



Beamex bMobile

User Manual

Applies to version 2.11.0

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Beamex Oy Ab

Ristisuonraitti 10

FIN-68600 Pietarsaari

Finland

Tel: +358-10-5505000

E-mail: sales@beamex.com

Support Portal: <https://support.beamex.com>

Website: <https://www.beamex.com>

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1 Introduction

Beamex **bMobile** is an intuitive, multi-platform solution for offline guided execution and documentation of field calibrations and maintenance-related inspections. The application is used in combination with Beamex CMX or LOGiCAL Calibration Management Software.

The following instrument types are supported:

- Standard industrial instruments, e.g. pressure indicators, temperature sensors and signal transmitters,
- Limit switches, e.g. pressure and temperature switches,
- Weighing instruments.

With **bMobile** you can also carry out maintenance inspections (checklists).

You can use either Beamex CMX or Beamex LOGiCAL Calibration Management Software to manage what to calibrate and when, and then assign the work and send the instruments to be calibrated to your mobile device running **bMobile**. Field calibrations can be executed offline with step-by-step guidance from **bMobile**. The application documents and stores the calibration results securely and, when online, results can be transferred back to Beamex CMX or LOGiCAL for further data analysis or calibration certificate printing. Together, **bMobile** and CMX form a powerful solution for maintenance-related inspections and weighing instrument calibrations and also reduce the risk of violating the ALCOA data principles by ensuring data integrity.

bMobile is available for iOS¹, Android², and Windows³ 11 (and newer) platforms and can be downloaded for free from Apple App Store, Google Play, or the Beamex website Download Center. You can try out **bMobile** without CMX or LOGiCAL using the demonstration mode. **bMobile** is compatible with LOGiCAL and with CMX version 2.11 or later. Weighing Instrument Calibration, Maintenance Inspection and Beamex Mobile Security Plus options are supported in **bMobile** if activated in CMX.



Note: Beamex CMX and LOGiCAL are calibration management systems where you create, maintain and send instruments for calibration to **bMobile**. For CMX, instruments cannot be created, edited or copied in **bMobile**. Those utilities are available in LOGiCAL.

To fully utilize **bMobile**, you need to be familiar with instruments, calibration and calibration procedures.

¹ iOS is a trademark of Cisco Systems, Inc.

² Android is a trademark of Google Inc.

³ Windows is a trademark of Microsoft Corporation

1.1 bMobile and CMX Requirements

bMobile requirements:

- Screen size: 4 inch or higher.
- Network connectivity.
- CWSI Server or Beamex Sync configured, in use for communication between bMobile and CMX.
- **Windows 11*** (tablet / desktop) and .net framework 4.6.1.

Recommended hardware:

- Intel® Quad-Core Atom processor, Z3795
- 128 GB storage / 4 GB RAM
- or an **Android*** device, operating system version 7.0 or later.

Recommended hardware:

- Quad-core 2.5 GHz Krait 400
- 16 GB storage / 3 GB RAM



Note: Even though bMobile may still work with an older Android version, it is highly recommended to update your device to the version 7.0 or later.

- or an **iOS*** device, operating system version iOS 13, iPadOS 13 or later.

Requirements in CMX (version 2.11 or later):

- Weighing Instrument option for calibrating Weighing Instruments and
- Maintenance Inspection option for doing checklist runs.
- Mobile Security Plus option is not required, but recommended.



Note: Instruments and checks are created in **CMX**. **bMobile** receives necessary data from **CMX** and communicates the results to **CMX**.

*) With above mentioned devices, there should not be any significant performance reduction when a device contains 50 instruments, 200 references, 30 users and 15 results. Less performant devices will work but can slow the performance down.

1.2 Installing bMobile

Beamex bMobile is available in Google Play store and in Apple App Store. Find the App there, select and download it. The installation should start automatically and **bMobile** is immediately available for use.

A Windows® version is also available. The installation software is available on the Beamex website in the **Download Center**. Install the software on your computer.



Note: See also chapter [Windows® Installation Specifics](#).

1.3 Communicating With CMX

bMobile communicates with CMX Calibration Management Software. Supported communication methods are:

- CWSI (Calibration Web Service Interface)
- Beamex Sync

CWSI is provided by Beamex on CMX's Installation Media. CWSI Server and CWSI Client are installed separately. The installation instructions are available in the *CMX Installation Guide*. The following subchapter covers the instructions related to CWSI communication. More about Beamex Sync and the instruction on how to set up the communication can be found in the *Beamex Sync Help*.

1.3.1 Communication Settings in CMX (CWSI)

When sending instruments to **bMobile**:

In CMX's **Send to Calibrator** window, select CWSI as **Protocol**. Then check the settings by clicking this button .

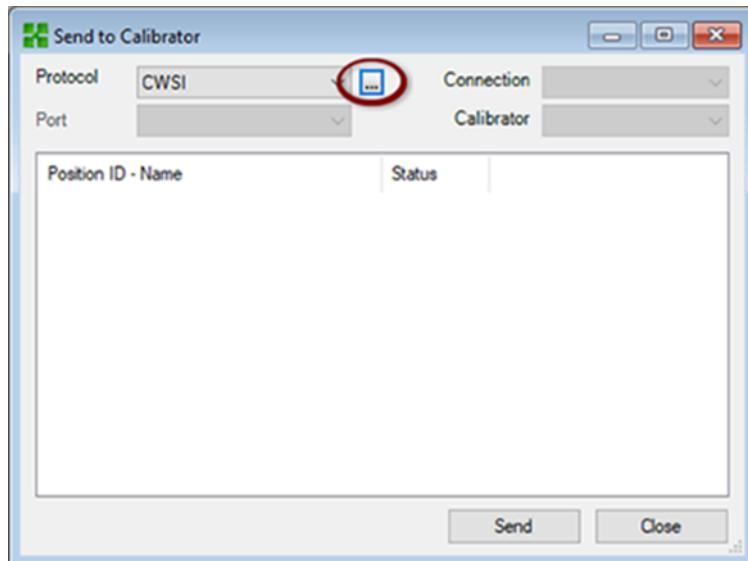


Figure 1: Send to Calibrator window

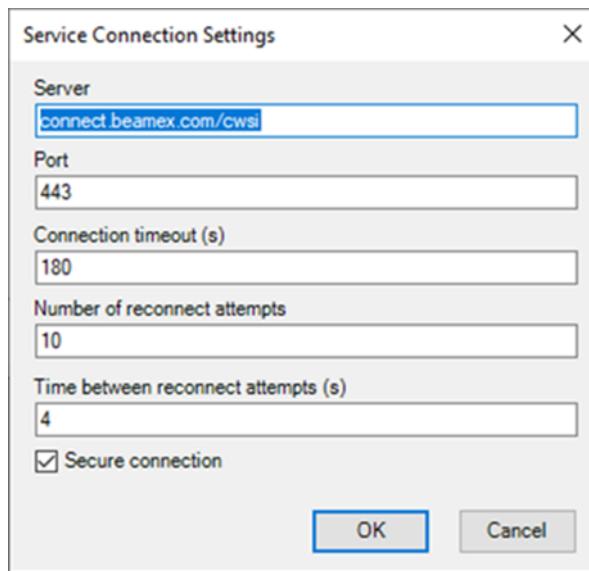


Figure 2: Service Connection Settings window

The CWSI server **connect.beamex.com** is provided by Beamex and made available for our customers.

If you then get connected with **bMobile**, the **Connection** field shows your **User ID** and the **Calibrator** field shows **bMobile**.

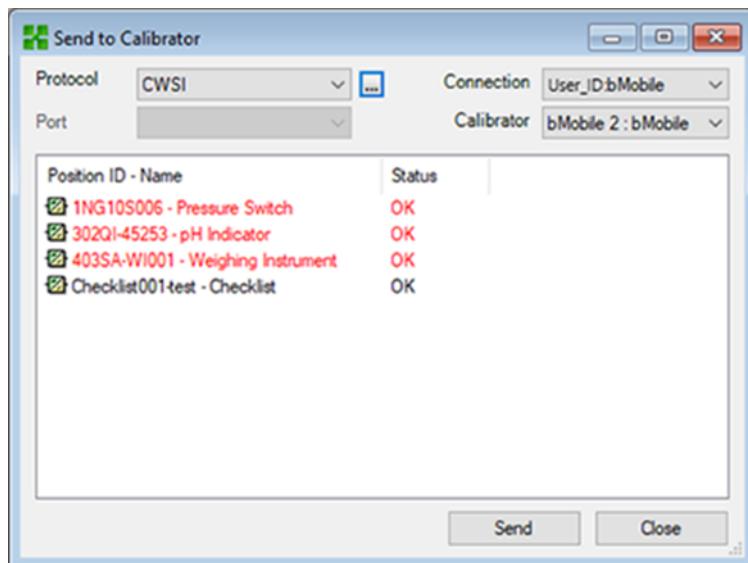


Figure 3: Send to Calibrator window after connecting

You can then send instruments from CMX to **bMobile** as it is normally done in CMX. Note however that when sending/receiving, you need to have the **Connection** window open in **bMobile**. See chapter [Connect](#).

Receiving results to CMX is done similarly.



Note: The server address (connect.beamex.com/cwsi) may be replaced with the address where your organisation's own CWSI server is installed.



Note: For more information, see *CMX Installation Manual* and the Appendix of this document.

2 About Instruments

An instrument in the Beamex product ecosystem refers to an entity that can be calibrated. It includes details about:

- Physical location
- Properties of exact physical device
- The quantity and range that the device measures
- The error limits that define the pass/fail status of the calibration
- The calibration schedule, test points and other details

2.1 Variants

Instruments come in two main variants:

Variant	Description
Instrument	An instrument is a device that can be attached to a physical location (position). An instrument can also be attached to the plant structure.
Free device	A free device is an instrument that is not attached to a position. A concrete example is a device that has been detached from a position for maintenance (or calibration) and then later re-installed to a position. A free device can be attached to the plant structure. <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;">  Note: LOGiCAL and bMobile only support creation and editing of free devices, not attaching to/detaching from a position. </div>

2.2 Position

A position defines where the instrument is installed or located within the facility. The properties include a unique position ID, name, and optionally, the location within the plant structure.

2.3 Device

A device defines properties of the exact physical device. The properties include manufacturer, model, serial number, and a device ID. The device ID typically follows the position ID but can also be set to any value.

2.4 Function

A function defines the type of quantity that the device measures (i.e. pressure, temperature) and the output it produces based on it. A single device can have one or more functions (see chapter [Extending instruments](#) on how to add functions to a device).

Main types of instrument functions that can be configured and calibrated:

- **Transmitters**

A transmitter measures a quantity and produces another quantity based on defined transfer function.

Example: Pressure transmitter, temperature sensor, PH transmitter

- **Indicators**

Indicators are devices that measure a quantity and display the measured value with an analog or a digital display.

Example: Pressure indicator

- **Switches**

A switch is a device that monitors a physical parameter (such as pressure or temperature) and changes its electrical state (actuates) – either opening or closing a circuit – when that parameter reaches a predefined setpoint and provides a binary output (ON/OFF) for control or safety purposes.

Example: Temperature switch

- **Weighing instruments (CMX only)**

A weighing instrument is a device to determine the mass of an object. It converts the applied load into a readable value, typically in units such as grams or kilograms.

Example: Analytical laboratory scale

- **Checklists for maintenance inspections**

A checklist can include any number of checklist items. Each item has an ID and a description specifying the inspection to be performed. For longer checklists, items can be organized into groups for clarity.

2.5 Error Limit

During calibration, bMobile calculates errors for each calibration point based on the input and output values provided by the user. If the calculated error for any calibration point exceeds the instrument's error limit, the calibration fails. A calibration passes if all calibration points are within the error limits.

Error unit allows selection of **error calculation method**, which defines three options:

Error Unit	Description
% of span	The constant error limit over the span of the instrument. The error limit is "flat" and the same for any input/output value within the span of the instrument. See Figure 4: Constant error limit (% of span) . An additional, relative component may be added.
% of reading	The relative error limit is relative to the reading within the span of the instrument. See Figure 5: Relative error limit (% of reading) . <ul style="list-style-type: none"> If set to zero, the error limit is constant ("flat") over the span. A value more than zero yields a conical shape in the error limit, which allows less error in lower range and more error in upper range of the span.
Engineering units (absolute error)	Error is presented in the unit defined either for the instrument's input or output, to be used as error limit. An additional, relative error component may be added.

A **single error limit** defines a continuous error limit across span of the measurement range. The constant and relative error limits define the extent and shape of the limit.

- [Figure 4: Constant error limit \(% of span\)](#) shows an error limit with constant error limit of 2 and relative error limit of 0.
- [Figure 5: Relative error limit \(% of reading\)](#) shows an error limit with constant error limit of 2 and relative error limit of 5. Notice the difference in shapes of the limits.

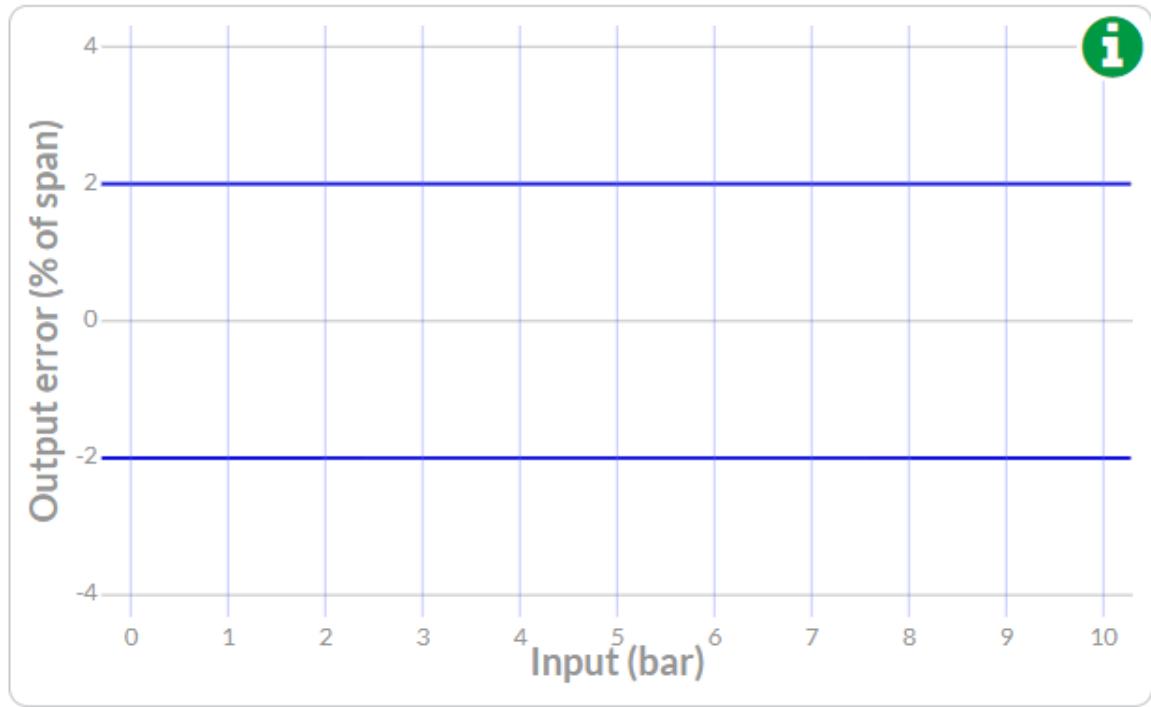


Figure 4: Constant error limit (% of span)

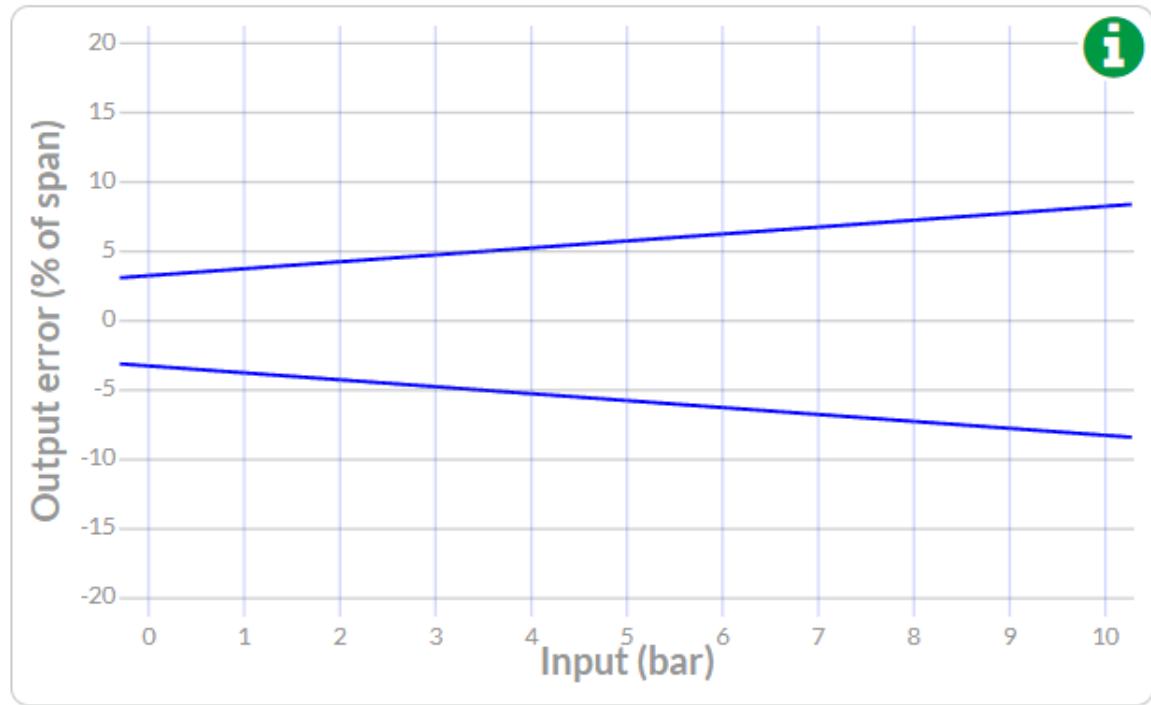


Figure 5: Relative error limit (% of reading)

Multiple error limits define a variable error limit across the span of measurement range. As an example, see the figure below.

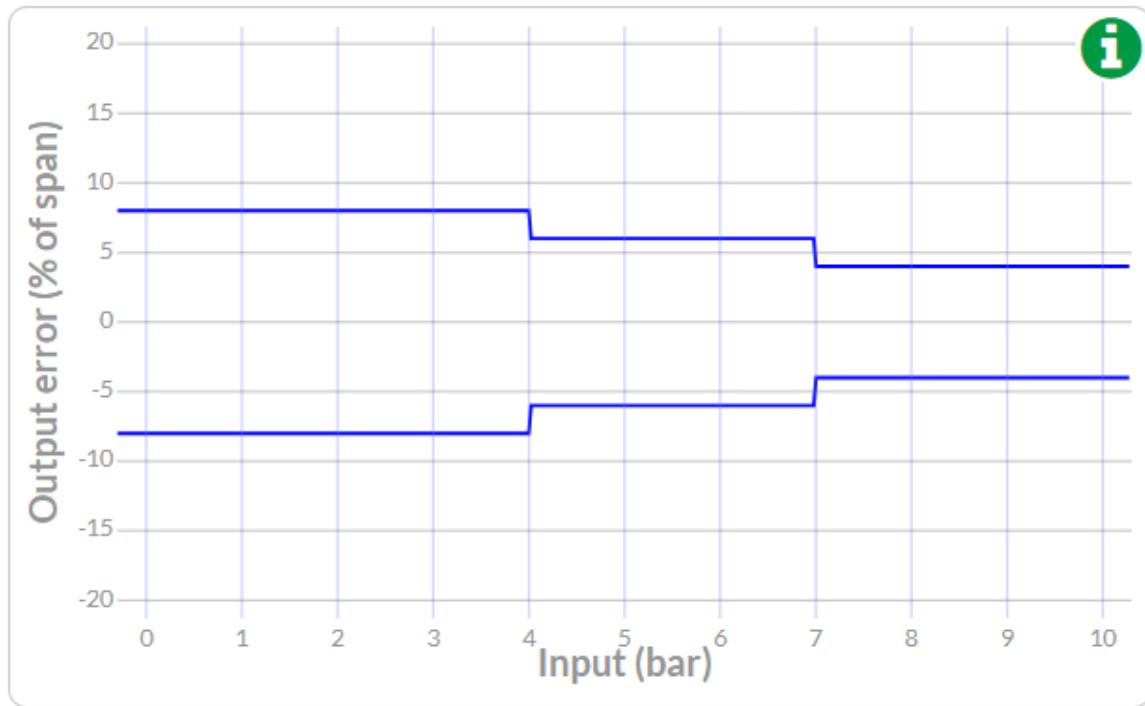


Figure 6: Multiple error limits

Asymmetric error limit allows error limits to have a positive or negative side offset, so that either more or less error may be allowed on positive or negative side. As an example, see the figure below where asymmetry allows more error on the negative side.

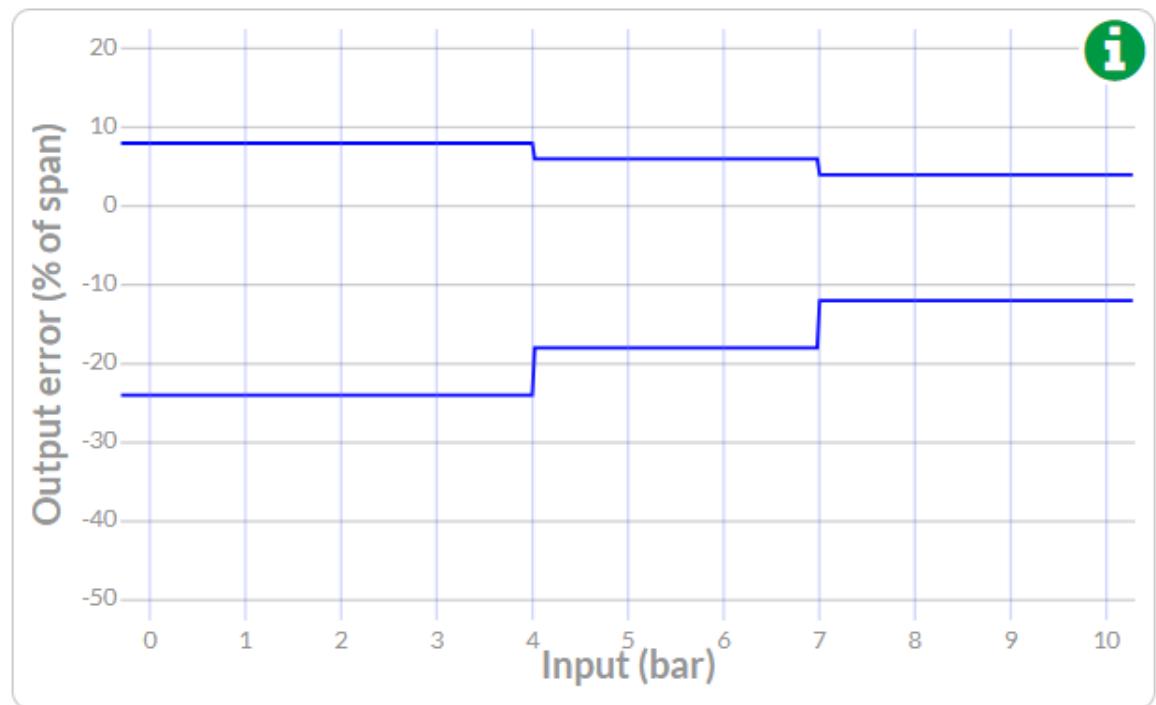


Figure 7: Asymmetric error limit

Additional error limits are optional error limits which help the calibration technician to decide whether the instrument should be adjusted.

Limit	Description
Adjust if error > (% of Reject if Error)	When error exceeds the limit, adjustment is recommendable.
Don't adjust if error < (% of Reject if Error)	When error is below the limit, adjustment is not needed.
Adjust to < (% of Reject if Error)	When adjusting, the maximum error after adjustment should be below this value.

Additional error limits are visualized in the error graph below, having values set to:

- 75% “Adjust if error”
- 75% “Don’t adjust if error”
- 50% “Adjust to error”

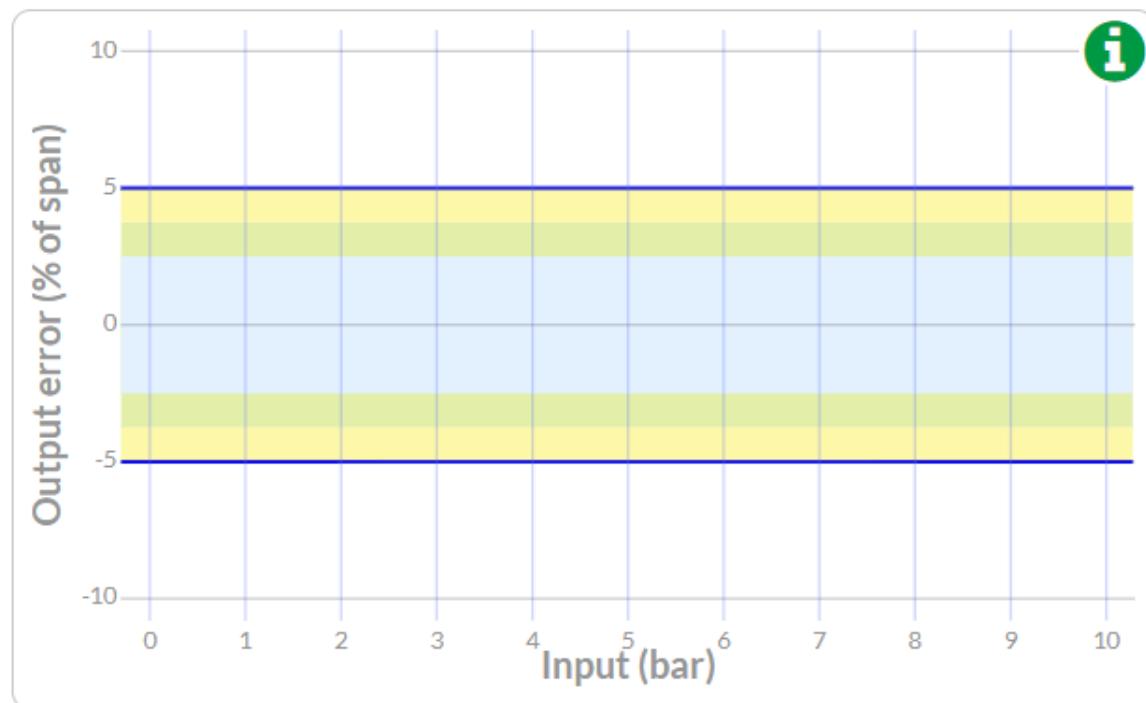


Figure 8: Additional error limits

Such configuration would mean:

- If calibration point error hits the yellow area nearest to the error limit, the instrument should be adjusted.
 - After the instrument is adjusted, its errors should stay within the blue area.
- If calibration point error hits the green area or is less than that, the instrument should not be adjusted.

2.6 Procedure

A procedure defines the instrument's calibration schedule and calibration test points.

Additional notes for the calibration technician can be given to be shown before, during and after the calibration run.

2.7 Plant Structure

The **plant structure** consists of **plant nodes**, defining a hierarchical structure to which instruments can be attached. The plant structure should represent the organization's sites and their respective structure. As an example, see the figure below.

