GE Industrial Systems

Control Assembly Backplane
IS200CABPG_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 IS200CABP Control Assembly Backplane (CABP) board is a multi-layer printed wiring board that provides the interconnections for the printed wiring boards inserted into it and interfaces to external signals. The boards inserted will vary with the power level and application of the Innovation Series™ drive that the CABP board is part of. These boards are:

- IS200BAIA Bridge Interface Board (BAIA)
- IS215GBIA Auxiliary Genius Interface Module (GBIA), IS215PBIA Auxiliary Profibus Interface Module (PBIA), or IS200ACL_ Application Control Layer Board (ACL_)
- IS200DSPX Digital Signal Process Control Board (DSPX) (Optional)
- IS200RAPA Rack Power Supply Board (RAPA)
- IS200BIC_ Bridge Interface Board (BIC_)
- IS200BPI_ Drive Bridge Personality Interface Board (BPI_) or IS200FOSA Bridge Interface Board (FOSA)

Connectors are also provided for various external interfaces such as user control inputs/outputs (I/O), four front panel meters, diagnostic/configuration tools, a front panel keypad, four ISBus™ ports, and power supply inputs. The CABP board is mounted to the Innovation Series board rack that provides the mounting points for the individual boards. See Figure 1 for a CABP board block diagram.

The CABP board is powered from a single IS200HFPA High Frequency Ac/Fan Power Supply Board (HFPA). Power connections are via a twisted/shielded pair cable for the 48 V ac power and a separate isolated twisted pair cable for the 17 V ac power. Isolation for these cables is 1000 V dc.

The CABP board connects the isolated power returns to the control cabinet common (CCOM) either through an impedance (resistor/capacitor) or directly. It also connects DCOM to CCOM. Provisions are available to tie cable shields (when applicable) to the chassis directly.

There are two application-specific stab-on connectors each for CCOM and for Chassis Ground (GND). GND is tied to the board rack chassis through the mounting screws. CCOM and GND are tied together through a capacitor. The CABP board CCOM is connected to the control cabinet CCOM via the stab-on connectors.

All fault string logic operations are performed on the BIC_ board.

Hardware Features

The terminal boards associated with the CABP board for user I/O are located near the application cable entry into the cabinet. Connection to these terminal boards is via two multi-conductor cables segregated into low voltage (less than 50 volts) and high voltage (greater than 50 volts) applications.

The CABP board is designed so that all non-board connectors are incapable of being inserted incorrectly. This is done by either using different connector types for each function, by keying each connector differently, or by spacing like connectors with sufficient separation that they cannot be inserted incorrectly.

Board connectors are either individually keyed, use different connectors (96 pin versus 128 pin) for similar modules, or maintain common pin assignments so that modules can be interchanged without damage. Normal board locations are as follows:

- Slot One BAIA board
- Slot Two DSPX board
- Slot Three ACL_ board or GBIA/PBIA mod.
- Slot Four BIC_ board
- Slot Five BPI_ or FOSA board

ACL_ Board, GBIA Module, or PBIA Module Determination

The CABP board is designed to accommodate insertion of either an ACL_ board or a GBIA/PBIA module into board slot three. The ACL_ board and GBIA/PBIA modules share the same pin configuration for the CABP board connector. Appropriate memory maps and protocols prevent any signal contentions on the data bus and control lines. The BAIA board monitors two sensing lines to determine which device is present in this board slot. The drive's software determines the operation of the DSPX board and the device that is inserted into this board slot (ACL_ board, GBIA module, or PBIA module).

- When an ACL_ board is present in board slot three, some functionality of the DSPX board is transferred to the ACL_ board by the BAIA board.
- When a GBIA or PBIA module is present in board slot three, pull-up resistors on the BAIA board set the logic levels on the sensing lines.

CABP Board Connectors

The CABP board includes stab-on connectors, plug connectors for external signal interfacing, and board (backplane) connectors.

Stab-on Connectors: E1 – E4 are the stab-on connectors for GND and CCOM.

- **E1, E2** GND Connectors
- **E3, E4** CCOM Connectors

Backplane Connectors: J13 – J21 are the board backplane connectors that the individual boards plug into. Connections are as follows (respectively):

- **J13, J17** BAIA board P1, P2
- **J14** RAPA board
- **J18** DSPX board
- **J19** ACL_ board or GBIA/PBIA mod.
- **J15, J20** BIC_ board P1, P2
- **J16, J21** BPI_ or FOSA board's P1, P2

External Interface Connectors: J1 – J12 are the external interface connectors for the CABP board.

