ENGLISH

Anybus® X-gateway™ PROFIBUS Master Interface

NETWORK GUIDE

SCM-1202-104
Version 1.1
Publication date 2023-06-02

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Contact Information

Postal address:
Box 4126
300 04 Halmstad, Sweden

E-Mail: info@hms.se

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1. Preface

1.1. About This Document

This document describes how to configure and use the Anybus X-gateway PROFIBUS Master Interface.

For additional documentation and software downloads, FAQs, troubleshooting guides and technical support, please visit www.anybus.com/support.

1.2. Document Conventions

Lists

Numbered lists indicate tasks that should be carried out in sequence:

1. First do this
2. Then do this

Bulleted lists are used for:

- Tasks that can be carried out in any order
- Itemized information

User Interaction Elements

User interaction elements (buttons etc.) are indicated with bold text.

Program Code and Scripts

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Program code and script examples
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Cross-References and Links

Cross-reference within this document: Document Conventions (page 1)

External link (URL): www.anybus.com

Safety Symbols

DANGER
Instructions that must be followed to avoid an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Instructions that must be followed to avoid a potential hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION
Instruction that must be followed to avoid a potential hazardous situation that, if not avoided, could result in minor or moderate injury.

IMPORTANT
Instruction that must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.

Information Symbols

NOTE
Additional information which may facilitate installation and/or operation.

TIP
Helpful advice and suggestions.

1.3. Document-specific Conventions

The following conventions are used specifically in this document:

- Hexadecimal values are written as NNNNh (the suffix h indicates hexadecimal notation).
- 16 and 32 bit values are stored in Motorola (big endian) format unless otherwise stated.

1.4. Trademarks

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2. Description

2.1. Overview

The Anybus X-gateway PROFIBUS Master Interface has complete PROFIBUS DP Master functionality according to IEC 61158. The PROFIBUS master interface allows up to 125 PROFIBUS slaves to exchange data with another network.

The interface exchanges data via two memory buffers:

Input Buffer	Contains data coming from the PROFIBUS slaves.
Output Buffer	Contains data going to the PROFIBUS slaves.

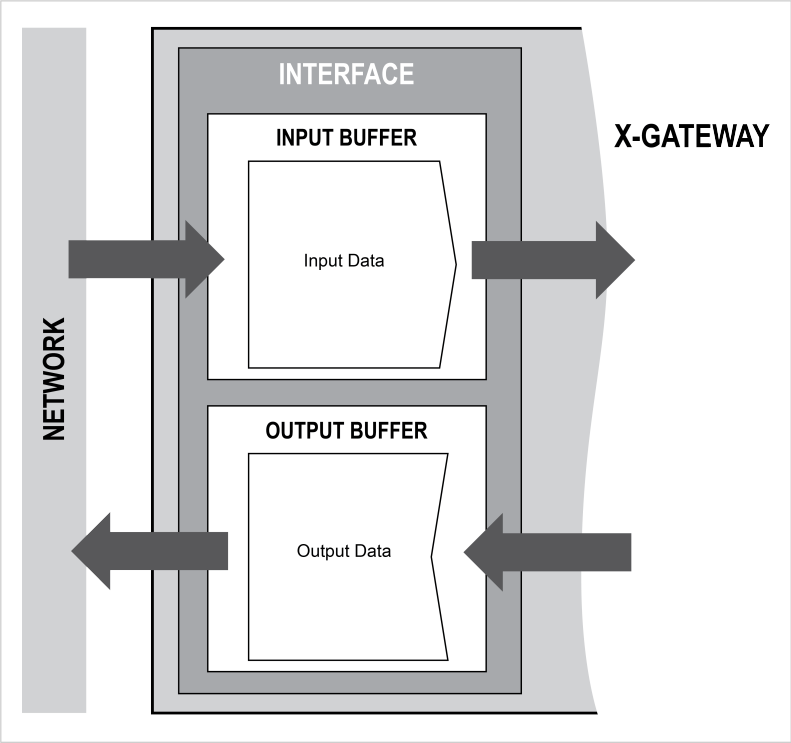


Figure 1. Data flow

The PROFIBUS master interface can exchange up to 512 bytes of I/O data in each direction. The actual byte sizes of input and output data are set in the network configuration created with a PROFIBUS network configuration tool such as Anybus NetTool for PROFIBUS.

