GE Industrial Systems

Expander Load/Source Board
IS200GGXIG_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

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Functional Description

The IS200GGXI Expander Load/Source Board (GGXI) provides isolation and control between the high voltage power bridge and the Innovation Series™ board rack containing the IS200BICI Bridge Interface Controller Board (BICI) and the IS200BPII Bridge Power Interface Board (BPII). The GGXI board provides gating control, signal distribution, voltage isolation, and dc bus voltage indication. Also, the GGXI board serves as a termination point for bridge attenuators and current sensors.

The BPII and BICI boards provide numerous control signals, feedback signals, and accessibility to the Innovation Series control software for the GGXI board. The BICI board communicates with the GGXI board via the JFBK connector. The BPII board communicates with the GGXI board via the JGATE connector.

The BPII board communicates the gate command and status signals to the GGXI board using RS422. The GGXI board converts the RS422 signals into fiber-optic signals to gate the bridge IGCT (Integrated Gate Commutated Thyristor) switching devices. The GGXI board distributes the gate-control signals, terminates attenuators and current transformer current sensors, and provides analog feedback. The board can interface with up to 12 power devices. The GGXI board sends scaled bridge voltage and current feedback signals to the BICI board.

Several status sensing signals from the GGXI board are driven by open-collector opto-isolators. LED indicators are provided for power supply and gating operation status, and testpoints are provided for signal measurement.

The GGXI board provides isolation for voltage, current, noise, and control/feedback signals by using the following:

- Fiber-optic interfaces
- Opto-isolators
- Isolated fuse switch sensor
- Electrically isolated identification chip
- Isolated power supplies
- Active transformer shields
- Grounding

The GGXI board and the DS200GDPA Gate Driver Power Assembly Board (GDPA) are located near the power bridge. See Figure 2 for a block diagram of the GGXI board.

Interface Connectors

The GGXI board interfaces with other boards and monitors certain inputs via plug connectors mounted on it.

Power Supply Inputs: Input connectors J1, J2, J3, and J4 (fed from the GDPA board's connector GIPL) provide 27 kHz square wave, 48 V ac (± 2 V ac) power to the GGXI board. The total power consumption of the GGXI board is approximately 48 V rms, 4 A. Each power input signal also contains a GDPA board CVOK signal (2 milliamp current source logic signal riding on 160 V dc common mode). When this is OK, the respective power status LED indicator lights and an OK status signal is sent to the BPII board.

Power Output and Feedback: Connectors J10, J11, and J12 provide power to the active current transformers, ±24 V dc (±10 %), 0.6 A maximum. Active current transformer feedback is ±5 V dc, 0.5 A rms.

115 V ac Monitor: Connector J5 monitors the 115 V ac, 60 Hz control power to the GDPA boards. The signal level is 115 V ac. When the signal is OK, a status LED indicator lights and an OK status signal is sent to the BPII board.

Fuse Fault Monitor: Connector J6 supplies a 36 V open-circuit, 40 milliamp short-circuit signal to monitor the closed status of fuse fault switches, (closed = fuse OK). When the signal is OK, a status LED indicator lights and an OK status signal is sent to the BPII board.

Voltage Feedback: Connectors J15 and J16 supply voltage feedback signals from the IS200NATO Voltage Feedback Scaling Board (NATO). These signals have a voltage amplitude of 10 V peak.

BICI Board Connectors: The GGXI board communicates with the BICI board via the JFBK connector. These input/output signals include:

- Current Sensors
- Voltage Sensors
- Board Identification
- Cable Checks

BPII Board Connectors: The GGXI board communicates with the BPII board via the JGATE connector. These input/output signals include:

- Gating Status
- Gating Commands
- Fuse Status
- GDPA Board Status
- Control Power Status
- P5 Status
- NATO Board Cable Check
- BICI to GGXI to BPII Board Cable Check

Fiber-Optic Connectors: Twelve pairs of fiber-optic connectors interface the gating command and gating status signals to the IGCTs.

Grounding

Grounding stabs include Local Common (LCOM) and Digital Common (DCOM).

- LCOM is normally for quiet circuits like an analog circuit
- DCOM is normally for the noisy circuits like a digital circuit

LCOM is used for the current transformer power supplies and is the center point of the transformer's sensing.

Also, LCOM terminates the voltage and current sensor burden resistors. Connecting the LCOM stab to one of the CHASSIS stabs makes a connection to chassis ground. Another of the CHASSIS stabs is typically connected to the sheet metal.