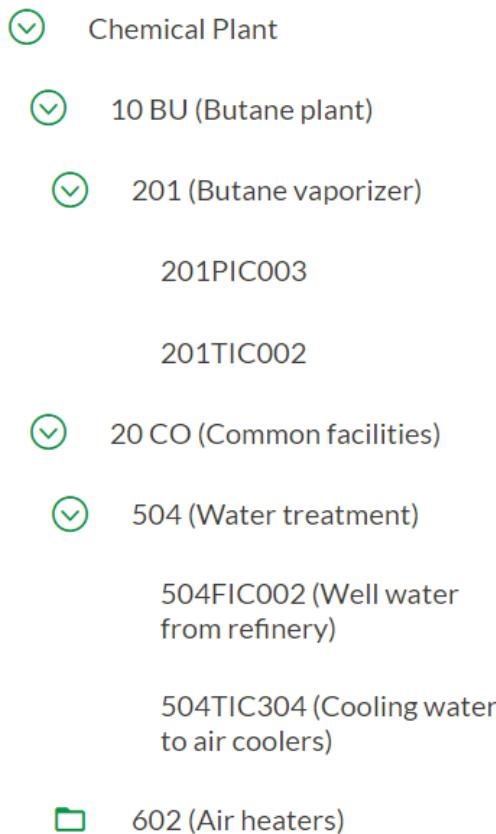


Figure 9: Example plant structure

3 Starting bMobile

bMobile communicates with two Beamex Calibration Management Systems: CMX and LOGiCAL. CMX supports communication over Sync (see *Beamex Sync Help*) and CWSI interfaces (see chapter [Calibration Web Service Interface \(CWSI\)](#)), while LOGiCAL only supports communication over the Sync interface. This initial selection defines which calibration management software and communication mode will be used. See following subchapters for more specific information about both systems. To change previously selected communication mode, see chapter [Settings](#).

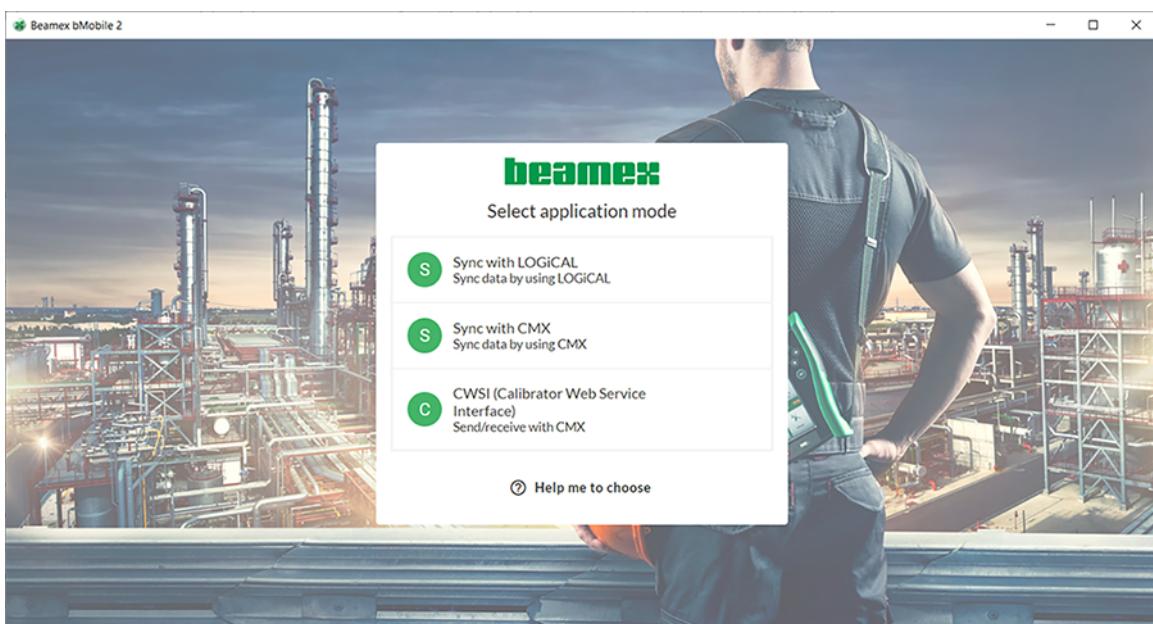


Figure 10: Communication mode selection screen

3.1 CMX with CWSI

This operating mode requires that your organization utilizes CMX with CWSI. For more information, see the *CMX Installation Guide* and the Appendix of this document.

Starting **bMobile** varies depending on whether there are any instruments or users available.

Additionally, the startup depends on whether **Mobile Security Plus** option is installed in CMX.

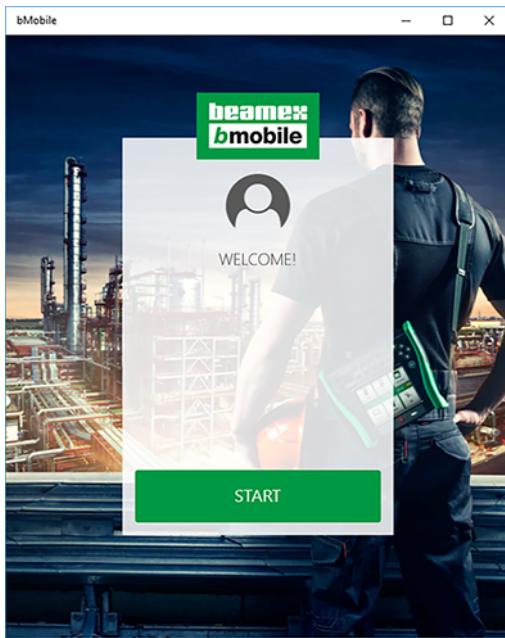


Figure 11: Welcome screen, when no instruments or users are available

3.1.1 No Mobile Security Plus

When Mobile Security Plus option is not installed/active, the logon screen is simple. Select user and login to open Home View/Instrument List.

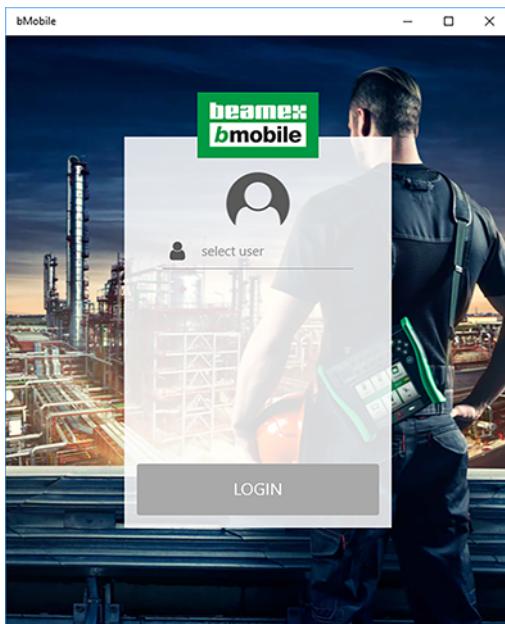


Figure 12: Login when there is no Mobile Security Plus

3.1.2 Mobile Security Plus In Use

When Mobile Security Plus option is active, the logon screen depends on whether the settings in CMX require that the user enters the User ID or whether the User ID can be selected from a list. In both cases, when necessary data is entered/selected: Tap on **Login** button to continue to Home View/Instrument List.

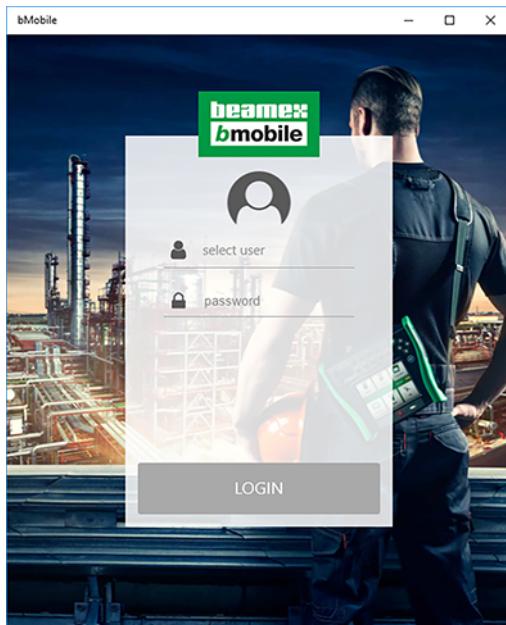


Figure 13: User ID available in list

3.1.3 Solving Login Problems with CWSI

In case the data in your application is not accessible, you must click/tap **Connect** or **Forgot Your Password?** link to continue. The shown screen depends on whether Mobile Security Plus is in use or not.

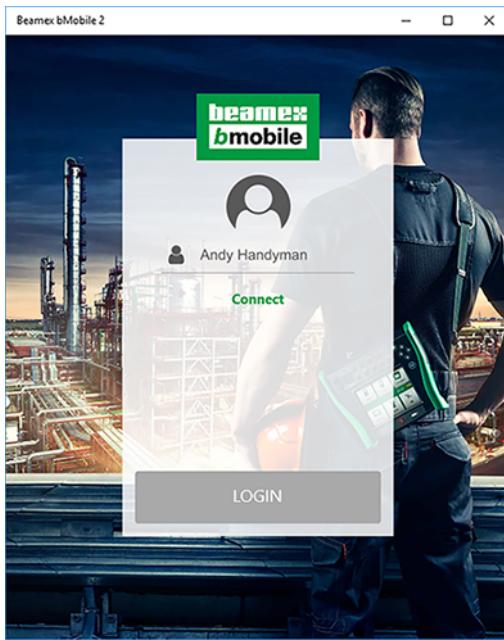


Figure 14: Connection problem when Mobile Security Plus is NOT in use

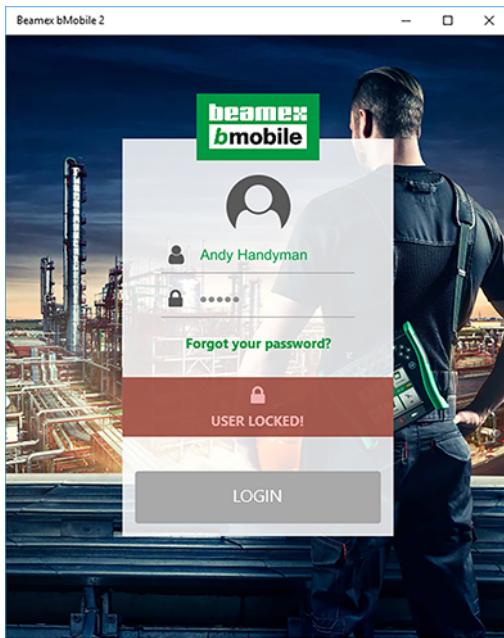


Figure 15: Connection problem when Mobile Security Plus IS in use

Note that the picture above also applies to the situation where the password is forgotten. The way to reconnect is similar in all the above mentioned situations



Note: If an instrument data sent from CMX does not include users, a dialog opens asking you to resend the instruments/users.

After clicking/tapping on **Connect** or **Forgot Your Password?**, the following window opens:

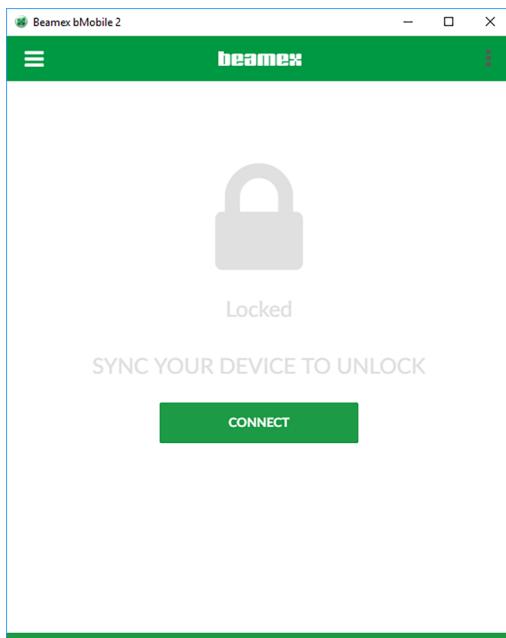


Figure 16: Lock window

The lock symbol means that there are instruments/results in **bMobile** that are not accessible without login.

Tap **Connect** in the **Lock** window or select **Connect** from the menu to reconnect (and unlock the password).

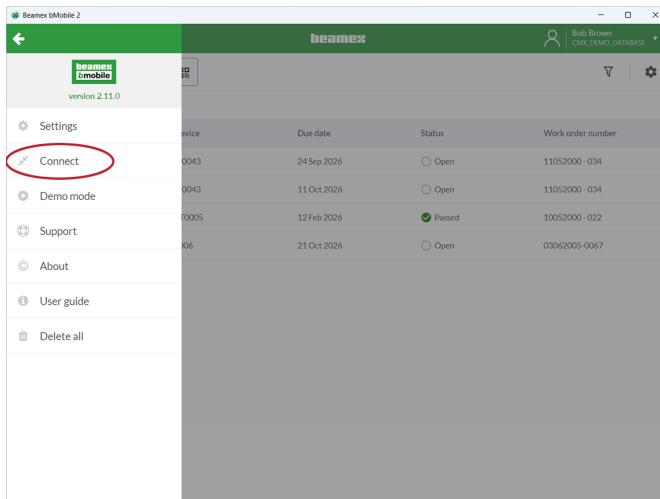


Figure 17: Menu with Connect option highlighted



Note: If you have totally forgotten your mobile password, reset it in CMX, then reconnect and send an instrument to **bMobile**.

3.2 CMX with Beamex Sync

This operating mode requires that your organization utilizes CMX with Beamex Sync. For more information, see *Beamex Sync Help*.

3.3 LOGiCAL Operating Mode

This operating mode requires that your organization utilizes LOGiCAL. For more information about getting started, visit the Beamex website.

By selecting LOGiCAL operating mode as described in [Starting bMobile](#), **bMobile** will communicate with LOGiCAL. Beamex **LOGiCAL** is a cloud-based calibration management software. You can store your instruments and references in the LOGiCAL database and use them as a basis for calibration tasks. The intuitive dashboard will let you know when your instruments are due for calibration.

You can plan your calibration work in LOGiCAL and assign the work to people doing the calibration. Once the calibration work is done, the results can be synchronized from the calibrator or mobile device to LOGiCAL.

You can find more information about LOGiCAL on the Beamex website.

If you wish to exit LOGiCAL mode, see chapter [Settings](#).

4 Sync

The following chapters contain information about Sync and how to sync data.

4.1 About Sync

The Sync mechanism is asynchronous, meaning the person assigning tasks and the person executing them do not need to be online at the same time. Data is queued and synchronized by the technician when online. This provides:

- Offline flexibility – Assignment of calibration work can happen any time. When technicians are online, they can sync the results of completed calibration tasks and automatically receive the newly assigned work.
- Reduced downtime – Work continues without waiting for both parties to be online at the same time.
- Better collaboration across time zones or shifts – Ideal for distributed teams.

4.2 Syncing Data

Sync must be initiated manually, but the sync process is fully automatic. If any user action is needed, user will be instructed within the sync progress screen.

In **Desktop mode**, start sync by clicking the highlighted button in the toolbar (see figure below).

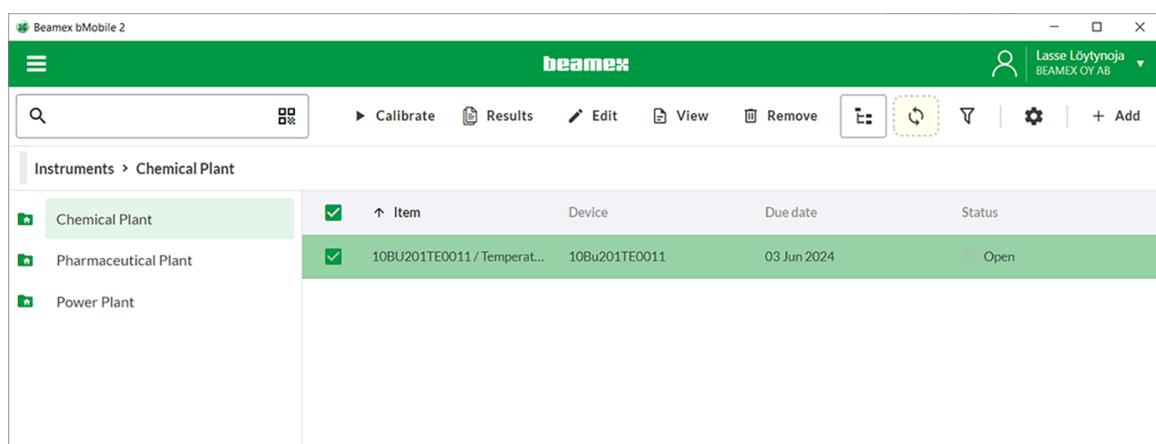


Figure 18: Sync on desktop

On a **mobile device**, press menu (1) and select Synchronize (2) (see figure below).

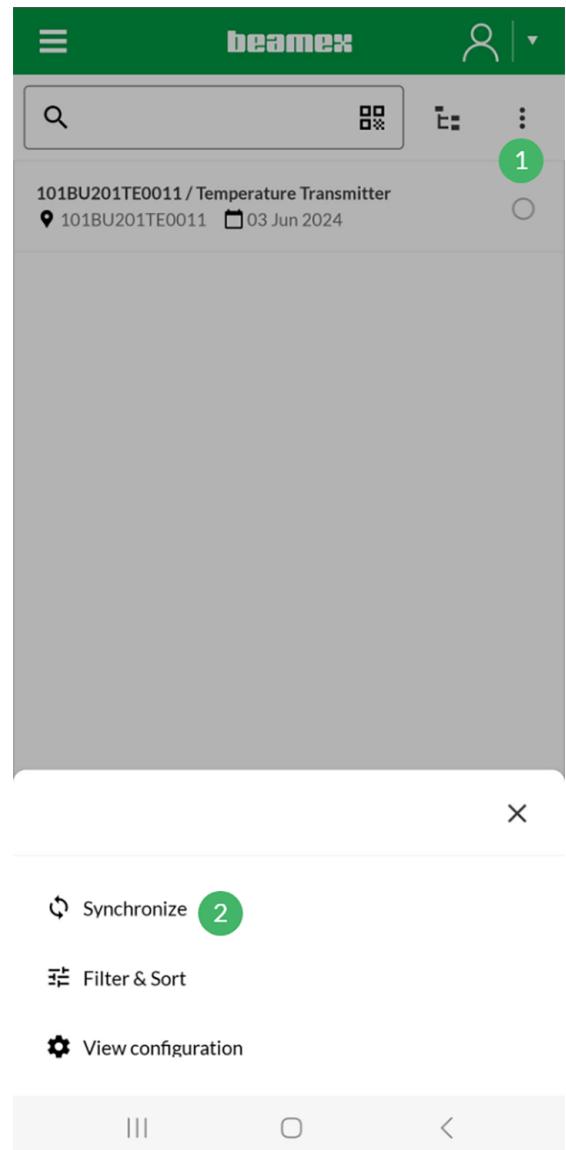


Figure 19: Sync on mobile device

5 Roles and Permissions

bMobile enforces the roles and permissions configured in LOGiCAL.

- bMobile supports Site-Based Access Control (different permissions for different sites within plant structure).
- If access control is not enabled in LOGiCAL, no access control is applied to bMobile either.
- The Organization Administrator role has the top priority. If a user has this role, it overrides the permissions of any other roles.

The table below explains how permissions affect bMobile:

LOGiCAL Permission Group	Effect
Instruments	Defines access for creating, editing, removing and reading instruments.
Plant structure	Defines access for creating, editing, removing and reading plant nodes.
Results	Defines access for creating (calibration), removing and reading results.

6 About the User Interface

One of the frequently seen elements in **bMobile**'s user interface is the expansion panel. An expansion panel can be identified from its gray bar. It shows/hides data presented below the expansion panel's gray bar/tab.

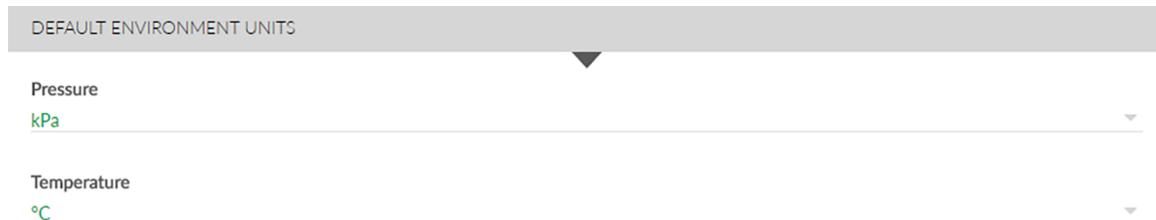


Figure 20: Default Environment Units expansion panel opened

Tap/click the gray bar/tab to open a hidden expansion panel. Similarly, close the expansion panel by tapping/clicking the gray bar/tab.

6.1 Home View – Main Menu

Main menu opens from Home View's upper left corner (☰). The menu may be closed, when needed, using the back arrow that replaced the (↶).

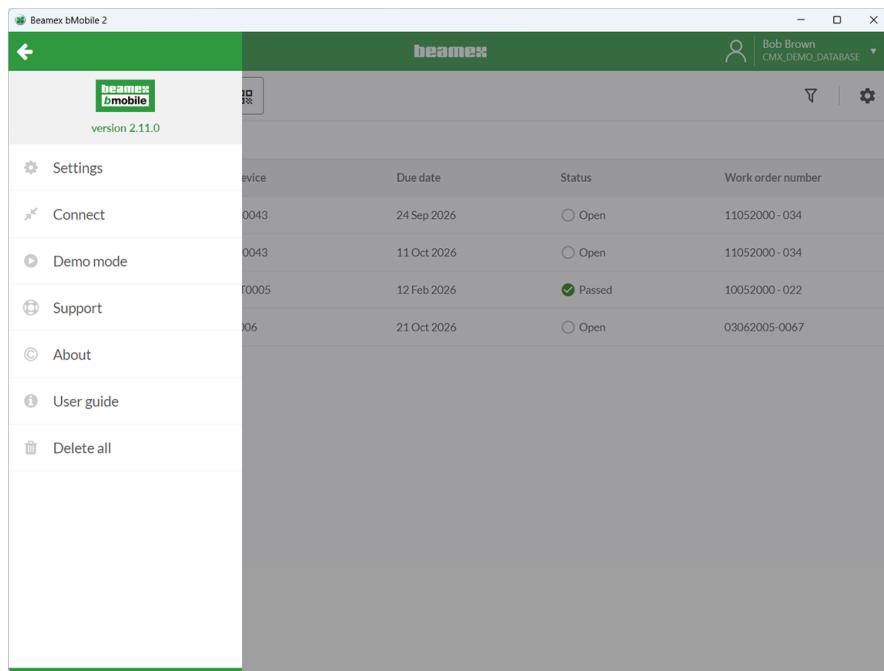


Figure 21: Main menu opened



Note: Whenever you need to return to Home View, use the back arrow(s).

The main menu items are explained in the chapters below.

6.1.1 Settings

Main Menu's **Settings** option opens a window for defining **bMobile's** settings:

General:

- **Language.**

Select the User Interface language.

- **Checklist execution.**

Decide on how the checklist runs advances: automatically or manually. If the checklist requires comments for all checks, use manual advancement to be able to add the required comments.

- **Date format.**

Select a suitable date format from the available options.

- **Time format.**

Select either 12 h or 24 h format.

- **Zoom level.**

Select one of the available zoom levels:

70 %, 85 %, 100 %, 115 % or 130 %.

- **Show Graph.**

Define whether the calibration graph is shown simultaneously while entering numeric calibration results. Options:

No, Yes or Auto.

The visibility also depends on the size of the used screen. The graph can always be seen by using the graph toggle button.

- **Show barcode reader.**

Choose whether the scan tool on Home View will be shown or not. For details, see chapter [QR/Barcode Reader](#).

- **Reference selection.**

Choose the default value when selecting references. Options:

Not defined, All points or This point.

- **Restore factory settings**

To switch between CMX and LOGiCAL operating modes, a "Restore Factory Settings" action needs to be performed. You will lose all the information after restoring. Access that setting from the context menu (three dots at the top right corner), see [Figure 22: Settings window](#).

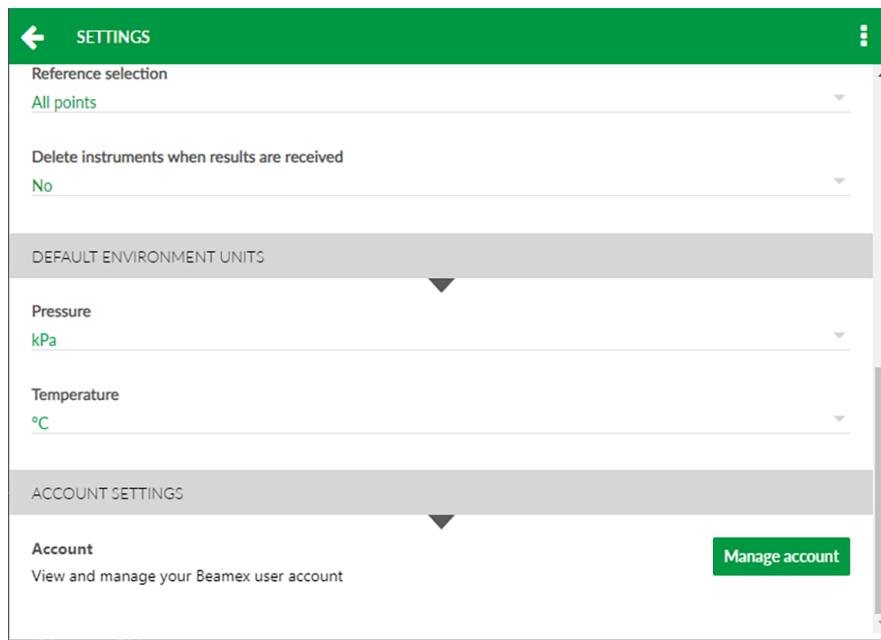


Figure 22: Settings window

Default environment units:

- **Pressure.**
The atmospheric pressure unit.
- **Temperature.**
The default temperature unit.



Note: In order to establish a secure connection, CWSI server needs to have an official certificate installed.

Account Settings:

- **Account.**
Press **Manage account** button to view and manage your myBeamex user account.
User account settings are opened in a new browser window.

Backend Settings:

- **Server address***.

Default value: connect.beamex.com.

Optionally: The location (url) where your own CWSI server resides.

- **Port***.

Default value: 443.

- **Endpoint***.

Default value: cwsi.

- **CMX User ID**

Default value: admin.

- **Description**.

Default value: bMobile.

- **Secure connection***.

Default value: On.

See also note below.

- **Secret**.

Password for connecting to cwsi/CMX.

Required when connecting to default server.



Note: If Mobile Security Plus is in use, Mobile Supervisors are the only ones allowed to change bMobile's communication settings, marked with an asterisk (*) in the above list. See also [Windows® Installation Specifics](#).

