

## Micro<sup>3</sup>C

### The True Micro PLC Ambassador



**Key features of the Micro<sup>3</sup>C include:**

- All the features of the Micro<sup>3</sup>
- Talks both ASCII and binary
- Equipped with two serial ports, RS232 and RS485
- Capable of connecting to dial-up modem, serial printer, and bar code reader
- Up to 500 data registers
- Handles a wide range of analog input signals
- Comes with an easy reset button
- Available in 2 sizes: 16- and 24-I/O with relay output

UL Listed  
File No. E102542

CSA Certified  
File No. LR66809

CE Certified  
EMC Approved  
File No. B950913332312



## Micro<sup>3</sup>

### The Benchmark for Micro-PLCs



**Key features of the Micro<sup>3</sup> include:**

- Built-in communications and networking
- Input/output analog capability
- User program password protection
- Catch input, pulse output
- Real-time clock and calendar available
- Built-in power supply for sensors
- Arithmetic, comparison, and Boolean computation
- High-speed: 400µ/100 steps, 10kHz

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	Standard Mode	High-Speed Mode
<b>Program Capacity</b>	1012 steps	100 steps (approximately)
<b>Processing</b>	2.9ms/1k steps (average)	400µs/100 steps (average)
<b>Internal Relay</b>	232 points	40 points
<b>Data Register</b>	Micro <sup>3</sup> : 100 points Micro <sup>3</sup> C: 500 points	32 points
<b>Control Data Register</b>	10 points	—
<b>Counter/Timer</b>	32 points total	16 points total
<b>Shift Register</b>	64 points	32 points
<b>Communication Channel</b>	Data link channel: RS485 Baud rate: 19,200 bps (fixed) Cable length: 656' (200m) (maximum) Data link: 6 slave stations (maximum) Expansion: 1 unit (maximum)	—
	Programming channel: complies with EIA RS485 (Micro <sup>3</sup> )/RS232 (Micro <sup>3</sup> C) standards Baud rate: 1,200/2,400/4,800/9,600/19,200 bps (selectable); Extension: 16.4' (5m) (maximum)	
<b>Instructions</b>	Micro <sup>3</sup> : 22 basic, 33 advanced Micro <sup>3</sup> C: 22 basic, 35 advanced	
<b>Memory</b>	EEPROM	
<b>I/O</b>	See configurations shown on page J-42	
<b>Catch Input Relays</b>	8 points	
<b>Special Internal Relay</b>	16 points	
<b>Power Failure Protection</b>	Internal relay, shift register, counter, data register; backup time, lithium battery fully charged— With clock: 30 days at 25°C (approximately); Without clock: 50 days at 25°C (approximately)	
<b>Self-Diagnostic Function</b>	CPU error (WDT), user program CRC error, user program sum check error, communication error, sensor power overload, transistor output overload	
<b>Catch Input</b>	8 points; Minimum detectable pulse width (when hard filter is set to 10); Input I0 ON pulse = 28µs, OFF pulse = 30µs; Inputs I1 to I7 ON pulse = 37µs, OFF pulse = 120µs (depending on input filter settings)	
<b>Input Filter Function (DC input type only)</b>	Normal input: 0ms, 3ms, 7ms, 10ms; Catch input: Input I0 ON pulse = 4 to 616µs, OFF pulse = 6 to 618µs; Input I1 to I7 ON pulse = 20 to 625µs, OFF pulse = 120 to 618µs	
<b>High-Speed Counter</b>	1 point, single-phase, 10kHz (maximum), 32 bits	
<b>Analog Potentiometer</b>	Micro <sup>3</sup> : 1 point (10-point), 2 points (16-, 24-point) Micro <sup>3</sup> C: 1 point only	
<b>Pulse Output</b>	1 channel, frequency/PWM output (not available in Micro <sup>3</sup> C)	
<b>Real Time Clock</b>	Clock accuracy ±30s/month (maximum) at 25°C (typical); year, month, day, hour, minute, second	
<b>Sensor Power Supply</b>	24V ±3.6V DC, 150mA (maximum) including input current, overload detected	



