GE Industrial Systems

Bridge Power Interface Board
IS200BPIIH_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 1
RS422 Drivers and Receivers 2
Open-Collector Status Signals 2
Electronic Board Identification and Cable Checking Signals 2
High Frequency Power Supply Status Signal 2
Gate Command ON Retention 2
Application Data 3
Connectors 3
Renewal/Warranty Replacement 17
How to Order a Board 17
How to Replace the Board 18

Functional Description

The IS200BPII Bridge Power Interface Board (BPII) is a bridge power interface for bridges using Integrated Gate Commutated Thyristor (IGCT) switching devices. The board occupies connectors J16 and J21 of the IS200CABP Cable Assembly Back-plane Board (CABP) in an Innovation Series™ board rack.

The BPII board provides for the relay of 24 gate firing commands and 24 gate status feedback signals between the IS200BICI Bridge Interface Control Board (BICI) and two remotely mounted IS200GGXI Expander Load Source Boards (GGXI). The GGXI board translates the firing and status commands between these signals and the fiber-optic interfaces for access to gate driver modules located in the bridge.

The BPII board is designed to interface with and complement the BICI board. The BPII board is connected to the BICI board through the Innovation Series™ board rack backplane. Card front connectors on both boards connect to the GGXI boards. High voltage isolation to the BPII and BICI boards is provided by fiber-optic connections to the GGXI boards. Voltage feedback isolation is provided by attenuation from the DS200NATO Voltage Feedback Scaling Board (NATO).

RS422 Drivers & Receivers

The BPII board uses standard RS-422 drivers and receivers for differential point-to-point signaling. If there is no connection to a given receiver (cable disconnected), then the receiver will default to a bad gate signal status.

Open-Collector Status Signals

Status signals received from the GGXI board are driven by open collector opto-isolators. The BPII board is responsible for supplying the pull-up resistors to P5 and the returns to DCOM for these signals. Current to the opto-isolators is limited to <1 milliamp and has a low-to-high transition with approximately a one microsecond time constant. If the cable is disconnected, the default status of these input signals is a fault.

Electronic Board Identification and Cable Checking Signals

The BPII board incorporates a serial prom identification chip that is connected to a board identification bus line (BRDID). The BPII board supplies pull-up resistors to P5 and the returns to DCOM for the BRDID line. The pull-up signal passes through to the GGXI board(s) that forward it on to the NATO board where it is connected to chassis. This indicates that all cables along this path are connected. The return (DCOM) can be used by other boards in the path to determine if they are connected to the BPII board. Alternatively, the GGXI board can use an opto-coupler output connected across these signals to indicate that the cable is plugged in.

The BPII board supplies opto-isolation to detect that the correct BICI and BPII board cable pairs are plugged into the GGXI board. To verify that the GGXI board(s) is properly connected, a pair of wires in the PFBK_ cable going from the BICI board to the GGXI board and in the JGATE_ cable going from the GGXI board to the BPII board are dedicated. To verify that the cables are not crossed, current is passed in opposite directions for the first and second GGXI boards. A signal showing that the current(s) has been detected in the correct direction is passed back to the BICI board from the BPII board. See Figure 1 for a diagram of this.

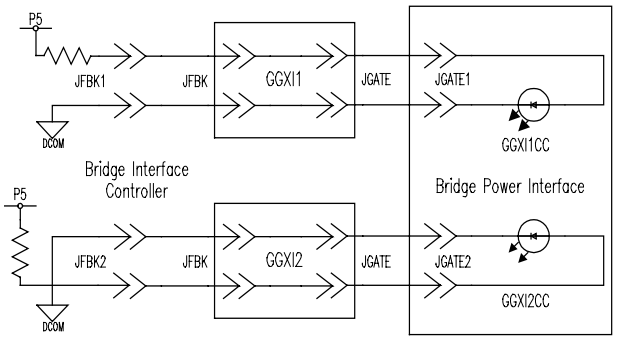

Figure 1. Cable Checking Signals

High Frequency Power Supply Status Signal

The BPII board is responsible for conditioning the P160 signal coming from the DS200GDPA High Frequency Power Supply Board (GDPA) that supplies power to the CABP board. The P160 signal is the 115 V ac power source to the GDPA board that has been rectified and passed through a resistor and a 6.8 V zener diode. The voltage from across the zener diode is supplied to the BPII board for sensing. The high side comes in on VAC1 and the low side on VAC2. These points are connected to CABP board connector J5.

Gate Command ON Retention

Once an IGCT cell has been commanded ON, it must remain ON for a minimum time to prevent damage to the IGCT. Since some gate drivers do not have this necessary protection, this protective circuitry must be added wherever the gate command may float. The bridge configuration also requires that the inner cells (2, 3) remain on a minimum of 5 microseconds longer than the outer cells (1, 4). The BPII board controls this timing of the gate command signals coming from the BICI board. If the signal goes low (to turn on the cell) and then "floats", an R-C time constant is present to provide a minimum time before the capacitor can charge to a logic high and turn OFF the cells. (The capacitor is sufficiently small so that is does not cause timing problems when the gate command is actively driven.)

Application Data

The BPII board has no LED indicators, fuses, adjustable hardware, or user testpoints. The BPII board does have two front panel connectors (JGATE1 and JGATE2) and two backplane connectors (P1 and P2). See Figure 2 for a front panel diagram and Figure 3 for a board component layout diagram.

Connectors

The BPII contains two 128-pin backplane connectors, P1 and P2. These connectors provide standard Innovation Series board rack signals and for interfacing with the host processor, other boards, and the exciter.

