

PLC-CPU-CM3-SP Series



FEATURES

- **Processor Speed: 200 ns/Step**
- **16DI/16DO**
- **10K Steps of Program Memory**
- **Expansion Max: 11 Modules (Max 384 pts.)**
- **PID Control**
- **Two 20K pps High-Speed Counters Built in**
- **Two 100K pps Pulse Output Built in**
- **Flash Memory for Permanent Backup of Program**
- **3 COM Ports Communicating Simultaneously**



DESCRIPTION

The PLC-S is a high-quality series occupying substantially less space than other PLC lines, without sacrificing performance. Even with a compact size of 30x90x61mm, the PLC-S series still manages to perform at the same level of capability as their larger counterparts. They are already equipped with several built-in functions, eliminating the need for any extra expansive modules and allowing the user to maintain a small system size. Speed Counters, Positioning Control, Floating-Point Arithmetic, 3-Way Simultaneous Communications, and PIC auto-tuning are just a few of their built-in features. If desired, the PLC-S Series can be configured with up to 11 expansion modules in order to perform a wide variety of additional functions. Also on the unit is a USB port and an SD Slot which allow for convenient program downloads. Ideal for small to medium performance tasks, the PLC-S offers one of the most flexible, reliable, and yet powerful MICRO-PLC systems in the industrial world.

SPECIFICATIONS

Items	Specifications				Reference
Ambient Temp	-10 ~ 65°C				
Storage Temp	-25 ~ 80°C				
Ambient Humidity	5 ~ 95% RH, (Non-Condensing)				
Storage Humidity	5 ~ 95% RH, (Non-Condensing)				
Vibration	Occasional Vibration				IEC 61131-2
	Frequency	Acceleration	Pulse Width	Times	
	10 ≤ f < 57Hz	-	0.075	X, Y, Z Each Direction, 10 Times	
	57 ≤ f ≤ 150Hz	9.8m/s ² {1G}	-		
	Frequency	Acceleration	Pulse Width		
10 ≤ f < 57Hz	-	0.035mm			
57 ≤ f ≤ 150Hz	4.9m/s ² {0.5G}	-			
Shocks	<ul style="list-style-type: none"> • Peak Acceleration: 147 m/s² • Duration: 11ms • Pulse Wave Type: Half-Sine (3 Times Each X, Y, Z 3 Direction) 				IEC61131-2
Impulse Noise	Square Wave Impulse Noise	± 2,000V			KDT Standard
	Electrostatic Discharge	Voltage:4kV (Contact Discharge)			IEC 61131-2 IEC 1000-4-2
	Radiated Electromagnetic Field Noise	27 ~ 500MHz, 10V/m			IEC 61131-2 IEC 1000-4-3
	Fast Transient/Burst Noise	Power	Digital I/O (24V or More)	Digital I/O (24V or Less) Analog I/O Comm. Interface	IEC61131-2 IEC 1000-4-4
		2kV	2kV	0.25kV	
Voltage	2KV/1min		0.5KV/1min		
Operation Ambience	Free from Corrosive Gases and Excessive Dust				
Altitude	2,000m or Less				
Pollution Degree	2 or Less				
Cooling Method	Air Cooling				

