameter selector
(Press 'Update' to apply selection)

Graph axis options

Graph options

5.1.4.1 Graph legend

Below the graph the graph legend is displayed. The parameter described in the legend has the same color as the parameter-line displayed in the graph. Click on a parameter inside the legend to change its color.

5.1.4.2 Parameter selector

Use the parameter selector to set which parameters are visible inside the Graph window.

- Press the ↑↓ button to minimize/maximize the selector window.
- Press the update button after you have selected the parameters that need to be plotted to plot them.

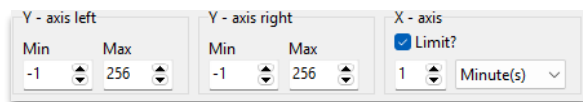


Graph window – Parameter selector list

This list only contains parameters that have the logging option enabled (see paragraph 3.6).

Only parameters with Y-Axis-L or Y-Axis-R checked are displayed.

5.1.4.3 Graph axis options



Graph axis options

This section lets you set the minimum and maximum value for both the left and right Y-Axis. By default, the X-Axis shows all gathered data, but this can be limited by checking the limit checkbox and setting a maximum timeframe to view inside the graph. If data is outside the selected axis settings, you can navigate to it by dragging the graph to the desired direction.



Large amounts of data points in the graph

Displaying large amounts of data points in the graph can result in slow performance. Limit the X-axis or zoom in to increase performance.

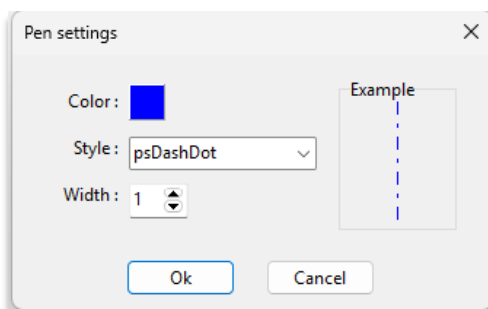
5.2 Graph cursors

Besides the plotted graphs inside the Graph window, extra cursors can be plotted to clarify the data inside the graph via the Cursor Tool bar. Enable the Cursor Tool bar via the Menu bar: *Click Cursors > Show*.

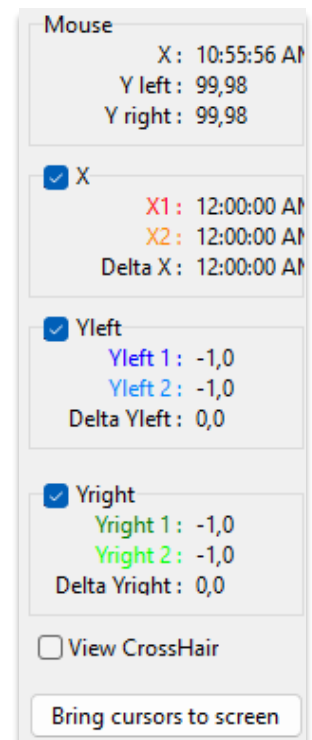
Inside the Cursor Tool bar you can enable a cursor for each axis by enabling the checkbox and clicking the “*Bring cursors to screen*” button. The value of the cursor can be changed by dragging the line with the mouse inside the graph to the desired position. The Cursor Tool bar also shows the coordinates of the mouse cursor. This way the user can precisely read values from the graph.

To enhance precision, you can enable the ‘*View CrossHair*’ checkbox. A crosshair that follows the mouse cursor will now appear when hovering over the graph.

Double click on the name of the cursor inside the Cursor Tool bar to change its appearance. If you double click on ‘X2’ for example, the Pen settings window appears where you can change the color, style, and width of the cursor:



Pen Settings window



Cursor Tool bar

5.3 Zooming

If graph updating is paused, use the zoom options (in the Tool bar or Menu bar) to zoom in and/or out on the graph. Press the ‘Reset zoom’ button to reset the zoom level to its default setting.

