

X-gateway Interface Addendum **FIP IO Slave**

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Rev: 2.00



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Important User Information

This document is intended to provide a good understanding of the functionality offered by the Interface described here.

The reader is expected to be familiar with high level software design, and communication systems in general. The use of advanced interface-specific functionality may require in-depth knowledge of networking internals and/or information from the network specifications. In such cases, the persons responsible for the implementation of this product should either obtain the necessary specifications to gain sufficient knowledge, or alternatively limit the implementation in such a way that this is not necessary.

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Trademark Acknowledgements

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WARNING: This is a class A product. in a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

ESD Note: This product contains ESD (Electrostatic Discharge) sensitive parts that may be damaged if ESD control procedures are not followed. Static control precautions are required when handling the product. Failure to observe this may cause damage to the product.

Table of Contents

Preface	About This Document	
	How To Use This Document	P-1
	Important User Information	P-1
	Related Documents.....	P-2
	Document History	P-2
	Conventions & Terminology.....	P-3
	Support	P-3
Chapter 1	About the FIPIO Slave Interface	
	General Description.....	1-1
	Features.....	1-1
	Overview	1-2
	<i>Network Status LEDs</i>	1-2
	<i>Connectors and Switches</i>	1-2
Chapter 2	Installation and Configuration	
	Configuration Switches	2-1
	Gateway Config Interface	2-2
Chapter 3	Data Exchange	
	General Information.....	3-1
	Input Data (Gateway to FIPIO)	3-2
	Output Data (FIPIO to Gateway).....	3-2
Appendix A	Technical Specification	
	FIPIO Interface Details	A-1
	FIPIO Connector Pinout.....	A-1

P. About This Document

P.1. How To Use This Document

This document describes network specific features and procedures needed when operating the FIP IO Slave Interface for the Anybus X-Gateway. For general information and operating instructions for the Anybus X-Gateway, consult the Anybus-X Generic Gateway User Manual.

The reader of this document is expected to be familiar with FIP IO networking technology, and communication systems in general.

For further information, documentation etc., please visit www.anybus.com

P.2. Related Documents

Document	Author
Anybus-X Gateway User Manual	HMS
FIP IO Slave Interface, Installation Sheet	HMS

P.3. Document History

Revision List

Revision	Date	Author	Chapter	Description
1.00	2004-04-02	PeP	All	First release
1.01	2007-07-02	PeP	All	Minor update
1.02	2008-05-21	PeP	2	Minor update
2.00	May 2014	SDa	All	New hardware and Anybus Configuration Manager.

P.4. Conventions & Terminology

The following conventions are used throughout this document:

- Numbered lists provide sequential steps
- Bulleted lists provide information, not procedural steps
- The term 'X-Gateway' refers to the Anybus X-Gateway
- The term 'Slave interface' refers to the Interbus Slave interface for the Anybus X-Gateway.
- The term 'user manual' refers to the Anybus-X Generic Gateway User Manual.
- Hexadecimal values are written in the format NNNNh, where NNNN is the hexadecimal value.
- 16/32 bit values are generally stored in Motorola (big endian) format unless otherwise stated.

P.5. Support

For contact information and support, please refer to the contact and support pages at:
www.anybus.com/support

1. About the FIP IO Slave Interface

1.1. General Description

The FIP IO Slave interface for the Anybus X-gateway acts as a slave node that can be read from/written to by a FIP master. The interface operates according to the FIP IO Extended Device Profile (FEDP) Class 0, exchanging 32 words of data in each direction.

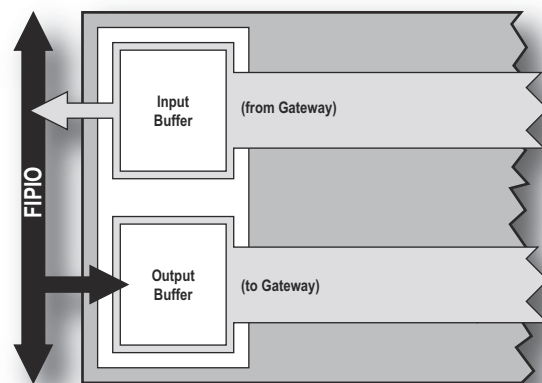
Like all X-Gateway interfaces, the FIP IO Slave interface exchanges data via two buffers as follows:

- **Input Buffer**

This buffer holds data forwarded *from* the other network, i.e. data which is read by the FIP master.

