

What is Micro 64?

Objectives

UPON COMPLETION OF THIS MODULE, YOU SHOULD BE ABLE TO:

- Describe the new Micro 64 concept;
- Understand the various micro configurations and expansions
- List the common features of Micro 64 and the benefits of each.

What are GE Fanuc VersaMax and Nano Controllers?

The VersaMax Micro and Nano are compact micro controllers with embedded I/O, communications and motion all in one package. They include flexible communications options for serial, Ethernet and USB. The VersaMax Micro is available with a wide range of I/O expansion options for both discrete and analog control.

They are all tightly integrated with software, Proficy™ Machine Edition that provides one tool for control and operator interface development. The units have a powerful instruction set that is a subset of larger controllers from GE Fanuc.

They also have powerful motion capability with both steppers and servos. GE Fanuc offers a wide range of steppers and servo systems to compliment the VersaMax Micro line of controllers.

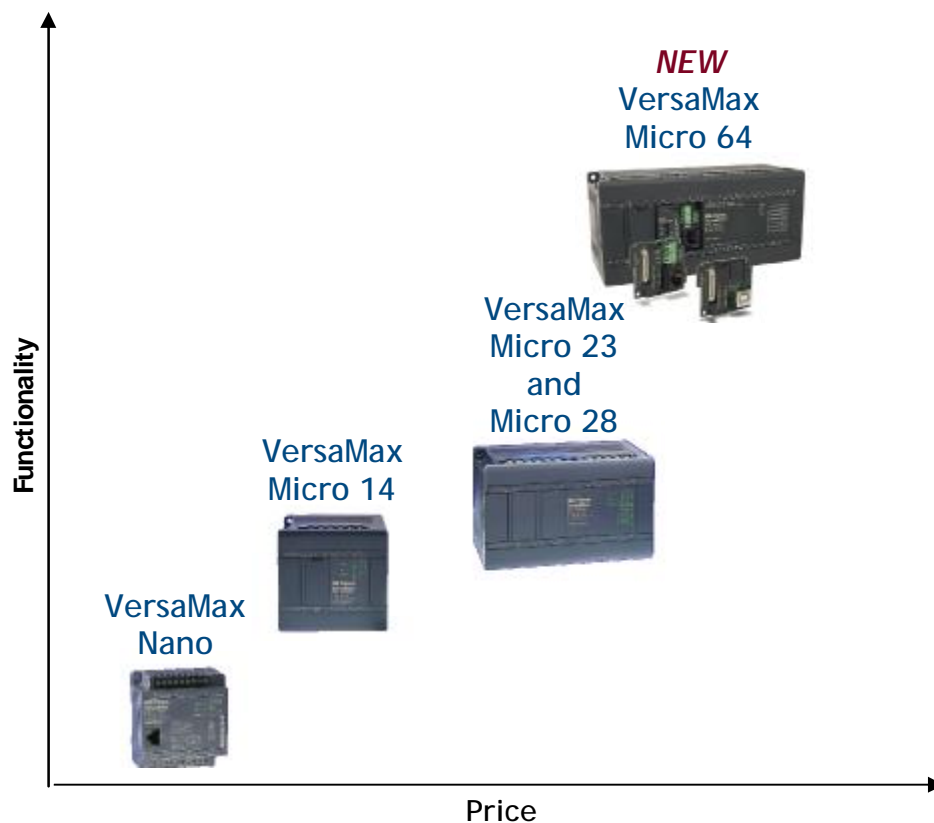


Figure 1 - 1. VersaMax Nano and Micro Family Price vs. Functionality

What is Micro 64?

The VersaMax Micro 64 is the latest control system from GE Fanuc Automation and is designed with the same high quality as the VersaMax Micro line of controllers. The Micro 64 quality construction provides reliable operation and is designed to minimize maintenance cost. To reduce field upgrades, the Micro 64 supports a user friendly Memory Module that can be easily connected to the controller to download the latest program changes without the need of a PC.



Figure 1 - 2. Micro 64

The Micro 64 is easy to use and support. The Proficy Machine Edition Logic Developer PDA software allows you to interface a Palm® handheld device to the VersaMax Micro 64. With Logic Developer PDA, you can monitor/ change data, view diagnostics, force ON/OFF, and configure machine setup – saving you time and increasing productivity.

The Micro 64 meets global standards and is supported internationally with GE Fanuc Automation sales offices and distribution. GE Fanuc also offers 24/7 Technical Support to reduce time to market and downtime.

The Micro 64 provides a complete solution for your automation needs. There are a wide range of I/O expansion modules and a variety of communications options. GE Fanuc also offers a wide range of operator interfaces and motion solutions for simple integration.

