

## EoE (Ethernet over EtherCAT)

### SV660N



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## 1 GENERAL DATA

Date: 07.04.2022

Hardware: AC810, SV660N

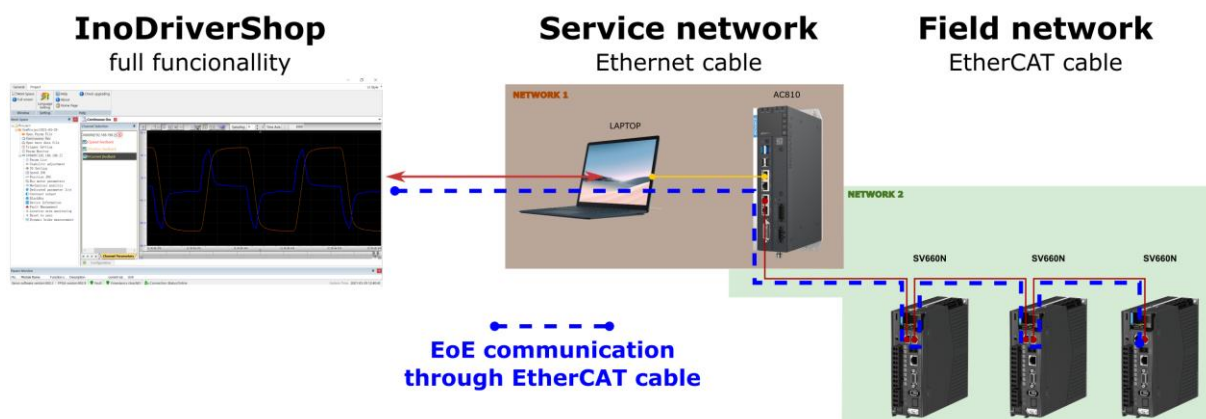
Software: InoShopPro v1.6.2, InoDriverShop v3.4.1.6

Info: SV660N procedure guide

## 2 PURPOSE OF THIS DOCUMENT

This document describes the procedure for configuring the EoE protocol on SV660N drives with the Inovance AC810 controller.

The following image shows the network topology that is achieved with the configuration described in this document. As can be seen, the EoE configuration allows the InoDriverShop diagnostic software to be connected to the SV660N drives through the EtherCAT cable, allowing faster communication with all the drives on the EtherCAT network using a single cable.

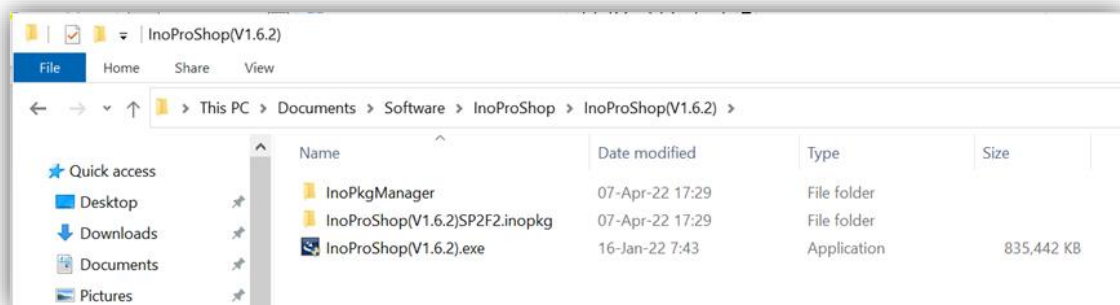


## 3 MAIN PROCEDURE

In order to use the EoE protocol with SV660N drives, the following steps must be followed:

1. The first step is to install the InoProShop v1.6.2. InoProShop is required to download the project with the EtherCAT master supporting the EoE protocol to the AC810 controller.
2. The next step is to copy the version of the InoDriverShop in the directory of the InoProShop. Refer to section 5
3. Finally setup the diagnostics laptop network configuration

**NOTE** Along with this document is attached a compressed file with all the necessary software



## 4 INSTALL INOPROSHOP V1.6.2

The first step is to install the InoProShop version 1.6.2 software plus the SP2F2 patch. To install InoProShop run the file InoProShop(V1.6.2).exe and follow the instructions of the installation wizard.



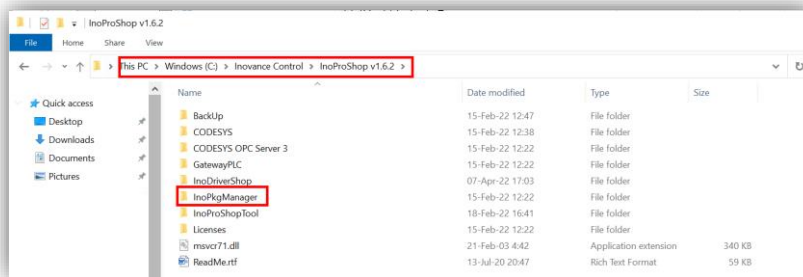
Once this software is installed continue with the next section to install the SP2F2 patch.

