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Control Station CE Iix QuickStart

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ControlStation CELLx Communication Module Quick Install Guide

PCIF I/O Adapter
BBSRAM Adapter
Profibus Adapter
DeviceNet Adapter

April 2002
GFK-1996A

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The following agency notices apply to the modules: PCIF I/O Adapter (IC752GEIU11), BBSRAM Adapter (IC752BBRU11), Profibus Adapter (IC752PBMU11). The Devicenet Adapter (IC752DNMU11) is not covered.

The covered modules have been tested and found to meet or exceed the requirements of U.S. (47 CFR 15), Canadian (ICES-003), Australian (AS/NZS 3548) and European (EN55022) regulations for Class A digital devices when installed in accordance with guidelines noted in this manual.

NOTE :

This equipment generates, uses and can radiate radio frequency energy and, if not installed in accordance with this instruction manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits of a Class A digital device pursuant to Part 15 of the FCC rules, which are designed to provide reasonable protection against harmful interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE :

This Class A digital apparatus complies with Canadian ICES-003.

The following statements are required to appear for Class 1, Div 2 Hazardous Locations.

1. EQUIPMENT LABELED WITH REFERENCE TO CLASS 1, GROUPS A, B, C, AND D, DIV 2 HAZARDOUS LOCATIONS IS SUITABLE FOR USE IN CLASS 1, DIVISION 2, GROUPS A, B, C, D, OR NON-HAZARDOUS LOCATIONS ONLY.

2. WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.

3. WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

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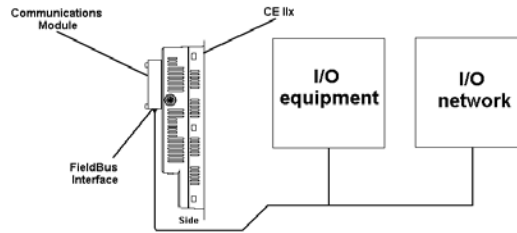
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Introduction

Congratulations on your purchase of a Communication Module for the ControlStation CE IIX.

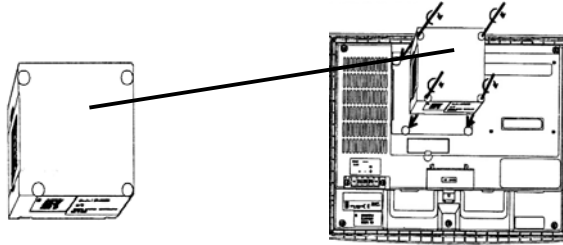
A Communication Module provides battery backed memory and an interface to an I/O network. The following adapters are available:

- BBSRAM (IC752BBRU11)
- Profibus + BBSRAM (IC752PBMU11)
- GE Fanuc 90-30 + BBSRAM (IC752GEIU11)
- DeviceNet + BBSRAM (IC752DNMU11)



Installing a Communication Module

Warning: Always use anti-static precautions when accessing the mating connector or the interior of the CE IIx.



1. Disconnect the power supply from your Power Input Terminal Block before connecting the Communication Module to the CE IIx.
2. Remove the protective plug from the mating connector on the back of the CE IIx. Only the left mating connector can be used.

3. Attach the Communication Module to the CE IIx by plugging the module into the mating connector on the back of the CE IIx.
4. Tighten the installation screws on the corners of the protective enclosure.

Connect your I/O network to external connections on the module enclosure (see applicable sections for details).

Maintenance

To ensure your safety and enhance the performance and durability of your Communication Module, ensure that the following precautions are taken:

- Do not install or store the unit in dusty environments or expose to direct sunlight.
- Excessive vibrations or sudden shocks may damage the unit. Do not install the unit where it may be subjected to excessive vibrations or shocks.
- Do not install the unit near high temperature equipment, where the temperature exceeds its specified range, or in areas where dramatic changes in temperatures occur.
- To avoid dangerous shock, short circuit or malfunction of the unit, do not allow water, liquids or metal particles to enter the unit.

