

INTERBUS Router

Datasheet

A-IBR

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1. PREFACE

1.1. ABOUT THIS DOCUMENT

This document contains the technical data for the INTERBUS Router.

1.2. INTRODUCTION TO THE INTERBUS ROUTER

This manual describes the installation, operation, and diagnostics of the Aparian INTERBUS Router module. The INTERBUS Router, (hereafter referred to as the **module**) provides intelligent data routing between either EtherNet/IP or Modbus TCP and an INTERBUS master.

INTERBUS is a fast sensor–actuator bus for transmitting process data in industrial environments. Due to its transmission procedure and ring topology, INTERBUS features a fast, cyclic, and time-equidistant process data transmission.

Each slave device has an input and output bidirectional port allowing the ring structure with only a single cable between each device.

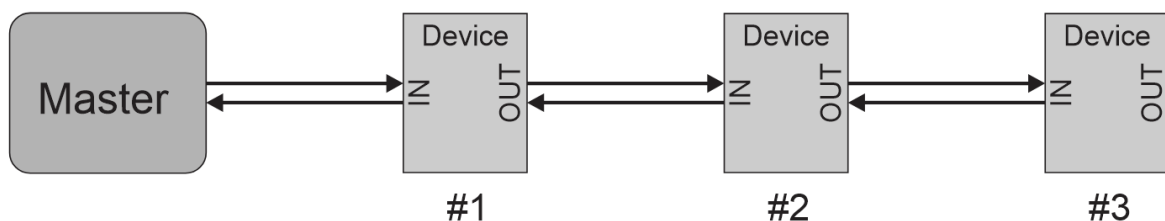


Figure 1.1. – INTERBUS System

The INTERBUS Router module can emulate up to 15 INTERBUS slave devices, and map the INTERBUS input and output data to EtherNet/IP or Modbus devices.

Each (virtual) INTERBUS device can be configured for a specific Device Class, Type, Data Direction and Data Width.

Primary Interface:

The module can use one of four Primary Interface modes:

EtherNet/IP Target

Here a remote EtherNet/IP device (e.g. a Logix controller) establishes a number of Class 1 connections to the module. INTERBUS data can be mapped into 4 separate input and output class 1 cyclic connections to the Logix controller (allowing up to 2KB input and 2KB output to be exchanged at the requested packet interval – RPI).

EtherNet/IP Originator

As an EtherNet/IP originator, the module can use one of two methods to read and write data to and from the INTERBUS master:

- **EtherNet/IP Explicit Messaging**

This allows an INTERBUS master to exchange data with up to 10 EtherNet/IP devices. The module can use either Class 3 or Unconnected Messaging (UCMM) to Get and Set data in the remote EtherNet/IP devices.

- **Direct-To-Tag technology**

This allows the INTERBUS master to exchange data with a Logix controller without the need to write any application code (e.g. ladder) in Studio 5000. The INTERBUS slave data is directly read from, or written to, Logix tags.

- **EtherNet/IP Class 1 connection**

INTERBUS data can be mapped to a maximum of 15 EtherNet/IP devices using input and output class 1 cyclic connections. This will allow the INTERBUS Router to “own” the EtherNet/IP target device and exchange INTERBUS slave data using the EtherNet/IP device’s input and output assemblies.

Modbus Server

The diagnostics and INTERBUS data will be written to, or read from, the module’s internal Modbus Registers (Holding or Input Registers). These registers can be accessed by a remote Modbus Client using Modbus TCP.

Modbus Client

The diagnostics and INTERBUS data will be written to, or read from, the module’s internal Modbus Registers (Holding or Input Registers). The Modbus Auxiliary Map can then be used to configure the Modbus data exchange between multiple remote Modbus Server devices and the module’s internal Modbus registers via Modbus TCP.

The INTERBUS Router is configured using the Aparian Slate application. This program can be downloaded from www.aparian.com free of charge.

