

General Specifications for HCQX-series Extension Modules

Electrical specifications

Items	Specifications	
Insulation voltage	Electrostatic	AC 500V60s
Insulation resistance	Electrostatic	1MΩ
EMC requirements	Discharge	Contact ±4kV, air ±8kV
	EFT	±2kV
	Surge	DC500V

Environment specifications

Items	Specifications
Working temperature	0~55°C
Storage temperature	-25~75°C
Relative humidity	95%no condensation
Altitude	2km or less
Atmosphere	108kPa~66kPa
Noise resistance	±2kV 5~100kHz
Sinusoidal vibration	9Hz<f<100Hz, 1.0 acceleration, constant amplitude
Drop	1m, 10 times, for packaging transportation

Power specification for IO special modules

Items	Specifications
Rated power for control end	DC 12V
Input voltage range	DC 10.8~13.2V
Max. current consumption	100mA/12V
Rated power for signal end	DC 24V
Input voltage range	DC 20.4~28.8V

Coupler/power/terminal modules
HCQX SERIES

ETHERCAT COUPLER



ETHERCAT COUPLER



AC POWER



END UNIT



Coupler module— Performance specifications

Items	Specifications	
	HCQX-EC01-D	HCQX-EC02-D
Models	HCQX-EC01-D	HCQX-EC02-D
Functions	Connect the terminal module and the 100BASE-TX EtherCAT network	Connect terminal module and 100BASE-TX EtherCAT network, support SLOT node
Number of local extension	Up to 16	Up to 16
Data transmission medium	EtherNet/EtherCAT (Cat.5E twisted pair cables at least) Shielded	EtherNet/EtherCAT (Cat.5E twisted pair cables at least) Shielded
Distance between station	Ethernet transmission, max.100m	Ethernet transmission, max.100m
Transmission protocol / transmission rate	EtherCAT/100Mbaud	EtherCAT/100Mbaud
Delay	about 1μs	About 1μs
Bus interface	2 × RJ45	2 × RJ45
Power supply	DC 24V (-15%~+20%)	DC 24V (-15%~+20%)
Current consumption	70mA+ (Σ QBUS current/4)	70mA+ (Σ QBUS current/4)
QBUS Load power	Max.1750mA (21W) (-25°C~+55°C) Max.1333mA (16W) (>+55°C)	Max.1750mA (21W) (-25°C~+55°C) Max.1333mA (16W) (>+55°C)
Electrical isolation	Isolated power supply	Isolated power supply

AC power module - Power specifications

Items	Specifications
Models	HCQX-PD01-A
Input voltage	AC 100~240V 50/60Hz
Output voltage	12V
Load power	60W

DIGITAL INPUT



HCQX-ID16-D2
16-point digital input
Support NPN/PNP input



HCQX-ID16-D
16-point digital input
Support NPN/PNP input



HCQX-ID32-D2
32-point digital input
Support NPN/PNP input

DIGITAL OUTPUT



HCQX-OD16-D2*
16-point digital output
Support NPN output



HCQX-OD16-D
16-point digital output
Support NPN output



HCQX-OD32-D2*
32-point digital output
Support NPN output

DIGITAL IN/OUT



HCQX-MD16-D2*
16-point digital I/O
Support NPN/PNP input
Support NPN output



HCQX-MD16-D
16-point digital I/O
Support NPN/PNP input
Support NPN output



HCQX-MD32-D2*
32-point digital I/O
Support NPN/PNP input
Support NPN output

Digital input modules — Performance Specifications

Items	Specifications	
Models	HCQX-ID16-D / HCQX-ID16-D2	HCQX-ID32-D2
Input points	16	32
Input form	NPN/PNP	NPN/PNP
Input voltage range	DC 24V (+20%~-15%)	DC 24V (+20%~-15%)
Input signal current	7mA / DC 24V	7mA / DC 24V
Input resistance	4.86kΩ	4.86kΩ
Input sensitivity ON-current	5.35mA or more	5.35mA or more
Input sensitivity OFF-current	2.1mA or less	2.1mA or less
Input voltage threshold	VIH_Min:15V VIL_Max:5V	VIH_Min:15V VIL_Max:5V
Input frequency response	5kHz	5kHz
Input response time	0.1ms or less	0.1ms or less
Pulse shape	Pulse width:100us or more Rising/falling edge:50us or less	Pulse width:100us or more Rising/falling edge:50us or less
Wiring method	2-wire, Shared by common terminal	2-wire, Shared by common terminal
Common method	Every 8 points share a common terminal	Every 8 points share a common terminal
Isolation voltage level	1.5kVrms	1.5kVrms

