

FDSI EtherNet/IP™ Driver for Field Device System Integrator (FDSI) Module



The Field Device System Integrator (FDSI) EtherNet/IP Driver enables the integration of the I/A Series® System with Allen-Bradley® ControlLogix® PLCs over Ethernet via the Common Industrial Protocol (CIP) EtherNet/IP protocol.

FEATURES

Features of the FDSI EtherNet/IP Driver are:

- ▶ Integration of ControlLogix PLCs into the I/A Series System over Ethernet using the EtherNet/IP protocol
- ▶ Simplex (FBM232) or Redundant (FBM233) operation of FDSI Fieldbus Modules
- ▶ Availability of standard I/A Series plant management functions and operator displays
- ▶ Support for ControlLogix PLCs in native mode using tag name addressing
- ▶ Support for multiple ControlLogix PLCs from simplex or redundant FBMs
- ▶ Monitoring of status for redundant ControlLogix PLCs using I/A Series FoxView™ software.
- ▶ Support for reading and writing of multiple points in a single EtherNet/IP message
- ▶ Integration of redundant FDSI FBMs and redundant ControlLogix PLCs providing a highly available solution.

OVERVIEW

The FDSI EtherNet/IP Driver for the FBM232 and FBM233 interfaces the I/A Series System with ControlLogix PLCs and provides ease of integration, full I/A Series support, redundancy options and convenient access to the PLC diagnostics.

Ease of Integration

A simple download of the FDSI EtherNet/IP Driver to an I/A Series FDSI FBM enables you to exchange data between the Allen-Bradley ControlLogix PLC and the I/A Series system, thus taking advantage of both the power of the I/A Series system and the flexibility of the ControlLogix PLCs. The driver is downloaded to an FBM232 for simplex operation as shown in Figure 1 or to an FBM233 for redundant operation as shown in Figure 2.

I/A Series System Support

The I/A Series system supports the EtherNet/IP protocol, which facilitates the transfer of data to and from the ControlLogix PLCs. I/A Series software also provides standard plant management functions and operator displays for these devices, in addition to startup and communication fault-detection and display using System Manager.

Redundancy

A pair of FBM233 modules provides redundancy at the FBM level. One FBM serves as the Master module and the other as the Tracker module. A communication link between the two modules allows each module to monitor the other's health and to share information about the health of the attached PLCs. Scanning of points takes place from the Master FBM, and the Tracker FBM receives updated

data from the Master via the Ethernet connection.

In all the redundant configurations supported, output points are written only from the Master FBM. If a device failure is detected, the Master requests an automatic role switch and generates a system alarm. Role-switching occurs without a loss of data.

Alternatively, you can manually initiate a role switch between Master and Tracker modules using System Manager.

When System Manager alerts you to an FBM or network connection failure, you can replace the faulty FBM or repair the network connection without upsetting field input signals to or output signals from the functional FBM.

The FDSI EtherNet/IP Driver integrates redundant ControlLogix PLCs with the I/A Series system via an FBM233 redundant pair, as shown in Figure 3, providing a highly available solution with no single point of failure in the I/A Series system or the ControlLogix system. In this configuration, the Master FBM233 communicates with the primary ControlLogix chassis. In the event of a switchover of the primary role from one ControlLogix chassis to the other chassis, the Master FBM233 communicates to the new primary ControlLogix chassis without any loss of data updates from the field.

Diagnostics

All diagnostic data for the ControlLogix PLCs is made available through I/A Series Distributed Control Interface (DCI) input blocks. The driver software on the I/A Series workstation includes graphics tools and scripts that enable rapid development of FoxView™ process displays that show device diagnostics and status.

