

Automation for a Changing World

Delta Controller with Human Machine Interface HMC Series



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 **DELTA**
Smarter. Greener. Together.

High Quality Display, Precise Control: The Optimum Combination of Display and Controller

Standard Type HMC08



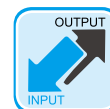
Manual Pulse Generator (MPG)



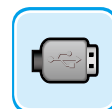
64K Colors TFT



DMCNET



Digital I/O



USB Disk



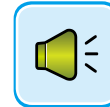
DMCNET



Ethernet



SD Card



Audio Output

Handheld Type HMC07 N412

New



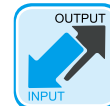
Manual Pulse Generator (MPG)



64K Colors TFT



DMCNET



Digital I/O



Nameplate Protection



Emergency Stop



Compact Design



DMCNET



SD Card



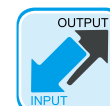
Safety Limit Switch



64K Colors TFT



DMCNET



Digital I/O



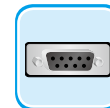
Nameplate Protection



Emergency Stop



Compact Design



DMCNET



SD Card

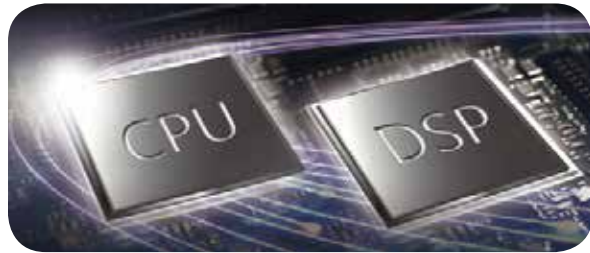


DOPSoft for HMI Screen Editing and PLC Programming



Powerful Dual Processors

Equipped with two high-speed CPUs: one for HMI operation, and the other as a Digital Signal Processor (DSP). The DSP serves as a motion processor for sequence control, which guarantees execution efficiency and system performance. The DSP supports up to four major PLC programs simultaneously.



Direct Remote I/O Connection

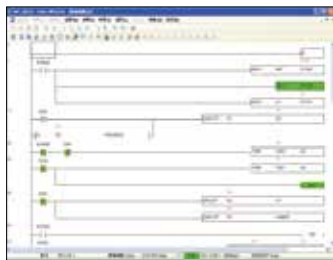


I/O points placed in the rear of the panel, result in complicated wiring and connection



Direct remote I/O connection provides simple and effortless wiring. Only one communication cable is needed to complete the I/O connection.

Quick PLC Ladder Monitoring



PLC ladder programs and registers can be monitored and changed in real time on a PC to greatly reduce the verification and debug time via Ethernet.

Ethernet



Built-in PLC ladder monitor devices allow users to display programs in real time and confirm machine operations without using a PC.

Full nameplate protection enhances tolerance to various conditions

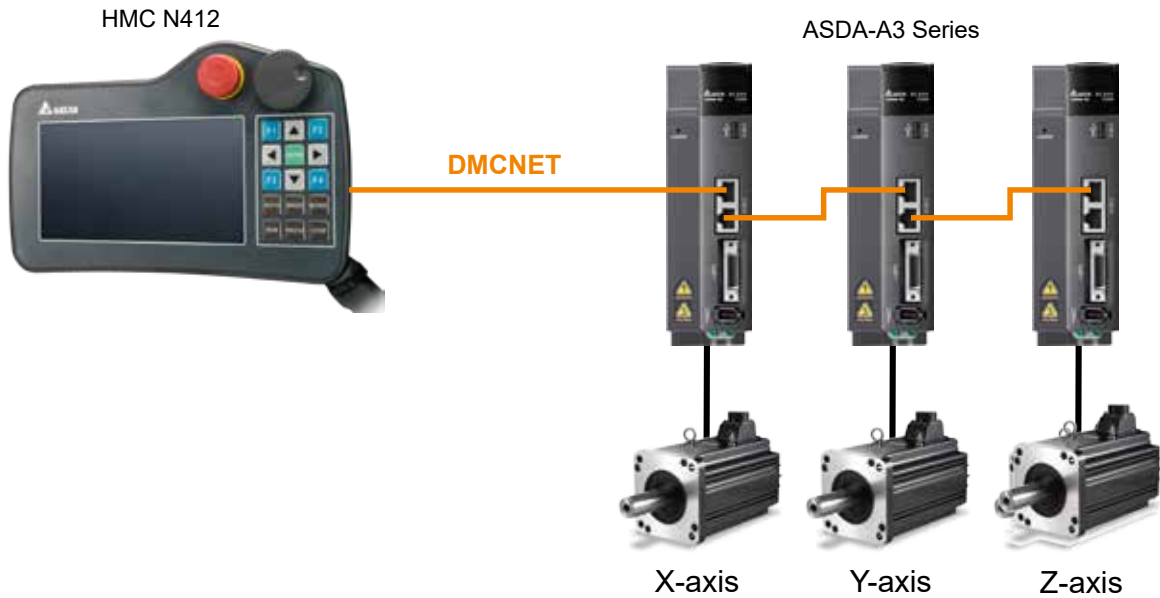
The new handheld models are equipped with full nameplate protection to prevent oil damage of the PCB and extend product life cycle.

