HEN_CTWE5Parser_CLX34 Add-On Instruction (AOI) User Guide

Overview

The `HEN_CTWE5Parser_CLX34` is a Studio5000 Add-On Instruction designed for CompactLogix and ControlLogix controllers (v34 firmware). It parses the Ethernet/IP input data from the Heraeus CasTemp Wireless E5 (CTW5) instrument. Parsed values include process measurements, diagnostics, and metadata from the wireless QUBE module.

This document provides detailed setup, configuration, and usage instructions for installing and using the AOI in a CompactLogix project.

Download AOI User Guide (PDF)

1. AOI Purpose and Function

The AOI:

- Accepts a `SINT[64]` array containing the 64-byte input portion of the 128-byte EIP telegram.
- Converts and maps the values into a structured `CTW5ResultsDataSet` tag.
- Handles byte-ordering (big-endian to little-endian) for floating point fields.
- Parses error bits and flags into individual BOOL tags for readability.
- Produces valid output only when all critical communication conditions are healthy.

Supported Telegram: CTW5 Output Telegram #10

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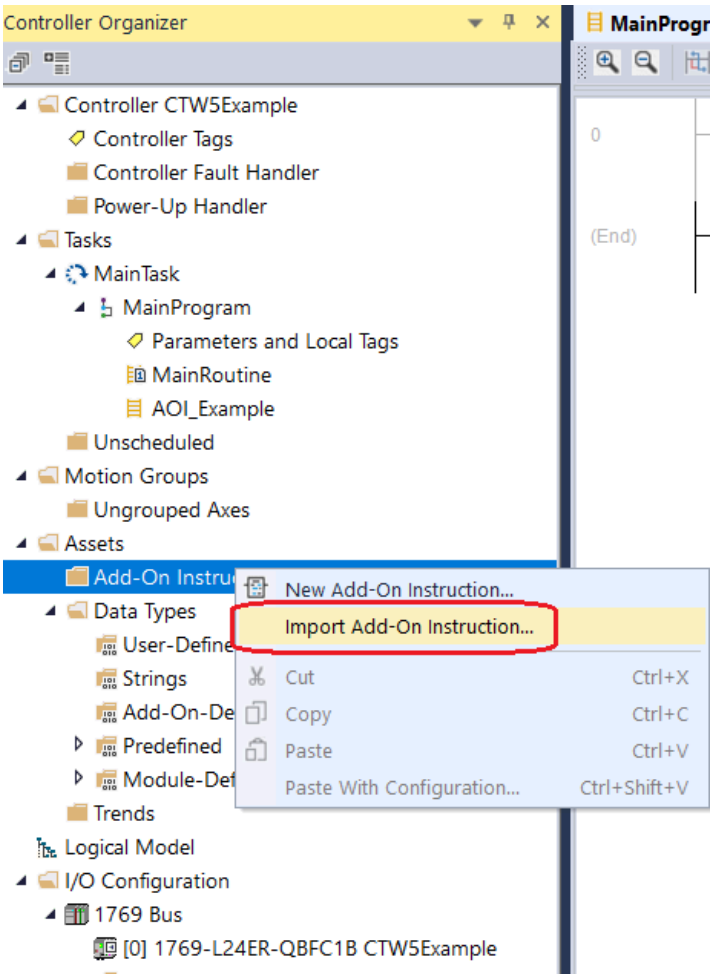
2. Installation in Studio5000

