

Programmable Logic Controllers



Selection Guide.....2

MicroSmart Family.....3

NEW MicroSmart Pentra CPU Part Numbers.....7

MicroSmart CPU Part Numbers8

Expansion Modules.....10

Programming Software - WindLDR23

Specifications & Dimensions24

OpenNet Controller45

IEC SmartRelay56

Selection Guide.....58

Programming Software - WindLGC60

Specifications & Dimensions61



For more information on this product family, visit our website.

Additional resources include:

- New and updated product information
- Downloadable software demos & upgrades
- Part configuration tool & cross reference
- Online stock check & ordering
- IEC field sales & distributor search
- Online literature request
- Downloadable manuals & CAD drawings
- Manufacturer's suggested retail price list
- Product training schedule & locations
- Advertising & trade show schedules
- Press releases & FAQs

Selection Guide

Programmable Logic Controllers

	MicroSmart Family		OpenNet Controller (ONC)	SmartRelay
	MicroSmart Pentra	MicroSmart		
Page	3	8	45	56
Appearance				
Rated Voltage	24V DC, 100-240V AC	24V DC, 100-240V AC	24V DC	12-24V DC, 24V AC/DC, 100-240V AC/DC
Max. Digital I/O	512	264	480	50
Max. Analog I/O	56	56	42	10
Program Capacity	62.4K bytes	31.2K bytes	32K bytes	2K bytes
Max. Communication Ports	7	2	3	1
Networking	Modbus RTU/ASCII	Yes	-	-
	Modbus TCP	Yes	-	-
	AS-Interface	Yes	-	Yes
	LONWORKS	-	-	Yes
32-bit Data	Yes	-	Yes	-
Floating Point Math	Yes	-	-	-
High-Speed I/O Freq.	100KHz	20KHz	10KHz	2KHz
Approvals				

PLCs

Operator Interfaces

Automation Software

Power Supplies

Sensors

Communication & Networking

MicroSmart Pentra



Micro-controllers play an increasingly central role in today's industrial applications. You have many controllers to choose from, but the one you turn to most often is the one that fits best, physically and practically. You'll find IDEC PLCs in various applications from water treatment plants to HVAC to printing press operations and more. They're always dependable, easy to program and almost as smart as you are.

IDEC brought some of the first micro-PLCs to the market, and has been meeting your changing control automation needs for decades. Now with the MicroSmart Pentra, you get the fastest and most full featured programmable logic controller there is.



International Approvals

All MicroSmart controllers have regulatory agency certifications for the worldwide market including being cULus Listed for Class1 Division 2 Hazardous Locations, TUV approved, CE, and certified for marine use by ABS and Lloyd's Registry.

Write & Run Your Programs Now

Relax. Programming the MicroSmart is fast and straightforward. Use IDEC's WindLDR software to configure, modify and monitor your MicroSmart programs with ease. This powerful and intuitive software makes it simple to get your system up and running.

Rugged, Compact, Modular Design

Every CPU module comes equipped with embedded I/O points, and you can conveniently add snap-on expansion modules for up to 512 I/Os based on your system requirements. All MicroSmart controllers are DIN-rail or panel mountable.

Upgrade Without Downtime

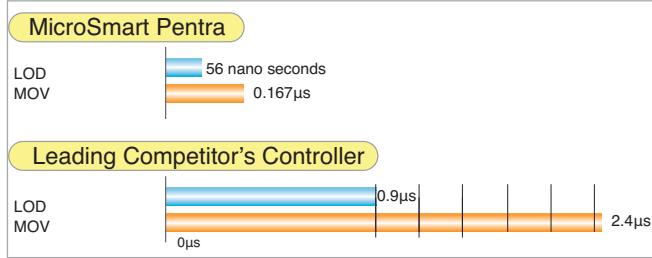
For added convenience, the same expansion I/O modules and accessories can be used on both the MicroSmart and MicroSmart Pentra controllers. In fact, both controllers share the same architecture, instruction set and programming software. The use of a single software platform for all IDEC PLCs means you won't have to reprogram or learn a new system to move from one to another.



MicroSmart Pentra Performance

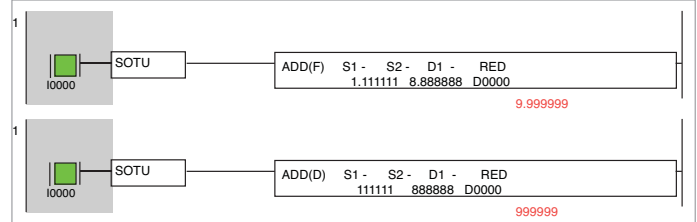
The Fastest Micro Controller in its Class!

MicroSmart Pentra is the fastest micro controller available in its class. The overall processing speed of the new Logic Engine CPU is 16 times faster than our competitor's average controller.



Supports 32-bit data and floating point math

MicroSmart Pentra supports double-word, floating point math operations, capturing and storing large values, and returning computed results accurate to seven decimal places.



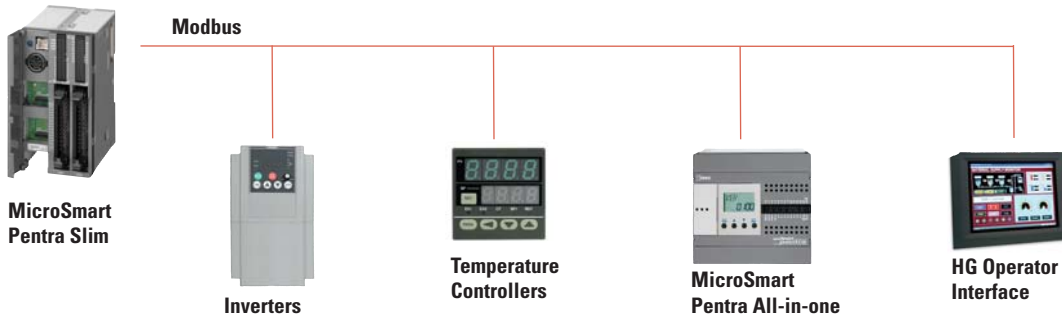
Field Upgradeable Firmware

Extend the life of your PLC! Upgrade your firmware on-site as new functions and versions become available.



