ProfinetIO Controller

straton user guide – Rev. 11

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CP_R31_006_H

straton

Content

1. Install straton Editor and Runtime

Download and install from https://straton-plc.com/telechargements/

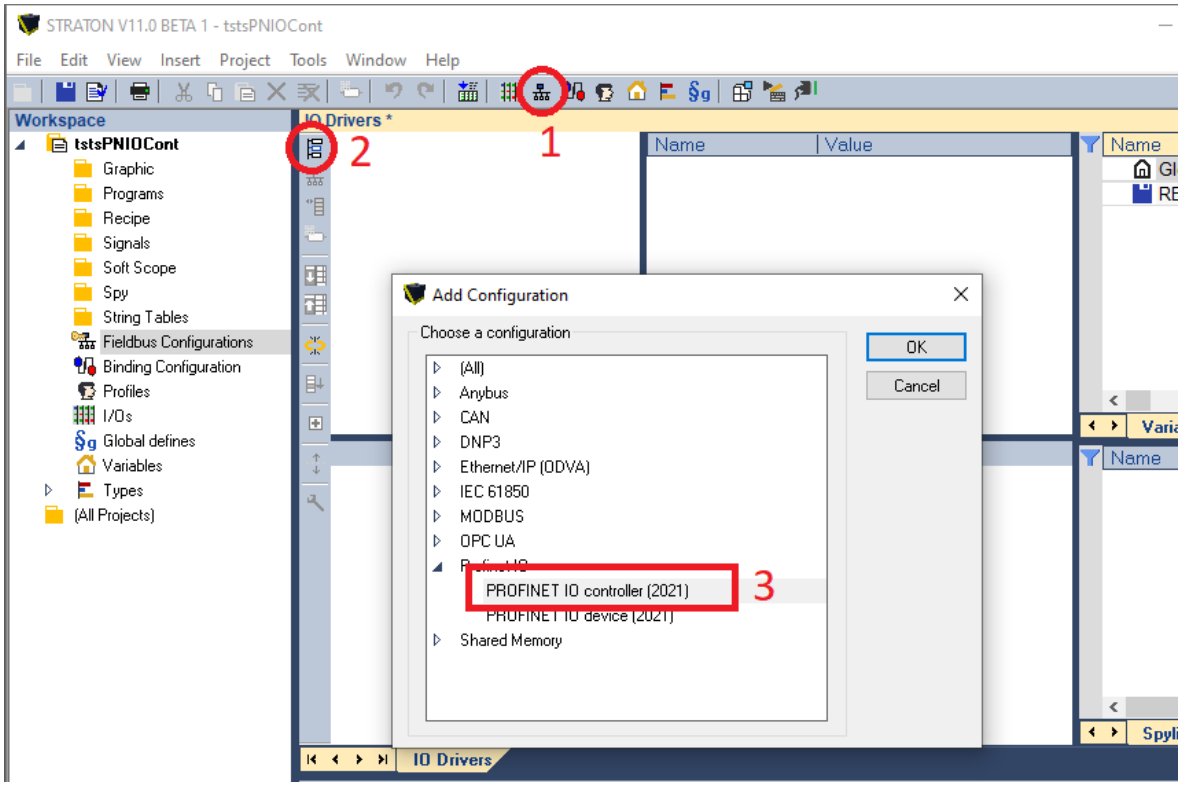
2. Install Profinet Driver

The Profinet protocol requires special access to the Ethernet board. On Linux, think to start the Runtime in administrator mode. On Windows, this is done through a COPA-DATA driver called "COPA-DATA Multiple Network Protocol Driver". This driver is installed by the product setup. This can be checked from the Windows Control Panel > Install/Uninstall a program.

