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ControlStation CE Module Installation Manual

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## *Open Automation Solutions*

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# **CONTROLSTATION CE**

*GE Fanuc Series 90-30: PC752GEI104 (for 6" and 10.5" Units)*

*DeviceNet Master: PC752DVM104 (for 6" and 10.5" Units)*

*Profibus Master: PC752PBM604 (for 6" Unit)*

*PC752PBM104 (for 10.5" Unit)*

*Quick Install Guide*

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# Installing Interface Modules

## ControlStation CE

ControlStation CE™ is a diskless industrial computer that delivers Windows CE to the factory floor. The ControlStation CE is the ideal platform for executing and supporting end user developed programs using FrameworkX software. With a bright color flat panel display, real-time I/O capability, and a touch screen interface, ControlStation CE is the tie that binds MES and ERP systems to operating personnel and machinery.

System expansion is offered with a PC/104 port. Special devices and system expansion can be selected from an ever increasing library of PC/104 cards.

## Unit Identification

### Part Nos.

**PC752PBM604** Scanner module, Profibus Master, for 6" Unit ONLY.

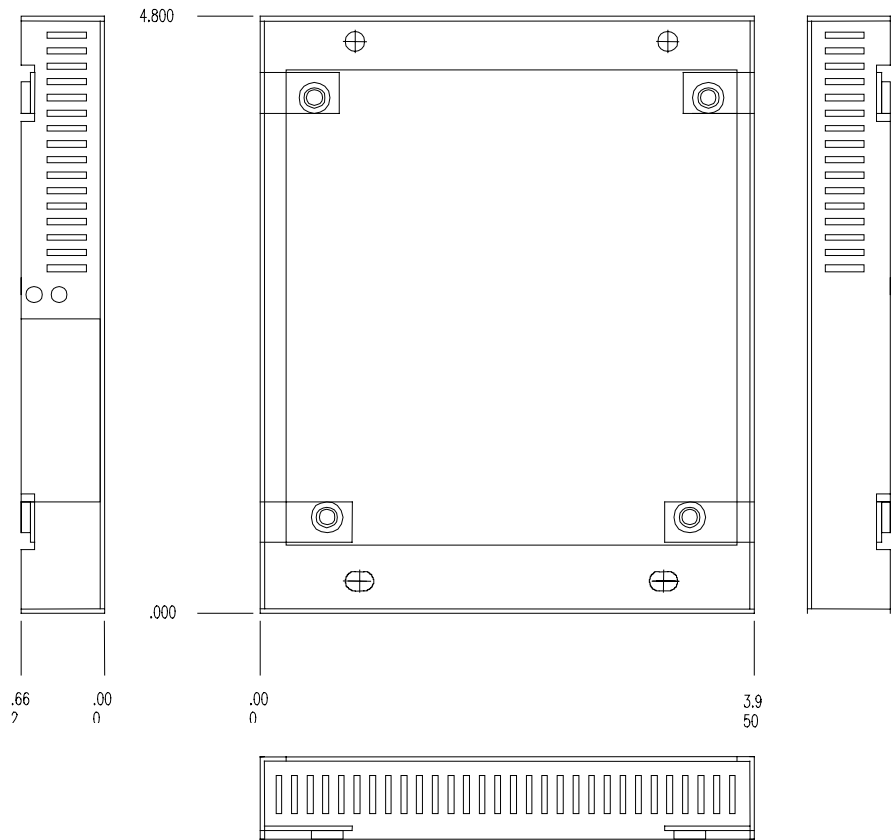
**PC752DVM104** Scanner module, DeviceNet Master for 6" and 10.5" Units.

**PC752PBM104** Scanner module, Profibus Master, for 10.5" Unit ONLY.

**PC752GEI104** Scanner module, GE Fanuc Series 90-30, for 6" and 10.5" units

## Module Dimensions

All of the modules have the same basic dimensions and style. A sample module chassis is shown below. The module is the same for 6" displays and 10.5" displays.



## Module Kits

Kits are made up of circuit boards, a metal chassis, standoff spacers, Metric and US size screws and multiple adapter pieces.

The kit contains parts required for installing modules on ControlStation CE 6" and 10.5" displays.

The main module assembly consists of the printed circuit board mounted in a metal chassis. The module contains a PC104 connector for mating with the connector on the ControlStation CE display unit.

The kit contains standoff spacers with both Metric and US threads. The Metric standoffs are for 10.5" displays, and the other standoffs with 6-32 threads are for the 6" display.

