Calibration Guide for ST-730SS Turbidity Sensor

Introduction

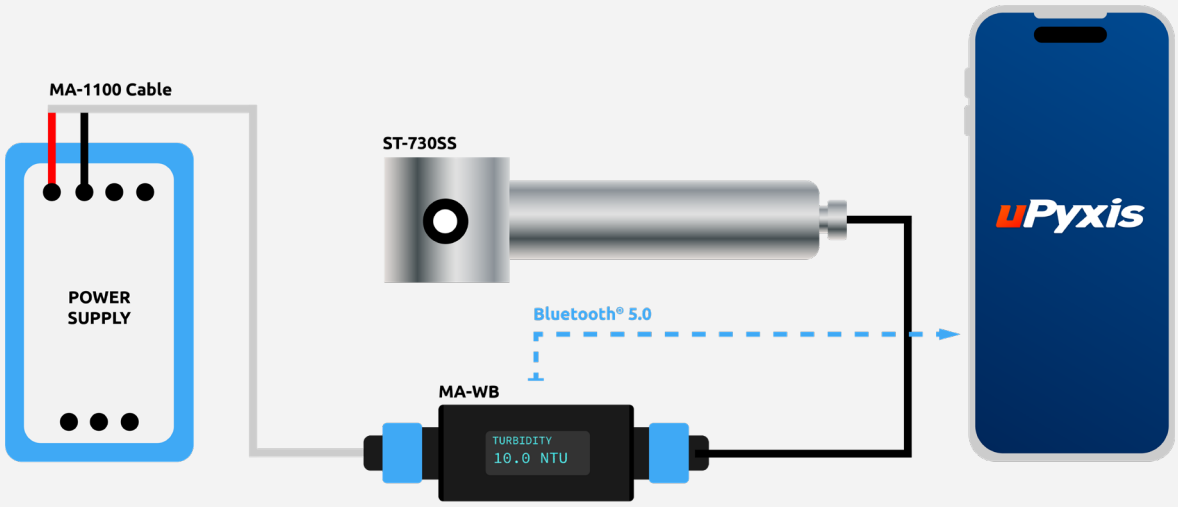
This document introduces how to calibrate ST-730SS turbidity sensor in detail. Customers requiring turbidity field calibration should read this document in advance.

1. PRE-REQUISITE

Please have the following items ready before carrying out any calibrations:

- uPyxis® 2.0 App and/or uPyxis® PC Software
- Pyxis Lab® MA-DB Device or a General USB-RS485 Adapter
- A Smart Phone with an iOS or Android Operating System or a PC Running Windows OS
- Calibration Solutions (Pyxis PG25 Based or DI Based/Formazine Standard Solutions)
- Pipettes

NOTE: *PG25 is a mixed fluid with a mass ratio of 25% Propylene Glycol and 75% Water*



2. PROCEDURES

The ST-730SS Turbidity Sensor is available with two-point calibration, process calibration and multi-point calibration. Each sensor is factory calibrated with Pyxis PG25 based turbidity solutions. If the sensor is installed in a non PG25 system, it is recommended that a two-point, process calibration or multi-point calibration be performed depending on the coolant used. You can calibrate the sensor using the uPyxis 2.0 App or uPyxis PC software.