On the GGXI board, there is no connection between chassis ground and DCOM except through the BPII board. The GGXI board and BICI/BPII boards have separate P5 power supplies and DCOMs (DCOMY/DCOMW from the BICI board). All unused pins on the two major cables, JFBK and JGATE, going between these boards are connected to DCOMY/DCOMW. This allows the GGXI board's DCOM to be tied to the board rack's DCOM, creating an extended ground plane by connecting the DCOM stab to the respective DCOMY/DCOMW. Alternatively, the DCOM stab can be connected to a CHASSIS stab.

Grounding stabs provide the selection of individual isolated stabs (see Table 1). A typical grounding scheme would have the following connections:

- CHASSIS stab to panel ground
- LCOM stab to CHASSIS stab
- DCOM stab to DCOMY stab

Electronic Board Identification

The GGXI board incorporates an isolated serial ID chip. The board identification (BRDID) net is extended to the GGXI boards through BICI board connectors PFBK1 and PFBK2. To verify that GGXI boards are connected properly, a pair of wires in the PFBK_/JFBK cable (from the BICI board to the GGXI board) and in the JGATE cable (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) have been detected in the correct direction is passed back to the BICI board (through the CABP board) from the BPII board. See Figure 1 for a diagram of this arrangement.

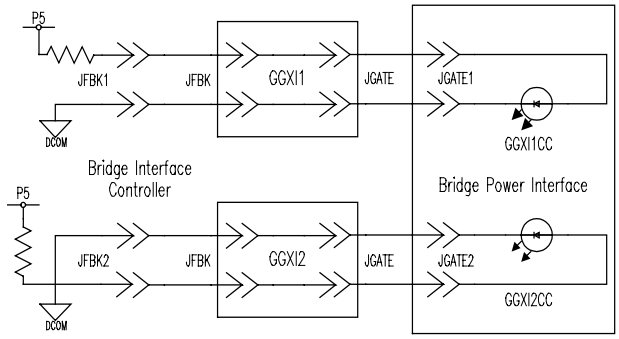
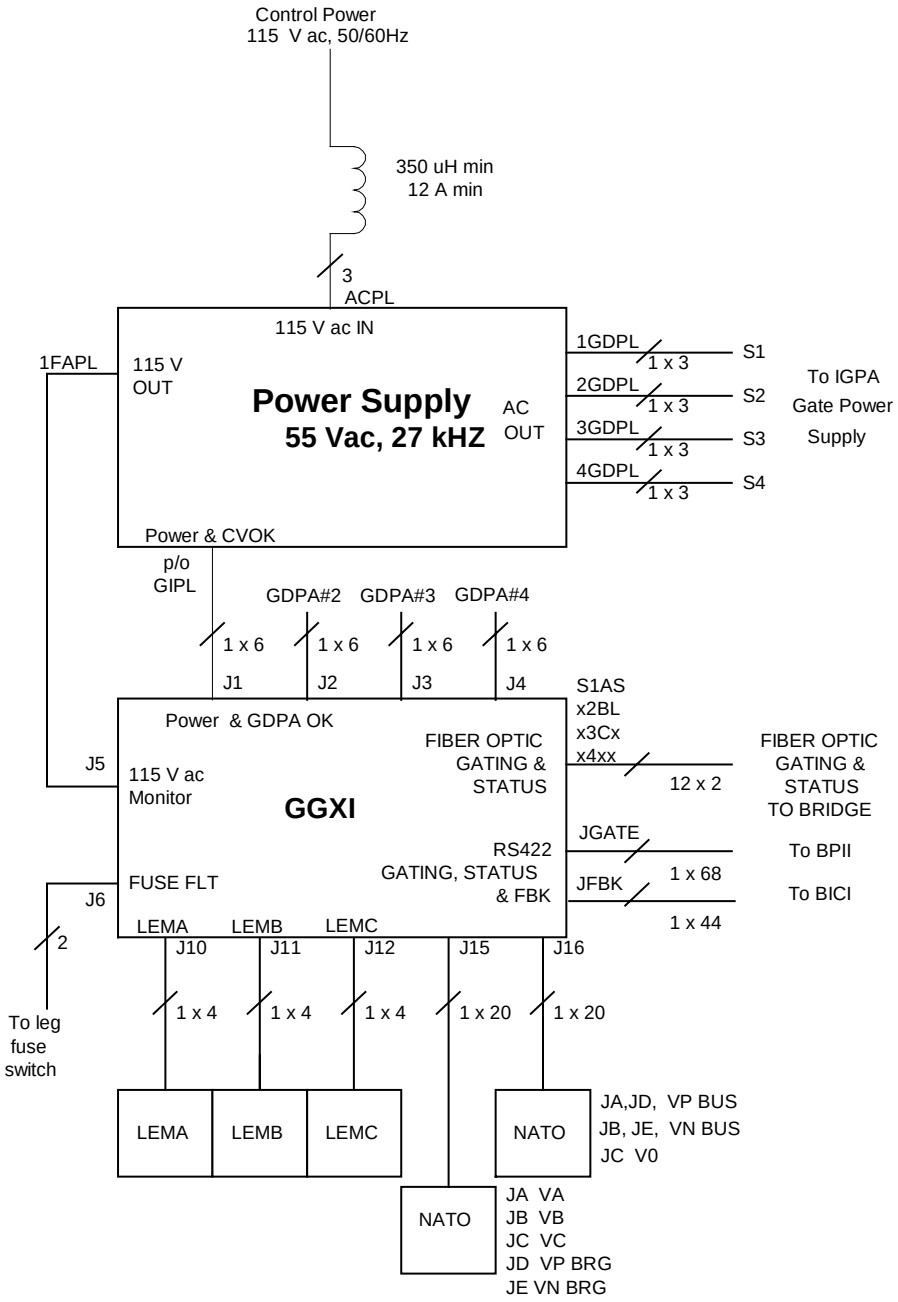


