

Application Note

Subject: **Commissioning guide of CDF600-EtherCAT for proxy and gateway mode**

SICK Product: CDF600-EtherCAT; All Auto Ident sensors

Department: Flexible Identification

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Version history

Version	Date	Author	Remarks
1	2025/04/28	AE-FlexID	Initial Version

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1. About this document

This document shows how an Auto Ident sensor can be integrated into a Beckhoff PLC using a CDF600 EtherCAT. It shows how EtherCAT communication is established between the PLC and the Auto Ident sensor in the two possible operating modes Gateway Mode and Proxy Mode.

2. Hardware Setup

The required hardware setup with the CDF600 EtherCAT depends on the used Auto Ident sensor. The following table lists the cables and accessories required depending on the Auto Ident sensor used.

Device connected to the CDF	Available operating mode	Connection method
CLV61x-65x	Proxy-Mode (recommended) & Gateway-Mode	D-sub device cable to CDF
Lector620	Proxy-Mode (recommended) & Gateway-Mode	17-pin M12 to 15-pin D-Sub cable (6077431)
Lector63x-65x Lector85x CLV69x	Gateway-Mode	Additional CDB650 or CDM420 required (more details in technical information document)
Lector611	Gateway-Mode	Option 1: use special device cable (2127037) Option 2: additional CDB650 required (more details in technical information document)
Lector621 RFH6xx RFU6xx	Gateway-Mode	17-pin M12 to 15-pin D-Sub cable (6077431)
IDM Handscanner	Gateway-Mode	RS232-Adapter needed (more details in technical information document)

Depending on the Auto Ident sensor, the proxy mode of the CDF600 EtherCAT is also possible. This offers more functionalities and is recommended. For more detailed information on the operating modes and the connection methods, please refer to the CDF600 EtherCAT Technical Information document. This document can be found in the SICK Support Portal (<https://support.sick.com>).

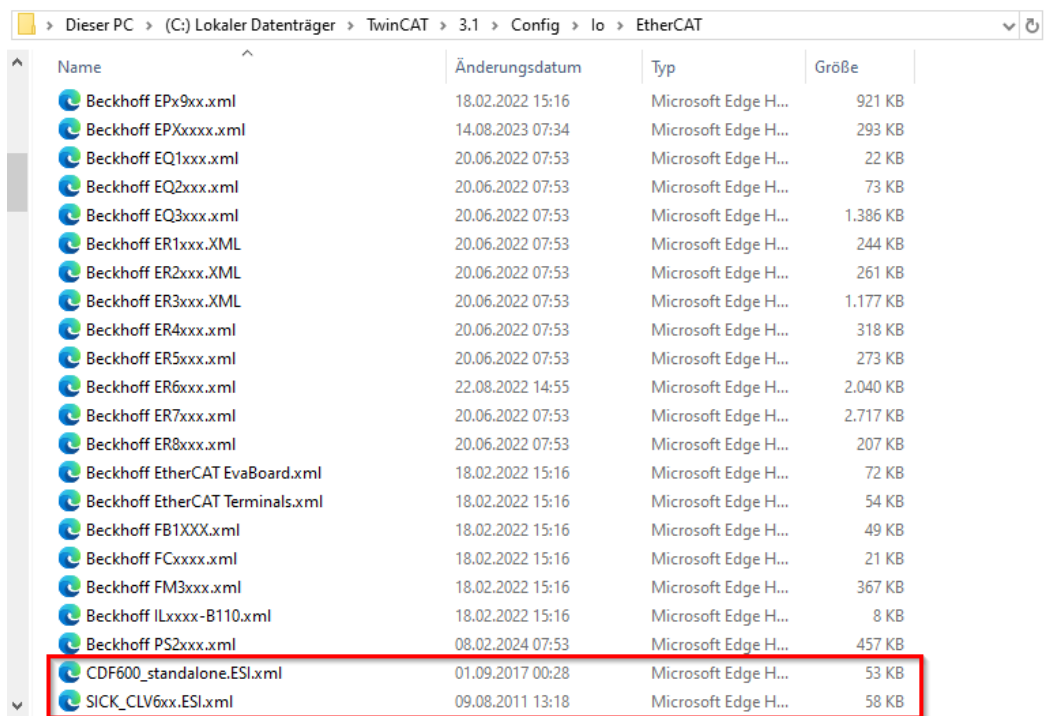
3. Download & Integration of ESI-File

Once the appropriate hardware setup has been set up, the suitable ESI file for the Auto Ident sensor and CDF600 EtherCAT combination must be downloaded. For the Auto Ident sensors for which the proxy mode is supported, there is always the option of using either the ESI file for the proxy mode or for the gateway mode.

Device connected to the CDF	Available operating mode	Connection method	ESI-File
CLV61x-65x	Proxy-Mode (recommended) & Gateway-Mode	D-sub device cable to CDF	ESI-file-CLV61x-F-CLV62x-65x-Proxy or ESI-file-CDF-Gateway
Lector620	Proxy-Mode (recommended) & Gateway-Mode	17-pin M12 to 15-pin D-Sub cable (6077431)	ESI-file-Lector620-Proxy or ESI-file-CDF-Gateway
Lector63x-65x Lector85x CLV69x	Gateway-Mode	Additional CDB650 or CDM420 required (more details in technical information document)	ESI-file-CDF-Gateway
Lector611	Gateway-Mode	Option 1: use special device cable (2127037) Option 2: additional CDB650 required (more details in technical information document)	ESI-file-CDF-Gateway
Lector621 RFH6xx RFU6xx	Gateway-Mode	17-pin M12 to 15-pin D-Sub cable (6077431)	ESI-file-CDF-Gateway
IDM Handscanner	Gateway-Mode	RS232-Adapter needed (more details in technical information document)	ESI-file-CDF-Gateway

The ESI files can be found in the support portal in the Knowledge Article CDF600-EtherCAT Technical Information or on SICK.com in the download section of the Auto Ident sensors.

After downloading the appropriate ESI file, the ESI XML file must be placed in the correct TwinCAT3 folder (TwinCAT/3.1/Config/lo/EtherCAT).



