# Establishing a Connection with the Fenac Ethernet IP Encoder Device

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 Ethernet IP 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 Ethernet IP master. Here we will talk about two methods. Defining a personal computer as an ethernet IP 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 Ethernet IP Master as traditionally.
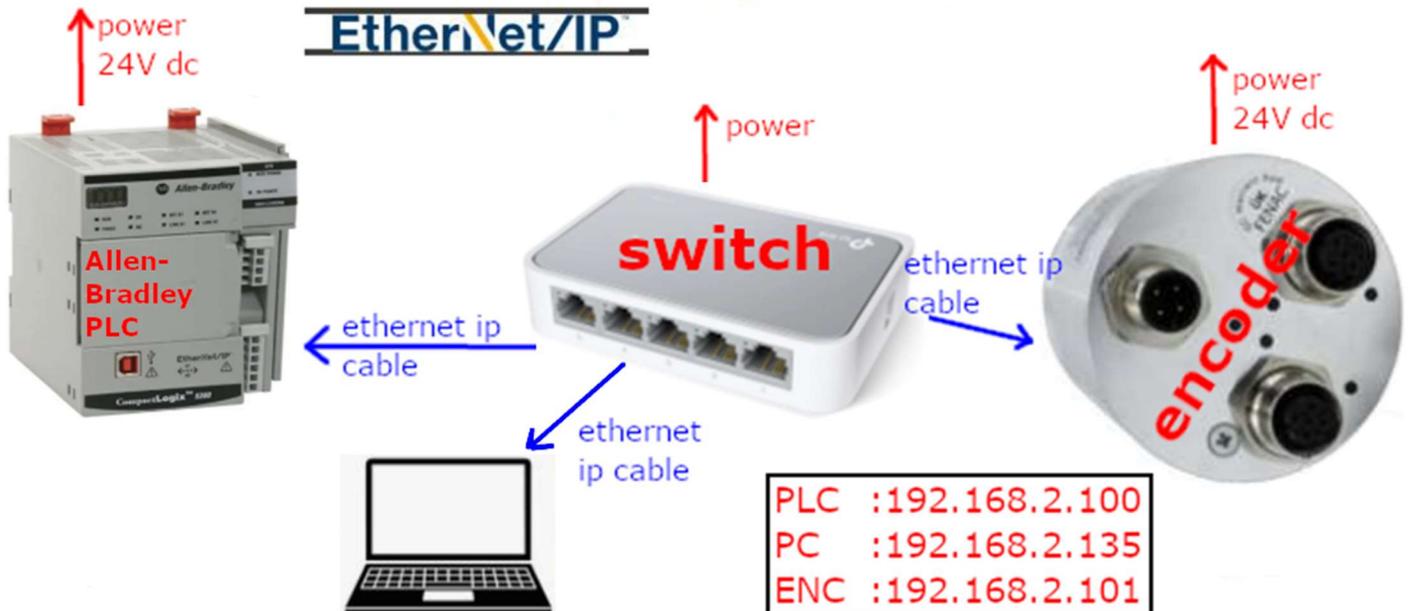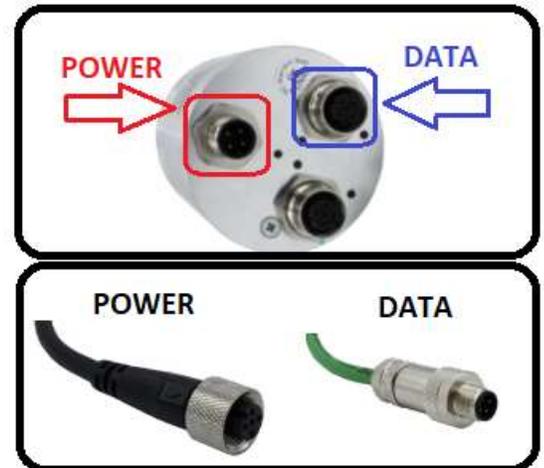
Allen- Bradley PLC as Ethernet IP Master

In our example here, we will use Allen Bradley's PLC as the master device. After supplying the Fenac Ethernet Ip Encoder by a voltage in the range of 10-30V from the power supply, connect the data cable to the Ethernet port of your PC. After this process, the status LEDs on the ethernet port of your PLC will light up, indicating that there is a successful connection.

Rockwell's Studio 5000 (in our case version 35.00.00) must be installed in your PC. Open the Studio 5000 interface.

1) Click on File>New> to start a new project. Select your PLC device, in our case it is 5069-L306ERM. Give the project to a name then click Next.