Figure 1. Board Identification Signals

Table 1. GGXI Board Grounding Stabs

Stab #	Nomenclature	Description
E1	DCOM	Digital common on GGXI board
E2	DCOMY	Extended ground plane through BICI board
E3	DCOMW	Extended ground plane through BPII board
E4	DCOM	Digital common on GGXI board
E5	LEM_GND	Active current transformers ground (LCOM)
E6	DCOM	Digital common on GGXI board
E7	CHASSIS	Drive chassis ground
E8	CHASSIS	Drive chassis ground
E9	CHASSIS	Drive chassis ground



ACPL harness: 3-PIN, 2 conductors + shield, 12A, 120 V ac

CPTPL harness: 2-pins to 5-pins, 2 wires, < 1A, 115 V ac

GDPL harness: 3-pins, 2 conductors + shield, 4A, 55 V ac

GIPL harness: 6-pins, 2 conductors, < 1A, 160 V dc

JGATE, harness: 68 pins SCSI cable

JFBK harness: 44 pin sub miniature D cable

LEM harness: pigtails to 4 pins , 3 conductors + shield, 4 A, 48 V dc

NATO harness: 20 individual wires, <1A 10 V

Figure 2. GGXI Board Block Diagram

Application Data

The GGXI board includes nine LED indicators, thirteen plug connectors, nine stab-on connectors, twelve pairs of fiber-optic connectors, and fourteen user testpoints as part of the board. There are no fuses or adjustable hardware devices included on the GGXI board. Refer to Figure 3, GGXI Board Layout Diagram, for the locations of these items.

Connectors

The BICI board interfaces to other boards through plug, stab-on, and fiber-optic connectors. See Figure 3 for the connector locations. See the following tables for pin signal descriptions of these connectors:

- See Tables 4, 5, 6, and 7 respectively for input connectors J1, J2, J3, and J4 signal descriptions
- See Table 8 for 115 V ac monitor connector J5 signal descriptions
- See Table 9 for fuse fault monitor connector J6 signal descriptions
- See Tables 10, 11, and 12 respectively for active current transformer power and feedback connectors J10, J11, and J12 signal descriptions
- See Tables 13 and 14 respectively for voltage feedback connectors J15 and J16 signal descriptions
- See Table 15 for connector JGATE to the BPII board signal descriptions.
- See Table 16 for connector PFBK to the BICI board signal descriptions.
- See Table 17 for Fiber-Optic Gate Signals to the IGCTs.

Testpoints

Fourteen user testpoints are provided to access signals for status or measurement. See Figure 3 for the testpoint locations. Refer to Table 3 for the testpoint signal descriptions.

LED Indicators

Nine LED indicators provide power supply, fuse, and voltage status indications. See Figure 3 for the LED indicator locations. Refer to Table 2 for descriptions of the LED indicators.

Table 2. LED Indicator Descriptions

LED	Nomenclature	Color	Description
DS10	GDPA1 OK	Green	GDPA1 status
DS11	GDPA2 OK	Green	GDPA2 status
DS12	GDPA3 OK	Green	GDPA3 status
DS13	V 115 OK	Green	115 V ac control power to GDPA 1 ok
DS14	P5 OK	Green	P5 supplying > 4.5 V dc
DS15	Fuse OK	Green	Bridge filter fuses ok (fuse contacts closed)
DS16	GDPA4 OK	Green	GDPA4 status
DS17	CAP-VP	Red	Voltage across P bus capacitors > 100 V dc
DS18	CAP-VN	Red	Voltage across N bus capacitors > 100 V dc