### 4.1 INSTALL PATCH SP2F2

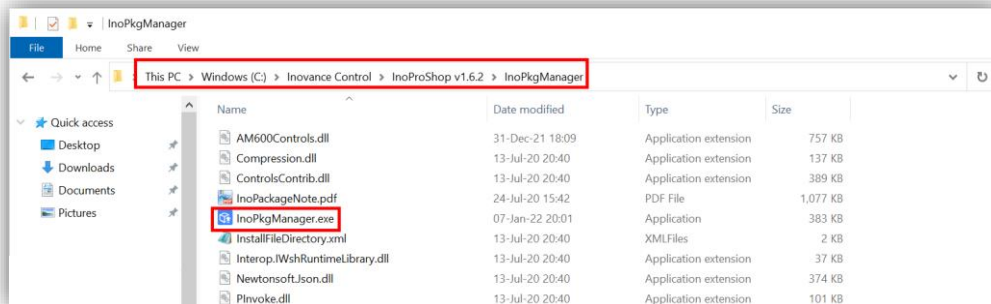
**NOTE** Close any instance of InoProShop before installing the update patch.

Copy the **InoPkgManager** folder to the installation path of **InoProShop(V1.6.2).exe**

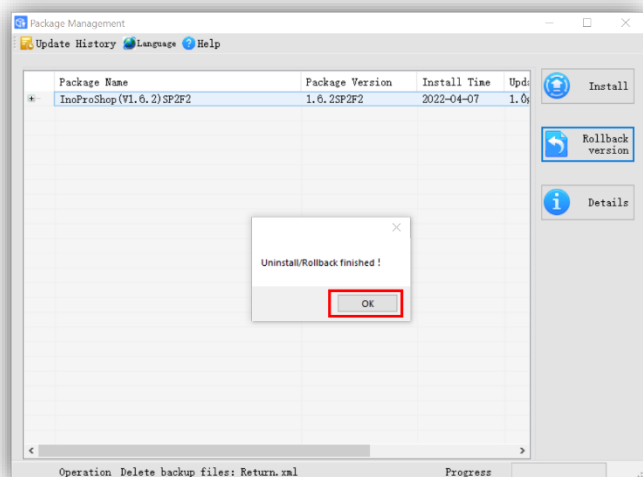
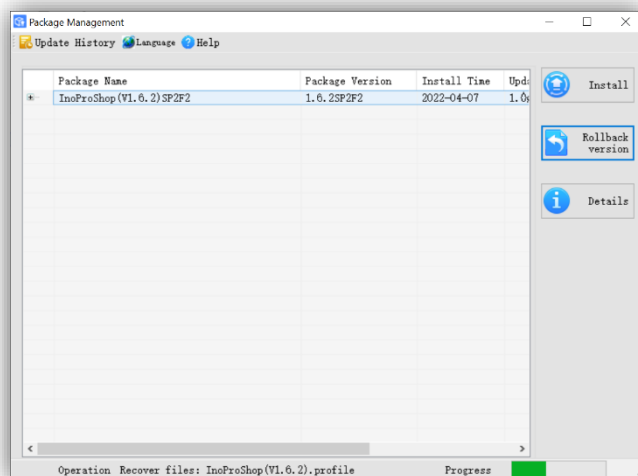
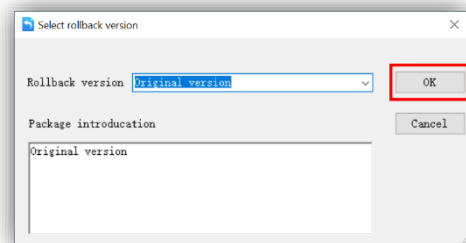
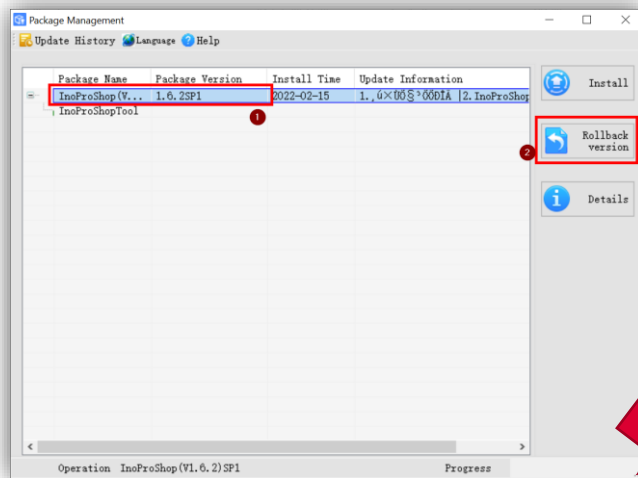
**NOTE** Do not replace the original folder **InoPkgManager**. Copy the folder and overwrite the current content.



Execute the InoPkgManager from this folder:

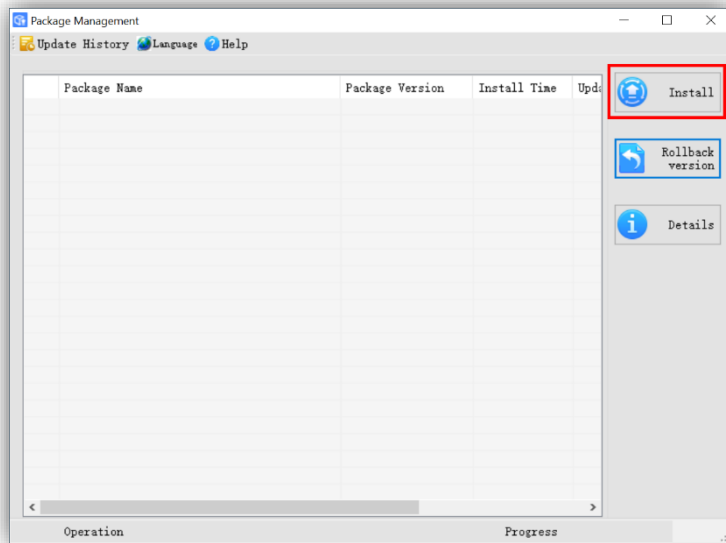


Remove previous Service Pack if necessary

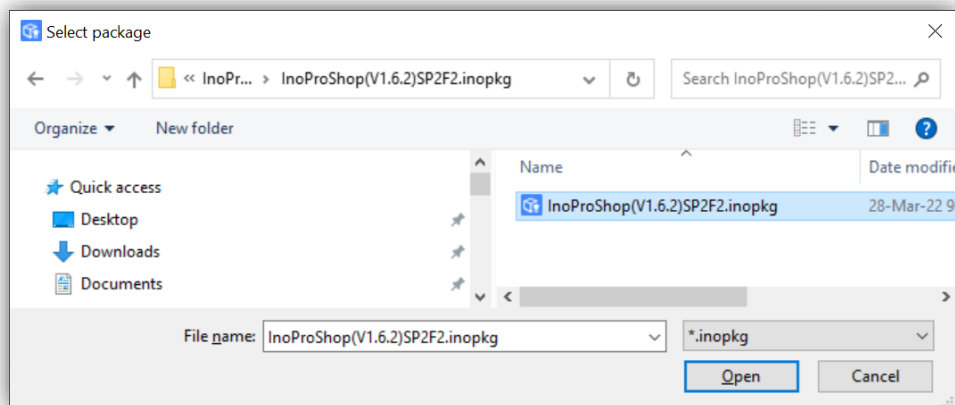


Install Service Pack **InoProShop(V1.6.2)SP2F2.inopkg**.

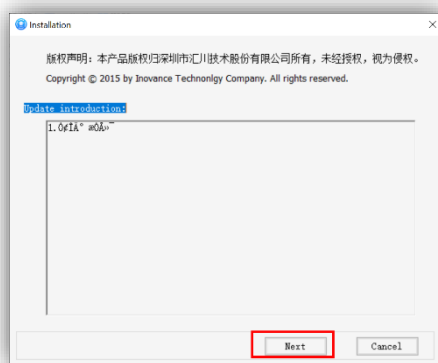
Click on install button:

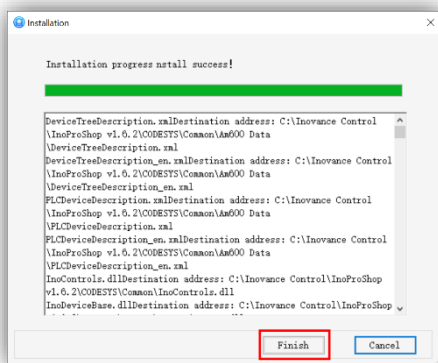
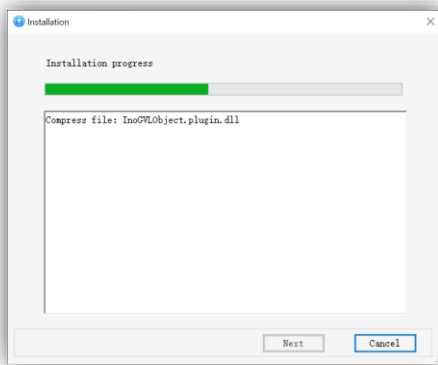


Select the patch file:

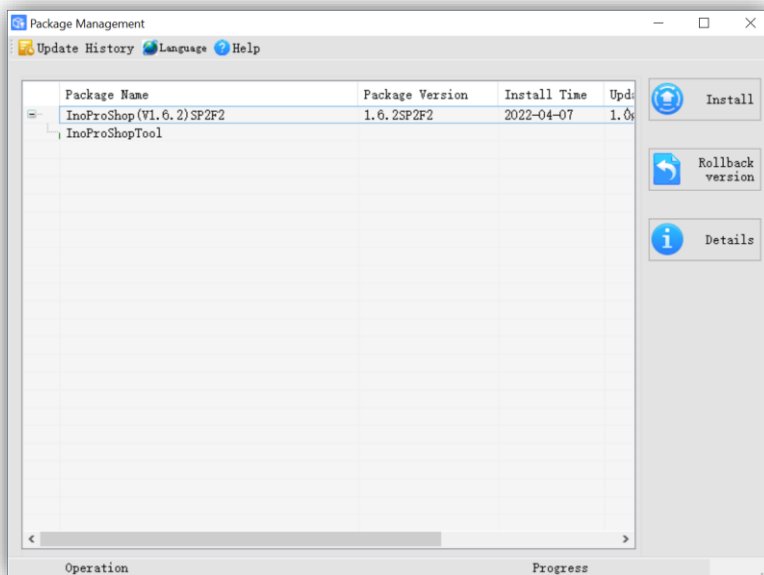


Follow the installation wizard:





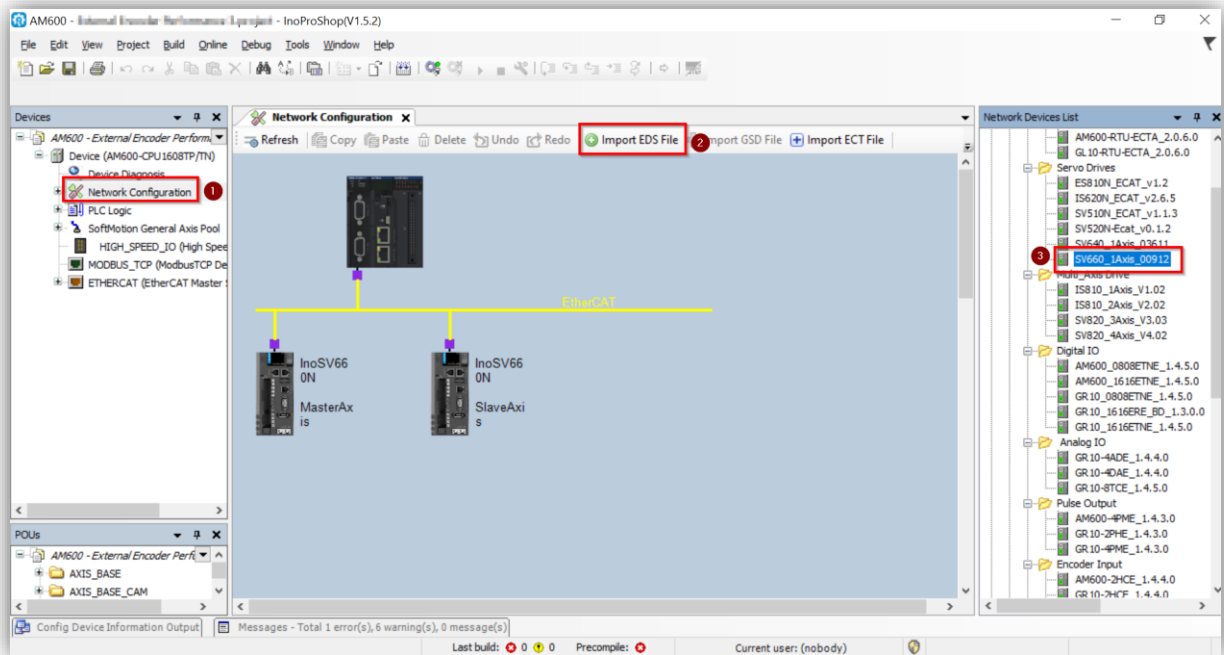
The main screen of the InoPkgManager shows information about the installed patch (1.6.2SP2F2):



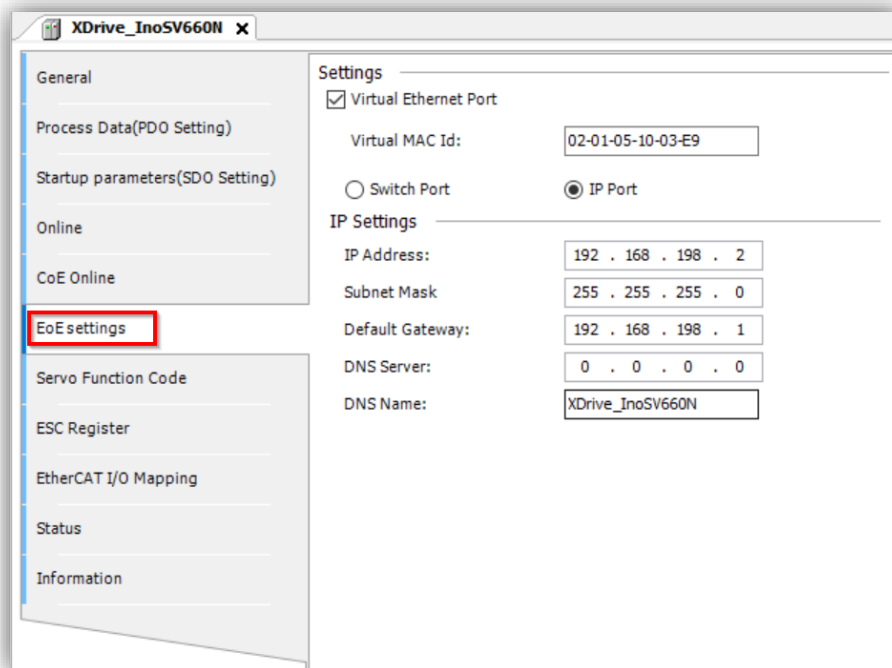


## 4.2 INSTALL XML FILES

It is necessary to update the XML file of the SV660N in order to configure the EoE protocol. To update the XML file, open the network configurator and import the file.

