



BRTSYS_AN_080

Modbus Configuration Utility Guide

Version 1.0

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1 Introduction

Modbus Configuration Utility facilitates the configuration of Modbus devices through a COM port connection to a PC.

The utility can scan all Modbus devices connected through the COM port and display comprehensive information for each detected device.

The utility allows users to configure individual device settings, including address, baud rate, and parity, for each connected Modbus device.

In addition to configuration, the utility supports firmware updates, device control operations, and real-time data reading from connected Modbus devices. It also offers calibration functionality for devices equipped with calibration features.

The utility is designed to support and manage all Modbus-compatible devices produced by BRT Systems.

2 Hardware Setup Pre-requisites

The following components are required:

- Windows based PC
- USB Type A to RS485 cable or board
- Interface between RS485 and Modbus Devices (Modbus devices has 2 interfaces namely RJ11 / JST)

For more information on hardware setup, refer to [Modbus Device Configuration application note](#).

3 Installing Modbus Configuration Utility

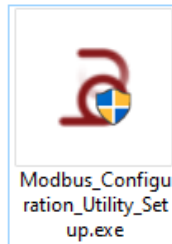
3.1 First Time Installation

Following are the steps to install Modbus Configuration Utility for the **first time** –

1. Download the installation package from BRTSys Website –

<https://brtsys.com/resources/software/brtsys-utility-tools>

2. Extract the Zip file and run the **Setup** (.exe) file provided with the installation package.



3. A Welcome message appears along with Modbus Configuration Utility Installer Wizard. Click **[Next]**.

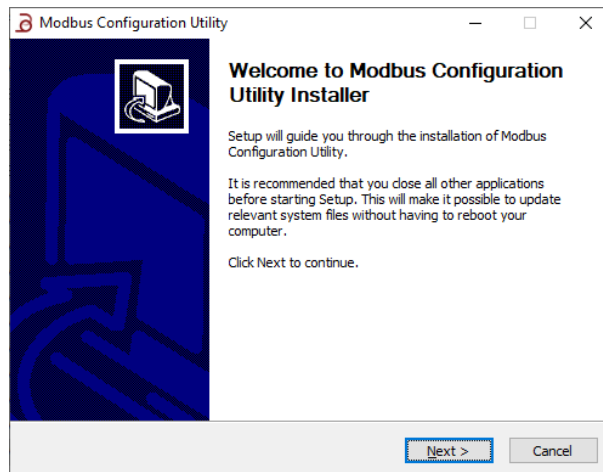


Figure 1 - Setup Wizard – Welcome Screen

4. Select or edit the Start Menu Folder Name. Click **[Next]**.

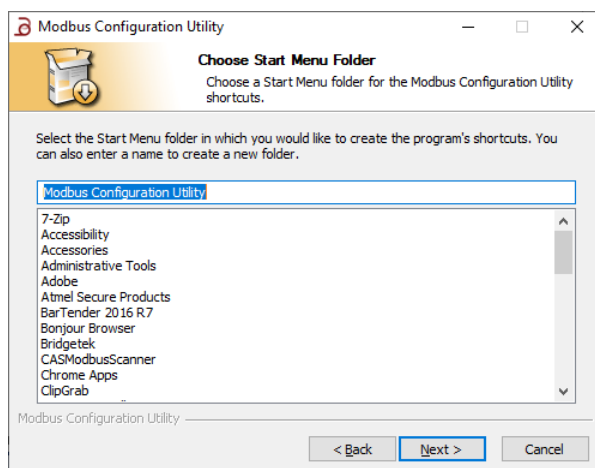


Figure 2 - Setup Wizard – Start Menu Folder Selection



NOTE:

At any point of time, during the installation, users may click [Back] to navigate to the previous window or click [Cancel] to abort the installation process.

5. Select a "Destination Folder" for installing the files. Accept the default folder or click **[Browse]** to specify a different location. Click **[Install]** to start the installation.

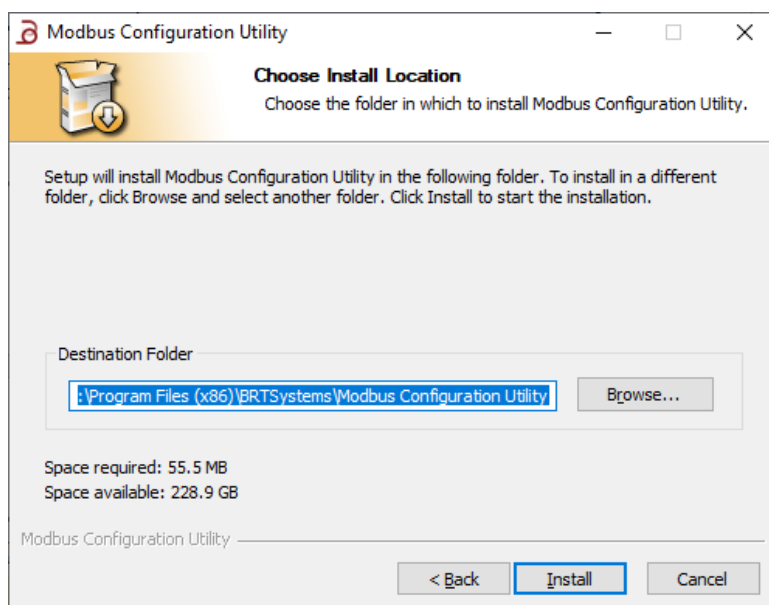


Figure 3 - Setup Wizard – Installation Location Selection

6. A progress bar indicates that the installation is in progress. It will request to install Microsoft.WindowsDesktop.App (runtime 9.0.2 is shown for illustration purpose), click **[OK]** to continue.

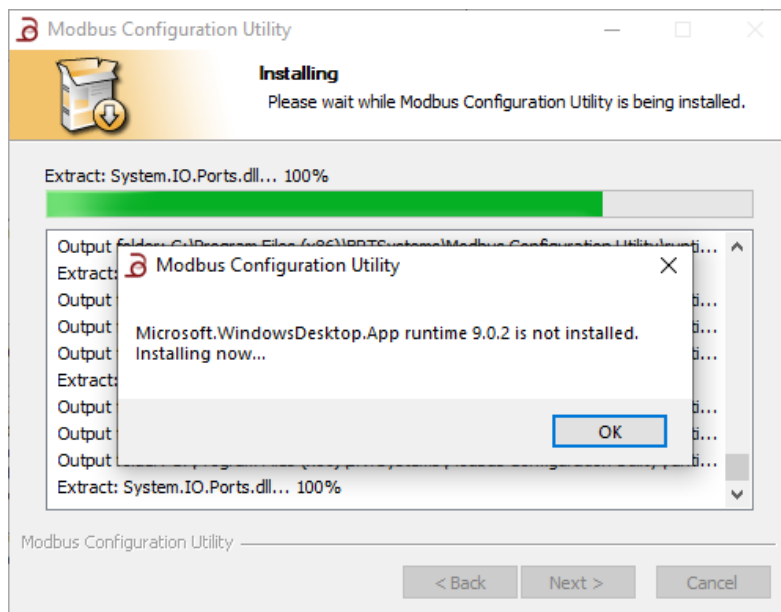


Figure 4 - Setup Wizard – Installation Progress

7. Upon successful installation, click **[Finish]** to close the setup. Select the check box to run the utility (optional).

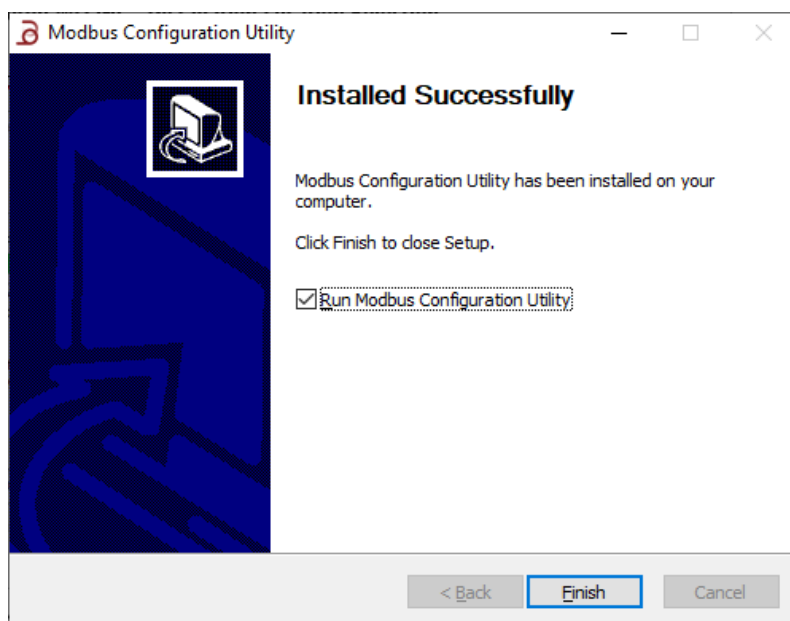


Figure 5 - Setup Wizard – Installation Complete

8. By default, the Modbus Configuration Utility is installed in this path – “\Program Files (x86)\BRTSystems\Modbus Configuration Utility.”

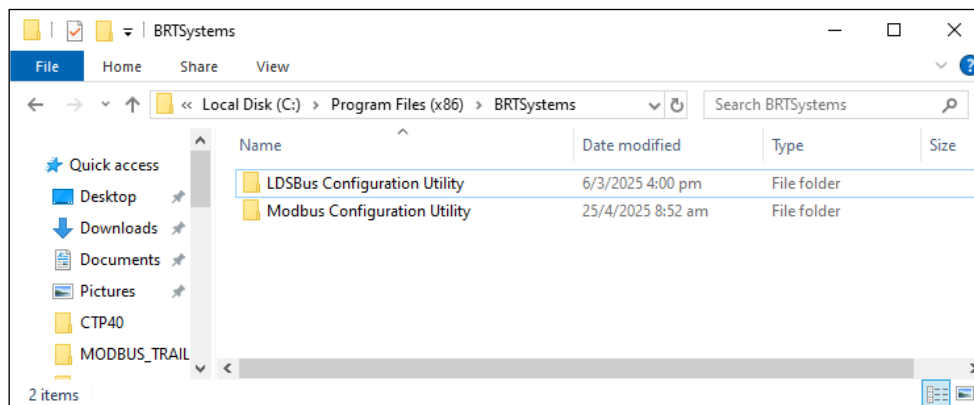


Figure 6 - Modbus Configuration Utility Installation Folder location

9. Logging Modbus device functionality records data in both **CSV** and **TXT** formats in default folder.

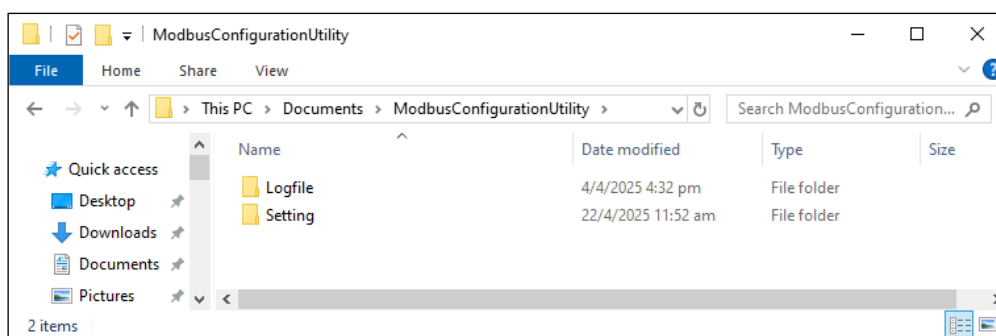


Figure 7 - Modbus Default Datalog Folder Location

3.2 Update to a New Version



NOTE:

While updating to a new version, an uninstaller will run and remove the previous package and information from the registry information. First-time installation will not show the uninstaller.