Built-in Modbus RTU/ASCII master & slave, and Modbus TCP (1:1) de-facto protocol

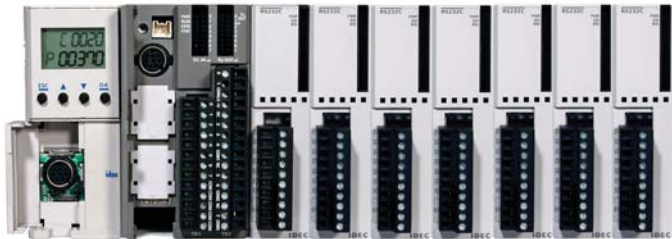
Modbus messaging protocol is a de-facto protocol in industrial networking. Communication with other devices on a Modbus network can be easily achieved with built-in Macros instructions.



MicroSmart Pentra Performance

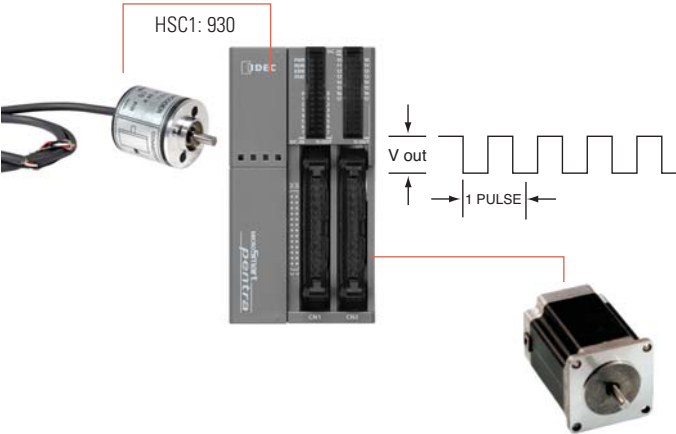
Maximum 7 Communication Ports

MicroSmart Pentra models can accommodate up to a total of seven communication ports. Now you can connect your HMI, PC, barcode reader, RFID equipment, printer and more.



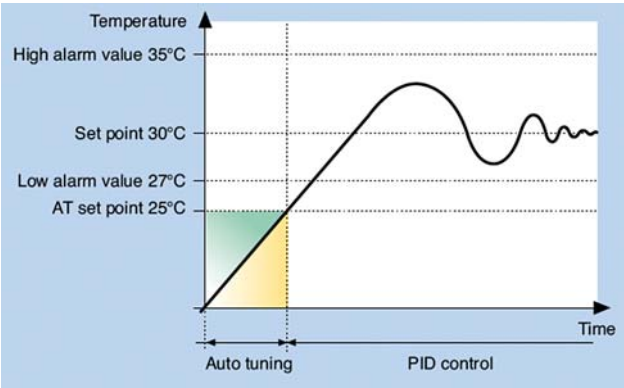
Integrated 100KHz Fast Inputs and Outputs

Configure up to four high-speed inputs from high-speed output devices such as rotary encoders or proximity switches at a maximum frequency of 100KHz, independent of the scan time. Up to three high-speed outputs can be used for simple positioning controls for stepper or servo motors.



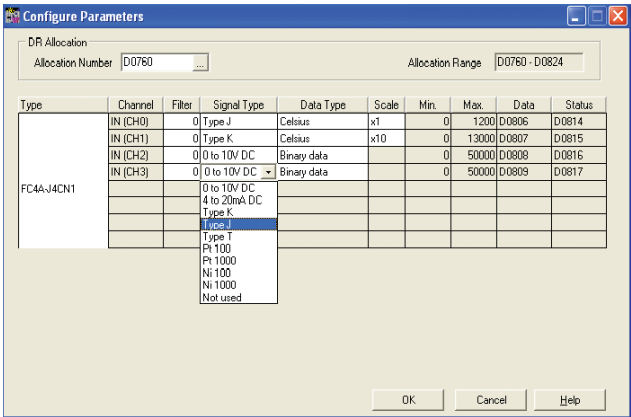
56 PID Loops

PID is the standard solution to many industrial process controls because of its accuracy and stability. With up to 56 PID loops and advanced auto-tuning features, your systems can be tuned to optimum values for the desired control response.



Maximum 56 Analog I/O

Your options include 0-10V, 4-20mA, RTD, thermocouple, thermistor inputs and +/-10V output. With built-in Macro instructions, configuring analog parameters is just a step away.



Compact & Modular Design

All-in-One CPU



Optional RS232C adapter



Optional RS485 adapter



Optional RS485 adapter - screw type

Built-in RS232C port

Built-in Potentiometers (x2)



All-in-one CPU



Optional HMI module for monitoring



FC5A-C24R2C



Optional EEPROM memory cartridge



Optional Real Time Clock cartridge

Slim CPU

Optional HMI module for monitoring



Optional HMI base module or RS232C/RS485 Comm. Modules



Optional RS232C adapter



Optional RS485 adapter



Optional RS485 adapter - screw type



Built-in Potentiometer

Built-in 0-10V analog input

Built-in RS232C port



Slim CPU



Optional EEPROM memory cartridge



Optional Real Time Clock cartridge

PLCs

Operator Interfaces

Automation Software

Power Supplies

Sensors

Communication & Networking

MicroSmart Pentra CPU Part Numbers

All-in-One

Appearance	Part Number	Power	I/O Points	Input	Output	Expandability
	FC5A-C10R2C	24V DC	10 (6 in/4 out)	24V DC (Sink/Source)	Relay	N/A
	FC5A-C10R2	100-240V AC				
	FC5A-C16R2C	24V DC	16 (9 in/7 out)			
	FC5A-C16R2	100-240V AC				
	FC5A-C24R2C	24V DC	24 (14 in/10 out)			88 Maximum I/O (up to 4 expansion modules)
	FC5A-C24R2	100-240V AC				

Slim

Appearance	Part Number	Power	I/O Points	Input	Output	Expandability	
	FC5A-D16RK1	24V DC	16 (8 in/8 out)	24V DC (Sink/Source)	6 Relays, 2 Transistor Sink	496 Maximum I/O (up to 15 expansion modules)	
	FC5A-D16RS1				6 Relays, 2 Transistor Source		
	FC5A-D32K3*		32 (16 in/16 out)		Transistor Sink	512 Maximum I/O (up to 15 expansion modules)	
	FC5A-D32S3*				Transistor Source		



*See page 20 for MIL Connector Cables and Breakout Modules.

