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Application Note

Interfacing Hilscher cards (Profinet) to Adaptive Vision Studio

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1. Purpose and equipment

Purpose:

This document explains how to interface a [Hilscher Profinet PC card](#) to Adaptive Vision Studio.

Required equipment:

- Supported Hilscher Profinet PC card.
- Adaptive Vision Studio 4.11 Professional or later.

2. Hardware connection

All devices must work in a common LAN network – henceforth called *shared network*. In most cases they are connected to each other through a network switch.

The devices shall be connected as follows:

- Connect hardware devices as follows:
 - Master device e.g. PLC to the shared network
 - Hilscher card to PC
 - Hilscher card to the shared network
 - Connect PC's network card to shared network.

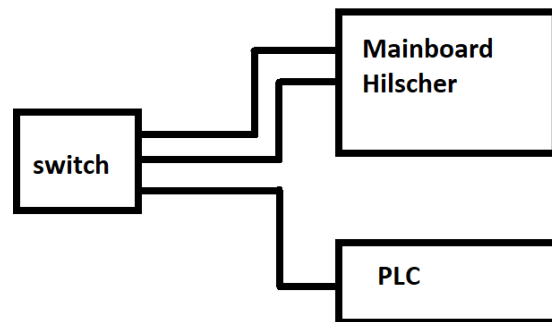


Figure 1- Hardware connection scheme.

Before proceeding to the further point, make sure that all devices are powered up.

3. Configuring Hilscher Devices

3.1 Introduction

- Be sure to have **the newest** version of following drivers installed:
 - Windows driver (recommended **1.5.0.0**)
<https://kb.hilscher.com/display/CIFXDRV/Versions+-+NXDRV-WIN>
 - SYCON.net for configuring slots, generating configuration files:
<https://kb.hilscher.com/display/SYCON/Version+History>
 - For profinet: Firmware (recommended **3.13** series)
<https://kb.hilscher.com/display/PNS3V5/Version+History+-+V3.5+to+V3.x>
- A computer restart is highly recommended after driver installations.

Make sure you have the recommended driver installed, newest SYCON.net, and firmware prepared. Profinet requirements are written down in [Hilscher Channel Open Profinet documentation](#).

The easiest way to install firmware to the cifX Driver is using the cifX Driver Setup software - the Windows Search in the start menu should find this tool, otherwise it is located in C:\Program Files\cifX Device Driver directory. In the cifX Driver Setup Utility select the channel you want to configure (usually channel 0 - CH#0) and remove preexisting firmware by clicking "Clear". To add a new firmware file, click "Add", navigate to the downloaded profinet slave firmware and click "Open". Finally, click "Apply" - the button should turn disabled.