- **Output Buffer**

This buffer is forwarded *to* the other network, i.e. data which is written by the FIP master.



1.2. Features

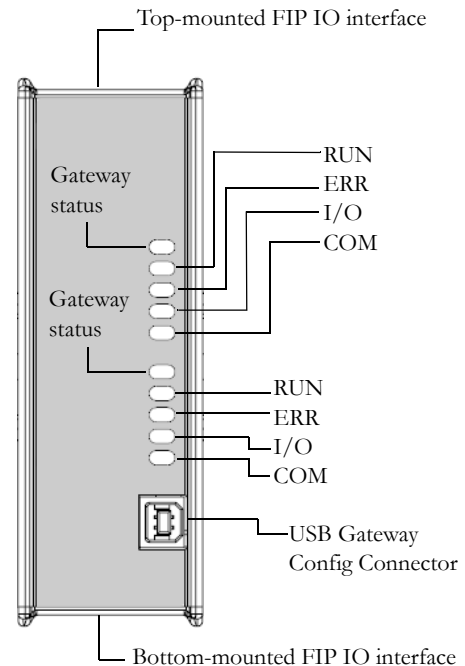
- Galvanically isolated fieldbus interface (RS422)
- FIP IO Extended Device Profile (FEDP), Class 0
- Up to 64 bytes (32 words) of I/O in each direction
- On-board node address switches
- Supports FIP and WorldFIP standards

1.3. External View

1.3.1. Network Status LEDs

LED	Colour	Indication
Gateway Status		See the user manual for further details.
RUN	Green	Normal operation
	Off	No power or major failure
ERR	Red	Major unrecoverable fault
	Red, flashing	Bus not connected or promptness timeout
	Off	No error
I/O	Red	External device error
	Off	Normal operation
COM	Yellow	Bus activity
	Off	No bus activity

Front View



1.3.2. Connectors and Switches

USB Gateway config connector

Consult the X-gateway user manual for further details.

FIP IO connector

See “FIPIO Connector Pinout” on page 12.

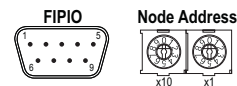
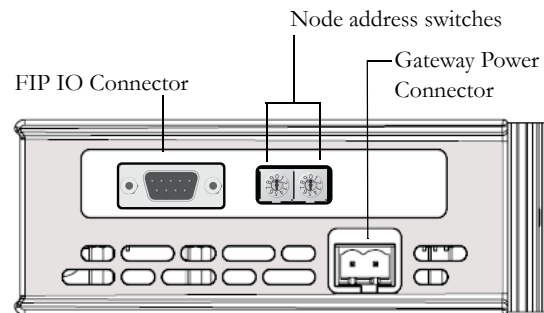
FIP IO node address switches

See “Configuration Switches” on page 8.

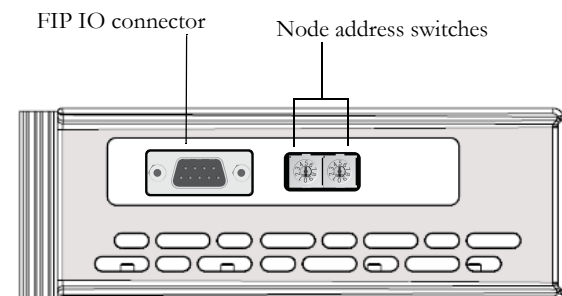
Gateway power connector

Consult the X-gateway user manual for further details.

Top-mounted Interface



Bottom-mounted Interface



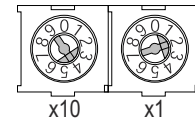
2. Installation and Configuration

2.1. Configuration Switches

On a FIP network, each node must be assigned its own unique node address. The slave interface features onboard switches for node address configuration, providing an address range of 1 - 99. The switches are read once during startup, i.e. the gateway must be restarted for any changes to have effect.

Example:

In this example, the FIP node address will be 42 (4×10) + (2×1).



Note: Depending on if the Slave interface is top or bottom-mounted, the orientation of the switches will be different.

Important to note is that certain node address are reserved and should not be used:

- Address 0 is reserved for the fieldbus control system (e.g. the PLC)
- Address 63 is reserved for configuration and diagnostic terminals
- Addresses 64 - 99 can only be used if supported by the fieldbus control system.