PLCs

Operator Interfaces

Automation Software

Power Supplies

Sensors

Communication & Networking

MicroSmart Performance

Features:

- Available in 10, 16, 20, 24, and 40 I/O CPUs.
- PID Controls
 - Program up to 14 PID loops
- High Speed I/O
 - Built-in 4 high speed inputs
 - Single or Dual Phase
 - Max. 20KHz frequency
- Built-in 2 High speed outputs (Slim model only)
- Configure up to 264 I/O Points
- Data link up to 32 MicroSmart and Pentra CPUs
- Using RS485 communication module/port, you can create a network of up to 32 CPUs.
- Worldwide Approvals
 - cULus listed, CE marked
 - Class 1 Div. 2 for hazardous locations
 - Lloyds Registered and ABS approved for shipping industry



MicroSmart CPU Part Numbers

All-in-One

Appearance	Part Number	Power	I/O Points	Input	Output	Expandability		
	FC4A-C10R2C	24V DC	10 (6 in/ 4 out)	24V DC (Sink/Source)	Relay	N/A		
	FC4A-C10R2	100-240V AC						
	FC4A-C16R2C	24V DC	16 (9 in/ 7 out)					
	FC4A-C16R2	100-240V AC						
	FC4A-C24R2C	24V DC	24 (14 in/ 10 out)					88 Maximum I/O (up to 4 expansion modules)
	FC4A-C24R2	100-240V AC						

MicroSmart CPU Part Numbers

Appearance	Part Number	Power	I/O Points	Input	Output	Expandability	
	FC4A-D20RK1	24V DC	20 (12 in/8 out)	24V DC (Sink/Source)	6 Relays, 2 Transistor Sink	244 Maximum I/O (up to 7 expansion modules)	
	FC4A-D20RS1				6 Relays, 2 Transistor Source		
	FC4A-D20K3				Transistor Sink	148 Maximum I/O (up to 7 expansion modules)	
	FC4A-D20S3				Transistor Source		
	FC4A-D40K3		40 (24 in/16 out)		Transistor Sink	264 Maximum I/O (up to 7 expansion modules)	
	FC4A-D40S3				Transistor Source		

Starter Kits and Solution Packages

MicroSmart Starter Kits

		Part Numbers	Controller	Power Supply	Software (Prog. Cables Included)
MicroSmart		MM-SMART-10	10 I/O All-in-One CPU	—	WindLDR
		MM-SMART-16	16 I/O All-in-One CPU	—	WindLDR
		MM-SMART-20	20 I/O Slim CPU	15W	WindLDR
		MM-SMART-24	24 I/O All-in-One CPU	—	WindLDR
		MM-SMART-40	40 I/O Slim CPU	15W	WindLDR
MicroSmart Pentra		MM-PENTRA-16	16 I/Os Slim CPU	30W	WindLDR
		MM-PENTRA-24	24 I/Os All-in-One CPU	—	WindLDR

MicroSmart Solution Packages

		Part Numbers	Operator Interface*	Controller	Power Supply
MicroSmart		MM-SMART-16-HG2F-M	HG2F 5.7" Mono STN	16 I/O All-in-One CPU	15W
		MM-SMART-20-HG2F-M	HG2F 5.7" Mono STN	20 I/O Slim CPU	60W
		MM-SMART-24-HG2F-M	HG2F 5.7" Mono STN	24 I/O All-in-One CPU	15W
		MM-SMART-40-HG2F-M	HG2F 5.7" Mono STN	40 I/O Slim CPU	60W
		MM-SMART-16-HG2F-C	HG2F 5.7" Color STN	16 I/O All-in-One CPU	15W
		MM-SMART-20-HG2F-C	HG2F 5.7" Color STN	20 I/O Slim CPU	60W
		MM-SMART-24-HG2F-C	HG2F 5.7" Color STN	24 I/O All-in-One CPU	15W
		MM-SMART-40-HG2F-C	HG2F 5.7" Color STN	40 I/O Slim CPU	60W
		MM-SMART-20-HG3F	HG3F 10.4" Color TFT	20 I/O Slim CPU	60W
		MM-SMART-24-HG3F	HG3F 10.4" Color TFT	24 I/O All-in-One CPU	60W
		MM-SMART-20-HG4F	HG4F 12.1" Color TFT	20 I/O Slim CPU	60W
		MM-SMART-24-HG4F	HG4F 12.1" Color TFT	24 I/O All-in-One CPU	60W
MicroSmart Pentra		MM-PENTRA-16-HG1F	HG1F 4.6" Mono STN	16 I/O Slim CPU	30W
		MM-PENTRA-24-HG1F	HG1F 4.6" Mono STN	24 I/O All-in-One CPU	30W
		MM-PENTRA-16-HG2F-C	HG2F 5.7" Color STN	16 I/O Slim CPU	30W
		MM-PENTRA-24-HG2F-C	HG2F 5.7" Color STN	24 I/O All-in-One CPU	30W
		MM-PENTRA-16-HG3F	HG3F 10.4" Color TFT	16 I/O Slim CPU	30W
		MM-PENTRA-24-HG3F	HG3F 10.4" Color TFT	24 I/O All-in-One CPU	30W
		MM-PENTRA-16-HG4F	HG4F 12.1" Color TFT	16 I/O Slim CPU	30W
		MM-PENTRA-24-HG4F	HG4F 12.1" Color TFT	24 I/O All-in-One CPU	30W



- *HG1F: Light Gray Bezel, RS232 Comm., HG2F/3F/4F: Light Gray Bezel.
- All packages come with WindLDR & WindO/I-NV2 software, programming and interface cables.

Solution Packages

Whether you want to give IDEC products a try or already use them but want a complete automation system that is quick and easy to put together, you'll find a great deal in our solution packages. Each package includes an IDEC operator interface:

- HG1F – 4.6" STN monochrome LCD touchscreen
- HG2G – 5.7" STN 256 color or monochrome LCD touchscreen
- HG3F – 10.4" TFT 256 color LCD touchscreen
- HG4F – 12.1" TFT 256 color LCD touchscreen

They also include a MicroSmart or MicroSmart Pentra PLC (Slim or All-in-One design), a slim power supply, cables and software. Buy one package and you're ready to go.

