Quick-Reference Guide for using the ePG together with other Beamex products

Introduction

This document provides an overview on how to use your MC6 family calibrator to control the ePG Electric Pressure Pump and Controller in your daily work. It also describes what to consider when working with Beamex Calibration Management Software (CMX or LOGiCAL).

Requirements

- MC6 family calibrator (MC6, MC6-WS, MC6-Ex or MC6-T) with firmware version 4.30 or later and “Pressure controller communication, ePG” option installed on the calibrator.

  Note: Both can be checked in the calibrator’s **Settings** > **About** window.

- ePG firmware version 2.00 or later.

Enable communication between an MC6 family calibrator and the ePG

MC6 family calibrator does not automatically recognize your ePG. You need to configure the controller communication to pair the devices.

Note: If you have more than one ePG, you can assign each ePG on a separate Controller Presets channel (maximum 4).

1. Connect an MC6 family calibrator to your ePG using a USB Type-A to Type-C communication cable.
2. Power both devices on (ePG will power itself on automatically when the USB cable is connected to the calibrator).
3. From MC6 Home View, open **Settings** > **Controller Presets**.
4. Set the following:
   - **Connection Inferface**: shows the connected ePG's with their serial numbers. Select the one you want to communicate with.
   - **Controller Type**: Beamex ePG
   - **Control Mode**: according to your needs (Shut off or Continuous)
   - **Reference Module**: select the pressure module of the MC6 family calibrator that you want to use as a reference (This can be any internal or external pressure module that is available). The ePG will not operate if no reference pressure module is available at all.

Working with an MC6 family calibrator and the ePG

When MC6 family calibrator is used to control the ePG, the reference pressure readings are taken from one of the MC6 family calibrator's internal or external pressure modules.

The selected reference pressure module range sets the available setpoint range for the ePG, however not in a way, that the setpoint range would become larger than normal ePG range. Examples:

- With P6C, the ePG provides the lower setpoint limit (-0.85 bar) and the pressure module provides the upper limit (6 bar)
- With P60, the pressure module limits the lower setpoint limit to 0 bar and the ePG provides the upper limit (20 bar)

The selected reference pressure module will be used in all MC6 operational modes, with one exception: the selected Input Port/Function in Documenting Calibrator in *Controlled* mode will permanently override the setting in Controller Presets.

The selected reference pressure module along with the controller's name are visible on all the buttons and dialogues, where the controller can be selected (see examples below).

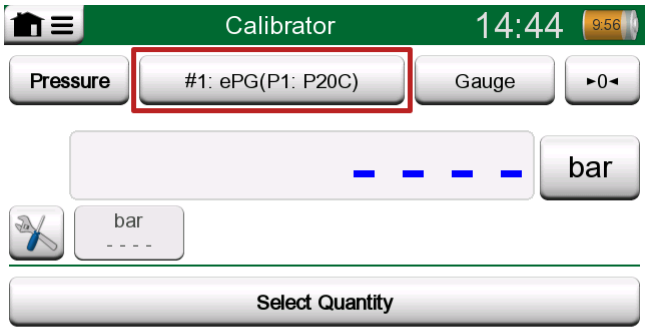


Figure 1: Example 1

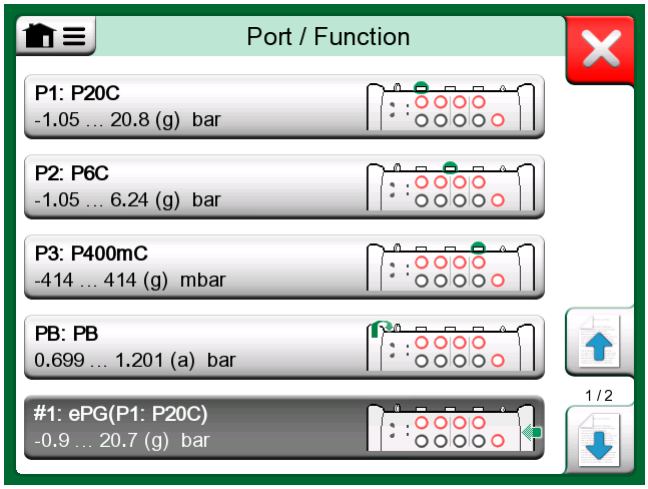


Figure 2: Example 2

Settings/Controller Presets: Shut off vs. Continuous

Global setting that is not available in Documenting Calibrator. If needed, change settings before calibration.