6.1.2 Connect

This screen allows to connect or disconnect to/from CWSI server. **Connect window must be open, when receiving instruments from CMX and sending results to CMX.**

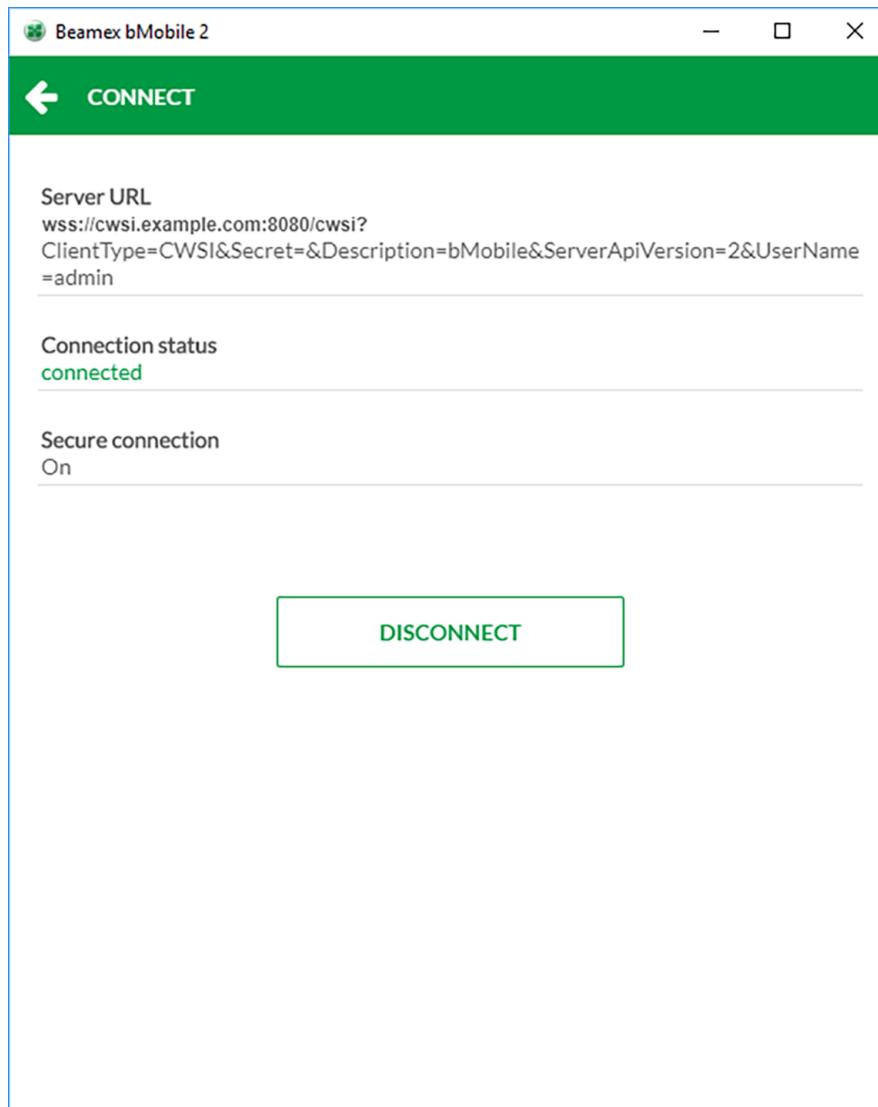


Figure 23: Connect window

All settings are defined in the **Settings** page. The server url and the connection type are presented in the read-only mode.



Note: This menu item is not visible when in the **Demo mode**.

6.1.3 Demo mode

The demo mode allows you to test **bMobile** functionality locally.

It includes some example instruments and a checklist to experiment with the **bMobile**. Demo mode can also be used for training purposes.

Item	Device	Due date	Status	Work order number
Free device / Pressure Transmitter	10PT021	Overdue 11 months	Open	
101DR-PI0014 / Checklist, IEC60079-17...	PI0043	Overdue 11 months	Open	11052000 - 034
101DR-PI0014 / Pressure Indicator	PI0043	Overdue 11 months	Open	11052000 - 034
101DR-PI0014 / Pressure Indicator (Free...	PI0043	Overdue 11 months	Failed	11052000 - 034
101DR-PT0002 / Pressure Transmitter	PT0005	Overdue 11 months	Open	10052000 - 022
101DR-TT0021 / Temperature Transmitter	TT0021	Overdue 11 months	Open	11052000 - 035
108U201TE001 / Temperature Sensor	12TE0021	Overdue 2 years	Open	11052000 - 037
1NG105006 / Pressure Switch	S006	Overdue 11 months	Open	03062005-0067
1NH10TT023Hart / Temperature transm...	TT023Hart	Overdue 9 months	Open	11052000 - 041
201DR-13016 (Loop) / 1 SCADA Temper...	10045T1SCADA	No due date	Open	13052000 - 157
201DR-13016 (Loop) / 2 Local Temperat...	0045T1	Overdue 2 years	Open	13052000 - 157
201DR-13016 (Loop) / 3 Temperature Tr...	0044T1	Overdue 2 years	Open	13052000 - 157
201DR-13016 (Loop) / 4 Temperature El...	0044TE	Overdue 2 years	Open	13052000 - 157
302QI-45253 / pH Indicator	302QI-45253	Overdue 2 years	Open	
403SA-W1001 / Weighing Instrument	403SA-W1001	Overdue 2 years	Open	

Figure 24: Demo mode window



Note: To indicate that you are in the Demo Mode, **bMobile** upper banner is gray. When not in the Demo Mode, Home View's upper banner is green. When ending the Demo Mode, all demo instruments' results are cleared. The instruments seen in the Demo Mode cannot be transferred to CMX or LOGiCAL.

6.1.4 Support

This menu item presents contact information to Beamex headquarters in Finland and to Beamex subsidiaries.

Support window also includes links to the manual, Beamex Youtube page and Beamex blog page.

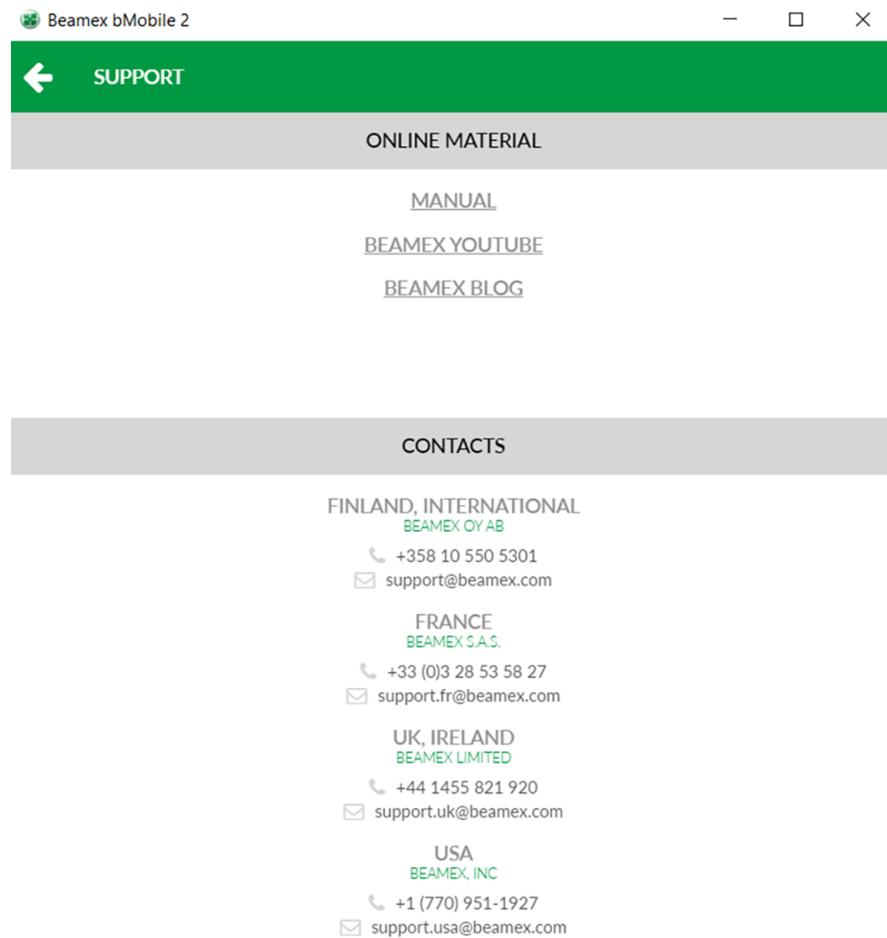


Figure 25: Support window

6.1.5 About

The About window presents information of the **bMobile** software at hand.

The serial number (highlighted in the picture) is unique for each user/installation.

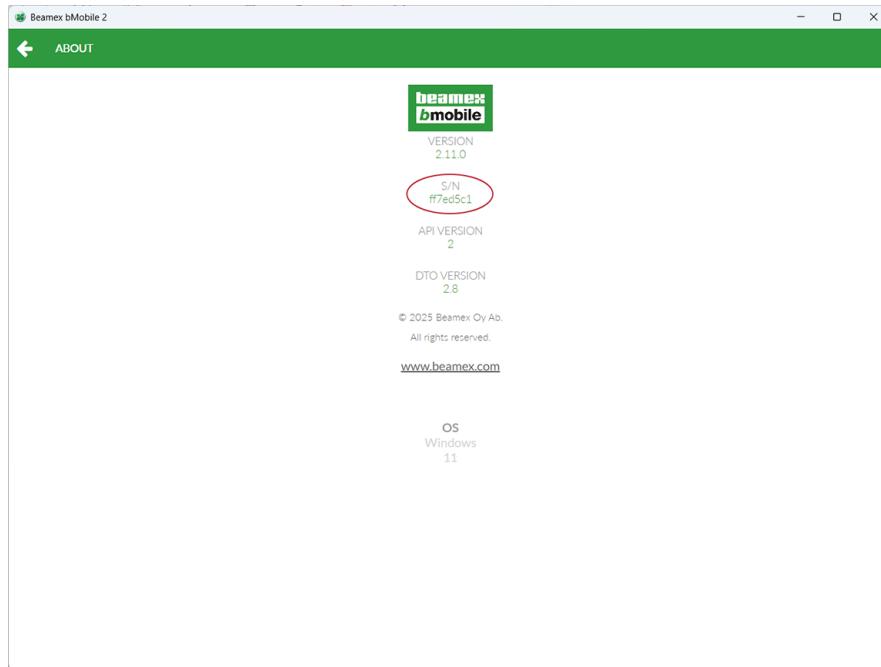


Figure 26: About window of bMobile

The serial number is shown in CMX Send/Receive window, when connecting to **bMobile**. This identifies the connection, when, e.g. multiple **bMobile** software are connected to CMX.

6.1.6 Sign Out

Signs user out from **bMobile**.

7 Managing Instruments

The following chapters contain information about how to manage instruments.

7.1 Instrument Management View

The instruments in your device are listed in the instrument management view. A row in the list represents an instrument function that can be calibrated.

In **Desktop mode**, the controls are as follows (see figure below):

1. Search field
2. Basic instrument management view controls
3. Show/hide the plant structure explorer
4. Sync with LOGiCAL or CMX
5. Show/hide the grouping and filtering controls
6. Open column configurator
7. Add instrument
8. Breadcrumb for plant structure
9. Instrument list columns

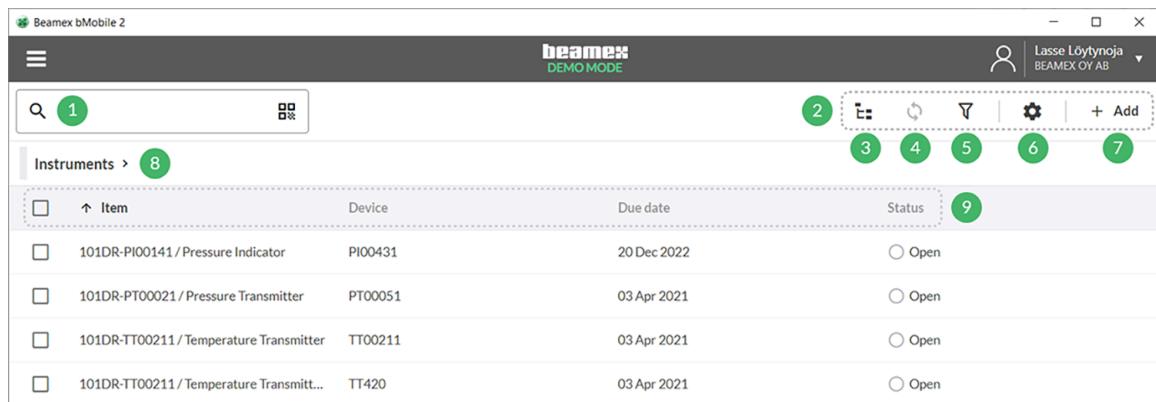


Figure 27: Instrument management view in desktop size

The instrument list columns are:

Item combines the position ID and the function name. If the instrument is a free device, then position ID is replaced with text “Free device”.

Device is the device ID of the instrument.

Due date is the calibration due date of the instrument.

Status represents the state that instrument is in:

- **Open** – The instrument doesn’t have any calibration started nor completed yet.
- **In progress** – The instrument has an ongoing calibration.
- **Passed** – The latest calibration result for the instrument has status “Passed”.
- **Failed** – The latest calibration result for the instrument has status “Failed”.

With **mobile devices**, the controls are (see figure below):

1. Search field
2. View plant structure browser
3. Menu containing sync, grouping and filtering, and column configuration controls
4. Breadcrumb showing current active plant structure level
5. Item combines position ID and function name
6. Device ID of the instrument
7. Calibration due date of the instrument
8. Instrument status (see desktop mode for explanation) in order from top: Open, In Progress, Passed, Failed
9. Add instruments

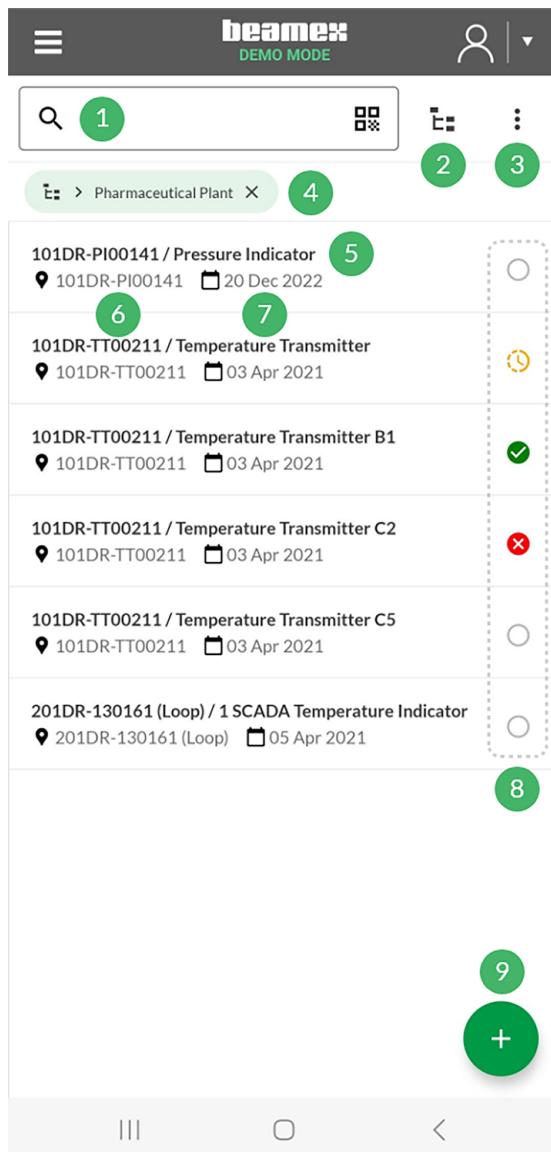


Figure 28: Instrument management view with mobile device



Note: Adding instruments and viewing a plant structure are features only available in LOGiCAL mode.



Note: You can select what columns are included in instrument list with column configurator.

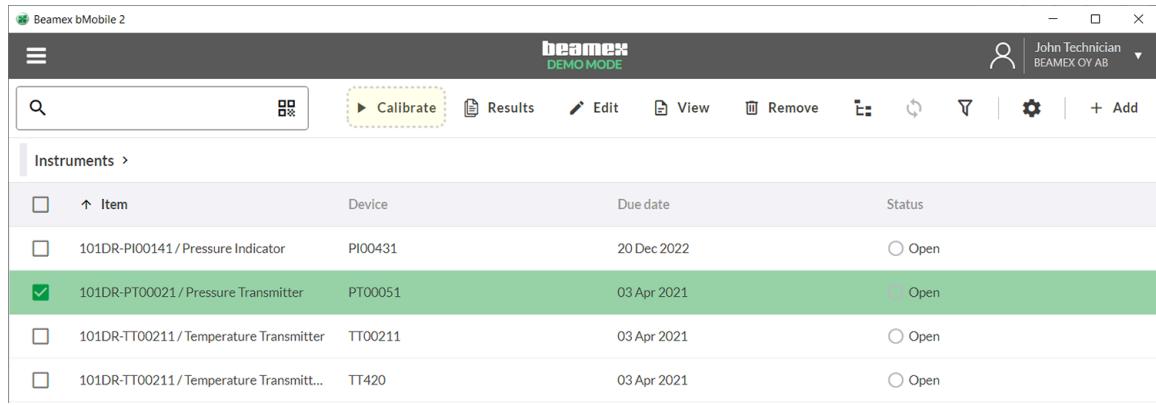


Note: To filter, sort or group the data to effectively find what you need, read more in chapter [Finding What You Need](#).

7.2 Starting Calibration

In **Desktop mode**, calibration can be started in two ways (see figure below):

- Click a row to activate it and select “Calibrate” in the toolbar
- Alternatively, right click on an instrument and select "Calibrate" in the context menu



<input type="checkbox"/>	Item	Device	Due date	Status
<input type="checkbox"/>	101DR-PI00141 / Pressure Indicator	PI00431	20 Dec 2022	Open
<input checked="" type="checkbox"/>	101DR-PT00021 / Pressure Transmitter	PT00051	03 Apr 2021	Open
<input type="checkbox"/>	101DR-TT00211 / Temperature Transmitter	TT00211	03 Apr 2021	Open
<input type="checkbox"/>	101DR-TT00211 / Temperature Transmitt...	TT420	03 Apr 2021	Open

Figure 29: Starting calibration in desktop mode

On a **mobile device**, start a calibration by pressing a row and click the green “Calibrate” button in the dialog that opens (see figure below).

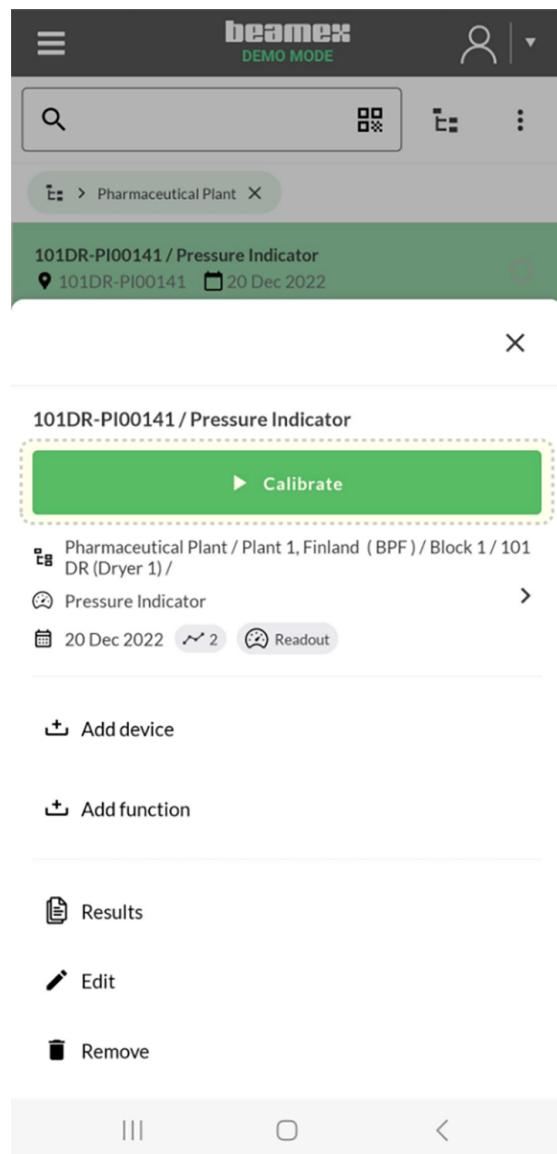


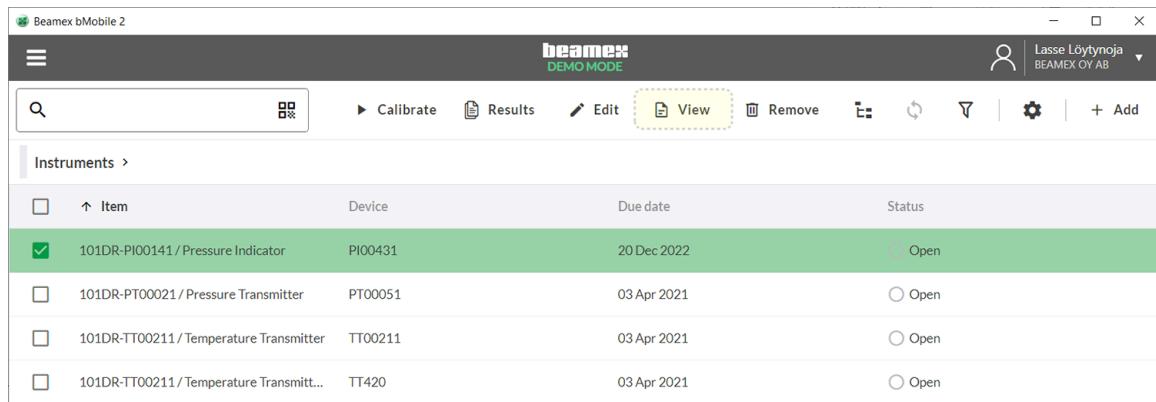
Figure 30: Starting calibration with mobile device

7.3 Viewing Instrument Details

You can view full details of an instrument (see figure below).

In Desktop mode:

- Click a row to activate it and select “View” in the toolbar
- Alternatively, right click on instrument and select “View” in context menu



<input type="checkbox"/>	Item	Device	Due date	Status
<input checked="" type="checkbox"/>	101DR-PI00141 / Pressure Indicator	PI00431	20 Dec 2022	Open
<input type="checkbox"/>	101DR-PT00021 / Pressure Transmitter	PT00051	03 Apr 2021	Open
<input type="checkbox"/>	101DR-TT00211 / Temperature Transmitter	TT00211	03 Apr 2021	Open
<input type="checkbox"/>	101DR-TT00211 / Temperature Transmitt...	TT420	03 Apr 2021	Open

Figure 31: Viewing instrument details on desktop

On a **mobile device**, view instrument details by pressing a row and click the control that shows the instrument details in the dialog that opens (see figure below).

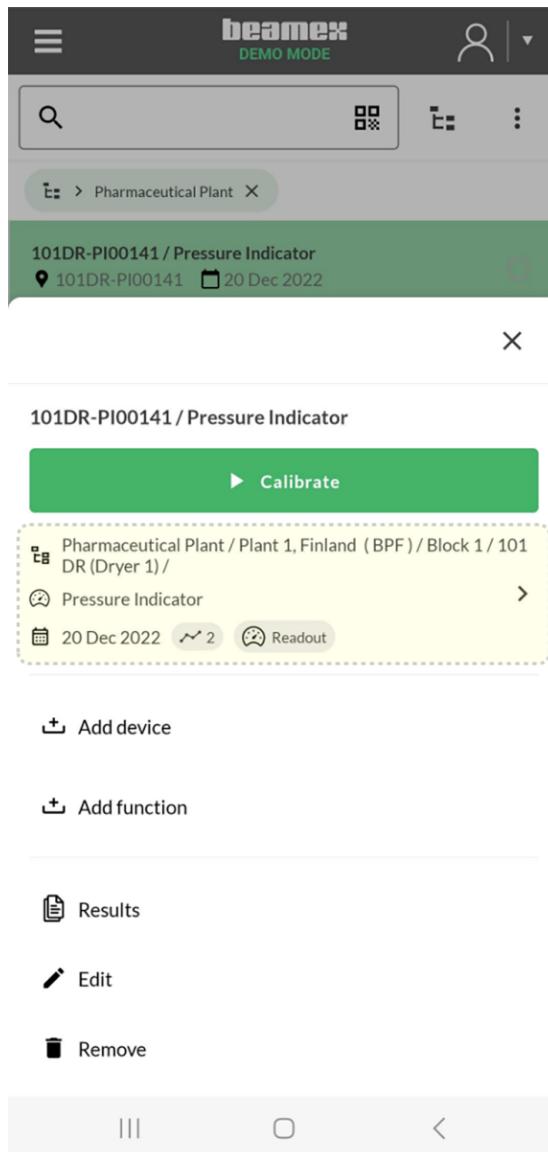


Figure 32: Viewing instrument details on mobile device

7.4 Viewing Calibration Results of an Instrument

If an instrument has calibration results, you can view full details of the result (see figure below).

In **Desktop mode**:

- Click a row to activate it and select “Results” in the toolbar
- Alternatively, right click on an instrument and select “Results” in the context menu

Item	Device	Due date	Status
101DR-PI00141 / Pressure Indicator	PI00431	20 Dec 2022	Open
101DR-PT00021 / Pressure Transmitter	PT00051	03 Apr 2021	Open
101DR-TT00211 / Temperature Transmitter	TT00211	03 Apr 2021	Open
101DR-TT00211 / Temperature Transmitt...	TT420	03 Apr 2021	Open

Figure 33: Viewing calibration results on desktop

On a **mobile device**, view results of an instrument by pressing a row and then press “Results” (see figure below).

101DR-PI00141 / Pressure Indicator

▶ Calibrate

Pharmaceutical Plant / Plant 1, Finland (BPF) / Block 1 / 101 DR (Dryer 1) / Pressure Indicator >

20 Dec 2022 ↗ 2 Readout

⊕ Add device

⊕ Add function

Results

Edit

Remove

Figure 34: Viewing calibration results on mobile device

7.5 Creating and Editing Instruments

Instruments can be created and edited in bMobile (see figure below).

Note: This feature is only available in LOGiCAL mode. If an instrument is synced from LOGiCAL or the instrument has a calibration result, the following fields are locked and cannot be edited in bMobile:

- Position ID
- Device ID
- Output category does not allow major type change (transmitter to switch, switch to transmitter)

In Desktop mode:

- To **create** an instrument, click “Add” in the toolbar:
 - Select either “Add instrument” or “Add free device” in the menu
- To **edit** an existing instrument:
 - Click a row to activate it and select “Edit” in the toolbar
 - Alternatively, right click on instrument and select “Edit” in context menu

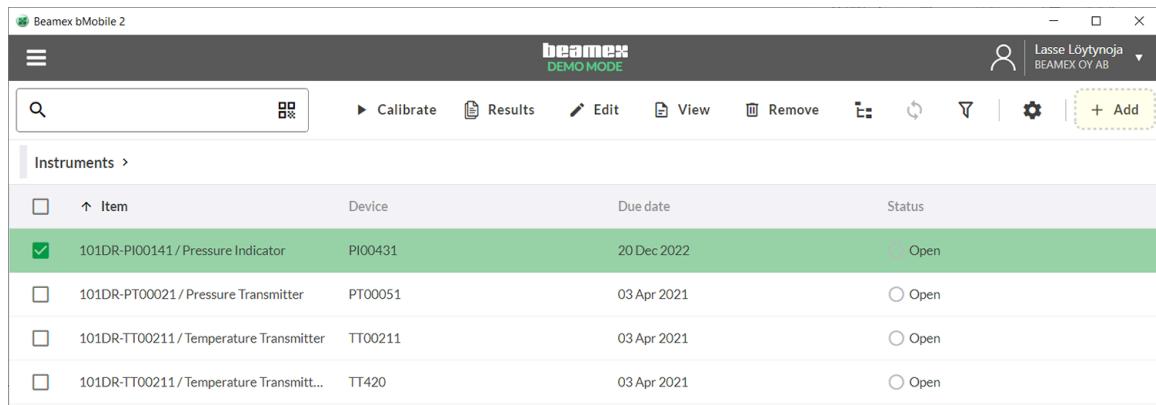


Figure 35: Creating instrument on desktop

On a mobile device:

- To **create** an instrument, press the big green button at the bottom of the screen (see figure below).
 - Select either “Add instrument” or “Add free device”

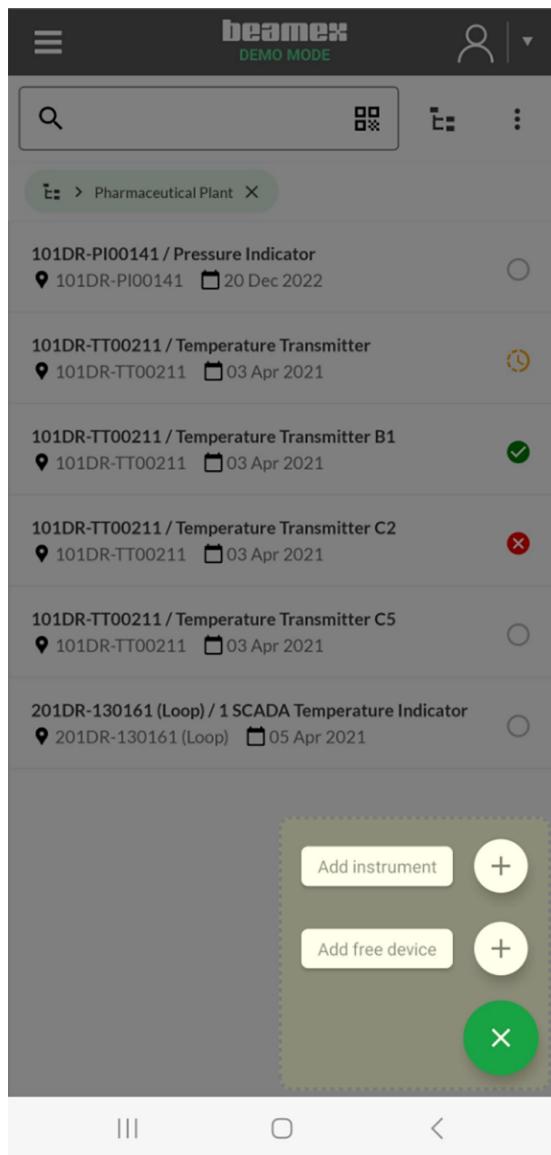


Figure 36: Creating an instrument on mobile device

- To **edit** an existing instrument, press a row and then press “Edit” (see figure below).