Besides the zoom buttons you can also click and drag a box inside the graph to zoom in to that specific section. Additionally, the scroll wheel can also be used to zoom in or out. The smallest zoom level is when the x-axis has a resolution of 2 s.



Availability zoom options

The zoom options are not available if graph updating is resumed, and new data is added!

5.4 Panning

To view data from outside the graph, click-and-hold the right-mouse-button and drag the mouse cursor over the graph to move it.

5.5 Logging

The values of the parameters on a project screen can be logged over a period of time inside LabVision. The paragraphs hereafter describes how to achieve this. For maximum performance, it is recommended to close or minimize the Graph window. See par. 6.3 and 6.4 to export the internal device logs if the device supports this feature.

5.5.1 Select parameters for logging

The parameters that need to be logged must be set before the log can start. This can be done in the same way as parameters can be made available in the Graph window (See chapter 4). This means that you have to right-click the parameter of choice and check the Y-Axis-L or Y-Axis-R option to enable it to be logging (see par. 4.6).

If the “Log off” option is selected, the parameter is not included in the log-file.

5.5.2 Start logging

Once everything is setup, start logging via the ‘Start logging’ button on the Tool bar or via the Tools menu in the Menu bar. The Preferences window - Logging tab will be displayed (see paragraph 5.5.4).

After the log-file location is correctly setup and you have clicked the OK button, the logging will start.

Once the logging has started, the rectangles inside the communication indicator on the Status bar will turn red (see paragraph 3.4.2), which indicates that LabVision is currently logging the data.

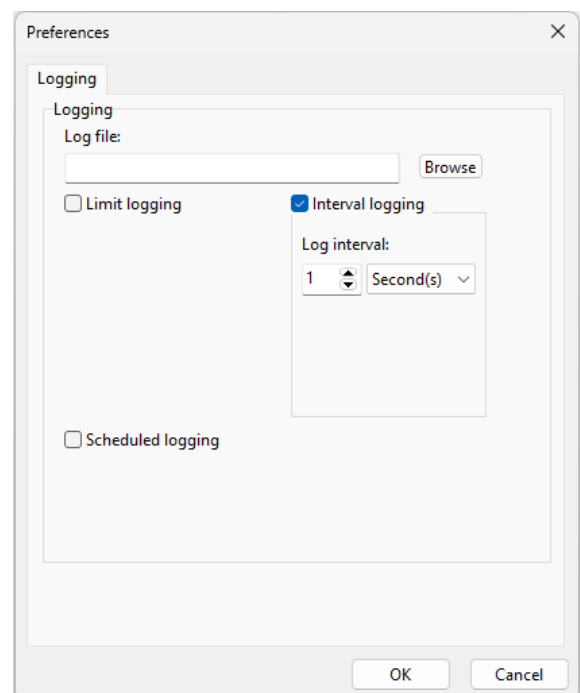
5.5.3 Stop logging

To stop logging press the ‘Stop logging’ button on the Tool bar or press the ‘Stop logging’ item in the Tools menu in the Menu bar. The rectangles inside the communication indicator will turn blue again (see par. 4.4.2).

5.5.4 Logging options

Via the ‘Start logging’ button the Loggings options will shows (See chapter 5.5.2).

Selecting one of the check boxes in the Preferences window shown on the right enables additional logging features (see par. 5.5.5 , 5.5.6, 5.5.7 and 5.5.8).



Preferences window - Logging tab

5.5.5 Log file location

The log-file location can be set via the 'Browse' button, select a location, type a filename and click the 'Open' button.

LabVision will ask if you want to create a new log-file if it does not already exist within the directory. A comment for the new log file can be added for clarification, for example to describe what is being logged.

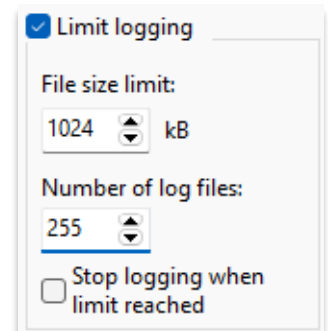
5.5.6 Limit logging

The maximum file size of a log-file can be limited. If this option is enabled and the file size limit is reached, a new log-file is created to continue logging.

