

Motion Controller

CODESYS

G Series and S Series



Better Life with Robots



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Guangzhou Auctech Automation Technology Limited

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V2.2



CODESYS

Based on CODESYS environment

Soft PLC Functions
 IEC 61131-3 programming language standard
 Support PLCopen standard
 Integration of universal motion control, robotics,
 CNC and vision solutions



Powerful Motion Control

Supports up to 256 servo axes at
 2ms scanning cycle
 Supports up to
 10 robot axesets at 4ms scan
 cycle



Industrial processor platforms

Intel processor
 Celeron and Core processors
 available



Product Advantage



Supports a wide range of manipulator models

Parallel type robots
 Tandem robots
 XYZ Modular Robot
 Tool hand free switching



High-speed bus control

EtherCAT protocol
 Minimum 500 μs for refresh time
 Jitter less than 25 μs



Embedded Compact Design

Sealed and dustproof



System Architecture Diagram



• Control layer



• Driver Layer

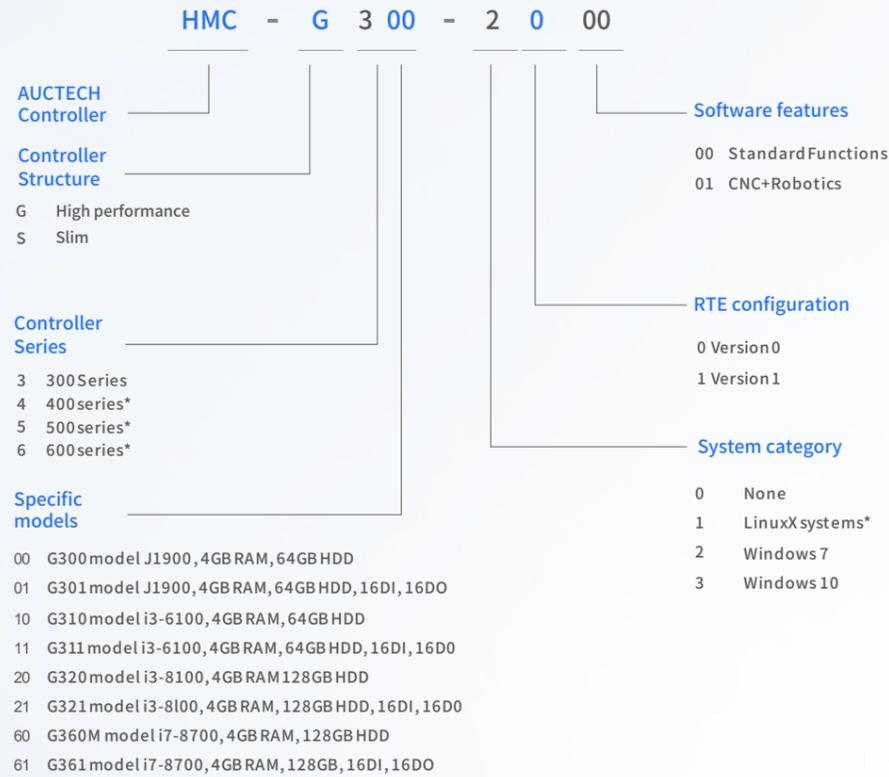


• Information layer



• Site level





Note: 1) Naming rules are only used for model resolution, and cannot be used for ordering.