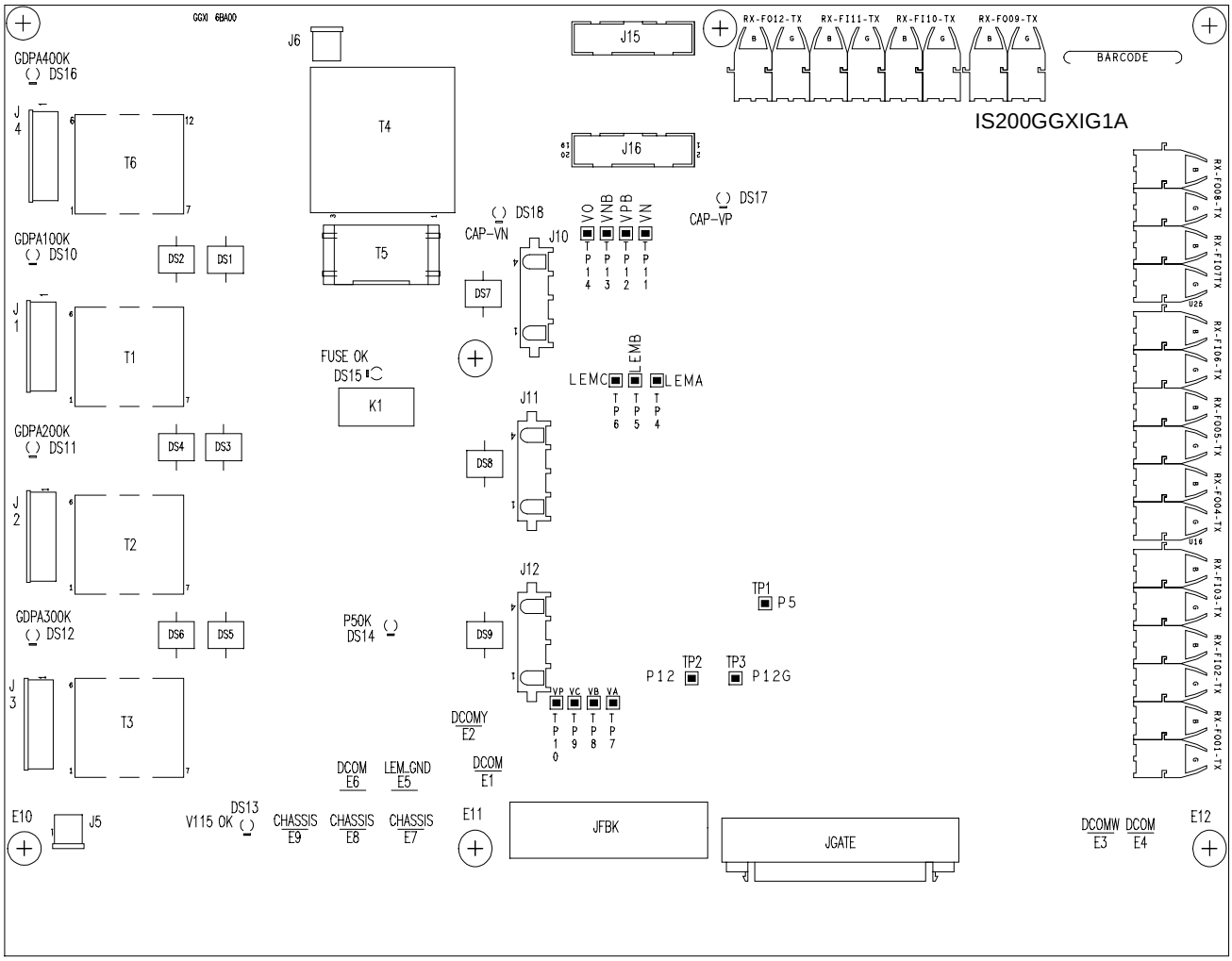


Figure 3. GGXI Board Layout Diagram

Table 3. Testpoint Descriptions

Testpoint	Nomenclature	Description
TP1	P5	5 V dc, ± 0.5 V
TP2	P11	11 V dc (±1 V)
TP3	P10G	10 V dc (±1 V), power with powerup glitch filter for fiber-optic transmitters
TP4	LEMA	Scaled phase A current
TP5	LEMB	Scaled phase B current
TP6	LEMC	Scaled phase C current
TP7	VA	Scaled bridge phase A to neutral voltage
TP8	VB	Scaled bridge phase B to neutral voltage
TP9	VC	Scaled bridge phase C to neutral voltage
TP10	VP	Scaled bridge P bus to neutral voltage
TP11	VN	Scaled bridge N bus to neutral voltage
TP12	VPB	Scaled capacitor P bus to neutral voltage
TP13	VNB	Scaled capacitor N bus to neutral voltage
TP14	VO	Scaled 0 bus voltage

