

Digitized Automation for a Changing World

Delta Controller with Human Machine Interface HMC Series



www.deltaww.com

 **DELTA**
Smarter. Greener. Together.

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

Standard Type HMC08



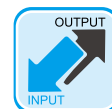
Manual Pulse Generator (MPG)



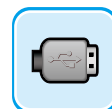
64K Colors TFT



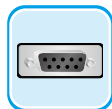
DMCNET



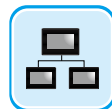
Digital I/O



USB Disk



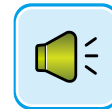
DMCNET



Ethernet



SD Card



Audio Output

Handheld Type HMC07-N412H5CX

New



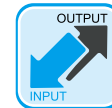
Manual Pulse Generator (MPG)



64K Colors TFT



DMCNET



Digital I/O



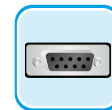
Nameplate Protection



Emergency Stop



Compact Design



DMCNET



SD Card



Safety Limit Switch

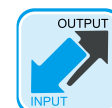
Handheld Type HMC07-N412H5CX



64K Colors TFT



DMCNET



Digital I/O



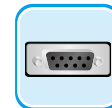
Nameplate Protection



Emergency Stop



Compact Design



DMCNET



SD Card



Handheld Type HMC07-R412H5CX

New



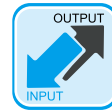
MPG 手搖輪



64K Colors TFT



DMCNET



Digital I/O



行業專用輔助鍵



銘版防護



緊急停止按鈕



輕量化設計



串列介面



SD 卡



限動開關

Handheld Type HMC07-R412H55X

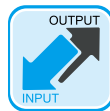
New



64K Colors TFT



DMCNET



Digital I/O



行業專用輔助鍵



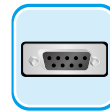
銘版防護



緊急停止按鈕



輕量化設計



串列介面



SD 卡



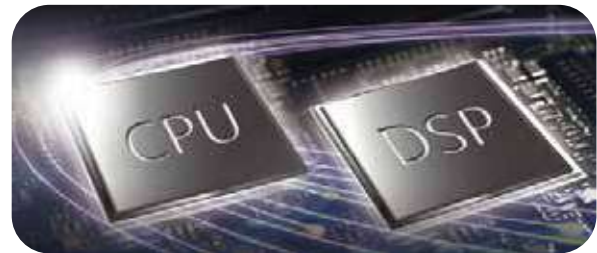
Features

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

OLD way



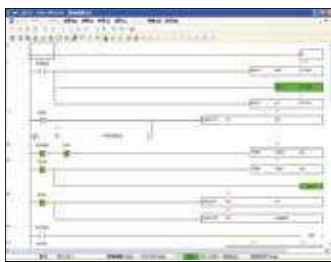
I/O points placed in the rear of the panel, result in complicated wiring and connection

