CAN Bus Router/B

Datasheet

A-CANBR/B

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1. PREFACE

1.1. ABOUT THIS DOCUMENT

This document contains the technical data for the CAN Bus Router/B.

1.2. INTRODUCTION TO THE CAN BUS ROUTER/B

The CAN Bus Router, (hereafter referred to as the **module**) provides intelligent data routing between either EtherNet/IP or Modbus TCP/RTU and a CAN Bus network. This allows the user to integrate CAN Bus devices into a Rockwell Automation Logix platform (e.g., ControlLogix or CompactLogix) or any Modbus Client or Server device with minimal effort.

Primary Interface:
The module supports 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. CAN Bus data can be mapped between the input and output class 1 cyclic connections of 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 three methods to read and write data to and from the CAN Bus network:

- **EtherNet/IP Explicit Messaging**

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

- **EtherNet/IP Class 1 connection**

  CAN Bus data can be mapped to a maximum of 10 EtherNet/IP devices using input and output class 1 cyclic connections. This will allow the CAN Bus Router to “own” the EtherNet/IP target device and exchange CAN Bus data using the EtherNet/IP device’s input and output assemblies.

Modbus Server
The diagnostics and CAN Bus 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 either Modbus TCP, Modbus RTU232, or Modbus RTU485.

Modbus Client
The diagnostics and CAN Bus 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. The Modbus communication can be via Modbus TCP, Modbus RTU232, or Modbus RTU485.

When configured as an EtherNet/IP Target, the software can generate an L5X file which can be imported into Studio 5000. This provides all the necessary UDTs, Tags and mapping ladder to allow the Logix application code to easily access the CAN Bus data.

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

The module also provides a range of statistics, CAN Bus and Modbus packet capture functions, and internal Modbus and Data table reads to simplify remote diagnosis.

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

A built-in webserver provides detailed diagnostics of system configuration and operation, including the display of CAN Bus operation and communication statistics, without the need for any additional software.

1.3. FEATURES

- Receive up to 100 pre-configured CAN Bus packets.
- Send up to 100 pre-configured CAN Bus packets.
- CAN Bus transmission can be scheduled (periodic), or externally triggered, sent on Start-up, or any combination of these.
- Logix L5X generation - Ready for import
- Supports Passthrough Messaging from Logix
- Module has various Primary Interfaces:
    - EtherNet/IP Target (Class 1 connection)
    - Modbus Server (TCP, RTU232, and RTU485)
    - Modbus Client (TCP, RTU232, and RTU485)

- EtherNet/IP Originator (Class 1 connection with up to 10 EtherNet/IP devices and Explicit Messaging, including Direct-To-Tag Logix tag access, with up to 10 EtherNet/IP devices).

- Slate software provides a CAN Bus and Modbus packet capture utility for better diagnosis of communication issues.
- Supports common CAN Bus Baud Rates (10k, 20k, 50k, 125k, 250k, 500k, 800k, 1M)
- Dual Ethernet ports which support Device-Level-Ring (DLR).
- Network Time Protocol (NTP) supported for external time synchronization.
- Small form factor – DIN rail mounted.

1.4. ARCHITECTURE

The figures below provide an example of the typical network setup for connecting CAN Bus devices to either EtherNet/IP or Modbus TCP/RTU232/RTU485.

