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HCFA



ATC

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BETTER WORK, BETTER LIFE 

New-generation & Standard
M-series PLC

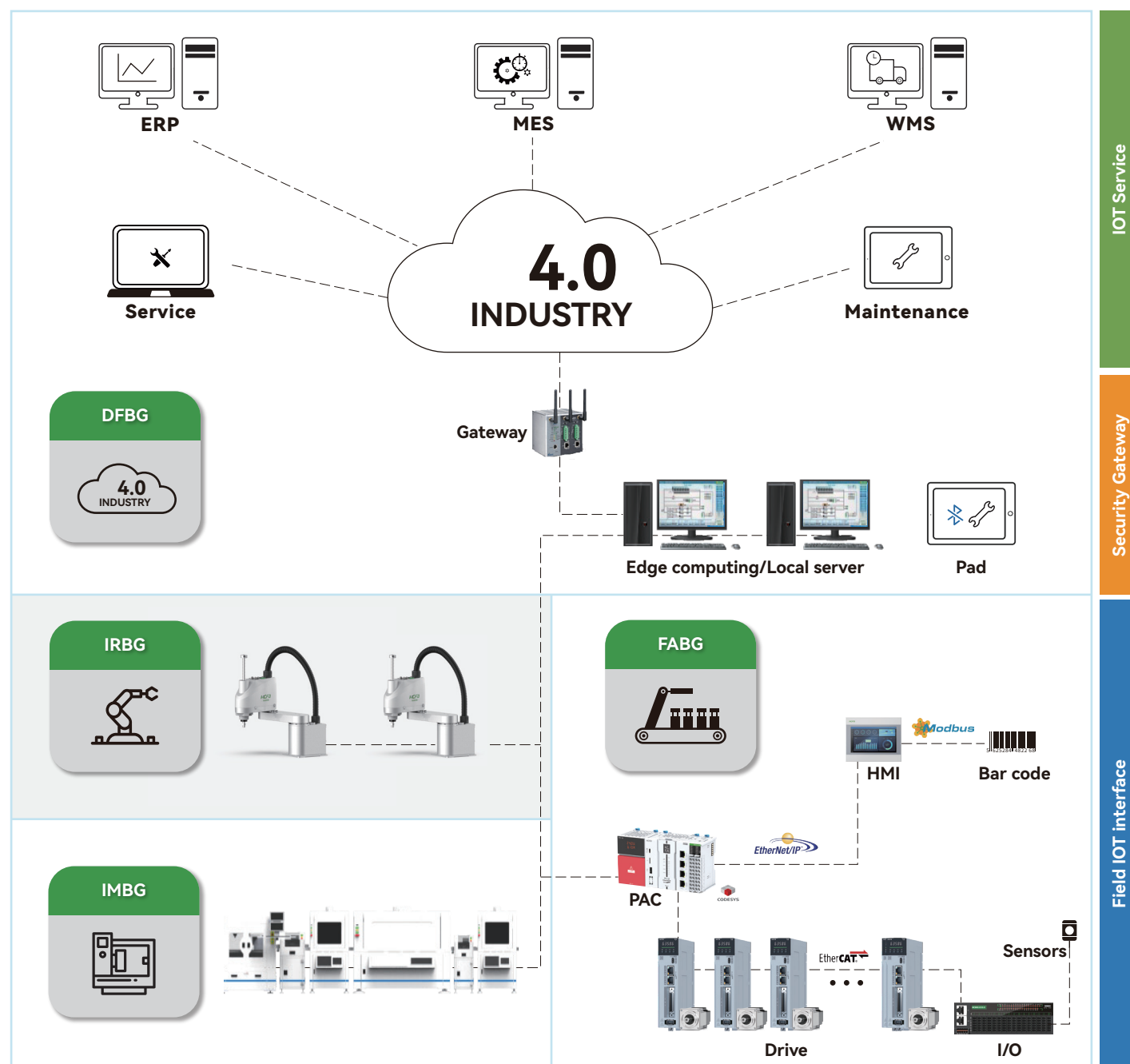
Independent and controllable



Better Work, Better Life



We not only provide the core components of industrial automation, but also engage in the industrial process, industrial robots, industrial machines, and digital factories, and can provide enterprises with comprehensive solutions of **automation + intelligent equipment + digitalization**



Be dedicated to creating values in automation industry

Zhejiang Hechuan Technology Co., Ltd., established in 2011, is a company that focuses on the research and development, manufacturing, sales and application integration of industrial automation products, and committed to providing core components and system integration solutions for smart factories.

The main products include controllers, servo systems, vision systems, encoders, VFDs, HMIs, electric rollers, precision transmission components, etc., covering the entire field of industrial automation.

We have newly established a 200-mu high-efficiency precision industrial transmission industrialization base. By introducing industry professionals, it has orderly promoted the industrialization application of precision guide rails, lead screws and other transmission components.

In November 2023, HCFA Technology and Bosch Rexroth signed a strategic cooperation agreement. Bosch Rexroth strategically invested in HCFA Technology and planned to cooperate to establish a subsidiary. Based on common innovation concepts and innovative thinking, the two parties will integrate their respective advantages, form resource complementarity, and carry out in-depth cooperation, striving to become ecological partners in the entire value chain of industrial automation and promote the further development of China's industrial automation industry.



Never stop to build up core competitiveness

R&D Centers

6

Set up nationally

R&D investment

10%+

Proportion of revenue

R&D personnel

300+

Elite gathering

- Established six R&D centers in Longyou, Hangzhou, Shenzhen, Dalian, Suzhou and Germany
- Self-designed ASIC and SOC chips, realize localization replacement
- First-class AMR magnetic technology/high-precision encoder in the industry

M

5 MAIN FEATURES



M-SERIES CONTROLLER

M-SERIES



Efficient and fast

Ultra-fast execution speed + multi-task management



Various control

Bus + pulse, respond to various needs



Flexible expansion

Module + optional card, flexible and efficient



Convenient Internet

The whole series built-in Ethernet and multi-protocols, which are easily interconnected.



Easy development

Standard instructions, multi-language, modular, which make development easier

EFFICIENT AND FAST

High-speed computing capability

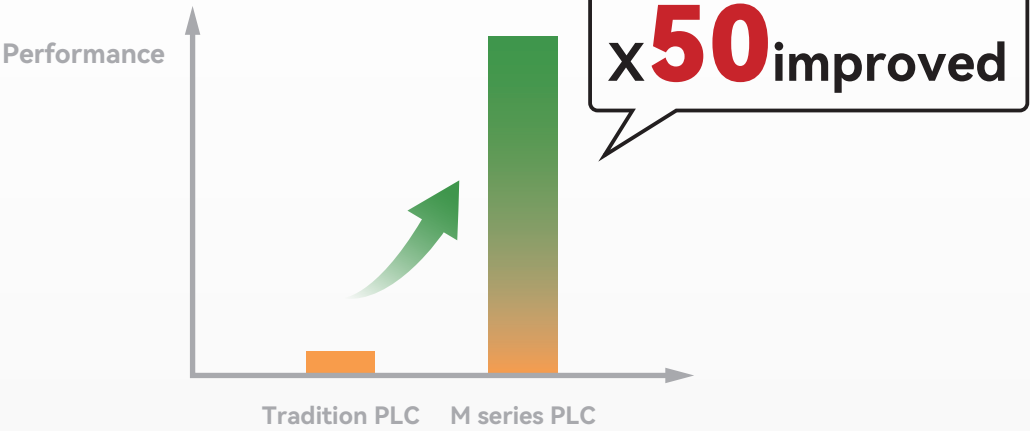
High-speed computing capability,the instruction processing speed greatly improved;
The execution speed of basic instructions is ns.

Operation instruction



Single instruction

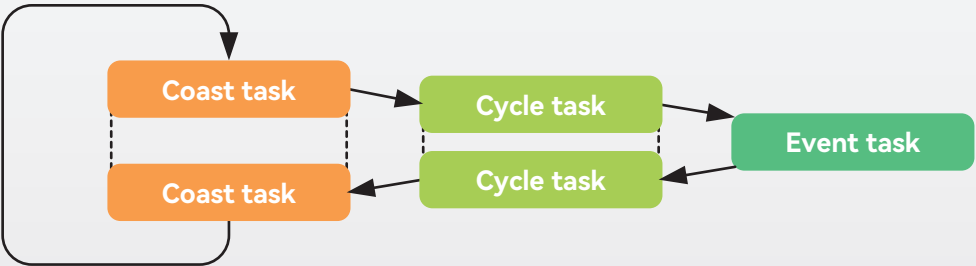
About **5ns**



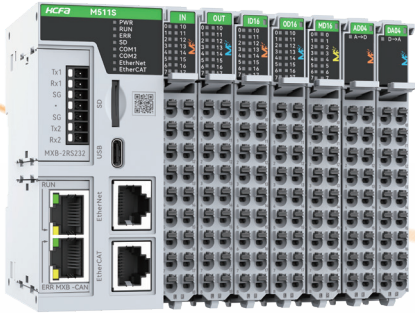
Efficient multitasking system

Multi-task management system: The execution mode and frequency of different tasks can be set, to realize efficient utilization of system resources

Main cycle

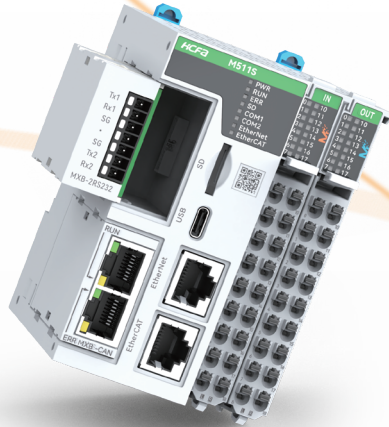


FLEXIBLE EXPANSION



FREE MODEL SELECTION

MEET DIFFERENT NEEDS



DUAL CARD-SLOT DESIGN

FLEXIBLE ASSEMBLY



BLADE-STRUCTURE

SPACE GREATLY SAVED



REMOVABLE PRESSING TERMINAL

EFFICIENT ASSEMBLY

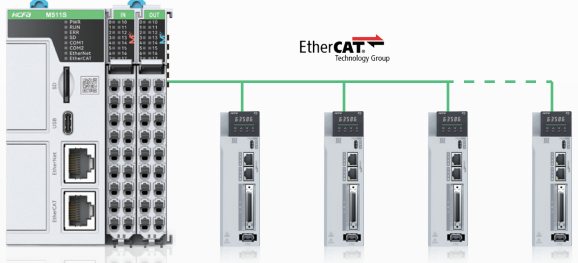
VARIOUS CONTROL

Bus, pulse type, flexible and diverse

Multiple axis control methods of bus, pulse, bus + pulse , adapt to different scenes;
EtherCAT high-speed bus, 8-axis 0.5ms is realized, to meet the high response requirements.