Built-in Motion Commands

Direct servo parameter setup and quick motion command editing, no additional communication commands are required.

Solution Structure

HMC N412 + ASDA-A3 Series

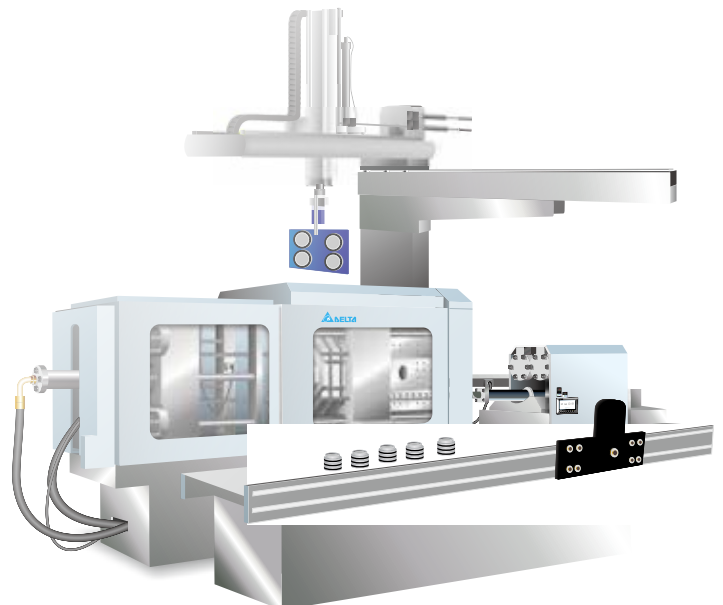


Application

Control of a Pick-an-Place Robot for an Injection Molding Machine

Features

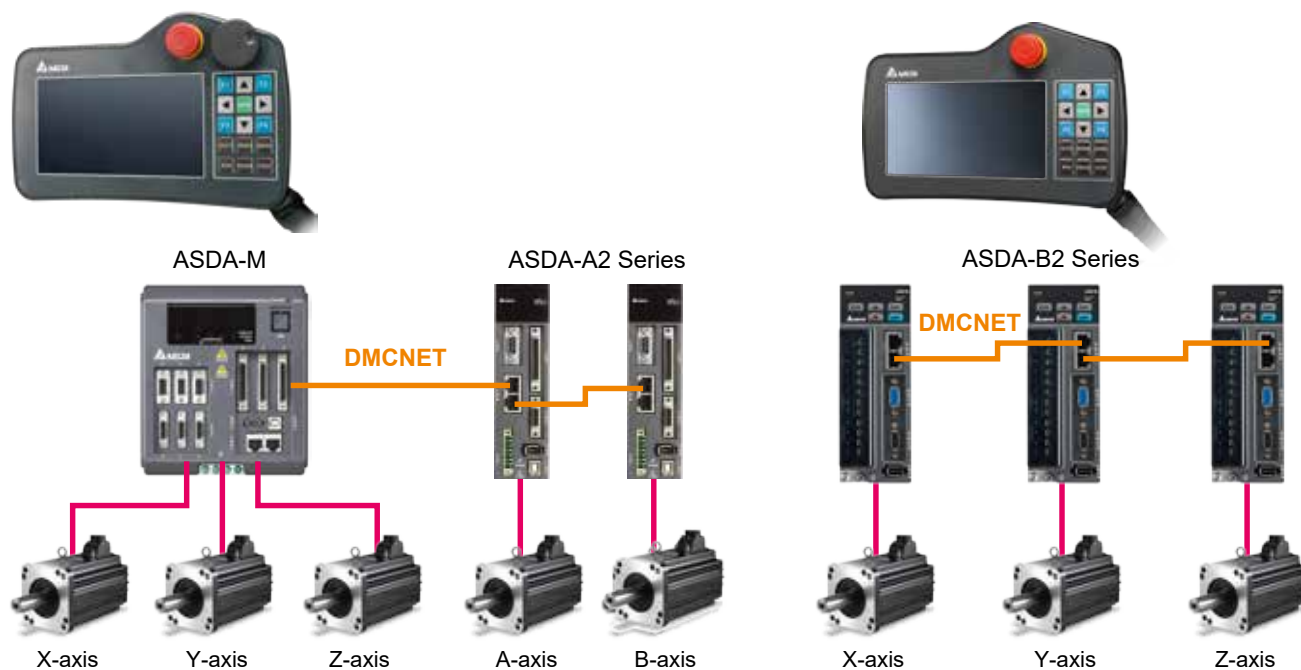
1. The HMC integrates display and remote control functions with built-in PLC
2. High speed motion control bus for Delta Industrial PC-Based Motion Control Solution DMCNET
3. High speed remote I/O modules
4. Built-in ASD-specific motion control device



