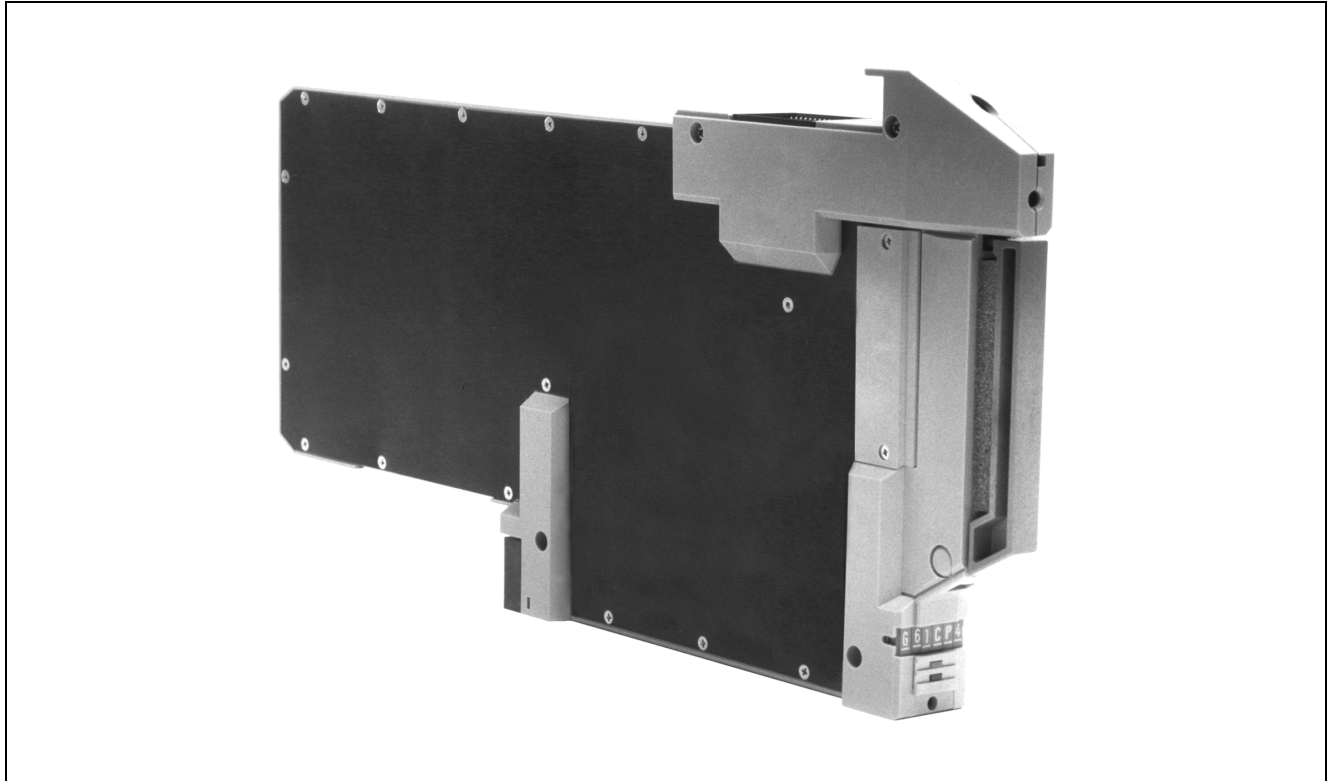


I/A Series® Hardware Device Integrator 30, Style B



The Device Integrator 30, Style B is an optionally fault-tolerant station on the I/A Series system providing interconnection and integration of remote computing devices to the I/A Series system. It has two RS-423/RS-232-C compatible serial ports for interfacing with synchronous or asynchronous devices over an RS-232-C line as shown in Figure 1. RS-485 compatible devices may be attached with adapters and interfaced to the system.

The Device Integrator receives the required data from foreign devices, such as gas analyzers, turbines, sequence of events monitors, paper machine gauges, on an exception or polled basis. The Integrator is responsible for converting this data and storing it in a database resident in the Integrator. The data then becomes accessible to every station on the I/A Series network.