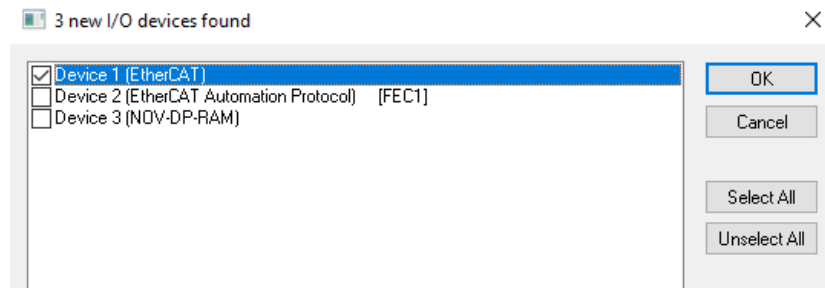
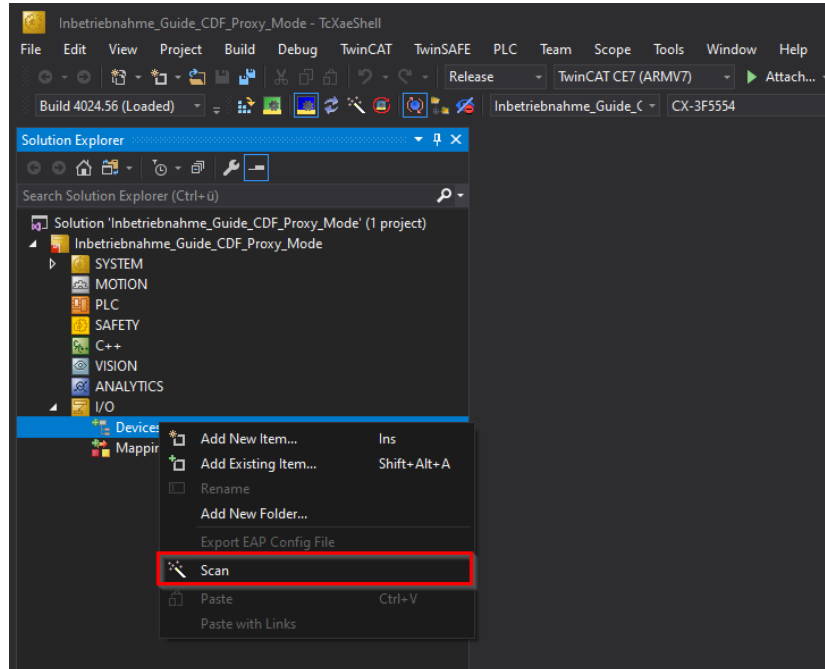
Depending on the operating mode used (proxy or gateway), it is important to ensure that the operating mode switch of the CDF600-EtherCAT is set correctly.



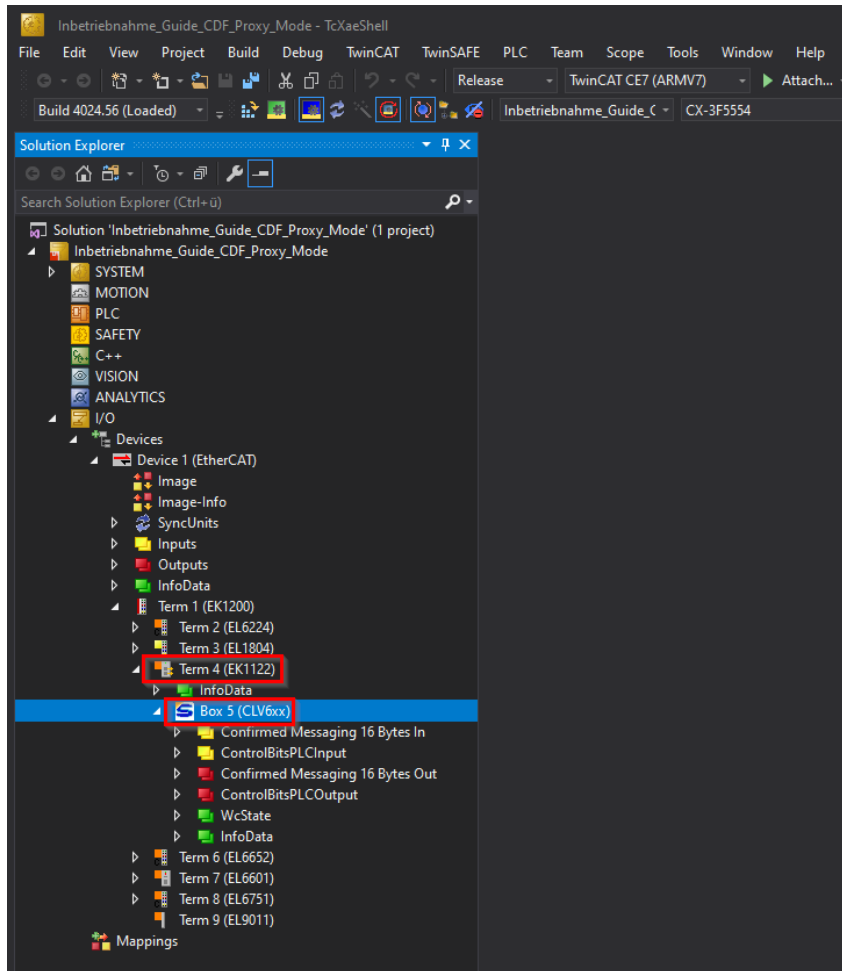
Switch 1 must be set to 0 for proxy mode and to 2 (57.6 kBd) or 4 (9.6 kBd) for gateway mode. Please note that the operating mode is only adopted after a reboot.