J1: Main Contactor Pilot Relay and Feedback Sense Input and the Charge Contactor Pilot Relay

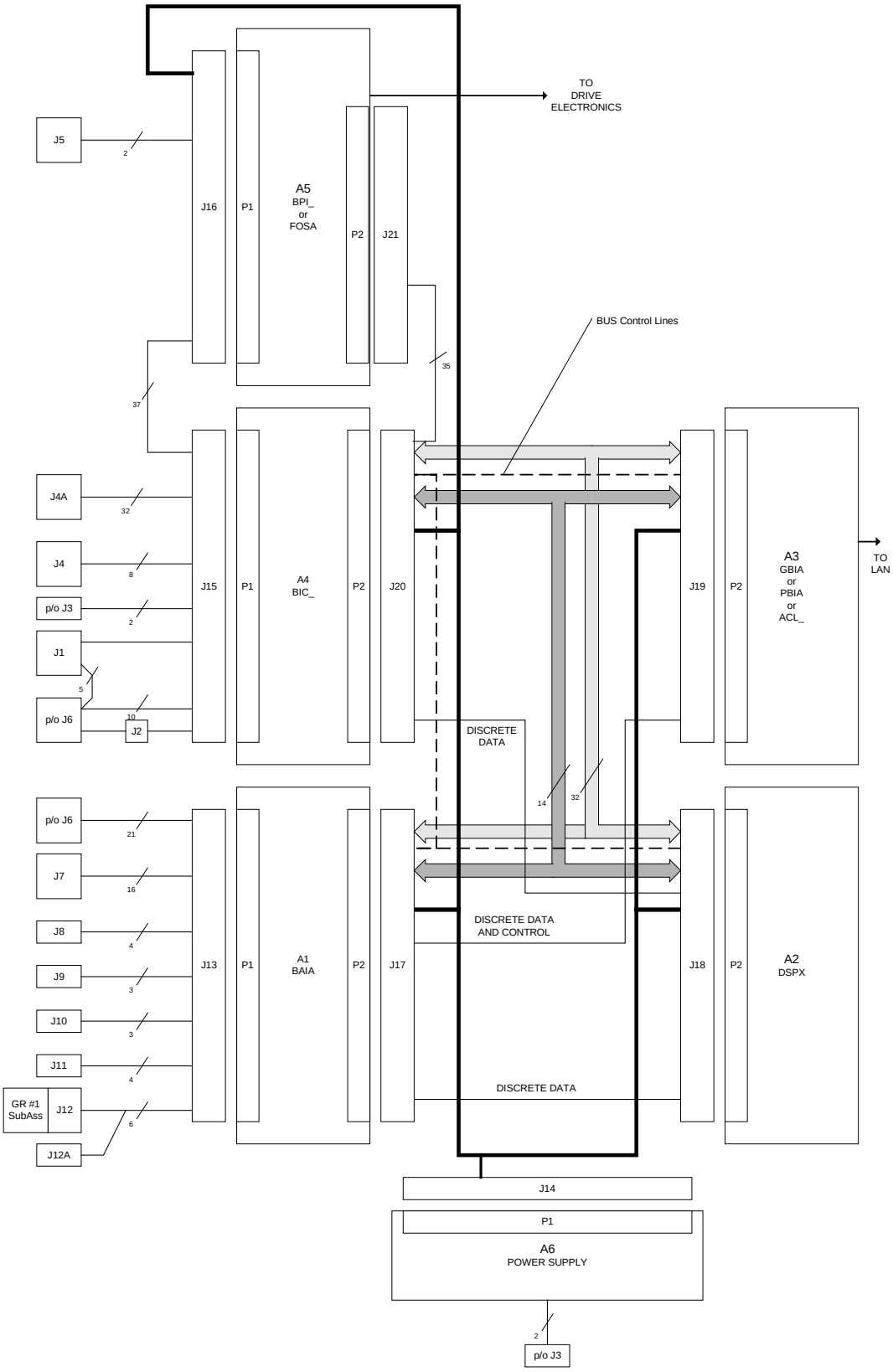

Figure 1. CABP Board Block Diagram

J2: LKPL Dc Power Disconnect Sensing

J3: HFPA Interface Connector

J4: Low Voltage Drives, Drive Temperature Sensor Connector
Medium Voltage Drives, User Analog I/O

J4A: Low Voltage Drives, Not Used
Medium Voltage Drives, User I/O

J5: HFPA Board Interface Connector. The power on this connector may be biased at 1000 V dc if there is a fault in the drive. Therefore, it must be isolated from the other connectors and cables via appropriate shielding/separation.