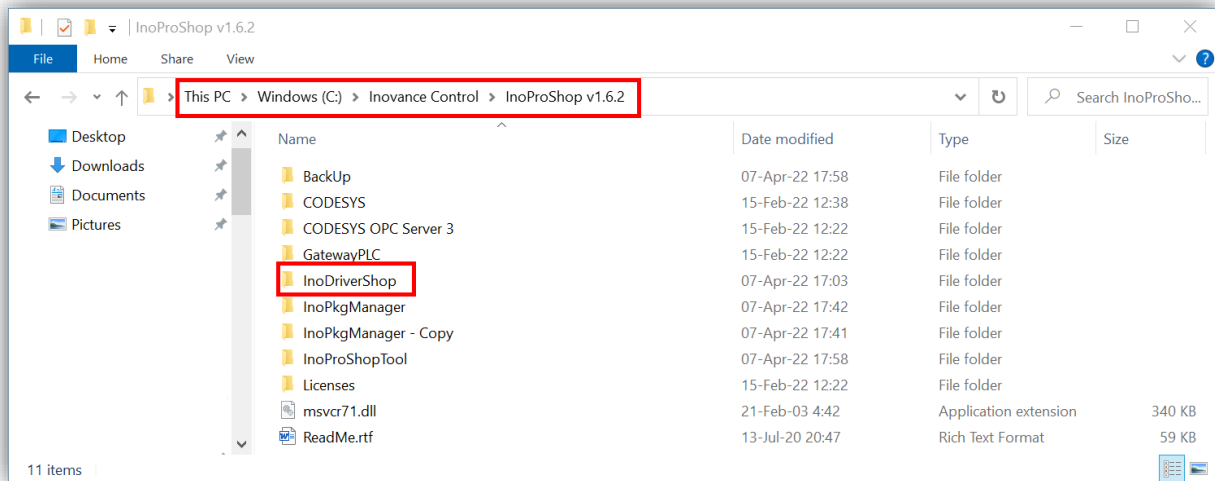


After installing the new SV660N XML file, in the EtherCAT slave configuration section there is a new section to configure the IP address of the slave:



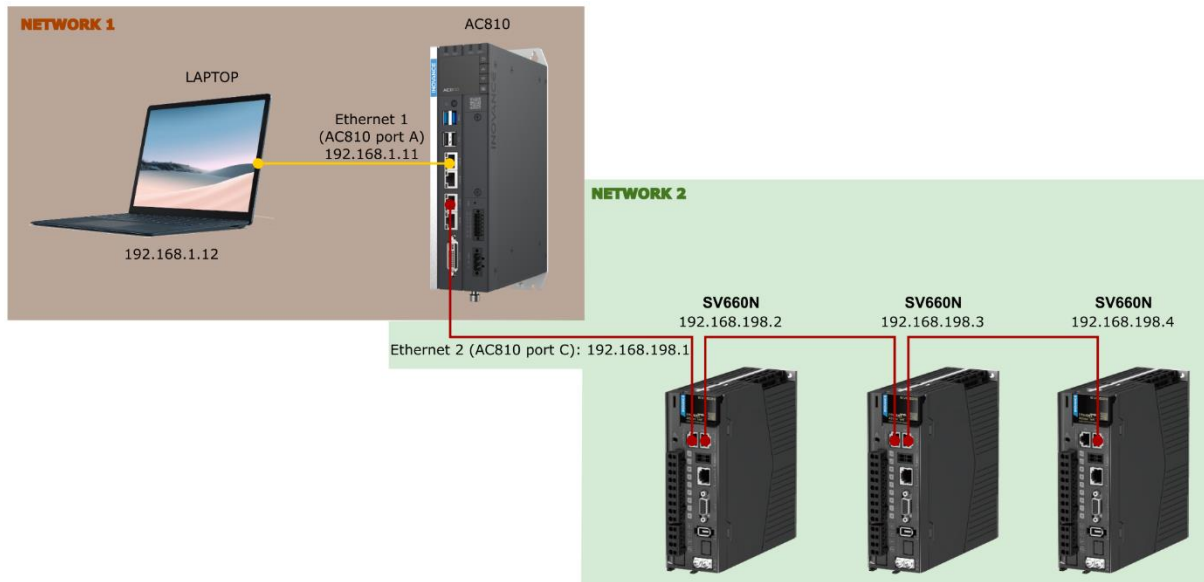
## 5 INSTALL INODRIVERSHOP SOFTWARE

The servo software has to be decompressed with the name 'InoDriverShop' and put into installation directory of InoProShop:



## 6 EOE NETWORK CONFIGURATION

The following image shows the topology of the EoE network that we are going to configure. As can be seen there are two different networks. The laptop network (network 1 – port A) and the SV660N drives EtherCAT network (network 2 – port C). The ac810 controller acts as a router for the frames coming from network 1 to network 2.




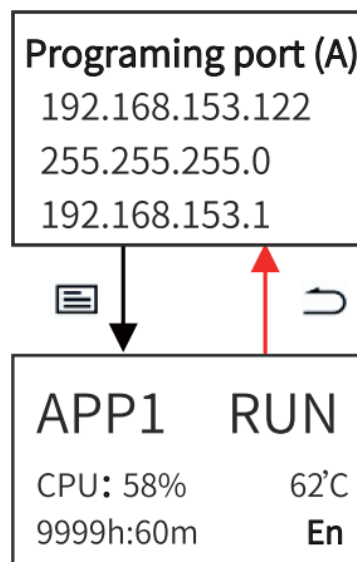
### 6.1 ETHERCAT MASTER CONFIGURATION

In this example the ac810 controller has two IP addresses:

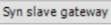
- **NETWORK 1** 192.168.1.11
- **NETWORK 2** 192.168.198.1

Network 1 can be a fixed IP address or automatically assigned by the DHCP server where the controller is connected.

To find out the network 1 address of the controller, click on the back button  of the controller and display the IP address on the controller's display.



The IP address of the **NETWORK 2** is defined by the user in the EtherCAT master configuration screen. This address must be in the same range as the addresses of the slaves on the EtherCAT network. In this case, the EtherCAT controller or master has the address 192.168.198.1 and the slaves can be configured in this range of addresses 192.168.198.2 to 192.168.198.254.

**NOTE** The "Sync slave gateway" button  allows to automatically and consecutively configure the IP addresses of the slaves on the EtherCAT network that have EoE activated. First it is necessary to activate the EoE in the slaves and then click on the "Sync slave gateway" button.

