GE Fanuc Automation

VersaMax™ Nano & Micro Controller Solutions

Powerful controls that are big on performance and small in size

VersaMax™

The new generation of control

www.gefanuc.com

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Introducing
VersaMax Nano & Micro Controllers

VersaMax Nano

The palm-sized VersaMax Nano PLC is highly compact, with an all-in-one construction that saves panel space. Plus it's very easy to apply: snap it onto a DIN rail or mount it on a panel.

VersaMax Micro

Don't let the size fool you. This Micro PLC is big on features, from up to 28 I/O (expandable to 84 I/O) points to fast cycle times, robust instruction set, and generous memory to allow more flexible programming. And it's all packaged in a sturdy modular design for easy access and long-term durability.

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A Powerful Nano PLC

The VersaMax Nano PLC is ideal for high-volume applications where cost, space, and fast processor speeds are all issues. The low-cost Nano PLC gives you more capabilities in a smaller, less expensive package, so you save in initial costs.

Then you'll save even more in life-cycle costs—from fast, easy installation to long-term reliability.

VersaMax Nano

Features

- 2K words of memory
- 1.2 µ sec. Per Boolean Operation Execution
- 6 inputs and 4 outputs
- Compact —75mm x 80mm x 47mm
- Powerful Instructions
  – PID
  – Floating Point Math
  – Subroutines
  – Serial Read/Write Commands
- Supports up to 2 High Speed counters (10 kHz)
- Three PWM/Pulse Train Outputs (5 kHz)

Quick Mounting

- Snap onto DIN rail
- Screw into panel

A Versatile Micro PLC

If you need powerful control without the need for high-end systems, then the VersaMax Micro PLC is ideal. We cut the size, but not the functionality to give you a big-featured PLC in a compact package. The all-in-one PLC gives you everything you need to control a wide variety of applications. And you can easily expand the number of I/O to suit your needs.

Dollar for dollar, feature for feature, the VersaMax Micro PLC gives more value, more power, and more flexibility in control applications than traditional controls.

The VersaMax Micro is available in either 14 point or 28 point and both can be expanded to meet your needs.
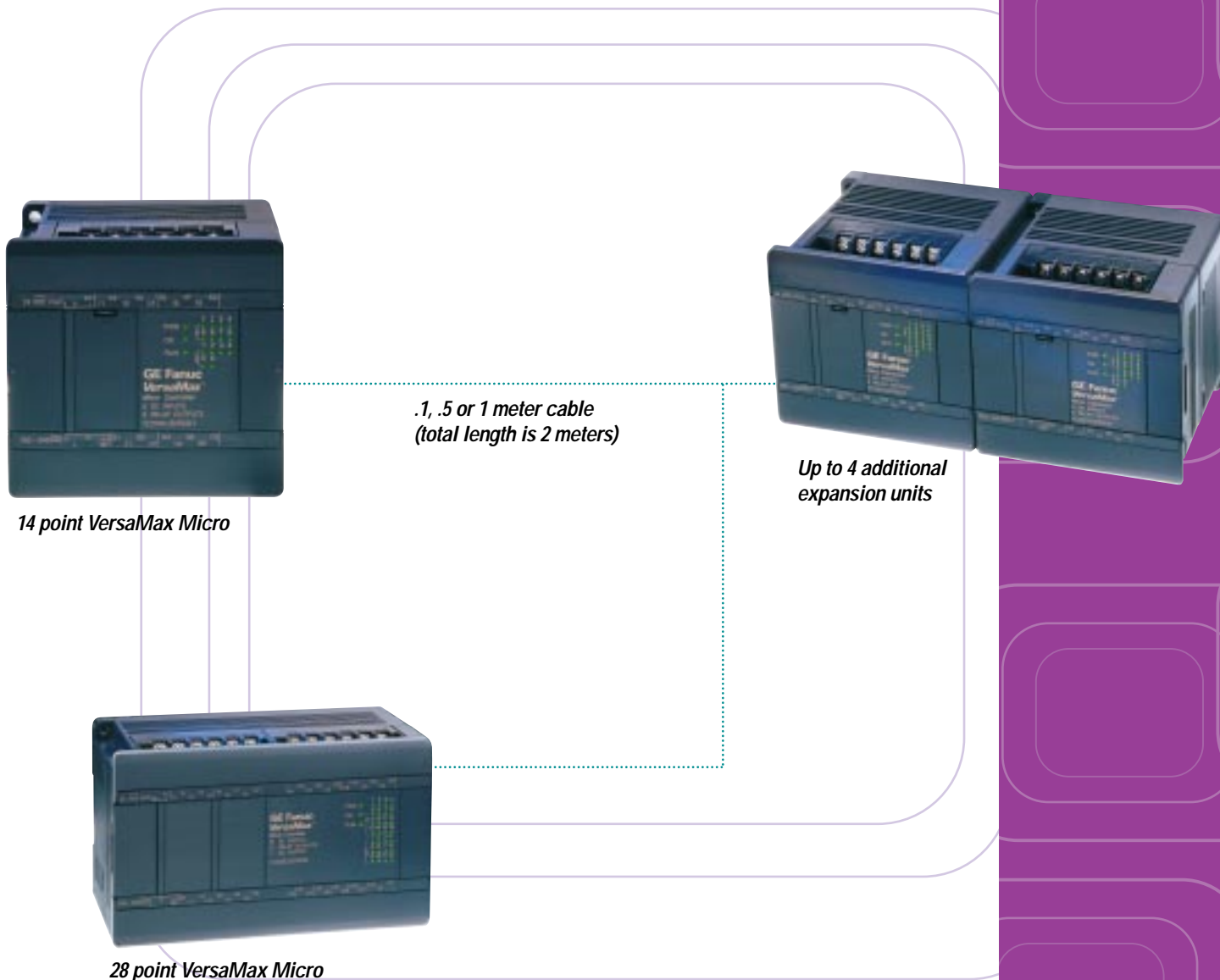
28 point VersaMax Micro

Expansion Port

• Up to four Expansion I/O modules can be added

• Expand up to 84 I/O with 28 point micro and 70 I/O using the 14 point micro

Stop/Run/Memory Protect Switch

Options

• Battery backup for data, memory and real-time clock

Powerful Processor

• 9K words of memory
• 1.0 µsec. Per Boolean Operation Execution
• Floating-point math
• Real-time clock
• PID
• Motion capability
• High-speed counters (4)
• Subroutines

Set Point Adjustment

• Two analog inputs for adjusting set points

14 point VersaMax Micro

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.1, .5 or 1 meter cable
(total length is 2 meters)

Up to 4 additional
expansion units

14 point VersaMax Micro

28 point VersaMax Micro

Powerful CPUs and Expansion Units

Feature	Nano PLCs		Micro PLCs									Expansion Units		
Part # IC200	NDR001	NDD101	UDR001	UDR002	UDD104	UAA003	UAL006	UDR005	UDR010	UDD110	UAA007	UEX011	UEX012	UEX014
Total Discrete Points	10	10	14*	14*	14*	14*	23*	28*	28*	28*	28*	14	14	14
DC Power Supply	✓	✓		✓	✓			✓	✓			✓	✓	
AC Power Supply			✓			✓	✓	✓				✓	✓	
DC Power for inputs and field devices	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓
DC Inputs	6	6	8	8	8		13	16	16	16		8	8	8
AC Inputs						8					16			
Analog Inputs							2							
Relay Outputs	4		6	6			9	11	11			6	6	
DC Outputs		4			6		1	1	1	12				6
AC Outputs						6					12			
Analog Outputs							1							
High Speed Counters	✓	✓	✓	✓	✓		✓	✓	✓	✓				
Pulsed Outputs		✓			✓		✓	✓	✓	✓				
Serial Ports	1	1	1	1	1	1	2	2	2	2	2			

*Can be expanded to a total of 4 expansion units.

Communications Options

The VersaMax Micro and Nano have various communications options to meet your control needs. Each unit has an RS-232 port that can be used for SNP Slave, Modbus RTU Slave or Serial In/Out commands. The second port on the 23 point and 28 point micro is an RS-485 port that supports SNP Slave, SNP Master, Modbus RTU Slave and Serial In/Out commands. Modems can easily be attached to either port. With the Serial I/O commands you can interface to devices such as pagers, intelligent scales, bar code readers and printers.

