Leadshine

Stock Code: 002979


Modbus

OPC UA

CANopen

EtherNet/IP™

EtherCAT®

# MC500 series

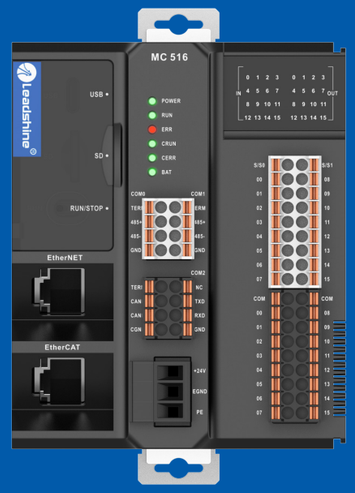
## General Type EtherCAT Bus PLC

# Stable  Efficient  Easy to use

In industries such as photovoltaic, semiconductor, electronics, CNC and logistics, alongside the upcoming of China's Intelligence Manufacturing 2025, there is a need to improve equipment efficiency and ease-of-use, as well as cost reduction. We need to find a more user-friendly, expandable and highly integrated control solution to achieve efficient operation throughout the entire installation process from wiring, programming, debugging and application.

Leadshine has launched a new economical bus type controller MC500 series to meet the increasingly high demands of motion control. MC500 series controller has a more complete functionalities for smart devices connection applications.

- Balancing motion control, complete functionality, and intelligent connectivity greatly
- Reduces user device development time, improving efficiency by 30% compared to traditional development models




## Features

### Motion control

- EtherCAT 32 axes
- 200kHz high-speed pulse 6 axes
- 6 axes linear / 3 axes circular interpolation
- E-CAM/flying shear/chasing shear

### Intelligent interconnection

- OPC UA
- EtherNET/IP
- 32 CANopen distributed control
- Modbus/Free communication port

### Rich functionality

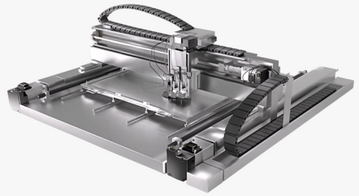
- local bus expand 32 I/O modules
- 32767 I/O
- 6 200kHz high-speed counting
- over temperature, over voltage, short circuit protection

# Motion control
# 6 high-speed pulse axes + 32 EtherCAT axes

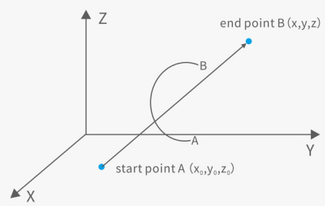
The excellent performance of a dual core SOC+FPGA high-speed processor enables motion control functions such as positioning, interpolation, and E-CAM that comply with PLCopen standards.

## Interpolation

Multidimensional linear interpolation, circular interpolation, and continuous interpolation can be used to control the trajectory for machining with certain precision and high-speed positioning transmission according to the shortest route.



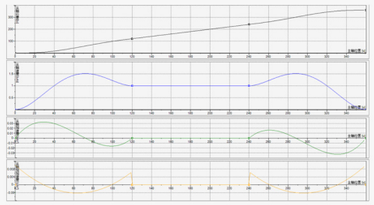
CAM graph



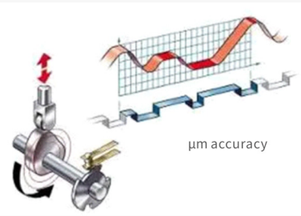

linear,circular interpolation

## E-CAM

By digitizing cam movements, the problems of low precision, easy wear and noise in mechanical cams can be solved.



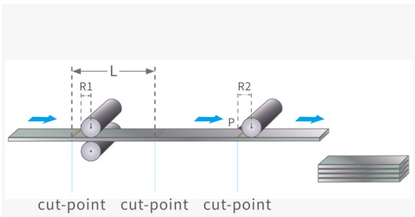
CAM graph




E-CAM

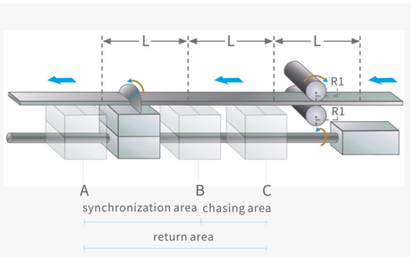
## Flying Shear

By setting values such as cutting length, number of cutting heads, and synchronization zone through process parameters, a rotary cutting cam table can be established within the synchronization zone, with the spindle and slave shafts operating at a certain speed ratio.




