

PLC S

The Compact All-Around PLC

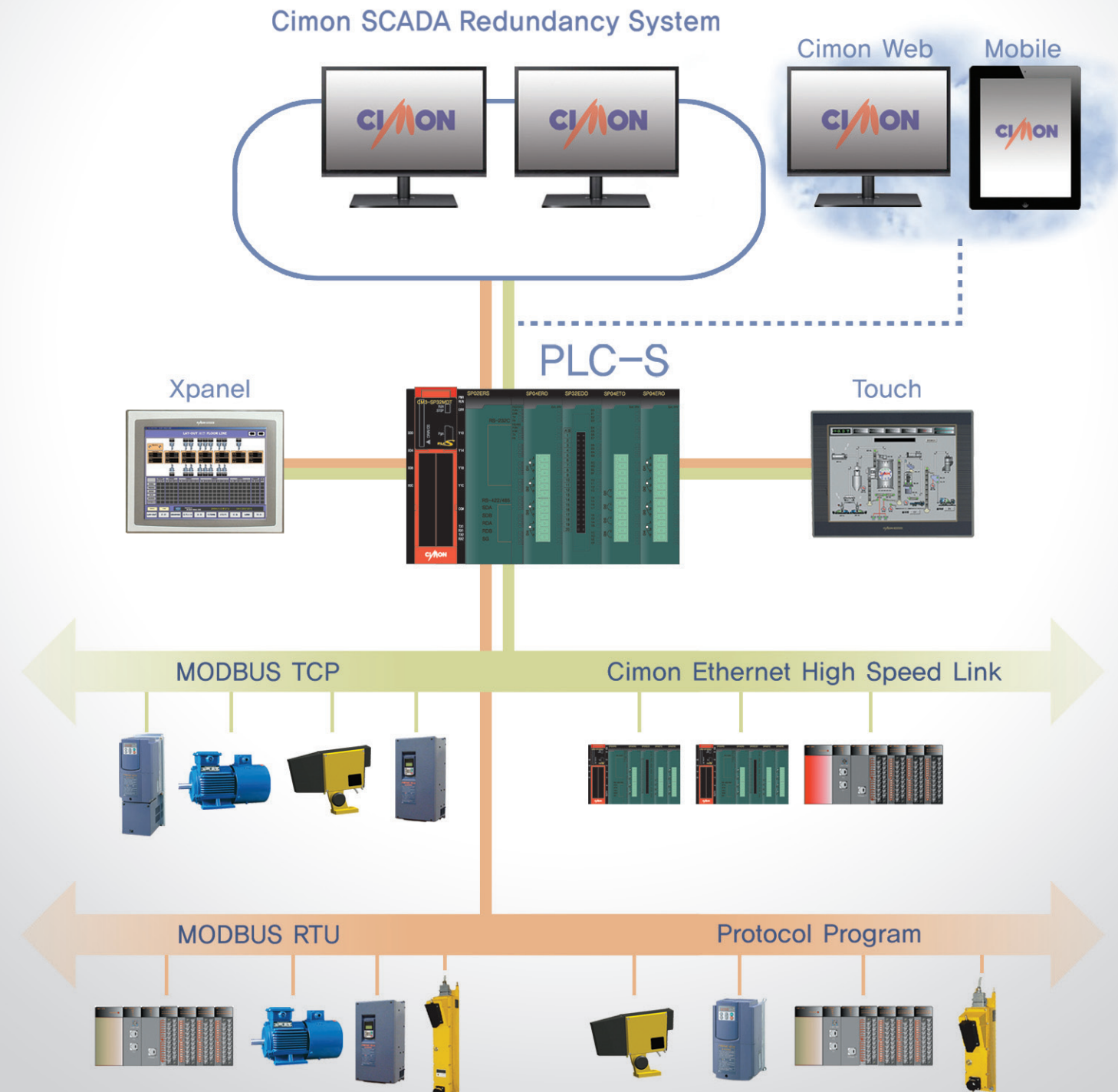




Strong Communication Solutions
Strong Expandability
Strong Built-In Functions

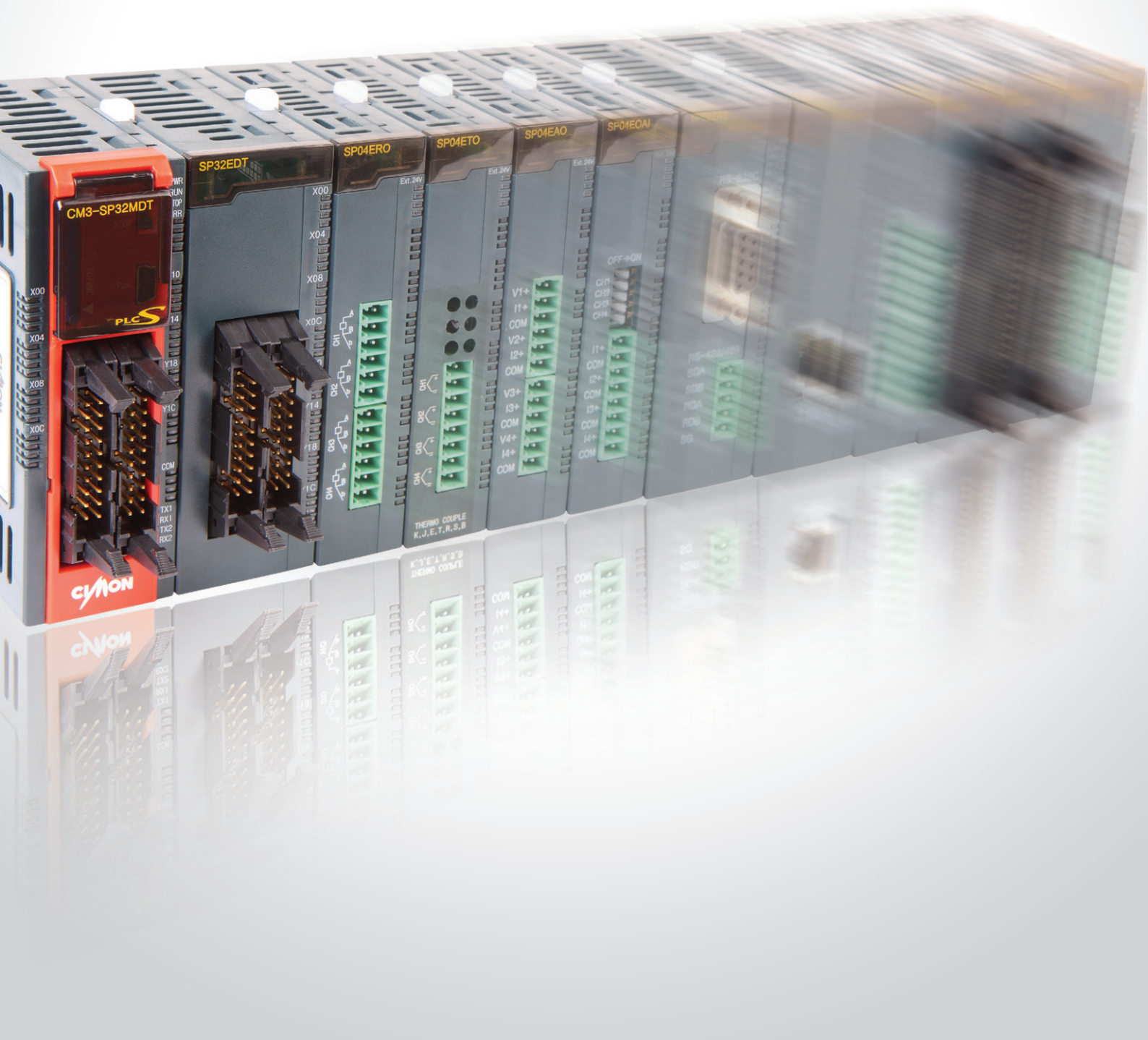


Various CIMON Network Solution



SPEED

Multi-Functional and Fast



SLIM

Compact Size with High Performance



CPU Module

CM3-SP32MDT/V/E/F
CM3-SP32MDC/V/E/F
CM3-SP16MDR/V/E/F

**Perfect CPU for Small to Medium Sized
Industrial Automation Systems**



CM3-SP32MDT/V/E/F

CM3-SP32MDC/V/E/F

CM3-SP16MDR/V/E/F

TR(Sink) TYPE



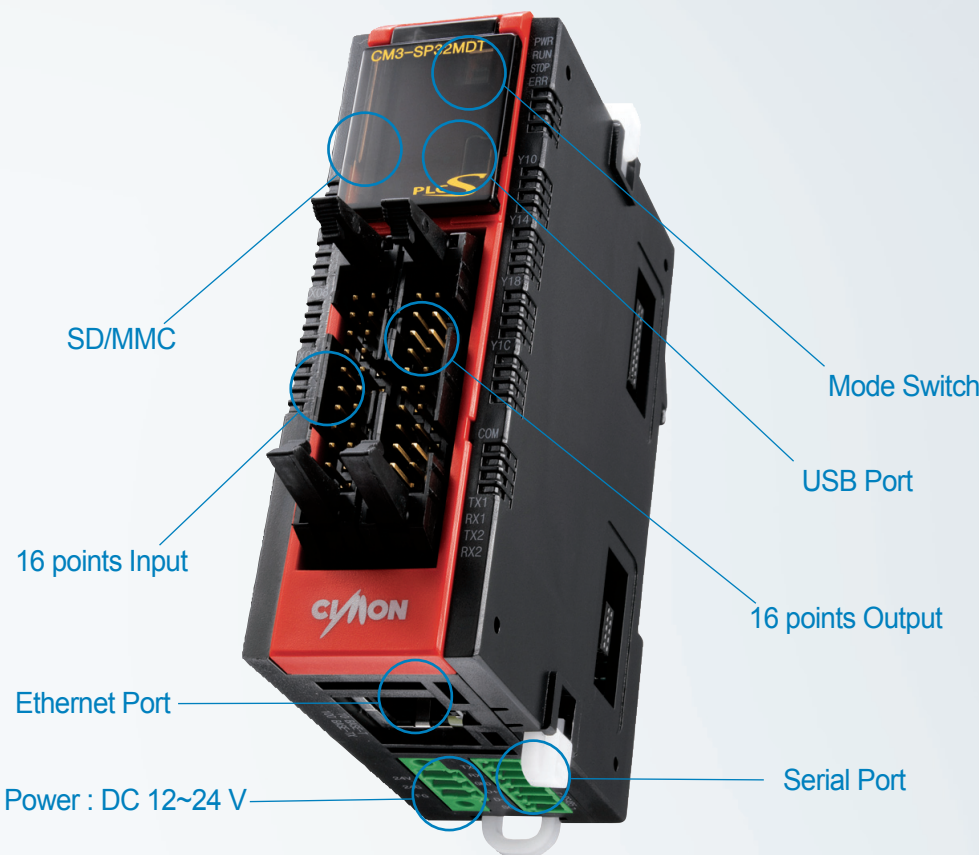
TR(Source) TYPE



RELAY TYPE



COMPACT BUT POWERFUL ALL-IN-ONE PLC



CPU Features

- TR Output(DC 24V) / Relay Output
- 200 nsec/step
- 32 pts. digital I/O (16 inputs and 16 outputs)
- 10K Step
- Expansion: Max. 11 modules (max. 384 pts.)
- Compact size of 30X90X61mm / 120g
- 3 built-in Comm. Ports (RS232C, RS422/485, Ethernet)
- USB loader port and SD card slot
- Built-in 20Kpps High Speed Counter (2ch)
- Built-in 100Kpps 2 axis Pulse Output (positioning)
- Built-in PID 32 loop
- Floating point arithmetic
- Run time editing, LD/IL/SFC language
- Built-in flash memory

PLC-S delivers high and fast performance and provides reliable environment for industrial systems without compromising the size and the cost. This is the smallest sized PLC and yet it has the ability of those bigger PLC's and more. This ensures to occupy less space in the equipment but still maintain the high performance at the same time.

PLC-S is very cost-effective since the CPU module already has several functions built in such as high-speed counter, positioning control function, floating point arithmetic, 3 way simultaneous communications, PID auto-tuning and etc. Addition of expensive modules for these functions is not needed for this reason.

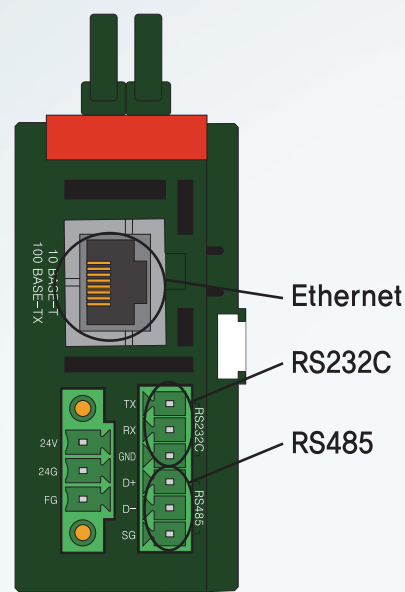
This unit can also be configured with other special expansion modules up to 11 modules to provide wide variety of functions. In addition, there's an USB port and a slot for SD cards for convenient program downloads.