4. Commissioning Proxy-Mode

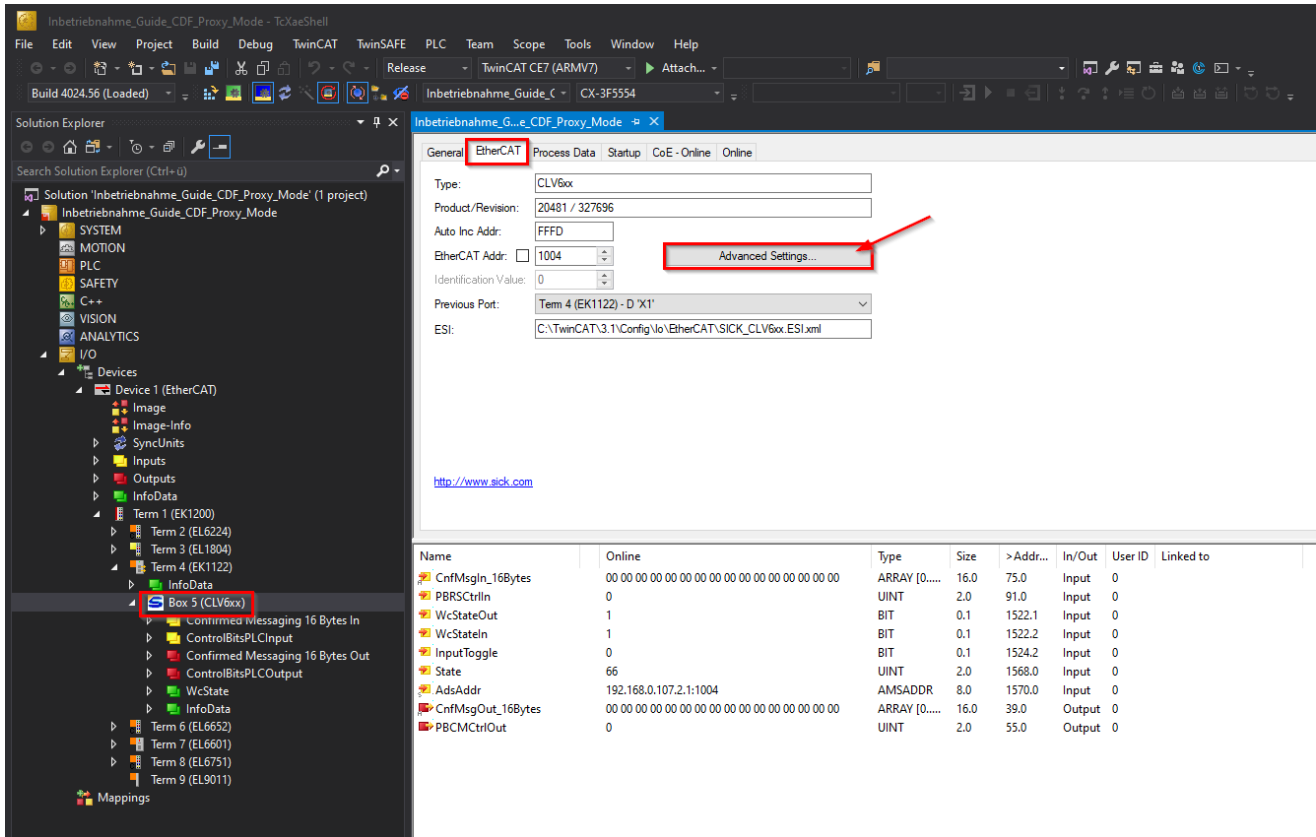
To commission the CDF600-EtherCAT with TwinCAT3 in proxy mode, the rotary switch of the CDF600-EtherCAT must be set to position 0. The CDF including Auto Ident Sensor can then be started. A TwinCAT3 project can be opened and a scan can be performed by right-clicking on “Devices” in order to find the devices on the PLC.



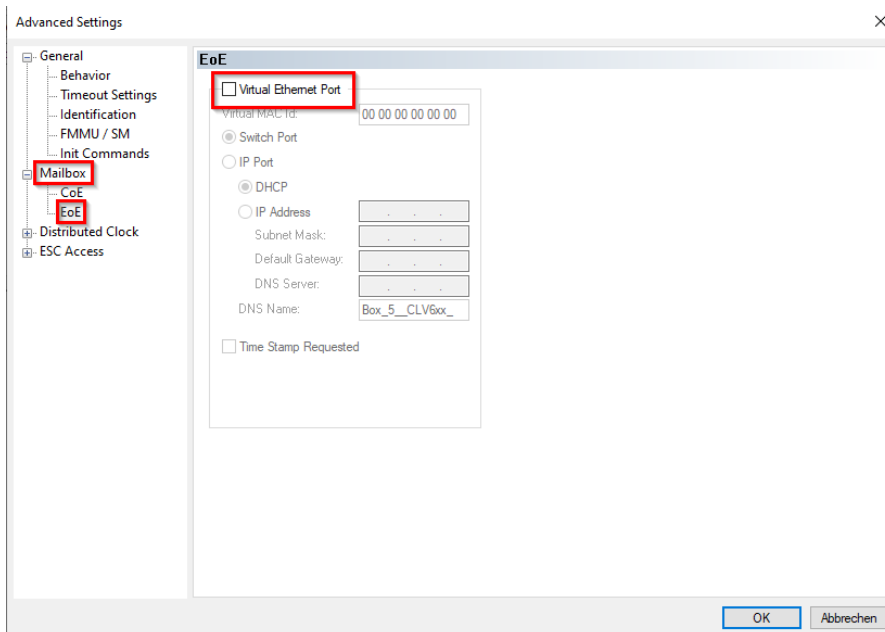
The Auto Ident sensor can now be found at the EtherCAT terminal of the PLC, in this example the “EK1122” terminal.



To be able to receive and send data from the Auto Ident Sensor via EtherCAT, the EoE (Ethernet over EtherCAT) must be deactivated in the Auto Ident Sensor. The EoE is active by default and must therefore be switched off manually. To do this, go to the menu of the Auto Ident Sensor and open the Advanced Settings under “EtherCAT”.



