# 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

### 2. Installation in Studio5000

#### - Import the AOI

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



#### 1. Browse and select the file: HEN\_CTWE5Parser\_CLX34\_A0I.L5X

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1. Click OK on the Import Configuration window.

Import Configuration - HEN_CTWE5F	Parser_CLX34_AOI.	LSX	×
문 또 Find: Find Within: Final Name	~ A A	Find/Replace	
Import Content:			
Add-On Instructions	Configure Add-	On Instruction Properties	÷.
HEN_CTWE5Parser_CLX34	Import Name:	HEN_CTWE5Parser_CLX34	
	Operation:	Create 🗸 🗋	
References		References will be imported as configured in the References folders	
Errors/Warnings	Final Name:	HEN_CTWE5Parser_CLX34 V Properties	
	Description:	Parses the INT[64] input byte array from a Heraeus CTW5 whose EIP output communication is configured to use the Telegram #10	
	Revision:	v1.0	
	Revision Note:		
	Vendor:	Herzeus Flertro-Nite	
	venuor.		
		OK Cancel Help	
Ready			-

### - 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).

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- Insert the AOI into a Rung

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

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Tools	Window	Help							
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#### 1. Drag HEN\_CTWE5Parser\_CLX34 from the Instruction toolbar or right-click to insert.



# 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).

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	HEN_CTWE5Parser_CLX34		5
_	HEN_CTWE5Parser_CLX3	CTW5Parser1	) -
	CTW5Inputs		
	CTW5Results	?	
	CTW5ModuleFaulted	?	
		??	

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

HEN_CTWE5Parser_CLX34			
CTW5Parser_CLX3 CTW5F		New "CTW5Parser1"	Ctrl+W
CTW5ModuleFaulted	Ж	Cut Instruction	Ctrl+X
	ŋ	Copy Instruction	Ctrl+C
	â	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
	1	Remove Parameter	
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		Open Instruction Logic	
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me:	CTW5Parser1	Create 🔍	
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ype:	Base V Connection		
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Parameter Connection:	~		
Scope:	CTW5Example ~		
External Access:	Read/Write ~		
Style:	~		
Constant			
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#### - CTW5Results field

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

HEN_CTWE5P	arser_CLX34		
HEN_CTWE5P	arser_CLX3	CTW5Parser1	
CTW5Inputs		?	
CTW5Results	CTW5		$\sim$
CTW5ModuleF	unca		
		??	

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

HEN_CTWE5Parser_CLX34 HEN_CTWE5Parser_CLX34	/5Par		
CTW5Inputs CTW5ModuleFaulted		? DAVE New "CTW5"	Ctrl+W
	¥ D ش	Cut Instruction Copy Instruction Paste	Ctrl+X Ctrl+C Ctrl+V
		Delete Instruction Add Ladder Element Edit Main Operand Description	Del Alt+Ins Ctrl+D
		Save Instruction Defaults Clear Instruction Defaults Remove Force	
		Go To Instruction Help	Ctrl+G F1
	C.	Remove Parameter Remove All Unknown Parameters	
Search		Open Instruction Logic Open Instruction Definition	
		Properties	Alt+Enter

New Tag		×
Name:	CTW5	Create 🗸
Description:		Cancel
		Help
Usage:	<controller></controller>	
Type:	Base ~ Connection	
Alias For:	~	
Data Type:	CTW5ResultsDataSet	]
Parameter Connection:		
Scope:	💭 CTW5Example 🗸 🗸	]
External Access:	Read/Write ~	]
Style:	~	
Constant		
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Open Conf	iguration	
Open Para	meter Connections	

#### - 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.

		I_CTWE5Parser_CLX34 I_CTWE5Parser_CLX3CTW5Parser1 V5Inputs V5Pasuite CTW5SINT:I.Data		[NOP]				
		Name	==	Data Type				
	F	CTW5SINT:I		_005A:ABCC_81EA6AAD:I:0	-			
		CTW5SINT:I.ConnectionFaulted		BOOL				
	•	CTW5SINT:I.Data		SINT[128]				
	Ē	CTW5SINT:0		_005A:ABCC_4DBB4234:0:0	1			
	Ē	CTWReader		HEN_CTWE5Parser_CLX34	- 11			
	Ē	CTWSendCriticalSuperHeatLimit		BOOL	- 11			
	Ē	CTWSendHeatNum		BOOL				
	•	CTWSendLadleEmptyTime		BOOL				
	Ē	CTWSendReadyToCast		BOOL				
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#### - 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.



Parses the INT[64 input byte array from a Heraeus CTV whose EIP output communication is configured to use the Telegram #10 .The received data is parsed into 1 userdefined CTW5ResultsDataS structure.	l V5 i
HEN_CTWE5Parser_CLX34	CTW5Parser1
HEN_CTWE5Parser_CLX3	CTW5SINT:I.Data
CTW5Inputs	CTW5
CTW5Results	ConnectionFaulted
CTW5ModuleFaulted CTW5SINT:I.0	0 ←

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.

### 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'.

Parses the INT[64] input byte array from a Heraeus CTW5 whose EIP output communication is configured to use the Telegram #10 . The received data is parsed into 1 userdefined CTW5ResultsDataSet structure. HEN_CTWE5Parser_CLX3 CTW5Inputs CTW5Inputs CTW5Results CTW5Results CTW5Inputs CTW5Inputs CTW5Inputs CTW5Parset	r1 .	ω <sup></sup> [NOP]
CTW5ModuleFaulted CTW5SINT:I.ConnectionFault		Edit "CTW5" Properties
		Find All "CTW5"
		Go To Cross Reference For "CTW5"
		Go To First Destructive Reference For "CTW5"
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	ŋ	Copy Instruction Ctrl+C
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		Delete Instruction Del
		Add Ladder Element Alt+Ins
		Edit Main Operand Description
		Save Instruction Defaults
		Clear Instruction Defaults
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		Go To Ctrl+G
Expression 200		Instruction Help F1
Constant	3	Remove Parameter
Testing	E	Remove All Unknown Parameters
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		Open Instruction Definition
		Properties Alt+Enter
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2. This will open the Controller Tags window, where the values can be viewed updating in real time.

🖉 Controller Tags - CasTemp_AOI_EDS(controller) 🗙 🗒 MainProgram - AOITest 📲 HEN_CTWE5Parser_CLX34 - Logic 📓 Data Type: CTW5ResultsDataSet							
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Name 📰 🔺	Value * Force	M +	Style	Data Type	Description	er Nar	
▲ CTW5	{}	{}		CTW5Result			
▶ e1W5.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	s	
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 $^{\circ}$ 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