The output data area can optionally include general status information from the PROFIBUS network. See the Anybus X-gateway User Manual for more information.

3. Installation

3.1. Connectors and Switches

IMPORTANT
This product contains parts that can be damaged by electrostatic discharge (ESD). Use ESD prevention measures to avoid damage.

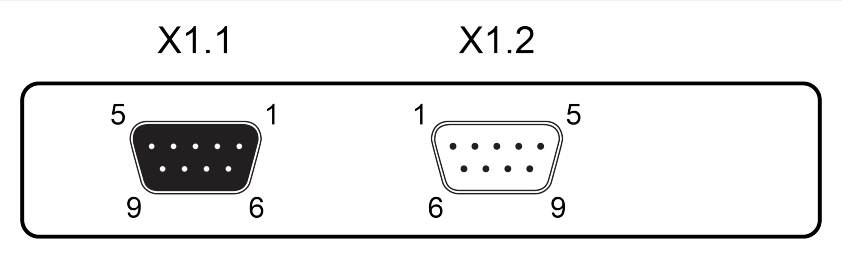


Figure 2. PROFIBUS master adapter interface

PROFIBUS Connector X1.1 (female 9-pin D-sub)

If the node is the last on a bus segment, use a PROFIBUS connector with built-in terminating resistors.

Pin	Signal	Description
1	-	(reserved)
2	-	(reserved)
3	Line B	Positive RS-485 RxD/TxD
4	RTS	Request To Send
5	GND BUS	Isolated signal ground (RS-485)
6	+5V BUS	+5 V (RS-485)
7	-	(reserved)
8	Line A	Negative RS-485 RxD/TxD
9	-	(reserved)
Housing	Shield	Connected to PE

PROFIBUS Configuration Connector X1.2 (male 9-pin D-sub)

The PROFIBUS configuration connector is used to connect a computer to the master interface for configuration. A null modem cable with female 9-pin D-sub connectors is required.

Pin	Signal	Description
1	-	(reserved)
2	RS-232 Rx	RS-232 receive data
3	RS-232 Tx	RS-232 transmit data
4	-	(reserved)
5	GND	Signal Ground
6	DSR	(reserved)
7	-	(reserved)
8	-	(reserved)
9	-	(reserved)
Housing	Shield	Connected to PE

3.2. LED Indicators

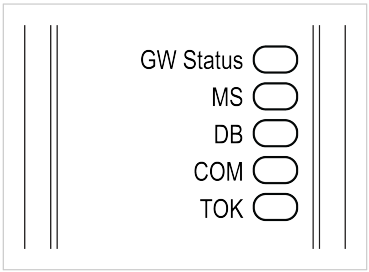


Figure 3. PROFIBUS master interface LED indicators

The GW Status LED indicates the status of the X-gateway. The other LEDs indicate network communication and interface status.

LED	Indication	Meaning
GW Status	Off	No power
	Green	Gateway running
	Red	Communication error
	Red, flashing	Network interface error
MS	Off	Offline
	Green	Operating mode
	Green, flashing	Clear mode
	Red	Stop mode
DB	Off	No database downloaded
	Green	Database OK
	Green, flashing	Database download in process
	Red	Database invalid
COM	Off	No data exchange
	Green	Data exchange with all configured slaves
	Green, flashing	Data exchange with at least one slave
	Red	Bus control error
TOK	Off	Master does not hold the token
	Green	Master holds the token

3.3. Installation Overview

Prerequisites

The following items are required for installation:

- USB cable
- PROFIBUS cable
- Null modem cable
- PROFIBUS network configuration tool
- GSD files for the slaves on the PROFIBUS network

The free Windows-based PROFIBUS network configuration tool Anybus NetTool for PROFIBUS can be downloaded from www.anybus.com/support.

Basic installation steps

Some steps are optional depending on your actual installation and method of configuration.