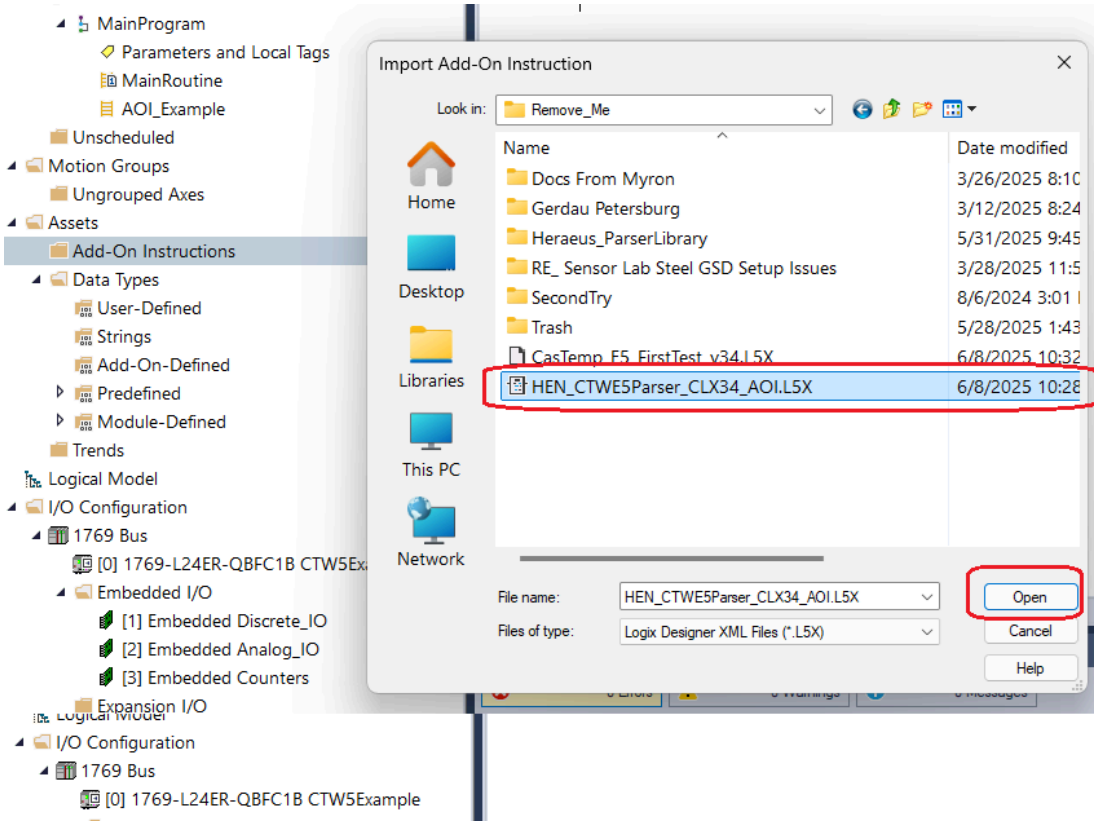
- Import the AOI

1. Open your Studio5000 project.
2. Navigate to **Controller Organizer** > **Add-On Instructions**.

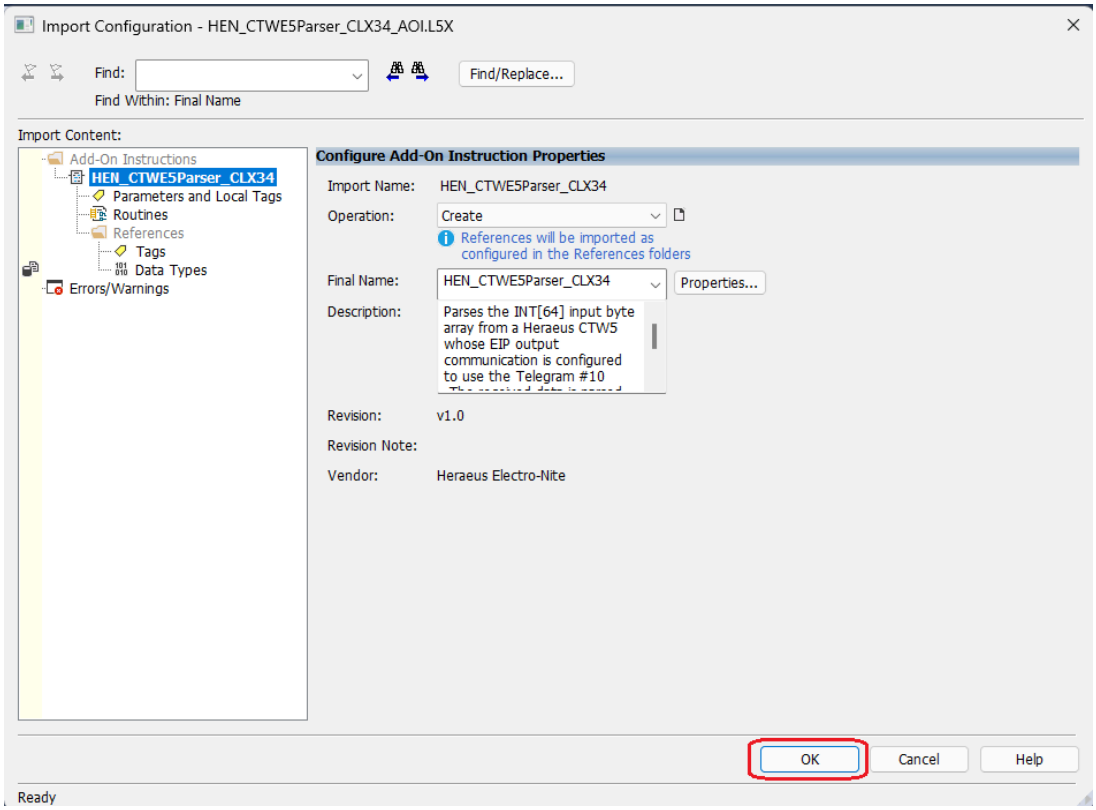


3. Right-click and select **Import Add-On Instruction**.

1. Browse and select the file: `HEN_CTWE5Parser_CLX34_AOI.L5X`



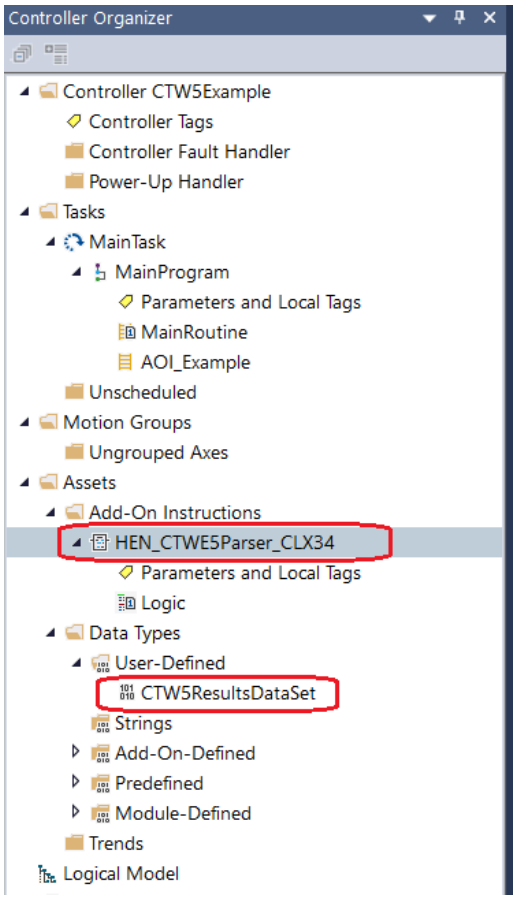
1. Click OK on the Import Configuration window.



- Confirm AOI Imports

After importing:

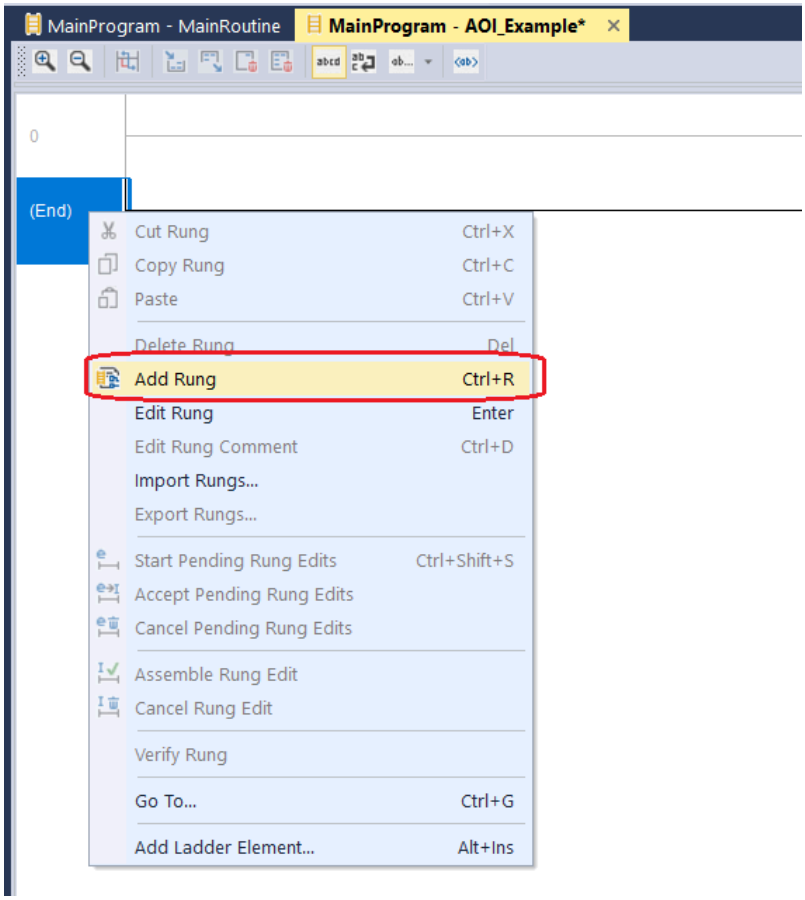
- "HEN_CTWE5Parser_CLX34" should appear in the Add-On Instructions folder.
- "CTW5ResultsDataSet" will appear in the User-Defined Data Types folder.

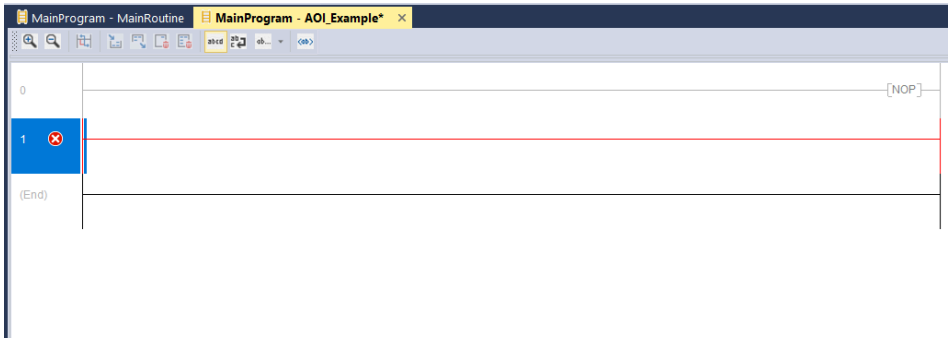


3. Adding AOI to Ladder Logic

- Create a Ladder Rung (if needed)

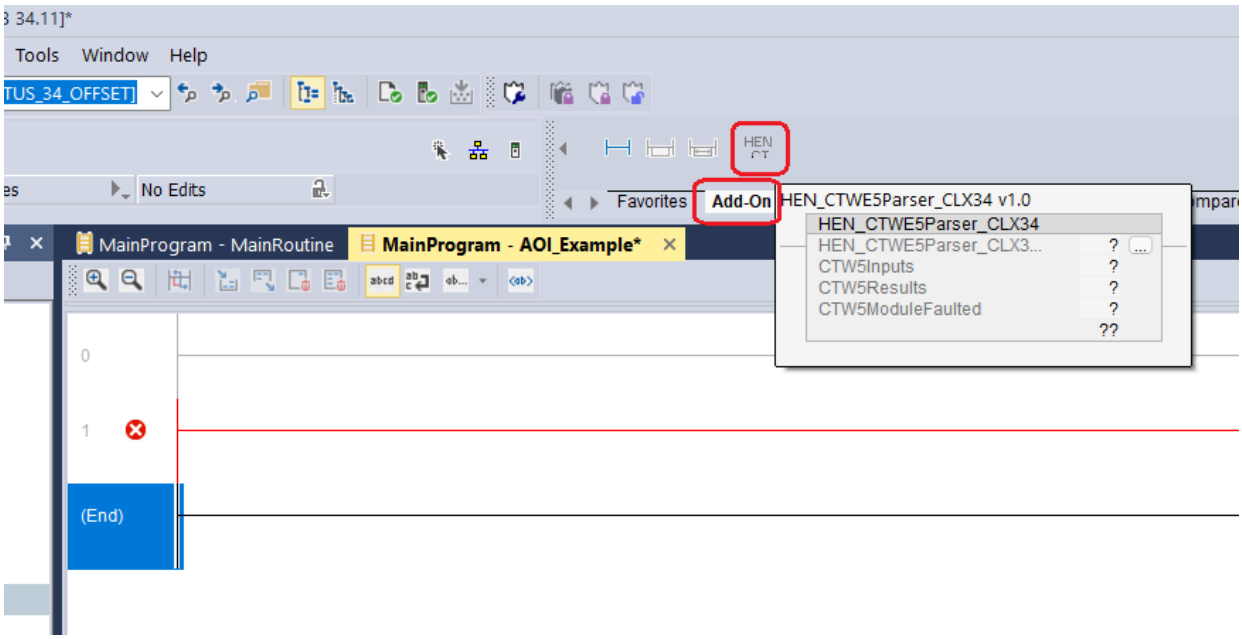
1. In your project, select the routine you wish to place the AOI into.
2. Right-click the Rung and select **Add Rung** (or reuse an existing one).