Bus

0.5ms 8-axis synchr onization

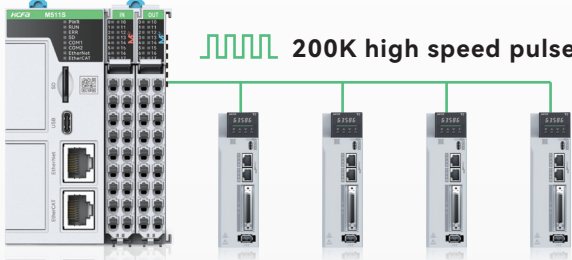


M511S

*Up to 8 axes

Bus+Pulse

200K high speed pulse



M511S

*Up to 4 axes

Pulse

200K high speed pulse

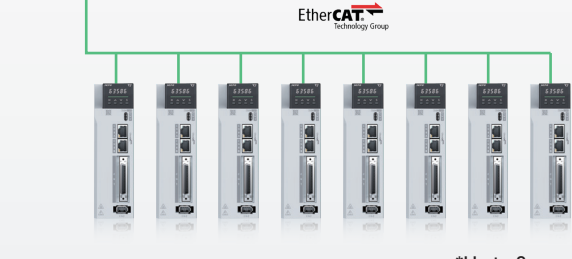


M312

*Up to 6 axes

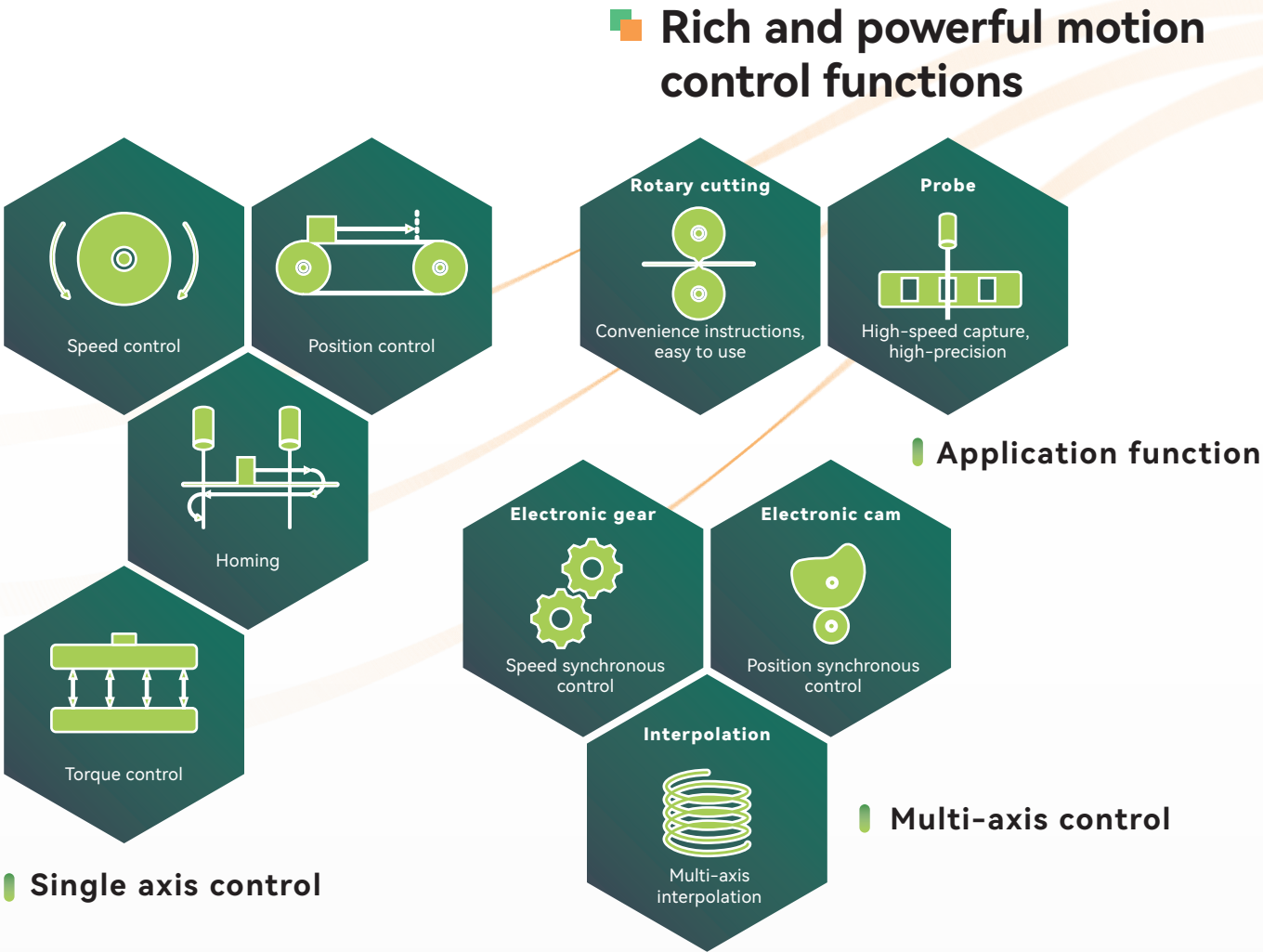
Bus+Pulse

200K high speed pulse



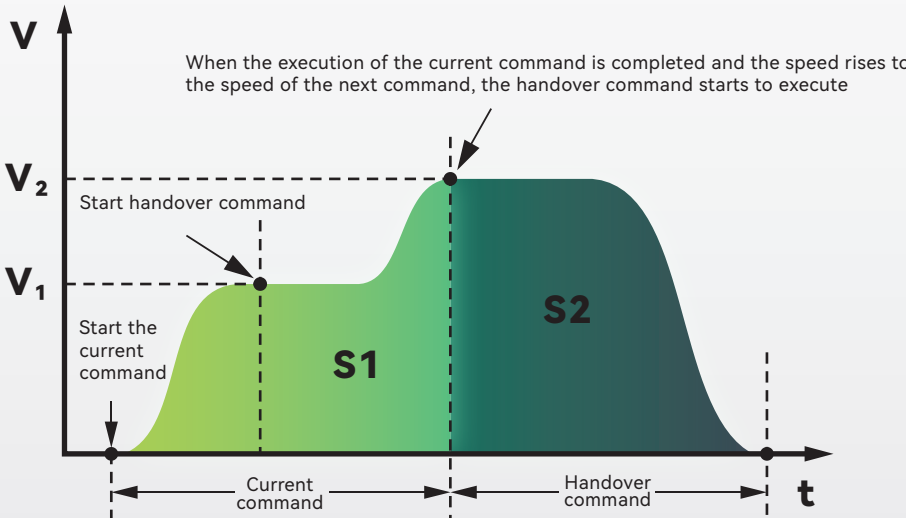
M511S

*Up to 8 axes

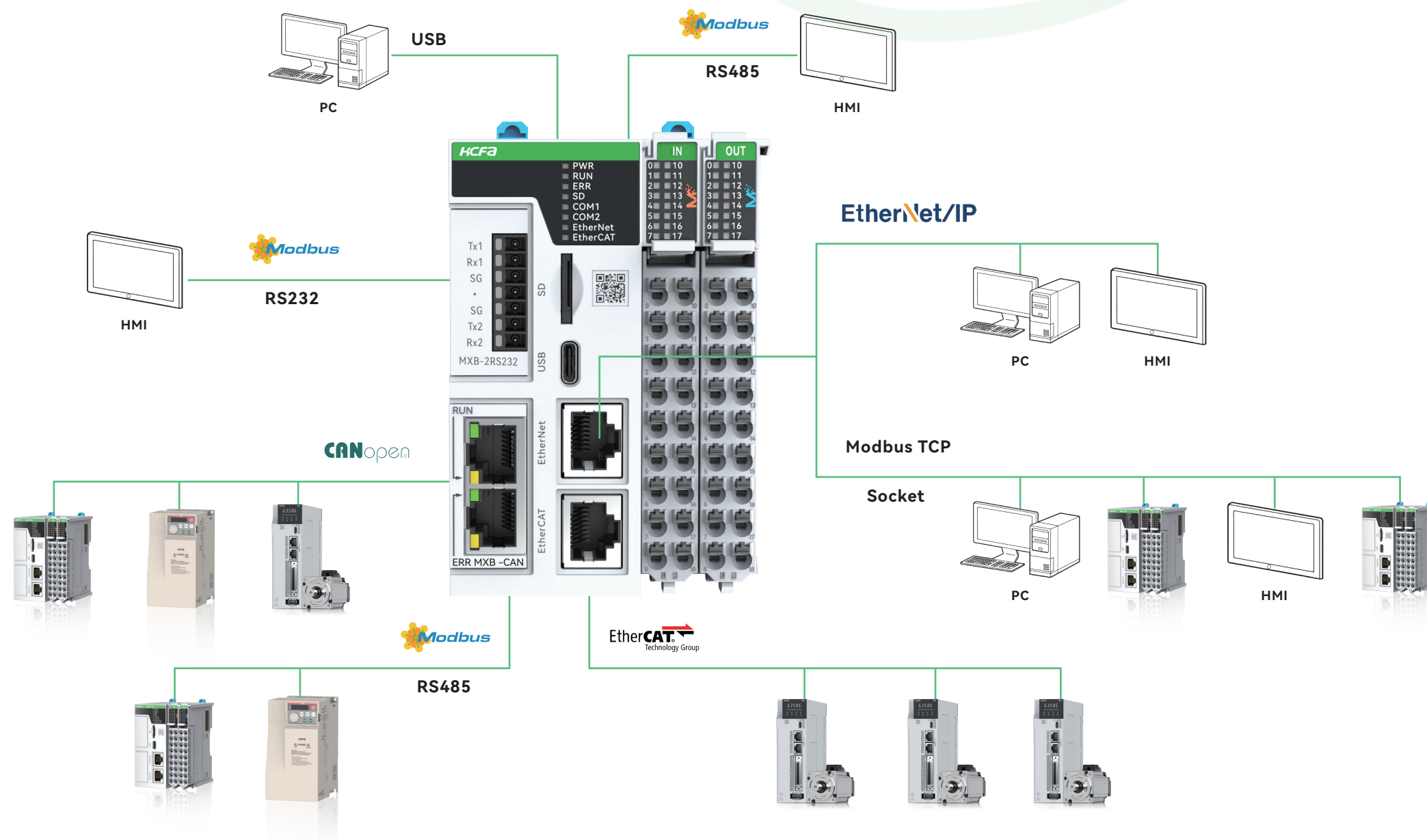


BufferMode

Continuous speed transition, easy to deal with multi-stage speed control;
No stop, elevating the action beat.