L011061

Items		Specifications
Power		DC24V
Program Control Method		Stored Program, Process-Driven Interrupt, Time Driven Interrupt
I/O Control Method		Indirect Method, Directed by Program Instruction
Program Language		IL (Instruction List), LD (Ladder Diagram)
Data Processing Method		32 Bit
Instructions	Sequence	55 Instruction
	Application	389 Instruction
Processing Speed (Sequence)		200ns / Step
Program Capacity		10K Step
Max. I/O Max. Expansion		384 pts / 1 Main Block + Max. 11 Block
Operation Mode		Run, Stop, Remote Run, Remote Stop
Back-up method		Data Which Set up as Retain
Total Program		128
Program Types	Scan	(127-Program Block)
	Cyclic Task	16
	Special	126
	Initial Task	2 (_INIT_ _H_INIT)
Subroutine		126
Self-Diagnosis		Detects Errors of Scan Time, Memory, I/O and Power Supply, Battery Error
Restart		Cold, Hot Restart
Device Memory Capacity	X	1024 pts (X0000 - X063F)
	Y	1024 pts (Y0000 - Y063F)
	M	8192 pts (M0000 - M511F)
	L	4096 pts (L0000 - L255F)
	K	4096 pts (K0000 - K255F)
	F	2048 pts (F0000 - F127F)
	T	512 pts (T0000 - T0511)
	C	512 pts (C0000 - C0511)
	S	100 states x 100 set (00.00 - 99.99)
	D	10000 Words (D0000 - D9999)
Z	1024 words (Call Stack: Z0000 - Z0063, Z1000 - Z1063)	
R	16 pts (Index)	
High Speed Counter		20Kpps, 2 Phase 2 Ch.
Positioning		Max. 100Kpps, 2 Axis, Linear Interpolation
PID		32 Channels, Auto-Tuning
RTC		Embedded (Battery CR2032 Backup)
Comm. Channel		Standard: USB Loader, Serial 1(RS232C) Optional: Serial 1Ch (RS485), Ethernet 1Ch
Etc.		

Key	Description
X	Input
M	Sub Relay
T	Timer
D	Data Device
L	Link Relay
F	Special Relay
Y	Output
K	Keep Relay
C	Counter
D	Sub Data Device
S	Step Control Relay
R	Index Register

- **Bit Data:** [Device]+[Card No.]+[Bit No.]
 - Device: X, Y, M, K, L, F, Card No.: 10Dec(Decimal), 3 Characters
 - Bit No.: 16 Hex. 1 Character
 - Ex) X0100 -> 10Dec. (Word) + 16Hex(Last Bit)
 - :[10th Address and 0th bit
- **Word Data:** [Device]+[Card No.]
 - Device: D, Z, T, C, Card No.: 10Dec. 4 Characters
 - Ex) D0100 -> 10Dec. (Word): [100th word Address]
- **Timer, Counter Output:** [Device]+[Card No.]
 - Device: T, C, Bit No. : 10Dec. 4 Characters
 - Ex) T0100 -> 10Dec. (Word): [T 100th Bit Address]
- **Step Controller I/O:** [Device]+[Card No.]+[.]+[Step No.]
 - Device: S
 - Card No.: 10Dec. 2 Characters, Step No.: 10Dec. 2 Characters
 - Sxx.xx -> xx is 10Dec.(0~99)
- **Assign Bit Device to Word:** [Device]+[Card No.]+[0]
 - Device: X, Y, M, K, L, F, Card No.: 10 Dec. 3 Characters
 - Ex) X010 -> 10Dec. (Word), [X 10th Address]

L011061

PLC-CPU-CM3-SP Series



I/O SPECIFICATIONS

Items	DC Input	Relay Output	TR Output
Rated Voltage I/O	DC 24V	AC 220V/ DC 24V	DC 12V / 24V
Rated Current I/O	4mA	1 point 2A / COM 5A	1 point 0.2A, COM 2A
On V/A	DC19V/3mA	-	-
Off V/A	DC6V/1mA	-	-
Response Time	3ms or less	10ms or less	1ms or less
Operation Indicator	Input ON, LED ON	Input ON, LED ON	Input ON, LED ON
Insulation Method	Photo Coupler Insulation	Relay Insulation	Photo Coupler Insulation
Input Method	Sink/SRC	-	-
Output Method	-	Relay	Sink