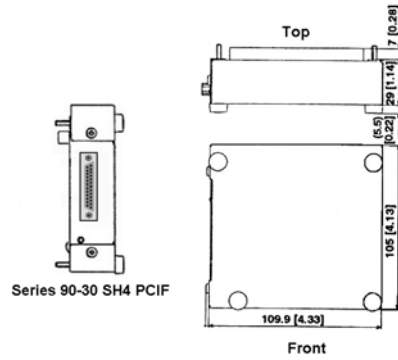
- To clean the unit, use a soft cloth moistened with a gentle cleansing solution. Do not use abrasive or toxic cleansers as these may damage the unit's surface.
- Ensure that the power supply to the CE IIx is fully disconnected prior to installation of the Communication Module to avoid harmful damage to the unit or dangerous shock hazards.
- To prevent injury or damage, design your system so that machinery will not malfunction due to a communication fault between the unit and other devices.

Warning: Other than changing the battery (see *Replacing a Worn Battery.*), there are no user serviceable parts inside. To avoid dangerous shock hazards, leave servicing to a certified GE Fanuc repair agent only. Visit the GE Fanuc website (www.gefanuc.ge.com), or call toll free 1-800-GEFANUC for information on an authorized GE Fanuc retailer in your area.

PCIF I/O Adapter

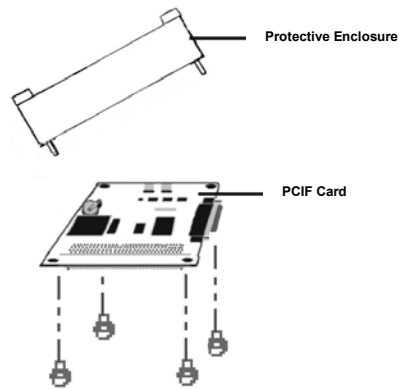
The GE Fanuc Series 90-30 CE IIx PCIF I/O (IC752GEIU11) provides a network interface to GE Fanuc Series 90-30 expansion racks and battery backed memory. Only one PCIF adapter can be installed on a CE IIx target.

Protective enclosure



Accessing the PCIF Card

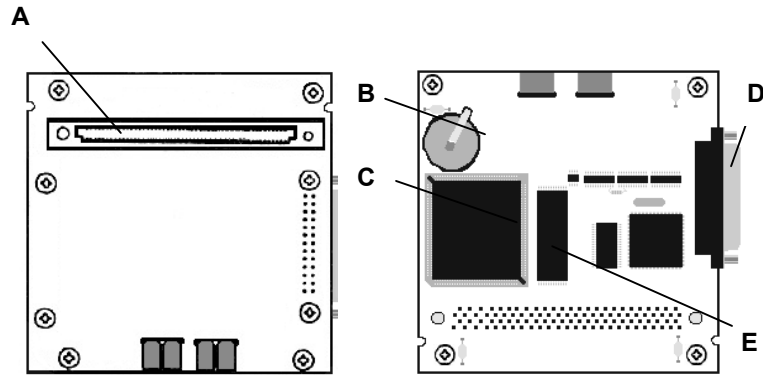
Four screws fasten the card to the protective enclosure.



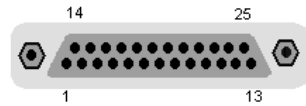
Note: The card is assembled at the factory. Changing a worn battery is the only reason you would have to access the interior of the module (see *Replacing a Worn Battery*).

Series 90-30 PCIF Components

The following diagrams illustrate the placement of major components on the PCIF card.



-
- A. **Mating connector:** Connects the Communication Module to the ControlStation CE IIx expansion bus.
 - B. **Battery clip:** The casing that holds the battery for the SRAM. For information on changing worn batteries (see *Replacing a Worn Battery*)
 - C. **FPGA:** Logic chip.
 - D. **25-pin connector:** Connection point of the PCIF card and a Series 90-30 I/O Expansion.
 - E. **SRAM chip:** 128k SRAM.