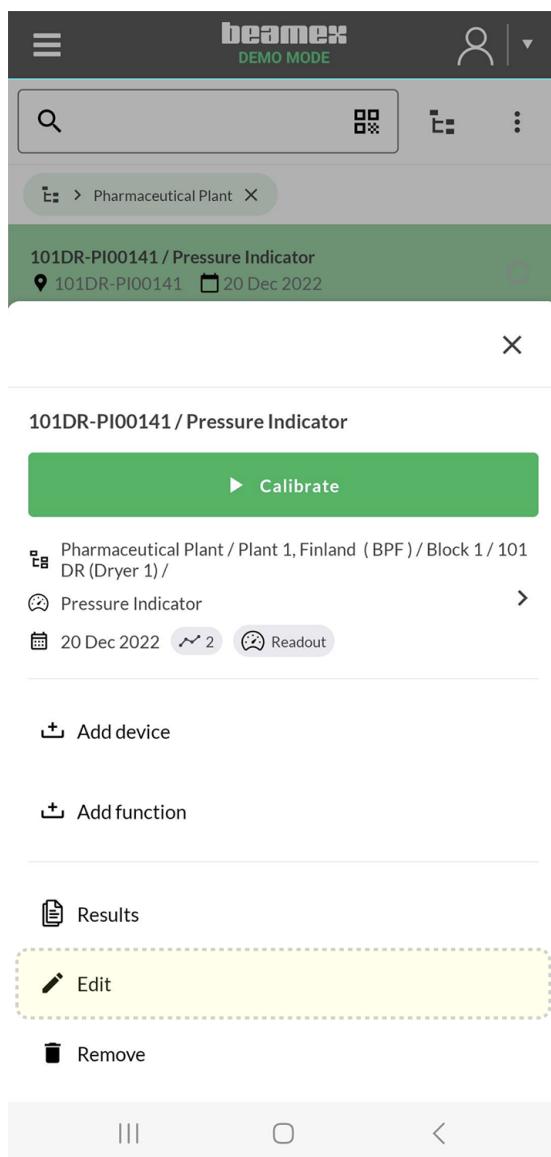


Figure 37: Editing an instrument on mobile device

7.6 Extending Instruments

An instrument can be extended by:

- Adding a device to a position. In practice this means that a single position would host more than one physical device.
- Adding a function to an instrument. In practice this means that a single device performs several measurement tasks (e.g chart recorder).



Note: This feature is only available in LOGiCAL mode.

In **Desktop mode** (see figure blow):

- Right click on an instrument and select “Add device” or “Add function” in the context menu.

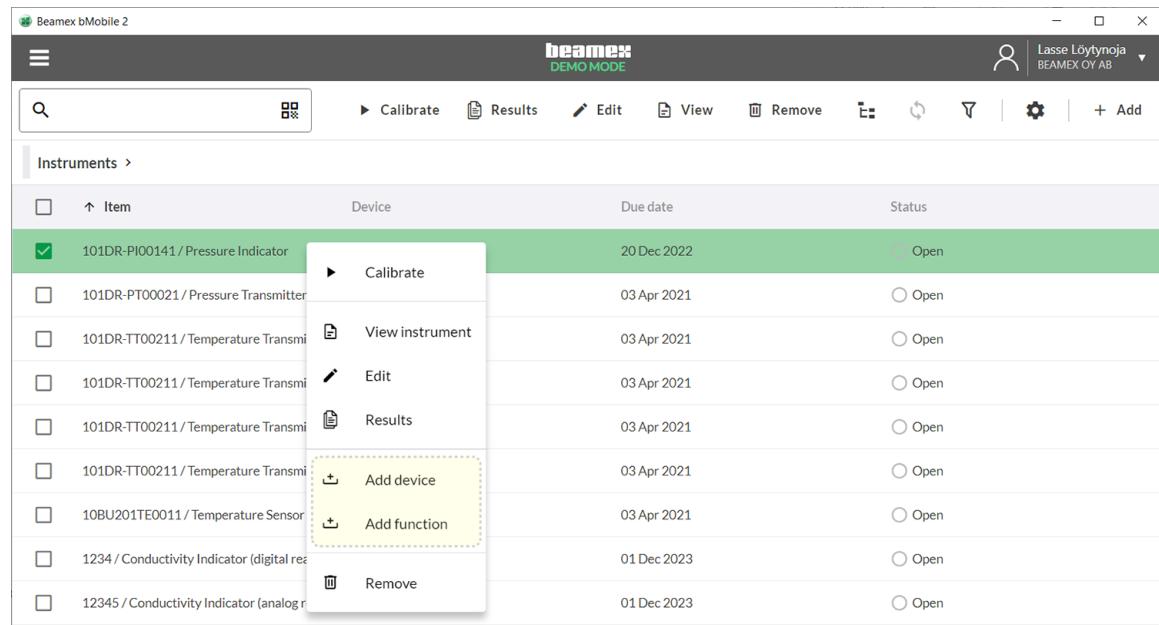


Figure 38: Extending an instrument on desktop

On a **mobile device**, extend an instrument by pressing a row and then press “Add device” or “Add function” in the dialog (see figure below).

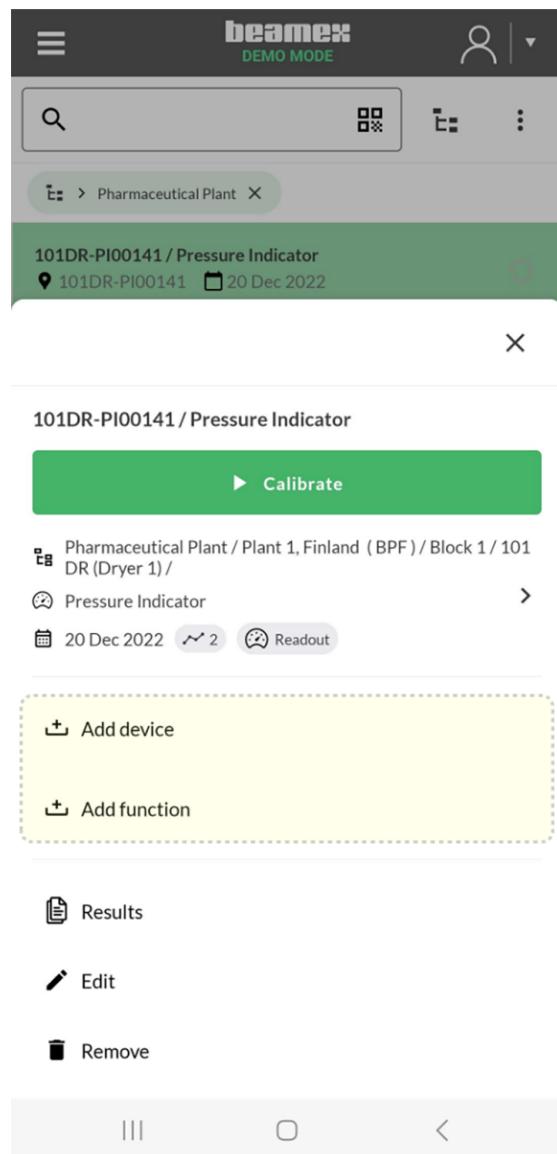


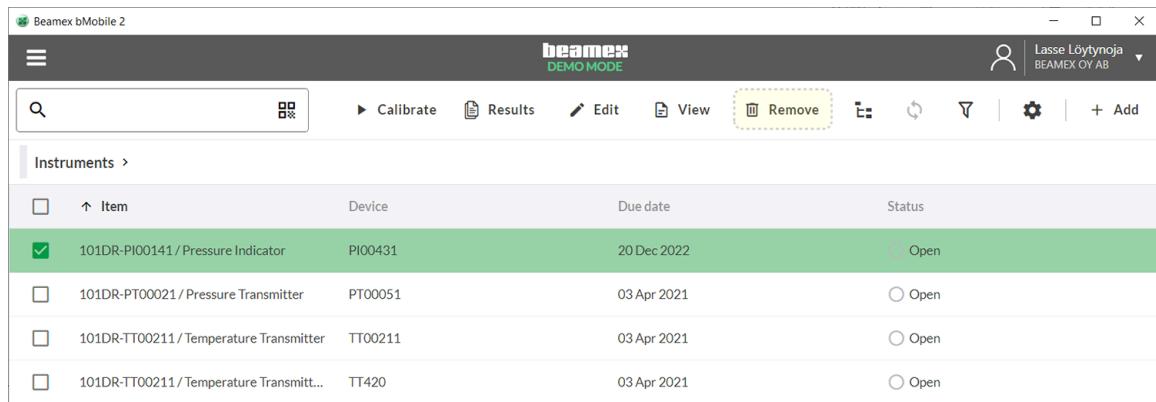
Figure 39: Extending instrument on mobile device

7.7 Removing Instruments

An instrument and all its results can be removed.

In **Desktop mode** (see figure below):

- Click a row to activate it and select “Remove” in the toolbar
- Alternatively, right click on an instrument and select “Remove” in context menu



<input type="checkbox"/>	Item	Device	Due date	Status
<input checked="" type="checkbox"/>	101DR-PI00141 / Pressure Indicator	PI00431	20 Dec 2022	Open
<input type="checkbox"/>	101DR-PT00021 / Pressure Transmitter	PT00051	03 Apr 2021	Open
<input type="checkbox"/>	101DR-TT00211 / Temperature Transmitter	TT00211	03 Apr 2021	Open
<input type="checkbox"/>	101DR-TT00211 / Temperature Transmitter	TT420	03 Apr 2021	Open

Figure 40: Remove an instrument on desktop

On a **mobile device**, remove an instrument by pressing a row and then press “Remove” (see figure below).

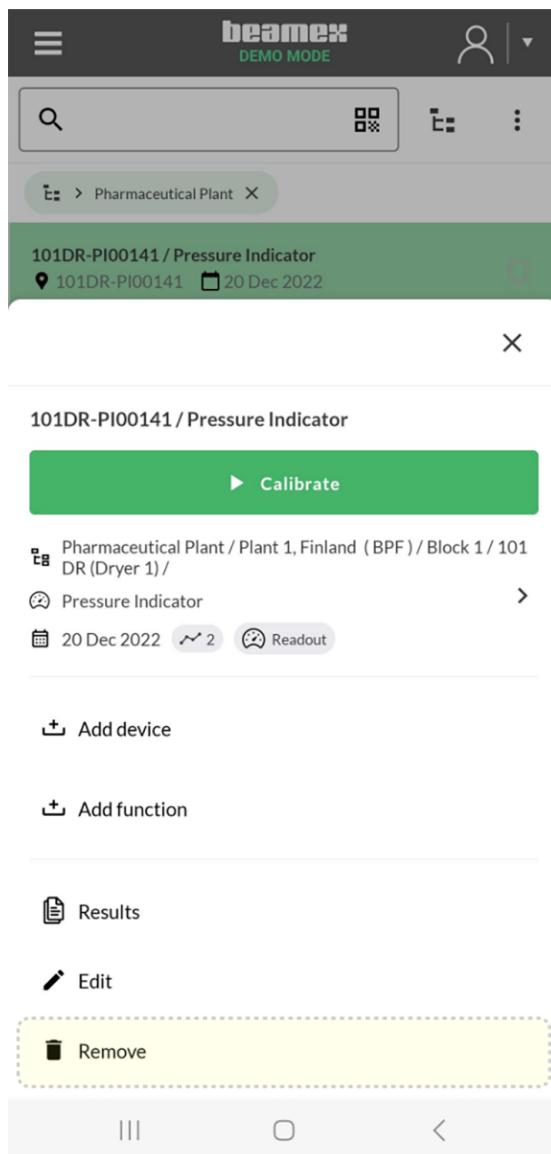


Figure 41: Remove instrument on mobile device



Note: Removing an instrument that has been synced in LOGiCAL will not remove the instrument from LOGiCAL. The instrument is only removed from your device.



Note: LOGiCAL access control affects the availability of instrument removal controls.



Note: Mobile Security settings in CMX affect the availability of instrument removal controls.

8 Managing Plant Structure

If your organization uses the plant structure, plant nodes are kept in sync with LOGiCAL, changes are synced to bMobile, and new nodes as well as modifications to the existing nodes are sent to LOGiCAL.



Note: Adding nodes and viewing a plant structure are features only available in LOGiCAL mode.

You can add, edit and remove plant nodes in bMobile, if sufficient permissions are granted in LOGiCAL.

To open the plant browser in **Desktop mode** (see figure below):

- Click **(1)** to show the plant browser **(2)**
- Click Edit **(3)** to open the plant editor

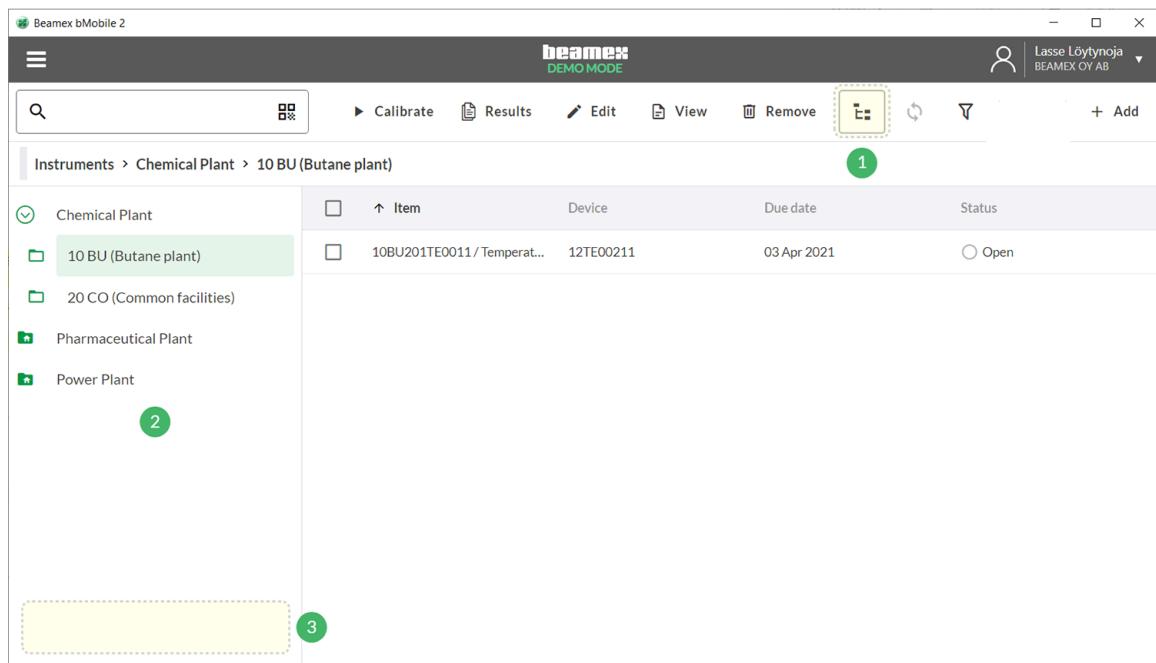


Figure 42: Manage plant structure on desktop

To open the plant browser on a **mobile device** (see figure below)

- Click (1) to show the plant browser (2)

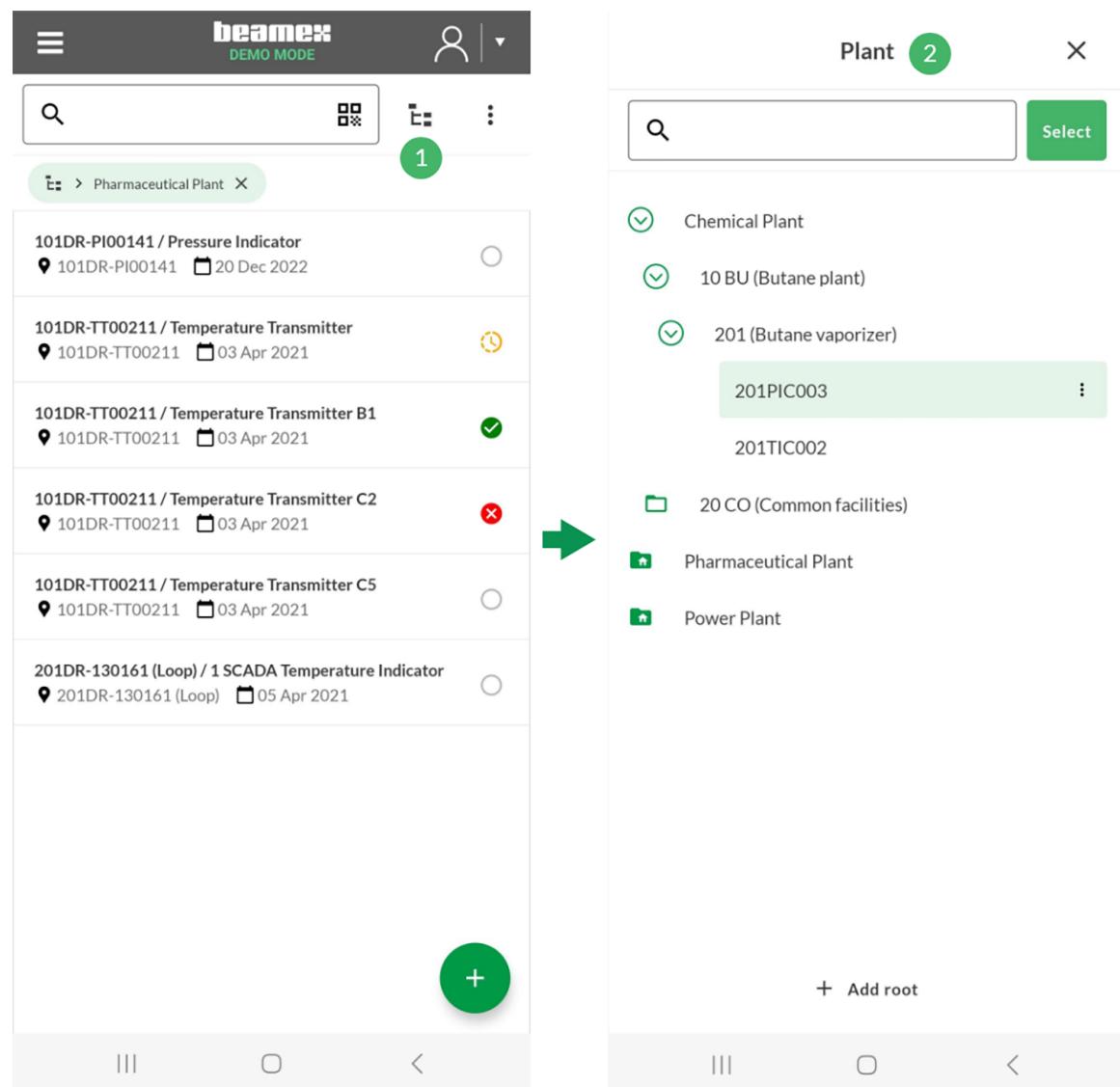


Figure 43: Manage plant structure on mobile device

8.1 Adding, Editing and Removing Plant Nodes

In the plant editor view, select a node and open the menu in the end of the highlighted row. In the context menu (1) you can select:

- **Edit** – Edit plant node details like name, description, and parent node, if you wish to move the node.
- **Add** – Add new plant node. The node will be a child node for the selected node.
- **Remove** – Remove plant node. If a node does not have sub-nodes nor instruments tied to it of any of its sub-nodes, it can be removed.
- **View** – View plant node details.

From **Add root** button (2) you can add a new root node to the plant structure. A root node is a first-level node like Chemical Plant or Power Plant, shown in the figure below.

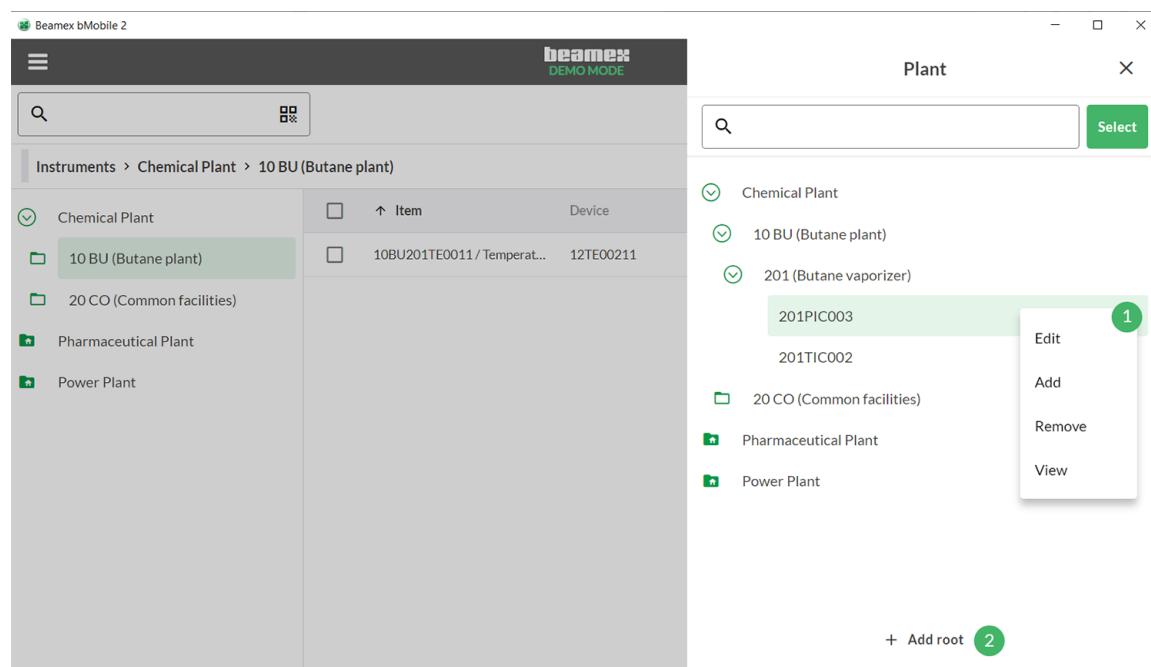


Figure 44: Plant node context menu on desktop

On a **mobile device**, the plant editor view is similar to the desktop view (see figure below).

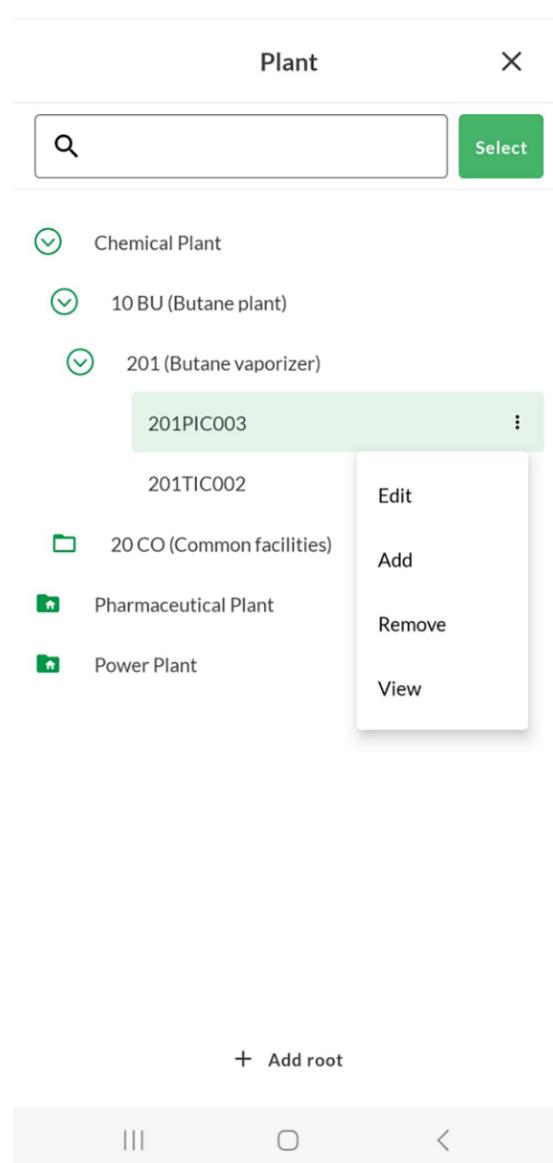


Figure 45: Plant node context menu on mobile device

9 Finding What You Need

This chapter explains the search, sort, filter and grouping capabilities that bMobile offers.

9.1 Plant Structure Filter



Note: Plant filter is a features only available in LOGICAL mode.

In **Desktop mode**, plant filter can be applied (see figure below).

- Show plant browser by pressing **(1)**.
- Select a plant node to filter **(2)**. In the figure below, 10 BU (Butane plant) has only one instrument **(3)**.
 - Selecting the root node of the site, like **Chemical Plant**, shows all instruments belonging to that site. To narrow down the selection, select plant node deeper in the structure.
- Selected plant path is reflected to breadcrumb **(4)**. Any part of breadcrumb can be clicked to change the active node.
- To reset the plant filter and show all instruments in the device, click on “**Instruments**” in breadcrumb.

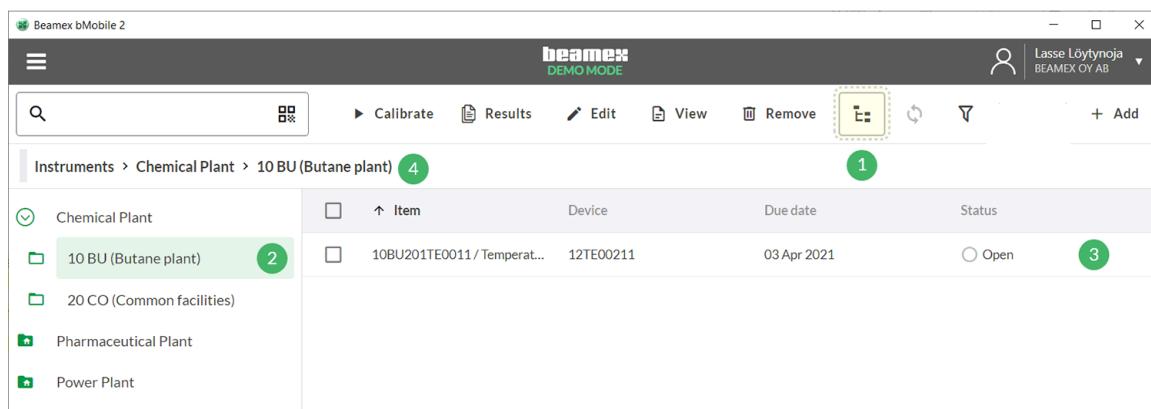


Figure 46: Plant filter on desktop

On a **mobile device** (see figure below):

- Show plant browser by pressing (1).
- In plant browser (2), select a plant node to filter by and apply filter by pressing “Select” (3). In the figure below, 10 BU (Butane plant) has only one instrument (4).

