How to create tags in Kepware (KEPServerEX): temperature tag, scaling, and verification

This guide shows you how to create tags in Kepware's KEPServerEX, using a Modbus temperature tag as the example. You add a static tag, set its data type, client access, and scan rate, and configure scaling. You then duplicate the tag for related data points and check the live values in the OPC Quick Client.

Prerequisites

Before you begin, make sure you have the following:

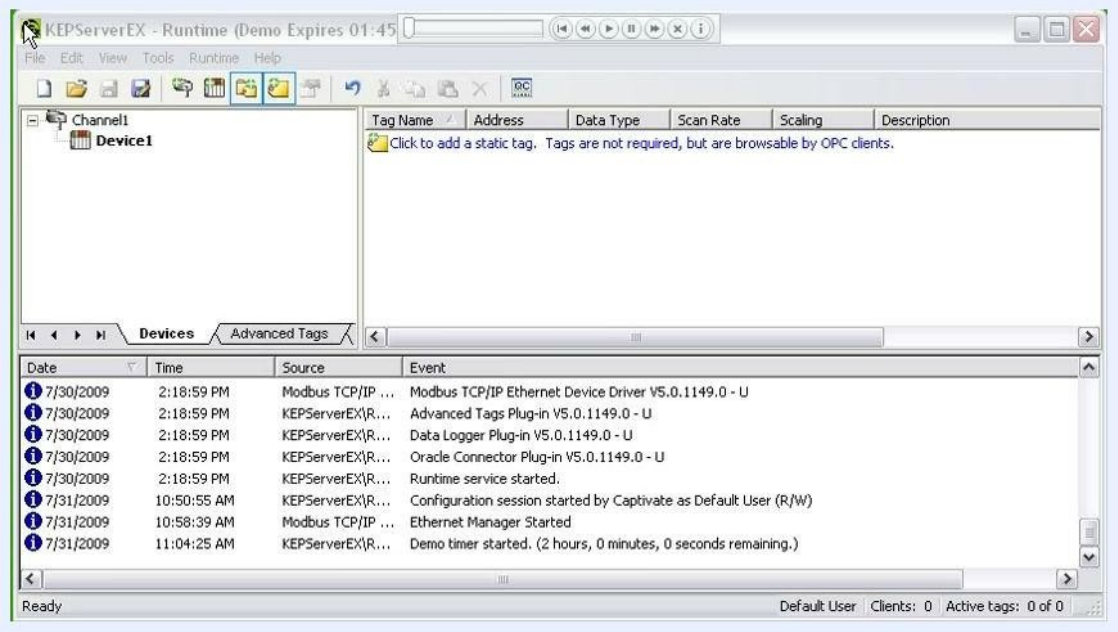
- KEPServerEX is running.
- Channel1 is listed in the left panel, with Device1 (your Modbus device) under it.

Create the temperature tag

Step 1: Open KEPServerEX and start to create a tag

1. In the left panel, expand Channel1 and verify that Device1 is listed.

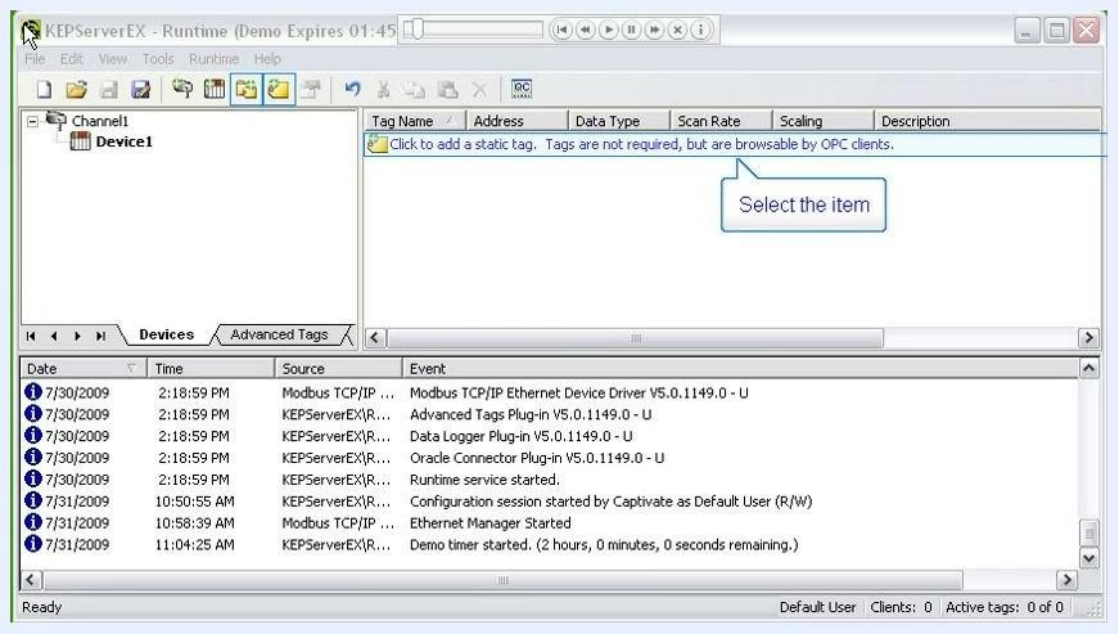
2. Check the main workspace. It shows the message "Click to add a static tag. Tags are not required, but are browsable by OPC clients."



KEPServerEX main window showing Channel1 and Device1, with the prompt to add a static tag

Step 2: Open the Tag Properties window

In the main workspace, click the blue **Click to add a static tag** link. The Tag Properties window opens.