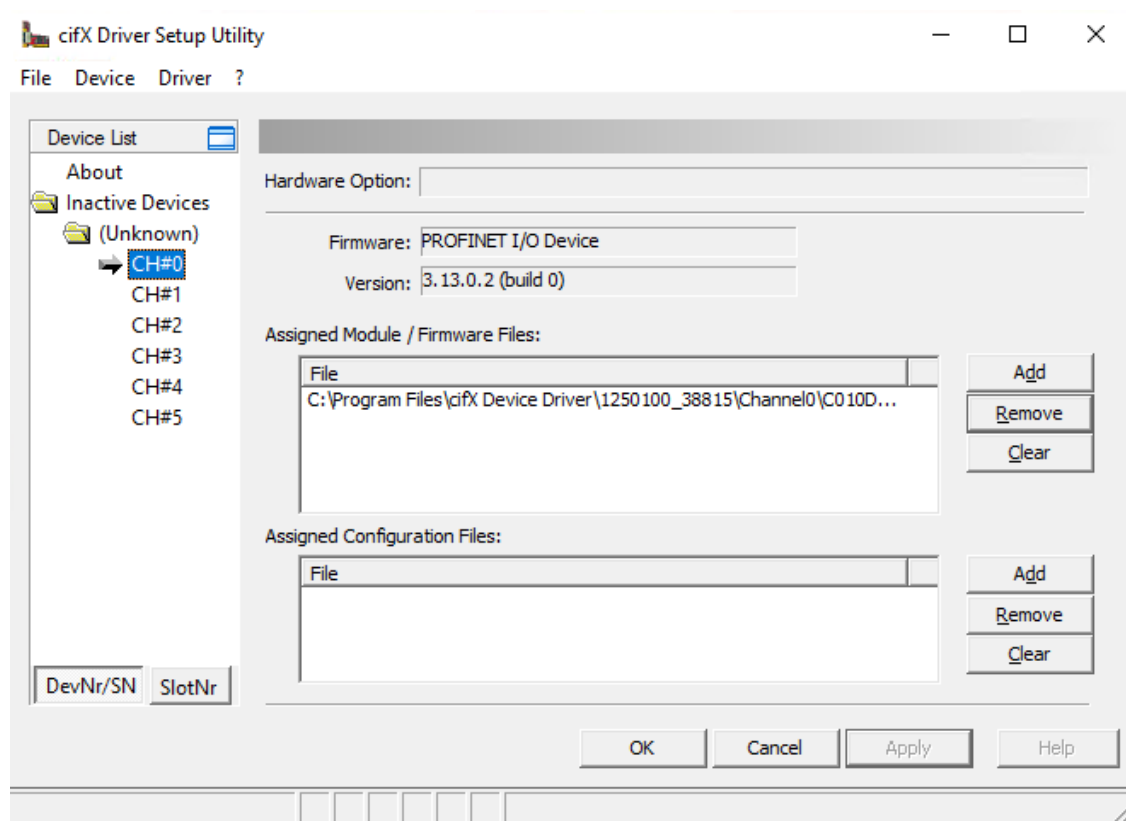


Figure 2 - cifX Driver SetupUtility configuration.

3.2 Generating channel configuration files

Channel configuration files are generated in SYCON.net software. Firstly, pick a proper slave device using a PCI card, here we use the Profinet Stand-Alone Slave, and drag it to the gray bus on the "Network View".