 - Selecting the root node of the site, like **Chemical Plant**, shows all instruments belonging to that site. To narrow down the selection, select plant node deeper in the structure.

- Selected plant path is shown in the breadcrumb (5). The number in the breadcrumb indicates how many nodes are hidden in-between.
- To reset the plant filter and show all instruments in the device, click on the small “X” at the end of the breadcrumb.

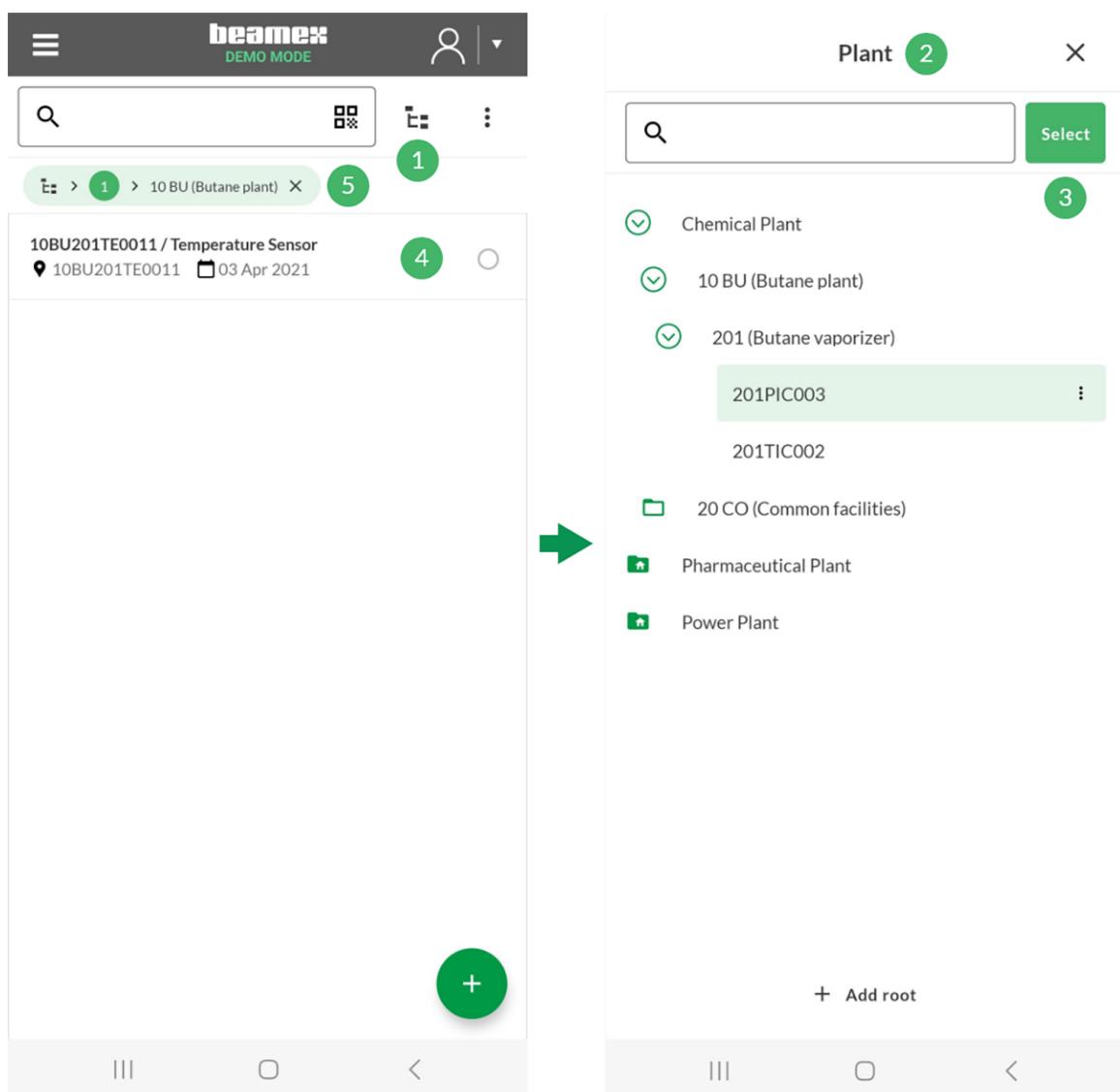
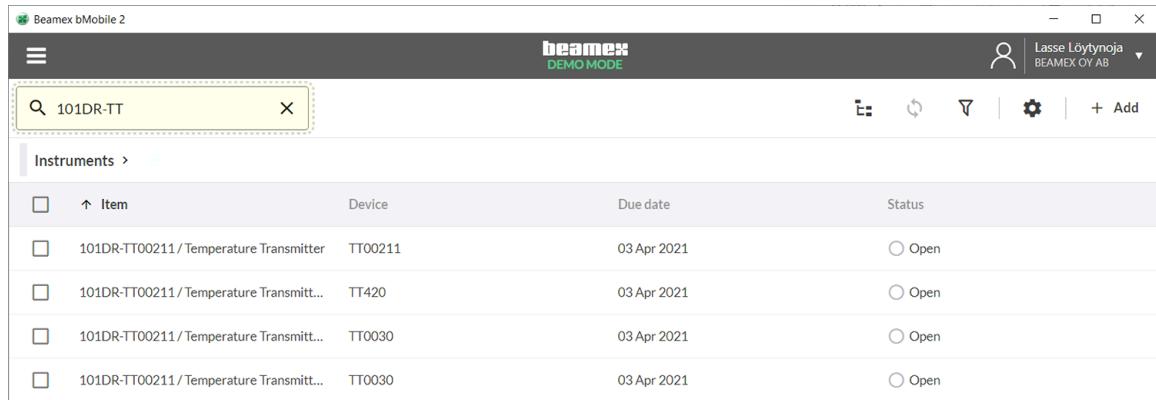


Figure 47: Plant filter on mobile device

9.2 Searching

To search for an instrument by item, device or work order ID, enter the search term in the search field and click enter (see figures below - desktop and mobile device).



The screenshot shows the Beamex bMobile 2 application interface. At the top, there is a search bar with the text "101DR-TT". Below the search bar is a table titled "Instruments". The table has columns: "Item", "Device", "Due date", and "Status". There are four rows of data, each representing a different instrument entry. All entries are marked as "Open".

Item	Device	Due date	Status
101DR-TT00211 / Temperature Transmitter	TT00211	03 Apr 2021	Open
101DR-TT00211 / Temperature Transmitt...	TT420	03 Apr 2021	Open
101DR-TT00211 / Temperature Transmitt...	TT0030	03 Apr 2021	Open
101DR-TT00211 / Temperature Transmitt...	TT0030	03 Apr 2021	Open

Figure 48: Search on desktop

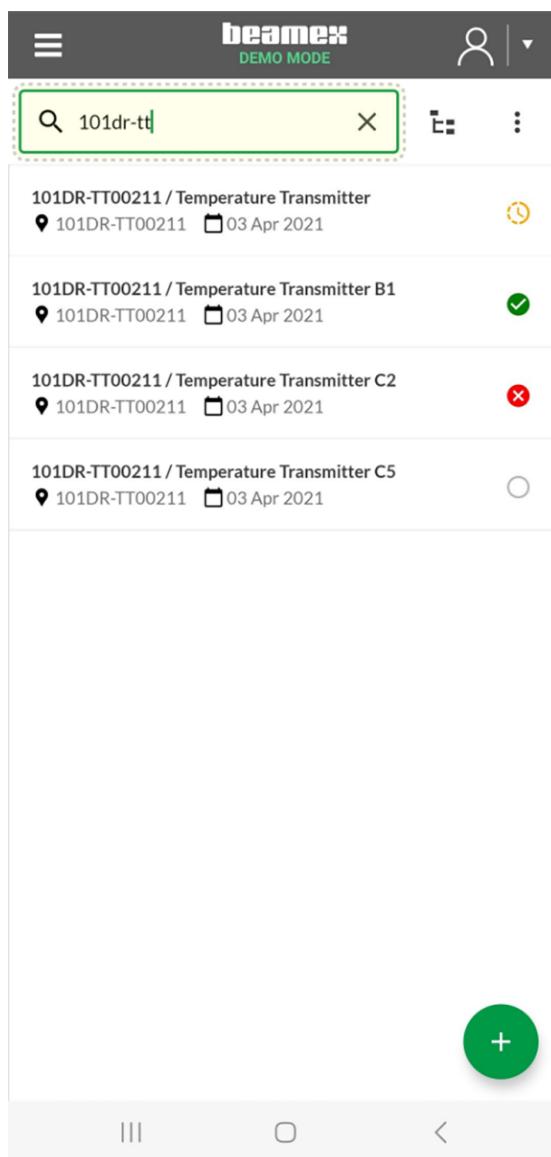


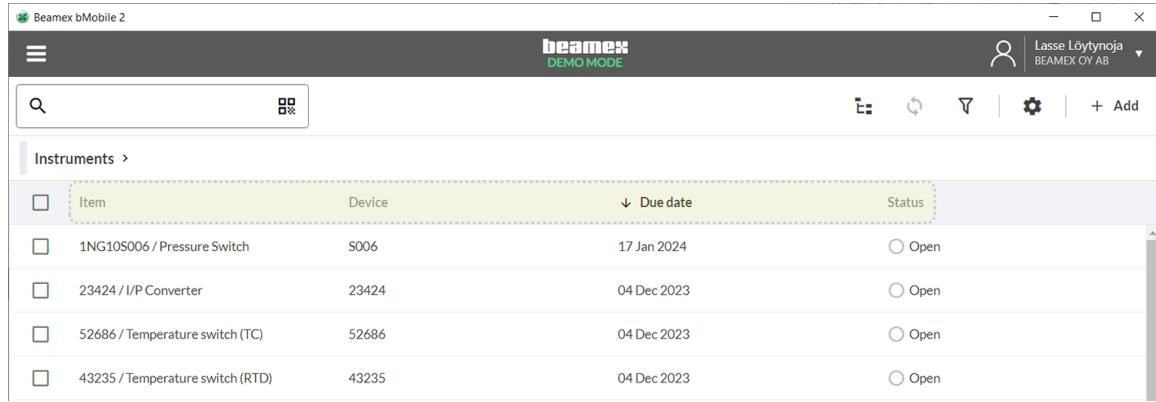
Figure 49: Search on a mobile device

9.3 Sorting

The instrument list can be sorted by any column, in ascending or descending order (see figure below).

In **Desktop mode**, sorting can be done in the following way:

- Click on any of the column headers. The arrow indicates the ascending or descending order.



Item	Device	Due date	Status
1NG10S006 / Pressure Switch	S006	17 Jan 2024	Open
23424 / I/P Converter	23424	04 Dec 2023	Open
52686 / Temperature switch (TC)	52686	04 Dec 2023	Open
43235 / Temperature switch (RTD)	43235	04 Dec 2023	Open

Figure 50: Sorting on desktop mode

On a **mobile device**, enable sorting in the following way (see figure below):

- Press menu (1) and select Filter & Sort (2).
- From dialog, select property to sort by (3).
- Press property again to change sort order.

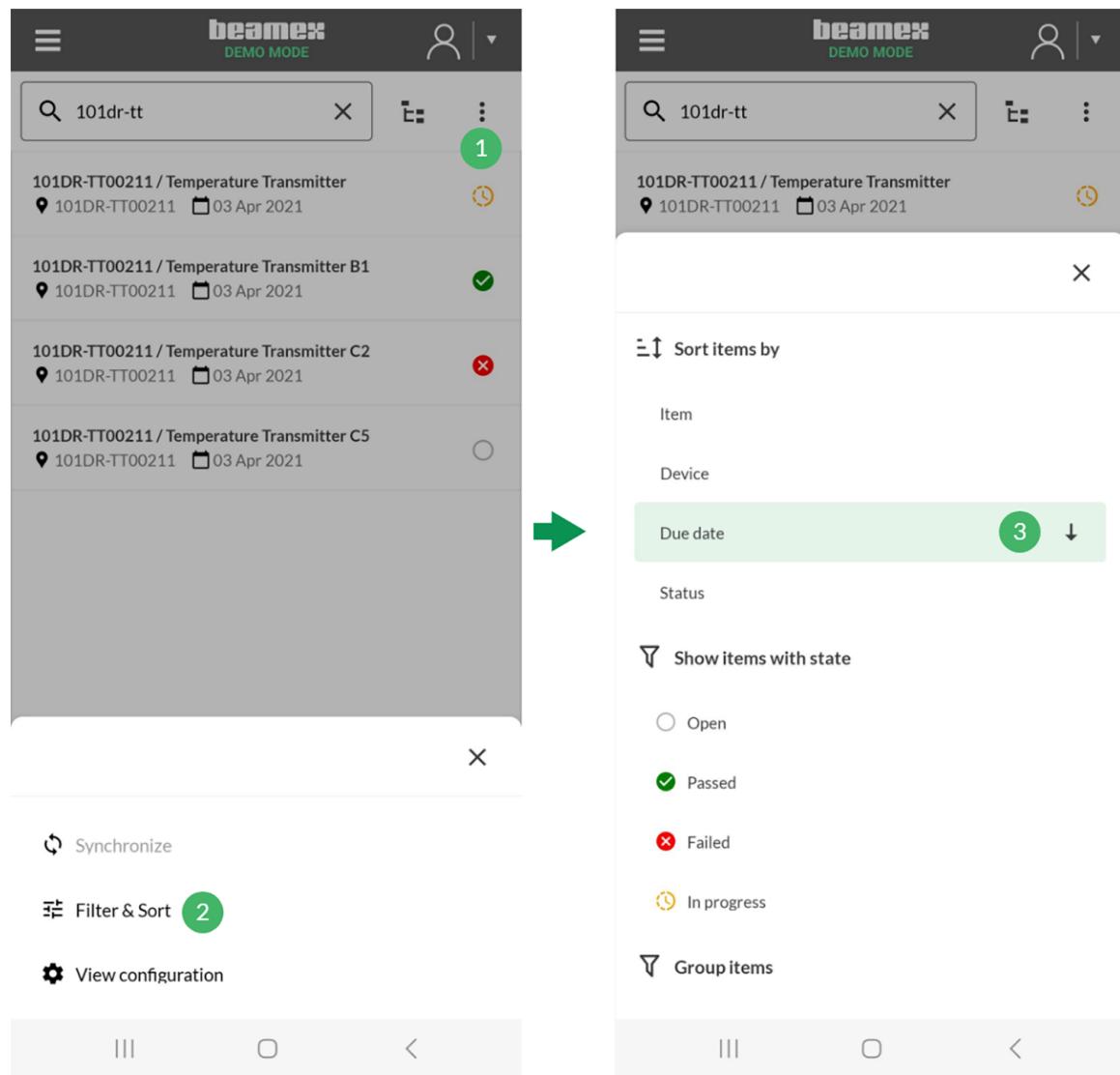


Figure 51: Sorting on mobile device

9.4 Filtering and Grouping

Filtering and grouping can be applied to the instrument list (see figure below):

- Filtering can be done by instrument state – for example set filter to “Open” to only see instruments that are in “Open” state.
- Grouping:
 - **Group by position** – Visually group all functions that belong to same position.
 - **Group by device** – Visually group all function that belong to same device.

In **Desktop mode**, filtering and grouping can be done in the following way:

- Click on (1) to show the filter & grouping sidebar (2).
- Apply state filter (3) and/or enable grouping (4).
- Active filtering and grouping are always shown as chips below toolbar (5).
- If Group by Position is enabled, the groups are presented in an instrument list (6).

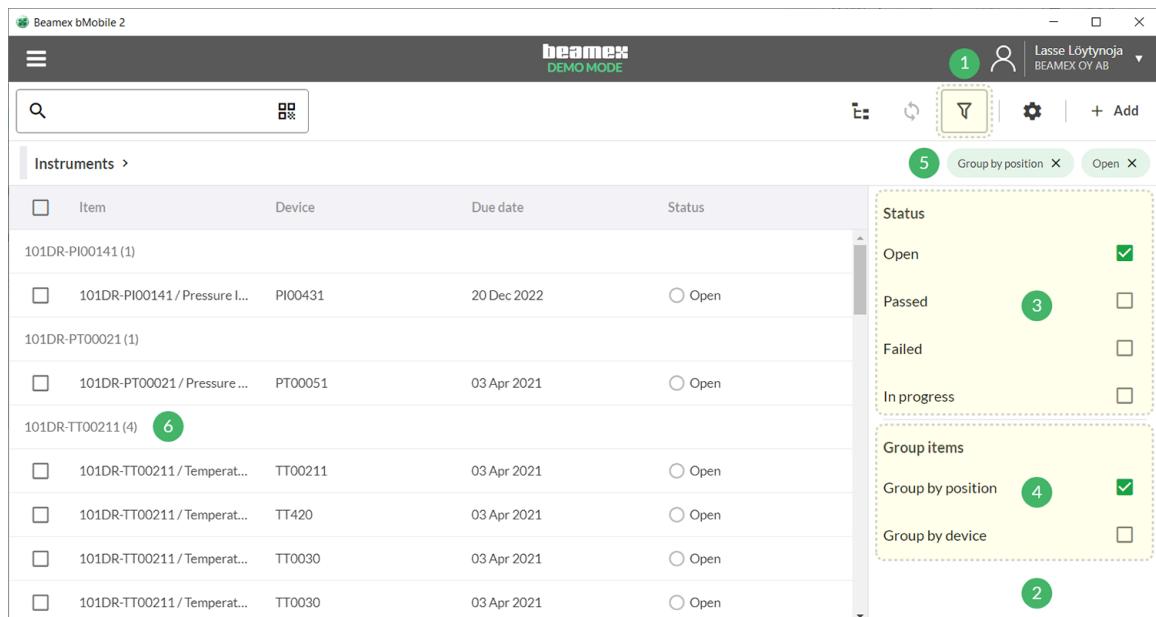


Figure 52: Filtering and grouping on desktop

On a **mobile device**, filtering and grouping can be done in the following way (see figure below):

- Press menu (1) and select Filter & Sort (2)
- In dialog, select:
 - State to filter (3)
 - Type of grouping (4)

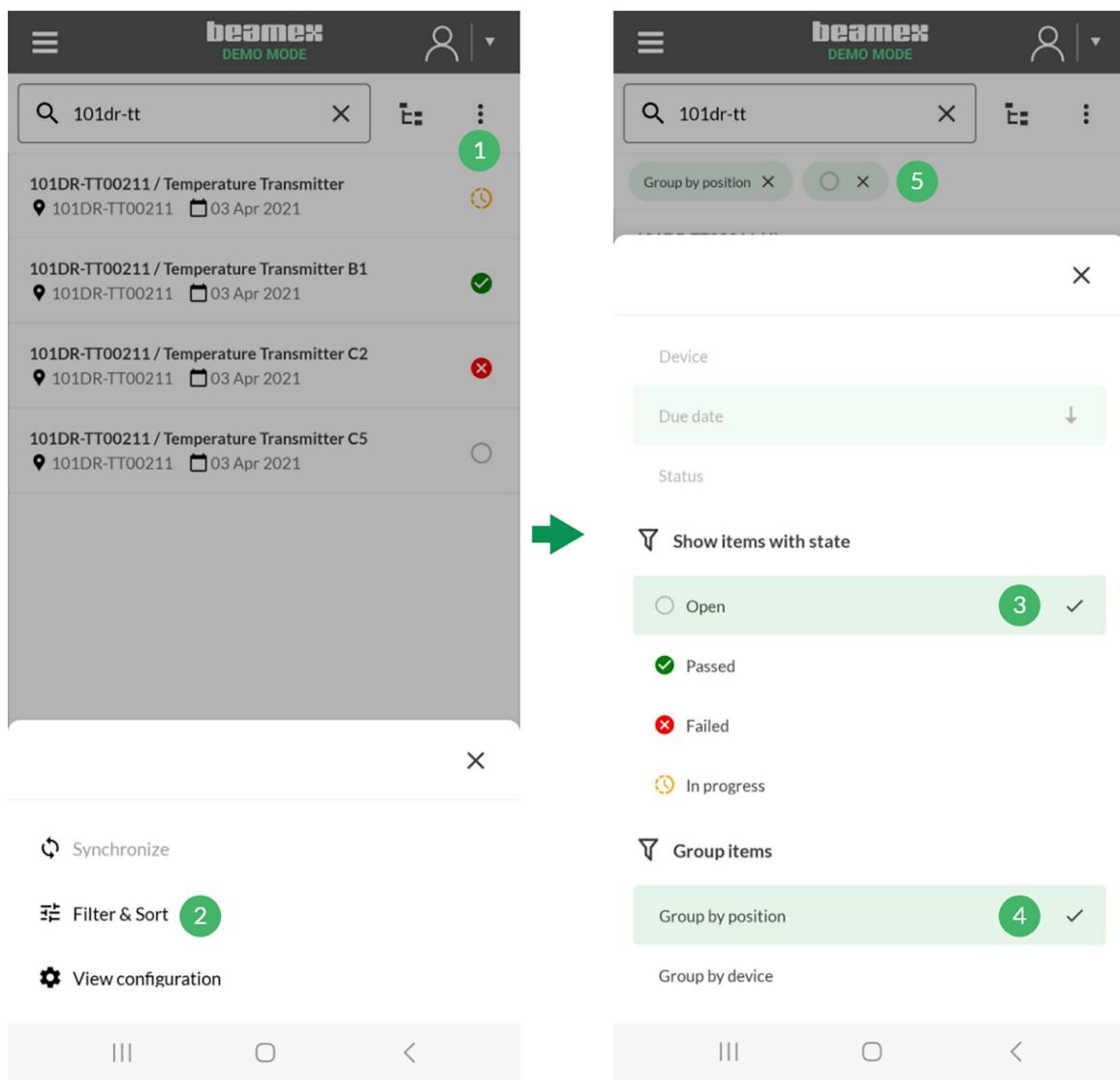


Figure 53: Filtering and grouping on mobile

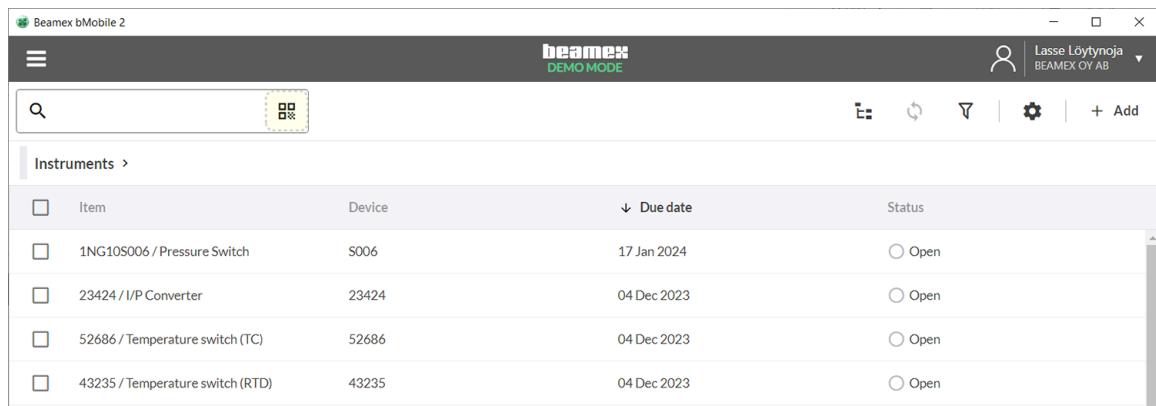
9.5 QR/Barcode Reader

If your device has a camera, it can be used as a barcode reader to find instruments from your device.

To use the barcode reader on desktop and mobile devices, follow these steps (see figure below):

- Click on the QR symbol in the search field.
- When the camera is open, point it to the code you want to read.
- When the code is read successfully, the value of the code is applied as a search string and the instrument list is filtered with it.

Supported barcode types are QR, EAN128, CODE128, UPC-A.



The screenshot shows the Beamex bMobile 2 software interface. At the top, there is a header with the title 'Beamex bMobile 2', the 'beamex DEMO MODE' logo, and a user profile for 'Lasse Löytynoja BEAMEX OY AB'. Below the header is a search bar with a QR code icon. To the right of the search bar are several icons: a magnifying glass, a refresh symbol, a downward arrow, a gear, and a '+' sign followed by 'Add'. The main content area is titled 'Instruments >'. It contains a table with the following data:

Item	Device	↓ Due date	Status
1NG10S006 / Pressure Switch	S006	17 Jan 2024	Open
23424 / I/P Converter	23424	04 Dec 2023	Open
52686 / Temperature switch (TC)	52686	04 Dec 2023	Open
43235 / Temperature switch (RTD)	43235	04 Dec 2023	Open

Figure 54: QR/barcode reader on desktop

10 Calibration/Checklist run

When you have selected an instrument or a checklist from the instrument list, the Instrument overview window opens. Select the **Start** button to start the Calibration/Checklist run.

bMobile supports calibrating/checking many types of instruments. The user interface adapts to the instrument at hand during Calibration/Checklist run. Each case is presented further on.

10.1 Modes

The following subchapters describe the modes in which calibrations and inspections can be performed.

10.1.1 Calibrations

Calibrations can be performed in either of the following modes:

- **Table mode** – All calibration points are shown in a grid, and values can be entered in any order.
- **Point by point mode** – Calibration points are presented, and values are entered sequentially one at a time, from the first point until the last point is accepted.

By default, calibrations use **Table mode**. The default mode can be changed in the application settings.

10.1.2 Inspections

Inspections can be performed in either of the following modes:

- **List mode** – All check items are displayed in a list.
- **Check by check mode** – Check items are presented one by one.

Values for check items can be entered in any order in both modes. By default, inspections use **List mode**. The default mode can be changed in the application settings. In Windows environments, the use of either mode can also be enforced with a configuration parameter.

10.2 Common Features

The following subchapters present the common features and functionalities shared across calibration and inspection views.