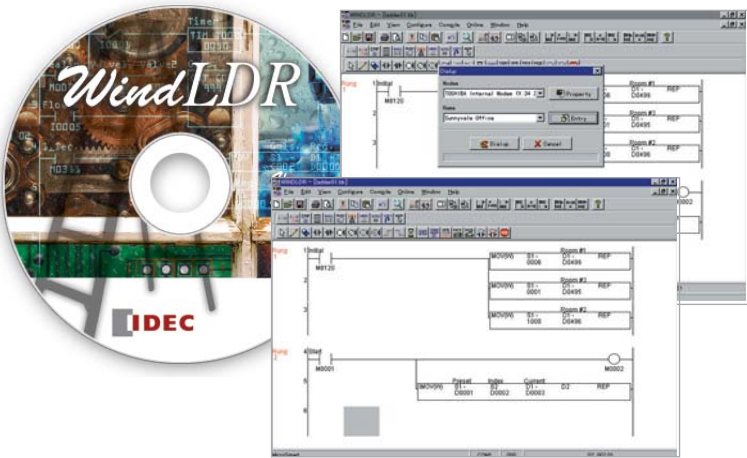


Control at your fingertips

		Part Numbers			Operator Interface**	Controller Type	Power Supply
MicroSmart		MM-SMART-20-HG3F			HG3F 10.4" Color TFT	20 I/O Slim CPU	60W
		MM-SMART-24-HG3F			HG3F 10.4" Color TFT	24 I/O All-in-One CPU	60W
		MM-SMART-20-HG4F			HG4F 12.1" Color TFT	20 I/O Slim CPU	60W
		MM-SMART-24-HG4F			HG4F 12.1" Color TFT	24 I/O All-in-One CPU	60W
MicroSmart Pentra		MM-PENTRA-16-HG1F			HG1F 4.6" Mono STN	16 I/O Slim CPU	30W
		MM-PENTRA-24-HG1F			HG1F 4.6" Mono STN	24 I/O All-in-One CPU	30W
		MM-PENTRA-16-HG2G-EM			HG2G 5.7" Mono STN, Ethernet	16 I/O Slim CPU	30W
		MM-PENTRA-24-HG2G-M			HG2G 5.7" Mono STN	24 I/O All-in-One CPU	30W
		MM-PENTRA-24-HG2G-EM			HG2G 5.7" Mono STN, Ethernet	24 I/O All-in-One CPU	30W
		MM-PENTRA-16-HG2G-EC			HG2G 5.7" Color STN, Ethernet	16 I/O Slim CPU	30W
		MM-PENTRA-24-HG2G-C			HG2G 5.7" Color STN	24 I/O All-in-One CPU	30W
		MM-PENTRA-24-HG2G-EC			HG2G 5.7" Color STN, Ethernet	24 I/O Slim CPU	30W
		MM-PENTRA-16-HG3F			HG3F 10.4" Color TFT	16 I/O Slim CPU	30W
		MM-PENTRA-24-HG3F			HG3F 10.4" Color TFT	24 I/O All-in-One CPU	30W
		MM-PENTRA-16-HG4F			HG4F 12.1" Color TFT	16 I/O Slim CPU	30W
		MM-PENTRA-24-HG4F			HG4F 12.1" Color TFT	24 I/O All-in-One CPU	30W

WindLDR
Programming Software

Unique ladder logic programming tool
designed to program all IDEC PLCs



Part Number

Part Number	Description
FC9Y-LP2CDW	WindLDR PLC programming software

Single Platform for all IDEC PLCs

WindLDR is an excellent, long-term investment for your control solutions. It programs every IDEC PLC including the OpenNet Controller, MicroSmart and the fastest micro-controller on the market, MicroSmart Pentra. It's adaptable to whatever hardware you need today and down the road.

Simple-to-use Editors

Use the tag editor to access and edit coil data. Edit comments and rung comments. Simulation mode tests your program in WindLDR to guarantee that it works the way you expected, before downloading it to your PLC.

User-friendly Interfaces

Icon-based toolbars and drag-and-drop functionality make basic ladder programming accessible to anyone. But WindLDR also shows you how to display parameters and settings and how to input your parameters, and the built-in shortcuts and tutorials will keep you on the right track.

Free Lifetime Upgrade

Not only is WindLDR the easiest and most convenient ladder programming software on the market, it also comes with a very special price with no strings attached. Our software comes with a free-lifetime upgrade. That means that you no longer need to spend thousands of dollars for software that has to be renewed every year costing you additional money. Save yourself money by using an IDEC PLC and WindLDR programming software.