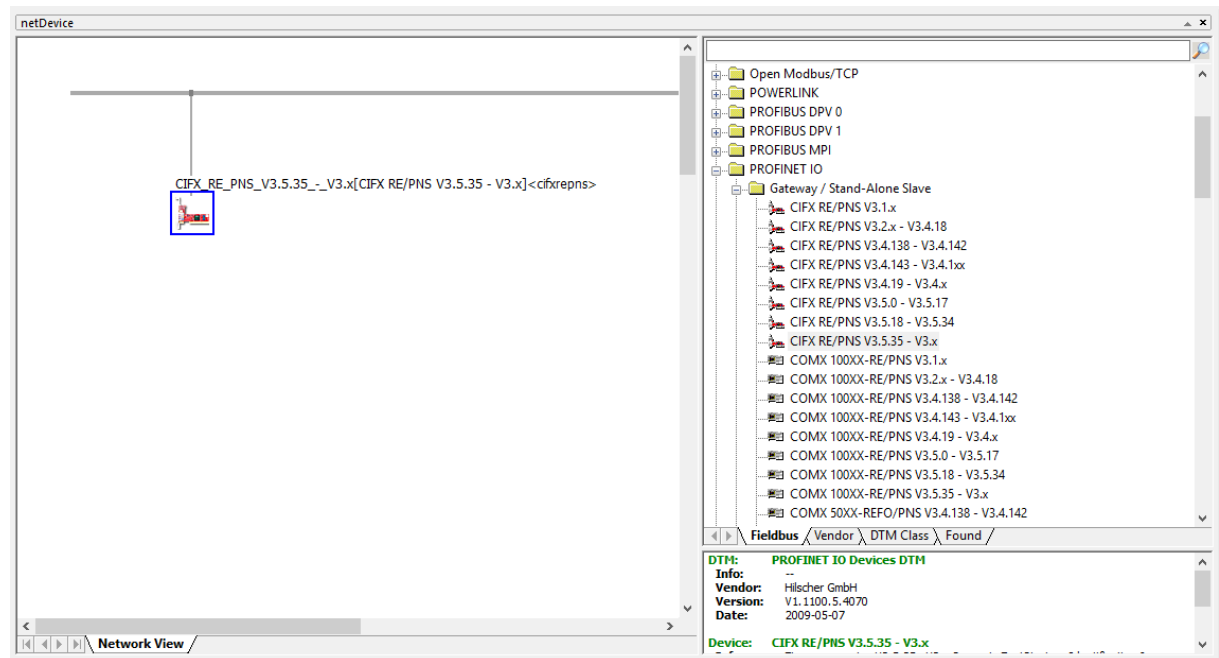


Figure 3 - Network View in Sycon.net application.

To open card configuration, double click on its icon and select the "Configuration/Modules" category in the Navigation Area on the left side of the dialog. In the main window you can add individual modules. Remember that in Profinet, **Slot configuration must match the configuration from your master device, otherwise the connection will not work**. For boolean indicators we recommend "1 Byte Output" or "1 Byte Input".