If the user plans to log data for a longer period (multiple hours) it is strongly recommended to limit the file size to 5128 kB per log-file.

Large log-files (> 5MB) take a long time to load or will not load at all. With the standard interval (every ~200 ms. when 'interval logging' is not enabled), a 5128kB log-file contains about 5 hours of data.

The limit of the amount of log-files that LabVision can create is settable. There is also the option to stop logging when this limit has been reached. If the 'Stop logging when limit reached' option is not checked, LabVision continues logging and by default overwrite the oldest log-file.



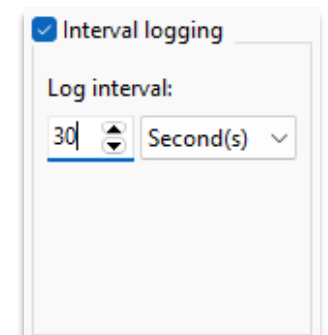
Limit logging

5.5.7 Interval logging

Interval logging can be used to set the interval that is used for logging. It indicates the time between two logged data points. The slower the interval, the slower the log-file grows. It is recommended to set the interval to a suitable value before logging.

For example: if a slow-changing value that only changes once every 5 minutes is being logged, the interval can be set to 5 minutes. This way the log-file does not grow as quickly, which makes handling the log-file easier.

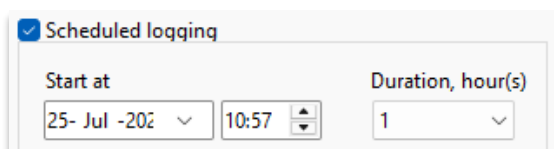
If this option is disabled, LabVision will always use a logging interval of ~200 ms. This means that every 200 milliseconds all parameters to-be-logged are written to the log-file.



Interval logging

5.5.8 Scheduled logging

Use the Scheduled logging feature to schedule when logging should start and stop. Set the date, time and duration. Ensure to setup all the parameters that need to be logged before the Scheduled log starts.



Scheduled logging

5.6 View log-file in LabVision

Log-files can be viewed in LabVision's Graph window. To load a log-file, press the '*Load log file in Graph window*' option in the Tools menu of the Menu bar or drag the log-file into the LabVision Graph window. LabVision will ask if you want to load this log-file, after which the log-file will be loaded into the Graph window.



NOTE

Graph window data when log-file is loading

Any (unsaved) data in the Graph window is lost if a log-file is loaded. See chapter 5 for more info about Graph interaction.

5.7 View log files in Microsoft Excel

The log-file is stored in the comma-separated-values file (csv) format, so it can be opened with spreadsheet applications such as Microsoft Excel. This allows the viewing of exact values and manually processing the data using a spreadsheet. The file has several sections, which are described in the paragraphs hereafter.



NOTE

Using a copy of the original CSV-file

If you save the csv-file with Microsoft Excel, it cannot be reopened by LabVision anymore. Therefore, always use a copy of the original csv-file when using Microsoft Excel.

5.7.1 Log settings

The Log Settings section contains information such as the Start date and time of the log, any comments made and the LabVision version used to create the log-file.

5.7.2 LogLegend bus

The LogLegend bus section contains all the used devices for this log-file. For each device the name, buss address and firmware checksum are stored.

5.7.3 LogLegend watches

The LogLegend watches contain the logged parameters and extra information for LabVision, such as which Y-Axis to use to plot the value.

5.7.4 LogData

The last and biggest section is LogData, which has the actual logged values. Each record starts with the date and time of the record, followed by the values of each parameter.