Shut off

Shut off means that once the setpoint is reached, adjustment stops. The ePG will not try to adjust the pressure even in case of an overshoot. This way the hysteresis will not be lost.

Continuous

Continuous means that adjustment continues even after the setpoint is reached. This is useful for compensating small leaks and temperature expansion over a longer period.

When an MC6 family calibrator is controlling the ePG, all the push buttons on the ePG, except for the power button, are disabled. When entering the **Home View**, the control is released and manual operation is possible (alternatively by removing the ePG from the measurement channel by selecting another function, e.g. other quantity or port, etc.).

Note: When the user returns to the **Home View**, the ePG will keep the pressure in the system by closing all the valves.

Venting and Zeroing

The ePG vents when you enter value 0 in Gauge mode. If no other setpoint is given, **Vent** leaves the valves open for 1 minute. This gives the user some time to zero the reference pressure module.

Tip: Zeroing is important – a possible offset in the reference module can confuse the ePG controlling the pressure.

Zeroing is performed as follows:

- enter value 0 in Gauge mode to vent the ePG. The ePG keeps the valves open for 1 minute
- allow the pressure to stabilize
- press the zeroing button on the MC6 display

Note: MC6 does not accept zeroing if there is pressure in the system.

Documenting Calibrator mode

In order for the references to be properly displayed on the calibration certificates, Documenting Calibrator mode settings have to be configured properly. When you create instruments in the MC6 family calibrator and plan to send the results to either CMX or LOGiCAL, create the instrument **Input** by following the example instruction below:

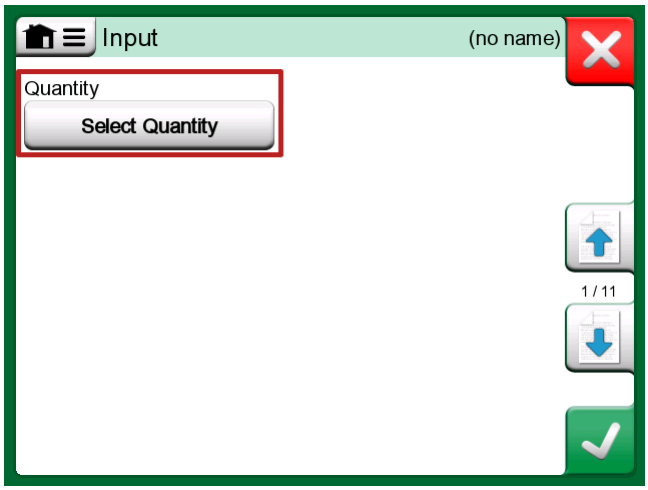


Figure 3: Step 1: Select Quantity for the instrument Input

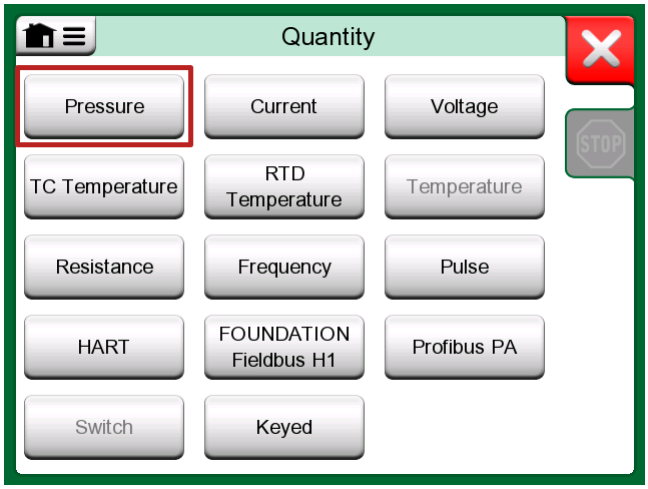


Figure 4: Step 2: Select Pressure

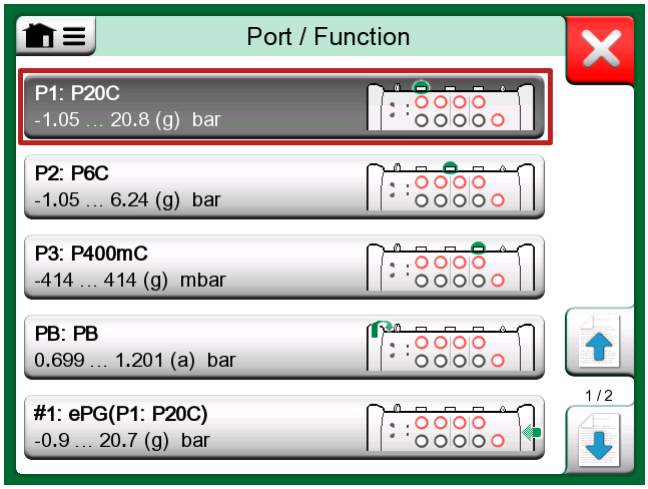


Figure 5: Step 3: Select an INT or EXT pressure module as a Port/Function

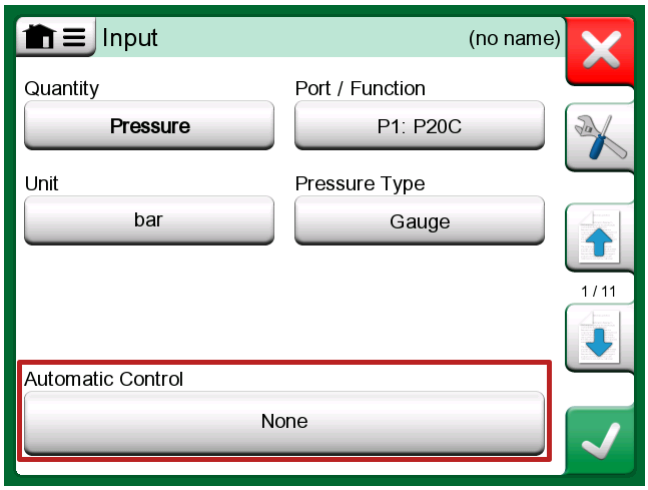


Figure 6: Step 4: Select controller via Automatic Control

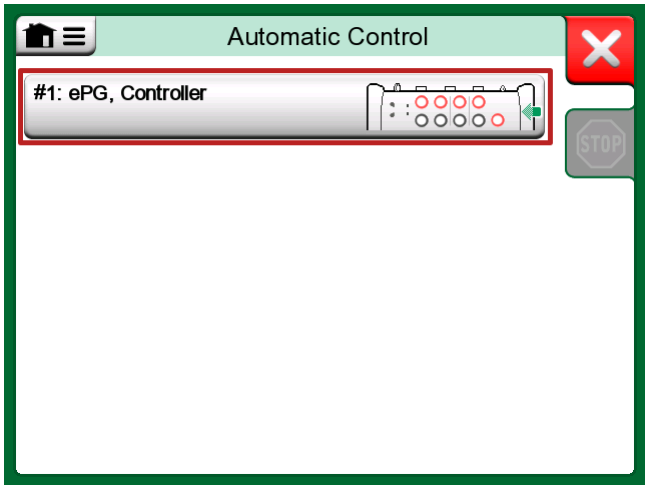


Figure 7: Step 5: Select the ePG

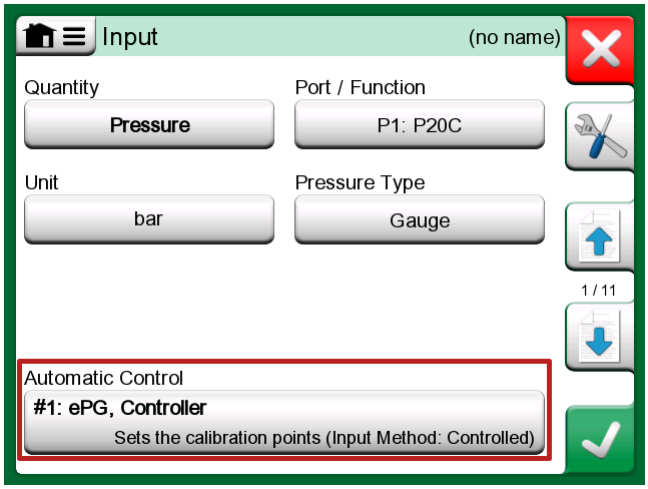


Figure 8: Step 6: The pressure module selected for Port/Function is the reference. This pressure module will override and change the Reference Pressure selection in the Controller Presets

Calibrating Analog gauges