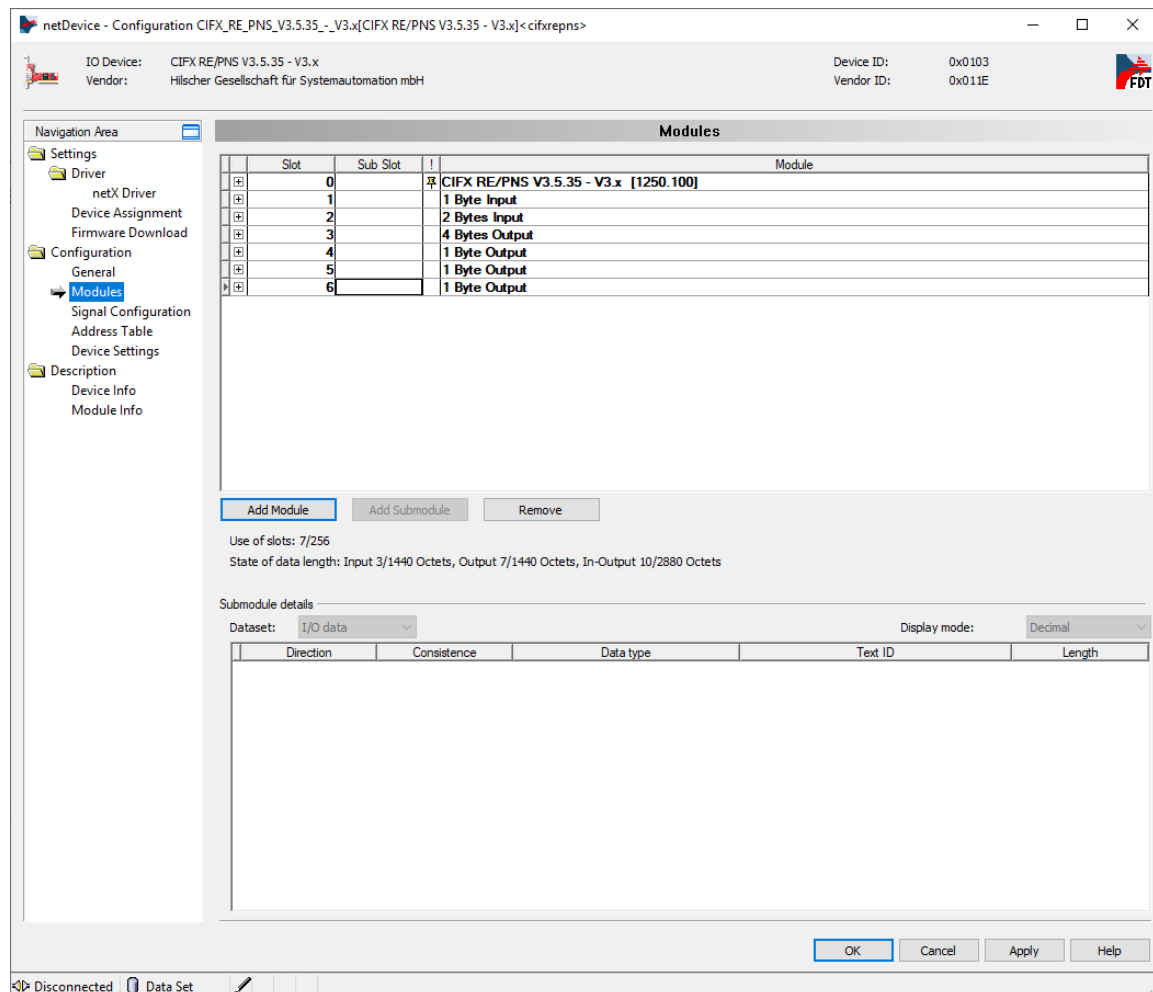


Figure 4 - Slot configuration in Sycon.net application.

You can see the final address table (addresses on the Hilscher device where input or output data will be available) in the "Configuration/Address table" category. If you plan to use IORead and IOWrite filters, for example [Hilscher Channel IORead Sint8](#), note the addresses. You can switch the display mode to decimal, as Adaptive Vision Studio accepts decimal addressing, not hexadecimal. Adaptive Vision Studio implementation of Profinet checks whether the address and data size match. In the sample configuration below, writing a byte to address 0x002 would not work, because that module address starts at 0x001 and spans 2 bytes. Moreover, Adaptive Vision Studio prohibits writing with a SlotWrite filter to input areas and reading with a SlotRead filter from output areas. Click "OK" when you have finished the proper configuration.