2.1 Two Point Calibration

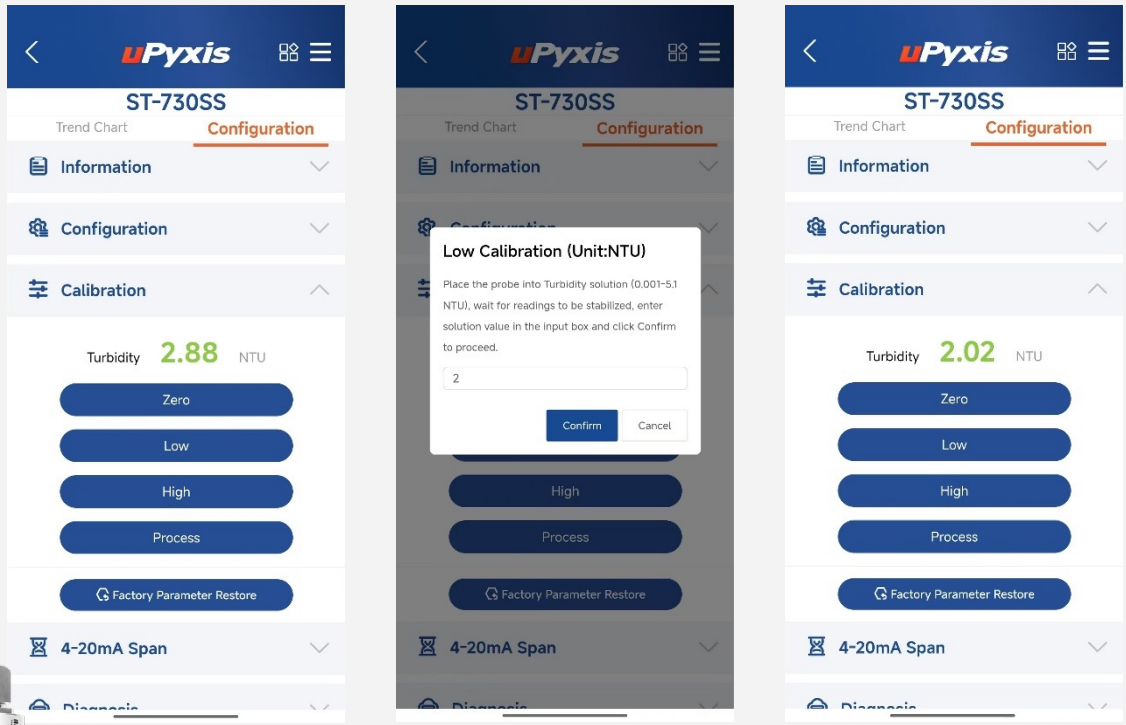
We recommend a low-range or high-range calibration if your field application only concerns low or high range measurement.

2.1.1 Low Range Calibration

It is recommended to use a standard turbidity solution to do a low range calibration if your typical turbidity measurement is within 0-2 NTU.

- **Zero Calibration**
  Rinse the probe a few times with the ZERO calibration solution (A ZERO calibration solution means that the solution is clean and free of turbidity particles), then fill a beaker with zero calibration solution using a pipette to avoid air bubbles. Cover with a towel and wait for the turbidity reading to stabilize. Click Zero button in the uPyxis 2.0 App and wait for calibration to be completed. Once the calibration succeeds, the turbidity reading will tighten up to 0. Please note, it may take 1-2 minutes for the turbidity reading come close to 0.

- **Low Point Calibration**
  Rinse the probe a few times with 2 NTU turbidity solution, then fill a beaker with 2 NTU turbidity solution using a pipette,. Cover with a towel and wait for the turbidity reading to stabilize. Click Low button and enter low calibration solution value (in this case, input value 2) in the uPyxis 2.0 App, then click Confirm button and wait for calibration to be completed. Once the calibration succeeds, the turbidity reading will tighten up to 2. Please note, it may take 1-2 minutes for the turbidity reading come close to 2 NTU.



2.1.2 High Range Calibration

If the application turbidity measurement range is greater than 5NTU and less than 100NTU, it is recommended to use a standard solution or process water sample value for a high range calibration.

