Indu-Sol GmbH – Specialist in Industrial Networks

Agent Blond

User Manual

Diagnostic and service tools for PROFINET

PROFIBUS PROFINET INDUSTRIAL ETHERNET CAN DeviceNet SafetyBUS p ASi INTERBUS EMC WIRELESS

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Our **technical support** team can be contacted on +49 (0)34491 / 58 0 321 on weekdays between 7.30 am and 4.30 pm (CET). Or you can send us an e-mail to: support@indu-sol.com

Is your system down? You can reach our emergency service around the clock by calling: +49 (0)34491 / 580 0.

Inspection overview

Inspection date	Revision	Change(s)
14.07.2025	0	First version

W A R N I N G

This device may only be commissioned and operated by qualified personnel. Qualified personnel in the sense of the safety instructions in this manual are persons who are authorised to commission, ground and label devices, systems and circuits in accordance with safety engineering standards.

Improper use or configuration of the ***Agent Blond*** in the network can lead to serious physical injury and damage to property and material, also due to uncontrolled machine movements.

Table of contents

1 General information

Please read this document carefully from start to finish before you start installing and commissioning the device.

1.1 Overview of the *Agent Blond* - functional scope

Agent Blond combines the functions of a PROFINET measuring point with a simple PROFINET network analysis within the PLC. The following network parameters are determined:

- Global telegram gap (history / last minute)
- Global jitter (history / last minute)
- Station data (ID, MAC address, IP address, update time)
- Jitter station (history / last minute)
- Telegram gap station (history / last minute)

1.2 Scope of delivery

The scope of delivery includes the following individual parts:

- ***Agent Blond***
- 3-pole plug-in terminal block (power supply)
- 2-pole plug-in terminal block (Out for measuring device)

Please check the contents of your delivery for completeness before commissioning. If you have any questions, please contact our Technical Support team immediately before commissioning.

1.3 Safety instructions

Before commissioning the device, check that it is in perfect external condition. If you suspect damage, return the ***Agent Blond*** to your supplier immediately and do not use the appliance. Our technical support team will be happy to answer any questions you may have.

The ***Agent Blond*** was developed for use in PROFINET applications in accordance with Conformance Class A. For full support of the PROFINET standards, please also note the selection of the data cables used in accordance with the standard.

Always observe the technical specification of the device to ensure safe and optimal use. The device was developed for IP20 protection environments. Take suitable measures in the event of a different operating environment to ensure proper operation of the device.

Never open the housing. No serviceable parts have been installed. Unauthorised opening of the housing will invalidate any warranty claims.

2 Connections and status displays on the device

2.1 Device connections

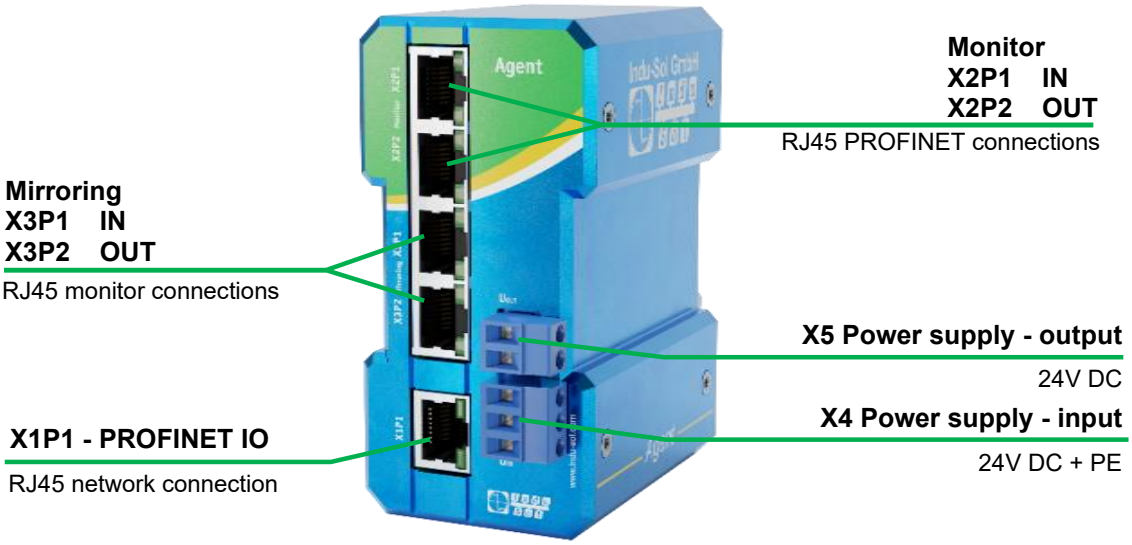

Figure 1: Device connections

2.2 Installation

The ***Agent Blond*** is designed for individual use in control cabinets of various types and can be mounted on a standard 35 mm DIN rail.

Only use the existing top-hat rail fastening for mounting the device or, if necessary, purchase appropriate spare parts to ensure adequate electrical contacting and the mechanical load capacity of the device.