3. Create a Profinet project

3.1. Insert Profinet driver

Open the IO Drivers window ( ) and insert the Profinet IO Controller driver ( )

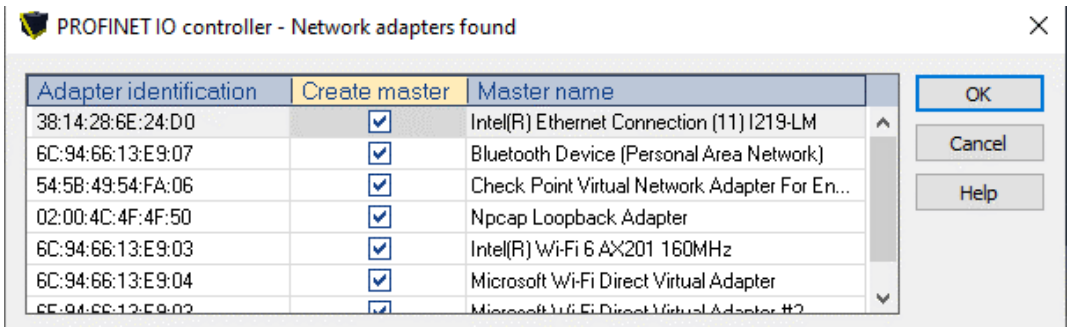


3.2. Configure the application

Depending on the Profinet IO Controller, this step is very important!

3.2.1. Profinet IO Controller application on a Windows runtime

If the Profinet Controller application is downloaded on a Windows runtime, then, doing a right-click on the configuration, select "Browse network adapters"



Select the Ethernet card to use, it will automatically fill the adapter identification in your configuration (adapter's MAC address).

3.2.2. Profinet IO Controller application on an external device

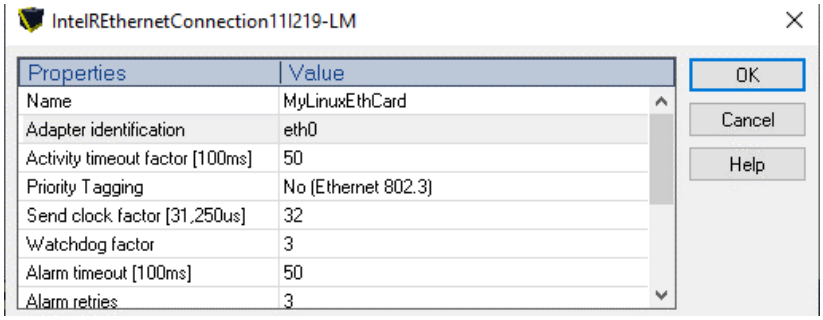
If the Profinet Controller application is aimed to run on an external device, then, choose to "Insert Master/Port" () in the configuration.

Choose a name for the Ethernet card of the PNIO Controller device.

Set the "Adapter identification". Depending on the device's OS, it can be, for example:

- Linux: `eth0`, `eth1`...
- VxWorks: `gei0`, `gei1`...
- QNX: `fxp0`...
- (Windows: MAC address of the Ethernet card)

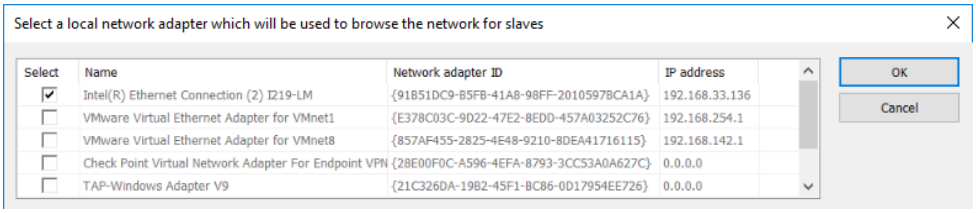
Most of the time, this parameter can be found typing "`ifconfig`" in the device's command window.



3.3. Browse for Profinet Device

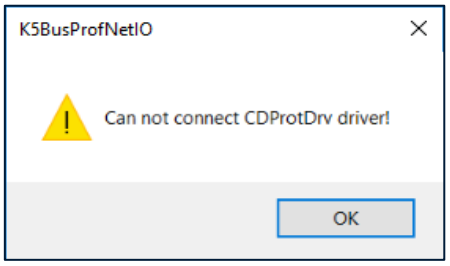
This operation aims to automatically search for connected PNIO Devices on the network. The "browser" will be your PC through its Ethernet card. It means that both the PC and the Device must be on the same network. It also means that this is totally independent of the overall application: your PC will check for connected device(s) and its(their) configuration, so it does the browse from its Ethernet card, but the final application can be on an external Linux PC with "eth1" as ethernet card, for example.