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Controllers

G300 Series

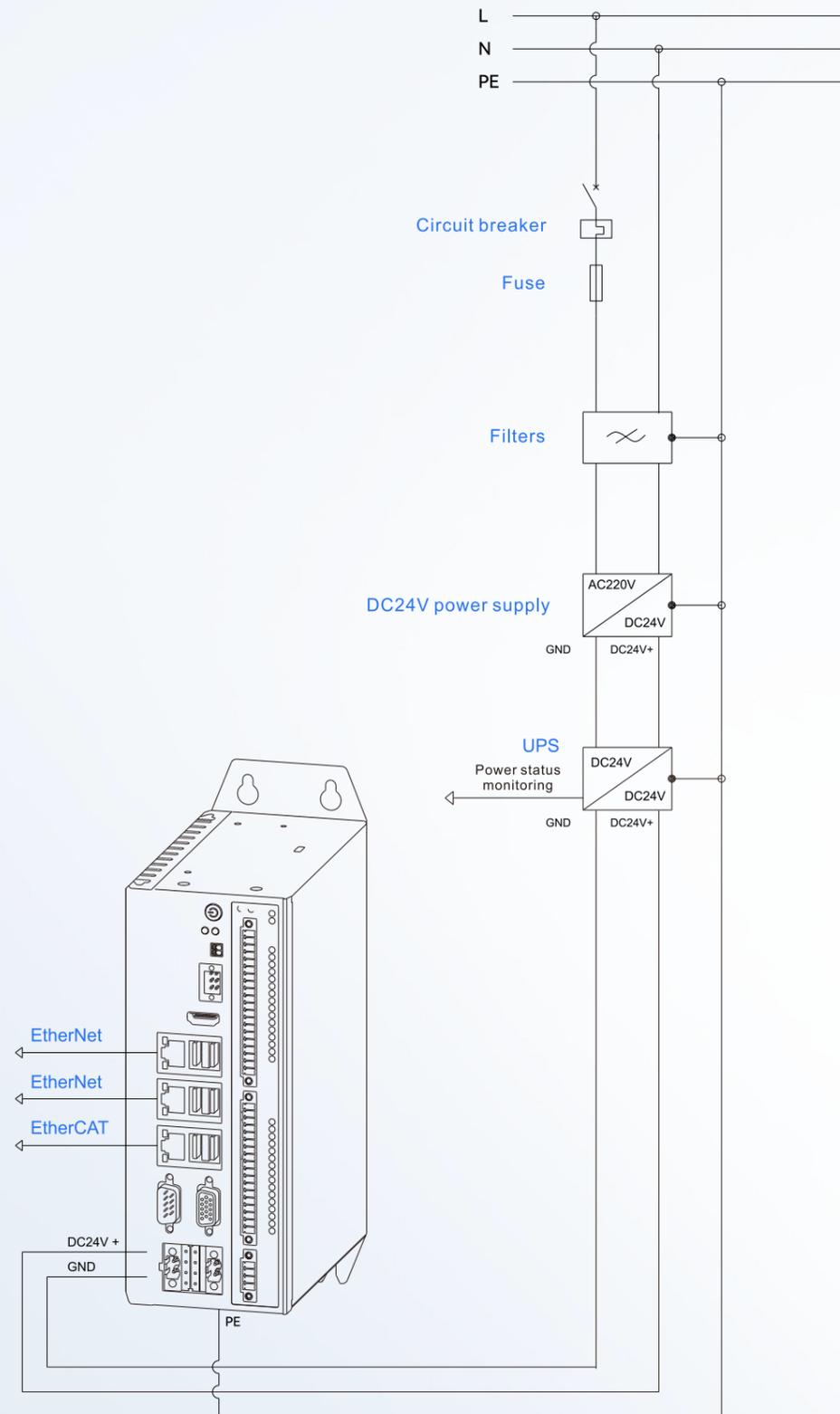


Technical Specification

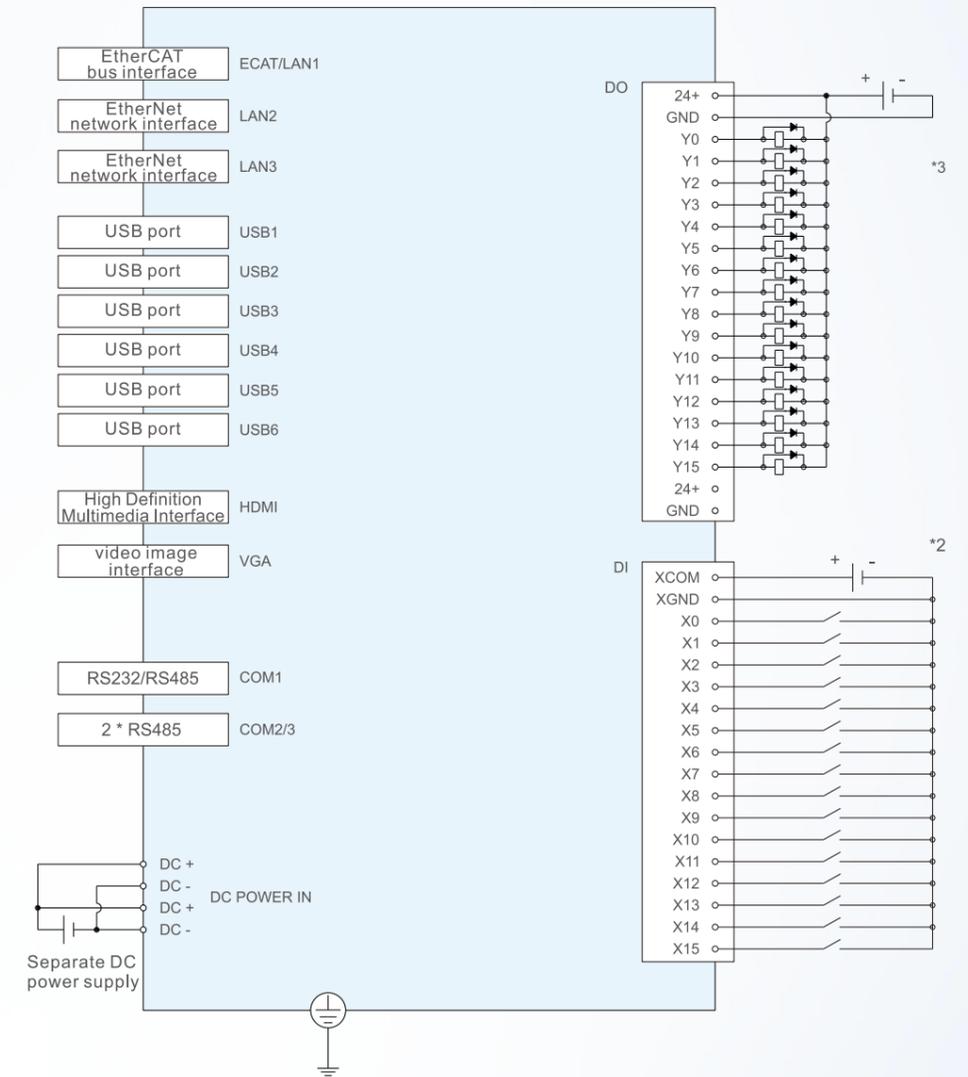
Model	HMC-G300-2000 (HMC-G301-2000)	HMC-G310-3100 (HMC-G311-3100)	HMC-G320-3100 (HMC-G321-3100)	HMC-G360-3100 (HMC-G361-3100)
Operating system	Windows 7 (standard)	Windows 10 (standard)		
CPU	Intel Celeron 2.0GHz	Core i3 6100 3.7GHz	Core i3 8100 3.6GHz	Core i7 8700 3.2GHz
Rated power consumption	42W(45W)	120W(125W)	120W(125W)	120W(125W)
Rated current	1.75A(1.875A)	5.0A(5.2A)	5.0A(5.2A)	5.0A(5.2A)
random access memory (RAM)	DDR3L-1333MHz, 4GB	DDR4-2400MHz, 4GB	DDR4-2400MHz, 4GB	DDR4-2400MHz, 4GB
hard drive	64GB	64GB	128GB	128GB
programme memory	128M Byte			
Variable Memory	128M Byte			
Power Down Hold Variable Memory	Variable value change save and hold data 128K; Periodic save and hold data unlimited			
At bus period 2ms. Number of servo control axes supported	32	64	128	128+128
Minimum Task Cycle	500µs			
CNC Applications	Support	Support	Support	Support
Robot control	Support	Support	Support	Support
Power supply	24VDC(-10%~10%)	24VDC(-10%~10%)	24VDC(-10%~10%)	24VDC(-10%~10%)
I/O of the principal device	None (16DI, 16DO)	None (16DI, 16DO)	None (16DI, 16DO)	None (16DI, 16DO)