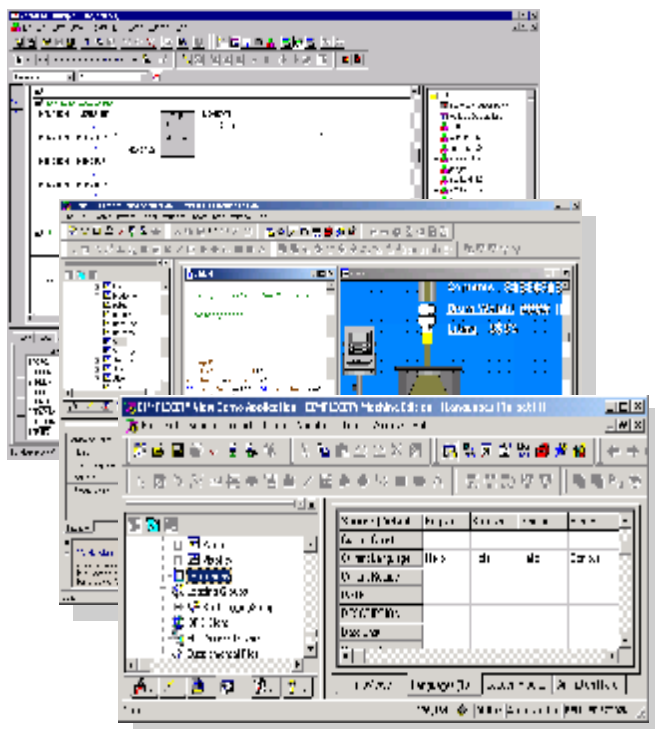


Figure 1 - 3. Micro 64 Uses Proficy Machine Edition

Proficy Machine Edition programming software, which provides a universal engineering development environment for all programming, configuration and diagnostics of GE Fanuc controllers, drives the Micro 64.

Micro 64 is programmed and configured using the programming software to perform real time control of machines, processes, and material handling systems.

The CPU communicates with I/O and smart option modules from one base to the other with various length cables. It communicates with the programmer and/or HMI devices via the serial or Ethernet port GE Fanuc SNP-X, Serial I/O, or Modbus RTU master or slave protocols.

Performance

For your motion needs, the Micro 64 supports four independent 65KHz Pulse Train outputs and can easily be adapted to GE Fanuc's line of PowerCube stepper amplifiers and motors. The Micro 64 High Speed Counter supports four independent 100KHz type A counters or one type B counter for precise positioning.

Compatibility

The Micro 64 is compatible with all VersaMax Micro expansion units. There are over 25 discrete and analog I/O expansion options.

Programming the Micro 64 is common to all GE Fanuc controllers and program migration is simple. GE Fanuc has a full line of text (VersaMax DP) and graphical (QuickPanel™) operator interfaces that can be easily connected to the Micro 64. Tags created in Control can easily be shared with View and vice versa, simplifying development.

The GE Fanuc PowerCube Stepping Motor Drive Package (full, half, and "1000" step) motion solution provides high-speed stepper capability, along with precise positioning and/or velocity control and provides performance not available in lesser motors. Motors are available in NEMA 23 and NEMA 34 flange sizes. Torque ranges are 61 to 605 oz-in (0.43 to 4.27 Nm).

The integrated Motor Cube combines a stepper motor and amplifier into one compact package for direct connection to a pulse command interface.

Motor Cubes are available in 50, 100 and 175 oz-in models.

Flexibility

The Micro 64 supports a wide range of communication options that include serial, USB and Ethernet (SRTP and Modbus TCP). The communications options enable the Micro 64 to easily interface to bar code readers, pagers, modems, Ethernet LANs, operator interfaces and much more. The Micro 64 supports 48Kbytes of user ladder logic and 32K words of data registers. The abundance of memory enables the Micro 64 to solve complex applications requiring multiple program storage and large data storage. The data can also be written to internal Flash to eliminate the need for a battery.

Productivity

Proficy Machine Edition provides one tool for Control and View. The software gives you one universal engineering development environment for all programming, configuration and diagnostics, resulting in faster time to solution and reduced training time.

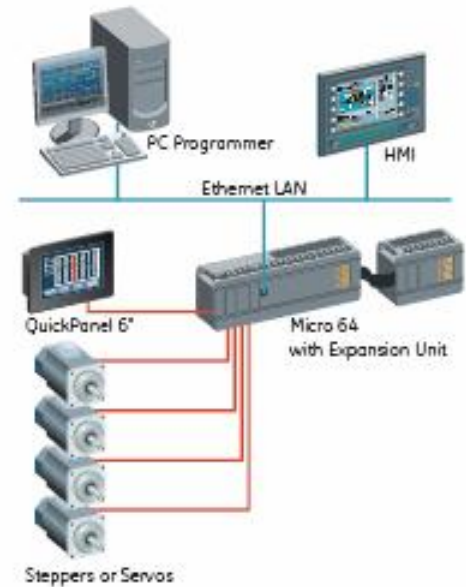


Figure 1 - 4. Micro 64



What is Micro 64?

Micro 64 Models

Catalog Number	Description
IC200UDD064	64 point PLC,(40) 24VDC In, (24) 24VDC Outputs with ESCP protection, 24VDC Power Supply.
IC200UDD164	64 point PLC,(40) 24VDC In, (24) 24VDC Sink Outputs, 24VDC Power Supply.
IC200UDR064	64 point PLC,(40) 24VDC In, (24) Relay Out, 24VDC Power Supply.
IC200UDR164	64 point PLC,(40) 24VDC In, (24) Relay Out, 120/240VAC Power Supply.
Port 2 Communications Options	
IC200UEM001	10/100 Ethernet option board. Supports SRTP, Modbus TCP Server and Tunneling (point to point)
IC200USB001	RS-232 option board with (2) 0 -10VDC analog inputs. Connector to support Memory Board.
IC200USB002	RS-485 option board with (2) 0 -10VDC analog inputs. Connector to support Memory Board.
IC200UUB001	USB option board (no analog option). No connector for Memory Board.
IC200UMB001	Flash Memory Board for program download to Micro 64.