Table 4. Connector J1, Power Supply Input From GDPA Board

Pin #	Nomenclature	Description
J1-1	GDPA1H	GDPA1OK signal
J1-2	GDPA1R	GDPA1OK signal
J1-3	NC	Not Connected
J1-4	V48PA	48 V ac, 27 kHz power from GDPA1
J1-5	NC	Not Connected
J1-6	V48NA	48 V ac, 27 kHz power from GDPA1

Table 5. Connector J2, Power Supply Input From GDPA Board

Pin #	Nomenclature	Description
J2-1	GDPA2H	GDPA2OK LED signal
J2-2	GDPA2R	GDPA2OK LED signal
J2-3	NC	Not Connected
J2-4	V48PB	48 V ac, 27 kHz power from GDPA2
J2-5	NC	Not Connected
J2-6	V48NB	48 V ac, 27 kHz power from GDPA2

Table 6. Connector J3, Power Supply Input From GDPA Board

Pin #	Nomenclature	Description
J3-1	GDPA3H	GDPA3OK LED signal
J3-2	GDPA3R	GDPA3OK LED signal
J3-3	NC	Not Connected
J3-4	V48PC	48 V ac, 27 kHz power from GDPA3
J3-5	NC	Not Connected
J3-6	V48NC	48 V ac, 27 kHz power from GDPA3

Table 7. Connector J4, Power Supply Input From GDPA Board

Pin #	Nomenclature	Description
J4-1	GDPA4H	GDPA4OK LED signal
J4-2	GDPA4R	GDPA4OK LED signal
J4-3	NC	Not Connected
J4-4	V48PD	48 V ac, 27 kHz power from GDPA4
J4-5	NC	Not Connected
J4-6	V48ND	48 V ac, 27 kHz power from GDPA4

Table 8. Connector J5, 115 V Monitor Input

Pin #	Nomenclature	Description
J5-1	115V	115 V ac monitoring signal (shown on LED DS13)
J5-2	115R	115 V ac monitoring signal return (shown on LED DS13)

Table 9. Connector J6, Fuse Fault Monitor Input

Pin #	Nomenclature	Description
J6-1	FUSES	Fuse fault monitoring signal (shown on LED DS15)
J6-2	FUSER	Fuse fault monitoring signal return (shown on LED DS15)

Table 10. Connector J10, Power Output/Feedback To Active Current Transformers

Pin #	Nomenclature	Definition
J10-1	P24A	Positive 24 V dc to active current transformer for phase A
J10-2	ILEMA	Phase A active current transformer feedback
J10-3	N24A	Negative 24 V dc to active current transformer for phase A
J10-4	CHASSIS	Chassis ground

Table 11. Connector J11, Power Output/Feedback To Active Current Transformers

Pin #	Nomenclature	Definition
J11-1	P24B	Positive 24 V dc to active current transformer for phase B
J11-2	ILEMB	Phase B active current transformer feedback
J11-3	N24B	Negative 24 V dc to active current transformer for phase B
J11-4	CHASSIS	Chassis ground

Table 12. Connector J12, Power Output/Feedback To Active Current Transformers

Pin #	Nomenclature	Definition
J12-1	P24C	Positive 24 V dc to active current transformer for phase C
J12-2	ILEMC	Phase C active current transformer feedback
J12-3	N24C	Negative 24 V dc to active current transformer for phase C
J12-4	CHASSIS	Chassis ground

Table 13. Connector J15, Voltage Feedback Signals From NATO Board

Pin #	Nomenclature	Description
J15-1	LCOM	Local common
J15-2	NC	Not Connected
J15-3	LCOM	Local common
J15-4	VA	Scaled bridge phase A to neutral voltage
J15-5	LCOM	Local common
J15-6	VB	Scaled bridge phase B to neutral voltage
J15-7	LCOM	Local common
J15-8	VC	Scaled bridge phase C to neutral voltage
J15-9	LCOM	Local common
J15-10	VP	Scaled bridge positive bus to neutral voltage
J15-11	LCOM	Local common
J15-12	VN	Scaled bridge negative bus to neutral voltage
J15-13	LCOM	Local common
J15-14	NO_CBL_NATO1	NATO board #1 cable check signal
J15-15	LCOM	Local common
J15-16	LCOM	Local common
J15-17	LCOM	Local common
J15-18	LCOM	Local common
J15-19	LCOM	Local common
J15-20	NC	Not Connected

