MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

GE VERSAMAX

IC200CPUE05-CF

ETHERNET CPU MODULE

Used with the applicable VersaMax controllers configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: IC200CPUE05.pdf

Chapter 3

CPU Module Datasheet: CPUE05

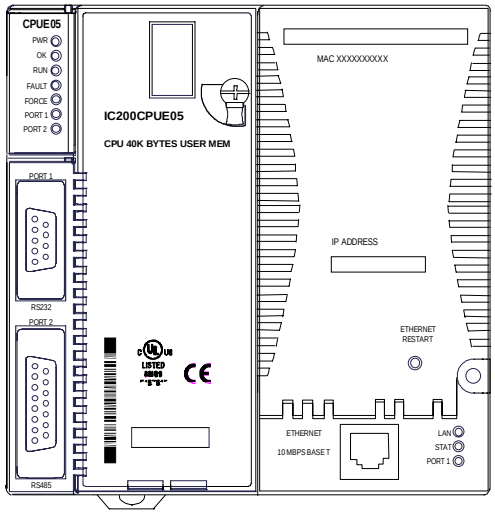
This chapter describes the appearance, features, and functionality of the following VersaMax PLC CPU module:

- IC200CPUE05: CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory

IC200CPUE05: CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory

VersaMax® PLC CPU IC200CPUE05 shares the basic features of the other VersaMax PLC CPUs. It provides powerful PLC functionality in a small, versatile system. CPUE05 can serve as the system controller for up to 64 modules with up to 2048 I/O points. Two serial ports provide RS-232 and RS-485 interfaces for serial communications. CPUE05 also provides a built-in Ethernet Interface. The RS-232 serial port can be configured for Local Station manager operation to provide access to diagnostic information about the Ethernet interface. CPUE05 has 64kB of configurable memory.

In addition, CPUE05 is compatible with the EZ Program Store device, which can be used to write, read, update, and verify programs, configuration, and reference tables data without a programmer or programming software.



Features

- 64kB of configurable memory
- Programming in Ladder Diagram, Sequential Function Chart, and Instruction List
- Compatible with EZ Program Store device.
- Non-volatile flash memory for program storage
- Battery backup for program, data, and time of day clock
- Run/Stop switch
- Floating point (real) data functions
- Embedded RS-232 and RS-485 communications
- Embedded Ethernet interface
- 70mm height when mounted on DIN rail with power supply

CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory: IC200CPUE05

Module Specifications

Size	4.95" (126mm) x 5.04" (128mm)		
Program storage	System flash, battery-backed RAM		
Backplane current consumption: IC200CPUE05	no serial port converter or EZ Program Store device	5V output: 160mA	3.3V output: 650mA*
	with serial port converter or EZ Program Store device	5V output: 260mA	
Floating point	yes		
Boolean execution speed	0.5ms/K (typical)		
Realtime clock accuracy (for timer functions)	100ppm (0.01%) or +/- 9sec/day		
Time of day clock accuracy	23ppm (0.0023%) or +/- 2sec/day @ 30C. 100 ppm (0.01%) or +/- 9sec/day @ full temperature range		
Embedded communications	RS-232, RS-485, Ethernet interface		
Configurable memory	64K bytes maximum		
Ethernet Interface Specifications			
Number of SRTP server connections	8		
Ethernet data rate	10Mbps		
Physical interface	10BaseT RJ45		
WinLoader support	via CPU port		
Number of Ethernet Global Data configuration-based exchanges	32		
EGD Exchange limits	100 data ranges and 1400 bytes of data per exchange; 1200 total data ranges across all exchanges.		
Time Synchronization	NTP - client only		
Selective Consumption of EGD	yes		
Load EGD configuration from PLC to programmer	yes		
Remote Station Manager over UDP	yes		
Local Station Manager (RS-232)	via CPU port		
Configurable Advanced User Parameters	yes		

* CPUE05 requires a power supply with expanded 3.3V.