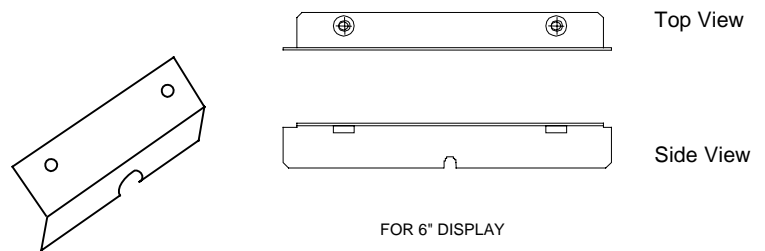
There are also two brackets, one specifically designed for the 6" and the other for the 10.5" display.

The installation section will illustrate each kit component and guide you to the proper component selection for each display type.

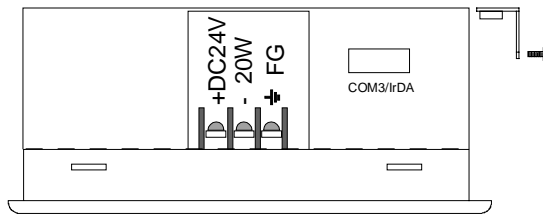
## Modules on a 6" Display

Each module is supplied in kit form, so you must assemble the component parts to the main unit.

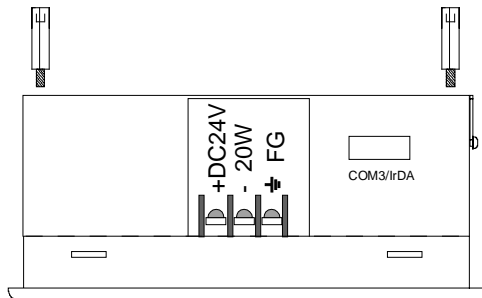
1. Remove the screws from the rear cover. Keep the screws handy as they will be used in subsequent assembly steps.
2. Locate the angle bracket (shown below).



3. Attach the angle bracket to the side of the main unit with a single screw.



4. Locate the threaded standoffs.  
Install two (6-32 thread) in the angle bracket and two (6-32 thread) in the main unit, utilizing the two holes from the previously removed cover.



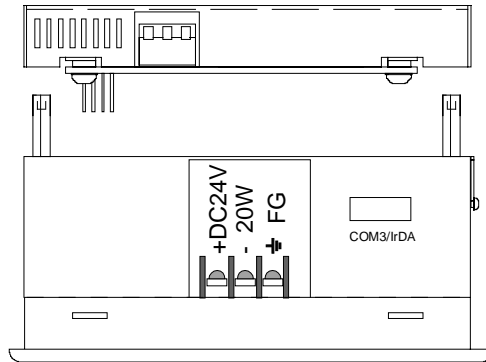
**For the Profibus Module:**

The Profibus Module requires an additional Power Supply Module when used with 6" display units.

For details on the Power Supply refer to the Power Supply Specifications in the next section.

Install the Power Supply Module before installing the Profibus Module. This arrangement provides for easier power cable connections and better access to the Profibus connector.

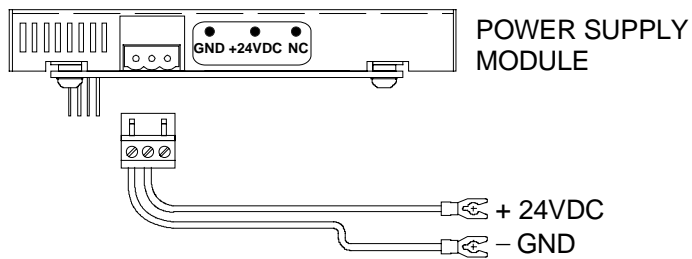
Align the PC104 pins on the Power Supply Module with the mating connector on the main unit. Insert the module into the main unit.



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**WARNING:** Use caution when connecting the Power Supply Module to the 6" display. Make sure the 24VDC and GND terminals are properly connected or you may cause damage to the modules.

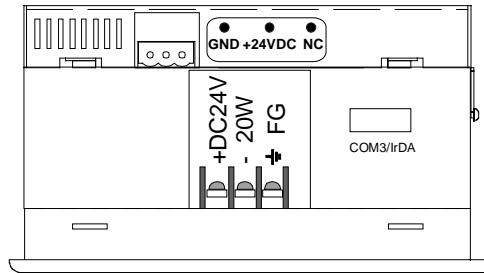
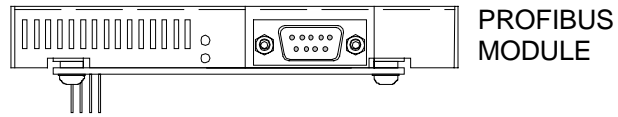
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5. Ensure the DIP switches are set to the proper configuration. DIP switch information is described in the Port Address Settings section for either card.
6. **For Profibus**, align the PC104 pins on the Profibus Module with the mating connector on the Power Supply Module. Insert the Profibus Module into the Power Supply Module.

**For DeviceNet**, align the PC104 pins on the DeviceNet Module with the mating connector on the main unit. Insert the module into the main unit.