## Chasing Shear

By setting values such as cutting length, waiting position, chasing area, synchronization area, and return area through process parameters, a chasing cam table can be established, which is suitable for application scenarios such as cutting and filling.



PLC | digital module | analog module | temperature module | encoder module

## Program
- Type-C port
- upload or download program

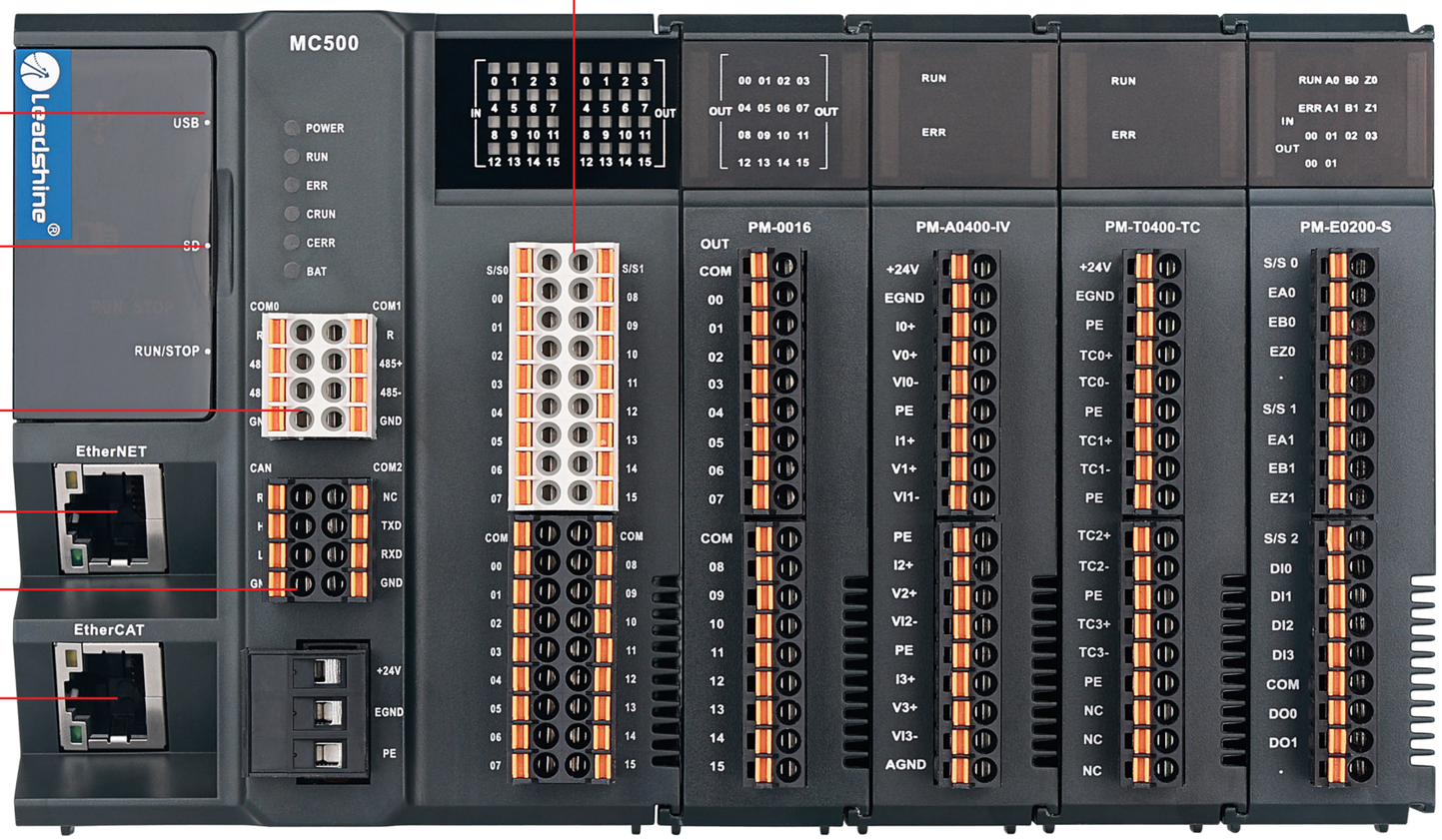
## Save
- Optional SD card
- download program ,save data

