GE Industrial Systems

Auxiliary Genius Bus Interface Module IS215GBIAH_A_ _

Safety Symbol Legend

Warning

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

Caution

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

Note Indicates an essential or important procedure or statement.

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Functional Description

The IS215GBIA Auxiliary Genius Bus Interface Module (GBIA) models the Innovation Series™ drive as an I/O block on the Genius™ bus (see Figure 1), providing seamless integration between the drive and controller.

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

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

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Innovation Series is a trademark of General Electric Company, USA.

The GBIA module is made up of an IS200BLIG LAN Interface-Genius Board (BLIG) and an IC660ELB912 µGENI Network Interface Board (µGeni). The module connects to the IS200CABP Cable Assembly Backplane Board (CABP) in the drive board rack.

For more information on the µGeni board, refer to GE Fanuc publication GFK-0845.

The GBIA module interfaces to the drive through its backplane connector, P8. All power and digital I/O signals are routed through this connector. The µGeni board mounts to the BLIG board on four standoffs (to create the GBIA module) and communicates to it through connectors P1 and P2. All digital address, data, and control signals between the two boards are interfaced via P1. Power is supplied to the µGeni board through P2. The GBIA module interfaces to the Genius bus via a four-pin connector located on the module's faceplate. Two LED indicators on the module's faceplate provide visual indications of module and Genius communications status.

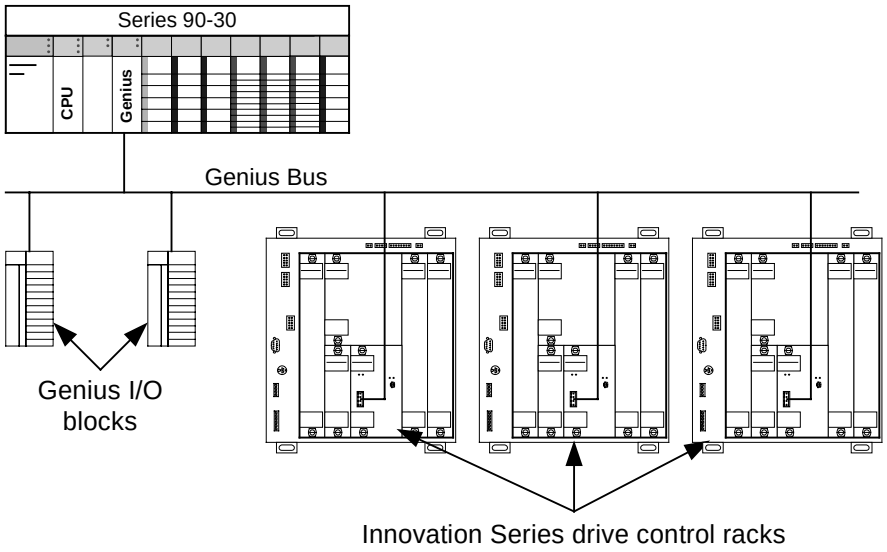


Figure 1. Genius Bus System

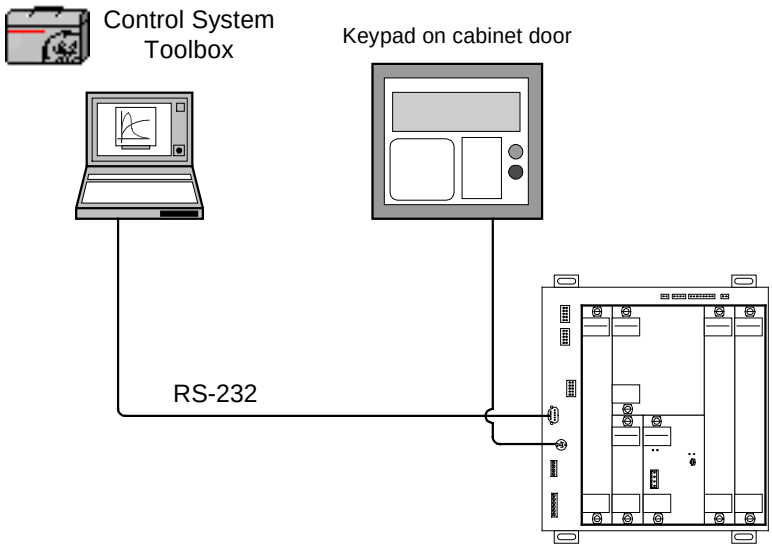


Figure 2. Configuration Devices

LED Indicators

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

When the module is functioning properly with no known faults, the green OK LED lights continuously. If there is a fault, this LED flashes a fault code (see Table 1). The green COMM OK LED provides Genius bus communications status information. This LED lights continuously when there are no known Genius I/O faults.