2) Next click Finish button to create project.
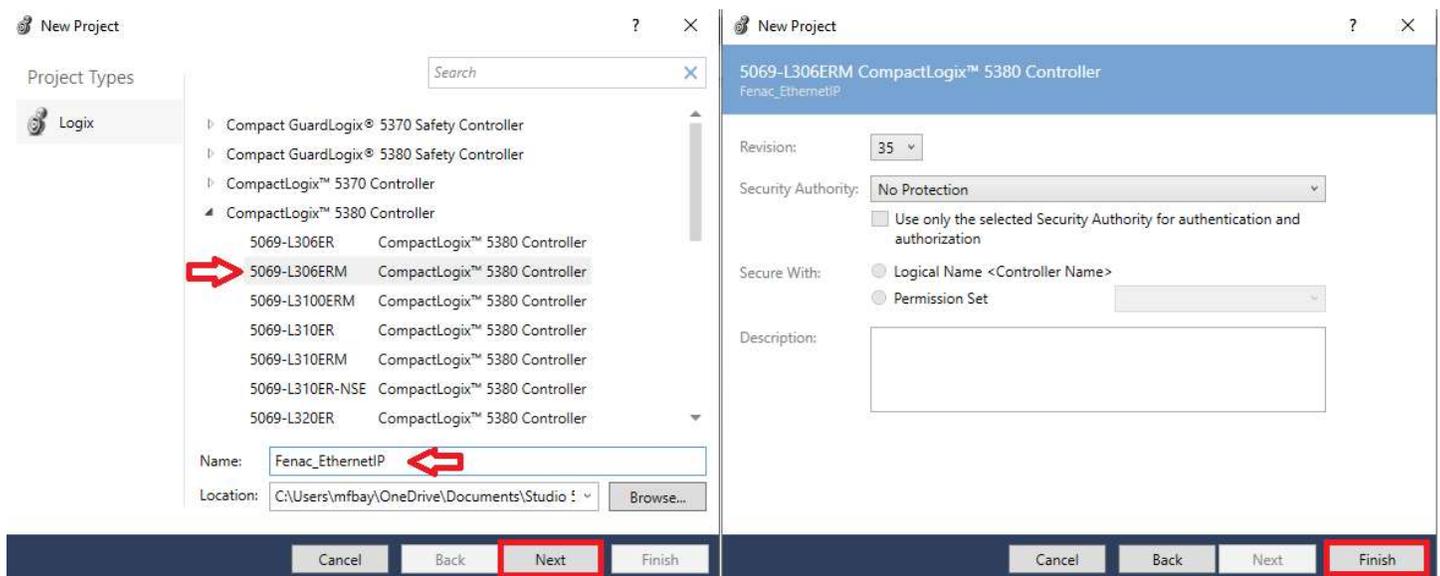
3) Click on Tool menu and Click EDS Hardware Installation Tool.
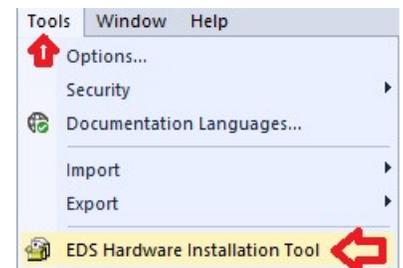
4) Click next. Make sure Register a device description files selected then click Next. Browse the eds file(you can downloaded from fenac.com.tr) and click Next till the finish button.
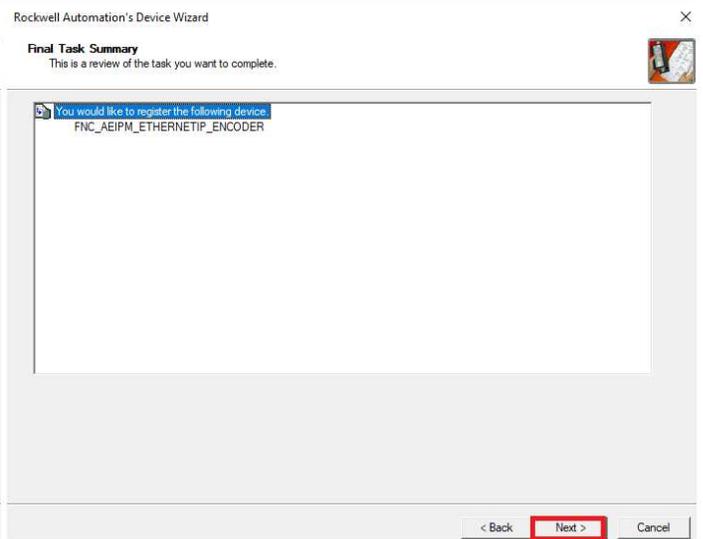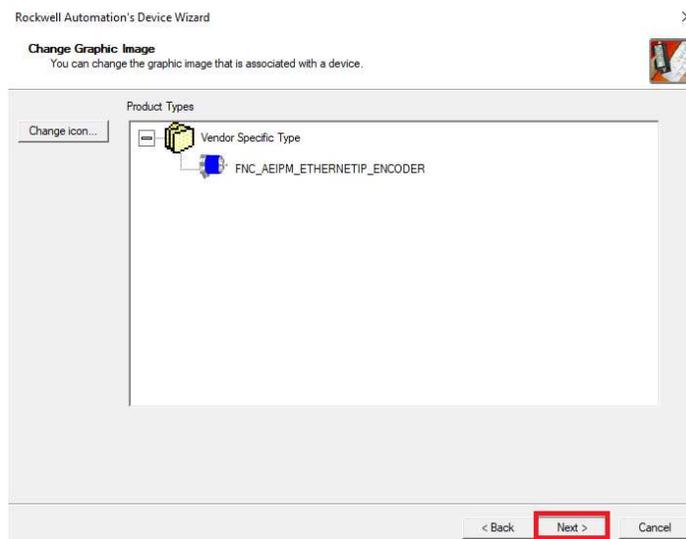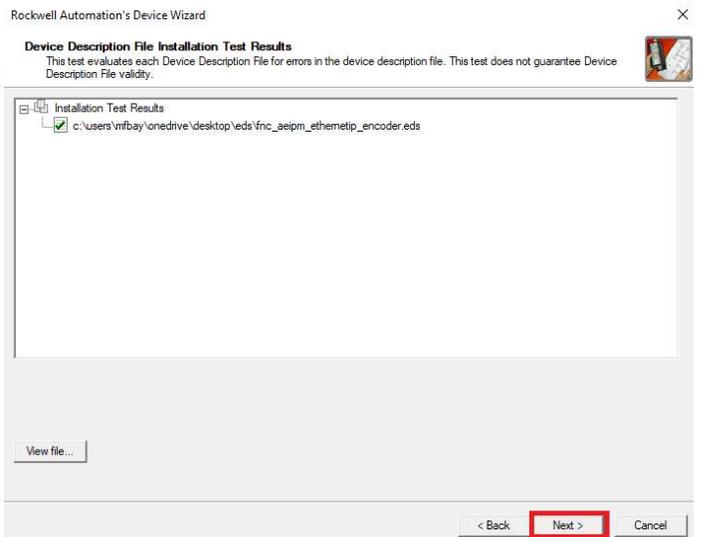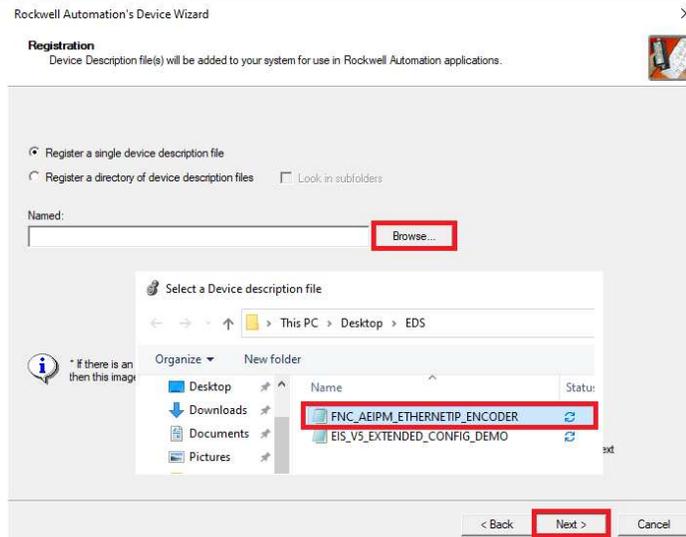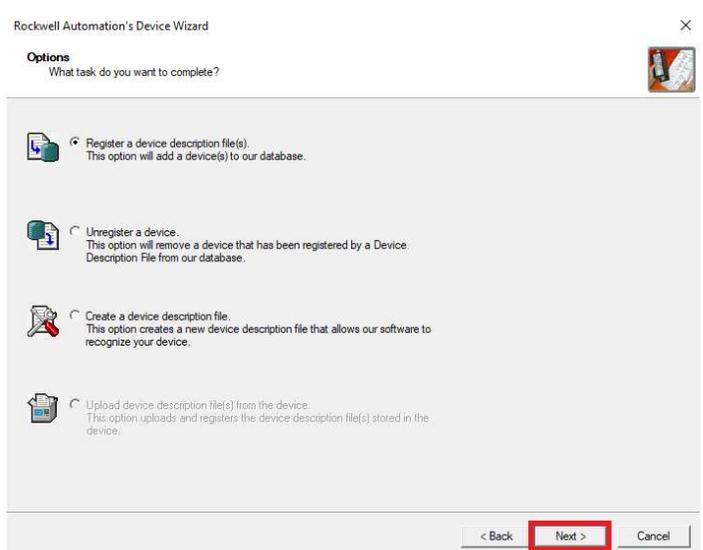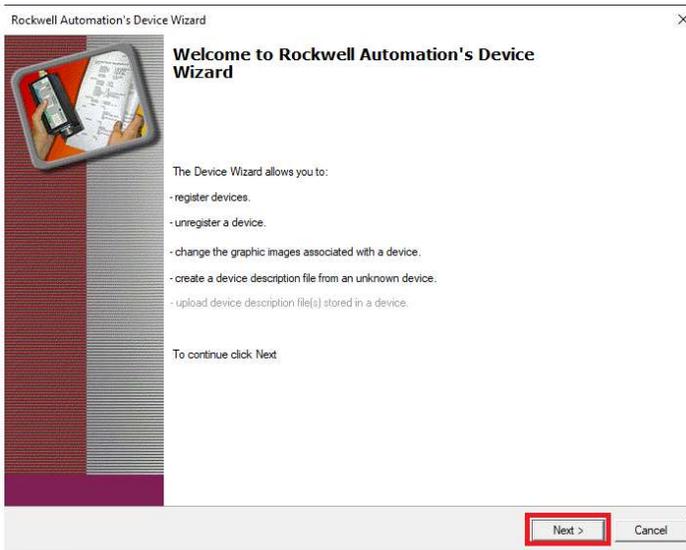