10.2.1 App Header

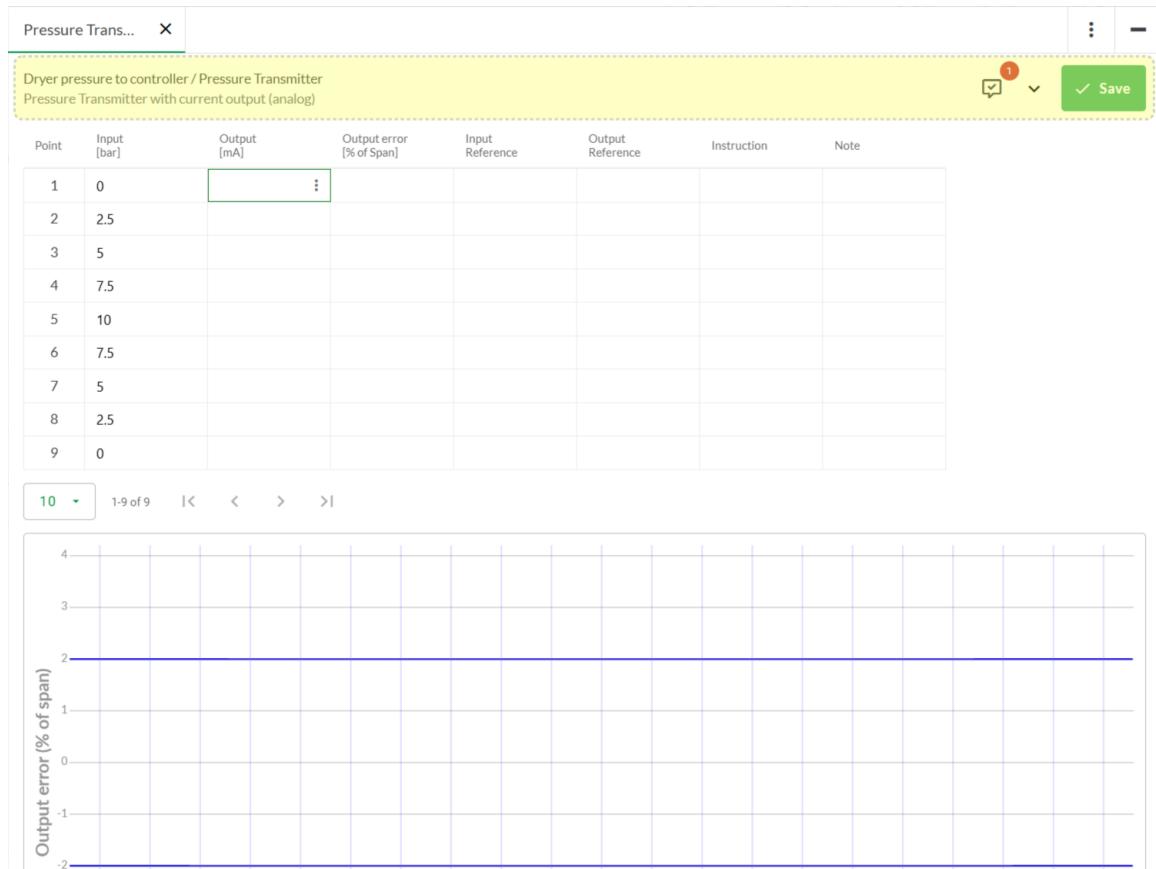


Figure 55: App header

The app header displays the instrument and its type (type shown only in LOGiCAL mode). Additionally, in Point by point mode, the app header shows the current calibration point and the total number of points (e.g., Point 2/9). The **Calibration menu** can be opened by pressing the header. **Notes** can be accessed either from the header or through the calibration menu. The **Save** button is used to save the calibration repeat.

10.2.2 Status Information (Point by Point Mode)

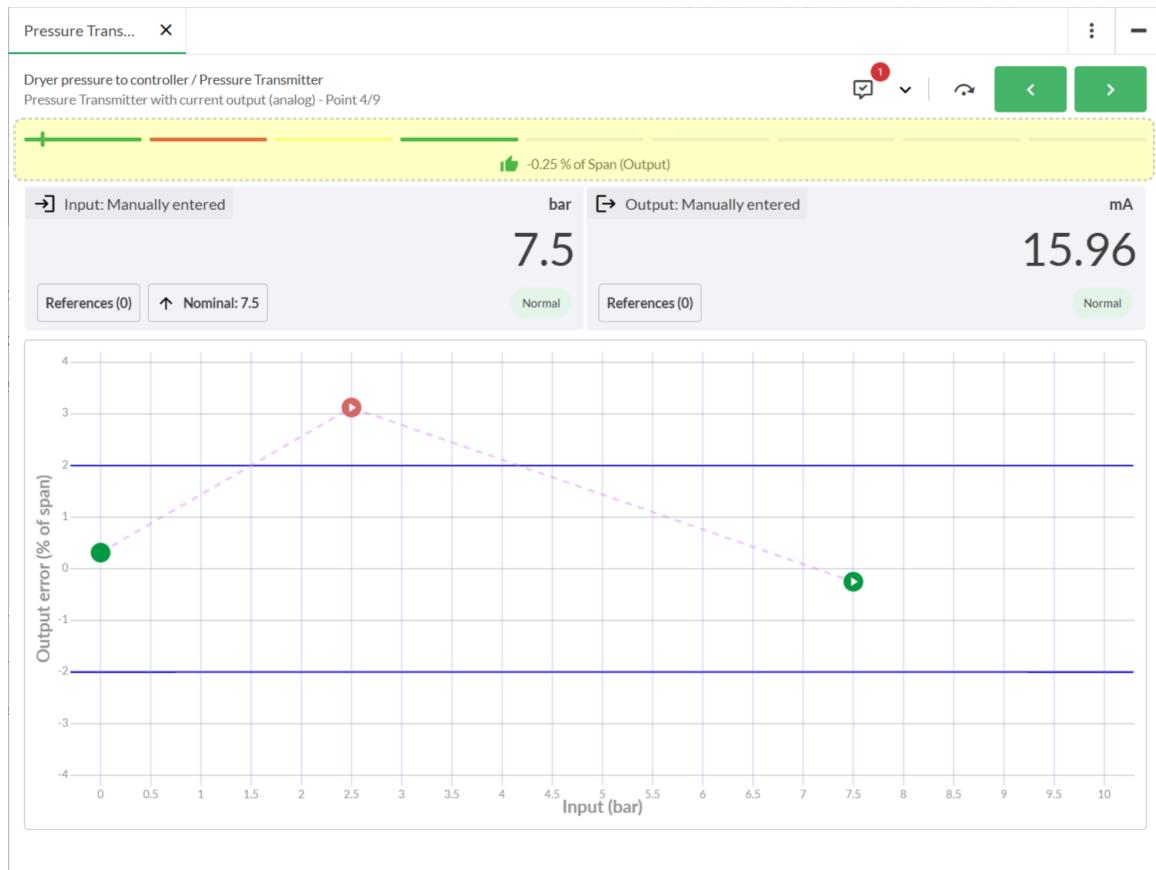


Figure 56: Status information in Point by point mode

The status bar shows the overall calibration progress and calibration point statuses:

- **Green:** Passed
- **Red:** Failed
- **Yellow:** Skipped
- **Grey:** Open (not yet entered)

Below the status bar, the calculated error and its status are displayed for the active point.

10.2.3 Calibration Menu (Instruments)

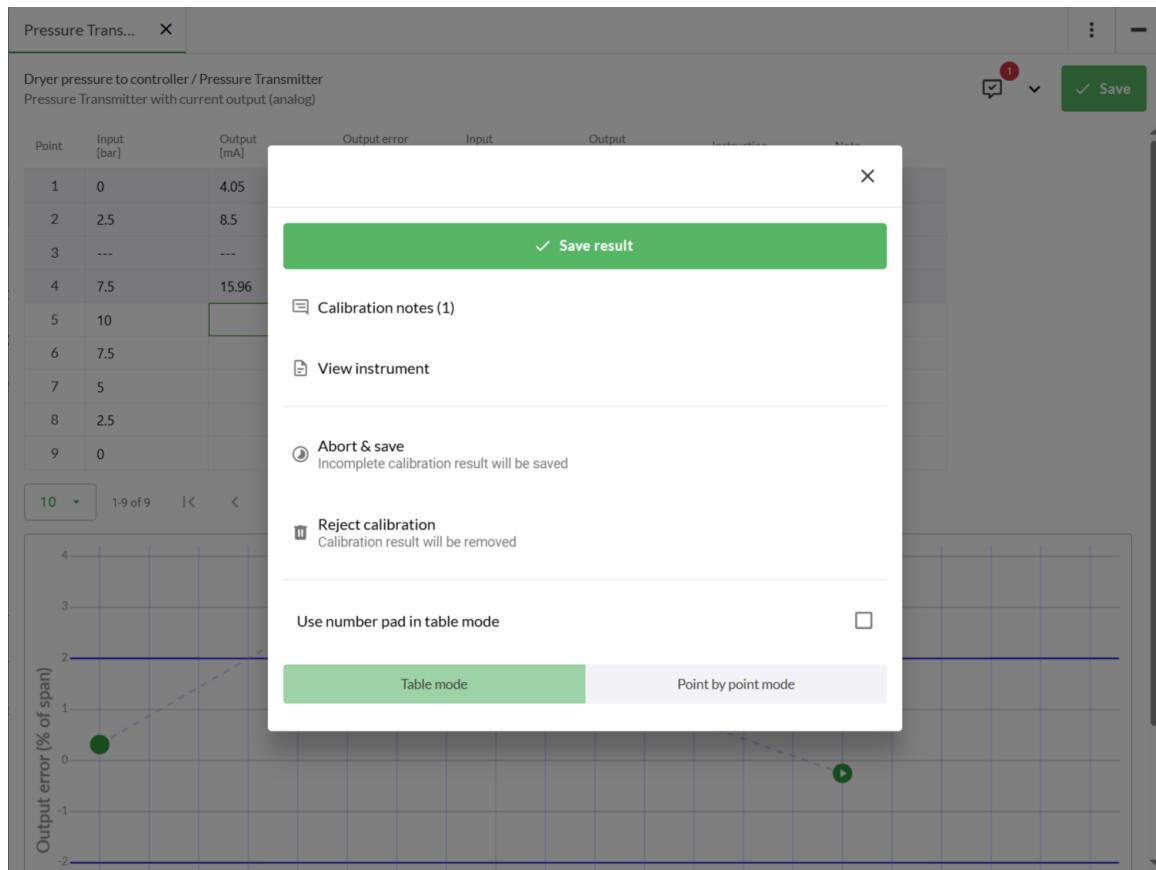


Figure 57: Calibration menu

The Calibration menu is available during an instrument calibration run. It gathers the most important actions into a single place, allowing users to save results, view instrument details, or end the calibration run when necessary.

Access the menu by pressing the app header during a calibration.

The menu provides the following options:

- **Save repeat** – Shows the result overview and allows the user to finalize the calibration.
- **Calibration notes** – Opens the notes view, allowing the user to view or edit notes related to the calibration (in Point-by-point mode).
- **View instrument** – Displays details of the instrument under calibration.
- **Abort & save** – Saves the calibration in its current, incomplete state. Useful if the run cannot be finished but partial results should be kept.
- **Reject calibration** – Removes the calibration result entirely. Use this option if the run is invalid or should not be stored.
- **Use number pad in table mode** – Toggles the numeric keypad when entering values in table mode.

At the bottom of the menu, the user can also select the preferred entry mode:

- **Table mode** – Changes the mode to Table mode.
- **Point by point mode** – Changes the mode to Point by point mode.

10.2.4 Checklist Menu

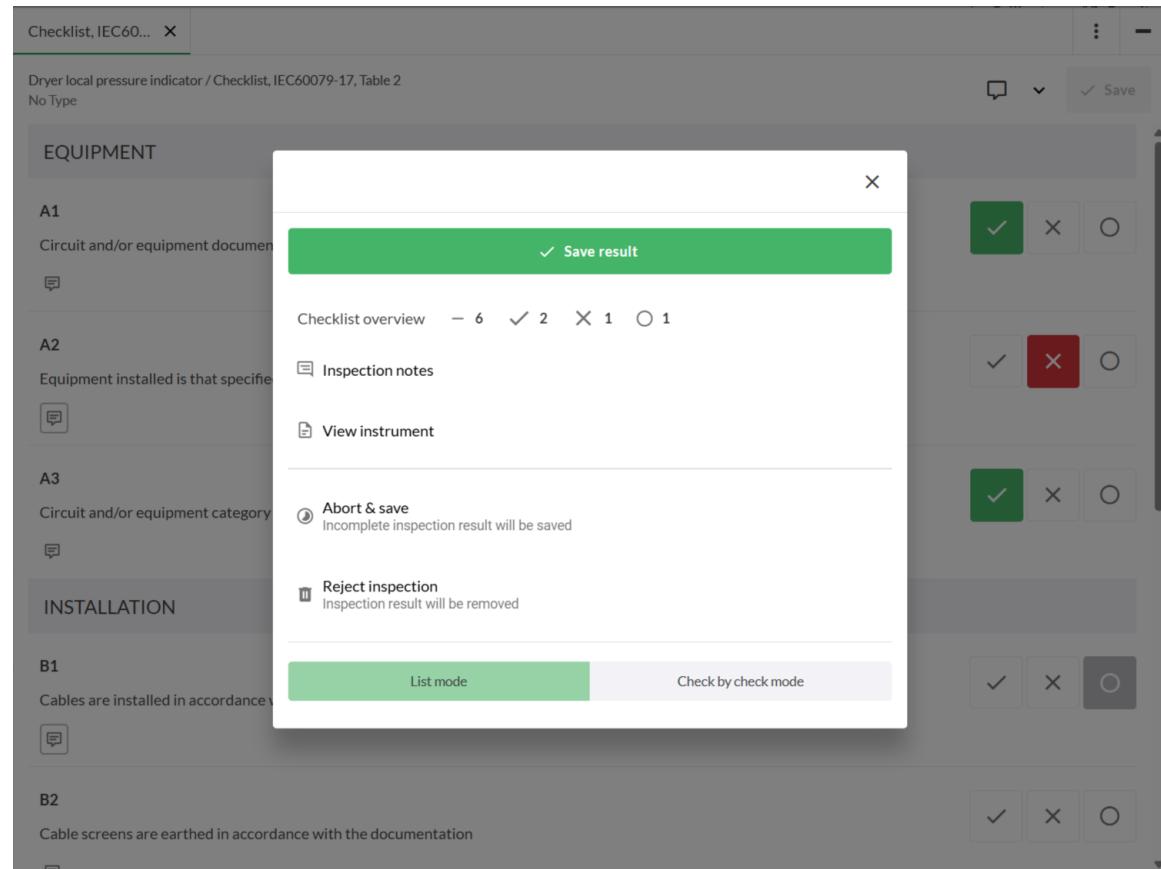


Figure 58: Checklist menu

The Checklist menu is available during an inspection run. It offers options similar to the calibration menu, with some naming and functional differences specific to checklists.

Access the menu by pressing the header during an inspection run.

The menu provides the following options:

- **Save inspection** – Starts the process of finalizing an inspection. See chapter [Finalizing a Calibration or Inspection Repeat](#) for details.
- **Checklist overview** – Shows an overview of check item statuses in the current inspection.
- **Inspection notes** – Displays the checklist description.
- **View instrument** – Displays details of the checklist instrument.
- **Abort & save** – Saves the inspection in its current, incomplete state. Useful if the run cannot be finished but partial results should be kept.
- **Reject inspection** – Removes the inspection result entirely. Use this option if the run is invalid or should not be stored.

At the bottom of the menu, the user can also select the preferred entry mode:

- **List mode** – Changes the mode to List mode.
- **Check by check mode** – Changes the mode to Check by check mode.

10.2.5 Notes

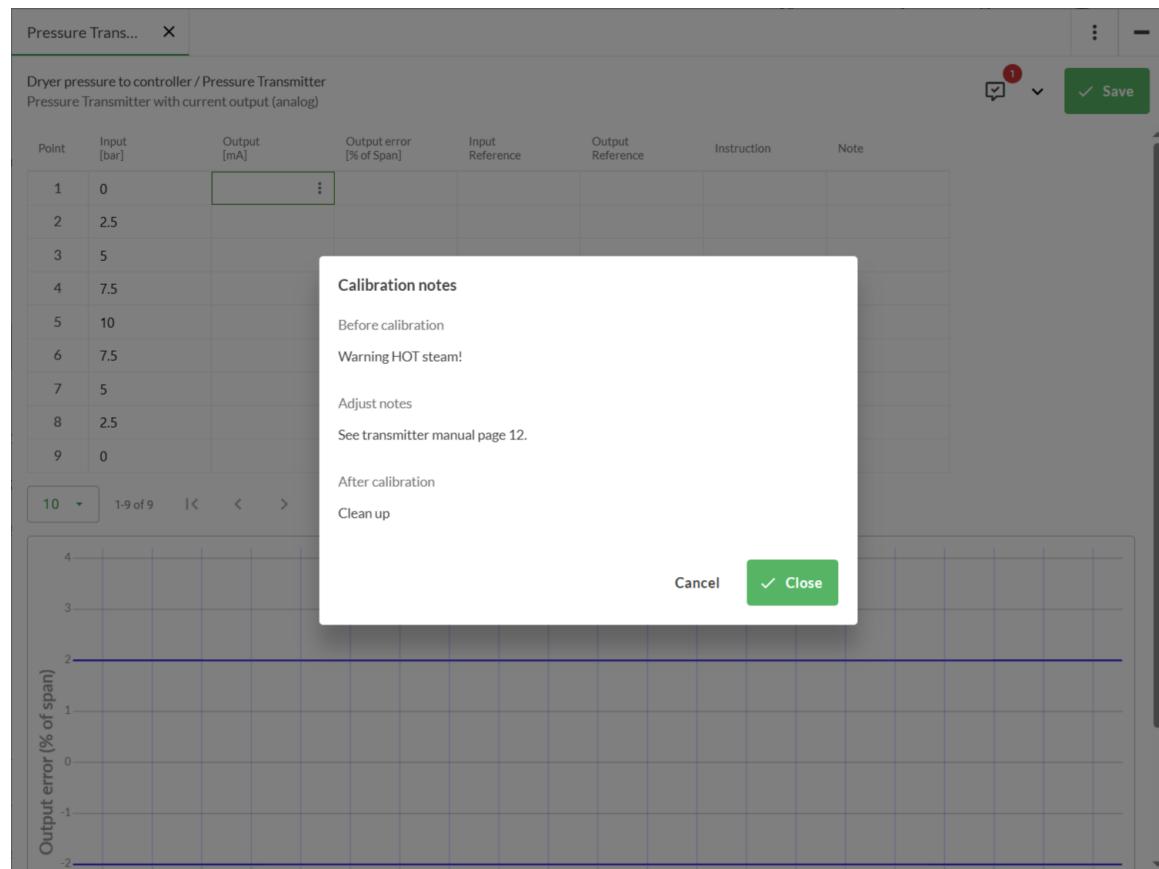


Figure 59: Calibration notes

The **before** and **after calibration notes**, as well as **point-specific instructions**, are automatically shown during calibration to guide the user. All notes and instructions are defined in the instrument data.

Access notes from the **Calibration menu** or via the dedicated icon in the header:

- **Before calibration note** – Shown just before starting the calibration, often used for preparation or setup details.
- **Adjust note** – Contains details about adjusting the instrument.
- **Calibration point instruction** – An instruction related to a specific calibration point (can be accessed through the table cell in table mode).
- **After calibration note** – Defined in the instrument data and shown after completing the calibration, typically used for observations or closing remarks.

10.2.6 Entering Readings to Calibrations (Table Mode)

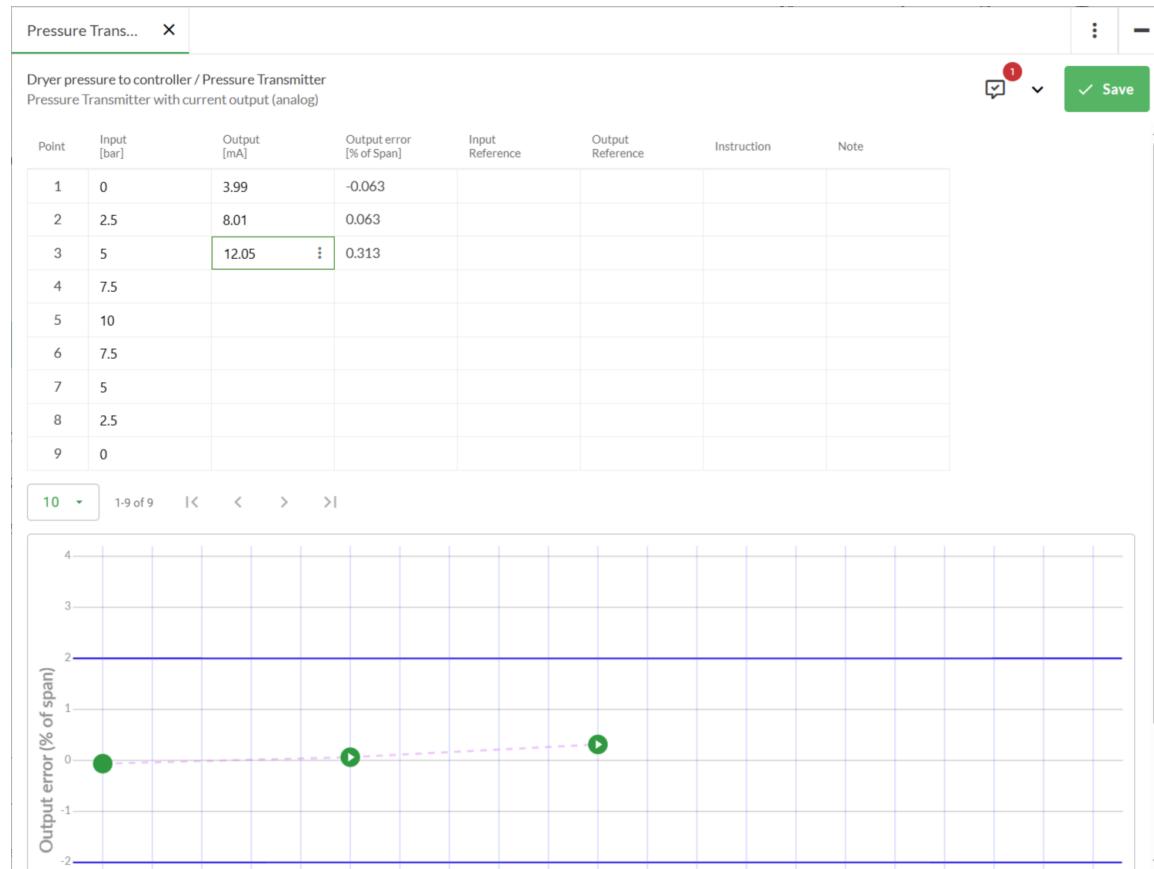


Figure 60: Entering readings - Table mode

Readings can be entered in **Table mode** directly in the table cells. In Windows, you can move between cells using the arrow keys.

Values can be entered by pressing a cell and typing the value directly.

Point status can be selected from the context menu of the cell by pressing the button with three dots. Each calibration point can be assigned to one of the following statuses:

- **Normal [=]** – The point is valid and stable (default status).
- **Unstable [≈]** – The reading is fluctuating and not stable enough to be considered accurate. Marking a point as unstable does not affect the point's pass/fail status.
- **Abnormal [✗]** – The reading is invalid or outside the measurement range. Marking a point as abnormal causes the calibration point to fail.

If the number pad is enabled in the Calibration menu options, values can be entered using the number pad.

10.2.7 Entering Readings to Calibrations (Point by Point Mode)

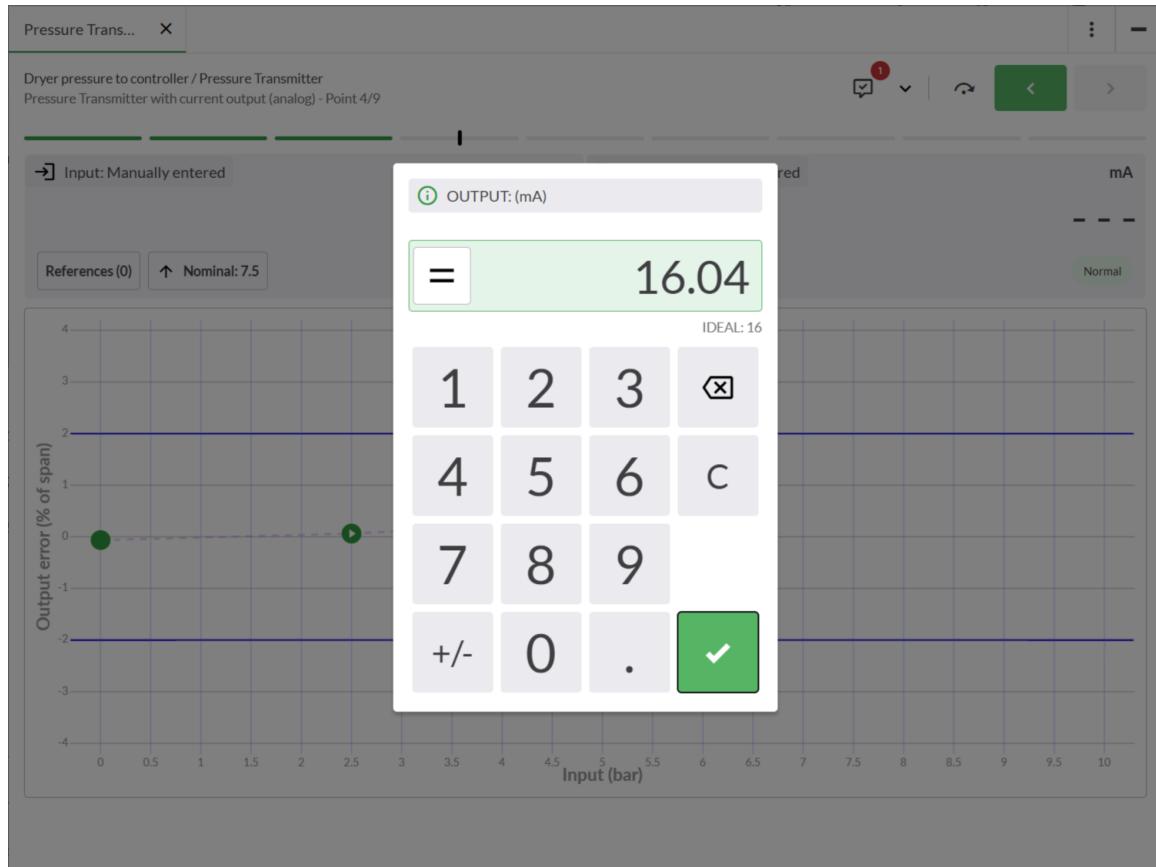


Figure 61: Entering readings - Point by point mode

Readings are entered one point at a time, in the order defined by the instrument's calibration points.

To enter a value, tap the **Input** or **Output** area to open the on-screen number pad. Enter the desired value and confirm by pressing the green button in the bottom right corner.

The point status works as described for Table mode in the previous subchapter. It can be changed by tapping the button to the left of the value field repeatedly.

10.2.8 Adding References

References are needed in calibration to ensure the accuracy and traceability of measurement results. They serve as reference devices with known and verified accuracy, allowing the instrument under test to be compared against a trusted standard. Including references also ensures that the associated measurement uncertainty can be properly evaluated and documented.

References are defined in **CMX** or **LOGiCAL**. The Calibration Management Software (CMX/LOGiCAL) may also require the user to choose the references in **bMobile** when performing a calibration. In this case, a calibration point cannot be accepted if references are not assigned to it.

Reference picker

The **Reference picker** allows you to select one or more references and optional modules to specify which reference was used for a calibration point.