I/O Extended Form	Remote I/O Expansion with Coupler			
USB port	1×USB3.0, 5×USB2.0 (Built-in, USB hardware dog can be installed)	4×USB3.0 (Built-in, USB hardware dog can be installed)	4×USB3.0 (Built-in, USB hardware dog can be installed)	4×USB3.0 (Built-in, USB hardware dog can be installed)
COM port	1×RS232/RS485 + 2×RS485			
Fan	None	Embedded	Embedded	Embedded
Working altitude	2000m			
Electromagnetic interference	Class A			
Vibration during operation	1.5 Grms, IEC 6006 x -2-64, random, 5 ~ 500 Hz, 1 hr/axis			
Shock at work	G10, IEC 6006 X -2-64, half-sine, duration 11 ms			
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5%~95% (no condensation)			
Storage environment	Storage temperature: -40°C~80°C Storage humidity: 5%~95% (no condensation)			
Protection level	IP20			
Accreditation	CE certification			

Note: Support CPU and memory customization, please contact us for details.
()Parameters for Obi I/O models

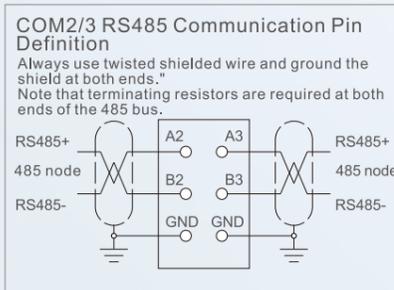
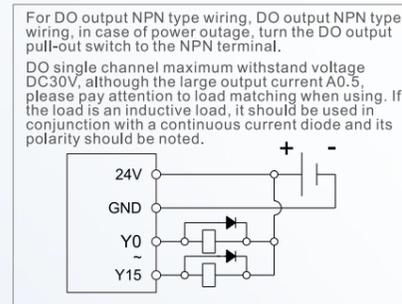
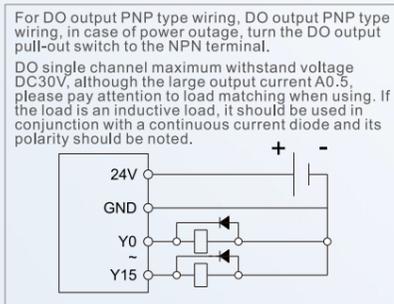
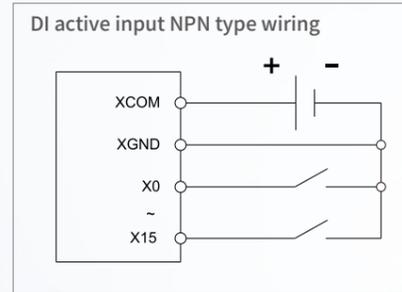
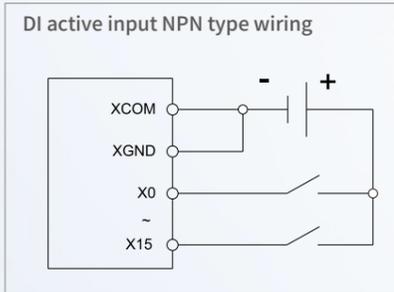
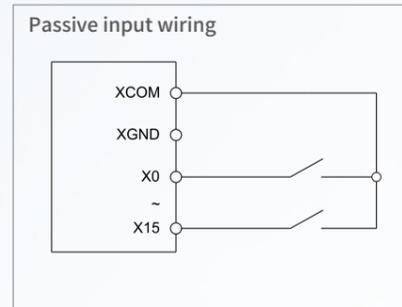
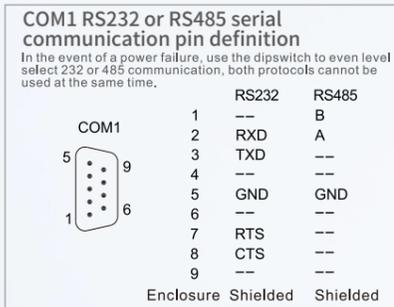
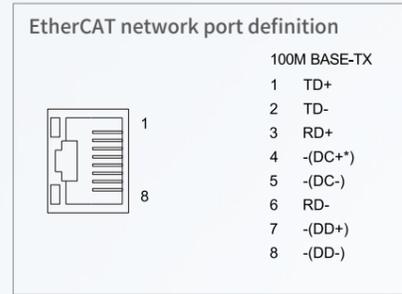
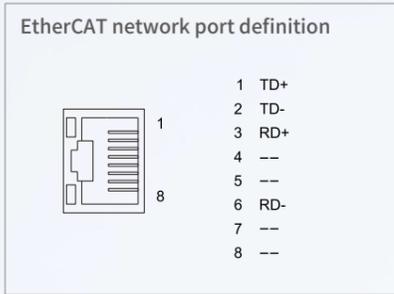
Wiring Diagram