Solution Structure

HMC + AC Servo Drive & Motor ASDA-M
+ AC Servo Drive & Motor ASDA-A2

HMC + AC Servo Drive ASDA-B2
+ E2M Motors



Application

Robotic Loading/Unloading for Machine Tools

Features

Distributed system bus supports various industry applications, large volume of program commands (1000 programs available, 400 edible items in each program) and dual system



New

Application Cases for Quick Implementation

- ▶ System parameter settings: including gear ratio, acceleration / deceleration time and speed

Serve Setting | 1 | DEMO | 2015/10/19 | 14:31:34

	Gear ratio (Mot.)	Gear ratio (Don.)	S-curve	Acc. time (ms)	Dec. time (ms)	Homing acc./dec.	Max speed (mm/s)	RPM	Dir.
X1 axis	128	1	125	10	10	600	333.333	2000	C.W.
Y1 axis	128	1	50	10	10	400	333.333	2000	C.W.
Z1 axis	128	1	240	10	10	400	333.333	2000	C.C.W.

X1 axis: 0.000 | Y1 axis: 0.000 | Z1 axis: 0.000

Operate Manual Teach I/O System Alarm Main

Motion Setting | 1 | DEMO | 2015/10/19 | 14:28:34

	Homing Offset (mm)	Homing Mode	Homing High speed (mm/s)	Homing Low speed (mm/s)	AutoRun speed (mm/s)	Jog speed	Torque protection (%)
X1 axis	0.000	20	50.000	20.000	121.522	100.000	1.0
Y1 axis	0.000	25	50.000	50.000	150.000	100.000	10.0
Z1 axis	0.000	25	50.000	50.000	150.000	100.000	20.0

X1 axis: -0.001 | Y1 axis: 0.000 | Z1 axis: 0.000

Operate Manual Teach I/O System Alarm Main

- ▶ Intuitive teaching interface

TEACH | 1 | DEMO | 2015/10/19 | 14:33:59

No. (Main Sys.) Instructions

- 1 Goto T.P., speed:5% , P1
- 2 Goto T.P., speed:5% , P2
- 3 Output[Y1]ON
- 4 Goto T.P., speed:5% , P1 , delay:1.0 Sec

Speed: 50 %
Delay before: 0.0 sec
Teach Point: 1 | T.Point

Cut / Delete Copy Insert Change
Clear All Paste Add Save

X1 axis: 0.000 | Y1 axis: 0.001 | Z1 axis: 0.001

Operate Manual Teach I/O System Alarm Main

- ▶ Positioning setting

Main system Teach Point coordinate

Comment	P	#X1 axis	#Y1 axis	#Z1 axis
Pos 1	1	100.000	0.000	0.000
Pos 2	2	0.000	100.000	0.000
Pos 3	3	0.000	0.000	0.000
Pos 4	4	0.000	0.000	0.000
Pos 5	5	0.000	0.000	0.000
Pos 6	6	0.000	0.000	0.000
Pos 7	7	0.000	0.000	0.000
Pos 8	8	0.000	0.000	0.000

Select T. Point: 1 | Write to Point | Read from Point

X1 axis: 0.000 | Y1 axis: 100.000 | Z1 axis: 0.000

Manual

- ▶ Operation program management

PROGRAM MANAGE | 1 | DEMO | 2015/10/19 | 14:33:17

No.	Program name	Modified time
1	DEMO	2015/10/19 10:52:48
2		
3	N.	2015/10/19 9:28:2
4		
5		
6		
7	3D	2015/10/19 9:26:20
8	EDIT-TEST-2	2015/10/19 9:26:8
9	EDIT-TEST	2015/10/19 9:29:34
10	LD-UL-A	2015/10/29 11:0:13

Select Program: 1 | Edit selected program | Show All | Edit Template

X1 axis: -0.001 | Y1 axis: 0.001 | Z1 axis: 0.001

Operate Manual Teach I/O System Alarm Main

- ▶ Operation information

AUTO | Running Setting | 1 | DEMO | 2015/10/19 | 15:17:15

No. T. Points (Main Sys.) Instructions

- 1 Goto T.P., speed:5% , P1
- 2 Goto T.P., speed:5% , P2
- 3 Output[Y1]ON
- 4 Goto T.P., speed:5% , P1 , delay:1.0 Sec