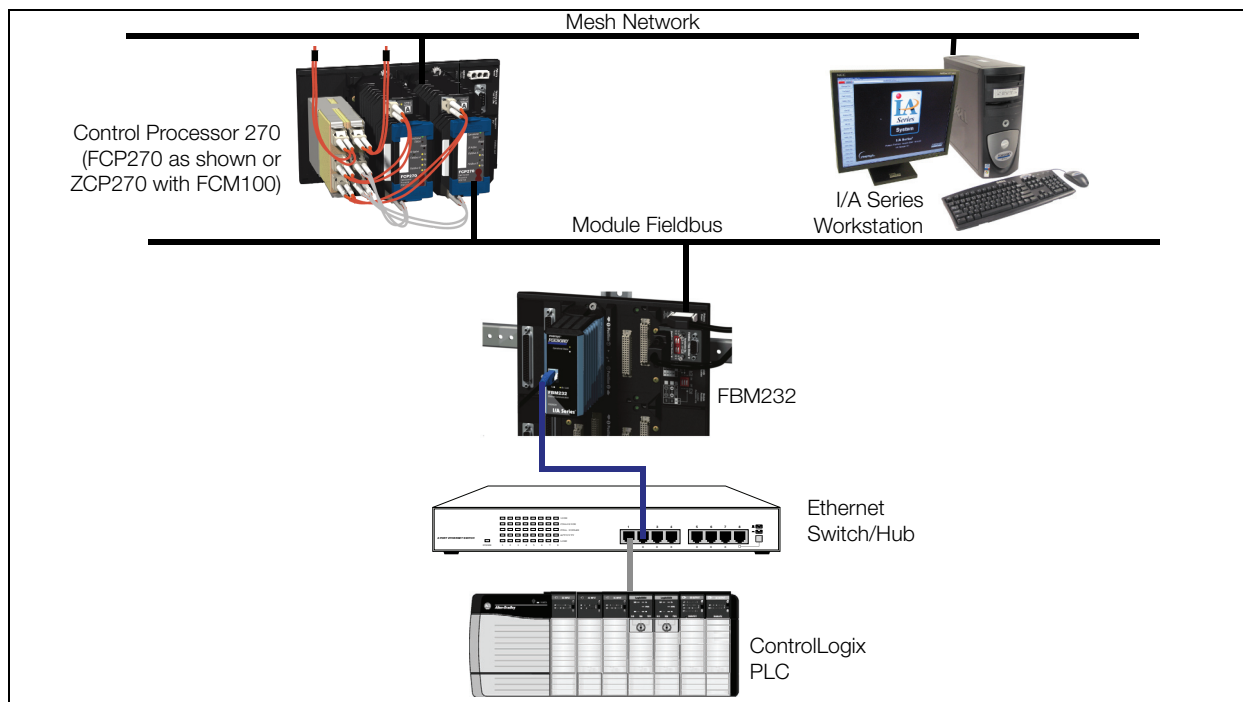


Figure 1. Interfacing a ControlLogix PLC via a Non-redundant FBM232

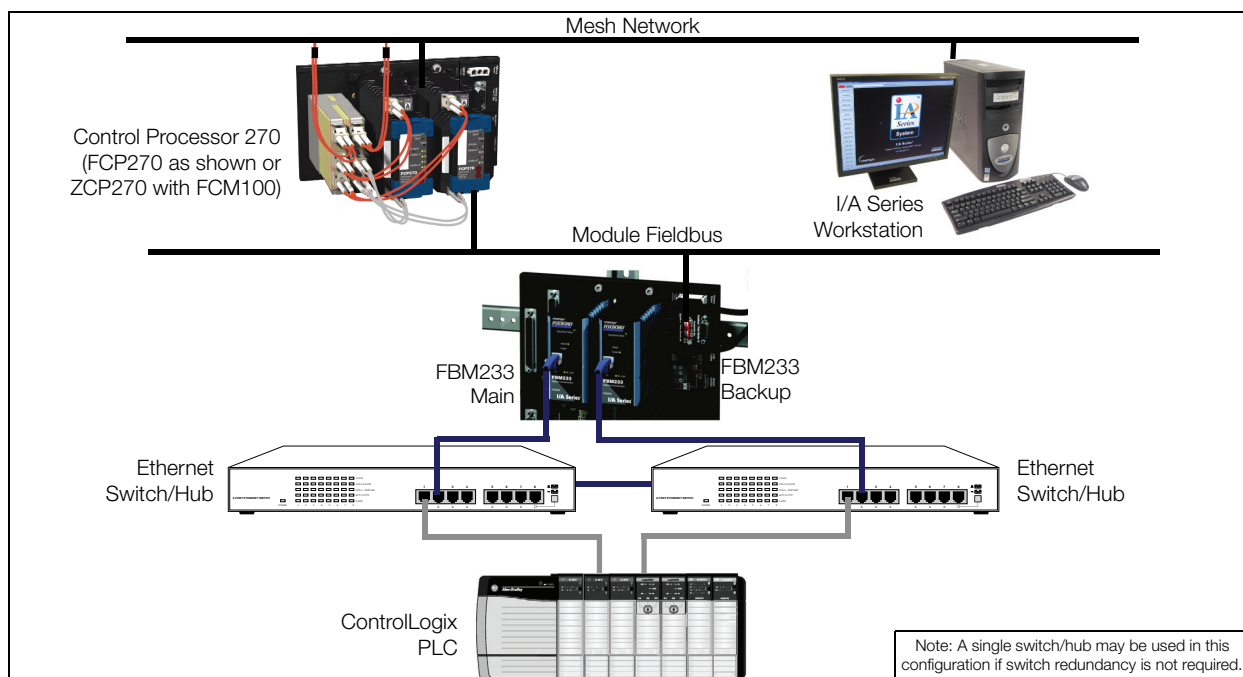


Figure 2. Integrating a ControlLogix PLC via a Redundant FBM233 Pair

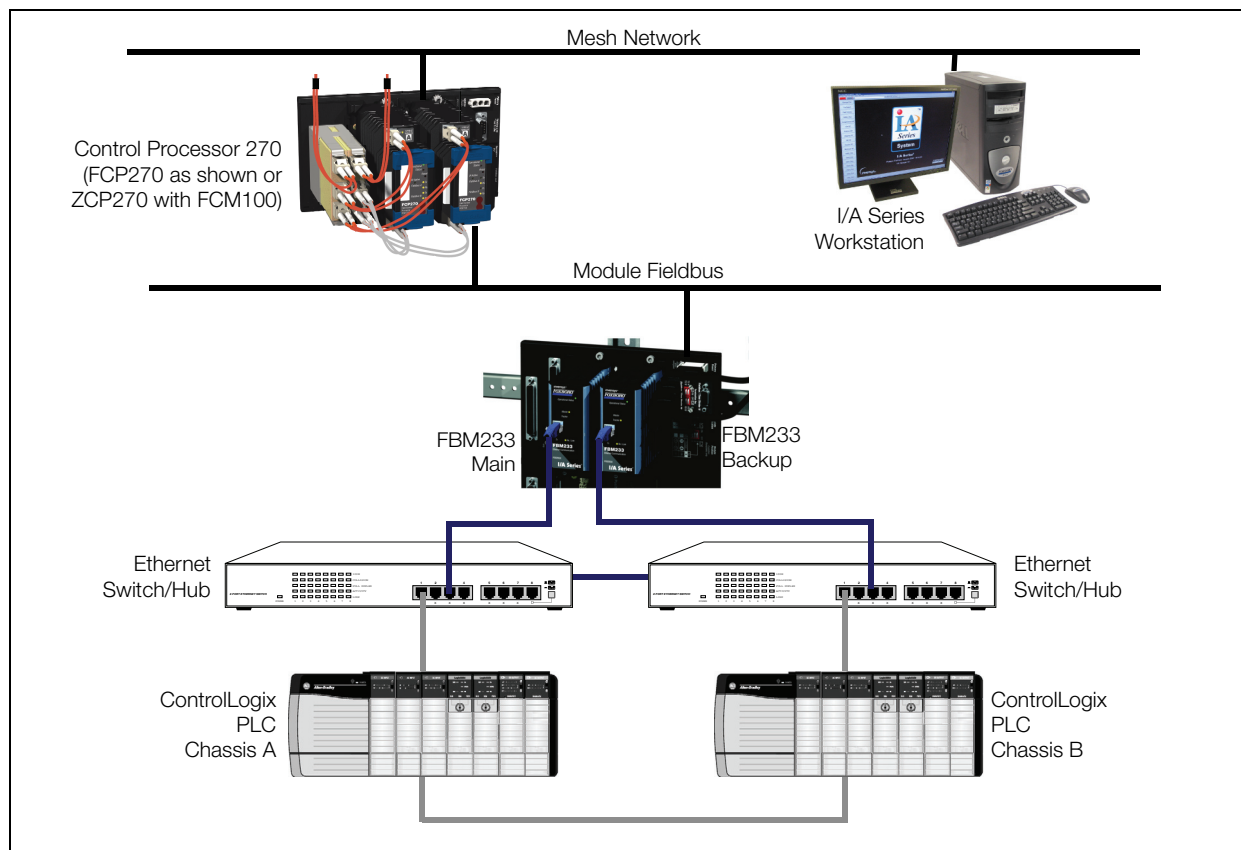


Figure 3. Interfacing Redundant ControlLogix PLCs with a Redundant FBM233 Pair

HARDWARE

The EtherNet/IP Integrator driver can be downloaded to one of the following FBMs, depending on redundancy requirements:

- ▶ The FBM232 provides an Ethernet interface between the I/A Series system and the PLCs. Refer to *FBM232 Field Device System Integrator Module 10/100 Mbps Ethernet, Single* (PSS 21H-2Z32 B4).
- ▶ Use two FBM233s to implement a redundant Ethernet interface between the I/A Series system and the PLCs. Refer to *FBM233 Field Device System Integrator Module, 10/100 Mbps Ethernet, Redundant* (PSS 21H-2Z33 B4).