Table 14. Connector J16, Voltage Feedback Signals From NATO Board

Pin #	Nomenclature	Description
J16-1	LCOM	Local common
J16-2	NC	Not Connected
J16-3	LCOM	Local common
J16-4	VPB	Scaled capacitor positive bus to neutral voltage
J16-5	LCOM	Local common
J16-6	VNB	Scaled capacitor negative bus to neutral voltage
J16-7	LCOM	Local common
J16-8	VO	Scaled O bus voltage
J16-9	LCOM	Local common
J16-10	VPCAP	Scaled capacitor positive bus voltage for voltage indicator
J16-11	LCOM	Local common
J16-12	VNCAP	Scaled capacitor negative bus voltage for voltage indicator
J16-13	LCOM	Local common
J16-14	NO_CBL_NATO2	NATO board #2 cable check signal
J16-15	LCOM	Local common
J16-16	LCOM	Local common
J16-17	LCOM	Local common
J16-18	LCOM	Local common
J16-19	LCOM	Local common
J16-20	VCAPN	Chassis connection from NATO board 2

Table 15. Connector JGATE, BPII Board Interface

Pin #	Nomenclature	Description
JGATE-1	DCOMW	To DCOMW stab-on connector on GGXI board
JGATE-2	FO1RXN	RS422 RX negative gating signal to FO01TX
JGATE-3	FO1TXN	RS422 TX negative status signal from FO01RX
JGATE-4	FI2RXN	RS422 RX negative gating signal to FI02TX
JGATE-5	FI2TXN	RS422 TX negative status signal from FI02RX
JGATE-6	FI3RXN	RS422 RX negative gating signal to FI03TX
JGATE-7	FI3TXN	RS422 TX negative status signal from FI03RX
JGATE-8	FO4RXN	RS422 RX negative gating signal to FO04TX
JGATE-9	FO4TXN	RS422 TX negative status signal from FO04RX
JGATE-10	CBL1OK	Cable connection check signal #1 from BPII board
JGATE-11	FO5RXN	RS422 RX negative gating signal to FO05TX
JGATE-12	FO5TXN	RS422 TX negative status signal from FO05RX
JGATE-13	FI6RXN	RS422 RX negative gating signal to FI06TX
JGATE-14	FI6TXN	RS422 TX negative status signal from FI06RX

Table 15. Connector JGATE, BPII Board Interface – Continued

Pin #	Nomenclature	Description
JGATE-15	FI7RXN	RS422 RX negative gating signal to FI07TX
JGATE-16	FI7TXN	RS422 TX negative status signal from FI07RX
JGATE-17	FO8RXN	RS422 RX negative gating signal to FO08TX
JGATE-18	FO8TXN	RS422 TX negative status signal from FO08RX
JGATE-19	DCOMW	To DCOMW stab-on connector on GGXI board
JGATE-20	FO9RXN	RS422 RX negative gating signal to FO09TX
JGATE-21	FO9TXN	RS422 TX negative status signal from FO09RX
JGATE-22	FI10RXN	RS422 RX negative gating signal to FI10TX
JGATE-23	FI10TXN	RS422 TX negative status signal from FI10RX
JGATE-24	FI11RXN	RS422 RX negative gating signal to FI11TX
JGATE-25	FI11TXN	RS422 TX negative status signal from FI11RX
JGATE-26	FO12RXN	RS422 RX negative gating signal to FO12TX
JGATE-27	FO12TXN	RS422 TX negative status signal from FO12RX
JGATE-28	DCOMW	To DCOMW stab-on connector on GGXI board
JGATE-29	P115S	115 V ac power supply checking signal
JGATE-30	P160S	GDPAs OK signal
JGATE-31	P5OKS	Positive 5 V dc power supply checking signal
JGATE-32	FUS	Fuse status checking signal
JGATE-33	CCHKS	NATO board connection checking signal
JGATE-34	DCOMW1	To DCOMW stab-on connector on GGXI board (through resistor R55)
JGATE-35	DCOMW	To DCOMW stab-on connector on GGXI board
JGATE-36	FO1RXP	RS422 RX positive gating signal to FO01TX
JGATE-37	FO1TXP	RS422 TX positive status signal from FO01RX
JGATE-38	FI2RXP	RS422 RX positive gating signal to FI02TX
JGATE-39	FI2TXP	RS422 TX positive status signal from FI02RX
JGATE-40	FI3RXP	RS422 RX positive gating signal to FI03TX
JGATE-41	FI3TXP	RS422 TX positive status signal from FI03RX
JGATE-42	FO4RXP	RS422 RX positive gating signal to FO04TX
JGATE-43	FO4TXP	RS422 TX positive status signal from FO04RX
JGATE-44	CBL2OK	Cable connection check signal #2 from BPII board
JGATE-45	FO5RXP	RS422 RX positive gating signal to FO05TX
JGATE-46	FO5TXP	RS422 TX positive status signal from FO05RX
JGATE-47	FI6RXP	RS422 RX positive gating signal to FI06TX
JGATE-48	FI6TXP	RS422 TX positive status signal from FI06RX
JGATE-49	FI7RXP	RS422 RX positive gating signal to FI07TX
JGATE-50	FI7TXP	RS422 TX positive status signal from FI07RX
JGATE-51	FO8RXP	RS422 RX positive gating signal to FO08TX
JGATE-52	FO8TXP	RS422 TX positive status signal from FO08RX
JGATE-53	DCOMW	To DCOMW stab-on connector on GGXI board