Micro<sup>3</sup>C only available in 16 I/O or 24

	AC Power	DC Power
<b>Rated Power Range</b>	100 to 240V AC, 50/60Hz (85 to 264V)	24V DC (19 to 30V DC)
<b>Power Consumption</b>	Approximately 30VA (240V AC)	Approximately 14W (24V DC)
<b>Inrush Current</b>	40A (maximum)	
<b>Power Disruption</b>	25ms (momentary disruption) allowed	
<b>Dielectric Strength</b>	Between power terminal and ground: 2,000V AC, 1 minute	Between power terminal and ground: 1,500V AC, 1 minute
	Between I/O terminal and ground: 1,500V AC, 1 minute	
<b>Temperature</b>	Operating: 0 to 60°C, Storage: -20 to +70°C	
<b>Operating Humidity</b>	45 to 85% RH (avoid condensation)	
<b>Vibration Resistance</b>	5 to 55Hz, 6G, 2 hours in each of 3 axes	
<b>Shock Resistance</b>	30G, 3 shocks in each of 3 axes	
<b>Noise Resistance</b>	Between power terminal and ground: 1.3kV, 1µs; Between I/O terminal and ground: 1kV, 1µs (with noise simulator) — complies with IEC1131-2	
<b>Insulation Resistance</b>	Between power or I/O terminal and ground: 10MΩ (minimum), 500V DC	
<b>Ground Resistance</b>	100Ω (maximum)	

Part Numbers: Micro<sup>3</sup>

Item	Description	Remarks	Part Number
<b>100 to 240V AC 50/60Hz Power Micro<sup>3</sup> CPU</b>	Output: Relay 240V AC, 2A 30V DC, 2A	16 I/O: 9 inputs and 7 outputs	Inputs: 120V AC (85-132V AC) 50/60Hz (housing = 24 I/O size) FC2A-CA16A1
		10 I/O: 6 inputs and 4 outputs 16 I/O: 9 inputs and 7 outputs 24 I/O: 14 inputs and 10 outputs	FC2A-C10A1 FC2A-C16A1 FC2A-C24A1
	Output: Transistor Sink 24V DC, 0.5A	10 I/O: 6 inputs and 4 outputs 16 I/O: 9 inputs and 7 outputs 24 I/O: 14 inputs and 10 outputs	FC2A-C10B1 FC2A-C16B1 FC2A-C24B1
<b>24V DC Power Micro<sup>3</sup> CPU</b>	Output: Relay 240V AC, 2A 30V DC, 2A	10 I/O: 6 inputs and 4 outputs 16 I/O: 9 inputs and 7 outputs 24 I/O: 14 inputs and 10 outputs	Inputs: 24V DC sink/source Only the 16- and 24-I/O units have real-time clock/calendar FC2A-C10A4 FC2A-C16A4 FC2A-C24A4
	Output: Transistor Sink 24V DC, 0.5A	10 I/O: 6 inputs and 4 outputs 16 I/O: 9 inputs and 7 outputs 24 I/O: 14 inputs and 10 outputs	FC2A-C10B4 FC2A-C16B4 FC2A-C24B4
	Output: Transistor Source 24V DC, 0.5A	10 I/O: 6 inputs and 4 outputs 16 I/O: 9 inputs and 7 outputs 24 I/O: 14 inputs and 10 outputs	FC2A-C10D4 FC2A-C16D4 FC2A-C24D4
<b>Programming Starter Kits</b>	Micro <sup>3</sup> 10 I/O, WindLDR, computer link cable, input switch simulator Micro <sup>3</sup> 16 I/O, WindLDR, computer link cable, input switch simulator Micro <sup>3</sup> 24 I/O, WindLDR, computer link cable, input switch simulator Micro <sup>3</sup> C 16 I/O, WindLDR, computer link cable, input switch simulator Micro <sup>3</sup> C 24 I/O, WindLDR, computer link cable, input switch simulator WindLDR, 3 computer link cables for Micro-1, Micro <sup>3</sup> and Micro <sup>3</sup> C		MM-MICRO3-10 MM-MICRO3-16 MM-MICRO3-24 MM-MICRO3C-16 MM-MICRO3C-24 MM-Cables
<b>Program Loader</b>	Program loader with cable		FC2A-HL1EC
<b>Loader Cable</b>	6.56' (2m) long 16.4' (5m) long	Connects program loader to Micro <sup>3</sup>	FC2A-KL1 FC2A-KL2
<b>Loader Adaptor</b>	5V power supply adaptor for using program loader when not connected to CPU		PSR-GA05005
<b>Programming Cable</b>	Connects Micro <sup>3</sup> or loader to PC (1:1 link), 6.56' (2m)		FC2A-KC2
<b>Memory Card</b>	Used with program loader to store user programs in SRAM memory		FC2A-MC1
<b>Expansion Cable</b>	Close proximity Micro <sup>3</sup> link expansion, 9.84" (250mm) long		FC2A-KE1
<b>1:N Computer Link Interface Unit</b>	One required to connect each Micro <sup>3</sup> in a 1:N computer link system (all connected to one central RS232C/RS485 converter)		FC2A-LC1
<b>1:N Computer Link Interface Cable</b>	One required to connect each Micro <sup>3</sup> in a 1:N computer link system (connected to each interface unit), 32.8' (10m) long		FC2A-KC3
<b>1:N RS232C/RS485 Converter</b>	One required to connect all Micro <sup>3</sup> units in a 1:N computer link system		HD9Z-T11
<b>1:N RS232C/RS485 Converter</b>	One required to connect all Micro <sup>3</sup> units in a 1:N computer link system; Additionally, the DS783 should be used in applications requiring PC to Micro <sup>3</sup> communications via modem		HD9Z-T11-DS783
<b>1:N PC Cable</b>	Connects RS232C/RS485 converter to PC in a 1:N computer link system, 4.92' (1.5m) long (D-sub 9-pin female computer connector)		HD9Z-C52
<b>Analog Input Unit</b>	0 to 5V 0 to 10V ±5V 4 to 20mA ±10V	Converts analog signals to digital and sends to input I0 of Micro <sup>3</sup> (not for use with AC input type units)	FC2A-AD1 FC2A-AD2 FC2A-AD3 FC2A-AD4 FC2A-AD5
<b>Analog Output Unit</b>	0 to 5V 0 to 10V ±5V 4 to 20mA ±10V	Converts digital (PWM) signal from output Q0 of Micro <sup>3</sup> to analog (not for use with relay output type units)	FC2A-DA1 FC2A-DA2 FC2A-DA3 FC2A-DA4 FC2A-DA5
<b>Analog Timer Unit</b>	For fine adjustment of analog timer preset value		PFA-1U11
<b>Input Switches</b>	Input simulator switches (6) for 10 I/O Micro <sup>3</sup> Input simulator switches (9) for 16 I/O Micro <sup>3</sup> Input simulator switches (14) for 24 I/O Micro <sup>3</sup>		FC2A-SW6 FC2A-SW9 FC2A-SW14
<b>WindLDR™</b>	Windows-based application software, performs ladder programming and monitors all IDEC PLCs including the Micro series, FA series, and Open NET controllers.		WINDLDR
<b>Manuals</b>	Micro <sup>3</sup> User's Manual		EM317
	Micro <sup>3</sup> C User's Manual (order both EM317 and EM318-0)		EM318-0