CONVENIENT INTERCONNECTION



Support multiple communication protocols



Multi-protocol to improve interconnection

EtherCAT[®]
Technology Group

EtherNet/IP

CANopen

Modbus

EASY DEVELOPMENT

EASY TO CONFIGURE

EtherCAT network configuration

Hardware Configuration

EASY TO PROGRAM

C/C++

ST

Ladder diagram (embedded ST)

EASY TO DEBUG

Program online monitoring

Tracing (Data Oscilloscope)

EASY TO PROTECT

User rights management

Developer Key (Execution ID)

Different user groups have different permissions

Display | Revise | Delete

Program execution ID Controller executionID

Is the ID consistent

YES NO

Program executed Program stop

Naming rule for M-series controllers

HCM501S-16MT4-D-****

1234567891011

1.Product name

HC

HC: HCFA

2.Product series

M5

M1: Simple logic controller (box-type)
M2: General-purpose logic controller (box-type)
M3: General-purpose logic controller (thin-type)
M5: General-purpose ECAT motion controller (thin-type)
M7: High-performance ECAT machine controller (thin-type)

3.Number of Ethernet ports

0

0: None
1: 1 Ethernet port
2: 2 Ethernet ports
3: 3 Ethernet ports

4.Model code

1

M100/M200/M300 Series
0: Type 1 products
1: Type 2 products
2: Type 3 products
3: Type 4 products

M500/M700 Series
1: 8 axes EtherCAT motion axes
2: 16 axes EtherCAT motion axes
3: 32 axes EtherCAT motion axes
4: 64 axes EtherCAT motion axes
5: 128 axes EtherCAT motion axes

5.Function code

S

None: Standard version
S: Economical version
P: Enhanced version

6.Total points

16

16: 8 inputs 8 outputs
32: 16 inputs 16 outputs

7.Description

M

M: Main unit

8.Output type

T

T: NPN transistor
R: Relay
P: PNP transistor

9.Pulse output

4

4: 4-ch pulse output
6: 6-ch pulse output
8: 8-ch pulse output
10: 10-ch pulse output

10.Power type

D

D: DC power
A: AC power

11.Control version numbers and non-standard specifications

*

Note: 1. The difference between the "Type x products" in the model code is mainly the function difference;
2. The EtherCAT motion axis in the model code is the maximum axis number.

PLC

Specification

M-SERIES CONTROLLER

Model name			HCM100-14MT3-A HCM100-14MR-A	HCM100-20MT4-A HCM100-20MR-A	HCM100-30MT6-A HCM100-30MR-A	HCM100-40MT6-A HCM100-40MR-A	HCM100-48MT6-A HCM100-48MR-A	HCM100-60MT6-A HCM100-60MR-A						
Appearance														
Programing	Program capacity	256KBytes												
	Variable capacity	256KBytes (The power-failure retention capacity is 16Kbytes)												
	I-area(%)	128Bytes												
	Q-area(%Q)	128Bytes												
Programming language	M-area(%M)	128KBytes												
		LD、ST、C/C++												
Axis capacity	Number of pulse axes (Only for MT models)	3 axes 100K		4 axes 100K		6 axes 100K								
	Number of encoder axes	2												
Right extension	Total number of axes (pulse axis + encoder axis + imaginary axis)	≤16												
	Max. number of extension modules	Do not support right-side expansion, can add optional card HCMX-CAN-100-BD to support CAN remote expansion												
RTC battery		Built-in main unit												
Optional card	Max. number of option cards	1												
I/O points for main unit	Inputs	Points	8 inputs		12 inputs		16 inputs		24 inputs		28 inputs		36 inputs	
		Function	Supports 8-ch external interrupts; 2-ch 200K high-speed pulse inputs (AB phase, pulse + direction, single pulse)											
	Output (MT model is NPN output, MR model is relay output)	Points	4 Outputs		8 Outputs		14 Outputs		16 Outputs		20 Outputs		24 Points Outputs	
		Function	Supports 3-ch 100K high-speed pulse output (pulse + direction)*		Supports 4-ch 100K high-speed pulse output (pulse + direction)*		Supports 6-ch 100K high-speed pulse output (pulse + direction)*							
Electronic cam	Number of cams	-												
	Number of key points of a single curve	-												
Axis group	Max. number of axis groups	-												
Gcode Capacity		-												
SD card		1-ch												
USB	Number of interfaces	1-ch USB2.0 Type-C												
	Supported functions	Program download, software monitoring and debugging, firmware upgrade												
Power supply			AC 220V											
Serial port	RS485	Number of interfaces	Max. 3 channels: The main unit has 1 channel, and 2 more channels can be expanded by installing the optional card HCMXB-2RS485-100-BD											
		Supported protocol	Modbus master and slave (ASCII/RTU); free protocol											
		Max. number of slaves	32											
		bps Max. number of slaves	9600、19200、38400、57600、115200											
	RS232	Number of interfaces	Max. 3 channels: The main unit has 1 channel, and 2 more channels can be expanded by installing the optional card HCMXB-2RS232-100-BD											
		Supported protocol	Modbus master and slave (ASCII/RTU); free protocol											
		Max. number of slaves	1											
		bps Max. number of slaves	9600、19200、38400、57600、115200											
CAN	Number of interfaces	Install optional card HCMXB-CAN-100-BD to support 1 channel												
	Supported protocol	CANopen protocol (DS301), can be used as master or slave; supports 32 slaves when used as master												

*Note: Only MT models support pulse output.

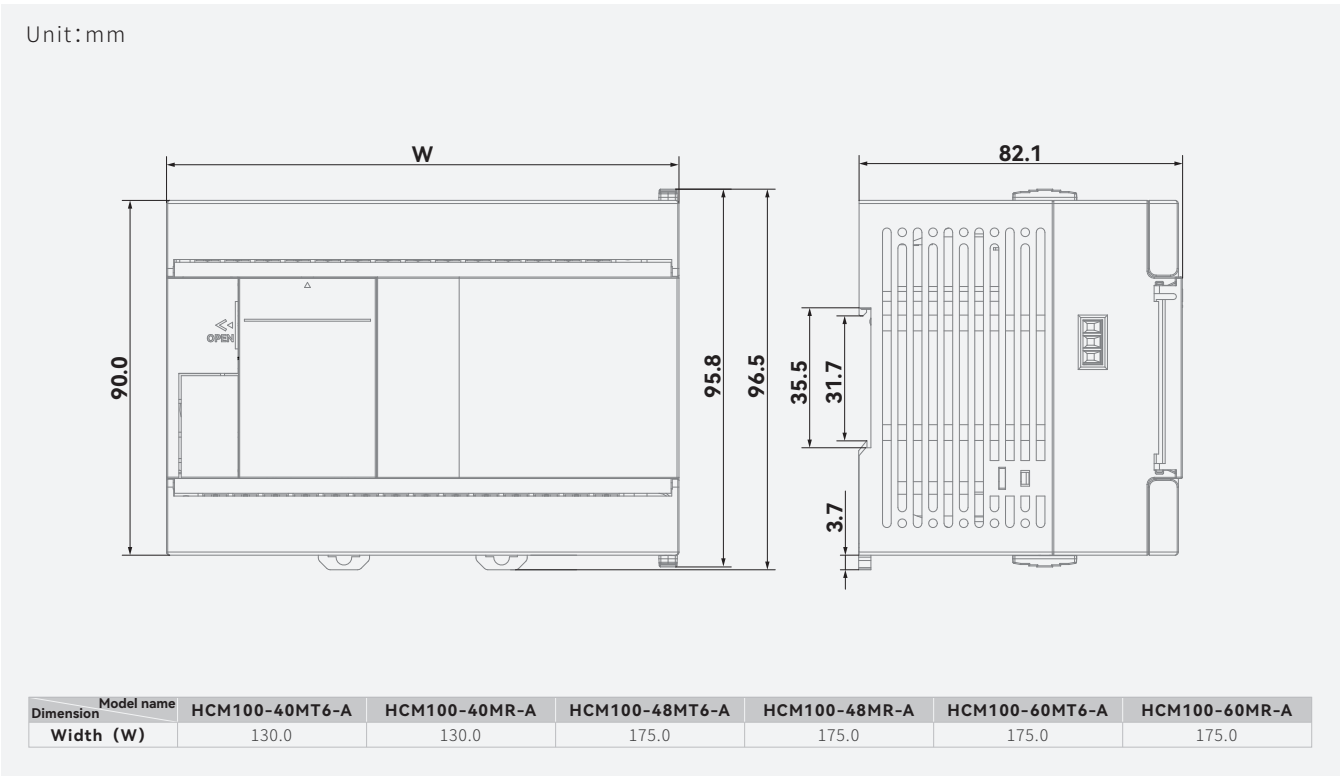
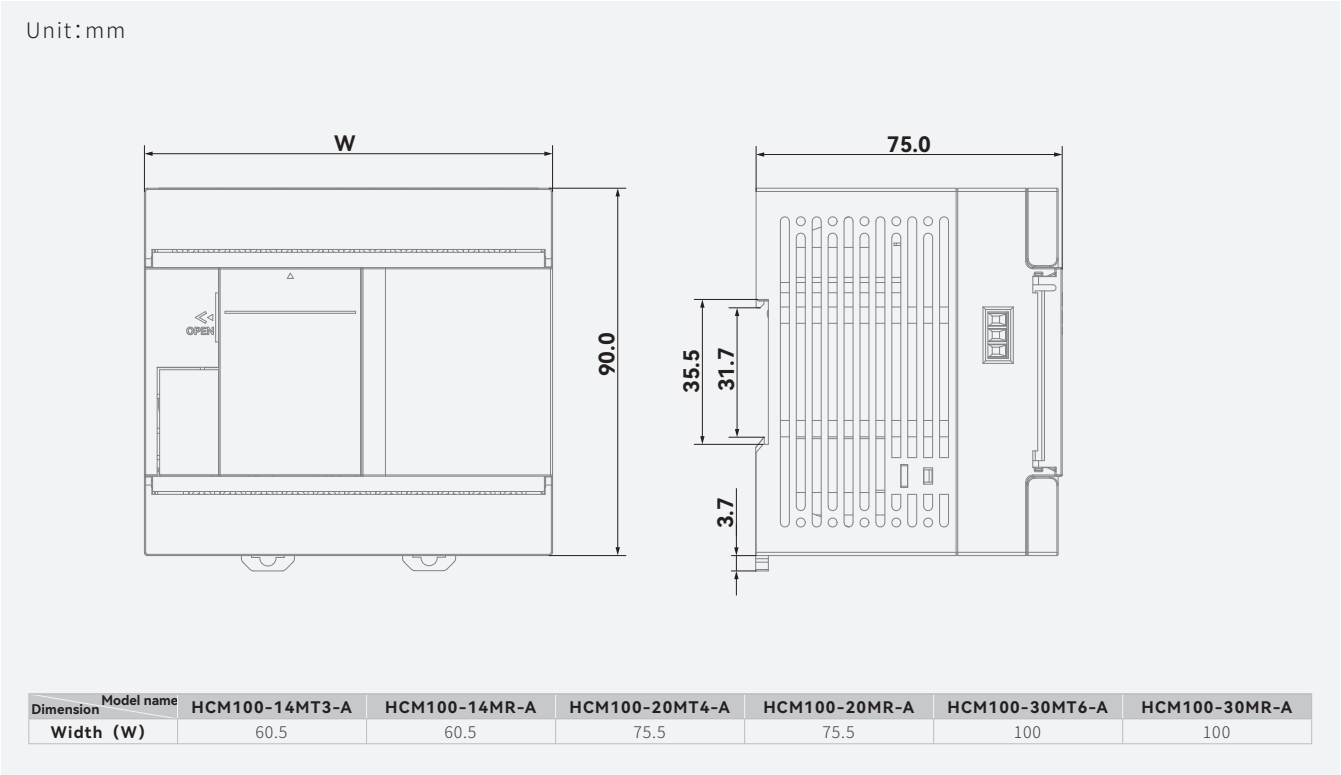
M-SERIES CONTROLLER