Genius Bus

Input/Output (I/O) applications of the Genius bus are typically configured with one controller, 1-30 I/O devices (Genius I/O blocks, Field Control I/O stations, drives, etc.), and one node reserved for the hand held monitor. The Genius bus operates asynchronously with the execution of control logic.

Genius Bus Connections

The GBIA module interfaces to the Genius bus via a four-pin connector labeled *GENIUS* on the faceplate.

There are two methods of physically connecting the module to the Genius bus:

- Bring the Genius bus directly to the GENIUS connector (TB1) on the faceplate of the module (see table below).
- Install an interposing terminal block on the DIN rail in the drive cabinet.

Note The GBIA module's faceplate screws must be tight because these tie the module to ground.

Pin No.	Label	Description
1	SHD OUT	Shield to ground
2	SHD IN	Shield to ground through a 0.1 µf capacitor
3	SER2	10 V differential signal on the Genius bus for data
4	SER1	10 V differential signal on the Genius bus for data

For more information and cable types, see GE Fanuc publication GEK-90486F-1 Genius I/O Systems and Communications User's Manual (Chapter 2, The Communications Bus).

The Genius bus must be terminated on each end by an impedance that is correct for the cable type used. The impedance will be 75, 100, 120, or 150 ohms. To terminate the end, connect the impedance (resistor) from SER1 to SER2.

➢ To connect Genius bus to GBIA module faceplate (see Figure 3)

From the previous device:

1. Connect Genius wire SER1 to SER1.
2. Connect Genius wire SER2 to SER2.
3. Connect Shield In to SHD IN.

To the next device:

4. Connect SHD OUT to Shield Out.
5. Connect SER1 of one device to SER1 of the next device.
6. Connect SER2 of one device to SER2 of the next device.

Connect so that one end of the shield is tied directly to ground and the other end is tied to ground through a capacitor.

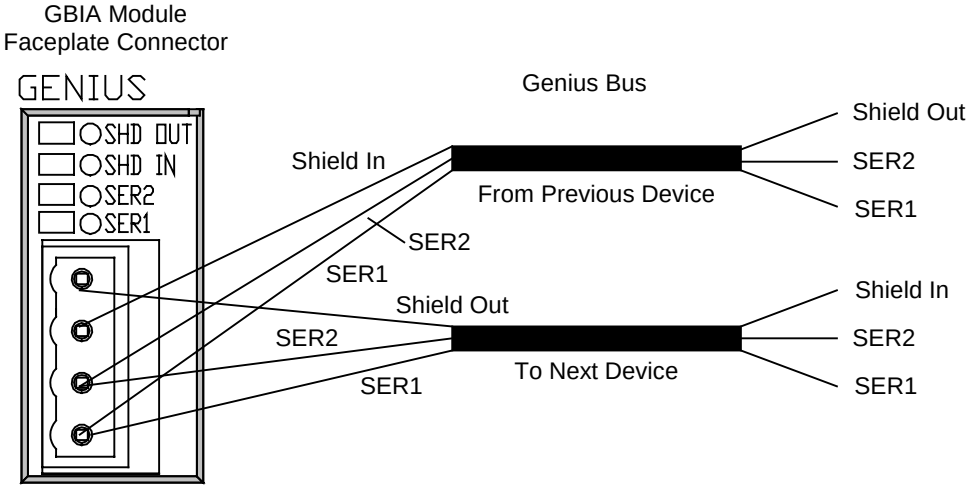


Figure 3. Direct Connection to Genius Bus

➢ To connect the Genius bus to a remote terminal strip (see Figure 4)

Terminal strip to next device:

1. Connect one shield to chassis.
2. Connect the other shield through a 0.1 microfarrad capacitor to chassis.

Terminal strip to GBIA module faceplate:

3. Run two twisted pairs to the GBIA module.
4. Tie the shield of wires A and B running to/from the GBIA module to the chassis at the terminal strip. (Leave the GBIA module end of the shield open.)