- See Table 1 for P1 pin signal descriptions
- See Table 2 for P2 pin signal descriptions

Additionally, two 68-pin connectors are provided on the board's front panel, JGATE1 and JGATE2. These connectors provide for interfacing with the GGXI board(s):

- See Table 3 for JGATE1 pin signal descriptions
- See Table 4 for JGATE2 pin signal descriptions

Note

The four testpods that are located on the BPII board are used to connect discrete test equipment for development use only. They are not to be accessed by the user.

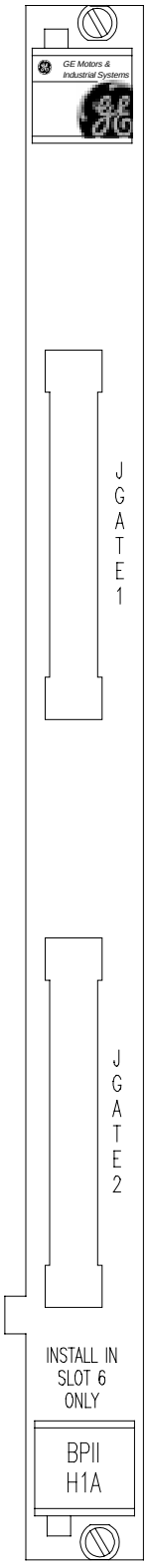

Figure 2. BPII Board Front Panel

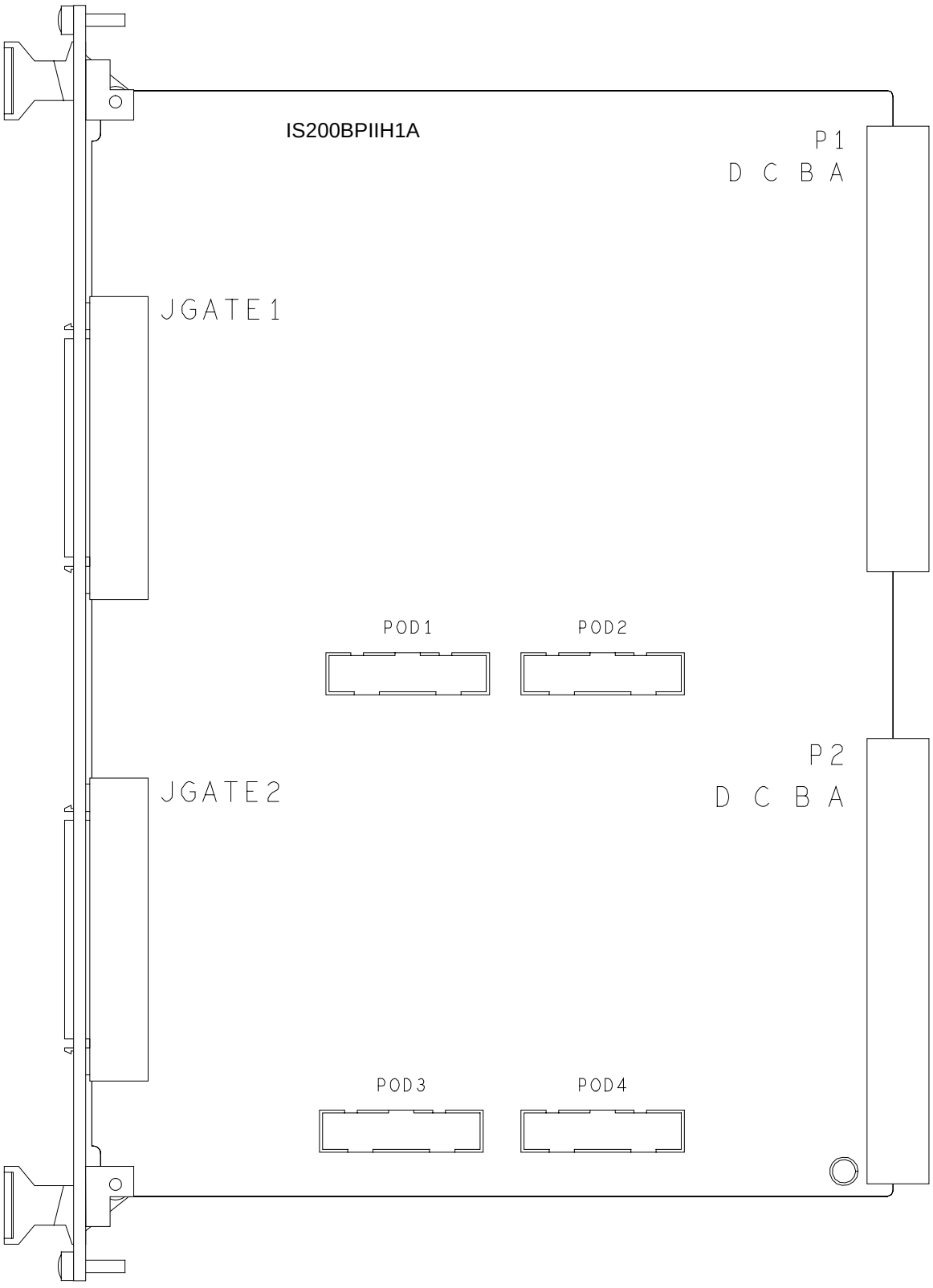

Figure 3. BPII Board Layout Diagram

Table 1. P1 Backplane Connector, Row A

Pin #	Nomenclature	Description
P1-A1	N/C	Not Connected
P1-A2	N/C	Not Connected
P1-A3	N/C	Not Connected
P1-A4	N/C	Not Connected
P1-A5	N/C	Not Connected
P1-A6	N/C	Not Connected
P1-A7	N/C	Not Connected
P1-A8	N/C	Not Connected
P1-A9	N/C	Not Connected
P1-A10	N/C	Not Connected
P1-A11	N/C	Not Connected
P1-A12	N/C	Not Connected
P1-A13	N/C	Not Connected
P1-A14	N/C	Not Connected
P1-A15	P5	+5 V dc digital power source
P1-A16	P5	+5 V dc digital power source
P1-A17	N/C	Not Connected
P1-A18	OFO8_S1	Gate status 8 from fiber-optic outer cell receivers on first GGXI board, 0 = OK
P1-A19	OFI11_S1	Gate status 11 from fiber-optic inner cell receivers on first GGXI board, 0 = OK
P1-A20	OFO12_S1	Gate status 12 from fiber-optic outer cell receivers on first GGXI board, 0 = OK
P1-A21	F_OK1	GGXI board #1 blown fuse indication, 1 = OK
P1-A22	N/C	Not Connected
P1-A23	P5	+5 V dc digital power source
P1-A24	P5	+5 V dc digital power source
P1-A25	N/C	Not Connected
P1-A 6	N/C	Not Connected
P1-A27	N/C	Not Connected
P1-A28	N/C	Not Connected
P1-A29	N/C	Not Connected
P1-A30	N/C	Not Connected
P1-A31	P5	+5 V dc digital power source
P1-A32	P5	+5 V dc digital power source

Table 1. P1 Backplane Connector, Row B – Continued

Pin #	Nomenclature	Description
P1-B1	VAC1	High side of differential signal, isolated for minimum 225 V peak, used to bring in GDPA board's P160 status
P1-B2	VAC2	Low side of differential signal, isolated for minimum 225 V peak, used to bring in GDPA board's P160 status
P1-B3	N/C	Not Connected
P1-B4	N/C	Not Connected
P1-B5	N/C	Not Connected
P1-B6	N/C	Not Connected
P1-B7	N/C	Not Connected
P1-B8	N/C	Not Connected
P1-B9	N/C	Not Connected
P1-B10	OFO1_G1	Gate command 1 to fiber-optic outer cell drivers on first GGXI board, 0 = Gate
P1-B11	N/C	Not Connected
P1-B12	N/C	Not Connected
P1-B13	OFI2_G1	Gate command 2 to fiber-optic inner cell drivers on first GGXI board, 0 = Gate
P1-B14	OFI3_G1	Gate command 3 to fiber-optic inner cell drivers on first GGXI board, 0 = Gate
P1-B15	OFO4_G1	Gate command 4 to fiber-optic outer cell drivers on first GGXI board, 0 = Gate
P1-B16	DCOM	+5 V dc digital power return (common)
P1-B17	OFO5_G1	Gate command 5 to fiber-optic outer cell drivers on first GGXI board, 0 = Gate
P1-B18	OFI6_G1	Gate command 6 to fiber-optic inner cell drivers on first GGXI board, 0 = Gate
P1-B19	DCOM	+5 V dc digital power return (common)