6 Preferences

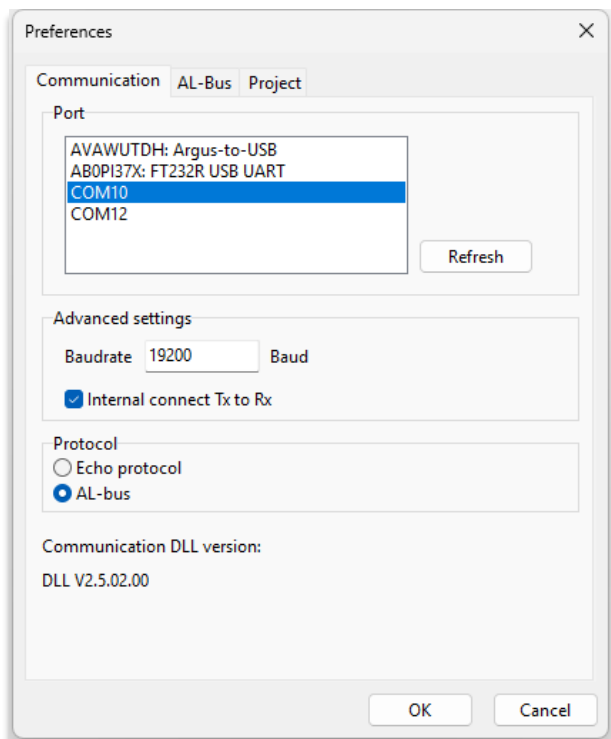
This chapter describes all options of the Preferences window, which can be opened via the Tool bar or Menu bar (*Options > Preferences*). The LabVision version that comes with your appliance is already preconfigured and therefore most options are already set to the correct value.

6.1 Communication tab

This tab contains most of the communication settings:

- In the communication port section, you can select a COM port or 850US device used to communicate with AL-bus (and your appliance). With Auto search it automatically checks on which com port the device is connected.
- In the communication settings section, the baud rate and internal loopback can be set. These settings are already configured for your product, **do not change these settings!**
- In the protocol section the communication protocol can be set. This setting is already configured for your product, **do not change these settings!**

Additionally, the version information of the DLL used is shown at the bottom of the communications section.

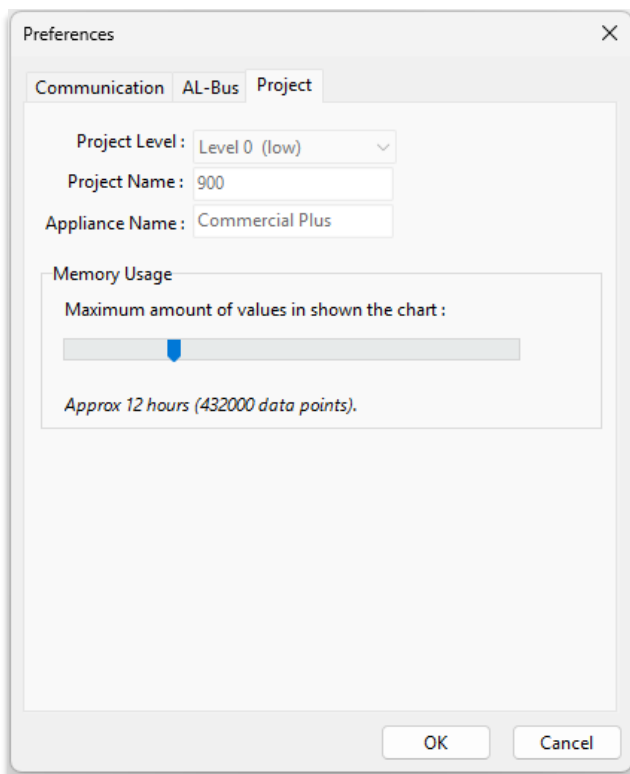


Communication preferences

6.2 Project tab

This tab contains project related information. This information is specific for each appliance:

- The project level shows the user level needed to view the current project. Log in to achieve a higher user level and see more project screens.
- Project name shows the internal name of the project.
- Appliance name shows the name of the appliance or group of appliances that LabVision is configured for.
- The Memory Usage setting limits the maximum number of values that are kept in memory to fill the graph. This is relevant if the graph is opened for several hours. More data in the graph can negatively impact the performance when panning and zooming.