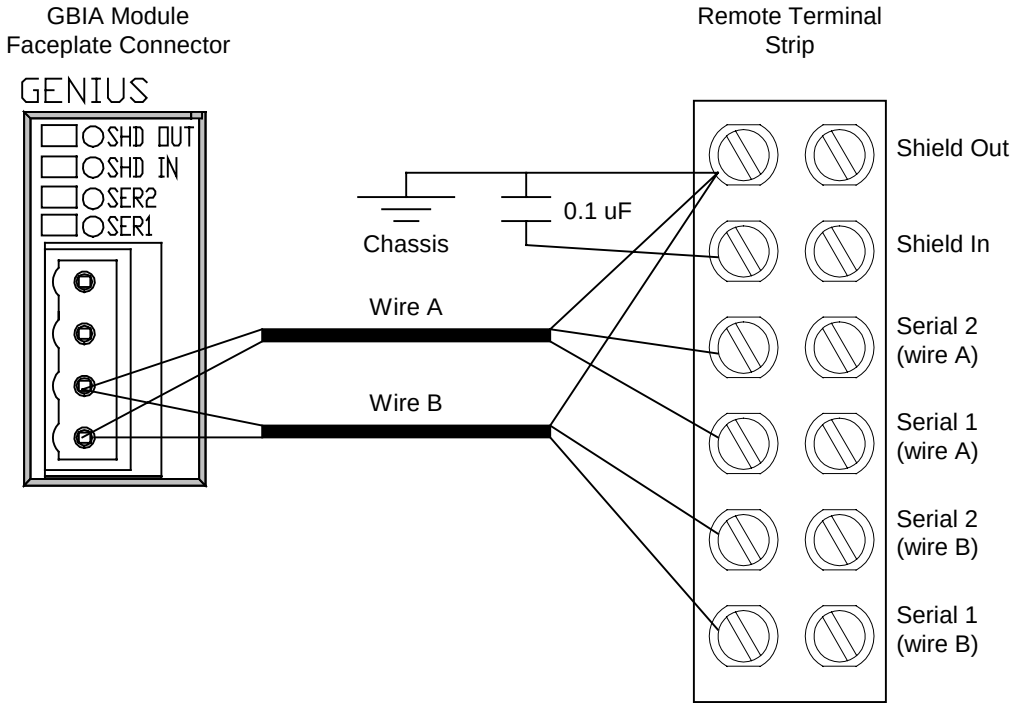


Figure 4. Remote Terminal Strip Genius Bus Connection

Genius Bus Performance

To specifically calculate the Genius bus sweep rate, refer to the Genius I/O Systems and Communications User Manaual (GEK-90486F-1). A detailed procedure is provided with equations.

On the Genius bus, the drive functions like a Genius I/O block. A controller sends control bits and setpoints to the drive on each bus scan using a directed message. The drive broadcasts its feedback bits and feedback variables back to the controller once per bus scan.

In controlling industrial processes, the frequency at which the drive and controller can exchange information is important. There are several factors that determine this performance over the Genius bus as shown in the following table:

Genius Bus Performance Factor	Description
Control logic sweep rate	Time required for a sweep of the control logic being executed in the controller (typically measured in milliseconds).
Configured baud rate of the bus	Baud rate of the bus is configurable as a parameter for each device.
Types of devices on the bus	The contribution of each device to the bus sweep rate varies with the quantity of I/O data being exchanged with the controller. Each drive contributes 4ms to the bus sweep time at a configured baud rate of 157K.
Quantity of devices on the bus	As the number of devices on the bus grows, so does the bus sweep rate.

Data Mapping

It is not possible to configure the drive through the Genius interface.

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

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

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

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

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

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

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

The **integer format** of the variable interface map consists of 17 words of reference and 17 words of feedback. The first two words of reference contain 32 bits, as do the first two words of feedback. The remaining 15 words of reference and of feedback contain signed integer variables.