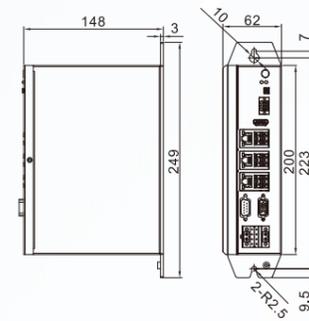
Wiring Diagram



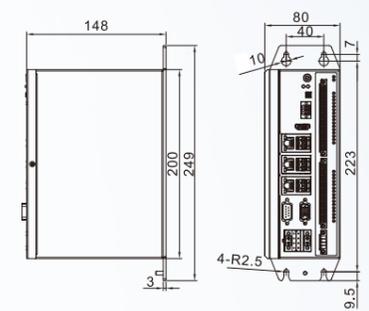
- Note: 1. This example is for HMC-G301-2000 model only, for other models, please consult the user manual for more detailed information.
2. The DI wiring in this example is NPN type wiring, if you need PNP input or passive input, please refer to the user manual for more detailed information. Note that only NPN or PNP can be selected for DI, and cannot be mixed.
3. The DO wiring in this example is NPN type wiring, if you need PNP type output, please refer to the user manual for more detailed information. Please note that only NPN or PNP can be selected for DO, and cannot be mixed.
4. Single-channel DO output, maximum withstand voltage DC30V, output current 0.5 A. Please pay attention to the matching when using external loads, otherwise it will lead to the damage of internal circuits.
5. If the output load of DO is inductive, please use it together with the continuity diode, and pay attention to the direction of current and the polarity of the continuity diode when using it, otherwise it will lead to the damage of the internal circuit.
6. There are two sets of 24V and GND pins in the DO terminal, you can connect any one of them when using. However, the total load capacity and external DC 24V power supply capacity must be matched, otherwise it may cause DO output abnormality.
7. Be sure to keep the controller DC power supply as an independent power supply, and do not share the DC power supply with other devices.
8. Always ensure that the grounding is firm and reliable.



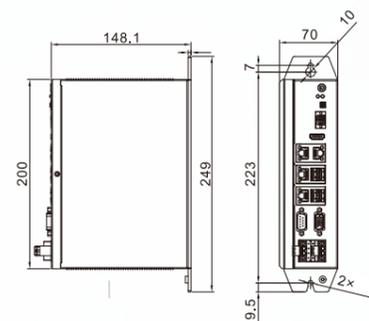
G300 Series



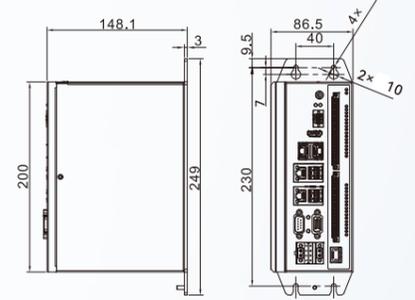
Model	Dimensions LxWxH (mm)
HMC-G300-2000	62×200×148



Model	Dimensions LxWxH (mm)
HMC-G301-2000	80×200×148



Model	Dimensions LxWxH (mm)
HMC-G310-3100	
HMC-G320-3100	70×200×148
HMC-G360-3100	



Model	Dimensions LxWxH (mm)
HMC-G311-3100	
HMC-G321-3100	87×200×148
HMC-G361-3100	



Note: 1. The naming rules are only used for model resolution, and cannot be used for ordering, please consult with AUCTECH Company before ordering.
2.*Products under planning, for more information, please contact AUCTECH.