This PLC is especially suitable for small to medium performance tasks. PLC-S is one of the most flexible, reliable, powerful but simplest Micro-PLC in the industrial world.

Specification

Maximum Expansion	11
Program Capacity	10k steps
Operation Rate	200 ns/step
I/O Points	Maximum 384 points
High Speed Counter	2 Phase 2 channels
Pulse Output	Maximum 100 kpps 2 axis, Linear Interpolation
Programming Tool	CICON Software
PID	32 channels, Auto-Tuning
RTC	Built-In (battery : CR2032)
ETC.	Floating Point Arithmetic Run Time Editing
Power	DC 24 V
Size & Weight	30 X 90 X 61 mm / 120 g

Specification



Communication Protocol	
Ethernet	MODBUS TCP, CICON (loader) CIMON-HMI (TCP,UDP), High Speed PLC Link
RS232C/485	MODBUS RTU Master, MODBUS RTU Slave, CICON (loader), CIMON-HMI, Protocol Program
Built-In Functions (High-Speed Counter)	
Counter Input Signal	Voltage Input (open collector)
Maximum Counting Speed	20 kpps
Number of Channels	2 channels (10 kkps)
Counting Range	Signed 32 bit (-2,147,483,648 ~ 2,147,483,647)
Built-In Functions (Positioning)	
Number of Control Axis	2 axis
Interpolation	2 axis Linear Interpolation
Pulse Output Type	Open Collector (DC 24 V)
Pulse Output	Pulse + Direction
Control Mode	Position Control Speed Control Speed / Position Switching Control, Position / Speed Switching Control
Maximum Output Speed	1 axis Position Control 100 kpps 1 axis Speed Control 100 kpps 2 axis Position Control 5 kpps 2 axis Speed Control 100 kpps

PLC-S Main-Block Options

TR(Sink) DC Power (Source Type: CM3-SP32MDC/V/E/F)

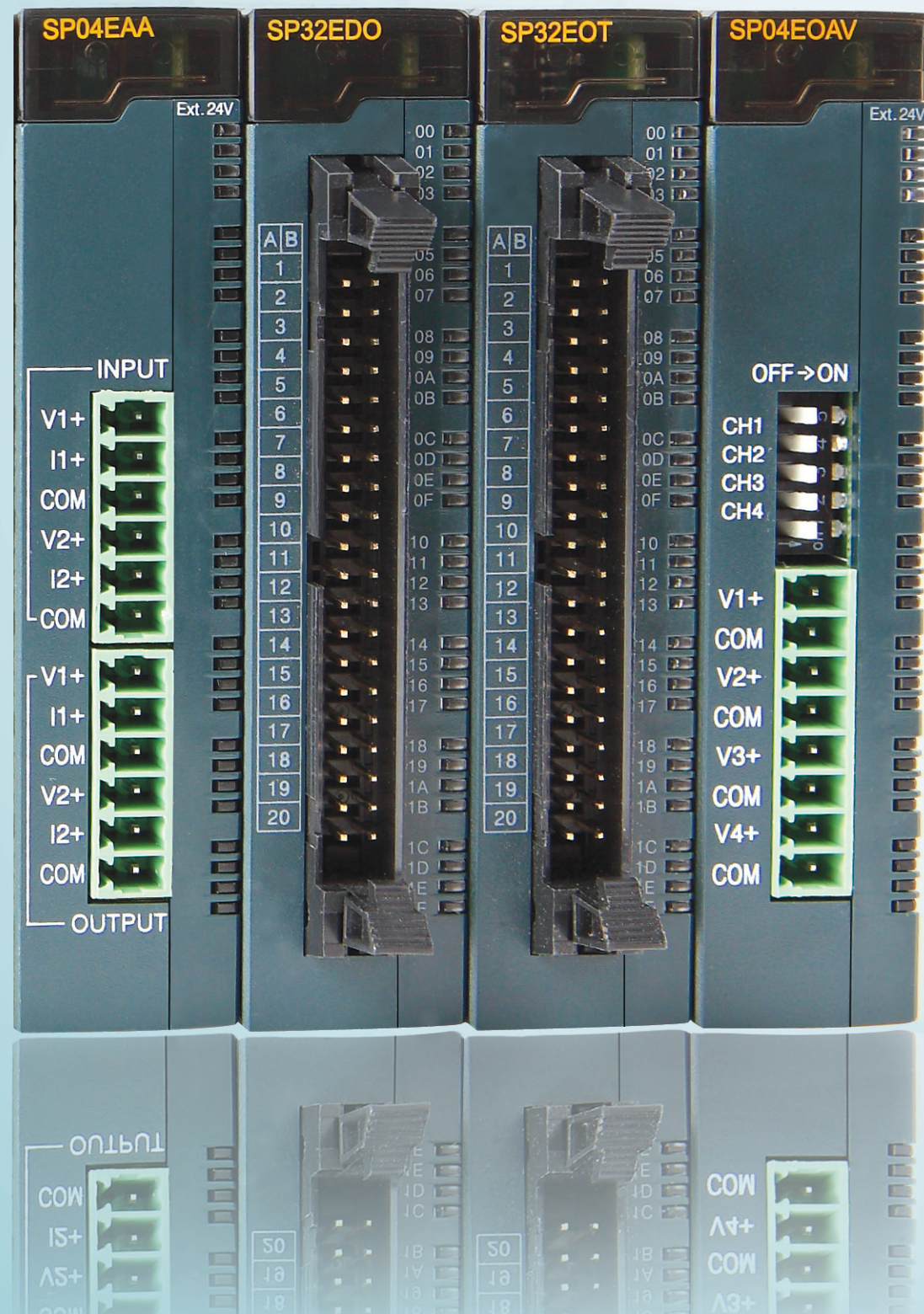
Model	CM3-SP32MDT	CM3-SP32MDT-SD	CM3-SP32MDTV	CM3-SP32MDTV-SD
Digital Input/Output	16 Digital Input 16 Digital Output	16 Digital Input 16 Digital Output	16 Digital Input 16 Digital Output	16 Digital Input 16 Digital Output
USB Loader	■	■	■	■
SD/MMC Card Slot	N/A	■	N/A	■
RS232C 1ch	■	■	■	■
RS485 1ch	N/A	N/A	■	■
Ethernet 1ch	N/A	N/A	N/A	N/A

