

CONNECTING FENAC ETHERNET/IP ENCODER TO CODESYS 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 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.



HARDWARE INSTALLATION

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







PING TEST

Before going into any stage first we should make sure our encoder hardware device connected successfully and we are in the same ip node. You should ping the encoder device if every connection made succesfully.

PLC :192.168.2.100 PC :192.168.2.135 ENC :192.168.2.101

C:\Users\	ping 192.168.2.101
Pinging 19	2.168.2.101 with 32 bytes of data:
Reply from	192.168.2.101: bytes=32 time=2ms TTL=255
Reply from	1 192.168.2.101: bytes=32 time=1ms TTL=255
Reply from	192.168.2.101: bytes=32 time<1ms TTL=255
Reply from	192.168.2.101: bytes=32 time=1ms TTL=255
Ping stati	stics for 192.168.2.101:
Packet	cs: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximat Minimu	e round trip times in milli-seconds: um = 0ms, Maximum = 2ms, Average = 1ms

If you can see the following output then you are in the same ip subnet and your encoder connected successfully. Else you get "Request timed out" message then you should fix you connection.





IP SETTINGS

You can set your **PC's IP subnet** in the following picture.

Network Connections ↑ 🔄 > Control Panel > Network and Internet > Network Connections Organize * Disable this network device Diagnose this connection Rename this connection Change settings of this connection Ethernet + VMware Network Adapter VMnet1 VMware Network Adapter VMnet8 Network cable unplugged Enabled Enabled Realtek Gaming GbE Family Contr... 49 VMware Virtual Ethernet Adapter ... VMware Virtual Ethernet Adapter ... Ethernet Properties Internet Protocol Version 4 (TCP/IPv4) Properties X Networking Sharing General Connect using: You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. Realtek Gaming GbE Family Controller Configure... Obtain an IP address automatically This connection uses the following items: (Use the following IP address: Spread Packet Driver (NPCAP) ~ ▶ 192.168.2.135 IP address: QoS Packet Scheduler Internet Protocol Version 4 (TCP/IPv4) Subnet mask:

And you can follow the below steps to set your PLC's IP subnet.

Devices - 4 X	EtherN	EtherNet_JP_Module & LocalDevice X Device							
☐ m@_ethernettP	LocalDevice	Parameters							
Di PLC Logic	Status	Parameter	Туре	Current Value	Prepared Value	Value	Default Value		
PLC_PRG (PRG)	Information	Port1GatewayAddr	STRING	'192.168.2.1' '192.168.2.100'	2	'192.168.88.1' '192.168.88.100'	'192.168.88.1 '192.168.88.100		
Task Configuration		Port1Mask	STRING	'255.255.255.0'	>	'255.255.255.0'	255.255.255.0		
EtherNet IP Adapter IOCude		 IOIntType 	Enumeration of BYTE	Disable		Disable	Disabl		
ENTPAdanterSenireTark		IIIntType	Enumeration of BYTE	Disable		Disable	Disabl		
EtherNet TP Adapter ServiceCude		I2IntType	Enumeration of BYTE	Disable		Disable	Disabl		
 S MainTask B PLC_PRG LocalDevice ← S SoftMotion General Axis Pool 									

C:\Users\ _____>ping 192.168.2.100



After that as you can see here you should ping the PLC's IP Address(192.168.2.100) too.



CODESYS SETTINGS

Devices	• 4 X StherNet	IP_Module & LocalDevice	Device X		
= mfb_ethernet/P	Communication	Settings - Scar nethiotic	Gateway - Device -		
=]] PLC Logic = O Application	Applications			-	
Library Manager Drc_PRG (PRG)	Backup and Res	tore			1
Task Configuration	Files				· · ·
EtherNet_IP_Adapter EtherNet_IP_Adapter Sector 2	er.IOCyde Log		Gatemay-1	~ [0003	3854.8064] (active)
EtherNet_IP_Adapte	er.ServiceCycle PLC Settings		IP-Address:	Device	e Name:
MainTask PLC_PRG	PLC Shell		Port: 1217	Device 0003.	e Address: 1854 8064
SoftMotion General Axis Pool	Users and Group	ps	Colum Davies		
	Access Rights		Select Device		
	Symbol Rights		Select the network path to the control	ler:	Device Name:
single left click		5	D HCQ0-1200D [0003.385	4.B064]	HCQ0-1200D
double left click	Task Deploymen	nt	1		Device Address: 0003.385A.8064
R right	Status				Block driver:
Device (HCQ0-1200-D) Device (HCQ0-1200-D) PLC Logic Device (HCQ0-1200-D) PLC Logic Device (HCQ0-1200-D) Device (HCQ0-1	ut opy aste velete	EtherNet/IP	idapter iet 📌 35 - Smart Softwar	e Solutions GmbH 3.5.14.	0 Ethernet Link.
= 💹 Task Configur 🕞 P	roperties				
= 🧱 Task Configur 🕞 P	roperties				
Task Configur P MainTask PLC A LocaDevice	roperties Add Object Add Folder	•			

Ethernet (Ethernet)	* @ @ ×	Cut Copy Paste Delete	EtherNet/IP Scanner	s GmbH	3.5.14.10	EtherNet/IP Scanner
		Refactoring				
	-	Properties				
		Add Object Add Folder				
		Add Device ←				



EDS FILE SETTINGS





Devices - 4 X	EtherNet_IP_Module	LocalDevice	Device Ethe	ernet x
Mit _ethernetIP	Canaral			
Device [connected] (HCQ0-1200-D)	General	Interface:		
	Status	IP Address	192 . 168 . 0 .	1
Application		Cubant Mark	255 255 255	
PLC PRG (PRG)	Ethernet Device I/O Mappi	ing Subnet Mask	255 . 255 . 255 .	0
= 🥁 Task Configuration	Ethernet Device IEC Object	Default Gateway	0.0.0.	0
😑 🥩 ENIPAdapterIOTask	contract o evice ince objec	Adjust Operati	ng System Settings	
EtherNet_IP_Adapter.IOCyde	Information	Non-order Andrews		~
ENIPAdapterServiceTask		Network Adapte	ers	^
EtherNet_IP_Adapter.ServiceCycle		Interfaces:		
		Name De	escription IP Address	
LocalDevice		lo	127.0.0.1	
SoftMotion General Axis Pool		ecat1	0.0.0.0	
😑 🛐 Ethernet (Ethernet) 🧲 🖳		eth1	192 168 2 10	1 (~~
EtherNet_IP_Adapter (EtherNet/IP Adapter)		usb0	0.0.0.0	
EtherNet_IP_Module (EtherNet/IP Module)		IP Address	192 168 2	100
		C. hard Mark	366 336 336	0
		Subnet Mask	200 . 200 _ 200 _	0
		Default Gatewa	iy 192 . 168 . 2 .	1
• 4	X Device	LocalDevice) 🗑 Ethernet 🗙	EtherNet_IP_Scanner
Device (4500 1300 D)	General		Bus cycle options	
Bl protocic			Bus cycle task	Use parent bus cycle setting V
= O Application	Status			Use parent bus cycle setting ENIPScannerIOTask
Library Manager Ic_PRG (PRG)	Ethernet Devi	ce I/O Mapping ←		ENIPScannerServiceTask MainTask
Task Configuration ENIPScannerIOTask	Ethernet Devi	ce IEC Objects		
EtherNet_IP_Scanner.IOCycle	Information			
EtherNet_IP_Scanner.ServiceCyd	e			
B) PLC PRG				
> LocalDevice				
Contraction Conners Auto Deal				
Ethernet (Ethernet)				
EtherNet_IP_Scanner (EtherNet/IP Scanner)				

Finally under the Device tab click on PLC Settings and set below settings.