Table 1 - 1. Micro 64 Models

Features

Micro 64 models have the following features in common:

- Built-in 24VDC user supply (435mA) for field devices or powering expansion units
- Built-in 40 inputs and 24 outputs with expansion up to 4 bases of discrete, motion or analog
- 32bit 100Khz High Speed Counter inputs
- 32bit 65Khz Pulse Train/PWM outputs on DC output models
- 32K words of data storage and 48Kbytes of user logic memory
- Write and Read data (register data) to internal Flash
- Battery backup for program, data, and time of day clock
- Configurable Run/Stop mode switch
- Embedded RS-232 port one and optional port 2 for Ethernet, RS-232, RS-485 or USB
- Removable terminal strips
- Portable memory device to download ladder logic without a PC

VersaMax Micro 64 Communications Options

The VersaMax Micro 64 has one built-in RS-232 port that supports SNP, Modbus Master, Modbus Slave, Serial Read/Write. The connection is via a RJ-45 female

connector. The ports also provides 200mA of 5VDC out pin 7 to power operator interfaces or GE Fanuc's



Figure 1 - 5. Communication Options



What is Micro 64?

RS-232 to RS-485 converter.

Port 2 supports a wide range of optional communications modules. These modules simply plug into the connector on the Micro 64. These communications options can easily be connected to an operator interface, PC, LAN, or other third party devices

RS-232: SNP, Modbus Master/Slave and Serial Read/Write and provides two analog inputs (0 to 10VDC) with 10 bit resolution.

RS-485: SNP, Modbus Master/Slave and Serial Read/Write and provides two analog inputs (0 to 10VDC) with 10 bit resolution.

USB: SNP Slave and Serial Read

Ethernet: 10/100 Mbaud

Supports SRTP, Modbus Server and Tunneling.

Supports Flash Memory Module

Number of Connections Supported: Supports up to 8 TCP/IP connections (4 for SRTP, 8 for Modbus TCP, 1 for Tunneling)

Mode: Full Duplex

Future release to include WEB and Modbus TCP Client

VersaMax Micro 64 Specifications

Micro 64 Controller	
Processor Type/Speed	32-bit RISC processor (SH 7043), 28Mhz
Memory Allocation	Total Memory 512 Kbytes of Solid State Drive Memory (Operating System and User Program/Configuration) 256 Kbytes of SRAM 48 Kbytes of User Program Storage 32 Kwords of User Data Storage
I/O and Data Storage Memory Reference Addresses	
Discrete Inputs/Outputs	512 Discrete Inputs and 512 Discrete Outputs
Analog Inputs/Outputs	128 Analog Inputs and 128 Analog Outputs
Internal Contacts	1,024 Internal Battery Backed Bits and 256 Temporary Bits
Register data	32,640 words
Program Languages Supported and Programming Tools	
Languages	Relay Ladder and Instruction List
Program Blocks	Up to 64 program blocks. Maximum size for a block is 16K bytes.
Instructions	Relay Functions, Floating Point Math, PID, Data Moves, Data Conversions, Timers, Counters, Relational Functions, Math and Numerical Functions, Table Functions and more.
Write and Read Data from Internal FLASH	Logic controlled Read/Write of data values to internal FLASH. Up to 3,200 words of data can be written to internal Flash at any one time. A maximum of 10 words of data can be written to or read from the internal Flash at one time.



Hardware Specifications	
Number of I/O Supported	64 I/O on CPU (40 In and 24 Out) and supports up to 4 expansion bases. Total of 176 physical I/O.
High Speed Counter	Up to 4 Type A high speed counters and 1 A QUAD B Counter is supported at 100Khz.
Pulse Train Outputs / PWM	Up to 4 Pulse Train Outputs / PWM Outputs supported at 65Khz (DC output CPU models only)
Output Protection	24VDC Source Output models have ESCP (Electronic Short Circuit Protection) with self-healing. No external fusing required.
Battery Back-up	Battery back-up option backs data up to 2 year of continuous power outage. Systems that are off only occasionally will last much longer.
Real-Time-Clock	Yes
Run/Stop Switch	Yes
Removable Terminals	Yes
Mounting	35mm DIN Rail or Panel Mount
Dimensions (W/H/D)	190mm x 90mm x 76mm
Communications Support	
Port 1	RS-232. Supports SNP (Master and Slave), SNPX, Modbus RTU (Slave and Master) and Serial Read/Write. Modem ready.
Port 2 Option Modules	<p>Ethernet 10/100Mbaud supports SRTP, Modbus Server and Tunneling. Supports Flash Memory Module.</p> <p>Number of Connections Supported: Supports up to 8 TCP/IP connections (4 for SRTP, 8 for Modbus TCP, 1 for Tunneling)</p> <p>Mode: Full Duplex</p> <p>RS-232 with two 0 to 10VDC (10 bit) analog input channels built-in. Supports SNP, SNPX, SNP Master, Serial Read/Write, Modbus Master and Slave. Modem ready. Supports Flash Memory Module.</p> <p>RS-485 with two 0 to 10VDC (10 bit) analog input channels built-in. Supports SNP, SNPX, SNP Master, Serial Read/Write, Modbus Master and Slave. Modem ready. Supports Flash Memory Module.</p> <p>USB (Slave only, Version 2.0). Supports SNP, SNPX, Serial Read, Modbus Slave. No analog input support on module. Flash Memory Module is supported on module.</p> <p>Flash Memory Module. The Flash Memory Module provides a means of downloading a logic program (128Kbytes memory size) without a programmer. Module can be connected directly to Micro 64 or can be stacked onto communications option boards.</p>
Environmental and Agency Specifications	
Temperature Range	0 to 55 degrees C) ambient (Storage temperature -40 to +85 degrees C)
Agency Approvals	UL508, C-UL (Class I, DIV II, A, B, C, D), CE Mark
RoHS Compliance	Target date to meet RoHS is December 2006.