Model	CM3-SP32MDTE	CM3-SP32MDTE-SD	CM3-SP32MDTF	CM3-SP32MDTF-SD
Digital Input/Output	16 Digital Input 16 Digital Output	16 Digital Input 16 Digital Output	16 Digital Input 16 Digital Output	16 Digital Input 16 Digital Output
USB Loader	■	■	■	■
SD/MMC Card Slot	N/A	■	N/A	■
RS232C 1ch	■	■	■	■
RS485 1ch	N/A	N/A	■	■
Ethernet 1ch	■	■	■	■

Relay Output (DC Power)

Model	CM3-SP16MDR	CM3-SP16MDRV	CM3-SP16MDRE	CM3-SP16MDRF
Digital Input/Output	8 Digital Input 8 Digital Output	8 Digital Input 8 Digital Output	8 Digital Input 6 Digital Output	8 Digital Input 6 Digital Output
USB Loader	■	■	■	■
SD/MMC Card Slot	N/A	N/A	N/A	N/A
RS232C 1ch	■	■	■	■
RS485 1ch	N/A	■	N/A	■
Ethernet 1ch	N/A	N/A	■	■

Build Your Own Complete System



Digital I/O Module

CM3-SP32EDO CM3-SP32EOT
CM3-SP32EOC CM3-SP16EOR
CM3-SP32EDT

Analog I/O Module

CM3-SP04EAO CM3-SP04EOAI
CM3-SP04EOAV CM3-SP04EAA

RTD Module

CM3-SP04ERO

TC Module

CM3-SP04ETO

Analog Mux Module

CM3-SP04EAM

CM3-SP32EDO CM3-SP32EOT CM3-SP32EOC
CM3-SP32EDT CM3-SP16EOR



Features

- External terminal block for easy installation and maintenance
- Insulated photo-coupler and relays block interference

Specification					
Model	CM3-SP32EDO	CM3-SP32EOT	CM3-SP32EOC	CM3-SP16EOR	CM3-SP32EDT
Type	32 points Input	32 points TR Output	32 points TR Output	16 points Relay Output	16 points Input 16 points TR Output
Input Voltage	DC 24 V	N/A	N/A	N/A	DC 24 V
Output Voltage	N/A	DC 12 V / 24 V	DC 12 V / 24 V	AC 220 V / DC 24 V	DC 12 V / 24 V
Input Current	4 mA	N/A	N/A	N/A	4 mA
Cutput Current	N/A	1 point 0.2A COM 2A	1 point 0.2A COM 2A	1 point 2A COM 5A	1 point 0.2A COM 2A
On Voltage / Current	DC 19 V / 3 mA	N/A	N/A	N/A	N/A
Off Voltage / Current	DC 6 V / 1 mA	N/A	N/A	N/A	N/A
Response Time	Less than 3 ms	Less than 1 ms	Less than 1 ms	Less than 10 ms	Less than 1 ms
Indication Lamp	LED On	LED On	LED On	LED On	LED On
Nsulaton Type	Photo Coupler Insulation	Photo Coupler Insulation	Photo Coupler Insulation	Relay Insulation	Photo Coupler Insulation
Input Method	SINK/SRC Compatible	N/A	N/A	N/A	SINK/SRC Compatible
Cutput Method	N/A	Sink	Source	Relay	Sink

CM3-SP04EAO



Features

- Provides wide input range
- Very reliable with less than $\pm 0.05\%$ of error
- Protected from interference by the photo coupler insulation between input ports and the PLC

Specification		
Model		CM3-SP04EAO
Analog Input Point		4 channels
Analog Input	Voltage	0 ~ 5 V 1 ~ 5 V 0 ~ 10 V -10 ~ 10 V
	Current	0 ~ 20 mA 4 ~ 20 mA
Digital Conversion		14 bit (0 ~ 16000)
Maximum Resolution	0V ~ 5 V	312.5 mV
	1V ~ 5 V	250 mV
	0V ~ 10 V	625 mV
	-10V ~ 10 V	1250 mV
	0mA ~ 20 mA	1.25 nA
	4mA ~ 20 mA	2 nA
Accuracy		$\pm 0.1\%$ (full scale)
Maximum Conversion Rate		2.1 ms / 4 channels
Absolute Maximum Input		Voltage: ± 15 V, Current: ± 30 mA
Insulation Type		Photo Coupler Insulation between Input Ports and PLC (non-insulation between channels)
Access Terminal		12 points

CM3-SP04EOAV, CM3-SP04EOAI



Features

- Provides wide output range
- Very reliable with less than ±0.1% of error
- Protected from interference by the photo coupler insulation between output ports and the PLC

Specification		
Model	CM3-SP04EOAV	CM3-SP04EOAI
Number of Analog Output Channel	4 channels	4 channels
Analog Output	-10 V ~ 10 V / 0 V ~ 10 V (selected by DIP switch)	4 mA ~ 20 mA
Digital Conversion	14 bit (0 ~ 16000)	
Max. Resolution	1.25 mV	1.25 µA
Accuracy	±0.1 %	
Maximum Conversion Rate	10ms	
Absolute Maximum Output	Voltage: ± 15 V	Current: ± 24 mA
Insulation Type	Photo Coupler Insulation between Input Ports and PLC	
Access Terminal	8 points	

CM3-SP04EAA



Features

- Provides wide input/output range
- 16 bit conversion for high resolution measurement
- Very reliable with less than ±0.05% of error
- Protected from interference by the photo coupler insulation between input ports and the PLC

Specification		
Model		CM3-SP04EAA
Number of Analog Channel		Input: 2 channels, Output: 2 channels
Analog Input / Output	Voltage	0 ~ 5 V
		1 ~ 5 V
		0 ~ 10 V
		-10 ~ 10 V
	Current	0 ~ 20 mA
		4 ~ 20 mA
Digital Conversion		14 bit (0 ~ 16000) / 16 bit (0 ~ 64000)
Maximum Resolution	0 V ~ 5 V	78.1 µV
	1 V ~ 5 V	62.5 µV
	0 V ~ 10 V	156.3 µV
	-10 V ~ 10 V	312.5 µV
	0 mA ~ 20 mA	312.5nA
	4 mA ~ 20 mA	250nA
Accuracy		± 0.05 % (full scale)
Maximum Conversion Rate		2.1 ms / 4 channels
Absolute Maximum Input		Voltage: ± 15 V, Current: ± 30 mA
Insulation Type		Photo Coupler Insulation Between Input Ports and PLC (non-insulation between channels)
Access Terminal		12 points

RTD Module

CM3-SP04ERO



Features

- Detects disconnected cables from each channel
- Supports most RTD's
- 4 channels and $\pm 0.1\%$ accuracy
- Ability to detect the values out of range
- Digital temperature measurements in 0.1 degree increments
- Converts input data to 16 bit digital value

Specification		
RTD Type	PT100,JPT100,PT1000, NI1000 (DIN 43760), NI1000 (TCR 5000)	
Range of Temperature	PT100 : -200.0 °C to 600 °C (18.48 to 313.59 Ω) JPT100 : -200.0 °C to 600 °C (17.14 to 317.28 Ω) PT1000 : -200.0 °C to 600 °C (184.8 to 3135.9 Ω) NI1000 (DIN 43760): -50.0 °C to 160 °C (742.6 to 1986.3 Ω) NI1000 (TCR 5000): -50.0 °C to 160 °C (790.9 to 1799.3 Ω)	
Digital / Temp Output	Digital Value : 0 ~ 16,000 (-8000 ~ 8000) Temp : -200.0°C ~ 600.0°C (floating point x 10)	
Disconnection Detection	3 points Indication for Each Channel	
Accuracy	$\pm 0.1\%$ (full scale)	
Maximum Conversion Rate	50 ms / 4 Channels	
Number of Input Channels	4 channels / 1 module	
Insulation Method	Photo Coupler Insulation between Input Ports and PLC (Non-insulation between channels)	
Connection Terminal	12 points	
Internal Current Consumption (mA)	+5 V	60 mA
External Current Consumption (mA)	+5 V	30 mA

TC Module

CM3-SP04ETO



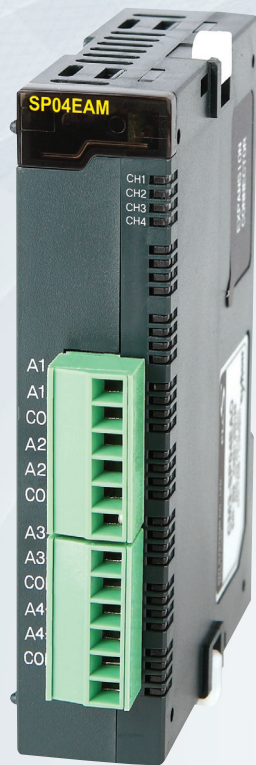
Features

- Measures wide range of temperature
- Supports many different types of TC's
- Supports 4 channels and $\pm 0.3\%$ accuracy
- This module converts analog temperature to digital data
- Input data can be processed to first decimal point as digital value
- Detects cable disconnection and values out of range

Specification		
Available TC	Type K,J,E,T,B,R,S,N	
Digital Output	Digital Value : 0 ~ 16,000 (-8000 ~ 8000) Temp Value : °C, °F (0.1 °C Resolution)	
Disconnection Detection	3 points Indication for Each Channel	
Accuracy	$\pm 0.3\%$ (Full Scale) $\pm 1\text{ }^{\circ}\text{C}$ (error for base contact compensation)	
Maximum Conversion Rate	50ms / 4 Channels	
Compensation Type	Automatic Compensation	
Number of Input Channels	4 channels / 1 module	
Insulation Method	Photo Coupler Insulation between Input Ports and PLC (non-insulation between channels)	
Connection Terminal	8 points	
Internal Current Consumption (mA)	+5 V	60 mA
External Current Consumption (mA)	+24 V	30 mA