2.3 Installation

The ***Agent Blond*** is mounted vertically in the switch cabinet on a 35 mm top-hat rail in accordance with DIN EN 60715.

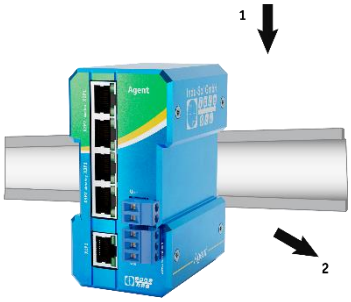

Figure 2: Mounting on the top-hat rail

The following distances to other modules must be maintained for correct installation:

- To the left and right: 20 mm
- Upwards and downwards: 50 mm

The installation and removal of the device is shown in Figure 3.

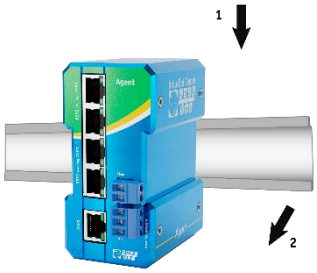

Figure 3: Removal from the top-hat rail

Do not install the ***Agent Blond*** directly next to devices that generate strong electromagnetic interference fields, e.g. transformers, contactors, frequency converters, etc.

Do not install the ***Agent Blond*** directly next to devices that generate a lot of heat and protect the device from direct sunlight to prevent unwanted heating. Protect the ***Agent Blond*** from additional heat radiation and observe the permitted storage and operating temperature range.

2.4 Power supply connection

Operate your ***Agent Blond*** with a nominal voltage of DC 24 V. Connect the power supply to the correspondingly labelled connection terminals of the supplied 3-pin terminal block adapter (+, -, PE) of X4. The PE contact should be connected to the local PE system. The listed labelling is also printed on the device.

Attention: Ensure correct polarity when connecting.

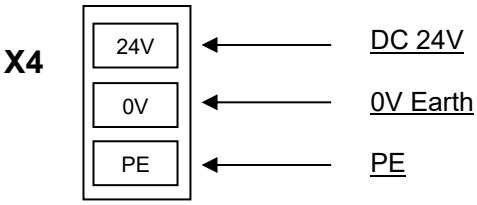

Figure 4: Assignment of terminal block X4

Measuring devices such as the PROFINET-INspektor NT can be connected to the terminals of X5 to supply them with 24V DC. A maximum current of 1A is permitted here, which must not be exceeded.

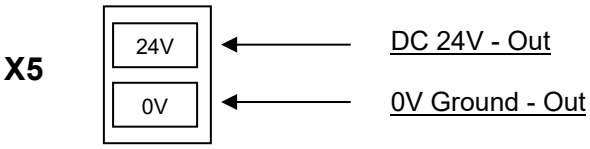

Figure 5: Assignment of terminal block X5

2.5 LED displays

There is a diagnostic LED on port X3P2.

The ports of X1 and X2 also have status LEDs.

The LEDs show the most important diagnostic information about the device and connection status of the ***Agent Blond*** in your PROFINET network (see Table 1).

LED	Status LED	Meaning
Status X3P2	Off	No supply voltage
	On	Power supply available
LED X1P1, X2P1/P2	Off	No link
	Flashing	Link + data exchange (flashing speed reflects link speed)
	On	Link

Table 1: LED- Functions

2.6 Connection to the PROFINET network

2.6.1 Integration into the link

For permanent network analysis, the ***Agent Blond*** is permanently integrated into the network between the PLC (controller) and the first I/O device or switch. For this purpose, the device is integrated into the system via the X2P1 and X2P2 sockets.

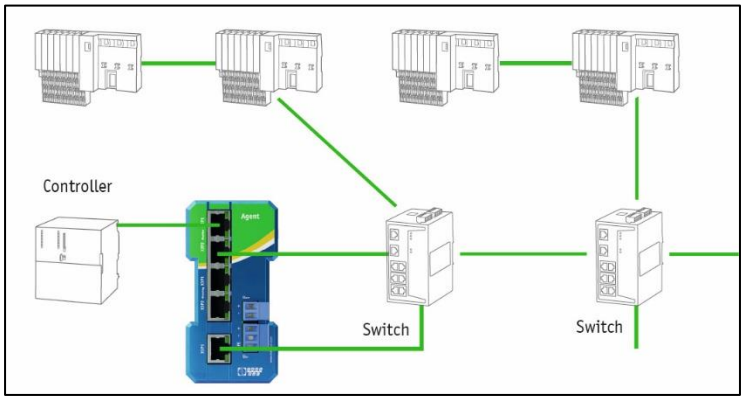

Figure 6: Integration into the network structure

An extended network analysis with the PROFINET-INspektor NT is possible via the mirror sockets. The IN and OUT sockets of the PROFINET-INspektor NT must be connected to the X3P1 and X3P2 sockets of the ***Agent Blond*** using patch cables.