Digital output modules — Performance Specifications

Items	Specifications	
Models	HCQX-OD16-D / HCQX-OD16-D2	HCQX-OD32-D2
Output points	16	32
External power range	DC 5V~30V	DC 5V~30V
Output form	The standard models support NPN; PNP needs to be customized	The standard models support NPN; PNP needs to be customized
Max. load current	0.25A/point 2A/8point	0.25A/point 2A/8point
Voltage drop at power-ON	1V or less	1V以下
Leakage current at -OFF	0.1mA/DC 24V	0.1mA/DC 24V
Output response	5kHz	5kHz
Output response time	0.1ms point	0.1ms or less
Wiring method	2-wire, Shared by common terminal	2-wire, Shared by common terminal
Common method	Every 8 points share a common terminal	Every 8 points share a common terminal
Isolation voltage level	1.5kVrms	1.5kVrms

Digital I/O module — Performance Specifications

Items	Specifications	
Models	HCQX-MD16-D / HCQX-MD16-D2	HCQX-MD32-D2
I/O points	8, 8	16, 16
Input form	NPN/PNP	NPN/PNP
Output form	The standard models support NPN; PNP needs to be customized	The standard models support NPN; PNP needs to be customized
Input voltage range	DC 24V (+20%~-15%)	DC 24V (+20%~-15%)
Input signal current	7mA / DC 24V	7mA / DC 24V
Input resistance	4.86kΩ	4.86kΩ
Input sensitivity ON-current	5.35mA or more	5.35mA or more
Input sensitivity OFF-current	2.1mA or less	2.1mA or less
Input voltage threshold	VIH_Min:15V VIL_Max:5V	VIH_Min:15V VIL_Max:5V
Input frequency response	5kHz	5kHz
Input response time	0.1ms or less	0.1ms or less
Input pulse waveform	Pulse width:100us or more Rising/falling edge:50us or less	Pulse width:100us or more Rising/falling edge:50us or less
External power range	DC 5V~30V	DC 5V~30V
Max. load current	0.25A/point 2A/8point	0.25A/point 2A/8point
Voltage drop at power-ON	1V or less	1V or less
Leakage current at power-OFF	0.1mA/DC 24V	0.1mA/DC 24V
Output response frequency	5kHz	5kHz
Output response time	0.1ms or less	0.1ms or less
Wiring method	2-wire, Shared by common terminal	2-wire, Shared by common terminal
Common method	Every 8 points share a common terminal	Every 8 points share a common terminal
Isolation voltage level	1.5kVrms	1.5kVrms

*PNP output needs to be customized, the model name is:HCQX-□□□□, If needed, please contact HCFA sales or distributors.

ANALOG INPUT



HCQX-AD04-D

4-ch analog input

Input voltage range: 0~10V, -10~10V, -5~5V, 0~5V, 1~5V

Differential/
single-ended input

Input current range: 0~20mA, 4~20mA

ANALOG OUTPUT



HCQX-DA04-D

4-ch analog output

Input voltage range: 0~10V, -10~10V, -5~5V, 0~5V, 1~5V

Single-ended output

Input current range: 0~20mA, 4~20mA

TEMPERATURE MEASUREMENT



HCQX-TS04-D

4-ch temperature measurement

Thermocouple type: K, J, E, T, N, B, R, S

Thermal resistance: PT100, PT1000, Ni100, Ni1000

Analog input module — Performance Specifications

Items	Specifications
Models	HCQX-AD04-D
Analog current consumption	Type: 80mA
Voltage sampling input	0~10V, -10~10V, -5~5V, 0~5V, 1~5V
Max. voltage input	-50V~+50V
Current sampling input	0~20mA, 4~20mA
Max. current sampling input	-50mA~+50mA
Voltage input type	Differential input/single-ended input
Current input type	Single-ended input
Sampling rate	4ksps
Accuracy	±0.3%FSR(Full scale range)
Voltage channel temperature drift	±7uV/°C (0.003%FSR)
Current channel temperature drift	±3nA/°C

Analog output module — Performance Specifications

Items	Specifications
Models	HCQX-DA04-D
Analog current consumption	Type: 160mA
Voltage conversion output	0~10V, -10~10V, -5~5V, 0~5V, 1~5V
Current conversion output	0~20mA, 4~20mA
Voltage output type	Single-ended output
Current output type	Single-ended output
Conversion rate	4ksps
Accuracy	±0.3%FSR
Voltage channel temperature drift	±0.03%FSR
Current channel temperature drift	±0.05%FSR
Voltage output load	Min: 1kΩ
Current output load	Max: 0.625 kΩ