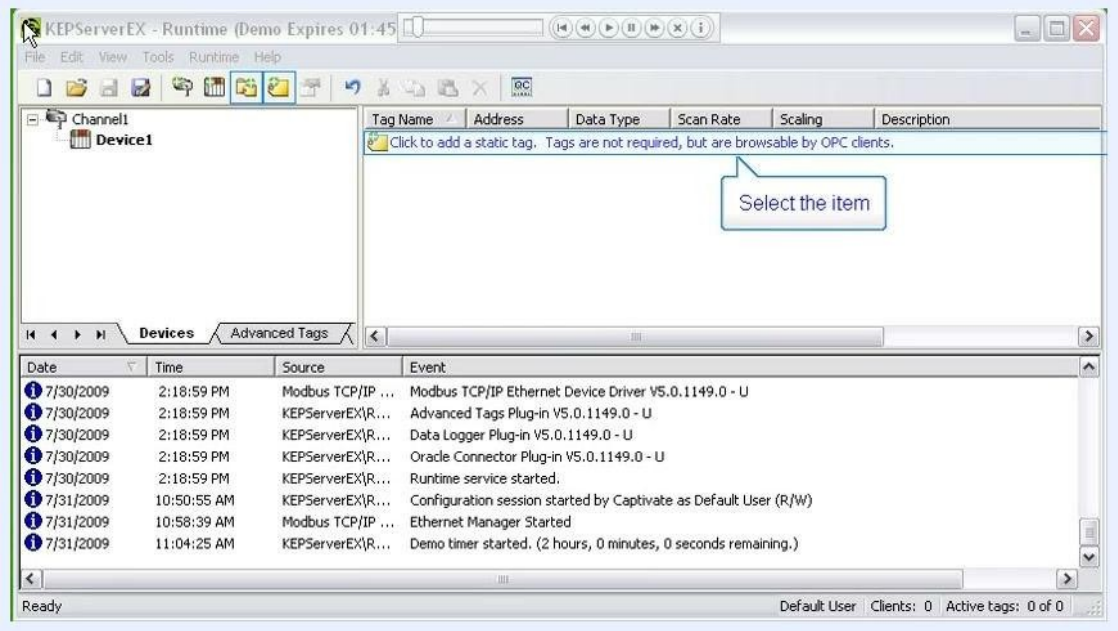
KEPServerEX with the tag area ready for you to add a new tag

Step 3: Enter the tag identification details

In the Tag Properties window, fill in the following fields:

- **Name:** Enter Temp_C (temperature in degrees Centigrade).
- **Address:** Enter 40001, the Modbus holding register for the temperature probe.

- **Description:** Enter Temperature in Degrees C.



Tag Properties window with Name set to Temp_C, Address set to 40001, and the Description field highlighted

Step 4: Change the data type to Float

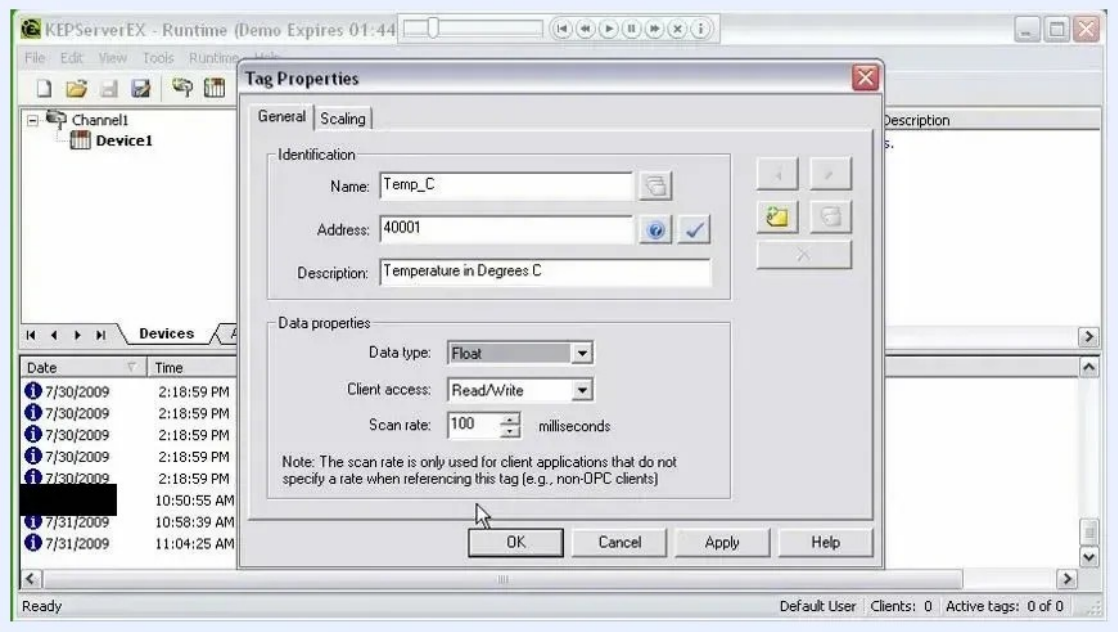
1. In the Data properties section, locate the **Data type** dropdown.
2. Click the dropdown and select **Float** instead of the default value.

Float makes the tag read the temperature as a floating-point number, which is typical for analog temperature data.

If you are unsure which data types an address supports, check the driver help file:

- Open the help file for your Modbus driver.
- Go to the "Addressing" topic.
- Review the supported addresses and their data types. The default data type for each address range is shown in bold.

Boolean addresses usually default to "Boolean", and analog addresses typically default to "Word".