NEW way



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

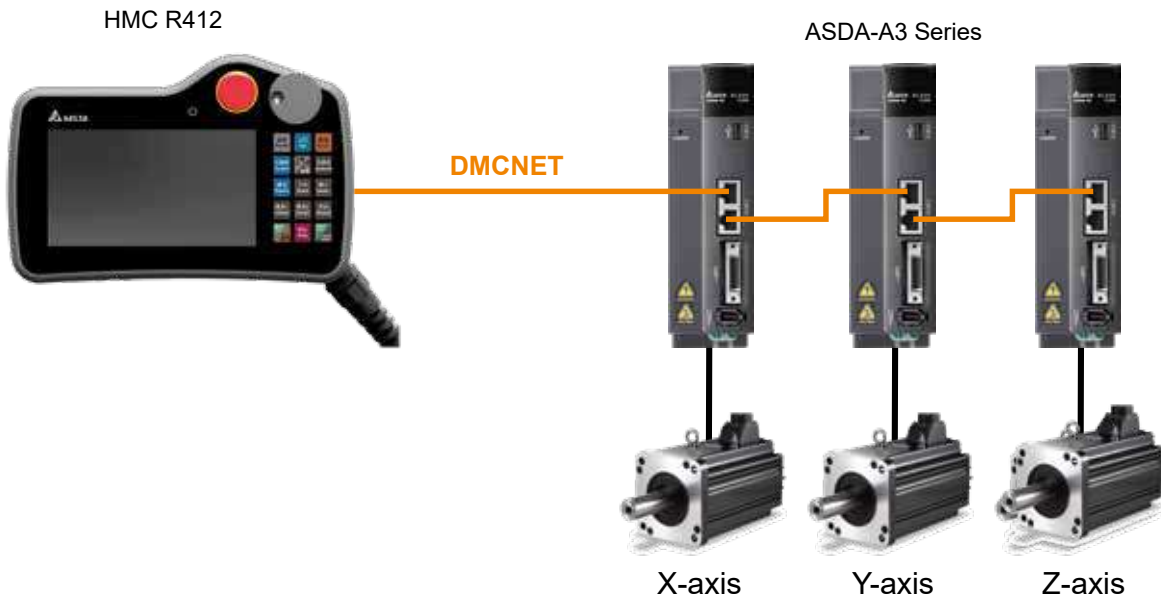
The new handheld models are equipped with full nameplate protection to prevent oil damage of the PCB and extend product life cycle.

Built-in Motion Commands

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

Solution Structure

HMC R412 + ASDA-A3 Series



Application

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

Features

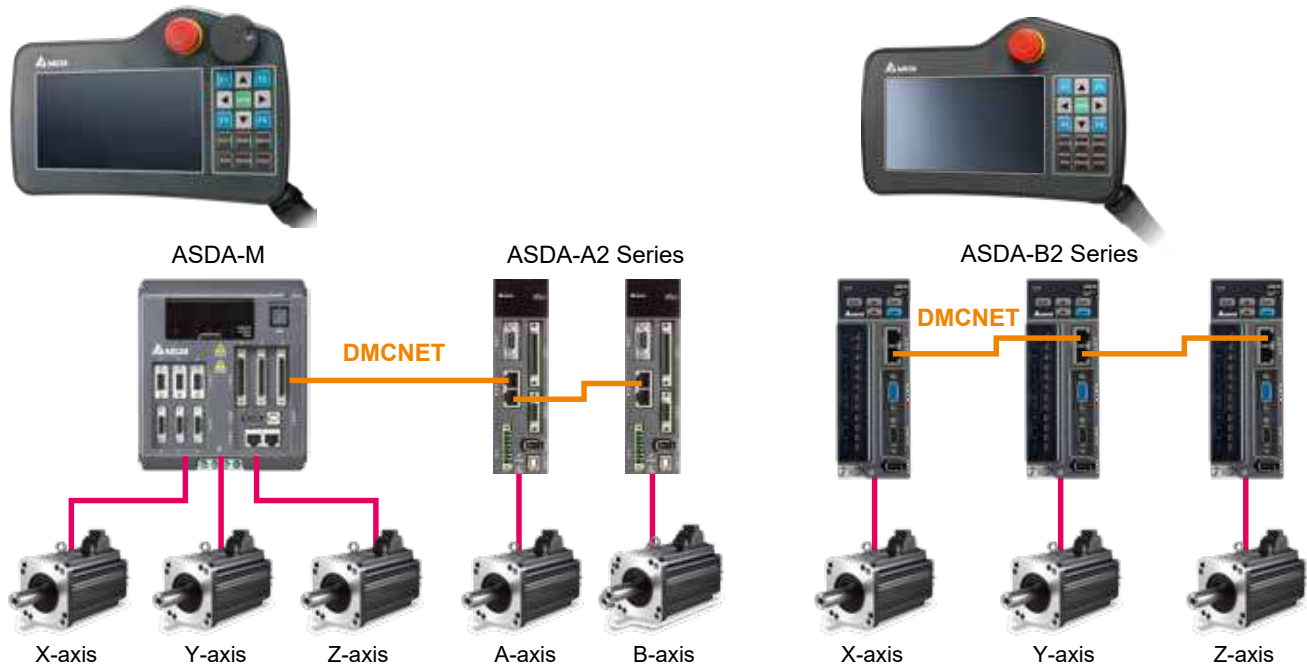
1. The HMC integrates display and remote control functions with built-in PLC
2. High speed motion control bus for Delta Industrial PC-Based Motion Control Solution DMCNET
3. High speed remote I/O modules
4. Built-in ASD-specific motion control device