J6: User I/O Connector (signals typically greater than 50 volts)

J7: User I/O Connector (signals typically less than 50 volts)

J8: Meter Connector (will support up to four meters)

J9: Diagnostic/Configuration Tool Port (powered by an isolated power supply)

J10: Keypad Interface Connector (supplied by power that is not isolated - power/signal return should not be tied to other power supply returns)

J11A: Local ISBus Interface Connector (RJ45). This connector contains isolated transmit and receive signals as well as isolated 24 V dc. The signal isolation is accomplished either by optical isolators or transformers on the generating and receiving boards. This ISBus connector is intended for local applications such as drive/local I/O expansion. Connection to higher-level controllers such as the ACL_ board is to be done through the system ISBus connector. This connector is normally connected either directly to an I/O transmitter output or to an IS200ISBE ISBus Extender Board (ISBE) transmit/receive connector (designed to mate directly with J11A).

J11B: Local ISBus Interface Connector (RJ45). This connector contains an isolated transmit signal (the same signal as on J11A) and is also intended for local applications. This connector is normally used to interface directly to an expanded I/O board's receiver input.

J12A: System ISBus Interface Connector (RJ45). This connector contains isolated transmit and receive signals as well as the isolated 24 volts. The signal isolation is accomplished either by optical isolators or transformers on the generating and receiving boards. This ISBus connector is intended for extended applications such as ACL_ board and I/O expansion. This connector is normally connected either directly to an I/O transmitter output or to an IS200ISBE ISBus Extender Board (ISBE) transmit/receive connector (designed to mate directly with J12A).

J12B: System ISBus Interface Connector (RJ45). This connector contains an isolated transmit signal (the same signal as on J12A) and is also intended for extended applications. This connector is normally used to interface directly to an expanded I/O board's receiver input.

Application Data

The CABP board has no LED indicators, fuses, adjustable hardware, or user testpoints. The CABP board does have four stab-on connectors (E1 – E4), 15 front panel connectors (J1 – J12), and nine backplane connectors (J13 – J21). See Figure 2 for a board component layout diagram showing the locations of these connectors.

Connectors

The CABP contains the following connectors. Refer to the Tables as listed for individual pin signal descriptions.

Stab-on Connectors: E1 – E4 are the stab-on connectors for GND and CCOM. See **Table 1** for connector descriptions.

Backplane Connectors: J13 – J21 are the CABP board backplane connectors that the individual boards plug into. Each board publication includes a complete pin signal description table for its P1/P2 connectors that mate with J13 – J21. Refer to **Table 2** for a backplane connector to board publication matrix to obtain these signal descriptions from if necessary.

External Interface Connectors: J1 – J12 are the external interface connectors for the CABP board. Refer to the Tables as follows for individual pin signal descriptions of each connector:

Table 3 **J1 -** Main Contactor Pilot Relay and Feedback Sense Input and the Charge Contactor Pilot Relay

Table 4 **J2 -** LKPL DC Disconnect Sensing

Table 5 **J3 -** HFPA Interface Connector

Table 6A **J4 -** Drive Temperature Sensor Connector (low voltage applications)

Table 6B **J4** - Analog User I/O Connector (medium voltage applications)

Table 7 **J4A -** User I/O Connector (medium voltage applications; not used for low voltage applications)

Table 8 **J5 -** HFPA Board Interface Connector

Table 9 **J6 -** User I/O Connector (signals typically greater than 50 volts)

Table 10 **J7 -** User I/O Connector (signals typically less than 50 volts)

Table 11 **J8 -** Meter Connector

Table 12 **J9 -** Diagnostic/Configuration Tool Port.

Table 13 **J10 -** Keypad Interface Connector

Table 14 **J11A -** Local ISBus Interface Connector

Table 15 **J11B -** Local ISBus Interface Connector

Table 16 **J12A -** System ISBus Interface Connector

Table 17 **J12B -** System ISBus Interface Connector

Table 1. Grounding Stab-On Connectors

Connector	Nomenclature	Description
E1	GND	Ground
E2	GND	Ground
E3	CCOM	Control cabinet common
E4	CCOM	Control cabinet common