## Serial port
- 2*RS485,1*RS232
- Integrated serial port adapted instrument connection

## Ethernet
OPC UA EtherNet/IP
- OPC UA,EtherNet/IP
- Modbus-TCP,Socket

## Motion control
EtherCAT
- maximum control 32 axes
- Configure up to 128 EtherCAT slaves

## Distributed
CANopen
- The farthest transmission
- distance : 2.5km Configure up to 31 CANopen slaves



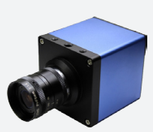

## I/O
integrated 32 IO(16 inputs 16 outputs)
- 6*200kHz high-speed pulse
- output6*200kHz high-speed counting

**100M high-speed internal backplane bus,maximum expanding 32 I/O modules**

- CPU:Dual core high-speed processor
- I/O,motion control synchronous time:1ms
- synchronous jitter time:1μs
- processing speed: 10ns
- program capacity:20MB
- data capacity: 40MB
- Power-Failure Retention Area:512KB

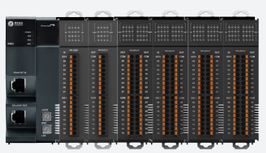
## Application
photovoltaic, Lithium battery, semiconductor, 3C, Logistics industry, packing, Special machine tool industry ect.


Robot


Industrial camera

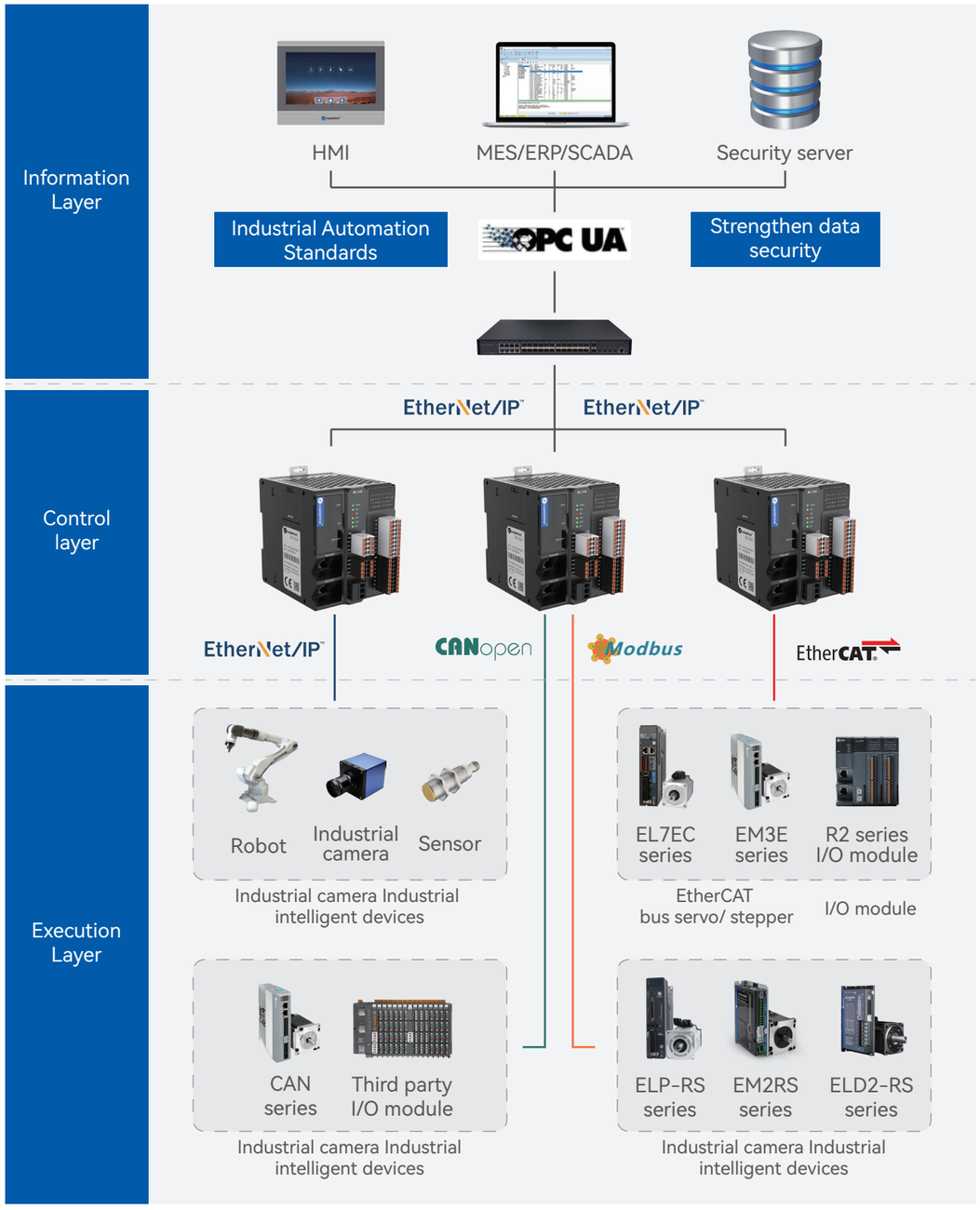

Servo

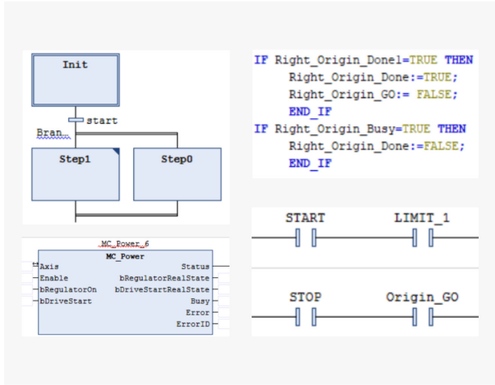

Stepper


R2 series i/o module

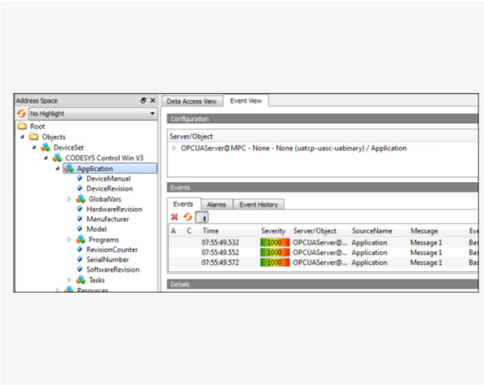
# Intelligent interconnection

OPC UA is an open international standard communication protocol. It is an industrial communication specification for intelligent manufacturing. It can directly and securely connect with IT systems such as MES/ERP to achieve tamper proof data, strengthen secure transmission, and eliminate interoperability barriers between the Mechanical floor and the information layer, helping traditional enterprises to achieve lean production in factories.