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 editable items in each program) and dual system



Application Cases for Quick Implementation

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

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

	Gear ratio (Mot.)	Gear ratio (Din.)	S-curve	Acc. time (ms)	Dec. time (ms)	Homing acc./dec.	Max speed (mm/s)	IPM	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 | 14:36:34

	Homing Offset (mm)	Homing Mode	Homing High speed (mm/s)	Homing Low speed (mm/s)	Auto run speed (mm/s)	Jog speed (mm/s)	Torque protection (%)
X1 axis	0.000	20	30.000	30.000	120.000	100.000	10.0
Y1 axis	0.000	35	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 | Motion Setting | 1 | DEMO | 2015/10/19 | 14:33:59

No. (Main Sys.) Instructions

- Goto T.P., speed:5% , P1
- Goto T.P., speed:5% , P2
- Output(Y)ON
- Goto T.P., speed:5% , P1 ,delay:0.0 Sec

Speed: 50 %
Delay define: 0.0 Sec

Teach Point: 1 | T.Point

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 10:58:49
2		
3		2015/10/19 9:28:2
4		
5		
7	3D	2015/10/19 9:28:26
8	EDIT-TEST-2	2015/10/19 9:28:4
9	EDIT-TEST	2015/10/19 9:28:34
10	LD-UL-A	2015/10/19 11:0:15

Operate Manual Teach I/O System Alarm Main

- ▶ Operation information

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

No. (Main Sys.) Instructions

- Goto T.P., speed:5% , P1
- Goto T.P., speed:5% , P2
- Output(Y)ON
- Goto T.P., speed:5% , P1 ,delay:0.0 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