Serial Port Applications

- Computer
- Printer
- Modem
- Pager
- Bar Code Reader
- Intelligent Scales
- ASCII Devices
- Operator Interfaces
- SCADA
- Master/Slave

Serial I/O can be used to

- Initialize either port
- Set up the size of the received data buffer
- Flush the received data buffer
- Read the port status
- Activate/deactivate RTS on the serial port
- Cancel an operation
- Automatically dial a modem and send a specified byte string
- Send up to 250 characters from word memory to a remote device through the specified port
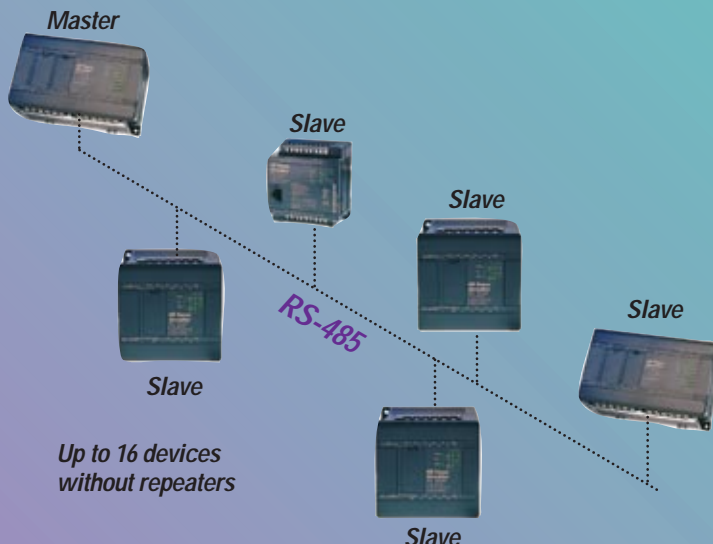- Read one or more received characters from an internal input buffer

Master/Slave Communications

Master

Slave

Slave

Slave

Slave

RS-485

Slave

Up to 16 devices without repeaters

Slave

(Slaves that have RS-232 ports require an RS-232 to 485 Converter - IC200ACC415)

Multi Drop Communications

(Devices that have RS-232 ports require an RS-232 to 485 Converter - IC200ACC415)

HMI

RS-485

Other GE Fanuc PLCs
- Series 90 Micro
- VersaMax
- Series 90-30
- Series 90-70

Motion Options

The VersaMax Micro and Nano are ideal for low end motion applications. Both products can be used with either a PWM or a Pulse Train device. There are up to 4 PWM/Pulse Train outputs available. In addition, the VersaMax Micro and Nano come with built-in High Speed counters that can be used in either Type A (Up or Down, Independent Pulse) or Type B (Both Directions, A QUAD B Encoder Inputs) configuration.

GE Fanuc also offers a wide range of Servo and Stepper motors and amplifiers for your motion application. The new Stepping Motor Cube provides a cost effective integrated motor and amplifier solution. The Power Cube motor drive package provides a cost effective solution for OEM stepping motor applications in a rugged and easy to install package. For more information refer to catalog GFW-3025.

Voltage Specifications

DC Inputs	24 VDC Sink/Source	All DC Input Models
DC Outputs	5/12/24 VDC Source	IC200UDR005 IC200UDR010 IC200UAL006
DC Outputs	12/24 VDC Source	IC200UDD104 IC200UDD110 IC200NDD101

VersaMax Micro *(see note below)

	Maximum Amount		
	Number of PWM/Pulse	Number of Type A Counters	Number of Type B Counters
	1	3	0
	1	0	1
	2	2	0
	3	1	0
	4	0	0

VersaMax Nano

	Maximum Amount		
	Number of PWM/Pulse	Number of Type A Counters	Number of Type B Counters
	1	2	0
	1	0	1
	2	1	0
	3	0	0

Note: IC200UDD104, IC200UDD110 and IC200NDD101 have only 1 DC output

Key Features
- 5 kHz PWM or Pulse Train
- 10 kHz High Speed Counter, Type A and B available
- Variable Frequency Function
- Multi-step Ramping

Stepping Motor Cube — integrated motor and amplifier

Material Handling
- Pick and Place
- Conveying
- Accumulating
- Assembly

Packaging
- Wrapping
- Lane diverting
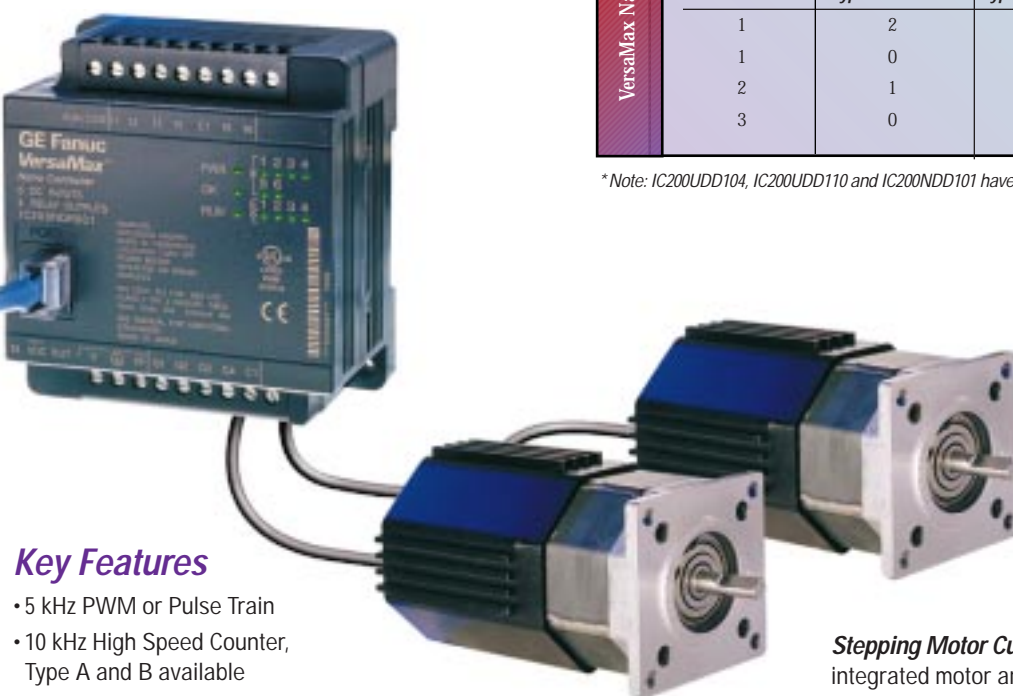- Milk cartoning
- Dispensing
- Labeling
- Gluing

Converting
- Fabric winding
- Laminating
- Folding
- Printing press
- Fabric silk screen
- Slitting
- Winding

VersaPro™ Programming Software

PLC Programming Made Easy

With GE Fanuc's VersaPro Software, programming your PLC for even the most complex applications is now a simple and intuitive process. Designed specifically for ease-of-use, VersaPro programming software gives you maximum flexibility for programming your VersaMax™ Micro and Nano PLCs.
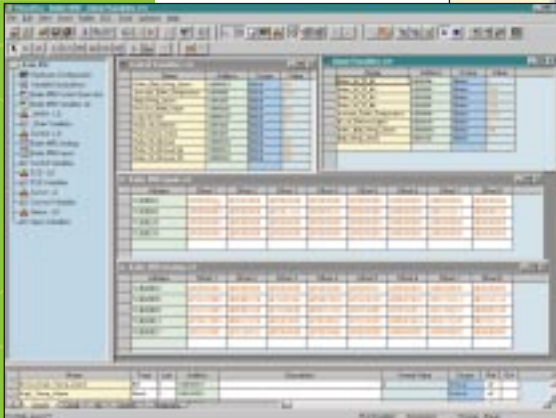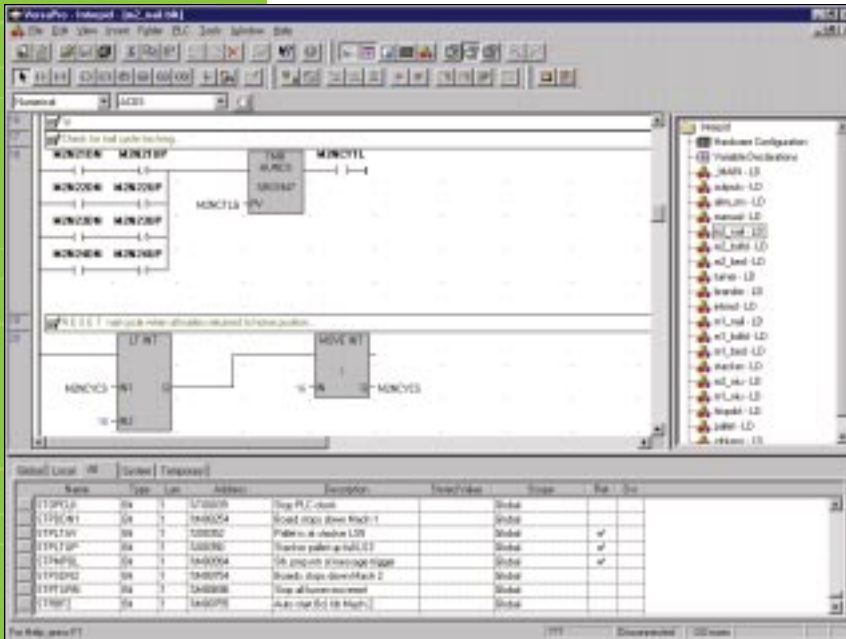
Award-winning VersaPro Allows You to

- Install and run under Windows® 95, 98 and Windows NT® 4.0
- Import your existing LogicMaster™ programs to get the most from your programming investment
- Mix programming languages within an application using both Relay Ladder Diagram (RLD) and Instruction List (IL)
- Convert a program block from RLD to IL and vice-versa
- Take advantage of PC-based programming to integrate documents created in other programs

View Tables

- Develop and save custom view tables to monitor key information in a format that allows you to troubleshoot quickly and easily
- Build mixed reference tables to monitor several PC references in the same window

On-line Monitoring and Control

- Use the reference tables you create to monitor, maintain and update your variables in real time without any PLC downtime
- View PLC and I/O system fault tables on demand
- Connect to your PLCs using serial communications for direct access

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VersaPro Toolbars are Designed to Save You Time

Everything you need to start VersaPro, configure your PLC, write logic in RLD or IL, store the program to a PLC and monitor the program can be found in a VersaPro toolbar—no pull-down menu is required.