Table 15. Connector JGATE, BPII Board Interface – Continued

Pin #	Nomenclature	Description
JGATE-54	FO9RXP	RS422 RX positive gating signal to FO09TX
JGATE-55	FO9TXP	RS422 TX positive status signal from FO09RX
JGATE-56	FI10RXP	RS422 RX positive gating signal to FI10TX
JGATE-57	FI10TXP	RS422 TX positive status signal from FI10RX
JGATE-58	FI11RXP	RS422 RX positive gating signal to FI11TX
JGATE-59	FI11TXP	RS422 TX positive status signal from FI11RX
JGATE-60	FO12RXP	RS422 RX positive gating signal to FO12TX
JGATE-61	FO12TXP	RS422 TX positive status signal from FO12RX
JGATE-62	DCOMW	To DCOMW stab-on connector on GGXI board
JGATE-63	DCOM	Return for 115 V ac power supply checking signal (JGATE-29)
JGATE-64	P160R	Return for GDPAs OK signal (JGATE-30)
JGATE-65	P5OKR	Return for Positive 5 V dc power supply checking signal (JGATE-31)
JGATE-66	FUSR	Return for fuse status checking signal (JGATE-32)
JGATE-67	CCHKR	Return for NATO board connection checking signal (JGATE-33)
JGATE-68	DCOMW2	To DCOMW stab-on connector on GGXI board (through resistor R56)

Table 16. Connector JFBK, BICI Board Interface

Pin No.	Nomenclature	Definition
JFBK-1	LEMAS	Active current transformer phase A scaled current
JFBK-2	LEMAR	Active current transformer phase A scaled current return
JFBK-3	LEMBS	Active current transformer phase B scaled current
JFBK-4	LEMBR	Active current transformer phase B scaled current return
JFBK-5	LEMCS	Active current transformer phase C scaled current
JFBK-6	LEMCR	Active current transformer phase C scaled current return
JFBK-7	VA	Scaled bridge phase A to neutral voltage
JFBK-8	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-9	VB	Scaled bridge phase B to neutral voltage
JFBK-10	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-11	VC	Scaled bridge phase C to neutral voltage
JFBK-12	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-13	VP	Scaled bridge positive bus to neutral voltage
JFBK-14	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-15	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-16	VN	Scaled bridge negative bus to neutral voltage
JFBK-17	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-18	VPB	Scaled capacitor positive bus to neutral voltage

Table 16. Connector JFBK, BICI Board Interface – Continued

Pin No.	Nomenclature	Definition
JFBK-19	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-20	VNB	Scaled capacitor negative bus to neutral voltage
JFBK-21	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-22	V0	Scaled 0 bus voltage
JFBK-23	LCOM	Local common
JFBK-24	CBL1OK	Cable connection check signal #1 from BICI board
JFBK-25	CBL2OK	Cable connection check signal #2 from BICI board
JFBK-26	BRDIDS	Board identification signal
JFBK-27	BRDIDR	Board identification signal return
JFBK-28	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-29	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-30	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-31	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-32	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-33	DCOMY1	To DCOMY stab-on connector on GGXI board (through resistor R28)
JFBK-34	DCOMY2	To DCOMY stab-on connector on GGXI board (through resistor R29)
JFBK-35	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-36	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-37	DCOMY3	To DCOMY stab-on connector on GGXI board (through resistor R30)
JFBK-38	DCOMY4	To DCOMY stab-on connector on GGXI board (through resistor R31)
JFBK-39	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-40	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-41	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-42	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-43	DCOMY	To DCOMY stab-on connector on GGXI board
JFBK-44	DCOMY	To DCOMY stab-on connector on GGXI board
45 (screw)	CHASSIS	Chassis ground
46 (screw)	CHASSIS	Chassis ground