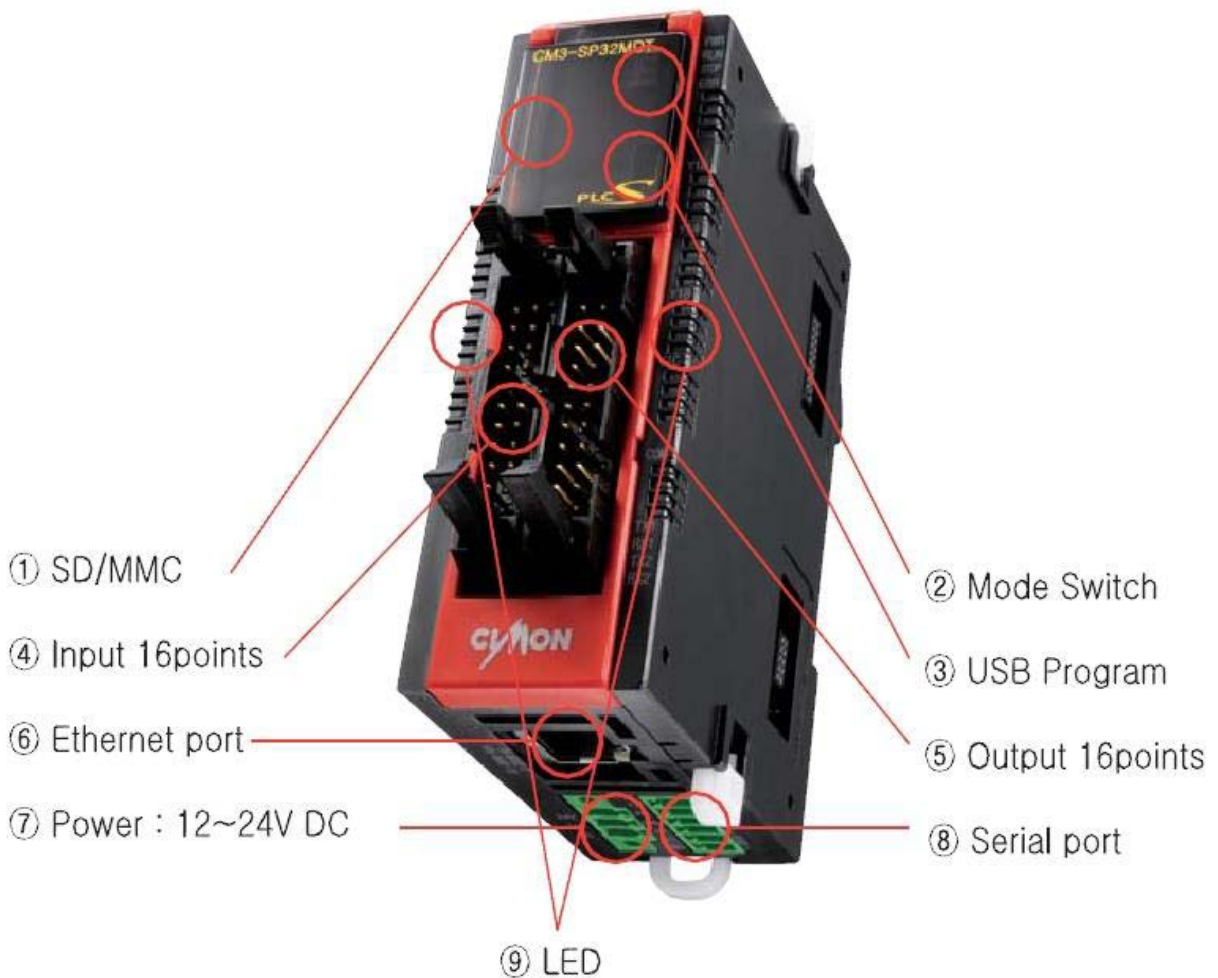
Circuit Diagram

24 VDC
4mA

220 VAC
2A

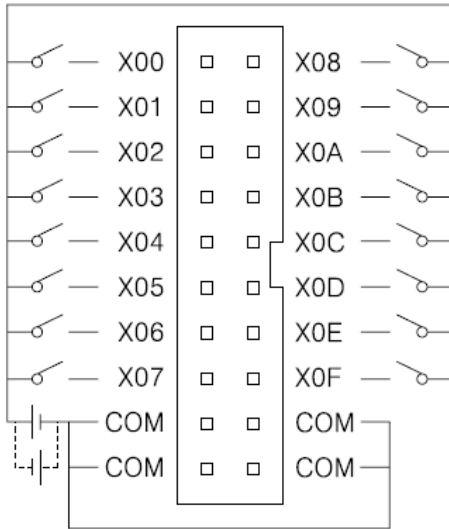
24 VDC
0.2 A Sinking

COMPONENTS

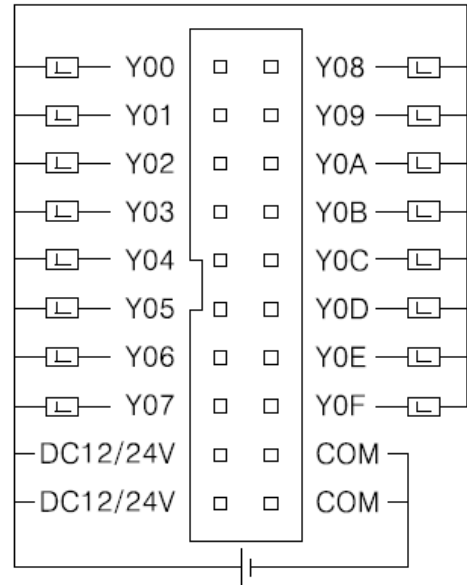


L011061

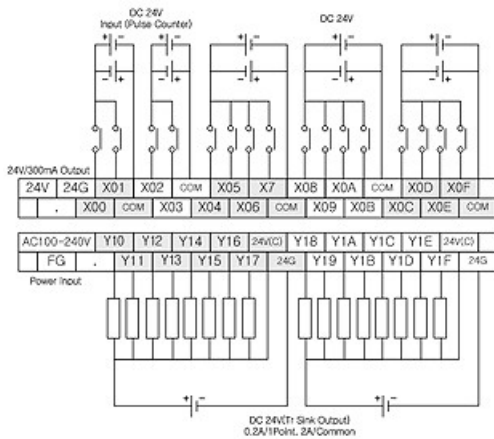
MDT Input



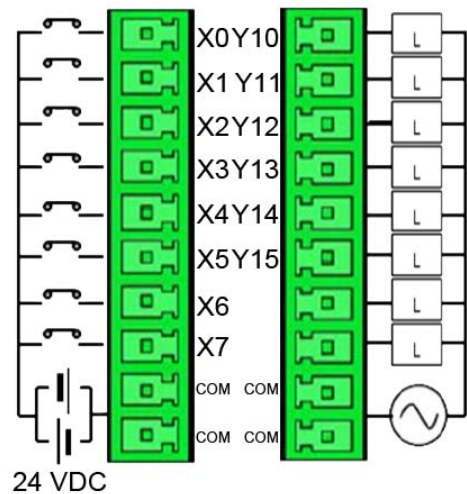