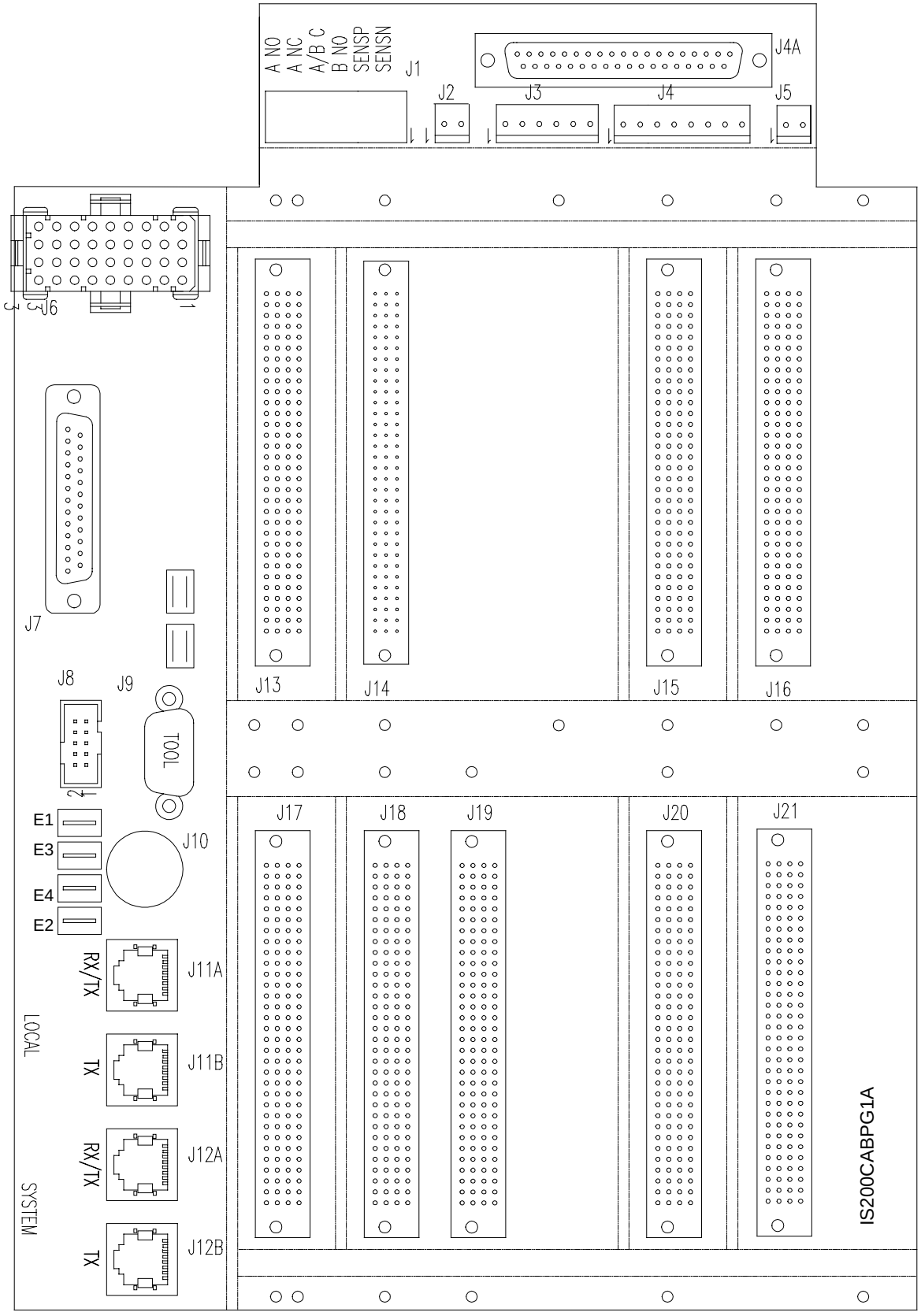

Figure 2. CABP Board Layout Diagram

Table 2. Backplane Connector To Board Publication/Board Connector Reference

Connector	Board Publication	Board and Board Connector*
J13 & J17	GEI-100268	IS200BAIA Bridge Interface Board, connectors P1 and P2 (respectively)
J14	GEI-100261	IS200RAPA Rack Power Supply Board, connector P1
J18	GEI-100267	IS200DSPX Digital Signal Processor Control Board, connector P1
J19	GEH-6379 GEI-100269	IS200ACL_ Application Control Layer Board, connector P1 IS215GBIA Auxiliary Genius Interface Module, connector P8 IS215PBIA Auxiliary Profibus Interface Module, connector P8
J15 & J20	GEI-100297 GEI-100264 GEI-100281 GEI-100418	IS200BICI Bridge Interface Board, connectors P1 and P2 (respectively) IS200BICL Bridge Interface Board, connectors P1 and P2 (respectively) IS200BICM Bridge Interface Board, connectors P1 and P2 (respectively) IS200BICH 5-Level H-Bridge Interface and Control Board, connectors P1 and P2 (respectively)
J16 & J21	GEI-100298 GEI-100265 GEI-100266 GEI-100417	IS200BPII Bridge Power Interface Board, connectors P1 and P2 (respectively) IS200BPIA Bridge Power Interface Board, connectors P1 and P2 (respectively) IS200BPIB Bridge Power Interface Board, connectors P1 and P2 (respectively) IS200BPIH Bridge Interface Differential transceiver Board, connectors P1 and P2 (respectively)

*Board and board publications vary with the power/application of the Innovation Series drive. When more than one selection is available for the backplane connector, refer to the applicable selection for the particular drive.