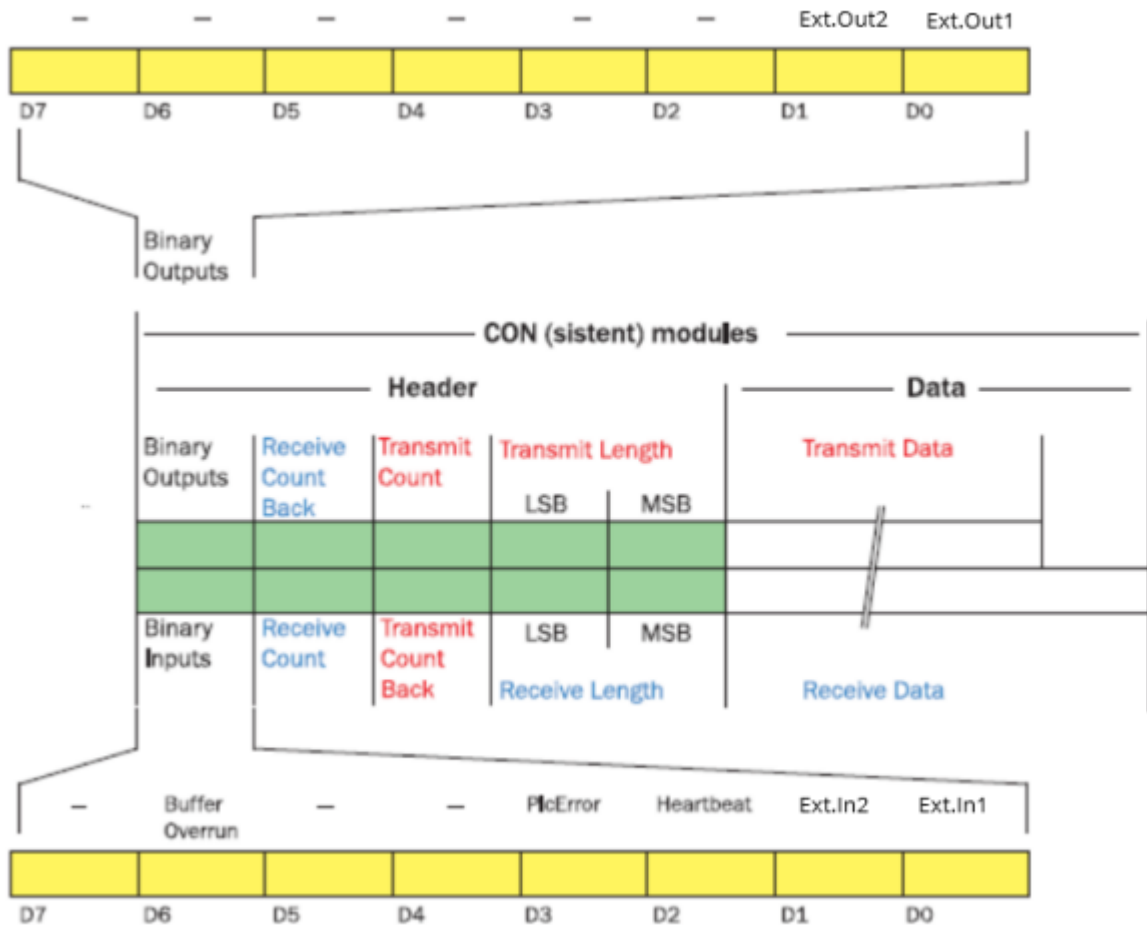
The EoE settings can be found under “Mailbox”. The tick must be removed in the EoE menu.



After the EoE has been deactivated, the devices can be reloaded in TwinCAT. Input data from the Auto Ident sensor should now be sent to the PLC. This can be recognized when the heartbeat toggles in the input data. The first byte of the Confirmed Messaging input data should toggle between 4 and 0 and the input toggle between 1 and 0.

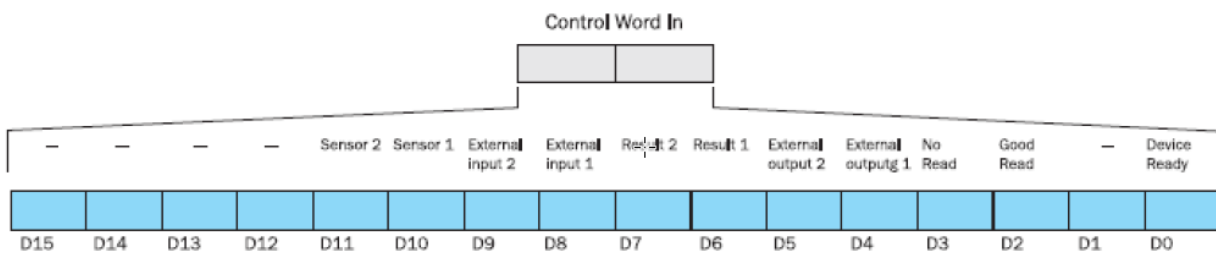
Name	Online	Type	Size	> Addr...	In/Out	User ID	Linked to
CnfMsgIn_16Bytes	04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ARRAY [0.....	16.0	75.0	Input	0	
PBRSCtrlIn	32873	UINT	2.0	91.0	Input	0	
WcStateOut	0	BIT	0.1	1522.1	Input	0	
WcStateIn	0	BIT	0.1	1522.2	Input	0	
InputToggle	1	BIT	0.1	1524.2	Input	0	
State	8	UINT	2.0	1568.0	Input	0	
AdsAddr	192.168.0.107.2.1:1004	AMSADDR	8.0	1570.0	Input	0	
CnfMsgOut_16Bytes	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ARRAY [0.....	16.0	39.0	Output	0	
PBCMCtrlOut	0	UINT	2.0	55.0	Output	0	

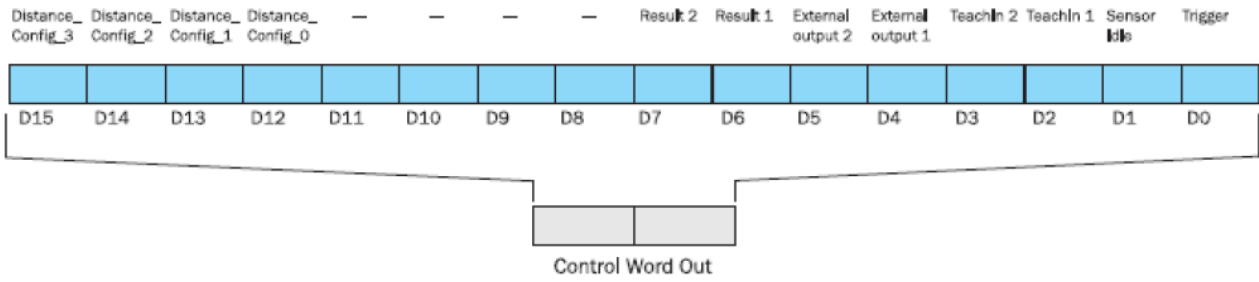
If the input data is successfully received, the process data can be converted to the desired size. The process data in proxy mode consists of the Confirmed Messaging Input / Output data and the 2-byte Control Bits In / Out. The Confirmed Messaging data is structured as shown in the following figure:



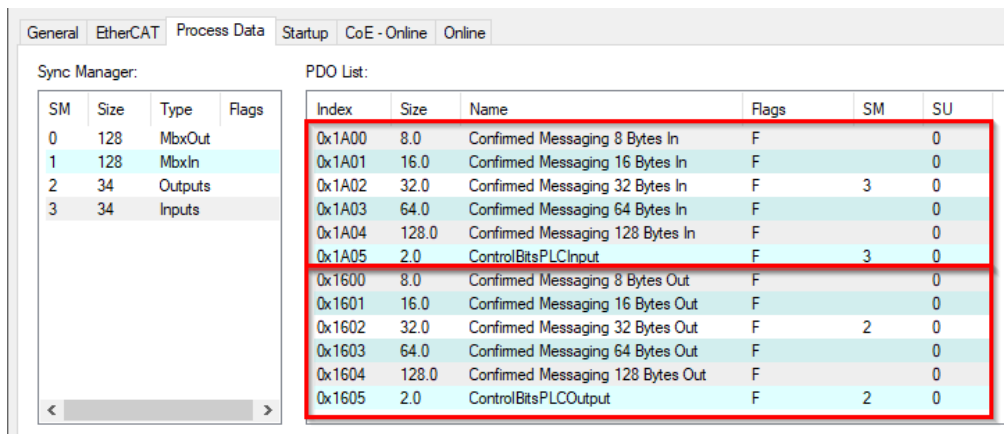
The first 5 bytes of the Confirmed messaging data consist of headers. The header has the binary inputs/outputs in the first byte, which are used to control and diagnose the sensor. The remaining 4 bytes represent the handshake mechanism between the sensor and PLC. The bytes after the header are data for communication between the sensor and PLC. The size of the Confirmed Messaging data can be customized. It is possible to send and receive packets from 8 bytes up to 128 bytes in size.

The control bits are only available in proxy mode and offer extended options for obtaining more information about the sensor and controlling the sensor. The control bits are shown in the following images:

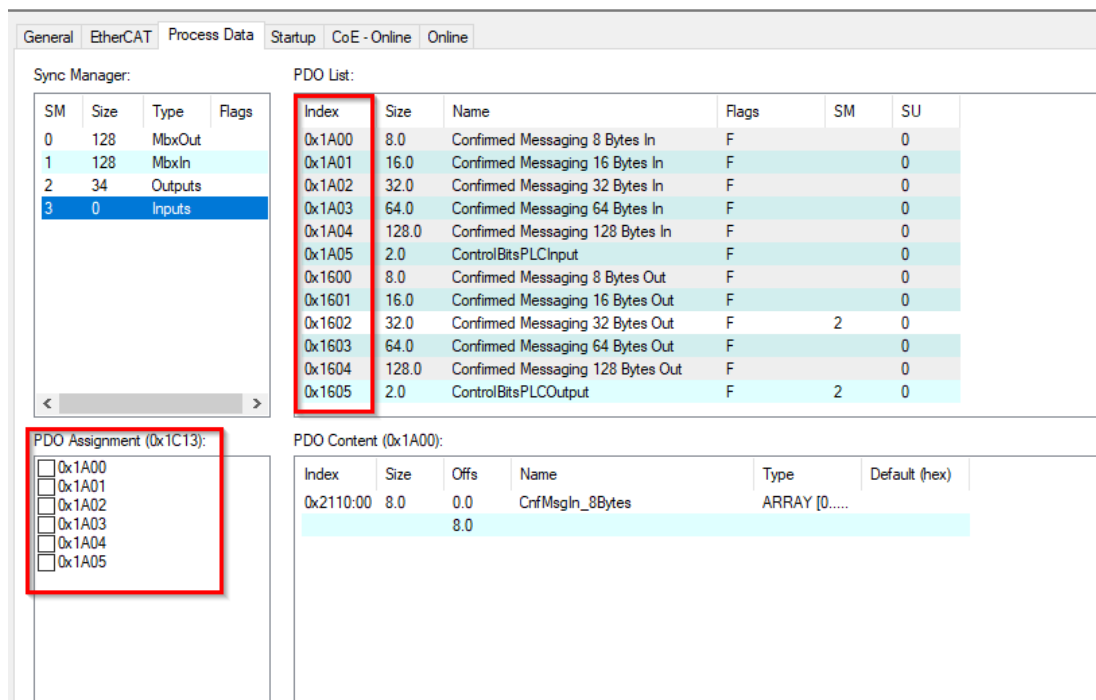




In TwinCAT3, the process data can be viewed in the Auto Ident Sensor menu under the “Process Data” tab.



In this menu item it is possible to adjust the size of the Confirmed Messaging Inputs / Outputs and to either switch the Control Bits Input / Output on or off via the PDO assignment.

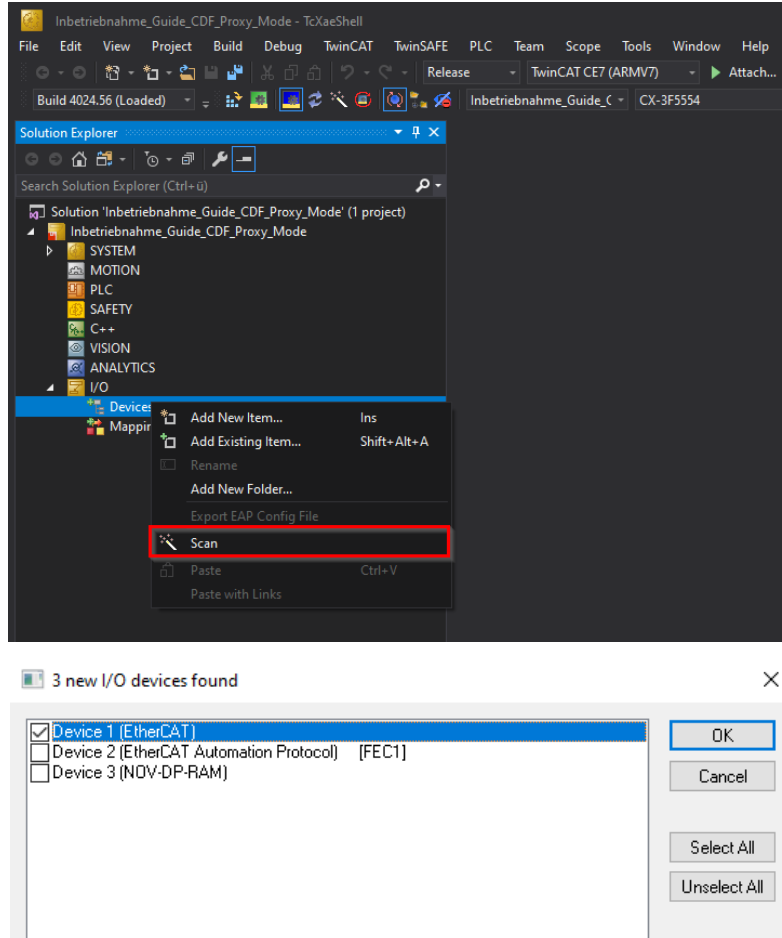


As soon as the input and output process data have been converted to the appropriate size and communication between the PLC and sensor is established, the process data can be used for PLC programming.

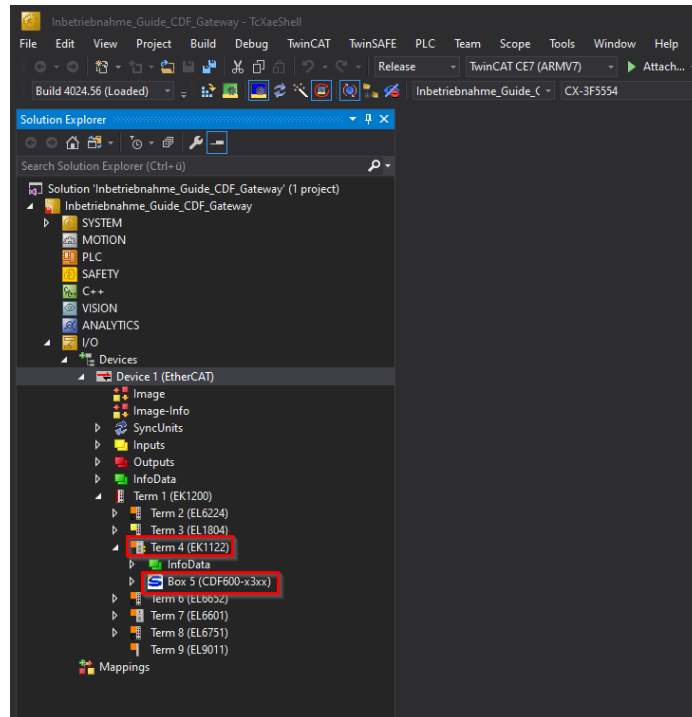
For easier operation of the Auto Ident sensor, we recommend using the SICK function block. The function block for Proxy Mode can be found on SICK.com in the Auto Ident Sensor download section or on the SICK support portal in the knowledge article "CDF600-EtherCAT Technical Information". Further steps, how the function block is integrated into TwinCAT3 and which functionalities the function block provides, are described in more detail in the function block documentation.

5. Commissioning Gateway-Mode

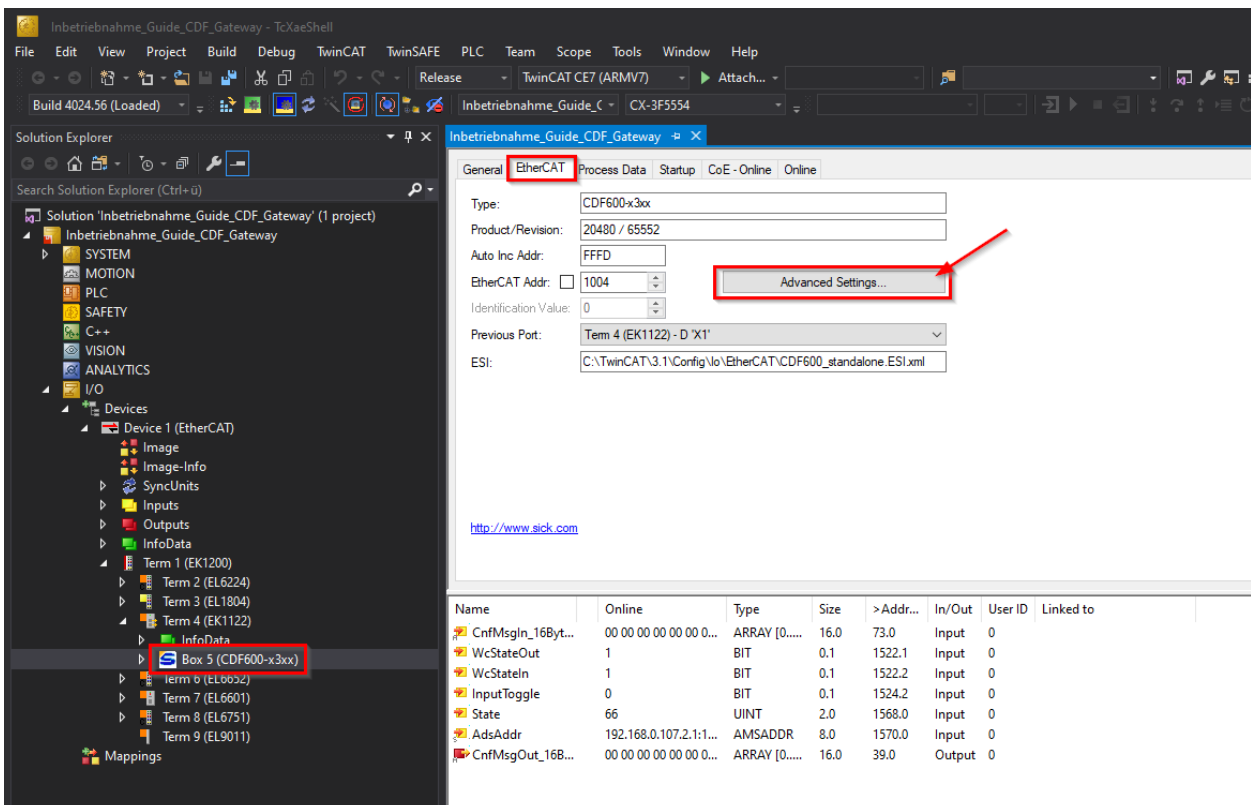
To commission the CDF600-EtherCAT with TwinCAT3 in gateway mode, the rotary switch of the CDF600-EtherCAT must be set to position 2 (57,6 kBd) or position 4 (9,6 kBd). The CDF including Auto Ident Sensor can then be started. A TwinCAT3 project can be opened and a scan can be performed by right-clicking on “Devices” in order to find the devices on the PLC.



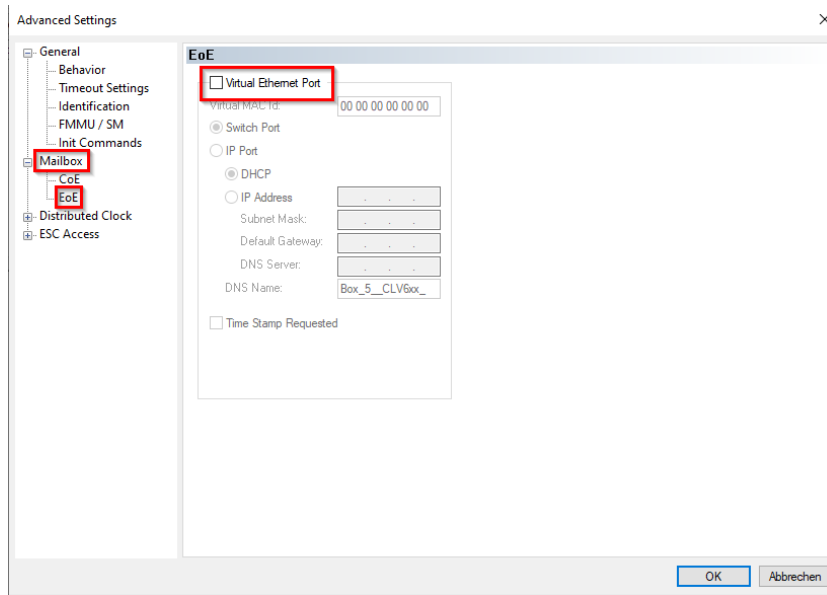
The CDF600-EtherCAT can now be found at the EtherCAT terminal of the PLC, in this example the “EK1122” terminal.



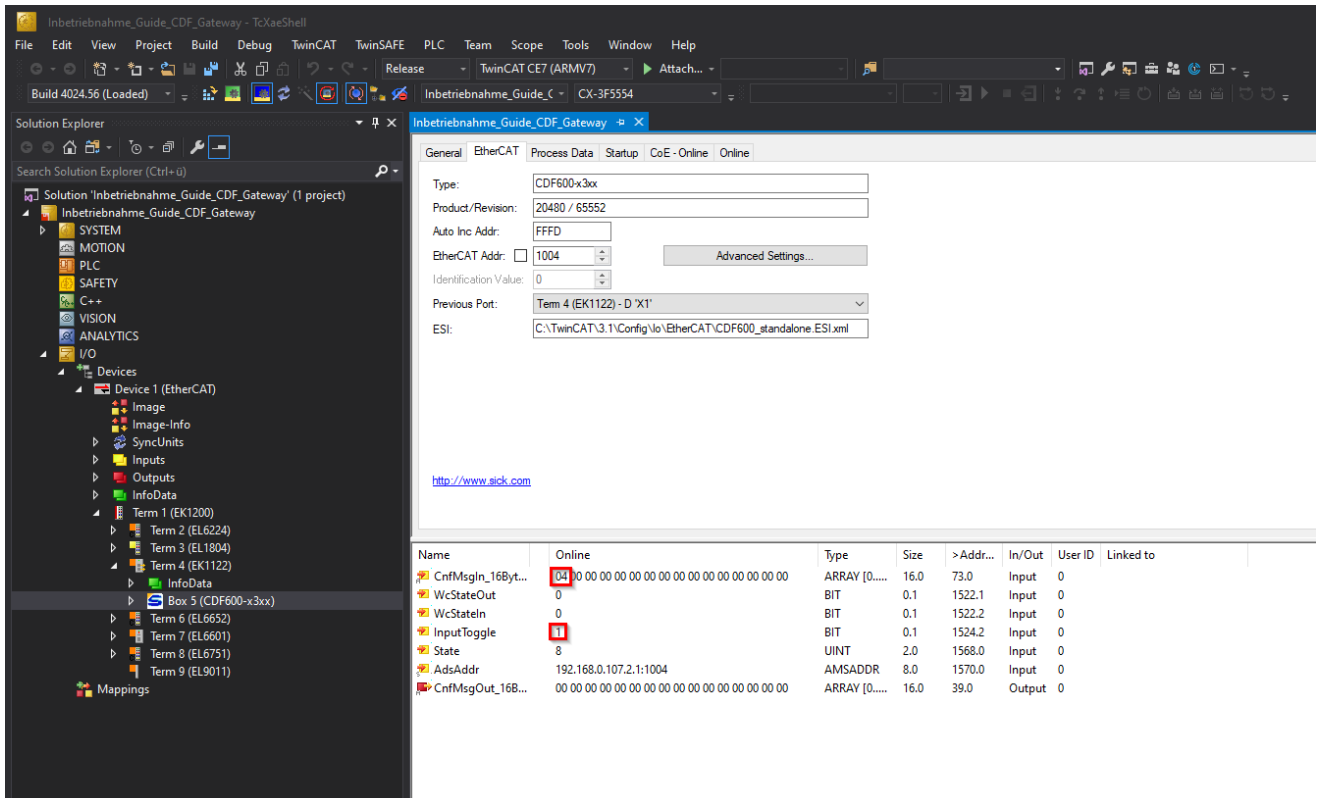
To be able to receive and send data from the CDF600-EtherCAT via EtherCAT, the EoE (Ethernet over EtherCAT) must be deactivated in the Auto Ident Sensor. The EoE is active by default and must therefore be switched off manually. To do this, go to the menu of the Auto Ident Sensor and open the Advanced Settings under “EtherCAT”.



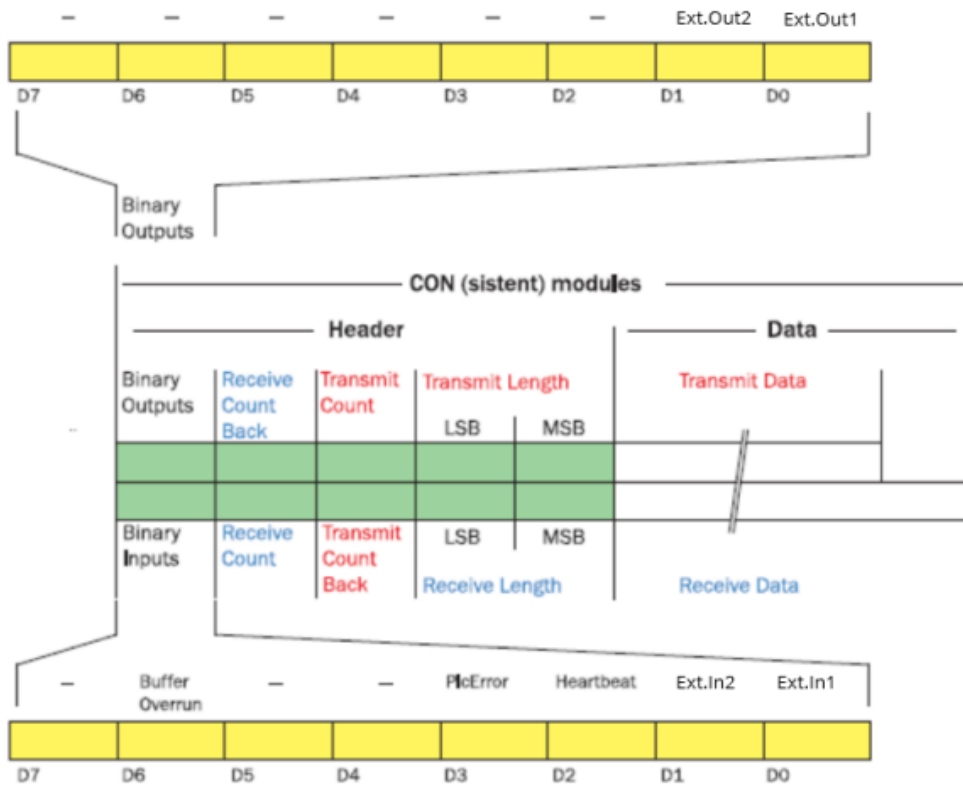
The EoE settings can be found under “Mailbox”. The tick must be removed in the EoE menu.



After the EoE has been deactivated, the devices can be reloaded in TwinCAT. Input data from the CDF600-EtherCAT should now be sent to the PLC. This can be recognized when the heartbeat toggles in the input data. The first byte of the Confirmed Messaging input data should toggle between 4 and 0 and the input toggle between 1 and 0.



If the input data is successfully received, the process data can be converted to the desired size. The process data in gateway mode consists only of the Confirmed Messaging Input / Output data. The Confirmed Messaging data is structured as shown in the following figure:



The first 5 bytes of the Confirmed messaging data consist of header data. The header has the binary inputs/outputs in the first byte, which are used to control and diagnose the sensor. The remaining 4 bytes represent the handshake mechanism between the sensor and PLC. The bytes after the header are data for communication between the CDF600-EtherCAT and PLC. The size of the Confirmed Messaging data can be customized. It is possible to send and receive packets from 8 bytes up to 128 bytes in size.

It should be noted that no control bits are available compared to proxy mode.

General EtherCAT Process Data Startup

Sync Manager:

SM	Size	Type	Flags
0	128	MbxOut	
1	128	MbxIn	
2	32	Outputs	
3	32	Inputs	

PDO List:

Index	Size	Name	Flags	SM	SU
0x1A00	8.0	Confirmed Messaging 8 Bytes In	F		0
0x1A01	16.0	Confirmed Messaging 16 Bytes In	F		0
0x1A02	32.0	Confirmed Messaging 32 Bytes In	F	3	0
0x1A03	64.0	Confirmed Messaging 64 Bytes In	F		0
0x1A04	128.0	Confirmed Messaging 128 Bytes In	F		0
0x1600	8.0	Confirmed Messaging 8 Bytes Out	F		0
0x1601	16.0	Confirmed Messaging 16 Bytes Out	F		0
0x1602	32.0	Confirmed Messaging 32 Bytes Out	F	2	0
0x1603	64.0	Confirmed Messaging 64 Bytes Out	F		0
0x1604	128.0	Confirmed Messaging 128 Bytes Out	F		0

Input

Output

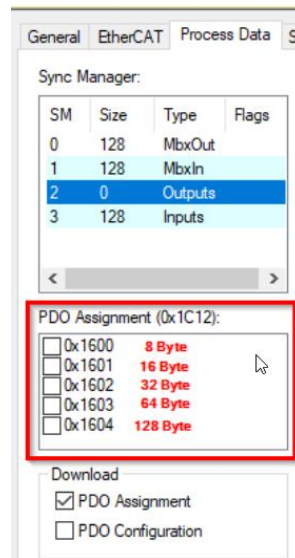
PDO Assignment (0x1C13):

- 0x1A00 (excluded by 0x1A02)
- 0x1A01 (excluded by 0x1A02)
- 0x1A02
- 0x1A03 (excluded by 0x1A02)
- 0x1A04 (excluded by 0x1A02)

PDO Content:

Index	Size	Offs	Name	Type	Default (hex)
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In the menu item “Process Data” it is possible to adjust the size of the Confirmed Messaging Inputs / Outputs via the PDO assignment.



As soon as the input and output process data have been converted to the appropriate size and communication between the PLC and sensor is established, the process data can be used for PLC programming.

For easier operation of the Auto Ident sensor, we recommend using the SICK function block. The function block for Gateway Mode can be found on SICK.com in the Auto Ident Sensor download section or on the SICK support portal in the knowledge article "CDF600-EtherCAT Technical Information". Further steps, how the function block is integrated into TwinCAT3 and which functionalities the function block provides, are described in more detail in the function block documentation.