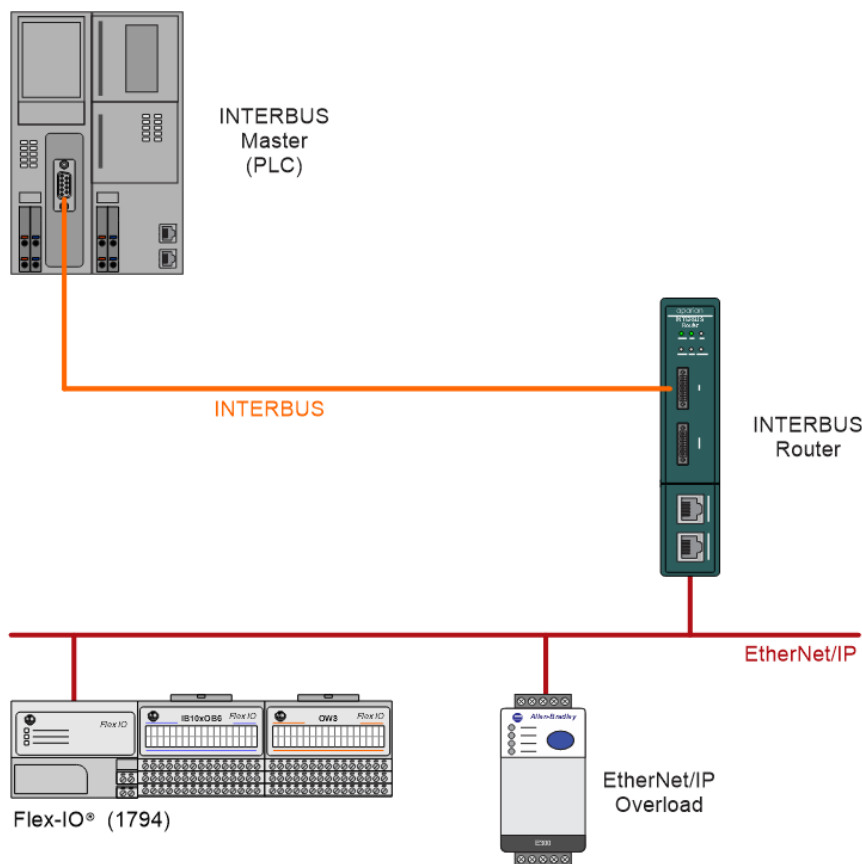


Figure 1.2. – Example of a configuration connecting INTERBUS master to EtherNet/IP I/O

The module also provides a range of statistics, Modbus packet capture functions, and internal Modbus and Data table reads to simplify the diagnostic process for remote diagnosis.

The module has two Ethernet ports and supports Device-Level-Ring (DLR) architectures.

1.3. FEATURES

- Module can emulate up to 15 INTERBUS slaves.
- Supports both INTERBUS Baud Rates (500 kb & 2 Mb).
- Module has various Primary Interfaces:
 - EtherNet/IP Target (Class 1 connection)
 - Modbus Server (TCP)
 - Modbus Client (TCP)
 - EtherNet/IP Originator (Class 1 connection with up to 15 EtherNet/IP devices and Explicit Messaging, including Direct-To-Tag Logix tag access, with up to 10 EtherNet/IP devices).
- Slate software provides a Modbus packet capture utility for better diagnosis of issues.
- Dual Ethernet ports which support Device-Level-Ring (DLR).
- Small form factor – DIN rail mounted.

1.4. ARCHITECTURE

The figures below provide an example of the typical network setup for connecting INTERBUS devices to either EtherNet/IP or Modbus TCP.