Speed: 50 % | High Speed | Low Speed

Running Information

Planned cycles: 0
Remainder: 0
Cycle time: 0.00 Sec

Zero Return Run Pause Stop CycleStop Magn: 1 | Hand Wheel

X1 axis: 59.825 | Y1 axis: 0.000 | Z1 axis: 0.000

Operate Manual Teach I/O System Alarm Main

► Abundant operating instructions



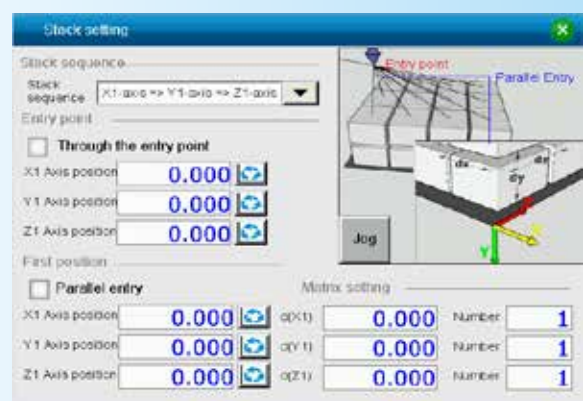
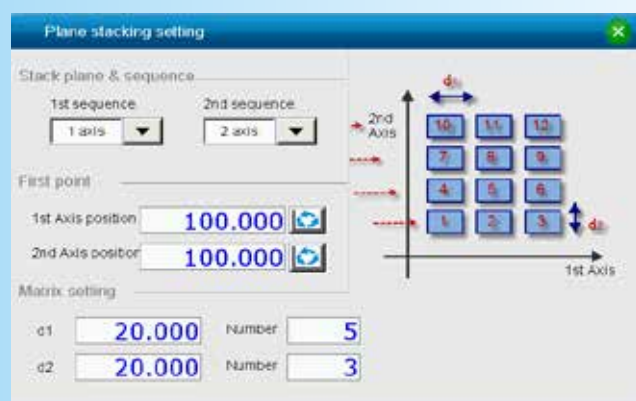
► Jog function