VersaPro provides you the flexibility to use both a graphical Relay Ladder Diagram (RLD) editor and a text based Instruction List (IL) editor as you create your application programs. Some tasks are inherently easier to create, debug and troubleshoot in a graphical format, while other tasks are more easily created or represented in a text based editor.

Programming

- Use both RLD and IL Language Editors to suit your programming needs
- Import your existing LogicMaster and Control programs to get your PLCs up and running even faster
- Use simple variable programming to quickly create programs that are easy to understand and troubleshoot
- Increase your productivity with powerful grid-based editors that support cut, copy, paste, and drag-and drop functions
- Reduce keystrokes and the chance of errors when entering Logic with intuitive, context-sensitive editors

Hardware Configuration

- Save time with drag-and-drop graphical configuration tools
- View your hardware mapping with automatically built reference tables

Relay Ladder Diagram

- Provides an easy to read graphical format for creating Sequential Logic or Interlocking Boolean Logic
- Easily understood by technicians and maintenance personnel
- On-line display of information makes this editor a powerful troubleshooting tool
- A structured programming environment provides the capability to call subroutines written in IL or RLD
- Programs written in RLD can be converted to IL if desired

Instruction List

- Mathematical calculations, comparison and conversion operations are easily created and represented in the VersaPro IL editor
- Program blocks can be created in other programs like Microsoft® Word or Excel and easily imported into the VersaPro IL editor
- The IL editor allows the programmer to provide documentation on each instruction entered in Logic to improve program readability
- On-line documentation displays the value of every variable to aid in troubleshooting
- Program blocks written in IL can be converted to RLD if desired

Instruction Set

Bit Operation Functions
Logic AND, Logical OR
Exclusive OR, Logical Invert (NOT)
Shift Right/Shift Left
Rotate Right/Rotate Left
Bit Test
Bit Set, Bit Clear
Masked Compare
Bit Position
Bit Sequencer

Control Functions
Do I/O
Call
End
Subroutines
Comment
Master Control Relay
Service Request
PID

Data Move Functions
Move
Block Move
Block Clear
Shift Register
Communication Request
   Motion Moves
   High Speed Counter
   Serial Read/Write

Data Type Conversion Functions
Convert to BCD-4
Convert to Signed Integer
Convert to Double Precision Signed Integer
Convert to Real
Convert Real to Word
Truncate Real Number

Math and Numerical Functions
Add, Subtract, Multiply Divide
Modulo Division
Scaling
Square Root
Trigonometric Functions
Logarithmic/Exponential Functions
Convert Radians/Degrees

Relation Functions
Equal
Not Equal
Greater Than
Less Than
Greater or Equal
Less or Equal
Range

Relay Functions
Contacts, Coils
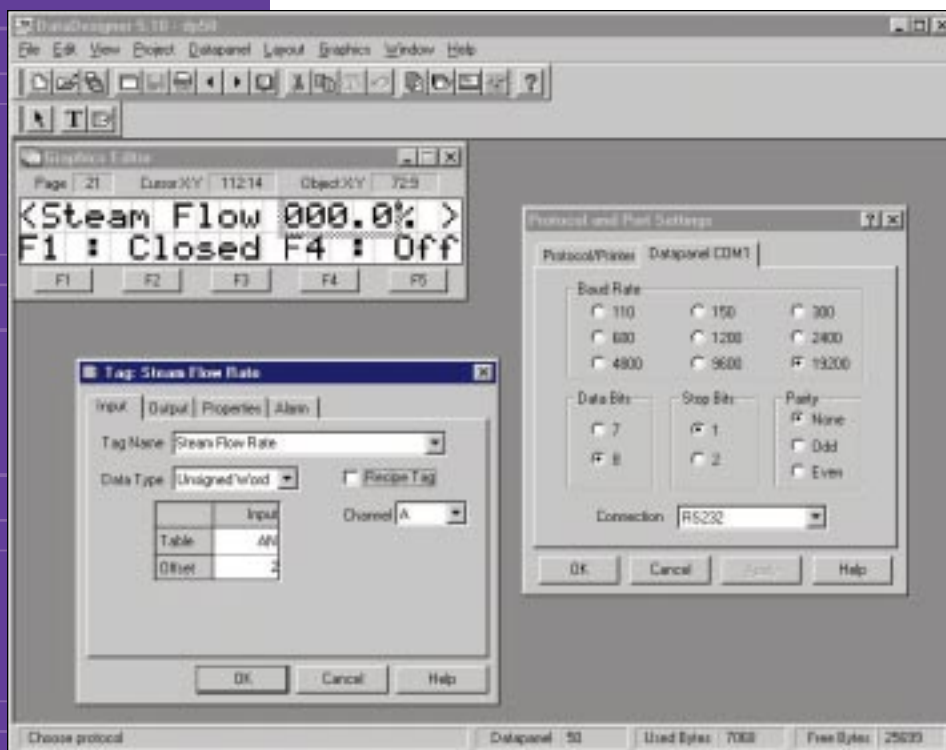Fault and No Fault Contacts
Alarm Contacts

Table Functions
Array Move
Search

Timer and Counter Functions
Time-tick Contacts
On Delay Stopwatch Timer
On Delay Timer
Off Delay Timer
Up Counter
Down Counter

Operator Interface Options

GE Fanuc VersaMax DataPanels are ideal for a broad range of applications ranging from a simpleTimer/Counter/Register Access to full text message display with numeric keypad. All of the VersaMax DataPanels are preprogrammed to quickly connect to a VersaMax Micro or Nano without user configuration. The VersaMax DataPanels are cost effective solutions.

Key Features:
- Programmable function/numeric keys
- Up to 200 messages
- Navigation and edit keys
- Programmable LEDs
- Alarm, recipes, and menu support
- VersaMax Micro and Nano ready

DataDesigner Software enables you to design your text messages quickly using simple dialog prompts.

Specifications

Model	DP20	DP45	DP65	DP85
Part Number	IC200DTX200	IC200DTX450	IC200DTX650	IC200DTX850
Dimensions– Width x Height x Depth (mm)	108 x 60 x 30	110 x 60 x 60	96 x 96 x 50	182 x 101 x 37
Cut Out– Width x Height (mm)	92 x 45	92 x 45	92 x 92	158 x 74
Characters Per Line and Number of Lines	16 x 2	16 x 2	16 x 4	20 x 4
Display Type	LCD Display with LED Backlight			
Function Keys	0	6	8	8
Numeric Keypad	No	No	Yes	Yes
Operating Temperature	0-50C			
Powered by Serial Cable from PLC	Yes	No	No	No
Serial Port	RS-232			
Power Requirements	5 V @ 100 ma	24 V @ 40 ma	24 V @ 80 ma	24 V @ 50 ma
Agency	UL, Class 1 Div 2, FCC and CE			
NEMA Rating	NEMA 4			
Memory Size (Number of Messages)	N/A	200	200	200
Programming Software	DataDesigner Part # IC752DDZ000			

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DP 20

Quickly change timer/counter and register values

Alarm messages and information messages can be sent from the controller to the DP 20 using the Serial Write command.

DP 45

• 6 function keys
• Stores 200 messages
• 2 line display

VersaMax Micro

DP 65

• 8 function keys
• Stores 200 messages
• 4 line display

DP 85

• 8 function keys and data entry keypad
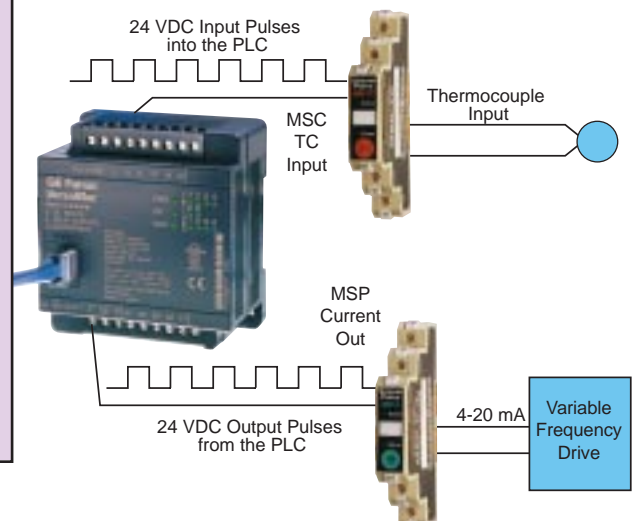• Stores 200 messages
• 4 line display

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Signal Conditioning Options

If your application requires additional analog I/O such as current inputs/outputs, voltage inputs/outputs, RTD, Thermocouple or potentiometer, the line of SensorPulse signal conditioners is the solution. The MSP family of single channel analog I/O modules permits most analog sensors or actuators to be used with the VersaMax Micro and Nano. Each MSP model supports one analog signal type and provides one interface channel with the PLC.