Range of Temperature			
Type	Standard	Range of Temp (°C)	Range of Voltage (μV)
K	ITS-90	-200.0 ~ 1200.0	-5891 ~ 48828
J		-200.0 ~ 800.0	-7890 ~ 45498
E		-200.0 ~ 600.0	-8824 ~ 45085
T		-200.0 ~ 400.0	-5602 ~ 20869
B		400.0 ~ 1800.0	786 ~ 13585
R		0.0 ~ 1750.0	0 ~ 21006
S		0.0 ~ 1750.0	0 ~ 18612
N		-200.0 ~ 1250.0	-3990 ~ 43846

CM3-SP04EAM



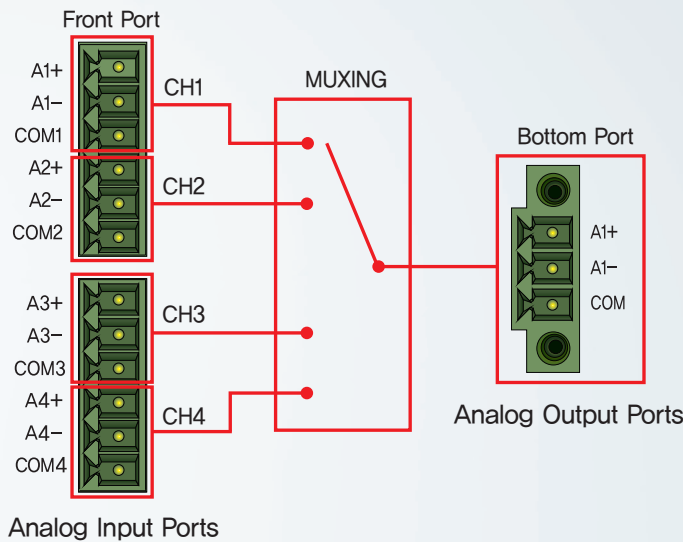
Features

Analog Mux Module receives 4 channel analog signals and switches them sequentially to an output port by a set time interval. By connecting up to 4 mux modules with 1 analog module (AD, RTD, TC, etc.), maximum 16 channels of analog expansions can be achieved.

- Channels can be enabled/disabled and easy channel information check
- Relay ON time can be selected by 0.1~1000.0 sec interval
- Relay life expectancy can be checked through the relay counter function
- Auto/Manual mode selectable
- Not suitable for current signal use since this module only switches analog signals repeatedly

Specification	
Number of Analog Channel	3-wire, 4 channels
Analog Input	Voltage, RTD, TC
Relay Min/Max ON TIME	Minimum : 0.1 sec, Maximum : 1000 sec
Insulation Type	Relay
Capacity	16 points
Access Terminal	12 points
Relay Life-Expectancy	Number of Operation of 10 ⁸

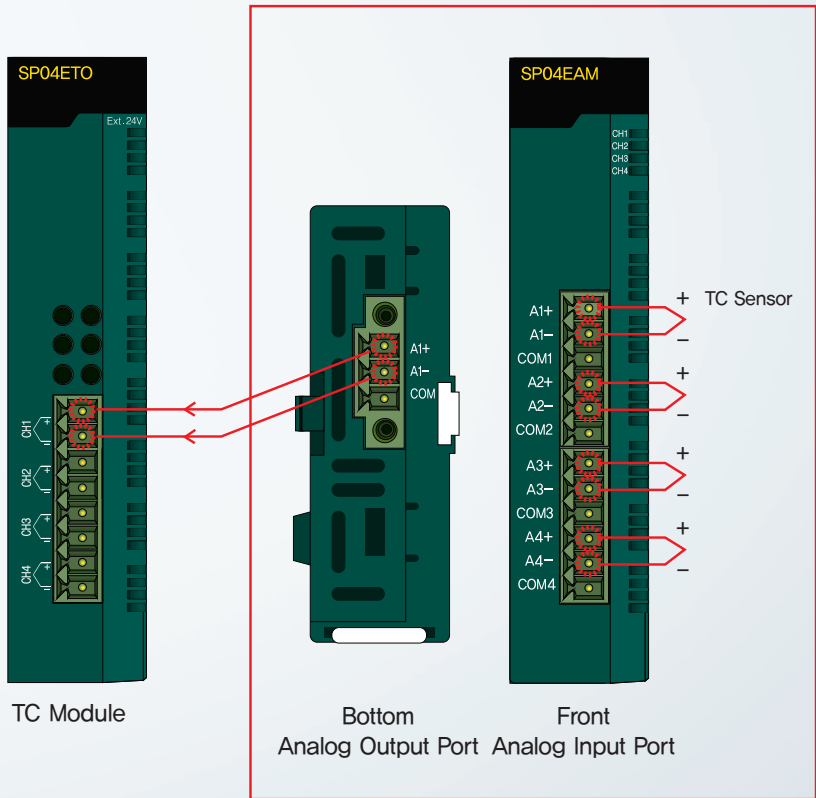
Concept Diagram



〈SP04EAM Concept Diagram〉

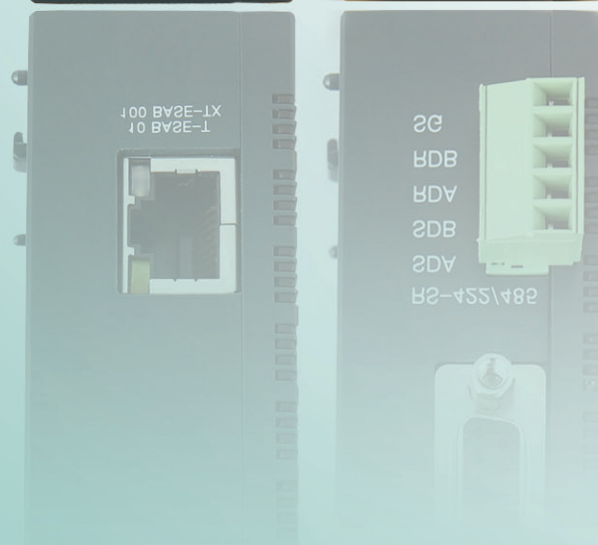
Wiring Example

Ex) SP04ETO Module and SP04EAM Module Wiring Diagram



MUX Module

**Fast, Flexible, and Reliable
Industrial Communication**



Ethernet Module

CM3-SP01EET

Serial Module

CM3-SP02ERS

CM3-SP02ERR

CM3-SP01EET



Features

- Follows IEEE802.3 standard and supports ARP, ICMP, IP, TCP, UDP protocols
- Operates with CIMON-SCADA to support DHCP
- Supports MODBUS TCP Master function to communicate with third-party devices
- High-speed linkage to communicate along CIMON PLC's and supports up to 64 simultaneous communications

Specification		
Model		CM3-SP01EET
Media Interface		10BASE-T 100BASE-TX
Transmission Speed		10/100 M
Max. Distance (Node to Node)		100 m
Service Capacity		UDP, TCP : 12 Service
Service	Loader	Yes (UDP)
	HMI Protocol	Yes (TCP, UDP)
	MODBUS TCP Slave	Yes
	MODBUS TCP Master	Yes
	Protocol Special Program	Yes (TCP, UDP)
	High-Speed PLC Link	Yes
	DHCP	Yes

CM3-SP02ERS

Features

- Read and write data by HMI protocol
- Up to 32 units communication available for Multi-Drop configuration (RS422/485)
- Supports wide range of communication speed (300 bps ~ 38400 bps)
- Full-Duplex (RS422) and Half-Duplex (RS485)
- Supports 1:1 / 1:N / N:M communication for RS422 and R485
- RS232C/422/485 communication ports are available by setting up independent channel or linked channel
- RS422 and RS485 channels are properly insulated to prevent any outer interference
- Supports universal protocol
- MODBUS RTU Master function is built-in for an easy acquisition of data from third-party devices (MODBUS RTU Slave)



Specification		
Model		CM3-SP02ERS
Interface		Direct Communication between Each Ports (RS-232C/RS422)
Comm. Method	Null Modem	10/100 M
Operation Mode	Protocol Special Program	Use Protocol Special Program to Communicate
	HMI Protocol	Use CIMON-PLC HMI Protocol to Communicate
	MODBUS Protocol	Use MODBUS RTU Protocol to Communicate
	Graphic Loader Protocol	Use Connect Function in CICON to Control PLC
	MODBUS Master Program	Communicate with Slave Devices that Uses MODBUS RTU Protocol
Data Type	Data Bit	8 bits
	Stop Bit	1 or 2 bit
	Parity	Even / Odd / None
Synchronization		Asynchronous
Transmission Speed (bps)		300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200 / 38400
Insulation Type		RS232C : N/A RS422/485 : Photo Coupler Insulation