2.2. Gateway Config Interface

The X-Gateway and the FIP IO interface may be configured by using the software tool **Anybus Configuration Manager** (ACM), which is available from www.anybus.com/support

When ACM is connected to the gateway via the USB configuration connector, the following settings are available:

Network Type

Name	FIP I/O Slave
------	---------------

General

Input Process data Size (bytes)	20
Output Process data Size (bytes)	20
Offline option	Clear ▼
Control word/Status word	Disable ▼

See also...

- The Anybus X-gateway User Manual, for full details on using ACM.
- The online help in ACM, for further help on the available settings.

3. Data Exchange

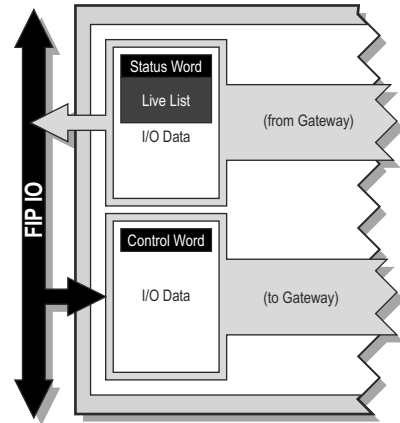
3.1. General Information

The Slave Interface exchanges data in accordance with the FIP IO Extended Device Profile (FEDP), which means that the maximum data size is limited to 64 bytes (32 words) in each direction.

The amount of data to exchange on FIP IO is specified via the Gateway Config Interface.

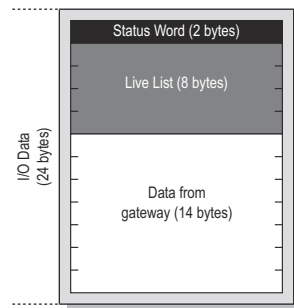
See also...

- 2-9 “Gateway Config Interface”

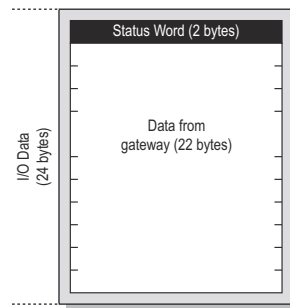


3.2. Input Data (Gateway to FIP IO)

Depending on the actual gateway configuration and how it has been set up to operate, parts of the Input Data may be used to represent status information (i.e. Status Word, Live List etc.).



Example A:
 I/O Data Size = 24
 Live List = Enabled
 Control & Status Word = Enabled

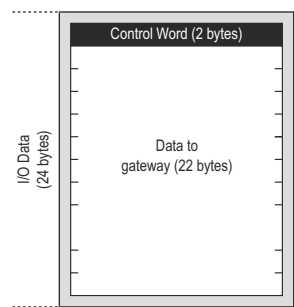


Example B:
 I/O Data Size = 24
 Live List = Disabled
 Control & Status Word = Enabled

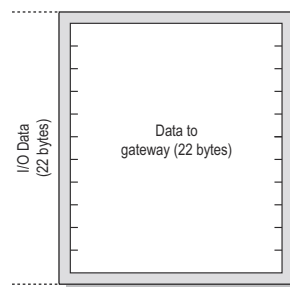
Note: The Live List is only available on master-slave gateway configurations.

3.3. Output Data (FIP IO to Gateway)

Depending on the actual gateway configuration and how it has been set up to operate, the first two bytes of the Output Data may be interpreted as control information (i.e. the Control Word).



Example A:
 I/O Data Size = 24
 Control Word = Enabled



Example B:
 I/O Data Size = 22
 Control Word = Disabled

A. Technical Specification

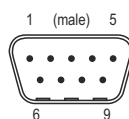
A.1. FIP IO Interface Details

- I/O according to FIP IO Extended Device Profile (FEDP), Class 0¹
- Exchanges up to 32 words of I/O in each direction
- Baudrate: 1Mbit/s
- Galvanically isolated bus electronics
- Address range: 1-99 using on-board switches
- LED-indications: RUN, ERR, I/O and COM
- Vendor name: 'HMS Ind. Networks'
- Model name: 'Anybus-S FIPIO'

A.2. FIPIO Connector Pinout

FIPIO connectivity is provided via a 9 pin male D-sub connector.

#	Signal
housing	Shield
1	
2	-
3	-
4	-
5	-
6	A (D+)
7	B (D-)
8	B (D-)
9	A (D+)



1. Diagnostics (Standard Status and Specific Status) are not supported.