A small ladder logic program is provided to convert the pulse string to and from the MSP and stored in registers for your control program. The MSP modules come from the factory pre-configured and may be reconfigured using SignalFlex™ configuration software.

Part Number	Description
Analog Inputs	
11-1000-10	4 - 20 mA
11-1001-10	0 - 20 mA
11-2000-10	0 - 10 VDC
11-2001-10	0 - 5 VDC
Thermocouple Input	
11-3004-10	Type J -200 to 760 C (-328 to 1400 F)
11-3005-10	Type K -200 to 1370 C (-328 to 2498 F)
11-3006-10	Type N -200 to 1300 C (-328 to 2372 F)
11-3007-10	Type T -200 to 400 C (-328 to 752 F)
11-3008-10	Type E -200 to 1000 C (-328 to 1832 F)
11-3009-10	Type S 0 to 1768 C (32 to 3214 F)
RTD Input	
11-4000-10	PT100 0,00385 -200 to 850 C (-328 to 1562 F)
11-4002-10	PT100 0,00385 -50 to 200 C (-58 to 392 F)
11-4003-10	PT100 0,00392 -200 to 850 C (-328 to 1562 F)
11-4004-10	NI120 -80 to 200 (-112 to 392 F)
Analog Out	
11-7000-10	4 - 20 mA
11-7001.10	0 - 20 mA
11-8000-10	0 - 10 VDC
11-8001-10	0 - 5 VDC
Power Supply	
30-1004-10	24 VDC, 170 mA output; 85 – 250 VAC, 50/60 Hz input
Configuration Tool	
12-1000-10	SignalFlex isolated configuration cable and software

General Specifications:

- Input power 15 to 32 VDC
- Output voltage from MSP to PLC is 24 VDC
- Input voltage from PLC to MSP is 24 VDC
- Update Speed 0.1 to 0.5 seconds depending on PLC scan rate
- Operating Temperature: -40 to +85ºC
- Mounting: 32 x 35 mm DIN & G rail
- Dimensions: 75 mm H x 12.2 mm W x 60 mm D
- Diagnostics LEDs: Active and Alarm
- Input and Output voltage to PLC is 24 VDC
- Accuracy: +/- 0.05% of Full Scale
- Thermal stability: 0.01% Full Scale/ ºC

24 VDC Input Pulses into the PLC

MSC TC Input

Thermocouple Input

MSP Current Out

24 VDC Output Pulses from the PLC

4-20 mA

Variable Frequency Drive

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General Specifications

General Specifications	VersaMax Micro	VersaMax Nano
Controller		
Processor	Hitachi Super H Processor Operating at 28.0 MHz	
Execution Time (Per Boolean Operation)	1.0 μsec	1.2 μsec
Program Storage	Flash (Battery Backed RAM on 23 and 28 point Micros with battery option)	
User Program Logic Memory	9K Words	2K Words
Real Time Clock	Yes on 23 and 28 point micro	No
Flash Memory	1 Meg	512K
Physical I/O Maximum	84 I/O for 28 point with Expansion 79 I/O for 23 point with Expansion 70 I/O for 14 point with Expansion	10 I/O no expansion
I/O and Register Addressing		
Discrete Inputs	512 bits (%I001 to %I512)	
Discrete Outputs	512 bits (%Q001 to %Q512)	
Discrete Global References	1280 bits (%G001 to %G1280)	
Discrete Internal Coils (Battery Backed)	1024 bits (%M001 to %M1024)	
Discrete Temporary Coils	256 bits (%T001 to %T256)	
Status Bits	128 bits (%S001 to %SC0032)	
Registers	2K words (%R001 to %R2048)	512 words (%R001 to %R512)
Analog and High Speed Counter Inputs	128 Words (%AI001 to %AI0128)	
Analog Outputs	128 Words (%AQ001 to %AQ0128)	
System Registers	16 Words (%SR001 to %SR0016)	
Timers/Counters	682 Maximum	170 Maximum
Memory Retention (typical at 25° C)		
Temporary Memory Data Retention (SuperCap)	3 Days for 14 point 30 Minutes 28/23 point	Not Available
Battery Back-up Option (23 point and 28 point Micro's only)	2 months Retention	Not Available
Motion Control		
High Speed Counter– Type A and B	10 kHz (Maximum of 4)	10 kHz (Maximum of 2)
PWM/Pulse Train (DC Outputs only)	5 kHz (Maximum of 4)	5 kHz (Maximum of 3)
Communications		
Serial Ports	(1) RS-232 on 14 point (1) RS-232 and (1) RS-485 on 23 and 28 point micro	(1) RS-232
Protocols	SNP, SNP X, and Modbus Slave (2 and 4 wire RTU Slave)	
Master/Slave	Slave on port 1 and Master/Slave on second port of 23 and 28 point micro	Slave only
Modem Compatible	Yes	
Multi-drop	Yes. RS-232 to RS-485 converter available for port 1 (IC200ACC415 RS-232 to RS-485 Converter)	
Serial Read and Write command support	Yes	
Serial port connector type	Port 1—RJ-45 (8 pin) Port 2—DB-15 on 23 and 28 point Micros	
Hardware Specifications		
Run/Stop Switch	Yes	Yes using external switch on input terminal
Removable I/O Terminal Strips	Yes	No
Mounting	35mm DIN Rail or Panel Mount	
Dimensions (W/H/D)	14 point and Expansion units — 95mm x 90mm x 76mm 23/28 point—150mm x 90mm x 76mm	75mm x 80mm x 47mm

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Specifications

Power Supply and I/0 Specifications

AC Power Supply	**100 to 240 VAC, 50/60 Hz**
Voltage Range	85 to 264 VAC
Frequency	50 -5% to 60 +5% Hz
Hold-Up	20 ms at 100 VAC
Inrush Currents	15 A maximum at 100 VAC 40 A maximum at 200 VAC
Input Current	0.2 A typical at 100 VAC 0.1 A typical at 200 VAC
Input Power Supply Rating	35 VA
24 VDC User Power	200 ma
DC Power Supply	**24 VDC**
Voltage Range	19.2 VDC to 30 VDC
Hold up	10 m sec.
Input Power	8 watts internal + 5 watts out to user 24 VDC out

24 VDC Inputs	**24 VDC (Pos./Neg.)**	AC Inputs	**120 VAC**
Voltage Range	0 to 30 volts DC	Voltage Range	85–132 VAC, 50 -5% to 60 +5% Hz
Input Current	7.5 mA typical	Maximum Input Voltage	132 V rms, 50/60 Hz
Input Resistance	2.8 Kohms	Input Current	7 mA rms, (100 VAC, 60 Hz)
Input Threshold Voltage ON / OFF	15 V minimum 5 V maximum	Voltage ON / OFF	Minimum 80 V rms, 4.5 mA rms Maximum 30 V rms, 2 mA rms
Input Threshold Current ON / OFF	4.5 mA maximum 1.5 mA minimum	Response ON / OFF	25 ms maximum 30 ms maximum
Inrush Current	1.4 A typical at 24 VDC	OFF State Leakage	0.1 mA maximum
Response Time	0.5 to 20 ms configurable as regular input	**AC Outputs**	**120 VAC/240 VAC**
24 VDC Outputs–Low Current	**24 VDC/12 VDC/5 VDC (Pos.)**	Voltage Range	100 -15% to 240 +10% VAC, 50 -5% to 60 +5% Hz
Voltage Range	24 VDC, +20%, -79%	Maximum Resistive Load Current	14 point–0.5 A/point (0.6 A max.. on COM 1; 1.2 A max. on COM 2) 28 point–0.5 A/point (0.6 A max. on COM 1 and COM 3; 1.2 A max. on COM 2 and COM 4)
Maximum Pilot Duty Rating	0.75 A at 24 VDC		
Maximum Resistive Load Rating	0.75 A at 24 VDC 0.5 A at 12 VDC 0.25 A at 5 VDC		
Output Voltage Drop	0.3 VDC maximum	Maximum Inrush Current	5 A (1 period)/point 10 A (1 period)/common
Response ON / OFF	0.1 ms maximum (24 VDC, 0.2 A) 0.1 ms maximum (24 VDC, 0.2 A)	Maximum Voltage Drop When ON	1.5 V rms
OFF State Leakage	0.1 mA maximum	Maximum Leak Current when OFF	1.8 mA rms (115 VAC) 3.5 mA rms (230 VAC)
24 VDC Outputs–High Current	**24 VDC (Pos.)** **IC200UDD104/110 Units Only**	Response Time OFF to ON / ON to OFF	Maximum 1 ms Maximum 1 ms + 1/2 Cycle Period
Voltage Range	24 VDC, +10%, -57%	**Relay Outputs**	**5 to 30 VDC 5 to 250 VAC**
Maximum Load	1 A per point (Q1–Q2) at 100% ON duration 0.5A per point (Q3–Q6) at 100% ON duration plus additional for IC200UDD110: 0.5 A per point (Q7–Q10) at 100% ON duration 1.0 A per point (Q11–Q12) at 100% ON duration	Operating Voltage	5 to 30 VDC and 5 to 250 VAC
		Leakage Current	15 mA
		Maximum Pilot Duty Rating	2 amps at 24 VDC and 240 VAC
		Maximum Resistive Load Rating	2 amps at 24 VDC and 240 VAC
		Minimum Load	1 mA
Maximum Inrush Current	8 A of 20 ms, 1 pulse (1 A outputs) 4 A of 20 ms, 1 pulse (1 A outputs)	On Response Time	15 ms maximum
		Off Response Time	15 ms maximum
Output Voltage Drop	0.3 V maximum	Contact Life	Mechanical 20,000,000 Electrical 200,000 electrical operations resistive load (2 amp)
Response ON / OFF	0.1 ms maximum (24 VDC, 0.2 A) 0.1 ms maximum (24 VDC, 0.2 A)		
OFF state leakage	100 mA maximum		