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Controllers

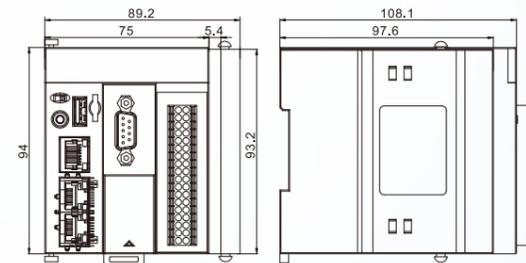
S3 Series



Technical Specification

Model	HMC-S3-22N00
Power supply	Two sets of 24VDC (-15%-20%)
Rated input current (not counting I/O current)	500mA
Rated power (not counting I/O)	12W
Random access memory (RAM)	1GB
Programme memory	256M Byte
Variable memory	(Q, I, M) 512K Byte each
Power down hold variable memory	2MB + 512KB (M Zone)
Minimum task cycle time	1ms
I/O of the principal device	16DI/16DO
I/O expansion form	LSB extension
USB port	1×USB2.0
COM interface	3×RS485, 1×CAN
Working altitude	2000m
EMC	Class B
Network port	1×1000Mbps+2×100Mbps
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5% - 95%(no condensation)
Storage environment	Storage temperature: -40°C~80°C Storage humidity: 5% - 95%(no condensation)
Protection class	IP20

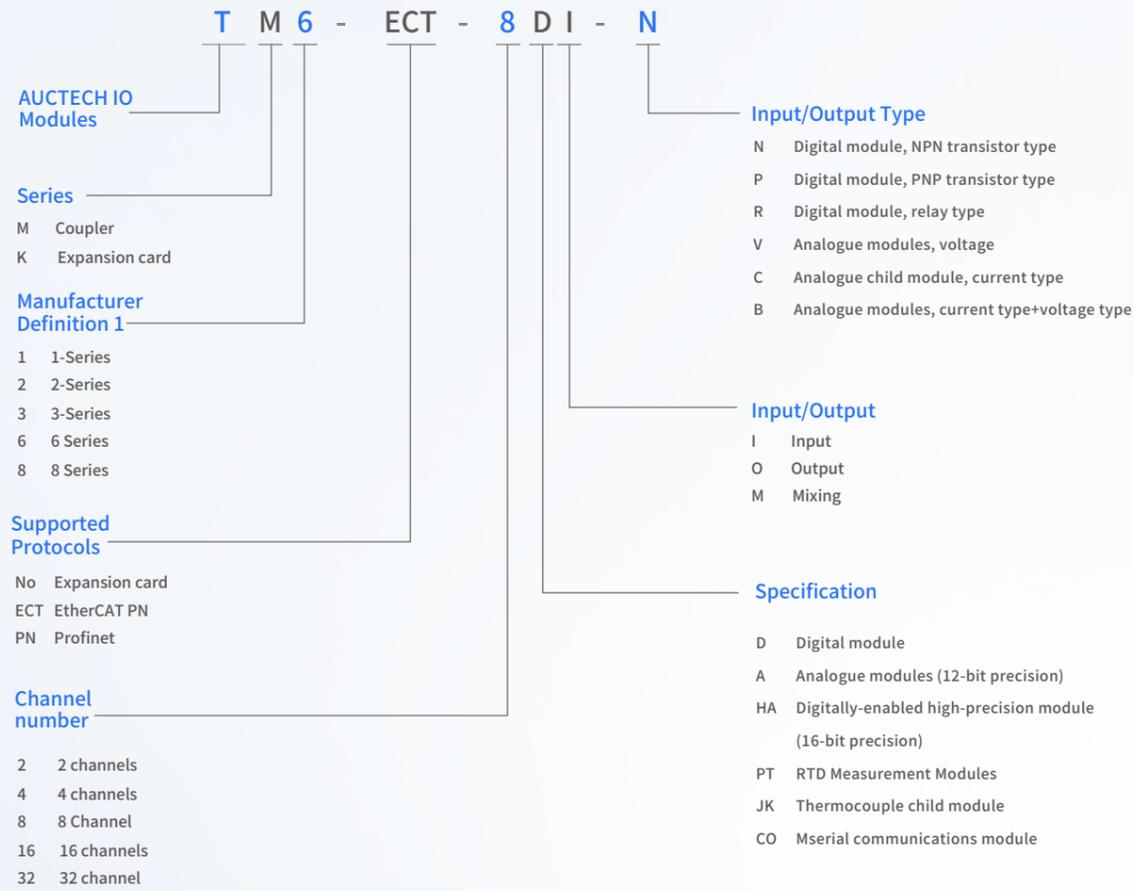
Dimensions



No. Controller model Dimension Wx H xD(mm)

1	HMC-S3-22N00	75×94×108
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Note: This 1:1 controller comes with a terminal cover plate (TK6-END), please keep it in a safe place. When there is only a controller on the application site, the terminal cover plate should be installed on the right side of the controller; if there is an expansion module installed on the right side of the controller, the terminal cover plate should be installed on the right of the last expansion module, otherwise the system will not operate normally.