5) Right click on "A1, Ethernet" and chose Properties. On the "General" tab window click on "Change IP Mode" then select A1/A2: Linear/DLR and click OK to save.
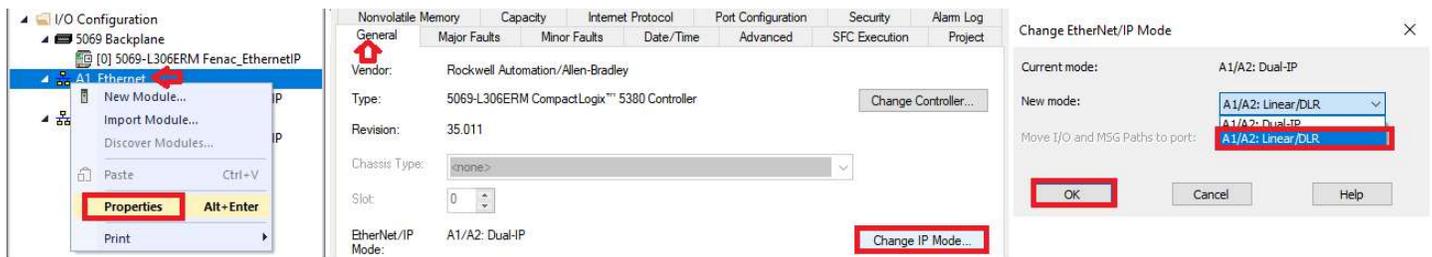
6) Open your PC's Network & Internet Settings. Change adapter options than click properties. Select Internet Protocol Verison 4(TCP/Ipv4) then click on properties. Enter the IP address and Subnetmask below then click OK.
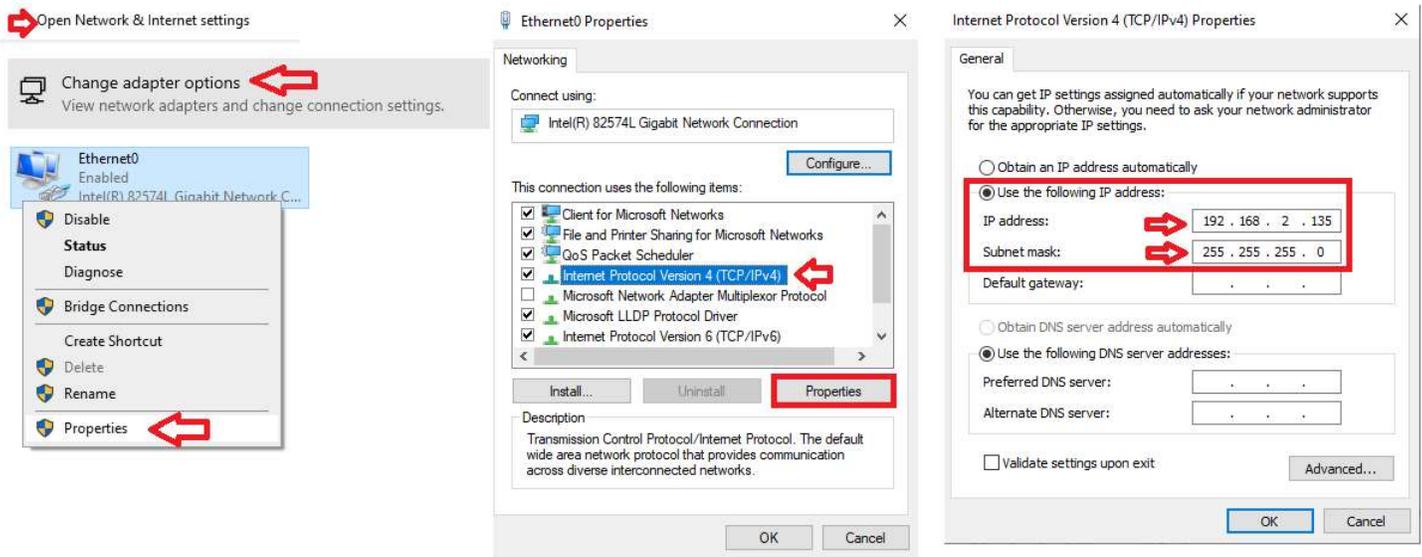