9030 Remote I/O Connector

Pin #	Signal	Direction
1	SHLD	N/A
2	DFRAME +	Output
3	DFRAME -	Output
7	GND	N/A
8	RUN +	Output
9	RUN -	Output
12	PERR +	Input
13	PERR -	Input
16	DATA +	Input/Output
17	DATA -	Input/Output
20	RSEL +	Output
21	RSEL -	Output
24	IOCLK+	Output
25	IOCLK-	Output

Interconnecting Cable

The cable used should feature seven twisted pairs, with an overall shield and drain wire (Belden 8107 or equivalent). The final rack on the I/O Bus should be terminated with an I/O Bus terminator plug, catalog number IC693ACC307.

Interconnecting cables may be standard length GE Fanuc expansion cables, or custom length cables.

• Part Number	• Cable Type
• IC693CBL300	• 1 meter "Wye" cable
• IC693CBL301	• 2 meter "Wye" cable
• IC693CBL302	• 15 meter "point to point" cable

Design Specifications**Network:**

Cable	See <i>Interconnecting Cable</i> page 16
Protocol	90-30 Backplane
Fanout	Seven rack daisy chain
Data Rate	125 KHz/MHz depending on rack type
Termination	EXP BUS TER PLUG IC693ACC307A

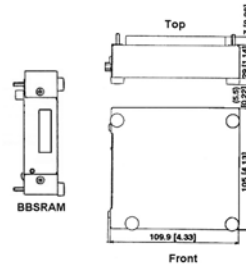
Environmental:

Storage Temperature	-20° to 70°C
Operating Temperature	0° to 55°C
Operating Humidity	5 to 90% (non-condensing)

BBSRAM Adapter

Protective Enclosure

The GE Fanuc Battery Backed Static Random Access Memory adapter (BBSRAM, IC752BBRU11) is an expansion module for the ControlStation/ViewStation CE IIx.

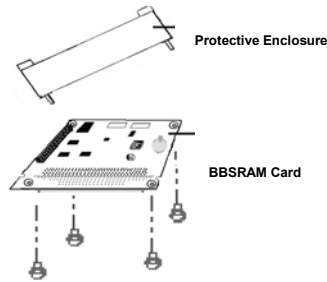


A metal housing attaches to the CE IIx and protects the card (see *Installing a Communication Module*).

Accessing the BBSRAM Card

Warning: Disconnect the power supply from your Power Input Terminal Block before attempting to disassemble it. Always use anti-static precautions before accessing internal components.

Four screws fasten the card to the protective enclosure.

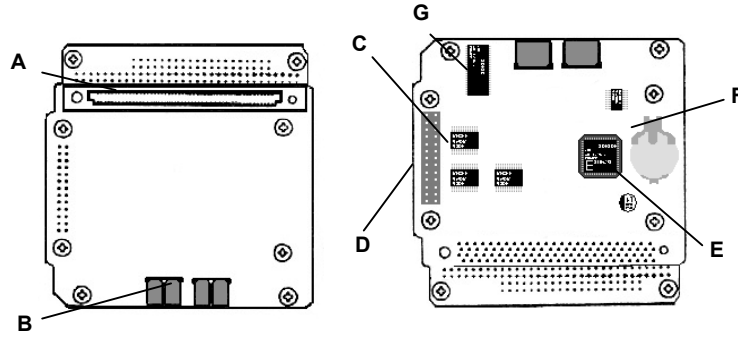


Note: The card is assembled at the factory. Changing a worn battery is the only reason you would have to access the interior of the module (see *Replacing a Worn Battery*).

BBSRAM Components

As the ControlStation CE IIx does not have built-in battery backed SRAM, BBSRAM is available as a source of non-volatile memory.

The following diagrams illustrate the placement of major components on the BBSRAM card.