Note: The naming rules are only used for model resolution, and cannot be used for ordering, please consult AUCTECH before ordering.



TM6-ECT

EtherCAT Coupler Modules



Product Features

- 2 RJ45 interfaces, 100Mbit/s
- Stand-alone as EtherCAT slave, expandable with 16 KCK6 modules
- The body comes with DI points
- Response time is less than 2ms to meet the needs of fast acquisition

Technical Specification

Model	TM6-ECT-32DM-N
Supply voltage	24VDC(-15%~20%)
Communications interface	210M/100M adaptive Ethernet interfaces
Transmission medium	Network cable
Electrical isolation	500Vrms (supply voltage/field bus)
Current consumption	100mA@24VDC
Channel number	16-channel source/drain inputs, 16-channel drain outputs
Input impedance	3.3kΩ
ON state input voltage	13-30VDC
Maximum load output current	U.5A/channel
Voltage output range	12-32VDC
Communication protocols	EtherCAT
Support services	CoE(PDO, SDO)
Homologation	Servo using DC-distributed clock, IO using inputs and outputs in the synchronous way
Physical layer	100BASE-TX
Communication rate	100Mbit/s(100Base-TX)
Duplex mode	Full duplex
Topological structure	Linear topology
Transmission distance	Less than m100 between two nodes(EtherCAT)
Number of slave station(s)	Up to 127, sequentially and automatically arranged internal addresses or fixed addresses depending on master configuration and network bus connection
Frame length	44 bytes - 1498 bytes
Process data	Maximum 1486 bytes per Ethernet frame
Synchronized jitter in both slave stations	<1us
Refresh time	Approx, 30μs for 1000 switching inputs and outputs, approx, 100ps for 32 servo axes
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5%-90% (no condensation)
Storage environment	Storage temperature: -40°C~85°C Storage humidity: 5%-90% (no condensation)
Certification and testing	CE certification, GB/T25119 vehicle specification testing

TK6

Digital Input Modules



Product Features

- 32 Channel source/Drain Input (Bidirectional optocoupler) module
- LED indicators: work, fault, channel input indication
- System and field optocoupler isolation
- Supports hot swapping

Technical Specification

Model	TK6-32DI
Contact type	DC, Source/Drain
Number of input channels	32 channels of voltage inputs (isolated between channels)
Input Type	Digital input
System measurement power consumption	5VDC/50mA (internally self-powered)
Switch-on current	≥5mA
ON response time	0.5ms
OFF response time	0.5ms
Input motion display	Input indicator light when driven by optocoupler
Isolation method	Optical isolation for each channel, isolation withstand voltage ≥22KVrms
Input impedance	7.2KΩ
ON state	17~30VDC
OFF state	-3~5VDC
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5%-90% (no condensation)
Storage environment	Storage temperature: -40°C~85°C Storage humidity: 5%-90% (no condensation)
Certification and testing	CE certification, GB/T25119 vehicle specification testing

TK6

Digital Input And Out Modules



Product Features

- TK6-16DM-N is a 16-channel drain/source input, 16-channel drain output.
- Output voltage range 5-32VDC, single channel 500mA current output
- Isolation between the system and the channels in the field
- LED indicators: work, fault, channel output indication
- Support hot-swapping

Technical Specification

Model	TK6-32DM-N	
Channel number	16-channels voltage inputs (source/drain)	
Switch-on current	>5mA/channel	
Input (Electrical) impedance	4.7KΩ	
	ON state	15~32VDC
	OFF state	-3~8VDC
Channel number	16-channel voltage output(drain type)	
Output Output Voltage Range	5-32VDC	
	Maximum negative cutting current	0.5A/channel
	overload protection	500mA overcurrent protection
System side power consumption	5VDC/30mA(internally self-powered)	
ON response time	0.5ms	
OFF response time	0.5ms	
Channel indication	Input indicator light when there is signal input, output indicator light when there is signal output.	
Isolation method	Each channel is optically isolated, isolation voltage ≥2KVrms	
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5%-90% (no condensation)	
Storage environment	Storage temperature: -40°C~85°C Storage humidity: 5%-90% (no condensation)	
Certification and testing	CE certification, GB/T25119 vehicle specification testing	

TK6

Digital Output Module



Product Features

- 16-channel relay output
- Outputs 3A/250VAC, 3A/30VDC
- Overcurrent protection
- Isolation between the system and the channels in the field
- LED indicators: work, fault, channel output indication

Technical Specification

Model	TK6-16DO-R
Contact type	AC(A3/250VAC), DC(3A/30VDC)
Number of input channels	16-channel relay output
Output type	Digital relay
System side power consumption	5VDC/30mA (internal self-powered)
Output current	3A/250VAC, 3A/30VDC
Output motion display	Input indicator light when driven by optocoupler
Isolation method	Optical isolation for each channel, isolation voltage $\geq 2\text{KVrms}$
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5%-90% (no condensation)
Storage environment	Storage temperature: -40°C~85°C Storage humidity: 5%-90% (no condensation)
Certification and testing	CE certification, GB/T25119 vehicle specification testing