LocalDevice Dev	ice 🗙 💮 Ethernet 🍐 Soft	Motion General Axis Pool	nerNet_IP_Scanner
Communication Settings	Application for I/O handling:	Application	~
Applications	PLC settings		
Backup and Restore			
buckup and restore	Behaviour for outputs in Stop:	Set all outputs to default	
Files	Always update variables:	Enabled 2 (always in bus cycle task)	- v
Log	Bus cycle options		
	Bus cycle task:	ENIPScannerServiceTask ←	~
PLC Settings 🔶			



Etherilet/IP

		· · · · · · · · · · · · · · · · · · ·								
Seneral	Connection Name	RDI (ma	0.21	cize (huter)	T->O size	e (huter)	Provy Config size	(hutec) Targe	Config size (hutes)	Connection Path
Connections	1. Exclusive Owner	10	8	Size (bytes)	16	e (oytes)	Proxy coning size	28	coming size (bytes)	20 04 24 66 2C 64 2C 65
ssemblies	<									>
ser-Defined Parameters	Add Connection	Delete C	onnection	Edit Co	nnection					
nerNet/IP I/O Mapping	Configuration Data									Defaults
erNet/IP IEC Objects	Parameters		Value	Unit	Datatype	Minimum	Maximum	Default	Help String	
itus	Exclusive Owner									
	 Target Config da SingleTurp 	ita	(360)	counte	LIDINT		15 #40000	15 #40000	Number of requestet	teor par tire countrioar
ormation	TotalRange		360	counts	UDINT	1	16#40000000	16#40000000	Total number of steps	ticps por tant, counts por
	Preset_Para	meter	0		UDINT	0	16#40000000	0		
	preset_chan	ged			UDINT	0	16#40000000	0		
	Store_Paran	neters	0		UDINT	0	16#40000000	0	0x65766173 The signa	ature that shall be written i
	Restore_Par	ameters	0		UDINT	0	16#40000000	0	0x64616F6C The sign	ature that shall be written
	Occurrence D	acamatar	(1)		LITAT	0	16 #4000	0		
	Operating_P	arameter	9		OTAL	•	10#4000	0		

You can configure the parameters like "SingleTurn", "TotalRange", "Preset_Parameter", "preset_changed" and "Operating_Parameter" here in this Connection page. After that you should click on "Login" button to set this parameters. Then start button to start operations.

General	Find			Filter	Show all	- 🕂 A
Connections	Varia E 🍬 🍫	Channel Fault Header	Address %ID0	Type DWORD	Current Value	Description New Help String
Assemblies	🛞 🦄	Position Value	%ID1	DINT	156	Current position sensor value (32 bit)
	🛞 - 🧤	Velocity Value	%ID2	DINT	0	
User-Defined Parameters	🛞 - 🦄	Alarm Flag	%IB12	SINT	0	New Help String
	- *	Warning Flag	%IB13	SINT	0	
EtherNet/IP I/O Mapping	08 · 🍫	Unused Parameter	%IB14	BYTE	0	
Sector and the sector of the	B- 🍫	Unused Parameter	%IB15	BYTE	0	
EtherNet/IP IEC Objects		Consumed Data	%QW0	UINT	0	
	B. *ø	Consumed Data	%QW1	UINT	0	
Status	÷-**	Consumed Data	%QW2	UINT	0	
Information		Consumed Data	%QW3	UINT	0	

Here in this Ethernet/IP I/O Mapping page you can see the proccess datas like Position Value and Velocity value.



ONLINE PRESET MODE

User also can set Preset Value when online. Click on EtherNet/IP I/O Mapping tab under FNC_AEIPM. Enter desired Preset Value to Prepared Value. After Click on Debug menu, Force values or just simply press F7 shortcut key.

Etherivet_IP_Scanner	Ethernet	Device	I FNC	_ALIPM_ETHER	NETIP_ENCODER	X
General	Find			Filter Show	all	• 🖷 Add FB for IO channel + Go to instance
Connections	Variable	Channel Fault Header	Type DWORD	Current Val 0	Prepared Value	Description Fault status
Assemblies	۰ 🍫	Position Value	DINT	55276		Current position sensor value (32 bit)
	······	Velocity Value	DINT	0		Speed value in RPM by default. Change speed_measure for Oh:cps 1h:cp100ms 2h:cp10ms 3h:rpm
User-Defined Parameters	÷ 🐐	Alarm Flag	SINT	0		Alarm status
	······	Warning Flag	SINT	0		Warning Status
EtherNet/IP I/O Mapping -	· · · ·	Unused Parameter	BYTE	0		
	**	Unused Parameter	BYTE	0	A	
EtherNet/IP IEC Objects	8.50	Preset_Online	UDINT	0	1234 -	User can set a Preset value online. (You should enter a value different than before.)
	· · · ·	Consumed Data	UINT	0	-	
Status	· · · · ·	Consumed Data	UINT	0		

After that you should see the Position Value changes to your desired value.

Variable	Channel	Туре	Current Val	Prepared Value
÷ 🍫	Fault Header	DWORD	0	
£. 🍫	Position Value	DINT	1234	
8 %	Velocity Value	DINT	0	
÷ 🍫	Alarm Flag	SINT	0	
H- 🍫	Warning Flag	SINT	0	
£-*>	Unused Parameter	BYTE	0	
÷ 🍫	Unused Parameter	BYTE	0	
£-*\$	Preset_Online	UDINT	1234	
±-*•	Consumed Data	UINT	0	
£- *ø	Consumed Data	UINT	0	



CHANGE IP ADDRESS

User can change dafault IP Address (192.168.2.101). On our device tab click on **Connections and enter desired IP Address byte inside of "Change IP Address"** parameter then enter value between 1 to 255 to set up the last byte of the IP Address. (192.168.2.XXX) You can change other bytes of IP address like this. After user need to store parameters by entering 1702257011 to "Store_Parameters". Click Login button to send this changes to our Ethernet IP encoder throug PLC. Last step is restarting encoder device.

Devices 👻 🕈 🗙	EtherNet_IP_Scanne	er 💮 Ethernet	Dev	ice 🔐	FNC_AEIPI	M_ETH	HERNETIP_ENC	oder 🗙 🗲	-		
	General	Connection Name 1. Exclusive Owner	RPI (ms 20) O->Tsiz 8	e (bytes)	T- 16	>0 size (bytes)	Proxy Co	onfig size (bytes)	Target Config size (bytes) 36	Connection Path 20 04 24 66 2C 64 2C 65
	Assemblies	Add Connection	Delete C	onnection	Edit Co	nnecti	οπ				
	EtherNet/IP I/O Mapping	Parameters Exclusive Owner	_	Value	Datatype	e Min	Maximum	Default	Help String		
	EtherNet/IP IEC Objects	 Target Config da SingleTurn TotalRange 	ata	262144 1073741824		1	16#40000 16#40000000	16#40000 16#40000000	Counts for per re Total number of c	volution. counts	
LocalDevice SoftMotion General Axis Pool Ethernat (Ethernat)	Information	Preset_Para preset_char	meter nged	0	UDINT	0	16#40000000 16#40000000	0	Set a value for po Enabling Preset v	osition at the moment. alue. Enter 1 to enable Preset_Pa	rameter I ba unitan in "nava" (aune)
EtherNet_IP_Scanner (EtherNet/IP Scann		Restore_Para Operating_F	rameters Parameter	0	UDINT	0	16#7FFFFFFF 16#4000	0	1684107116 (0x6 Enter 4 for Scaling	64616F6C) The signature that sha g enable. Enter 1 for increment Ci	ll be written is "load" (doal) CW. Enter 5 for Scaling enal
		Unused Para Unused Para Change IP #	ameter ameter	0	BYTE BYTE	Bit 0 Bit 0	Bit 7 Bit 7 16#7EEE	0	197, 168, 2, XXX, F	inter 1-255 to change XXX byte of	f IP Address
		Change IP A Change IP A	ddress2 ddress3	2 168	UINT	0	16#7FFF 16#7FFF	2 168	192.168.YYY.101 192.ZZZ.2.101 E	Enter 1-255 to change YYY byte nter 1-255 to change ZZZ byte of	of IP Address. IP Address.
		Change IP A	ddress4	192	UINT	0	16#7FFF	192	TTT. 168.2.101 Er	nter 1-255 to change TTT byte of	IP Address.

After we need to change IP Address Settings of Codesys.



Or delete the device and "Scan for Device" again, this will automatically finds the scanned encoder's IP Address.

LocalDevice SoftMotion General Axis Pool	Add Device
Ethernet (Ethernet)	Insert Device
EtherNet_IP_Scanner (EtherNet/IP Scann	Scan For Devices ←





4. Connector & Pin Assignment

Pin Assignment





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