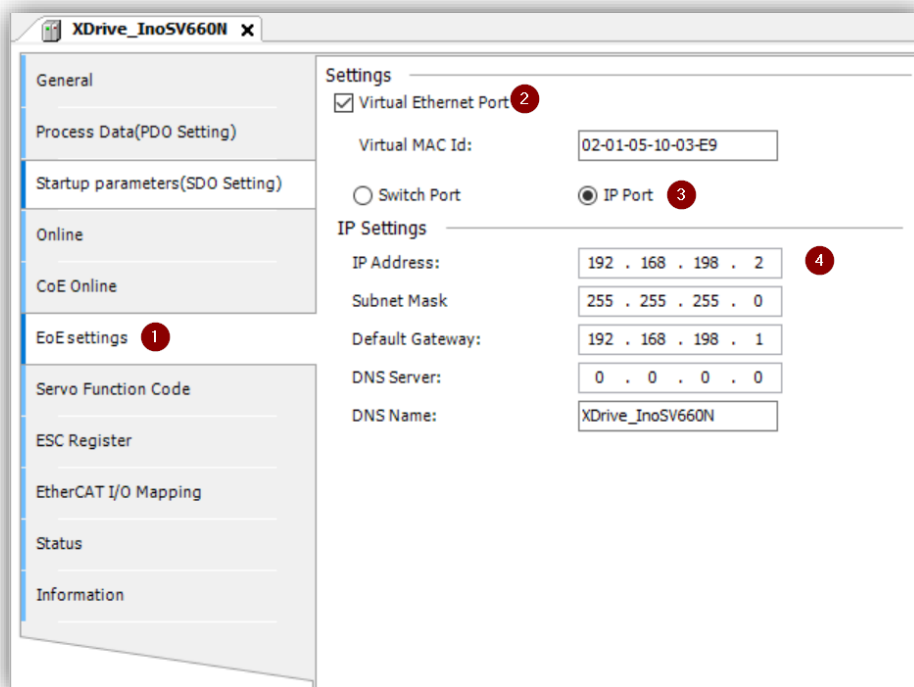
## 6.2 ETHERCAT SLAVE CONFIGURATION

Each slave on the EtherCAT network that needs to use the EoE protocol must activate it from the configuration screen. On this screen there is a tab to configure the EoE network. In this tab you have to activate the virtual ethernet port checkbox and the IP Port radio button.

Finally the IP address of the slave is configured. Each slave must have a different IP address and in the same range as the IP address configured in the EtherCAT master. See section 6.1

In this case, the EtherCAT controller or master has the address 192.168.198.1 and the slaves can be configured in this range of addresses 192.168.198.2 to 192.168.198.254

The subnet mask and gateway address must be the same as that configured on the EtherCAT master.



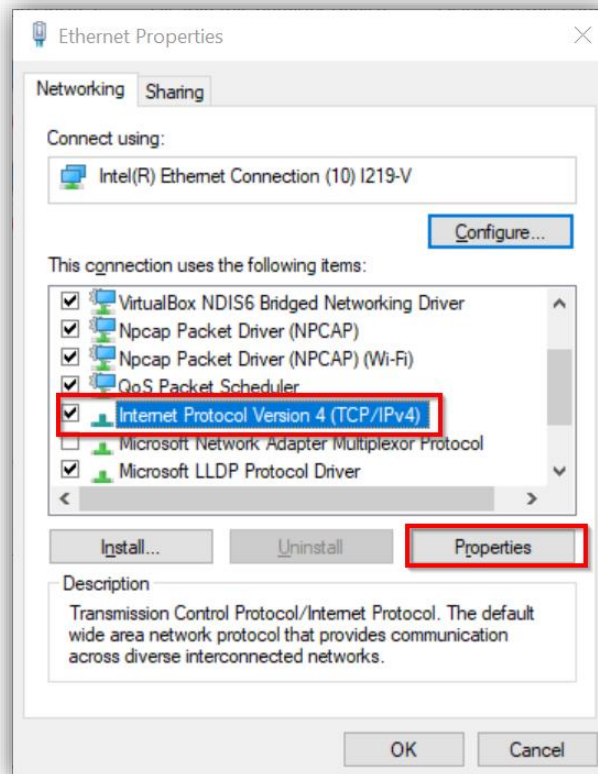
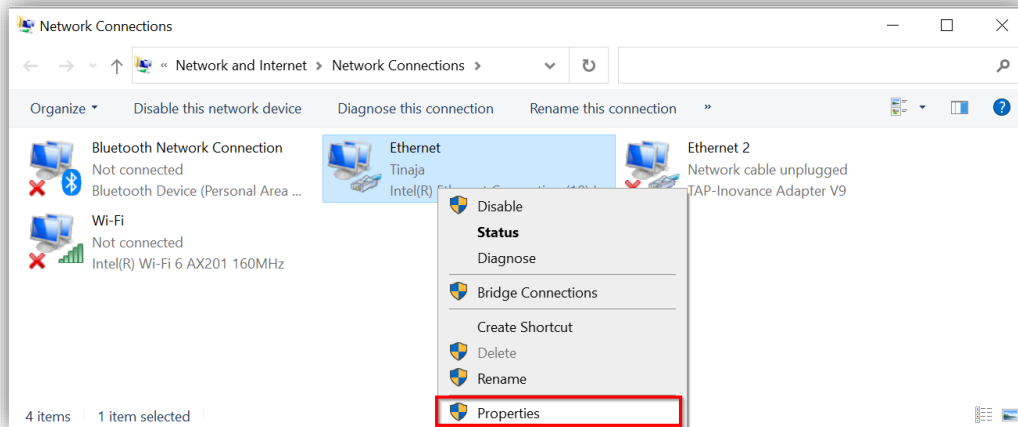
## 6.3 REDIRECT TRAFFIC FROM NETWORK 1 TO NETWORK 2

As already mentioned in the previous sections, in this EoE configuration there are two networks with a range of different IP addresses. Therefore, it is necessary to redirect traffic from one network to another. In other words, the traffic of network 1 must be directed to the IP address of the controller, so that it transfers the Ethernet packets to the slaves of the EtherCAT network.