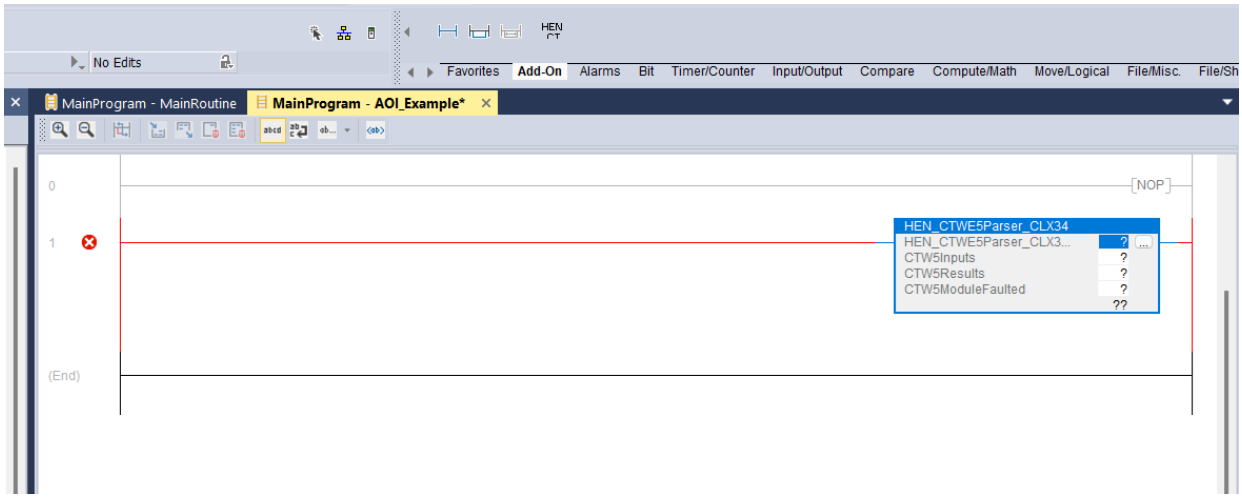


- Insert the AOI into a Rung

1. Select the Add-On tab on the instructions bar.



1. Drag `HEN_CTWE5Parser_CLX34` from the Instruction toolbar or right-click to insert.



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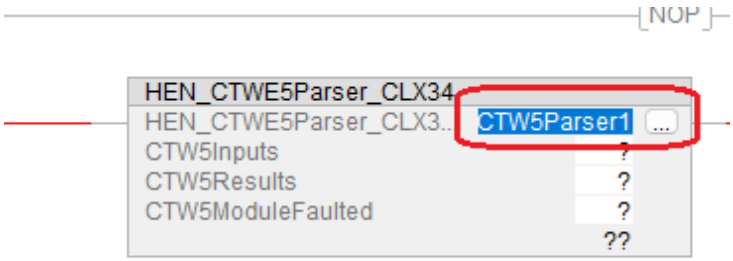
4. Populating AOI Parameters

Required Parameters:

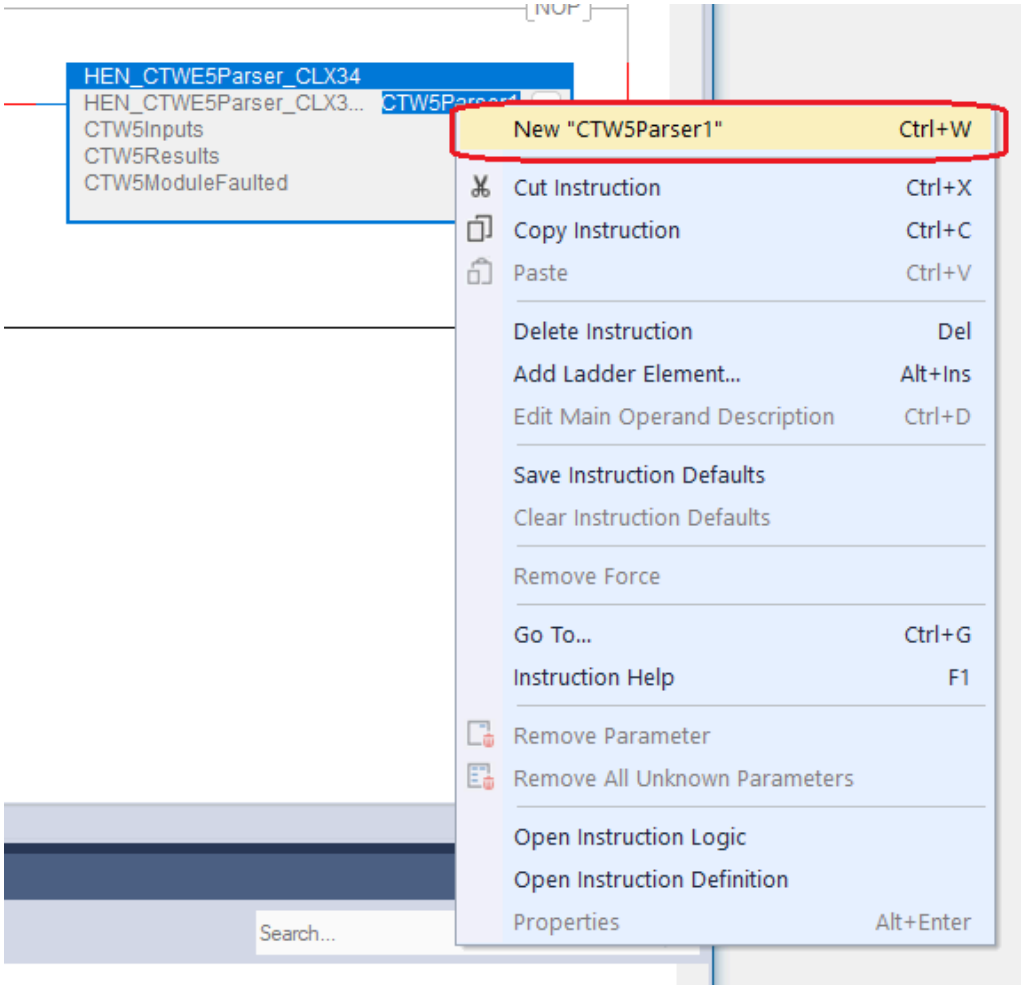
Parameter	Description	Example
`HEN_CTWE5Parser_CLX34`	Datatype for AOI	`CTW5Parser1`
`CTW5Inputs`	EIP SINT[64] data from CTW5 input connection	`CTW5SINT:I.Data`
`CTW5Results`	UDT tag of type `CTW5ResultsDataSet`	`CTW5`
`CTW5ModuleFaulted`	BOOL indicating module fault from EIP status	`CTW5SINT:I.ConnectionFaulted`