P1-B20	OFI7_G1	Gate command 7 to fiber-optic inner cell drivers on first GGXI board, 0 = Gate
P1-B21	DCOM	+5 V dc digital power return (common)
P1-B22	OFO8_G1	Gate command 8 to fiber-optic outer cell drivers on first GGXI board, 0 = Gate
P1-B23	OFO9_G1	Gate command 9 to fiber-optic outer cell drivers on first GGXI board, 0 = Gate
P1-B24	OFI10_G1	Gate command 10 to fiber-optic inner cell drivers on first GGXI board, 0 = Gate
P1-B25	DCOM	+5 V dc digital power return (common)
P1-B26	OFI11_G1	Gate command 11 to fiber-optic inner cell drivers on first GGXI board, 0 = Gate
P1-B27	DCOM	+5 V dc digital power return (common)
P1-B28	OFO12_G1	Gate command 12 to fiber-optic outer cell drivers on first GGXI board, 0 = Gate
P1-B29	TACH1A	Differential pair tach signal (#1A) that is passed on to BICI board
P1-B30	DCOM	+5 V dc digital power return (common)
P1-B31	TACH1B	Differential pair tach signal (#1B) that is passed on to BICI board
P1-B32	DCOM	+5 V dc digital power return (common)

Table 1. P1 Backplane Connector, Row C – Continued

Pin #	Nomenclature	Description
P1-C1	VAC1	High side of differential signal, isolated for minimum 225 V peak, used to bring in GDPA board's P160 status
P1-C2	VAC2	Low side of differential signal, isolated for minimum 225 V peak, used to bring in GDPA board's P160 status
P1-C3	N/C	Not Connected
P1-C4	N/C	Not Connected
P1-C5	N/C	Not Connected
P1-C6	N/C	Not Connected
P1-C7	GDPA_C_OK	GDPA board connection to board rack status, 1 = OK
P1-C8	N/C	Not Connected
P1-C9	N/C	Not Connected
P1-C10	OFO1_S1	Gate status 1 from fiber-optic outer cell receivers on first GGXI board, 0 = OK
P1-C11	N/C	Not Connected
P1-C12	N/C	Not Connected
P1-C13	N/C	Not Connected
P1-C14	OFI2_S1	Gate status 2 from fiber-optic inner cell receivers on first GGXI board, 0 = OK
P1-C15	OFI3_S1	Gate status 3 from fiber-optic inner cell receivers on first GGXI board, 0 = OK
P1-C16	OFO5_S1	Gate status 5 from fiber-optic outer cell receivers on first GGXI board, 0 = OK
P1-C17	DCOM	+5 V dc digital power return (common)
P1-C18	OFO9_S1	Gate status 9 from fiber-optic outer cell receivers on first GGXI board, 0 = OK
P1-C19	BRD_ID	Serial board identification line (also extends out to GGXI boards)
P1-C20	GDPA_OK1	GGXI board #1 GDPA board connection status, 1 = OK
P1-C21	V115_OK1	GGXI board #1 115 V power supply problem, 1 = OK
P1-C22	P5_OK1	GGXI board #1 +5 V power supply problem, 1 = OK
P1-C23	JA4	Connection to backplane JA4 connector
P1-C24	CCHK_OK1	Cable to GGXI board #1 check signal, 1 = plugged in
P1-C25	DCOM	+5 V dc digital power return (common)
P1-C26	BIC_CCHK_OK1	BICI board to GGXI board #1 to BPII board cable check signal, 1 = OK
P1-C27	TACH2A	Differential pair tach signal (#2A) that is passed on to BICI board
P1-C28	TACH2B	Differential pair tach signal (#2B) that is passed on to BICI board
P1-C29	DCOM	+5 V dc digital power return (common)
P1-C30	TACH3A	Differential pair tach signal (#3A) that is passed on to BICI board
P1-C31	DCOM	+5 V dc digital power return (common)
P1-C32	TACH3B	Differential pair tach signal (#3B) that is passed on to BICI board