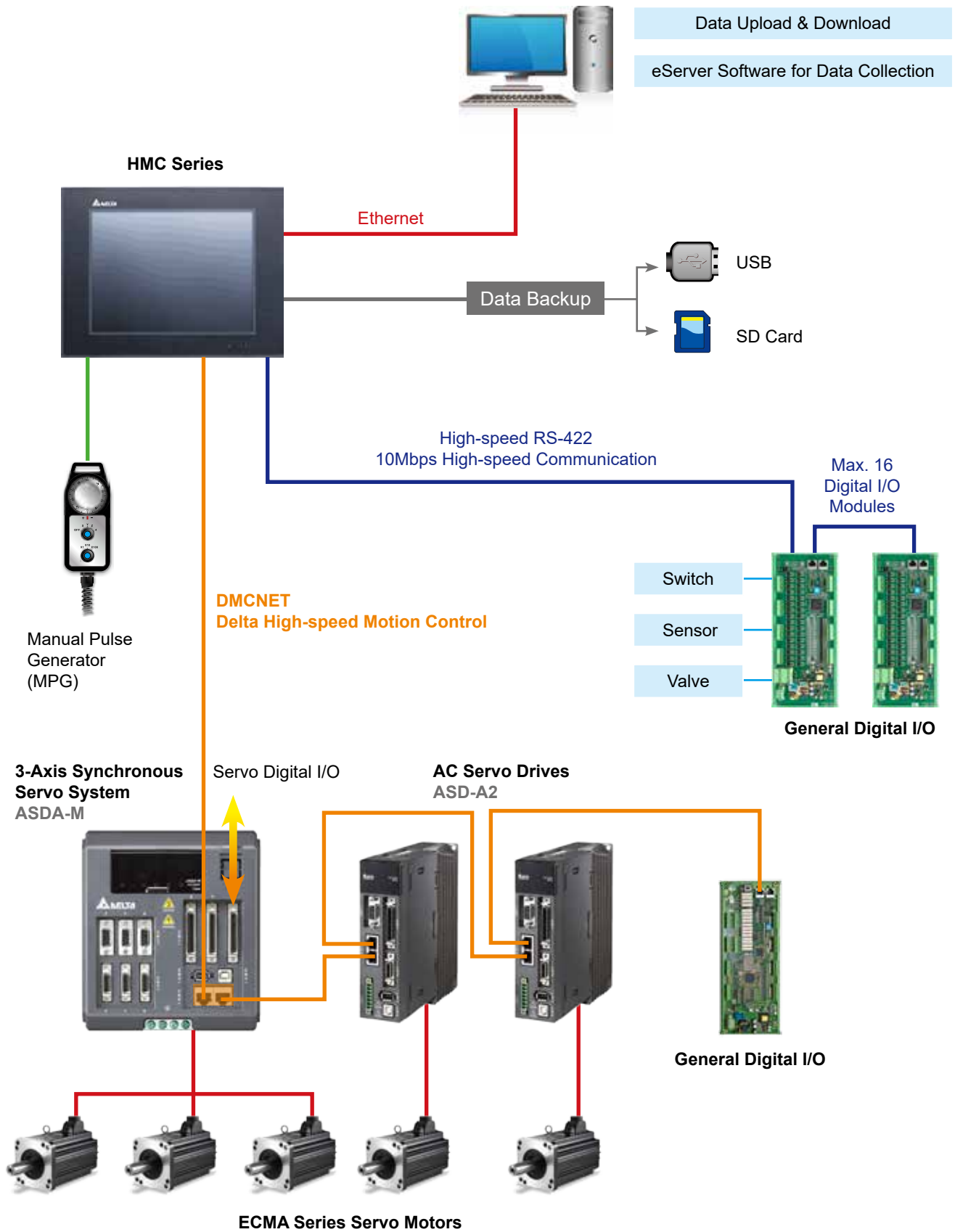
► Security zone setting



► Various stacking instructions



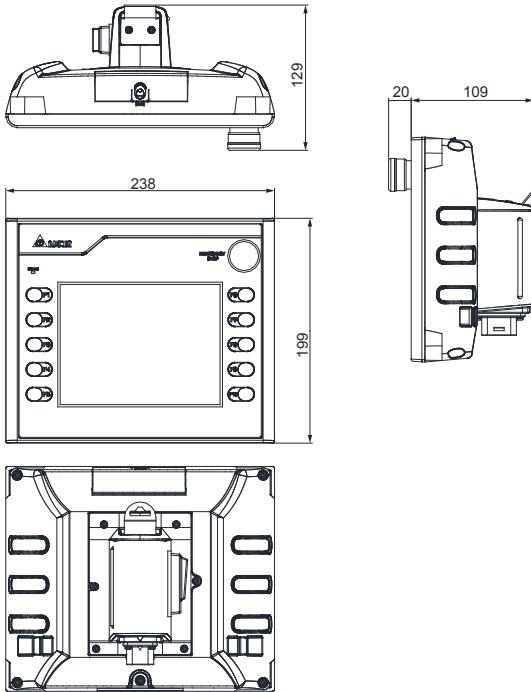
Complete Total Solution



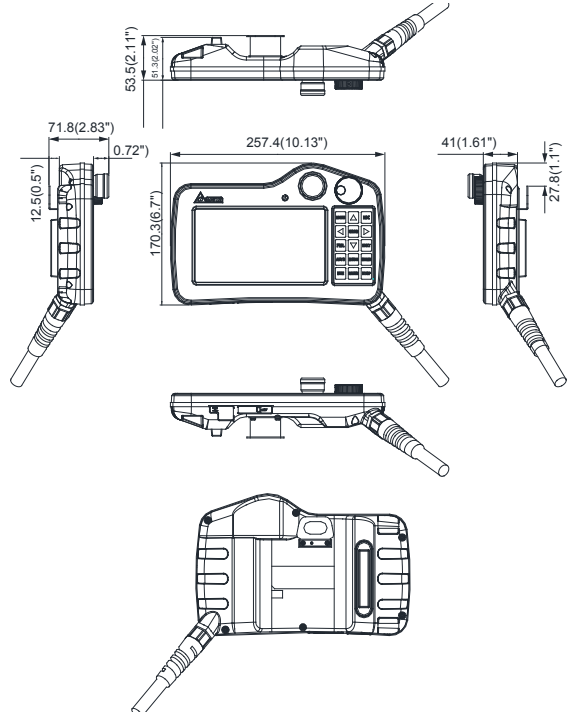


Dimensions Dimensions are in mm (in.)