When calibrating pressure gauges (analog indicators), it can be challenging to interpret the readings between the marks on the pressure gauge. That is why a cardinal point calibration is usually performed. This means that you adjust the pressure so that the gauge dial is aligned with a cardinal point, which makes it easier for you to interpret the reading. You can do this in the Documenting Calibrator mode as follows:

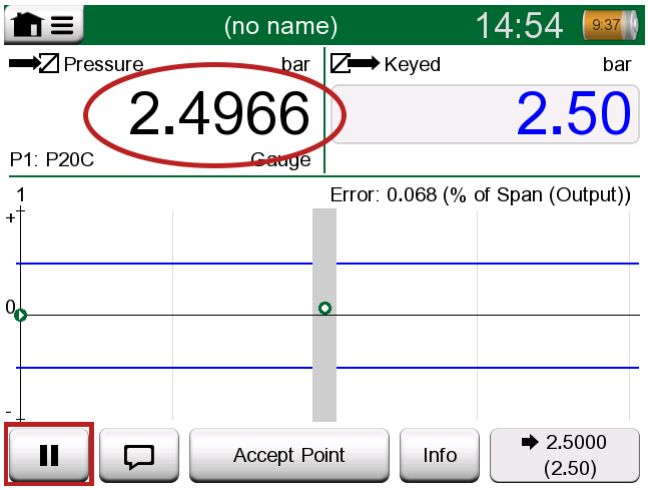


Figure 9: Cardinal point calibration

If you want to fine-tune the setpoint, press the Pause button and change the setpoint via the menu (see figure below).

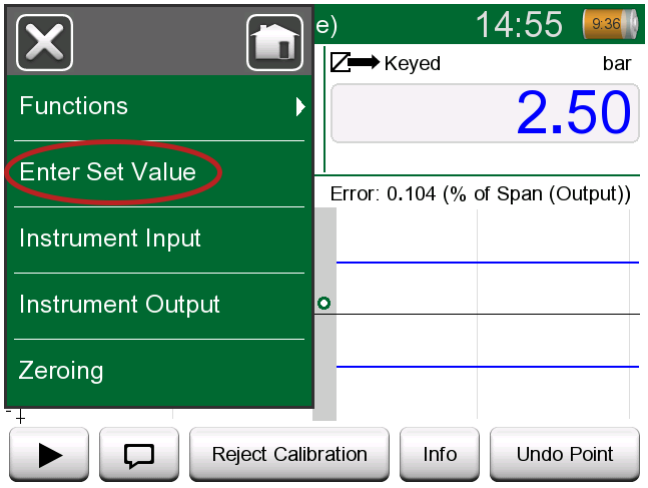


Figure 10: Menu dialog to change the setpoint value

It is possible to go back and forth between the Pause and Play buttons at the same setpoint.