Backed by an on-board battery, BBSRAM prevents your retentive variables from losing content over a cycle in the event of a power failure.

- A. **Mating connector:** Connection point of the Communication Module and the ControlStation CE IIx expansion bus.
- B. **Contact ground:** Acts as a ground for the SRAM expansion module. After installing the unit, the contact ground connects with the CE IIx.
- C. **SRAM chips:** 128k SRAM.
- D. **FieldBus connector:** Connection point of the BBSRAM card and an optional FieldBus card.
- E. **BBSRAM control logic device:** Controls the signal on the BBSRAM card.
- F. **Battery clip:** The casing that holds the battery for the SRAM. (For information on changing worn batteries, see *Replacing a Worn Battery*).
- G. **Decoder chip.**

Replacing a Worn Battery.

Warning: Always use anti-static precautions before changing a battery on the BBSRAM card.

1. Disconnect the power supply from your Power Input Terminal Block before attempting to change a battery.
2. Apply upward pressure to the base of the battery in the battery clip. The battery pops out of the battery clip.
3. With the positive (+) side facing up, insert one edge of a fresh battery under the three pronged side of the battery clip then press down on the opposite side of the battery until it snaps into place.



Notes: Replace the worn battery with a *Panasonic BR2032 3v or equivalent*.

Battery life at nominal operating temperature is approximately five years.

Caution: To avoid damage to the battery clip, do not force the battery out if it is stuck. Take the unit to an authorized GE Fanuc repair facility for servicing.

Design Specifications

General:

Battery	Panasonic BR20323V or equivalent
----------------	----------------------------------

Environmental:

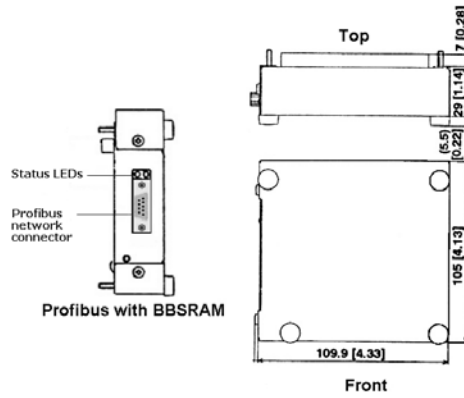
Storage Temperature	-20° to 70°C
Operating Temperature	0° to 55°C
Operating Humidity	5 to 90% (non-condensing)

Profibus Adapter

The Profibus adapter provides a network master and BBSRAM.

Protective Enclosure

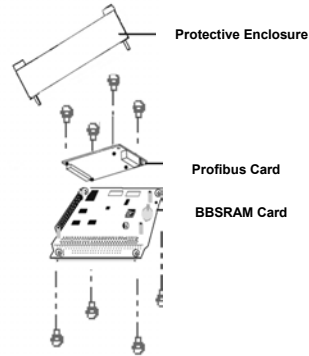
This model of the Communication Module contains a Profibus card (IC752PBMU11) designed to connect the CE IIX to a Profibus network.



A metal housing attaches to the CE IIx and protects the card (see *Installing a Communication Module*).

Accessing the Profibus Card

Four screws fasten the Profibus card to the BBSRAM card. Four additional screws fasten the BBSRAM/ Profibus combination to the protective enclosure.

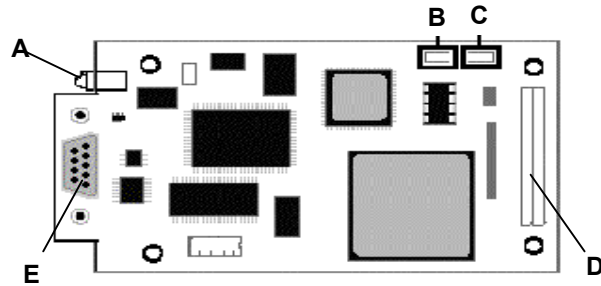


Note: The card is assembled at the factory. Changing a worn battery is the only reason you would have to access the interior of the module (see *Replacing a Worn Battery*).