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I/O Specifications

Analog Inputs

Input Ranges	0 to 10 V (10.24 V max.)	
	0 to 20 mA (20.5 mA max.)	
	4 to 20 mA (20.5 mA max.)	
Resolution: 0 to 10 V Range	12 bits (1 LSB=2.5 mV)	
0 to 20 mA Range	12 bits (1 LSB=5 µA)	
4 to 20 mA Range	11+ bits (1 LSB=5 µA)	
Accuracy	+/- 1% of full scale over full operating temperature range	
Linearity	+/-3 LSB maximum	
Common mode voltage	+/- 200 V maximum	
Current input impedance	249 ohms	
Voltage input impedance	100 K ohms	
Input Filter Time	20 ms to reach 1% error for step input	

Analog Outputs

Output Ranges	0 to 10 V (10.24 V max.)
	0 to 20 mA (20.5 mA max.)
	4 to 20 mA (20.5 mA max.)

Resolution: 0 to 10 V Range	12 bits (1 LSB=2.5 mV)	
0 to 20 mA Range	12 bits (1 LSB=5 µA)	
4 to 20 mA Range	11+ bits (1 LSB=5 µA)	
Accuracy	+/- 1% of full scale over full operating temperature range	
Current: Max Voltage at 20 mA	10 VDC	
User Load Range	10 to 500 OHM	
Output Load Capacitance	2000 pF Maximum	
Output Load Inductance	1 Henry Maximum	
Voltage: Output Loading	10K OHM Minimum at 10 VDC	
Output Load Inductance	1 µ F Maximum	

Analog Input Potentiometer (Micro only)

Analog Input Channels	2
Input Ranges	0 to 1024
Resolution	10 bits
Input Filter Time	Configurable

Environmental and Agency Specifications

Agency Approvals Overview

Industrial Control Equipment [Safety]	UL508, CSA C22.2 No 142-M1987	
Hazardous Locations [Safety] Class I, Div II, A, B, C, D	UL1604 CSA C22.2 No 213-M1987	
European EMC Directive	CE Mark	

Standards Overview

		Conditions
Environmental		
Vibration	IEC68-2-6, JISC0911	2G @ 57-500 Hz, 0.15 mm p-p @ 10-57 Hz
Shock	IEC68-2-27, JISC0912	15G, 11ms
Operating Temperature		0° C to 55° C [ambient]
Storage Temperature		-10° C to +75° C
Humidity		5% to 95%, non-condensing
Enclosure Protection	IEC529	Enclosure per IP54; protection from dust & splashing water
EMC Emissions		
Radiated, Conducted	CISPR11, EN55011 47 CFR 15	Group 1, Class A [applies to CE Marked modules] part 15, subpart J
EMC Immunity		
Electrostatic Discharge	EN 61000-4-2	8 KV Air Discharge, 4 KV Contact Discharge
Radiated RF ENV 50140, ENV 50204	EN 61000-4-3	10 V_{rms}/m, 80 MHz to 1000 MHz, modulated
Fast Transient Burst	EN 61000-4-4	2 KV: power supplies, 1 KV: I/O, communications
Surge Withstand	IEC 1000-4-5 IEC 1000-4-12	Power >50 V, 2 KV (line-to-ground), 1 KV (line-to-line) supply: <50 V, 0.5 KV (line-to-ground), 0.5 KV (line-to-line) Communications port and I/O: 1 KV
Conducted RF	EN 61000-4-6	10 V, 150 kHz to 80 MHz injection for comm cables >30m
Isolation		
Dielectric Withstand	UL508, UL840, IEC664	1.5 KV for modules rated from 51 V to 250 V
Power Supply		
Input Dips, Variations	IEC1000-4-11	During Operation: Dips to 30% and 100%, Variation for AC ±10%, Variation for DC ±20%

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Panel Control Options

C-2000™ Contactors & Starters

IEC contactors and starters, rated from
3 to 1250 amps, come with an array of
accessories broad enough to meet every
motor control need.
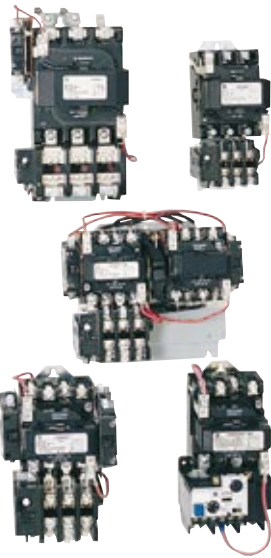
300-Line Contactors & Starters

NEMA contactors and starters through
NEMA size 9, are the choice for applications
where the environment is demanding and
the need for reliability is paramount.

ASTAT Solid-State Starters

Solid state starters, with optional integral
bypass and circuit protection, deliver total
control of motors from fractional to 1000 hp.
Choose open or enclosed versions.

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Electronic Timers & Relays

Electronic timers and relays bring logic, control and protection in a wide variety of forms to panel and machine applications.

Control Power Transformers

Type IP control power transformers in 50-3000VA are designed for easy terminations, built for durability, and encapsulated for the highest quality electrical performance.

IEC Manual Motor Starters

IEC manual motor starters, integrated starters and a full line of accessories offer flexible control and full protection in full compliance with NEMA, UL, NEC and IEC requirements.

C-2000 Push Buttons

22mm push buttons deliver outstanding appearance, thoughtful ergonomics, broad selection, innovative contact blocks, modular versatility, long-term reliability and global applicability.

CR104P Push Buttons

30mm NEMA push buttons offer the industry's only all-metal NEMA 4X protection, proven over time and appreciated for both their rugged reliability and good looks.
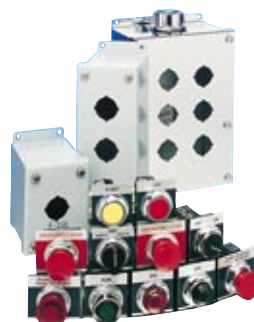
IEC Switches

All kinds of switches—disconnect switches, rotary cam switches, fusible switches and more—support applications that range from logic level to power distribution system protection.
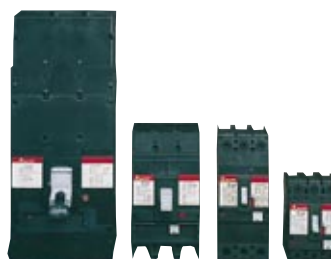
Spectra Series™ Molded Case Circuit Breakers

The full range of circuit breakers includes solid state and standard molded case circuit breakers plus a full line of insulated case breakers, air frame ANSI breakers and even miniature DIN rail-mounted supplemental protectors.

AF-300 P11 Variable Frequency Drives

Adjustable frequency drives with exclusive soft-switching technology, intelligent keypads and feature-rich design take it easy on motors and make it easy for you.