Opening an instrument while the ePG is not connected

If you open an instrument, where controller communication is needed and the controller is not available, the calibrator will prompt you about a missing controller. You are still able to access and edit the instrument and when you connect the pressure controller, calibration can start.

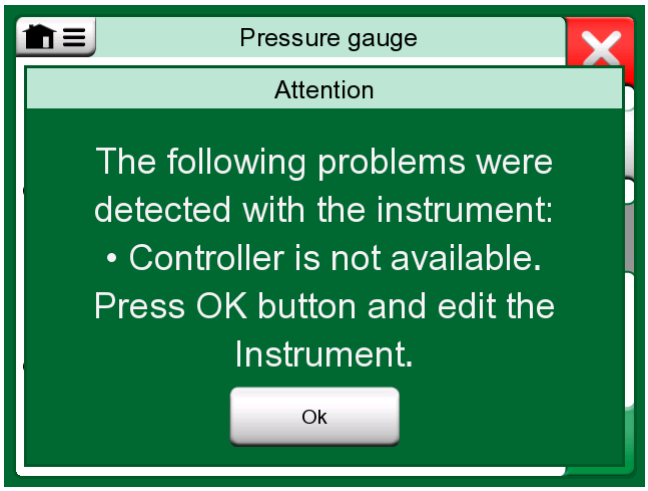


Figure 11: Missing controller notification

Working with the Calibration Management Software

The following chapter describes the ePG settings to be taken into consideration for the Calibration Management Software configuration (CMX or LOGiCAL).

Working with CMX

Requirements

There is no need to upgrade the CMX version in order to start using the ePG. The only requirement is that your MC6 family calibrator is able to communicate with your CMX version.

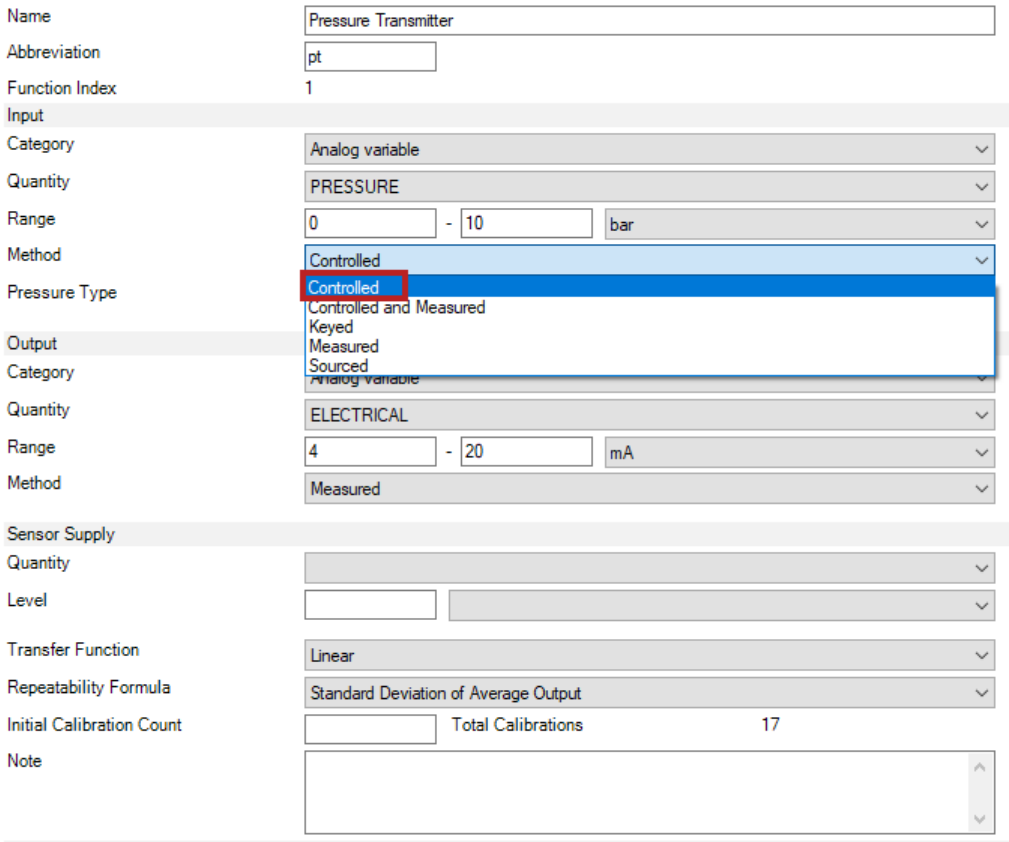
Table 1: MC6 family calibrator and CMX version compatibility