Table 1. P1 Backplane Connector, Row D – Continued

Pin #	Nomenclature	Description
1	N/C	Not Connected
2	N/C	Not Connected
3	N/C	Not Connected
4	N/C	Not Connected
5	N/C	Not Connected
6	N/C	Not Connected
7	N/C	Not Connected
8	N/C	Not Connected
9	N/C	Not Connected
10	N/C	Not Connected
11	N/C	Not Connected
12	N/C	Not Connected
13	N/C	Not Connected
14	N/C	Not Connected
15	OFO4_S1	Gate status 4 from fiber-optic outer cell receivers on first GGXI board, 0 = OK
16	OFI6_S1	Gate status 6 from fiber-optic inner cell receivers on first GGXI board, 0 = OK
17	OFI7_S1	Gate status 7 from fiber-optic inner cell receivers on first GGXI board, 0 = OK
18	OFI10_S1	Gate status 10 from fiber-optic inner cell receivers on first GGXI board, 0 = OK
19	N/C	Not Connected
20	N/C	Not Connected
21	N/C	Not Connected
22	N/C	Not Connected
23	N/C	Not Connected
24	N/C	Not Connected
25	N/C	Not Connected
26	N/C	Not Connected
27	N/C	Not Connected
28	I24	Isolated 24 V dc power source (for customer relays)
29	I24_COM	I24 isolated power return (common)
30	N/C	Not Connected
31	P5	+5 V dc digital power source
32	P5	+5 V dc digital power source

Table 2. P2 Backplane Connector, Row A

Pin #	Nomenclature	Description
P2-A1	P5	+5 V dc digital power source
P2-A2	N/C	Not Connected
P2-A3	N/C	Not Connected
P2-A4	DCOM	+5 V dc digital power return (common)
P2-A5	N/C	Not Connected
P2-A6	N/C	Not Connected
P2-A7	N/C	Not Connected
P2-A8	N/C	Not Connected
P2-A9	N/C	Not Connected
P2-A10	N/C	Not Connected
P2-A11	N/C	Not Connected
P2-A12	DCOM	+5 V dc digital power return (common)
P2-A13	N/C	Not Connected
P2-A14	N/C	Not Connected
P2-A15	N/C	Not Connected
P2-A16	N/C	Not Connected
P2-A17	OFO1_G2	Gate command 1 to fiber-optic outer cell drivers on second GGXI board, 0 = Gate
P2-A18	OFI3_G2	Gate command 3 to fiber-optic inner cell drivers on second GGXI board, 0 = Gate
P2-A19	OFO4_G2	Gate command 4 to fiber-optic outer cell drivers on second GGXI board, 0 = Gate
P2-A20	DCOM	+5 V dc digital power return (common)
P2-A21	0RESET	Reset signal for BPII board, 0 = Reset
P2-A22	P15	Non-isolated +15 V dc power source
P2-A23	OFI6_G2	Gate command 6 to fiber-optic inner cell drivers on second GGXI board, 0 = Gate
P2-A24	OFO8_G2	Gate command 8 to fiber-optic outer cell drivers on second GGXI board, 0 = Gate
P2-A25	OFO9_G2	Gate command 9 to fiber-optic outer cell drivers on second GGXI board, 0 = Gate
P2-A26	HIFI2A	Differential pair signal (#2A) from BAIA board (corresponds to tach signals)
P2-A27	CHASSIS	Chassis ground
P2-A28	DCOM	+5 V dc digital power return (common)
P2-A29	GDPA_OK2	GGXI board #2 GDPA board connection status, 1 = OK
P2-A30	N/C	Not Connected
P2-A31	CHASSIS (TO BICI)	Chassis ground also connected to BICI board
P2-A32	P5	+5 V dc digital power source