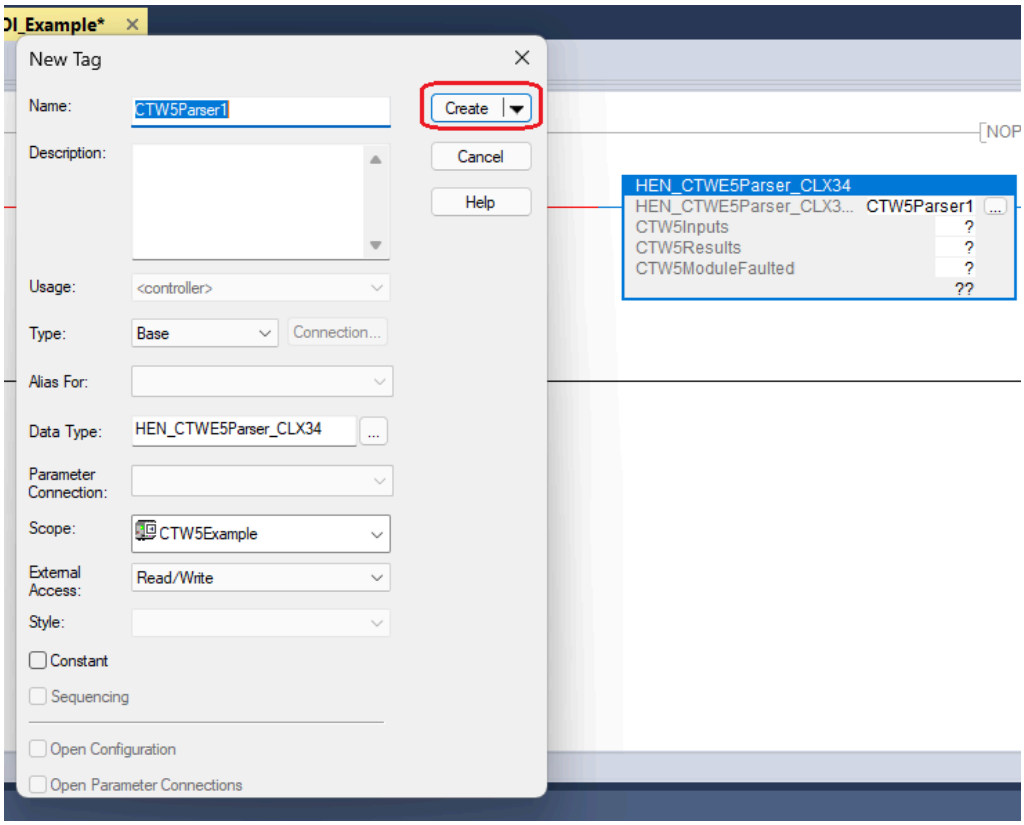
- HEN_CTWE5Parser_CLX34 field

1. Enter a tag name into the HEN_CTWE5Parser_CLX34 field of the AOI (e.g., CTW5Parser1).



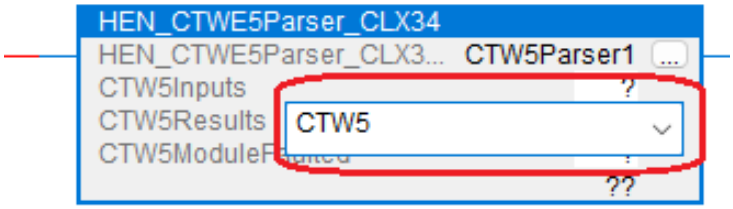
2.Right-click and define the new tag using the default settings.