The LAN connection X1P1 represents the Ethernet network connection to the ***Agent Blond***. This is a 100BASE-TX RJ45 interface. A standard Ethernet cable is used as the connection cable to a switch (not included in the scope of delivery). This access point can be used to display device information and to carry out firmware updates. However, this interface is primarily used for PROFINET communication with the controller and for sending I/O data. The ***Agent Blond*** is supplied from the factory without a network configuration. As with other PN devices, this must be assigned before use.

2.6.2 Media selection & connection

The ***Agent Blond*** has 5 ports for connecting RJ-45 copper cables.

When designing, selecting, assigning and assembling your data cable, pay attention to the applicable standards and fixed connections in the connector application in order to ensure the maximum possible cable length and cascading of network segments according to your media type (copper, fibre optic, etc.).

2.6.3 Cabling

To connect your ***Agent Blond*** via the existing RJ-45 data ports, use twisted pair cables of category 5 (Cat 5) or higher with a maximum cable length of up to 100 metres. We recommend the PROFINET RJ45 connectors from Indu-Sol to improve shielding.

3 Web application

The ***Agent Blond*** is equipped with a modern web interface that can be conveniently accessed from any web browser.

3.1 Preparations

Before using the web interface, install the ***Agent Blond*** in the network and make sure that the PC intended for configuring the device can access the switch via the web browser. The X1P1 connection is used to access the device. The ***Agent Blond*** and the client PC to be connected must be in the same IP address range and IP subnet. To do this, you must assign a corresponding IP address to your ***Agent Blond*** for the first time.

When the device is delivered, the following IP address, subnet mask and gateway are set:

- IP address: **0.0.0.0**
- Subnet mask: **0.0.0.0**
- Gateway: **0.0.0.0**

You can easily set your intended user addresses using the **Indu-Sol ServiceTool**. This is included in the scope of delivery or can be downloaded free of charge via the following link:
https://sdx.indu-sol.com/s/qLZS8QgyqKNw9YL

Our software is updated regularly. Please make sure that you have the latest version.

After installing and opening the software, establish a network connection from your computer to the ***Agent Blond*** port and scan the system with the ***Agent Blond*** search setting. You can then make the corresponding entries in the input mask and save them.

If you include the switch in a PROFINET system in the hardware configuration of the controller, the corresponding address settings will be made automatically.

3.2 Support and contact

After accessing ***Agent Blond***, you will be taken to the support and contact page. Here you will find all relevant contact information for Indu-Sol

3.2.1 Device information

The essential information about the device is displayed on this page. In addition to the serial number and MAC address for unique identification of the device, the firmware, framework and hardware version are also displayed here.

3.2.2 Use of open source licences

A list of the open source licences used is displayed here. Links are also provided to the homepage of the relevant software.

3.3 Firmware update

You can update the device's firmware here. Please only use firmware versions that you have received from Indu-Sol and that have been developed for the ***Agent Blond***. The device can also be restarted manually on this page.