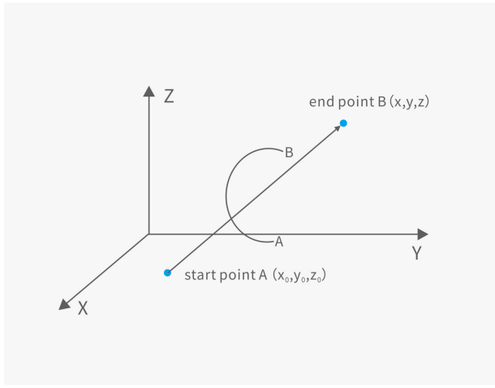



Program language :ST,LD,CFC,SFC,FBD,IL



OPC_UA informationize function

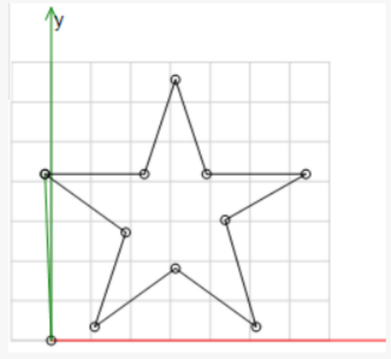



Space Interpolation

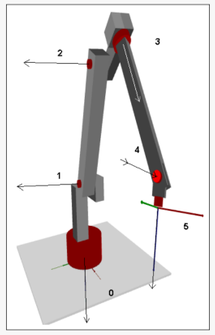
E-CAM

```
N000 G90
N010 G92 X0 Y0
N020 G00 X-5 Y134
N030 G01 X75 Y134
N040 X100 Y210
N050 X125 Y134
N060 X205 Y134
N070 X140 Y97
N080 X165 Y11
N090 X100 Y58
N100 X35 Y11
N110 X60 Y87
N090 X-5 Y134
N120
```

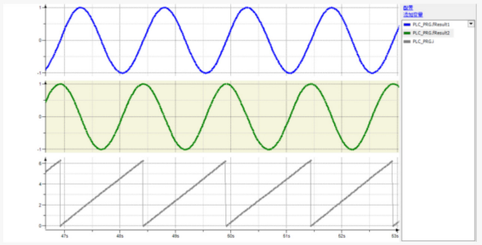
G code



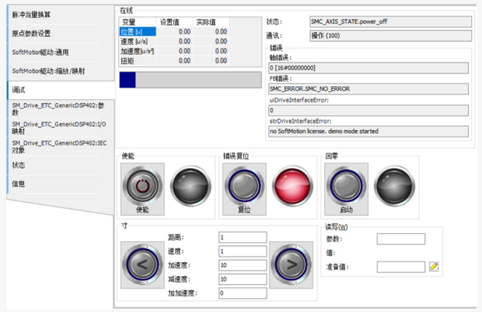

CNC tool path



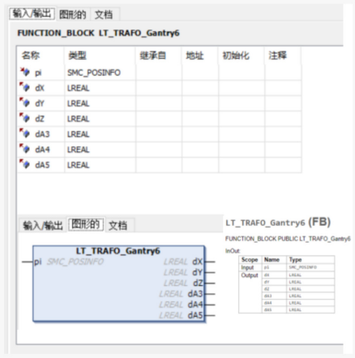

Robot



Trace monitor




Online simulation




Function Library developing

# Product information

## MC500 series PLC specification

| Specifications \ Model | MC508CS | MC516CS | MC532CS |
|---|---|---|---|
| | EtherCAT 8 axes + pulse+dir 6 axes | EtherCAT 16 axes + pulse+dir 6 axes | EtherCAT 32 axes + pulse+dir 6 axes |
| **Axes of Pulse +dir** | Local 6 axes 200K pulse output | | |
| **Extention Capacity** | maximum extend 32 R2 series extension modules | | |
| **EtherNET** | 1* EtherNET port, Modbus , Socket,program upload or download ,debugging | | |
| **EtherCAT** | EtherCAT master , up to 128 slaves | | |
| **serial port communication** | RS232*1,RS485*2,free communication protocol,modbus rtu master and slave | | |
| **CAN** | maximum 31 slave | | |
| **Capacity of Program file** | 20 M Byte | | |
| **Capacity of data** | 40 M Byte | | |
| **Power-Failure Retention Area** | 512K Byte | | |
| **USB port** | Type-C port, program upload or download,debugging | | |
| **SD card slot** | user download program,standard micro SD card,FAT32 type,Maximum capacity 32G | | |
| **Function** | Point to point , E-CAM, Interpolation | | |
| **High-speed counter** | 6 inputs ,200K | | |
| **IO Quantity** | 16 inputs High-speed input/ normal input: 12 inputs 200K/4 inputs 1K(NPN/PNP)<br>High-speed output/ normal output: 12 outputs 200K/4 outputs 10K(NPN) | | |
| **RTC clock** | support | | |
| **program software** | Leadsys Studio ,Codesys V3.5(SP15) | | |
| **Program Language** | ST,LD,CFC,SFC,FBD,IL | | |
| **Power input** | DC 24V | | |
| **Power rating** | 3.6W | | |
| **Dimension** | L 98.50mm*W 81.75mm*H100.00mm | | |