Table 3. Connector J1, Main Contactor Pilot Relay/Feedback Sense Input/Charge Contactor Pilot Relay

Pin #	Nomenclature	Description
J1-1	CONT_A_NO	Normally open contact of the Main Contactor Pilot Relay
J1-2	CONT_A_NC	Normally closed contact of the Main Contactor Pilot Relay
J1-3	CONT_A/B_COM	Common side of the NO and NC contacts of the Main Contactor Pilot Relay. This same terminal is used as the common side of the NO and NC contacts of the Charge Contactor Pilot Relay
J1-4	CONT_B_NO	Normally open contact of the Charge Contactor Pilot Relay
J1-5	SENSP	Positive terminal of the Feedback Sense Input
J1-6	SENSN	Negative terminal of the Feedback Sense Input

Table 4. J2, LKPL DC Disconnect Sense

Pin #	Nomenclature	Description
J2-1	LCL_COM	Common input side of the Local Fault String
J2-2	LKPL	Input side of the Dc Disconnect Sense

Table 5. J3, HFPA Board Interface Connector

Pin #	Nomenclature	Description
J3-1	SQV48A	Positive side of the line of the 48 V ac input to the CABP board
J3-2	SQV48B	Negative side of the line of the 48 V ac input to the CABP board
J3-3	PWR_SHLD	Shield for the 48 V ac lines
J3-4	FAN_SHLD	Shield for the fan speed control (Not used on Medium Voltage Applications)
J3-5	FAN_SPDP	Positive output of the fan speed PWM signal (Not used on Medium Voltage Applications)
J3-6	FAN_SPDN	Negative output of the fan speed PWM signal (Not used on Medium Voltage Applications)

Table 6A. J4, Temperature Sensor Connector (Low Voltage Applications)

Pin #	Nomenclature	Description
J4-1	TA_1	Bias output to Temperature Sensor A
J4-2	TA_2	Signal input from Temperature Sensor A
J4-3	TB_1	Bias output to Temperature Sensor B
J4-4	TB_2	Signal input from Temperature Sensor B
J4-5	TC_1	Bias output to Temperature Sensor C
J4-6	TC_2	Signal input from Temperature Sensor C
J4-7	TAMB_1	Bias output to Ambient Temperature Sensor
J4-8	TAMB_2	Signal input from Ambient Temperature Sensor

Table 6B. J4, Analog User I/O Connector (Medium Voltage Applications)

Pin #	Nomenclature	Description
J4-1	NC	Not Connected
J4-2	NC	Not Connected
J4-3	NC	Not Connected
J4-4	NC	Not Connected
J4-5	NC	Not Connected
J4-6	NC	Not Connected
J4-7	TAMB_1	Bias output to ambient temperature sensor
J4-8	TAMB_2	Signal input from ambient temperature sensor

Table 7. J4A, User I/O Connector (Medium Voltage Applications Only; Not Used For Low Voltage)

Pin #	Nomenclature	Description
J4A-1	NC	Not Connected
J4A-2	I24	Isolated 24 V output
J4A-3	I24	Isolated 24 V output
J4A-4	DO6N	Digital output #6 negative
J4A-5	DO5P	Digital output #5 positive
J4A-6	DO3P	Digital output #3 positive
J4A-7	DO1P	Digital output #1 positive
J4A-8	DI6P	Digital input #6 positive
J4A-9	DI4N	Digital input #4 negative
J4A-10	DI3P	Digital input #3 positive
J4A-11	DI1N	Digital input #1 negative
J4A-12	DI4P	Digital input #4 positive
J4A-13	DI1P	Digital input #1 positive
J4A-14	DI7N	Digital input #7 negative
J4A-15	DI8N	Digital input #8 negative
J4A-16	DO2N	Digital output #2 negative
J4A-17	DO4N	Digital output #4 negative
J4A-18	DO7N	Digital output #7 negative
J4A-19	DO8N	Digital output #8 negative
J4A-20	I24_RTN	Isolated 24 V return
J4A-21	I24_RTN	Isolated 24 V return
J4A-22	DO7P	Digital output #7 positive
J4A-23	DO6P	Digital output #6 positive
J4A-24	DO4P	Digital output #4 positive
J4A-25	DO1N	Digital output #1 negative
J4A-26	DI6N	Digital input #6 negative
J4A-27	DI5N	Digital input #5 negative
J4A-28	DI5P	Digital input #5 positive
J4A-29	DI3N	Digital input #3 negative
J4A-30	DI2P	Digital input #2 positive
J4A-31	DI2N	Digital input #2 negative
J4A-32	DI7P	Digital input #7 positive
J4A-33	DI8P	Digital input #8 positive
J4A-34	DO2P	Digital output #2 positive
J4A-35	DO3N	Digital output #3 negative
J4A-36	DO5N	Digital output #5 negative
J4A-37	DO8P	Digital output #8 positive