MDT Output



SP16MDR, SP16MDRV I/O

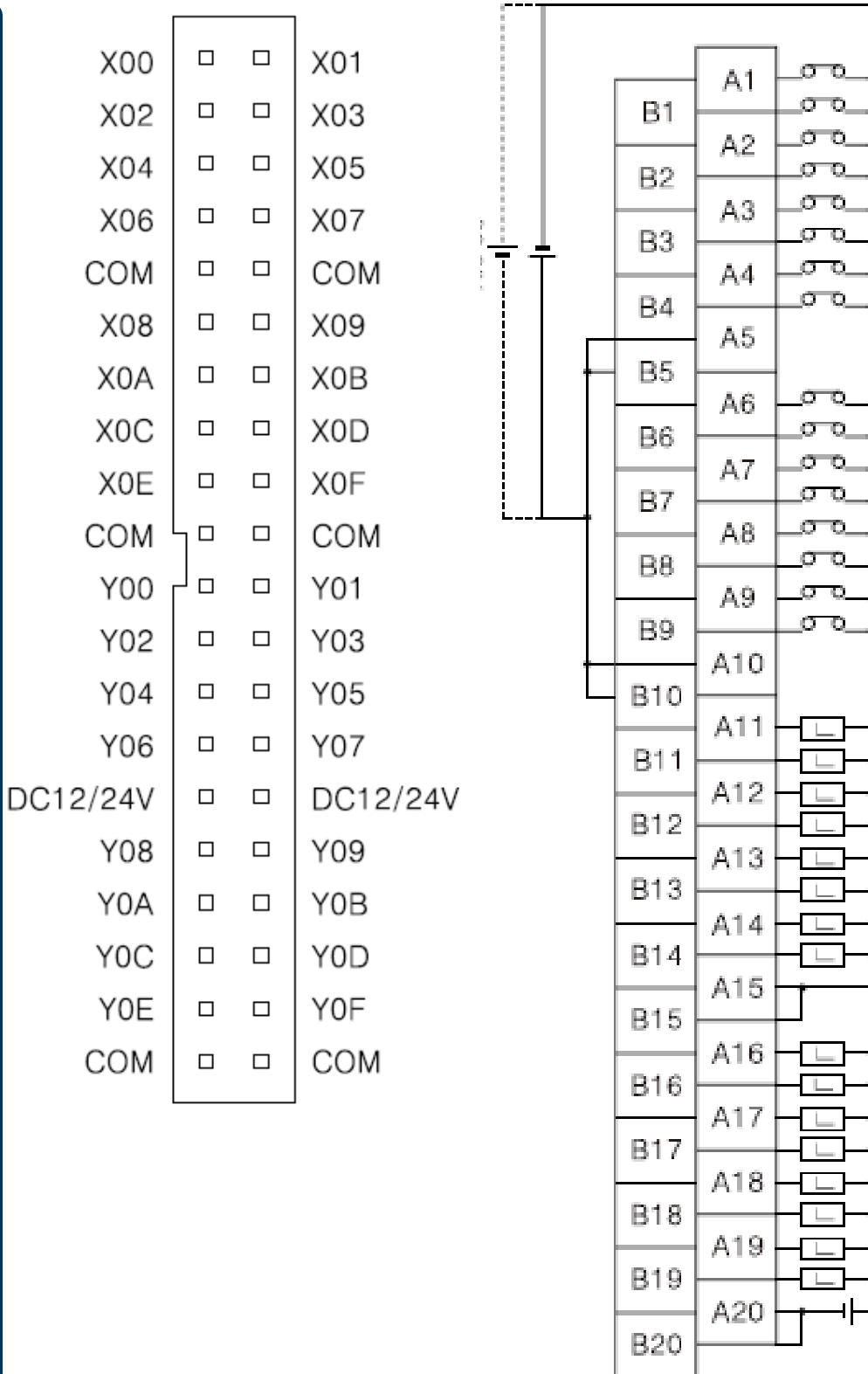


SP16MDRE, SP16MDRF I/O



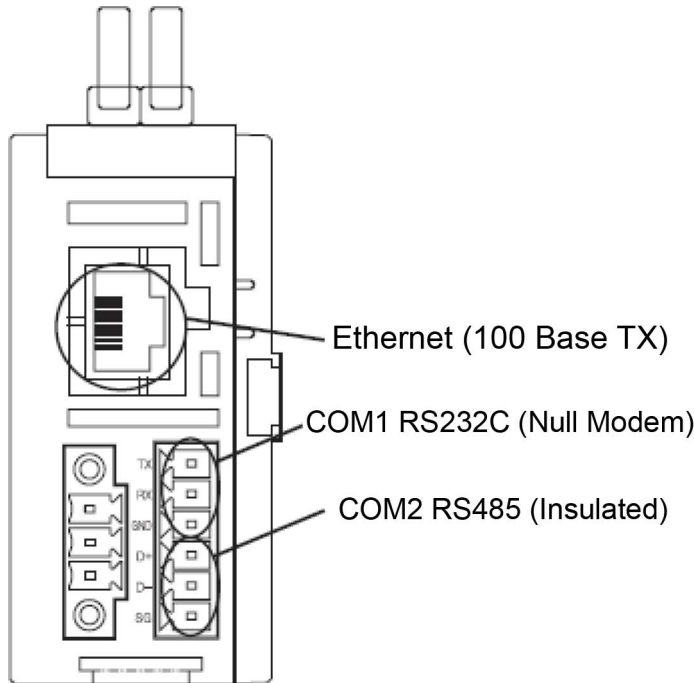
L011061

TERMINAL I/O PINOUT

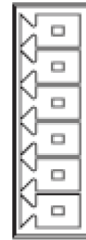


CM0-TB32M	CM3-SP32MDT
A1	X00
B1	X01
A2	X02
B2	X03
A3	X04
B3	X05
A4	X06
B4	X07
A5	COM
B5	COM
A6	X08
B6	X09
A7	X0A
B7	X0B
A8	X0C
B8	X0D
A9	X0E
B9	X0F
A10	COM
B10	COM
A11	Y10
B11	Y11
A12	Y12
B12	Y13
A13	Y14
B13	Y15
A14	Y16
B14	Y17
A15	12/24 VDC
B15	12/24 VDC
A16	Y18
B16	Y19
A17	Y1A
B17	Y1B
A18	Y1C
B18	Y1D
A19	Y1E
B19	Y1F
A20	COM
B20	COM