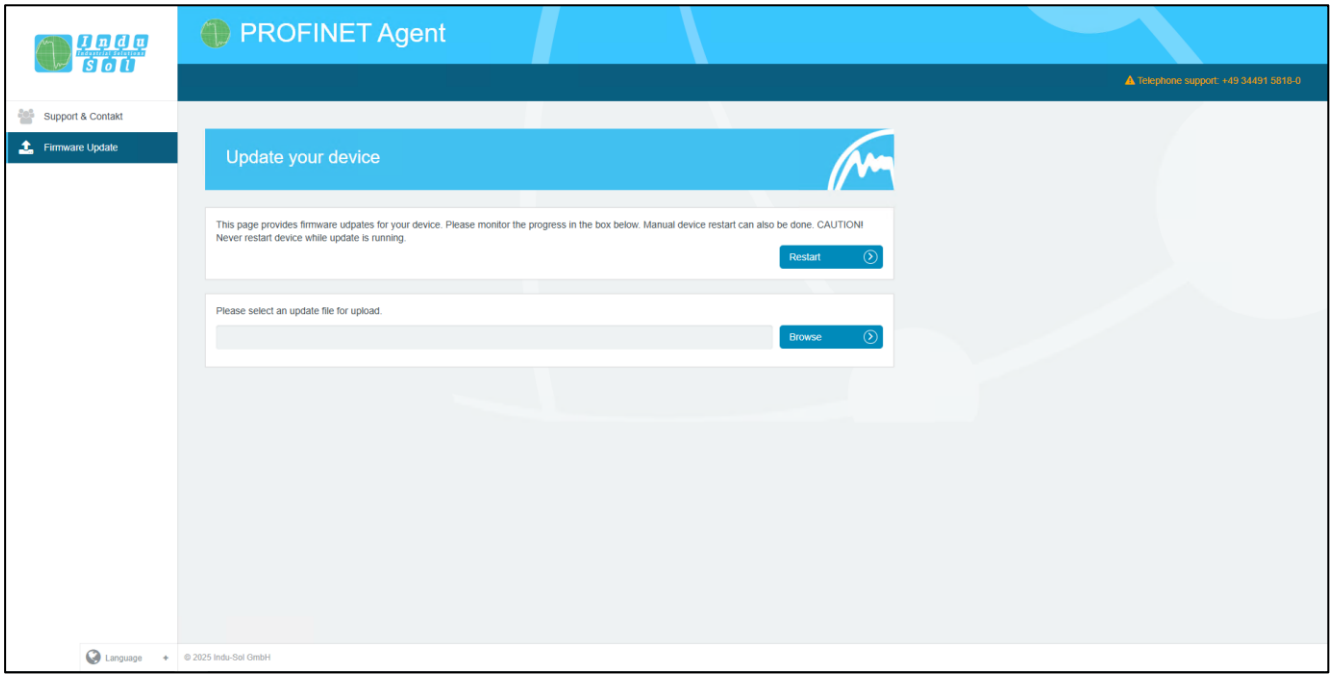

Figure 7: Firmware update

The firmware file is uploaded to the device. Before updating, check that you have selected the correct firmware image. The update file is selected via the "Browse" button.

- Upload: The firmware update is located on the computer currently in use and is transferred from there to the device.

Execution

Use the "Start update" button to carry out the action and confirm this in the window that opens. Please ensure that the firmware update can be carried out completely.

Important:

Refrain from the following actions while the firmware update is running.

- Do not disconnect the device from the power supply under any circumstances.
- Do not unplug or reconnect any network plugs.

A message will appear as soon as the update is complete. The device then restarts automatically.

3.4 Troubleshooting tips

- Check that the power supply is correct. The lower LED of X3P2 must light up.
- Check the Link/Act LEDs of the wired RJ45 sockets. When the connection is established, the link LEDs must light up or flash when data is being transmitted.

4 Integration into the PLC and function test

In order to use the diagnostic functions of the ***Agent Blond***, it must be integrated into the programming of the control system. The PN bit jammer can be used to generate telegram gaps in order to test the function of the ***Agent Blond***.

4.1 Integration into the PLC

The device can be set up in the TIA Portal using the GSDML file provided. This can be added in the project view via "Options" and "Manage general station description files (GSD)". The storage location of the GSDML file is selected as the source path before installation.

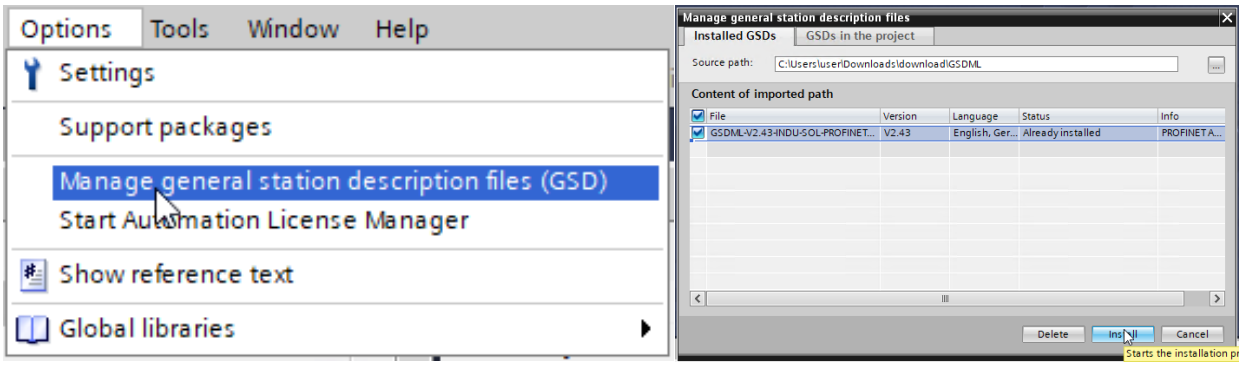

Figure 8: Installation of GSDML files in the TIA Portal

The according GSDML file is located in the Catalog under the following path: Other field devices -> PROFINET IO -> Network Components -> Indu-Sol -> Indu-Sol Agents -> PROFINET Agent

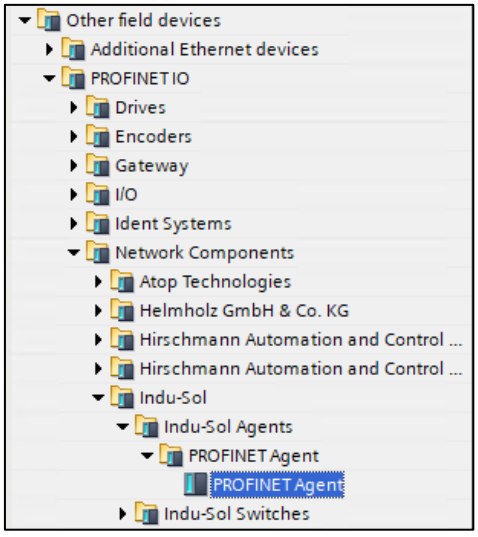

Figure 9: File path GSDML file

As is usual for a PN device, the IP address, PROFINET name and update time are assigned to the device. Threshold values for the use of a digital switching contact can be assigned under Module parameters.