Project preferences

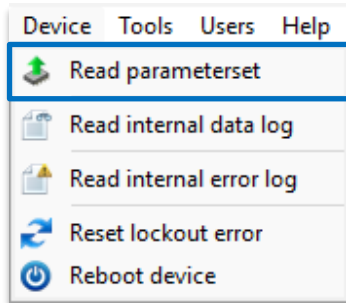
7 Advanced LabVision features

7.1 Reading appliance parameters - Creating parameter-files

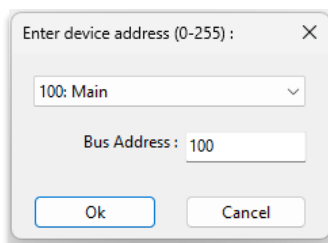
All parameters stored in the E2PROM of an appliance can be read and used to create a parameter-file (.bin-file). This file can then be used to write these parameters to other compatible appliances or to return them to ebm-papst. Also see the 'E2PROM Programming manual' on the Web Portal (in: 000\Instructions\Programming Manuals).

The following steps describe how to create such a parameter-file:

1. Start LabVision and establish a connection between the control and the LabVision software (also see chapter 2). Wait until the communication indicator turns grey with blue bars (see par. 4.4.2).
2. On the Menu bar of the main interface, click on 'Device' and select 'Read parameterset':



3. Select the device address (the Bus Address is automatically filled in after the appliance has been selected). Click 'OK'.



4. In the pop-up window that appears, select the location on your PC where the parameter-file (.bin-file) will be saved to and name the file as desired. Click 'OK' to start the parameter read procedure.
5. The parameter read procedure has successfully completed once the notification 'Reading parameterset from control successfully' appears.

After completion, the parameter-file is available on your computer (location chosen in step 5) and can be used to program other compatible appliances (with a compatible ebm-papst control) or to be returned to ebm-papst for review.

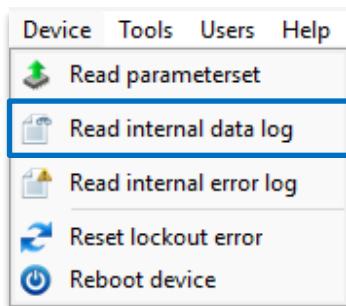
7.2 Reading the internal device data log

Some devices contain an internal data log feature that can continuously log predetermined parameters in the internal flash memory of the device during operation. With this feature it is possible to view for example sensor values from the device of the last couple of hours, which can be useful when debugging error conditions.

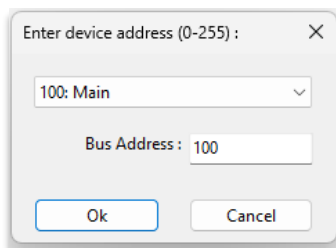
The amount of log entries, sample rate and the logged values depends on the hardware and firmware of the device and may vary between devices and firmware versions. Therefore, it is important that only the LabVision package that came with the device's firmware is used to read out the data log. LabVision can read this internal data log from the controller and export the data to a csv-file for further analysis.

The following steps describe how to read the data log from the device via LabVision:

4. Extract the file containing the LabVision PC software locally on your PC and run *LabVision.exe*.
5. Establish a connection between the board and the LabVision software (see chapter 2).
Wait until the communication indicator turns grey with blue (see par. 4.4.2).
6. On the Menu bar of the main interface, click on 'Device' and select 'Read internal data log':