Doing a right-click on the second level of the configuration, select "Browse Network for Slave" and choose the Ethernet card of your personal computer.

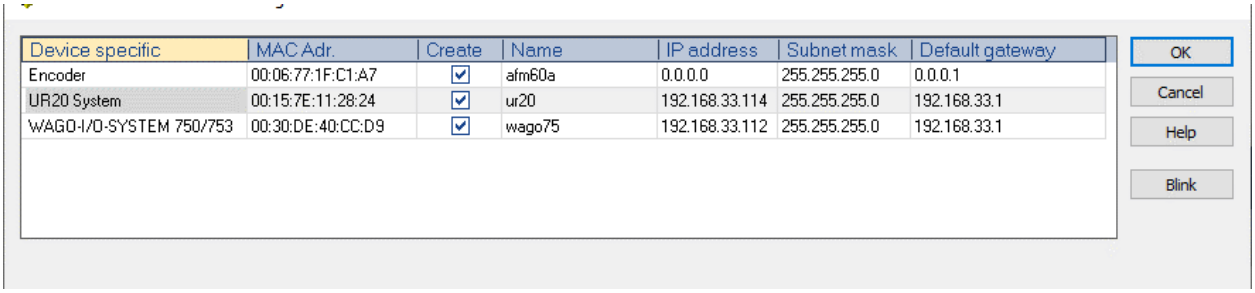


NOTE: The following window appears if the PROFINET driver is not installed on your PC or already in use.

("Can not connect to CDProtDrv driver")

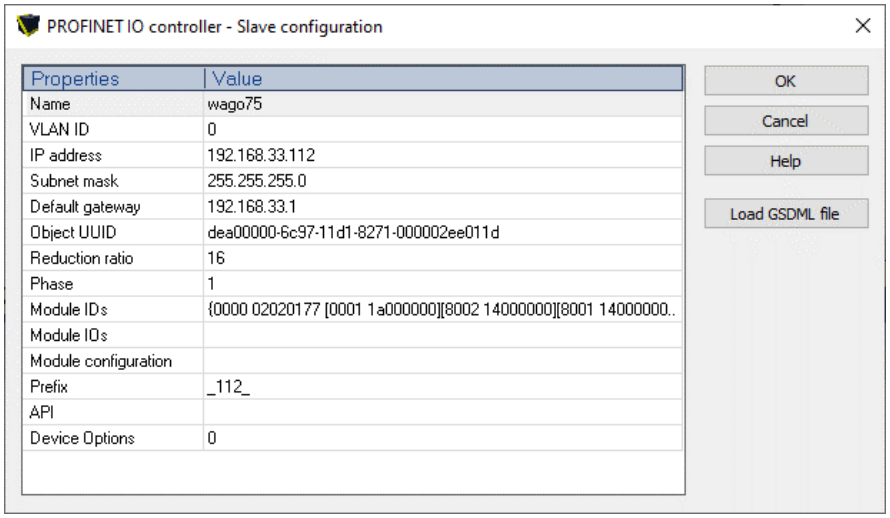


If the browse succeeded, select the device configuration you want to create. For each slave found, fill its IP address and, if this is not already done, give it a name:

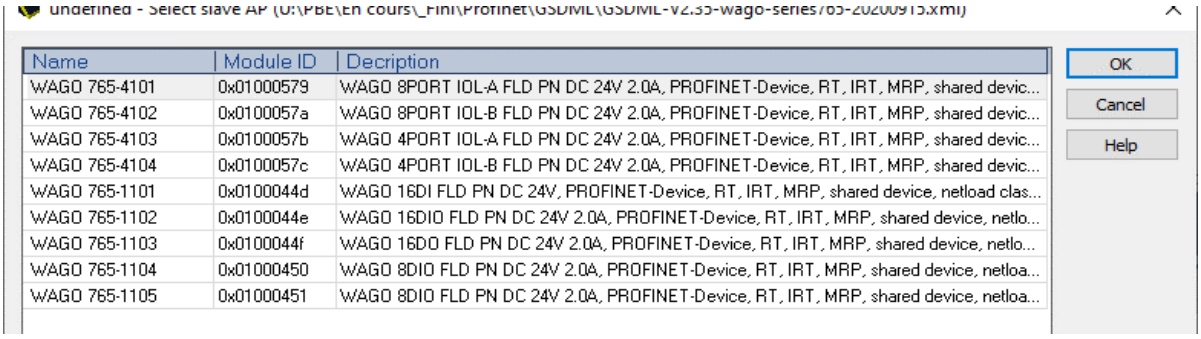


3.4. Device configuration

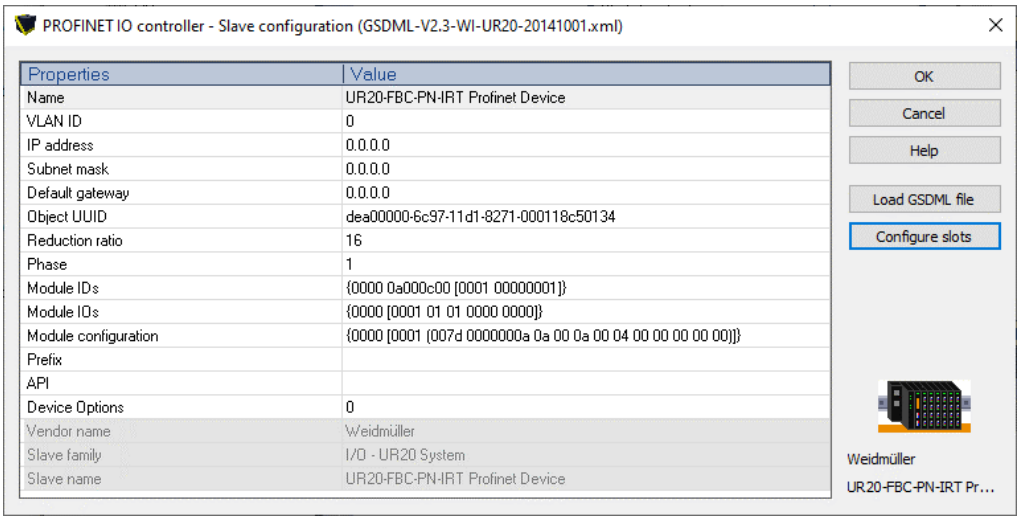
Double click on the slave device to configure it. Click on "Load GSDML file" and select the device's GSDML file:



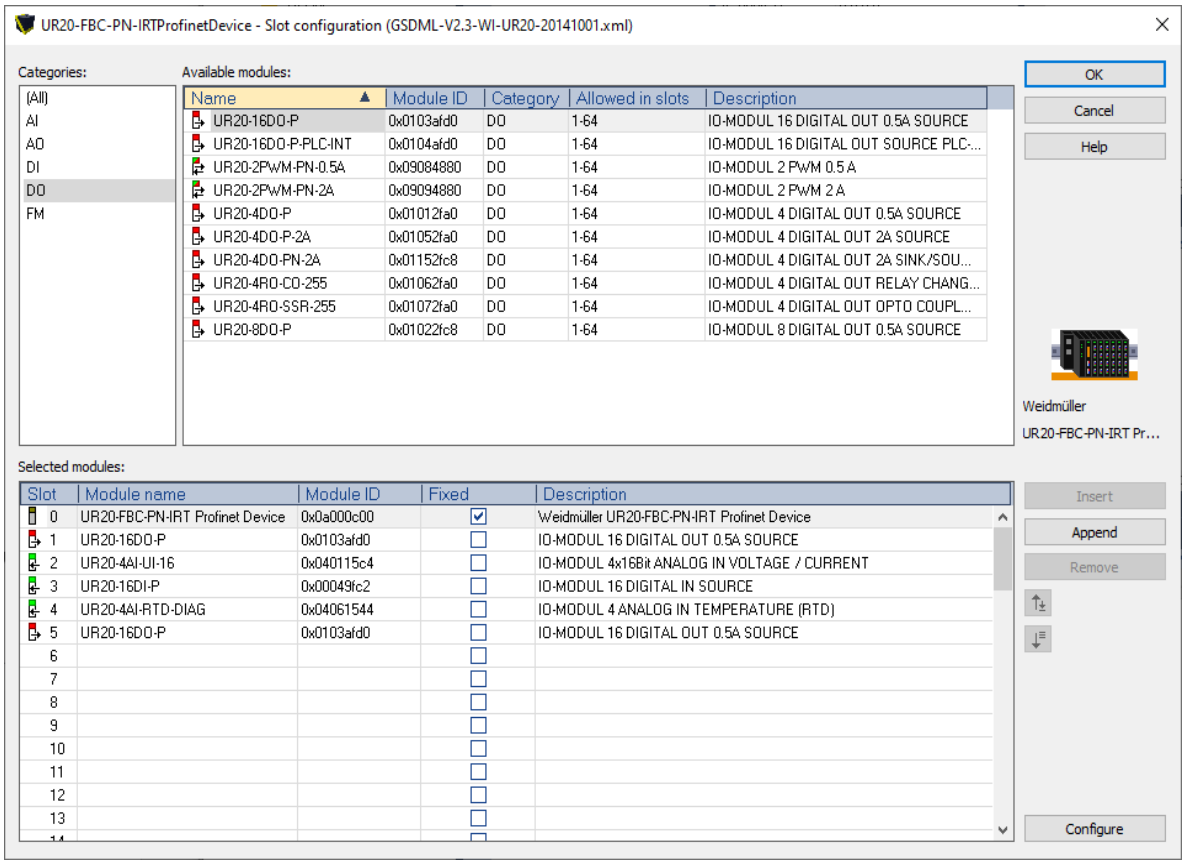
Sometimes, in the GSDML file, some devices are sharing the same Module ID for a different Module Name. In that case, the following window opens. Double click on a module's name to change it, if necessary.