Table 1 - 2. VersaMax Micro 64 Specifications

Migration to Micro 64

The Micro 64 uses the same expansion units as existing VersaMax Micro systems.

The migration allows conversion of VersaMax Micro programs to preserve existing development effort. Micro 64 is compatible with existing Micro and Nano application programs.

Conversion of VersaPro applications to Machine Edition allows smooth transition to Micro 64.

VersaMax Nano (Discrete: 6 inputs/4 outputs Analog 1 input*)

VersaMax Nano PLC Features

VersaMax Nano PLCs offer the perfect solution for smaller packaging machines, dispensing machines, and relay replacement applications with up to 6 inputs and 4 outputs. In spite of their small size, these versatile controllers provide powerful programming features such as built-in high-speed counter functionality, support for floating-point function blocks and subroutines, ability to assign passwords and privilege levels, and override capability.



Figure 1 - 6. VersaMax Nano

All VersaMax Nano PLCs feature:

- Two non-removable recessed “box-style” terminal strips.
- An external Run/Stop switch can be wired to the Nano PLC. The switch can be configured as a run/stop switch, or a memory protect switch, and used for clearing faults when a fatal fault exists.
- Configurable to read configuration at power up from either RAM or flash memory (ROM). Can also be configured to read application program from flash at power up.
- Capacitor backs up RAM for at least 30 minutes on hardware revisions C or above.
- Full-featured programming Instruction Set with floating point math.
- 2K words of program memory, 256 words of registers.
- *Selected models have 1 built-in analog input

Micro 14 (Digital: 8 inputs/6 outputs plus expansion)

All Micro 14 Point Micro PLCs feature:

- Two removable screw-down “barrier-style” terminal strips with protective covers.
- RS-232 serial port that supports SNP/SNPX, RTU slave protocols, and Serial I/O.
- Run/Stop mode switch that can be configured as a



Figure 1 - 7. Micro 14

run/stop switch, a memory protect switch, and also used for clearing faults when a fatal fault exists.

- Two analog potentiometers for data changes
- Full-featured programming Instruction Set with floating point math. The application program can be either Ladder Diagram (LD) or Instruction List (IL) format.
- 9K words of program memory, 256 words of registers.
- Support for up to four Expansion Units in any combination.
- Flash memory (ROM) for non-volatile program storage and for system firmware.
- Configurable to read configuration at power-up from either RAM or flash memory (ROM). Can also be configured to read application program from flash at power-up.
- Capacitor backs up RAM for at least 3 days.

Micro 23 (Discrete: 13 inputs/10 outputs Analog: 2 inputs/1 outputs plus expansion)

All Micro 23 Discrete/3 Analog Micro PLC Features:

- Supports up to four Expansion Units in any combination.
- Four removable screw-down "barrier-style" terminal strips with protective covers.
- Two Serial communications ports. Port 1 (RS-232) supports SNP/SNPX slave protocols. Port 2 (RS-485) supports SNP/ SNPX master and slave, RTU master and slave, and Serial I/O.
- Run/Stop mode switch that can be configured as a run/stop switch, a memory protect switch, and also used for clearing faults when a fatal fault exists.
- Battery backed Time-of-Day Clock.
- Two analog potentiometers for data changes.
- Full-featured programming Instruction Set with floating point math. The application program can be either Ladder Diagram (LD) or Instruction List (IL) format.
- 9K words of program memory, 2048 words of registers.
- Flash memory (ROM) for non-volatile program storage and for system firmware.
- Configurable to read configuration at power-up from either RAM or flash memory (ROM). Can also be configured to read application program from flash at power-up.
- Capacitor backs up RAM and the Time-of-Day clock for at least 30 minutes.
- Optional lithium battery backup for RAM and real-time clock.

Micro 28 (Discrete: 16 inputs/12 outputs plus expansion)

Features of Micro 28-Point Micro PLCs

- Supports up to four Expansion Units in any combination.
- Four removable screw-down “barrier-style” terminal strips with protective covers.
- Two Serial communications ports. Port 1 (RS-232) supports SNP/SNPX slave protocols. Port 2 (RS-485) supports SNP/ SNPX master and slave, RTU master and slave protocol, and Serial I/O.
- Run/Stop mode switch that can be configured as a run/stop switch, a memory protect switch, and also used for clearing faults when a fatal fault exists.
- Time-of-Day Clock.
- Two analog potentiometers for data changes
- Full-featured programming Instruction Set with floating point math. The application program can be either Ladder Diagram (LD) or Instruction List (IL) format.
- 9K words of program memory, 2048 words of registers.
- Flash memory (ROM) for non-volatile program storage and for system firmware
- Configurable to read configuration at power-up from either RAM or flash memory (ROM). Can also be configured to read application program from flash at power-up.
- Capacitor backs up RAM and the Time-of-Day clock for at least 30 minutes.
- Optional lithium battery backup for RAM and real-time clock.

Micro Expansion Units

Features of Micro 8, 14, 16 and 28-Point Expansion Units

- Modular Expansion Units can be used to increase the total I/O count of a Micro PLC. Up to 4 Expansion Units in any combination can be used with any 14-point to 64-point Micro PLC. Expansion Units can be located up to 2 meters from the Micro PLC.
- VersaMax Expansion Units provide the wiring flexibility of removable terminal assemblies. After turning off power to the Micro PLC, a terminal assembly and attached field wiring can be separated from the Micro PLC by loosening two screws.
- The connector on the left side of the Expansion Unit is used to connect to the Micro PLC or to the outgoing connector on the previous Expansion Unit. The connector on the right side of the Expansion Unit can be used to attach to the next Expansion Unit.