7) Open RSLinc Classic Application. Connect you PLC's usb cable (or ethernet) Under the USB section right click and select "Module Configuration". Under the "Port Configuration" tab, Set Port for A1 or A2 then set "Manually configure IP settings" and enter the valus below in the image.
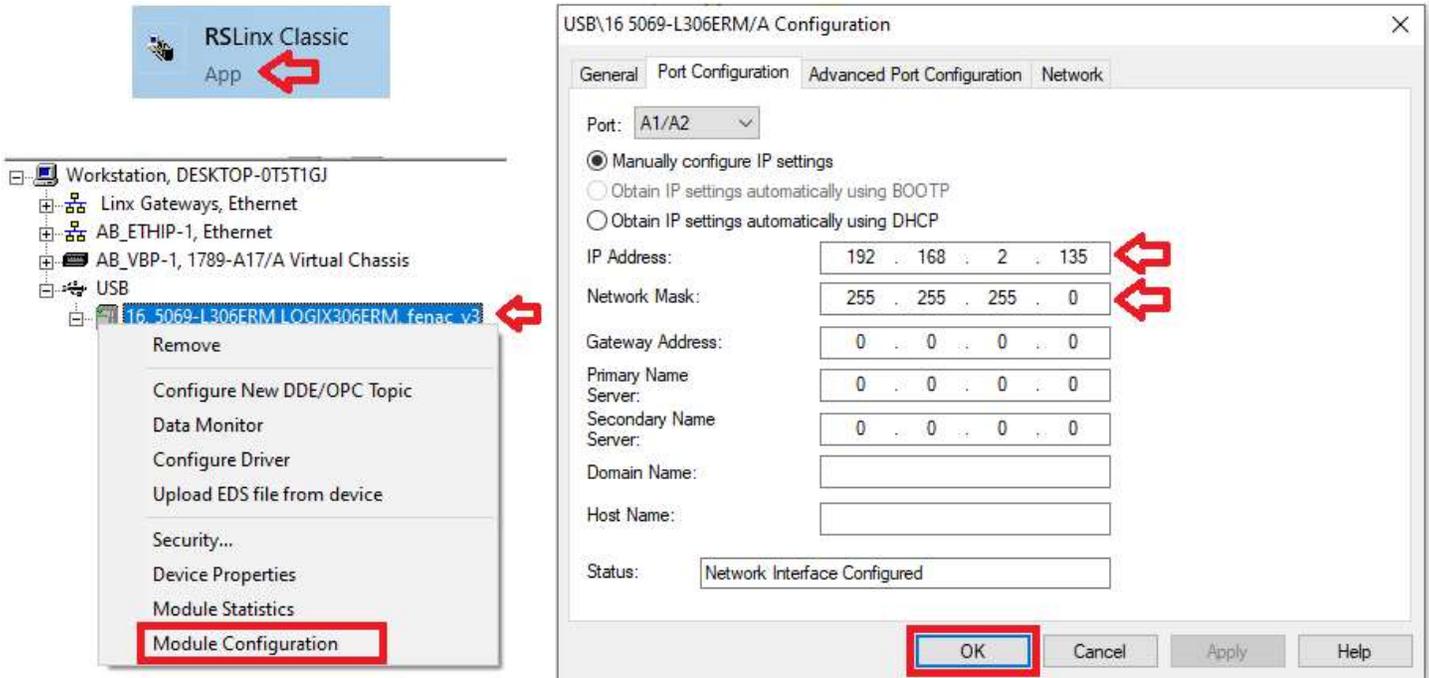
8) Right click on "A1/A2, Ethernet". Then In the Select Module Type menu search for fenac eds file and double click on it. Then write Name for Encoder in our case we use "fenac" as a name. Click IP Address and enter 192.168.2.101. To chose connection you can click on Change button.