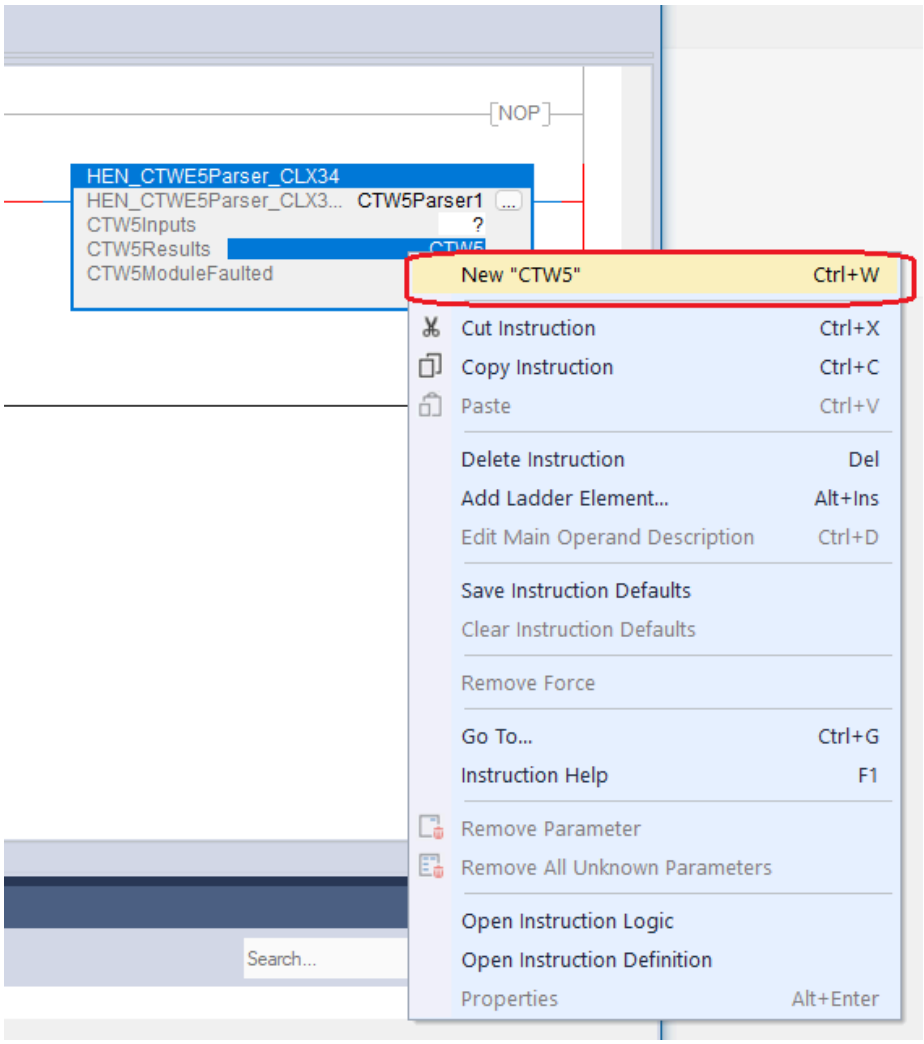


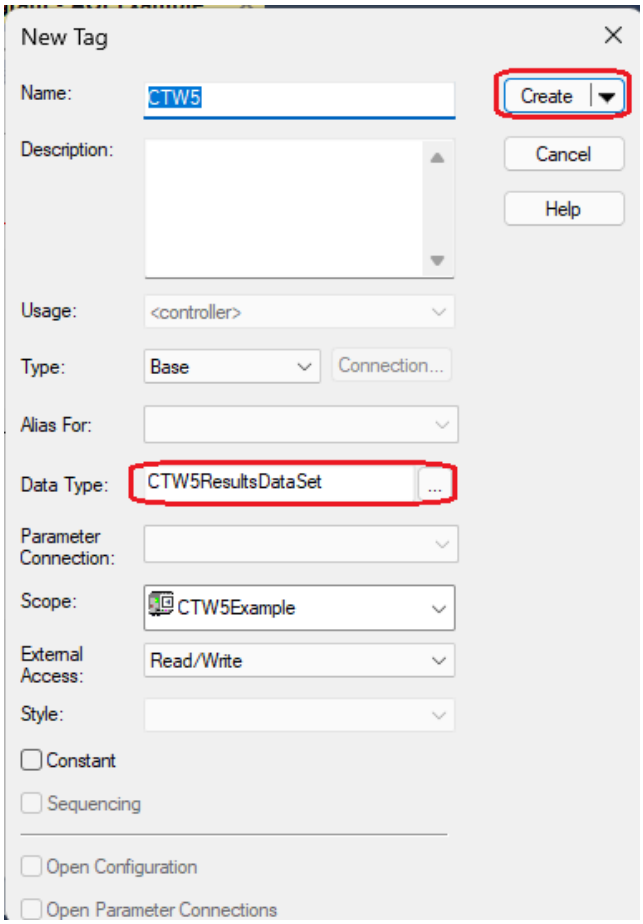
- CTW5Results field

1. Enter a tag name into the CTW5Results field of the AOI (e.g., CTW5).



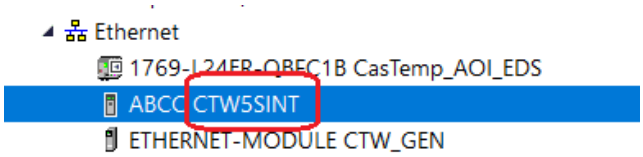
1. Right-click and define the new tag using the default settings. In this case it is UDT type "CTW5ResultsDataSet".


[NOP]
HEN_CTWE5Parser_CLX34
HEN_CTWE5Parser_CLX3...
CTW5Parser1
CTW5Inputs
?
CTW5Results
CTW5ModuleFaulted
New "CTW5" Ctrl+W
Cut Instruction Ctrl+X
Copy Instruction Ctrl+C
Paste Ctrl+V
Delete Instruction Del
Add Ladder Element... Alt+Ins
Edit Main Operand Description Ctrl+D
Save Instruction Defaults
Clear Instruction Defaults
Remove Force
Go To... Ctrl+G
Instruction Help F1
Remove Parameter
Remove All Unknown Parameters
Open Instruction Logic
Open Instruction Definition
Properties Alt+Enter
Search...