Table 2. P2 Backplane Connector, Row B – Continued

Pin #	Name	Pin #
P2-B1	P5	+5 V dc digital power source
P2-B2	N/C	Not Connected
P2-B3	N/C	Not Connected
P2-B4	N/C	Not Connected
P2-B5	N/C	Not Connected
P2-B6	N/C	Not Connected
P2-B7	N/C	Not Connected
P2-B8	DCOM	+5 V dc digital power return (common)
P2-B9	N/C	Not Connected
P2-B10	N/C	Not Connected
P2-B11	N/C	Not Connected
P2-B12	N/C	Not Connected
P2-B13	N/C	Not Connected
P2-B14	DCOM	+5 V dc digital power return (common)
P2-B15	N/C	Not Connected
P2-B16	OFO1_S2	Gate status 1 from fiber-optic outer cell receivers on second GGXI board, 0 = OK
P2-B17	N/C	Not Connected
P2-B18	DCOM	+5 V dc digital power return (common)
P2-B19	N/C	Not Connected
P2-B20	N/C	Not Connected
P2-B21	ACOM	±15 V dc power return (common)
P2-B22	OFO5_G2	Gate command 5 to fiber-optic outer cell drivers on second GGXI board, 0 = Gate
P2-B23	OFI6_S2	Gate status 1 from fiber-optic inner cell receivers on second GGXI board, 0 = OK
P2-B24	DCOM	+5 V dc digital power return (common)
P2-B25	HIFI1A	Differential pair signal (#1A) from BAIA board (corresponds to tach signals)
P2-B26	HIFI2B	Differential pair signal (#2B) from BAIA board (corresponds to tach signals)
P2-B27	HIFI1B	Differential pair signal (#1B) from BAIA board (corresponds to tach signals)
P2-B28	OFO11_S2	Gate status 11 from fiber-optic outer cell receivers on second GGXI board, 0 = OK
P2-B29	OFO12_S2	Gate status 12 from fiber-optic outer cell receivers on second GGXI board, 0 = OK
P2-B30	P5_OK2	GGXI board #2 +5 V power supply problem, 1 = OK
P2-B31	N/C	Not Connected
P2-B32	P5	+5 V dc digital power source

Table 2. P2 Backplane Connector, Row C – Continued

Pin #	Nomenclature	Description
P2-C1	P5	+5 V dc digital power source
P2-C2	N/C	Not Connected
P2-C3	N/C	Not Connected
P2-C4	N/C	Not Connected
P2-C5	N/C	Not Connected
P2-C6	N/C	Not Connected
P2-C7	N/C	Not Connected
P2-C8	DCOM	+5 V dc digital power return (common)
P2-C9	N/C	Not Connected
P2-C10	N/C	Not Connected
P2-C11	N/C	Not Connected
P2-C12	N/C	Not Connected
P2-C13	N/C	Not Connected
P2-C14	DCOM	+5 V dc digital power return (common)
P2-C15	N/C	Not Connected
P2-C16	N/C	Not Connected
P2-C17	OFI2_G2	Gate command 12 to fiber-optic inner cell drivers on second GGXI board, 0 = Gate
P2-C18	DCOM	+5 V dc digital power return (common)
P2-C19	N/C	Not Connected
P2-C20	OFO4_S2	Gate status 4 from fiber-optic outer cell receivers on second GGXI board, 0 = OK
P2-C21	ACOM	±15 V dc power return (common)
P2-C22	OFO5_S2	Gate status 5 from fiber-optic outer cell receivers on second GGXI board, 0 = OK
P2-C23	OFI7_G2	Gate command 7 to fiber-optic inner cell drivers on second GGXI board, 0 = Gate
P2-C24	DCOM	+5 V dc digital power return (common)
P2-C25	OFI9_S2	Gate status 9 from fiber-optic inner cell receivers on second GGXI board, 0 = OK
P2-C26	HIFI3A	Differential pair signal (#3A) from BAIA board (corresponds to tach signals)
P2-C27	OFI10_S2	Gate status 10 from fiber-optic inner cell receivers on second GGXI board, 0 = OK
P2-C28	OFO12_G2	Gate command 12 to fiber-optic outer cell drivers on second GGXI board, 0 = Gate
P2-C29	N/C	Not Connected
P2-C30	CCHK_OK2	Cable to GGXI board #2 check signal, 1 = plugged in
P2-C31	N/C	Not Connected
P2-C32	P5	+5 V dc digital power source

Table 2. P2 Backplane Connector, Row D – Continued

Pin #	Nomenclature	Description
P2-D1	P5	+5 V dc digital power source
P2-D2	N/C	Not Connected
P2-D3	N/C	Not Connected
P2-D4	DCOM	+5 V dc digital power return (common)
P2-D5	N/C	Not Connected
P2-D6	N/C	Not Connected
P2-D7	N/C	Not Connected
P2-D8	N/C	Not Connected
P2-D9	N/C	Not Connected
P2-D10	N/C	Not Connected
P2-D11	N/C	Not Connected
P2-D12	DCOM	+5 V dc digital power return (common)
P2-D13	N/C	Not Connected
P2-D14	N/C	Not Connected
P2-D15	N/C	Not Connected
P2-D16	N/C	Not Connected
P2-D17	OFI2_S2	Gate status 12 from fiber-optic inner cell receivers on second GGXI board, 0 = OK
P2-D18	OFI3_G2	Gate command 3 to fiber-optic inner cell drivers on second GGXI board, 0 = Gate
P2-D19	N/C	Not Connected
P2-D20	DCOM	+5 V dc digital power return (common)
P2-D21	N/C	Not Connected
P2-D22	N15	Non-isolated –15 V dc power source
P2-D23	OFI7_S2	Gate status 7 from fiber-optic inner cell receivers on second GGXI board, 0 = OK
P2-D24	OFO8_S2	Gate status 8 from fiber-optic inner cell receivers on second GGXI board, 0 = OK
P2-D25	OFI10_G2	Gate command 10 to fiber-optic inner cell drivers on second GGXI board, 0 = Gate
P2-D26	HIFI3B	Differential pair signal (#3B) from BAIA board (corresponds to tach signals)
P2-D27	OFI11_G2	Gate command 11 to fiber-optic inner cell drivers on second GGXI board, 0 = Gate
P2-D28	DCOM	+5 V dc digital power return (common)
P2-D29	V115_OK2	GGXI board #2 115 V power supply problem, 1 = OK
P2-D30	N/C	Not Connected
P2-D31	BIC_CCHK_OK2	BICI board to GGXI board #2 to BPII board cable check signal, 1 = OK
P2-D32	P5	+5 V dc digital power source