Conversely, the Device Integrator sends data to the foreign device on an exception or periodic basis from the database within the integrator.

The Device Integrator 30 is responsible for translating data values from stations on the network into device-specific messages. For each device, the integrator communicates using the device-specific protocol to send and receive data messages. User programs can also send messages already formatted for a particular device. In this case, no translation is performed.

The Device Integrator offers these features:

- Object Manager access to foreign device data
- Conversion of data
- Communication protocol handling
- Configurable mapping of foreign device databases to the I/A Series system.

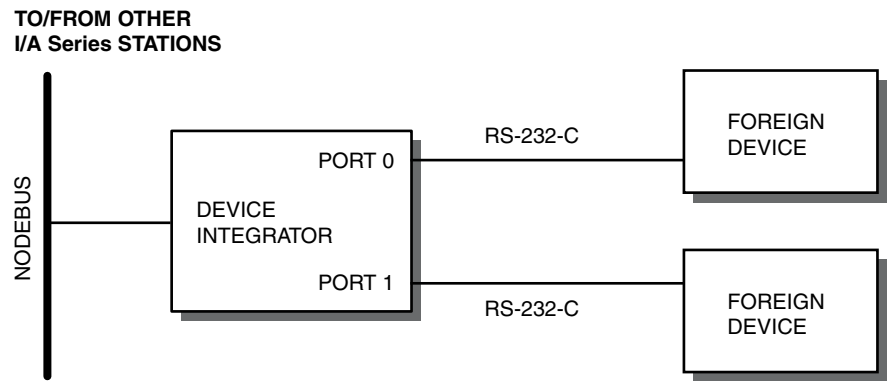


Figure 1. Device Integrator 30 Interface to I/A Series Nodebus

FUNCTIONAL SPECIFICATIONS

Object Manager Access to Foreign Device Data

Any station on the I/A Series network has access to all data variables imported to the system from the attached device. In addition, any station can initiate the sending of data values to the attached device.

Conversion of Data

Data variables of the type boolean, integer, and real are automatically converted from I/A Series format to the attached device format and from device format to I/A Series format.

Communications Protocol Handling

Message formatting and management of message traffic is performed automatically. All protocol-specific message exchanges are handled via standard techniques such as BCC character generation and checking, message retries, message addressing, ACKing and NAKing.

Configurable Mapping of Foreign Device Data Bases

Data in the attached device database can be mapped to an I/A Series database using the Integrated Control Configurator.

The Device Integrator supports both input from and output to the attached device(s) using the following I/A Series block types:

FDBIN	FDBOUT
FDIIN	FDIOUT
FDRIN	FDROUT
FDIDMS	FDMSBL

A special block, FDSCAN, is used to scan the foreign device for data and collect the input values and statuses to be sent to applications in an AP/AW. As many FDSCAN blocks as are needed may reside in a compound and each block may relate to multiple input data blocks. This block is not required in all applications.

The Device Integrator also supports the use of CALC blocks.

Alarm Functions

The Device Integrator fully supports I/A Series alarm functions. The following blocks support the alarming capability:

ALMKPRI	PATALM
BLNALM	REALM

Alarms are read from the foreign devices and reported to the I/A Series operator via the alarm logging devices as configured in the Device Integrator compound/block database. All alarms (process and system) are acknowledged from specific I/A Series displays. To allow for the dynamic suppression of selected alarms from the I/A Series workstation, the priorities and inhibit parameters of alarms are specified during block configuration.

System Management Support

The System Health displays for the Device Integrator show the Integrator as a control processor, with the attached devices appearing as Fieldbus Modules (FBMs). These displays can be used to connect or disconnect communication paths to the devices.