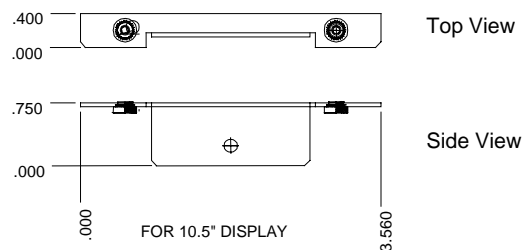
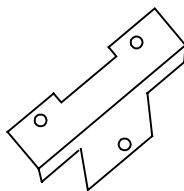


7. If this is the last module to be installed, locate the cover and attach it with four screws.  
To install an additional module, add four more standoffs and insert the next module in the same manner as the first.

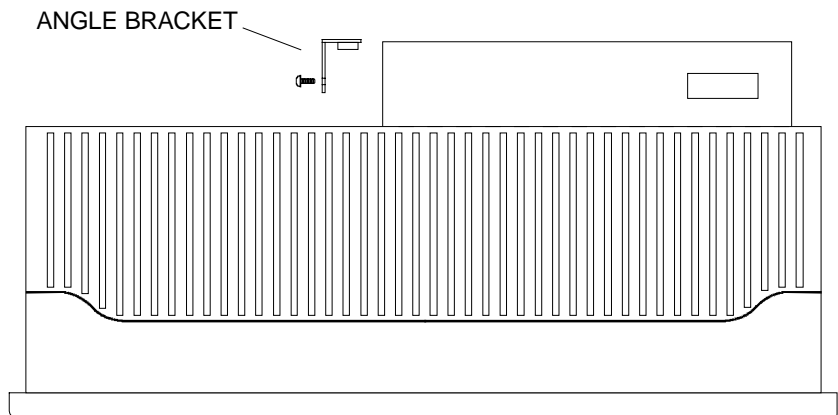
## Modules on a 10.5" Display

Each module is supplied in kit form, so that you must assemble the component parts to the main unit.

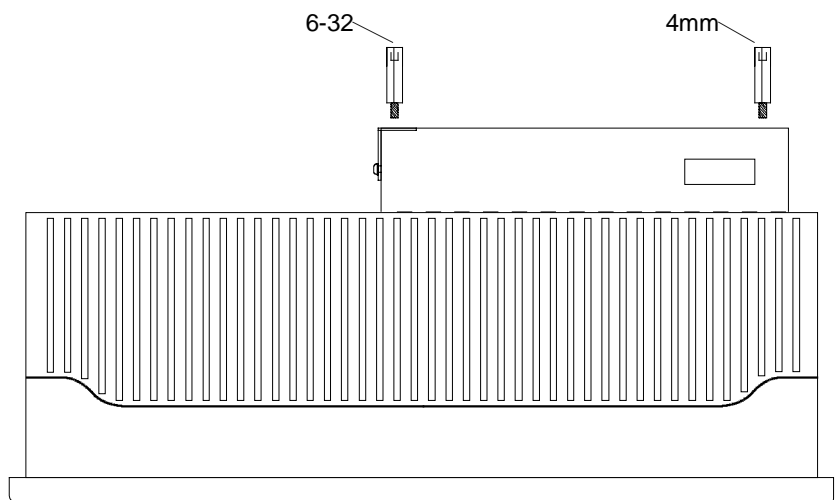
1. Remove the screws from the rear cover. Keep the screws handy as they will be used in subsequent assembly steps.
2. Locate the angle bracket (shown below).



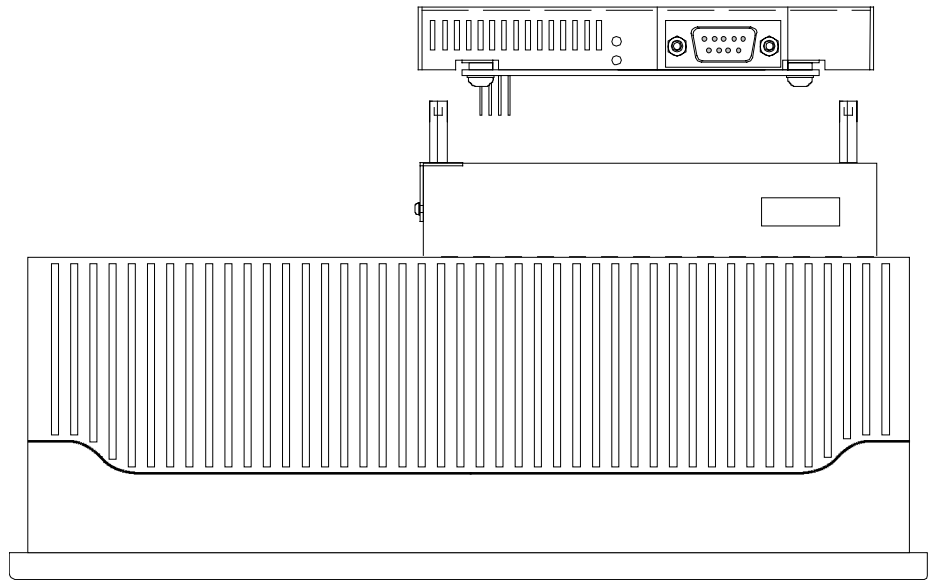
3. Attach the angle bracket to the bottom of the main unit with a single screw.