CM3-SP02ERR



Features

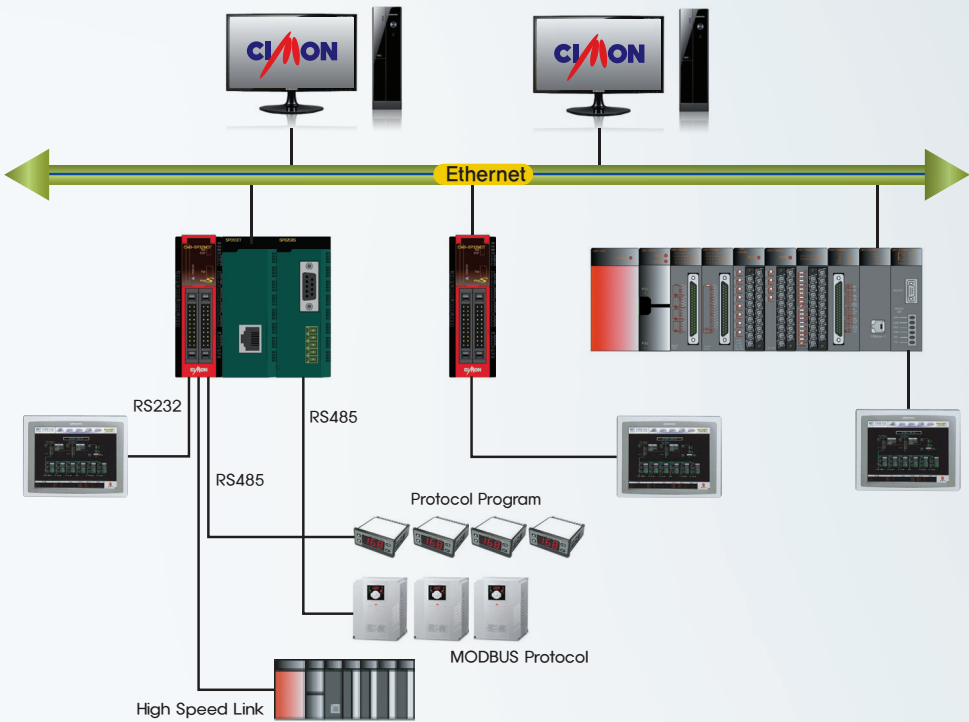
- 2 Channels of RS-232C
- Read and write data by HMI protocol
- Supports wide range of communication speed (300 bps ~ 38400 bps)
- RS232C communication ports are available by setting up independent channel or linked channel
- Supports universal protocol
- MODBUS RTU Master function is built-in for an easy acquisition of data from third-party devices (MODBUS RTU Slave)

Specification

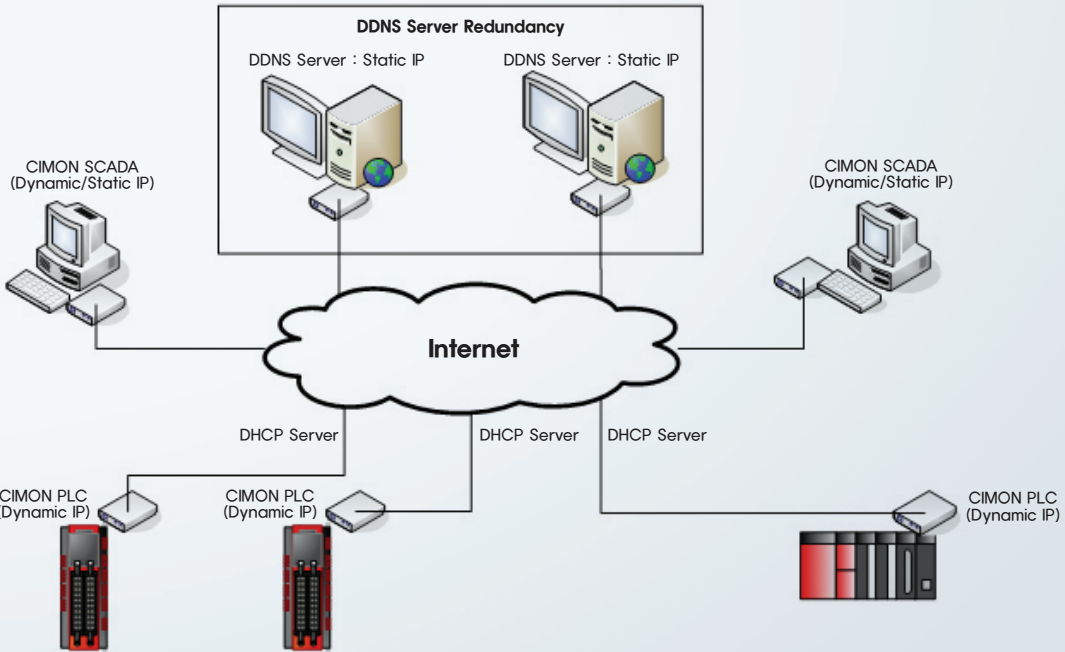
Specification		
Model		CM3-SP02ERR
Interface		RS232C 2 channels
Comm. Method	Null Modem	Direct Communication between Each Ports
Operation Mode	Protocol Special Program	Use Protocol Special Program to Communicate
	HMI Protocol	Use CIMON-PLC HMI Protocol to Communicate
	MODBUS Protocol	Use MODBUS RTU Protocol to Communicate
	Graphic Loader Protocol	Use Connect Function in CICON to Control PLC
	MODBUS Master Program	Communicate with Slave Devices that Uses MODBUS RTU Protocol
Data Type	Data Bit	8 bits
	Stop Bit	1 or 2 bit
	Parity	Even / Odd / None
Synchronization		Asynchronous
Transmission Speed (bps)		300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200 / 38400

System Configuration

System Configuration

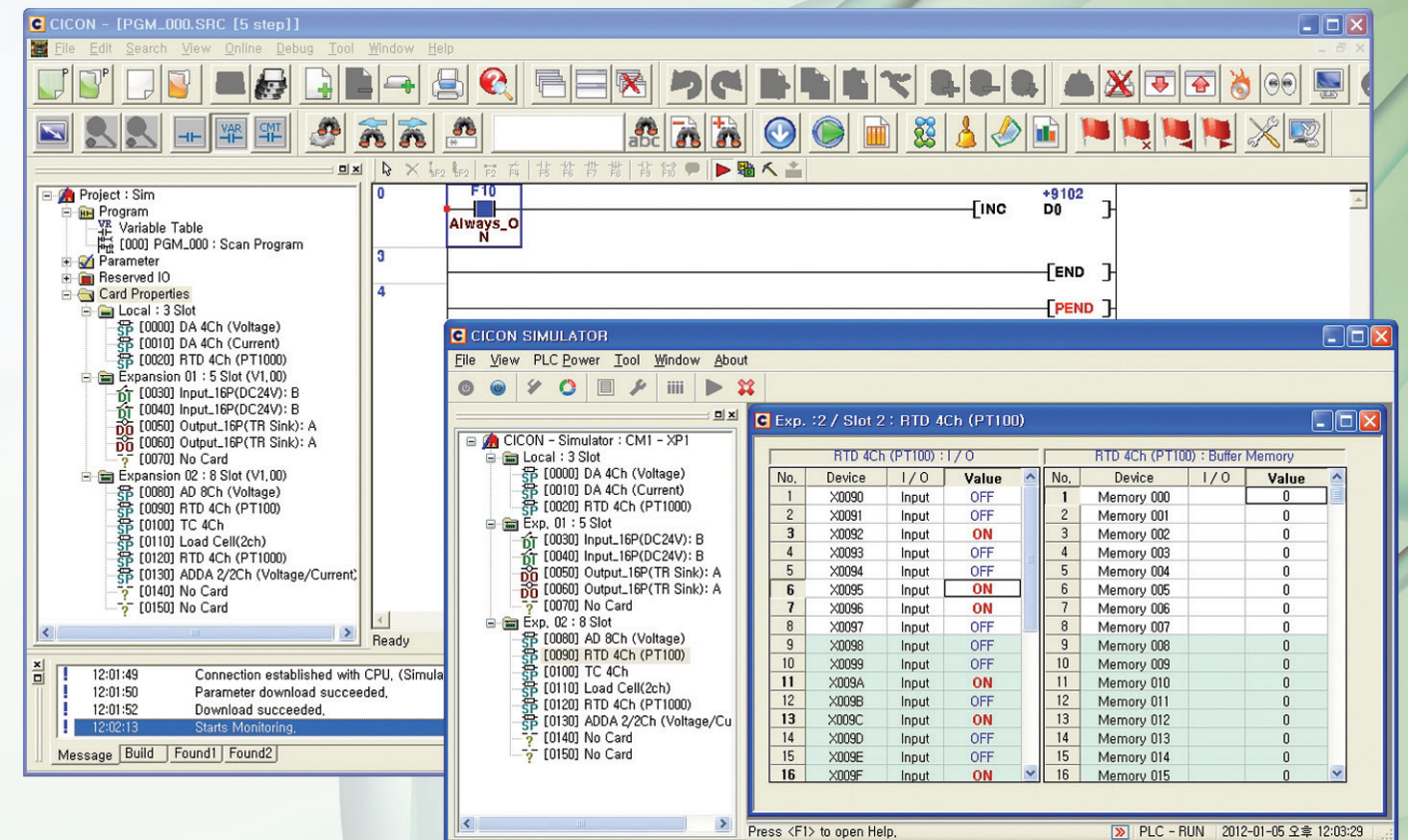
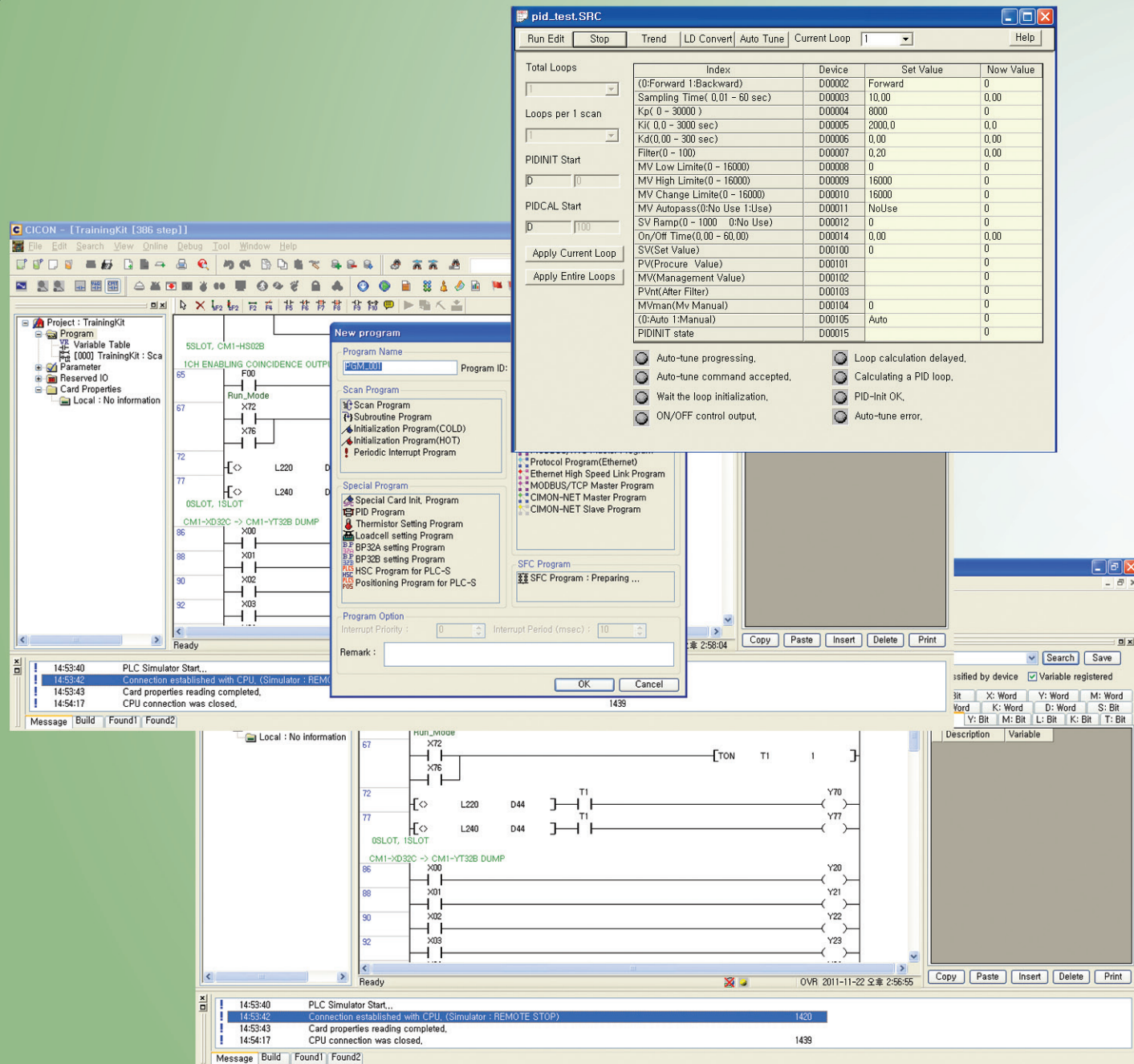