Communications Networks
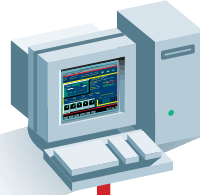
CIMPLICITY HMI
FrameworX
VersaPro
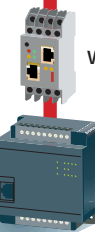Control
Logicmaster 90
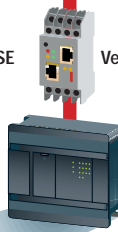
Ethernet

TCP/IP   TCP/IP
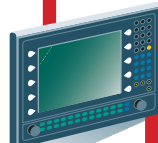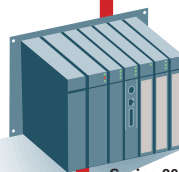
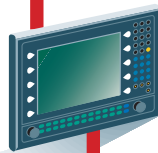FrameworX   Series 90-70
PLC   OpenFactory CNC

VersaMax SE   Vers

VersaMax
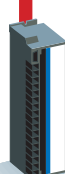Nano   VersaMax
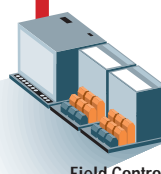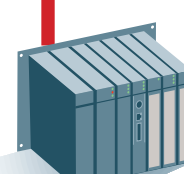Micro

Genius Bus

CIMPLICITY
HMI   Power Mate D
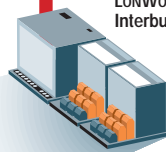Power Mate H   Genius
I/O   Field Control
I/O   Series 90-70
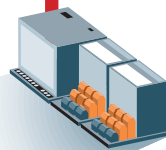PLC   VersaMax
I/O

WorldFIP, Profibus, Interbus-S

Profibus-DP
WorldFIP
LONWORKS
Interbus-S   Profibus-DP
DeviceNet
Modbus   Profibus-DP   Profibus
DeviceNet

Field
Control I/O   GE Fuji
Drives   Series 90-70
PLC   CNC

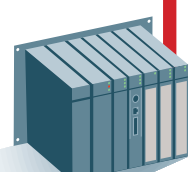**SNP (Series Ninety Protocol)   RS-485, Modbus RTU**

Micro Field Processor

Field
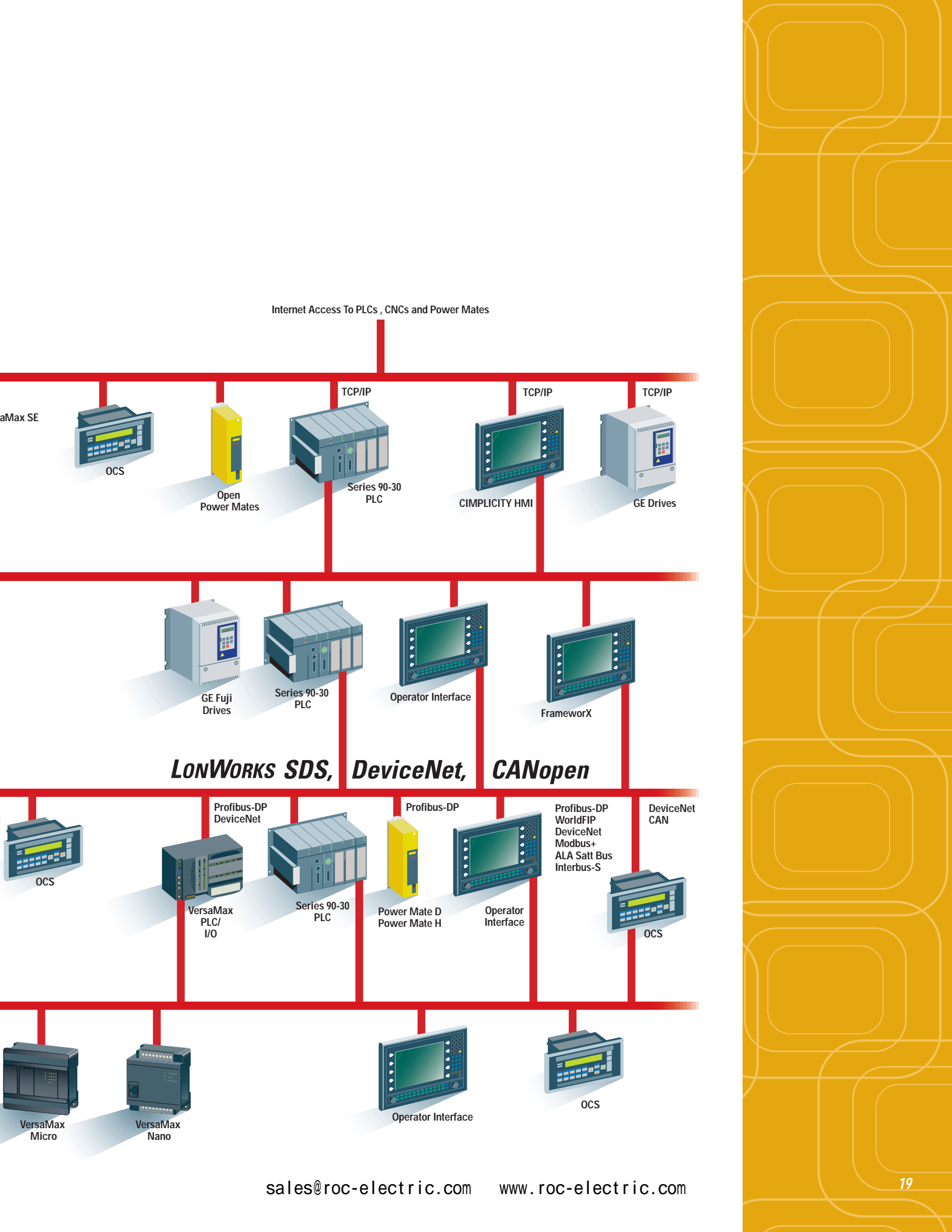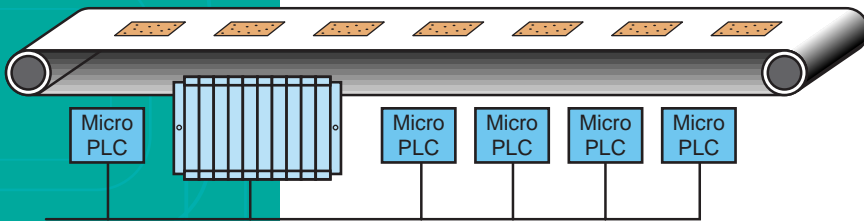Control I/O   Series 90-30
PLC   VersaMax
PLC   Series 90-70
PLC

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Internet Access To PLCs , CNCs and Power Mates

aMax SE

OCS

Open Power Mates

TCP/IP

Series 90-30 PLC

TCP/IP

CIMPLICITY HMI

TCP/IP

GE Drives

GE Fuji Drives

Series 90-30 PLC

Operator Interface

FrameworX

LONWORKS SDS, DeviceNet, CANopen

OCS

Profibus-DP DeviceNet

VersaMax PLC/ I/O

Series 90-30 PLC

Profibus-DP

Power Mate D Power Mate H

Profibus-DP WorldFIP DeviceNet Modbus+ ALA Satt Bus Interbus-S

Operator Interface

DeviceNet CAN

OCS

VersaMax Micro

VersaMax Nano

Operator Interface

OCS

# Micro/Nano Applications

Bakery Industry—
Pastry Line Conveyor Control

Ten VersaMax Micro PLCs are distributed along the conveyor belt at each packaging point of a toaster pastry line. The high-speed counting ability of the VersaMax Micro PLC and its local logic allow it to make the necessary on-the-fly decisions for conveyor control, based on the high-speed counting of pastries and the downstream packaging machinery loading. System parameters are transmitted to a Series 90-70 PLC, which monitors the overall performance of the system.
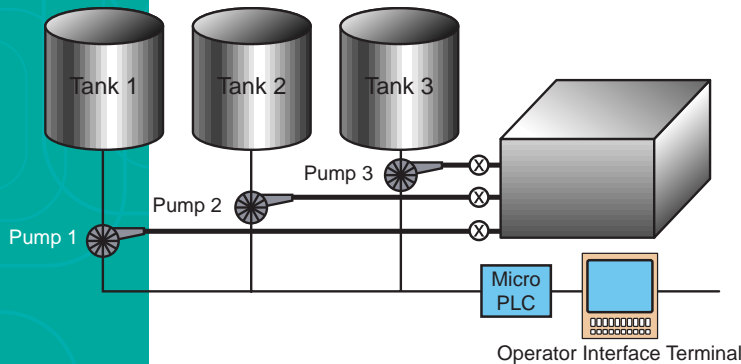
Chemical Industry—
Chemical Pumping Station

A 14-point VersaMax Micro PLC is used with an operator interface terminal to replace mechanical timers, counters, and relays that control pumping stations delivering chemicals to the cleaning station. The existing mechanical system was hard-wired and difficult to modify. The new PLC-based system offers flexibility through programming, reduced need for panel space, and ease of wiring.

Packaging Industry—
## Shrink Wrapping Machines
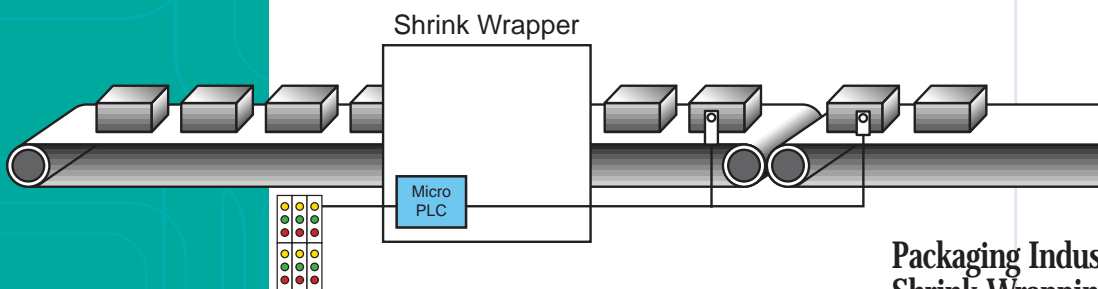
The VersaMax Micro PLC uses input from various sensors to determine the position of product and parameters from the control panel to sequence the wrapping of the products.