4. Locate the threaded standoffs. Install two (6-32 thread) in the angle bracket and two (4 mm thread) in the main unit, utilizing the two holes from the previously removed cover.



5. Ensure the DIP switches are set to the proper configuration. DIP switch information is described in the Port Address Settings section for either card.
6. Align the PC104 pins on the Profibus or DeviceNet Module with the mating connector on the main unit. Insert the module into the main unit.



7. If this is the last module to be installed, locate the cover and attach it with four screws.  
To install an additional module, add four more standoffs and insert the next module in the same manner as the first.

# Power Supply Specifications

The Profibus Module requires an additional Power Supply Module when used with 6" display units. The Power Supply Module is installed first, then the Profibus Module.

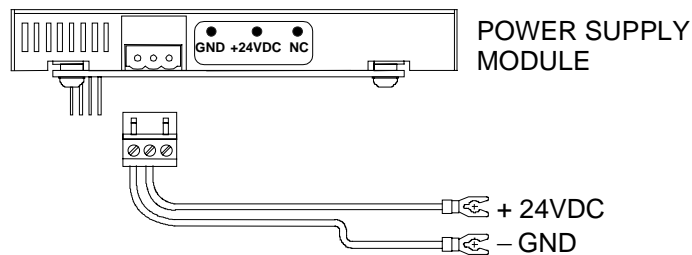
The Power Supply Module comes with a power connector for use with a power source of +10 VDC to +60 VDC. When the module is ordered for use with a 6" display, the connector will be wired for direct connection to the display. If you connect the Power Supply Module to the 6" display, the power source must be 24VDC, 55W or greater.

The Power Supply Module provides +5 VDC to pins 3 and 29 of row 'B' of the PC104 8 bit header. The module and power cable for a 6" display are shown below.

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**NOTE:** Install the Power Supply Module before installing the Profibus Module. This arrangement provides for easier power cable connections and better access to the Profibus connector.

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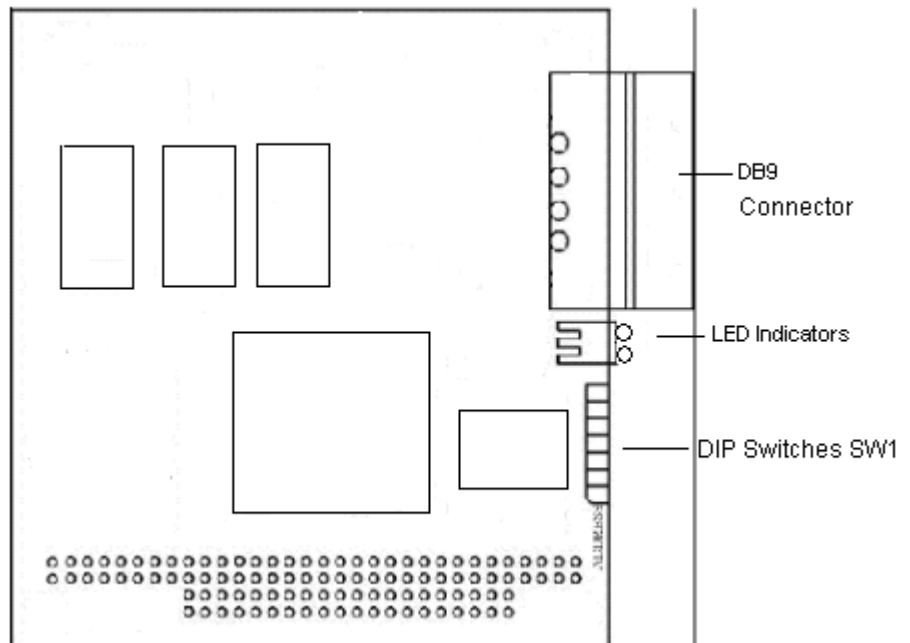
## Power Supply Module Operating Specs

Input:	10-60 VDC
Output:	+5 VDC (for PC104 pins 3 and 29 Row B)
Ripple:	Less than 0.2 VDC at 10 Amps
Protection:	Input Transient protection on input Over-current fast blow fuse Diode polarity reversal Output Over-current fast blow fuse
Temperature:	0 to +50C (-30 to +80C non-operating)
Humidity:	50-90% Non-Cond.
Altitude:	10,000 ft ASL
Fuse F1 (Input)	8 Amp 20x5 mm standard
Fuse F2 (Output)	10 Amp 20x5 mm standard