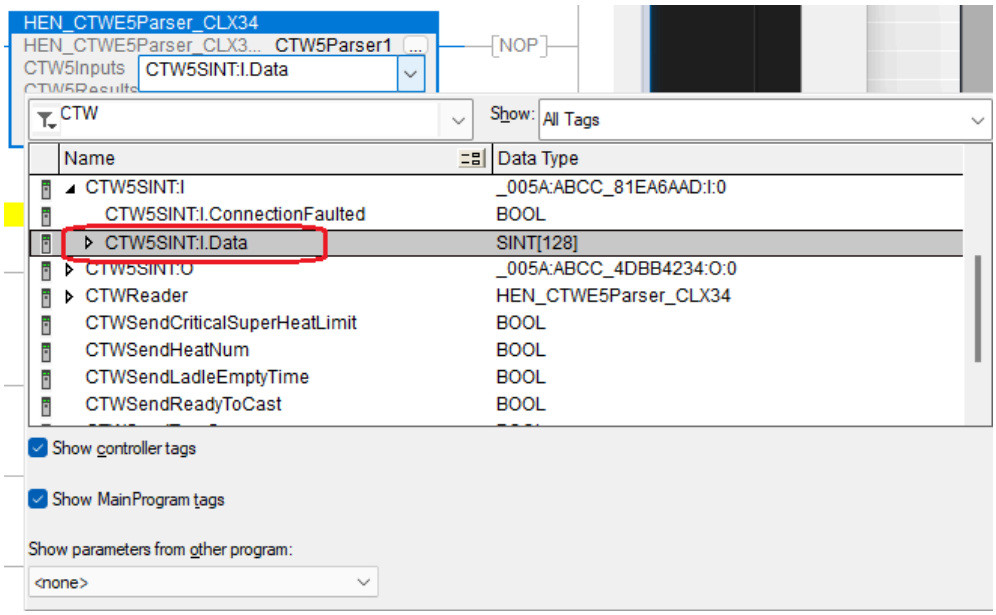


- CTW5Inputs field

1. Note the name of the EIP communication module connection to the CTW5 device. In this case it is "CTW5SINT".

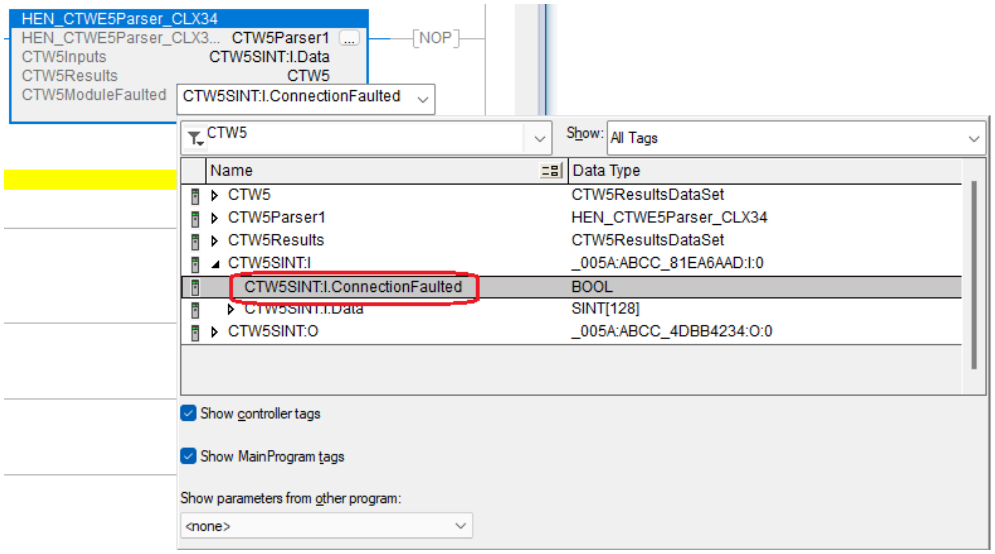


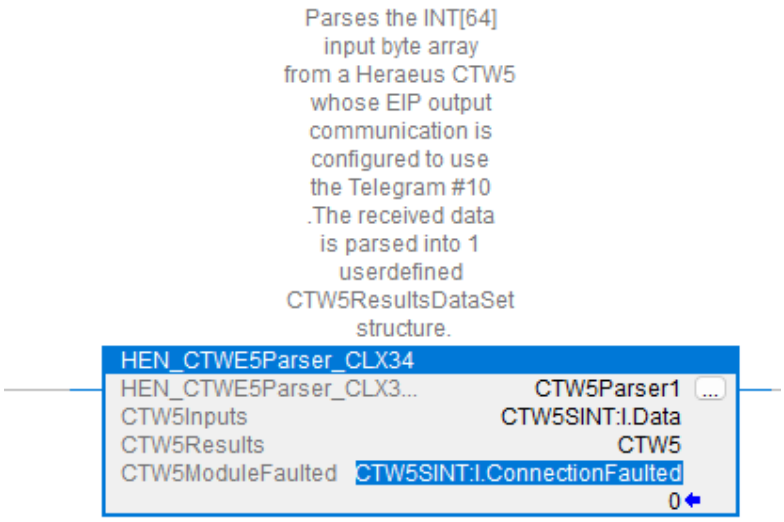
2. Select the I:Data array from the CTW5Inputs dropdown list that matches the name of the EIP communications module connected to the CTW5 instrument.



- CTW5ModuleFaulted field

1. From the CTW5ModuleFaulted dropdown list, select the I:ConnectionFaulted Boolean that corresponds to the EIP communications module connected to the CTW5 instrument. NOTE: If a Generic Ethernet Module is used, this field can be set to 0, as the I:ConnectionFaulted value is not available in that case.





2. This completes the configuration of the required fields for AOI operation.
3. If these changes were made offline, download them to the PLC. If made online, test and accept the edits as needed.

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5. Viewing Results

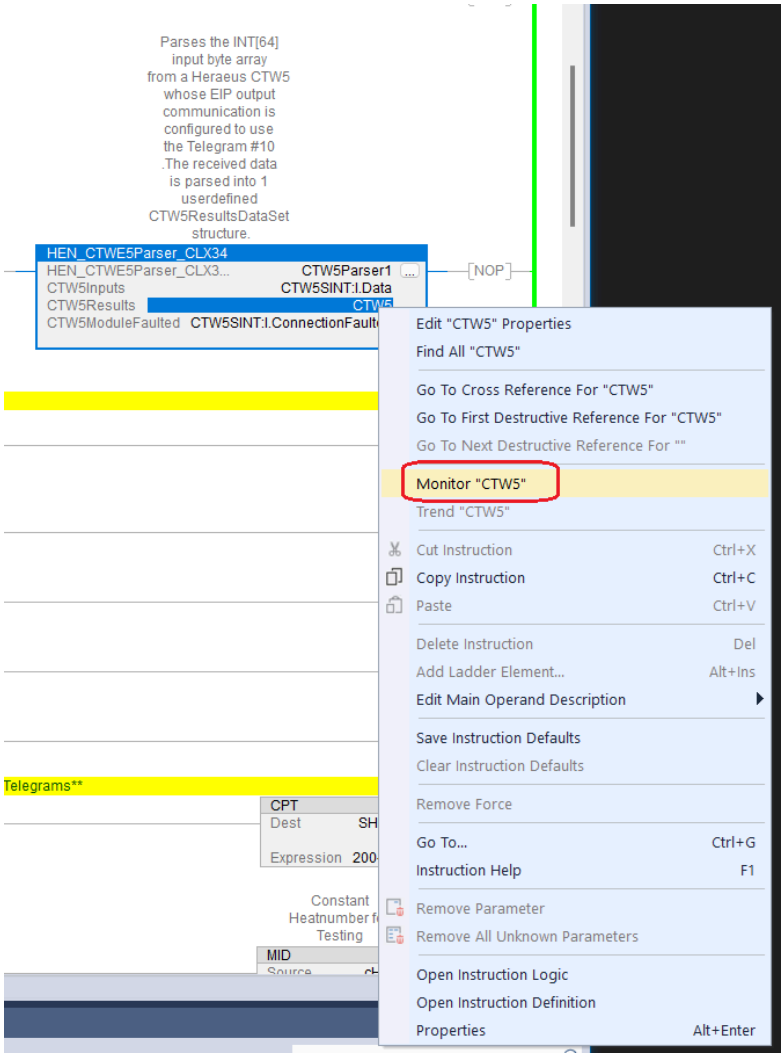
Parsed Outputs:

The AOI populates values such as:

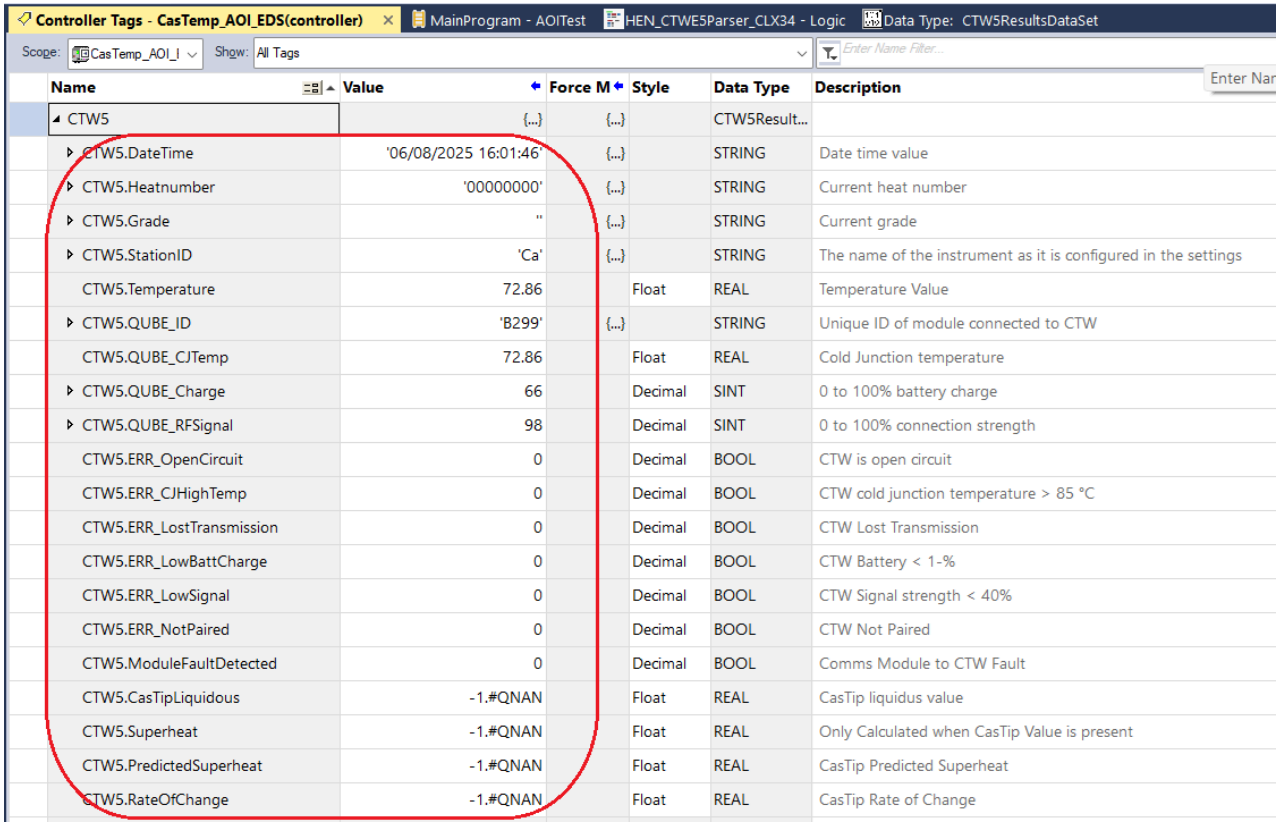
- `Temperature` (REAL)
- `QUBE_CJTemp` (REAL)
- `Superheat`, `CasTipLiquidous`, `PredictedSuperheat`, `RateOfChange` (REAL) - CasTip Only
- `QUBE_Charge` and `QUBE_RFSignal` (% SINTs)
- `QUBE_ID`, `Heatnumber`, `StationID`, `DateTime` (STRINGs)
- Diagnostic Flags: `ERR_OpenCircuit`, `ERR_LowSignal`, etc.

To View Results:

1. With Studio5000 online with the PLC, right-click the tag in the AOI's CTW5Results field and select Monitor. In this example, the tag name is 'CTW5'.



2. This will open the Controller Tags window, where the values can be viewed updating in real time.



Name	Value	Force M	Style	Data Type	Description
CTW5	{...}	{...}		CTW5Result...	
CTW5.DateTime	'06/08/2025 16:01:46'	{...}		STRING	Date time value
CTW5.Heatnumber	'00000000'	{...}		STRING	Current heat number
CTW5.Grade	''	{...}		STRING	Current grade
CTW5.StationID	'Ca'	{...}		STRING	The name of the instrument as it is configured in the settings
CTW5.Temperature	72.86		Float	REAL	Temperature Value
CTW5.QUBE_ID	'B299'	{...}		STRING	Unique ID of module connected to CTW
CTW5.QUBE_CJTemp	72.86		Float	REAL	Cold Junction temperature
CTW5.QUBE_Charge	66		Decimal	SINT	0 to 100% battery charge
CTW5.QUBE_RFSignal	98		Decimal	SINT	0 to 100% connection strength
CTW5.ERR_OpenCircuit	0		Decimal	BOOL	CTW is open circuit
CTW5.ERR_CJHighTemp	0		Decimal	BOOL	CTW cold junction temperature > 85 °C
CTW5.ERR_LostTransmission	0		Decimal	BOOL	CTW Lost Transmission
CTW5.ERR_LowBattCharge	0		Decimal	BOOL	CTW Battery < 1-%
CTW5.ERR_LowSignal	0		Decimal	BOOL	CTW Signal strength < 40%
CTW5.ERR_NotPaired	0		Decimal	BOOL	CTW Not Paired
CTW5.ModuleFaultDetected	0		Decimal	BOOL	Comms Module to CTW Fault
CTW5.CasTipLiquidous	-1.#QNAN		Float	REAL	CasTip liquidus value
CTW5.Superheat	-1.#QNAN		Float	REAL	Only Calculated when CasTip Value is present
CTW5.PredictedSuperheat	-1.#QNAN		Float	REAL	CasTip Predicted Superheat
CTW5.RateOfChange	-1.#QNAN		Float	REAL	CasTip Rate of Change

6. Notes

- The AOI automatically ignores data when the connection is faulted, open circuit, not paired, or data is invalid.
- Sentinel value `-999` is used when values are out of range or unavailable.
- If a Generic Ethernet Module is used, the CTW5ModuleFaulted field can be set to 0, as the I:ConnectionFaulted value is not available in that case.

Appendix:

Issue	Possible Cause
All results = -999	Telegram not active, CTW5 not paired, faulted
RF signal = 0	Poor antenna position or interference
QUBE Charge = 0%	QUBE not fully charged or measurement not started
`CTW5ModuleFaulted = 1`	Loss of communication from EIP device