Table 3. JGATE1 Connector Pin Signal Descriptions

Pin #	Nomenclature	Description
JGATE1-1	DCOM	Digital common (return)
JGATE1-2	FO1TX1N	RS422 differential gating command 1 from BICI to GGXI, 0 = Gate
JGATE1-3	FO1RX1N	RS422 differential gate status 1 from GGXI to BICI, 0 = OK
JGATE1-4	FI2TX1N	RS422 differential gating command 2 from BICI to GGXI, 0 = Gate
JGATE1-5	FI2RX1N	RS422 differential gate status 2 from GGXI to BICI, 0 = OK
JGATE1-6	FI3TX1N	RS422 differential gating command 3 from BICI to GGXI, 0 = Gate
JGATE1-7	FI3RX1N	RS422 differential gate status 3 from GGXI to BICI, 0 = OK
JGATE1-8	FO4TX1N	RS422 differential gating command 4 from BICI to GGXI, 0 = Gate
JGATE1-9	FO4RX1N	RS422 differential gate status 4 from GGXI to BICI, 0 = OK
JGATE1-10	BIC_CCHK1H	High side of BICI to GGXI #1 to BPII cable check signal
JGATE1-11	FO5TX1N	RS422 differential gating command 5 from BICI to GGXI, 0 = Gate
JGATE1-12	FO5RX1N	RS422 differential gate status 5 from GGXI to BICI, 0 = OK
JGATE1-13	FI6TX1N	RS422 differential gating command 6 from BICI to GGXI, 0 = Gate
JGATE1-14	FI6RX1N	RS422 differential gate status 6 from GGXI to BICI, 0 = OK
JGATE1-15	FI7TX1N	RS422 differential gating command 7 from BICI to GGXI, 0 = Gate
JGATE1-16	FI7RX1N	RS422 differential gate status 7 from GGXI to BICI, 0 = OK
JGATE1-17	FO8TX1N	RS422 differential gating command 8 from BICI to GGXI, 0 = Gate
JGATE1-18	FO8RX1N	RS422 differential gate status 8 from GGXI to BICI, 0 = OK
JGATE1-19	DCOM	Digital common (return)
JGATE1-20	FO9TX1N	RS422 differential gating command 9 from BICI to GGXI, 0 = Gate
JGATE1-21	FO9RX1N	RS422 differential gate status 9 from GGXI to BICI, 0 = OK
JGATE1-22	FI10TX1N	RS422 differential gating command 10 from BICI to GGXI, 0 = Gate
JGATE1-23	FI10RX1N	RS422 differential gate status 10 from GGXI to BICI, 0 = OK
JGATE1-24	FI11TX1N	RS422 differential gating command 11 from BICI to GGXI, 0 = Gate
JGATE1-25	FI11RX1N	RS422 differential gate status 11 from GGXI to BICI, 0 = OK
JGATE1-26	FO12TX1N	RS422 differential gating command 12 from BICI to GGXI, 0 = Gate
JGATE1-27	FO12RX1N	RS422 differential gate status 12 from GGXI to BICI, 0 = OK
JGATE1-28	DCOM	Digital common (return)
JGATE1-29	V115A	GGXI 115 V ac to GDPA status, OC, 0 = OK
JGATE1-30	P160A	GGXI GDPA P160 status, OC, 0 = OK
JGATE1-31	P5A	GGXI P5 status, OC, 0 = OK
JGATE1-32	FUSA	GGXI fuse status, OC, 0 = OK
JGATE1-33	CCHK_OK1	Cable connected check through GGXI, NATO, NATP
JGATE1-34	BIC_CCHK1H	High side of BICI to GGXI board #1 to BPII cable check signal
JGATE1-35	DCOM	Digital common (return)