1. Connect the PROFIBUS master interface to the network.
2. Connect a computer to the USB connector.
3. Connect a computer to the PROFIBUS configuration connector using a null modem cable.
4. Power on the gateway.
5. Install the GSD file in the PROFIBUS network configuration tool and configure the PROFIBUS network.
6. Configure the data exchange options for the PROFIBUS master interface and the other network interface in Anybus Configuration Manager.

4. Configuration

4.1. Anybus Configuration Manager

The data exchange between the interfaces in the Anybus X-gateway is configured using the Windows-based configuration tool Anybus Configuration Manager, which can be downloaded from www.anybus.com/support.

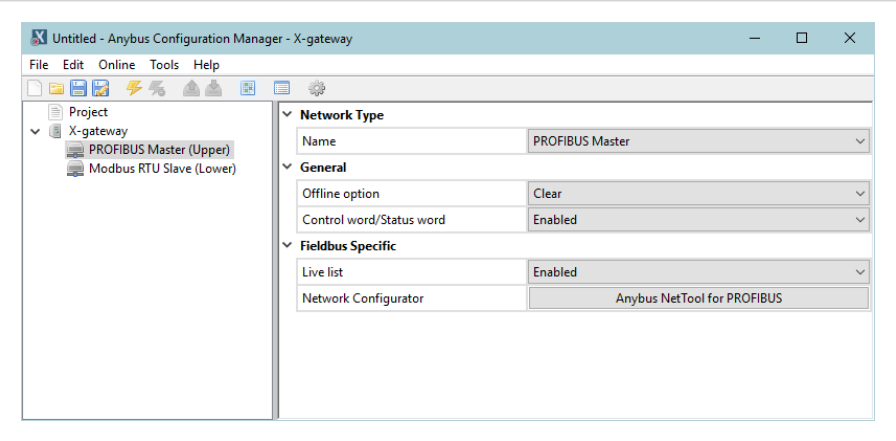


Figure 4. Anybus Configuration Manager

General Settings

Offline option	The action to perform if the network goes offline. The gateway can either freeze (keep the current value) or clear (set to zero) the data from the offline network.
Control word/Status word	Enables/disables representation of the Control/Status word.

Fieldbus Specific Settings

Live list	Enables/disables the Live List.
Network Configurator	If Anybus NetTool for PROFIBUS is installed it can be launched by clicking here.

4.2. Live List

The Live List holds bit coded status information for PROFIBUS slaves 0-63.

A set bit indicates that the corresponding slave is in data transfer, a cleared bit indicates that the slave is not exchanging data.

Note that the master exchanges data with slaves 64 ... 125 even though the slaves are not represented in the Live List.

4.3. Network Configuration Example

In this example a simple PROFIBUS network has been created using the free Windows-based network configuration tool Anybus NetTool for PROFIBUS. The network consists of 3 slaves and an Anybus X-gateway PROFIBUS Master Interface acting as master.