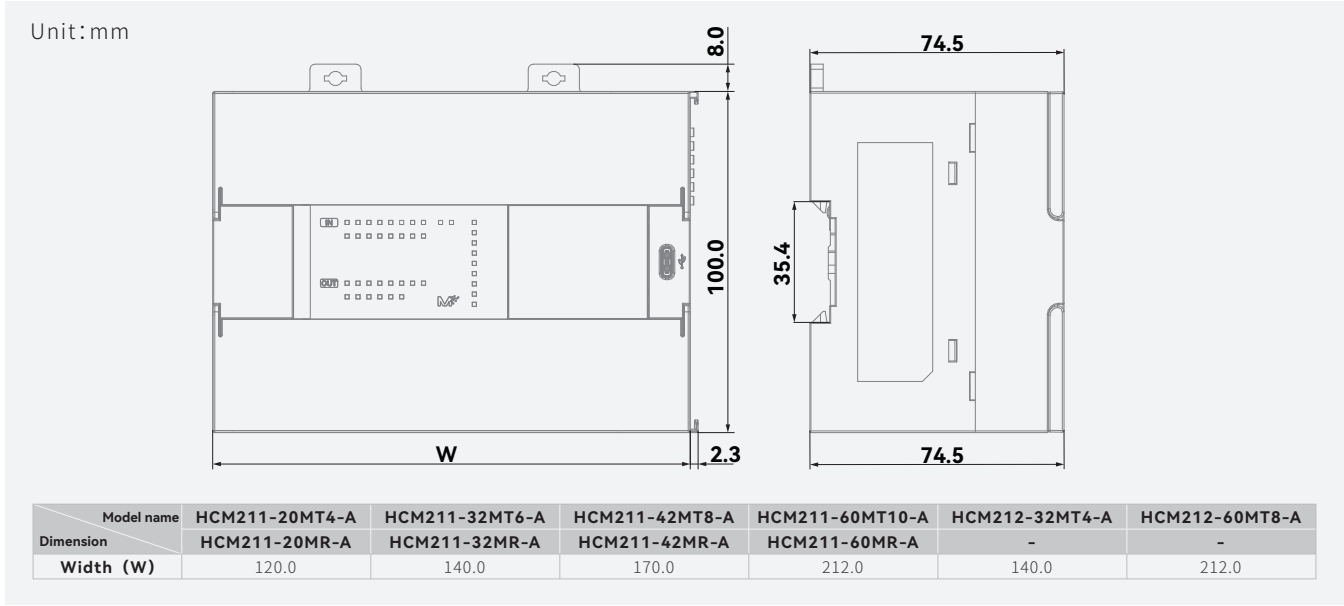
Model name			HCM211-20MT4-A HCM211-20MR-A		HCM211-32MT6-A HCM211-32MR-A		HCM211-42MT8-A HCM211-42MR-A		HCM211-60MT10-A HCM211-60MR-A		HCM212-32MT4-A -		HCM212-60MT8-A -		
Appearance															
Programing	Program capacity	512KBytes													
	Variable capacity	256KBytes(The power-failure retention capacity is 32KBytes)													
	I-area(%I)	128Bytes													
	Q-area(%Q)	128Bytes													
	M-area(%M)	128KBytes													
Programming language			LD、ST、C/C++												
Axis capacity	EtherCAT Axes		-												
	Number of pulse axes (Only for MT models)		4-axis 200K		6-axis 200K		8-axis 200K		10-axis 200K		4-axis 200K			8-axis 200K	
	Number of encoder axes		2				4		10-axis 200K		2			4	
	Total number of axes (pulse axis + encoder axis + imaginary axis)		≤16												
Right extension	Max. number of extension modules		16												
RTC battery			Built-in main unit												
Optional card			1												
I/O points for main unit	Inputs	Points	12 inputs		18 inputs		24 inputs		36 inputs		18 inputs			36 inputs	
		Function	Supports 8-ch external interrupts; 2-ch 200K high-speed pulse inputs (AB phase, pulse + direction, single pulse)		Supports 8-ch external interrupts; 4-ch 200K high-speed pulse inputs (AB phase, pulse + direction, single pulse)		Supports 8-ch external interrupts; 4-ch 200K high-speed pulse inputs (AB phase, pulse + direction, single pulse)		Supports 8-ch external interrupts; 2-ch 200K high-speed pulse inputs (AB phase, pulse + direction, single pulse)		Supports 8-ch external interrupts; 2-ch 200K high-speed pulse inputs (AB phase, pulse + direction, single pulse)		Supports 8-ch external interrupts; 4-ch 200K high-speed pulse inputs (AB phase, pulse + direction, single pulse)		
		Output (MT model is NPN output, MR model is relay output)	8 Outputs		14 Outputs		18 Outputs		24 Outputs		14 Outputs			24 Outputs	
		Function	Supports 4-ch 200K pulse output (pulse + direction)		Supports 6-ch 200K pulse output (pulse + direction)		Supports 8-ch 200K pulse output (pulse + direction)		Supports 10-ch 200K pulse output (pulse + direction)		Supports 4-ch 200K pulse output (pulse + direction)			Supports 8-ch 200K pulse output (pulse + direction)	
Electronic cam	Number of cams		16												
	Number of key points of a single curve		32												
Axis group	Max. number of axis groups		1 axis groups (max. 8-axis interpolation per axis group)												
Gcode Capacity			-												
SD card			1-ch												
USB	Number of interfaces		1-ch USB2.0 Type-C												
	Supported functions		Program upload/download, software monitoring and debugging, firmware upgrade												
Power supply			AC 220V												
Serial port	RS485	Number of interfaces	Max. 4 channels: The main unit has 2 channels, and 2 more channels can be expanded by installing the optional card HCMXB-2RS485-200-BD												
		Supported protocol	Modbus master and slave (ASCII/RTU); free protocol												
		Max. number of slaves	32												
		Baud rate bps	9600、19200、38400、57600、115200												
	RS232	Number of interfaces	Install optional card HCMXB-2RS232-200-BD to support 2-channel												
		Supported protocol	Modbus master and slave (ASCII/RTU); free protocol												
Max. number of slaves		1													
CAN	Number of interfaces	9600、19200、38400、57600、115200													
		1-ch													
		CANopen protocol (DS301), can be used as master or slave; supports 32 slaves when used as master													
EtherNet	Supported protocol		CANopen protocol (DS301), can be used as master or slave; supports 16 slaves when used as master										CANopen protocol (DS301), can be used as master or slave; supports 16 slaves when used as master		
	Number of interfaces		1-ch												
	Function		Communication, program upload/download, etc.												
	Data transmission speed		100/10Mbps												
	Total number of TCP connections		16(ModbusTCP+Socket + EtherNet/IP)										12(ModbusTCP+Socket)		
	Modbus TCP		Maximum number of connections for client (master): 16; Maximum number of connections for server (slave): 16												
Socket		Maximum number of connections: 8 (UDP+TCP)													
Cables		Standard Industrial Ethernet Communication Cable													
EtherNet /IP (Only salve support)	CIP implicit communication		Maximum number of connections: 8; Maximum data volume per connection: 200Bytes; Cycle interval: 5~1000ms												
	CIP explicit communication		Number of Class3 connections: 8; Number of UCMM (non-connection type) clients accessing simultaneously: 16												
EtherCAT	Topology		Linear												
	Transmission medium		Standard EtherCAT communication cable												
	Max. transmission distance between nodes		100m												
	Max. number of nodes		8(PDO configuration is not required, only supports slaves provided in the programming software)												
	Max. number of process points		1380 bytes (maximum frame number is 1)												
	Communication cycle		Minimum 500μs												
	Supported protocols		EtherCAT master												

*Note: Only MT models support pulse output.