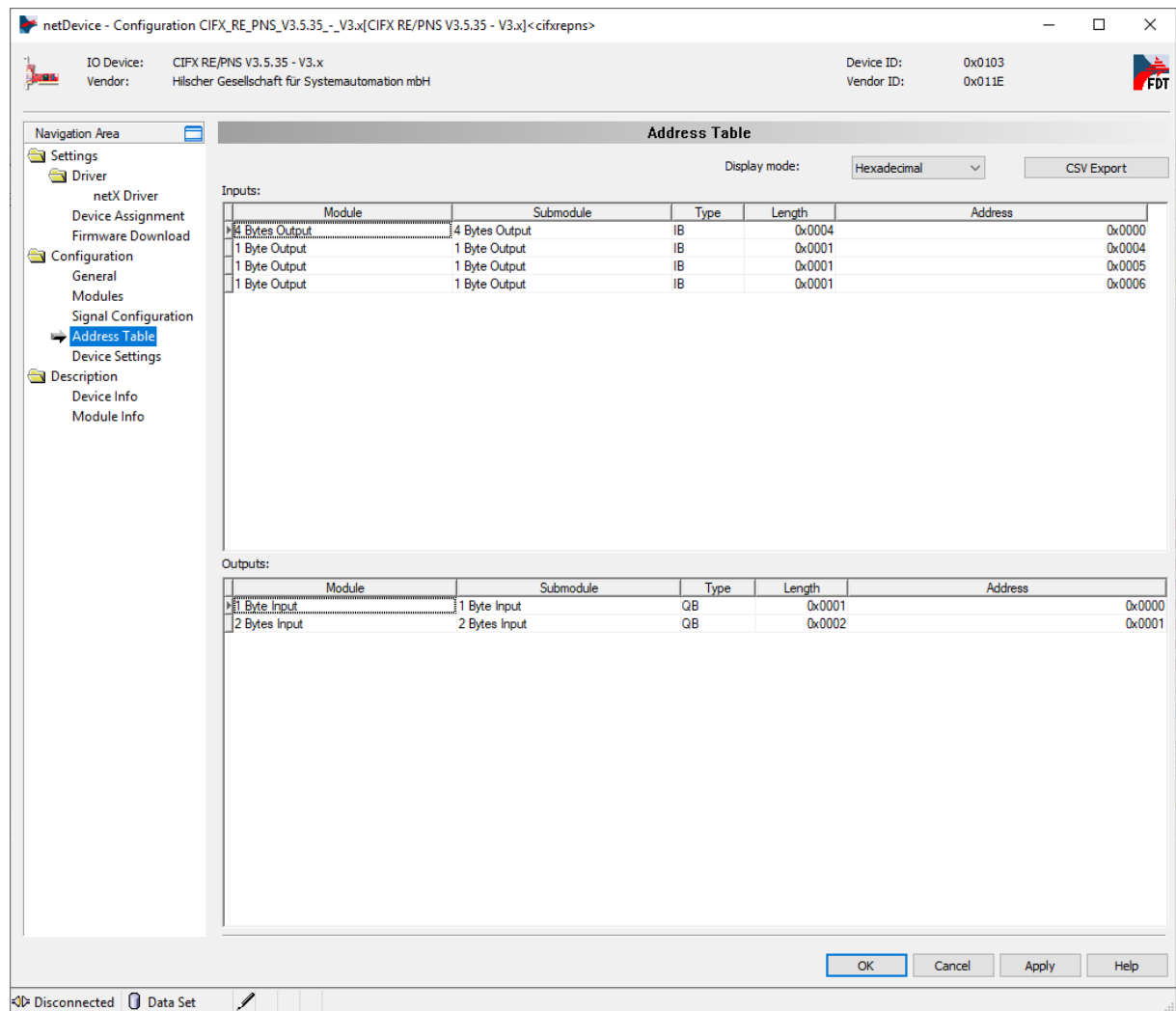


Figure 5 - Address table in Sycon.net application.

The final step is to generate configuration files for Adaptive Vision Studio. You can do this by right-clicking on the device icon, then navigating to "Additional Functions->Export->DBM/nxd...", entering your configuration name and clicking "Save". You can now close SYCON.net for this example, **remember to save your project before, so that it is easier to add new slots.**