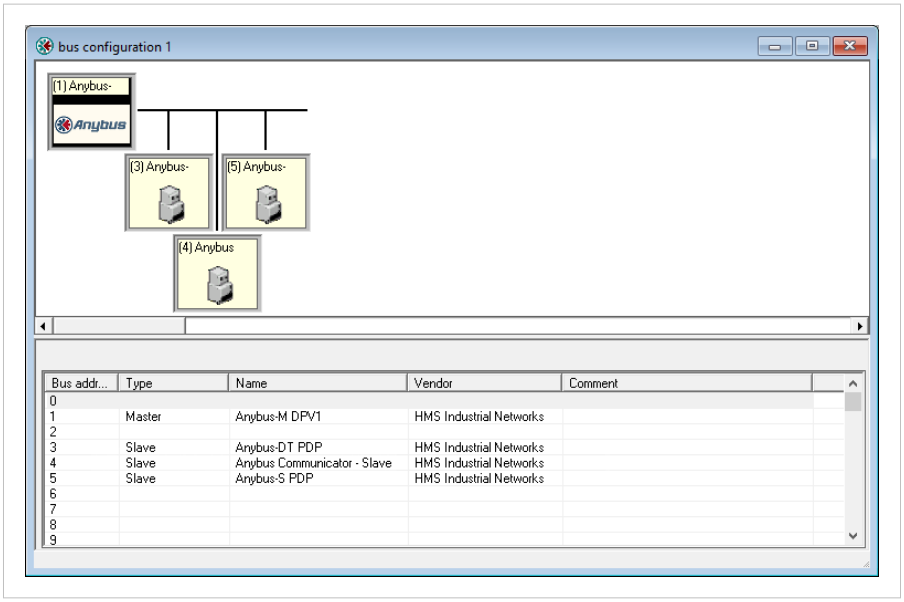


Figure 5. Example network in Anybus NetTool for PROFIBUS

Node	Slot	Input data size	Output data size
0 (master)			
3	1	128 bytes	128 bytes
	2		32 bytes
4	1		32 bytes
5	1	32 bytes	
	2		64 bytes

The slave I/O addresses overview window in NetTool shows the resulting slave I/O map:

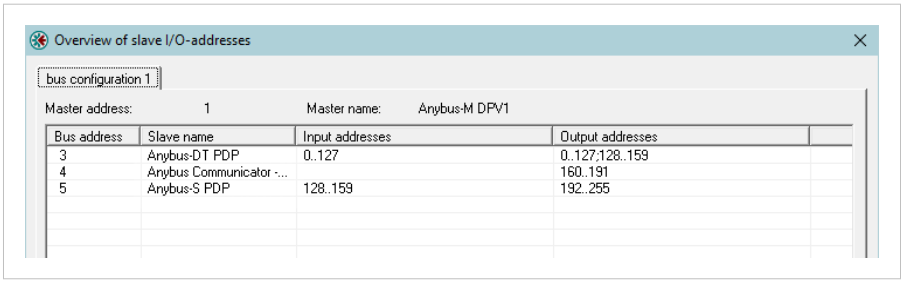
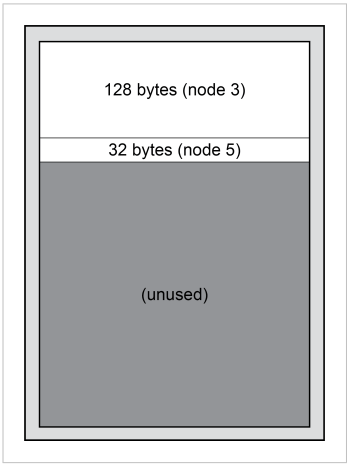
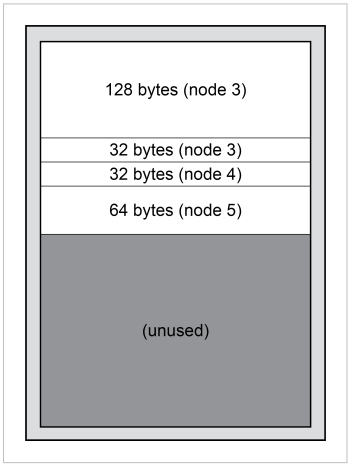


Figure 6. Slave address overview in Anybus NetTool

Node	Input address range	Output address range
3	0... 127	0... 127 128... 159
4	-	160... 191
5	128... 159	192... 255

Note that the actual input/output addresses defined in the I/O map are the ones that will be used on the other end.

The slave I/O map is also reflected in the input and output data exchange buffers of the PROFIBUS master interface:

Slave Input Data	Slave Output Data
	

Anybus NetTool for PROFIBUS can be downloaded from www.anybus.com/support, where you will also find additional documentation and configuration examples.

5. Technical Data

5.1. Technical Specifications

PROFIBUS functionality	• Complete Profibus DP Master functionality according to IEC 61158 • Optional Live List of the active status of the connected slaves
Maximum number of slaves	125
Maximum I/O data	512 bytes in each direction
Supported baud rates	Automatic baudrate detection up to 12 Mbit/s
Configuration method	Anybus Configuration Manager via serial port (RS-232)
PROFIBUS connector	1 x D-sub 9-pin female
Configuration port	1 x D-sub 9-pin male