

# I/A Series<sup>®</sup> Hardware Nodebus, Nodebus Extender, and Nodebus Interface



The Nodebus interconnects stations (Control Processors, Application Processors, Workstation Processors, Application Workstations, and so forth) in the I/A Series system, to form a process management and control node. Operating in conjunction with the Nodebus interface electronics in each station, the Nodebus provides high-speed, redundant, peer-topeer communications between the stations.

Nodebus Extenders, used in pairs, provide for extension of the Nodebus, as illustrated above.

The Nodebus Interface connects an I/A Series personal workstation (with appropriate connector card and software) to the Nodebus, allowing the workstation to operate as a station on the I/A Series system. The Nodebus Interface also allows connection of an Application Workstation or Workstation Processor hosting Micro-I/A<sup>™</sup> stations (via an Ethernet star or Ethernet daisy chain configuration) to the Nodebus. See PSS 21H-7B1 B3 Nodebus for additional information.



## NODEBUS FUNCTIONAL SPECIFICATIONS

### **Bus Type**

Redundant IEEE 802.3 bus with CSMA/CD access protocol

### **Data Transfer Rate**

Clocked at 10 megabits/s

Characteristic Impedance 50 ohms

Nodebus Segment Termination

50 ohm terminators, one at each end

Maximum Number of Modules Connected in a

Segment<sup>(a,b,c)</sup> 32

Maximum Number of Stations Connected in an Extended Node $^{(a,b)}$ 

64

### Maximum Number of Segments in a Node<sup>(d)</sup>

3

4

(a) Fault-tolerant stations count as two modules.

(b) A Nodebus Extender pair counts as two modules.

(c) For example, an Industrial Enclosure 32 has two mounting structures; therefore, no more than three Industrial Enclosure 32s can be included in a segment.

- (d) If Dual Nodebus Interface Extenders (DNBXs) are used in the node, two Nodebus segments (maximum) can be implemented.
- (e) This does not include mounting structure bus lengths.
- (f) Control Processor 10 is limited to 697 m (2,300 ft) Nodebus lengths.
- (g) FONBE is limited to a two segment Nodebus with a single fiber extension at a maximum length of 2,000 m (6,560 ft) or 3 segments with the total sum of fiber lengths at a maximum of 2000 m (6,560 ft).

## NODEBUS EXTENDERS AND NODEBUS INTERFACE FUNCTIONAL SPECIFICATIONS

## Power Requirements

INPUT VOLTAGE (REDUNDANT) 26 to 42 V dc (39 V dc typical) CONSUMPTION (HEAT DISSIPATION) *Nodebus Extender* 14 W, maximum

Nodebus Interface 8 W, maximum

Maximum Number of Nodebus Interfaces Allowed in a Single Node

## **Nodebus Interface Cabling Distance**

Maximum cabling (AUI) distance between Nodebus Interface and workstation is 45 m (150 ft). Maximum cabling distance between Nodebus Interface and Ethernet hub configuration is 45 m (150 ft).

Maximum cabling (ThinNet) distance between Nodebus Interface Extender and end of daisy chain configuration is 150 m (500 ft).

## **Communication Characteristics**

The Nodebus Interface is non-redundant.

Maximum Number of Mounting Structure Buses per Segment<sup>(C)</sup> 6

Maximum Nodebus Segment Length<sup>(e)</sup> 30 m (100 ft)

**Maximum Cabling Length Between Segments** 300 m (1,000 ft) or 2,000 m (6,560 ft) with FONBE point-to-point configuration<sup>(f,g)</sup>

**Maximum Overall Cable Length in a Node** 600 m (2,300 ft) or 2,060 m (6,758 ft) with FONBE point-to-point configuration<sup>(f,g)</sup>

## **Configuration Limitations**

Not more than three Nodebus segments (four Nodebus Extender pairs) can be implemented in a single node.<sup>(d, g)</sup>

## NODEBUS EXTENDER AND NODEBUS INTERFACE ENVIRONMENTAL SPECIFICATIONS(a)

### Operating

TEMPERATURE 0 to 60°C (32 to 140°F) RELATIVE HUMIDITY 5 to 95% (Noncondensing) ALTITUDE -300 to +3,000 m (-1,000 to +10,000 ft)

#### Storage

TEMPERATURE -40 to +70°C (-40 to +158°F) RELATIVE HUMIDITY 5 to 95% (Noncondensing) ALTITUDE -300 to +12,000 m (-1,000 to +40,000 ft)

## **Environmental Contamination Level**

Class G3 (Harsh) as defined in ISA Standard S71.04

(a) The environmental ranges can be extended by the type of enclosure containing the Nodebus Extender or interface. [Refer to applicable Product Specification Sheet (PSS) which describes the specific enclosure that is to be used.]

## NODEBUS EXTENDERS AND NODEBUS INTERFACE PHYSICAL SPECIFICATIONS

**Configuration**<sup>(a)</sup> Single-width Z-Module Mass (Maximum) 1.0 kg (2.2 lb)

## Mounting

May be placed in any mounting structure slot.

(a) Nodebus Extenders are used in pairs (two single-width Nodebus Extender modules at each end of the extension cable).

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