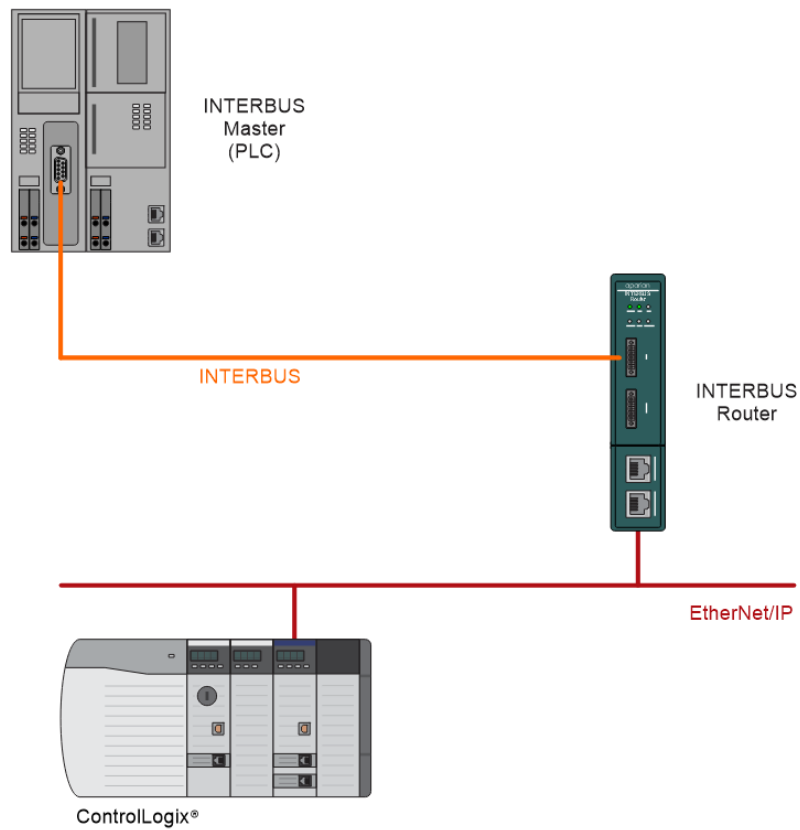


Figure 1.3. – Example of connecting to a Logix Controller

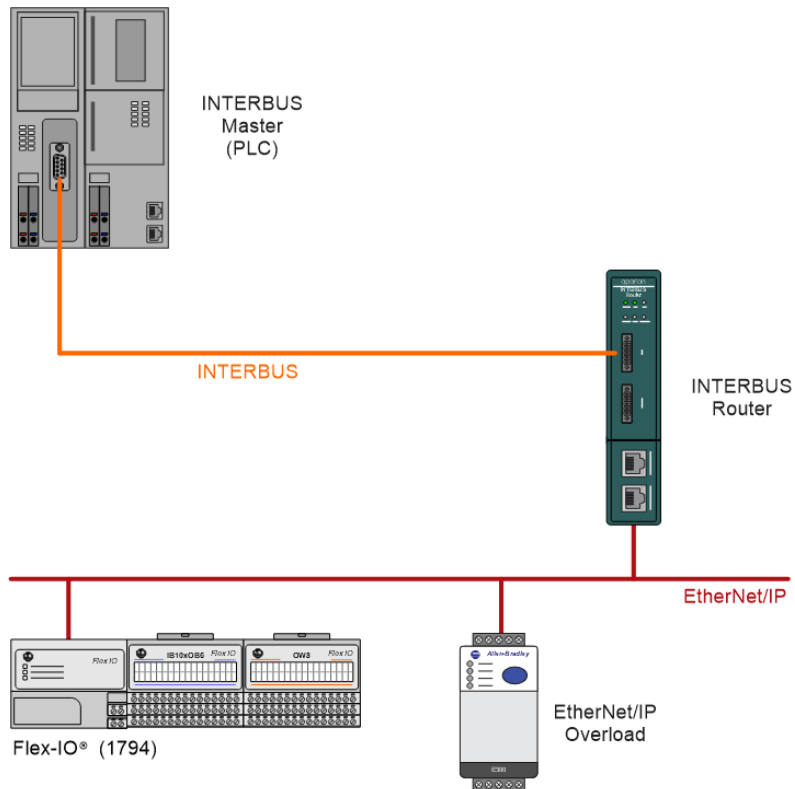


Figure 1.4. – Example of connecting EtherNet/IP I/O

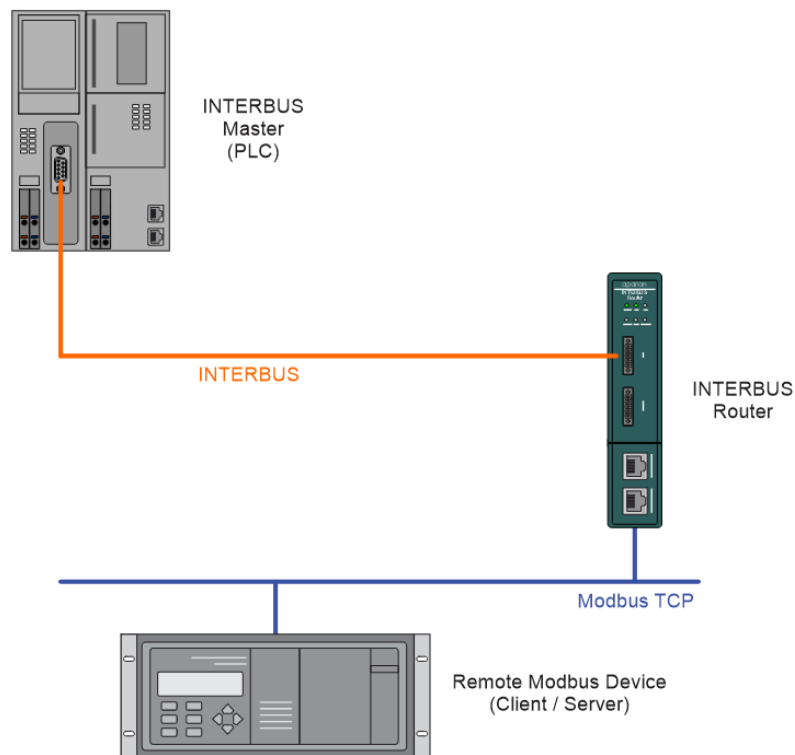


Figure 1.5. - Example of connecting to a Modbus TCP Client or Server

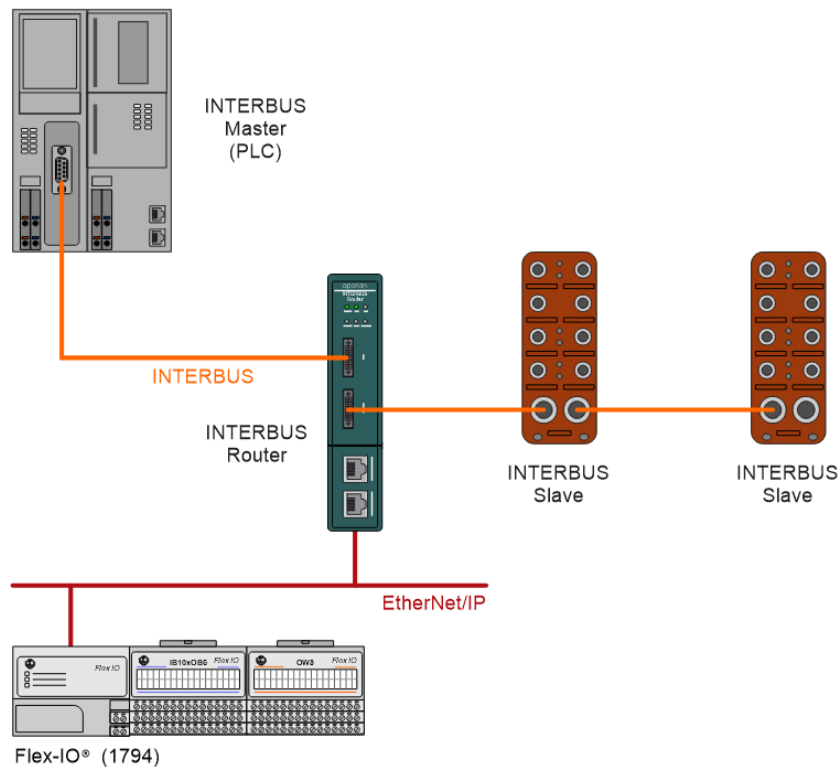


Figure 1.6. - Example of extending INTERBUS to additional INTERBUS slaves.

1.5. ADDITIONAL INFORMATION

The following documents contain additional information that can assist the user with the module installation and operation.

Resource	Link
Slate Installation	http://www.aparian.com/software/slate
INTERBUS Router User Manual INTERBUS Router Datasheet Example Code & UDTs	https://www.aparian.com/products/INTERBUSRouter
Ethernet wiring standard	www.cisco.com/c/en/us/td/docs/video/cds/cde/cde205_220_420/installation/guide/cde205_220_420_hig/Connectors.html

Table 1.1. - Additional Information

1.6. SUPPORT

Technical support is provided via the Web (in the form of user manuals, FAQ, datasheets etc.) to assist with installation, operation, and diagnostics.