The **floating point format** of the variable interface map consists of 16 references and 16 feedbacks. Each reference and feedback is a double word (4-byte) entity. The first double word of references contains 32 bits, as does the first double word of feedbacks. Each of the remaining 15 references and 15 feedbacks is in IEEE floating point format. Internally, the drive stores these floating point values in Little Endian (Intel) format. This format applies to each double word of the map, including the double word containing the bits.

Drive Parameters

Genius LAN parameters are located in the toolbox Outline View. Parameters can differ according to the product loaded.

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

The following parameters configure the application interface:

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

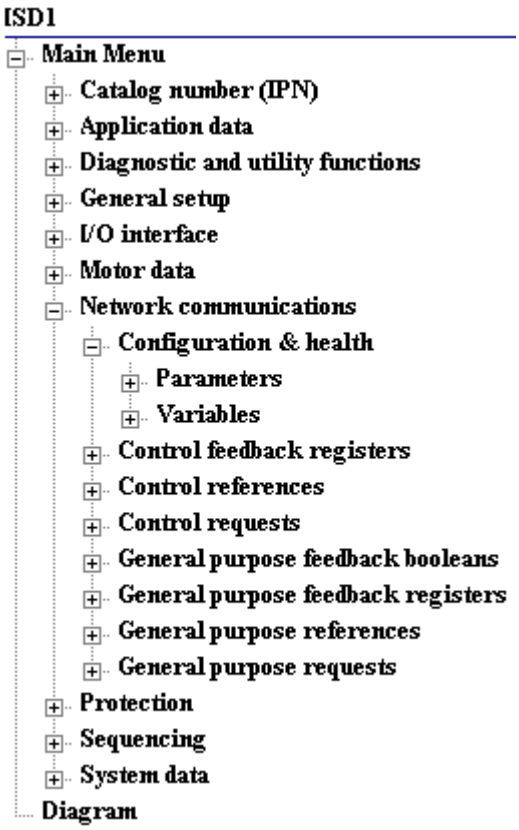
Additional LAN-specific parameters (LAN parameter 01 – 16) are required to configure direct LAN interfaces. These parameters are referred to as generic LAN parameters in the core drive product.

Set Parameters Using the Toolbox

➢ **To download and modify parameters**

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

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



5. Select and load the following parameters:
   - **LAN Board Options** – Set the value to 0
   - **Genius Device Number** – Enter the desired device number
   - **Genius Baud Rate** – Set the **Baud Rate Selection Number** for the desired baud rate. Baud Rate Selection Numbers are:
     0 = 153.6 Kb extended
     1 = 38.4 Kb standard
     2 = 76.8 Kb standard
     3 = 153.6 Kb standard
   - **Genius Refr Address** – Set the Genius Reference Address if required (see *Series Six Genius LAN* section)
6. From the **Device** menu, select **Reset to Drive** and then **Hard Reset**. This hard reset must be performed for the changes to take place.

Set Parameters Using the Drive Keypad

The Genius LAN parameters have both a generic/short name and a specific/long name.

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

➢ **To download and modify parameters (see Figure 5)**

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

1. Press the **Menu** key (in *Navigation* portion of the keypad) to display the **Main Menu**.
2. Press the **Down Arrow** key to highlight **Network Communications**, then press the **Enter** key to display the selections.
3. Verify that **Configuration & Health** is highlighted, then press the **Enter** key to display the selections.
4. Verify that **Parameters** is highlighted, then press the **Enter** key to display the selections.
5. Verify that **Network Interface** is highlighted, then press the **Enter** key to display the selections.
6. Press the **Down Arrow** key to highlight **DRIVENET**, then press the **Enter** key to enable the drive's interface to the GBIA module.
8. Press the **Down Arrow** key to highlight **LAN Parameter 1** or **LAN Network Enabled** and set its value to **1** to enable the GBIA module for Genius LAN operation.
9. Press the **Down Arrow** key to highlight **LAN Parameter 2** or **LAN Board Options** and set its value to **0**.