# R2 series extension module

## EtherCAT coupler

| Diagram | Model | Bus type | Bus port | Bus function | Dimension |
|---|---|---|---|---|---|
|  | R2EC | EtherCAT | 2* RJ45,1 input 1 output,rate : 100M | Complies with EtherCAT bus standards, occupies one slave station, can expand up to 32 modules with one coupler | L 100.92mm* W 42.5mm* H 110mm |

## Digital input module

| Diagram | Model | Pins | Input type | terminal | dimension |
|---|---|---|---|---|---|
|  | PM-1600 | 16 | NPN/PNP | Pressing terminal | L 111.92mm* W 25.9mm* H 101.5mm |
|  | PM-3200 | 32 | NPN/PNP | Pressing terminal | L 111.92mm* W 30.9mm* H 101.5mm |

## Dimension and parts (PM-1600/PM-3200)

| Diagram | Model | Pins | output type | terminal | dimension |
|---|---|---|---|---|---|
|  | PM-0016-N | 16 | NPN | Pressing terminal | L 111.92mm* W 25.9mm* H 101.5mm |
|  | PM-0016-P | 16 | PNP | Pressing terminal | L 111.92mm* W 25.9mm* H 101.5mm |
|  | PM-0016-R | 16 | Relay | Pressing terminal | L 111.92mm* W 25.9mm* H 101.5mm |
|  | PM-0032-N | 32 | NPN | Pressing terminal | L 111.92mm* W 30.9mm* H 101.5mm |

## Digital I/O module

| Diagram | Model | Pins | input type | output type | terminal | dimension |
|---|---|---|---|---|---|---|
|  | PM-1616-N | 32 | NPN/PNP | NPN | Pressing terminal | L 111.92mm*<br>W 30.9mm*<br>H 101.5mm |

## Analog input module

| Diagram | Model | Channels | Input range | conversion time | resolution | input type | dimension |
|---|---|---|---|---|---|---|---|
|  | PM-A0400-IV | 4 | 1V~5V/0V~5V/<br>-5V~5V/0V~10V/<br>-10V~10V/<br>0mA~20mA/<br>4mA~20mA | 1ms/4 channels | 16-bit (±3200) | single -ended/ differential | L 111.92mm*<br>W 25.9mm*<br>H 101.5mm |

## Analog output module

| Diagram | Model | Channels | output range | conversion time | resolution | dimension |
|---|---|---|---|---|---|---|
|  | PM-A0004-IV | 4 | 1V~5V/0V~5V/<br>-5V~5V/0V~10V/<br>-10V~10V/<br>0mA~20mA/<br>4mA~20mA | 1ms/4 channels | 16-bit (±3200) | L 111.92mm*<br>W 25.9mm*<br>H 101.5mm |

## Thermocouple temperature module*

| Diagram | Model | Channels | sensor type | detection range | control method | resolution | dimension |
|---|---|---|---|---|---|---|---|
|  | PM-T0400-TC* | 4 | Two-wire, thermocouple (J-type,K-type, R-type,S-type, T-type, E-type, N-type, B-type)<br><br>input voltage : ±100mV (±0.5%) (16-bit display -32000~32000) | J-type:<br>-100℃ ~1200℃<br>K-type:<br>-100℃ ~1,350℃<br>R-type:<br>0℃ ~1,750℃<br>S-type:<br>0℃ ~1,750℃<br>T-type:<br>-150℃ ~400℃<br>E-type:<br>-150℃ ~980℃<br>N-type:<br>-150℃ ~1,300℃<br>B-type:<br>200℃ ~1,800℃ | PID temperature control | 0.1℃ /0.1 ℉ | L 111.92mm*<br>W 30.9mm*<br>H 101.5mm |