Application Cases for Quick Implementation

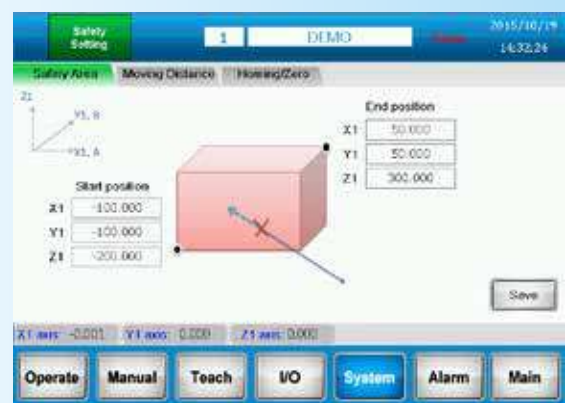
▶ Abundant operating instructions



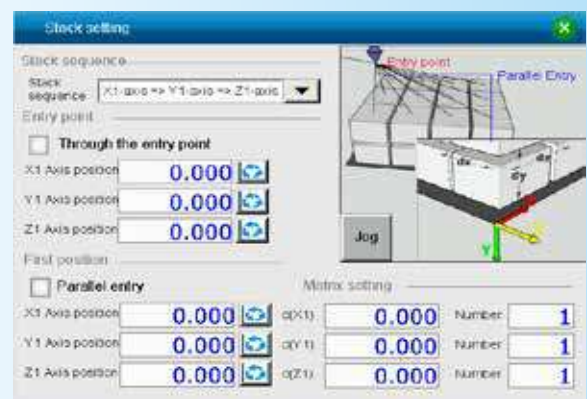
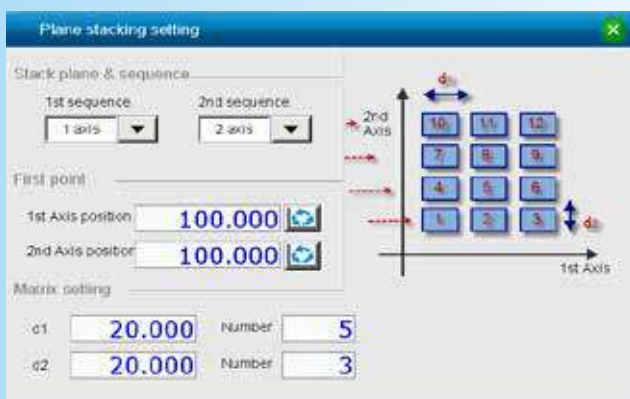
▶ Jog function