J Programmable Logic Controllers

**Part Numbers: Micro<sup>3</sup>C**

Item	Description	Part Number	
AC Power (100 to 240V AC, 50/60Hz power supply)	Base units: Input (24V DC sink/source) Relay output (240V AC/30V DC, 2A)	24 I/O (14 in, 10 out)	FC2A-C24A1C
		16 I/O (9 in, 7 out)	FC2A-C16A1C
DC Power (24V DC, 19 to 30V DC)		24 I/O (14 in, 10 out)	FC2A-C24A4C
		16 I/O (9 in, 7 out)	FC2A-C16A4C
Program Loader	Version 2.0+; also compatible with Micro <sup>3</sup>	FC2A-HL1EC	

Optional Item	Description	Part Number
Loader Cable (2m)	Connects basic unit (loader port) and program loader	FC2A-KL3C
Loader Cable (2m)	Connects basic unit (data link terminal) and program loader	FC2A-KL4C
Modem Cable (3m)	Connects basic unit (loader port) and modem (1:1 communications)	FC2A-KM1C
PC Interface Cable (3m)	Connects basic unit (loader port) and PC (1:1 communications)	FC2A-KC4C
PC Interface Cable (2m)	Connects basic unit (data link terminal) and PC (1:1 communications)	FC2A-KC6C
User Communication Cable (2.4m)	Connects basic unit (loader port) and user's equipment	FC2A-KP1C
PC Connect Cable (5m)	Connects basic unit (loader port) and Micro O/I™	HG9Z-XC183
Memory Card (RAM)	Memory to store user's programs (64K)	FC2A-MC1
AC Adaptor	Connects basic unit (data link terminal) and program loader/PC	PSR-GA05005
Expansion Cable (25cm)	Connects basic unit and expansion function unit	FC2A-KE1
1:N Link Adaptor	Connects basic unit (data link terminal) and PC	FC2A- MD1
RS232C Cable (4 lines, 1.5m)	Connects link adaptor and PC (1:N communications), D-sub 9-pin	HD9Z-C52
WindLDR™	Windows-based application software, performs ladder programming and monitors all IDEC PLCs including Micro series, FA series, MicroSmart and ONC	WINDLDR

## Micro<sup>3</sup>C I/O Expansion

**16** 9 Inputs 7 Outputs 1. These Micro<sup>3</sup>C expansions listed are examples. You may create your own combinations as well.