Table 3. JGATE1 Connector Pin Signal Descriptions – Continued

Pin #	Nomenclature	Description
JGATE1-36	FO1TX1P	RS422 differential gating command 1 from BICI to GGXI, 0 = Gate
JGATE1-37	FO1RX1P	RS422 differential gate status 1 from GGXI to BICI, 0 = OK
JGATE1-38	FI2TX1P	RS422 differential gating command 2 from BICI to GGXI, 0 = Gate
JGATE1-39	FI2RX1P	RS422 differential gate status 2 from GGXI to BICI, 0 = OK
JGATE1-40	FI3TX1P	RS422 differential gating command 3 from BICI to GGXI, 0 = Gate
JGATE1-41	FI3RX1P	RS422 differential gate status 3 from GGXI to BICI, 0 = OK
JGATE1-42	FO4TX1P	RS422 differential gating command 4 from BICI to GGXI, 0 = Gate
JGATE1-43	FO4RX1P	RS422 differential gate status 4 from GGXI to BICI, 0 = OK
JGATE1-44	DCOM	Digital common (return)
JGATE1-45	FO5TX1P	RS422 differential gating command 5 from BICI to GGXI, 0 = Gate
JGATE1-46	FO5RX1P	RS422 differential gate status 5 from GGXI to BICI, 0 = OK
JGATE1-47	FI6TX1P	RS422 differential gating command 6 from BICI to GGXI, 0 = Gate
JGATE1-48	FI6RX1P	RS422 differential gate status 6 from GGXI to BICI, 0 = OK
JGATE1-49	FI7TX1P	RS422 differential gating command 7 from BICI to GGXI, 0 = Gate
JGATE1-50	FI7RX1P	RS422 differential gate status 7 from GGXI to BICI, 0 = OK
JGATE1-51	F08TX1P	RS422 differential gating command 8 from BICI to GGXI, 0 = Gate
JGATE1-52	F08RX1P	RS422 differential gate status 8 from GGXI to BICI, 0 = OK
JGATE1-53	DCOM	Digital common (return)
JGATE1-54	FO9TX1P	RS422 differential gating command 9 from BICI to GGXI, 0 = Gate
JGATE1-55	FO9RX1P	RS422 differential gate status 9 from GGXI to BICI, 0 = OK
JGATE1-56	FI10TX1P	RS422 differential gating command 10 from BICI to GGXI, 0 = Gate
JGATE1-57	FI10RX1P	RS422 differential gate status 10 from GGXI to BICI, 0 = OK
JGATE1-58	FI11TX1P	RS422 differential gating command 11 from BICI to GGXI, 0 = Gate
JGATE1-59	FI11RX1P	RS422 differential gate status 11 from GGXI to BICI, 0 = OK
JGATE1-60	FO12TX1P	RS422 differential gating command 12 from BICI to GGXI, 0 = Gate
JGATE1-61	FO12RX1P	RS422 differential gate status 12 from GGXI to BICI, 0 = OK
JGATE1-62	DCOM	Digital common (return)
JGATE1-63	DCOM	Digital common (return) for V115 signal
JGATE1-64	DCOM	Digital common (return) for P160 signal
JGATE1-65	DCOM	Digital common (return) for P5 signal
JGATE1-66	DCOM	Digital common (return) for FUSE signal
JGATE1-67	DCOM	Digital common (return) used to indicate cable plugged into BPII by GGXI
JGATE1-68	BIC_CCHK1L	Low side of BICI to GGXI board #1 to BPII cable check signal
Shield	S1	Chassis ground
Shield	S2	Chassis ground

Table 4. JGATE2 Connector Pin Signal Descriptions

Pin #	Nomenclature	Description
JGATE2-1	DCOM	Digital common (return)
JGATE2-2	FO1TX2N	RS422 differential gating command 1 from BICI to GGXI, 0 = Gate
JGATE2-3	FO1RX2N	RS422 differential gate status 1 from GGXI to BICI, 0 = OK
JGATE2-4	FI2TX2N	RS422 differential gating command 2 from BICI to GGXI, 0 = Gate
JGATE2-5	FI2RX2N	RS422 differential gate status 2 from GGXI to BICI, 0 = OK
JGATE2-6	FI3TX2N	RS422 differential gating command 3 from BICI to GGXI, 0 = Gate
JGATE2-7	FI3RX2N	RS422 differential gate status 3 from GGXI to BICI, 0 = OK
JGATE2-8	FO4TX2N	RS422 differential gating command 4 from BICI to GGXI, 0 = Gate
JGATE2-9	FO4RX2N	RS422 differential gate status 4 from GGXI to BICI, 0 = OK
JGATE2-10	BIC_CCHK2H	High side of BICI to GGXI #2 to BPII cable check signal
JGATE2-11	FO5TX2N	RS422 differential gating command 5 from BICI to GGXI, 0 = Gate
JGATE2-12	FO5RX2N	RS422 differential gate status 5 from GGXI to BICI, 0 = OK
JGATE2-13	FI6TX2N	RS422 differential gating command 6 from BICI to GGXI, 0 = Gate
JGATE2-14	FI6RX2N	RS422 differential gate status 6 from GGXI to BICI, 0 = OK
JGATE2-15	FI7TX2N	RS422 differential gating command 7 from BICI to GGXI, 0 = Gate
JGATE2-16	FI7RX2N	RS422 differential gate status 7 from GGXI to BICI, 0 = OK
JGATE2-17	FO8TX2N	RS422 differential gating command 8 from BICI to GGXI, 0 = Gate
JGATE2-18	FO8RX2N	RS422 differential gate status 8 from GGXI to BICI, 0 = OK
JGATE2-19	DCOM	Digital common (return)
JGATE2-20	FO9TX2N	RS422 differential gating command 9 from BICI to GGXI, 0 = Gate
JGATE2-21	FO9RX2N	RS422 differential gate status 9 from GGXI to BICI, 0 = OK
JGATE2-22	FI10TX2N	RS422 differential gating command 10 from BICI to GGXI, 0 = Gate
JGATE2-23	FI10RX2N	RS422 differential gate status 10 from GGXI to BICI, 0 = OK
JGATE2-24	FI11TX2N	RS422 differential gating command 11 from BICI to GGXI, 0 = Gate
JGATE2-25	FI11RX2N	RS422 differential gate status 11 from GGXI to BICI, 0 = OK
JGATE2-26	FO12TX2N	RS422 differential gating command 12 from BICI to GGXI, 0 = Gate
JGATE2-27	FO12RX2N	RS422 differential gate status 12 from GGXI to BICI, 0 = OK
JGATE2-28	DCOM	Digital common (return)
JGATE2-29	V115B	GGXI 115 V ac to GDPA status, OC, 0 = OK
JGATE2-30	P160B	GGXI GDPA P160 status, OC, 0 = OK
JGATE2-31	P5B	GGXI P5 status, OC, 0 = OK
JGATE2-32	FUSB	GGXI fuse status, OC, 0 = OK
JGATE2-33	CCHK_OK2	Cable connected check through GGXI, NATO, NATP
JGATE2-34	BIC_CCHK2L	Low side of BICI to GGXI board #2 to BPII cable check signal
JGATE2-35	DCOM	Digital common (return)