A 28-point VersaMax Micro PLC provides cost-effective operating control for a shrink-wrapping machine. The system receives inputs from sensors to determine the position of the product, then wraps the product. The flexibility of the VersaMax Micro PLC allows the parameters for different products to be changed at a control panel without any programming modifications.

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## Water and Wastewater Industry— Flood Control Monitoring

A VersaMax Micro PLC and an operator interface terminal are used for a reliable and cost-effective system for flood-control pumping stations. The VersaMax Micro PLC monitors start and stop cycles, elapsed time, on/off status, and fault conditions. The Micro PLC-based system replaces an older system of hardwired pilot lights, which conveyed only basic information to the operator and were difficult to maintain. Through the operator interface unit, the VersaMax Micro PLC provides ample metering information that helps the maintenance team identify possible problem areas in the sewer line. The Micro PLC provides valuable data about the capabilities of the existing sewer system to handle large amounts of water during heavy storms. The data is then transmitted via a modem to a SCADA System.
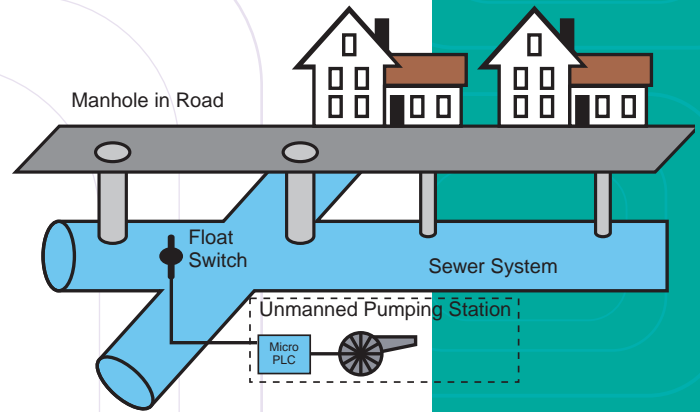
VersaMax PLCs use float switches to monitor the level of water in the sewer system. During storms it cycles relief pumps on and off to prevent the backup of water into houses and businesses.

## Construction Equipment Industry— Pipe Measuring System

A 14-point VersaMax Micro PLC and an operator interface terminal provide a control system that accurately measures and controls cutting of pipe in 4-foot to 28-foot lengths. Measurement data is received from an encoder. The operator display shows pipe lengths in feet, inches, and fractions of inches. Operators specify pipe length and the control system measures the pipe and cuts it to the specified length. The Micro PLC's four built-in high-speed counters allow it to interface to the quadrature encoder that measures the pipe sections. The VersaMax Micro PLC produces reliable machine operation and improved machine performance, reduced setup time and faster processing of products.
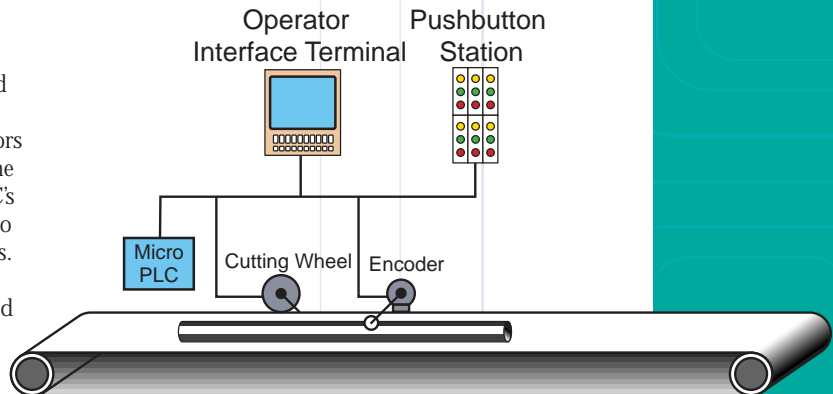
The VersaMax Micro PLC measures the length of the pipe using input from the encoder and displays the length on the operator interface unit.

Plastics Industry— Injection Molding

The 14-point VersaMax Micro PLC is installed in an injection molding machine that controls the application of plastic handles to milk and juice jugs. It counts and sequences two jugs that are then joined with one plastic handle (for retail customer convenience). Jugs are queued up before being fed through the handle applicator. The Micro PLC accepts either continual or random feeding, and operates with jugs ranging in size from one quart to one gallon. Handles are heated for easy application without melting or deforming. Diagnostics indicate when the supply of handles is low or empty. Additional diagnostics alert personnel to equipment feed jams, feed rate, and count. The manufacturer of the injection molding machine can easily modify the application program to match the machine operation in the customer's environment.
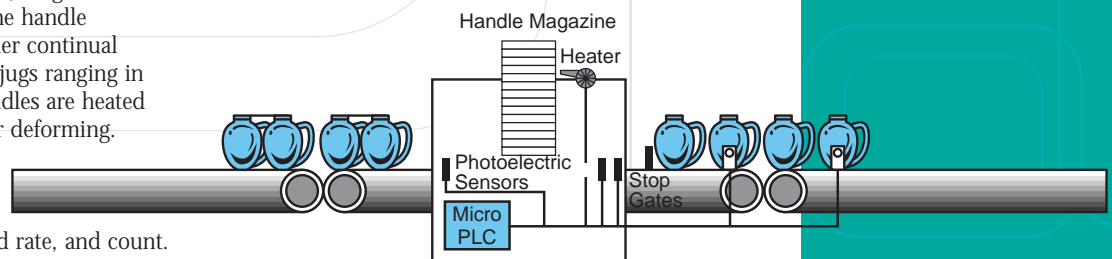
The VersaMax Micro PLC uses inputs from various sensors to control the handle applicator system

VersaMax Micro and Nano Selection Guide

Applications Requiring:
1 serial port with 6 discrete inputs & 4 outputs or less

VersaMax Nano

Non Expandable:
VersaMax Nano Controller Options:

(6) 24 VDC Inputs and (4) 24 VDC Outputs, 24 VDC Power Supply: Part # IC200NDD101

(6) 24 VDC Inputs and (4) Relay Outputs, 24 VDC Power Supply: Part # IC200NDR001

See page 13 for more details.

Applications Requiring:
1 serial port with 8 discrete inputs & 6 outputs or less

VersaMax Micro 14 point

Expandable to 70 I/O:
VersaMax Micro Controller Options:

(8) 24 VDC Inputs and (6) 24 VDC Outputs, 24 VDC Power Supply: Part # IC200UDD104

(8) 24 VDC Inputs and (6) Relay Outputs, 24 VDC Power Supply: Part # IC200UDR002

(8) 24 VDC Inputs and (6) Relay Outputs, 120/220 VAC Power Supply: Part # IC200UDR001

(8) 120 VAC Inputs and (6) 120 VAC Outputs, 120/220 VAC Power Supply: Part # IC200UAA003

See page 13 for more details.

VersaMax Micro Expansion Options: (Max. of 4 Units)

(8) 24 VDC Inputs and (6) 24 VDC Outputs, 24 VDC Power Supply: Part # IC200UEX014

(8) 24 VDC Inputs and (6) Relay Outputs, 24 VDC Power Supply: Part # IC200UEX012

(8) 24 VDC Inputs and (6) Relay Outputs, 120/220 VAC Power Supply: Part # IC200UEX011

VersaMax Expansion Unit

Expansion Cable Options:

(0.1 meter cable is included with expansion base)

0.5 meter cable: Part # IC200CBL505

1.0 meter cable: Part # IC200CBL510

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Applications Requiring:

2 serial ports with 16 discrete Inputs, 12 discrete outputs also applications requiring 2 Analog in 1 Analog out

Expandable up to 84 I/O:

VersaMax Micro Controller Options:

(16) 24 VDC Inputs and (12) 24 VDC Outputs, 24 VDC Power Supply: Part # IC200UDD110

(16) 24 VDC Inputs, (1) 24 VDC Output and (11) Relay Outputs, 24 VDC Power Supply: Part # IC200UDR010

(16) 24 VDC Inputs, (1) 24 VDC Output and (1) Relay Outputs, 120/220 VAC Power Supply: Part # IC200UDR005

(16) 120 VAC Inputs and (12) 120 VAC Outputs, 120/220 VAC Power Supply: Part # IC200UAA007

(13) 24 VDC Inputs, (1) 24 VDC Output and (9) Relay Outputs, (2) Analog Inputs, (1) Analog Output, 120/220 VAC Power Supply: Part # IC200UAL006

Real Time Clock and Long Term Data Retention require battery: Part # IC200ACC403

See page 13 for more details.