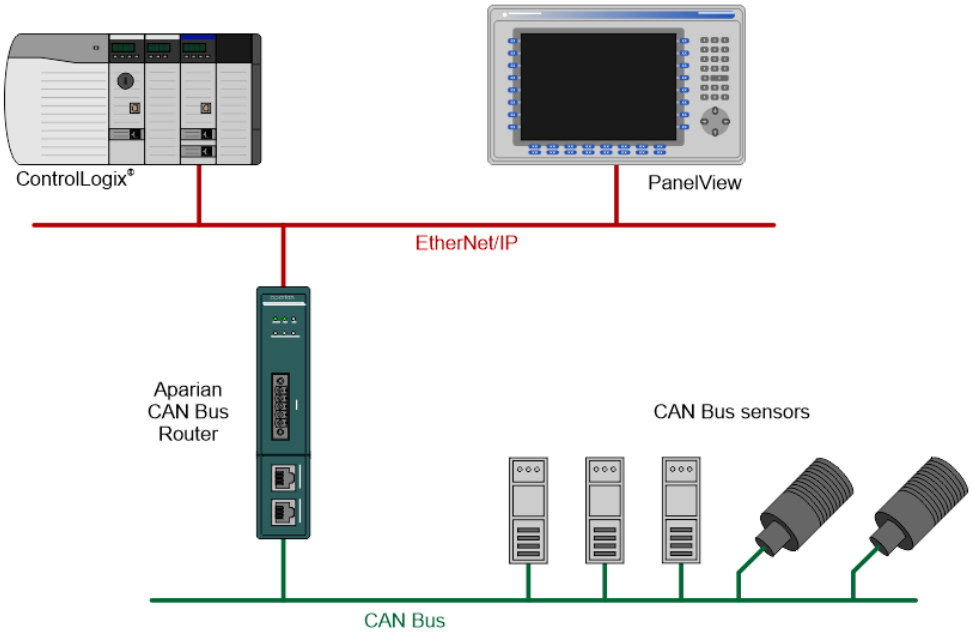

Figure 1.1. – Example of connecting CAN Bus sensors to a Logix Controller

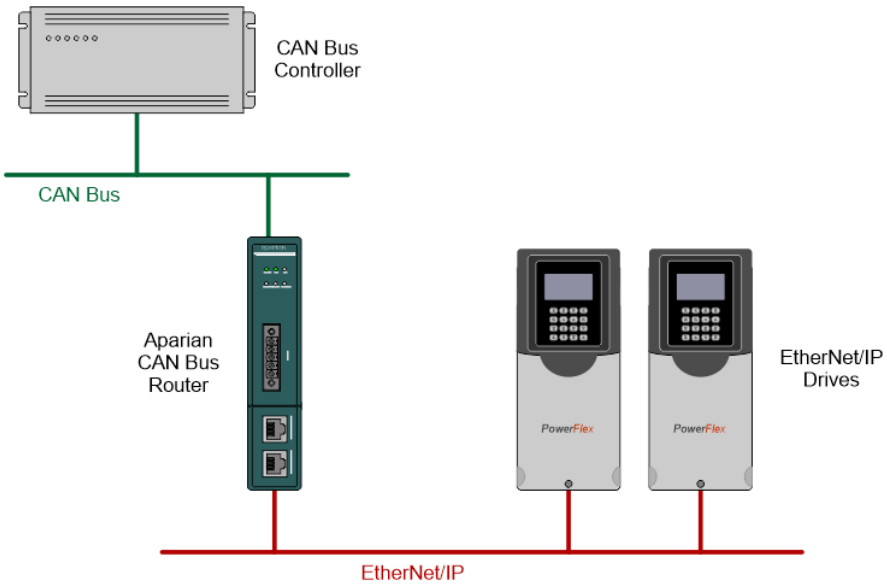

Figure 1.2. – Example of connecting EtherNet/IP drives to a CAN Bus network

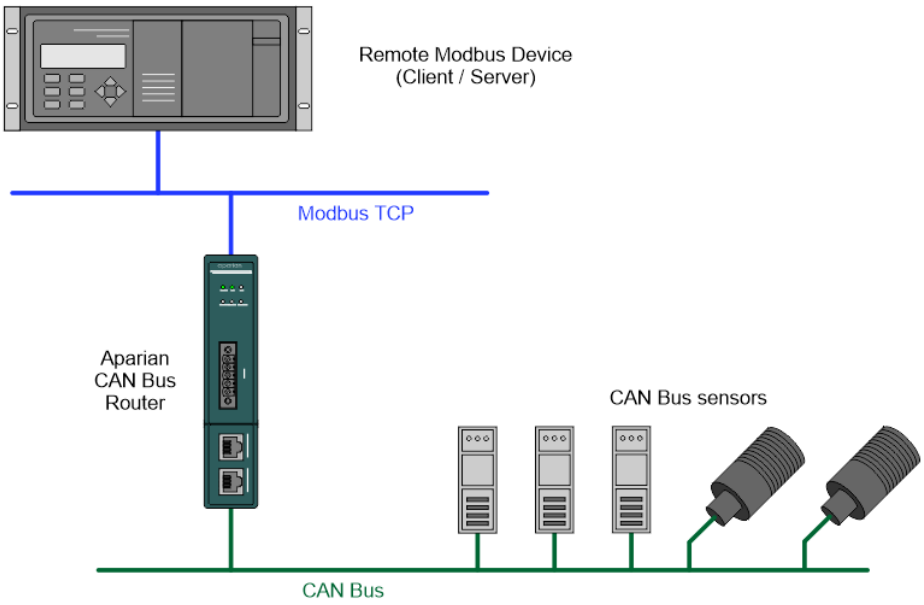

Figure 1.3. - Example of connecting CAN Bus devices to a Modbus TCP Client or Server