SOFTWARE

The FDSI EtherNet/IP Driver is compatible with all releases of the I/A Series System software starting with V8.0.b.

OPERATION

The FBM232/233 collects the required data from the devices, performs the necessary conversions, and then stores the converted data in its database for incorporation into the I/A Series plant management functions and operator displays. Data may also be written out to the individual devices from the I/A Series system.

Installation and Download

Installation of the driver does not require shutting down the I/A Series system or rebooting the I/A Series workstation. Furthermore, any updated driver can be downloaded to the FBM232 or FBM233 without disrupting the rest of the I/A Series system.

COMMUNICATIONS

The FDSI EtherNet/IP Driver communicates over Ethernet using the EtherNet/IP protocol to ControlLogix controllers, which can be configured to operate with PLC5 and SLC5 PLCs, on a device-by-device basis. The I/A Series System interfaces with the ControlLogix controller, which supports various hardware configurations, including ControlLogix controllers connected to PLC5s and SLC5s through ControlNet or DHPlus interfaces. The I/A Series System can access data contained in the PLC5 or SLC5 by mapping ControlLogix tag names to this data.

CONFIGURATION

FDSI Configurator

To configure the FDSI EtherNet/IP Driver, you must use the FDSI Configurator software, which can be installed on a workstation running the Windows XP® operating system. The FDSI Configurator is required for configuring Ethernet port properties. Optionally, the FDSI Configurator can be used to build device configuration files to support *aliasing* of tag names or to support tag names greater than 32 characters.

ControlLogix Configuration

To configure the ControlLogix controller and its associated devices, you must use the RSLinx and RSLogix-5000 configuration application software supplied by Rockwell Automation.

PRODUCT SUPPORT

The FDSI EtherNet/IP Driver can be ordered from BuyAutomation. The product includes media and documentation. Engineering assistance can be provided through the normal channels.

SPECIFICATIONS

Supported Data Types and Formats

The Control Processor 270 that hosts the FBM232/233 can make up to 2,000 DCI connections to read data from or write data to the PLCs. The connections can be:

- ▶ Analog input or output values (integer or IEEE single-precision floating point)
- ▶ Single digital input or output values.

The FDSI EtherNet/IP Driver supports the following ControlLogix data types:

- ▶ BOOL
- ▶ BOOLEAN ARRAY
- ▶ SINT (8 bit integer)
- ▶ INT (16 bit integer)
- ▶ DINT (32 bit integer)
- ▶ REAL (32 bit float)
- ▶ TIMER (32 bit integer – units of milliseconds)
- ▶ COUNTER (32 bit integer)
- ▶ CONTROL (32 bit integer)
- ▶ Array (single dimensional).

Number of Devices

Up to 64 ControlLogix PLCs or PLC pairs per FBM232/233 maximum. The actual number of PLCs is performance and configuration dependent.

Number of Points

An I/A Series control station can access up to 2,000 analog I/O values, or up to 64,000 digital I/O values, or a combination of digital and analog values using a single FBM232 or a pair of FBM233s.

Control Block Support

The FBM232 and FBM233 offer support for the standard I/A Series Equipment Control Block (ECBs) listed in Table 1 and the DCI blocks listed in Table 2.

Table 1. ECBs Supported by the FDSI EtherNet/IP Driver

ECB200	Parent ECB, representing the FBM232
ECB202	Parent ECB, representing the FBM233
ECB201	Child ECB, representing a ControlLogix PLC

Table 2. DCI Blocks Supported by the FDSI EtherNet/IP Driver

BIN	Binary Input
BINR	Redundant Binary Input
BOUT	Binary Output
IIN	Integer Input
IINR*	Redundant Integer Input
IOUT	Integer Output
PLSOUT	Pulse Output
RIN	Real Input
ROUT	Real Output
PAKIN	Packed Input
PAKINR*	Redundant Packed Input
PAKOUT	Packed Output

* I/A Series System software V8.4 and later supports the redundant DCI blocks IINR and PAKINR.



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