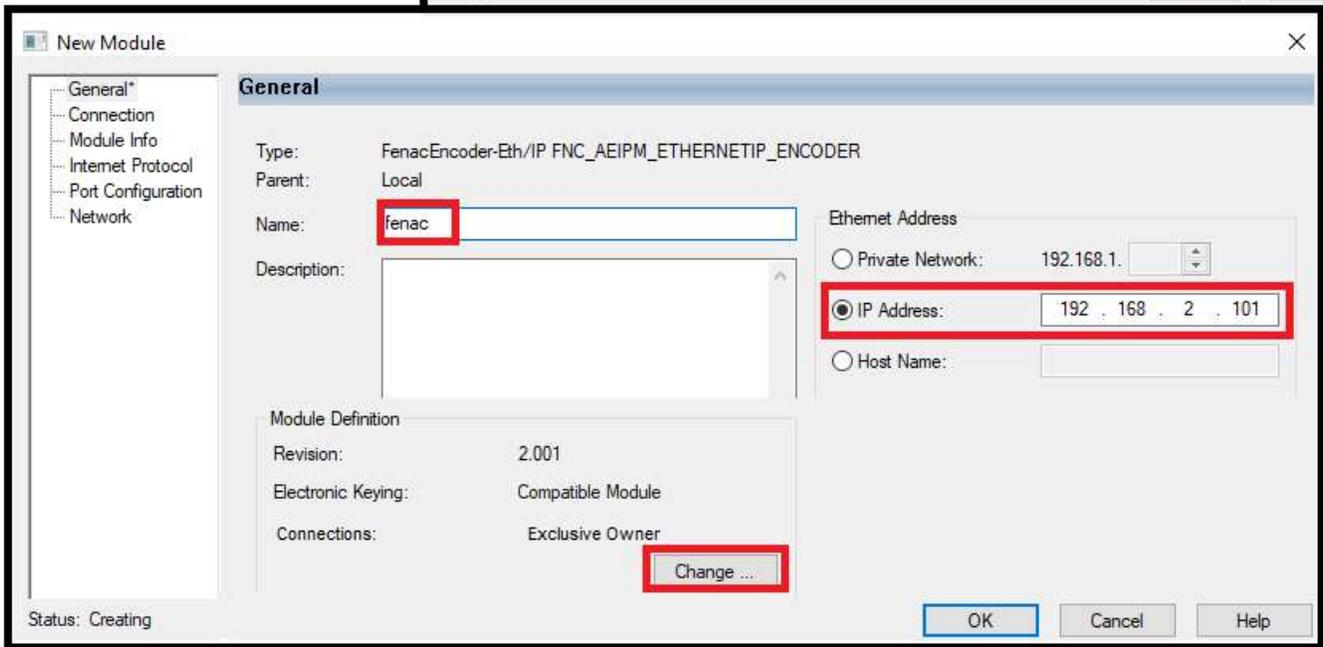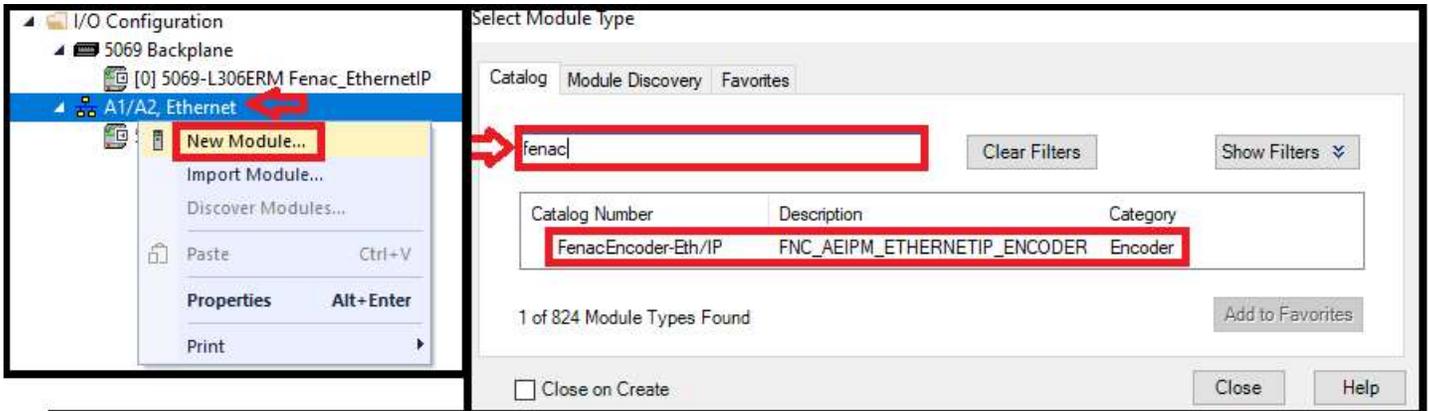
9) Click on SINT to change it to DINT for proper parameter showing. Select connection, we chose Exclusive Owner and click OK. Click yes to any warning in this stage.
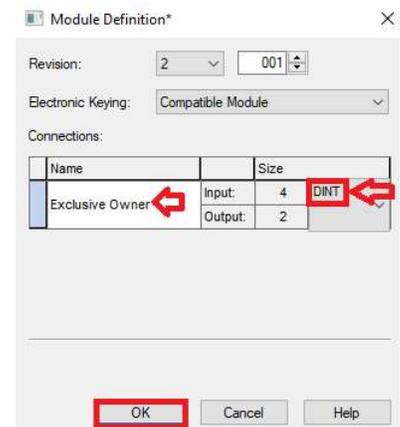
10) Click on Communications tab on Studio 5000 then select Who Active. Find you PLC under USB tab and click Download button. Click Download to warning again.
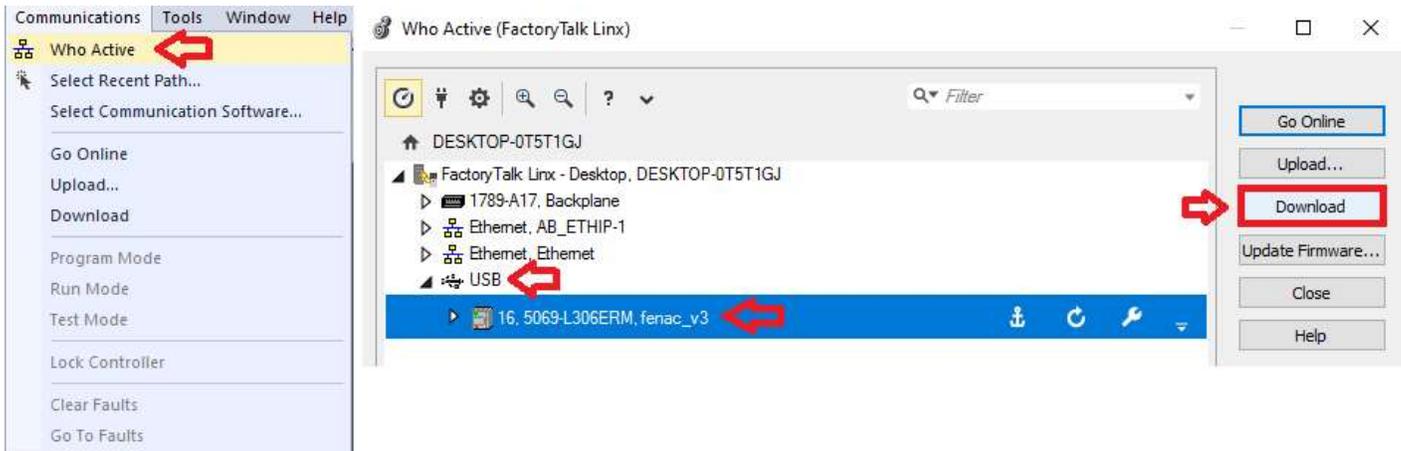
11) Double Click on Controllers Tags to see parameters.