2. TECHNICAL SPECIFICATIONS

2.1. DIMENSIONS

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

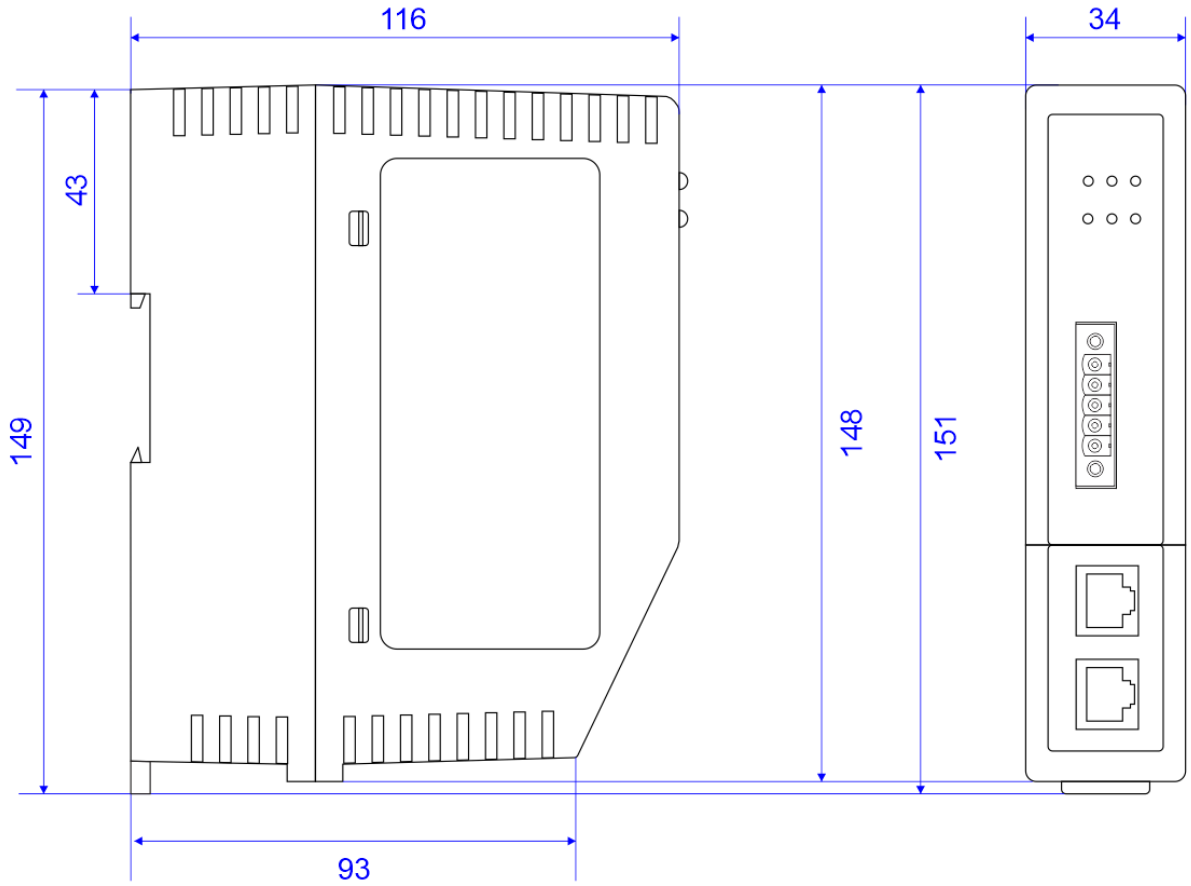

Figure 2.1 – CAN Bus Router/B enclosure dimensions

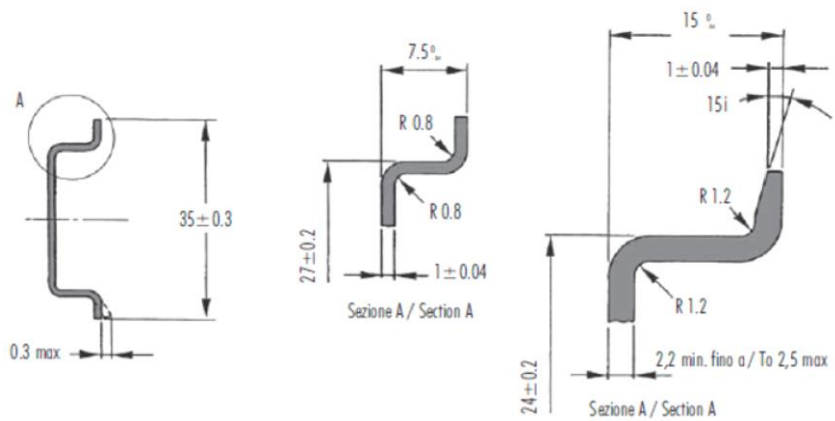

Figure 2.2 - Required DIN dimensions

ELECTRICAL

Specification	Rating
Power requirements	Input: 10 – 32V DC
Power consumption	2.2 W (Max.) Current: 180 mA @ 10 V Current: 85 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

ETHERNET

Specification	Rating
Connector	RJ45
Conductors	CAT5 STP/UTP
ARP connections	Max 100
TCP connections	Max 100
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

SERIAL PORT (RS232)

Specification	Rating
RS232 Connector	9-way terminal (shared with RS485)
RS232 Conductor	24 – 18 AWG
Electrical Isolation	1000 Vdc
BAUD	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
Parity	None, Even, Odd
Data bits	8
Stop bits	1

Table 2.3 – RS232 Serial Port specification

SERIAL PORT (RS485)

Specification	Rating
RS485 Connector	9-way terminal (shared with RS485)
RS485 Conductor	24 – 18 AWG
Electrical Isolation	1500 Vrms for 1 minute.
BAUD	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
Parity	None, Even, Odd
Data bits	8
Stop bits	1

Table 2.4 – RS485 Serial Port specification

CAN BUS

Specification	Rating
Connector	5-way terminal, 5.08mm pitch.

Max CAN Receive Items	100
Max CAN Send Items	100
Passthrough Messaging	Supported