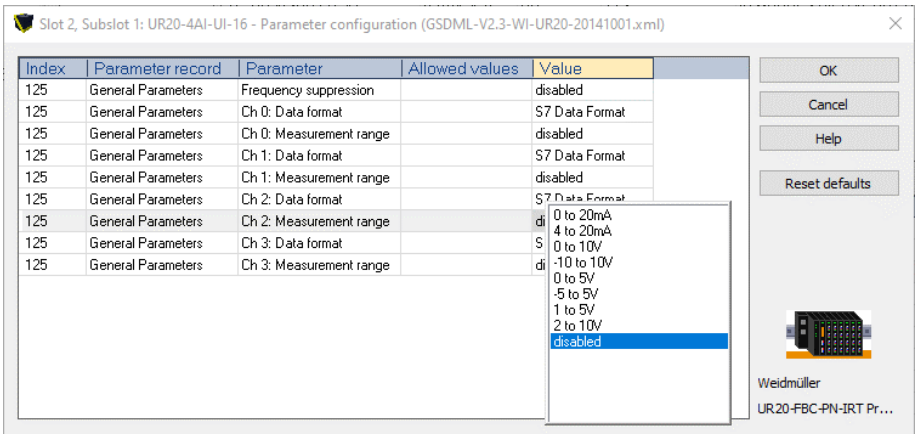
If needed or in the case of manual configuration, configure the slots of the device by clicking on the "Configure slots" button



A device is composed of several physical or virtual slots. The configuration in the Profinet Controller should correspond exactly to the Profinet Device configuration.



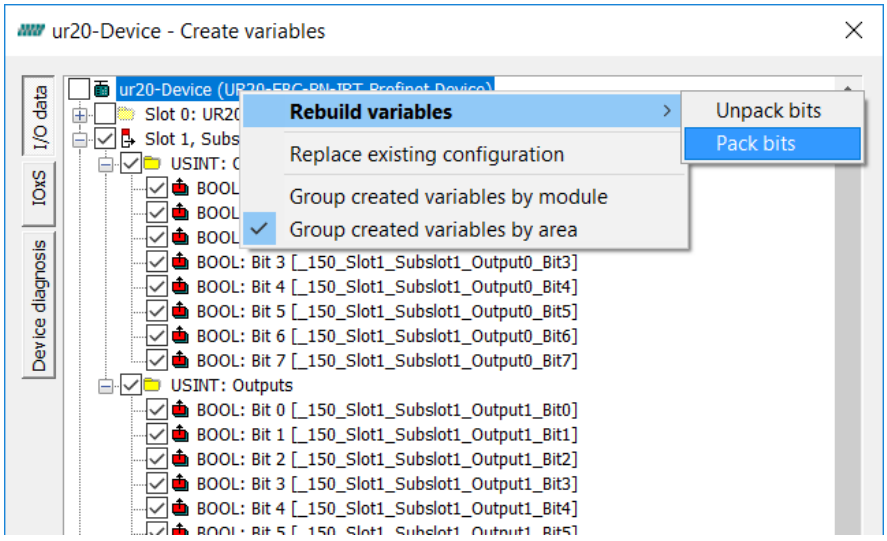
Some slots can be configured by double clicking on this line, or selecting the slot then clicking on the "Configure" button. In this case this type of window opens:



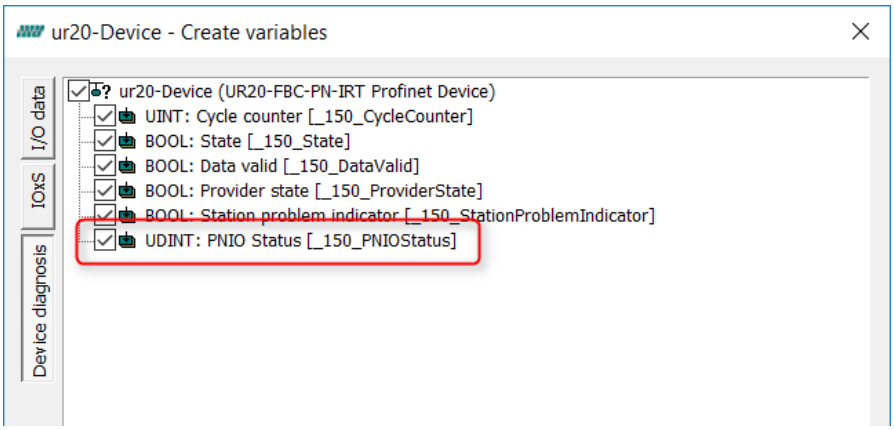
3.5. Create data and diagnostics variables

Right-click on the device and "Create variables" for I/Os and diagnosis.

It is possible to rebuild variables. For example, instead of creating 8 variables for each bit of an input data, one can create only one byte variable.



Since straton version 9.2, the Profinet IO Status, set in case of errors and displayed in the message output window, can be recovered as a diagnosis variable:



3.6. Load the application

Download the application to the straton runtime:

- Select the communication parameters in menu Tools/Communication Parameters
- Establish the connection through menu Project/Online

Result is:

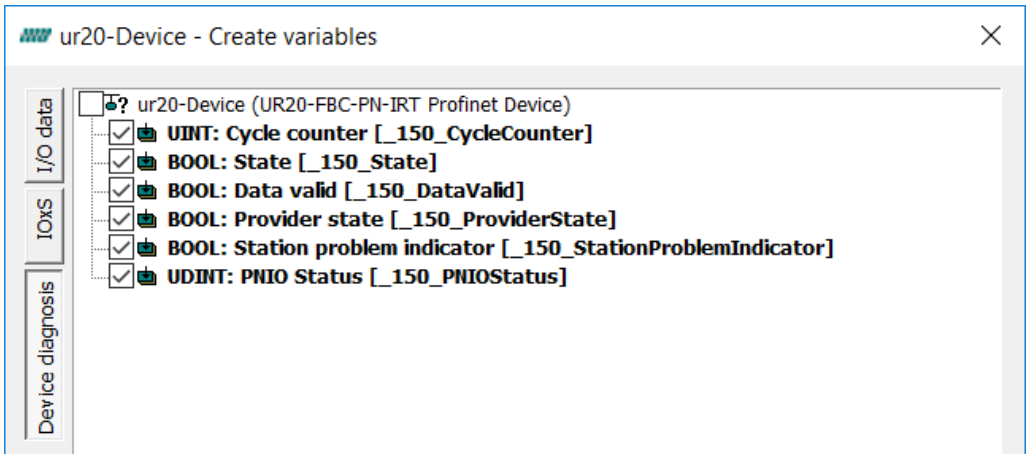
The download is successful and application starts correctly.