- Status LEDs on the Expansion Unit provide quick visual verification of operating status. In addition to LEDs for Expansion Unit local Power and OK mode, there is an LED for each I/O point.
- A 0.1 meter ribbon cable is provided (IC200CBL501) with each Expansion Unit. Cables are also available in 0.5 meter (IC200CBL505) and 1 meter (IC200CBL510) lengths. Maximum of 2 meters of total cable from CPU to last base.

Expansion units available:

Discrete Models

- IC200UEC008 8 Points, (4) 24VDC In, (4) 24VDC Out with ESCP, 24VDC Power Supply
- IC200UEC108 8 Points, (4) 24VDC In, (4) 24VDC Transistor Out, 24VDC Power Supply
- IC200UEC208 8 Points, (4) 24VDC In (4) Relay Out 24VDC Power Supply
- IC200UEI008 8 Points, (8) 24VDC In, 24VDC Power Supply
- IC200UEI016 16 Points, (16) 24VDC In, 24VDC Power Supply
- IC200UEO008 8 Points, (8) 24VDC Output with ESCP, 24VDC Power Supply
- IC200UEO108 8 Points, (8) 24VDC Transistor Out, 24VDC Power Supply
- IC200UEO016 16 Points, (16) 24VDC Output with ESCP, 24VDC Power Supply
- IC200UEO116 16 Points, (16) 24VDC Transistor Out, 24VDC Power Supply
- IC200UER008 8 Points, (8) Relay Outputs, 24VDC Power Supply
- IC200UER016 16 Points, Relay Outputs, 24VDC Power Supply
- IC200UEX009 14 Points, (8) 120 VAC In, (2) Relay Out at 10 Amps, (4) Relay Out at 2 amps, 120/240VAC Power Supply
- IC200UEX010 14 Points, (8) 120VAC In, (6) 120VAC Out, 120/240VAC Power Supply
- IC200UEX011 14 Points, (8) 24VDC In, (6) Relay Out, 120/240VAC Power Supply
- IC200UEX012 14 Points, (8) 24VDC In, (6) Relay Out, 24VDC Power Supply
- IC200UEX013 14 Points, (8) 12VDC In, (6) Relay Out, 12VDC Power Supply
- IC200UEX014 14 Points, (8) 24VDC In, (6) 24VDC Out, 24VDC Power Supply
- IC200UEX015 14 Points, (8) 12VDC In, (6) 12VDC Out, 12VDC Power Supply
- IC200UEX122 14 Points, (8) 24VDC In, (6) 24VDC Out with ESCP, 24VDC Power Supply
- IC200UEX209 28 Point Expansion Unit, (16) 120VAC In, (2) Relay Out at 10 Amps, (10) Relay Out at 2 Amps, 120/240VAC Power Supply
- IC200UEX210 28 Point Expansion Unit, (16) 120VAC In, (12) 120VAC Out, 120/240VAC Power Supply
- IC200UEX211 28 Point Expansion Unit, (16) 24VDC In, (12) Relay Out, 120/240VAC Power Supply
- IC200UEX212 28 Point Expansion Unit, (16) 24VDC In, (12) Relay Out, 24VDC Power Supply
- IC200UEX213 28 Point Expansion Unit, (16) 12VDC In, (12) Relay Out, 12VDC Power Supply
- IC200UEX214 28 Point Expansion Unit, (16) 24VDC In, (12) 24VDC Out, 24VDC Power Supply
- IC200UEX215 28 Point Expansion Unit, (16) 12VDC In, (12) 12VDC Out, 12VDC Power Supply
- IC200UEX222 28 Point Expansion Unit, (16) 24VDC In, (12) 24VDC Out with ESCP technology, 24VDC Power Supply

Analog Expansion Models

- IC200UEX624 4 Point Analog Expansion Unit, (4) Analog In, 24 VDC Power Supply
- IC200UEX616 6 Point Analog Expansion Unit, 4) Analog In and (2) Analog Out, 12 VDC Power Supply
- IC200UEX626 6 Point Analog Expansion Unit, (4) Analog In and (2) Analog Out, 24 VDC Power Supply
- IC200UEX636 6 Point Analog Expansion Unit, (4) Analog In and (2) Analog Out, 100/240 VAC Power Supply
- IC200UEX724 4 RTD, Pt 100 In, 24VDC Power Supply
- IC200UEX726 4 RTD, Pt 100 In and 2 Analog Out, 0 - 20mA, 4 - 20mA, or 0 - 10VDC, 24VDC Power Supply
- IC200UEX734 4 RTD, Pt 100 In, 100/240VAC Power Supply
- IC200UEX736 4 RTD, Pt 100 In and 2 Analog Out, 0 - 20mA, 4 - 20mA, or 0 - 10VDC, 100/240VDC Power Supply