# Profibus Specifications

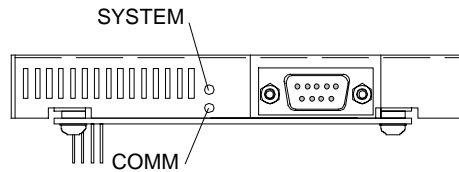
- 16-bit PC104 stackable card
- 24 MHz Intel i960 RISC processor with 1 Mbytes of 32-bit local RAM
- Siemens ASPC2 LAN controller for Profibus functions
- Supports baud rates from 9.5 Kbaud to 12 Mbaud
- Standard Profibus 9-pin D-connector to connect to L2 bus connector
- Hardware watchdog
- Diagnostic LED gives instantaneous status of network
- Current requirements: maximum 750 mA at 5V
- Operating temperature: 0 to 50C (32 to 122°F)
- Storage temperature: -25 to 70C (-13 to 158°F)

Pin	Use
1	chassis ground
2	reserved
3	Data +
4	Tx enable
5	isolated ground
6	voltage plus
7	reserved
8	Data -
9	reserved



## LED Indicators

The two physical ends of the network should be terminated. There should be two and only two terminators on a network.



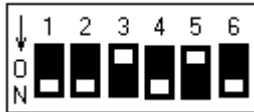
The SYSTEM STATUS LED flashes red if there is a problem with one of the configured PFBPROFI operations and green if the operation is OK. For DP master, amber means all slaves are OK but scanning is in program mode.

The COMMUNICATION STATUS LED shows the health of the network. It is green when the card has the token. It is red whenever there is a network error (token pass failure, communication failure, etc.). If there is an error, it is on for a minimum of 1 second.

## Port Address settings for the Profibus card

The Profibus card requires 8 I/O port addresses in the host computer. You set the base address of these port addresses using the DIP switches on the card.

The default base port address is 16#250. Unless there is a known conflict with some other hardware in your computer, do not change the port location from the default value.



Default = 16#250

The base port address is set through a series of six DIP switches.

The following table shows four possible port addresses and the corresponding switch settings. With the ControlStation CE it is recommended that the default address and settings be used.

### S1 Setting

I/O Address	1	2	3	4	5	6	Comment
16#250	ON	ON	OFF	ON	OFF	ON	Default
16#258	ON	ON	OFF	ON	OFF	OFF	
16#260	ON	ON	OFF	OFF	ON	ON	
16#268	ON	ON	OFF	OFF	ON	OFF	

**Note:** For a more detailed listing of additional addresses and settings, please refer to the driver online help.

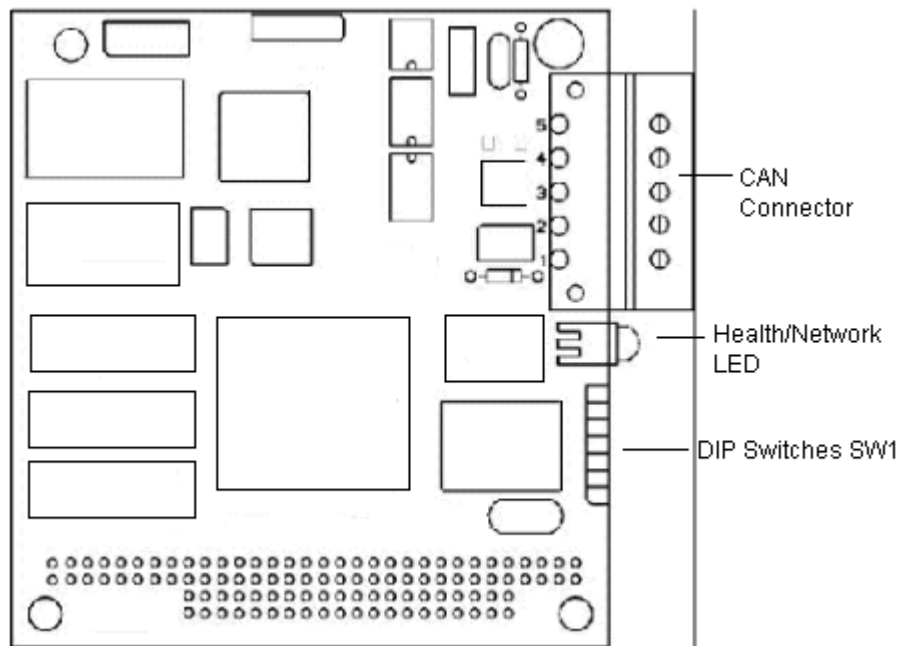
# DeviceNet Specifications

The DeviceNet interface module connects your PC104 bus computer to DeviceNet. Installation of the DeviceNet Module is described in the 'Installation' section.