Following are the steps to update to a latest version of Modbus Configuration Utility –

1. Run the **Setup.exe** file.
2. The Modbus Configuration Utility Uninstaller is displayed. Click **[Next]**.

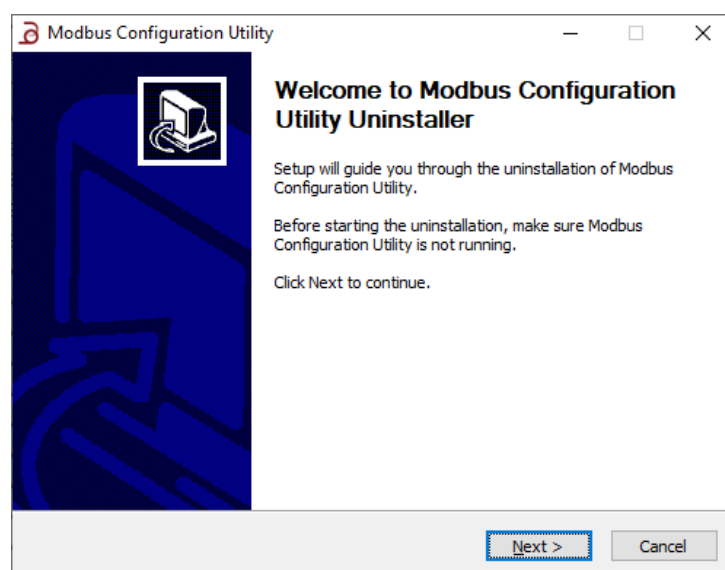


Figure 8 - Modbus Configuration Utility – Uninstaller

3. Click **[Uninstall]** to start uninstalling the old version. The uninstallation will be in progress.

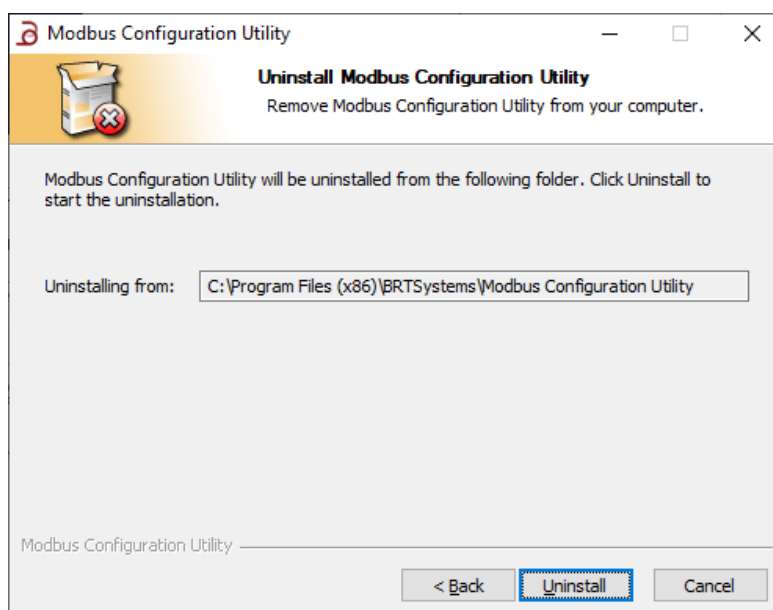


Figure 9 - Modbus Configuration Utility – Uninstallation in Progress

- Click **[Finish]** to complete the uninstallation.

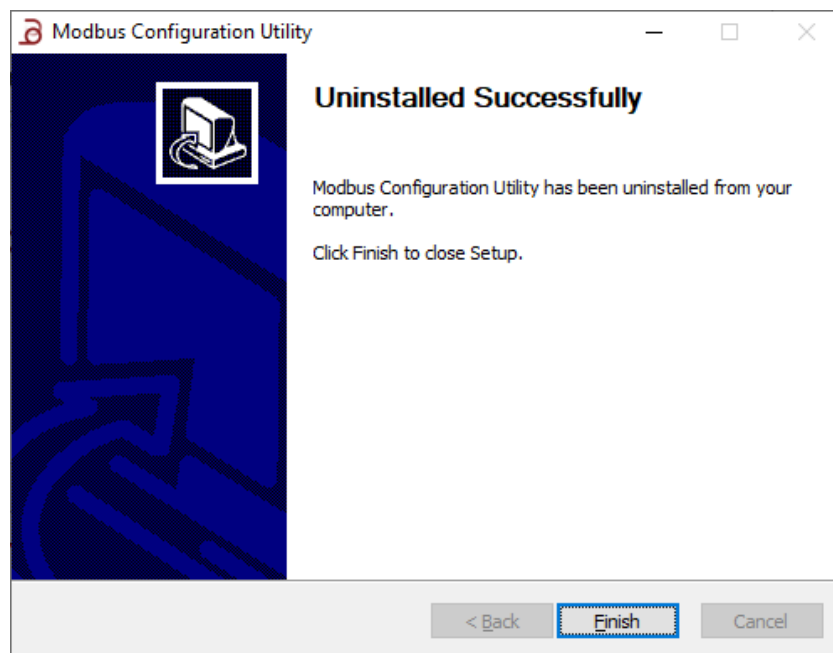


Figure 10 - Modbus Configuration Utility – Uninstallation Completed



NOTE:

Refer to Section [3](#) for installing the Modbus Configuration Utility.

4 Modbus Configuration Utility – GUI Overview

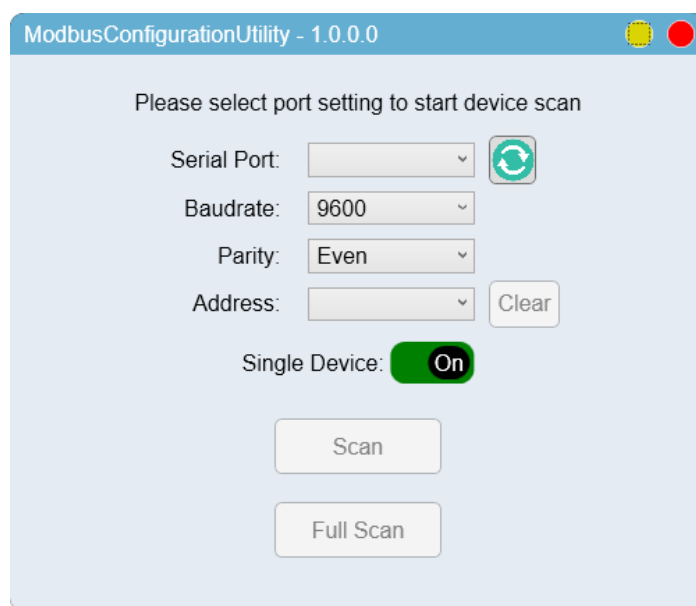


Figure 11 - Modbus Configuration Utility Startup Window

4.1 Startup Window

Upon launching the application, the startup window (refer to **Figure 11**) requires users to configure basic communication settings before initiating a scan for devices on the communication bus.

- **Serial Port:** Allows the user to select the appropriate COM port.  button can be used to rescan and update the list of available COM ports.
- **Baud Rate:** Enables the user to configure the communication speed. For more information about the supported baud rates, refer to the Modbus Registers section in the respective device datasheets. The default baud rate for newly manufactured devices is set to 9600 bps.
- **Parity:** Allows the user to select the parity mode for communication. Supported values include *None*, *Odd*, and *Even*. By default, newly manufactured devices are configured with *Even* parity.
- **Address:** Enables the user to specify the device address when only one device is connected to the communication bus. The valid address range is from 1 to 126, with new devices defaulting to address 126. For multiple devices, leave the Address settings empty and toggle the **[Single Device]** option to **Off**.
- **Single Device Toggle Button:** Determines whether the scan should assume a single device or multiple devices are connected to the bus. When enabled and multiple devices are present, the scan process will terminate after the first device is detected. The default state is **On** upon application startup.
- **Scan Button:** Click the **[Scan]** button to initiate the scanning process and detect devices connected to the communication bus.
- **Full Scan Button:** Click the **[Full Scan]** button to search through all possible combinations of **baud rate**, **parity**, and **device address**. This feature is ideal for locating devices with unknown or misconfigured communication settings.

4.2 Device Setting Window

For illustration purpose, the procedure for scanning single device is given here.

Click the **[Scan]** button to initiate the device scanning process as outlined below:

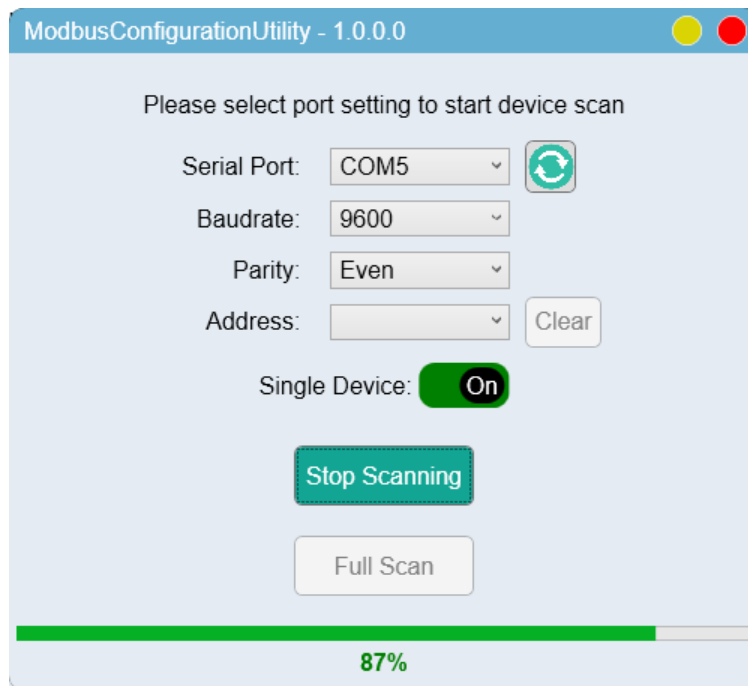


Figure 12 - Modbus Configuration Utility Scan Process

Upon completion of the scan, a message box appears indicating the number of devices detected. If a single device is found, its address will be displayed in the message as well.

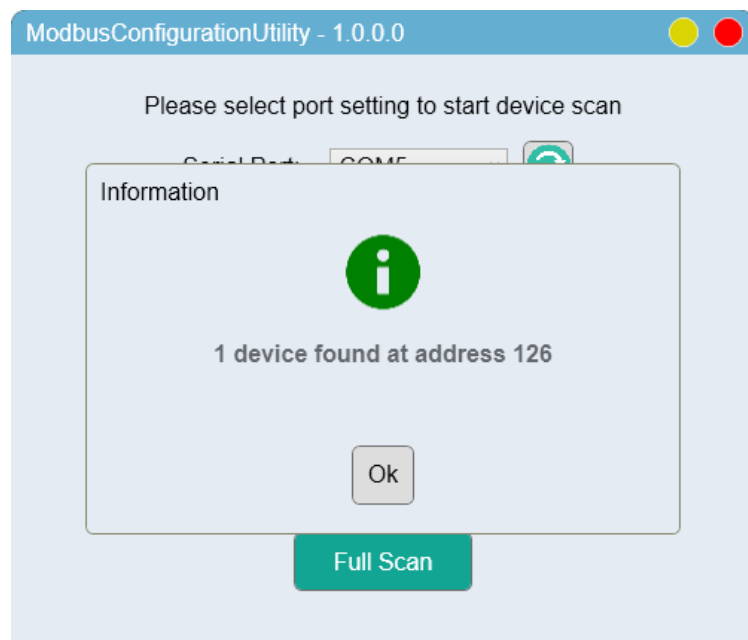


Figure 13 - Modbus Configuration Utility After Scan Message

Note 1: Upon disabling the **Single Device** option (i.e. Setting Single Device – Off), all the devices in the bus are discovered. If the Single Device option is enabled (i.e. Setting Single Device – On), only the very first device in the bus will be discovered.

Note 2: **Full Scan** feature will search through all possible combinations of **baud rate, parity, and device address**. This feature is ideal for locating devices with unknown or misconfigured communication settings.

Once devices are detected and **[Ok]** is clicked, the Device Configuration window will be displayed, as shown in **Figure 14** . This interface allows users to view device information and modify communication and operational parameters.

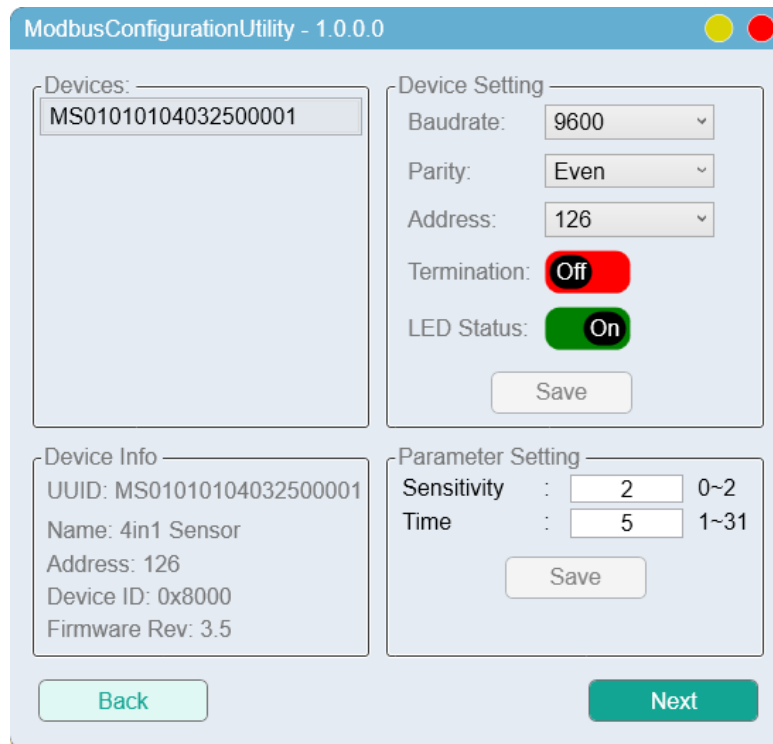


Figure 14 - Device Configuration Window

Devices List

- Displays the UUIDs of all detected devices.
- Selecting a device from the list populates the corresponding fields in the **Device Setting**, **Device Info**, and **Parameter Setting** sections.