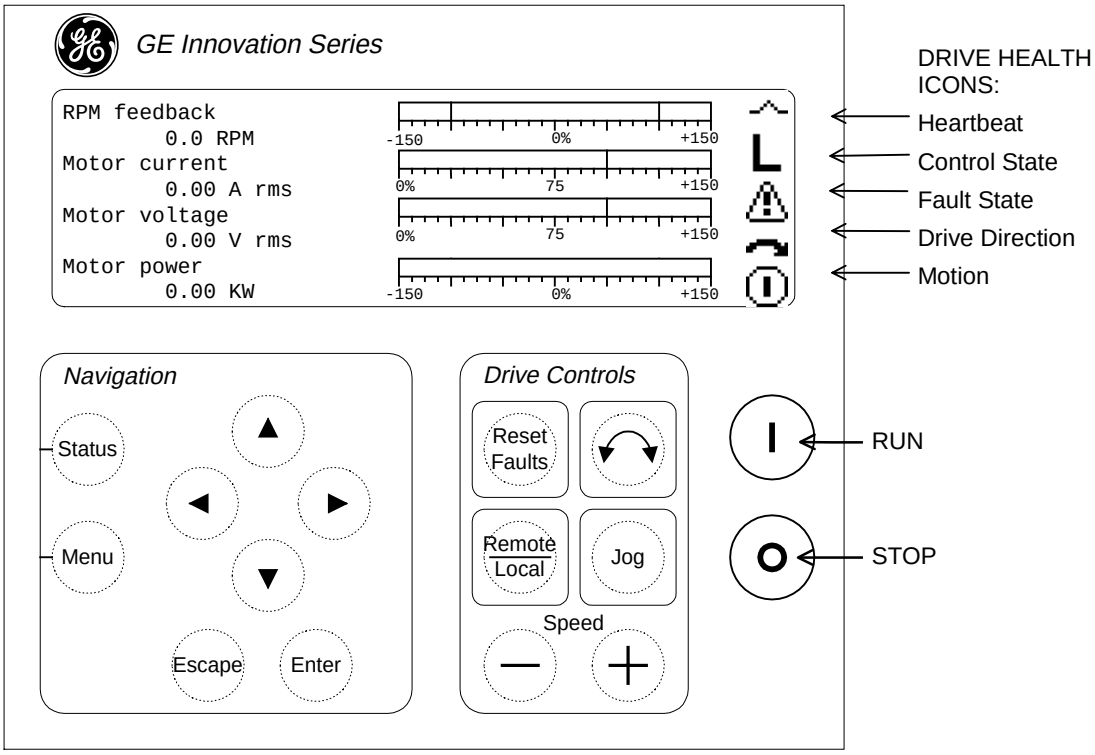


Figure 5. Example DDI (Keypad)

10. Press the **Down Arrow** key to highlight **LAN Parameter 3** or **Genius Device Number** and set its value to the desired device number.
11. Press the **Down Arrow** key to highlight **LAN Parameter 4** or **Genius Baud Rate** and set the **Baud Rate Selection Number** for the desired baud rate. Baud Rate Selection Numbers are:
    0 = 153.6 Kb extended
    1 = 38.4 Kb standard
    2 = 76.8 Kb standard
    3 = 153.6 Kb standard
12. Press the **Down Arrow** key to highlight **LAN Parameter 5** or **Genius Refr Address** and set the **Genius Reference Address** if required (see *Series Six Genius LAN* section).
13. Press the **Reset Faults** and **Stop** keys simultaneously to initiate a hard reset of the drive. This must be done for the changes to take effect.

Series Six Genius LAN

Certain older versions of the Series Six Genius LAN require the address of the Genius block (not the drop or block number). The drive must be coded with the Genius I/O address in order for the µGeni board to communicate on the Series Six Genius LAN. The parameter **Genius Refr Address** holds the address information for the Series Six Genius LAN. The Series Six interprets the information in this parameter as the address of the I/O to be populated and the type of I/O. The most significant bit determines if the I/O is loaded into parameter memory or the regular I/O table.

- If the most significant bit of Genius Refr Address is cleared (0), then the outputs of the drive are directed to the input table of the Genius controller. The beginning address is specified by the fifteen least significant bits of Genius Refr Address. The drive inputs come from the output table of the Genius controller beginning at the same address specified by the fifteen least significant bits of Genius Refr Address.
- If the most significant bit of Genius Refr Address is set (1), then the outputs from the drive are directed to the register table beginning at the address specified by the fifteen least significant bits of GREFRN. The drive inputs come from the information in the registers immediately following the output registers.

LAN Status and Faults

Two levels of validation are available to the drive:

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

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

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

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

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

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

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

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

The following signals determine LAN health and declare LAN faults:

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

The following faults are associated with the LAN interface:

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

Application Data

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

- Jumper JP1 is open and should not be inserted by the user.
- Testpoints TP1 and TP2 and connectors J1 and J2 (BLIG board) are for engineering test use only and not defined in this document.

The GBIA module has five plug connectors (BLIG board), one backplane connector (P8), and five LED indicators. See Figure 6 for a module faceplate diagram and Figure 7 for a BLIG board layout diagram that show the locations of these components. See Figure 8 for the location of the GBIA module in the board rack.

Note Two LED indicators are also present on the µGeni board. These LEDs are not visible when the GBIA module is mounted in the board rack and are not defined in this document. Connector P3 is not used and is not defined in this document.

Refer to the following tables for complete descriptions:

Table	Description
1	OK LED fault codes
2	TB1 Genius bus connector
3	P1 µGeni board interface connector
4	P2 µGeni board power supply connector
5	P8 GBIA module backplane connector

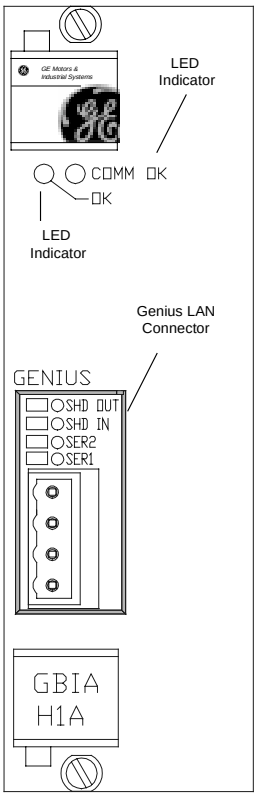


Figure 6. GBIA Module Faceplate

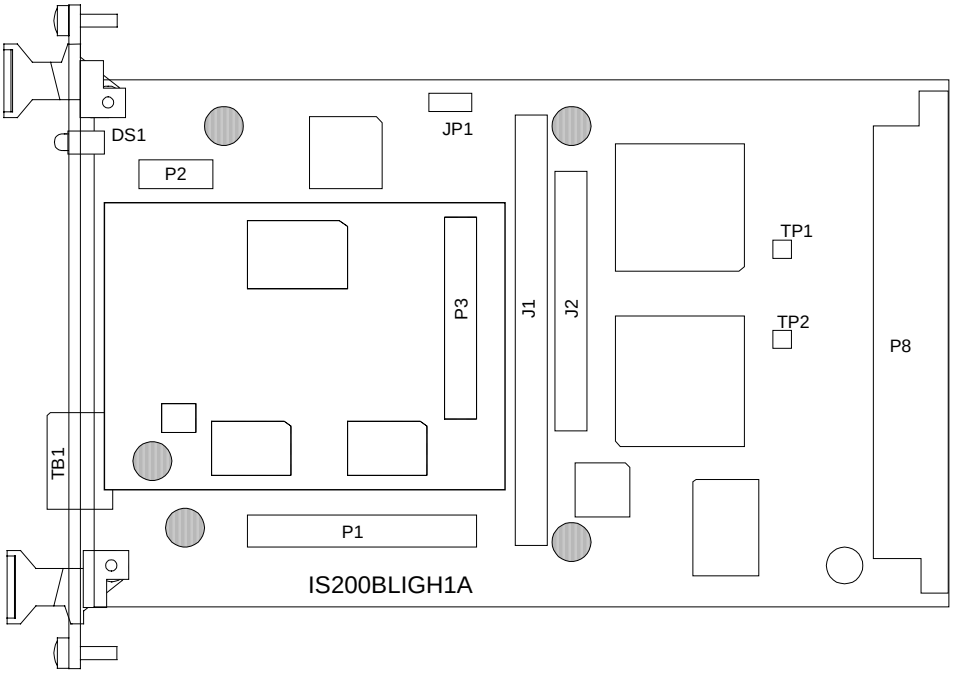


Figure 7. GBIA Module (BLIG Board) Layout Diagram

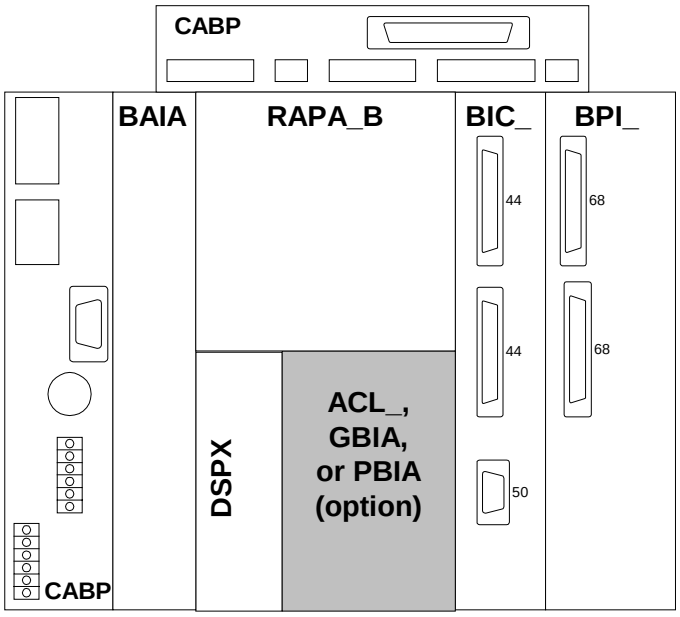


Figure 8. GBIA Module Location in the Board Rack

Table 1. OK LED Fault Codes for GBIA Module

Flashes	Fault No.	Fault Name	Description
1	1	FLT_BOOTCKSM	GBIA boot code failed the initialization checksum test.
2	2	FLT_FLSHCKSM	GBIA module needs a flash download because the flash checksum failed or a flash download header was received and now the GBIA module is ready for a flash download.
3	3	FLT_FLDNFAIL	Flash download to the GBIA module has failed.
4	4	FLT_FLDNGOOD	Flash download to the GBIA module is good and the GBIA now needs a hard reset (this is true after a flash download).
5	5	FLT_LINTNRAM	GBIA (internal to the processor) RAM failed the initialization testing.
6	6	FLT_LXTRNRAM	GBIA (external to the processor, internal to the board) RAM failed the initialization testing.
7	7	FLT_LINTTMRS	Internal GBIA processor timers failed the initialization testing.
8	8	FLT_LDPRTRAM	Dual port RAM memory failed the initialization testing.
9	9	FLT_LXC5202_	XC5202 (programmable gate array) serial download failed.
10	10	FLT_LSTCKOVR	GBIA stack has overflowed.
11	11	FLT_LDSPWD0G	DSPX board watchdog timer failed (DSPX did not update the watchdog timer within the specified time interval)
12	12	FLT_LCLNACTV	GBIA firmware active bit was mistakenly cleared. This bit should always be set while the GBIA is active (operational).
13	13	FLT_GENINIT	Genius initialization fault
14	14	FLT_GENIRTM	Genius run time fault
15	15	FLT_PROFINI	Profibus-DP initialization fault
16	16	FLT_PROFIRT	Profibus-DP run time fault

Table 2. Connector TB1, Genius Bus Connection to GBIA Module

Pin No.	Nomenclature	Description
1	SHD OUT	Shield to ground
2	SHD IN	Shield to ground through a 0.1 µf capacitor
3	SER2	10 V differential signal on the Genius bus for data
4	SER1	10 V differential signal on the Genius bus for data

Table 3. Connector P1, I/O Between the BLIG Board and µGeni Board

Pin No.	Nomenclature	Description
1	DCOM	Digital common ground
2	P5	+5 V dc
3	DCOM	Digital common ground
4	P5	+5 V dc
5 – 18	GA0 – GA13	Genius LAN address lines 0 – 13
19	P6 (7)	Genius LAN setup signals
20	P6 (6)	Genius LAN setup signals
21	P6 (5)	Genius LAN setup signals
22	P6 (4)	Genius LAN setup signals
23	P6 (3)	Genius LAN setup signals
24	P6 (2)	Genius LAN setup signals
25	P6 (1)	Genius LAN setup signals
26	P6 (0)	Genius LAN setup signals
27	N/C	Not Connected
28	0GRST	Genius reset line
29	0GENINT	Genius interrupt
30	0RD	Read line to Genius
31	0WRL	Genius LAN write strobe
32	0MCS1	Genius LAN board select
33	0GENRDY	Genius LAN ready signal
34	MONO	For factory use only
35 – 42	GD0 – GD7	Genius LAN data signals (D0 – D7)
43	0GIOK	Micro Genius board OK
44	0COMOK	Genius LAN communication OK
45 – 48	N/C	Not Connected
49	GEN1X2	Genius LAN connection
50	GEN1X1	Genius LAN connection

Table 4. Connector P2, Power Supply to µGeni Board

Pin No.	Nomenclature	Description
1, 3, 5, 7, 9	P5	+ 5 V dc (± 10%) power supply input to µGeni board
2, 4, 6, 8, 10	DCOM	Digital common

Table 5. P8 Backplane Connector, Row A

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

Table 5. P8 Backplane Connector, Row B – Continued

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

Table 5. P8 Backplane Connector, Row C – Continued

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

Table 5. P8 Backplane Connector, Row D – Continued

Pin No.	Nomenclature	Description
D1	P5	+5 V dc digital power source
D2	XD(3)	Transmit data, line 3
D3	XD(7)	Transmit data, line 7
D4	DCOM	+5 V dc digital power return (digital common)
D5	XD(11)	Transmit data, line 11
D6	XD(15)	Transmit data, line 15
D7	XD(19)	Transmit data, line 19
D8	XD(23)	Transmit data, line 23
D9	XD(27)	Transmit data, line 27
D10	XD(31)	Transmit data, line 31
D11	XA(3)	Transmit address, address 3
D12	DCOM	+5 V dc digital power return (digital common)
D13	XA(7)	Transmit address, address 7
D14	XA(11)	Transmit address, address 11
D15	0XWR	Dual port RAM write enable
D16	0XBUSY	Dual port RAM busy signal
D17, D18	N/C	Not Connected
D19	BRD_ID	Serial board identification signal
D20	DCOM	+5 V dc digital power return (digital common)
D21	N/C	Not Connected
D22	N15	–15 V dc
D23 – D27	N/C	Not Connected
D28	DCOM	+5 V dc digital power return (digital common)
D29 – D31	N/C	Not Connected
D32	P5	+5 V dc digital power source

Renewal/Warranty Replacement

How to Order a Board/Module

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

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

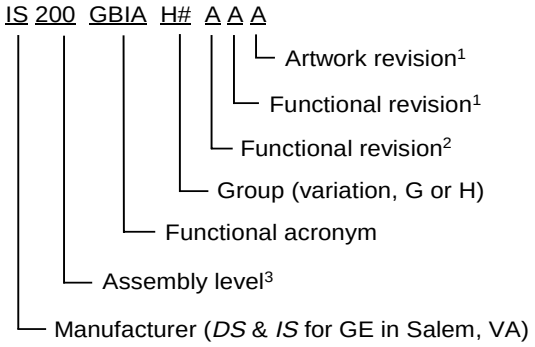
- How to accurately identify the part
- If the part is under warranty
- How to place the order

Board Identification

All digits are important when ordering or replacing any board.

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

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



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

Figure 9. 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
(Replace + with the international access code.)

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

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

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

Module, Motherboard, Daughterboard

The GBIA module consists of an IC660ELB912 µGENI Network Interface Board (µGeni) and the IS200BLIG BIC LAN Interface-Genius Board. To order a replacement module that includes the µGeni board, specify an **IS215GBIAH** module.

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

How to Replace the Board/Module

Handling Precautions

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

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

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

Replacement Procedures

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

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

➢ To remove the GBIA module from the board rack

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

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

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

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

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

Notes

GE Industrial Systems

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