VersaMax Nano and Micro Selection Guide

Features	Nano 10	Micro 14	Micro 23	Micro 28	Micro 64
Built-in Discrete	6 in/4 out	8 in/6 out	13 in/10 out	16 in/12 out	40 in/24 out
Built-in Analog	On some models	None	2 in/ 1 out	None	Serial Plug-in Modules
Expansion Units	None	Up to 4	Up to 4	Up to 4	Up to 4
Logic Memory	2K words	9K words	9K words	9K words	24K words
Data Storage	256 words	256 words	2K words	2K words	32K words
Data Back-up	Super Cap up to 30 minutes	Super Cap up to 3 days Battery: Up to 3 years	Super Cap up to 30 minutes Battery: Up to 3 years	Super Cap up to 30 minutes Battery: Up to 3 years	Super Cap up to 30 minutes Battery: Up to 3 years
Read/Write data to Internal Flash	No	Yes	Yes	Yes	Yes
Real Time Clock (built-in)	No	No	Yes	Yes	Yes
Serial Ports Available	1	1	2	2	1 built-in 2nd port optional
Ethernet Option	Optional VersaMax SE	Optional VersaMax SE	Optional VersaMax SE	Optional VersaMax SE	Optional plug-in module
High Speed Counter	Up to 4 @ 10Khz	Up to 4 @ 10Khz	Up to 4 @ 10Khz	Up to 4 @ 10Khz	Up to 4 @ 100Khz
PWM/Pulse Train	Up to 4 @ 5Khz	Up to 4 @ 5Khz	Up to 4 @ 5Khz	Up to 4 @ 5Khz	Up to 4 @ 65Khz

Table 1 - 3. VersaMax Nano and Micro Selection Guide

VersaMax Serial to Ethernet Adapter

The VersaMax IC200SET001 Serial to Ethernet Adapter (VMSE) can be used to connect a VersaMax Micro PLC or Nano PLC to an Ethernet network.

By default, SRTP/SNP firmware is loaded in flash memory. Use SRTP/SNP to communicate with VersaPro, Proficy HMI, Series 90-30, Series 90-70, and other GE Fanuc products.

Additional firmware options are provided on the CD that is shipped with the VMSE. These include Modbus TCP/RTU, and Pass Thru firmware, which can be used to send serial communication via Ethernet.

Serial Interface is the RJ45 port on the VMSE supports RS232. The screw block port supports both RS232 and RS485/422. Setting the switch on the front of the VMSE and configuring the VMSE setup selects RS232 or RS485/422. Only one port can be used at a time.

Network Interface supports 10/100 Mbit Ethernet through its RJ45 (10BaseT) connector. Power Requirements: input voltage can vary between 9VDC and 30VDC (or 24VAC) with a maximum of 3 Watts. The VMSE can be powered from the 12 or 24 Volt supply on a VersaMax Micro PLC (200mA available), or an external supply can be used. For a Nano PLC, an external power supply is required.



Figure 1 - 8. VM Serial to Ethernet Adapter

Operator Interfaces

DataPanel Operator Interfaces



The GE Fanuc DataPanels are ideal of a broad range of applications ranging from a simple Timer/Counter/Register Access to full text message display with numeric keypad. All of the DataPanels are preprogrammed to quickly connect to a VersaMax Micro on Nano without user configuration. The DataPanels are a cost effective solution for low-end control.

Figure 1 - 9. DataPanel OIs

Features:

- VersaMax Micro and Nano Ready
- Preinstalled VersaMax Micro and Nano Drivers
- System Diagnostic Screens

- Pre-made cable for quick connection
- Text Display
- Programmable Function/Numeric Keys
- Up to 200 messages
- Navigation and edit keys
- Programmable LEDs Alarm, recipes and Menu Support

QuickPanel View Operator Interfaces



Figure 1 - 10. QuickPanel OIs

Available in a variety of display sizes, the QuickPanel View bundled visualization solution provides the tools required for today's application needs. By integrating the best-selling QuickPanel family of touch screens with award-winning Proficy™ Machine Edition software, QuickPanel View delivers flexible, scalable performance on a rugged hardware platform. The intuitive environment of Proficy View - Machine Edition software helps reduce application development time, and connectivity is made easy with a family of serial, Ethernet and Fieldbus interfaces.

- The QuickPanel View family is a robust, integrated hardware and software solution. Advantages include:
- Broad range of display sizes from 6" to 15"
- Choice of Monochrome, Color-STN, or Color-TFT display
- Microsoft Windows® CE operating system
- Expandable memory & Fieldbus cards (CompactFlash)
- Cost-effective replacement for panel operators
- Functions from data collection and trending to system security and alarming
- Built-in web server for access to data, and panels using any standard browser
- Communication over serial, Ethernet and communication expansion cards
- Multi-language support selectable by the operator when the system is online
- Shared tags for increased productivity - applications developed for QuickPanel View can share tags with other Proficy Machine Edition applications, eliminating the need to enter the data more than once
- Migration of applications developed with QuickDesigner
- Extensive library of pre-configured animation objects



What is Micro 64?

Motion Solutions

GE Fanuc provides motion control solutions to address major engineering and business issues such as reducing costs, increasing efficiency and enhancing profitability. High performance servo motion solutions can dramatically improve machine productivity, yield and flexibility.

Changeover time between product runs can be reduced from hours to minutes. GE Fanuc combines a wide selection of operator interface, controller and motion products with our award winning Proficy Machine Edition software to help OEMs optimize their motion control system for individual end user applications such as packaging, material handling and assembly. Knowledgeable application support and training services reduce and improve engineering efficiency.