- **Zero Calibration**
  Rinse the probe a few times with the ZERO calibration solution (A ZERO calibration solution means that the solution is clean and free of turbidity particles), then fill a beaker with zero calibration solution using a pipette to avoid air bubbles. Cover with a towel and wait for the turbidity reading to stabilize. Click Zero button in the uPyxis 2.0 App and wait for calibration to be completed. Once the calibration succeeds, the turbidity reading will tighten up to 0. Please note, it may take 1-2 minutes for the turbidity reading come close to 0.
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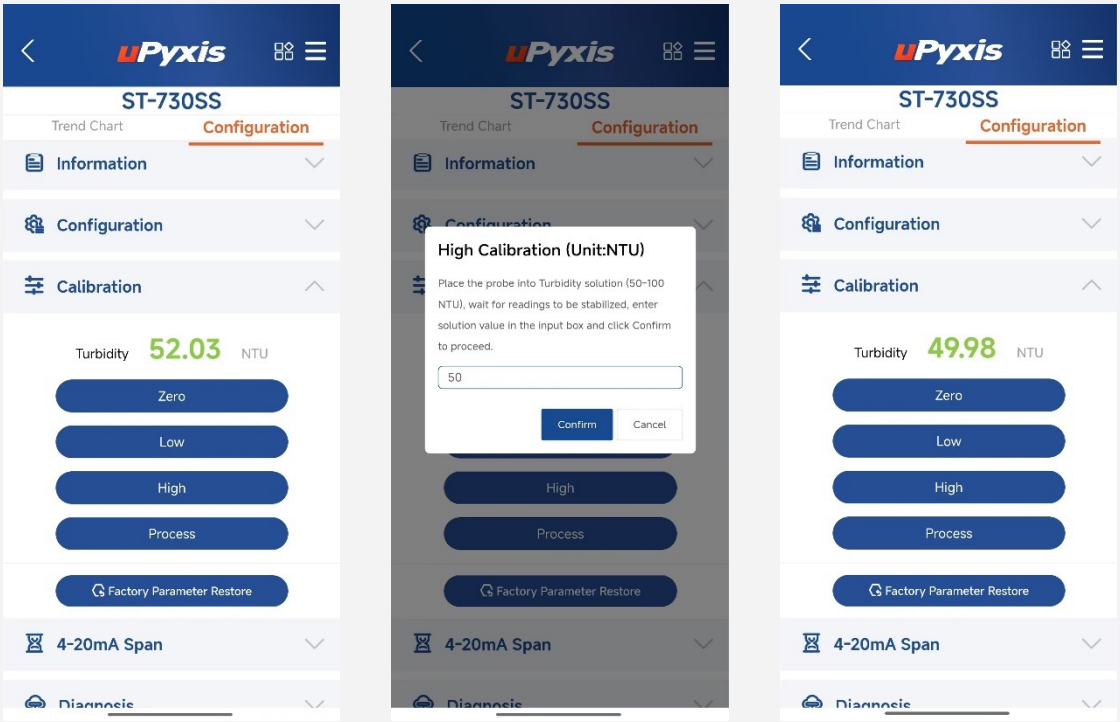
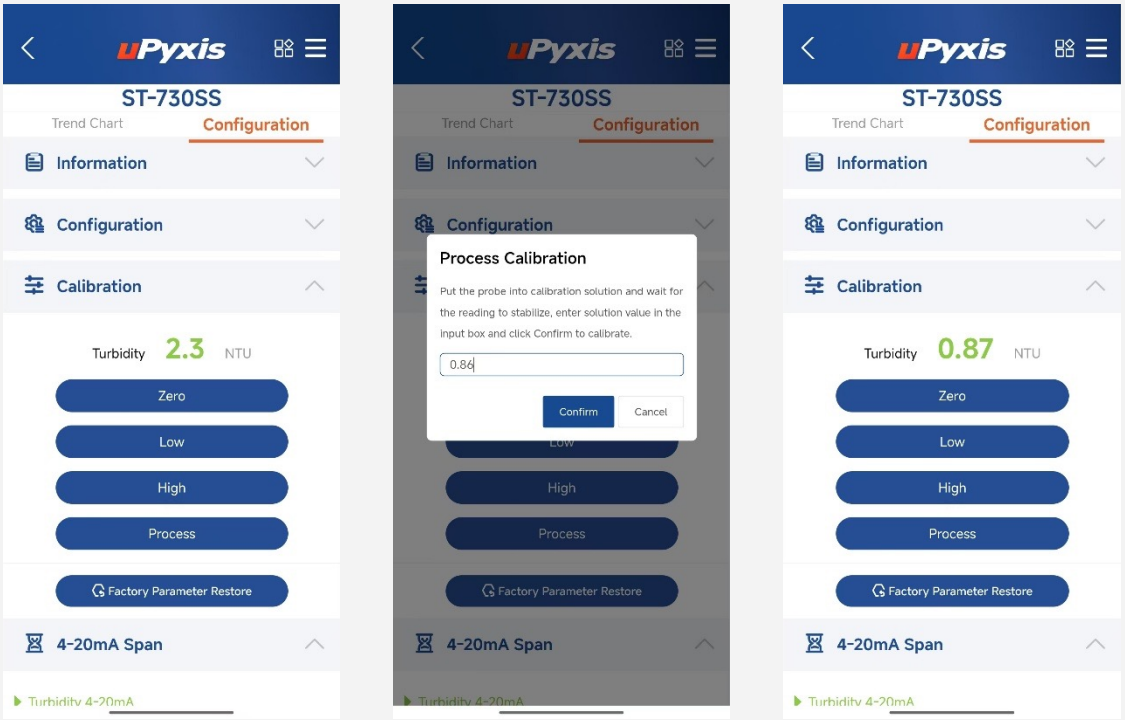
- **High Point Calibration**
  Rinse the probe a few times with 50 NTU turbidity solution, then fill a beaker with 50 NTU turbidity solution using a pipette to avoid air bubbles. Cover with a towel and wait for the turbidity reading to stabilize. Click High button and input high calibration solution value (in this case, input value 50) in the uPyxis 2.0 App, then click Confirm button and wait for calibration to be completed. Once the calibration succeeds, the turbidity reading will tighten up to 50. Please note, it may take 1-2 minutes for the turbidity reading come close to 50 NTU.



2.2 Process Calibration

Process calibration allows customer to manually add an offset in the sensor measurements to match the actual turbidity value in the process water which is often obtained through a hand-held turbidimeter. Click Process button, enter the actual turbidity value in the uPyxis 2.0 App and click Confirm button and wait for calibration to be completed. Once the calibration succeeds, the sensor turbidity reading will tighten up to the actual turbidity value.



2.3 Multi-Point Calibration

A multi-point calibration is recommended if ST-730SS turbidity sensor is installed in a non PG25 fluid system.

2.3.1 Zero Calibration

Rinse the probe a few times with the ZERO calibration solution (A ZERO calibration solution means that the solution is clean and free of turbidity particles), then fill a beaker with zero calibration solution using a pipette to avoid air bubbles. Cover with a towel and wait for the turbidity reading to stabilize. Click Zero button in the uPyxis 2.0 App and wait for calibration to be completed. Once the calibration succeeds, the turbidity reading will tighten up to 0. Please note, it may take 1-2 minutes for the turbidity reading come close to 0.

After the zero calibration, please do the low point and high range calibration in turn.

2.3.2 Low Point Calibration

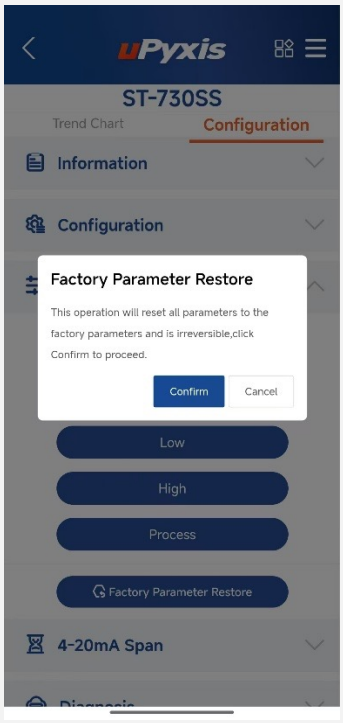
Rinse the probe a few times with 2 NTU turbidity solution, then fill a beaker with 2 NTU turbidity solution using a pipette. Cover with a towel and wait for the turbidity reading to stabilize. Click Low button, enter low calibration solution value (in this case, enter value 2) in the uPyxis 2.0 App, then click Confirm button and wait for calibration to be completed. Once the calibration succeeds, the turbidity reading will tighten up to 2. Please note, it may take 1-2 minutes for the turbidity reading come close to 2 NTU.

2.3.3 High Point Calibration

Rinse the probe a few times with 50 NTU turbidity solution, then fill a beaker with 50 NTU turbidity solution using another pipette. Cover with a towel and wait for the turbidity reading to stabilize. Click High button, enter high calibration solution value (in this case, enter value 50) in the uPyxis 2.0 App, then click Confirm button and wait for calibration to be completed. Once the calibration succeeds, the turbidity reading will tighten up to 50. Please note, it may take 1-2 minutes for the turbidity reading come close to 50 NTU.

2.4 Restore Calibration

If you mess up the turbidity calibration of the ST-730SS turbidity sensor, you can in any case restore the factory default calibration settings via the uPyxis 2.0 application, which will ensure that you get the correct starting point for the next calibration.



NOTES

- The ST-730SS been calibrated with formazine turbidity solution of PG25 fluid prior to shipping, but the sensor was actually being installed in a water-based fluid system to measure its turbidity, you may find that the sensor's measurements in the target system is slightly higher than the actual turbidity value due to the difference in refractive index between water and propylene glycol. In this case, use a handheld turbidimeter to measure the actual turbidity value in the target system and use this actual turbidity value to do process calibration on the ST-730SS turbidity sensor. However, in order to obtain more accurate reading values, it is recommended to perform multi-point calibration with turbidity solutions made for the target system.

- Pyxis offers traceable 2 NTU and 50 NTU calibration solutions made for PG25 fluid system. It is highly recommended to use Pyxis traceable PG25 based calibration solutions for your field calibration if the ST-730SS turbidity sensor is installed in a PG25 fluid system to measure its turbidity.

Standard Solutions

Accessory Name	*Part Number*
TURB-2 Turbidity Calibration Standard Solution 2NTU/500mL	57010-6
TURB-50 Turbidity Calibration Standard Solution 50NTU/500mL	57009
TURB-2-PG25 Turbidity Calibration Standard Solution 2NTU/500mL	36828
TURB-50-PG25 Turbidity Calibration Standard Solution 50NTU/500mL	34210