MC6 family calibrator (with firmware version 4.30 or later)	CMX version from which calibrator communication is supported
MC6	2.7
MC6-WS	2.7
MC6-Ex	2.11.2
MC6-T150	2.12.2
MC6-T660	2.12.1

Configuration

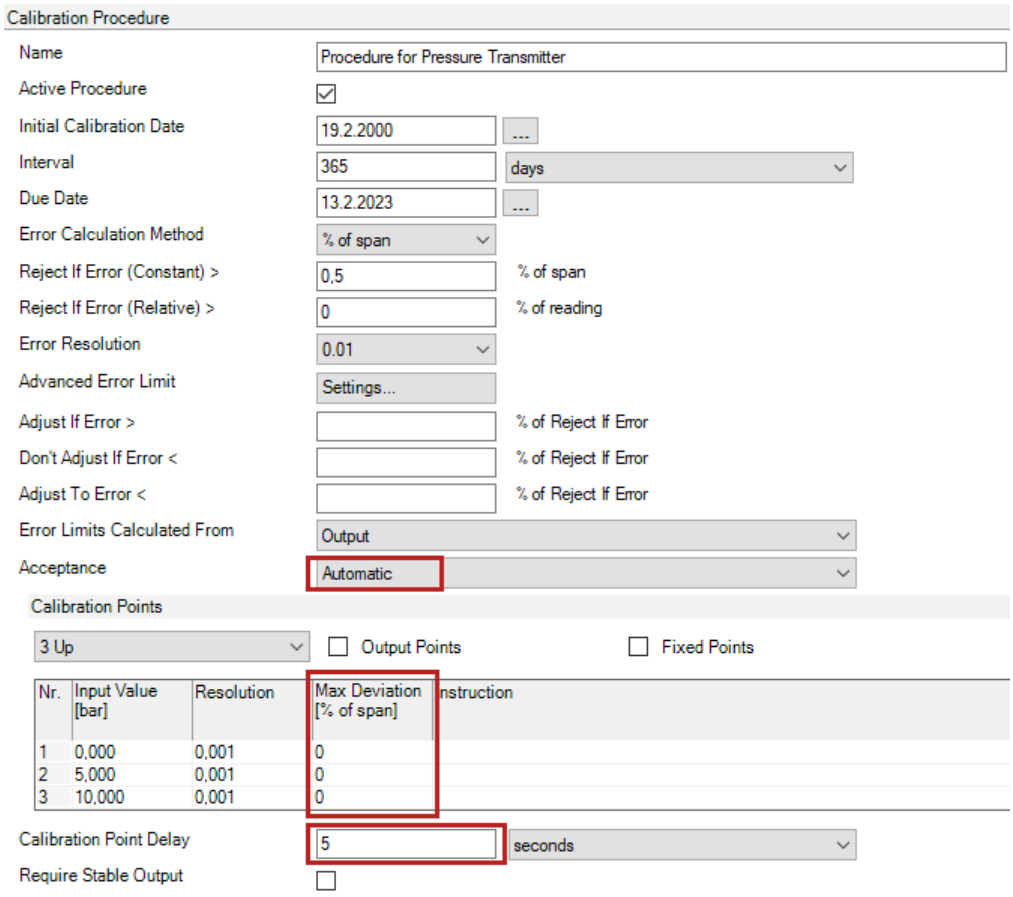
A minor configuration change is needed for the pressure instruments, when you want to use the MC6 to control the ePG to generate the pressure. If you have previously been using hand pumps to generate the input pressure, you have set the Input method in the function window as *Measured*.