**24** 14 Inputs 10 Outputs

**32** 18 Inputs 14 Outputs

**40** 23 Inputs 17 Outputs

**48** 28 Inputs 20 Outputs

## Micro<sup>3</sup> I/O Expansion

**10** 6 Inputs 4 Outputs 2. These Micro<sup>3</sup> expansions listed are examples. You may create your own combinations as well.

**16** 9 Inputs 7 Outputs

**20** 12 Inputs 8 Outputs

**24** 14 Inputs 10 Outputs

**26** 15 Inputs 11 Outputs

**32** 18 Inputs 14 Outputs

**34** 20 Inputs 14 Outputs

**40** 23 Inputs 17 Outputs

**48** 28 Inputs 20 Outputs

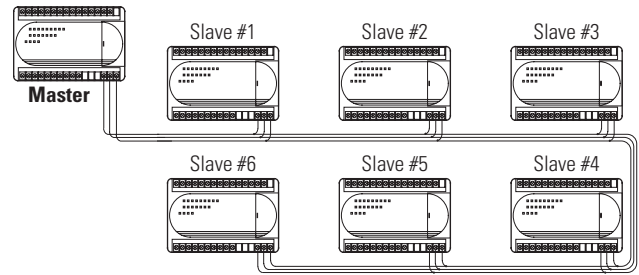
## Micro<sup>3</sup> and Micro<sup>3</sup>C Data Link

A data link network is simple to set up. No special cables or junctions are required. Just wire up to 6 Micro<sup>3</sup>s or Micro<sup>3</sup>Cs in a bus configuration, over a total distance of 656' (200m).

Using a built-in data link, the master initiates communication automatically—no special programming is required. Values from 2 read registers and 2 write registers are exchanged between the master and each slave.

Data link channel 19200, RS485 is fixed.

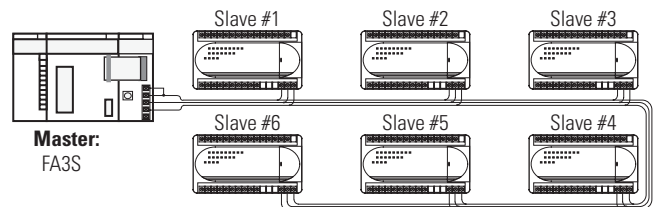
3. The expansion link and data link cannot be used concurrently.



## Micro<sup>3</sup> and Micro<sup>3</sup>C Link with FA3S Master

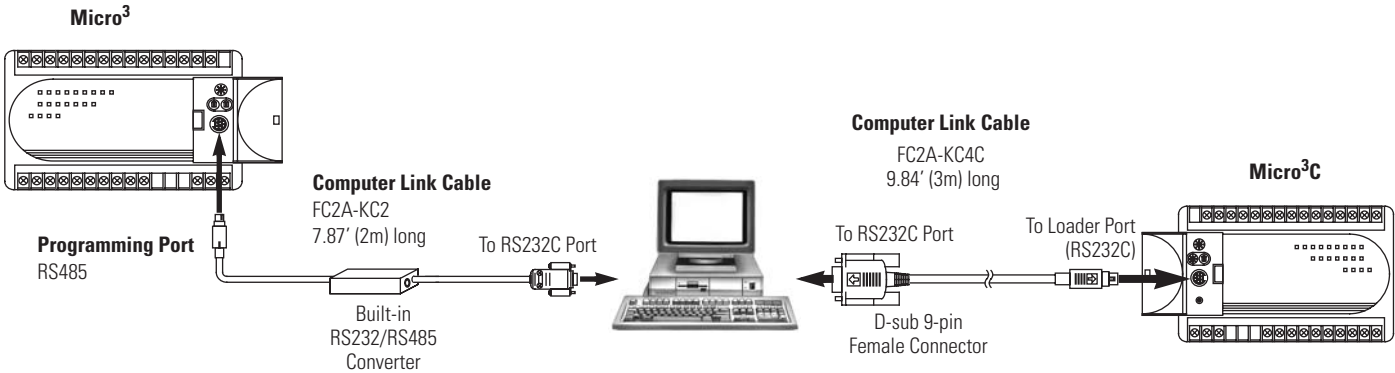
A high-performance FA3S CPU an PF3S-SIF4 interface module can manage data transfer with up to 6 Micro<sup>3</sup>s. Two interface modules can be used with each FA3S CP12 or CP13, making it possible to network up to 12 Micro<sup>3</sup>s total.