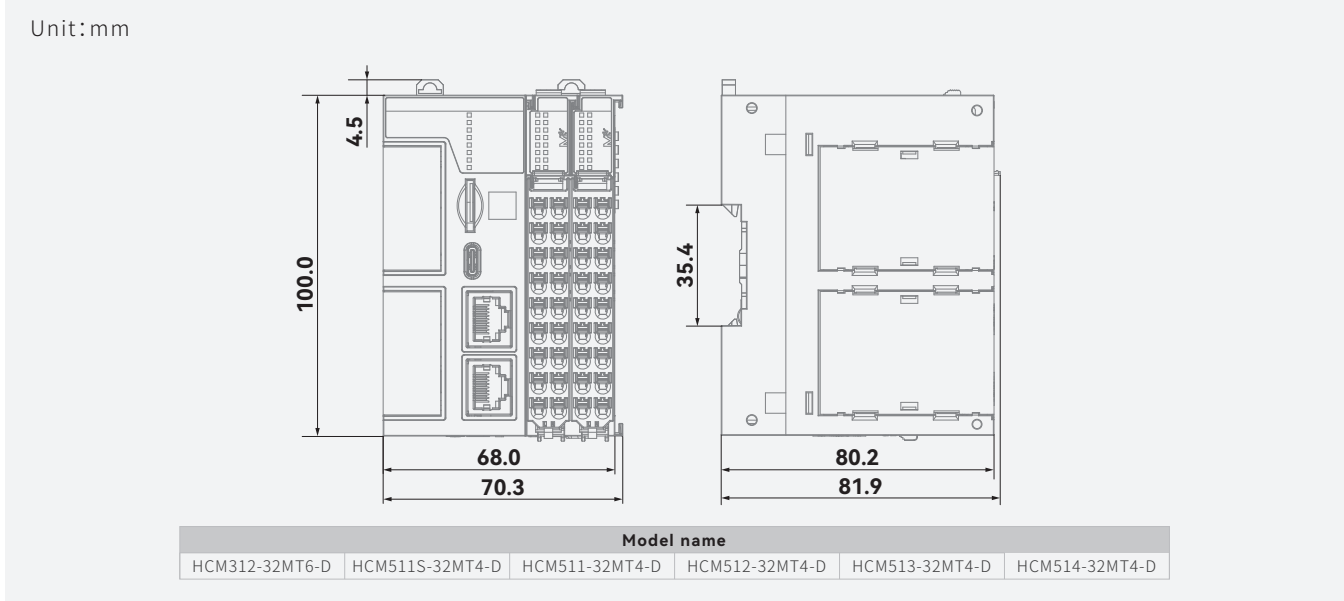
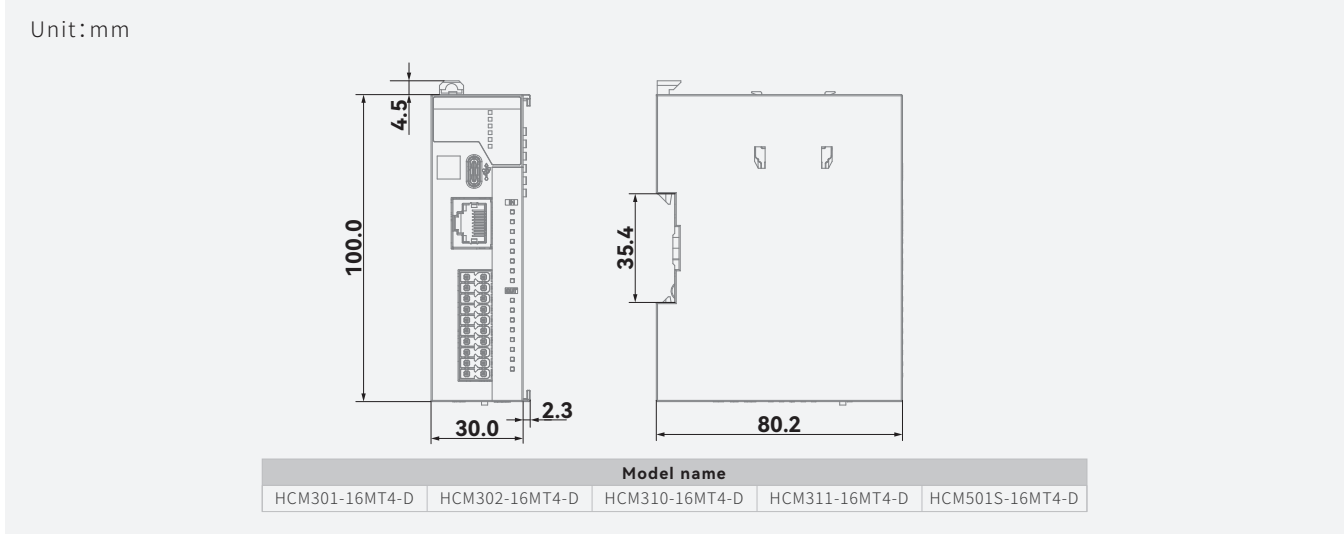
M-SERIES PLC DIMENSION DRAWING

M100 series controller





M300/M500 series controller



PLC

Specifications

M-SERIES CONTROLLER

Model name			HCM301-16MT4-D	HCM302-16MT4-D	HCM310-16MT4-D	HCM311-16MT4-D	HCM312-32MT6-D	-	
Appearance								-	
Programing	Program capacity		256KBytes				512KBytes	-	
	Variable capacity		256KBytes (The power-off retention capacity is 16KBytes)				256KBytes (The power-off retention capacity is 16KBytes)	-	
	I-area(%I)		128Bytes					-	
	Q-area(%Q)		128Bytes					-	
	M-area(%M)		128KBytes					-	
Programming language			LD、ST、C/C++					-	
Axis capacity	Number of pulse axes		4-axis 100K		4-axis 200K		6-axis 200K	-	
	Number of encoder axes		2						-
	Total number of axes (pulse axis + encoder axis + imaginary axis)		≤16						-
Right extension	Max. number of extension modules		16						-
RTC battery			Built-in main uni				Supported by installing option card HCMXB-RTC-BD	-	
Optional card	Max. number of option cards		-				2	-	
I/O points for main unit	Input	Points	8 inputs				16 inputs	-	
		Function	Supports 8-ch external interrupts; 2-ch 100K high-speed pulse inputs (AB phase, pulse + direction, single pulse)				Supports 8-ch external interrupts; 2-ch 200K high-speed pulse inputs (AB phase, pulse + direction, single pulse)	-	
	Output	Points	8 outputs				16 outputs	-	
		Function	Supports 4-ch 100K high-speed pulse output (pulse + direction)				Supports 4-ch 200K high-speed pulse output (pulse + direction)	Supports 6-ch 200K high-speed pulse output (pulse + direction)	-
Electronic cam	Number of cams		-	16	-	16	16	-	
	Number of key points of a single curve		-	32	-	32	32	-	
Axis group	Max. number of axis groups		-	1 axis groups (max. 8-axis interpolation per axis group)	-	1 axis groups (max. 8-axis interpolation per axis group)	1 axis groups (max. 8-axis interpolation per axis group)	-	
Gcode Capacity			-					-	
SD Card			-				1-ch	-	
USB	Number of interfaces		1-ch USB2.0 Type-C					-	
	Supported functions		Program upload/download, software monitoring and debugging, firmware upgrade					-	
Power supply			DC24V(±10%)					-	
Serial port	RS485	Number of interfaces	1-ch				Max. 4 channels: The main unit has 2 channels, and 2 more channels can be expanded by installing the optional card HCMXB-2RS485-BD	-	
		Supported protocol	Modbus master and slave (ASCII/RTU); free protocol					-	
		Max. number of slaves	32					-	
		bps Max. number of slaves	9600、19200、38400、57600、115200					-	
	RS232	Number of interfaces	1-ch				Install HCMXB-2RS232-BD optional card to support 1 channel	-	
		Supported protocol	Modbus master and slave (ASCII/RTU); free protocol					-	
		Max. number of slaves	1					-	
		bps Max. number of slaves	9600、19200、38400、57600、115200					-	
CAN	Number of interfaces		-				Install HCMXB-CAN-BD optional card to support 1 channel	-	
	Supported protocol		-				CANopen protocol (DS301), can be used as master or slave; supports 32 slaves when used as master	-	
EtherNet	Number of interfaces		-	1-ch				-	
	Function		-	Communication, program upload/download, etc.				-	
	Data transmission speed		-	100/10Mbps				-	
	Total number of TCP connections		-	16(ModbusTCP+Socket + EtherNet/IP)				-	
	Modbus TCP		-	Maximum number of connections for client (master): 16; Maximum number of connections for server (slave): 16				-	
	Socket		-	Maximum number of connections: 8, support TCP/UDP				-	
	Cables		-	Standard Industrial Ethernet Communication Cable				-	
EtherNet /IP (Only salve support)	CIP implicit communication		-	Maximum number of connections: 8; Maximum data volume per connection: 200Bytes; Cycle interval: 5~1000ms				-	
	CIP explicit communication		-	Number of Class3 connections: 8; Number of UCMM (non-connection type) clients accessing simultaneously: 16				-	

Model name		HCM501S-16MT4-D		HCM511S-32MT4-D		HCM511-32MT4-D		HCM512-32MT4-D		HCM513-32MT4-D		HCM514-32MT4-D		
Appearance														
Programming	Program capacity	512KBytes				20MBytes								
	Variable capacity	256KBytes (The power-off retention capacity is 32KBytes)				20MBytes (The power-off retention capacity is 128KBytes)								
	I-area(%I)					128Bytes								
	Q-area(%Q)					128Bytes								
Programming language	M-area(%M)					128KBytes								
						LD、ST、C/C++								
Axis capacity	EtherCAT Axes	8 (PDO configuration is not required, only supports slaves provided in the programming software)		8 (PDO configuration is not required, only supports slaves provided in the programming software)		8		16		32		64		
	Number of pulse axes					4-axis 200K								
	Number of encoder axes					2								
	Total number of axes (pulse axis + encoder axis + imaginary axis)	Total≤16								Total≤64		Total≤128		
Right extension	Max. number of extension modules					16								
RTC battery		Built-in main uni				Supported by installing option card HCMXB-RTC-BD								
Optional card	Max. number of option cards	-				2								
I/O points for main unit	Inputs	Points	8 inputs						16 inputs					
		Function									Supports 8-ch external interrupts; 2-ch 200K high-speed pulse inputs (AB phase, pulse + direction, single pulse)			
	Output (MT model is NPN output, MR model is relay output)	Points	8 outputs						16 outputs					
		Function	Supports 4-ch 200K high-speed pulse output (pulse + direction)		Supports 4-ch 200K high-speed pulse output (pulse + direction)								Supports 4-ch 200K high-speed pulse output (pulse + direction)	
Electronic cam	Number of cams	16						64						
	Number of key points of a single curve	32						2048						
Axis group	Max. number of axis groups	1 axis groups (max. 8-axis interpolation per axis group)								8 axis groups (max. 8-axis interpolation per axis group)				
Gcode Capacity		-								16M(Supports up to 64 G-code files, each file is up to 256K)				
SD card		Not supported								1-ch				
USB	Number of interfaces					1-ch USB2.0 Type-C								
	Supported functions					Program upload/download, software monitoring and debugging, firmware upgrade								
Power supply						DC24V(±10%)								
Serial port	RS485	Number of interfaces	1-ch				Max. 4 channels: The main unit has 2 channels, and 2 more channels can be expanded by installing the optional card HCMXB-2RS485-BD							
		Supported protocol					Modbus master and slave (ASCII/RTU); free protocol							
		Max. number of slaves					32							
		bps Max. number of slaves					9600、19200、38400、57600、115200							
	RS232	Number of interfaces	1-ch				Install optional card HCMXB-2RS232-BD to support 2-channel							
		Supported protocol					Modbus master and slave (ASCII/RTU); free protocol							
Max. number of slaves						1								
bps Max. number of slaves						9600、19200、38400、57600、115200								
CAN	Number of interfaces	-				Install HCMXB-CAN-BD optional card to support 1 channel								
	Supported protocol	-				CANopen protocol (DS301), can be used as master or slave; supports 32 slaves when used as master								
EtherNet	Function	-				Communication, program upload/download, etc.								
	Data transmission speed	-				100/10Mbps								
	Total number of TCP connections	-		12(ModbusTCP+Socket)		16(ModbusTCP+Socket + EtherNet/IP)								
	Modbus TCP	-		Maximum number of connections for client (master): 4; Maximum number of connections for server (slave): 4		Maximum number of connections for client (master): 16; Maximum number of connections for server (slave): 16								
	Socket Cables	-		Maximum number of connections: 4, support TCP/UDP		Maximum number of connections: 8, support TCP/UDP								
EtherNet /IP (Only salve support)						Standard Industrial Ethernet Communication Cable								
	CIP implicit communication	-				Maximum number of connections: 8; Maximum data volume per connection: 200Bytes; Cycle interval: 5~1000ms								
EtherCAT	CIP explicit communication	-				Number of Class3 connections: 8; Number of UCMM (non-connection type) clients accessing simultaneously: 16								
	Topology					Linear								
	Transmission medium					Standard EtherCAT communication cable								
	Max. transmission distance between nodes					100m								
	Max. number of nodes	8 (PDO configuration is not required, only supports slaves provided in the programming software)		8 (PDO configuration is not required, only supports slaves provided in the programming software)		16		32		64		128		
	Max. number of process points					1380 bytes (maximum frame number is 1)								
	Communication cycle			Minimum 500μs						Minimum 250μs				
Supported protocols					EtherCAT master									