Table 8. J5, HFPA Board Interface Connector

Pin #	Nomenclature	Description
J5-1	VAC1	Positive side of the 17.7 V ac input line to the CABP board
J5-2	VAC2	Negative side of the 17.7 V ac input line to the CABP board

Table 9. J6, User I/O Connector (Signals Typically Greater Than 50 Volts)

Pin #	Nomenclature	Description
J6-1	CONT_A_NO	Normally open contact of the Main Contactor Pilot Relay
J6-2	SENSP	Positive terminal of the Feedback Sense Input
J6-3	SYS115	115 Volt Input Side of the System Fault String
J6-4	LCL_COM	Common Input Side of the Local Fault String
J6-5	CONT_A_NC	Normally closed contact of the Main Contactor Pilot Relay
J6-6	SENSN	Negative terminal of the Feedback Sense Input
J6-7	SYSCOM	Common Input side of the System Fault String
J6-8	SYS24	SYS24
J6-9	CONAB_C	Common Side of the NO and NC contacts of the Main Contactor Pilot Relay. This same terminal is used as the common side of the NO and NC contacts of the Charge Contactor Pilot Relay
J6-10	SSRP	Open collector output of the Solid State Relay Driver. The other side of the relay should be connected to the Isolated 24 Volts
J6-11	LCL24	24 Volt Input Side of the Local Fault String
J6-12	LCL115	115 Volt Input Side of the Local Fault String
J6-13	RLY1_NO	Normally Open terminal of Relay 1
J6-14	SSRN	Return side of the Solid State Relay Driver and is the I24_RTN
J6-15	I24	Isolated 24 Volt output
J6-16	I24_RTN	Isolated 24 Volt return
J6-17	RLY1_COM	Common side of the NO and NC contacts of Relay 1
J6-18	DIN2P	Positive side of the line for Digital Input 2
J6-19	DIN1N	Negative side of the line for Digital Input 1
J6-20	DIN1P	Positive side of the line for Digital Input 1
J6-21	RLY1_NC	Normally closed terminal of Relay 1
J6-22	DIN3P	Positive side of the line for Digital Input 3
J6-23	DIN3N	Negative side of the line for Digital Input 3
J6-24	DIN2N	Negative side of the line for Digital Input 2
J6-25	RLY2_NO	Normally Open terminal of Relay 2
J6-26	DIN4N	Negative side of the line for Digital Input 4

Table 9. J6, User I/O Connector (Signals Typically Greater Than 50 Volts) – Continued

Pin #	Nomenclature	Description
J6-27	DIN5P	Positive side of the line for Digital Input 5
J6-28	DIN4P	Positive side of the line for Digital Input 4
J6-29	RLY2_COM	Common side of the NO and NC contacts of Relay 2
J6-30	DIN5N	Negative side of the line for Digital Input 5
J6-31	DIN6P	Positive side of the line for Digital Input 6
J6-32	DIN6N	Negative side of the line for Digital Input 6
J6-33	RLY2_NC	Normally Closed terminal of Relay 2
J6-34	RLY3_NO	Normally Open terminal of Relay 3
J6-35	RLY3_COM	Common side of the NO and NC contacts of Relay 3
J6-36	RLY3_NC	Normally Closed terminal of Relay 3

Table 10. J7 Customer I/O Connector (Signals Typically Less Than 50 Volts)

Pin #	Nomenclature	Description
J7-1	NC	Not Connected
J7-2	NC	Not Connected
J7-3	POT_P	Positive power terminal to the Potentiometer
J7-4	AOUT1	Positive terminal of Analog Output #1
J7-5	AOUT2	Positive terminal of Analog Output #2
J7-6	NC	Not Connected
J7-7	AIN2P	Positive terminal of Analog Input #1
J7-8	AIN1P	Positive terminal of Analog Input #1
J7-9	NC	Not Connected
J7-10	DT_PSP	Positive of Digital Tach Power
J7-11	DT_M	Positive terminal of Digital Tach Marker Input
J7-12	DT_A	Positive terminal of Digital Tach A Input
J7-13	DT_B	Positive terminal of Digital Tach B Input
J7-14	NC	Not Connected
J7-15	POT_N	Negative power terminal to the Potentiometer
J7-16	ACOM	Negative terminal of Analog Output #2
J7-17	ACOM	Negative terminal of Analog Input #1
J7-18	NC	Not Connected
J7-19	AIN2N	Negative terminal of Analog Input #2
J7-20	AIN1N	Negative terminal of Analog Input #1

Table 10. J7 Customer I/O Connector (Signals Typically Less Than 50 Volts) – Continued