Now, when working with the ePG, the Input method needs to be changed to *Controlled*, which means that the external controller (ePG) only generates the setpoints. The pressure generated by the ePG is measured by the MC6 using a separate internal or external pressure module.

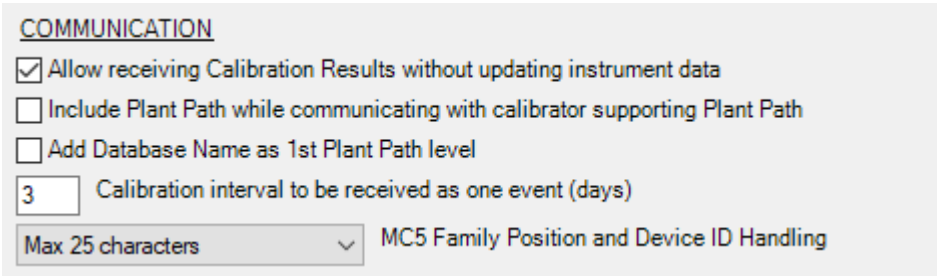


If you want the calibrator to automatically accept the calibration points, make sure you have the following configurations in the procedure window:

- *Acceptance* set to automatic
- *Max Deviation* sets a range around the setpoint (in % of span). When the Input is within the set range, the calibration point can be automatically accepted, even though the exact setpoint has not been reached.
- *Calibration Point Delay* defines the time (in seconds) how long the calibrator waits after the Input is stable before the readings are accepted.