Profibus Card Components

The Profibus card is the active component of the Communication Module and acts as a master on the Profibus network.

The following diagram illustrates the placement of major components on the Profibus card.

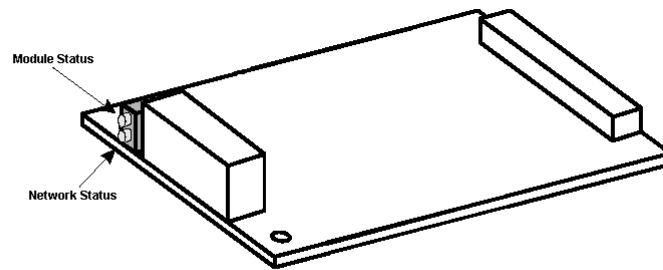


The Profibus card is an optional expansion that attaches to the BBSRAM card. You must have a BBSRAM to support a Profibus card.

- A. **Status LEDs:** Indicates the status of the module (see *Status LEDs*).
- B. **BA1:** Module address jumper. Jumper BA1 selects the board address of the FieldBus interface (see *Board Address Jumpers*).
- C. **BA2:** Module address jumper. Jumper BA2 selects the board address of the FieldBus interface (see *Board Address Jumpers*).
- D. **FieldBus Host Connector:** Connects to the BBSRAM (see *FieldBus Host Connector*).
- E. **Profibus Network Connector:** 9-pin network interface connection (see *Profibus Network Connector*).

Status LEDs

The Profibus FieldBus card is equipped with two LEDs including the Module Status LED and the Network Status LED as described in the tables on the following pages.



Module Status LED

LED Status	Description
Off	Interface closed.
Solid Red	Interface opened, at least one slave device is faulted.
Amber	Interface opened, Data Exchange – clear mode.
Solid Green	Interface opened Data Exchange mode. No slave device errors.

Network Status LED

LED Status	Description
Off	Offline.
Solid red	Online, bus error (baud rate, or wiring problems).
Solid green	Online, no physical layer or data link errors.

Module Address Jumpers

The configuration settings of the Module Address Jumpers are illustrated in the following table.

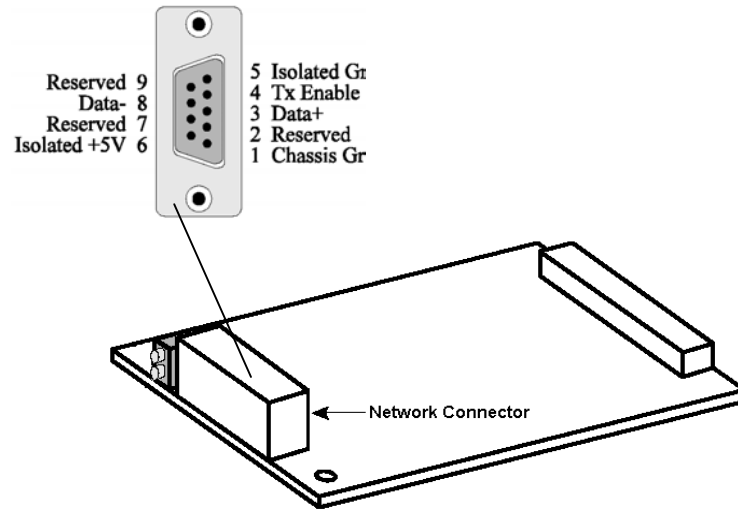
Caution: Contact your local GE Fanuc distributor for information about changing the default setting. Do not alter the default settings yourself as your system will malfunction.

BA1	BA2	I/O Address
On	On	Module Address 3 (Default as shipped)
On	Off	Module Address 2
Off	On	Module Address 1
Off	Off	Module Address 0

Note: The default address is pre-configured in the factory for ControlStation (CE IIx application of CIMPLICITY Machine Edition projects).