VersaMax Micro 28 point

VersaMax Micro Expansion Options: (Max. of 4 Units)

(8) 24 VDC Inputs and (6) 24 VDC Outputs, 24 VDC Power Supply: Part # IC200UEX014

(8) 24 VDC Inputs and (6) Relay Outputs, 24 VDC Power Supply: Part # IC200UEX012

(8) 24 VDC Inputs and (6) Relay Outputs, 120/220 VAC Power Supply: Part # IC200UEX011

Expansion Cable Options:

(0.1 meter cable is included with expansion base)

0.5 meter cable: Part # IC200CBL505

1.0 meter cable: Part # IC200CBL510

VersaMax Expansion Unit

Programming, Communications and Operator Interface Options:

Programming Options: (see page 9 for more details)

VersaPro Programming Software without RS-232 cable: Part # IC641VPS002

VersaPro Programming Software with RS-232 cable (IC200CBL500): Part # IC640VPS002

Communications Options: (see page 6 for more details)

RS-232 to RS-485 Converter: Part # IC200ACC415

RS-485 to RS-232 Converter: Part # IC690ACC901

RS-485 to RS-485 Isolator: Part # IC690ACC903

Programming Cable: Part # IC200CBL500 and comm cable

Operator Interface Options: (see page 10 for more details)

Timer/Counter/Register Access interface with 2 x 16 character display: Part # IC200DTX200

2 x 16 character display, stores up to 200 messages and has 6 function keys: Part # IC200DTX450

4 x 16 character display, stores up to 200 messages and has 8 function keys: Part # IC200DTX650
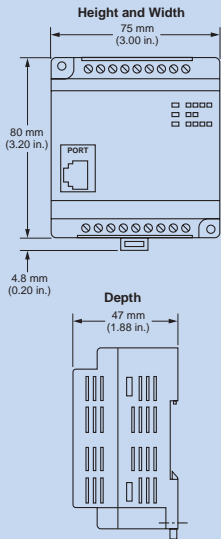
4 x 20 character display, stores up to 200 messages and has 8 function keys and data keypad: Part # IC200DTX850

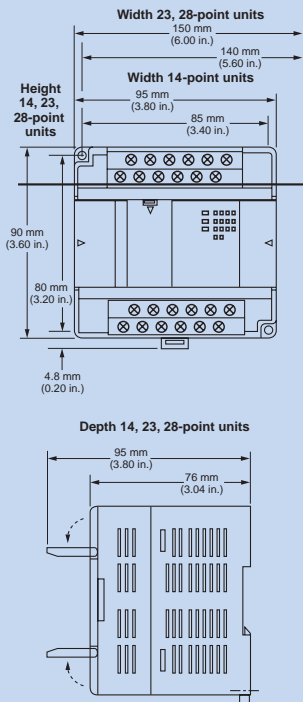*VersaMax Data Panel programming package with cable: Part # IC752DDZ000*

Communications Cable between VersaMax Micro or Nano and VersaMax DataPanel operator interface: Part # IC200CBL550

Dimensions of Nano PLCs

Height and Width
75 mm (3.00 in.)

80 mm (3.20 in.)

PORT

4.8 mm (0.20 in.)

Depth
47 mm (1.88 in.)

Dimensions of 14, 23, and 28-Point Micro PLCs and 14-Point Expansion Units

Width 23, 28-point units
150 mm (6.00 in.)
140 mm (5.60 in.)

Width 14-point units
95 mm (3.80 in.)
85 mm (3.40 in.)

Height 14, 23, 28-point units
90 mm (3.60 in.)
80 mm (3.20 in.)
4.8 mm (0.20 in.)

Depth 14, 23, 28-point units
95 mm (3.80 in.)
76 mm (3.04 in.)

VersaMax Micro and Nano Components

Part Number	Description
Nano (10 Point) non expandable	
IC200NDD101	10 point (6) 24 VDC In, (4) 24 VDC Out, 24 VDC Power Supply
IC200NDR001	10 point (6) 24 VDC In, (4) Relay Out, 24 VDC Power Supply
VersaMax Micro (14 Point) expandable up to 4 units	
IC200UAA003	14 point (8) 120 VAC In, (6) 120 VAC Out, 120/240 VAC Power Supply
IC200UDD104	14 point (8) 24 VDC In, (6) 24 VDC Out, 2 1.0 A, 4 0.5A, 24 VDC Power Supply
IC200UDR001	14 point (8) 24 VDC In, (6) Relay Out, 120/240 VAC Power Supply
IC200UDR002	14 point (8) 24 VDC In, (6) Relay Out, 24 VDC Power Supply
VersaMax Micro (28 Point) expandable up to 4 units	
IC200UDR005	28 point; (16) 24 VDC In, (11) Relay Out, (1) 24 VDC Out, 120/240 VAC Power Supply. Battery (IC200ACC403) is required for long term data retention. Battery not included.
IC200UDR010	28 point; (16) 24 VDC In, (11) Relay Out, (1) 24 VDC Out, 24 VDC Power Supply. Battery (IC200ACC403) is required for long term data retention. Battery not included.
IC200UAA007	28 point; (16) 120 VAC In, (12) 120 VAC Out, 120/240 VAC Power Supply. Battery (IC200ACC403) is required for long term data retention. Battery not included.
IC200UDD110	28 point; (16) 24 VDC In, (12) 24 VDC Out 6 1.0 A, 6 0.5A, 24 VDC Power Supply. Battery (IC200ACC403) is required for long term data retention. Battery not included.
VersaMax Micro with Analog expandable up to 4 units	
IC200UAL006	23 point; (13) 24 VDC In, (9) Relay Out, (1) 24 VDC Out, (2) Analog In and (1) Analog Out, 120/240 VAC Power Supply. Battery (IC200ACC403) is required for data retention. Battery not included.
VersaMax Micro Expansion Units (.1 meter cable included)	
IC200UEX011	14 point (8) 24 VDC In, (6) Relay Out, 120/240 VAC Power Supply
IC200UEX012	14 point (8) 24 VDC In, (6) Relay Out, 24 VDC Power Supply
IC200UEX014	14 point (8) 24 VDC In, (6) DC Out, 24 VDC Power Supply
VersaMax Nano and Micro Tool Boxes	
IC200TBX010	Tool box, 10 point, (IC200NDR001) DC In/Relay Out, DC Power Supply With software, manuals and cables (IC640VPS002)
IC200TBX014	Tool box, 14 point, (IC200UDR001) DC In/Relay Out, AC Power Supply With software, manuals and cables (IC640VPS002)
IC200TBX023	Tool box, 23 point, (IC200UAL006) DC In/Relay Out, 2 analog In, 1 analog out, AC Power Supply With software, manuals and cables (IC640VPS002)
IC200TBX028	Tool box, 28 point, (IC200UDR005) DC In/Relay Out, AC Power Supply With software, manuals and cables (IC640VPS002)

Part Number	Description
VersaMax Micro and Nano I/O Expansion/Communication Cables and Converters	
IC200CBL500	Programming cable (RJ-45 to DB-9 pin) RS-232. 3 Meters.
IC690ACC901	RS-485 to RS-232 Converter
IC200ACC415	RS-232 to RS-485 Converter requires IC200CBL500 or equivalent.
IC690ACC903	RS-485 to RS-485 Isolator
IC200CBL501	I/O Expansion cable, 0.1 meter long (Qty 5)
IC200CBL505	I/O Expansion cable, 0.5 meter long
IC200CBL510	I/O Expansion cable, 1 meter long
VersaMax Micro Accessories	
IC200ACC402	Removable Terminal Strips, 10 per pack
IC200ACC403	Battery for 23 and 28 point Micro for data retention
IC200ACC404	Spare parts kit. Two terminal strips and four plastic doors and four covers
IC200KIT001	The kit includes VersaPro (IC640VPS002), CAD files, programming cable, manuals and other tools to aid in the conversion process from Series 90 Micro to VersaMax Micro.
VersaPro Programming Software	
IC641VPS002	VersaPro programming software and documentation for VersaMax Micro and Nano Only. Programming cable not included.CD format
IC640VPS002	VersaPro programming software and documentation for VersaMax Micro and Nano Only. Programming cable (IC200CBL500) included. CD format
VersaMax Data Panel Operator Interfaces	
IC200DTX200	Operator Interface for changing timer/counter/ register values. 2 x 16 character LCD backlight display and 6operation keys. No stored messaging, PLC stores messages. Requires IC200CBL550 cable or equivalent. Operates on 5 VDC @ 100ma from Micro or Nano.
IC200DTX450	Operator Interface with up to 200 stored messages. 2 x 16 character LCD backlight display and 6 function keys. Requires IC200CBL550 cable or equivalent. Operates on external 24 VDC @ 40ma.
IC200DTX650	Operator Interface with up to 200 stored messages. 4 x 16 character LCD backlight display and 8 function keys. Requires IC200CBL550 cable or equivalent. Operates on external 24 VDC @ 80ma.
IC200DTX850	Operator Interface with up to 200 stored messages. 4 x 20 character LCD backlight display, 8 function keys and numeric keypad. Requires IC200CBL550 cable or equivalent. Operates on external 24 VDC @ 50ma.
IC752DDZ000	VersaMax DataPanel programming package with cable.
IC200CBL550	RS232 communications cable (3 meter) between VersaMax Micro or Nano and VersaMax DataPanel operator interface.

Standards: UL Class I Div II, C-UL, CE. Some approvals pending for certain models. Contact GE Fanuc for details.

www.gefanuc.com

GE Fanuc Automation

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