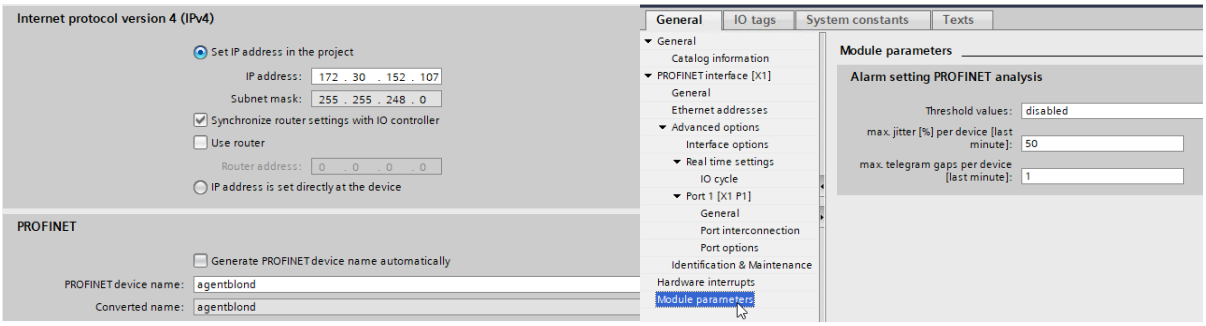

Figure 10: Configuration of the device in the TIA Portal

4.1.1 Use of cyclic I/O data

The analysis data from ***Agent Blond*** can be made available to the PLC as corresponding input addresses for further processing and evaluation. These input addresses contain information on global diagnostic data, such as the absolute number of telegram gaps, as well as device-specific data, such as the MAC address, IP address, and device-related diagnostic data. In addition to the input addresses, corresponding actions can be executed via the output addresses of ***Agent Blond***:

- New measurement: All diagnostic data and station data are deleted.
- Delete data: All diagnostic data are deleted.
- Device scan: The PROFINET system is scanned for accessible devices. This is necessary to determine the IP addresses of the devices.

Device overview

Module	Rack	Slot	I address	Q address	Type
PROFINET-Agent_1	0	0			PROFINET Agent
PN-IO	0	0 X1			PROFINET-Agent
Global diagnostic data_1	0	1			Global diagnostic data
Jitter Global [History]	0	1 Jitter Global [History]	320...321		Jitter Global [History]
Telegram gap Global [History]	0	1 Telegram gap Global [History]	322...323		Telegram gap Global [History]
Jitter Global [Last Minute]	0	1 Jitter Global [Last Minute]	324...325		Jitter Global [Last Minute]
Telegram gap Global [Last Minute]	0	1 Telegram gap Global [Last Minute]	326...327		Telegram gap Global [Last Minute]
New Measurement	0	1 New Measurement		195	New Measurement
Delete data	0	1 Delete data		196	Delete data
Device Scan (DCP)	0	1 Device Scan (DCP)		197	Device Scan (DCP)
Digital switching contact	0	1 Digital switching contact	328		Digital switching contact
Station data_1	0	2			Station data
Station ID	0	2 Station ID	329		Station ID
MAC address [0]	0	2 MAC address [0]	330		MAC address [0]
MAC address [1]	0	2 MAC address [1]	331		MAC address [1]
MAC address [2]	0	2 MAC address [2]	332		MAC address [2]
MAC address [3]	0	2 MAC address [3]	333		MAC address [3]
MAC address [4]	0	2 MAC address [4]	334		MAC address [4]
MAC address [5]	0	2 MAC address [5]	335		MAC address [5]
IP address [0]	0	2 IP address [0]	336		IP address [0]
IP address [1]	0	2 IP address [1]	337		IP address [1]
IP address [2]	0	2 IP address [2]	338		IP address [2]
IP address [3]	0	2 IP address [3]	339		IP address [3]
Update time	0	2 Update time	340...343		Update time
Station diagnostic data_1	0	3			Station diagnostic data
Jitter Station [History]	0	3 Jitter Station [History]	344...345		Jitter Station [History]
Telegram gap Station [History]	0	3 Telegram gap Station [History]	346...347		Telegram gap Station [History]
Jitter Station [Last Minute]	0	3 Jitter Station [Last Minute]	348...349		Jitter Station [Last Minute]
Telegram gap Station [Last Minute]	0	3 Telegram gap Station [Last Minute]	350...351		Telegram gap Station [Last Minute]

Figure 11: Process image in the TIA Portal

4.1.2 Uses of thresholds

To enable the ***Agent Blond*** to send messages to the PLC that can be evaluated via the diagnostic buffer in the event of telegram gaps or increased jitter, the threshold values must be activated and the corresponding limit values set in the project. In addition, the digital switch contact in the input addresses is set to 1 for the period during which the alarm is pending.