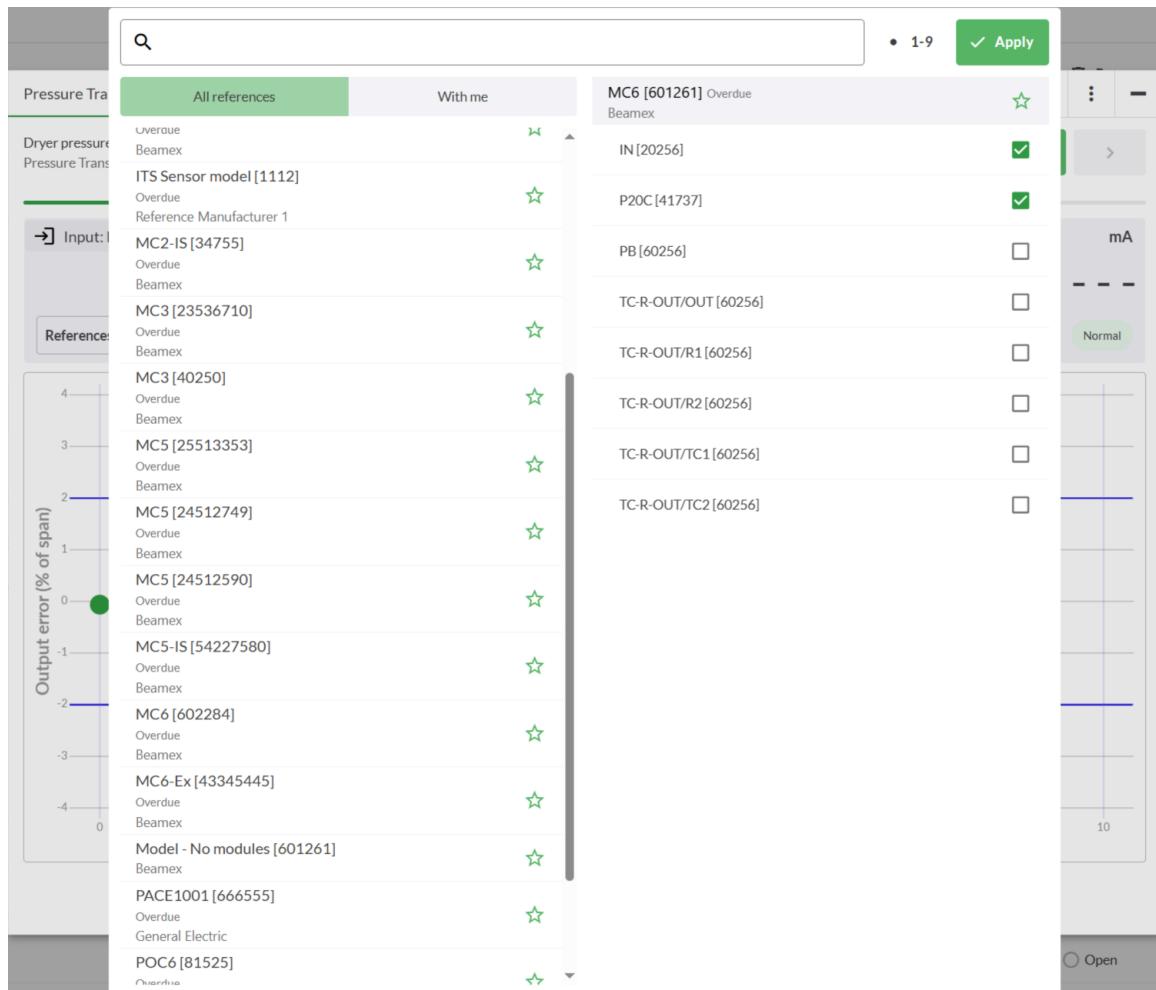


Figure 62: Adding references – Reference picker

To access the **Reference picker**:

- **In Table mode** – Press the corresponding cell in the table.
- **In Point by point mode** – Press the **References** button in the input or output area.



Note: Only the input reference can be selected for indicators.

Depending on the device in use, the Reference picker may appear as either a two-pane window or a single-pane window.

In **two-pane view** (desktop or tablet), the left pane lists all available references, excluding those already selected, while the right pane shows the references currently selected.

In **single-pane view** (mobile or phone), content is shown in one pane at a time, and you can swipe to toggle between available references and the currently selected references.

Selecting and removing references

You can select a reference by pressing it in the left pane. When a reference is selected, its modules are listed in the right pane, where you can press a module to select or deselect it. To remove a reference, press it in the right pane.



Tip: Press the star icon to mark a reference as a favorite. Favorite references are always displayed at the top of the list, making frequently used references easy to access.

Use the **search field** to quickly locate a specific reference.



Note: References that are past their due date display an *Overdue* label.

Applying references

The menu next to the **Apply** button controls whether the selected references are applied to the current calibration point or to all points:

- **This point** – The reference is applied only to the currently selected point.
- **All points** – The reference is applied to all calibration points in the procedure.



Tip: Press **Copy from previous repeat** to copy the references and modules from the previous calibration result.

Search	• 1-9	✓ Apply
FB350R [11008] Overdue	Beamex	★
MC3 [23536710] Overdue	Beamex	★
MC4 [40250] Overdue	Beamex	★
MCS [24512590] Overdue	Beamex	★
MC5 [24512749] Overdue	Beamex	★
MC5 [25513353] Overdue	Beamex	★
MC5-IS [54227580] Overdue	Beamex	★
MC6 [601261] Overdue	Beamex	★
pH Buffer/Calibration Solution [Batch123]	Captive Purity	★
POC6 [81525] Overdue	Beamex	★
TS1 [K19-2387] Overdue	Sartorius	★

Figure 63: Copying the references

Press **Apply** to save the selected references to the calibration point(s).



Note: The Calibration Management Software (CMX or LOGiCAL) may require that a reference is selected for each calibration point. If such a setting is active, this condition is indicated in the Reference picker.

10.2.9 Error Graph

The Error graph visualizes the **input range** of the instrument under calibration on the x-axis and the **calculated error** for each point on the y-axis. The error limits are shown as tolerance bands. For more details about defining additional error limits, see the chapter [Creating and Editing Instruments](#).



Figure 64: An example of an error graph

10.2.10 Pausing and Resuming a Calibration or Inspection

To pause a calibration or inspection, press the – button in the top-right corner of the calibration view. The ongoing run will be marked as *In progress* on the Home screen. To resume a calibration, select the corresponding row and press **Calibrate** to continue from where you left off.

To view all ongoing calibrations as a list, press the context menu in the top-right corner.



Note: To view all calibrations in progress, press the button located in the bottom-right corner of the Home view.

5 IN PROGRESS

10.3 Calibrating Standard Instruments

The Calibration view for **standard instruments** is used to perform the calibration of devices such as transmitters, indicators, and sensors. It allows the user to record measurement readings for one or more calibration points. Calibration is carried out using these points, which are defined by the instrument or procedure, enabling each point to be measured and documented individually.

10.3.1 Entering Readings

To enter the readings:

- **In Point by point mode** – Press the **Input** or **Output** area to open the number pad and enter a value. The nominal value of the input, as defined in the instrument, can be entered quickly by pressing the **Nominal value** button. References for input and output can be selected using the **References** buttons.
- **In Table mode** – Press the **Input** or **Output** cell in the table to enter a value. References for input and output are entered in the corresponding table cells for each row.



Note: The error is calculated once both the input and output values are entered, and the error status information and graph are updated immediately.



Note: Make sure that both the input reference and the output reference are entered if you want **CMX** to calculate the uncertainties based on the calibration results.

10.3.2 Workflow

For each calibration point, enter both the input and the output readings, as well as any optional references:

- **Point by point mode** – Requires you to fill in the required values before a point can be accepted.
- **Table mode** – Allows you to complete the points in any order.

Continue through all calibration points until the procedure is complete, then proceed to **Finalizing a Calibration or Inspection Repeat** by pressing the **Save** button.

10.4 Calibrating Switches

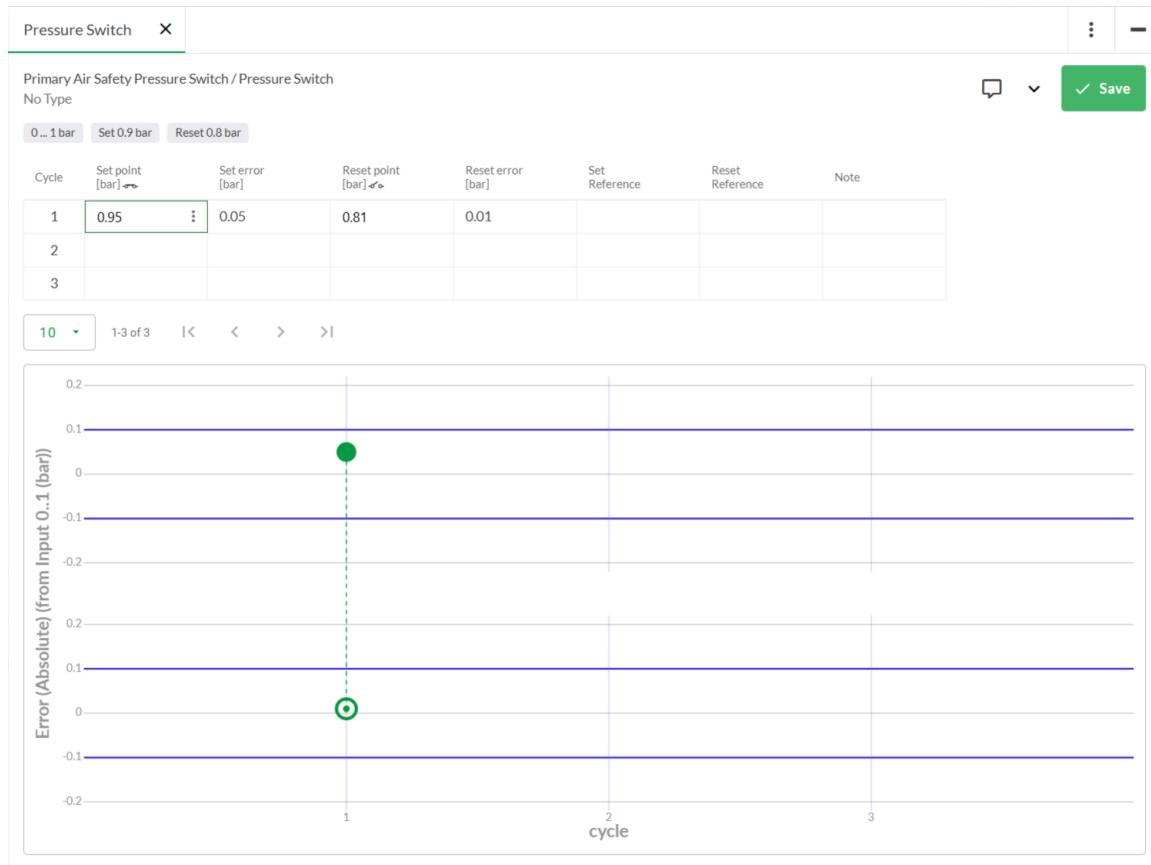


Figure 65: An example of pressure switch calibration

The calibration view for switches is used to perform the calibration of switch instruments. It allows the user to record both the **set point** and **reset point** readings. The calibration is carried out in cycles, allowing the user to repeat the set and reset point measurements as many times as required by the instrument.

10.4.1 Entering Readings

To enter the readings:

- **In Point by point mode** – Tap the **Set** or **Reset** area to open the on-screen number pad. The nominal value can be quickly assigned to both set and reset points using the **Quick-insert** button. References can be selected separately for the set and reset sides.
- **In Table mode** – Enter values directly into the **Set point** or **Reset point** cells of each test cycle. The nominal values for set and reset are displayed above the table, and references are assigned in the **Set reference** and **Reset reference** columns.



Note: Make sure that both the input reference and the output reference are entered if you want **CMX** to calculate the uncertainties based on the calibration results.

10.4.2 Workflow

For each calibration cycle, enter both the set point and reset point readings, as well as any optional references:

- **Point by point mode** – Requires you to fill in the required values before a cycle can be accepted.
- **Table mode** – Allows you to complete the cycles in any order.

Continue through all calibration cycles until the procedure is complete, then proceed to [Finalizing a Calibration or Inspection Repeat](#) by pressing the **Save** button.

10.4.3 Switch Error Graph

The error graph for switches differs from the standard instrument error graph as it displays the error for both the set and reset points simultaneously:

- **Closed circle (●)** – Represents the set point of the switch. Its meaning (switch closes or opens) depends on the **Set action** defined in the instrument configuration.
- **Open circle (○)** – Represents the reset point of the switch. Its behavior (switch opens or closes) is also determined by the **Set action** setting.

Input range	Set point	Reset point	Set action	Reset action	Set value	Set symbol	Reset value	Reset symbol
0...1	0.6	0.4	Closes	Opens	0.6	●	0.4	○
			Opens	Closes	0.6	○	0.4	●

10.5 Calibrating Weighing Instruments

Weighing instrument calibration is based on using a **weight set** that contains one or more individual weights as the input reference. The Input value is the sum of the selected weights and may also include **other loads**, such as those presented in the table below:

Load type	Description
Substitution load	A known load used when the full test weight cannot be applied directly.
Substitution load uncertainty	The uncertainty associated with the used substitution load. This enables CMX to calculate uncertainty using the substitution load as an uncertainty component.
Tare weight	The weight of a container, vessel, or support that the scale cannot be tared (zeroed) with.
Additional weight	The additional weight needed to increment the least significant digit of a digital scale. This value is used when calculating the true indication.

The **Output value** is the reading entered from the weighing scale display.



Note: Weighing calibrations are not available with **LOGiCAL**.

10.5.1 Weighing Test Types

The available test types depend on the weighing instrument settings in **CMX**:

Configuration	Test types available
USP41 / Ph.Eur disabled	<ul style="list-style-type: none"> • Eccentricity test • Repeatability test • Weighing test • Minimum weight test
USP41 / Ph.Eur enabled, Sensitivity test disabled	<ul style="list-style-type: none"> • Eccentricity test • Repeatability test (USP41 variant) • Weighing test
USP41 / Ph.Eur enabled, Sensitivity test enabled	<ul style="list-style-type: none"> • Eccentricity test • Repeatability test (Ph.Eur variant) • Weighing test • Sensitivity test

The test type can be selected when the weighing calibration is started.

10.5.2 Performing a Weighing Instrument Calibration

When calibrating weighing instrument, valid input comes from selected weights, other loads, or both, for Point by point mode as well as Table mode. The procedure for each test point is the same for both modes. Select the weights (references), other loads, or both used for the test point, and enter the output reading from the instrument.

In Point by point mode:

1. Select the weight sets and weights and/or other loads by clicking the **Weight sets** button.
2. Select the used weights and/or type in values for other loads below the input area. The **Input** field shows the sum of all input values.
3. Enter the output reading displayed on the weighing instrument.

In Table mode:

1. Select the weight sets and weights by clicking the **Weight sets** cell.
2. Enable other loads, if needed, by pressing the **+** symbol in the **Other loads** column. The **Input** cell shows the sum of all input values.
3. Enter the output reading in the corresponding table cell.

10.6 Performing an Inspection

An inspection run is the process of evaluating equipment or tasks against a predefined checklist, which consists of check items grouped by check groups. The **Require Result Note** setting can be enabled for all check states (except *Open*). When enabled, **bMobile** will prompt the user to enter a note before the selected check state is applied.

10.6.1 Check States

During an inspection run, each checklist item can be assigned one of the following states:

- **Passed (✓)** – The check item is passed.
- **Failed (X)** – The check item is failed.
- **Skipped (○)** – The check item was intentionally left without a status.
- **Open (no state)** – The check item has not yet been addressed.

10.6.2 List Mode

In **List mode**, the entire checklist structure is visible at once.

The screenshot shows a checklist interface in List mode. At the top, there is a header bar with the title 'Checklist' and a close button 'X'. To the right are three icons: a three-dot menu, a minus sign, and a 'Save' button with a checkmark. Below the header, the title 'test / Checklist' and 'Checklist' are displayed. The main content area contains five items, each with a grey header bar and a note icon (a speech bubble with a plus sign) to its left. Item A1: 'Equipment is appropriate to the EPL/Zone requirements of the location' (Status: ✓). Item A2: 'Equipment group is correct' (Status: ✗). Item A3: 'Equipment temperature class is correct (only for gas)' (Status: ✓). Item A4: 'Equipment maximum surface temperature is correct' (Status: ✗). Item A5: 'Degree of protection (IP grade) of equipment is appropriate for the level of protection/group/conductivity' (Status: ✗). A vertical scroll bar is visible on the right side of the content area.

Figure 66: An example of a checklist in List mode

Check groups are presented as grey bars with the check group title, and their respective check items are listed underneath. The user can set the state of a check item directly by pressing the corresponding button, and can add a note by pressing the **Note** icon below the item description.

10.6.3 Check by Check Mode

In **Check by check mode**, the checklist is completed one item at a time.

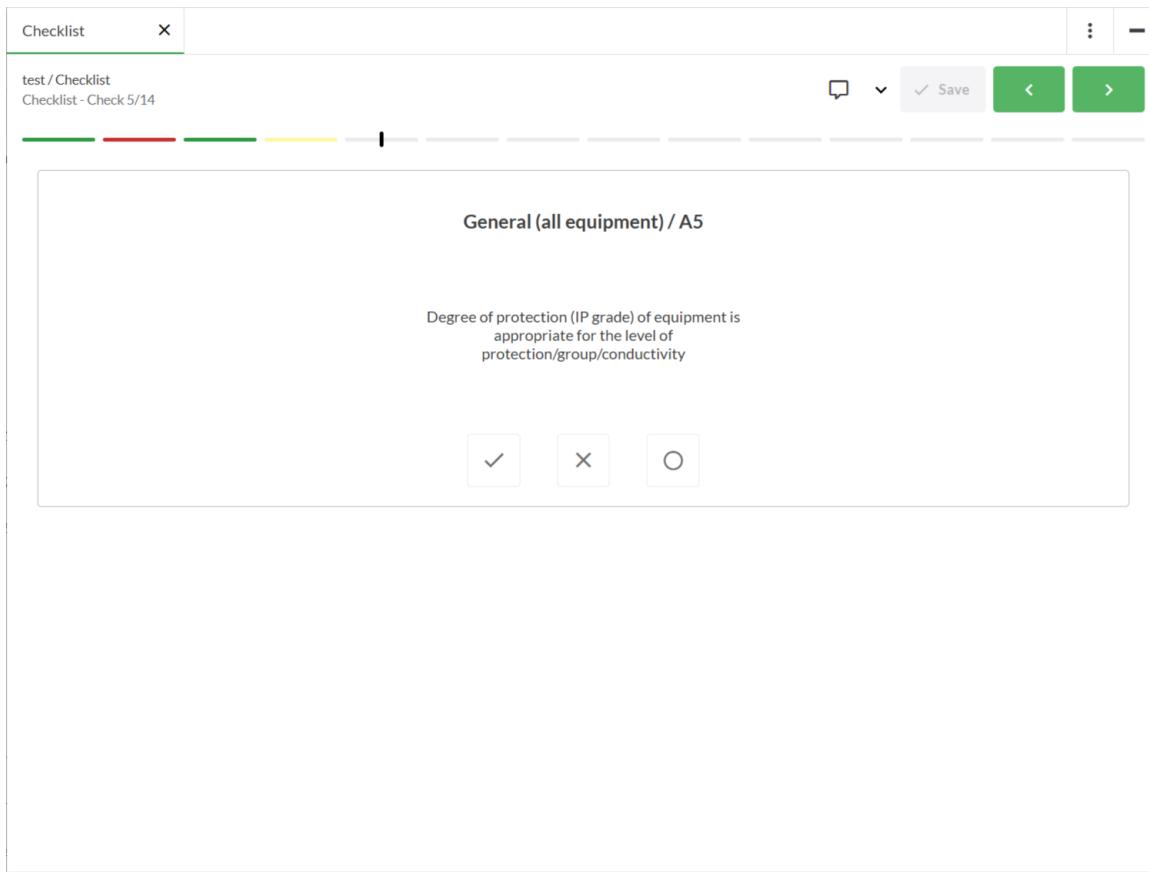


Figure 67: An example of a checklist in Check by check mode

The current check item is shown with its description. The user can set the state of a check item directly by pressing the corresponding button, and can add a note by pressing the **Note** icon.

At the top of the screen, checklist status information is displayed as a dashed line:

- **Grey** – Open (not yet addressed)
- **Green** – Passed
- **Red** – Failed
- **Yellow** – Skipped



Note: You can freely switch between List mode and Check by check mode, depending on your workflow needs.

10.7 Managing Calibration Runs

This chapter provides an overview of the user interface controls available in the calibration view, describing their functions and how they are used during the calibration.

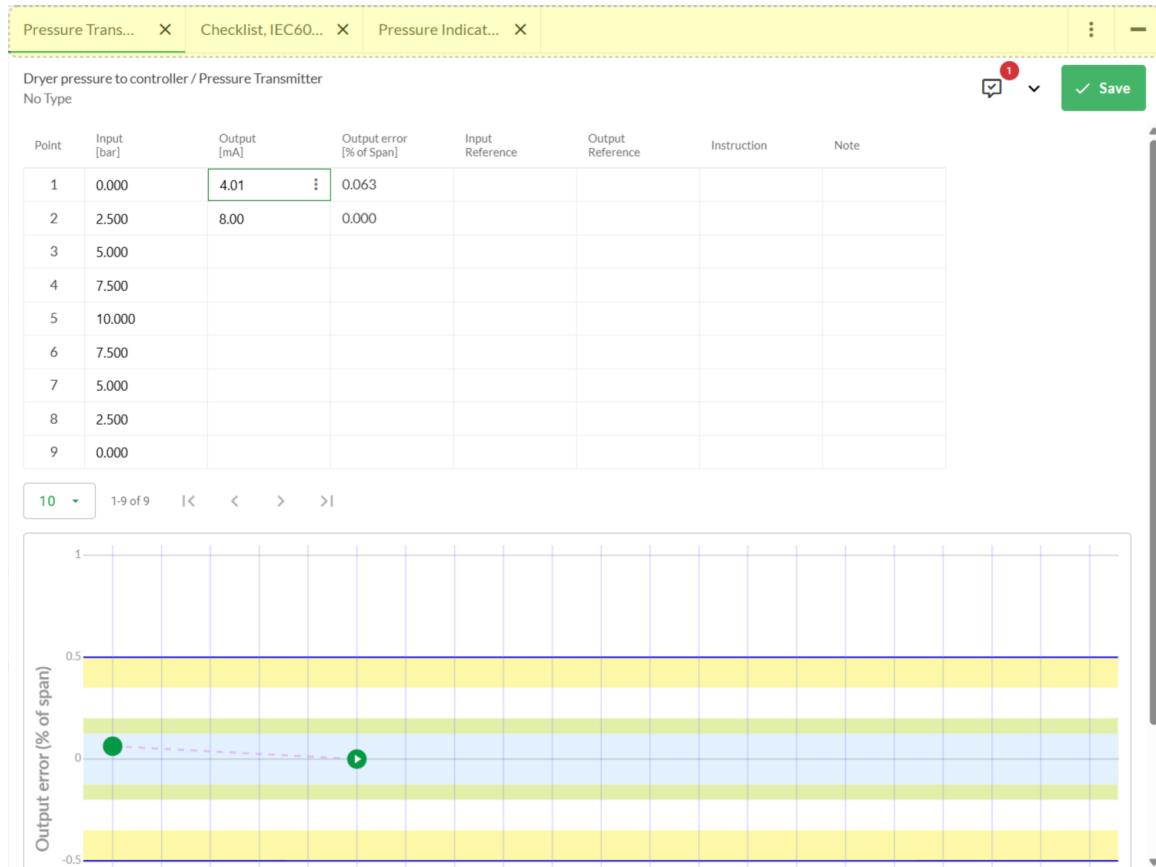


Figure 68: Ongoing calibrations view

Starting Calibrations

A calibration can be started for a single instrument by selecting it from the list and pressing **Calibrate**. Multiple calibrations can also be launched simultaneously by selecting several instruments and starting them together. Each calibration opens in its own tab, and additional calibrations can be started even while others are already in progress.

Tabs and Closing behavior

Each ongoing calibration or checklist run appears in a separate tab. You can freely switch between tabs without interrupting the process. However, closing a tab will reject the calibration and prevent it from being saved. To continue later, always minimize the calibration view instead of closing the tab.

Minimizing Calibrations

Calibrations can be minimized using the **minus (-)** symbol in the top-right corner of the calibration view (on desktop and tablet). On smaller screens, the same control is available through the context menu.

Resuming Calibrations

To resume a paused calibration, you can either select a calibration in **In progress** state and press **Calibrate** again, or press the **In progress** button in the bottom-right corner of the screen. The calibration continues from where it was left off.

Status	Work order number
<input type="radio"/> Open	
<input checked="" type="radio"/> In progress	11052000 - 034
<input type="radio"/> Open	11052000 - 034
<input checked="" type="radio"/> In progress	11052000 - 034
<input checked="" type="radio"/> In progress	10052000 - 022
<input type="radio"/> Open	11052000 - 035
<input type="radio"/> Open	11052000 - 037
<input type="radio"/> Open	030  3 IN PROGRESS
<input type="radio"/> Open	11052000 - 041

Figure 69: Resuming paused calibration

Viewing Ongoing Calibrations

All ongoing calibrations can be viewed from the context menu of the calibration view. It provides a quick overview of active runs, which is especially useful when all tabs do not fit on the screen, such as on a phone.

Split-screen Mode

If multiple calibrations are running simultaneously, a **split-screen mode** becomes available:

- **On tablets** – up to two simultaneous runs can be displayed side by side.
- **On desktop** – up to four runs can be shown at once.

This allows monitoring and interacting with multiple calibrations efficiently within the same workspace.

10.8 Finalizing a Calibration or Inspection Repeat

After completing a calibration or inspection repeat, the system presents a detailed summary of the results. This allows the user to verify outcomes, add notes, and finalize the repeat before saving.

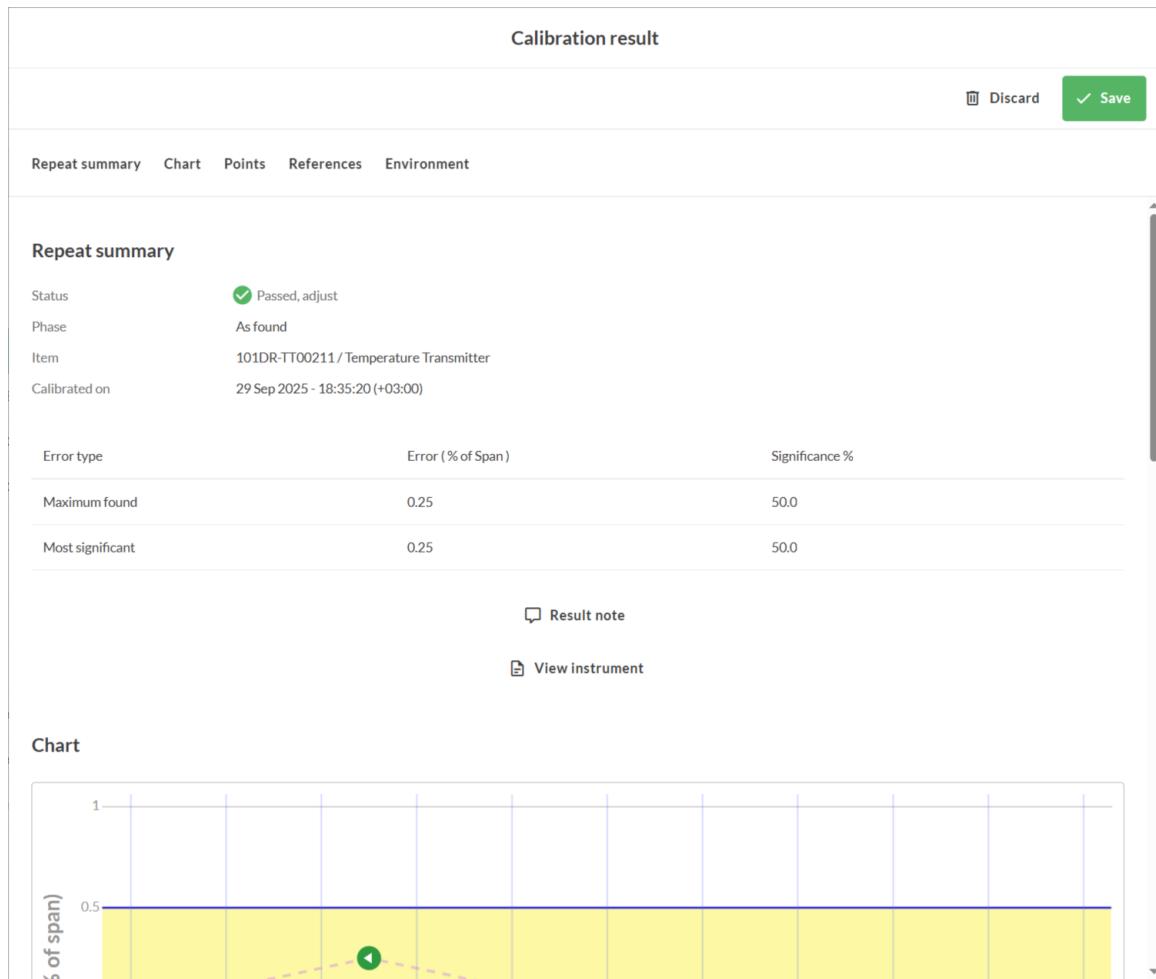


Figure 70: An example of Calibration result window

10.8.1 Repeat Summary

At the top of the Calibration result view, the repeat status is displayed. Possible statuses are:

- Passed
- Passed, adjust
- Passed, do not adjust
- Failed

If the result was saved as incomplete (meaning not all points were completed), this is clearly indicated.