PLCs

Operator Interfaces

Automation Software

Power Supplies

Sensors

Communication & Networking

Specifications

All-in-One

Part Number	AC Power	FC5A-C10R2	FC5A-C16R2	FC5A-C24R2	FC4A-C10R2	FC4A-C16R2	FC4A-C24R2
	DC Power	FC5A-C10R2C	FC5A-C16R2C	FC5A-C24R2C	FC4A-C10R2C	FC4A-C16R2C	FC4A-C24R2C
Rated Voltage		AC power model: 100 to 240V AC, DC power model: 24V DC					
Allowable Voltage Range		AC power model: 85 to 264V AC, DC power model: 20.4 to 28.8V DC (including ripple)					
Rated Power Frequency		AC power model: 50/60 Hz (47 to 63 Hz)					
Maximum Input Current		250mA (85V AC) 160mA (24V DC)	300mA (85V AC) 190mA (24V DC)	450mA (85V AC) ¹ 360mA (24V DC) ²	250mA (85V AC) 160mA (24V DC)	300mA (85V AC) 190mA (24V DC)	450mA (85V AC) ² 360mA (24V DC) ³
Maximum Power Consumption	AC Power	FC5A-C10R2/FC4A-C10R2: 30VA (264V AC) / 20VA (100V AC) ³ FC5A-C16R2/FC4A-C16R2: 31VA (264 V AC) / 22VA (100V AC) ³ FC5A-C24R2/FC4A-C24R2: 40VA (264V AC) / 33VA (100V AC) ¹					
	DC Power	FC5A-C10R2C/FC4A-C10R2C: 3.9W (24V DC) ⁴ FC5A-C16R2C/FC4A-C16R2C: 4.6W (24V DC) ⁴ FC5A-C24R2C/FC4A-C24R2C: 8.7W (24V DC) ²					
Allowable Momentary Power Interruption		10ms (rated power voltage)					
Dielectric Strength		Between power and ⊕ or ⊖ terminals: 1500V AC, 1 minute Between I/O and ⊕ or ⊖ terminals: 1500V AC, 1 minute					
Insulation Resistance		Between power and ⊕ or ⊖ terminals: 10 MΩ minimum (500V DC megger) Between I/O and ⊕ or ⊖ terminals: 10 MΩ minimum (500V DC megger)					
Noise Resistance		AC power terminals: 1.5 kV, 50 ns to 1μs DC power terminals: 1.0 kV, 50 ns to 1μs I/O terminals (coupling clamp): 1.5 kV, 50 ns to 1μs					
Inrush Current		35A		40A	35A		40A
Power Supply Wire		UL1015 AWG22, UL1007 AWG18					
Operating Temperature		0 to 55°C					
Storage Temperature		-25 to +70°C (no freezing)					
Relative Humidity		Level RH1 (IEC61131-2), 1 to 95% RH (no condensation)					
Altitude		Operation: 0 to 2,000m, Transport: 0 to 3,000m					
Pollution Degree		2 (IEC60664-1)					
Corrosion Immunity		Free from corrosive gases					
Degree of Protection		IP20 (IEC60529)					
Grounding Wire		UL1007, AWG16					
Vibration Resistance		When mounted on a DIN rail or panel surface: 5 to 9 Hz amplitude 3.5 mm, 9 to 150 Hz acceleration 9.8 m/s ² (1G), 2 hours per axis on each of three mutually perpendicular axes (IEC61131-2)					
Shock Resistance		147 m/s ² (15G), 11ms duration, 3 shocks per axis, on three mutually perpendicular axes (IEC61131)					
Weight		AC: 230g DC: 240g	AC: 250g DC: 260g	AC: 305g DC: 310g	AC: 230g DC: 240g	AC: 250g DC: 260g	AC: 305g DC: 310g

1. CPU module (including 250mA sensor power) + 4 I/O modules
2. CPU module + 4 I/O modules
3. CPU module (including 250mA sensor power)
4. CPU module (24V DC)

Slim

Part Number			FC5A-D16RK1 FC5A-D16RS1			FC5A-D32K3 FC5A-D32S3			FC4A-D20K3 FC4A-D20S3			FC4A-D20RK1 FC4A-D20RS1			FC4A-D40K3 FC4A-D40S3		
Control System			Stored program system														
Instruction Words			35 basic														
Program Capacity ¹			88 advanced						92 advanced			55 advanced			72 advanced		
User Program Storage			62.4 KB (10,400 steps)						27 KB (4,500 steps)			31.2 KB (5,200 steps) ²					
Processing Time			Basic Instruction						EEPROM (10,000 times rewritable)								
END Processing ³			83μs (1,000 steps)						1.65ms (1,000 steps)								
Expandable I/O Modules			7 modules + additional 8 modules using the expansion power supply module						7 modules								
I/O Points	Input	8	Expansion: 224			16			Expansion: 224			12			Expansion: 128		
	Output	8	Additional: 256			16			Additional: 256			8			Expansion: 224		
Internal Relay			2,048 points						1,024 points								
Shift Register			256 points						128 points								
Data Register			42,000 points ⁴						1,300 points								
Expansion Data Register			6,000 points						—			6,000 points					
Counter			256 points						100 points								
Timer (1-sec, 100-ms, 10-ms, 1-ms)			256 points						100 points								
RAM Backup	Backup Data		Internal relay, shift register, counter, data register, expansion data register														
	Backup Duration		Approx. 30 days (typical) at 25°C after backup battery fully charged														
	Battery		Lithium secondary battery														
	Charging Time		Approx. 15 hours for charging from 0% to 90% of full charge														
	Battery Life		5 years														
	Replaceability		N/A														
Self-diagnostic Function			Power failure, watchdog timer, data link connection, user program EPPROM sum check, timer/counter preset value sum check, user program RAM sum check, keep data, user program syntax, user program writing, CPU module, clock IC, I/O bus initialize, user program execution														
Input Filter			Without filter or 3 to 15ms filter (selectable in increments of 1ms)														
Catch Input/Interrupt Input			Four inputs (I2 through I5) Minimum turn on pulse width: 5μs minimum Minimum turn off pulse width: 5μs minimum						Four inputs (I2 through I5) Minimum turn on pulse width: 40μs minimum Minimum turn off pulse width: 150μs minimum								
High-speed Counter	Maximum Counting Frequency and High-speed Counter Points		Total 4 points Single/two-phase selectable: 100 KHz (2 points) Single-phase:100 KHz (2 points)						Total 4 points Single/two-phase selectable: 20 KHz (2 points) Single-phase: 5 KHz (2 points)								
	Counting Range		0 to 4294967295 (32 bits)						0 to 65535 (16 bits)								
	Operation Mode		Rotary encoder mode and adding counter mode														
Analog Potentiometer		Number	1 point														
		Data Range	0 to 255														
Analog Voltage Input	Number		1 point														
	Input Voltage Range		0 to 10V DC														
	Input Impedance		Approx. 100kΩ														
	Data Range		0 to 255 (8 bits)														
Pulse Output	Number		2 points			3 points			2 points								
	Maximum Frequency		100KHz						20KHz								
Sensor Power Supply	Output Voltage Current		—														
	Isolation																
Port 1			RS232C (maintenance communication, user communications)														
Port 2 Communication Adapter (option) ⁵			Possible			Possible			Possible			Possible			Possible		
Clock Cartridge (option)			Possible			Possible			Possible			Possible			Possible		
Memory Cartridge (option)			Possible			Possible			Possible			Possible			Possible		
HMI Module (option)			Possible			Possible			Possible			Possible			Possible		



- 1 step equals 6 bytes.
- Expandable up to 64 KB when a memory cartridge is used.
- Not including expansion I/O service time, clock function processing time, data link processing time, and interrupt processing time.
- Extra data registers D10000 through D49999 are enabled using WindLDR

- Function Area Settings, then run-time program download cannot be used.
- Maintenance communication, user communication, Modem communication, data link, Modbus master/slave communication (FC5A only).
- Note: The maximum number of relay outputs that can be turned on simultaneously is 54 including those on the CPU module.