Dynamic IP System

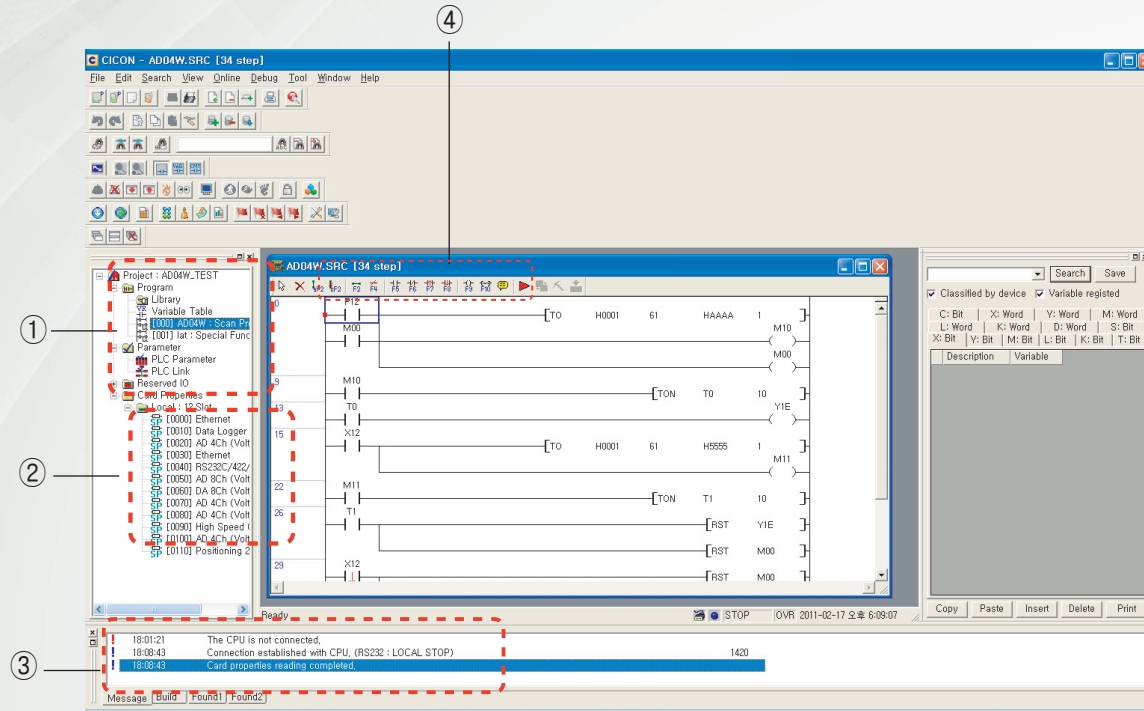


Intelligent User-Friendly Software

CICON Engineering Software

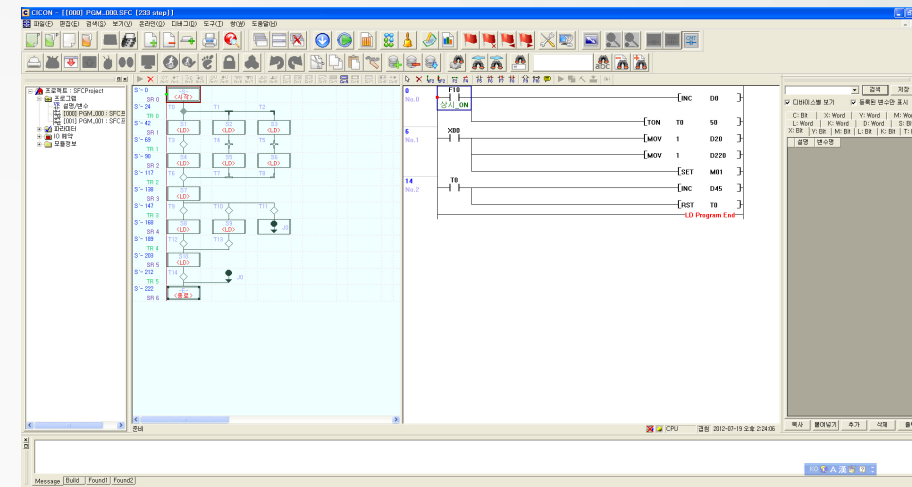


- User-friendly interface for editing and modifying the program
- Supports various types of communication methods such as CPU Loader, RS232C/422/485 and Ethernet
- Debugging function and system diagnosis

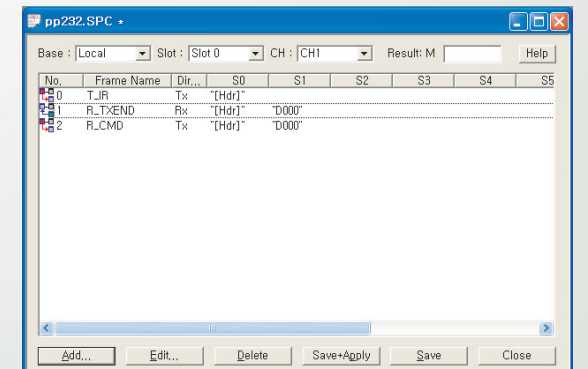
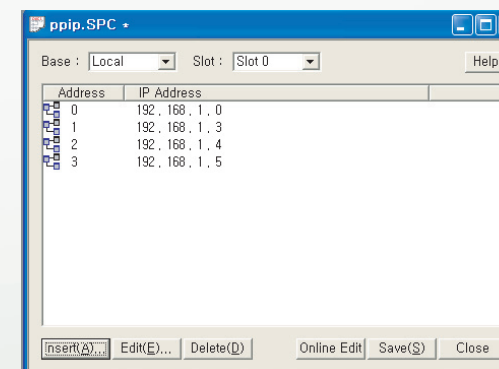
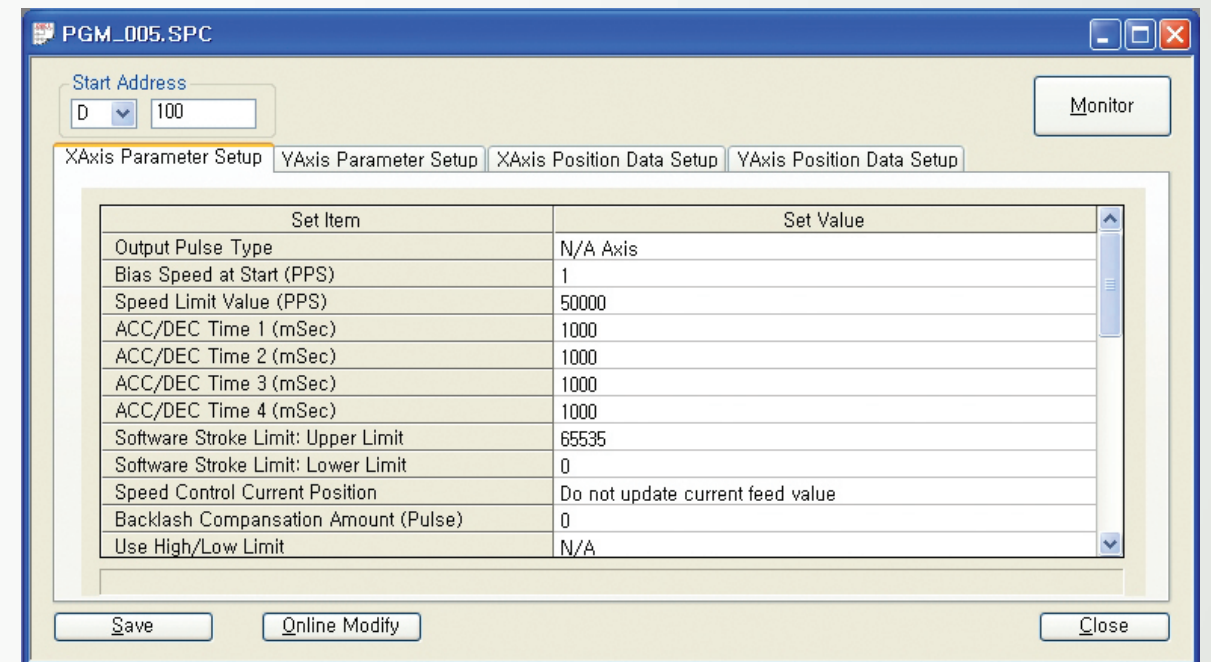