## Specifications:

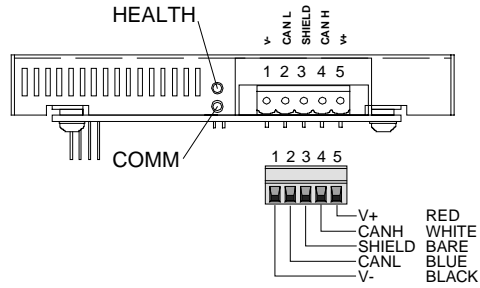
- Compatible with PC104 bus
- High performance 40 MHz processor with 512 Kbytes RAM, 512 Kbytes Flash
- DeviceNet compatible 5-pin DeviceNet connector
- DeviceNet compatible network status bicolor indicator
- Supports all standard DeviceNet data rates: 125, 250 and 500 Kbaud
- 500 V optically isolated CAN interface
- DeviceNet conformance tested
- Operational temperature: 0 to 60C (32 to 140°F)
- Storage temperature: -25 to 70C (-13 to 158°F)
- Power requirements: +5 V +/- 5% 325 mA (typical)

The following diagram illustrates the layout of the major card components.





## LED Indicators



The HEALTH indicator is a bicolor LED that shows the status of the interface module.

Off	No Power
Green	Application module loaded and running
Red	Application module not loaded, error during loading, or runtime fatal error occurred

The COMM indicator is a bicolor LED showing the status of the communication channel. The meaning of the LED is determined by the loaded Application module.

The DeviceNet Module does not have a built-in termination resistor. You must add termination in accordance with the requirements of the target CAN network.

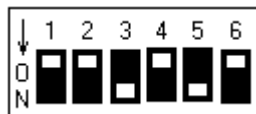
If the CAN network does not supply 11-24 VDC power, connect an external power supply to the V+ and V- pins on the connector. (50ma)

The network shield should be connected directly to earth ground at only one point in the network.

## Port Address settings for the DeviceNet card

The I/O base port address must be set with DIP switches (SW1) to accommodate the eight I/O ports required by the card. The default base port address is 16#250.

The software selectable base memory address must be set to allow exclusive use of a 16k block of RAM. The default is 16#0D0000.



**Default = 16#250**

The base port address is set through a series of six DIP switches.

The following table shows the four possible I/O port addresses and the corresponding DIP switch (SW1). With the ControlStation CE it is recommended that the default address and setting be used.

**Note:** SW1 is a 10 position switch (7 - 10 are unused).

I/O Address	SW1 Setting						Comment
	1	2	3	4	5	6	
16#250	OFF	OFF	ON	OFF	ON	OFF	Default
16#258	OFF	ON	ON	OFF	ON	OFF	
16#260	OFF	OFF	OFF	ON	ON	OFF	
16#268	OFF	ON	OFF	ON	ON	OFF	

**Note:** For a more detailed listing of additional addresses and settings, please refer to the driver online help.

## Connecting to a DeviceNet Network

Connect either a DeviceNet Trunk or Drop cable to the 5-pin connector. Make sure that all strands of wire go into the connector as bent strands may cause shorts to the adjacent terminal.

Directly connecting DeviceNet Trunk cable is not recommended due to the mechanical stress placed on the connector by the heavy trunk cable. If you must attach a trunk cable, secure it so no undue stress is placed on the 5-pin connector.

# GE Fanuc Series 90-30 Specifications

## Description

The PC752GEI104 is an interface card that plugs into a PC/104 slot connecting a control computer with up to seven Series 90-30 Expansion/Remote I/O Racks. Up to 1280 bytes of I/O may be monitored/controlled. A variety of analog and digital modules are supported (for a complete list of supported modules, contact GE Fanuc). Remote I/O racks may be physically located as far as 700 feet from the control computer; expansion racks can be up to 50 feet away. The remote and/or expansion racks are connected to the card in a daisy-chained fashion via a 25-pin female D connector (J1). The interface card also features a watchdog supervised RUN output signal and relay, to allow for integration with safety circuits. This relay is accessed from a three-pin removable terminal strip (J2).