Table 17. GGXI Board Fiber-Optic Connector Interface With IGCT Modules

Connector	Color	Nomenclature	Description
FO01-TX	Gray	FO01-TX	Gating command to IGCT cell #1, light = gate (fire cell)
FO01-RX	Blue	FO01-RX	Gating status from IGCT cell #1, light = OK
FI02-TX	Gray	FI02-TX	Gating command to IGCT cell #2, light = gate (fire cell)
FI02-RX	Blue	FI02-RX	Gating status from IGCT cell #2, light = OK
FI03-TX	Gray	FI03-TX	Gating command to IGCT cell #3, light = gate (fire cell)
FI03-RX	Blue	FI03-RX	Gating status from IGCT cell #3, light = OK
FO04-TX	Gray	FO04-TX	Gating command to IGCT cell #4, light = gate (fire cell)
FO04-RX	Blue	FO04-RX	Gating status from IGCT cell #4, light = OK
FO05-TX	Gray	FO05-TX	Gating command to IGCT cell #5, light = gate (fire cell)
FO05-RX	Blue	FO05-RX	Gating status from IGCT cell #5, light = OK
FI06-TX	Gray	FI06-TX	Gating command to IGCT cell #6, light = gate (fire cell)
FI06-RX	Blue	FI06-RX	Gating status from IGCT cell #6, light = OK
FI07-TX	Gray	FI07-TX	Gating command to IGCT cell #7, light = gate (fire cell)
FI07-RX	Blue	FI07-RX	Gating status from IGCT cell #7, light = OK
FO08-TX	Gray	FO08-TX	Gating command to IGCT cell #8, light = gate (fire cell)
FO08-RX	Blue	FO08-RX	Gating status from IGCT cell #8, light = OK
FO09-TX	Gray	FO09-TX	Gating command to IGCT cell #9, light = gate (fire cell)
FO09-RX	Blue	FO09-RX	Gating status from IGCT cell #9, light = OK
FI10-TX	Gray	FI10-TX	Gating command to IGCT cell #10, light = gate (fire cell)
FI10-RX	Blue	FI10-RX	Gating status from IGCT cell #10, light = OK
FI11-TX	Gray	FI11-TX	Gating command to IGCT cell #11, light = gate (fire cell)
FI11-RX	Blue	FI11-RX	Gating status from IGCT cell #11, light = OK
FO12-TX	Gray	FO12-TX	Gating command to IGCT cell #12, light = gate (fire cell)
FO12-RX	Blue	FO12-RX	Gating status from IGCT cell #12, light = OK

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 4 explains the structure of the part number. The board's functional acronym, shown in Figure 4, normally is based on the **board description**, or name. For example, the GGXI board is described as the Expander Load/Source Board.

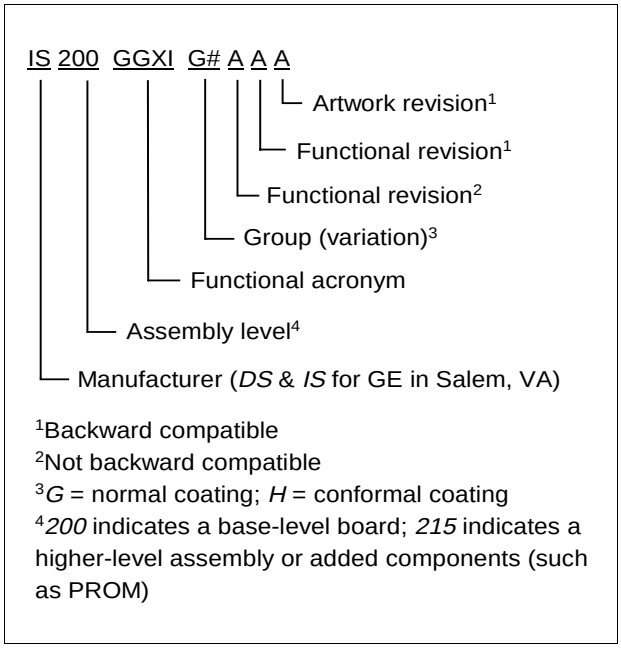


Figure 4. Board Part Number Conventions

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 as follows:

1. Make sure that the drive in which the board resides has been de-energized.
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 as follows:
   a. Disconnect the electrical connections and note the wire locations and board orientation.
   b. Remove the seven mounting screws.

Note

Be careful with the four plastic standoffs (top and middle locations) and the three metal standoffs (bottom locations, with star washers) mounted on the board. As the screws are removed, catch the standoffs and star washers. Remember that the star washers must be paired with the metal standoffs at reassembly.

Install the new (replacement) board as follows:

1. Orient the new GGXI board in the same position as previously installed board.

CAUTION

Be sure the star washers are mated with the metal surfaces with the metal standoffs, not with the plastic standoffs. The metal standoffs and star washers make a protective circuit shunting any accidental high voltage to ground.

2. Install the new GGXI board with seven mounting screws, four plastic standoffs, and three metal standoffs with the star washers. Tighten all screws evenly to secure the board in place.
3. Reconnect all electrical connections.

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