For additional support the user can use either of the following:

Resource	Link
Contact Us web link	https://www.prosoft-technology.com/Services-Support/Customer-Support
Support email	support@prosoft-technology.com

Table 1.2. – Support Details

2. TECHNICAL SPECIFICATIONS

2.1. DIMENSIONS

Below are the enclosure dimensions as well as the required DIN rail dimensions. All dimensions are in millimeters.

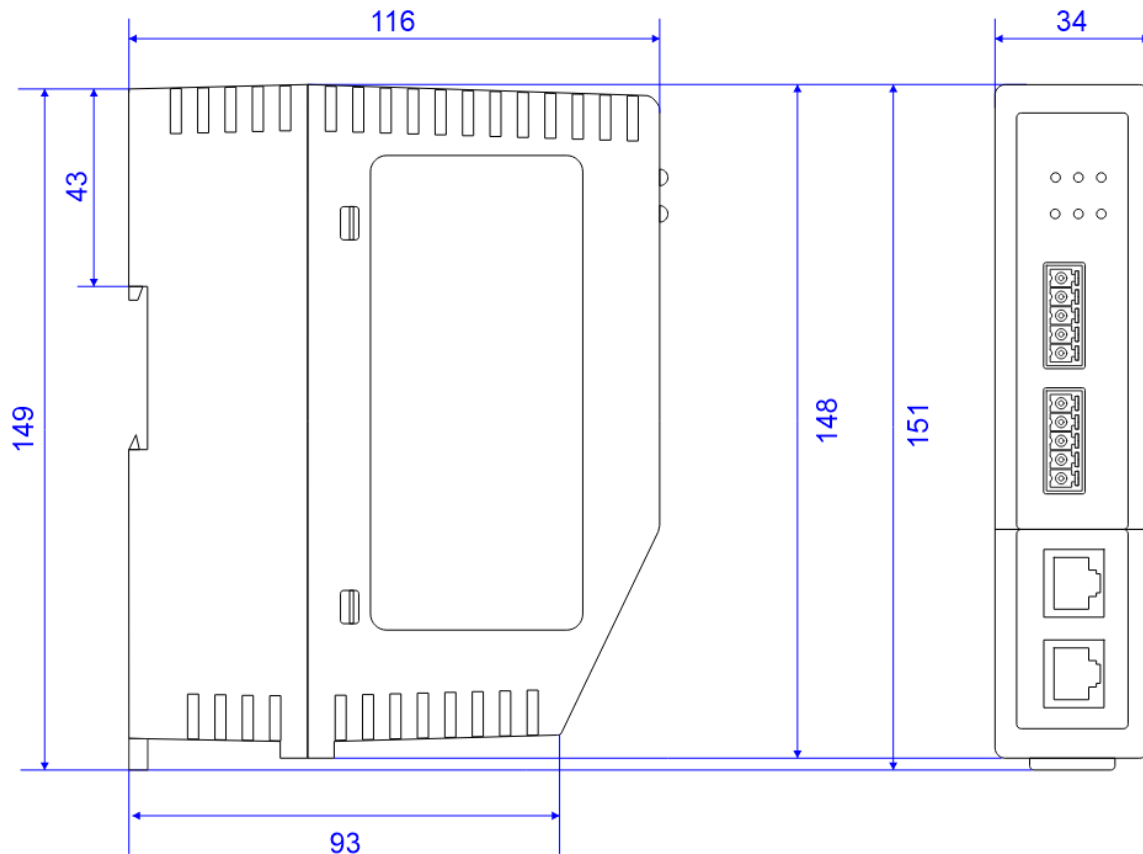


Figure 2.1 – INTERBUS Router enclosure dimensions

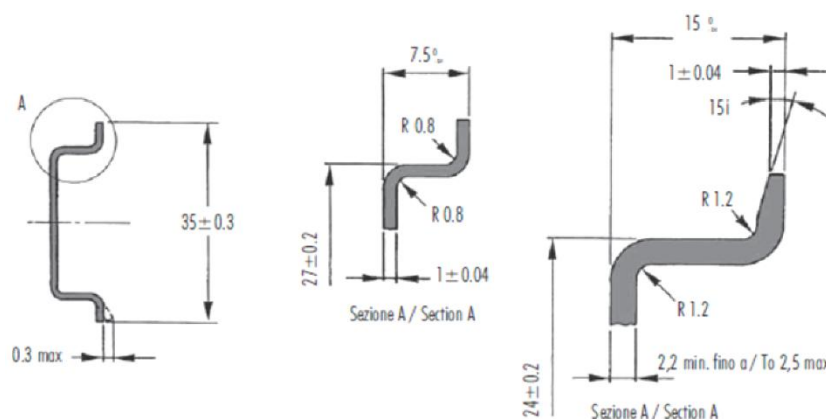


Figure 2.2 - Required DIN dimensions

2.2. ELECTRICAL

Specification	Rating
Power requirements	Input: 10 – 32V DC
Power consumption	3.0 W (Max.) Current: 260 mA @ 10 V Current: 120 mA @ 24 V
Connector	3-way terminal
Conductors	24 – 18 AWG
Enclosure rating	IP20, NEMA/UL Open Type
Temperature	-20 – 70 °C
Earth connection	Yes, terminal based
Emissions	IEC61000-6-4
ESD Immunity	EN 61000-4-2
Radiated RF Immunity	IEC 61000-4-3
EFT/B Immunity	EFT: IEC 61000-4-4
Surge Immunity	Surge: IEC 61000-4-5
Conducted RF Immunity	IEC 61000-4-6

Table 2.1 - Electrical specification

2.3. ETHERNET

Specification	Rating
Connector	RJ45
Conductors	CAT5 STP/UTP
ARP connections	Max 20
TCP connections	Max 20
CIP connections	Max 15
Communication rate	10/100Mbps
Duplex mode	Full/Half
Auto-MDIX support	Yes
Embedded switch	Yes, 2 x Ethernet ports

Device Level Ring (DLR)	Supported
Network Time Protocol (NTP)	Supported

Table 2.2 - Ethernet specification

2.4. INTERBUS PORTS

Specification	Rating
Connector	5-way terminal
Conductor	24 – 18 AWG
Electrical Isolation	1000 Vrms for 1 minute.