Name		Value	Force Mask	Style	Data Type
◢ fenac:C		{...}	{...}		_0400:FenacEncoder_EthIP_13375B54:C:0
▷ fenac:C.SingleTurn		262144		Decimal	DINT
▷ fenac:C.TotalRange		1073741824		Decimal	DINT
▷ fenac:C.Preset_Parameter		0		Decimal	DINT
▷ fenac:C.preset_changed		0		Decimal	DINT
▷ fenac:C.Store_Parameters		0		Decimal	DINT
▷ fenac:C.Restore_Parameters		0		Decimal	DINT
▷ fenac:C.Operating_Parameter		0		Decimal	INT
▷ fenac:C.Change_IP_Address		101		Decimal	INT
▷ fenac:C.Change_IP_Address2		2		Decimal	INT
▷ fenac:C.Change_IP_Address3		168		Decimal	INT
▷ fenac:C.Change_IP_Address4		192		Decimal	INT
◢ fenac:I		{...}	{...}		_0400:FenacEncoder_EthIP_40A1F725:I:0
fenac:I.ConnectionFaulted		0		Decimal	BOOL
◢ fenac:I.Data		{...}	{...}	Decimal	DINT[4]
▷ fenac:I.Data[0] **FAULT HEADER**		0		Decimal	DINT
▷ fenac:I.Data[1] **POSITION**		268637		Decimal	DINT
▷ fenac:I.Data[2] **SPEED**		0		Decimal	DINT
▷ fenac:I.Data[3] **FLAGS**		0		Decimal	DINT
◢ fenac:O		{...}	{...}		_0400:FenacEncoder_EthIP_B992380C:O:0
◢ fenac:O.Data		{...}	{...}	Decimal	DINT[2]
▷ fenac:O.Data[0] **PRESET ONLINE**		1071		Decimal	DINT
▷ fenac:O.Data[1]		0		Decimal	DINT