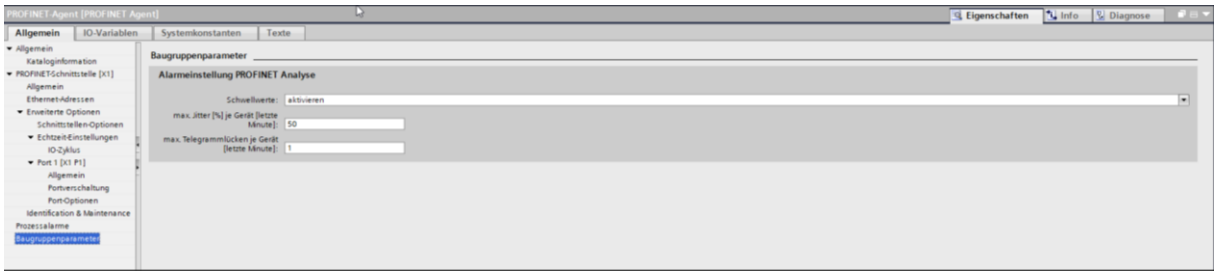

Figure 12: Threshold values in the TIA Portal

4.2 Integration of the function module

The following is a description of the implementation of a ready-made function block. This is used to read out the data provided by the ***Agent Blond***.

Download link for function module: https://sdx.indu-sol.com/s/MPsr63inTtXdr5f

The implementation is carried out via the "Libraries" and "Global libraries" tab. The library can be added here.

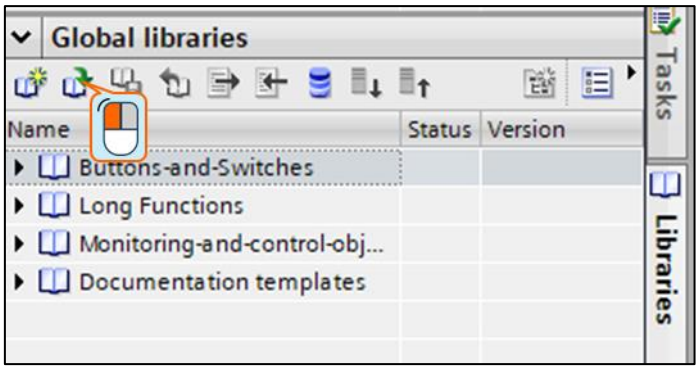

Figure 13: Inserting global libraries

The function block can be inserted directly into the project for use via drag & drop. The PLC data types used are generated automatically.

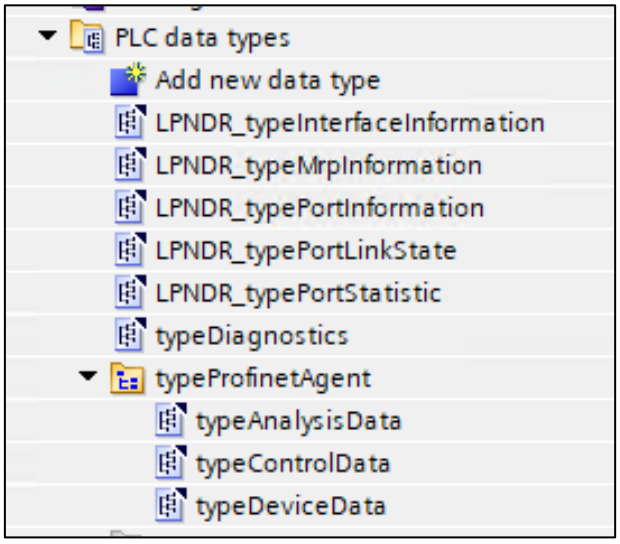

Figure 14: Automatically generated PLC data types

The data block used for a simple implementation can also be found in the copy templates.

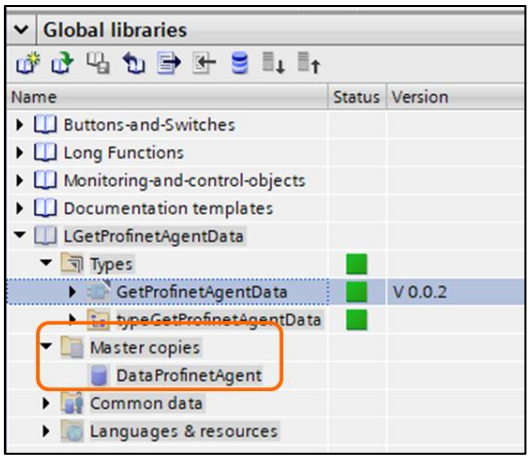

Figure 15: Data block copy template

In order for the function block to be able to read the corresponding data, knowledge of the correct hardware ID must be obtained. This ID can be found in the device view under the "System constants" tab under "PROFINET-Agent~Globale_Diagnosedaten_1". This ID is then entered at the "hwIdProfinetAgent" input when the function block is called in OB1.