General specifications for M-series controller

> Environmental specifications

Items	Specifications
Working temperature	0~55℃
Storage temperature	-25~75℃
Ambient humidity	10~95% (no condensation)
Altitude /pressure	2000m or less (80kPa)
Pollution level	Pollution degree II, generally only non-conductive pollution, but temporary conductivity caused by condensation should also be expected.
Cooling method	Passive cooling, natural air cooling

> AC power supply specifications (M100, M200 series)

Items	Specifications
Power voltage	AC 100-240V
Allowable voltage fluctuation range	AC 90-265V
Rated frequency	50/60HZ
Allowable instantaneous power failure time	≤5ms
Max. power consumption	25W

> DC power supply specifications (M300, M500S, M500 series)

Items	Specifications
Power voltage	DC 24V
Allowable voltage fluctuation range	DC 20.4-28.8V
Power consumption	5W
Undervoltage level	19V

> Relay output specifications

Items	Specifications
Output type	Relay output
External power supply	AC250V,DC30V or less
Circuit insulation	Mechanical insulation
Maximum load	Load is resistance type: 2A/each point
	Load is inductive type: 1A/each point
Minimum load	Load is inductive type: 1A/each point
	Load is bulb type: 30W/each point
Insulation resistance	DC5V 10mA
ON/OFF response time	1000MΩ (500VDC)
	<10ms

> High-speed I/O input specifications

Items	Specifications
Rated input voltage	DC 24V
Input type	Supports source or sink input
Rated input current	5mA
ON current	>4mA
OFF current	<2.5mA
ON voltage	≥15V DC
OFF voltage	≤5V DC
Input resistance	2.7kΩ
Max. input frequency	200kHz
Isolation mode	Capacitor isolation

> Transistor output specifications

Items	Specifications
Output type	Supports sink output
Maximum load	Load is resistive type: 0.5A/point
	Load is inductive type: 13W (24VDC)
Minimum load	Load is bulb type: 2.5W (24VDC)
	1mA / 5V
Leakage current at OFF	<10μA
Maximum output frequency	200kHz
ON/OFF response time	<2.5us
Isolation mode	Capacitor isolation

Naming rule for M-series optional card

H C M X B - 2 R S 2 3 2 - 2 0 0 - B D

1

2

3

4

5

1.Product name

HC

HC: HCFA controller

2.Optional card series

MXB

MXB: M-series optional expansion

3.Product series

2RS232

2RS232: 2-ch 232 serial ports
2RS485: 2-ch 485 serial ports
CAN: CANopen protocol
RTC: Perpetual calendar battery card

4.Suffix

200

None: M300/M500S/M500 series optional card
200: M200 series optional card
100: M100 series optional card

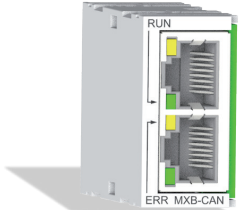
5.Suffix

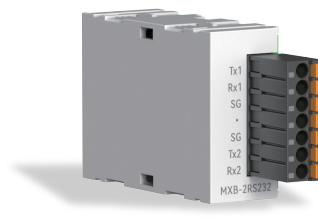
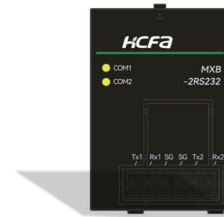
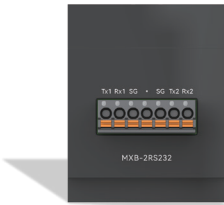
BD

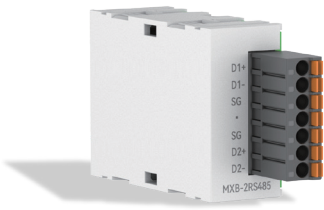
BD: BD optional card

Specification
M-SERIES APOLEGAMY

Specification for M-series optional card

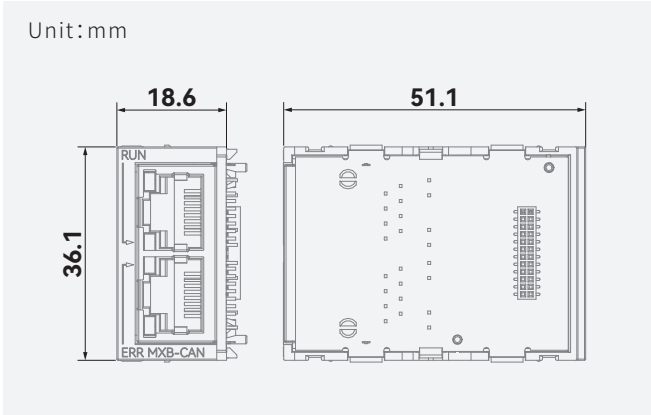
Model name	HCMXB-CAN-BD (Applicable to M300, M500S, M500 series main units)	HCMXB-CAN-100-BD (Applicable to M100 series main units)
Appearance		
Specifications	Supports CANopen protocol (DS301), can be used as master station or slave station	
Number of slave stations supported	Refer to Controller Specifications	
Link layer	CAN2.0A	
Terminating resistor	120Ω, externally connected	
Baud rate (bps)	20K, 50K, 125K, 250K, 500K, 1M	
Topology	Daisy chain, star-type	
Transmission medium	Comply with CIA standard CAN communication cable	
Max. communication distance	2500m (20K bps)	
Synchronization period	Mini. 1ms	

Model name	HCMXB-2RS232-BD (Applicable to M300, M500S, M500 series main units)	HCMXB-2RS232-100-BD (Applicable to M100 series main units)	HCMXB-2RS232-200-BD (Applicable to M200 series main units)
Appearance			
Specifications	2-channel RS232 communication optional card; can be used as a master or slave station, supports Modbus protocol and free protocol		
Communication mode	RTU/ASCII		
Max. supported number of slave stations	1		
Baud rate (bps)	9600, 19200, 38400, 57600, 115200		
Max. communication distance	15m (9600bps)		

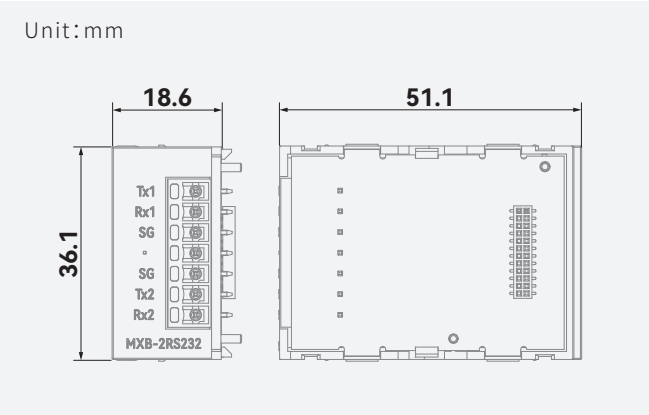
Model name	HCMXB-2RS485-BD (Applicable to M300, M500S, M500 series main units)	HCMXB-2RS485-100-BD (Applicable to M100 series main units)	HCMXB-2RS485-200-BD (Applicable to M200 series main units)
Appearance			
Specifications	2-ch RS485 communication optional card; Can be used as a master station or slave station,Support Modbus protocol and free protocol		
Communication mode	RTU/ASCII		
Max. communication distance	32		
Terminating resistor	120Ω, externally connected		
Baud rate (bps)	9600, 19200, 38400, 57600, 115200		
Max. communication distance	500m (9600bps)		

Model name	HCMXB-RTC-BD (Applicable to M312, M511S, M500 series main units)
Appearance	
Specifications	Perpetual calendar battery card (The perpetual calendar time can continue to count after the controller powered off)
Clock accuracy	120s/month
Clock format	Year-month-day-week-hour-minute-second
Battery specifications	Standard battery, can be replaced, service life 3~5 years