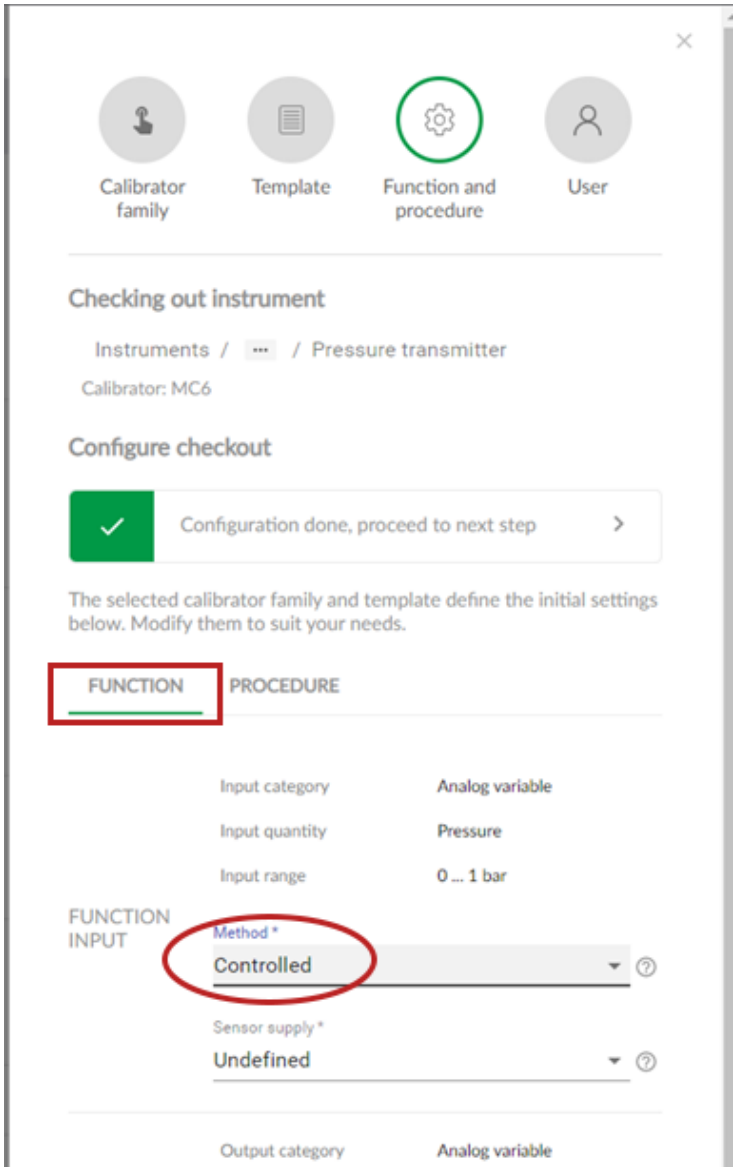


If you occasionally need to use a hand pump to calibrate the instrument, it is possible to configure CMX so that the user can change the Input method in the calibrator and perform the calibration. When transferring results from the calibrator to CMX, the user will be notified that the instrument differs, but it is possible to transfer the results without affecting the instrument. This setting can be found in CMX settings/Calibration tab:



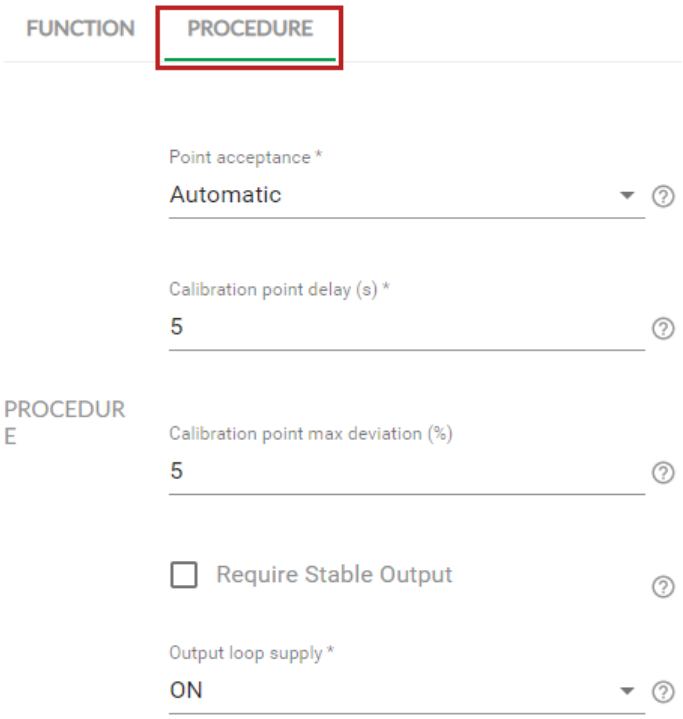
Working with LOGiCAL

When you check out the instrument for calibration, set the Input method in the function tab as *Controlled*.



On the procedure tab, you can configure the following settings to make the calibration points automatically accepted:

- *Point acceptance:* set to automatic
- *Max Deviation* sets a range around the setpoint (in % of span). When the Input is within the set range, the calibration point can be automatically accepted, even though the exact setpoint has not been reached.
- *Calibration Point Delay* defines the time (in seconds) how long the calibrator waits after the Input is stable before the readings are accepted.



The chosen method can also be changed in the calibrator and the ePG will not be a part of the traceability chain.

Troubleshooting

Table 2: Troubleshooting

I cannot choose ePG from the Controller Presets	Check that the Requirements to communicate with the ePG are fulfilled
I cannot generate 20 bar pressure	Make sure you have selected a reference pressure module that is capable of measuring 20 bar
I don't see the pressure rising in my MC6 family calibrator even though the pump is running	Check your connections. Make sure you are connected to the correct pressure module (the one that is selected as the Reference Module in Controller Presets)
Pressure generation stops in the middle of the calibration, pressure is vented and the ePG switches itself off	This happens when the ePG battery runs out. You need to recharge the ePG battery to continue working
Pressure generation stops in the middle of the calibration but pressure is not vented	Check that your cables are connected. The ePG stops generation if the USB communication cable is removed