Using a built-in data link, the master initiates communication automatically when executing a network communication program. Values from 2 read registers and 2 write registers are exchanged between the master and each slave.



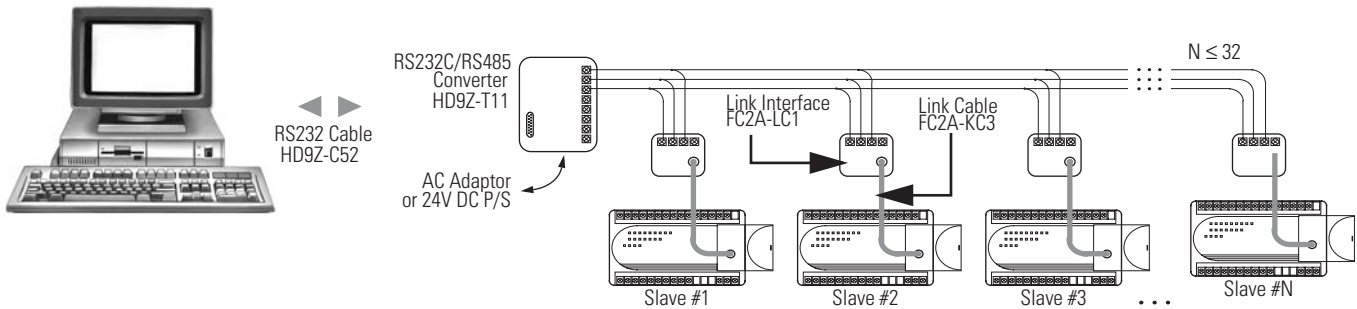
## Computer Link 1:1 Communication

The Micro<sup>3</sup> and Micro<sup>3</sup>C can be programmed from a PC using WindLDR ladder programming software. A computer link cable is required to connect the PC's RS232 serial port with the Micro's programming port.



## Computer Link 1:N Communication (Micro<sup>3</sup> only)

A network of Micro<sup>3</sup>s can be set up for programming and monitoring with WindLDR. The network can also be used for supervisory control and data acquisition (SCADA). Up to 32 Micro<sup>3</sup>s can be networks with a PC as the master. Each Micro<sup>3</sup> should be programmed with a specific device number in FUN9. FUN9 can be set with a program loader or with a PC in 1:1 mode running WindLDR.



## Instruction Set

	Steps	Instruction	Description
<b>Basic Instructions</b>	1	AND	And
	1	AND LOD	And load
	1	ANDN	And not
	1	BPP	Bit pop
	1	BPS	Bit push
	1	BRD	Bit read
	2	CNT	Counter
	2	CC=	Counter compare =
	2	CC≥	Counter compare ≥
	1	END	End
	1	JEND	Jump end
	1	JMP	Jump
	1	LOD	Load
	1	LODN	Load not
	1	MCS	Master control set
	1	MCR	Master control reset
	—	NOT	Not
	1	OR	Or
	1	OR LOD	Or load
	1	ORN	Or not
	1	OUT	Output
	1	OUTN	Output not
	1	RST	Reset
	1	SET	Set
	2	SFR	Shift register
	2	SFRN	Shift register not
	1	SOTD	Single output falling
	1	SOTU	Single output rising
2	TIM	100ms timer	
2	TM	10ms timer	
2	TMS	1ms timer	