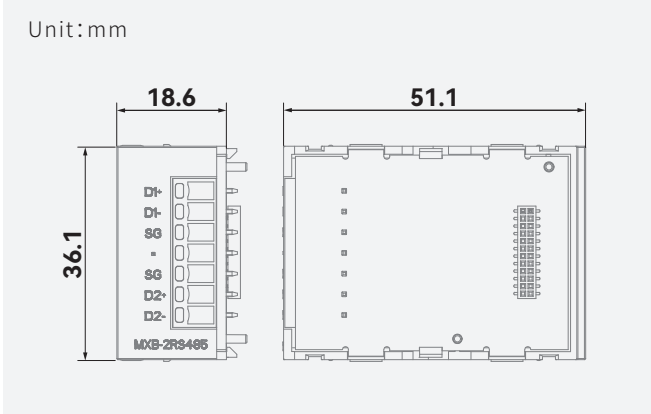
HCMXB-CAN-BD



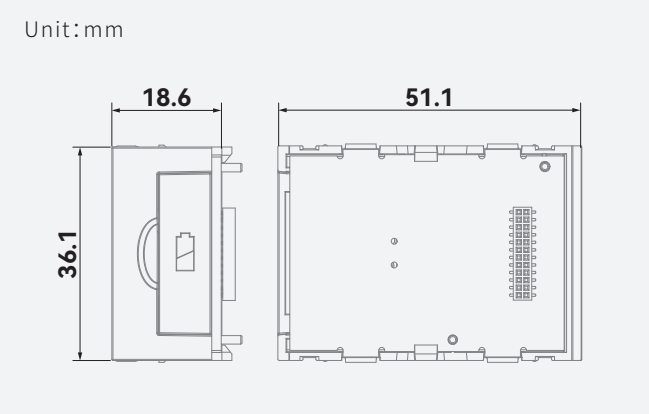
HCMXB-2RS232-BD



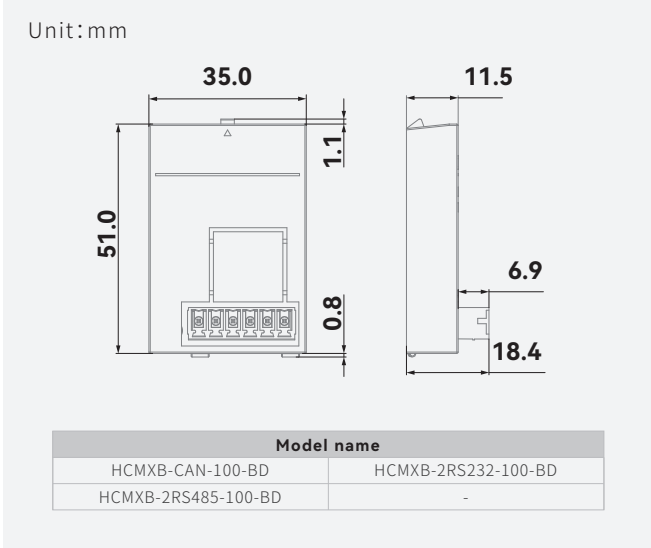
HCMXB-2RS485-BD



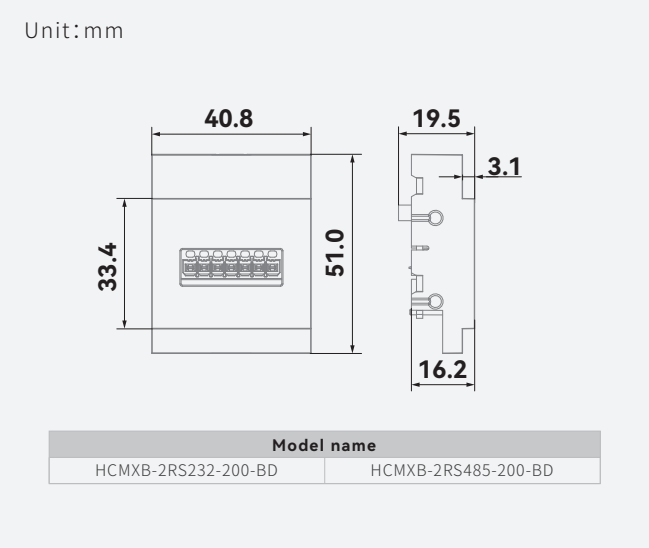
HCMXB-RTC-BD



Optional card for M100 series main unit



Optional card for M200 series main unit



Naming rule for M-series extension module

H C M X - M D 1 6 - D - * * * *

1.Product name

HC HC: HCFA

5.DC power

D D: DC power

2.Product series

MX MX: M-series general extension

6.Control version and non-standard specifications

*

3.Extension module type

MD ID : Digital input
OD : Transistor output
MD : Digital I/O
AD : Analog input
DA : Analog output
EC : EtherCAT coupler

4.Number of module channels

16

Coupler module

Model name	HCMX-EC01-D
Appearance	
Product Type	EtherCAT Coupler
Number of expandable modules on the right-side	16
Communication protocol	EtherCAT
Communication rate	100Mbps
Maximum communication distance between sites	100m
Operation mode	FreeRun、SM-Synchron、DC-Synchron
Rated voltage	DC 24V

M-series remote expansion module

Model name	HCMXE-MD16-D	HCMXC-MD16-D
Appearance		
Product Type	EtherCAT Remote I/O	CANopen Remote I/O
Number of expandable modules on the right-side	16	
Input specifications	8 input points, support NPN or PNP input	
Output specifications	8 output points, support NPN output	
Communication protocol	EtherCAT	CANopen
Communication rate	100Mbps	Max. 1Mbps
Max. communication distance	100m	5000m (10Kbps)
Operation mode	FreeRun、SM-Synchron、DC-Synchron	-
Rated voltage	DC 24V	

M-series digital module

Model name		HCMX-ID16-D	HCMX-OD16-D	HCMX-MD16-D
Appearance				
Input specifications	Input points	16	-	8
	Input form	Compatible with NPN and PNP	-	Compatible with NPN and PNP
	Rated input voltage	DC24V	-	DC24V
	Rated input current	5mA	-	5mA
	Input OFF voltage	≤DC5V	-	≤DC5V
	Input OFF current	<2.5mA	-	<2.5mA
	Input ON voltage	≥DC15V	-	≥DC15V
	Input ON current	>4mA	-	>4mA
	ON/OFF response time	100μs	-	100μs
	Input resistance	2.7kΩ	-	2.7kΩ
Output specifications	Output points	-	16	8
	Output form	-	NPN	NPN
	Leakage current at power OFF	-	< 10μA	< 10μA
	Output frequency	Resistive load	-	100Hz
		Inductive load	-	0.5Hz
		Lamp load	-	10Hz
	Max. load	Resistive type	-	0.5A/point 4A/module
		Inductive type	-	7.2W/point (DC24V) 24W/module
		Lamp type	-	5W/point (DC24V) 18W/module
	Max. load	-	1mA / 5V	1mA / 5V
	ON/OFF response time	-	100μs	100μs
	Output isolation voltage	-	3.75kV	3.75kV
Input power rated voltage		DC24V (±10%)		
Power consumption		1W		
Common mode		The two common terminals S0 and COM are independent. S0 can be connected to 24V or 0V of 24VDC, and COM can only be connected to 0V of 24VDC.		
Module hot-swappable function		Not supported		
Weight (g)		About 70		

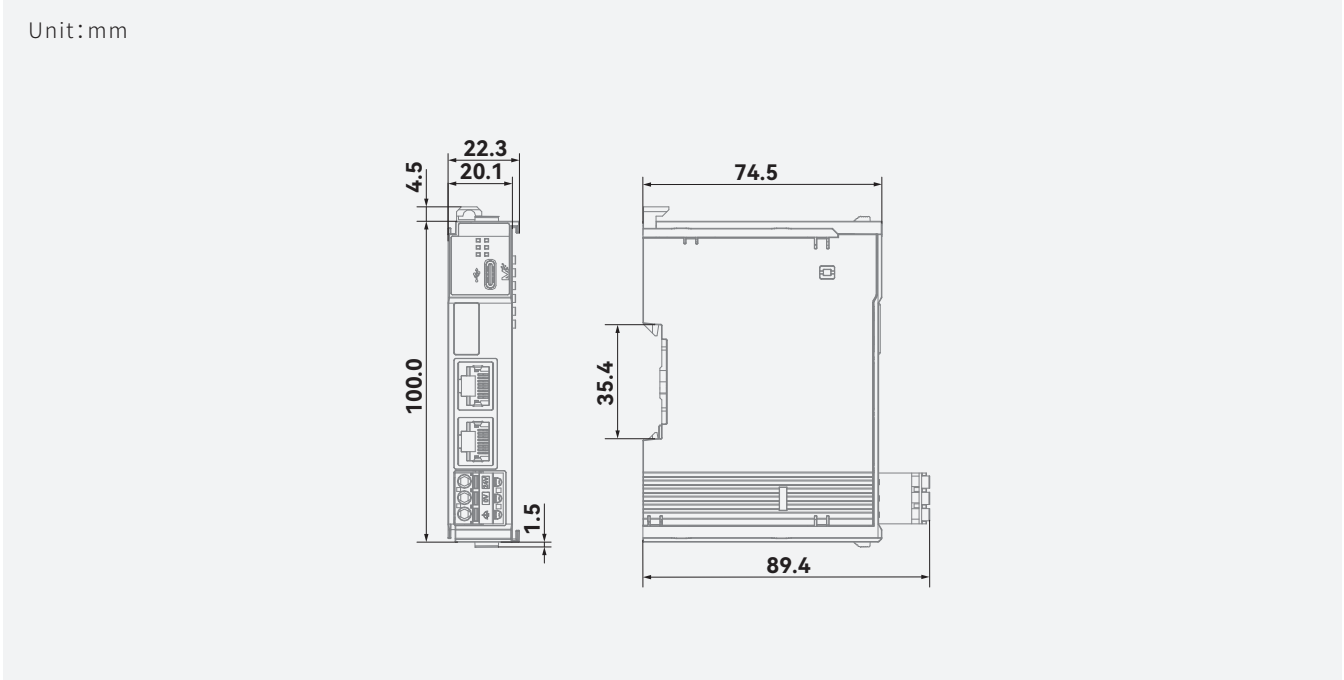
M-series analog module

Model name		HCMX-AD04-D	HCMX-AD04S-D
Appearance			
Number of input channels		4	
Input mode		Voltage/current	
Input range		-10V~10V	
		-5V~5V	
		0V~5V	
		1V~5V	
		-20mA~20mA	
		0mA~20mA	
		4mA~20mA	
Input type		Single-ended input	
Input resistance		1MΩ	
Sampling time		60μs/4-ch (when the number of sampling is set to 1)	
Sampling refresh		Bus cycle synchronization refresh	
Stop mode		Can select to continue or stop inputting	
Resolution		16bit	14bit
Input accuracy		Normal temperature 25 °C : ±0.1% (full range) Full temperature range : ±0.2% (full range)	Normal temperature 25 °C : ±0.5% (full range) Full temperature range : ±1% (full range)
Input power rated voltage		DC24V (±10%)	
Input power rated current		20mA	
Power consumption		1W	
Module hot-swappable function		Not supported	
Weight (g)		About 68	

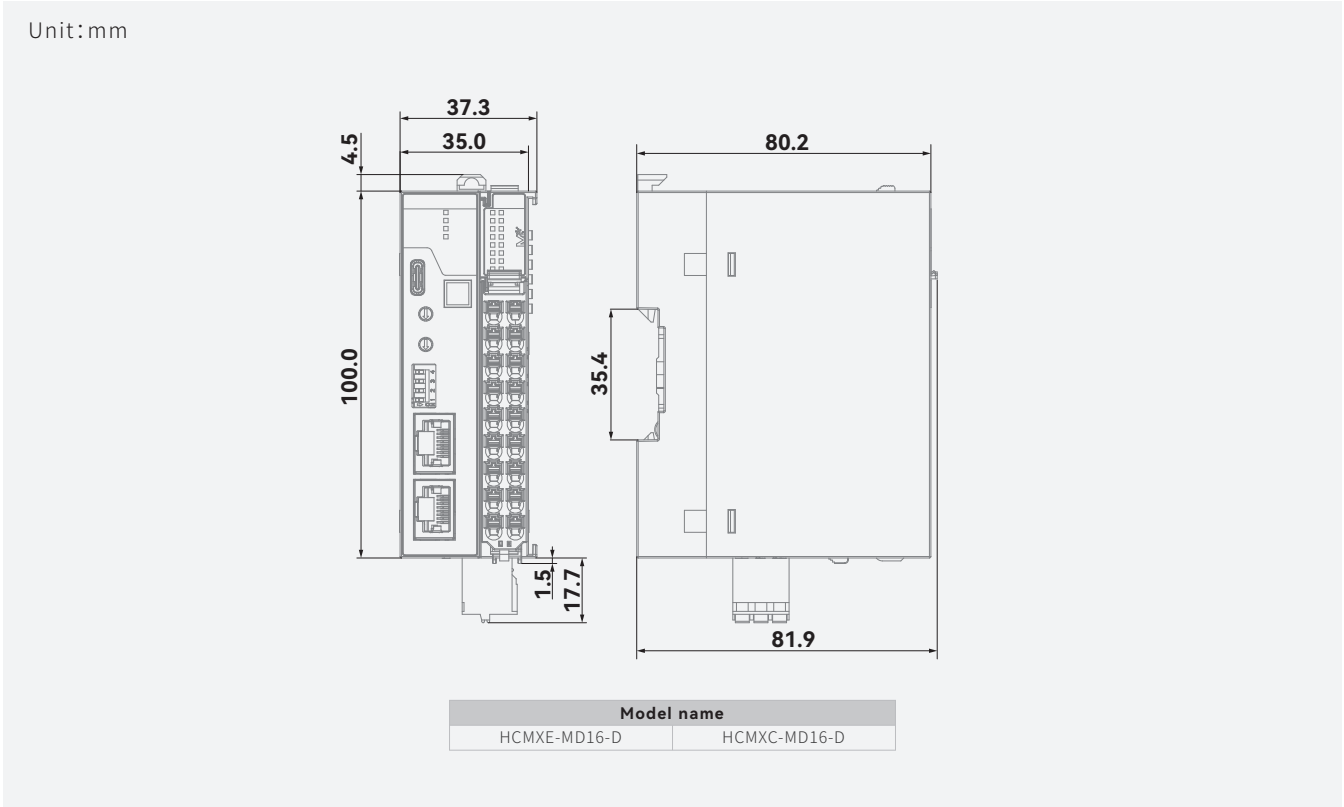
M-series analog module

Model name	HCMX-DA04-D	HCMX-DA04S-D
Appearance		
Number of output channels	4	
Output mode	Voltage/current	
Output range	-10V~10V	
	0V~10V	
	0mA~20mA	
	4mA~20mA	
Output type	Single-ended input	
Conversion time	90μs/4-ch	
Output refresh	Bus cycle synchronization refresh	
Stop mode	Can select to continue or stop inputting	
Resolution	16bit	14bit
Output accuracy	Normal temperature 25 °C : ±0.1% (full range) Full temperature range : ±0.2% (full range)	Normal temperature 25 °C : ±0.5% (full range) Full temperature range : ±1% (full range)
Input power rated voltage	DC24V (±10%)	
Input power rated current	20mA	
Power consumption	1W	
Module hot-swappable function	Not supported	
Weight (g)	About 68	

Coupler module (HCMX-EC01-D)

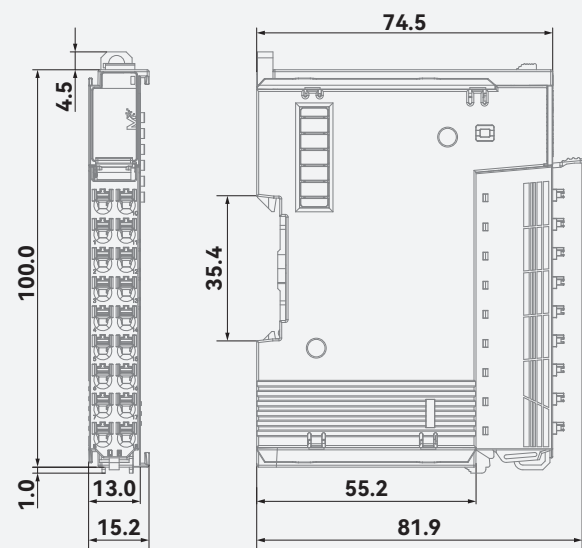


M-series remote expansion module



M-series digital/analog module

Unit:mm



Model name						
HCMX-ID16-D	HCMX-OD16-D	HCMX-MD16-D	HCMX-AD04-D	HCMX-AD04S-D	HCMX-DA04-D	HCMX-DA04S-D

Selection Guide

HCFA Control System Product Overview

M-series controller/ Optional card

Extension module

Selection Guide

Selection guide for M-series controller

Model name	Specifications	Page
HCM100-14MR-A	Relay output, 100K high-speed counting*2, 8 inputs and 6 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-14MT3-A	100K pulse axis*3, 100K high-speed counter*2, 8 inputs and 6 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-20MR-A	Relay output, 100K high-speed counting*2, 12 inputs and 8 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-20MT4-A	100K pulse axis*4, 100K high-speed counter*2, 12 inputs and 8 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-30MR-A	Relay output, 100K high-speed counter*2, 16 inputs and 14 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-30MT6-A	100K pulse axis*6, 100K high-speed counter*2, 16 inputs and 14 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-40MR-A	Relay output, 100K high-speed counting*2, 24 inputs and 16 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-40MT6-A	100K pulse axis*6, 100K high-speed counter*2, 24 inputs and 16 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-48MR-A	Relay output, 100K high-speed counting*2, 28 inputs and 20 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-48MT6-A	100K pulse axis*6, 100K high-speed counter*2, 28 inputs and 20 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-60MR-A	Relay output, 100K high-speed counting*2, 36 inputs and 24 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM100-60MT6-A	100K pulse axis*6, 100K high-speed counter*2, 36 inputs and 24 outputs, RS232*1, RS485*1, USB*1, 1 optional card	12
HCM211-20MR-A	Relay output, 200K high-speed counter*2, 12 inputs and 8 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM211-20MT4-A	200K pulse axis*4, 200K high-speed counter*2, 12 inputs and 8 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM211-32MR-A	Relay output, 200K high-speed counter*2, 18 inputs and 14 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM211-32MT6-A	200K pulse axis*6, 200K high-speed counter*2, 18 inputs and 14 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM211-42MR-A	Relay output, 200K high-speed counter*4, 24 inputs and 18 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM211-42MT8-A	200K pulse axis*8, 200K high-speed counter*4, 24 inputs and 18 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM211-60MR-A	Relay output, 200K high-speed counter*4, 36 inputs and 18 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM211-60MT10-A	200K pulse axis*10, 200K high-speed counter*4, 36 inputs and 24 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM212-32MT4-A	200K pulse axis*4, 200K high-speed counter*2, EtherCAT bus axis*8, 18 inputs and 14 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM212-60MT8-A	200K pulse axis*8, 200K high-speed counter*4, EtherCAT bus axis*8, 36 inputs and 24 outputs, EtherNet*1, CAN*1, RS485*2, USB*1, 1 optional card	13
HCM301-16MT4-D	100K pulse axis*4, RS485*1, RS232*1, 8 inputs and 8 outputs, supports 16 right-side expansion modules	16
HCM302-16MT4-D	100K pulse axis*4, RS485*1, RS232*1, 8 inputs and 8 outputs, supports 16 right-side expansion modules	16
HCM310-16MT4-D	200K pulse axis*4, EtherNet*1, RS485*1, RS232*1, 8 inputs and 8 outputs, supports 16 right-side expansion modules	16
HCM311-16MT4-D	200K pulse axis*4, EtherNet*1, RS485*1, RS232*1, 8 inputs and 8 outputs, supports 16 right-side expansion modules	16
HCM312-32MT6-D	200K pulse axis*6, EtherNet*1, RS485*2, 16 inputs and 16 outputs, 2 optional cards, support 16 right-side expansion modules	16
HCM501S-16MT4-D	200K pulse axis*4, EtherCAT bus axis*8*1, RS485*1, RS232*1, 8 inputs and 8 outputs, supports 16 right-side expansion modules	17
HCM511S-32MT4-D	200K pulse axis*4, EtherCAT bus axis*8*1, EtherNet*1, RS485*2, 16 inputs and 16 outputs, 2 optional cards, support 16 right-side expansion modules	17
HCM511-32MT4-D	200K pulse axis*4, EtherCAT bus axis*8, EtherNet*1, RS485*2, 16 inputs and 16 outputs, 2 optional cards, support 16 right-side expansion modules	17
HCM512-32MT4-D	200K pulse axis*4, EtherCAT bus axis*16, EtherNet*1, RS485*2, 16 inputs and 16 outputs, 2 optional cards, support 16 right-side expansion modules	17
HCM513-32MT4-D	200K pulse axis*4, EtherCAT bus axis*32, EtherNet*1, RS485*2, 16 inputs and 16 outputs, 2 optional cards, support 16 right-side expansion modules	17
HCM514-32MT4-D	200K pulse axis*4, EtherCAT bus axis*64, EtherNet*1, RS485*2, 16 inputs and 16 outputs, 2 optional cards, support 16 right-side expansion modules	17

*1: PDOs are fixed configuration; only available to slaves in the configuration software.

M-series optional card selection table

Model name	Applicable main unit	Specifications	Page
HCMXB-CAN-100-BD	M100 series	Supports CANopen protocol (DS301), can be used as master station or slave station	20
HCMXB-2RS232-100-BD		2-ch RS232 serial port, can be used as a master station or slave station, supports Modbus protocol and user-defined protocol	20
HCMXB-2RS485-100-BD		2-ch RS485 serial port, can be used as master station or slave station, supports Modbus protocol and user-defined protocol	21
HCMXB-2RS232-200-BD	M200 series	2-ch RS232 serial port, can be used as a master station or slave station, supports Modbus protocol and user-defined protocol	20
HCMXB-2RS485-200-BD		2-ch RS485 serial port, can be used as master station or slave station, supports Modbus protocol and user-defined protocol	21
HCMXB-CAN-BD	M312 M511S M511 M512 M513 M514	Supports CANopen protocol (DS301), can be used as master station or slave station	20
HCMXB-2RS232-BD		2-ch RS232 serial port, can be used as a master station or slave station, supports Modbus protocol and free protocol	20
HCMXB-2RS485-BD		2-ch RS485 serial port, can be used as master station or slave station, supports Modbus protocol and free protocol	21
HCMXB-RTC-BD		Perpetual calendar battery card, the perpetual calendar time can continue to count after the controller is powered off	21

M-series extension module selection table

Model name	Specifications	Page
HCMX-EC01-D	EtherCAT coupler, supports 16 right-side expansion modules	24
HCMXE-MD16-D	EtherCAT remote IO, 8 inputs and 8 outputs, supports 16 right-side expansion modules	24
HCMXC-MD16-D	CANopen remote IO, 8 inputs and 8 outputs, supports 16 right-side expansion modules	24
HCMX-ID16-D	16-point digital input, supports source or sink wiring	25
HCMX-OD16-D	16-point digital output (transistor), supports sink wiring	25
HCMX-MD16-D	16-point I/O: 8 inputs, 8 outputs (transistor), input supports source or sink wiring, and output supports sink wiring	25
HCMX-AD04-D	4-ch 16-bit analog input; supported modes: -10V~10V, -5V~5V, 0V~5V, 1V~5V, -20mA~20mA, 0mA~20mA, 4mA~20mA	26
HCMX-AD04S-D	4-ch 14-bit analog input; supported modes: -10V~10V, -5V~5V, 0V~5V, 1V~5V, -20mA~20mA, 0mA~20mA, 4mA~20mA	26
HCMX-DA04-D	4-ch 16-bit analog output; supported modes: -10V~10V, 0V~10V, 0~20mA, 4mA~20mA	27
HCMX-DA04S-D	4-ch 14-bit analog output; supported modes: -10V~10V, 0V~10V, 0~20mA, 4mA~20mA	27

M-series programming software

Software name	Overview	Page
SysCtrl Studio	M series programmable controller programming software with multiple functions	-