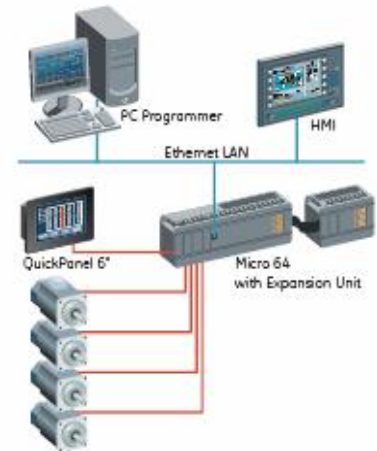


Figure 1 - 11. Sample Motion

PowerCube Stepper Amplifier Features



Figure 1 - 12.
PowerCube Stepper Amplifier

- Compact amplifier design can be mounted on a DIN rail
- 12- 48 VDC power is excellent for battery powered applications
- Pulse/Direction Motion Command Interface
 - Micro 64 PLC Pulse/Direction Output for speed up to 3000 RPM @ 1000 steps/rev
- MTR Series NEMA 23, 34 and 42 motors
 - Torque range from 3.8-37.8 in-lb (0.43 to 4.27 Nm)
- Use in Simple Indexing Applications
 - Point-to-Point moves
 - Automatic fixturing
 - Test equipment
 - Material handling
 - Edge guides and back stops

MotorCube "Smart" Stepper Motor Features

- Integrated Design: motor, amplifier, motion controller in one unit
- 3 NEMA 23 Motor Sizes: Torque range from 3.1-11 in-lb (0.35 to 1.24 Nm)
- Selectable step size (200, 400, 1000 steps/rev; 50 kHz max step rate)



Figure 1 - 13. MotorCube Smart Stepper



What is Micro 64?

- Optional 500 ppr incremental encoder
- 24 or 48 VDC power input
- Pulse/Direction Motion Command Interface
- Micro 64 PLC Pulse/Direction Output
- Simple Indexing Applications
- Feed to length
- Guide rails
- End stops
- Back gauge

S2K Servo and Stepper Control

- High Performance 1-Axis Motion Controller
 - 122 μ S Servo Update & High Performance Motors
 - Powerful Multi-tasking Operating System - Simplify complex applications
 - Advance Features - Cam, Registration, Dual Loop Control
- Integrated Machine Control Solution
 - Up to 4 axis control from the Micro 64
 - Programmable Motion & I/O in One Program
 - Integrated Amplifier, Power Supply and Analog & Digital I/O
- Scalable Performance
 - Servo or Stepping Models use Same Program
 - Broad Motor Range
 - Powerful Peer-Peer Multi-axis Solution

Programming Software

Ladder diagram specific toolbar provides for rapid development of PLC application programs.

All components of your PLC application: Hardware Configuration, Program Logic, Data Watches, and Reference View Tables, are organized in the navigator. Click on an item to open it, click on the right mouse menu for a list of operations that you can perform on an item.

Ladder Diagram Editor provides a display of the PLC application, and indicates the Off-line and On-line values of application variables. Force status for discrete variables and Retentive status for coils is also indicated.

Status bar indicates the current state of the PLC, as well as the Configuration and Logic equality between the PLC programmer and the PLC.

Customizable Workspace lets you navigate quickly between windows and display multiple windows of information at a time.

Figure 1 - 14. Proficy Machine Logic Developer Software

Proficy Machine Edition Logic Developer

GE Fanuc's Proficy Machine Edition is an automation software breakthrough deploying HMI, motion, and multi-target control in an integrated development environment. This environment provides a common user interface, drag-and-drop editing, and a rich set of development tools. Proficy Machine Edition includes all the automation software components you need to reduce your programming, configuration, commissioning, monitoring, and maintenance costs.

Build Your Application on Industry Standards. Combining the best of traditional programming and graphics applications with such powerful open industry-standard technologies as COM/DCOM, ActiveX, OPC, and XML, Proficy Machine Edition provides a smooth migration path to the latest development tools.

Save Time through Tight Integration. In addition to sharing common development tools, all Proficy Machine Edition components – View, Logic Developer, and Motion Developer – share a common database and common objects across applications,



What is Micro 64?

including logic, scripts, and animation. Once a variable is created, it can easily be used in all other components of the project.

Design Full-Featured Machine-Level Graphics. Proficy Machine Edition includes an intuitive, machine-level HMI for shop-floor devices, including PLCs, CNCs, motion controllers, marquees, serial devices, and other machine-level components, with an all-inclusive graphics tool that allows you to place objects within the common object repository, or "Toolchest." Applications can be developed for QuickPanel™, QuickPanel View (Windows CE), and Windows® NT/2000/XP based systems. View supports communication protocols for all major PLCs and includes OPC client and server drivers and lets you publish your data and graphical panels over the Web to a standard web browser.

Work in both PLC and PC Control Environments. Whether you work in a PLC or PC-based control environment, or both, Logic Developer provides all the tools you need to develop, monitor, and troubleshoot your applications. In addition, Logic Developer provides full scalability from Windows CE-based QuickPanel Control units to Embedded NT/XP and Windows NT/2000/XP as well as across the full spectrum of GE Fanuc PLC and PACSystems™ controllers.

Develop Motion Control Programs Quickly. With Motion Developer, you can develop motion control programs for GE Fanuc S2K series motion controllers quickly and efficiently.

Protect Your Investment with Centralized System Management. Proficy Change Management provides central storage, version control, and access control capabilities for all Proficy Machine Edition projects.