Other information available under **Repeat summary** section are:

- **Phase** – Indicates whether the repeat represents *As found* or *As left* result. If saved as *As both*, see description of phases in chapter [Saving the Calibration Repeat](#).
- **Item** – The position and function identifier of the instrument.
- **Calibrated on** – The timestamp of when the last point was changed.
- **Source** – The application or device where the calibration was performed (bMobile and the serial number of the device).

For inspections, a check summary is included, presenting an overview of the check statuses recorded during the repeat.

The user can also view the details of the instrument as it was at the time of calibration or enter a calibration note for the entire result.

10.8.2 Chart

The **Chart section** provides a visual representation of the test points and their corresponding errors:

- Errors are plotted against the input values.
- If uncertainty is enabled in LOGiCAL and for the instrument being calibrated, the uncertainty for each calibration point is shown as uncertainty bars.
- Error limits and additional error limits are displayed to help the user quickly determine whether points are within tolerance.



Note: The chart is not visible for checklists and for *Eccentricity* type weighing tests.

10.8.3 Point Details

The **Point table** provides detailed information for each test point or test cycle, including:

- Input and output values for standard and weighing instruments.
- Set and reset values for each test cycle of switch instruments.
- Calculated error based on the defined error reference and error unit.
- Uncertainty (if configured in LOGiCAL).
- Error significance (%).
- Associated input and output, or set and reset references.
- Point-specific notes.

10.8.4 Group Details

For inspections, the **Group details** section provides detailed information about each check group, including:

- Each check group with its respective check items.
- Statuses and descriptions of check items.
- Notes attached to individual check items.

10.8.5 References

The **References** section lists the exact reference devices used during calibration.

Each **reference device** is identified by its model and serial number, while each **module** is defined by model, serial number, calibration date, and coefficient information (for temperature sensors).

References or modules are linked by index (for example, A, B, or C) to the test point table, indicating which reference was used for each point.

10.8.6 Environment

The **Environment** section records additional context for the calibration, including:

- Calibrated by – The user who performed the calibration.
- Worktime – The duration of the calibration, entered in hours and minutes.
- Environmental conditions – Temperature, pressure, and humidity at the time of calibration.

10.8.7 Result-level Custom Fields

In addition to the predefined sections, the user can also complete result-level custom fields. These fields are displayed only if they have been configured in **LOGiCAL** or **CMX**.

10.8.8 Saving the Calibration Repeat

Once all information has been reviewed and entered, the calibration repeat can be saved. When saving the repeat, several options are available, and additional information can be set or added.

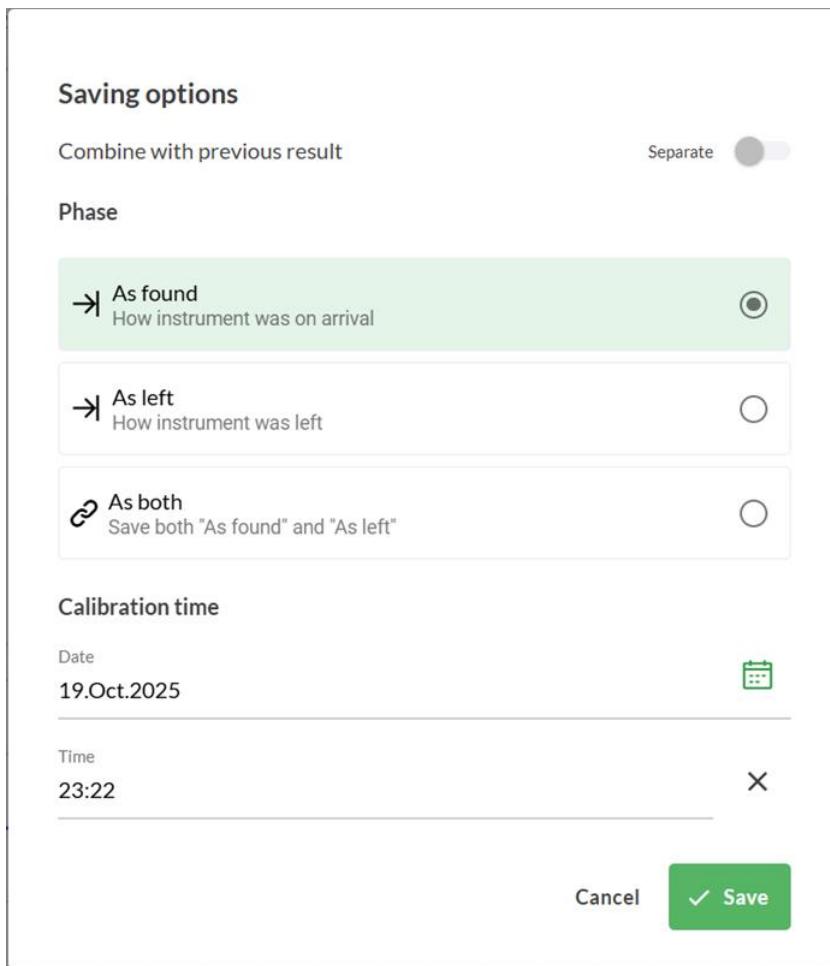


Figure 71: Calibration repeat – Saving options

Combine with previous result – If a previous result already exists for the same instrument, the current repeat can be combined with the earlier result. Alternatively, the repeat can be saved without combining, creating a new result.

Phase – The correct phase must be selected for the result from the following options:

- **As found** – The instrument's results when first checked on arrival.
- **As left** – The instrument's results after being left in its final state, for example after adjustment.
- **As both** – Saves two copies of the same repeat with phases *As found* and *As left* in a single result.

Calibration time – By default, the calibration date and time are set automatically when the last test point is entered. Setting the time is optional. Date and time can be adjusted if needed, which is useful when a calibration was performed earlier (for example, first documented on paper) and later needs to be recorded as an official result in **CMX** or **LOGiCAL**.

11 Result History

You can view the calibration result history of an instrument by first selecting the instrument and then choosing **Results**, either from the toolbar or from the context menu.

The result history view displays all calibration results related to the selected instrument in ascending order.

For each result entry, the list shows:

- **Status** – Passed / Passed, adjust / Passed, do not adjust / Failed.
- **Repeats** – The number of repeats performed for the result.
- **Calibrated by** – The user who performed the calibration.
- **Date and time** – The time of the last change in the calibration point.



Note: The overall status, date and time, and calibrated by information are always determined by the chronologically latest repeat of the result.

To view the details of a result, select its row in the list. This opens the detailed view, which includes full information about the calibration and all its repeats.

11.1 Removing Repeats

To remove a calibration repeat or inspection run, open a result, select the desired repeat, and press **Remove**.

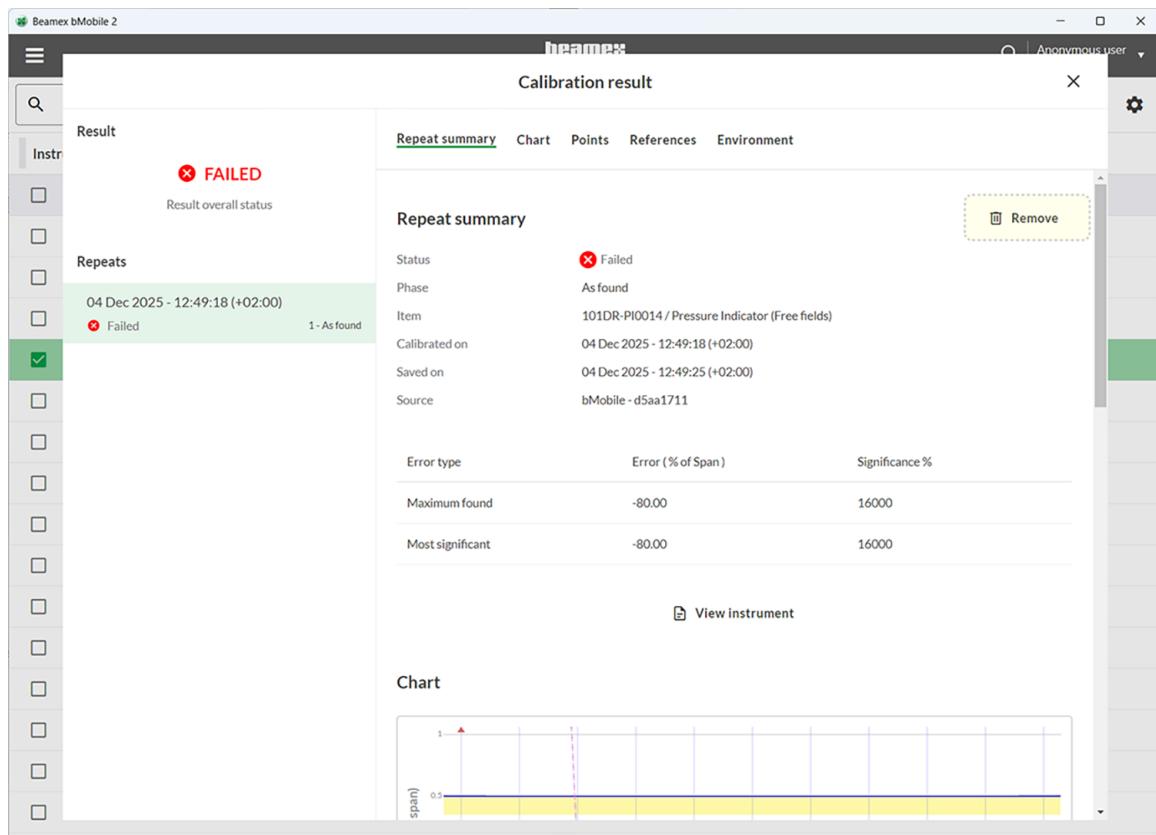


Figure 72: Result history - removing repeats

12 Appendix

The following sections presents additional information related to **bMobile**. Topics presented in this section:

- **Windows® Installation Specifics**
 - **Default Settings**
 - **Silent Install**
- **Calibration Web Service Interface (CWSI)**,
- **CMX and CWSI** and
- **Troubleshooting**

13 Windows® Installation Specifics

13.1 Overriding Default Settings During Installation

The application can be installed with specific values, overriding the default ones. This needs to be done from the command prompt (Powershell).

Open up a command prompt in the directory containing the bmobile2Setup.msi file. Run command:

```
msiexec /i bmobile2Setup.msi /quiet PARAMETER="value"
```

Available parameters are:

- **INSTALLFOLDER**
- **SERVERADDRESS**
- **PORT**
- **ENDPOINT**
- **SECURECONNECTION**
- **DEFAULTPRESSUREUNIT**
- **DEFAULTTEMPERATUREUNIT**
- **DATEFORMAT**
- **BARCODEREADERVISIBILITY**
- **REFERENCESELECTION**
- **APPLICATIONMODE**

Command example for changing the target installation directory:

```
msiexec /i bmobile2Setup.msi /quiet INSTALLFOLDER="c:\path"
```

Command example using all available parameters:

```
msiexec /i bmobile2Setup.msi /quiet
    INSTALLFOLDER="c:\path"
    SERVERADDRESS="connect.beamex.com"
    PORT="443"
    ENDPOINT="cws1"
    SECURECONNECTION="true"
```

```
DEFAULTPRESSUREUNIT="kPa"
DEFAULTTEMPERATUREUNIT="°C"
DATEFORMAT="YYYY.MM.DD"
BARCODEREADERVISIBILITY="true"
REFERENCESELECTION="1"
APPLICATIONMODE="logical"
```



Note: The whole command should be written in one line.

13.2 Overriding Default Settings After Installation

When **bMobile** is installed, a file called "**defaultsettings.xml**" is located in the installation folder. Editing this file before starting **bMobile** for the first time allows you to create custom default settings.

If you do multiple installations, copy the customized "**defaultsettings.xml**" to all devices where you have installed **bMobile**. Remember not to start **bMobile** before the customized custom default settings are saved on the device.

Default path:

C:\Program Files (x86)\Beamex\bMobile 2\defaultSettings

Example of **defaultsettings.xml**:

```
<?xml version="1.0" encoding="utf-8"?>
<configuration>
  <backendSettings>
    <serverAddress>connect.beamex.com</serverAddress>
    <port>443</port>
    <endPoint>cwsi</endPoint>
    <secureConnection>true</secureConnection>
  </backendSettings>
  <environmentSettings>
    <defaultPressureUnit>kPa</defaultPressureUnit>
    <defaultTemperatureUnit>°C</defaultTemperatureUnit>
  </environmentSettings>
  <generalSettings>
    <dateFormat>DD.MM.YYYY</dateFormat>
    <barcodeReaderVisibility>true</barcodeReaderVisibility>
    <referenceSelection>1</referenceSelection>
    <applicationMode>cmx</applicationMode>
  </generalSettings>
</configuration>
```

13.3 Available Default Settings and Their Options

The following options are available when installing bMobile using MSIEEXEC in command prompt or in "**defaultsettings.xml**". See chapters [Overriding Default Settings During Installation](#) and [Overriding Default Settings After Installation](#).

Parameter in bMobile User Interface	Options in User Interface	Parameter Name when using MSIEEXEC	Parameter Name in XML	Corresponding options in MSIEEXEC and XML
Date Format DD = Numeric date MM = Numeric month MMM = Alphabetic month, e.g. "April" YYYY = Numeric year	DD.MM.YYYY MM.DD.YYYY YYYY.MM.DD DD/MM/YYYY MM/DD/YYYY YYYY/MM/DD DD-MM-YYYY MM-DD-YYYY YYYY-MM-DD DD MMM YYYY MMM DD YYYY	DATEFORMAT	dateFormat	DD.MM.YYYY MM.DD.YYYY YYYY.MM.DD DD/MM/YYYY MM/DD/YYYY YYYY/MM/DD DD-MM-YYYY MM-DD-YYYY YYYY-MM-DD DD MMM YYYY MMM DD YYYY
Show barcode reader	Yes No	BARCODEREADERVISIBILITY	barcodeReaderVisibility	true false
Reference selection	Not defined All points This point	REFERENCESELECTION	referenceSelection	0 1 2
Pressure	kPa hPa Pa mbar mmHg torr inHg psi atm	DEFAULTPRESSUREUNIT	defaultPressureUnit	kPa hPa Pa mbar mmHg torr inHg psi atm
Temperature	°C °F	DEFAULTTEMPERATUREUNIT	defaultTemperatureUnit	°C °F
Server address	<i>Address to any server where CWSI server is installed.</i>	SERVERADDRESS	serverAddress	<i>E.g. "connect.beamex.com", a string</i>
Port	<i>Port available in CWSI server.</i>	PORT	port	<i>E.g. "443", a number</i>
Endpoint	<i>Endpoint defined in CWSI server.</i>	ENDPOINT	endPoint	<i>E.g. "cws1", a string</i>
Secure connection	On Off	SECURECONNECTION	secureConnection	true false
Application mode selection	CMX/LOGICAL	APPLICATIONMODE	applicationMode	undefined cmx logical cmxSync

14 Calibration Web Service Interface (CWSI)

These instructions are written for the Calibration Web Service Interface (CWSI) shipped with CMX.

14.1 Architecture

CWSI includes two components: the **CWSI Client**, which is installed locally on every computer that is physically connected to a calibrator and the **CWSI Server**, which is a common gateway for all CWSI Clients. In addition to this, CWSI support is implemented into the CMX Client, which enables CMX to communicate with calibrators connected to CWSI clients via the familiar Send/Receive window.

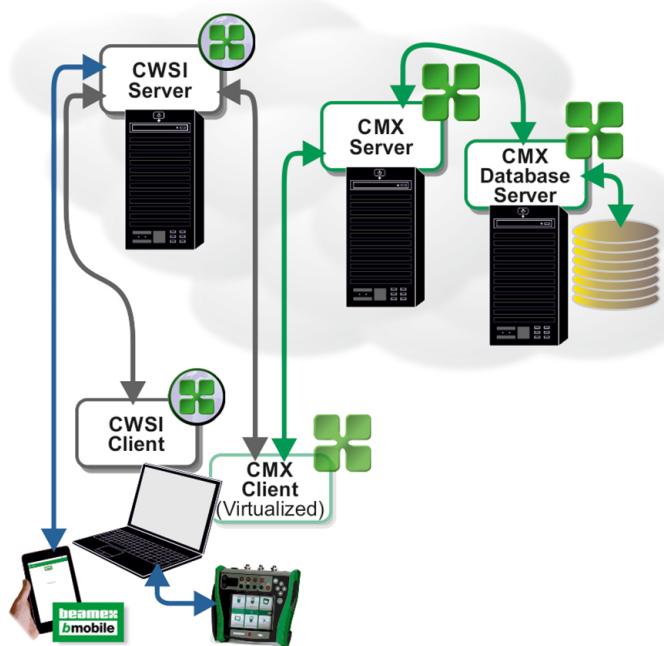


Figure 73: CWSI Structure

It is recommended to virtualize the CMX Client to reduce latency for database communication. While the CWSI Client must be installed on multiple computers, only one CWSI Server installation is needed. The CWSI Server can be installed on e.g. same server as CMX Server. CWSI Server is installed as a Windows Service, just like the CMX Server.

Communication between CWSI client, CWSI server and CMX client utilises the WebSocket protocol (RFC 6455, <http://tools.ietf.org/html/rfc6455>), which enables two-way communication without the need for complex Firewall rules.

Instructions on how to install CWSI Server and CWSI Client are included in the **CMX Installation Guide**.



Note: **bMobile** includes in its software the CWSI Client. To communicate with a CWSI Server, enter the server URL and parameters as described in chapters **Settings** and **Connect** and also chapter **CWSI Server**.

14.2 CWSI Server

The CWSI Server consists of two executables:

- **Beamex.CWSI.WebSocketServer.Service.exe**, which is installed as a Windows Service (CWSI service).
- **Beamex.CWSI.Server.Configurator.exe**, which is a graphical tool to configure parameters for the Windows Service.

14.2.1 Configuring CWSI Server

To configure the CWSI Server service, start “**CWSI Server Configurator**”. Use Windows' search tool to locate CWSI Server Configurator.

The way of invoking the search tool depends on the operating system version.

The picture below presents the search tool from Windows® 10.

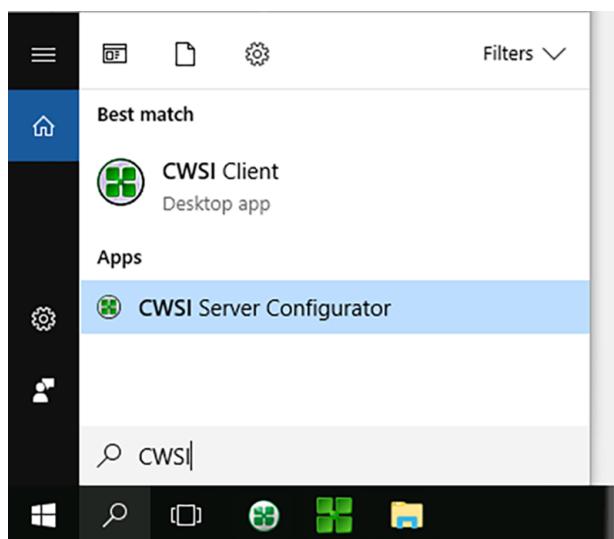


Figure 74: Windows search tool

CWSI Server Settings

Available CWSI Server settings:

- **Port**, this is the TCP port that the server is listening on. Make sure that no other applications on the same machine is listening on the same port.
The default port is **8080**.
- **Endpoint**, this is the endpoint that the server is listening on.
The default value is **cwsi**.
- **Allow Cross-User communication**, if checked, this provides the opportunity for a user with supervisor privileges in CMX to communicate with all CWSI Clients connected to the CWSI Server.
- **Secure connection**, if checked, communication will be secured using SSL/TLS protocol. A X.509 Certificate is required. This is highly recommended when this product is in use.
- **Certificate type**, if secure connection is checked, a X.509 Certificate is required. A certificate can either be loaded from a Certificate Store or from a Local File. This file is recommended for test use only.
- **Store Parameters**
 - **Location**, specifies the X.509 Certificate Store Location to be used as a search parameter. Local Machine is recommended, since Current User can only be used if the CWSI Server Configurator and CWSI Server Service is executed as the same user.
 - **Name**, specifies the X.509 Certificate Store Name to be used as a search parameter.
 - **Certificate**, specifies the X.509 Certificate to be used. Please note that the CN attribute specified in the certificate's subject distinguished name must match the server location used by CWSI client and CMX.
- **File Parameters**
 - **File**, the absolute path to the pfx-file. Please note that the CN attribute specified in the certificate's subject distinguished name must match the server location used by CWSI client and CMX. |keyword=File Parameters,File |keyword=CWSI Server,File Parameters,File
 - **Password**, the password for the pfx-file. Please note that this password is stored in plain text on the machine running the CWSI Server. This option should therefore be used with caution.

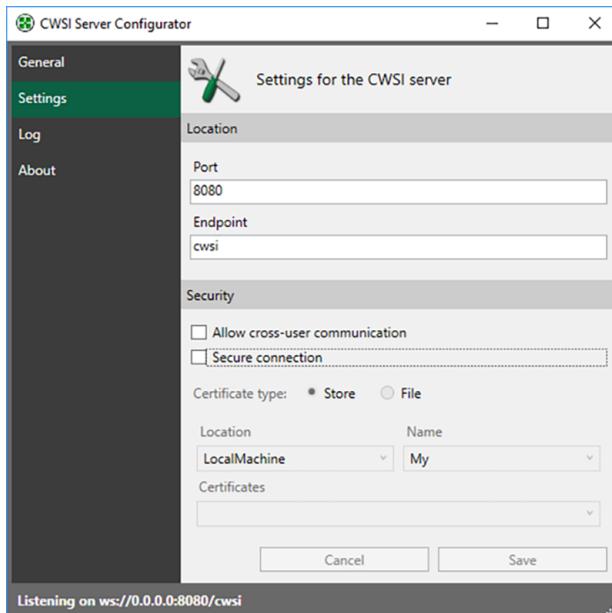


Figure 75: CWSI Server Configurator's Settings page



Note: Please note that any changes made to the configuration won't be taken into use until the CWSI Server Service is restarted.

14.2.2 Starting and Stopping CWSI Server

Starting and stopping the CWSI Server service can be done either via the CWSI Server Configurator or via the Services snap-in in Microsoft Management Console.

For advanced startup configuration (startup type, logon, etc.), use Services snap-in in Microsoft Management Console. Look for "Beamex CWSI Server Service".

15 CMX and CWSI

CWSI is integrated as a new protocol (Web Service) in both the **Send** and **Receive** windows of **CMX**. To configure the CWSI parameters, open Send or Receive window, select CWSI as protocol and click the three dots button located next to the protocol:

- **Server**, this specifies the location of the CWSI Server (including the endpoint specified in server). If secure connection is used, this would most likely correspond to the CN of the Certificate's subject distinguished name used by the server.
- **Port** specifies the TCP port that the CWSI Server is listening on.
- **Connection timeout** specifies the amount of seconds the CMX will wait before cancelling a request.
- The **Number of reconnect attempts** and **Time between reconnect attempts** settings don't normally need to be changed. The IT specialist may want to change these settings if faced with communication problems.
- **Secure Connection** specifies if the server is using secure connection (SSL/TLS). This must correspond to the CWSI Server settings.

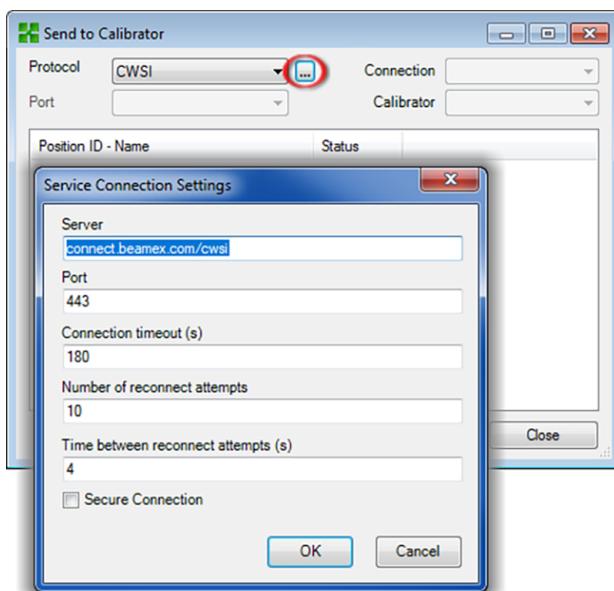


Figure 76: CWSI communication settings in CMX

When CWSI is correctly configured, and one or more matching CWSI Clients are found (e.g. the **CMX user id** in CWSI is the same as the **User ID** in CMX), they are listed in the **Connection** combo box. Each connected calibrator of the CWSI Client is listed in the **Calibrator** combo box. Both Send and Receive window can be used normally.

If the CWSI Client has a secret specified, the secret is prompted when selecting the client connection.

16 Troubleshooting

The following chapters contain information about how to troubleshoot the CWSI server and CMX.

16.1 CWSI Server

If the server is having issues loading a configured X.509 certificate, please note that CWSI Server Configurator and CWSI Server Service might be executed as different users. By default, the CWSI Server Service is configured to be executed by the LocalSystem Account and might not have access to the configured file.

This might also be an issue if Certificate Store Location is set to Current User.

16.2 CMX

All configuration changes made in CMX are stored individually per user under location shown below:

```
%APPDATA%\Beamex Oy Ab\... CMX Calibration Management Software\...
<version>\ServiceConnectionSettings.xml
```

Where:

%APPDATA% is currently logged user's application data directory. **<version>** is the current software version number of CMX.

If CMX for some reasons crashes during opening of Send or Receive window, try to delete the above file in order to load the factory default settings.

To copy CWSI settings between user profiles, simply copy the ServiceConnectionSettings.xml between the user profiles.

To modify the default CWSI settings, modify the ServiceConnectionDefaults section in the file BxbMUIPD.exe.config located in the CMX installation directory.

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The third party licenses are presented in alphabetic order.

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17.11 asmcrypto-lite

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17.12 babel-runtime

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17.13 base-64

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17.15 cef.redist.x86

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17.16 cefsharp

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17.19 date-fns

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17.21 google-protobuf

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17.22 grpc

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17.23 immutable

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17.25 jsc-android

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17.26 json-checker

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17.27 jwt-decode

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17.28 lodash

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17.30 newtonsoft.Json

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17.31 prop-types

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17.34 react

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17.38 react-native

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17.64 regenerator

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17.65 rn-fetch-blob

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17.66 text-encoding

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17.67 transit-immutable-js

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