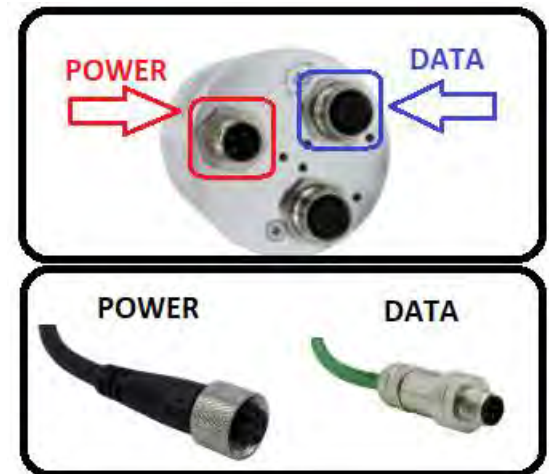


CONNECTING FENAC ETHERCAT ENCODER TO TWINCAT ENVIRONMENT

Power cable and data cable are correctly connected to the device. Details about the connection pinout structure are explained in the section "[4.Connector & Pin Assignment](#)". Power cable and data cable are indicated in the figure on the side. It is also specified to which input ports the power cable and data cable will be connected to the Fenac EtherCAT encoder. The device can be supplied with DC voltage in the range of 10V to 30V. The other end of the data cable must be connected to an EtherCAT master.