IC200CPUE05: CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory

VersaMax General Product Specifications

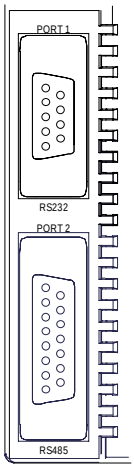
VersaMax products should be installed and used in conformance with product-specific guidelines as well as the following specifications:

Environmental		
Vibration	IEC68-2-6	1G @57-150Hz, 0.012in p--p @10-57Hz
Shock	IEC68-2-27	15G, 11ms
Operating Temp.		0 deg C to +60 deg C ambient
Storage Temp.		-40 deg C to +85 deg C
Humidity		5% to 95%, noncondensing
Enclosure Protection	IEC529	Steel cabinet per IP54: protection from dust & splashing water
EMC Emission		
Radiated, Conducted	CISPR 11/EN 55011	Industrial Scientific & Medical Equipment (Group 1, Class A)
	CISPR 22/EN 55022	Information Technology Equipment (Class A)
	FCC 47 CFR 15	referred to as FCC part 15, Radio Devices (Class A)
EMC Immunity		
Electrostatic Discharge	EN 61000-4-2	8KV Air, 4KV Contact
RF Susceptibility	EN 61000-4-3	$10V_{rms}$ /m, 80Mhz to 1000Mhz, 80% AM
	ENV 50140/ENV 50204	$10V_{rms}$/m, 900MHz +/-5MHZ 100%AM with 200Hz square wave
Fast Transient Burst	EN 61000-4-4	2KV: power supplies, 1KV: I/O, communication
Surge Withstand	ANSI/IEEE C37.90a	Damped Oscillatory Wave: 2.5KV power supplies, I/O [12V-240V]; 1KV communication
	IEC255-4	Damped Oscillatory Wave: Class II, power supplies, I/O [12V-240V]
	EN 61000-4-5	2 kV cm(P/S); 1 kV cm (I/O and communication modules)
Conducted RF	EN 61000-4-6	$10V_{rms}$, 0.15 to 80Mhz, 80%AM
Isolation		
Dielectric Withstand	UL508, UL840, IEC664	1.5KV
Power Supply		
Input Dips, Variations	EN 61000-4-11	During Operation: Dips to 30% and 100%, Variation for AC +/-10%, Variation for DC +/-20%

IC200CPUE05: CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory

Serial Ports

The two serial ports are software-configurable for SNP slave or RTU slave operation. 4-wire and 2-wire RTU are supported. If a port is being used for RTU, it automatically switches to SNP slave mode if necessary. Port 1 can also be configured for Local Station Manager operation to provide access to diagnostic information about the Ethernet interface. Both ports default to SNP slave and both automatically revert to SNP slave when the CPU is in Stop mode, if configured for Serial I/O. Either port can be software-configured to set up communications between the CPU and various serial devices. An external device can obtain power from Port 2 if it requires 100mA or less at 5VDC.



Port 1: is an RS-232 port with a 9-pin female D-sub connector. The pinout of Port 1 allows a simple straight-through cable to connect with a standard AT-style RS-232 port.

Port 1 can be configured for either CPU serial communications (SNP, RTU, Serial I/O), or local Station Manager use. If Port 1 has been configured for CPU use, it can be forced to local Station Manager operation using the Restart pushbutton. Once forced, Port 1 remains available for station manager use until the PLC is power cycled, or the Restart pushbutton is pressed.

If Port 1 is configured as a local Station Manager, it cannot be used for CPU serial communications or for firmware upgrades using Winloader. The Restart pushbutton will NOT toggle it to the CPU serial protocols.

Port 2: is an RS-485 port with a 15-pin female D-sub connector. This can be attached directly to an RS-485 to RS-232 adapter (IC690ACC901). Port 2 can be used for program, configuration, and table updates with the EZ Program Store module.

The following table compares the functions of Port 1 and Port 2.

	Port 1	Port 2
CPU Protocols (SNP slave, RTU slave, Serial I/O)	Defaults to SNP slave	Defaults to SNP slave
Local Station Manager	Yes (see above)	no
Firmware Upgrade	PLC in Stop/No I/O mode, Port 1 not disabled or in Local Station Manager mode.	no
Smart module firmware upgrade	PLC in Stop/No I/O mode, Port 1 configured for CPU protocol	PLC must be in Stop/No IO mode.
EZ Program Store device	No	Read, Write, Verify, and Update. PLC must be in Stop/No IO mode.

CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory: IC200CPUE05

Cable Lengths

Maximum cable lengths the total number of feet from the CPU to the last device attached to the cable are:

Port 1 (RS-232) = 15 meters (50 ft.)
Port 2 (RS-485) = 1200 meters (4000 ft.)