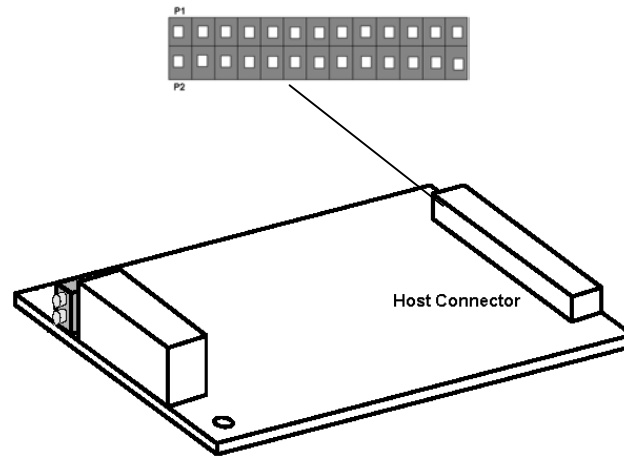
Profibus Network Connector

The Profibus FieldBus card has a DB9 socket connection.
The pinout is as follows:



FieldBus Host Connector

A FieldBus card attaches to a BBSRAM card via a 26-pin mating connector (see *BBSRAM Components*).



Design Specifications**Network:**

Cable	Profibus Compatible
Isolation	1000 VAC RMS for 1 sec
Protocol	Profibus DP, FDL
Data Rate	All baud rates from 9600 bps to 12 Mbps with auto baud rate detection
Termination	External termination required at the end of the network cable.

Environmental:

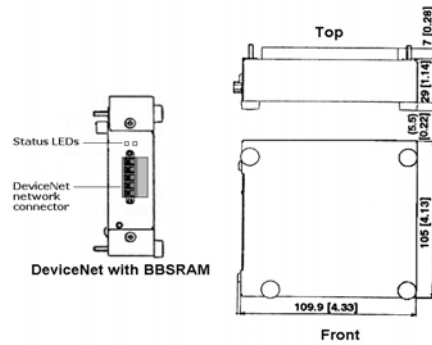
Storage Temperature	-20° to 70°C
Operating Temperature	0° to 55°C
Operating Humidity	5 to 90% (non-condensing)

DeviceNet Adapter

The DeviceNet adapter provides a network master and BBSRAM.

Protective Enclosure

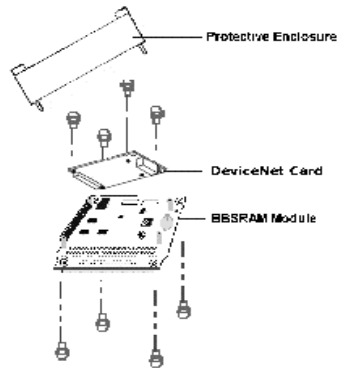
This model of the Communication Module contains a DeviceNet card designed to connect the CE IIx to a DeviceNet network.



A metal housing attaches to the CE IIX and protects the card (see *Installing a Communication Module*).

Accessing the DeviceNet Card

Four screws fasten the DeviceNet card to the BBSRAM card. Four additional screws fasten the BBSRAM/DeviceNet combination to the protective enclosure.

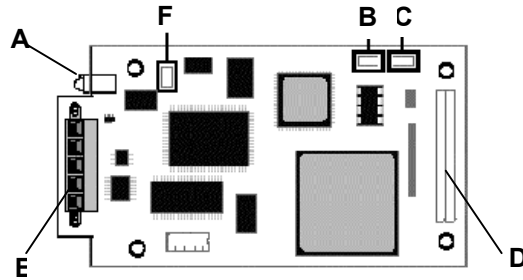


Note: The card is assembled at the factory. Changing a worn battery is the only reason you would have to access the interior of the module (see *Replacing a Worn Battery*).

DeviceNet Card Components

The DeviceNet card is the active component of the Communication Module and acts as a master on the DeviceNet network.