Device Setting

- **Baudrate:** Dropdown menu to select the communication speed (e.g., 9600 bps).
- **Parity:** Dropdown to choose between *None*, *Odd*, or *Even*.
- **Address:** Allows setting a new Modbus address (1–126).
- **Termination:** Toggle button to enable or disable bus termination.
 - **Red (Off)** indicates termination is disabled.
 - **Green (On)** indicates termination is enabled.
- **LED Status:** Toggle to turn the device's LED indicator On or Off.

- **Red (Off)** indicates LED is disabled.
- **Green (On)** indicates LED is enabled.
- **[Save]**: Saves the above settings to the selected device.

Device Info

- **UUID**: Unique identifier of the device.
- **Name**: Product name or type (e.g., *4in1 Sensor*).
- **Address**: Current Modbus address.
- **Device ID**: Internal device identifier (e.g., *0x8000*).
- **Firmware Rev.**: Firmware version (e.g., *3.5*).

Parameter Setting [Device Specific Feature]

- **Sensitivity**: Adjustable value in the range **0–2**.
- **Time**: Adjustable value in the range **1–31**.
- **[Save]**: Applies the parameter settings to the device.

Navigation Buttons

- **[Back]**: Returns to the previous screen.
- **[Next]**: Proceeds to the next step in the utility.

4.3 Sensor Reading Display Window

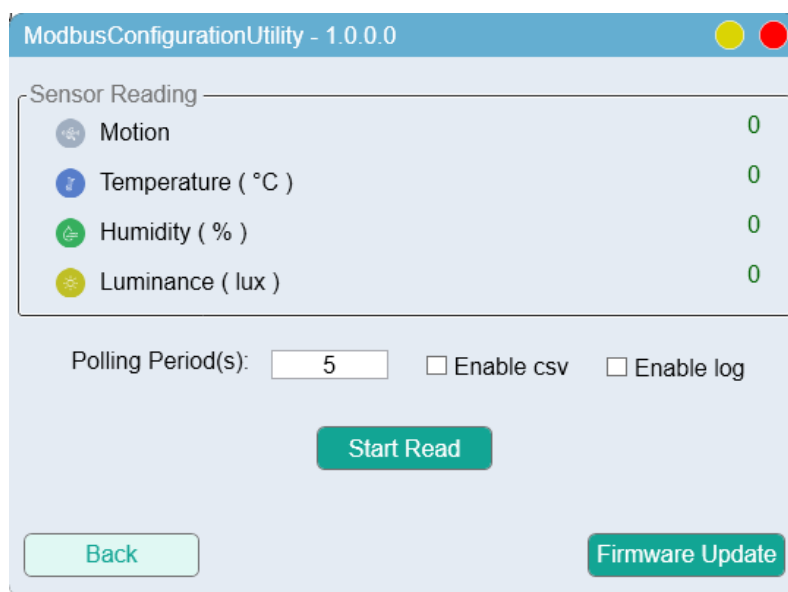


Figure 15 - Sensor Reading Display Window

After device configuration, users can navigate to the **Sensor Reading Display Window** to monitor live sensor data and configure data logging preferences. This feature is available **only for devices equipped with sensor functionalities**.

For devices that support control operations instead of sensor readings, the utility will automatically navigate to their **respective control interfaces** tailored for those device functions.

Sensor Reading Panel

Displays real-time values from the connected device (e.g., *4in1 Sensor*):

- **Motion**: Indicates motion detection status (0 = no motion, 1 = motion detected).
- **Temperature (°C)**: Current ambient temperature.
- **Humidity (%)**: Relative humidity reading.
- **Luminance (lux)**: Current light intensity in lux.

Polling Period

- **Polling Period (s)**: Specifies the interval (in seconds) at which the sensor values are refreshed.
(Default: 5 seconds)

Data Logging Options

- **Enable CSV**: When checked, sensor data will be saved in CSV format for further analysis.
- **Enable Log**: When checked, enables logging of sensor data into a text-based log file.

Control Buttons

- **Start Read**: Begins reading and displaying real-time sensor values based on the specified polling period.
- **Back**: Returns to the previous screen.
- **Firmware Update**: Opens the firmware upgrade interface for the connected device.

4.4 Firmware Update

To update the device firmware, click the **[Firmware Update]** button. A file browser window will appear, prompting the user to select the appropriate .unv firmware file. Select the correct .unv file to proceed with the firmware update process.

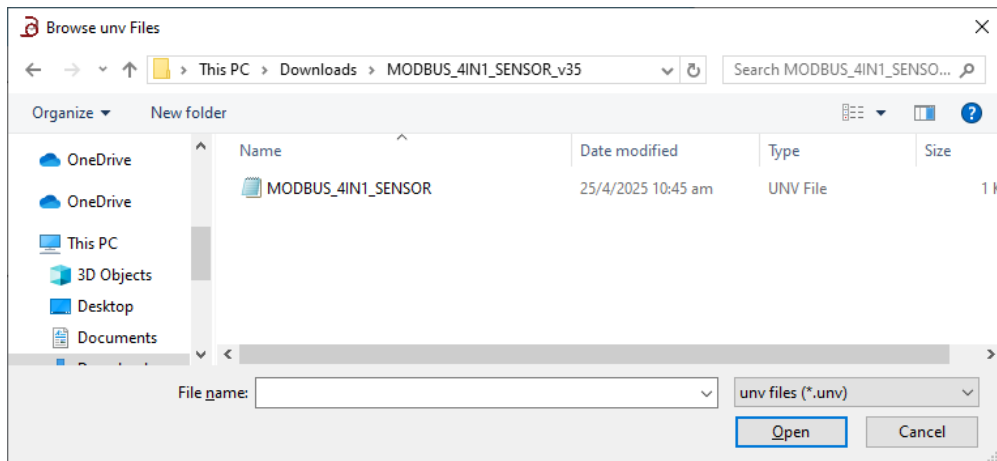


Figure 16 - Firmware update file browser window

Firmware Update in Progress

Once a valid .unv firmware file is selected, the firmware update process begins. During the update:

- The **progress bar** at the bottom visually indicates the current status of the update.
- The **percentage** is displayed in real-time to inform the user of the update progress.
- All interaction buttons such as **Start Read**, **Firmware Update**, and **Back** are **disabled** to prevent accidental interruption.



Do not disconnect the device or close the utility during the firmware update process. After the update reaches 100%, a confirmation message will be displayed to indicate successful completion.

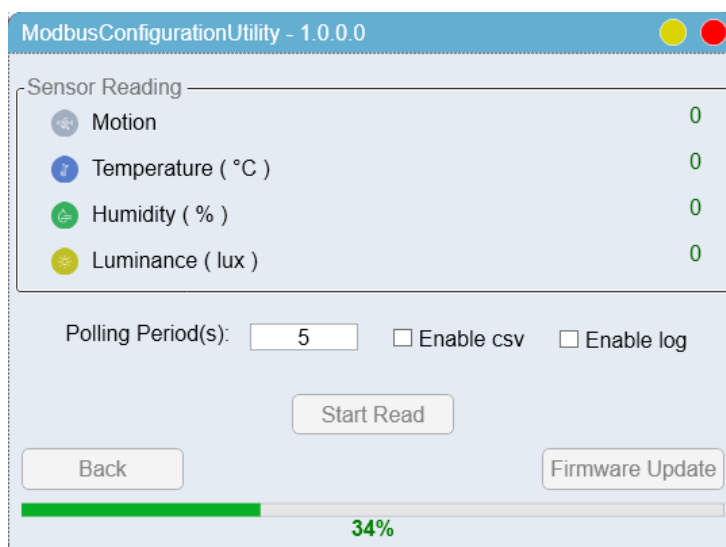


Figure 17 - Firmware Update Progress

Upon completion of the firmware update, a popup message will be displayed to indicate whether the update was successful or unsuccessful.

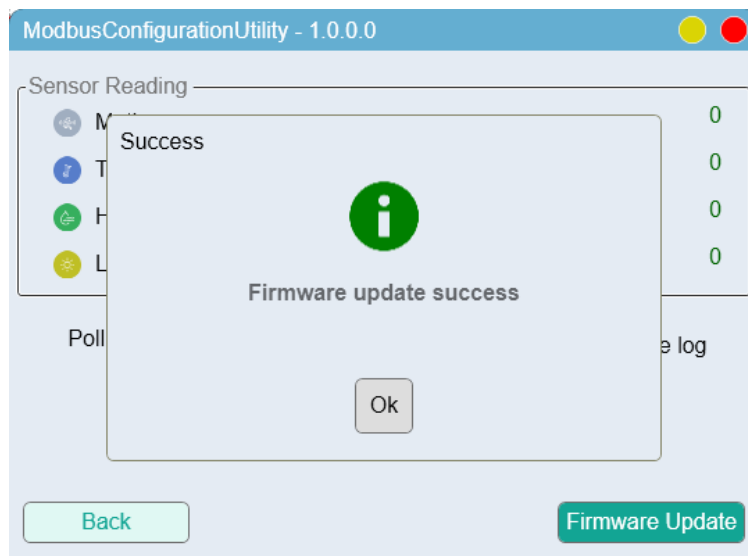


Figure 18 - Firmware update success popup message

4.5 Modbus 2CH Relay Control Window



Figure 19 - Modbus 2CH Relay Control Window

Modbus 2CH Relay Control Window allows users to configure the output behaviours for two relays: **Relay-1** and **Relay-2**. Each relay can be independently set for different output modes, timing parameters, polarity, and deactivation modes. The configuration supports applications such as timed control, pulse generation, or level-based switching.

Relay-1 Configuration Panel

- **Output Mode:**
Dropdown to choose how the relay behaves:
 - Level: Maintains output for a set duration.
 - Pulse: Output single in pulse mode
- **Polarity:**
Dropdown to set signal polarity:
 - Negative: Inverted output.
 - Positive: Normal output
- **Deactivation Mode (only available for Pulse Output Mode):**
Dropdown to select deactivation behaviour:
 - None: No special deactivation behaviour applied.
 - Immediate: Deactivation immediately
 - Deactivate immediately after T1 completion
 - Deactivate immediately after T2 completion
- **Timing and Cycle Parameters:**
 - **T1 (Secs):** Duration for first phase (default: 60).
 - **T2 (Secs):** Duration for second phase (default: 60).
 - **Cycles:** Number of repetitions (default: 1).
- **Relay State Display:**
 - Button to toggle relay control **ON/OFF**
- **Save Button:**
 - Saves the current configuration for Relay-1.

Relay-2 Configuration Panel

This panel is identical to the Relay-1 configuration panel, but it controls **Relay-2**. All settings and options mirror those of Relay-1.

Control Buttons

- **Back:** Returns the user to the previous screen.
- **Firmware Update:** Navigates to the firmware update section of the application. [Firmware Update](#)

User Actions

- Configure desired values for each relay:
 - Select appropriate Output Mode, Polarity, and Deactivation Mode.
 - Enter timing and cycle values.
- Click **Save** for each relay to apply and store the changes.
- Relay state will remain **Inactive** until activated based on configuration logic.
- Use **Back** to return or **Firmware Update** to update the firmware if needed.

Notes

- Ensure valid numeric input in timing and cycle fields.
- Configuration does not apply until **Save** is clicked.
- Relay activation will depend on device-specific triggers or external inputs.

4.6 Modbus 2CH Relay + iSENSE Control Window



The screenshot shows the 'ModbusConfigurationUtility - 1.0.0.0' window. It contains three main sections: 'Relay-1 Config', 'Relay-2 Config', and 'iSENSE Current Reading'. Each relay config section has dropdowns for 'Output Mode' (Level), 'Polarity' (Negative), and 'Deact Mode' (None), along with input fields for 'T1 (Secs)' (60), 'T2 (Secs)' (60), and 'Cycles' (1). A 'Save' button is next to each. The 'Relay State' section shows 'Relay-1 Inactive' and 'Relay-2 Inactive' with a toggle button. The 'iSENSE Current Reading' section shows 'Relay 1 Current: 0 mA' and 'Relay 2 Current: 0 mA', a 'Polling Period(s)' field (5), and checkboxes for 'Enable csv' and 'Enable log'. A 'Start Read' button is at the bottom. Navigation buttons 'Back' and 'Firmware Update' are at the very bottom.