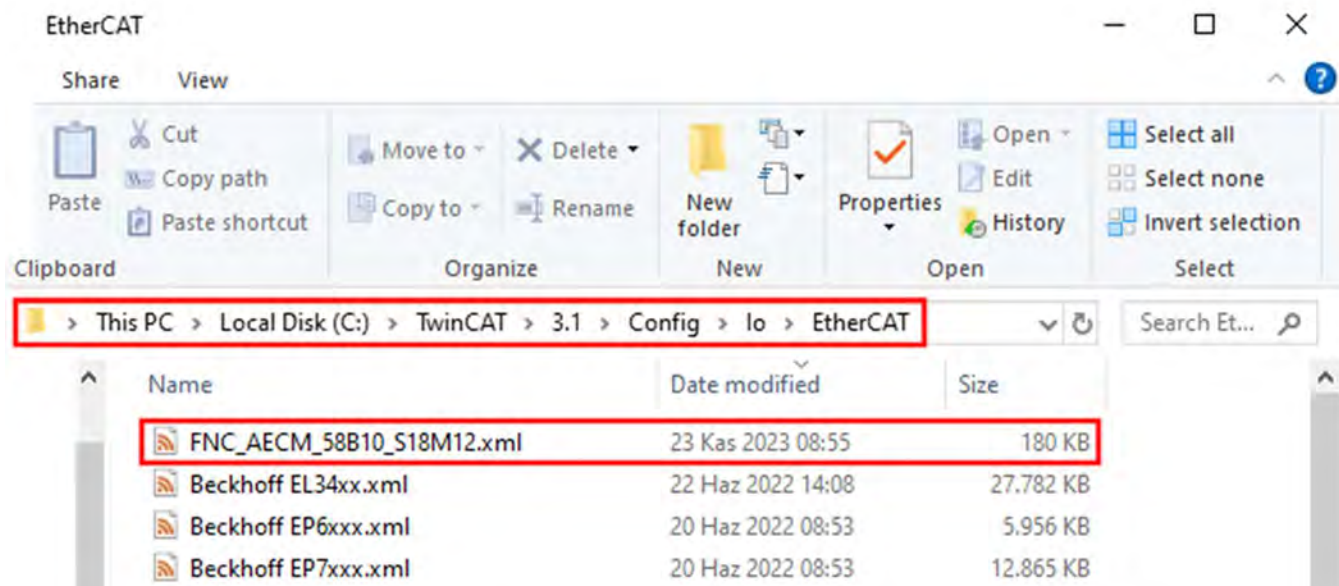
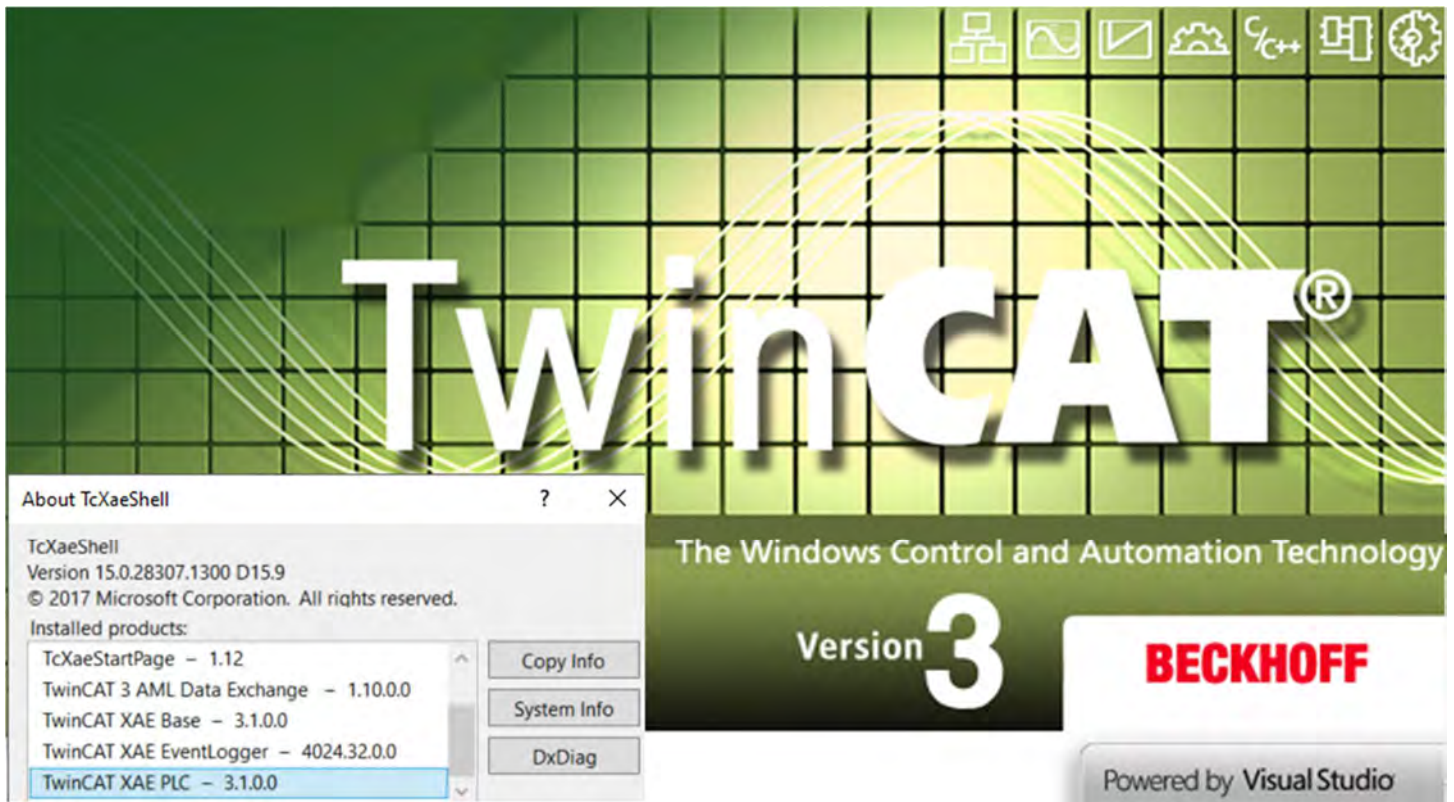
Here we will talk about two methods. Defining a personal computer as an EtherCAT master device and connect the data cable to the ethernet port of a PC is an easy method, as no external hardware is required. You can do your various tests in this way. The other method is to use a PLC device with EtherCAT Master as traditionally. In our explanation here, the first method, that is, the connection will be established by using the computer as the ethercat master.