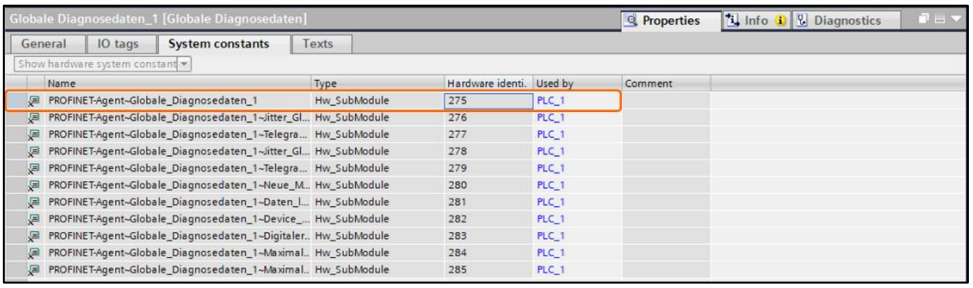

Figure 16: Hardware ID in system constants

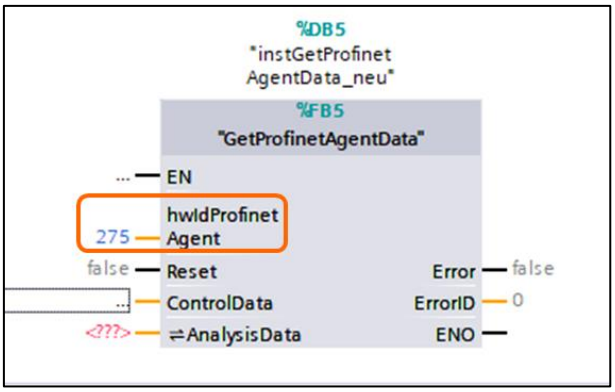

Figure 17: Hardware ID in function block call

In addition, the corresponding inputs and outputs are assigned the variables of the "DataProfinetAgent" data block from the copy templates.

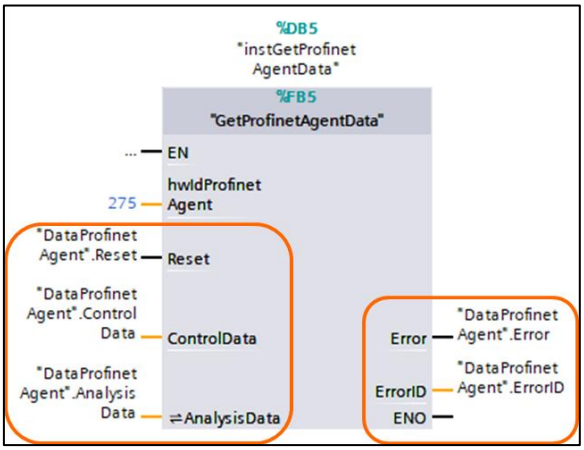

Figure 18: Creating the variables from the data block

The individual variables of the block can now be used for further programming. They can still be accessed via the name of the variable. Direct addressing is not possible as the "Optimized block access" attribute is activated for the data block. Further information on variables is provided in the next section.

DataProfinetAgent

		Name	Datentyp	Startwert
1		Static		
2		AnalysisData	"typeAnalysisData"	
3		telegramGapGloba..	UInt	0
4		affectedDevices	UInt	0
5		totalDevices	UInt	0
6		lastDeviceID	UInt	0
7		affectedDevicesList	Array[1..100] of UInt	
8		furthterAnalysisData	Struct	
9		deviceData	Array[1..100] of "ty...	
10		ControlData	"typeControlData"	
11		ID	UInt	0
12		sendData	Struct	
13		Error	Bool	false
14		ErrorID	DWord	16#0
15		Reset	Bool	false

Figure 19: Overview of variables in the data block

4.3 Variable information

The variables and parameters used are described here. Understanding this is essential for the correct use of ***Agent Blond*** and the function block.

4.3.1 Input parameters

The input parameters influence the behaviour of the block and provide the necessary information.

hwIdProfinetAgent (data type: HW_SUBMODULE):

Description: The unique hardware identifier of the Agent Blond I/O submodule.

Use: This value identifies the device from which the data is read. The correct identifier can be seen in the TIA Portal in the device view under the "System constants" tab.

Reset (data type: Bool):

Description: Resets the block to its defined initial state.

Use: A rising edge (from FALSE to TRUE) at this input resets the internal states completely. This ensures a complete reinitialisation of the hardware identifiers.

ControlData (data type: "typeControlData"):

Description: A data structure that contains control commands. These can be sent to the device.

Use: This structure can be used to send truth values, such as newMeasurement or deleteData, to the device in order to trigger actions on the device. The calling programme sets the corresponding truth values in the structure.

4.3.2 Output parameters

The output parameters return the results and the current status of the block.

Error (data type: Bool):

Description: A general, collective error.

Usage: This output is TRUE as soon as one of the error conditions exists. It is a direct logical result of (Status <> 0).

Status (data type: DWord):

Description: Represents a detailed status or error code in hexadecimal form.

Usage: A value of 0 indicates an error-free function. Another value represents a specific error (e.g. watchdog timeout, initialisation error, I/O access error).