Figure 20 - Modbus 2CH Relay + iSENSE Control Window

Modbus 2CH Relay + iSENSE Control Window allows users to configure the output behaviours for two relays: **Relay-1** and **Relay-2**. Each relay can be independently set for different output modes, timing parameters, polarity, and deactivation modes. The configuration supports applications such as timed control, pulse generation, or level-based switching.

Relay-1 Config Panel

- **Output Mode:**
 Dropdown to choose how the relay behaves:
 - Level: Maintains output for a set duration.
 - Pulse: Output single in pulse mode
- **Polarity:**
 Dropdown to set signal polarity:
 - Negative: Inverted output.
 - Positive: Normal output
- **Deactivation Mode(only available for Pulse Output Mode):**
 Dropdown to select deactivation behaviour:
 - None: No special deactivation behaviour applied.
 - Immediate: Deactivation immediately
 - Deactivate immediately after T1 completion
 - Deactivate immediately after T2 completion
- **Timing and Cycle Parameters:**
 - **T1 (Secs):** Duration for first phase (default: 60).
 - **T2 (Secs):** Duration for second phase (default: 60).
 - **Cycles:** Number of repetitions (default: 1).
- **Relay State Display:**
 - Button to toggle relay control **ON/OFF**
- **Save Button:**

- Saves the current configuration for Relay-1.

Relay-2 Config Panel

This panel is identical to the Relay-1 configuration panel, but it controls **Relay-2**. All settings and options mirror those of Relay-1.

iSENSE Current Reading Panel

Displays real-time current readings from Relay 1 and Relay 2 connections.

- **Data Logging Options**
 - **Enable CSV:** When checked, sensor data will be saved in CSV format for further analysis.
 - **Enable Log:** When checked, enables logging of relay data into a text-based log file.

Control Buttons

- **Start Read:** Begins reading and displaying real-time relay's status based on the specified polling period.
- **Back:** Returns the user to the previous screen.
- **Firmware Update:** Navigates to the firmware update section of the application. [Firmware Update](#).

User Actions

- Configure desired values for each relay:
 - Select appropriate Output Mode, Polarity, and Deactivation Mode.
 - Enter timing and cycle values.
- Click **Save** for each relay to apply and store the changes.
- Relay state will remain **Inactive** until activated based on configuration logic.
- Use **Back** to return or **Firmware Update** to update the firmware if needed.

Notes

- Ensure valid numeric input in timing and cycle fields.
- Configuration does not apply until **Save** is clicked.
- Relay activation will depend on device-specific triggers or external inputs.

4.7 Modbus 4CH Solid State Relay Control Window



ModbusConfigurationUtility - 1.0.0.0

Temperature(°C): 23.75

Relay-1 Config

Output Mode: T1 (Secs):
T2 (Secs):
Deact Mode: Cycles:
Relay State:

Relay-2 Config

Output Mode: T1 (Secs):
T2 (Secs):
Deact Mode: Cycles:
Relay State:

Relay-3 Config

Output Mode: T1 (Secs):
T2 (Secs):
Deact Mode: Cycles:
Relay State:

Relay-4 Config

Output Mode: T1 (Secs):
T2 (Secs):
Deact Mode: Cycles:
Relay State:

Figure 21 - Modbus 4CH Solid State Relay Control Window

Modbus 4CH Solid State Relay Control Window allows users to configure the output behaviours for four relays: **Relay-1, Relay-2, Relay-3 and Relay-4**. Each relay can be independently set for different output modes, timing parameters and deactivation modes. The configuration supports applications such as timed control, pulse generation, or level-based switching.

Temperature Reading Panel

- Read the board temperature and refresh every 10 seconds

Relay-1 Config Panel

- **Output Mode:**
Dropdown to choose how the relay behaves:
 - Level: Maintains output for a set duration.
 - Pulse: Output single in pulse mode

- **Deactivation Mode (only available for Pulse Output Mode):**

Dropdown to select deactivation behaviour:

- None: No special deactivation behaviour applied.
- Immediate: Deactivation immediately
- Deactivate immediately after T1 completion
- Deactivate immediately after T2 completion

- **Timing and Cycle Parameters:**

- **T1 (Secs):** Duration for first phase (default: 60).
- **T2 (Secs):** Duration for second phase (default: 60).
- **Cycles:** Number of repetitions (default: 1).

- **Relay State Display:**

- Button to toggle relay control **ON/OFF**

- **Save Button:**

- Saves the current configuration for Relay-1.

Relay-2 Config Panel

This panel is identical to the Relay-1 configuration panel, but it controls **Relay-2**. All settings and options mirror those of Relay-1.

Relay-3 Config Panel

This panel is identical to the Relay-1 configuration panel, but it controls **Relay-3**. All settings and options mirror those of Relay-1.

Relay-4 Config Panel

This panel is identical to the Relay-1 configuration panel, but it controls **Relay-4**. All settings and options mirror those of Relay-1.

Control Buttons

- **Back:** Returns the user to the previous screen.
- **Firmware Update:** Navigates to the firmware update section of the application [Firmware Update](#)

User Actions

- Configure desired values for each relay:
 - Select appropriate Output Mode, Polarity, and Deactivation Mode.
 - Enter timing and cycle values.
- Click **Save** for each relay to apply and store the changes.
- Relay state will remain **Inactive** until activated based on configuration logic.
- Use **Back** to return or **Firmware Update** to update the firmware if needed.

Notes

- Ensure valid numeric input in timing and cycle fields.
- Configuration does not apply until **Save** is clicked.
- Relay activation will depend on device-specific triggers or external inputs.

4.8 Modbus Trailing Edge Dimmer Control Window

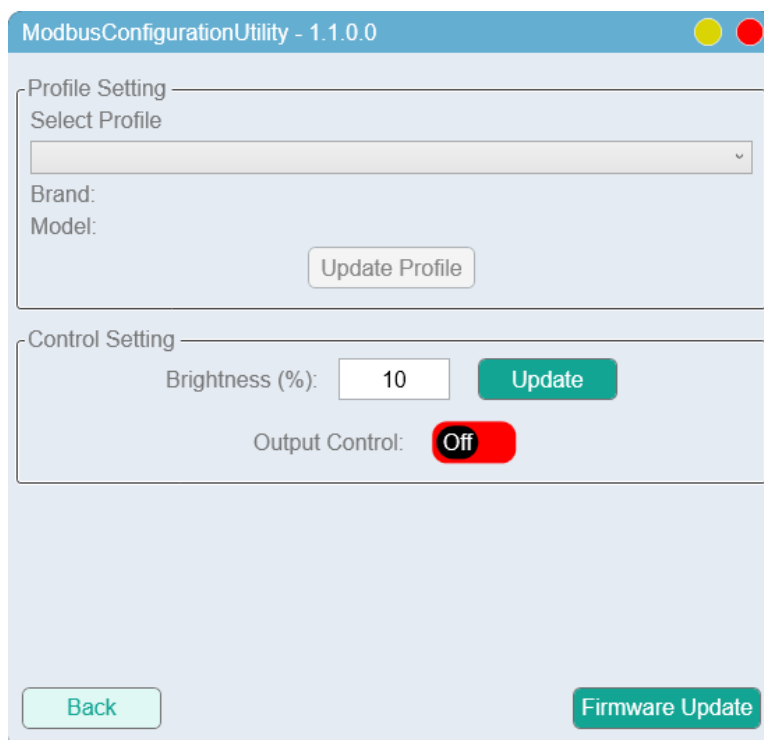


Figure 22 - Modbus Trailing Edge Dimmer Control Window

The Modbus Trailing Edge Dimmer Control Window allows users to configure the device profile, adjust brightness levels, control the output state and update the firmware.

Profile Setting Section

- **Select Profile Dropdown:** Allows you to choose a device profile.
- **Brand & Model Fields:** These are auto-filled based on the selected profile.
- **Update Profile Button:** Update selected profile to the connected device.

Control Setting Section

- **Brightness (%):** Allows you to enter a brightness level (in this case, it's set to 10) and update it.
- **Output Control:** Currently **Off** (displayed in a red button), toggles device output on or off.

Navigation Buttons

- **Back:** Returns the user to the previous screen.
- **Firmware Update:** Navigates to the firmware update section of the application. [Firmware Update](#)

5 Calibration Procedure

Sensor calibration is the process of aligning the sensor's output to known reference values to ensure accurate and consistent measurement performance. It is recommended to follow the calibration procedure before taking measurements to ensure accurate results. Before starting the calibration procedure, ensure that the required equipment and buffer solution are prepared.

5.1 Single Point Calibration Procedure

The flowchart below depicts single point sensor calibration procedure, which is applicable to the following sensors:

- CO2 Sensor
- DO Sensor
- ORP Sensor

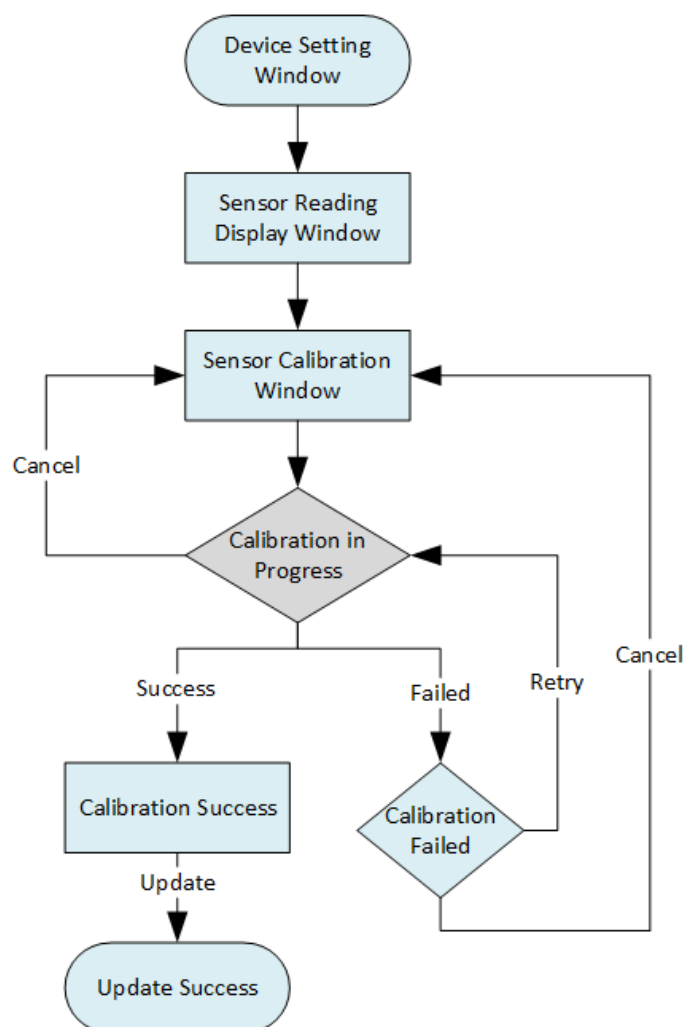
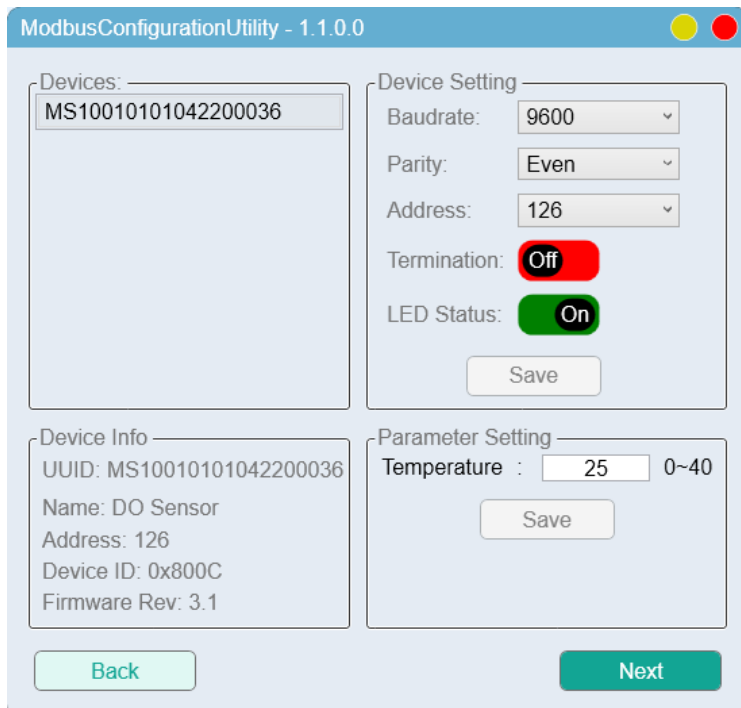