- ① Easy management of project files
- ② Automatically detects special cards info
- ③ Present processing condition shown in the message window
- ④ Convenient editing by keyboard shortcuts

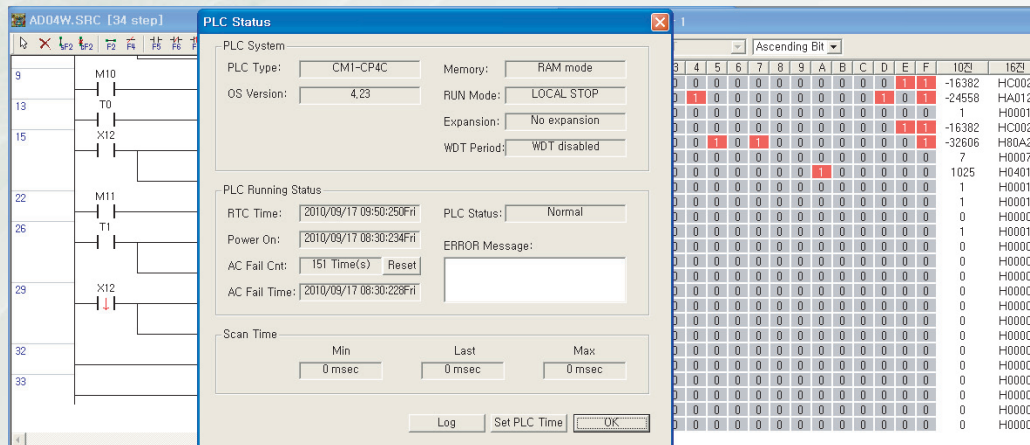
SFC



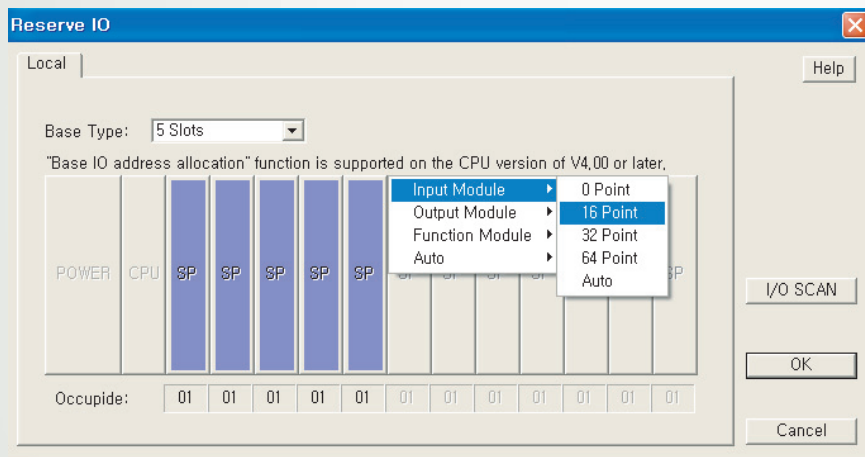
- Stress-free programming by simply setting up a dialog box for special functions instead of writing a complicated ladder program. (communication set-up, positioning, PID, protocol program, etc.)



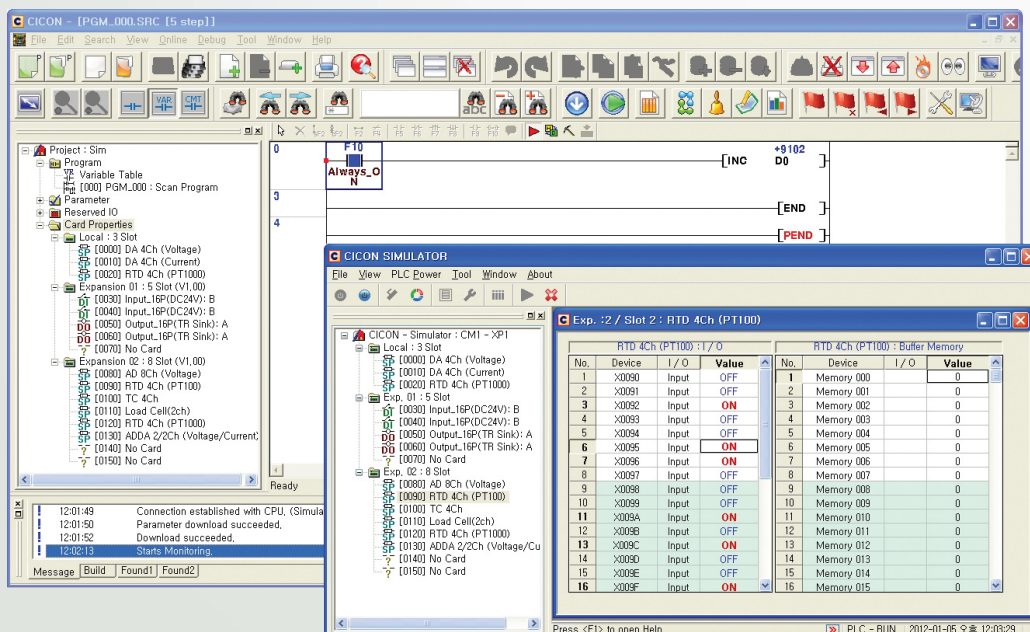
- Constant monitoring of the PLC status
- Fast and accurate error detection for each cards



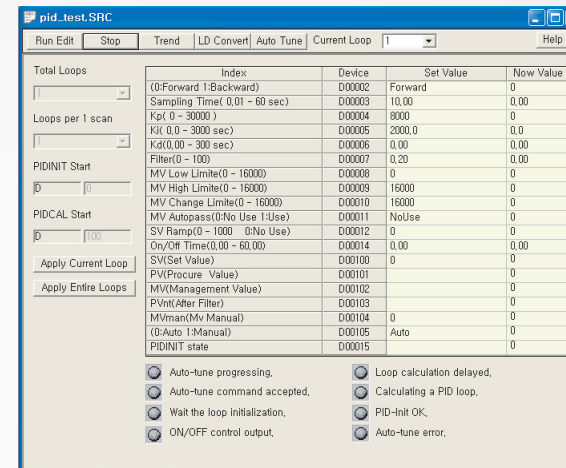
- Reserving the I/O
Compares and detects a card and checks if the card is inserted or not



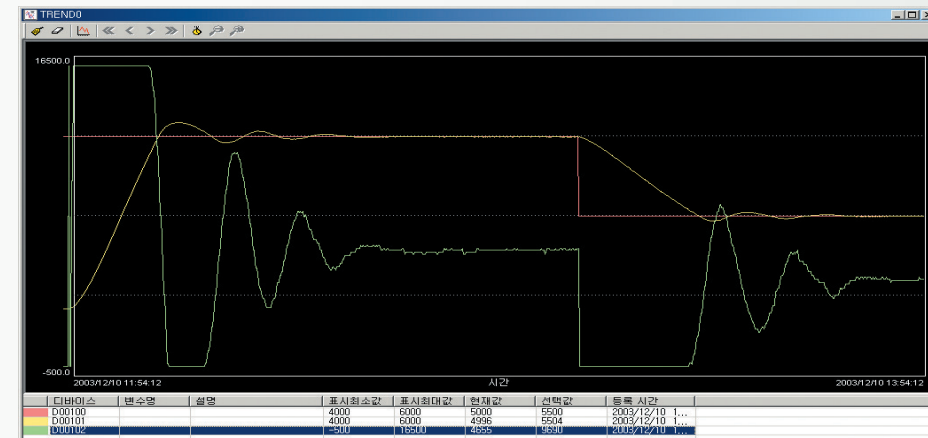
- Testing functions and programs is possible without connecting to a physical PLC by CICON Simulator



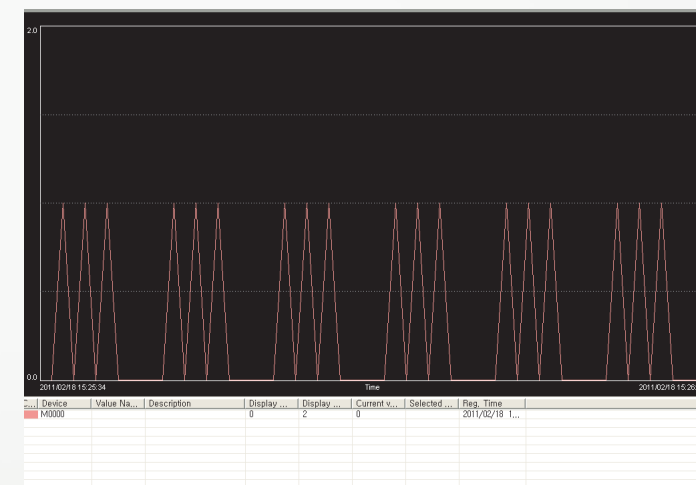
- PID auto tuning
Check PID input and current values constantly in dialog box.