HARDWARE INSTALLATION

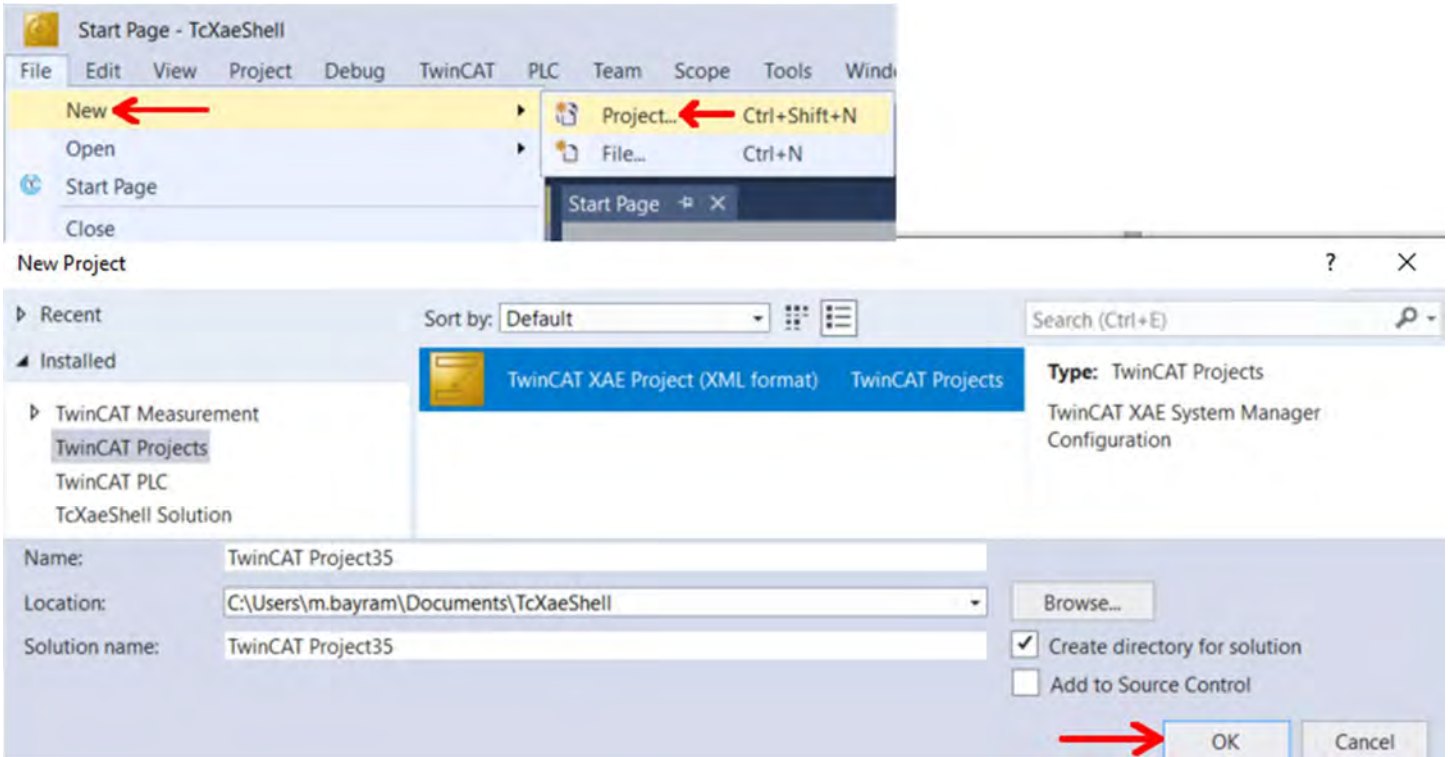
In order to connect the Fenac EtherCAT encoder and make its adjustments, a connection must be made as shown in the figure.



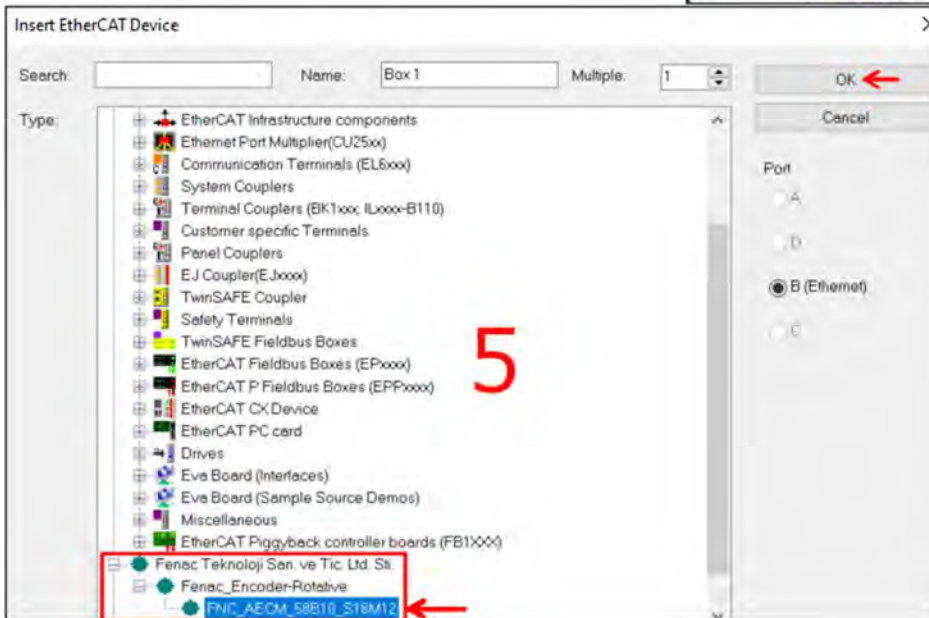
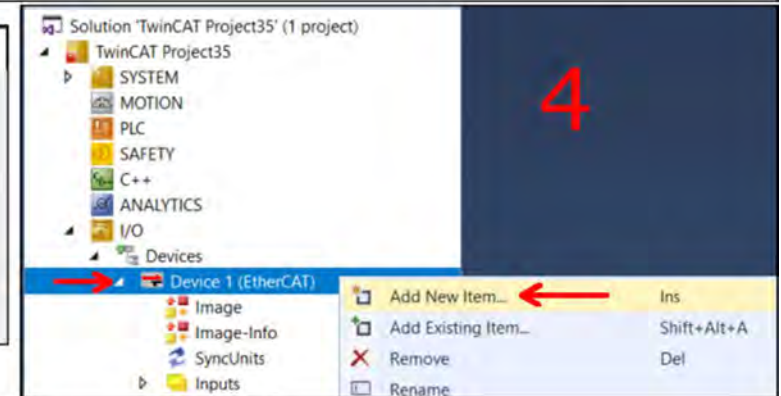
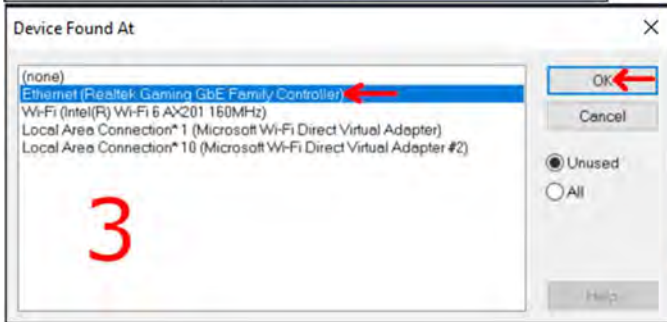
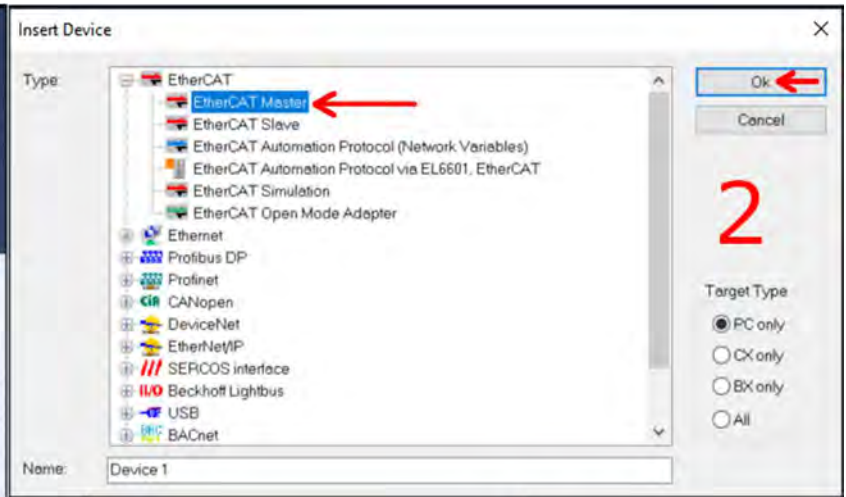
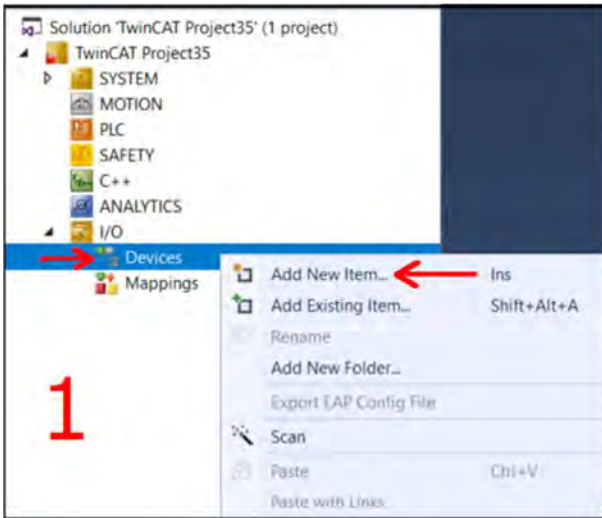
TWINCAT SETTINGS



First you should add xml (ESI) file to TwinCAT's related directory. In this case it is "C:\TwinCAT\3.1\Config\Io\EtherCAT". You could find latest version of xml file from fenac.com.tr.



After xml(ESI) file addition, you can create new TwinCAT project as shown here.



You can follow this steps to scan your ethercat encoder. We used our PC as ethercat master device here so we do not need any PLC in this case. We can connect our ethernet cable directly to PC's ethernet port.

The screenshot displays the TwinCAT software interface. On the left, the Solution Explorer shows a project structure for 'TwinCAT Project35' with various components like SYSTEM, MOTION, PLC, SAFETY, C++, ANALYTICS, and I/O. Under I/O, 'Devices' is expanded to show 'Device 1 (EtherCAT)', which includes 'Box 1 (FNC_AECM_58B10_S18M12)' and its associated PDOs and mappings.

The main window shows the 'EtherCAT' tab with an 'Update List' table. The table contains the following data:

Index	Name	Flags	Value	Unit
6002	TOTAL MEASURING RANGE	M RW	0x40000000 (1073741824)	
6003	Preset Value	M RW	0x00000000 (0)	
6004	Position Value	M RO P	0x00000000 (0)	
6030.0	Speed Value	RO	> 1 <	
6500	Operating Status	RO	0x0000 (0)	
6501	SINGLE TURN RESOLUTION	RO	0x00040000 (262144)	
6502	Physical Number of Turns	RO	0x1000 (4096)	
6503	Alarm Status	RO P	0x0000 (0)	
6504	Alarms Supported	RO	0x1001 (4097)	
6505	Warning Status	RO P	0x0000 (0)	
6506	Warnings Supported	RO	0xB003 (45059)	
6507	VERSION OF SW AND PROF...	RO	0x01240302 (19137282)	
6508	OPERATING TIME (x0.1HOU...	RO	0x00000000 (0)	
6509	INTERNAL OFFSET	RO	669396318	
650A.0	MODULE IDENTIFICATION	RO	> 3 <	
650B	Serial Number	RO	0x01450985 (21301637)	

Below the table, there is a list of PDOs and objects with the following columns: Name, Online, Type, Size, >Addr..., In/Out, User ID, and Linked to.

Name	Online	Type	Size	>Addr...	In/Out	User ID	Linked to
Position Value		UDINT	4.0	39.0	Input	0	
Speed Value		INT	2.0	43.0	Input	0	
Alarm Status		UINT	2.0	45.0	Input	0	
Warning Status		UINT	2.0	47.0	Input	0	
WcState		BIT	0.1	1522.1	Input	0	
InputToggle		BIT	0.1	1524.1	Input	0	
State		UINT	2.0	1548.0	Input	0	
AdsAddr		AMSADDR	8.0	1550.0	Input	0	
sensor_1_Input_B...		BYTE	1.0	39.0	Output	0	
sensor_1_Input_B...		BYTE	1.0	40.0	Output	0	
sensor_2_Input_B...		BYTE	1.0	41.0	Output	0	
sensor_2_Input_B...		BYTE	1.0	42.0	Output	0	
CyclicCounter_Di...		BYTE	1.0	43.0	Output	0	
CyclicCounter_Sp...		BYTE	1.0	44.0	Output	0	

Finally you can see the PDO and object list. To be able to see the online values you should click on reload devices button ()

SCALING PROCESS

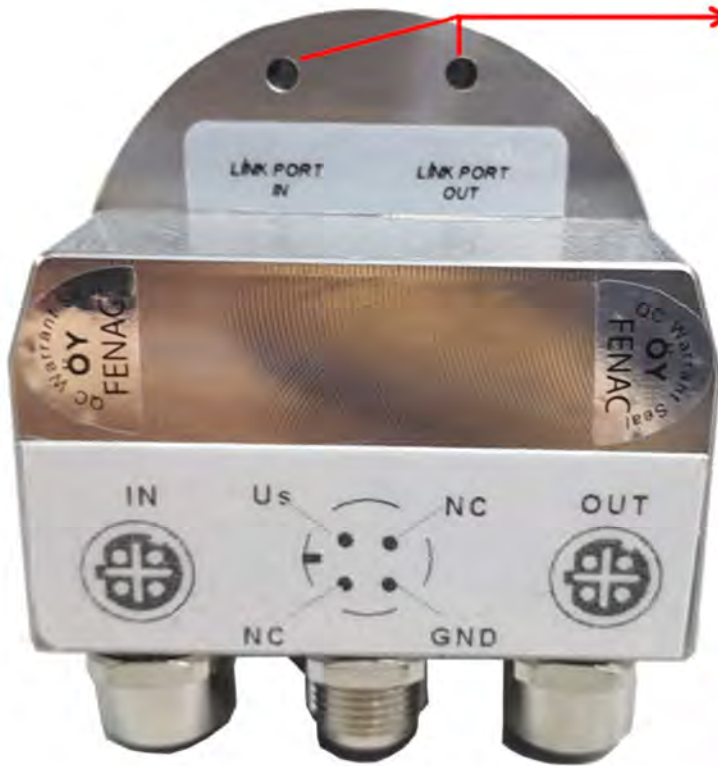
To change the scaling settings of the device, first set to 0x6000 Operating Parameter 4, thus scaling is enabled. Presetting should not be done before this process. 0x6001 COUNTS PER REVOLUTION is a maximum of 18 bits, so enter values lower than 18 bits. 0x6002 TOTAL MEASURING RANGE maximum is 30 bits and you can enter values below 30 bits.

We observed that the Position data changed from 93215688 to 23303921 as expected.

After scaling, the position value can be preset to the desired value.

🔑	Position Value	93215688		
6000	Operating Parameters	M RW	0x0004 (4) (18 bit)	
6001	COUNTS PER REVOLUTION	M RW	0x00040000 (262144) (16bit)	← 0x00010000 (65536)
6002	TOTAL MEASURING RANGE	M RW	0x40000000 (1073741824) (30 bit)	← 0x20000000 (536870912) (29 bit)
🔑	Position Value	23303921		

ETHERNET STATUS LEDS



Ethernet Status LEDs

The Ethernet Status Led algorithm works the same for two ports, PORT IN and Port OUT. LED statuses related to the connected port will appear.

OFF: If the Ethernet cable is not connected, it is off in case of cable problems such as loose contact.

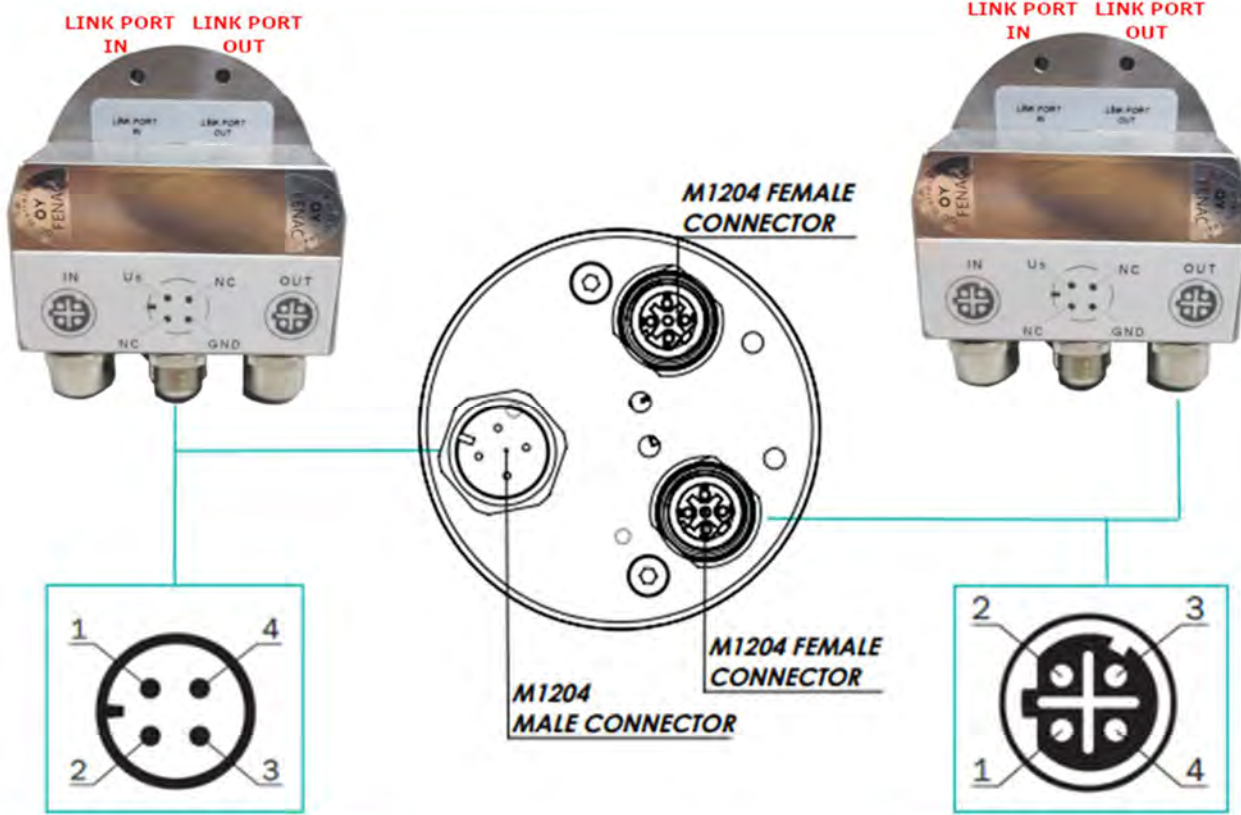
ON: If the Green Led is constantly on and does not blink, it means that the connection with the master is successful but there is no data transmission.

Blink: Green Led blinks while data is being transmitted.

*In addition, the device Ethernet Status LEDs, when state Init LED lights up continuously, blinks in Pre-op, Safe-Op and Op states.

Connector & Pin Assignment

Pin Assignment



PIN	Signal
1	U _s 10 V...30V
2	Not assigned
3	GND
4	Not assigned

PIN	Signal
1	T x D+
2	R x D+
3	T x D-
4	R x D-

Counter Connector Part Number
FCSF M1204 : M1204 Female Connector
FCSF M1204 R200 : M1204 Female Connector with 2 meter cable

Counter Connector Part Number
FCSM DTM1204 : D Type M1204 Female Connector
FCSM DTM1204 R200 : D Type M1204 Female Connector with 2 meter cable

