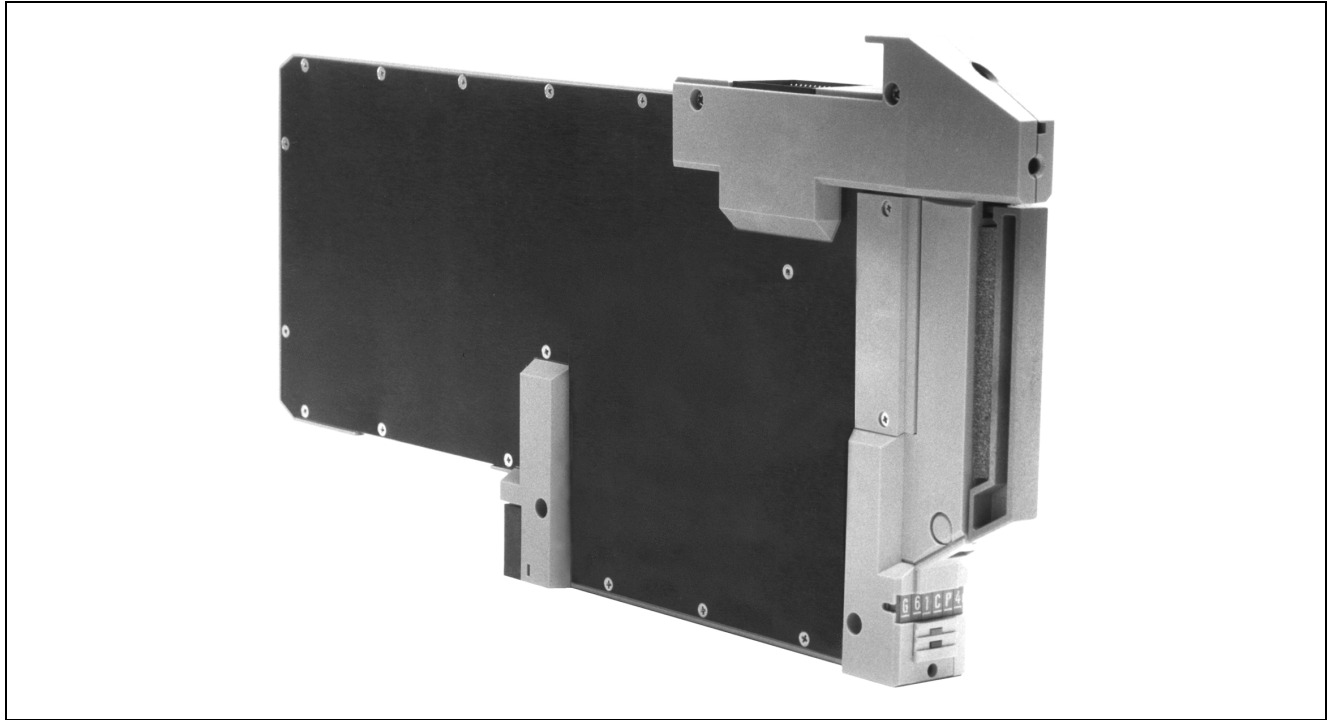


# I/A Series<sup>®</sup> Hardware Integrator 30, Style B for Allen-Bradley<sup>™</sup> Programmable Logic Controllers



The I/A Series Integrator 30, Style B for Allen-Bradley Programmable Logic Controllers is an optionally fault-tolerant station on the I/A Series system. The Integrator 30 allows the integration of data from Allen-Bradley Programmable Logic Controllers (PLCs<sup>™</sup>) into I/A Series databases so that the data may be accessed by standard I/A Series blocks. The supported PLC families are: PLC-2, PLC-3, PLC-5, and SLC-5/04.

The Integrator 30 interfaces to the Allen-Bradley Data Highway<sup>™</sup>, Data Highway Plus<sup>™</sup>, or Data Highway II using Allen-Bradley Communication Adapter Modules (CAMs) as shown in Figure 1. The Integrator is responsible for translating data received from the PLCs into an I/A Series database for incorporation into I/A Series based plant management functions and operator displays. Data access is supported by a subset of the Allen-Bradley DF1 protocol command set.

The Integrator also provides an interface for application programs to communicate with controllers via standard I/A Series interprocess communication (IPC) connected services. An application can transmit commands to specific controllers for reading and writing controller parameters. All error checking for message commands must be done by the application.

The Integrator for Allen-Bradley offers these features:

- High performance interface to the Allen-Bradley PLCs
- Fault-tolerant configuration
- Support for Message Pass-Through (MPT) function whereby any DF1 command for one of the supported Allen-Bradley PLCs may be generated on an AP/AW and “passed through” to a PLC

- Redundant communications or multi-path functionality
- Support for both input and output to PLCs for the following I/A Series blocks:

AIN	CIN	MAIN	MTR
ALMPRI	COUTDEP	MCIN	PATALM
AOUT	EXC	MCOUT	REALM
BLNALM	GDEV	MON	TIM
CALC	IND	MOVLV	VLV
CHARC			

A special block, ABSCAN, is used to define the PLC data table access specifications for a compound. Only one ABSCAN block may reside in a compound and access a maximum of 128 byte messages from the PLC. The actual number of accessible points from a PLC is dependent upon the scan rate and compound configuration

- Support for standard I/A Series alarm functions.