Error ID	Meaning	Possible cause	
16#EEEE_0001	LOG2GEO Error	The hardware ID provided at the input is invalid or does not belong to a PROFINET device. The device cannot be reached or is incorrectly configured.	1. check the ID provided at the input. 2. ensure that the device is correctly configured in the device and network view 3. ensure that the device is physically connected to the network and is switched on.
16#EEEE_0101	GEO2LOG Error Slot 1	The submodule in slot 1 of the device could not be addressed. The configuration in the TIA portal does not match that of the device or the GSDML file.	1. compare the device configuration in the TIA portal with that of the device.

			2. ensure that the correct number of diagnostic submodules is configured in slot 1. 3. ensure that the GSDML file used matches the firmware version used.
16#EEEE_0102	GEO2LOG Error Slot 2	Same as for ...0101, but related to the submodules of slot 2	Same as ...0101, but for slot 2.
16#EEEE_0103	GEO2LOG Error Slot 3	Same as for ...0101, but related to the submodules of slot 3	Same as ...0101, but for slot 3.
16#EEEE_FFFF	Watchdog timeout	The block does not receive any new data from the device. The index for reading out the device (lastDeviceID) has not changed for a certain duration. The duration is specified at the WatchdogTime input.	1. checking the network connection of the device. 2. checking the device status (e.g. via the web interface or status LEDs). 3. analysing the PROFINET network that is being monitored. There may be a complete failure of the network. 4. check the diagnostic buffer of the control unit. There may be communication problems with the device.

4.3.3 Input & output parameters

These parameters are both read and written by the block.

AnalysisData (data type: "typeAnalysisData"):

Description: The central data structure that contains all analysis and diagnostic data collected by the device

Use: As an IN_OUT parameter, a variable of this data type must be created in a global data block (DB) and attached to it. The block then reads and writes the data directly within the DB.

Content: This structure contains, among other things

deviceData: An array containing the detailed data for each individual PROFINET device.

totalDevices: The complete number of recognised devices.

affectedDevices: The number of devices with errors.

affectedDevicesList: A sorted list of the IDs of the faulty devices.

And other global diagnostic data.

4.4 Function test

Telegrams can be influenced by various factors. If the influences are strong enough, the telegram is destroyed and an error telegram is generated. The switch rejects these error telegrams and telegram gaps are created. The ***Agent Blond*** records the telegram gaps.

The PN Bit Destroyer can be used for simulation and tests in order to generate error telegrams and thus telegram gaps as simply as possible.

To put the PN Bit Destroyer into operation, it must first be supplied with power. It is then integrated into the connection of a switch and a PN device. In most cases, the IN side must point to the device and the OUT side to the switch. In some cases, such as installation between two switches, the bit jammer may have to be inserted in the other direction. The signal is disturbed on wires 1 and 2. If, for example, the autocrossing function is activated, the data transmitted on the cores may be swapped. If installed incorrectly, the PN Bit Destroyer would only destroy the requests from the control unit instead of the responses from the device. If the PN Bit Destroyer is installed correctly, the rotary knob can be carefully turned clockwise until telegram gaps can be recognised with the ***Agent Blond***.

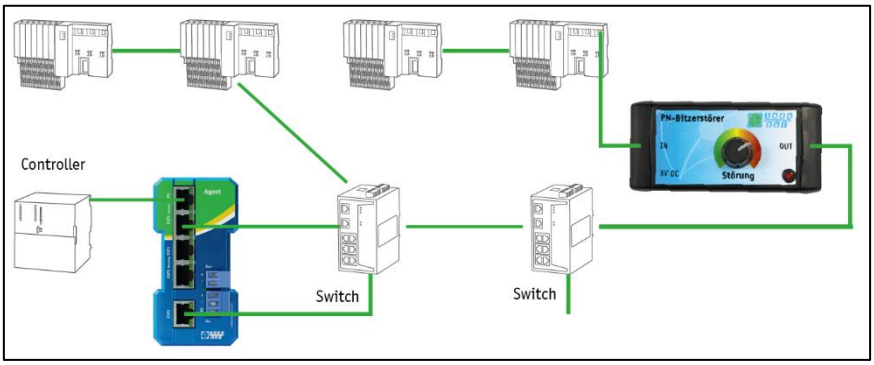

Figure 20: Integration of the bitz jammer

5 Technical specifications

Network connections	5 x 100 Mbit/s RJ45
Power supply	24 V DC
Voltage tolerance	±10 %
Current consumption	Maximum 150 mA
Power consumption	Maximum 4 W
Output voltage	24V DC (maximum 1 A)
Dimensions (HxWxD)	105 mm x 53 mm x 92 mm
Weight	0.345 kg
Housing	Aluminium, anodised
Storage temperature	-20 °C ... 70 °C
Operating temperature	5 °C ... 55 °C
Humidity	Humidity 10 % ... 90 % RHD non-condensing
Protection class	IP20
Mounting	35 mm DIN top-hat rail
LED display	Port LEDs / power supply
Firmware update	from local PC

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Wir sind zertifiziert nach DIN EN ISO 9001:2015