The straton runtime is not started or communication parameters are wrong.

The application is not yet downloaded or an error occurs during startup. More detail can be found in the output view.

4. Diagnostics data

Diagnostics data can be created for each Device module using the right mouse button on the Device > Create Variables > Device diagnosis.



The meaning of these variables is described in the Profinet standard. Here is a short summary:

CycleCounter: Counter for PROFINET cyclic messages

State: TRUE= connection is ready, FALSE = connection is down or passive

DataValid: TRUE if received data is valid

ProviderState: TRUE = Run, FALSE = Stop

StationProblemIndicator: TRUE = no problem. FALSE = this indicates a problem but does not necessarily mean that all data sent are invalid or that the connection to the slave is broken.

PNIOStatus: The Profinet IO status error, recovered as a variable in straton since version 9.2 (see the straton Online Help or the Profinet IO Device tutorial or the Profinet standard for more details and how to decode it)

5. Frequently Asked Questions

What does the different parameter of the configuration means?

Refer to the Editor's online help for more details

What are the common PNIO status meanings?

PNIO status	Check the specified setting
1C010003	Slave\ObjectUUID (correct GDML file)
DB81010A	Master\Activity timeout factor
DB81010B	Master\Controller name
DB81010C	Master\Controller name
DB810207	Master\RT-Class
DB81020A	Master\Send clock factor
DB81020B	Slave\Reduction ratio
DB81020C	Slave\Phase
DB81020F	Master\Watchdog factor
DB810210	Master\Watchdog factor
DB8103**	Slave\Module IDs,IOs
DB810407	Master\Alarm timeout
DB810408	Master\Alarm retries

How to decode the PNIO status?

Refer to the Editor's online help and/or to the Profinet standard for more details. The PNIO status is composed of four bytes (64 bits). Each of those have a specific meaning and some are dependent from each other.

Eg. ErrorCode1 (bits 8-15) have a different meaning depending on ErrorDecode's value (bits 16-23).

I received a message indicating the PNIO status changed but the variable still is equal to zero.

Since straton 10.0 this variable is updated also if the Device is offline. Before, this was not the case.

The Controller does not manage to connect to the Device?

Verify the name of the Device in your configuration.

If the device is also configured using straton then set the "Default station name" in the Profinet IO Device configuration.

Also think that only one Controller can be connected to a Device.

The application is downloaded but there is an error indicating that the Controller cannot find the Device.

It could occur if the connection delays are too short. In the Controller, configuration options can be checked to start even if the slave is not found, for example, so the application will start and the connection with the slave will be made automatically later (if it is possible).

After downloading the application to the Runtime, it indicates "Error opening ethernet socket".

On Windows, the Adapter Identification (second level of the configuration) must be the MAC address of the Ethernet card in use to connect to the device. On other OSes, it must be the card's name (eg. eth0).

The configuration cannot be read from the Device.

It could occur if the firewall blocks some PNIO packets, sent from the Device to the Controller, or if the network is badly configured (sometimes using a HUB instead of a SWITCH blocks the PNIO communications).

Some GSDML attributes are ignored by the Configurator and/or Driver. What are the supported Profinet specification versions?

The Profinet IO Controller driver has been developed according to PNIO version 2.0.

The GSDML parser has been developed according to the GSDML version 1.0.

It may happen that the Controller received Alarms (LOW or HIGH) from the Device. Just after, the communication is restarted. Why?

Eg. "*Received Alarm Notification Low / 4 RTC Frames missing / Disconnected*"

Since straton 9.4 the Controller can manage PNIO Alarms. Refer to the online help and to the PNIOGETALARM and PNIOACKALARM blocks' help.

The option "Manage alarms" must be checked on the second level of the PNIO Controller configuration.

If the application is not aimed to manage alarms or diagnosis, then try to deactivate it through the Device's configuration. Most of the time this is in the header module's parameters. Refer to the part 3.4 of this document for more details.

How to identify which device sent the alarm?

Since straton version 10.0 this is possible using the PNIOGETDEVNAME block. The input ID must be connected to the "Dst_endpoint" of the PNIOGETALARM block.

IMPORTANT: if the device is offline, the device name will be empty, even if the ID is correct.

Refer to the online help for more details.