Figure 23 - Single Point Calibration Procedure

The following UI images illustrate the single point calibration of a DO sensor:

5.1.1 Device Setting Window

If a Modbus DO Sensor is connected to the bus, the sample device setting window will appear as shown below:

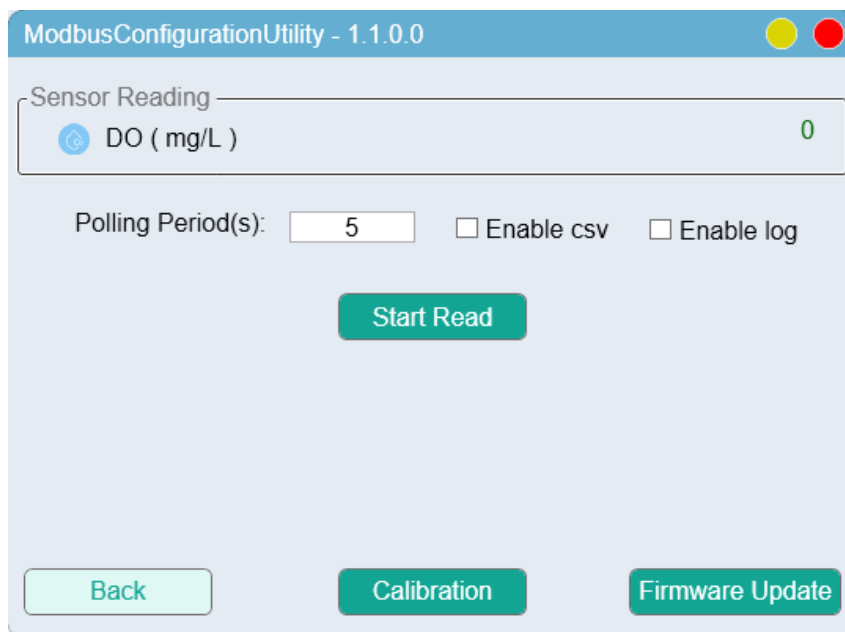


The screenshot shows the 'ModbusConfigurationUtility - 1.1.0.0' window. It has a 'Devices' list on the left containing 'MS10010101042200036'. The 'Device Setting' panel on the right includes dropdowns for 'Baudrate' (9600), 'Parity' (Even), and 'Address' (126). It also features toggle switches for 'Termination' (Off) and 'LED Status' (On), and a 'Save' button. Below this is the 'Device Info' section showing details like 'UUID: MS10010101042200036', 'Name: DO Sensor', 'Address: 126', 'Device ID: 0x800C', and 'Firmware Rev: 3.1'. To the right of this is the 'Parameter Setting' section with a 'Temperature' input set to 25 and a range of 0~40, with a 'Save' button. At the bottom are 'Back' and 'Next' buttons.

Figure 24 - Modbus DO Sensor Device Setting Window

5.1.2 Sensor Reading Display Window

Click the **[Next]** (refer to **Figure 24**) to proceed to the Sensor reading display window, as illustrated below:



The screenshot shows the 'ModbusConfigurationUtility - 1.1.0.0' window in the 'Sensor Reading' mode. It displays 'DO (mg/L)' with a value of '0'. Below this, there is a 'Polling Period(s):' input set to '5', and checkboxes for 'Enable csv' and 'Enable log'. A large 'Start Read' button is centered. At the bottom are three buttons: 'Back', 'Calibration', and 'Firmware Update'.

Figure 25 - Modbus DO Sensor Reading Display Window

5.1.3 Sensor Calibration Window

Click the **[Calibration]** button as shown in Figure 25, to proceed to the Modbus DO Sensor calibration window:

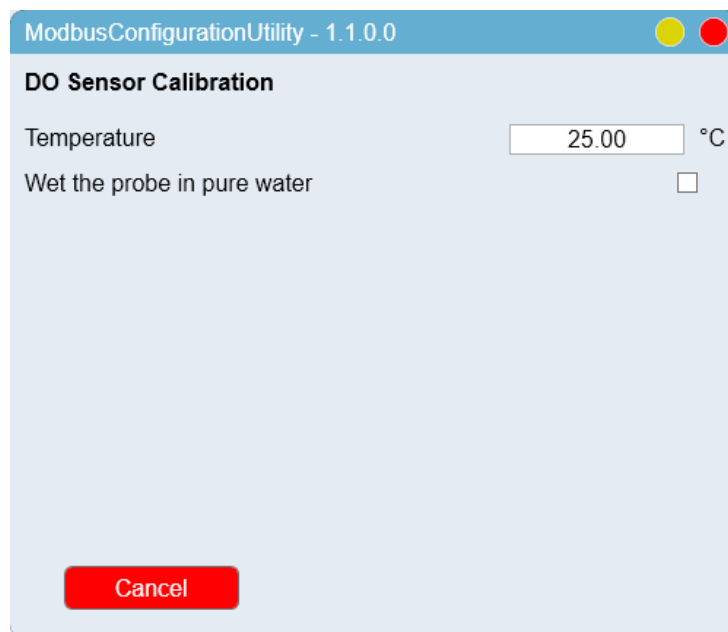


Figure 26 - Modbus DO Sensor Calibration Window

5.1.4 Calibration in Progress

Enter the correct calibration parameters, follow the given steps, and check each tick box upon completing the corresponding step. The entire calibration process will take approximately 3 minutes.

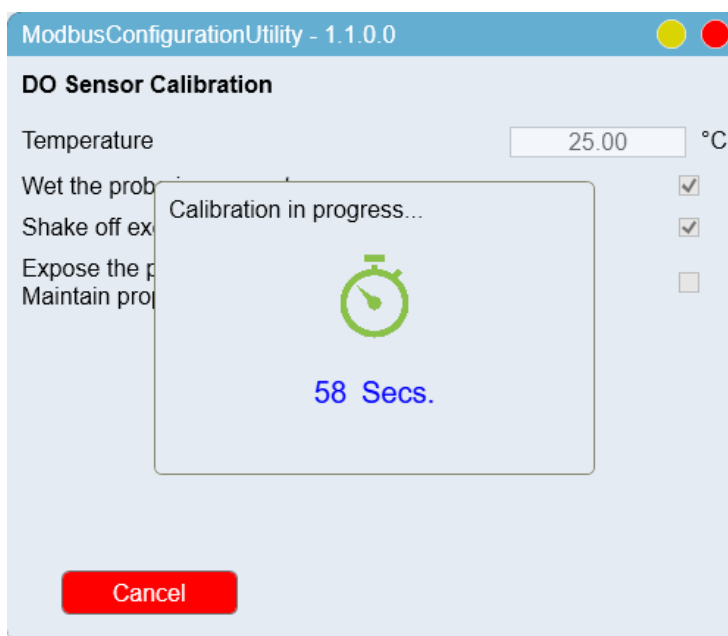


Figure 27 - Modbus DO Sensor Calibration in Progress

5.1.5 Calibration Success

If calibration was successful, user will be presented with a success message as shown below.

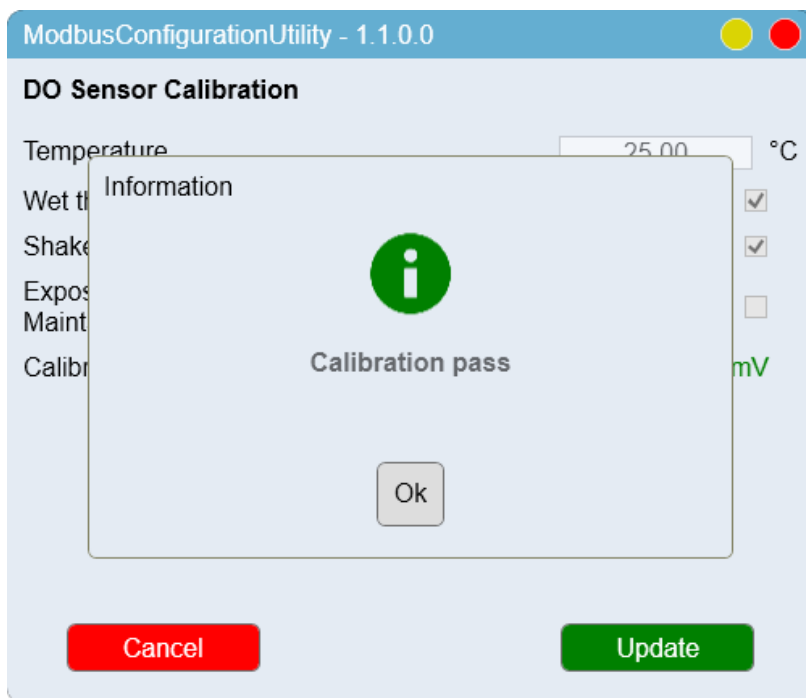


Figure 28 - Modbus DO Sensor Calibration Done

Click the **[Ok]** button to view the detailed readings.

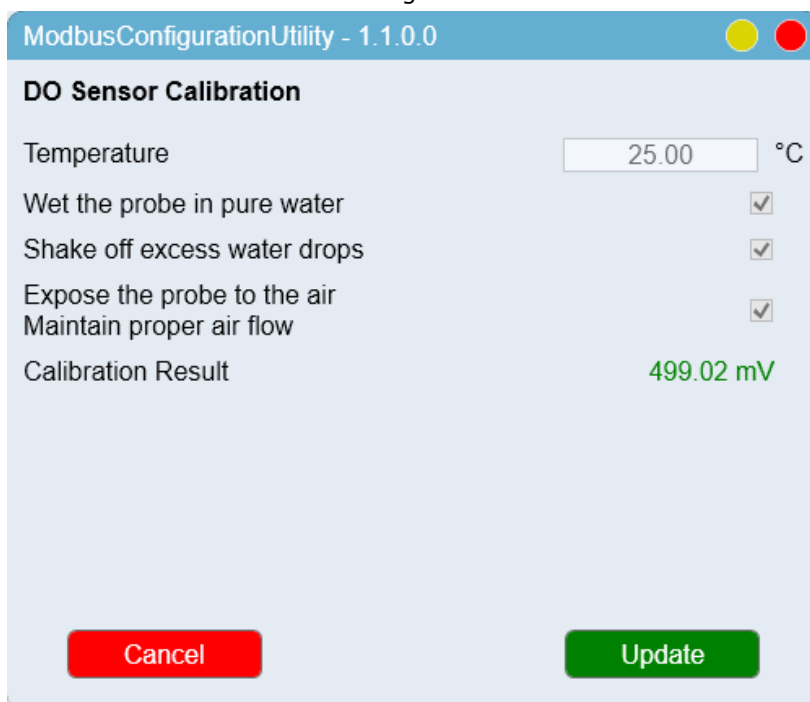


Figure 29 - Modbus DO Sensor Calibration Pass Reading

If user is satisfied with the calibration readings, click the **[Update]** button to apply the calibration to the device.

5.1.6 Update Success

The following message indicates that the calibration data has been successfully updated.

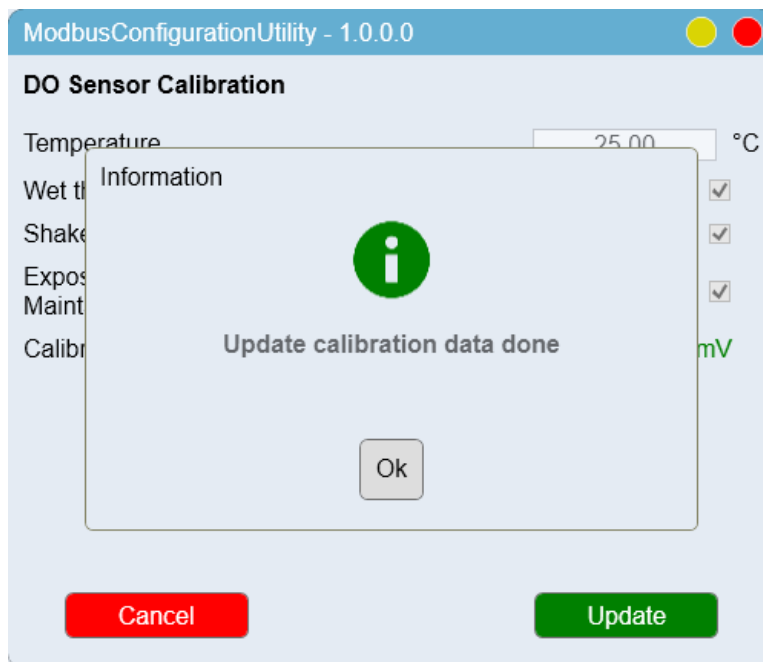


Figure 30 - Modbus DO Sensor Calibration Data Update Done

Click the **[Ok]** button to proceed to the Modbus DO Sensor reading display window to finish calibration.

5.1.7 Calibration Failed

If calibration failed, user will be presented with a message as shown below.

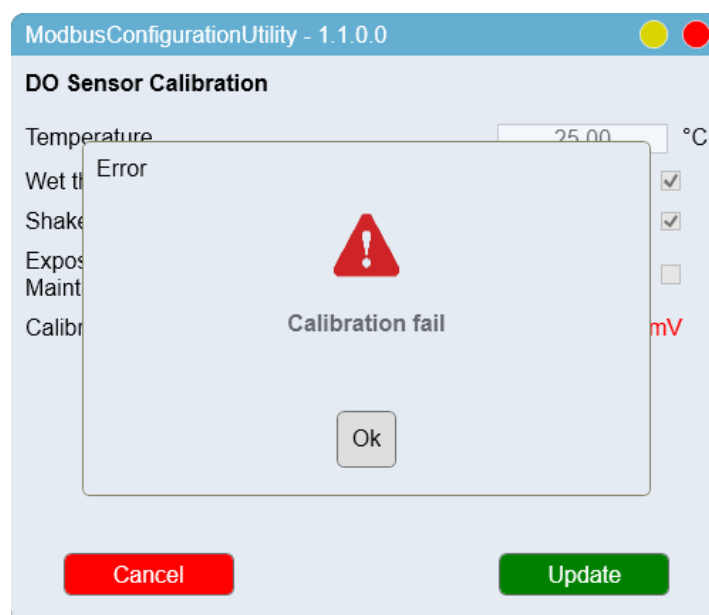
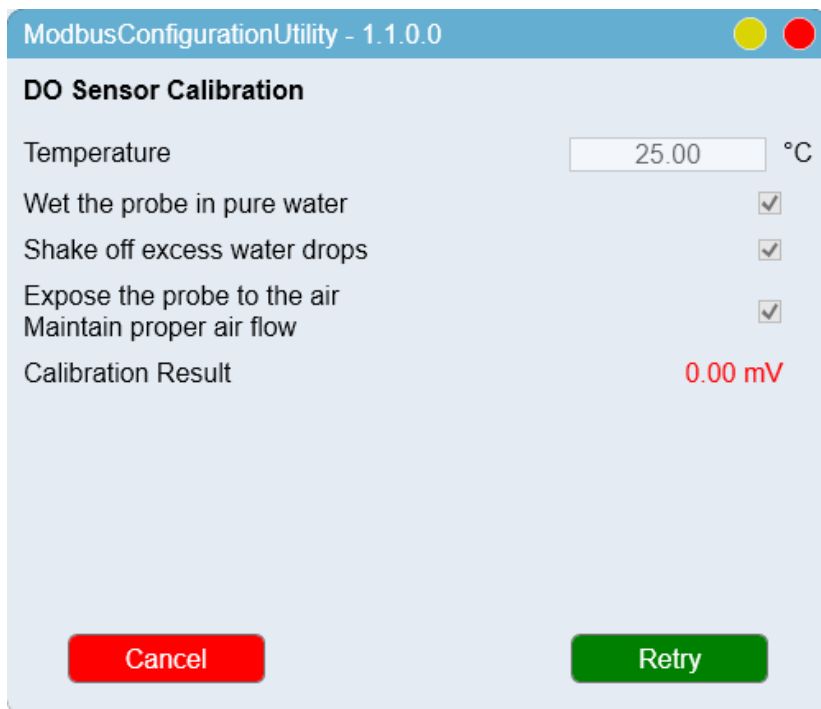


Figure 31 - Modbus DO Sensor Calibration Failure Message

Click **[Ok]** to view the detailed calibration readings.



The image shows a software window titled "ModbusConfigurationUtility - 1.1.0.0". Inside the window, the section "DO Sensor Calibration" is active. It contains a temperature input field set to "25.00" with a "°C" unit. Below this are three instructions, each followed by a checked checkbox: "Wet the probe in pure water", "Shake off excess water drops", and "Expose the probe to the air". The "Calibration Result" is displayed in red text as "0.00 mV". At the bottom of the window are two buttons: a red "Cancel" button and a green "Retry" button.

Figure 32 - Modbus DO Sensor Calibration Failure Reading

User can either click **[Cancel]** to stop the calibration or select **[Retry]** to try again.

5.2 Two Point Calibration Procedure

The flowchart below depicts two point sensor calibration procedure, which is applicable to the following sensors:

- pH Sensor
- EC Sensor
- Salinity Sensor

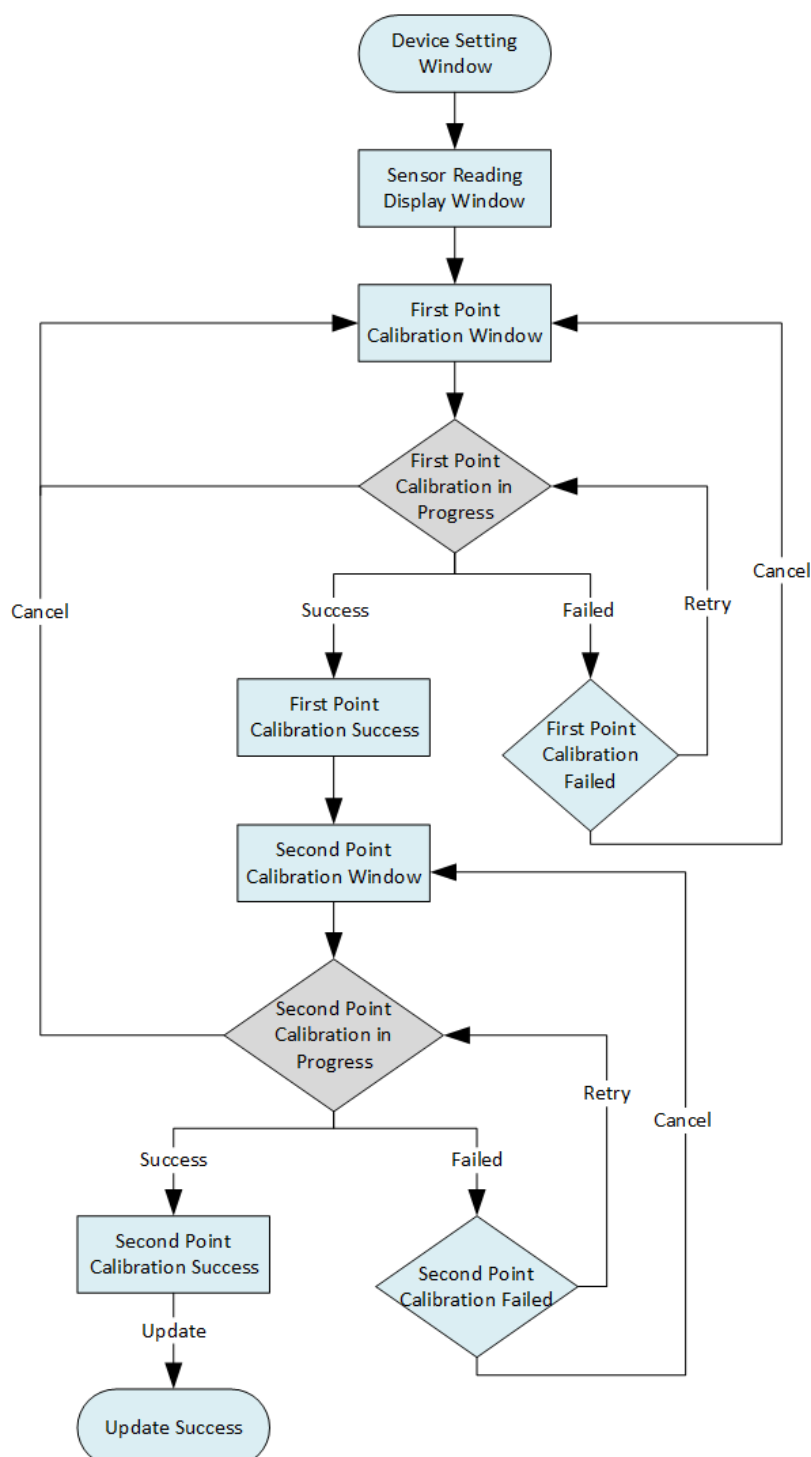
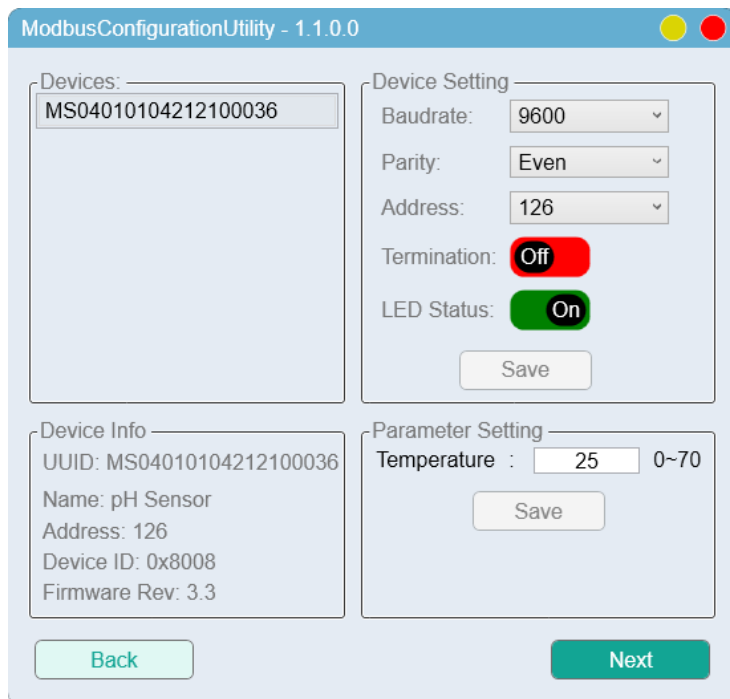


Figure 33 - Two Point Calibration Procedure

The following UI images illustrates double point calibration of a pH sensor:

5.2.1 Device Setting Window

If a Modbus pH Sensor is connected to the bus, the sample device setting window will appear as shown below:

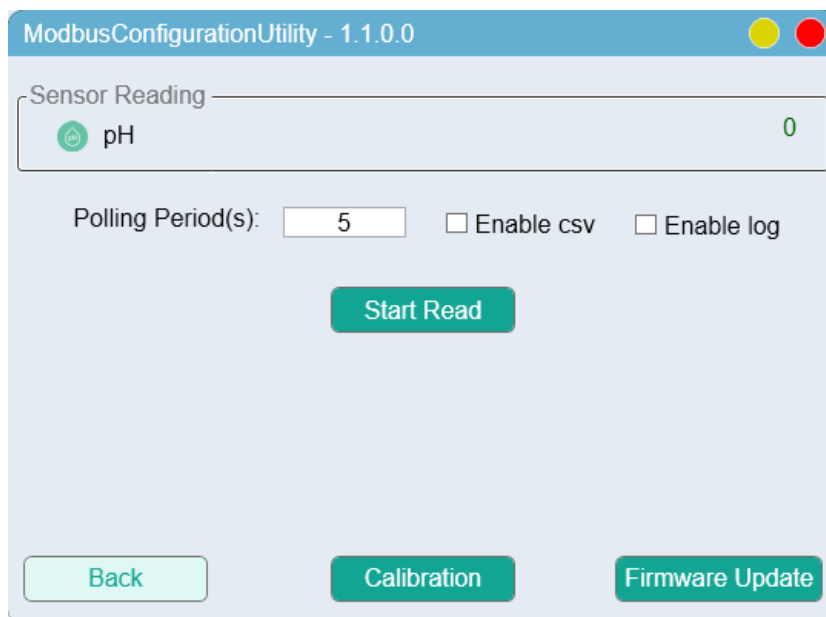


The screenshot shows the 'ModbusConfigurationUtility - 1.1.0.0' window. It has a 'Devices' list on the left containing 'MS04010104212100036'. The 'Device Setting' panel on the right includes: Baudrate (9600), Parity (Even), Address (126), Termination (Off), and LED Status (On). Below these are 'Save', 'Back', and 'Next' buttons. The 'Device Info' panel shows: UUID: MS04010104212100036, Name: pH Sensor, Address: 126, Device ID: 0x8008, and Firmware Rev: 3.3. The 'Parameter Setting' panel shows Temperature (25) with a range of 0~70 and a 'Save' button.

Figure 34 - Modbus pH Sensor Device Setting Window

5.2.2 Sensor Reading Display Window

Click the **[Next]** button to proceed to the Modbus pH Sensor reading display window, as illustrated below:



The screenshot shows the 'ModbusConfigurationUtility - 1.1.0.0' window in the 'Sensor Reading' state. It displays a 'pH' sensor icon and a reading of '0'. Below this, there is a 'Polling Period(s)' field set to '5', and checkboxes for 'Enable csv' and 'Enable log'. A large 'Start Read' button is centered. At the bottom are 'Back', 'Calibration', and 'Firmware Update' buttons.

Figure 35 - Modbus pH Sensor Reading Display Window

5.2.3 First Calibration Window

Click the **[Calibration]** button to proceed to the pH Sensor first point calibration window, as illustrated in Figure 36.

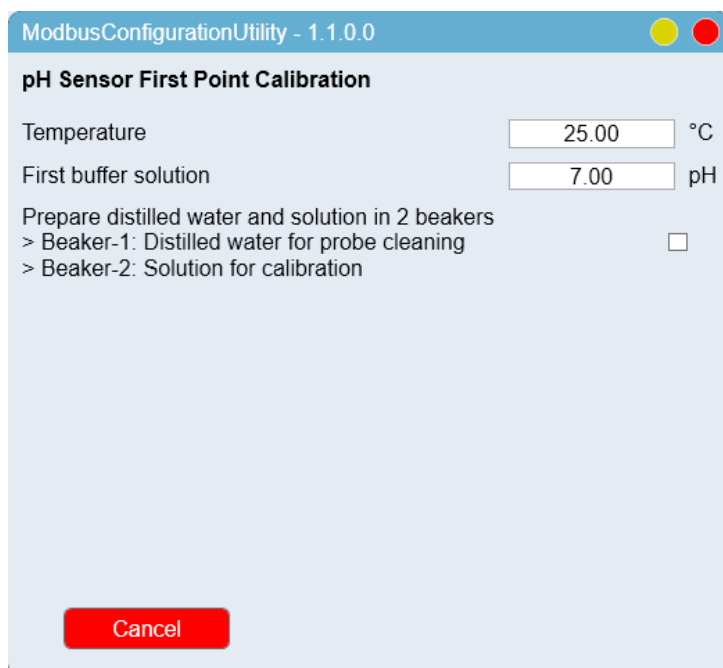


Figure 36 - Modbus pH Sensor First Point Calibration Window

5.2.4 First Point Calibration in Progress

Enter the correct calibration parameters, follow the given steps, and check each tick box upon completing the corresponding step. After the final step is checked, a 60-second countdown timer will automatically appear to initiate the calibration process. Do not remove the probe from the buffer solution during the calibration process to ensure accurate results.

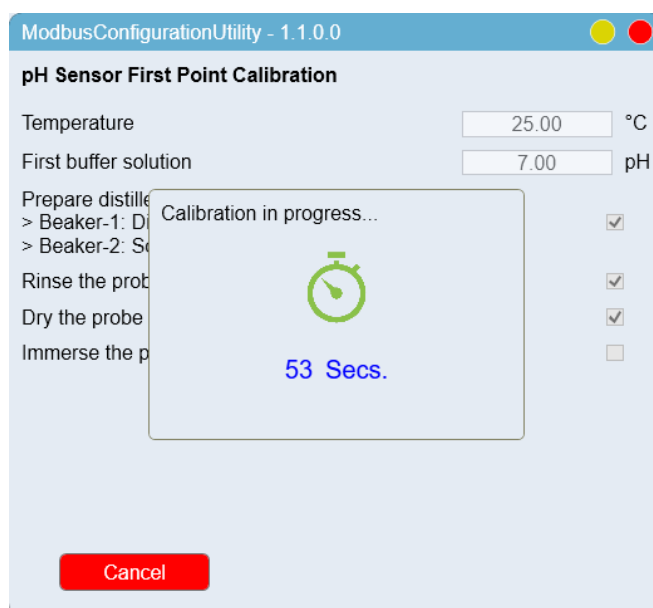


Figure 37 - Modbus pH Sensor First Point Calibration Timer

5.2.5 First Point Calibration Success

The following is an example of a calibration pass message.

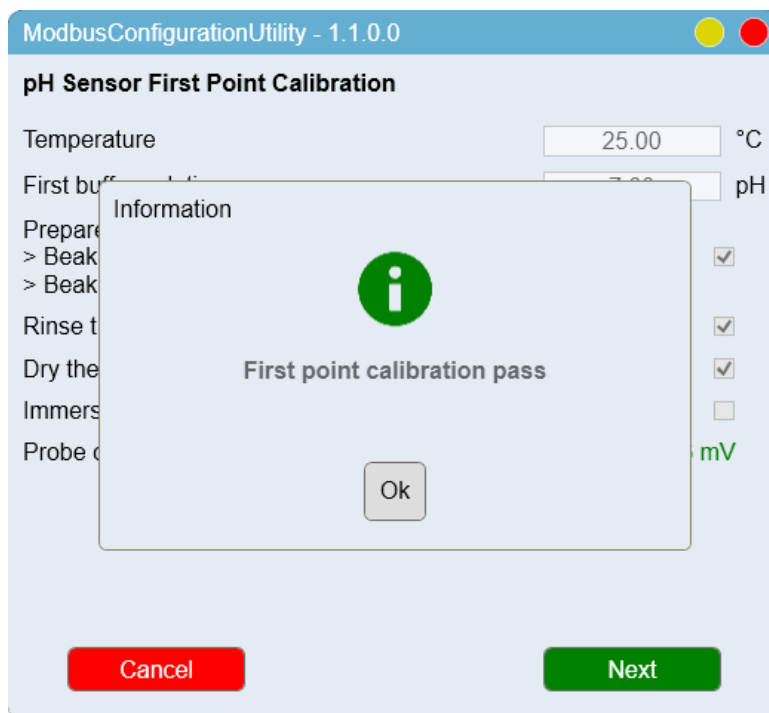


Figure 38 - Modbus pH Sensor First Point Calibration Pass Message

Click the **[Ok]** button to view the detailed readings. An example is shown in Figure 39.

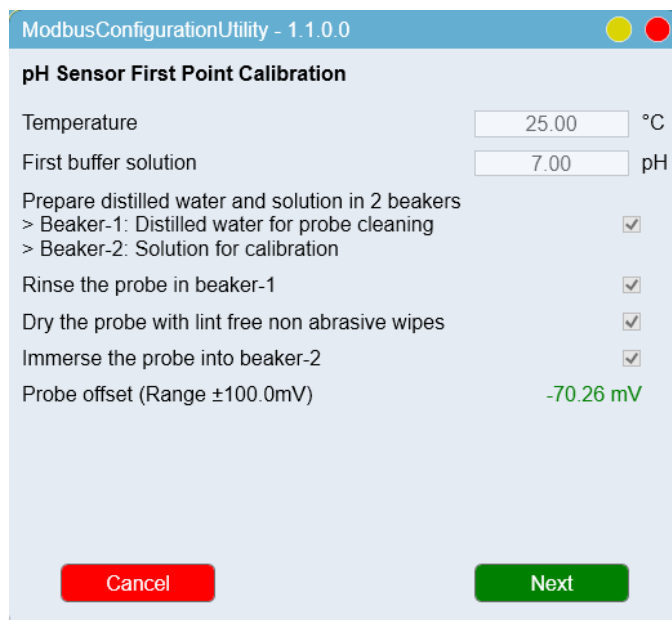


Figure 39 - Modbus pH Sensor First Point Calibration Pass Reading

5.2.6 First Point Calibration Failed

The following is an example of a calibration failure message.

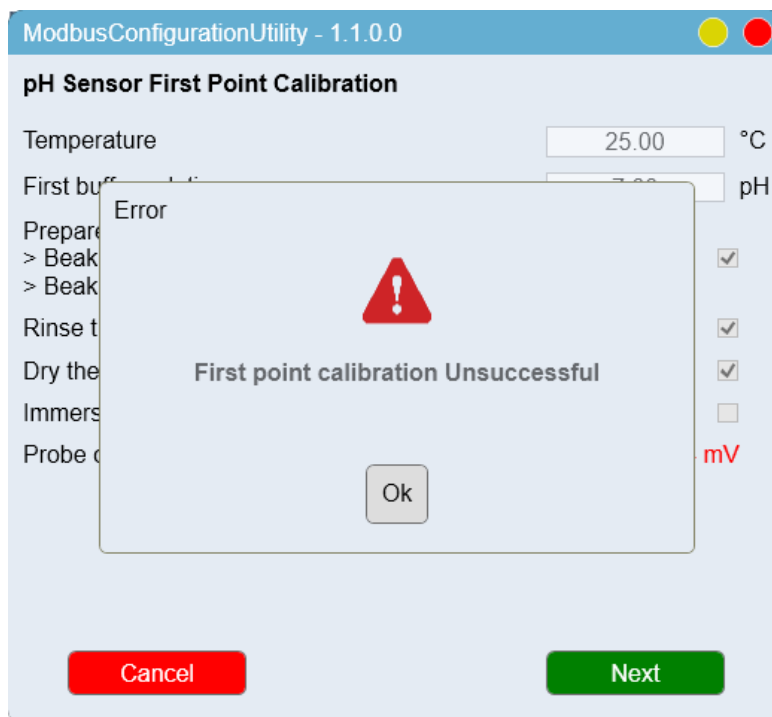


Figure 40 - Modbus pH Sensor First Point Calibration Failure Message

Click the **[Ok]** button to view the detailed calibration readings (see [Figure 41](#)).
Click the **[Retry]** button to repeat the first point calibration. An example of the result display is shown below:

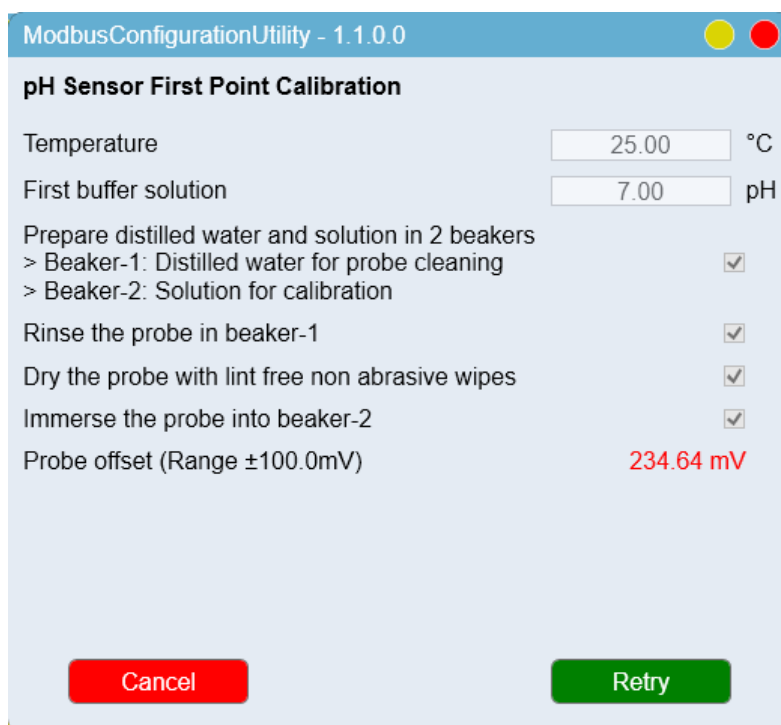


Figure 41 - Modbus pH Sensor First Point Calibration Failure Reading

5.2.7 Second Point Calibration Window

Click the **[Next]** button in Figure 39 to proceed to the second point calibration window for the pH sensor.

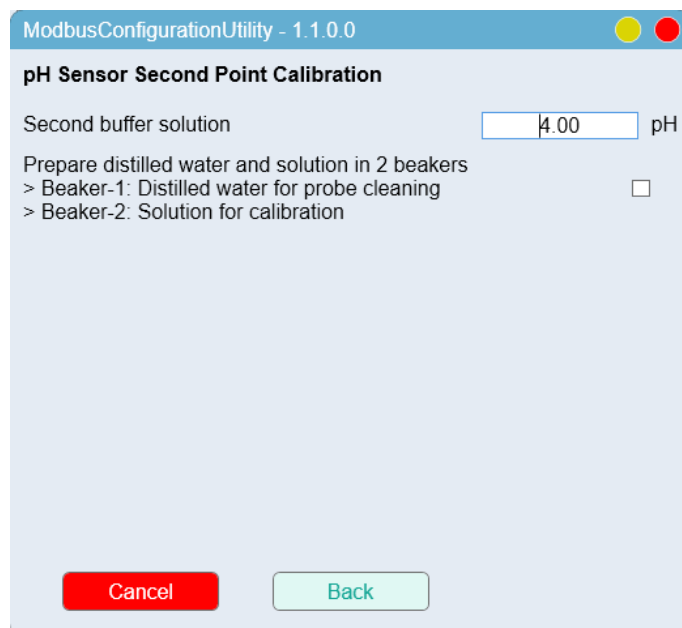


Figure 42 - Modbus pH Sensor Second Point Calibration Window

5.2.8 Second Point Calibration in Progress

Enter the correct calibration parameters, follow the given steps, and check each tick box upon completing the corresponding step. After the final step is checked, a 60-second countdown timer will automatically appear to initiate the calibration process. Do not remove the probe from the buffer solution during the calibration process to ensure accurate results.

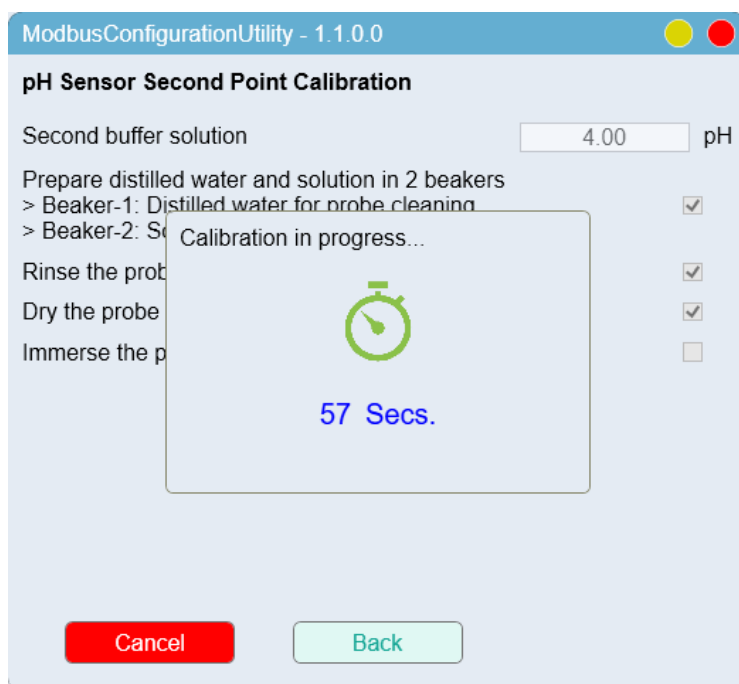


Figure 43 - Modbus pH Sensor Second Point Calibration Timer

5.2.9 Second Point Calibration Success

The following is an example of a calibration pass message.

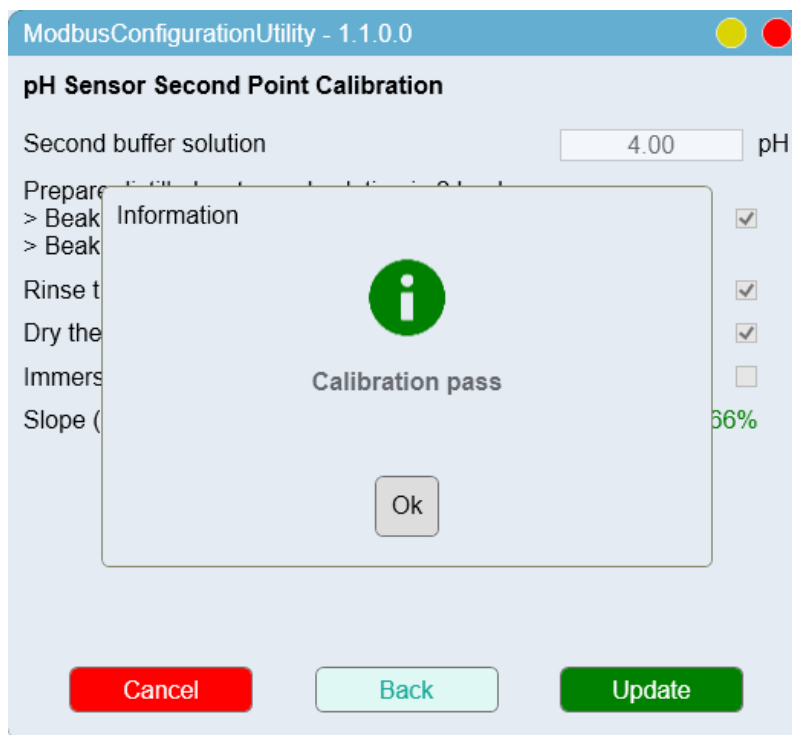


Figure 44 - Modbus pH Sensor Second Point Calibration Pass Message

Click the **[Ok]** button to view the detailed readings. An example is shown in Figure 45.

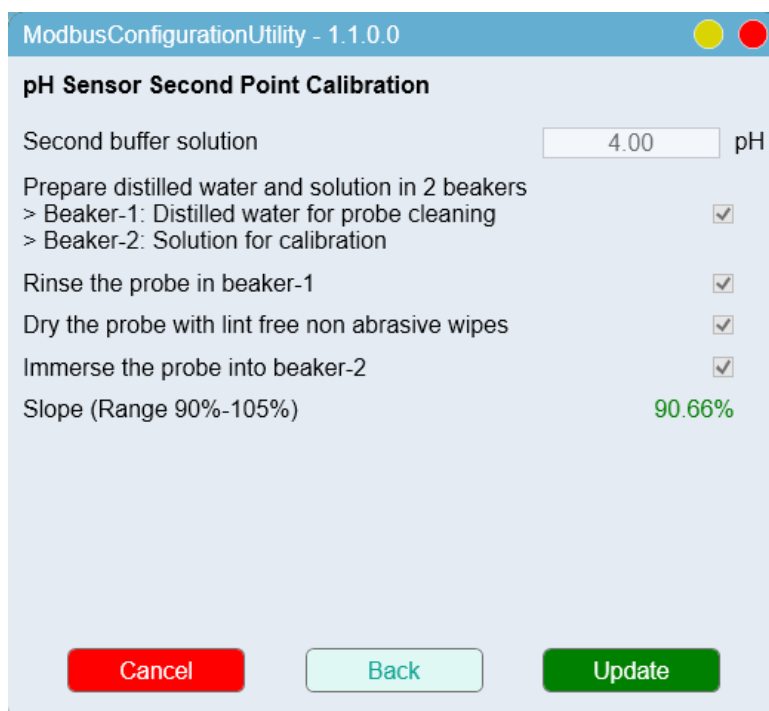


Figure 45 - Modbus pH Sensor Second Point Calibration Pass Reading

5.2.10 Update Success

If you are satisfied with the calibration readings, click the **[Update]** button to apply the calibration to the device. The following message indicates that the calibration data has been successfully updated.

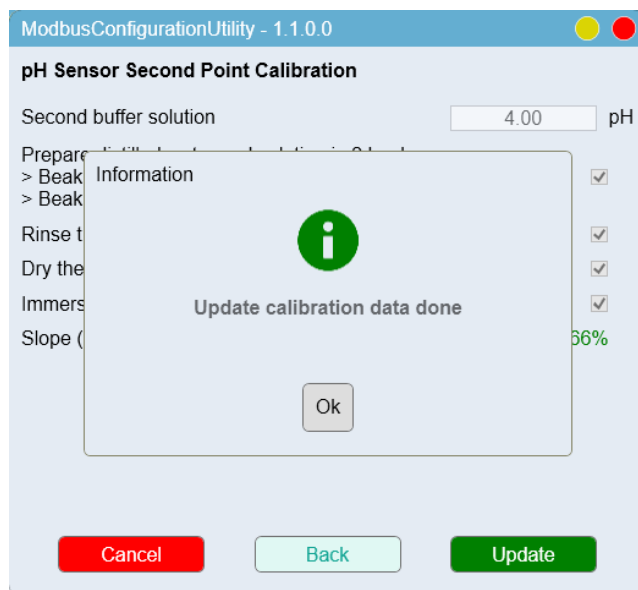


Figure 46 - Modbus pH Sensor Calibration Data Update Done

Click the **[Ok]** button to proceed to the Modbus pH Sensor reading display window to finish calibration.

5.2.11 Second Point Calibration Failed

The following is an example of a calibration failure message.

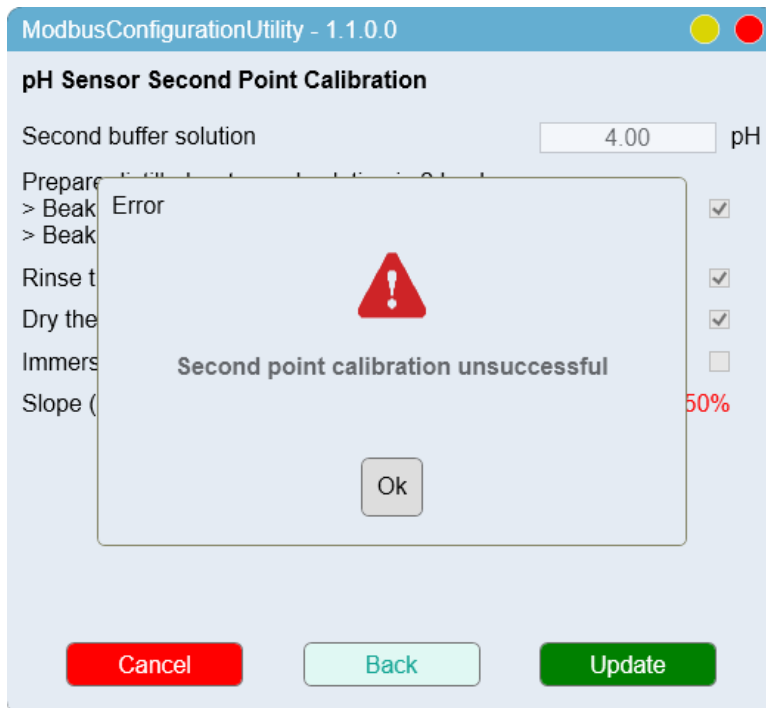


Figure 47 - Modbus pH Sensor Second Point Calibration Failure Message

Click the **[Ok]** button to view the detailed calibration readings. See [Figure 48](#).

Click the **[Retry]** button to repeat the second point calibration. Click **[Back]** to return back to first point calibration. An example of the result display is shown below:



ModbusConfigurationUtility - 1.1.0.0

pH Sensor Second Point Calibration

Second buffer solution pH

Prepare distilled water and solution in 2 beakers

- > Beaker-1: Distilled water for probe cleaning ☒
- > Beaker-2: Solution for calibration ☒

Rinse the probe in beaker-1 ☒

Dry the probe with lint free non abrasive wipes ☒

Immerse the probe into beaker-2 ☒

Slope (Range 90%-105%) **72.50%**

Cancel **Back** **Retry**

Figure 48 - Modbus pH Sensor Second Point Calibration Failed Reading

6 Contact Information

Refer to <https://brtsys.com/contact-us/> for contact information.

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Appendix A – References

Document References

Modbus Utility

[Modbus Device Configuration Application Note](#)

Actuators

[2CH Relay Datasheet](#)

[2CH Relay + iSENSE Datasheet](#)

[4CH Solid State Relay Datasheet](#)

[Isolated IO Controller Datasheet](#)

[Trailing Edge Light Dimmer Datasheet](#)

[2CH NL Relay Datasheet](#)

[2CH NL Relay + iSENSE Datasheet](#)

Adapters

[DO Sensor Adapter Datasheet](#)

[EC Sensor Adapter Datasheet](#)

[ORP Sensor Adapter Datasheet](#)

[pH Sensor Adapter Datasheet](#)

[Salinity Sensor Adapter Datasheet](#)

[Thermocouple Sensor Adapter Datasheet](#)

Sensors

[4in1 Sensor Datasheet](#)

[CO2 Sensor Datasheet](#)

[Gas and TrueVOC Sensor Datasheet](#)

Acronyms and Abbreviations

Terms	Description
COM	Communication Port
CO2	Carbon dioxide
DO	Dissolved Oxygen
EC	Electrical Conductivity
ORP	Oxidation Reduction Potential
PC	Personal Computer
UUID	Universally Unique Identifier
USB	Universal Serial Bus

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NA

Appendix B – Revision History

Document Title: BRTSYS_AN_080 Modbus Configuration Utility Guide

Document Reference No.: BRTSYS_000169

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Product Page: [Software \(Utility Tools\) - BRT Systems Pte Ltd](#)

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Revision	Changes	Date
1.0	Initial release for the Modbus Configuration Utility Ver.1.1.0.0	01-08-2025