L011061



Pin	Name
1	TX
2	RX
3	GND
4	D+
5	D-
6	SG



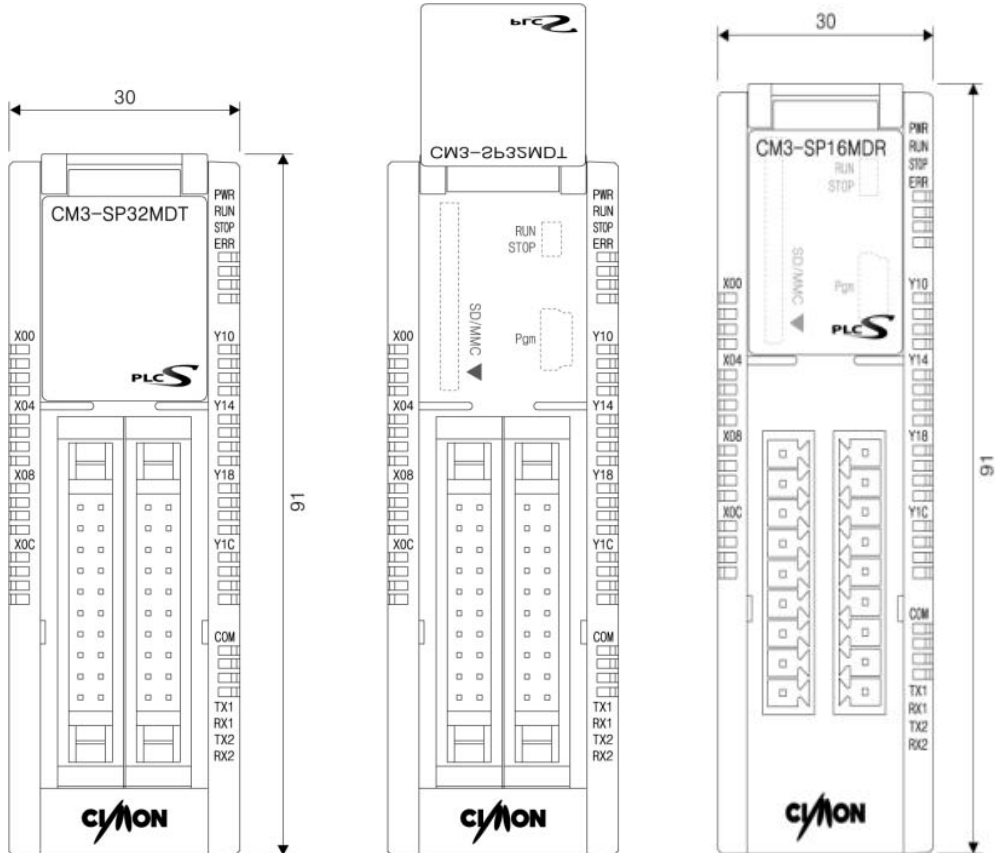
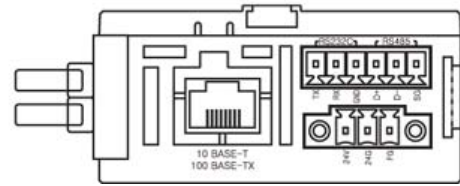
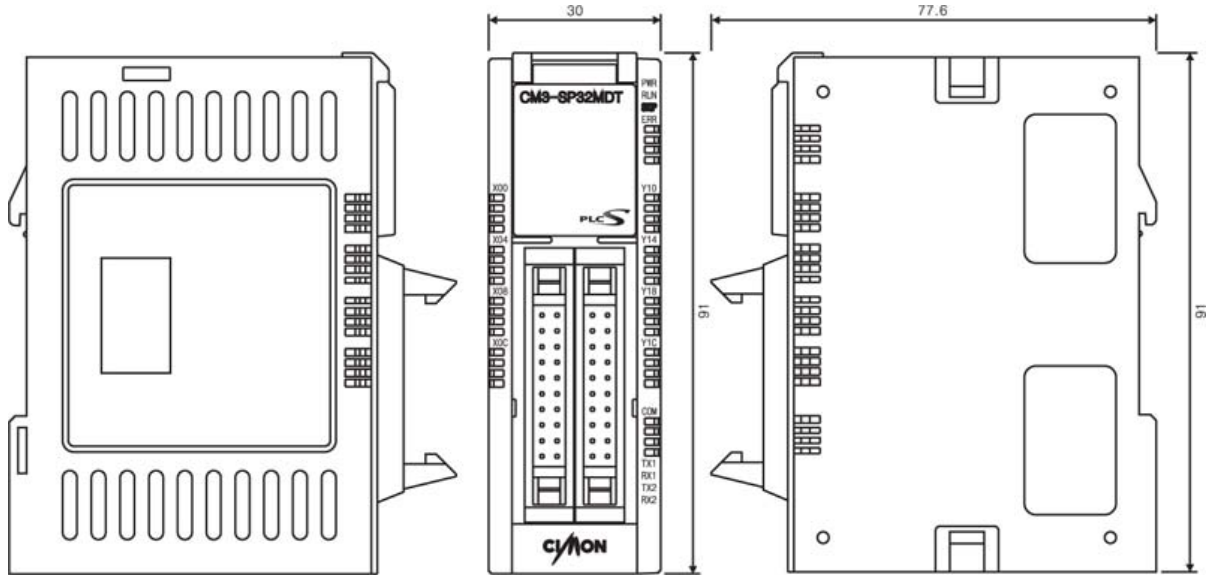
Items		RS232C	RS422/485	Ethernet
Power		Supplied by CPU		
Comm. Module	Dedicated Protocol	HMI Protocol (1:n)		
	Loader Protocol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	User Defined Protocol	<input type="radio"/>	<input type="radio"/>	
	MODBUS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	PLC Link			<input type="radio"/>
	DHCP			<input type="radio"/>
Types	Data Bit	8 Bit		
	Stop Bit	1 or 2 Bit		
	Parity	Even / Odd / None		
Synchronization		Asynchronous		
Transmission Speed		300 ~ 38,400		10/100 Mbps
Modem		Long Distance Comm. is Possible by External Modem		

L011061

PLC-CPU-CM3-SP Series



DIMENSIONS



L011061

*All Units are in mm