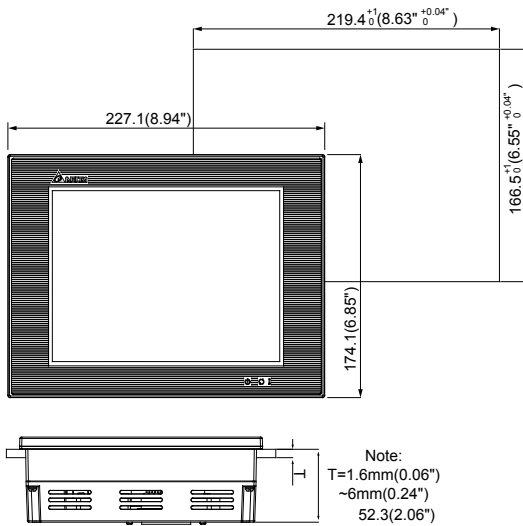
Model Name HMC07-N5xx Series



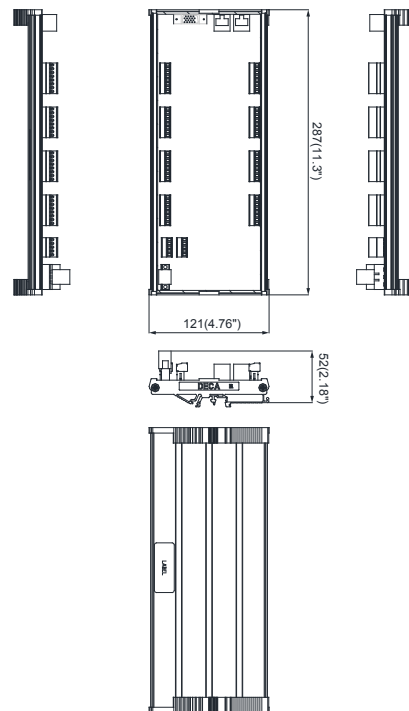
New
Model Name HMC07-N4xx Series



Model Name HMC08-N5xx Series



Model Name Remote I/O Module



Specifications

LCD Module	Display Type	7" TFT LCD	8" TFT LCD
	Colors	65535	
	Resolution (pixels)	800 x 480	800 x 600
	Backlight	LED back light (Half-life > 20 k hours in 25 °C environment) ¹⁾	
	Display Size (mm)	154.08 x 85.92	162 x 121.5
Axes of Control	Max. 12 axes	Max. 5 axes	Max. 12 axes
Operating System	Delta Real Time OS		
CPU	HMI	32-bit RISC Micro-controller	
	Controller	32-bit DSP	
Flash ROM (Bytes)	Flash ROM 128 MB (OS System: 30 MB / Backup: 16 MB / User Application: 82 MB)		
Backup Memory (Bytes)	16 MB ROM, 128 KB SRAM		
Buzzer	Multi-Tone Frequency (2K ~ 4 KHz) / 85 dB		
Communication Networks	Ethernet	N/A	
	Social COM Port	RS-485 (Built-in power isolation ²⁾)	RS-232/RS-422/RS-485 ²⁾
	Motion Control BUS	DMCNET	
	USB	1 USB Slave Ver 2.0	
SD	SD/SDHC		
Emergency Stop Switch	Push-lock switch Output: 2 contacts B-contact (normally closed) x 2 Rated voltage: DC 30V Max. rated current: 500 mA Min. load allowed: 5VDC / 1 mA	N/A	
3-Position Operation Switch	Only for internal register, no output signal	N/A	N/A
Manual Pulse Generator (MPG)	Only for internal register, no output signal	N/A	N/A
Function Key	15		N/A
Cable Length	The X in HMC model name indicates cable length ³⁾		N/A
Perpetual Calendar	Built-in		
Cooling Method	Natural cooling		
Safety Certification	CE	CE/UL	
Protection Rating	IP54	IP65	
Voltage ³⁾	DC + 24V _{DC} (± 15%) ⁴⁾ (Supplied by SELV circuits isolated from MAINS by double insulation)		
Voltage Endurance	Between DC24 terminal and FG terminal: AC500V, 1 min		
Power Consumption	6W ⁵⁾	11W	
Backup Battery	3V lithium CR2450 × 1	3V lithium CR2032 × 1	
Backup Battery Life	5 years or more at 25°C, may vary due to temperature and usage condition		
Operation Temperature	0°C ~ 40°C	0°C ~ 50°C	
Storage Temperature	-10°C ~ 60°C		
Operation Environment	10% ~ 90% RH [0 ~ 40°C], 10% ~ 55% RH [41 ~ 50°C], Pollution Degree 2		
Vibration	IEC61131-2 compliant 5 Hz ~ 8.3 Hz 3.5 mm, 8.3 Hz ~ 150 Hz 1 G		
Shock	IEC60068-2-27 compliant 11 ms, 15G Peak, X, Y, Z direction for 6 times		
Dimensions (W) x (H) x (D) mm	257.4 x 170.3 x 71.8 (Emergency stop button and hook included)	219.4 x 174.1 x 52.3	
Weight	750 g (Wire excluded)	about 1314 g	

Note:

- 1) The half-life of the backlight is defined as the original luminance being reduced by 50% when the maximum driving current is supplied to the HMI
- 2) The isolated power circuit can withstand a 1500 V for 1 minute.
- 3) X = 5 : 5 m, X = A : 10 m, X = F : 15 m, X = K : 20 m
- 4) Isolated power supply recommended
- 5) The value of the power consumption indicates the electrical power consumed by HMI with no peripheral devices connected. To ensure normal operation, it is recommended using a power supply with a capacity 1.5 ~ 2 times the value of the power consumption