Pin #	Nomenclature	Description
J7-21	NC	Not Connected
J7-22	DT_PSN	Negative terminal of Digital Tach Power
J7-23	DT_MX	Negative terminal of Digital Tach Marker Input
J7-24	DT_AX	Negative terminal of Digital Tach A Input
J7-25	DT_BX	Negative terminal of Digital Tach B Input

Table 11. J8, Meter Connector

Pin #	Nomenclature	Description
J8-1	NC	Not Connected
J8-2	NC	Not Connected
J8-3	DCOM	Common connection for all four meters
J8-4	MTR4P	Positive terminal meter output #4
J8-5	MTR3P	Positive terminal meter output #3
J8-6	MTR2P	Positive terminal meter output #2
J8-7	MTR1P	Positive terminal meter output #1
J8-8	DCOM	Common connection for all four meters
J8-9	NC	Not Connected
J8-10	NC	Not Connected

Table 12. J9, Diagnostic/Configuration Tool Port

Pin #	Nomenclature	Description
J9-1	NC	Not Connected
J9-2	TX232	Transmit output from the assembly, Receive input to the tool
J9-3	RX232	Receive input to the assembly, Transmit input of the tool
J9-4	NC	Not Connected
J9-5	ICOM12	Common/Return of the Isolated power supply
J9-6	NC	Not Connected
J9-7	NC	Not Connected
J9-8	TXEN232	RTS of the assembly, CTS of the tool
J9-9	NC	Not Connected

Table 13. J10 Keypad Interface Connector

Pin #	Nomenclature	Description
J10-1	P18/24	Positive terminal of the power to the keypad
J10-2	KPTX232	Transmit output from the assembly, Receive input to the keypad
J10-3	KPRX232	Receive input to the assembly, Transmit input of the keypad
J10-4	DCOM	Power supply return
J10-5	DCOM	Power supply return
J10-6	DCOM	Power supply return
J10-7	P18/24	Positive terminal of the power to the keypad
J10-8	KPRTS232	RTS of the assembly, CTS of the keypad

Table 14. J11A, Local ISBus Interface Connector

Pin #	Nomenclature	Description
J11A-1	BTX_P	Positive terminal of ISBus Transmit
J11A-2	BTX_N	Negative terminal of ISBus Transmit
J11A-3	B_RXP	Positive terminal of ISBus Receive
J11A-4	Interlock	CABP board backplane connector between pins 4 and 5 (for continuity)
J11A-5	Interlock Return	CABP board backplane connector between pins 4 and 5 (for continuity)
J11A-6	B_RXN	Negative terminal of ISBus Receive
J11A-7	I24	24 V power supply to an ISBus Extender Board
J11A-8	I24 RTN	24 V power supply return to an ISBus Extender Board

Table 15. J11B, Local ISBus Interface Connector

Pin No.	Nomenclature	Description
J11B-1	NC	Not Connected
J11B-2	NC	Not Connected
J11B-3	BTX_P	Positive terminal of ISBus Transmit
J11B-4	NC	Not Connected
J11B-5	NC	Not Connected
J11B-6	BTX_N	Negative terminal of ISBus Transmit
J11B-7	NC	Not Connected
J11B-8	NC	Not Connected

Table 16. J12A, System ISBus Interface Connector

Pin #	Nomenclature	Description
J12A-1	ATX_P	Positive terminal of ISBus Transmit
J12A-2	ATX_N	Negative terminal of ISBus Transmit
J12A-3	A_RXP	Positive terminal of ISBus Receive
J12A-4	Interlock	CABP board backplane connector between pins 4 and 5 (for continuity)
J12A-5	Interlock Return	CABP board backplane connector between pins 4 and 5 (for continuity)
J12A-6	A_RXN	Negative terminal of ISBus Receive
J12A-7	I24	24 V power supply to an ISBus Extender Board
J12A-8	I24 RTN	24 V power supply return to an ISBus Extender Board

Table 17. J12B, System ISBus Interface Connector

Pin No.	Nomenclature	Description
J12B-1	NC	Not Connected
J12B-2	NC	Not Connected
J12B-3	ATX_P	Positive terminal of ISBus Transmit
J12B-4	NC	Not Connected
J12B-5	NC	Not Connected
J12B-6	ATX_N	Negative terminal of ISBus Transmit
J12B-7	NC	Not Connected
J12B-8	NC	Not Connected

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 CABP board is described as the Control Assembly Backplane Board.