There are two ways to configure a route to the controller's IP address. Adding a new gateway in the ethernet adapter configuration or adding a new route with the windows *route* command. The following sections show these two methods.

## 6.3.1 CONFIG WINDOWS ETHERNET ADAPTER

The following screenshots show how to add a gateway on the ethernet adapter:



Internet Protocol Version 4 (TCP/IPv4) Properties

General

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.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 192 . 168 . 1 . 12

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 192 . 168 . 1 . 1

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

☐ Validate settings upon exit

Advanced...

OK Cancel

Advanced TCP/IP Settings

IP Settings DNS WINS

IP addresses

IP address	Subnet mask
192.168.1.12	255.255.255.0

Add... Edit... Remove

Default gateways:

Gateway	Metric
192.168.1.1	Automatic
192.168.1.11	Automatic

Add... Edit... Remove

☒ Automatic metric

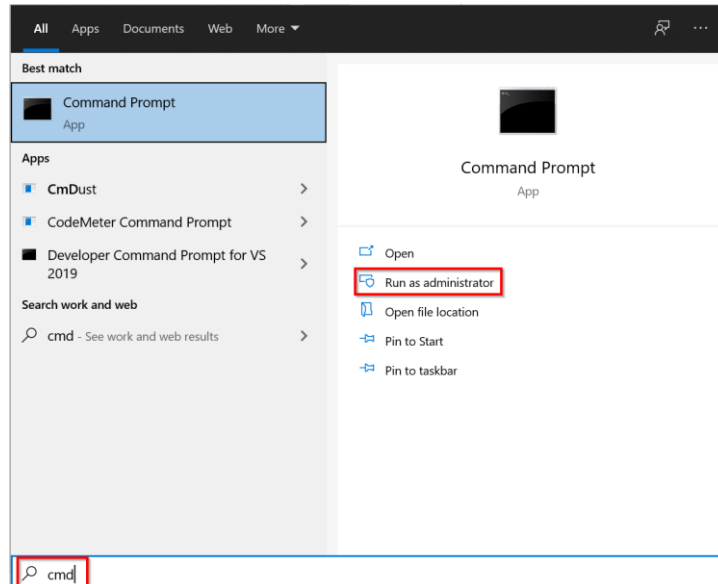
Interface metric:

OK Cancel

## 6.3.2 ADD ROUTE WITH COMMAND LINE

Using the windows command line and the “route” command it is possible to add a new route that redirects the traffic from the 129.168.198.x addresses to the AC810 controller.

**NOTE** It is necessary to execute the command line with administrator privileges:



To add a new route from the 192.168.198.x addresses to the 192.168.1.11 controller address run the following command:

```
route add X.X.X.X mask Y.Y.Y.Y Z.Z.Z.Z
```

Where:

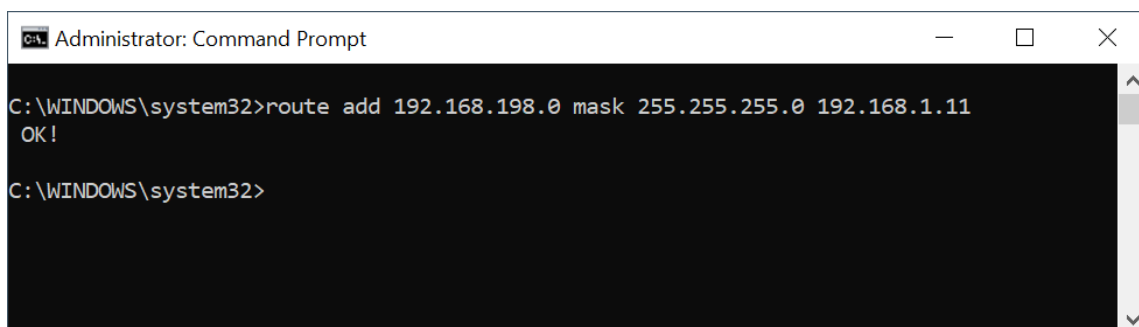
X.X.X.X is the address range from network 2

Y.Y.Y.Y is the network mask from network 2

Z.Z.Z.Z is the network 1 gateway to reach the network 2

In this example the command would be:

```
route add 192.168.198.0 mask 255.255.255.0 192.168.1.11
```