## Specifications

### Supply Power

Supply Voltage: 4.75 to 5.25 Volts

Supply Current: 230 mA maximum

### Watchdog Relay

Initial Resistance: 50 mohm

Maximum Switching Power: 60W, 62.5 VA

Maximum Switching Voltage: 220 VDC, 250 VAC

Maximum Switching Current: 2 A

Maximum Carrying Current: 3 A

UL/CSA Ratings:

125 VAC @ 0.3A

110 VDC @ 0.3A

30 VDC @ 1.0A

Minimum Operations (Mechanical): 100000000

Minimum Operations (Electrical):

500,000 (30 VDC @ 1.0A, resistive)

100,000 (30 VDC @ 2.0A, resistive)

### Environmental:

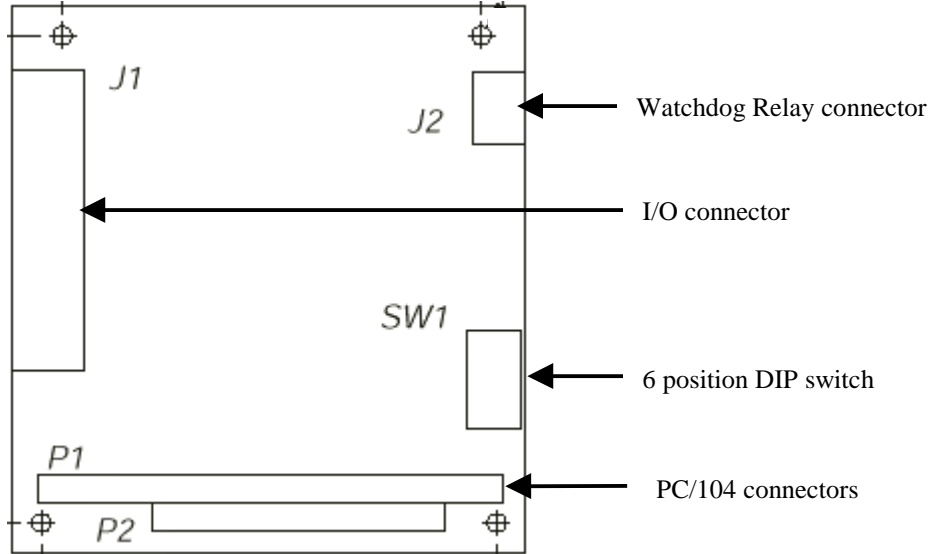
Operating Temperature: 0 to +60°C

Storage Temperature: -40 to +85°C

Humidity: 5 to 95% non-condensing

## Layout

The following picture shows the position of connectors and switches on the PC752GEI104



## Setup

The PC752GEI104 utilizes 8 contiguous I/O ports in the range of 200H to 3FFH. If the factory default address of 300H to 307H conflicts with another device in the host computer, the 6-position DIP switch (SW1) should be set to the desired address. The following table shows the possible settings for SW1.

Board Address	SW 1 Settings					
	6	5	4	3	2	1
200 – 207	ON	ON	ON	ON	ON	ON
208 – 20F	ON	ON	ON	ON	ON	OFF
210 – 217	ON	ON	ON	ON	OFF	ON
218 – 21F	ON	ON	ON	ON	OFF	OFF
220 – 227	ON	ON	ON	OFF	ON	ON
228 – 22F	ON	ON	ON	OFF	ON	OFF
230 – 237	ON	ON	ON	OFF	OFF	ON
238 – 23F	ON	ON	ON	OFF	OFF	OFF
240 – 247	ON	ON	OFF	ON	ON	ON
248 – 24F	ON	ON	OFF	ON	ON	OFF
250 – 257	ON	ON	OFF	ON	OFF	ON
258 – 25F	ON	ON	OFF	ON	OFF	OFF
260 – 267	ON	ON	OFF	OFF	ON	ON
268 – 26F	ON	ON	OFF	OFF	ON	OFF
270 – 277	ON	ON	OFF	OFF	OFF	ON
278 – 27F	ON	ON	OFF	OFF	OFF	OFF
280 – 287	ON	OFF	ON	ON	ON	ON