## Resistance temperature module*

| Diagram | Model | Channels | sensor type | detection range | control method | resolution | dimension |
|---|---|---|---|---|---|---|---|
|  | PM-T0400-TR* | 4 | two-wire/ three-wire, resistance (Pt100/Ni100/ Pt1000/Ni1000/ Jpt100/LG-Ni1000/Cu50/ Cu100) | Pt100:<br>-180℃ ~800℃<br>Ni100:<br>-80℃ ~170℃<br>Pt1000:<br>-180℃ ~800℃<br>Ni1000:<br>-80℃ ~170℃<br>Jpt100:<br>-180℃ ~500℃<br>LG-Ni1000:<br>-50℃ ~180℃<br>Cu50:<br>-50℃ ~150℃<br>Cu100:<br>-50℃ ~150℃ | PID temperature control | 0.1℃ /0.1 ℉ | L 111.92mm*<br>W 30.9mm*<br>H 101.5mm |

## Differential encoder module*

| Diagram | | |
|---|---|---|
| Model | | PM-E0200-D* |
| encoder input | encoder quantity | 2(EA+EB+EZ) |
| | input type | 5V differential input/single-ended input |
| | input pulse frequency | 4M(fourfoldfrequency 16M) |
| high-speed output | channels | 4 |
| | output type | NPN |
| normal digital input | pins | 4 |
| | input type | NPN/PNP |
| normal digital output | pins | 4 |
| | output type | NPN |
| dimension | | L 111.92mm*W 30.9mm*H 101.5mm |

## Single-ended encoder module*

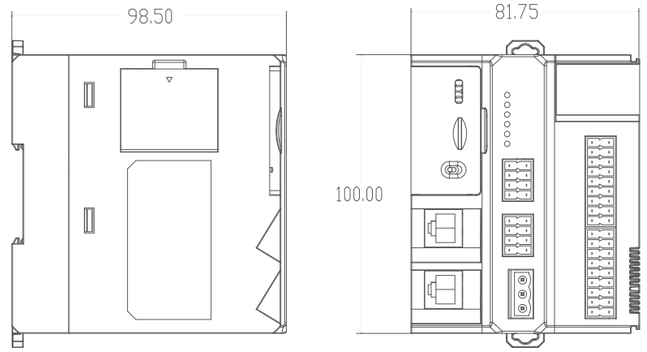
| Diagram | | |
|---|---|---|
| Model | | PM-E0200-S* |
| encoder input | encoder quantity | 2(EA+EB+EZ) |
| | input type | single-endedABZ/pulse+direction/up-down pulse |
| | input pulse frequency | single phase 500KHz( fourfold frequency 2MHz) |
| high-speed output | channels | 2 |
| | output type | NPN/PNP |
| normal digital input | pins | 2 |
| | input type | NPN/PNP |
| normal digital output | pins | 2 |
| | output type | NPN |
| dimension | | L 111.92mm*W 25.9mm*H 101.5mm |

Note": *"indicates upcoming release, please stay tuned.

# Dimension

## MC508CS/MC516CS/MC532CS

(Unit:mm)




## Model and label

**MC - 5 - 16 CS - RS**

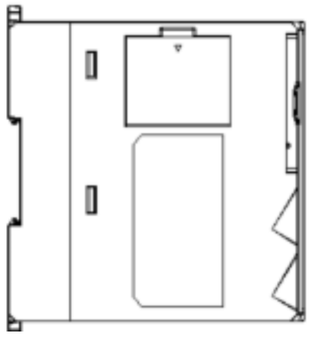
| PLC series | |
|---|---|
| MC | Medium controller |

| Function series | |
|---|---|
| 5 | General type |

| | |
|---|---|
| CS | Codesys software |

| EtherCAT axes capacity |
|---|

| Customized | |
|---|---|
| RS | RS485 type |
| CN | CAN type |
| blank | Standard |



| Leads hine |
|---|
| Model:MC516CS |
| POWER INPUT:DC24V 1A |
| 16DI:DC24V NPN/PNP |
| 16DO:DC24V NPN 0.3A |
| S/N:XXX-XXX-XXX |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