Temperature measurement module — Performance Specifications

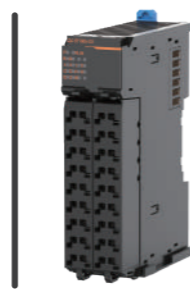
Items	Specifications
Models	HCQX-TS04-D
Signal voltage	Thermocouple: K, J, E, T, N, B, R, S (Default K-type) Thermal resistance: PT100, PT1000, Ni100, Ni1000 (Default PT100) 3-wire system
Settings	No need to set the address in the software, codesys will make the configuration automatically; Functions include overrun detection / disconnection detection / sampling cycle setting / sensor-type setting / Input filter setting and temperature unit conversion setting Typical 1Khz; Depends on sensor-type, conversion time and length
Input filter limit frequency	Typical 1Khz; Depends on sensor type, conversion time and length
Resolution	0.1 °C per digit , 0.1°F per digit
Warm-up time during TC test	30 mins
Absolute max. ratings	±150mV
Conversion time	About 100ms~1.3s, according to the configuration and filter settings and provide disconnection detection. (Turned on by default) and takes 460ms. TC time: 100ms* number of open channels*filtering times of this channel PT time: 200ms* number of open channels*filtering times of this channel
Temperature range	Determined by the corresponding sensor type; For TC, default setting K: -200~1370 °C, -7~55mV; For PT, default setting PT100: -200~850°C, 18~391Ω.
Measurement error (total error range)	TC: <±0.3% (For full scale) PT: <±0.5°C

HIGH SPEED COUNTER



- HCQX-HC04-D2
- 4-ch high-speed counting
- Single-ended input
- Single-phase / dual-phase pulse input

STEP DRIVER



- HCQX-ST1505-D2
- Single-axis control
- Supported mode: PP PV CSP HM

High-speed counter module — Line drive specifications

Items	specifications
Models	HCQX-HC04-D2
Collector input	DC 24V/8.4mA
ON-voltage/ON-current	DC 15V or more/5mA or more
Single-phase max. response frequency (A/B-phase)	200kHz
ON/OFF response time	Less than 2μs

High-speed counter module — Input specifications

Items	specifications
Models	HCQX-HC04-D2
Number of channel	4
Number of input points per channel	4
Rated input voltage	DC 24V (DC 20.4~28.8V)
Input resistance	3kΩ
Input type	NPN /PNP
Wiring method	Three-wire encoder
Pulse input method	Orthogonal phase pulse(x2/4)/Pulse + direction/Up/down pulse
Counting unit	Pulse
Counting range	- 2,147,483,648~2,147,483,647

High-speed counter module — Counting functions

Items	specifications
Models	HCQX-HC04-D2
Counter type	Ring counter or linear counter
Counter control	Gate control, counter reset and counter preset
Lock function	1 external input lock and 1 internal lock
Measurement method	Pulse rate measurement and pulse period measurement

Step drive module — Power Specifications

Items	Specifications
Models	HCQX-ST1505-D2
QBUS rated voltage	DC 12V
QBUS current consumption	Type: 100mA (without encoder) Max: 300mA (with encoder)
Input voltage range	DC 20~50V
Max. input current	5A

Step drive module — Control Specifications

Items	Specifications
Models	HCQX-ST1505-D2
Control protocol	CiA402
Communication scan cycle	250μs, 500μs, 1ms, 2ms, 4ms, 8ms
Subdivision level	32~256 step
Power supply to the encoder	4.5~5V, 200mA (Max)
Encoder input type	Differential input
Encoder max. response frequency	200kHz
Motor control mode	PP, PV, CSP, Homing
Digital input	I0~I4, single-ended DC 24V, max. pulse frequency 5kHz
Digital output	Q0~Q1, open-drain collector, max. 30V/250mA, max. pulse frequency 2kHz
Motor parameters	The motor parameters can be detected by servo drive automatically

Step drive module — Drive Specifications

Items	Specifications
Models	HCQX-ST1505-D2
Power output type	Dual H-bridge
Current control	PWM frequency 25kHz
Output current	Continuous max. peak current 5A
Protection functions	Overcurrent protection, undervoltage protection, overvoltage protection, over-temperature protection