PACKAGING AND ARCHITECTURE

The Device Integrator 30 is packaged as a single width Z-Module which utilizes a Communication Processor 30 hardware base with Control Processor 30 and Integrator-specific software. When installed in an I/A Series mounting structure, the Integrator connects to the Mounting Structure Bus and accesses the Nodebus. Device interface module connections are made via cable connectors secured to the mounting structure that houses the Integrator module. The Integrator hardware architecture consists of the following elements:

- Multiple processors
- Dynamic RAM
- Nodebus interface
- Two interface I/O ports compatible with EIA RS-423/RS-232-C.

For enhanced reliability during maintenance operations the Integrator 30 is equipped with a recessed reset button, located at the front of the module. This feature provides for manually switching module power off and on (for maintenance purposes) without removing the module from the enclosure.

Enhanced Reliability

Certain OEM devices that offer redundant communication and/or processing are supported by an optional fault-tolerant Device Integrator 30 for enhanced reliability. The Device Integrator 30 provides optional fault-tolerance when this support is offered. The fault-tolerant configuration consists of two modules, operating in parallel, each with a separate connection to the Nodebus and to the foreign devices as shown in Figure 2.

The two processor modules, married together as a fault-tolerant pair, are designed to provide continued operation in the event of virtually any hardware failure occurring within one module of the pair. Both modules receive and process information simultaneously, and faults are detected by the modules themselves.

One of the significant methods of fault detection is comparison of communication messages at the module external interfaces. Upon detection of a fault, self-diagnostics are run on both modules to determine which module is defective. The non-defective module then assumes control without affecting normal system operations.

To further ensure reliable communication, the fault-tolerant processor performs error detection and address verification tests in its Nodebus interfaces.

Consult Foxboro for optional fault-tolerant Device Integrator 30 availability.

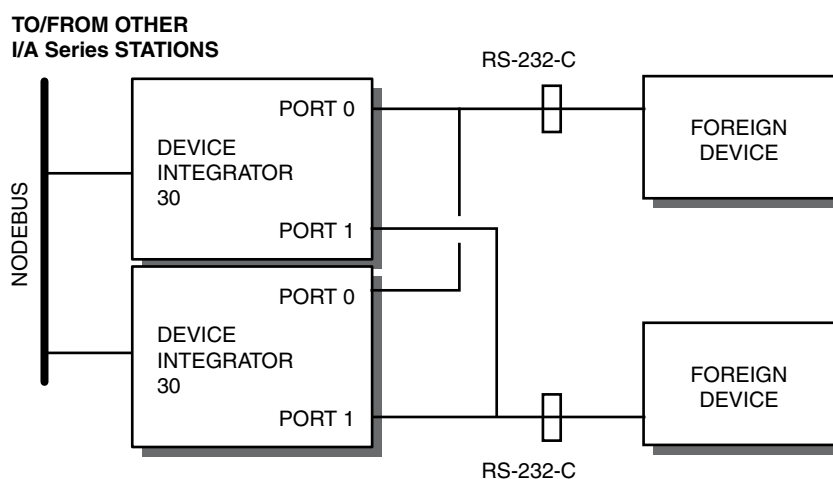


Figure 2. Device Integrator 30 Fault-Tolerant Configuration

DIAGNOSTICS

The communication processor utilizes three types of diagnostics to detect and/or isolate faults:

- Power-up Self-Checks
- Run-time and Watchdog Timer Checks
- Off-line Diagnostics.

Power-up self-checks are self-initiated when power is applied to the communication processor. These checks perform sequential tests on the various processor functional elements. Red and green indicators at the front of the processor module reflect the successful (or unsuccessful) completion of the startup sequence.

The run-time and watchdog timer checks provide continuous monitoring of communication processor functions during normal system operations. The operator is informed of a malfunction by means of printed or displayed system messages.

Off-line diagnostics are run for the purpose of performing comprehensive tests and checks on various system station components. By using the off-line diagnostics, the operator is able to isolate and/or confirm a suspected fault in the processor.

Additionally, software display templates used in conjunction with user-built CALC blocks provide communication diagnostic capabilities. Communication information is also available via System Management displays.

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