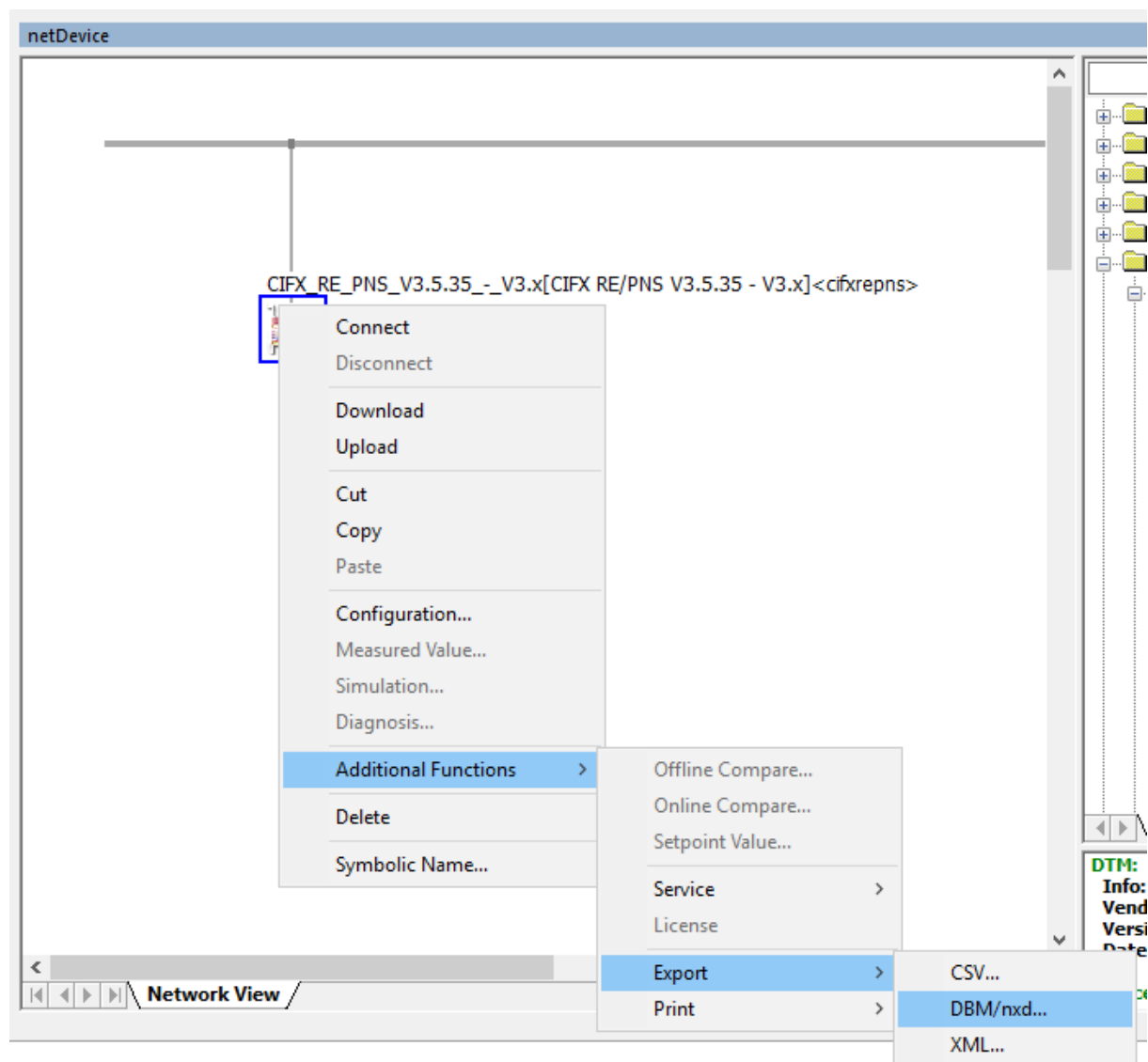


Figure 6 - Exporting files generated in Sycon.net.

4. Working with Profinet in AVS

The full list of filters for communication over Hilscher devices is available [here](#).

Below proceeding to the further steps, please check Hilscher and AVS connection using [Hilscher Driver GetBoardInformation](#) filter. If all previous steps are done correctly you will be able to get device board information including BoardName and ID. Please note that in this step the connection with the Hilscher card via Sycon.net is required, so you need to run the software, right-click on the card icon and click *Connect*.

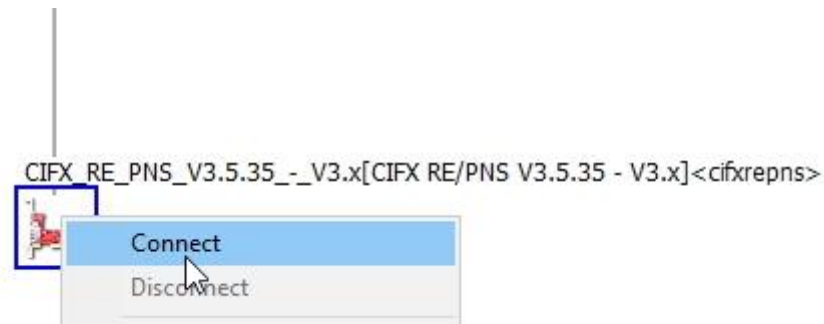


Figure 7- Connection with card via Sycon.net.

As described in previous chapter the Sycon.net application is not required for a proper operation. On the contrary, it is highly recommended to keep it closed and use the generated configuration files to guarantee high stability of the connection.

After following the instruction from chapter 3.2, you have a *xxx.nxd* and *xxx_nwid.nxd* files. To send data over Profinet, follow the below steps:

1. Configure connection in AVS with [Hilscher Channel Open:Profinet](#) filter. Drag it from *Program I/O* category in the Toolbox and drop it in the Program Editor.
2. In *InBoardName* input enter value acquired from [Hilscher Driver GetBoardInformation](#) filter. In *inConfig* and *inNwid* inputs enter paths to generated files from Sycon.net.



Figure 8 - Hilscher_Channel_Open:Profinet configuration.

3. To prevent from I/O errors make sure that you open connection in the initialization step with [Hilscher Channel Open:Profinet](#) and close it at the end of the program using [Hilscher Channel Close](#) filter.
4. For IO, we recommend SlotRead and SlotWrite filters, as they are more convenient. For example, the [Hilscher Channel SlotWrite_SInt8](#) filter writes 8 bytes of signed data to the selected slot. Slot numbers match those in the "Configuration/Modules" category of card configuration in SYCON.net program.