12) We need to change the status and Go Offline to be able to configure the encoder device. Most of the time, single turn value and total turn value are changing in encoders. Lets change the SingleTurn and TotalRange parameters (to do this we also need to enable scaling option with setting Operating_Parameter to 4) We also try to preset device from 50 (to do this we need to enable preset_changed to 1). After that we need to Download this new configuration to out encoder device.

Rem Run	No Forces	
	Go Offline	⇐
	Upload...	
	Download	
	Program Mode	
	Run Mode	
	Test Mode	
	Clear Faults	
	Go To Faults	
	Controller Properties	

Name	▲ Value
◢ fenac:C	{...}
▷ fenac:C.SingleTurn	→ (100)
▷ fenac:C.TotalRange	→ (250)
▷ fenac:C.Preset_Parameter	→ (50)
▷ fenac:C.preset_changed	→ (1)
▷ fenac:C.Store_Parameters	0
▷ fenac:C.Restore_Parameters	0
▷ fenac:C.Operating_Parameter	→ (4)
▷ fenac:C.Change_IP_Address	101
▷ fenac:C.Change_IP_Address2	2
▷ fenac:C.Change_IP_Address3	168
▷ fenac:C.Change_IP_Address4	192

| Offline	No Forces	
	Go Online	
	Upload...	
	Download	
	Program Mode	
	Run Mode	
	Test Mode	
	Clear Faults	
	Go To Faults	
	Controller Properties	

CHANGING CONFIG INSTANCE PARAMETERS

To change config instance parameters user needs to be in offline mode. For instance we can change single turn value to 100, Preset to 1234 and preset changed flag to 1 , Operating Parameter to 4 (Scaling enabler) , IP Address to 120 (192.168.2.120) and lastly to save all the changes to flash memory set Store Parameters to 1702257011 (save in hex form).

Name		Value	Force Mask	Style	Data Type
▲ shdf:C		{...}	{...}		_0400:FenacEncoder_EthIP_4100C9FF:C:0
▷ shdf:C.SingleTurn	→	100		Decimal	DINT
▷ shdf:C.TotalRange		1073741824		Decimal	DINT
▷ shdf:C.Preset_Parameter	→	1234		Decimal	DINT
▷ shdf:C.preset_changed	→	1		Decimal	DINT
▷ shdf:C.Store_Parameters	→	1702257011		Decimal	DINT
▷ shdf:C.Restore_Parameters		0		Decimal	DINT
▷ shdf:C.Operating_Parameter	→	4		Decimal	INT
▷ shdf:C.Change_IP_Address	→	120		Decimal	INT

After downloading , new configuration and re-starting the encoder we need to change the IP Address to 192.168.2.120 to be able to communicate.
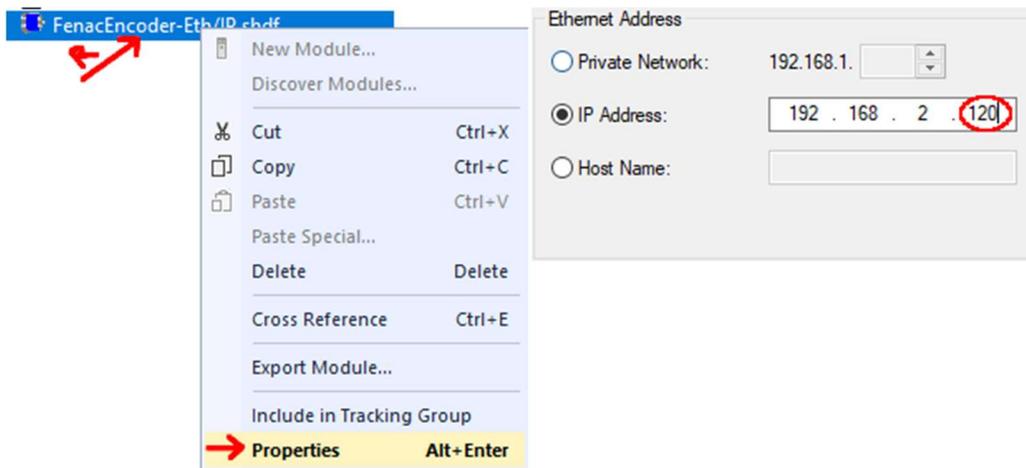
We can go online mode to see our changes. We can see Presetted value 1234 and we are able to connect 192.168.2.120 IP Address. And If we turn 1 turn the encoder we can see 100 counst per turn.