TK6

Digital Output Module



Product Features

- 32 channels of drain/source outputs
- Output voltage range 15-32VDC, single channel 500mA current output
- Overcurrent protection
- Isolation of the system from all channels in the field
- LED indicators: work, fault, channel output indication
- Supports hot-swapping

Technical Specification

Model	TK6-32DO-N	TK6-32DO-P
Contact type	DC, Drain type	DC, Source
Number of input channels	32 channels of voltage output (non-isolated between channels)	
System side power consumption	5VDC/30mA (internally self-powered)	
Voltage output parameters	15-32VDC	
Maximum load current	0.5A/channel	
ON response time	0.5ms	
OFF response time	0.5ms	
Output motion display	Output LED on when driven by optocoupler	
Isolation method	Optical isolation for each channel, isolation voltage $\geq 2\text{KVrms}$	
Overload protection	500mA over current protection	
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5%-90% (no condensation)	
Storage environment	Storage temperature: -40°C~85°C Storage humidity: 5%-90% (no condensation)	
Certification and testing	CE certification, GB/T25119 vehicle specification testing	

TK6

Analogue high precision input modules



Product Features

- TK6-8HAI-C, support for holding 8-channel current inputs.
- TK6-8HAI-C for ranges 0-20mA, 16-bit resolution.
- TK6-8HAI-B Supports 8-channel voltage/current inputs.
- TK6-8HAI-B for ranges of $\pm 10V$, $\pm 5V$, 0-10V, 0-5V, 4-20mA, 0-20mA, 16 bit resolution.
- TK6-8HAI-V: Supports 8 channels of voltage inputs.
- TK6-8HAI-V for ranges 0-10V, 16-bit resolution.
- Filter time configurable
- LED indicators: work, fault, communication indication.
- Supports hot swapping

Technical Specification

Model	TK6-8HAI-C	TK6-8HAI-B	TK6-8HAI-V
Number of input channels	8-channel current input	8-channel voltage/current input	8-channel voltage input
Voltage input range	—	+10V, +5V, 0-10V, 0-5V	0-10V
Voltage input impedance	—	110K Ω	
Current input range	0-20mA	4-20mA, 0-20mA	—
Current input impedance	250 Ω		—
System side power consumption	5VDC/50mA(internal self-powered)		
Site side power consumption	24VDC/20mA(internally self-powered)		
Resolution	16-bit		
Sampling time	1 ms/channel		
Conversion time	2ms/channel		
Filtering time	1 -255ms, configurable		
Measurement accuracy	<0.1%F.S.@25°C		
Limit input voltage	—	$\pm 11V$	
Limit input current	$\pm 22mA$		
Isolation method	Non-isolated between channels, optically coupled isolation of system and field side, isolation voltage $\geq 2KV_{rms}$		
Input indication	Operation, fault, communication indication, etc.		
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5%-90% (no condensation)		
Storage environment	Storage temperature: -40°C~85°C Storage humidity: 5%-90% (no condensation)		
Certification and testing	CE certification, GB/T25119 vehicle specification testing		

TK6

Analogue High Precision Output Modules



Product Features

- TK6HA-80-V, supports 8-channel voltage outputs
- TK6HA8-0-V for ranges 0-10V, 16-bit resolution
- TK6HA8-0-C, support has channel current outputs
- TK6HA8-0-C for ranges 0-20mA, 16-bit resolution
- Isolation between system and site
- Filter time configurable
- LED indicators: work, fault, communication indication
- Supports hot swapping

Technical Specification

Model	TK6-8HAO-V	TK6-8HAO-C
Number of input channels	8-channel voltage output	8-channel current output
Current output range	—	0-20mA
Current output load	—	650 Ω
Voltage output range	0-10V	—
Voltage output load	1K Ω -1M Ω	—
System side power consumption	5VDC/50mA(internal self-powered)	
Site side power supply	24VDC/250mA(internally self-powered)	
Resolution	16-bit	
Sampling time	1 ms/channel	
Output accuracy	Voltage $\pm 0.1\%F.S$	Current $\pm 0.1\%F.S$
Output short circuit protection	Support	
Measurement accuracy	<0.1%F.S.@25°C	
Isolation method	Non-isolated between channels, optically coupled isolation of system and field side, isolation voltage $\geq 2KV_{rms}$	
Output indication	Operation, fault, communication indication, etc.	
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5%-90% (no condensation)	
Storage environment	Storage temperature: -40°C~85°C Storage humidity: 5%-90% (no condensation)	
Certification and Testing	CE certification, GB/T25119 vehicle specification testing	