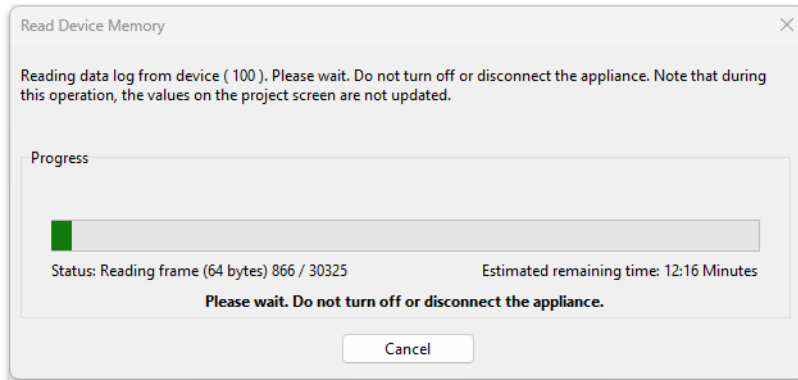


6. In the popup, select the address of the device that should be read.
Click 'Ok' to confirm.

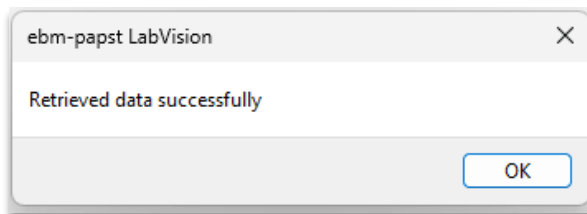


7. Select the location on your PC where the csv-file (with the data) will be saved to and name the file as desired.
Click 'Save' to start the operation.

8. Wait until the operation finishes: **do not use LabVision while this operation is busy!**
The values on the project screen will not be updated during this procedure.



9. When the operation has finished, LabVision will show the following popup.
Click 'OK' to close the message. The data on the project screen will be updated once this message is closed.



10. Examine the created file using a spreadsheet program like Microsoft Excel.
The file cannot be opened by LabVision itself.

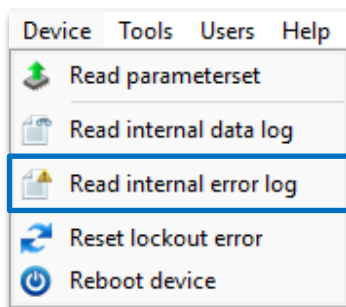
7.3 Reading the internal device error log

Some devices contain an internal error log feature that can store more than hundreds of error- and warning codes in flash with a precise timestamp (if the RTC is set correctly). Please be aware that this feature differs from the 'Error history' project screen that holds 16 locking and 16 blocking errors.

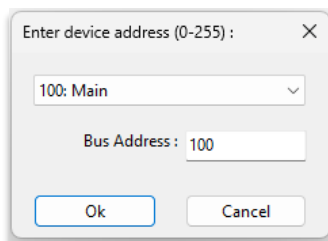
LabVision can read this internal error log from the controller and export the data to a csv-file for further analysis.

The following steps describe how to read the error log from the device via LabVision:

1. Extract the file containing the LabVision PC software and run *LabVision.exe*.
2. Establish a connection between the board and the LabVision software (see chapter 2).
Wait until the communication indicator turns grey with blue (see par. 4.4.2).
7. On the Menu bar of the main interface, click on 'Device' and select 'Read internal error log':