The following diagram illustrates the placement of major components on the DeviceNet card.

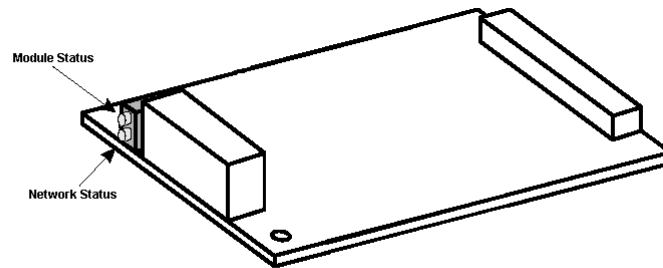


The DeviceNet card is an optional expansion card that attaches to the BBSRAM card. You must have a BBSRAM card to support a DeviceNet expansion card.

- A. **Status LEDs:** Indicates the status of the module (see *Status LEDs*).
- B. **BA1:** Module address jumper. Jumper BA1 selects the board address of the FieldBus interface (see *Board Address Jumpers*).
- C. **BA2:** Module address jumper. Jumper BA2 selects the board address of the FieldBus interface (see *Board Address Jumpers*).
- D. **FieldBus Host Connector:** Connects to the BBSRAM (see *FieldBus Host Connector*).
- E. **DeviceNet Network Connector:** 5-pin network interface connection (*DeviceNet Network Connector*).
- F. **Network Power Jumper** Selects the source of the power used for the optically isolated section of the network interface (see *Network Power Jumpers*).

Status LEDs

The DeviceNet FieldBus card is equipped with two LEDs including the Module Status LED and the Network Status LED as described in the tables on the following pages.



Module Status LED

LED Status	Description
Off	No power, or hard / soft reset asserted.
Flashing Red	Recoverable configuration fault. (Invalid firmware, OEM date or personality data.)
Solid Red	Hardware error or fatal runtime error.
Flashing Green	No errors, data exchange interface is not open.
Solid Green	No errors, data exchange interface is open.
Amber (Red/Green)	Configuration mode.

Network Status LED

LED Status	Description
Off	Network interface offline. No network power.
Flashing Red	I/O connection(s) in timed-out state or other recoverable fault.
Flashing Green	Device is online, but has no connections.
Solid red	Unrecoverable fault.
Solid green	Online with established connections.

Module Address Jumpers

The configuration settings of the Module Address Jumpers are illustrated in the following table.

Caution: Contact your local GE Fanuc distributor for information about changing the default setting. Do not alter the default settings yourself, as your system will malfunction.

BA1	BA2	I/O Address
On	On	Module Address 3 (Default as shipped)
On	Off	Module Address 2
Off	On	Module Address 1
Off	Off	Module Address 0

Note: The default address is pre-configured in the factory for ControlStation CE Iix application of CIMPLICITY Machine Edition projects.

Network Power Jumpers

The configuration settings of the Network Power Jumpers are illustrated in the following table.

Caution: Contact your local GE Fanuc distributor for information about changing the default setting. Do not alter the default settings yourself, as your system will malfunction.

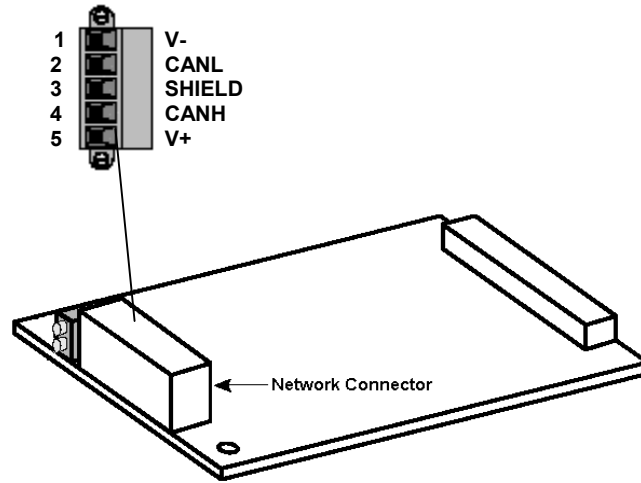
Position	Power Source
1-2	External (5-wire, powered CAN networks).
2-3	Internal (3-wire, non-powered CAN networks).