TK6

Temperature measurement module



Product Features

- 4/8 channel thermal resistor or thermocouple input
- 24-bit resolution
- The thermocouple module supports a temperature resolution of 0.0078125°C
- The filtering level of each channel can be configured separately
- The thermocouple module can support multiple types of thermocouple sensors for temperature measurement.
- The thermal resistance module can support multiple types of thermal resistance sensors for temperature measurement
- The thermocouple module is equipped with built-in cold junction compensation, with a cold compensation accuracy of $\pm 0.7^\circ\text{C}$
- Thermocouple module input end provides $\pm 45\text{V}$ overvoltage protection
- The thermocouple module has automatic linear compensation function for thermocouples, with a linear error of $\pm 0.15\%$ F.S
- System is separated from the site
- Support for hot swapping

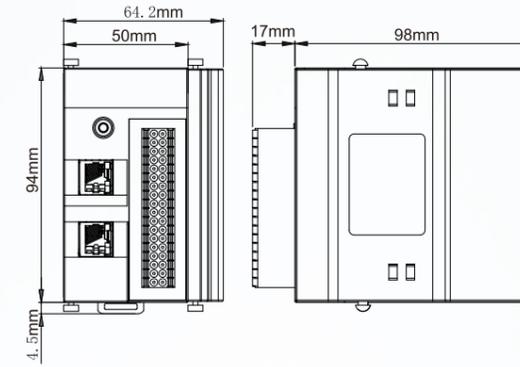
Technical Specification

Model	TK6-4PT	TK6-8PT*	TK6-4JK
Number of input channels	4-channel	8-channel	4-channel
Sensor type	Thermal resistance PT100, PT1000		Thermocouples K, J, E, B, N, R, S, T
Wiring method	Two-wire, three-wire, four-wire		Two-wire
Thermocouple cold junction compensation method	—		Internal cold end compensation
Resolution	24-bit		
Sensitivity	0.1°C, 0.1°F		
Filtering time	0~100s configurable		
Accuracy (at room temperature of 25°C)	($\pm 0.15\%$ F.S)		($\pm 0.15\%$ F.S) $\pm 2^\circ\text{C}$
Accuracy (at ambient temperature 0-55°C)	($\pm 0.3\%$ F.S)		($\pm 0.3\%$ F.S) $\pm 2^\circ\text{C}$
Isolation method	IO terminal power isolation, non-isolated between channels		
System side power consumption	5VDC/50mA(internal self powered)		
Power consumption on site side	24VDC/20mA(internal self powered)		
Working environment	Operating temperature: 0°C~50°C Operating humidity: 5%-90% (no condensation)		
Storage environment	Storage temperature: -40°C~85°C Storage humidity: 5%-90% (no condensation)		
Certification and testing	CE certification, GB/T25119 vehicle specification testing		

Note: * is a planned product, For details, please consult AUCTECH Company.

Dimensions

Coupler

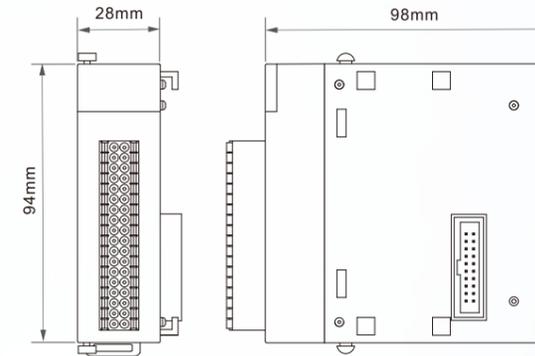


The following models are included:

Unit: mm

- TM6-ECT-32DM-N

Expansion module

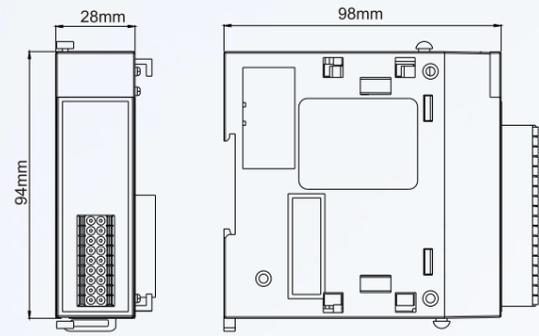


The following models are included:

Unit: mm

- TK6-16DO-R
- TK6-32DI
- TK6-32DO-N
- TK6-32DO-P
- TK6-32DM-N
- TK6-8HAI-B

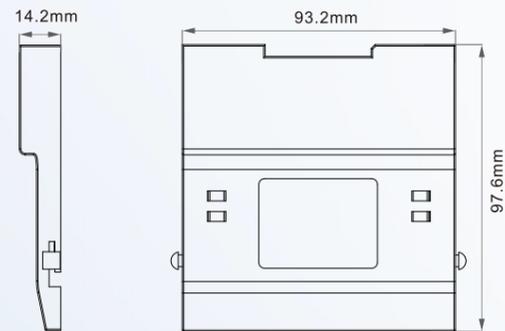
Expansion module



The following models are included: Unit: mm

- TK6-4PT
- TK6-8HAI-C
- TK6-8HAO-V
- TK6-4JK
- TK6-8HAI-V
- TK6-8HAO-C

Terminal cover



The following models are included: Unit: mm

- TM6-END

Note: Delivered with HMC-S3-22N00 and TM6-ECT-32DM-N only, no additional purchase is required, please contact AUCTECH for details.