Serial Port Baud Rates

	Port 1	Port 2
RTU protocol	1200, 2400, 4800, 9600, 19.2K, 38.4*K, 57.6*K	1200, 2400, 4800, 9600, 19.2K, 38.4*K, 57.6*K
Serial I/O protocol	4800, 9600, 19.2K, 38.4K*, 57.6K*	4800, 9600, 19.2K, 38.4K*, 57.6K*
SNP protocol	4800, 9600, 19.2K, 38.4K*	4800, 9600, 19.2K, 38.4K*
Local Station Manager (this is independent of serial protocol baud rate)	1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K	na
Firmware Upgrade via WInloader	2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K	na

* Only available on one port at a time.

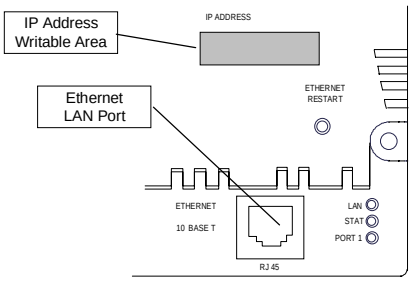
The VersaPro software allows configuration of RTU and Serial I/O at 115.2K baud. However, these baud rates are not supported by the CPU. If a configuration using these baud rates is stored to the PLC:

1. For RTU, an “Unsupported Feature in Configuration” fault is logged and the PLC transitions to Stop Faulted mode.
2. For Serial I/O, the same fault is logged when the transition to Run mode occurs. The PLC will immediately transition to Stop Faulted mode.

Ethernet LAN Port

The Ethernet LAN port supports SRTP Server and Ethernet Global Data. This port connects directly to a 10BaseT (twisted pair) network without an external transceiver. The 10BaseT twisted pair cables must meet applicable IEEE 802 standards. CPUE05 automatically selects either half-duplex of full-duplex operation, as sensed from the network connection.

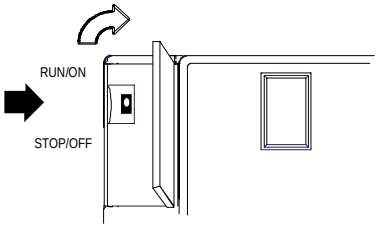
A space is provided on the front of the CPUE05 module where the configured IP Address can be written.



IC200CPUE05: CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory

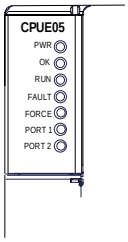
Mode Switch

The Mode switch is located behind the module door. It can be used to place the PLC in Stop or Run mode. It can also be used to block accidental writing to CPU memory and forcing or overriding discrete data. Use of this feature is configurable. The default configuration enables Run/Stop mode selection and disables memory protection.



CPU LEDs

The seven CPU LEDs, visible through the module door, indicate the presence of power and show the operating mode and diagnostic status of the CPU. They also indicate the presence of faults, forces, and communications on the CPU's two ports

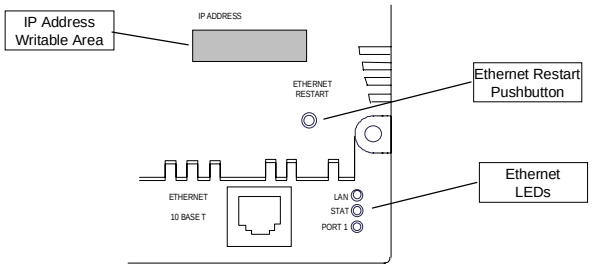


POWER	ON when the CPU is receiving 5V power from the power supply. Does not indicate the status of the 3.3V power output.
OK	ON indicates the CPU has passed its powerup diagnostics and is functioning properly. OFF indicates a CPU problem. Fast blinking indicates that the CPU is running its powerup diagnostics. Slow blinking indicates the CPU is configuring I/O modules. Simultaneous blinking of this LED and the green Run LED indicates that the CPU is in boot mode and is waiting for a firmware update through port 1.
RUN	Green when the CPU is in Run mode. Amber when the CPU is in Stop/IO Scan mode. If this LED is OFF but OK is ON, the CPU is in Stop/No IO Scan mode. If this LED is flashing green and the Fault LED is ON, the module switch was moved from Stop to Run mode while a fatal fault existed. Toggling the switch will continue to Run mode.
FAULT	ON if the CPU is in Stop/Faulted mode because a fatal fault has occurred. To turn off the Fault LED, clear both the I/O Fault Table and the PLC Fault Table. If this LED is blinking and the OK LED is OFF a fatal fault was detected during PLC powerup diagnostics. Contact PLC Field Service.
FORCE	ON if an override is active on a bit reference.
PORT 1 **PORT 2**	Blinking indicates activity on that port when controlled by the CPU.

CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory: IC200CPUE05

Ethernet Restart Pushbutton

The Ethernet Restart pushbutton is located on the right side of the module.



The Ethernet Restart pushbutton has two functions:

- When pressed for less than 5 seconds, it resets the Ethernet hardware, tests the Ethernet LEDs, and restarts the Ethernet firmware. This disrupts any Ethernet communications that are presently underway.
- When pressed for at least 5 seconds, it toggles the function of Port 1 between its configured operation and forced local Station Manager operation. Note that if Port 1 is available for Local Station Manager operation, Winloader cannot be used for a firmware upgrade.

Ethernet LEDs

The three Ethernet LEDs indicate the status and activity of the Ethernet interface.

LAN	indicates the status and activity of the Ethernet network connection. ON/flickering green indicates Ethernet interface is online. ON amber indicates Ethernet interface is offline
STAT	indicates the general status of the Ethernet interface. ON green indicates no "exception" detected. ON amber indicates an exception. Blinking amber indicates error code. Blinking green indicates waiting for configuration or waiting for IP address.
PORT1	indicates when the Ethernet interface is controlling the RS-232 serial port. It also indicates when the Ethernet Restart pushbutton has been used to override configured RS-232 port usage for Local Station Manager operation. ON amber indicates Port 1 is available for Local Station Manager use (either by configuration or forced). OFF indicates PLC CPU is controlling Port 1. (Does not blink to indicate traffic).

The Ethernet LEDs turn ON briefly, first amber then green, whenever a restart is performed in the Operational state by pressing and releasing the Restart pushbutton. This allows you to verify that the Ethernet LEDs are operational. All three LEDs blink green in unison when a software load is in progress.

IC200CPUE05: CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory

Configurable Memory

CPUE05 provides a total of 64K bytes of configurable user memory. This 64K of memory is use for the application program, hardware configuration, registers (%R), analog inputs (%AI), and analog outputs (%AQ). The amount of memory allocated to the application program and hardware configuration are automatically determined by the actual program and configuration entered from the programmer. The rest of the 64K bytes can be easily configured to suit the application.

Configurable memory	64K bytes maximum
Application program size (not configurable)	128 bytes minimum
Hardware configuration size (not configurable)	528 bytes minimum
Registers (%R)	256 bytes minimum
Analog Inputs (%AI)	256 bytes minimum
Analog Outputs (%AQ)	256 bytes minimum

CPU with Two Serial Ports, Embedded Ethernet Interface, and 64K Configurable Memory: IC200CPUE05

Ethernet Interface Overview

CPUE05 has a built-in Ethernet interface that makes it possible to communicate on a 10BaseT network. Both half-duplex and full-duplex operation are supported. Using 10/100 hubs allows CPUE05 to communicate on a network containing 100Mb devices.-

SRTP Server

CPUE05 supports up to eight simultaneous SRTP Server connections for use by other devices on the Ethernet network, such as the PLC programmer, CIMPLICITY HMI, SRTP channels for Series 90 PLCs, and Host Communications Toolkit applications. No PLC programming is required for server operation.

Ethernet Global Data

CPUE05 supports up to 32 simultaneous Ethernet Global Data exchanges. Global Data exchanges are configured using the PLC programming software, then stored to the PLC. Both Produced and Consumed exchanges may be configured. CPUE05 supports up to 1200 variables across all Ethernet Global Data exchanges, and supports selective consumption of Ethernet Global Data exchanges. See chapter 13for information about Ethernet Global Data.

Station Manager Functionality

CPUE05 has built-in Station Manager functionality. This permits on-line diagnostic and supervisory access through either the Station Manager port or via the Ethernet network. Station Manager services include:

- An interactive set of commands for interrogating and controlling the station.
- Unrestricted access to observe internal statistics, an exception log, and configuration parameters.
- Password security for commands that change station parameters or operation.

Use of the Station Manager function requires a separate computer terminal or terminal emulator.

See GFK-1876 for information about Station Manager operation.