



Auxiliary Profibus-DP Interface Module IS215PBIAH_A_ _

Safety Symbol Legend



Warning

Indicates a procedure, practice, condition, or statement that, if not strictly observed, could result in personal injury or death.



Caution

Indicates a procedure or condition that, if not strictly observed, could result in damage to or destruction of equipment.

Note Indicates an essential or important procedure or statement.

These instructions do not purport to cover all details or variations in equipment, nor to provide every possible contingency to be met during installation, operation, and maintenance. If further information is desired or if particular problems arise that are not covered sufficiently for the purchaser's purpose, the matter should be referred to GE Industrial Systems.

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Functional Description

The IS215PBIA Auxiliary Profibus-DP Interface Module (PBIA) models the Innovation Series™ drive as an I/O block on a Profibus-DP network (see Figure 1), providing seamless integration between the drive and controller.

- Discrete commands and references are sent from the controller (typically a PLC) to the drive.
- Selected discrete and word variables are fed back from the drive.

The PBIA module provides either an integer or floating-point variable map between the drive and controller. A floating-point map is defined with all of the variables in engineering units, the integer map requires certain variables to be scaled. Configuration of the interface is done with either the local keypad or the Control System Toolbox (see Figure 2).

The PBIA module is made up of an IS200BLIG LAN Interface-Genius Board (BLIG) and a Universal Communications System Profibus-DP board (UCS™, manufactured by SST Inc.). The module connects to the IS200CABP Cable Assembly Backplane Board (CABP) in the board rack.

For more information on the UCS board (UCS-PFB-1), contact:

S-S Technologies, Inc
 50 Northland Road
 Waterloo, Ontario,
 Canada, N2V 1N3
 (519) 725-5136
 www.sstech.on.ca

The PBIA module interfaces to the drive through its backplane connector, P8. All power and digital I/O signals are routed through this connector. The UCS board mounts to the BLIG board on four standoffs (to create the PBIA module) and communicates to it through connector P3. All digital address, data, and control signals between the two boards are interfaced through P3. Power is also supplied to the UCS board through P3. The PBIA module interfaces to the Profibus-DP network through a nine-pin connector, DB-9, located on the module's faceplate. LED indicators located on the module's faceplate and on the individual board surfaces provide visual indications of operation, communications, and power supply status.

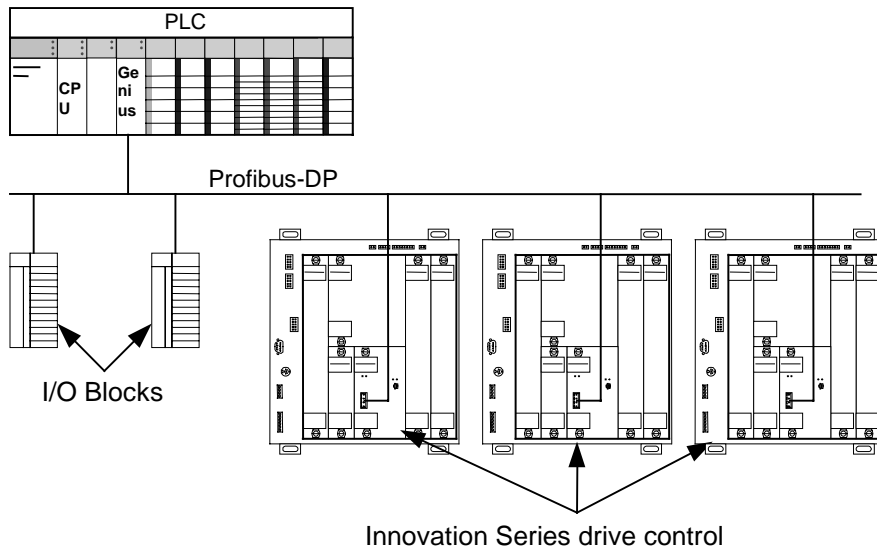


Figure 1. Profibus-DP Network Example

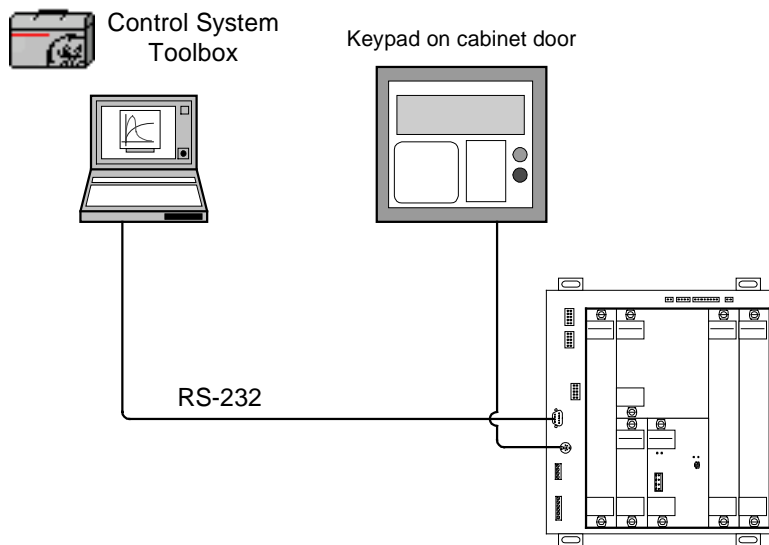


Figure 2. Configuration Devices

LED Indicators

Two LED indicators, OK (DS1_A2) and DIAGNOSTIC (DS1_A1), are located on the module's faceplate and provide visual indications of module and communications status. A third LED (DS2) is located on the BLIG board's surface and indicates the P5 power supply status (ON when P5 is present).

The green OK LED lights when the module is functioning properly with no known faults. If there is a fault, this LED blinks out a fault code. The green DIAGNOSTIC LED is for manufacturing use only and is OFF during normal operation.

In addition, there are two LEDs on the UCS board. These LEDs, designated NETWORK and STATUS, provide additional status information. Refer to the *Application Data* section of this document for LED indicator tables.

Profibus-DP

Profibus-DP is a field bus or network designed for fast data exchange. Profibus-DP communication is established between an Active Station (Master) central unit (a Programmable Logic Controller or Personal Computer) and Passive Stations (Follower) units, such as sensors, actuators, or drives. The data exchange is cyclic; the Active Station reads the Passive Station's input data and writes the Passive Station's output data. The bus cycle time is usually shorter than the cycle time of the central unit with scan times of 4–7 milliseconds being typical.

Note Different terms are used by different Profibus-DP interface equipment manufacturers to describe the relationship between devices. This document uses the Profibus-DP standard of Active Station and Passive Station. Terminology equivalents are as follows:

Active Station = Leader = Master

Passive Station = Follower = Slave

Standards

Profibus-DP is fully described in the European Field Bus Standard *EN 50 170 Part 3* manual. This standard was previously known as the German standard *DIN 19245 Part 3*. The protocol architecture of Profibus-DP is based on the Open Systems Interconnection (OSI) reference model in accordance with the international standard *ISO 7498*.

Profibus-DP is supported in the United States by the Profibus-DP Trade Organization (PTO) and internationally by the Profibus-DP Nutzerorganization (PNO).

For information about Profibus-DP theory, standards, cable requirements, connectors, or other information, contact the PTO or the PNO at the following addresses:

PROFIBUS-DP Trade Organization USA
PTO - USA Branch Office
16101 N. 82nd Street, Suite 3B
Scottsdale, AZ 85260 USA
Tel: + 1 602 483 2456
Fax: + 1 602 483 7202
(Replace + with the international access code.)
www.profibus.com

Profibus-DP Nutzer Organization (PNO)
Haid-und-Neu-Strasse 7
D-76131 Karlsruhe
Tel: + 49 (0) 721 9658 590
Fax: + 49 (0) 721 9658 589
(Replace + with the international access code.)
PROFIBUS_International@Compuserve.com

The user must connect the PBIA module to the Profibus-DP network in accordance with the guidelines specified by *EN 50 170*. Contact the PNO or PTO (listed previously) for details. The cable used must adhere to the Profibus-DP specification. Belden 3079A cable is one example of an acceptable cable.

Network Connections

The proper termination resistors are built in on many Profibus-DB connectors available from several vendors. Usually, the connector has a switch to enable or disable the terminating resistors.

The PBIA module uses a Profibus-DP compatible DB-9 receptacle connector as shown in Figure 3. If the PBIA module is at either end of the network cable, external termination must be provided. The design of the external termination is specified by *EN 50 170* and is shown in Figure 2. Only the devices at the ends of the cable should have the terminating resistors enabled. The Profibus-DP uses active termination and power must be provided to the termination resistors whenever the network is to be operational.

Grounding Practices: The Profibus-DP standard specifies that the cable shield be connected directly to chassis ground at both ends of the cable. Any potential difference between the chassis grounds of different pieces of equipment must be eliminated before the Profibus-DP is installed. The PBIA module's faceplate screws must be tight because these tie the module to ground.

Note There is a green four-pin connector on the PBIA faceplate that is reserved for other networks. This should be left unconnected for Profibus-DP applications.

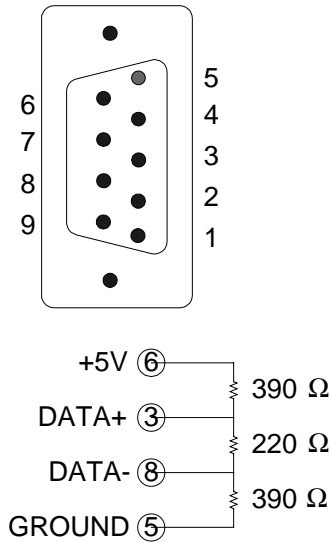


Figure 3. Profibus-DP Connector and Termination Resistors (Also See Table 4)

Network Performance

On the Profibus-DP network, the drive functions as a Passive Station. An Active Station reads the Passive Station's input data and writes the Passive Station's output data once per network scan.

In controlling industrial processes, the frequency at which the Active and Passive Stations can exchange information is important.

Several factors determine this performance as shown in the following table:

Network Performance Factor	Description
Active Station scan time	Time required for a scan of the control logic being executed in the Active Station (typically measured in milliseconds).
Network scan time	Time required for a scan of the control logic being executed on the network (typically measured in milliseconds).
Type of data interface	Synchronous or asynchronous nature of the interface between the Active Station and the Profibus-DP network module
Configured baud rate of the network	The baud rate of the network is configurable as a parameter for each device.
Types of devices on the network	The contribution of each device to the network sweep rate varies with the quantity of I/O data being exchanged with the controller.
Quantity of network devices	As the number of devices grows, so does the scan time.

Data Mapping

It is not possible to configure the drive through the Profibus-DP interface.

The drive is configured through its keypad or by the Control System Toolbox (toolbox). Once configured, the drive exchanges a fixed set of variables with the Active Station during each bus cycle as follows.

- Variables sent to the drive are defined as references
- Variables retrieved from the drive are defined as feedbacks.

The variables available are specified in the drive documentation (see Table below).

Pattern	Publication No.	Drive/Publication Type
ACDCF-G	GEH-6393	Innovation Series Low Voltage Reference and Troubleshooting
ACDCF-S	GEH-6394	Innovation Series Low Voltage Reference and Troubleshooting
ACDCF-V	GEH-6395	Innovation Series Low Voltage Reference and Troubleshooting
ACCBN-A	GEH-6396	Innovation Series Low Voltage Reference and Troubleshooting
ACCBR-A	GEH-6397	Innovation Series Low Voltage Reference and Troubleshooting
ACMVAC4-G	GEH-6383	Innovation Series Medium Voltage – GP Type G Drives Users Guide
ACMVACR-G	GEH-6131	Innovation Series Medium Voltage – GP Type H Drives Users Guide

The drive treats all internal variables, except for bits, as floating point quantities. The drive has two fixed variable interface maps to provide variable data transfer to and from a network:

- One map contains the drive's references and feedbacks in the form of 16-bit **integers**.
- The other map presents the same information in 32-bit IEEE **floating point** format.

Only one of the two maps is available at any given time, and the selected map can only be changed through the drive's keypad or the toolbox by modifying the *LAN Page Format* parameter. Refer to the specific drive's documentation for instructions on selecting the variable interface map and for descriptions of each variable.

The **integer format** of the variable interface map consists of 17 words of reference and 17 words of feedback. The first two words of reference contain 32 bits, as do the first two words of feedback. The remaining 15 words of reference and of feedback contain signed integer variables. Internally, the PBIA stores these integers in Little Endian (Intel) format. The PBIA module can be configured to present the map to the Profibus-DP network in Little Endian or Big Endian formats. This format applies to each word of the map, including the words containing bits. The Profibus-DP standard for integer values is to use Big Endian data.

The **floating point format** of the variable interface map consists of 16 references and 16 feedbacks. Each reference and feedback is a double word (4-byte) entity. The first double word of references contains 32 bits, as does the first double word of feedbacks. Each of the remaining 15 references and 15 feedbacks is in IEEE floating point format. Internally, the drive stores these floating point values in Little Endian (Intel) format. The PBIA module can be configured to present the map in Little Endian or Big Endian formats. This format applies to each double word of the map, including the double word containing the bits. There is no Profibus-DP standard for byte ordering of floating point values.

Note Care must be taken to ensure that the Active Station correctly interprets each value, especially if the floating point map is used. It must provide data coherency across at least 32-bit quantities. On some platforms, such as the Series 90-70 PLC, this is accomplished using a special synchronous mode of operation controlled by the PLC.

Drive Parameters

Profibus-DP specific parameters are located in the toolbox Outline View. Parameters can differ according to the product loaded.

All of the PBIA module's configuration parameters are stored in the drive and loaded into the PBIA module when the drive is powered up or reset. The parameters cannot be modified through the Profibus-DP network and must be configured through the drive's keypad or the Control System Toolbox (toolbox). The toolbox uses an RS-232C connection to download parameters to the drive.

The following parameters configure the network interface:

- Network interface (Net_Type)
- Lan frame time (Lan_Frm_Tm)
- Lan fbk avg time (Lan_Avg_Tm)
- Lan page format (Lan_Pag_Fmt)
- Lan cmd inhibit (Inh_Lan_Cmd)
- Lan trips inhibit (Inh_Lan_Trp)
- Lan heartbeat time (Lan_Htbt_Tm)


Additional LAN-specific parameters (LAN parameters 01 – 16) are required to configure direct LAN interfaces. These parameters are referred to as generic LAN parameters in the core drive product.

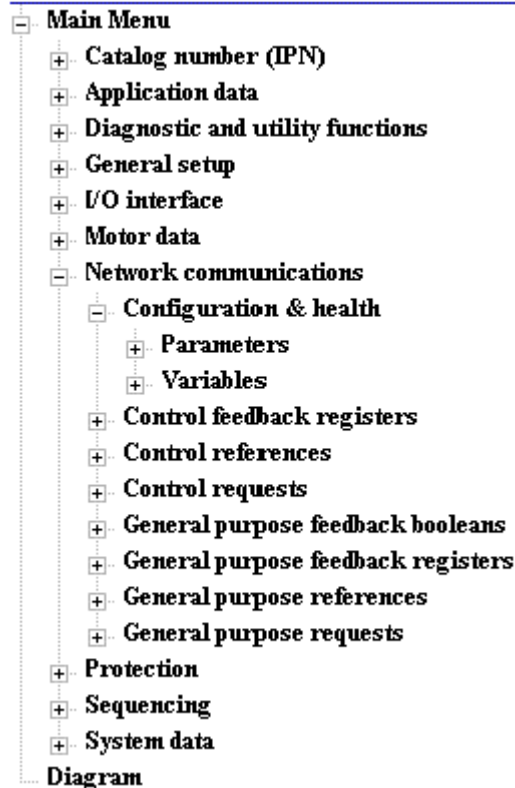
Set Parameters Using the Toolbox

➤ **To download and modify parameters**

1. From the toolbox **Outline View**, double-click on the file name, such as ISD1. The **Edit Innovation Series Drive** dialog box displays.
2. From the **Network Interface** drop-down box, select **Profibus**. Click **OK**.
3. Download parameter names by selecting **Device** menu, **Download to Drive** and **Keypad (DDI) Menus**. (You must go online to download parameters.)
4. Expand items in the Outline View and modify parameters as follows:

ISD1

From the Outline View, click  to expand items and select parameters. For example, Main Menu, Network Communications, Configuration & Health, and Parameters.



5. Select and load the following parameters:
 - **LAN Board Options** - Select either **Big Endian** or **Little Endian**. (The effect of this option is described in the Data Mapping section.)
 - **Station Address** - Enter the desired network device number for this Passive Station
 - **Group Mask** - Enter the desired group mask for this Passive Station. Each bit of the mask represents a group to which the Passive Station may belong. The Passive Station will be a member of a group only if there is a 1 in the bit location representing that group. Bit 0 represents group 1, bit 1 represents group 2, and so on.

Example: If the Passive Station is to be a member of groups 1 and 7, the mask should be set to 41 hexadecimal, which must be entered as 65 decimal.

6. From the **Device** menu, select **Reset to Drive** and then **Hard Reset**. This hard reset must be performed for the changes to take place.

Set Parameters Using the Drive Keypad

The Profibus-DP parameters have both a generic/short name and a specific/long name.

- Specific/long parameter names that display in the toolbox will display on the keypad.
- Generic/short parameter names display with no toolbox.

➤ **To download and modify parameters (see Figure 4)**

Note The keypad displays the drive's status when the drive is powered up. The Menu key must be pressed to display the Main Menu items.

1. Press the **Menu** key (in *Navigation* portion of the keypad) to display the **Main Menu**.
2. Press the **Down Arrow** key to highlight **Network Communications**, then press the **Enter** key to display the selections.
3. Verify that **Configuration & Health** is highlighted, then press the **Enter** key to display the selections.
4. Verify that **Parameters** is highlighted, then press the **Enter** key to display the selections.
5. Verify that **Network Interface** is highlighted, then press the **Enter** key to display the selections.
6. Press the **Down Arrow** key to highlight **DRIVENET**, then press the **Enter** key to enable the drive's interface to the PBI module.
7. Press the **Down Arrow** key to highlight **LAN Parameter 1** or **LAN Network Enabled** and set its value to **2** to enable the PBI module for Profibus-DP operation.
8. Press the **Down Arrow** key to highlight **LAN Parameter 2** or **LAN Board Options** and set its value to **1** for *Big Endian* data or **0** for *Little Endian* data. (The effect of this option is described in the *Data Mapping* section.)

DISPLAY –
Provides both **analog** and **digital** representations of drive functions, values, and text-based menus.

KEYPAD –
Organized into two functional groups:
Navigation keys and **Drive Control** keys.
RUN and **STOP** keys are placed to the side for easy access.

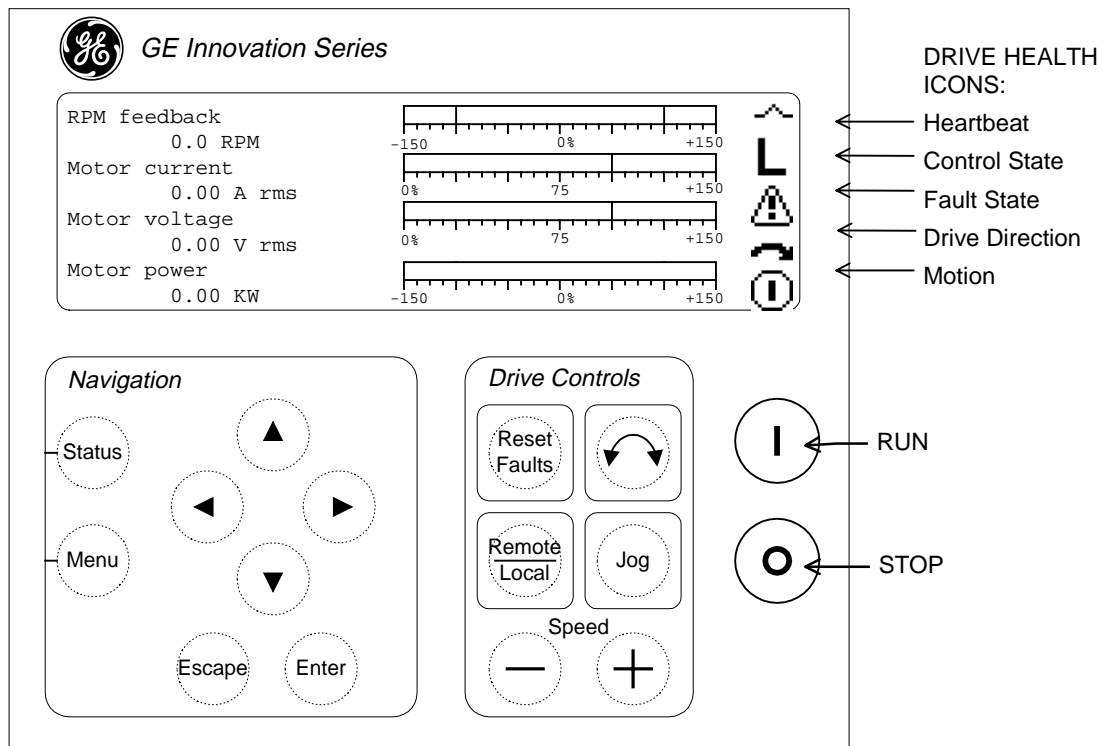


Figure 4. Example DDI (Keypad)

9. Press the **Down Arrow** key to highlight **LAN Parameter 3** or **Station Address** and enter the desired network station address for this Passive Station.
10. Press the **Down Arrow** key to highlight **LAN Parameter 4** or **Group Mask** and enter the desired group mask for this Passive Station. Each bit of the mask represents a group to which the Passive Station may belong. The Passive Station will be a member of a group only if there is a 1 in the bit location representing that group. Bit 0 represents group 1, bit 1 represents group 2, and so on.

Example: If the Passive Station is to be a member of groups 1 and 7, the mask should be set to 41 hexadecimal, which must be entered as 65 decimal.
11. Press the **Down Arrow** key to highlight **LAN Parameter 16** or **MF Use Only** and set its value to **0** (for engineering test use only; must remain 0).
12. Press the **Reset Faults** and **Stop** keys simultaneously to initiate a hard reset of the drive. This must be done for the changes to take effect.

LAN Status and Faults

Two levels of validation are available to the drive:

LAN watchdog function determines the status of the connection between the DSPX board and the PBI module. This is done in the form of a handshake protocol. The actions of the watchdog function are limited to alarms and status variables, although the status information is also used for interface management. The watchdog offers no information as to the status of the LAN connection beyond the immediate interface.

LAN heartbeat function provides a means by which to loop back a signal between the drive and any level in the LAN hierarchy such that a higher-level controller can validate the entire connection pathway, including the drive itself.

The drive can be configured to generate a trip or alarm if the heartbeat reference signal fails to transition within a configurable period of time. The first bit in the drive's reference map is used as a heartbeat from the Active Station to the drive. The Active Station is expected to continually toggle this heartbeat reference.

If the drive is accepting references from the Profibus-DP network and the network fails (the Active Station fails or the Profibus-DP cable is disconnected), the drive continues to use the last references received from the Profibus-DP. If the drive is accepting references from the Profibus-DP network, the drive faults if there is no transition of the heartbeat reference within the time period specified by the *LAN Heartbeat Time* parameter (this parameter must not be zero).

The first bit in the drive's feedback map is used as a heartbeat from the drive to the Active Station. The drive always writes the heartbeat feedback to the same state as the heartbeat reference. Thus, the Active Station can monitor the status of the communication with the drive by continually toggling the heartbeat to the drive and monitoring the heartbeat from the drive.

Note One easy way for a PLC (used as an Active Station) to generate a heartbeat to the drive is to simply invert the heartbeat from the drive and send that value back to the drive.

Drive status information is conveyed to the user and/or application by status signals and fault declarations.

Variables sent to the drive are defined in the drive's reference map. Variables retrieved from the drive are defined in the drive's feedback map.

The following signals determine LAN health and declare LAN faults:

- LAN connection OK (Lan_OK)
- LAN commands OK (Lan_Cmds_OK)
- Heartbeat ref, LAN (Lan_Htbt_Ref)
- Heartbeat fbk, LAN (Lan_Htbt_Fbk)

The following faults are associated with the LAN interface:

- LAN heartbeat trip (Lan_Hb_Trp)
- LAN heartbeat alarm (Lan_Hb_Alm)
- LAN watchdog alarm (Lan_Wd_Alm)
- LAN trip request (Lan_Trp)
- LAN alarm request (Lan_Alm)

Application Data

The PBIA module has no fuses, user adjustable hardware, or user testpoints.

- Jumper **JP1** (BLIG board) is open and should not be inserted by the user.
- Jumpers **BA1** and **BA2** (UCS board) should not be removed by the user. (These select the UCS board's address and must be in place for proper operation of the PBIA module).
- Testpoints **TP1** and **TP2** and connectors **J1** and **J2** (BLIG board) are for engineering test use only and not defined in this document.

The PBIA module has six plug connectors and one backplane connector (P8, on the BLIG board). The module also includes a total of five LED indicators (two on the UCS board and three on the BLIG board). See Figure 5 for a module faceplate diagram, Figure 6 for a component layout diagram (BLIG board), and Figure 7 for a component layout diagram (UCS board). Figure 8 shows the location of the PBIA module in the board rack.

Note Connectors P1, P2, and TB1 are not used and are not defined in this publication.

Refer to the following tables for complete descriptions and a sample device data file:

Table	Description
1	OK LED Fault codes
2	UCS board STATUS LED codes
3	UCS board NETWORK LED codes
4	Connector DB9 pin signals
5	Interface connector P3 pin signals
6	Backplane connector P8 pin signals
7	Sample Device Data File for the PBIA Module

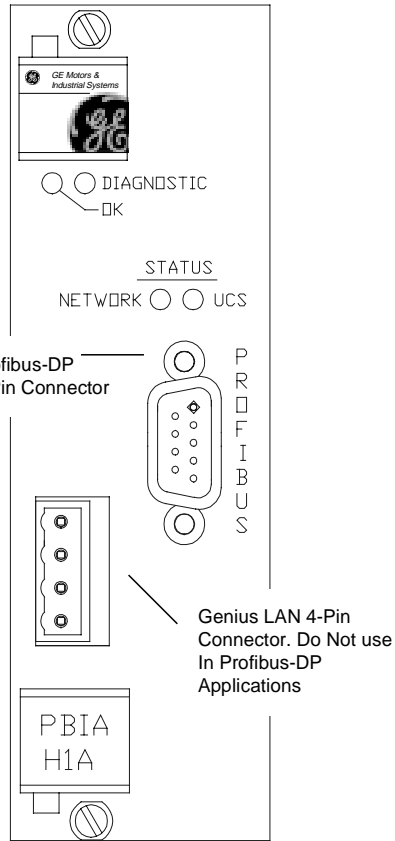


Figure 5. PBIA Module Faceplate

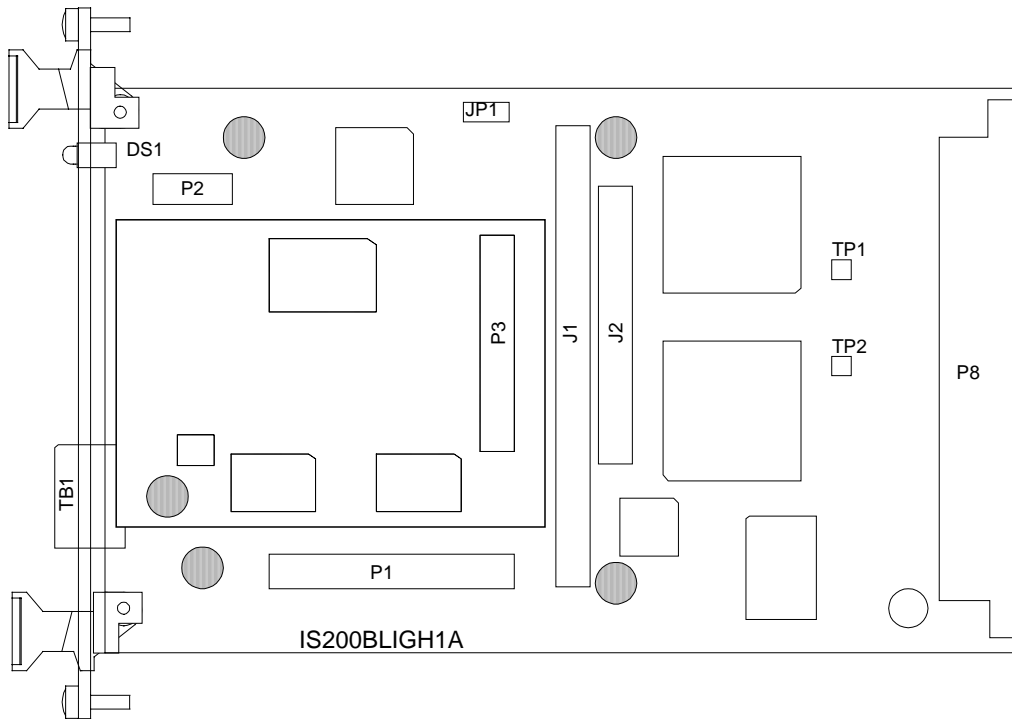


Figure 6. PBIA Module (BLIG Board) Layout Diagram

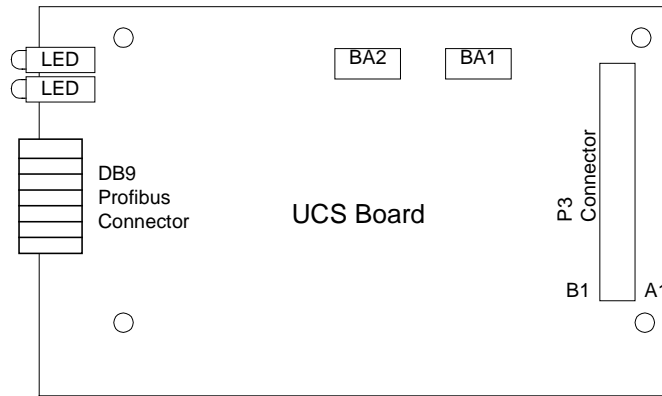


Figure 7. PBI Module (UCS Board) Layout Diagram

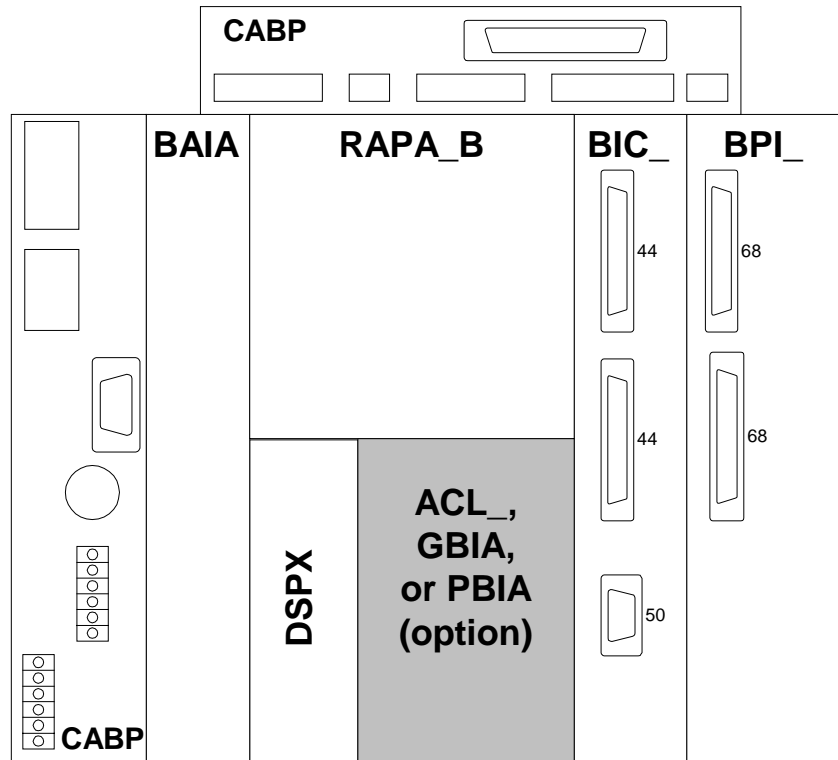


Figure 8. PBI Module Location in the Board Rack

Table 1. OK LED Fault Codes for PBIA Module

Flashes	Fault No.	Fault Name	Description
1	1	FLT_BOOTCKSM	The PBIA boot code failed the initialization checksum test.
2	2	FLT_FLSHDNLD	The PBIA flash (run time) code failed the initialization checksum test.
3	3	FLT_NEED_RST	The PBIA needs a hard reset (this is true after a flash download).
4	4	FLT_LINTNRAM	The PBIA (internal to the processor) RAM had failed the initialization testing.
5	5	FLT_LXTRNRAM	The PBIA (external to the processor, internal to the board) RAM has failed the initialization testing.
6	6	FLT_LINTTMRS	The internal PBIA processor timers failed the initialization testing.
7	7	FLT_LDPTRTRAM	The dual port RAM memory failed the initialization testing.
8	8	FLT_LXC5202_	The XC5202 (programmable gate array) serial download failed.
9	9	FLT_LSTCKOVR	The PBIA stack has overflowed.
10	10	FLT_LDSPWD0G	DSPX board watchdog timer failed (DSPX did not update the watchdog timer within the specified time interval)
11	11	FLT_LCLNACTV	PBIA firmware active bit was mistakenly cleared. This bit should always be set while the PBIA is active (operational).
12	12	FLT_GENINIT	Genius initialization fault
13	13	FLT_GENIRTM	Genius run time fault
14	14	FLT_PROFINI	Profibus-DP initialization fault
15	15	FLT_PROFIRT	Profibus-DP run time fault

Table 2. UCS Board Status LED

LED State	Description
Off	No power or a RESET has been asserted
Flashing Red	Invalid firmware
Solid Red	Hardware error or fatal runtime error
Flashing Green	No UCS board errors, PBIA module is not active
Solid Green	No errors, interface to PBIA module is active
Amber	Firmware configuration mode

Table 3. UCS Board Network LED

LED State	Description
Off	Network interface is disabled
Flashing Red	Baud rate detected, not configured by Profibus Active Station
Solid Red	Network offline, no bus or Baud rate detected
Green/Red Flash	Online, network clear mode
Solid Green	Online, data exchange mode

Table 4. Connector DB9, PBIA Module Profibus Connection

Pin No.	Description
1	Chassis ground
2	Reserved
3	Data Positive
4	Transmit enable
5	Isolated ground
6	Reserved
7	Isolated +5 V
8	Data Negative
9	Reserved

Table 5. Connector P3, Interface Between the BLIG Board and UCS Board

Pin No.	Nomenclature	Description
A1	VDD	+5 V dc
A2	D0	Data bit 0
A3	D2	Data bit 2
A4	DP	Optional Even Parity Bit (unused)
A5	D4	Data bit 4
A6	D6	Data bit 6
A7	0RD	Read strobe to UCS
A8	0SEL	UCS board select
A9	A0	Register address 0
A10	A2	Register address 2
A11	BA1	Module address 1
A12	0RESET	Reset to UCS
A13	VDD	+5 V dc
B1	DCOM	Digital common ground
B2	D1	Data bit 1
B3	D3	Data bit 3
B4	DCOM	Digital common ground
B5	D5	Data bit 5
B6	D7	Data bit 7
B7	0WRL	Write strobe to UCS
B8	DCOM	Digital common ground

Table 5. Connector P3, Interface Between the BLIG Board and UCS Board – Continued

Pin No.	Nomenclature	Description
B9	A1	Register address 1
B10	BA0	Module address 0
B11	0IRQ	Interrupt from UCS
B12	0FAULT	Bus fault indication from UCS
B13	DCOM	Digital common ground

Table 6. P8 Backplane Connector, Row A

Pin No.	Nomenclature	Description
A1	P5	+5 V dc digital power source
A2	XD(0)	Transmit data, line 0
A3	XD(4)	Transmit data, line 4
A4	DCOM	+5 V dc digital power return (digital common)
A5	XD(8)	Transmit data, line 8
A6	XD(12)	Transmit data, line 12
A7	XD(16)	Transmit data, line 16
A8	XD(20)	Transmit data, line 20
A9	XD(24)	Transmit data, line 24
A10	XD(28)	Transmit data, line 28
A11	XA(0)	Transmit address, address 0
A12	DCOM	+5 V dc digital power return (digital common)
A13	XA(4)	Transmit address, address 4
A14	XA(8)	Transmit address, address 8
A15	XA(12)	Transmit address, address 12
A16, A17	N/C	Not Connected
A18	0X_CS	Dual Port RAM chip select
A19	0X_CS_SPR	Spare 0X_CS (not connected)
A20	DCOM	+5 V dc digital power return (digital common)
A21	0XRST	Module reset
A22	P5	+5 V dc digital power source
A23 – A27	N/C	Not Connected
A28	DCOM	+5 V dc digital power return (digital common)
A29	CHASSIS	Chassis ground
A30	KTX_ACL	Keypad transmit (Not Connected)
A31	N/C	Not Connected
A32	P5	+5 V dc digital power source

Table 6. P8 Backplane Connector, Row B – Continued

Pin No.	Nomenclature	Description
B1	P5	+5 V dc digital power source
B2	XD(1)	Transmit data, line 1
B3	XD(5)	Transmit data, line 5
B4	XD(9)	Transmit data, line 9
B5	XD(13)	Transmit data, line 13
B6	XD(17)	Transmit data, line 17
B7	XD(21)	Transmit data, line 21
B8	DCOM	+5 V dc digital power return (digital common)
B9	XD(25)	Transmit data, line 25
B10	XD(29)	Transmit data, line 29
B11	XA(1)	Transmit address, address 1
B12	XA(5)	Transmit address, address 5
B13	XA(9)	Transmit address, address 9
B14	DCOM	+5 V dc digital power return (digital common)
B15	XA(13)	Transmit address, address 13
B16, B17	N/C	Not Connected
B18	DCOM	+5 V dc digital power return (digital common)
B19, B20	N/C	Not Connected
B21	ACOM	Analog common
B22, B23	N/C	Not Connected
P8-B24	DCOM	+5 V dc digital power return (digital common)
B25 – B29	N/C	Not Connected
B30	KRX_ACL	Keypad receive (Not Connected)
B31	N/C	Not Connected
B32	P5	+5 V dc digital power source

Table 6. P8 Backplane Connector, Row C – Continued

Pin No.	Nomenclature	Description
C1	P5	+5 V dc digital power source
C2	XD(2)	Transmit data, line 2
C3	XD(6)	Transmit data, line 6
C4	XD(10)	Transmit data, line 10
C5	XD(14)	Transmit data, line 14
C6	XD(18)	Transmit data, line 18
C7	XD(22)	Transmit data, line 22
C8	DCOM	+5 V dc digital power return (digital common)
C9	XD(26)	Transmit data, line 26
C10	XD(30)	Transmit data, line 30
C11	XA(2)	Transmit address, address 2
C12	XA(6)	Transmit address, address 6
C13	XA(10)	Transmit address, address 10
C14	DCOM	+5 V dc digital power return (digital common)
C15	0XRD	Dual port RAM read enable
C16, C17	N/C	Not Connected
C18	DCOM	+5 V dc digital power return (digital common)
C19, C20	N/C	Not Connected
C21	ACOM	Analog common
C22, C23	N/C	Not Connected
C24	DCOM	+5 V dc digital power return (digital common)
C25 – C29	N/C	Not Connected
C30	PIO22	Keypad RTS (Not Connected)
C31	N/C	Not Connected
C32	P5	+5 V dc digital power source

Table 6. P8 Backplane Connector, Row D – Continued

Pin No.	Nomenclature	Description
D1	P5	+5 V dc digital power source
D2	XD(3)	Transmit data, line 3
D3	XD(7)	Transmit data, line 7
D4	DCOM	+5 V dc digital power return (digital common)
D5	XD(11)	Transmit data, line 11
D6	XD(15)	Transmit data, line 15
D7	XD(19)	Transmit data, line 19
D8	XD(23)	Transmit data, line 23
D9	XD(27)	Transmit data, line 27
D10	XD(31)	Transmit data, line 31
D11	XA(3)	Transmit address, address 3
D12	DCOM	+5 V dc digital power return (digital common)
D13	XA(7)	Transmit address, address 7
D14	XA(11)	Transmit address, address 11
D15	0XWR	Dual port RAM write enable
D16	0XBUSY	Dual port RAM busy signal
D17, D18	N/C	Not Connected
D19	BRD_ID	Serial board identification signal
D20	DCOM	+5 V dc digital power return (digital common)
D21	N/C	Not Connected
D22	N15	-15 V dc
D23 – D27	N/C	Not Connected
D28	DCOM	+5 V dc digital power return (digital common)
D29 – D30	N/C	Not Connected
P8-D32	P5	+5 V dc digital power source

Table 7. Sample Device Data File For The PBIH Module

```
; Device Data File for SST UCS Profibus DP SLAVE as used on the GE Innovation
Series Drive
; GSD Rev 1.02

#Profibus_DP

Vendor_Name = "GE Industrial Systems"
Model_Name = "Innovation Series Drive"
Revision = "Rev 1.02"
Ident_Number = 0x0870 ; PNO assigned id for SST UCS module
Protocol_Ident = 0
Station_Type = 0
FMS_Supp = 0
Hardware_Release = "1.3"
Software_Release = "1.18"

; Supported baudrates
9.6_supp = 1
19.2_supp = 1
93.75_supp = 1
187.5_supp = 1
500_supp = 1
1.5M_supp = 1
3M_supp = 1
6M_supp = 1
12M_supp = 1

; Maximum responder time for supported baudrates
MaxTsdr_9.6 = 60
MaxTsdr_19.2 = 60
MaxTsdr_93.75 = 60
MaxTsdr_187.5 = 60
MaxTsdr_500 = 100
MaxTsdr_1.5M = 150
MaxTsdr_3M = 200
MaxTsdr_6M = 200
MaxTsdr_12M = 200

; Setup time for supported baud rated
Tset_9.6 = 1
Tset_19.2 = 1
Tset_93.75 = 1
Tset_187.5 = 1
Tset_500 = 1
Tset_1.5M = 1
Tset_3M = 4
Tset_6M = 8
Tset_12M = 16
```

Table 7. Sample Device Data File For The PBIA Module (continued)

```
; Supported hardware features
Redundancy = 0
Repeater_Ctrl_Sig = 2
24V_Pins = 0

; Slave Specific
Freeze_Mode_Supp = 1
Sync_Mode_Supp = 1
Auto_Baud_Supp = 1

; Maximum length of user parameter
User_Prm_Data_Len = 0

; Default user parameter string
;User_Prm_Data = 0x00

Min_Slave_Intervall = 2      ;the spec says "_Interval", but "_Intervall" is the
defacto spelling!
Modular_Station = 1
Max_Module = 32
Max_Input_Len = 244
Max_Output_Len = 244
Max_Data_Len = 400

; Integer map configuration.
; Eight consistent Input blocks of 4 bytes, One consistent Input block of 2
bytes.
; Eight consistent Output blocks of 4 bytes, One consistent Output block of 2
bytes.
Module = " Integer Map " \
  0x93, 0x93, 0x93, 0x93, 0x93, 0x93, 0x93, 0x93, 0x91, \
  0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa1
EndModule

; Floating Point map configuration.
; Sixteen consistent Input blocks of 4 bytes each.
; Sixteen consistent Output blocks of 4 bytes each.
Module = " Floating Point Map " \
  0x93, 0x93, 0x93, 0x93, 0x93, 0x93, 0x93, 0x93, \
  0x93, 0x93, 0x93, 0x93, 0x93, 0x93, 0x93, 0x93, \
  0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa3, \
  0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa3, 0xa3
EndModule
```

Renewal/Warranty Replacement

This information helps ensure that GE can process the order accurately and as soon as possible.

All digits are important when ordering or replacing any board.

How to Order a Board/Module

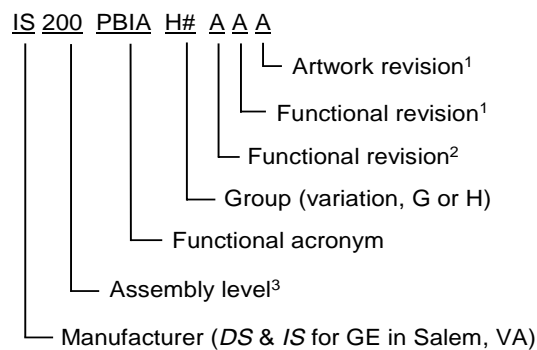
When ordering a replacement board/module for a GE drive, you need to know:

- How to accurately identify the part
- If the part is under warranty
- How to place the order

Board Identification

A printed wiring board/module is identified by an alphanumeric **part (catalog) number** located near its edge. Figure 9 explains the structure of the part number.

The board's functional acronym, shown in Figure 9, normally is based on the **board/module description**, or name. For example, the PBI module is described as the Auxiliary Profibus-DP Interface Module.



¹Backward compatible

²Not backward compatible

³200 indicates a base-level board; 215 indicates a higher-level assembly or added components (such as PROM)

Figure 9. Board/Module Part Number Conventions

Warranty Terms

The GE *Terms and Conditions* brochure details product warranty information, including **warranty period** and **parts and service coverage**. The brochure is included with customer documentation. It may be obtained separately from the nearest GE Sales Office or authorized GE Sales Representative.

Placing the Order

Parts still under **warranty** may be obtained directly from the factory:

GE Industrial Systems
Product Service Engineering
1501 Roanoke Blvd.
Salem, VA 24153-6492 USA
Phone: +1 540 387 7595
Fax: +1 540 387 8606

(Replace + with the international access code.)

Renewals (spares or those not under warranty) should be ordered by contacting the nearest GE Sales or Service Office. Be sure to include:

- Complete part number and description
- Drive serial number
- Drive Material List (ML) number

Note The factory may substitute later versions of boards based on availability and design enhancements. However, GE Industrial Systems ensures backward compatibility of replacement boards.

Module, Motherboard, Daughterboard

The PBI module consists of a UCS-PFB-1 Universal Communications System Profibus-DP Board (UCS) and the IS200BLIG BIC LAN Interface-Genius Board. To order a replacement module that includes the UCS board, specify an **IS215PBI AH** module.

Note The PBI module should be replaced as a unit. It is not recommended to replace the boards individually due to software compatibility issues.

How to Replace the Board/Module

Handling Precautions



Caution

To prevent component damage caused by static electricity, treat all boards with static sensitive handling techniques. Wear a wrist grounding strap when handling boards or components, but only after boards or components have been removed from potentially energized equipment and are at a normally grounded workstation.

Printed wiring boards may contain static-sensitive components. Therefore, GE ships all replacement boards in antistatic bags. Use the following guidelines when handling boards:

- Store boards in antistatic bags or boxes.
- Use a grounding strap when handling boards or board components (per above *Caution* criteria).

Replacement Procedures



Warning

To prevent electric shock, turn off power to the board/module, then test to verify that no power exists in the board before touching it or any connected circuits.



Caution

To prevent equipment damage, do not remove, insert, or adjust board/module connections while power is applied to the equipment.

➤ To remove the PBIA module from the board rack

1. Make sure that the drive in which the module resides has been deenergized.
2. Open the drive's cabinet door, and using equipment designed for high voltages, test any electrical circuits **before touching them** to ensure that power is off.
3. Carefully remove the module from the rack, as follows:
 - a. Loosen the screws at the top and bottom of the faceplate, near the ejector tabs. (The screws are captive in the faceplate and should not be removed.)
 - b. Unseat the module by raising the ejector tabs.
 - c. Using both hands, gently pull the module from the rack.

➤ To install the new (replacement) module in the board rack



Caution

Because Innovation Series boards/modules are designed for specific rack slots, inserting the PBIA module into the wrong slot can damage the electronics.

1. Slide the module into the **correct slot** in the rack.
2. Begin seating the module by firmly pressing the top and bottom of the faceplate at the same time with your thumbs.
3. Finish seating the module in the slot by starting and then tightening the screws at the top and bottom of the faceplate. **Tighten the screws evenly** to ensure that the module is seated squarely.

Note If the PBIA module must be configured in any way, refer to the applicable User's Manual for the drive/source for procedures.



GE Industrial Systems