5. Troubleshooting

If it is still not possible to use AVS with Hilscher card first, make sure that you done correctly all previous steps and then use following advices.

1. Use Ethernet Device Configuration software to set static IP address to Hilscher card.

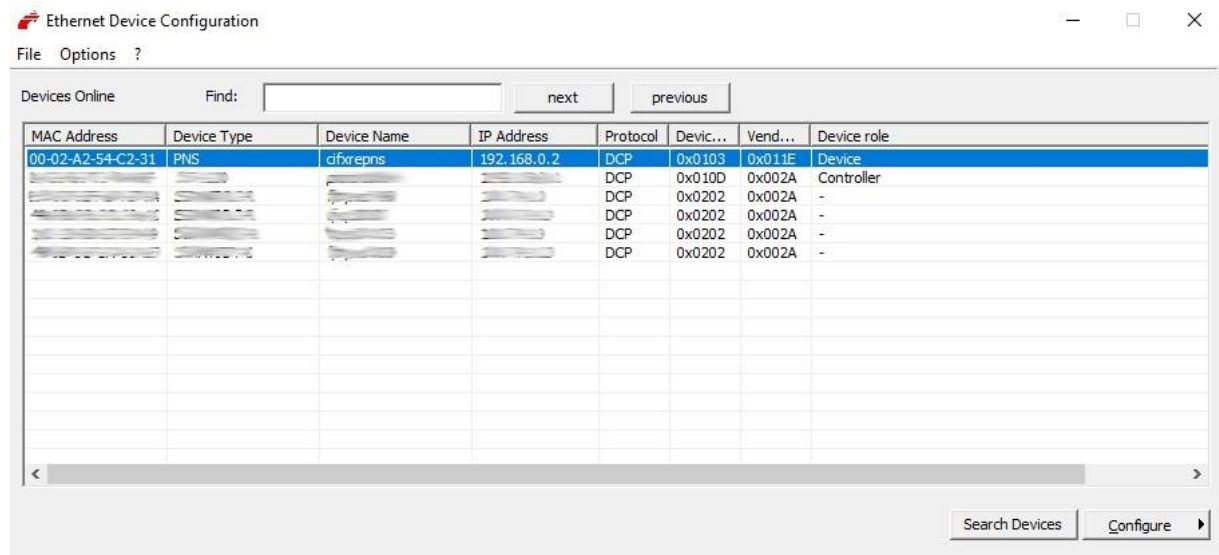


Figure 9 - Ethernet Device Configuration application.

2. Make sure that current program setting is loaded to Hilscher card. If not please use SYCON.net application to connect and download settings to the devices as shown at the picture bellow.

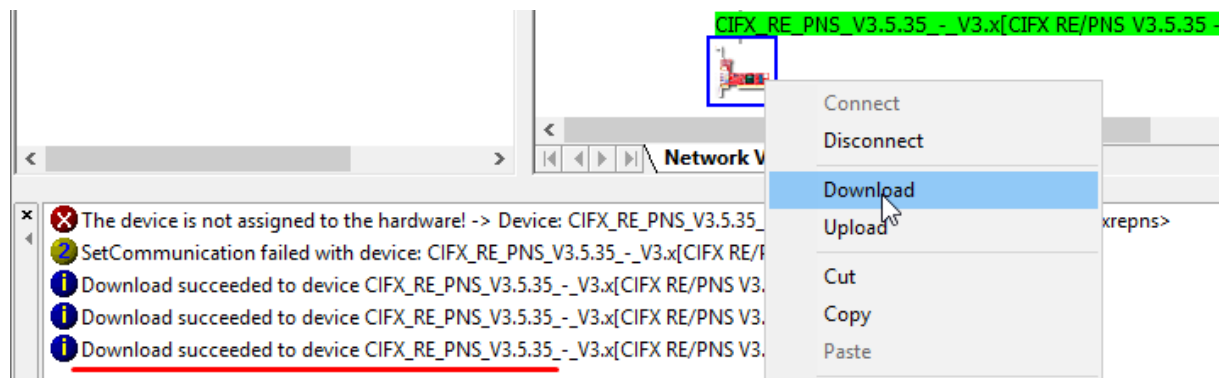


Figure 10 - Download settings to the Hilscher device.