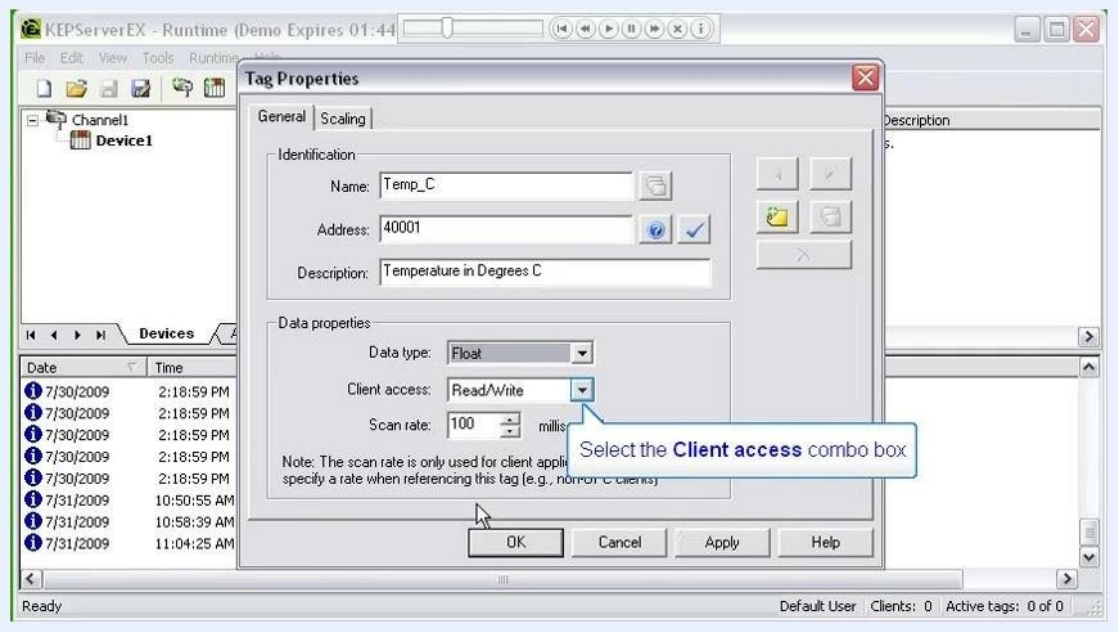


Tag Properties window with Data type changed to Float, Name Temp_C, Address 40001, Description Temperature in Degrees C, Client access Read/Write, and Scan rate 100 ms

Step 5: Set client access to Read Only

1. Find the **Client access** dropdown.
2. Click the dropdown and select **Read Only**.

Use this setting if your PLC does not allow writing to the temperature value. It prevents accidental writes and reduces confusion.



Tag Properties window with Data type set to Float and the Client access dropdown highlighted, ready to change from Read/Write to Read Only

Step 6: Review the scan rate

Make sure **Scan rate** is set to 100 milliseconds, or adjust it for your application. The scan rate determines how often the tag value updates for client applications that do not specify a rate.

This setting applies only to non-OPC clients. Examples include Excel (using DDE), Wonderware (using FastDDE or SuiteLink), and GE's iFix (using PDB and IO). These clients do not use OPC requests and responses, so they pass no scan rate to the server when they connect. Instead, the server polls the tag's address at the scan rate set here. At 100 milliseconds, the server polls the device for this tag every 100 ms.



Tag Properties window showing Data type Float, Client access Read Only, and Scan rate 100 milliseconds, with a note explaining scan rate use for non-OPC clients

Configure scaling

Step 7: Open the Scaling tab

At the top of the Tag Properties window, click the **Scaling** tab to switch from the General tab. This tab contains the scaling options for the tag value.

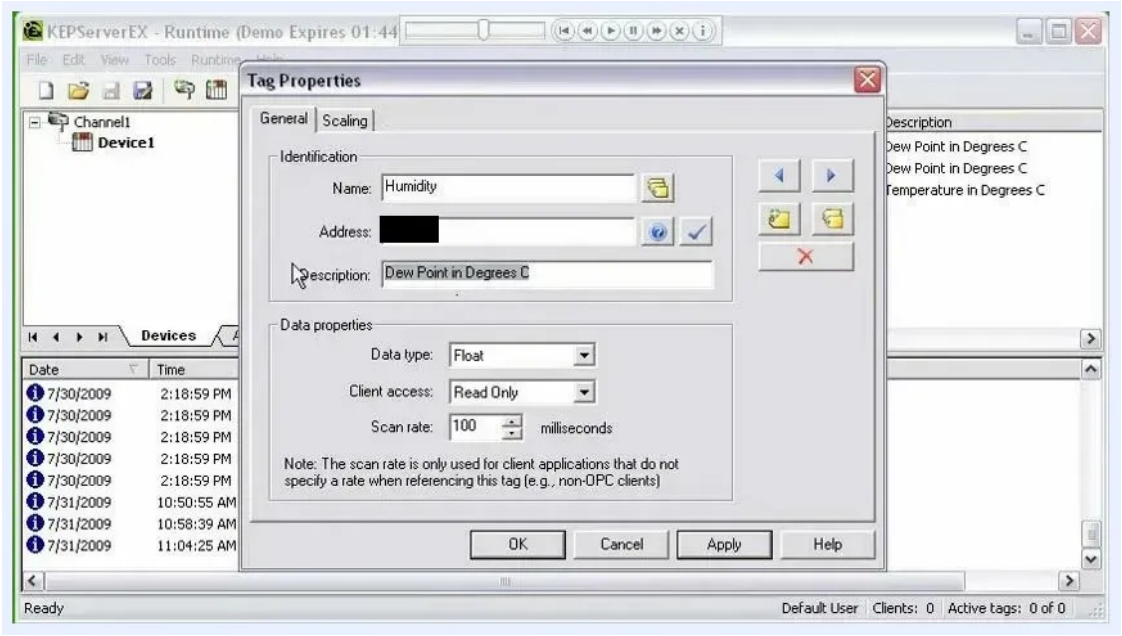


Tag Properties window with the Scaling tab highlighted

Step 8: Choose a scaling method

In the Scaling tab, choose the scaling method that fits your data. The options are **None**, **Linear**, and **Square root**. Square root scaling provides high precision for certain types of measurements.

Then configure the Raw Value Range and Scaled Value Range for your application.



Scaling tab showing the None, Linear, and Square root options and the Raw Value Range and Scaled Value Range fields

Step 9: Select Linear scaling

Select the **Linear** radio button to apply a linear transformation between the raw and scaled value ranges. The tab then shows the following defaults.

Raw Value Range:

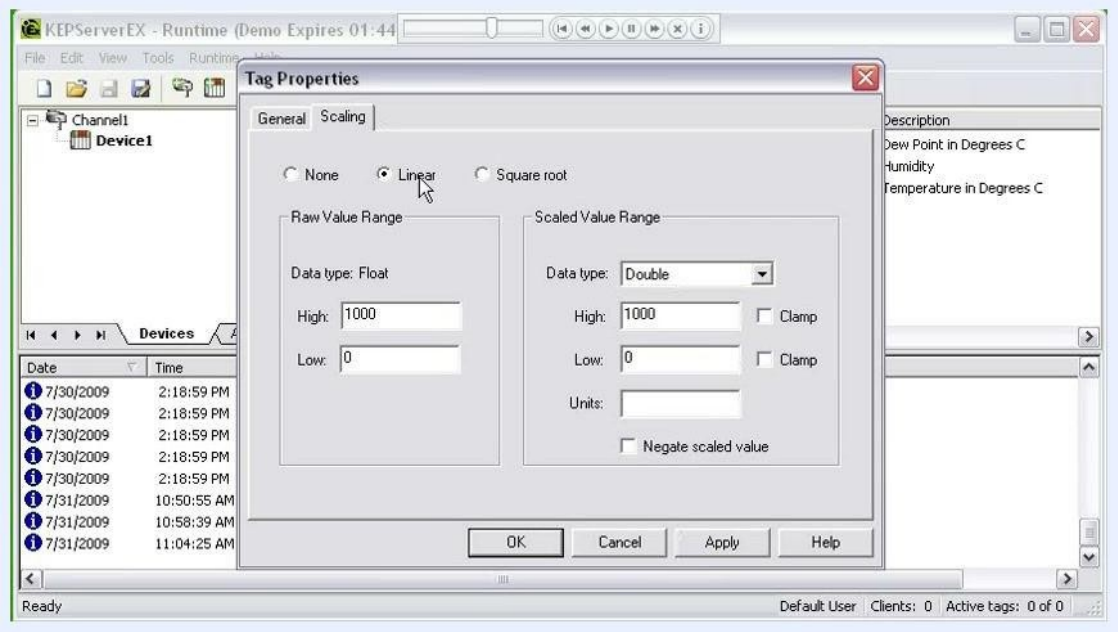
- Data type: Float
- High: 1000
- Low: 0

Scaled Value Range:

- Data type: Double (selectable from a dropdown)
- High: 1000
- Low: 0
- Units: leave blank or enter a value as needed

The Scaled Value Range also offers Clamp checkboxes for High and Low, and a **Negate scaled value** option.

If your sensor sends floating-point data, make sure the data type matches the sensor output. If your sensor sends a different format, adjust the data type accordingly.



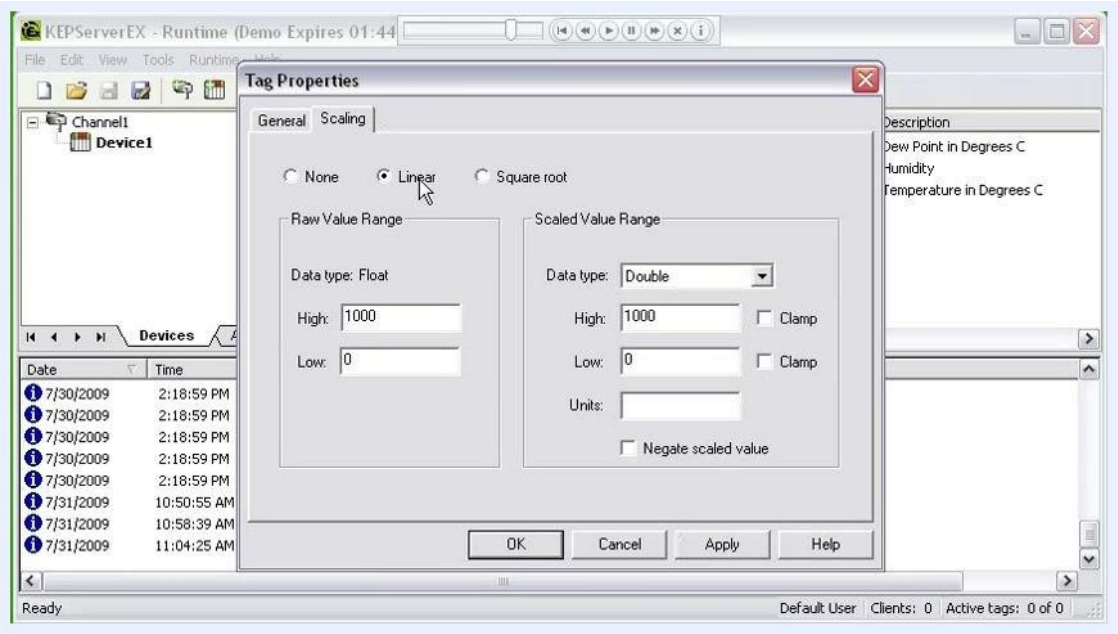
Scaling tab with Linear selected, Raw Value Range (Float, 0–1000), Scaled Value Range (Double, 0–1000), and the Clamp and Negate options visible

Step 10: Convert raw sensor values to engineering units

Some controllers display a temperature, but the transmitted value uses a different format, such as a scaled integer or float. For example, a controller may show 70.3°C while transmitting 703, which is scaled by a factor of 10. Use scaling to convert the raw value to the true temperature.

Enter the High and Low values for both the Raw and Scaled ranges to match your device's scaling. A raw range of 0–1000 with a scaled range of 0–1000 is a 1:1 scaling, so adjust the values for your application.

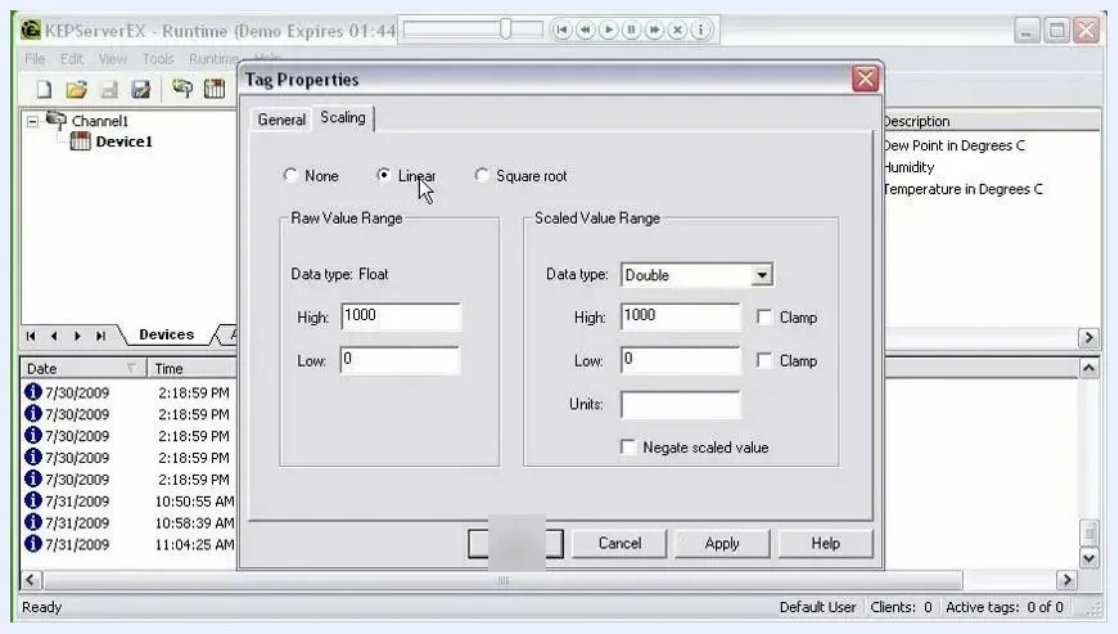
Because of how the scaling calculation works, the scaled value can deviate from the expected result, especially near the limits of the range. This can happen if the raw input exceeds the specified range or because of floating-point precision. Monitor your scaled values to make sure they stay within acceptable bounds.



Scaling tab with Linear selected and the cursor pointing to the Linear option, showing the Raw and Scaled Value Range settings

Step 11: Clamp the scaled value

To keep the scaled value within the High and Low limits, select the **Clamp** checkbox next to High, Low, or both in the Scaled Value Range section. Clamping prevents the scaled value from exceeding the defined range. This is useful when the input might send values outside the expected or calibrated range.



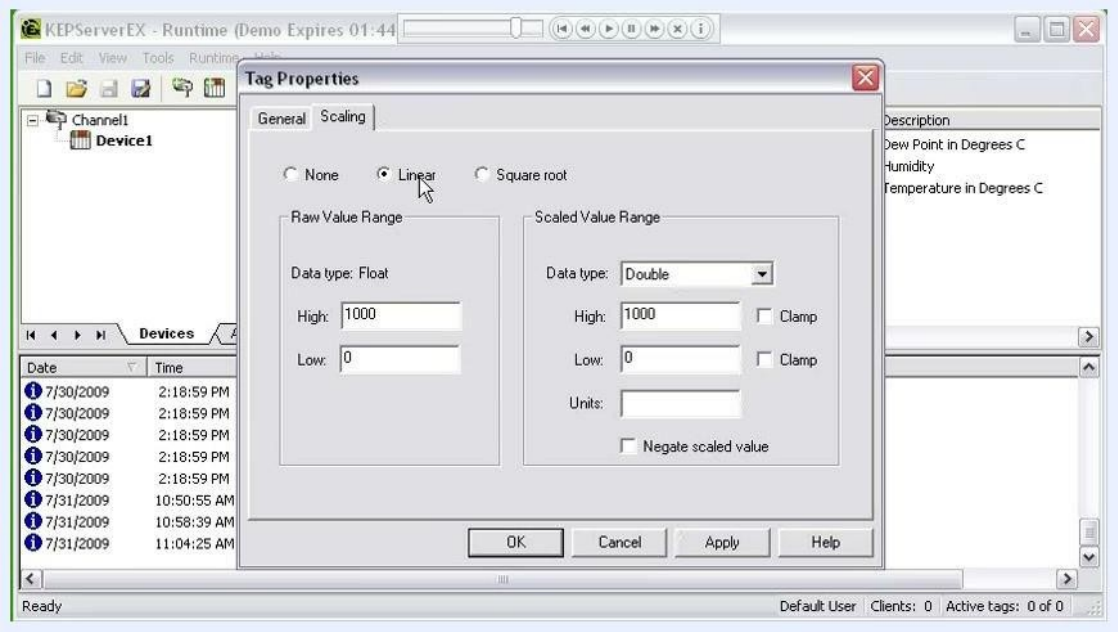
Scaling tab with the Clamp options highlighted in the Scaled Value Range section

Step 12: Adjust the ranges for your device

Some devices output a raw range that differs from your scaled range, such as 0–500 instead of 0–1000.

1. Set the Raw Value Range **High** and **Low** fields to match your device's output.

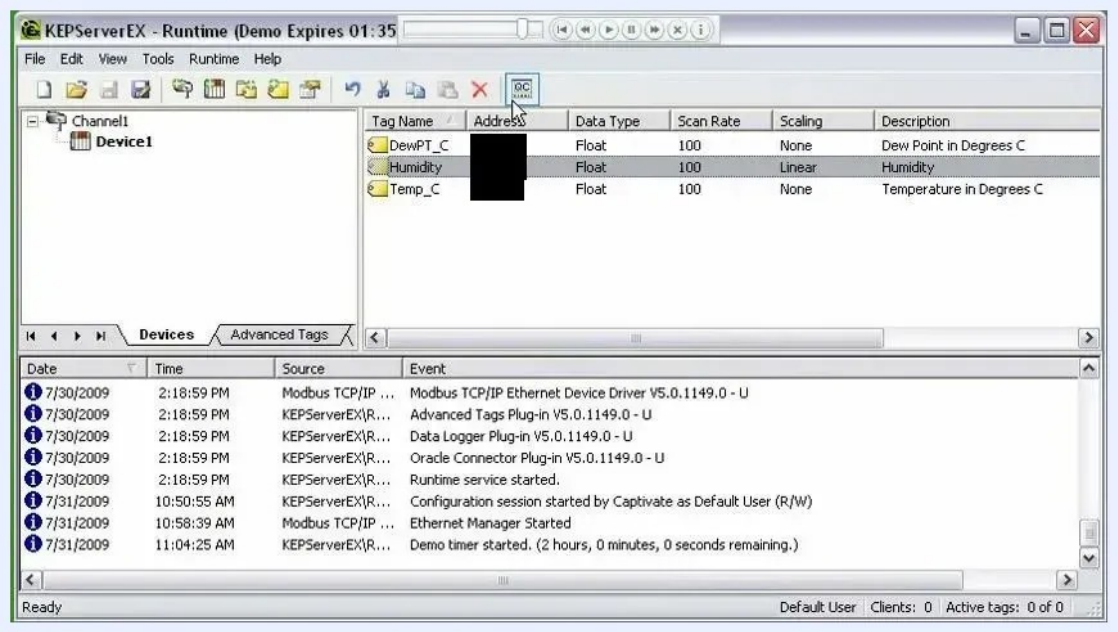
2. Make sure the Scaled Value Range matches the engineering units you want to display or use.



Scaling tab with the Raw Value Range and Scaled Value Range fields visible

Step 13: Negate the scaled value (optional)

If your application needs the scaled value inverted (multiplied by -1), select the **Negate scaled value** checkbox. The result of the scaling calculation is then inverted automatically.

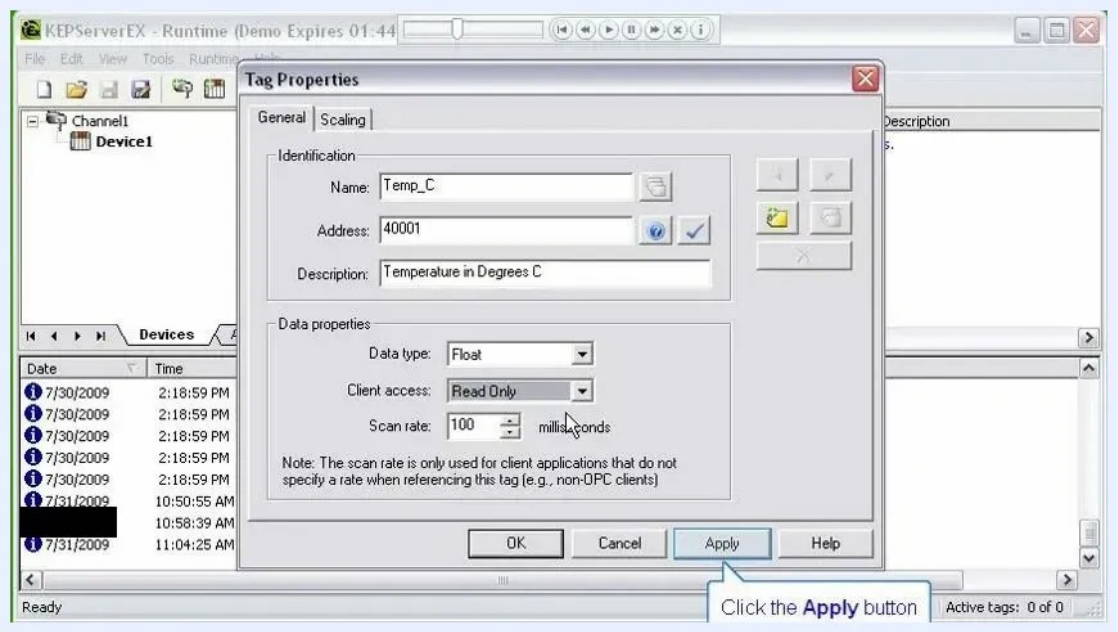


Scaling tab with the Negate scaled value option visible

Apply the tag configuration

Step 14: Apply your changes

Click **Apply** at the bottom of the Tag Properties window to save your changes. The tag updates with the new data type, client access, and scan rate settings.



Tag Properties window with the cursor over the Apply button, ready to save changes

Duplicate the tag for more data points

Step 15: Duplicate the tag

When you need similar tags, such as for dew point or other temperature readings, duplicate the existing tag instead of creating a new one from scratch.

1. Click the **Duplicate** button (the icon with two overlapping documents) in the Tag Properties window.

2. Check the new tag. It adds a 1 to the name (Temp_C becomes Temp_C1) and increments the address by one (40001 becomes 40002).



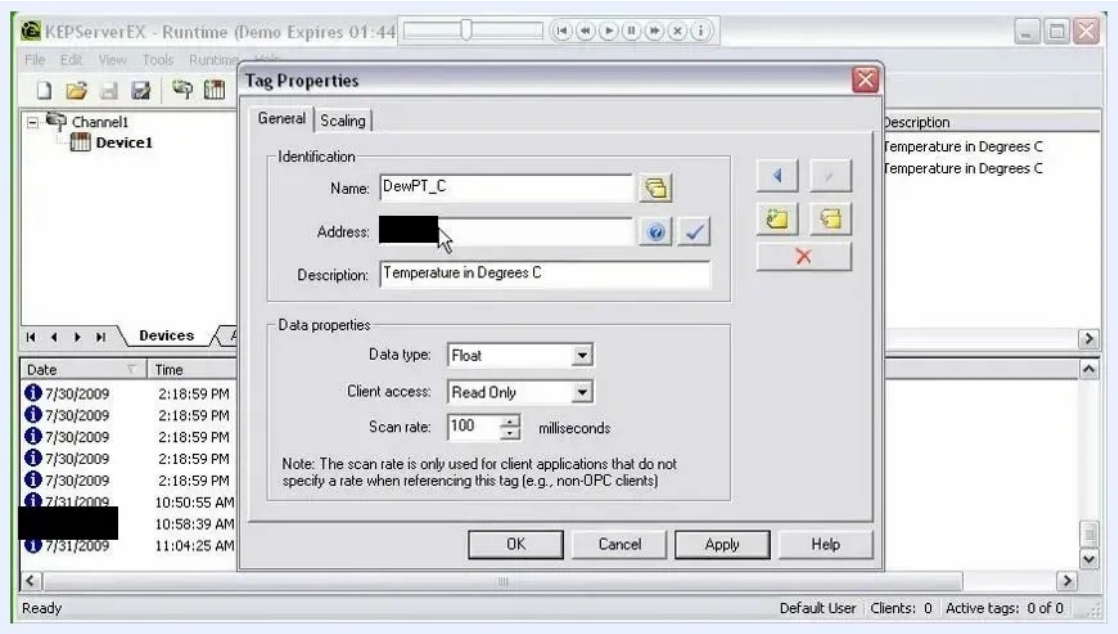
Tag Properties window after duplicating, showing the new tag Temp_C1 with address 40002

Step 16: Rename and adjust the duplicated tag

Update the duplicated tag for the new data point:

- Change **Name** to reflect the new data point, such as DewPT_C for dew point in degrees Centigrade.
- Update **Address** to the correct Modbus holding register, such as 40003 for dew point.
- Make sure **Description** accurately describes the tag. The source example uses "Temperature in Degrees C".
- Confirm that **Data type** is Float, **Client access** is Read Only, and **Scan rate** is 100 milliseconds.

Modbus registers are 16-bit, but floating-point data is 32-bit and spans two consecutive registers. When you duplicate tags for floating-point values, increment the address by two for each new tag to avoid overlap. For example, if the first tag uses 40001, the next floating-point tag should use 40003.

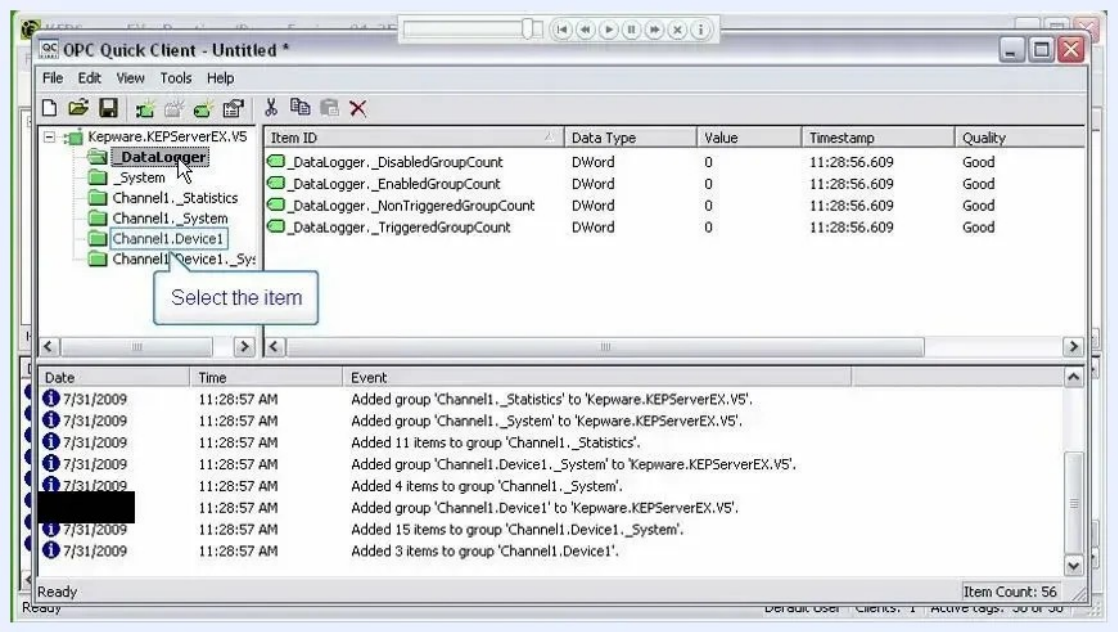


Tag Properties window with Name set to DewPT_C, Address set to 40003, and the other settings unchanged

Verify tag data

Step 17: Open the OPC Quick Client

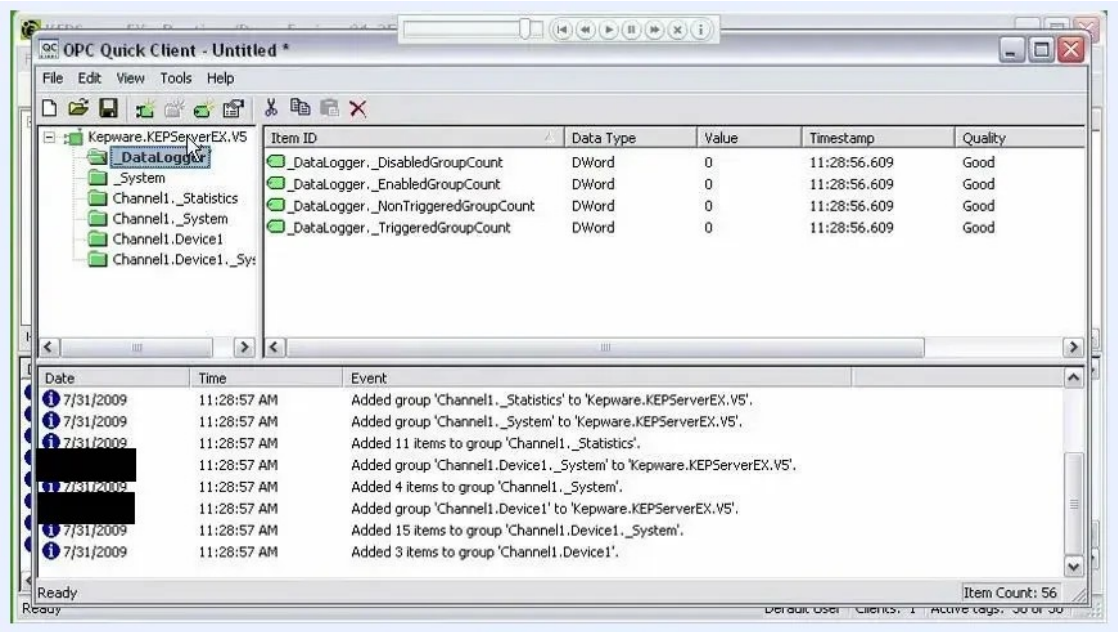
In the KEPServerEX main window, click the **QC** (Quick Client) button on the toolbar. The OPC Quick Client opens, and you can use it to monitor live data from your configured tags.