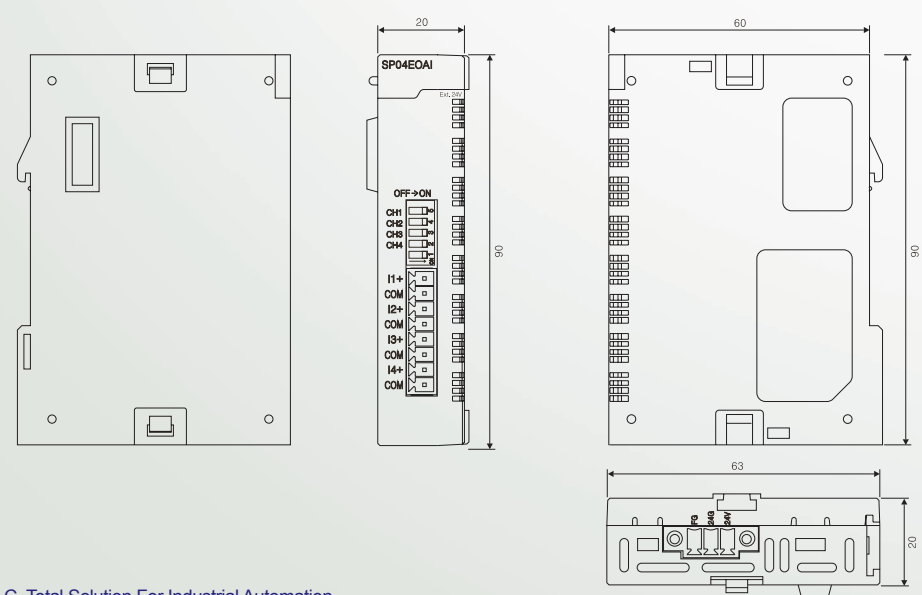
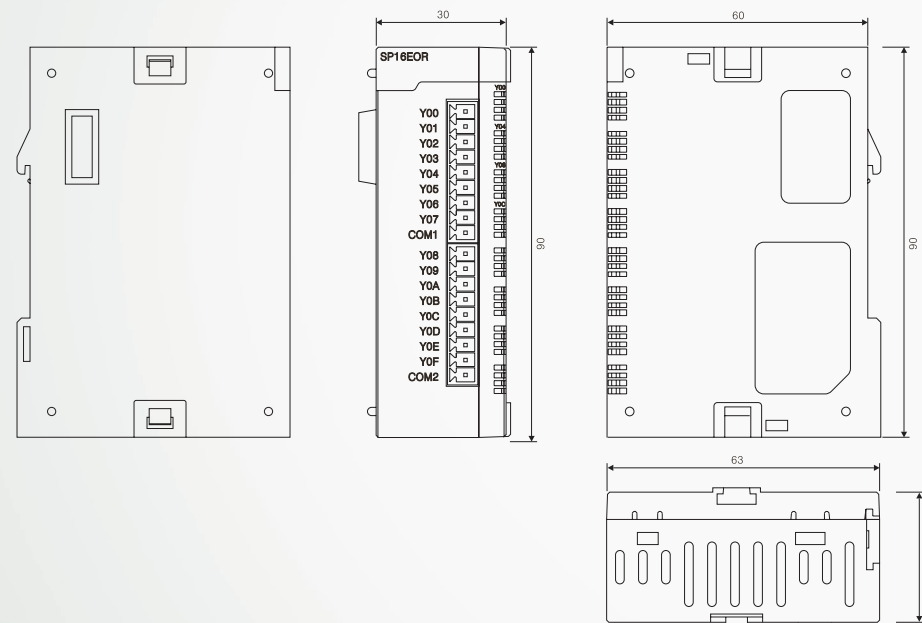
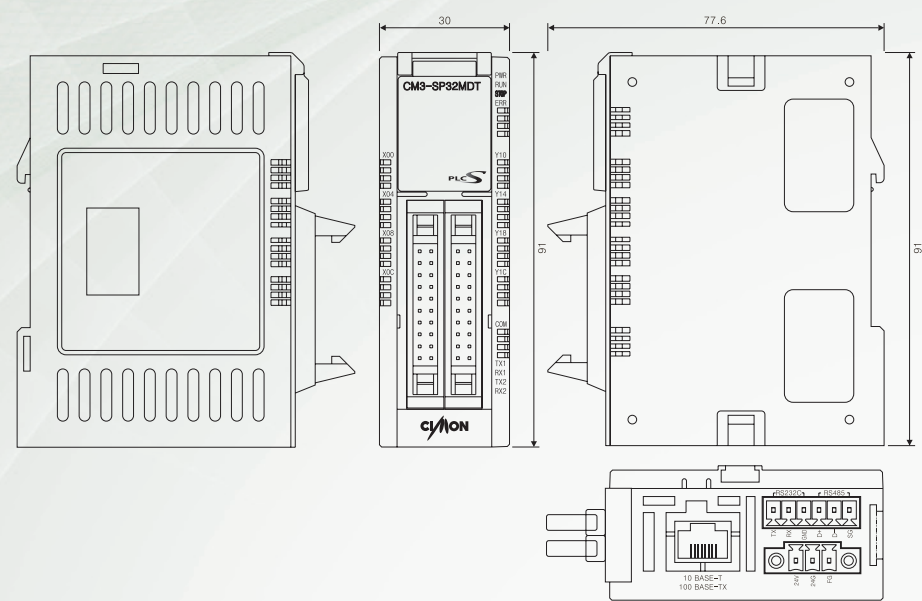


- PID operation condition shows as a trend type.



- PID tuning is available by controlling ON-OFF.





CIMON-PLC-S Series

Main-Block

No.	Model	Type	Description
1	CM3-SP32MDT	TR Output (DC Power)	DI16/DO16, USB Loader, RS232C 1ch
2	CM3-SP32MDT-SD		DI16/DO16, USB Loader, SD/MMC Card Slot, RS232C 1ch
3	CM3-SP32MDTV		DI16/DO16, USB Loader, RS232C 1Ch, RS485 1ch
4	CM3-SP32MDTV-SD		DI16/DO16, USB Loader, SD/MMC Card Slot, RS232C 1ch, RS485 1ch
5	CM3-SP32MDTE		DI16/DO16, USB Loader, RS232C 1Ch, Ethernet 1ch
6	CM3-SP32MDTE-SD		DI16/DO16, USB Loader, SD/MMC Card Slot, RS232C 1ch, Ethernet 1ch
7	CM3-SP32MDTF		DI16/DO16, USB Loader, RS232C 1ch, Ethernet 1ch, RS485 1ch
8	CM3-SP32MDTF-SD		DI16/DO16, USB Loader, SD/MMC Card Slot, RS232C 1ch, Ethernet 1ch, RS485 1ch
9	CM3-SP16MDR	Relay Output (DC power)	DI 8/DO 8(Relay), USB Loder/RS232 1ch
10	CM3-SP16MDRV		DI 8/DO 8, USB Loder, RS232 1ch, RS485 1ch
11	CM3-SP16MDRE		DI 8/DO 6, USB Loader, RS232C 1ch, Ethernet 1ch
12	CM3-SP16MDRF		DI 8/DO 6, USB Loader, RS232C 1ch, Ethernet1ch, RS485 1ch

* TR (Source) Type: CM3-SP32MDC/V/E/F

Digital Expansion-Block

No.	Model	Type	Description
1	CM3-SP32EDO	DI-32	DI 32pts, DC 24V
2	CM3-SP32EOT	DO-32	DO 32pts. DC 24V (TR)Sink
3	CM3-SP32EOC	DO-32	DO 32pts. DC 24V (TR)Source
4	CM3-SP16EOR	DO-16	DO 16pts, Relay Output
5	CM3-SP32EDT	DI-16/DO-16	DI 16pts, DO 16pts, (TR)Sink

Analog Expansion-Block

No.	Model	Type	Description
1	CM3-SP04EAO	AI-4	AI 4ch Current Voltage
2	CM3-SP04EAA	AIO-4	AI 2ch Current Voltage/AO 2ch Current Voltage
3	CM3-SP04ERO	AI-4	AI 4ch RTD
4	CM3-SP04ETO		AI 4ch TC
5	CM3-SP04EOAI	AO-4	AO 4ch Current Output
6	CM3-SP04EOAV		AO 4ch Voltage Output
7	CM3-SP04EAM	MUX	4ch MUX

Comm. Expansion-Block

No.	Model	Type	Description
1	CM3-SP02ERS	Comm.	RS232C 1ch, RS422/485 1ch
2	CM3-SP01EET	Comm.	Ethernet 1ch
3	CM3-SP02ERR	Comm.	RS232C 2ch

Accessories

No.	Model	Type	Description
1	CM0-TB32M	SP32MDT	Multi-Terminal
2	CM0-SCB15M	SP32MDT	Main Block 1.5M Cable
3	CM0-SCB15E	SP32EDO SP32EOT	I/O 32pts. 1.5M Cable