Micro 64 Instruction Set

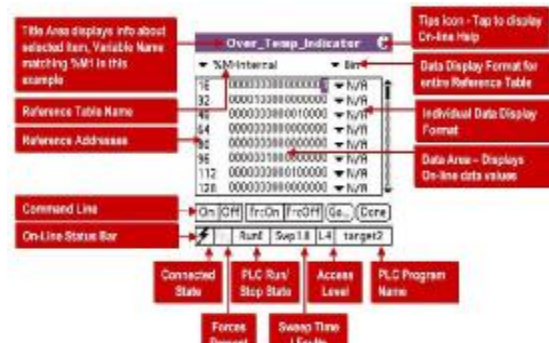
Bit Operation Functions		
P Logic AND, Logic OR	P Exclusive OR, Logical Invert	P Shift Right/Left
P Rotate Right/Left	P Bit Test/Set/Clear	P Masked Compare
P Bit Position	P Bit Sequencer	
Control Functions		
P Do I/O	P Service Request	P Call
P End	P Comments	P Master Control Relay
P Subroutines	P PID	
Table Functions		
P Array Move	P Search	
Data Move Functions		
P Move	P Block Move	P Block Clear
P Shift Register	P Communications Request	P Motion Moves
P High Speed Counter	P Serial Read/Write	P Modbus Master
Conversion Functions		
P BCD- 4	P Signed Integer	P Double Precision Signed Integer
P Real	P Real to Word	P Truncate Real Number

Math and Numerical Functions		
P +, -, x, /	P Modulo division	P Scaling
P Square Root	P Trigonometric Functions	P Logarithmic/Exponential
P Convert Radians		
Relation Functions		
P Equal	P Not Equal	P Greater Than
P Less Than	P Greater or Equal	P Less or Equal
P Range		
Relay Functions		
P Contacts, Coils	P Fault and No Fault Contacts	P Alarm Contacts
Timer and Counters		
P Time-tick Contacts	P Up Counter	
P Off-delay timer	P On-delay Stopwatch timer	
P Down Counter	P On-delay timer	
Motion Functions		
P Find Home	P Ramp	P Blended (multi velocity) Move (up to 4 continues moves)
P Go Home	P Jog	

Table 1 - 4. Micro 64 Instruction Set

Proficiency PDA Tool

Handheld Access to GE Fanuc PLCs. PROFICY® Machine Edition Logic Developer-PDA software allows you to interface a Palm® handheld device to any GE Fanuc Series 90™ and VersaMax® PLC. With Logic Developer-PDA, you can perform PLC Monitoring, Diagnostics, and Maintenance from any PLC location in the manufacturing facility, saving you time and increasing productivity.



Monitor. Logic Developer-PDA provides you with a complete set of Data Viewing tools to monitor the operation and execution of your PLC application. This includes the ability to view Default Reference Tables and User Defined Variable Tables. The Logic Developer-PDA Online Status Bar also provides a convenient display of the PLC's State, Sweep Time, and Program Name.

Diagnose. Logic Developer-PDA provides you with a complete set of tools to diagnose the operation of your PLC application. Diagnostic tools such as online Fault Tables and List of Forced References provide the ability to diagnose issues and problems that may have occurred in your system. These tools may be used to determine why the system is operating in a particular manner. The Logic Developer-PDA Online Status Bar provides a convenient indication if Forces or Faults exist in the PLC.

Maintain. Logic Developer-PDA provides you with a complete set of tools to aid you in maintaining your PLC applications. These tools provide the ability to change the PLC



What is Micro 64?

State, Clear Faults, and transfer PLC Application components between PLC RAM and Flash Memory. PLC Connectivity. Connect to any Series 90 and VersaMax PLC via the PLC's RS232 or RS485 serial port using the Series Ninety Protocol (SNP) networking standard. The user connects the Palm Handheld to the PLC using a standard Palm HotSync cable and serial adapter. Manage PLC Data. View default PLC Reference Tables, including %I, %Q, %R, %AI, %AQ, %T, %M, %S, and %G. View and modify I/O Status and I/O Force States, including the ability to Turn On, Turn Off, Force On, Force Off, and Remove Forces. View and modify Register values. Register values may be displayed in multiple display formats including: Binary, Double Integer, Hexadecimal, Integer, Real, String (ASCII), Unsigned Integer, and Double Unsigned Integer. Handheld Access to GE Fanuc PLCs. PROFICY® Machine Edition Logic Developer-PDA software allows you to interface a Palm® handheld device to any GE Fanuc Series 90™ and VersaMax® PLC. With Logic Developer-PDA, you can perform PLC Monitoring, Diagnostics, and Maintenance from any PLC location in the manufacturing facility, saving you time and increasing productivity.

Manage Variable Lists. Create and modify Variable Lists. Create a list of Variables in PLC memory that you want to access. Transfer Variable Lists between your PC and the PDA using the Shared Name File (SNF) format. You can also create these Variable Lists using PROFICY Machine Edition PLC programming software (Logic Developer-PLC). You can synchronize your Variable Lists using the Logic Developer-PDA Conduit that operates on your PC in conjunction with the Palm HotSync Manager.

Manage Other PLC Information. View PLC information such as CPU model, Firmware Revision, SNP ID, PLC Time/Date, Sweep Mode, and Memory Table Sizes. View and modify the PLC CPU Run/Stop state. View and clear PLC and I/O Fault Tables. View List of Forced PLC References. Read/write/verify PLC RAM memory and Flash memory. Log information to a Palm memo pad item for the Fault Table Details, List of Forced References, and PLC Information.

Summary of Micro 64 Advantages

Investment

- Micro 64 is loaded with features that would cost much more on competitive micros
- Reduced training. The programming is the same on the Micro 64 as all other GE Fanuc controllers.
- One development package for control and operator interface development

Flexibility

- The built-in motion capability is superior to comparable micros on the market
- 100Khz High Speed Counter and 65Khz Pulse Train out
- Wide range of serial communications and a powerful Ethernet option for only \$175.
- Modular expansion enable you to easily expand both discrete and analog I/O