KEPServerEX main window with the QC (Quick Client) button highlighted and the tag list visible (DewPT_C, Humidity, Temp_C)

Step 18: Review the Quick Client window

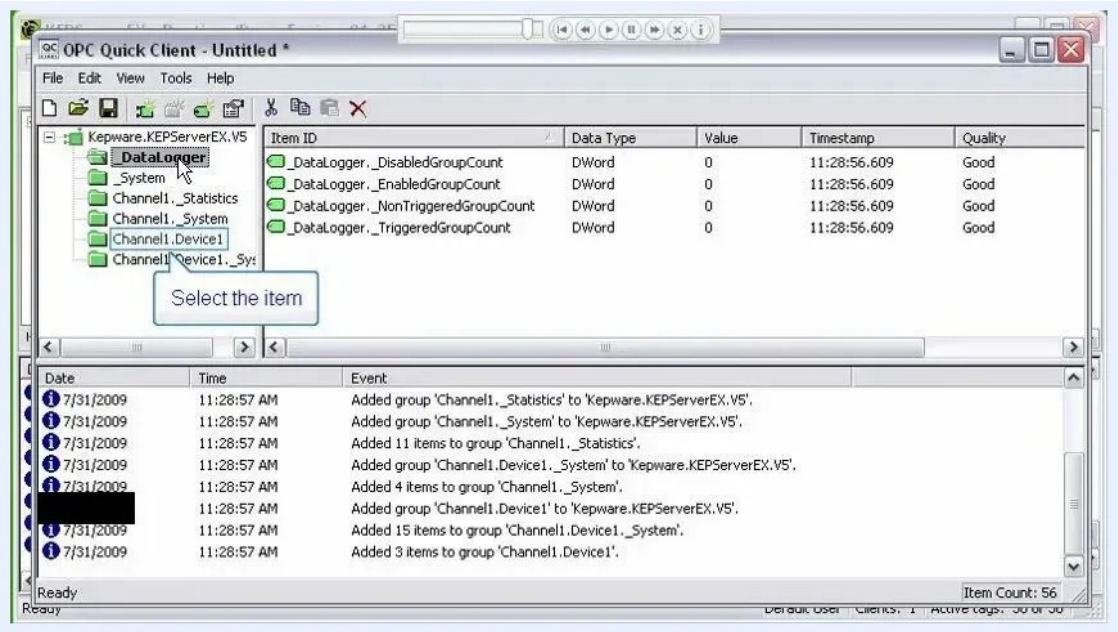
The Quick Client window shows the available groups and items. By default, you may see system and data logger groups with their items, data types, values, timestamps, and quality indicators. The event log at the bottom shows connection and group creation status.



OPC Quick Client window with the DataLogger group selected, the item list with DataLogger statistics, and the event log at the bottom

Step 19: Select your device group

In the Quick Client's left pane, expand the tree and select your device group, such as Channel1.Device1. The pane then lists the tags you configured, including those with scaling applied. The values you see reflect any scaling, clamping, or negation settings.



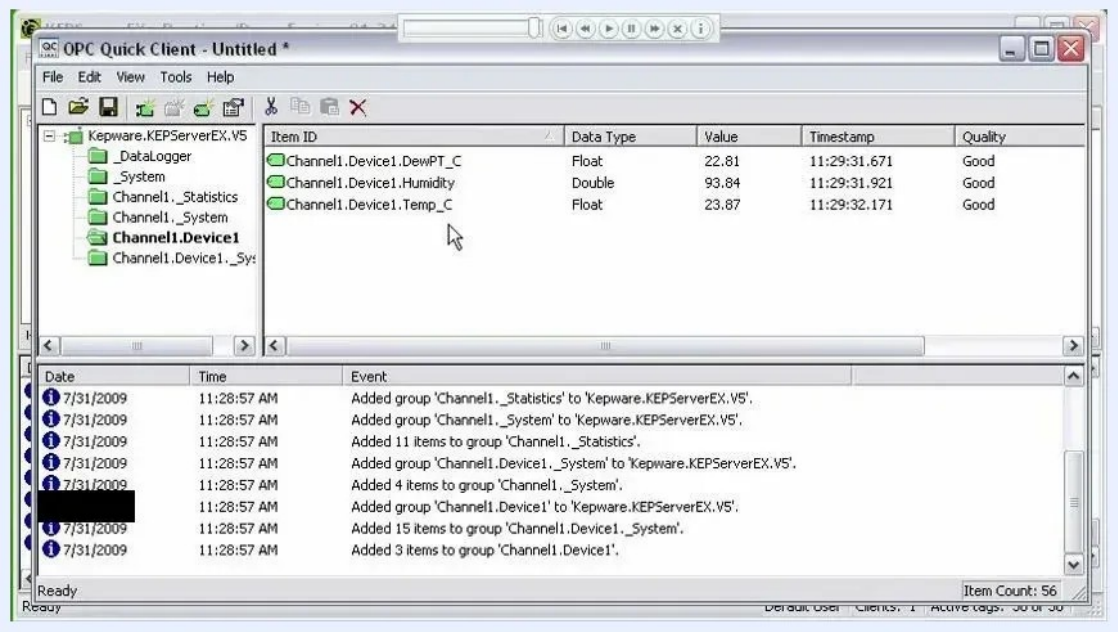
OPC Quick Client window with the Channel1.Device1 group selected, showing the item list and the event log

Step 20: Monitor live tag values

Watch the values for dew point, humidity, and temperature to confirm that data is updating. Check the **Value**, **Timestamp**, and **Quality** columns for each tag to make sure the data is sound. Example values include:

- DewPT_C: 22.81 (Float)
- Humidity: 93.84 (Double)
- Temp_C: 23.87 (Float)

Confirm that the values change over time, which indicates live data updates.



OPC Quick Client window showing the Channel1.Device1 group with the DewPT_C, Humidity, and Temp_C tags, their data types, values, timestamps, and quality indicators

Step 21: Close the OPC Quick Client

Once your tags are configured correctly and data is updating as expected, close the OPC Quick Client. If you run into issues, refer to the KEPServerEX documentation or contact technical support.

Summary

You now know how to create tags in Kepware's KEPServerEX. You created a Temp_C tag with a Float data type, Read Only client access, and a 100 ms scan rate. You also configured linear scaling and clamping, duplicated the tag for dew point, and verified live values in the OPC Quick Client.

What's next

- Create more tags by duplicating an existing one, and remember to increment floating-point addresses by two.
- Check the "Addressing" topic in your Modbus driver help file for supported addresses and default data types.
- Adjust the scaling ranges if your device outputs a different raw range.