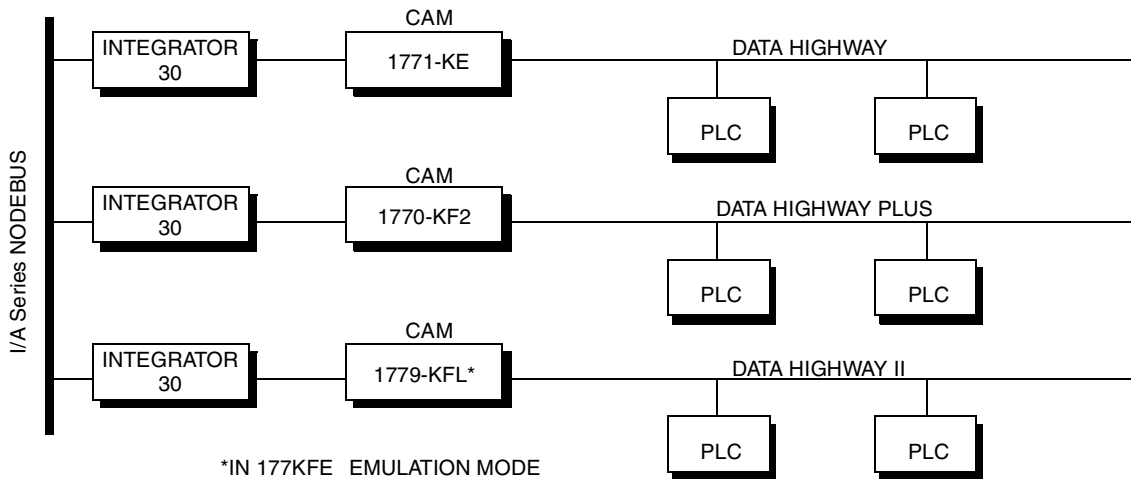


Figure 1. Integrator 30 Connections to Allen-Bradley Data Highways

**FUNCTIONAL SPECIFICATIONS**

The Integrator 30 provides communication with PLCs via an RS-232-C serial data link to a CAM connected to the Data Highway, or directly to a PLC-5 (PLC-5/40 or PLC-5/60) or SLC-5/04.

Two RS-232-C serial ports with two CAMs provide either redundant communication to the Allen-Bradley Data Highway or multi-path functionality. Multi-path functionality provides access to multiple devices that are unique to a specific port.

The following PLC families are supported: PLC-2, PLC-3, and PLC-5. The integrator communicates to the PLCs via the following Allen-Bradley Data Highway Communication Adapter Modules:

- Data Highway: 1771-KE, 1771-KF, 1770-KF2B
- Data Highway Plus: 1770-KF2, 1785-KE
- Data Highway II: 1779-KFL (in 1771-KE emulation mode).

The integrator collects the required data from the PLCs, converts the data, and then stores it in the Integrated Control Configurator database for access by I/A Series based plant management functions and operator displays. Data may also be written to individual PLCs from the I/A Series system.

**Alarm Functions**

The Integrator 30 fully supports standard I/A Series alarm functions on input/output data.

**System Management Support**

The System Health displays for the Integrator 30 show the integrator as a control processor with the CAM appearing as the primary equipment control block (ECBP). These displays can be used to connect or disconnect communications paths to the PLCs.

**PACKAGING AND ARCHITECTURE**

The Integrator 30 is packaged as a single width Z-Module. Connections to Allen-Bradley CAMs are made via cables secured to the mounting structure housing the integrator. The Integrator 30 hardware consists of the following major components:

- 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 hardware reset button located at the front of the module.

### Enhanced Reliability

The Integrator 30 offers optional fault tolerance for enhanced reliability. The fault-tolerant configuration consists of two modules operating in parallel with two separate connections to the Nodebus and two connections each to the two CAMs. Each CAM is then connected to the redundant Allen-Bradley Data Highway 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 communications, the fault-tolerant processor performs error detection and address verification tests in its Nodebus interfaces.

### DIAGNOSTICS

The Integrator 30 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 perform sequential tests on various Integrator functional elements. Red and green indicators at the front of the Integrator module reflect the success (or failure) of the various phases of the startup sequence.

The run-time and watchdog timer checks provide continuous monitoring of Integrator 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, a suspected fault in the Integrator can be isolated and/or confirmed.

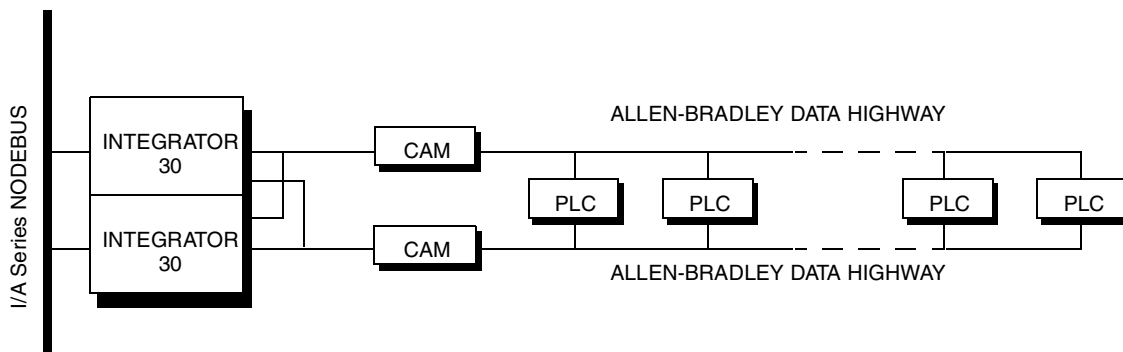


Figure 2. Fault-Tolerant Integrator 30 with Redundant Highway Configuration

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