|					
▲ shdf:I		{...}	{...}		_0400:FenacEncoder_EthIP_40A1F725:I:0
shdf:I.ConnectionFaulted		0		Decimal	BOOL
▲ shdf:I.Data		{...}	{...}	Decimal	DINT[4]
▷ shdf:I.Data[0]		0		Decimal	DINT
▷ shdf:I.Data[1]		1234		Decimal	DINT
▷ shdf:I.Data[2]		0		Decimal	DINT
▷ shdf:I.Data[3]		0		Decimal	DINT
▲ shdf:O		{...}	{...}		_0400:FenacEncoder_EthIP_B992380C:O:0
▲ shdf:O.Data		{...}	{...}	Decimal	DINT[2]
▷ shdf:O.Data[0]		0		Decimal	DINT
▷ shdf:O.Data[1]		0		Decimal	DINT

PRESET WHEN ONLINE

If we set Data[0] of Output parameters we can Preset Position value when online too as you can see in the below picture.

◢ shdf:I	{...}	{...}		_0400:FenacEncoder_EthIP_40A1F725:I:0
shdf:I.ConnectionFaulted	0		Decimal	BOOL
◢ shdf:I.Data	{...}	{...}	Decimal	DINT[4]
▷ shdf:I.Data[0]	0		Decimal	DINT
▷ shdf:I.Data[1] **POSITION**	50		Decimal	DINT
▷ shdf:I.Data[2]	0		Decimal	DINT
▷ shdf:I.Data[3]	0		Decimal	DINT
◢ shdf:O	{...}	{...}		_0400:FenacEncoder_EthIP_B992380C:O:0
◢ shdf:O.Data	{...}	{...}	Decimal	DINT[2]
▷ shdf:O.Data[0] **PRESET ONLINE** →	50		Decimal	DINT
▷ shdf:O.Data[1]	0		Decimal	DINT

4. Connector & Pin Assignment

Pin Assignment

M1204 FEMALE CONNECTOR

M1204 FEMALE CONNECTOR

M1204 MALE CONNECTOR
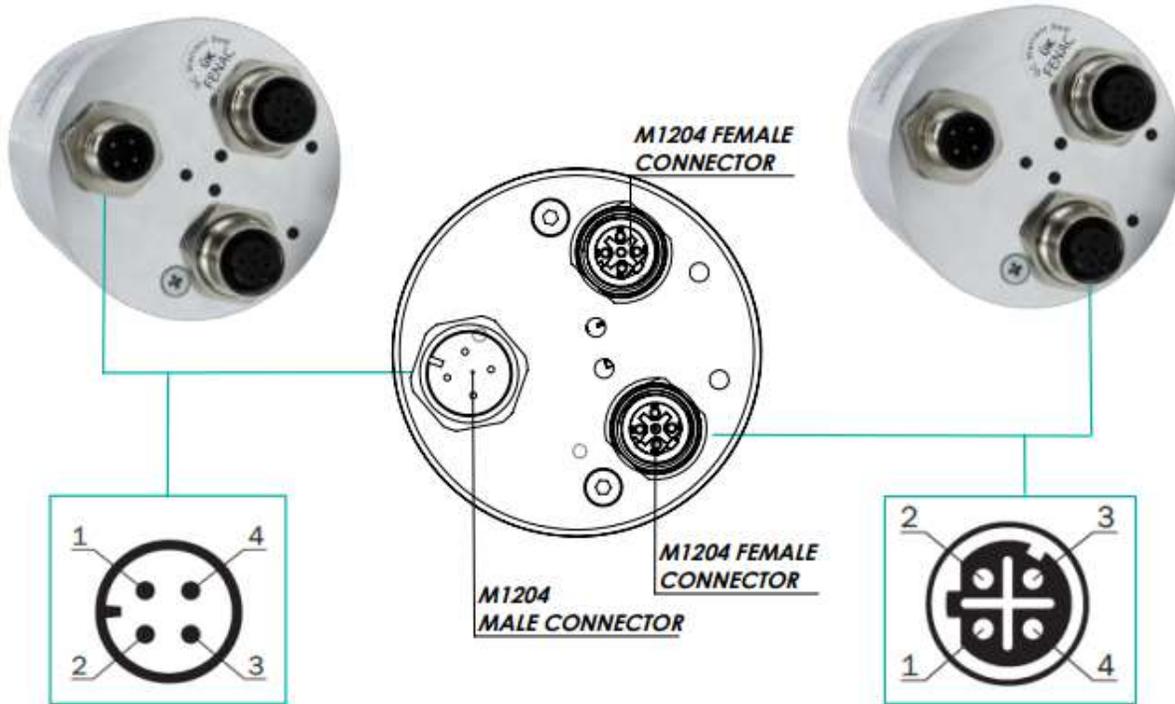
PIN	Signal
1	U_s 10 V...30V
2	Not assigned
3	GND
4	Not assigned

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