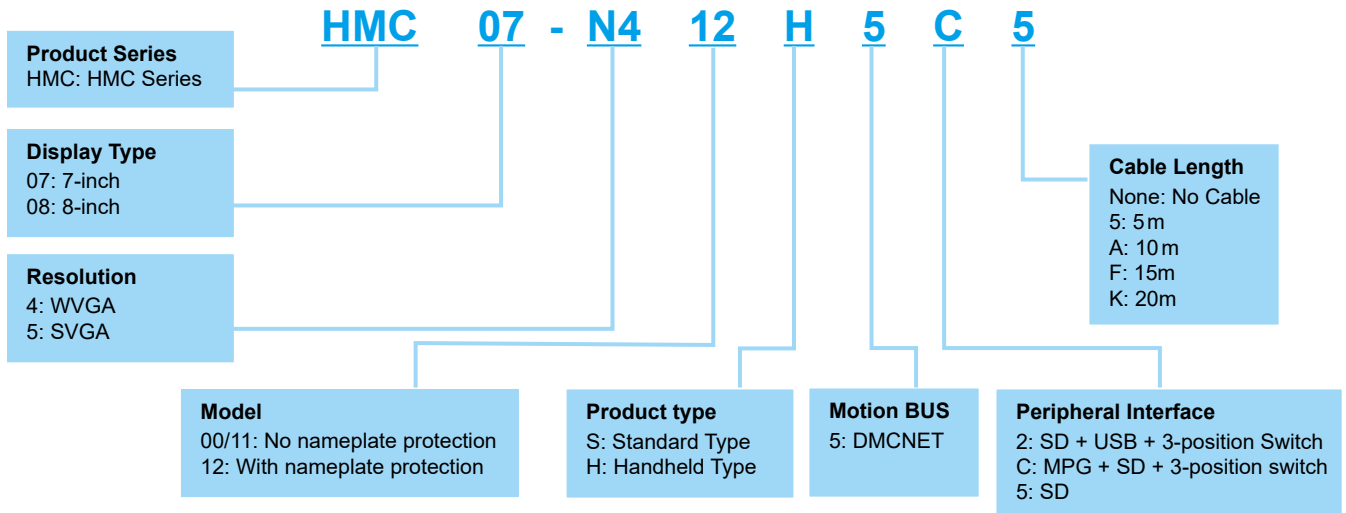
Electrical Specifications of Remote I/O Modules

Items/Model Name	Power Supply	Input Unit		Output Unit	
		Points	Type	Points	Type
HM-RIO3232T12	24 V _{DC}	32	NPN (Sink)	32	Transistor
Input Point Electrical Specifications			Output Point Electrical Specifications		
Input Impedance		4.7 KΩ		Max. Switching Frequency	
Max. Switching Frequency		100 kHz		500 kHz	
Active Level	Off → On	> 16.5 V _{DC}		Response Time (Relay)	On → Off
	On → Off	< 5 V _{DC}			On → Off
Response Time	Off → On	< 3 μs		-	
	On → Off	< 40 μs		-	