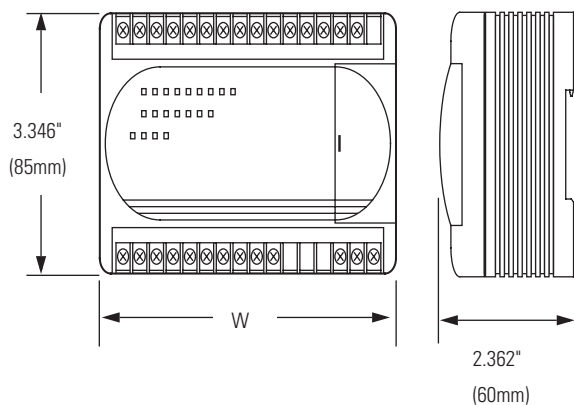
	Steps	Instruction	Description
<b>Advanced Instructions</b>	1	0	NOP No operation
	3-4	11	MOV Word move
	3-4	12	MOVN Word move not
	5-6	13	IMOV Word indirect move
	5-6	14	IMOVN Word indirect move not
	4-5	21	CMP= Equal compare
	4-5	22	CMP<> Not equal compare
	4-5	23	CMP< Less than compare
	4-5	24	CMP> Greater than compare
	4-5	25	CMP≤ Less than or equal compare
	4-5	26	CMP≥ Greater than or equal compare
	4-5	31	ADD Addition
	4-5	32	SUB Subtraction
	4-5	33	MUL Multiplication
	4-5	34	DIV Division
	4-5	41	ANDW And word
	4-5	42	ORW Or word
	4-5	43	XORW Exclusive or word
	3	51	SFTL Shift left
	3	52	SFTR Shift right
	3	53	ROTL Rotate left
	3	54	ROTR Rotate right
	2	71	CALR Calendar read*
	2	72	CALW Calendar write*
	2	73	CLKR Clock read*
	2	74	CLKW Clock write*
	1	75	ADJ Adjust*
	4	81	DISP Display
	4	82	DGRD Digital switch read
	2	83	ANRO Analog potentiometer 0 read
	2	84	ANR1 Analog potentiometer 1 read*
	3	91	PULS Pulse output
3	92	PWM Pulse width modulation	
2	93	A/D Convert analog to digital	
4	A1	HSC0 H/S counter 0 (32 bits)	
2	A2	HSC1 H/S counter 1 (32 bits)	
4	A3	HSC2 H/S counter 2 (32 bits)	
2	A4	HSC3 H/S counter 3 (16 bits)	
5-404	B1	TXD Transmit (Micro <sup>3</sup> C only)	
5-404	B2	RXD Receive (Micro <sup>3</sup> C only)	
4-5	B3	COMP <sup>2</sup> Double word compare (Micro <sup>3</sup> C only)	



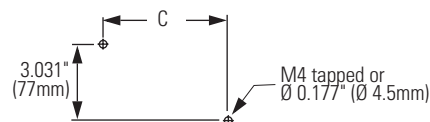
Instructions designated by \* are not affected by the change to the year 2000.

## Dimensions

### Micro<sup>3</sup> and Micro<sup>3</sup>C Base Units



### Mounting Hole Layout



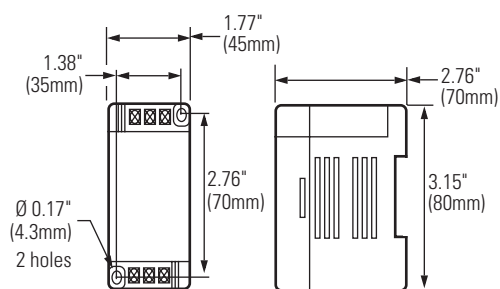
### Key to Dimensions

	W	C
10 I/O	4.134" (105mm)	3.386" (86mm)
16 I/O	5.315" (135mm)	4.567" (116mm)
24 I/O*	6.496" (165mm)	5.748" (146mm)*

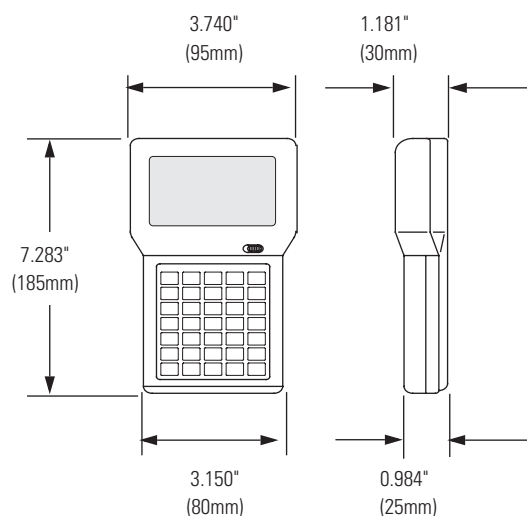


\*Dimensions are the same for the 16 I/O AC input unit.

### A/D and D/A Analog Converters



### Program Loader


**J**

Programmable Logic Controllers