



Bus Interface Unit (BIU)

Description

The *BIU-64* is a rack module which interfaces 24V logic I/O signals to the Synchronous Data Link Control (SDLC) serial bus of TS2 Type-1 cabinets. It is required in all TS2 Type-1 cabinets and in TS2 Type-2 cabinets whether controller I/O interface is through the SDLC bus, not via TS1 MS-A, B, and C connectors.

Physically, the *BIU-64* consists of a circuit board and a front panel. A male 64-pin DIN 41612 type-B series connector provides the connection to the backplane of the rack. A female 15-pin metal shell D subminiature connector with latching blocks provides the connection to the SDLC cable. The front panel provides separate indicator lights for Power, Transmit, and Valid Data. It also provides a handle for easy removal of the unit from the rack. A separate TS2 cabinet power supply provides the required 24 VDC power plus a 60 Hz line-timing reference.

SDLC Serial Bus

In a TS2 Type-1 cabinet, the full-duplex SDLC serial data bus provides high speed, bidirectional data exchange with the controller. Malfunction Management Unit (MMU), Detector Rack(s), and Terminals and Facilities. The bus operates at 153,600 bps and uses four sets of RS-485 balanced lines: Rx Data, Rx Clock, Tx Data, and Tx Clock. In a TS2 Type-2 cabinet, the A, B, and C connectors of TS1 are also available and allow point-to-point wiring to the controller without a BIU.

The SDLC bus overcomes the pin limitations of TS1, simplifies cabinet wiring, enhances reliability, allows virtually unlimited cabinet expansion, and provides a standardized interface to currently unspecified future devices. It allows the controller to serve as a backup for the MMU and to receive diagnostic data from detectors.

Signal I/O

The TS2 Standard specifies 24V logic pin assignments for the rear connector of the BIU as follows: eight inputs, four opto-isolated inputs, 24 re-mappable input/outputs, 15 outputs, and four address-select inputs.

The isolated inputs are intended to be used with pedestrian detectors and remote interconnect signals.

I/O Mapping

The four address-select inputs provide 16 BIU addresses, which are normally set by jumpers on the backplane. TS2 specifies the I/O mapping for eight of the addresses. Once one of the eight addresses has been set, all I/O pins of the backplane and the BIU are fully defined, thus allowing standardized cabinet wiring and simple menu-driven programming of the controller. Operation of the SDLC bus is completely transparent to the user. BIUs 1-4 are designated for Terminals and Facilities, BIUs 9-12 for Detector Racks.

TS2 Compatibility

The BIU complies with Section 8 and with all other applicable sections of the NEMA TS2-2002 Standard. It performs its specified functions under the environmental conditions set forth in Section 2 of the Standard, which includes operation from -30°F to +165°F (-34°C to +74°C). The *BIU-64* is usable in a TS2 cabinet by any manufacturer, provided that the cabinet fully meets the TS2 Standard.

Functions

- Interfaces detectors, load switches, and 24V signals to TS2 Port-1 SDLC bus
- Used in TS2 Type-2 for detector rack interface

Features

- Exceeds BIU requirements of NEMA TS2-2002
- Interfaces detectors, load switches, and 24V signals to TS2 Port-1 SDLC bus
- Used in all TS2 Type-1 cabinets for Terminal and Facilities plus Detector Racks
- Used in TS2 Type-2 for Detector Racks
- Fully hot-swappable
- Separate Power, Transmit, and Valid Data LED indicators display DC power and port status
- High current output drives
- SDLC bus surge protection
- Input/Output surge protection

Hardware

The *BIU* measures 2.34 in. W x 4.50 in. H x 6.60 in. D. Low-profile components are used in order to facilitate an optional half-width front plate unit which measures 1.17 in. x 4.5 in. x 6.60 in. The *BIU* will slide freely into two rack card-guides having a nominal slot width of 0.075 in. and a maximum slot width of 0.125 in.

An aluminum handle is provided on the front panel to allow easy removal of the *BIU* from the rack. Nominal outer dimensions of the handle shall be 1 in. x 2½ in.

The card rack connector on back of the *BIU* is a male 64-pin DIN 41612 type-B series. The connector is centered at the edge of the circuit board and oriented with Pin 1 located on top. The circuit board edges align with the connector per DIN 41612.

The Port-1 SDLC bus connector on the front panel of the *BIU* is a 15-pin metal shell subminiature type with female gold plated contacts. The connector is equipped with latching blocks and mates with a male 15-pin D-type cable connector that is equipped with spring latches (Amp part number 745012-1 or equivalent).

The front panel made of 0.090 in. sheet aluminum and is finished with a durable protective coating. Two indicator lamps are provided on the front panel, as specified by the TS2 Standard, for Power and Transmit. In addition, the front panel provides a Valid Data indicator, which lights whenever a Valid Data frame is received. The Power light flashes during absence of Line Frequency Reference (LFR) from

the cabinet power supply. The *BIU* operates with internally generated 60 Hz reference in the absence of the LFR signal.

The circuit board is made of NEMA FR-4 glass epoxy or equivalent. Exposed circuit traces are plated with solder.

Both sides of the board are coated with a clear, moisture-proof, and fungus-proof sealant. The designation of all components and the polarity of all capacitors are clearly marked adjacent to the component.

Pin assignments

Port-1 (SDLC bus) pin assignments shall be as specified in Section 8.6.2.1 of the TS2 Standard:

Pin	Function
1	Rx Data
2	Logic Ground
3	Rx Clock +
4	Logic Ground
5	Tx Data
6	Logic Ground
7	Tx Clock +
8	Logic Ground
9	Rx Data -
10	Not Used
11	Rx Clock -
12	Earth Ground
13	Tx Data -
14	Reserved
15	Tx Clock -

Card rack connector pin assignments shall be specified in the TS2 Standard:

Side A	Pin	Side B
+24 VDC	1	+24 VDC
Output 1	2	Output 2
Output 3	3	Output 4

Side A	Pin	Side B
Output 5	4	Output 6
Output 7	5	Output 8
Output 9	6	Output 10
Output 11	7	Output 12
Output 13	8	Output 14
Output 15	9	Input/ Output 1
Input/ Output 2	10	Input/ Output 3
Input/ Output 4	11	Input/ Output 5
Input/ Output 6	12	Input/ Output 7
Input/ Output 8	13	Input/ Output 9
Input/ Output 10	14	Input/ Output 11
Input/ Output 12	15	Input/ Output 13
Input/ Output 14	16	Input/ Output 15
Input/ Output 16	17	Input/ Output 17
Input/ Output 18	18	Input/ Output 19
Input/ Output 20	19	Input/ Output 21
Input/ Output 22	20	Input/ Output 22
Input/ Output 24	21	Input 1
Input 2	22	Input 3
Input 4	23	Input 5
Input 6	24	Input 6
Input 8	25	Opto-Input 1
Opto-Input 2	26	Opto-Input 3
Opto-Input 4	27	Opto-Common
Address Select 1	28	Address Select 2
Address Select 3	29	Address Select 4
Data Tx	30	Data Rx
Ground (earth)	31	Line Freq.
Ground (logic)	32	Ground (logic)

Isolated inputs

The *BIU* provides four optically isolated inputs for use with push-buttons and remote interconnect. These inputs provide minimum electrical isolation of 10MΩ, minimum electrical breakdown of 1000 VAC, and a nominal input impedance of 5KΩ.

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