Supported BAUD Rates	10k, 20k, 50k, 125k, 250k, 500k, 800k, 1M
CAN Terminator	120 Ω - Software Enabled

Table 2.5 – CAN Bus specification

ETHERNET/IP TARGET

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

Table 2.6 – EtherNet/IP Target specification

ETHERNET/IP ORIGINATOR

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

Table 2.7 – EtherNet/IP Originator specification

MODBUS CLIENT

Specification	Rating
Modes Supported	Modbus TCP, Modbus RTU232, Modbus RTU485
Modbus RTU485 Termination	125 Ω - Software Enabled
Max. Modbus Server Devices	20
Max. Modbus Mapping	100
Mapping Ranges	Holding Register 0 – 65535

	Input Register 0 – 65535 Input Status 0 – 65535 Coil Status 0 – 65535
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 2.8 – Modbus Client specification

MODBUS SERVER

Specification	**Rating**
Modes Supported	Modbus TCP, Modbus RTU232, Modbus RTU485 (simultaneous)
Modbus RTU485 Termination	Software set
Mapping Ranges	Holding Register 0 – 65535 Input Register 0 – 65535 Input Status 0 – 65535 Coil Status 0 – 65535
Base Offset	Modbus (Base 0) PLC (Base 1)
Configurable Modbus TCP Port	Yes

Table 2.9 – Modbus Server specification

CERTIFICATIONS

Certification	**Mark**
CE Mark	CE
RoHS2 Compliant	RoHS2

UL Mark File: E494895	 CLASS 1, DIV 2, GROUPS A, B, C, D
UKCA	
ATEX	 II 3 G Ex ec IIC T5 -25°C ≤ Ta ≤ 70 °C
ODVA Conformance	EtherNet/IP™

Table 2.10 – Certifications