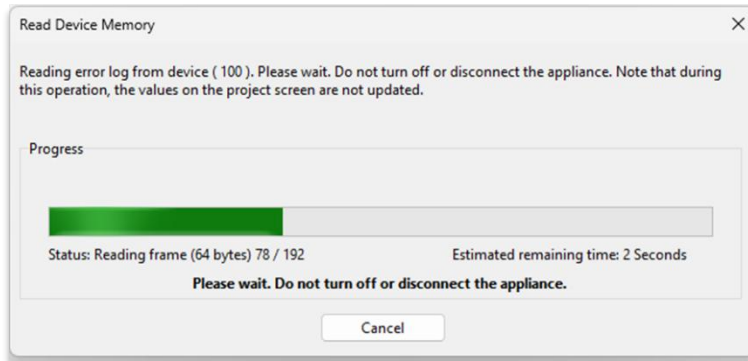


3. In the popup window that appears, select the address of the device that should be read.
Click "Ok" to confirm.

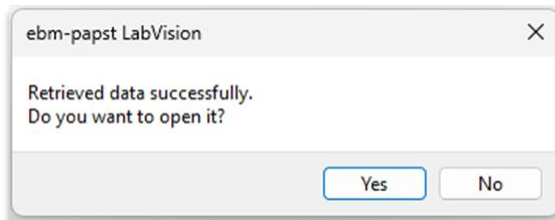


4. Select the location on your PC where the csv-file (with the data) will be saved to and name the file as desired.
Click "Save" to start the operation.

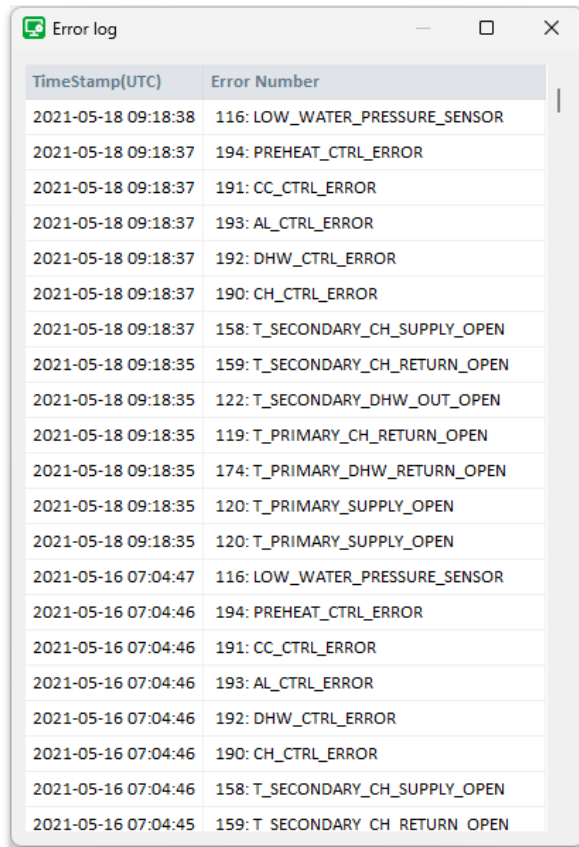
- Wait until the operation finishes: **do not use LabVision while this operation is busy!**
The values on the project screen will not be updated during this procedure.



- When the operation has finished, LabVision will show the following popup. Click “Yes” to open the error log popup window. The data on the project screen will be updated after this message has closed.



7. In the popup window that appears (shown hereafter), the user can scroll through the errors. It's also possible to examine the file using a spreadsheet program like Microsoft Excel.



The screenshot shows a window titled 'Error log' with a table of error entries. The table has two columns: 'TimeStamp(UTC)' and 'Error Number'. The entries are listed in descending order of timestamp, with the most recent errors at the top. The errors are categorized by their error numbers and descriptions.

TimeStamp(UTC)	Error Number
2021-05-18 09:18:38	116: LOW_WATER_PRESSURE_SENSOR
2021-05-18 09:18:37	194: PREHEAT_CTRL_ERROR
2021-05-18 09:18:37	191: CC_CTRL_ERROR
2021-05-18 09:18:37	193: AL_CTRL_ERROR
2021-05-18 09:18:37	192: DHW_CTRL_ERROR
2021-05-18 09:18:37	190: CH_CTRL_ERROR
2021-05-18 09:18:37	158: T_SECONDARY_CH_SUPPLY_OPEN
2021-05-18 09:18:35	159: T_SECONDARY_CH_RETURN_OPEN
2021-05-18 09:18:35	122: T_SECONDARY_DHW_OUT_OPEN
2021-05-18 09:18:35	119: T_PRIMARY_CH_RETURN_OPEN
2021-05-18 09:18:35	174: T_PRIMARY_DHW_RETURN_OPEN
2021-05-18 09:18:35	120: T_PRIMARY_SUPPLY_OPEN
2021-05-18 09:18:35	120: T_PRIMARY_SUPPLY_OPEN
2021-05-16 07:04:47	116: LOW_WATER_PRESSURE_SENSOR
2021-05-16 07:04:46	194: PREHEAT_CTRL_ERROR
2021-05-16 07:04:46	191: CC_CTRL_ERROR
2021-05-16 07:04:46	193: AL_CTRL_ERROR
2021-05-16 07:04:46	192: DHW_CTRL_ERROR
2021-05-16 07:04:46	190: CH_CTRL_ERROR
2021-05-16 07:04:46	158: T_SECONDARY_CH_SUPPLY_OPEN
2021-05-16 07:04:45	159: T SECONDARY CH RETURN OPEN

