



SYSTEMS M4500

INDUSTRIAL CONTROLLER

M4500 PRODUCT LINE



General Description

The M4500 is a family of “fast” controllers designed for high performance machine applications which cannot be adequately handled by standard Programmable Logic Controllers (PLC). It provides a modular architecture which can be configured to handle critical control requirements for a wide variety of small to medium range high speed production applications. It's small form factor and rugged construction makes this system a cost effective and reliable solution for system upgrades as well as for OEMs on new and re-built equipment.

The M4500 product line, generically referred to as the M4500, is a modular design consisting of a high performance Programmable Logic Controller (PLC) chassis. Beyond the common features, different versions of the M4500 have various configurations of I/O slots, optional integrated Programmable Limit Switch (PLS), display/keypad, power supply and mounting methods. Ten versions are available:

- M4500: 4-I/O slot PLC/PLS
- M4501: 4-I/O slot PLC
- M4502: 3-I/O slot PLC/Display
- M4503: 3-I/O slot PLC/PLS/Display
- M4508: 8-I/O slot PLC/PLS
- M4509: 8-I/O slot PLC
- M4510: 8-I/O slot PLC/PLS/Motion Controller
- M4512: 12-I/O slot PLC/PLS/Motion Controller
- M4513: 12-I/O slot PLC
- M4530: 8-I/O slot PLC/PLS/PMT Interface

Features

The M4500 requires a minimum of control cabinet space and versions are available for either door or back-panel mounting in NEMA 12 class cabinets. Modular packaging utilizing removable field wiring arms provides for convenient initial installation, reconfiguration of I/O, as well as easy field maintenance.

Features common to all versions of the M4500:

- High performance Programmable Logic Controller (PLC) with optional built-in Programmable Limit Switch (PLS).
- Modular form factor allows user configurable I/O with 16 and 32 point DC inputs, 16 point DC outputs, Analog I/O, communications, and motion control boards.
- Optional display/keypad with 2 line X 40 character back-lit LCD display and 24 key keypad for operator interface.
- 32K bytes battery-backed CMOS RAM user program memory and 8K bytes data memory.
- High Performance: 0.25 msec per 1K typical scan time with throughputs as low as 80 microseconds. Resolver PLS tracking rates up to 6,000 RPM.
- Programmed with SYSdev, windows or DOS based software package which allows programming in ladder, high-level ("C"), and assembly, as well as programming of the PLS section timing channels.
- Interfaces to windows or DOS based laptops or desktops via RS-232 COM port for program download and on-line monitoring.
- Two additional 10-30VDC digital interrupt inputs.
- Built-in analog I/O: Two 0-5 volt 10-bit analog inputs and two 0-10 volt 8-bit analog outputs.
- PLS section incorporates either 8, 16, 32, or 64 timing channels, programmable scale factor between 2 and 4096, up to 8 PLS programs, and speed compensation on the first 8 timing channels.



M4500 PRODUCT LINE

Specifications

General:

<u>Size:</u>	<u>Length</u>	<u>Height</u>	<u>Width</u>
M4500:	6.25"	9.00"	6.00"
M4501:	6.25"	9.00"	6.00"
M4502:	9.50"	5.85"	5.50"
M4503:	9.50"	5.85"	5.50"
M4508:	9.50"	9.00"	6.00"
M4509:	9.50"	9.00"	6.00"
M4510:	9.50"	9.00"	6.00"
M4512:	12.70"	9.00"	6.00"
M4513:	12.70"	9.00"	6.00"
M4530:	9.50"	9.00"	6.00"
P4500:	7.00"	3.75"	2.50"
D4590:	6.25"	4.50"	0.85"
D4591:	9.50"	5.85"	0.85"

<u>Configuration:</u>	<u>I/O Slots</u>	<u>PLS Section</u>	<u>Motion Control</u>
M4500:	4	Yes	No
M4501:	4	No	No
M4502:	3	No	No
M4503:	3	Yes	No
M4508:	8	Yes	No
M4509:	8	No	No
M4510:	8	Yes	Yes
M4512:	12	Yes	Yes
M4513:	12	No	No
M4530:	8	Yes	No

Power Requirements:

P4500 Input:

Supply Voltage:	100-250 VAC
Supply Frequency:	50/60/440 HZ
Supply Current:	1.2 Amps @ 115VAC
Inrush Current (max):	20 Amps for 100msec

M4500 Input:

Supply Voltage:	+5VDC, +12VDC, and -12VDC
+5VDC Current (max):	2.5 Amps
+12VDC Current (max):	0.5 Amps
-12VDC Current (max):	0.1 Amps

Temperature Ranges:

Storage:	0 to 85 degrees C
Operating:	0 to 60 degrees C

Relative Humidity:

5 to 95%



M4500 PRODUCT LINE

Specifications (cont'd)

PLC Section:

Memory:

Program: 32K bytes battery-backed CMOS RAM
Data: 8K bytes battery-backed CMOS RAM

Execution Times:

Scan Time: 0.25msec per 1K bytes
Main Program Overhead: 60 to 150 microseconds
Timed Interrupt Time Base: 0.250 to 65.000 milliseconds

Interface Ports:

PROG Port:
Type: RS-232
Comm Rate: 9600 Baud

Interrupt Inputs:

Number of Inputs: 2

Input Voltage:
Vin (on-min): 10.0 volts
Vin (on-max): 30.0 volts
Vin (off-min): 5.0 volts

Input Current (max): 20 milliamps at Vin=30 volts (imped=1.5K)

Input Filter Delay:
min delay: 25 microseconds
max delay: 60 microseconds

Optical Isolation: 1500 Vrms

Analog Input Section:

Number of Analog Inputs: 2
Input Range: 0-5 Volts
DC Input Resistance: 1M ohms or greater
Maximum Input Voltage: -30V to +30V

Accuracy: 2.0%
Repeatability: 0.5%

Analog-to-Digital Conversion Method: Successive Approximation
Analog-to-Digital Conversion Time: 25 microseconds
Resolution: 10-bit



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Specifications (cont'd)

Analog Output Section:

Number of Analog Outputs:	2
Output Range:	0-10 Volts
Load Resistance:	2K ohms or greater
Accuracy:	2.0%
Repeatability:	0.5%
Digital-to-Analog Conversion Method:	Pulse Width Modulation
Rise Time (max):	100 milliseconds
Resolution:	8-bit
Short Circuit Duration:	continuous

PLS Section:

Scale Factor:	2 to 4096
Offset:	0 to Scale Factor-1
Number of Timing Channels:	8, 16, 32, or 64
Number of PLS Programs:	up to 8
Speed Compensation:	Yes, channels 0 thru 7
Maximum Number of Set-Points per Channel:	
Unique:	50
Pulse Train:	Scale Factor/2
Resolver-to-Digital Converter:	
Resolution:	12 bits
Accuracy:	10 arc mins + 1LSB
Tracking Rate (R-to-D):	6,000 RPM
Signal Inputs (SIN and COS):	
Input voltage (nominal):	2 Vrms
Input voltage (max):	8 volts
Input impedance (typ):	100K ohms
Reference Output:	
Output voltage level:	1.45 Vrms
Output frequency:	2,500 HZ



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Specifications (cont'd)

Display/Keypad:

Display:

Number of Lines:	2
Number of Characters per Line:	
D4590:	20
D4591:	40
Character Height:	0.19"
Display Type:	Back-Lit LCD
Character Sets supported:	ASCII, Katakana, special symbols

Keypad:

Number of Rows:	3
Number of Columns:	8
Type:	Sealed
Key Legends:	User Customizable