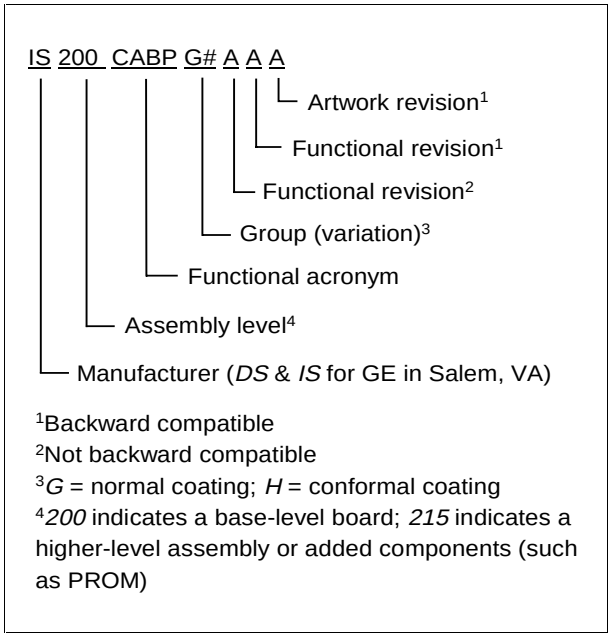

Figure 3. Board Part Number Conventions

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 also 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, and 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.

Replacing a CABP board requires removing the CABP board, and the Innovation Series board rack it is mounted to, from the control cabinet. The following paragraphs outline the complete procedure. Follow them in the sequence presented.

Remove All Boards From The Board Rack

1. Make sure that the drive where the CABP board to be replaced is located 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. Disconnect any connections from the individual boards mounted in the board rack. (Note/mark the locations of all connections to simplify reassembly.)
4. Loosen the screws at the top and bottom of each board, near the board ejector tabs. (The screws are captive in the board front and should not be removed.)
5. Unseat each board by raising its ejector tabs.
6. Using both hands, gently pull each board from its slot in the board rack.
   - Note the slot that the board was in to simplify reassembly.
   - Set each board aside in a safe location until reassembly.

Remove/Reinstall The Board Rack and Install New CABP Board

1. Disconnect all external interface connectors from J1 – J12 connectors from the CABP board. (Note/mark the locations of all connections to simplify reassembly.)
2. Disconnect the wiring from the cooling fan located at the bottom of the board rack (note orientation of wires to simplify reconnection).
3. Loosen and remove the four screws that secure the board rack with the CABP board to the control cabinet.
   - Support this assembly when removing the final screws to avoid having it fall.
4. Place the board rack face down on a clean flat surface to access the screws securing the CABP board to it.
5. Remove the 26 screws securing the CABP board to the board rack and remove the CABP board.
6. Orient the new (replacement) CABP board into the same position as the one removed and attach it to the board rack with the 26 screws removed in step 5 and fully tighten all screws

7. Place board rack with new CABP board into the control cabinet in the same position as when removed and remount it with the four screws removed in step 3.

8. Reconnect the wiring to the cooling fan that was disconnected in step 2.

9. Reconnect all external interface connections to the J1 – J12 connectors on the new CABP board that were disconnected in step 1.

Reinstall All Boards Into The Board Rack

1. Slide the board into the **correct slot** in the rack (see Figure 4).

CAUTION

Because boards are keyed for specific rack slots, inserting the 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.

4. Reconnect any electrical connections to the individual boards that were previously disconnected.

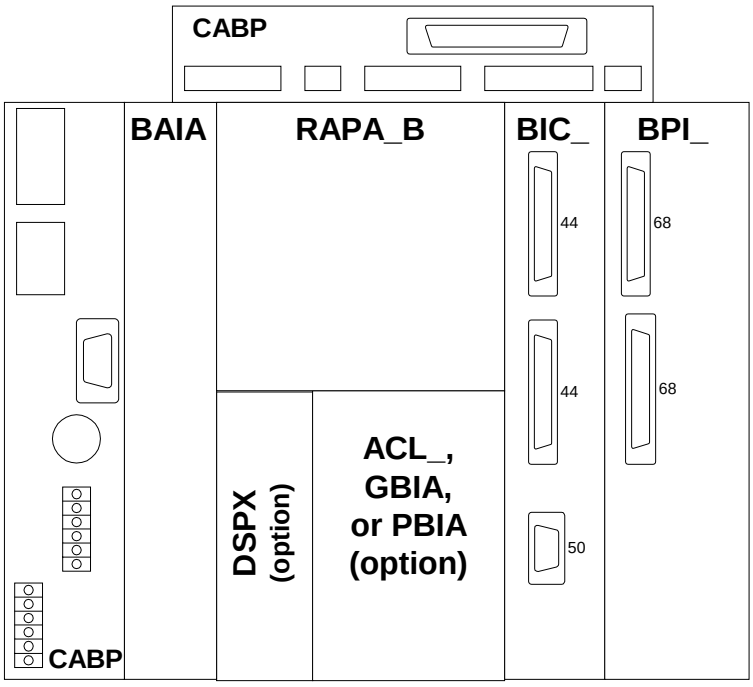

Figure 4. Board Locations

Notes:

GE Industrial Systems

Issue date: 1998-11-02

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