All-in-One

Part Number		FC5A-C10R2 FC5A-C10R2C	FC5A-C16R2 FC5A-C16R2C	FC5A-C24R2 FC5A-C24R2C		FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C	
Control System		Stored program system							
Instruction Words		35 basic							
Program Capacity ¹		13.8 KB (2,300 steps)	27 KB (4,500 steps)	54 KB (9,000 steps)		4.8 KB (800 steps)	15 KB (2,500 steps)	27 KB (4,500 steps)	
User Program Storage		EEPROM (10,000 times rewritable)							
Processing Time	Basic Instruction	1.16ms (1,000 steps)				1.65ms (1,000 steps)			
	END Processing ²	0.64ms				0.64ms			
Expandable I/O Module		—			4 modules		—		4 modules
I/O Points	Input	6	9	14	Expansion: 64	6	9	14	Expansion: 64
	Output	4	7	10		4	7	10	
Internal Relay		2,048 points				256 points		1,024 points	
Shift Register		128 points				64 points		128 points	
Data Register		2,000 points				400 points		1,300 points	
Extra Data Register		—				—			
Counter		256 points				32 points		100 points	
Timer (1-sec, 100-ms, 10-ms, 1-ms)		256 points				32 points		100 points	
RAM Backup	Backup Data	Internal relay, shift register, counter, data register							
	Backup Duration	Approx. 30 days (typical) at 25°C after backup battery fully charged							
	Battery	Lithium secondary battery							
	Charging Time	Approx. 15 hours for charging from 0% to 90% of full charge							
	Battery Life	5 years							
	Replaceability	N/A							
Self-diagnostic Function		Power failure, watchdog timer, data link connection, user program EPPROM sum check, timer/counter preset value sum check, user program RAM sum check, keep data, user program syntax, user program writing, CPU module, clock IC, I/O bus initialize, user program execution							
Input Filter		Without filter or 3 to 15ms filter (selectable in increments of 1ms)							
Catch Input/Interrupt Input		Four inputs (I2 through I5) Minimum turn on pulse width: 40μs minimum Minimum turn off pulse width: 150μs minimum							
High-speed Counter	Maximum Counting Frequency and High-speed Counter Points	Total 4 points Single/two-phase selectable: 50KHz (1 point) Single-phase: 5KHz (3 points)				Total 4 points Single/two-phase selectable: 20KHz (1 point) Single-phase: 5KHz (3 points)			
	Counting Range	0 to 65535 (16 bits)							
	Operation Mode	Rotary encoder mode and adding counter mode							
Analog Potentiometer	Number	1 point			2 points		1 point		2 points
	Data Range	0 to 255							
Analog Voltage Input	Number								
	Input Voltage Range								
	Input Impedance	—							
	Data Range								
Pulse Output	Number								
	Max. Frequency	—							
Sensor Power Supply (AC Power Only)	Output Voltage Current	24V DC (+10% to -15%), 250mA							
	Overload Detection	N/A							
	Isolation	Isolated from the internal circuit							
Port 1		RS232C (maintenance communication, user communication)							
Port 2 Communication Adapter (option) ³		Possible	Possible	Possible		—	Possible	Possible	
Clock Cartridge (option)		Possible	Possible	Possible		Possible	Possible	Possible	
Memory Cartridge (option)		Possible	Possible	Possible		Possible	Possible	Possible	
HMI Module (option)		Possible	Possible	Possible		Possible	Possible	Possible	



1. 1 step equals 6 bytes.

2. Not including expansion I/O service time, clock function processing time, data link processing time, and interrupt processing time.

3. Maintenance communication, user communication, Modem communication, datalink, Modbus master/slave communication (FC5A only).

Note: The maximum number of relay outputs that can be turned on simultaneously is 33 including those on the CPU module.