Table 4. JGATE2 Connector Pin Signal Descriptions – Continued

Pin #	Nomenclature	Description
JGATE2-36	FO1TX2P	RS422 differential gating command 1 from BICI to GGXI, 0 = Gate
JGATE2-37	FO1RX2P	RS422 differential gate status 1 from GGXI to BICI, 0 = OK
JGATE2-38	FI2TX2P	RS422 differential gating command 2 from BICI to GGXI, 0 = Gate
JGATE2-39	FI2RX2P	RS422 differential gate status 2 from GGXI to BICI, 0 = OK
JGATE2-40	FI3TX2P	RS422 differential gating command 3 from BICI to GGXI, 0 = Gate
JGATE2-41	FI3RX2P	RS422 differential gate status 3 from GGXI to BICI, 0 = OK
JGATE2-42	FO4TX2P	RS422 differential gating command 4 from BICI to GGXI, 0 = Gate
JGATE2-43	FO4RX2P	RS422 differential gate status 4 from GGXI to BICI, 0 = OK
JGATE2-44	DCOM	Digital common (return)
JGATE2-45	FO5TX2P	RS422 differential gating command 5 from BICI to GGXI, 0 = Gate
JGATE2-46	FO5RX2P	RS422 differential gate status 5 from GGXI to BICI, 0 = OK
JGATE2-47	FI6TX2P	RS422 differential gating command 6 from BICI to GGXI, 0 = Gate
JGATE2-48	FI6RX2P	RS422 differential gate status 6 from GGXI to BICI, 0 = OK
JGATE2-49	FI7TX2P	RS422 differential gating command 7 from BICI to GGXI, 0 = Gate
JGATE2-50	FI7RX2P	RS422 differential gate status 7 from GGXI to BICI, 0 = OK
JGATE2-51	F08TX2P	RS422 differential gating command 8 from BICI to GGXI, 0 = Gate
JGATE2-52	F08RX2P	RS422 differential gate status 8 from GGXI to BICI, 0 = OK
JGATE2-53	DCOM	Digital common (return)
JGATE2-54	FO9TX2P	RS422 differential gating command 9 from BICI to GGXI, 0 = Gate
JGATE2-55	FO9RX2P	RS422 differential gate status 9 from GGXI to BICI, 0 = OK
JGATE2-56	FI10TX2P	RS422 differential gating command 10 from BICI to GGXI, 0 = Gate
JGATE2-57	FI10RX2P	RS422 differential gate status 10 from GGXI to BICI, 0 = OK
JGATE2-58	FI11TX2P	RS422 differential gating command 11 from BICI to GGXI, 0 = Gate
JGATE2-59	FI11RX2P	RS422 differential gate status 11 from GGXI to BICI, 0 = OK
JGATE2-60	FO12TX2P	RS422 differential gating command 12 from BICI to GGXI, 0 = Gate
JGATE2-61	FO12RX2P	RS422 differential gate status 12 from GGXI to BICI, 0 = OK
JGATE2-62	DCOM	Digital common (return)
JGATE2-63	DCOM	Digital common (return) for V115 signal
JGATE2-64	DCOM	Digital common (return) for P160 signal
JGATE2-65	DCOM	Digital common (return) for P5 signal
JGATE2-66	DCOM	Digital common (return) for FUSE signal
JGATE2-67	DCOM	Digital common (return) used to indicate cable plugged into BPII by GGXI
JGATE2-68	BIC_CCHK2H	High side of BICI to GGXI board #2 to BPII cable check signal
Shield	S1	Chassis ground
Shield	S2	Chassis ground

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 BPII board is described as the Bridge Power Interface Board.

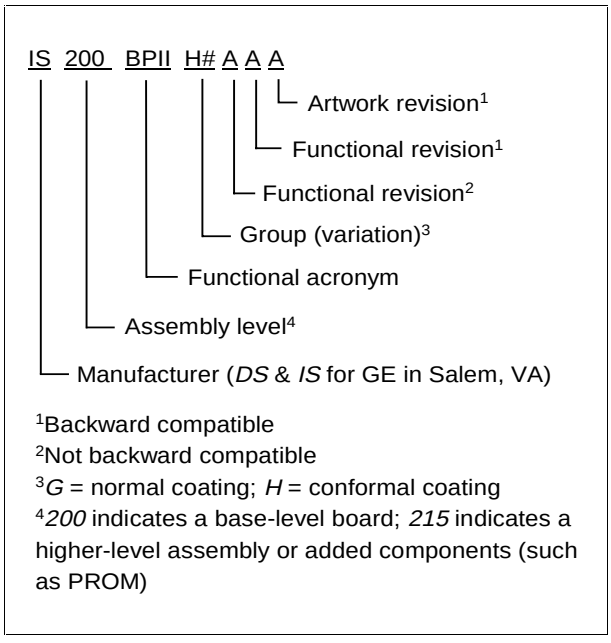

Figure 3. Board Part Number Conventions

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
("+" indicates the international access code required when calling from outside of the USA.)

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

CAUTION

To prevent component damage caused by static electricity, treat all boards with static sensitive handling techniques.

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.

Replacement Procedures

WARNING

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.

CAUTION

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

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

1. Make sure that the drive in which the board 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 board from the rack, as follows:
   a. Loosen the screws at the top and bottom of the board, near the board ejector tabs. (The screws are captive in the board front and should not be removed.)
   b. Unseat the board by raising the ejector tabs.
   c. Using both hands, gently pull the board from the rack.

Install the new (replacement) board in the rack as follows:

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

CAUTION

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

2. Begin seating the board by firmly pressing the top and bottom of the board 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 board. **Tighten the screws evenly** to ensure that the board is seated squarely.

GE Industrial Systems

Issue date: 1998-10-07

General Electric Company
1501 Roanoke Blvd.
Salem, VA 24153-6492 USA