8 Troubleshooting

Situation	Option
No ports found	Ensure the communication interface is connected correctly to the PC as well as the device (control). Also see par. 2 (Setup): - Check your Windows version and select (install) the correct SiLabs driver. - Check the installation of the cables and the USB-to-RS485 converter.
LabVision will not start.	- Ensure your computer meets the described system requirements (see par. 1.3). - Ensure all zip-files are unzipped (run LabVision from the unzipped folder). - Download the LabVision zip-file from the Web Portal again and follow the steps in chapter 2 if the problem still occurs.
Parameter values are not updated (or not displayed correct).	Check the communication status indicator (see par. 4.4.2): - If it is not moving, verify the communication settings and check the cable installation. - If the indicator's background color is yellow or green, please wait a moment. - During some operations (like reading or writing the parameter-sets or the internal device logs) the updating of the values is paused to speed up the process. This is indicated by the orange bar at the top of the window.
The project screen remains completely empty.	Try reloading the current project screen by selecting the project again (via the project selector of the Tool bar) or restart LabVision.
All (or part) of the expected parameters disappeared on the project screen.	- Check if the communication indicator is moving and has a grey background color. - Try to restart LabVision and your appliance. - Check the installation of the cables and the used communication interface.
The communication indicator is not moving.	- Go to the communication tab in the Preferences window and check if the correct COM port is selected. - Check if the communication interface is connected properly to the PC and the assigned Service interface connection pins. - When using the 850US: verify two LEDs are blinking (visible through the transparent housing).
LabVision is not displayed normal on my (high resolution) screen.	LabVision does not support display scaling in Windows. Disable scaling for LabVision by right-clicking on <i>LabVision.exe</i> and select '<i>Properties</i>'. Go to the Compatibility tab; check the '<i>Disable display scaling on high DPI settings</i>' checkbox and click OK. Alternatively, reset the (entire) display settings to 100% by opening '<i>Control Panel</i>', click '<i>Appearance and Personalization</i>', choose '<i>Display</i>', select 100% and click '<i>Apply</i>'.
Only the last minute of a log-file is shown in the Graph window.	Ensure that the 'Limit function' located in the X-Axis section is turned off as described in par. 5.1.4.3. Alternatively, you can pan through the graph by holding the right mouse button down and dragging the mouse-pointer across the graph.
Log-file cannot be opened by LabVision.	Ensure that the csv-log-file is not opened (and saved) by Microsoft Excel without making a copy of the original file. Microsoft Excel changes the format of the csv-file in such a way that it is not readable anymore for LabVision.
Data/Error log can only be saved as .bin-file.	Ensure you have the correct runtime and drivers of Microsoft Visual C++ (see chapter 2).
LabVision has no communication via the USB-to-RS485 converter.	See par. 2: - Check your Windows version and select (install) the correct SiLabs driver. - Check the installation of the cables and the USB-to-RS485 converter.
Language error	Ensure that the whole project is unpacked from the zip-file. It's only possible to run <i>LabVision.exe</i> with the required project files. Creating a shortcut from <i>LabVision.exe</i> is possible.