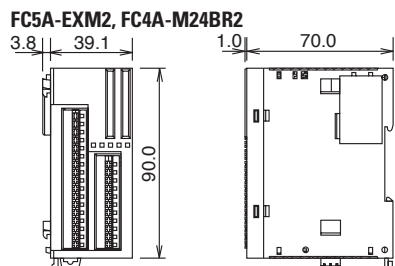
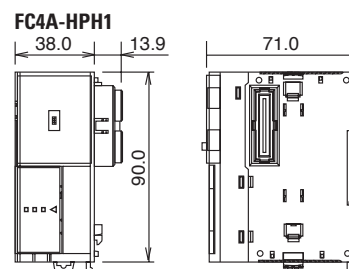
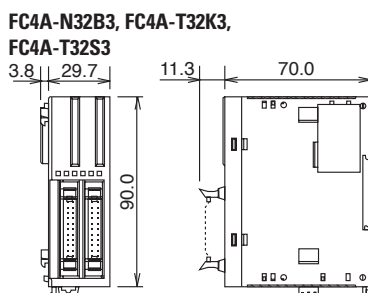
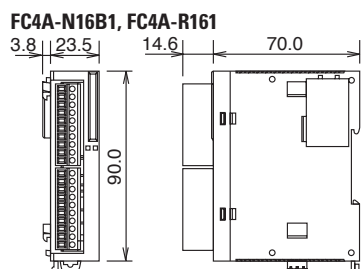
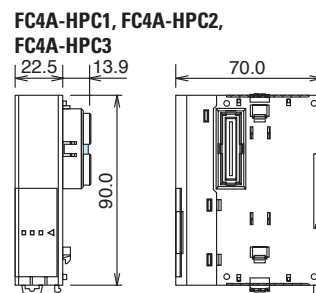
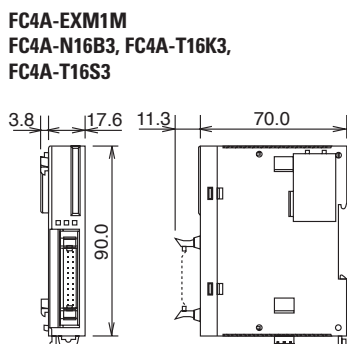
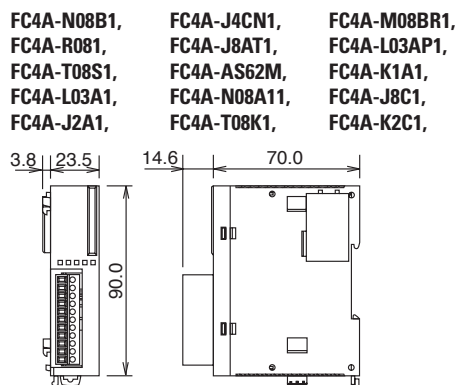
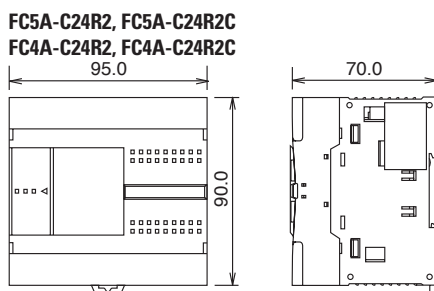
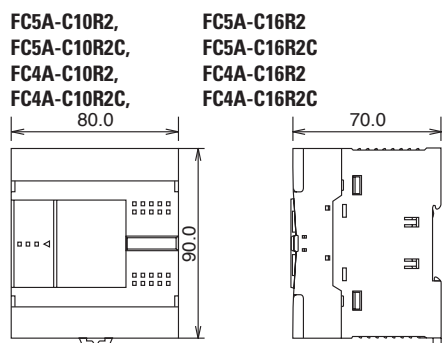
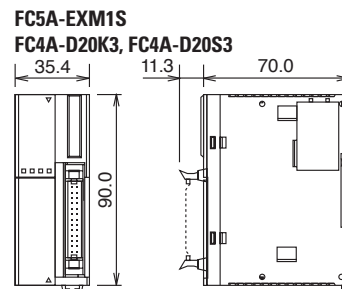
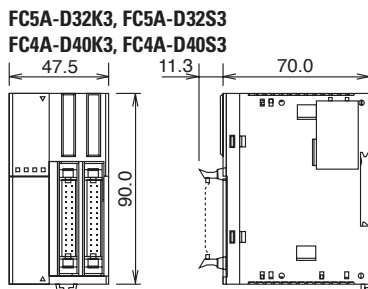
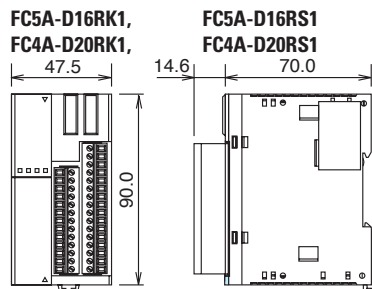
Communication Port (RS232C Port 1)

Model	Slim CPU	All-in-One CPU
Standards	EIA RS232C	
Maximum Baud Rate	FC5A: 57,600 bps (maintenance communication) FC4A: 19,200 bps (maintenance communication)	
Maintenance Communication	Possible	
User Communication	Possible	
Modem Communication	N/A	
Data Link	N/A	
Cable	Special cable (FC2A-KC4C, FC2A-KP1C, FC4A-KC1C, FC4A-KC2C)	
Isolation between Internal Circuit and Communication Port	Not isolated	

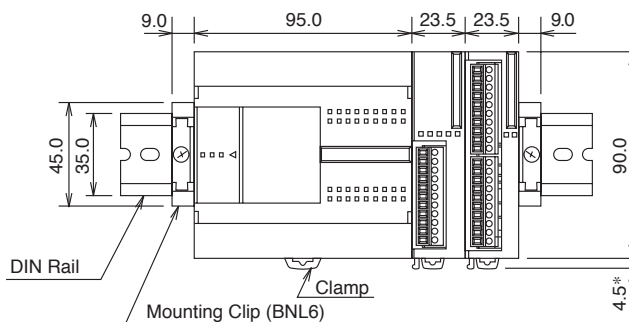
Input Specifications

Part Number		—	FC5A-D16RK1 FC5A-D16RS1	—	FC5A-D32K3 FC5A-D32S3	—	FC5A-C10R2 FC5A-C10R2C	FC5A-C16R2 FC5A-C16R2C	FC5A-C24R2 FC5A-C24R2C
		FC4A-D20K3 FC4A-D20S3	—	FC4A-D20RK1 FC4A-D20RS1	—	FC4A-D40K3 FC4A-D40S3	FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C
Input Points		12 (12/1 common)	8 (8/1 common)	12 (12/1 common)	16 (8/1 common)	24 (12/1 common)	6 (6/1 common)	9 (9/1 common)	14 (14/1 common)
Input Voltage		24V DC sink/source input signal							
Input Voltage Range		20.4 to 26.4V DC					20.4 to 28.8V DC		
Input Current		FC5A I0, I1, I3, I4, I6, I7: 4.5mA/point (24V DC) I2, I5, I10 to I17: 7mA/point (24V DC) FC4A I0, I1, I6, I7: 5mA/point (24V DC) I2 to I5, I10 to I27: 7mA/point (24V DC)					FC5A I0 and I1: 6.4mA/point I2 to I7, I10 to I15: 7mA/point (24V DC) FC4A I0 and I1: 11mA I2 to I7, I10 to I15: 7mA/point (24V DC)		
Input Impedance		FC5A I0, I1, I3, I4, I6, I7: 4.9kΩ I2 to I5, I10 to I17: 3.4kΩ FC4A I0, I1, I6, I7: 5.7kΩ I2 to I5, I10 to I17: 3.4kΩ					FC5A I0 and I1: 3.7kΩ I2 to I7, I10 to I15: 3.4kΩ FC4A I0 and I1: 2.1kΩ I2 to I7, I10 to I15: 3.4kΩ		
Turn ON Time		FC5A I0, I1, I3, I4, I6, I7: 5μs + filter value I2 and I5: 35μs + filter value I10 to I17: 40μs + filter value FC4A I0, I1, I6, I7: 35μs + filter value I2 to I5: 35μs + filter value I10 to I27: 40μs + filter value					FC5A I0 and I1: 2μs + filter value I2 to I7: 35μs + filter value I6, I7, I10 to I15: 40μs + filter value FC4A I0 and I1: 35μs + filter value I2 to I5: 35μs + filter value I6, I7, I10 to I15: 40μs + filter value		
Turn OFF Time		FC5A I0, I1, I3, I4, I6, I7: 5μs + filter value I2 and I5: 150μs + filter value I10 to I17: 150μs + filter value FC4A I0, I1, I6, I7: 45μs + filter value I2 to I5: 150μs + filter value I10 to I27: 150μs + filter value					FC5A I0 and I1: 16μs + filter value I2 to I7: 150μs + filter value I6, I7, I10 to I15: 150μs + filter value FC4A I0 and I1: 45μs + filter value I2 to I5: 150μs + filter value I6, I7, I10 to I15: 150μs + filter value		
Connector	On Mother Board	FL26A2MA (Oki Electric Cable)	MC1.5/18-G-3.81BK (Phoenix Contact)		FL26A2MA (Oki Electric Cable)		—		
	Insertion Durability	100 times minimum						—	
Isolation		Between input terminals: Photocoupler isolated Internal circuit: Not isolated							
Input		Type 1 (IEC61131-2)							
External Load for I/O Interconnection		Not needed							
Single Determination Method		Static							
Effect of Improper Input Connection		Both sinking and sourcing input signals can be connected. If any input exceeding the rated value is applied, permanent damage may be caused.							
Cable Length		3 m in compliance with electromagnetic immunity							