288 – 28F	ON	OFF	ON	ON	ON	OFF
290 – 297	ON	OFF	ON	ON	OFF	ON
298 – 29F	ON	OFF	ON	ON	OFF	OFF
2A0 – 2A7	ON	OFF	ON	OFF	ON	ON
2A8 – 2AF	ON	OFF	ON	OFF	ON	OFF
2B0 – 2B7	ON	OFF	ON	OFF	OFF	ON
2B8 – 2BF	ON	OFF	ON	OFF	OFF	OFF
2C0 – 2C7	ON	OFF	OFF	ON	ON	ON
2C8 – 2CF	ON	OFF	OFF	ON	ON	OFF
2D0 – 2D7	ON	OFF	OFF	ON	OFF	ON
2D8 – 2DF	ON	OFF	OFF	ON	OFF	OFF
2E0 – 2E7	ON	OFF	OFF	OFF	ON	ON
2E8 – 2EF	ON	OFF	OFF	OFF	ON	OFF
2F0 – 2F7	ON	OFF	OFF	OFF	OFF	ON
2F8 – 2FF	ON	OFF	OFF	OFF	OFF	OFF
300 – 307	OFF	ON	ON	ON	ON	ON
308 – 30F	OFF	ON	ON	ON	ON	OFF
310 – 317	OFF	ON	ON	ON	OFF	ON
318 – 31F	OFF	ON	ON	ON	OFF	OFF
320 – 327	OFF	ON	ON	OFF	ON	ON
328 – 32F	OFF	ON	ON	OFF	ON	OFF
330 – 337	OFF	ON	ON	OFF	OFF	ON
338 – 33F	OFF	ON	ON	OFF	OFF	OFF
340 – 347	OFF	ON	OFF	ON	ON	ON
348 – 34F	OFF	ON	OFF	ON	ON	OFF
350 – 357	OFF	ON	OFF	ON	OFF	ON
358 – 35F	OFF	ON	OFF	ON	OFF	OFF
360 – 367	OFF	ON	OFF	OFF	ON	ON
368 – 36F	OFF	ON	OFF	OFF	ON	OFF
370 – 377	OFF	ON	OFF	OFF	OFF	ON
378 – 37F	OFF	ON	OFF	OFF	OFF	OFF
380 – 387	OFF	OFF	ON	ON	ON	ON
388 – 38F	OFF	OFF	ON	ON	ON	OFF
390 – 397	OFF	OFF	ON	ON	OFF	ON
398 – 39F	OFF	OFF	ON	ON	OFF	OFF
3A0 – 3A7	OFF	OFF	ON	OFF	ON	ON
3A8 – 3AF	OFF	OFF	ON	OFF	ON	OFF
3B0 – 3B7	OFF	OFF	ON	OFF	OFF	ON
3B8 – 3BF	OFF	OFF	ON	OFF	OFF	OFF
3C0 – 3C7	OFF	OFF	OFF	ON	ON	ON
3C8 – 3CF	OFF	OFF	OFF	ON	ON	OFF
3D0 – 3D7	OFF	OFF	OFF	ON	OFF	ON
3D8 – 3DF	OFF	OFF	OFF	ON	OFF	OFF
3E0 – 3E7	OFF	OFF	OFF	OFF	ON	ON
3E8 – 3EF	OFF	OFF	OFF	OFF	ON	OFF
3F0 – 3F7	OFF	OFF	OFF	OFF	OFF	ON
3F8 – 3FF	OFF	OFF	OFF	OFF	OFF	OFF

**DIP switch (SW1) settings**

## Installation

After verifying the SW1 DIP switch setting, the PC752GEI104 may be installed in a PC/104 expansion slot. To ensure maximum system noise immunity, ensure the interface card makes good ground contact with the computer chassis, and the computer's power supply is solidly grounded. After the card has been installed in the computer, the Series 90-30 expansion and/or remote racks may be connected to the card's 25-pin D connector (J1). The following table lists the I/O connector pinout:

Pin	Signal Name	Direction
1	SHLD	n/a
7	GND	n/a
2	DFRAME+ Data Frame Signal Pair	Output
3	DFRAME-	
8	RUN+ Run Signal Pair	Output
9	RUN-	
12	PERR+ Parity Error Signal Pair	Input
13	PERR-	
16	DATA+ Data Signal Pair	I/O
17	DATA-	
20	RSEL+ Bus Select Signal Pair	Output
21	RSEL-	
24	IOCLK+ Data Clock Signal Pair	Output
25	IOCLK-	

### I/O Connector Pinout

Interconnecting cables may be standard length GE Fanuc expansion cables (listed in the following table), or custom length cables.

Part Number	Rack Type
IC693CBL300	1 meter "T" Cable
IC693CBL301	2 meter "T" Cable
IC693CBL302	15 meter "point-to-point" Cable

### GE Fanuc Standard Cables



The watchdog relay connector may now be wired to control external equipment, making sure not to exceed the specified contact ratings on the relay. The watchdog relay is controlled by the control software running on the host computer. In general, it is energized whenever the I/O is being actively controlled. For further details regarding its operation, contact your control software vendor. The following table lists the pinouts of the watchdog relay terminal strip (J2).

Pin	Signal Name
1	Common
2	Normally Closed Relay Contact
3	Normally Open Relay Contact

### RUN Relay Pinout

## Getting More Help

From within the FrameworkX environment:

1. Ensure that a supported I/O driver has been added to your project.
2. In the  **Control I/O** tool, right-click on the  **Driver** node.
3. Select **Driver Help**.

## Technical Support

Support is available to registered users at no charge for one year. The Continuing Support Program (CSP) can be purchased from your local Total Control distributor, after the first year.

If problems arise that can't be solved using the information in this guide or the online Help system, contact us by telephone, fax, or mail.

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When contacting us, call from a telephone near your computer. Keep the following information handy to help us assist you as quickly as possible:

- The product name, serial number, and version number.
- The brand and model of any hardware in your system.
- Operating system and version number.
- The steps you performed prior to the problem.