3. If your master device has problem with connection with Hilscher card use following settings using Sycon.net application. In order to do this right-click on the card icon and select Configuration...

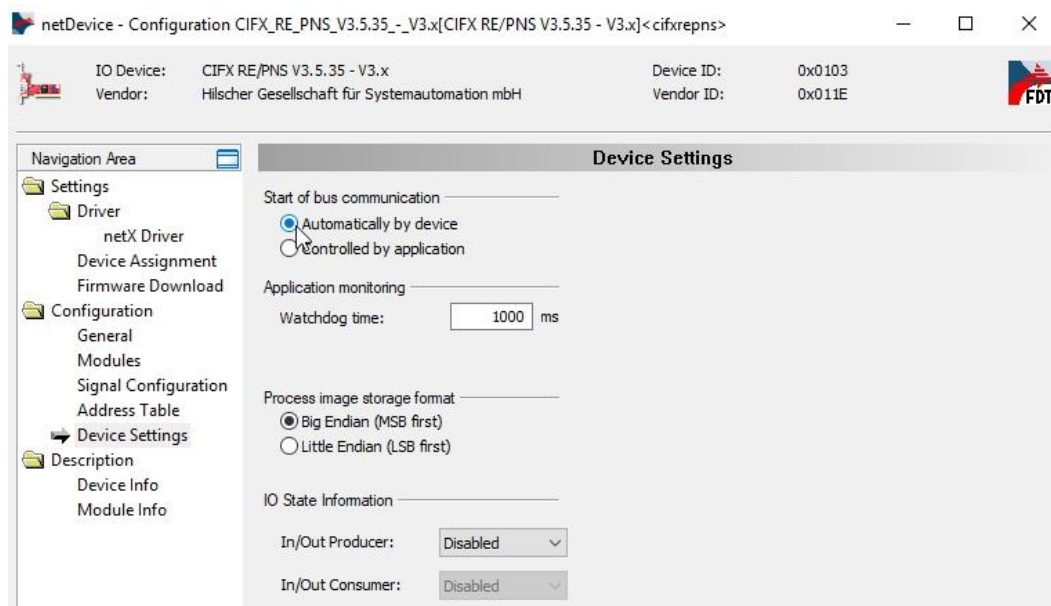


Figure 11 - Changing device settings.

4. After changes it may be necessary to restart ODMV3 service.

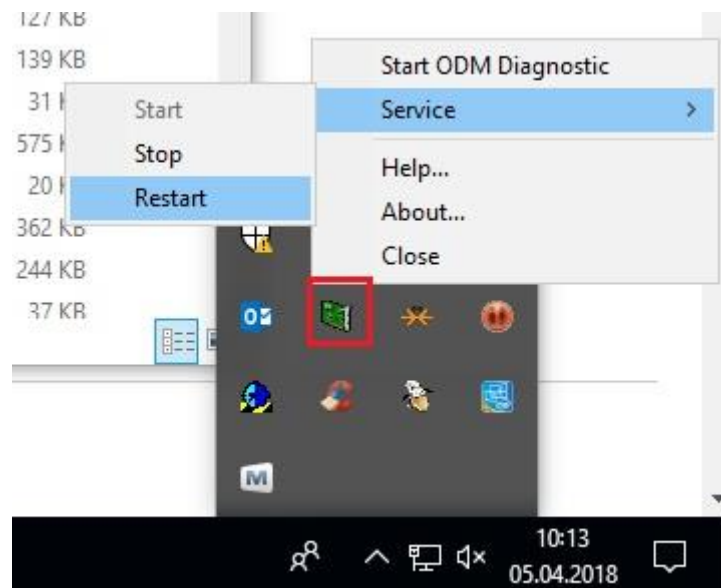


Figure 12 - Restarting ODM Service.

5. If none of the above advice has helped, please restart your computer.