Dimensions (mm)



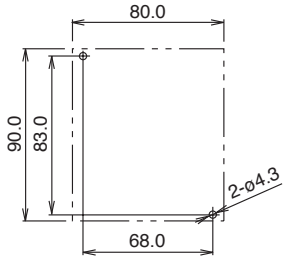
Example



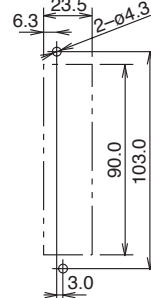
The figure illustrates a system setup consisting of the all-in-one 24-I/O CPU module, an 8-point relay output module, and a 16-point DC input module mounted on a 35-mm-wide-DIN rail using BNL6 mounting clips.

Mounting Hole Layout (mm)

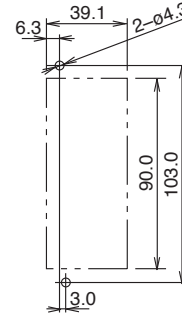
FC5A-C10R2, FC5A-C10R2C,
FC4A-C10R2, FC4A-C10R2C,
FC5A-C16R2, FC5A-C16R2C,
FC4A-C16R2, FC4A-C16R2C



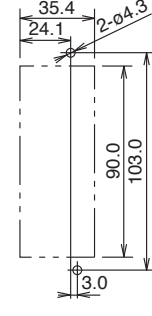
FC4A-N08A11, FC4A-R161, FC4A-T08S1, FC4A-L03A1, FC4A-J2A1, FC4A-J4CN1, FC4A-J8AT1, FC4A-R081, FC4A-T08K1, FC4A-M08BR1, FC4A-L03AP1, FC4A-K1A1, FC4A-T8C1, FC4A-K2C1



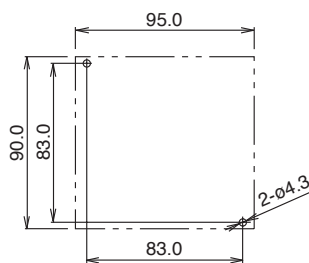
FC5A-EXM2, FC4A-M24BR2



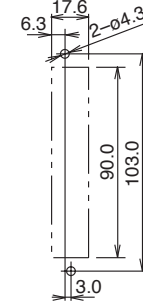
FC5A-EXM1S, FC4A-D20K3, FC4A-D20S3



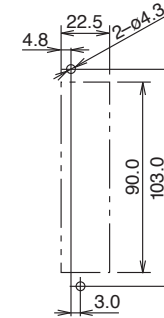
FC5A-C24R2, FC4A-C24R2C,
FC4A-C24R2, FC4A-C24R2C



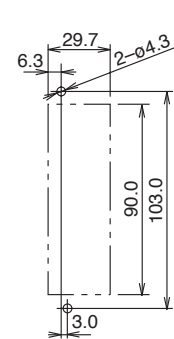
FC5A-EXM1M, FC4A-N16B3, FC4A-T16K3, FC4A-T16S3



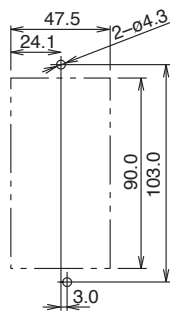
FC4A-HPC1, FC4A-HPC2, FC4A-HPC3



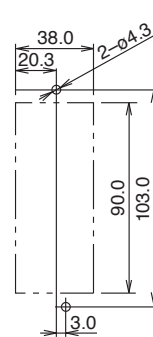
FC4A-N32B3, FC4A-T32K3, FC4A-T32S3



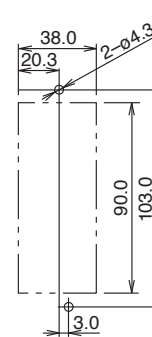
FC5A-D16RK1, FC5A-D16RS1, FC5A-D32K3, FC5A-D32S3, FC4A-D20RK1, FC4A-D20RS1, FC4A-D40K3, FC4A-D40S3



FC4A-HPH1

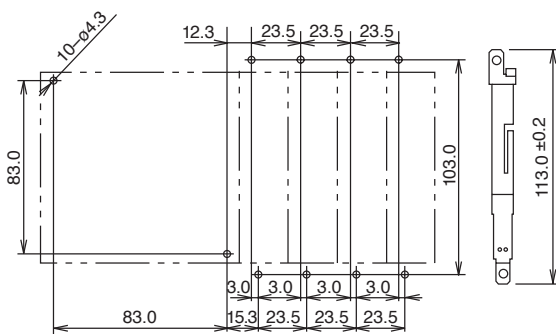


FC4A-HPH1



Examples

Mounting hole layout for FC5A-C24R2 or FC4A-C24R2 and four 23.5mm-wide I/O modules



Mounting hole layout from left, FC4A-HPH1, FC4A-D20K3, FC4A-N16B3, FC4A-N32B3, and FC4A-M24BR2 modules