Table 2.3 – INTERBUS Port specification

2.5. INTERBUS

Specification	Rating
Type	Slave
Max. Device Count	15
Max. Total INTERBUS Data	128 bytes
Max. Summation Frame	128 bytes
Parameter Channel (PCP)	Not Supported
Supported BAUD Rates	500kbps, 2Mbps

Table 2.4 – INTERBUS specification

2.6. ETHERNET/IP TARGET

Specification	Rating
Class 1 Cyclic connection count	4
Logix Direct-to-Tag Supported	Yes

Table 2.5 – EtherNet/IP Target specification

2.7. ETHERNET/IP ORIGINATOR

Specification	Rating
Class 1 Cyclic Connections Supported	Yes
Class 3 / UCMM Connections Supported	Yes
Class 1 Connection Count	15
Class 3 / UCMM Target Device Count	10
Class 3 / UCMM Mapping Count	50

Table 2.6 – EtherNet/IP Originator specification

2.8. MODBUS CLIENT

Specification	Rating
Modes Supported	Modbus TCP
Max. Modbus Server Devices	20
Max. Modbus Mapping	100
Mapping Ranges	Holding Register 0 – 4999 Input Register 0 – 4999 Input Status 0 – 4999 Coil Status 0 – 4999
Base Offset	Modbus (Base 0) PLC (Base 1)
Configurable Modbus TCP Port	Yes
Data Reformatting Supported	BB AA BB AA DD CC CC DD AA BB DD CC BB AA

Table 2.7 – Modbus Client specification

2.9. MODBUS SERVER

Specification	Rating
Modes Supported	Modbus TCP

Mapping Ranges	Holding Register 0 – 4999 Input Register 0 – 4999 Input Status 0 – 4999 Coil Status 0 – 4999
Base Offset	Modbus (Base 0) PLC (Base 1)
Configurable Modbus TCP Port	Yes

Table 2.8 – Modbus Server specification

2.10. CERTIFICATIONS

Certification	Mark
CE Mark	
RoHS2 Compliant	
UL Mark File: E494895	 CLASS 1, DIV 2, GROUPS A, B, C, D T4A
UKCA	
ODVA Conformance	

Table 2.9 – Certifications