Notes:

- This jumper must always be installed in the 1-2 position for proper operation with DeviceNet networks.
- The default position is pre-configured in the factory for ControlStation CE Iix application of CIMPLICITY Machine Edition projects.

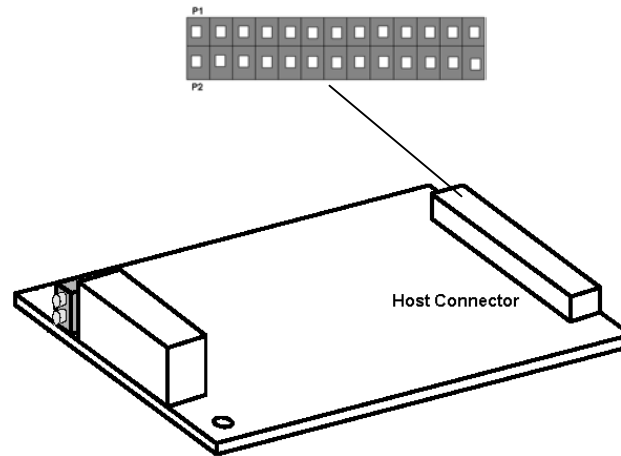
DeviceNet Network Connector

The DeviceNet FieldBus card has a DB5 socket connection.
The pinout is as follows:



FieldBus Host Connector

A FieldBus card attaches to a BBSRAM card via a 26-pin mating connector (see *BBSRAM Components*).



Design Specifications**Network:**

Cable	DeviceNet trunk or drop.
Isolation	1000 VAC RMS for 1 second.
Protocol	ISO 11898 physical layer compatible with DeviceNet and other CAN-based protocols.
Data Rate	Supports operation at 125, 250 & 500 Kbaud.
Supported Connection Types	Strobe I/O, Poll I/O, Cyclic I/O, Change-of-State (COS) I/O.
Messaging Type	Explicit.
Termination	External termination required at the end of the network cable.

Environmental:

Storage Temperature	-20° to 70°C
Operating Temperature	0° to 55°C
Operating Humidity	5 to 90% (non-condensing)

Troubleshooting

The following section outlines a number of malfunctions that may occur with your Communication Module and possible solutions to these problems.

Problem: There is no power to the Communication Module.

Solution: Is the mating connector on the CE IIx box properly connected to the connection on the Communication Module?

Problem: The unit does not fit in the protective enclosure.

Solution: Is anything inside the protective enclosure other than the expansion cards?

Problem: A Retentive Data Fault appears on the CE IIx screen.

- Solution:**
1. Is the CE IIx configured properly?
 2. Is the CE IIx powered up?
 3. Are the cards properly connected?
 4. Is the FieldBus card connected properly?
 5. Is there dirt or other debris blocking the mating connection on the FieldBus card?
 6. Is the contact ground on the back of the Communication Module connecting with the metallic tags on the CE IIx?

Problem:	The component(s) rattle inside the protective enclosure.
Solution:	Are the screws connecting the cards to the enclosure firmly tightened?

Problem:	BBSRAM memory fails after power outage.
Solution:	Replace the battery on the BBSRAM or PCIF card. If SRAM still malfunctions with a fresh battery, take the unit to a certified GE Fanuc repair outlet for servicing.

Profibus and DeviceNet only

Problem: The status LEDs are not illuminating on the Master scanner.

Solution: Is the FieldBus card connected to the BBSRAM card?

Problem: The FieldBus card does not recognize the connection.

Solution: 1. Is the FieldBus connection properly configured?

2. Are the address jumpers on the FieldBus card properly configured for your application.

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