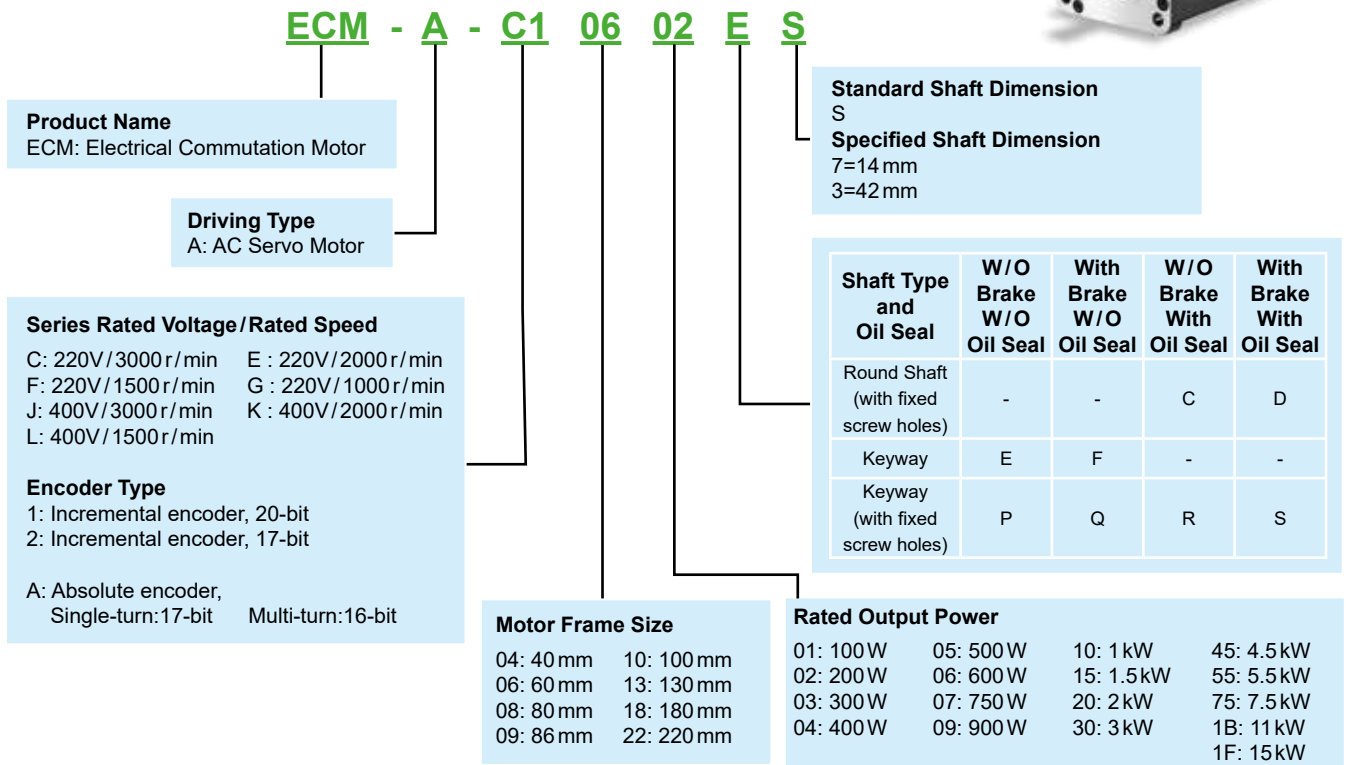
Items/Model Name	Power Supply	Input Unit		Output Unit	
		Points	Type	Points	Type
HMC-RIO3232RT5	24 V _{DC}	32	NPN (Sink)/ PNP (Source)	16 Relay/16 TR	Relay/Transistor
Input Point Electrical Specifications			Output Point Electrical Specifications		
Input Impedance		4.7 KΩ		Max. Switching Frequency	
Max. Switching Frequency		10 kHz		1 Hz (Relay) 8 kHz (TR)	
Active Level	Off → On	> 16.5 V _{DC}		Response Time (Relay)	Resistive Load
	On → Off	< 5 V _{DC}			300 mA/1 Point (TR) 2A/1 Point (Relay)
-			Response Time (TR)	Off → On	10 ms
-				On → Off	12 μs
-			-		115 μs

Model Introduction

HMC07 Series



Servo Motors ECMA Series



Servo Drives ASDA-M Series



ASD - M - 07 21 - F

Product Name: AC Servo Drive

Series: M

F: DMCNET

Input Voltage and Phase
 21: 220V 1-phase
 23: 220V 3-phase

Rated Output Power
 07: 750 W
 15: 1.5 kW

Servo Drives ASDA-A2 Series



ASD - A2 - 04 21 - F

Product Name: AC Servo Drive

Series: A2

F: DMCNET

Input Voltage and Phase
 21: 220V 1-phase/3-phase
 23: 220V 3-phase
 43: 400V 3-phase

Rated Output Power

01: 100 W	20: 2.0 kW
02: 200 W	30: 3.0 kW
04: 400 W	45: 4.5 kW
07: 750 W	55: 5.5 kW
10: 1.0 kW	75: 7.5 kW
15: 1.5 kW	1B: 11 kW
	1F: 15 kW

Optional Accessories

Model Name	Descriptions
HMC-CA3205C0	Handheld types HMC07-N5xx Series connection cable (5 m, 32-pin)
HMC-CA3210C0	Handheld types HMC07-N5xx Series connection cable (10 m, 32-pin)
HMC-CA1205C0	Handheld types HMC07-N5xx Series connection cable (5 m, 12-pin)
HMC-CA1210C0	Handheld types HMC07-N5xx Series connection cable (10 m, 32-pin)
NC-CAB-DMC003	DMCNET/Remote I/O connection cable (0.3 m)
NC-CAB-DMC015	DMCNET/Remote I/O connection cable (1.5 m)
NC-CAB-DMC050	DMCNET/Remote I/O connection cable (5 m)
NC-CAB-DMC100	DMCNET/Remote I/O connection cable (10 m)

Global Operations

ASIA (Taiwan)



Taoyuan Technology Center (Green Building)



Taoyuan Plant 1



Tainan Plant (Diamond-rated Green Building)

ASIA (China)



Wujiang Plant 3



Delta Electronics



ASIA (Japan)



Tokyo Office



ASIA (India)



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(Green Building)

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Amsterdam, Netherlands

AMERICA



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Smarter. Greener. Together.

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