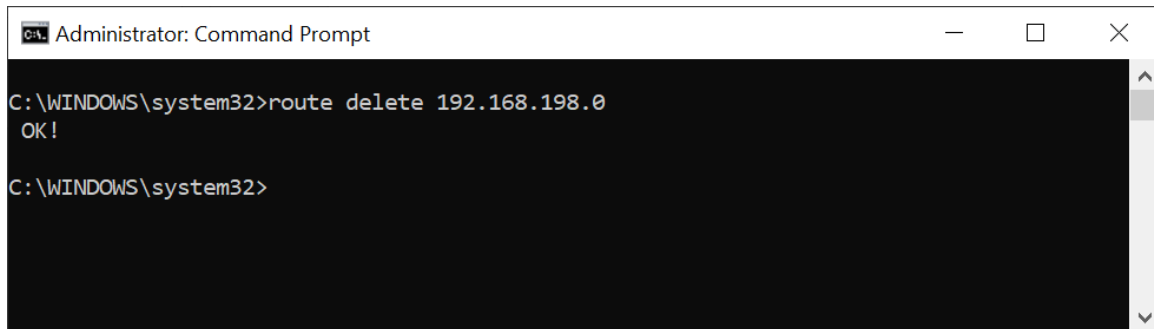




## 6.3.2.1 DELETE ROUTE

The following command removes the created route:

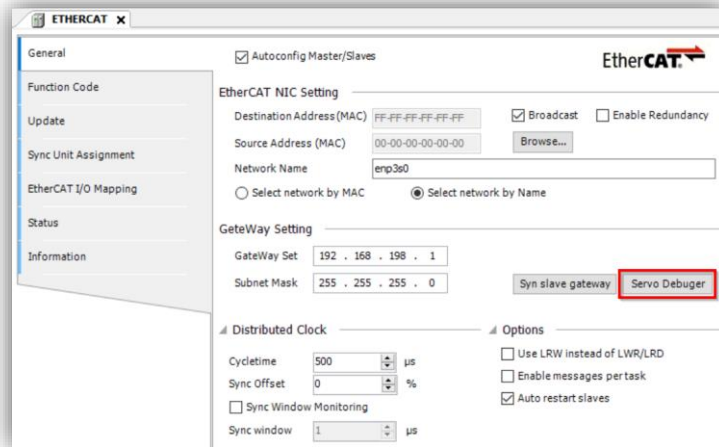
*route delete 192.168.198.0*



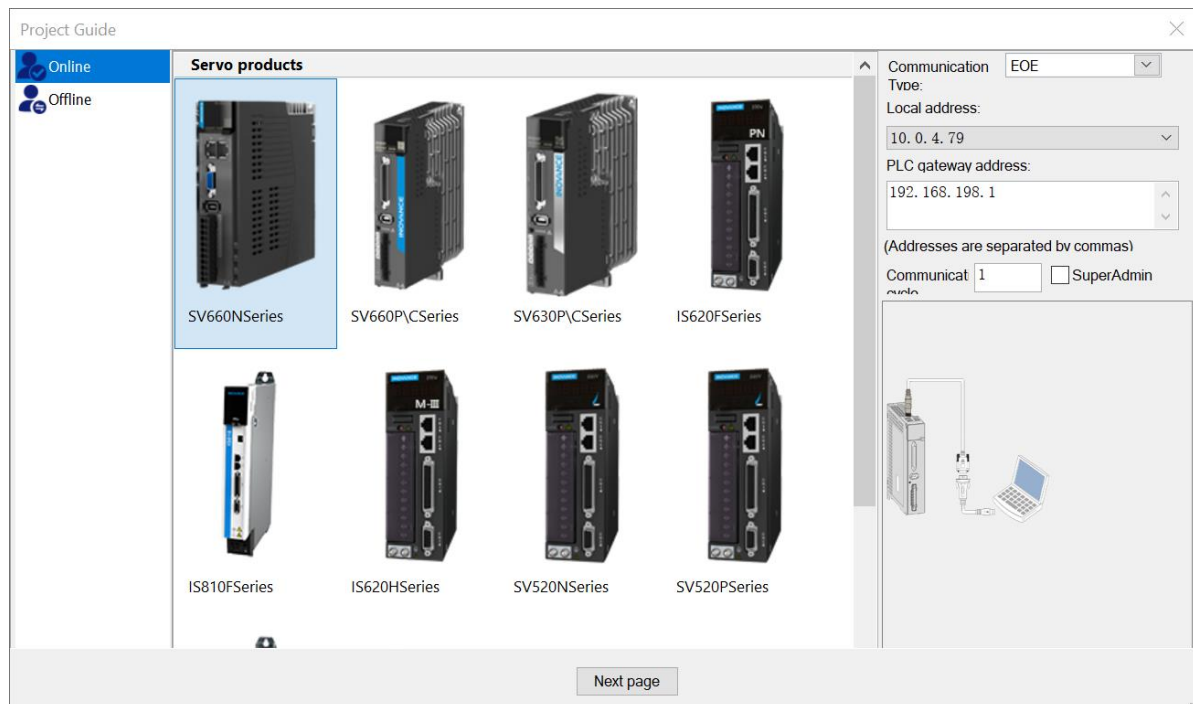
```
Administrator: Command Prompt
C:\WINDOWS\system32>route delete 192.168.198.0
OK!
C:\WINDOWS\system32>
```

## 7 OPEN INODRIVERSHOP

To connect via EoE with the SV660N drives, open the InoDriverShop software from the windows start menu or from the EtherCAT master configuration screen:



Create a new project and select the SV660N. In the communications section select EoE and add the IP address of the second network of the AC810 controller in the PLC Gateway box. That is, the address that has been configured in the EtherCAT master configuration screen. In this example the address 192.168.198.1:



Click on the button “next page” and the software starts to scan the slaves devices:

