GE Industrial Systems

Bridge Personality Interface Board
IS200BPIHH_A_ _

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.

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, practice, condition, or statement that, if not strictly observed, could result in damage to or destruction of equipment.**

Note Indicates an essential or important procedure, practice, condition, or statement.

Contents

Functional Description

The IS200BPIH Bridge Personality Interface Board (BPIH) is a board subassembly used in Innovation Series™ drives. The BPIH board connects into the IS200CABP Control Assembly Backplane (CABP), communicating to the IS200BICH H-Bridge Interface and Control Board (BICH) through CABP board signal paths. Most of the BICH board's bridge inputs/outputs (I/O) are routed through the BPIH board subassembly to the IS200FOSB Fiber-Optic Interface Board (FOSB). This is done on a per phase basis via three identical cables, assigned to phase A, B, and C signals. The front panels of the BICH board and BPIH board subassembly provide high-density shielded connectors for these cables and maintain shield continuity to the board rack chassis (Figure 1).

The control signals are buffered on the BPIH board subassembly and interfaced with the FOSB board fiber-optic array by twisted pairs with differential signaling. Individual high-speed signals (such as VCO feedbacks) are terminated at the receiving end with a termination resistor. The BPIH board subassembly is the RS-422 interface and distributor for all phase related signals going to or coming from the BICH and FOSB boards.

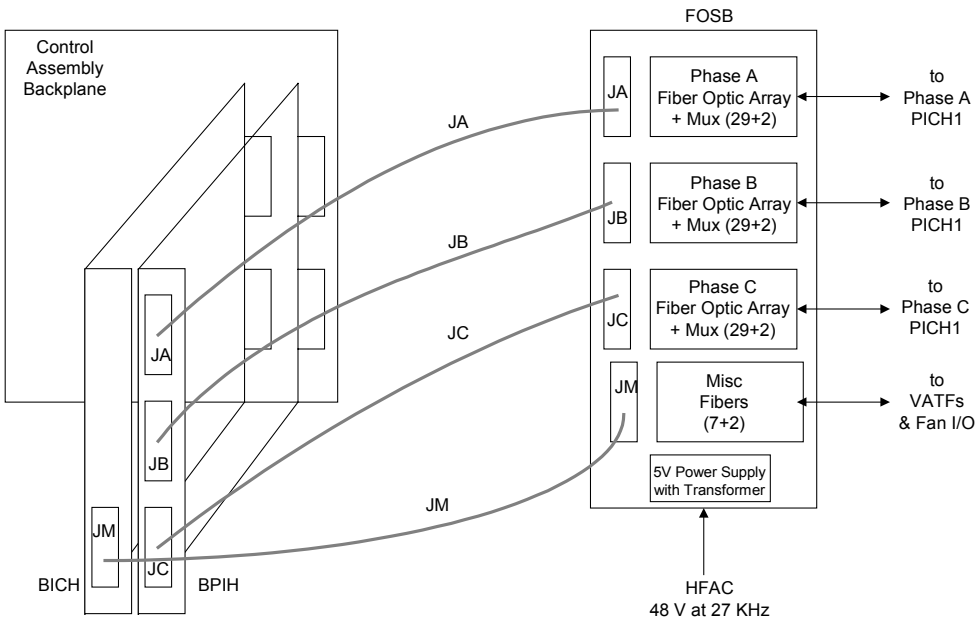


Figure 1. BICH Board, BPIH Board Subassembly, and FOSB Board Interconnections

RS-422 receivers are steered in a fail-safe direction by the termination networks to ensure disabled operation if the cable is open. A unique cable-missing signal is included in each cable.

The IS200RAPA Rack Power Supply Board (RAPA) generates the required +5 V power for the BPIH board subassembly.

Application Data

The BPIH board subassembly has no fuses, testpoints, LED indicators, or adjustable hardware. The BPIH board subassembly has three plug connectors (JA, JB, and JC) and two backplane connectors (P1 and P2). See Figure 2 for a layout diagram that shows the locations of these components and the following tables for the individual pin signal descriptions for each connector:

Table	Description
1	Plug connectors JA, JB, and JC
2	Backplane connector P1
3	Backplane connector P2

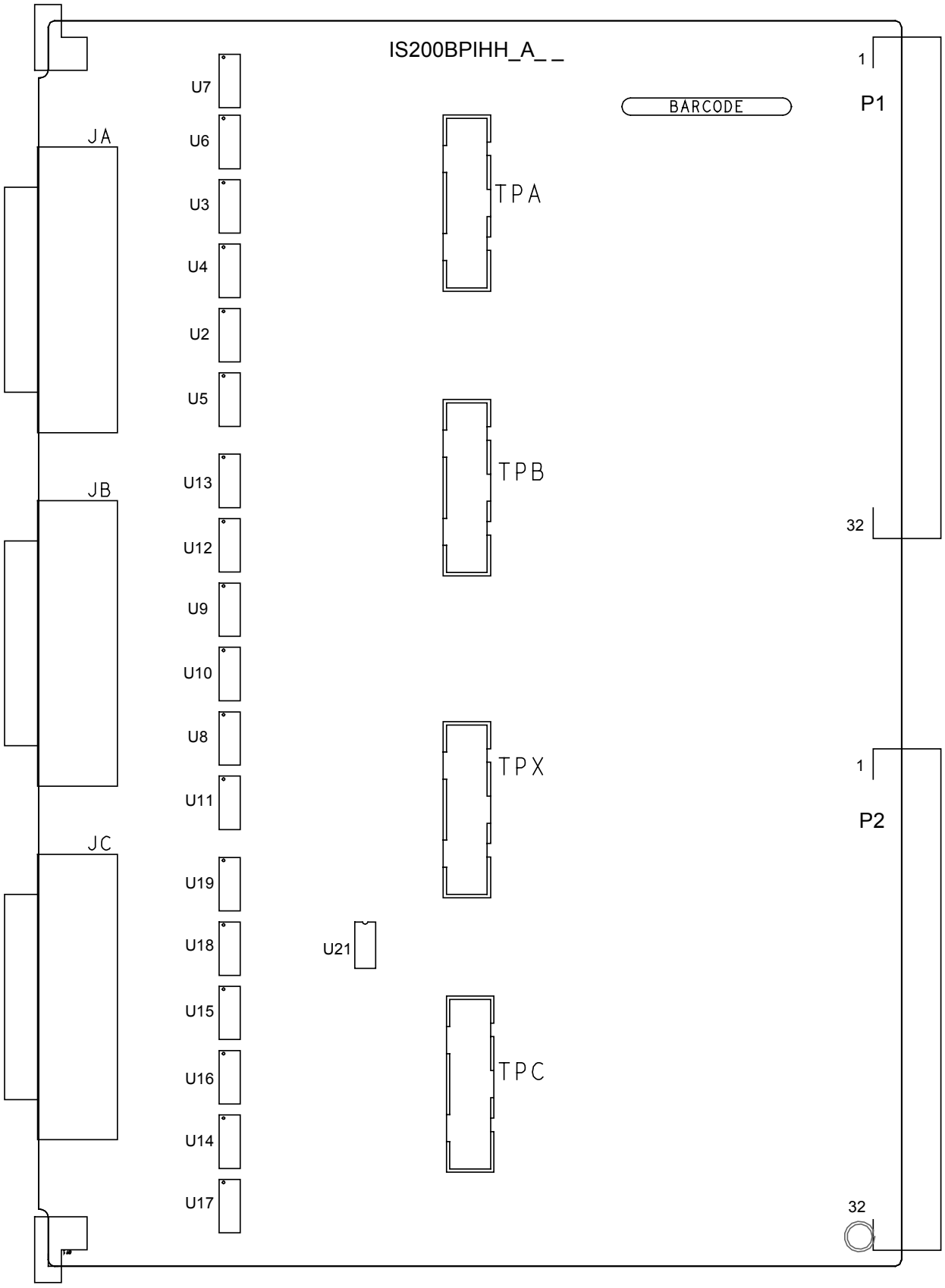


Figure 2. BPIH Board Subassembly Layout Diagram

*Table 1. BPIH Board Subassembly Connectors JA, JB, JC Pin Signal Descriptions**

Pin No.	Nomenclature	Description
1	_ FLTN	Phase_ faults serial data (11 faults multiplexed) differential signal negative
2	_ FLTP	Phase_ faults serial data (11 faults multiplexed) differential signal positive
3	_ DCNN	Phase_ negative dc bus voltage VCO feedback differential signal negative
4	_ DCNP	Phase_ negative dc bus voltage VCO feedback differential signal positive
5	_ DCPN	Phase_ positive dc bus voltage VCO feedback differential signal negative
6	_ DCPP	Phase_ positive dc bus voltage VCO feedback differential signal positive
7	_ VFBN	Phase_ motor voltage VCO feedback differential signal negative
8	_ VFBP	Phase_ motor voltage VCO feedback differential signal positive
9	_ IFBN	Phase_ motor current VCO feedback differential signal negative
10	_ IFBP	Phase_ motor current VCO feedback differential signal positive
11	_ DBRVN	Phase_ DB resistor voltage VCO feedback differential signal negative
12	_ DBRVP	Phase_ DB resistor voltage VCO feedback differential signal positive
13	_ TFBN	Phase_ temperature VCO feedback differential signal negative
14	_ TFBP	Phase_ temperature VCO feedback differential signal positive
15	_ IFBSN	Phase_ current fault differential signal negative
16	_ G_1MN	Phase_ motor IGBT #1 gate drive output differential signal negative
17	_ G_1MP	Phase_ motor IGBT #1 gate drive output differential signal positive
18	_ G_2MN	Phase_ motor IGBT #2 gate drive output differential signal negative
19	_ G_2MP	Phase_ motor IGBT #2 gate drive output differential signal positive
20	_ G_3MN	Phase_ motor IGBT #3 gate drive output differential signal negative
21	_ G_3MP	Phase_ motor IGBT #3 gate drive output differential signal positive
22	_ G_4MN	Phase_ motor IGBT #4 gate drive output differential signal negative
23	_ G_4MP	Phase_ motor IGBT #4 gate drive output differential signal positive

* The underscore character (_) signifies the applicable phase at its first use in a title/description.

Table 1. BPIH Board Subassembly Connectors JA, JB, JC Pin Signal Descriptions (continued)*

Pin No.	Nomenclature	Description
24	_ G_1NN	Phase_ neutral IGBT #1 gate drive output differential signal negative
25	_ G_1NP	Phase_ neutral IGBT #1 gate drive output differential signal positive
26	_ G_2NN	Phase_ neutral IGBT #2 gate drive output differential signal negative
27	_ G_2NP	Phase_ neutral IGBT #2 gate drive output differential signal positive
28	_ G_3NN	Phase_ neutral IGBT #3 gate drive output differential signal negative
29	_ G_3NP	Phase_ neutral IGBT #3 gate drive output differential signal positive
30	_ IFBSP	Phase_ current fault differential signal positive
31	_ DBTRIPN	Phase_ DB trip differential signal negative
32	_ DBTRIPP	Phase_ DB trip differential signal positive
33	_ G_4NN	Phase_ neutral IGBT #4 gate drive output differential signal negative
34	_ G_4NP	Phase_ neutral IGBT #4 gate drive output differential signal positive
35	_ G_DB1N	Phase_ DB IGBT #1 gate drive output differential signal negative
36	_ G_DB1P	Phase_ DB IGBT #1 gate drive output differential signal positive
37	_ G_DB2N	Phase_ DB IGBT #2 gate drive output differential signal negative
38	_ G_DB2P	Phase_ DB IGBT #2 gate drive output differential signal positive
39	_ RX1N	Phase_ spare receiver #1 differential signal negative
40	_ RX1P	Phase_ spare receiver #1 differential signal positive
41	_ TX1N	Phase_ spare transmitter #1 differential signal negative
42	_ TX1P	Phase_ spare transmitter #1 differential signal positive
43	J_ CHK1	Phase_ FOSB board to BPIH board cable check signal #1
44	J_ CHK2	Phase_ FOSB board to BPIH board cable check signal #2
45, 46	CHASSIS	Screw terminal connection to chassis ground

* The underscore character (_) signifies the applicable phase at its first use in a title/description.

Table 2. BPIH Board Subassembly Backplane Connector P1 Pin Signal Descriptions (128 pins - 4x32)

Pin No.	Nomenclature	Description
A1 – A14	N/C	Not Connected
A15, A16	P5	Positive 5 V power supply
A17	N/C	Not Connected
A18	OAG_1N	Phase A, neutral IGBT #1 gate drive output signal from BICH board
A19	OAG_2N	Phase A, neutral IGBT #2 gate drive output signal from BICH board
A20	OAG_3N	Phase A, neutral IGBT #3 gate drive output signal from BICH board
A21	OAG_4N	Phase A, neutral IGBT #4 gate drive output signal from BICH board
A22	N/C	Not Connected
A23, A24	P5	Positive 5 V power supply
A25 – A30	N/C	Not Connected
A31, A32	P5	Positive 5 V power supply
B1 – B9	N/C	Not Connected
B10	OAG_1M	Phase A, motor IGBT #1 gate drive output signal from BICH board
B11, B12	N/C	Not Connected
B13	OAG_2M	Phase A, motor IGBT #2 gate drive output signal from BICH board
B14	OAG_3M	Phase A, motor IGBT #3 gate drive output signal from BICH board
B15	OAG_4M	Phase A, motor IGBT #4 gate drive output signal from BICH board
B16	DCOM	Digital Common
B17	OAG_DB1	Phase A, DB IGBT #1 gate drive output signal from BICH board
B18	OAG_DB2	Phase A, DB IGBT #2 gate drive output signal from BICH board
B19	DCOM	Digital Common
B20	AFLT	Phase A faults, serial data, 11 faults multiplexed from the BICH board
B21	DCOM	Digital Common
B22	OBG_1M	Phase B, motor IGBT #1 gate drive output signal from BICH board
B23	OBG_2M	Phase B, motor IGBT #2 gate drive output signal from BICH board
B24	OBG_3M	Phase B, motor IGBT #3 gate drive output signal from BICH board
B25	DCOM	Digital Common
B26	OBG_4M	Phase B, motor IGBT #4 gate drive output signal from BICH board
B27	DCOM	Digital Common
B28	OBG_DB1	Phase B, DB IGBT #1 gate drive output signal from BICH board
B29	OBG_DB2	Phase B, DB IGBT #2 gate drive output signal from BICH board
B30	DCOM	Digital Common
B31	BFLT	Phase B faults, serial data, 11 faults multiplexed from the BICH board
B32	DCOM	Digital Common

Table 2. BPIH Board Subassembly Backplane Connector P1 Pin Signal Descriptions (128 pins - 4x32) (continued)

Pin No.	Nomenclature	Description
C1 – C6	N/C	Not Connected
C7	ADCN	Phase A negative dc bus voltage VCO feedback signal from BICH board
C8, C9	N/C	Not Connected
C10	ADCP	Phase A positive dc bus voltage VCO feedback signal from BICH board
C11 – C13	N/C	Not Connected
C14	AVFB	Phase A motor voltage VCO feedback signal from BICH board
C15	AIFB	Phase A motor current VCO feedback signal from BICH board
C16	ADBRV	Phase A DB resistor voltage VCO feedback signal from BICH board
C17	DCOM	Digital Common
C18	ATFB	Phase A temperature VCO feedback signal from BICH board
C19	BRD_ID	Board identification serial I/O signal
C20	ADBTRIP	Phase A DB trip signal from BICH board
C21	AIFBS	Phase A current fault signal from BICH board
C22	BDCN	Phase B negative dc bus voltage VCO feedback signal from BICH board
C23	N/C	Not Connected
C24	BDCP	Phase B positive dc bus voltage VCO feedback signal from BICH board
C25	DCOM	Digital Common
C26	BVFB	Phase B motor voltage VCO feedback signal from BICH board
C27	BIFB	Phase B motor current VCO feedback signal from BICH board
C28	BDBRV	Phase B DB resistor voltage VCO feedback signal from BICH board
C29	DCOM	Digital Common
C30	BTFB	Phase B temperature VCO feedback signal from BICH board
C31	DCOM	Digital Common
C32	BDBTRIP	Phase B DB trip signal from BICH board
D1 – D14	N/C	Not Connected
D15	ARX1	Phase A spare receiver signal from BICH board
D16	ATX1	Phase A spare transmitter signal from BICH board
D17	OJA_OK	Phase A FOSB board to BPIH board cable detector signal from BICH board
D18 – D30	N/C	Not Connected
D31, D32	P5	Positive 5 V power supply

Table 3. BPIH Board Subassembly Backplane Connector P2 Pin Signal Descriptions (128 pins - 4x32)

Pin No.	Nomenclature	*Description*
A1	P5	Positive 5 V power supply
A2, A3	N/C	Not Connected
A4	DCOM	Digital Common
A5 – A11	N/C	Not Connected
A12	DCOM	Digital Common
A13 – A16	N/C	Not Connected
A17	OBG_1N	Phase B, neutral IGBT #1 gate drive output signal from BICH board
A18	OBG_2N	Phase B, neutral IGBT #2 gate drive output signal from BICH board
A19	OBG_3N	Phase B, neutral IGBT #2 gate drive output signal from BICH board
A20	DCOM	Digital Common
A21, A22	N/C	Not Connected
A23	OCG_1N	Phase C, neutral IGBT #1 gate drive output signal from BICH board
A24	OCG_2N	Phase C, neutral IGBT #2 gate drive output signal from BICH board
A25	OCG_3N	Phase C, neutral IGBT #3 gate drive output signal from BICH board
A26	N/C	Not Connected
A27	CHASSIS	Chassis Ground
A28	DCOM	Digital Common
A29	OCG_4N	Phase C, neutral IGBT #4 gate drive output signal from BICH board
A30	CFLT	Phase C faults, serial data, 11 faults multiplexed from the BICH board
A31	CHASSIS	Chassis Ground
A32	P5	Positive 5 V power supply
B1	P5	Positive 5 V power supply
B2 – B13	N/C	Not Connected
B14	DCOM	Digital Common
B15	N/C	Not Connected
B16	OBG_4N	Phase B, neutral IGBT #4 gate drive output signal from BICH board
B17	N/C	Not Connected
B18	DCOM	Digital Common
B19, B20	N/C	Not Connected
B21	ACOM	Analog Common
B22	OCG_1M	Phase C, motor IGBT #1 gate drive output signal from BICH board
B23	OCG_2M	Phase C, motor IGBT #2 gate drive output signal from BICH board
B24	DCOM	Digital Common
B25 – B27	N/C	Not Connected
B28	OCG_3M	Phase C, motor IGBT #3 gate drive output signal from BICH board
B29	OCG_4M	Phase C, motor IGBT #4 gate drive output signal from BICH board

Table 3. BPIH Board Subassembly Backplane Connector P2 Pin Signal Descriptions (128 pins - 4x32) (continued)

Pin No.	Nomenclature	Description
B30	OCG_DB1	Phase C, DB IGBT #1 gate drive output signal from BICH board
B31	OCG_DB2	Phase C, DB IGBT #2 gate drive output signal from BICH board
B32	P5	Positive 5 V power supply
C1	P5	Positive 5 V power supply
C2 – C7	N/C	Not Connected
C8	DCOM	Digital Common
C9 – C13	N/C	Not Connected
C14	DCOM	Digital Common
C15, C16	N/C	Not Connected
C17	BIFBS	Phase B current fault signal from BICH board
C18	DCOM	Digital Common
C19	N/C	Not Connected
C20	OJB_OK	Phase B FOSB board to BPIH board cable detector signal from BICH board
C21, C22	N/C	Not Connected
C23	CDCN	Phase C negative dc bus voltage VCO feedback signal from BICH board
C24	DCOM	Digital Common
C25	CDCP	Phase C positive dc bus voltage VCO feedback signal from BICH board
C26	N/C	Not Connected
C27	CVFB	Phase C motor voltage VCO feedback signal from BICH board
C28	CIFB	Phase C motor current VCO feedback signal from BICH board
C29	CDBRV	Phase C DB resistor voltage VCO feedback signal from BICH board
C30	CTFB	Phase C temperature VCO feedback signal from BICH board
C31	CDBTRIP	Phase C DB trip signal from BICH board
C32	P5	Positive 5 V power supply
D1	P5	Positive 5 V power supply
D2, D3	N/C	Not Connected
D4	DCOM	Digital Common
D5 – D11	N/C	Not Connected
D12	DCOM	Digital Common
D13 – D16	N/C	Not Connected
D17	BRX1	Phase B spare receiver signal from BICH board
D18	BTX1	Phase B spare transmitter signal from BICH board
D19	N/C	Not Connected
D20	DCOM	Digital Common

Table 3. BPIH Board Subassembly Backplane Connector P2 Pin Signal Descriptions (128 pins - 4x32) (continued)

Pin No.	Nomenclature	Description
D21, D22	N/C	Not Connected
D23	CRX1	Phase C spare receiver signal from BICH board
D24	CTX1	Phase C spare transmitter signal from BICH board
D25	OJC_OK	Phase C FOSB board to BPIH board cable detector signal from BICH board
D26, D27	N/C	Not Connected
D28	DCOM	Digital Common
D29, D30	N/C	Not Connected
D31	CIFBS	Phase C current fault signal from BICH board
D32	P5	Positive 5 V power supply

Renewal/Warranty Replacement

How to Order a Board

When ordering a replacement board 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

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

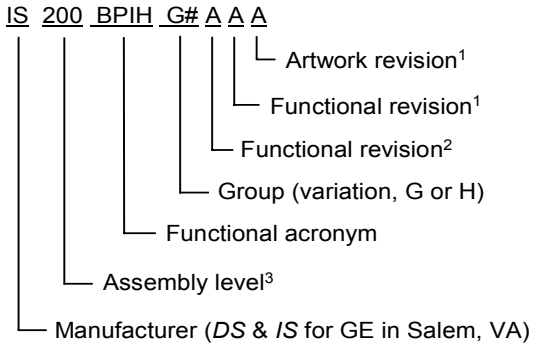
Board Identification

A printed wiring board is identified by an alphanumeric **part (catalog) number** located near its edge. Figure 3 explains the structure of the part number.

The board's functional acronym, shown in Figure 3, normally is based on the **board description**, or name. For example, the BPIH board subassembly is described as the Bridge Personality Interface Board.

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.



[1]Backward compatible
[2]Not backward compatible
[3]*200* indicates a base-level board; *215* indicates a higher-level assembly or added components (such as PROM)

Figure 3. Board Part Number Conventions

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

All digits are important when ordering or replacing any board.

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

How to Replace the Board

Handling Precautions

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

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

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

Remove the BPIH board subassembly from the Innovation Series board rack as follows:

1. Make sure that the drive in which the board resides has been de-energized and follow all local safety practices of Lock-Out/Tag-Out.

2. Open the control cabinet door and, using equipment designed for high voltages, test any electrical circuits **before touching them** to ensure that power is off.

3. Carefully disconnect all cables from the BPIH board subassembly to be replaced as follows:
   - Verify cables are labeled with the correct connector name (as marked on the board) to simplify reconnection.
   - For cables with pull-tabs, carefully pull the tab.

Avoid dropping mounting hardware into the unit, which could cause damage.

4. Carefully remove the board 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 board from the rack.

Install the new (replacement) BPIH board subassembly as follows:

1. Slide the board into the **correct slot** in the board rack.

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

2. Begin seating the board by firmly pressing the top and bottom of the faceplate at the same time with your thumbs.
3. Finish seating the board 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 board is seated squarely.
4. Reconnect all electrical connections that were disconnected in step 3 of *removing the board*.
5. Close the control cabinet door.

GE Industrial Systems

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