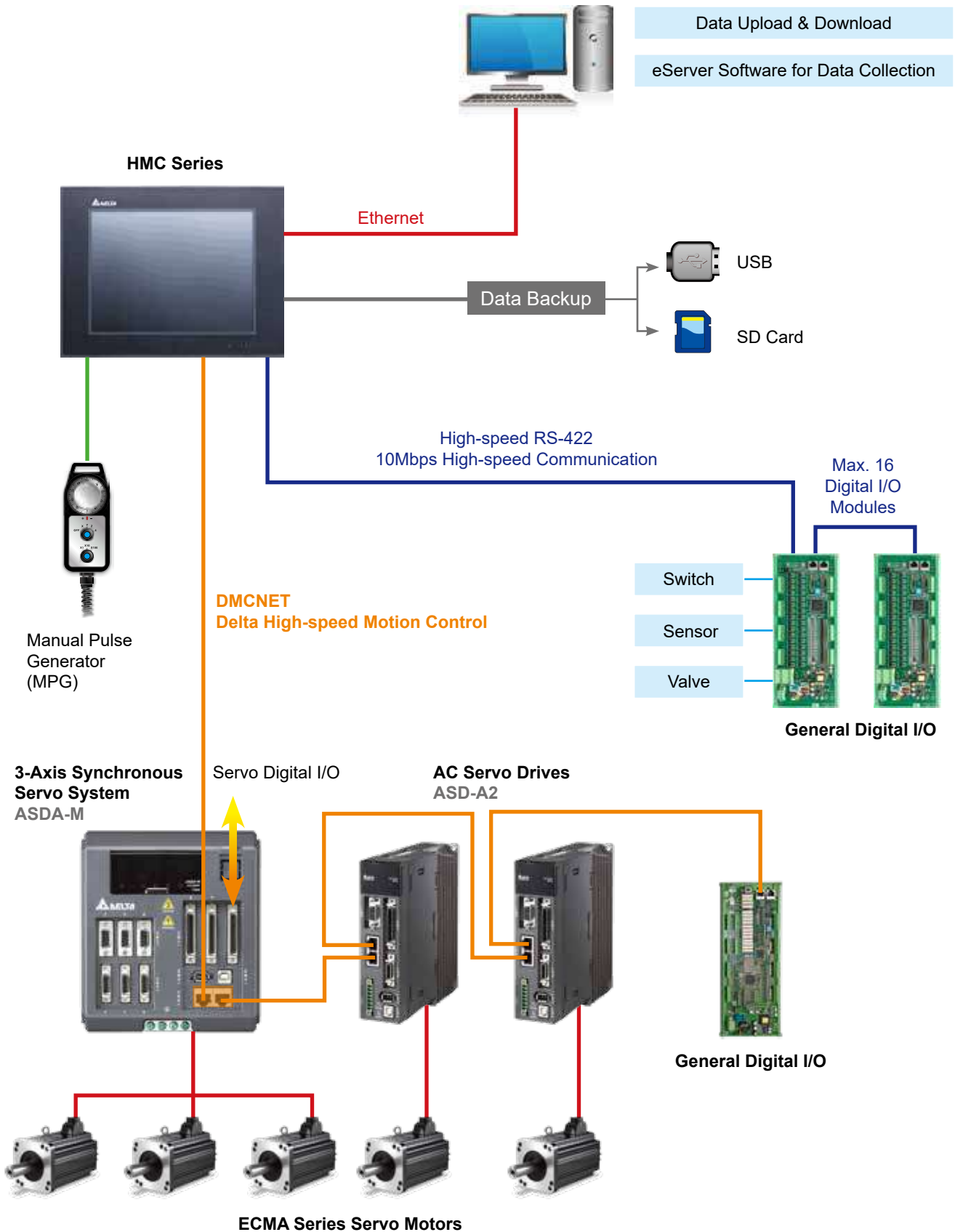
▶ Security zone setting



▶ Various stacking instructions



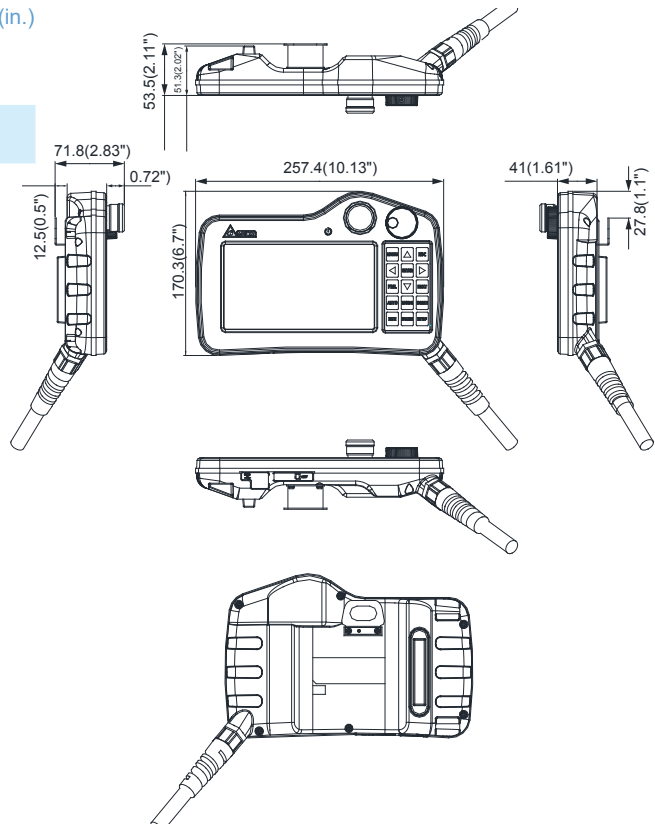
Complete Total Solution



Dimensions Dimensions are in mm (in.)

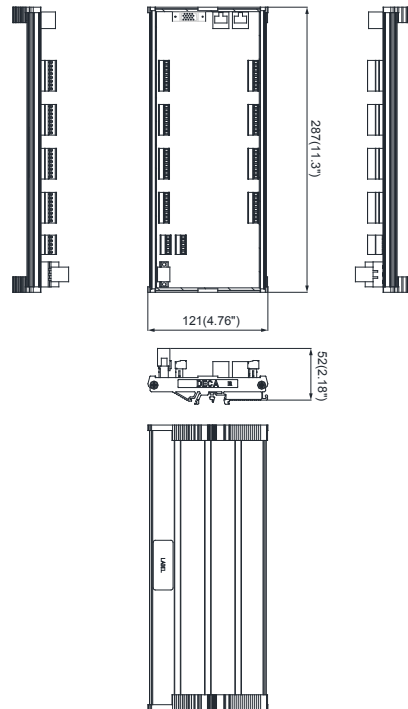
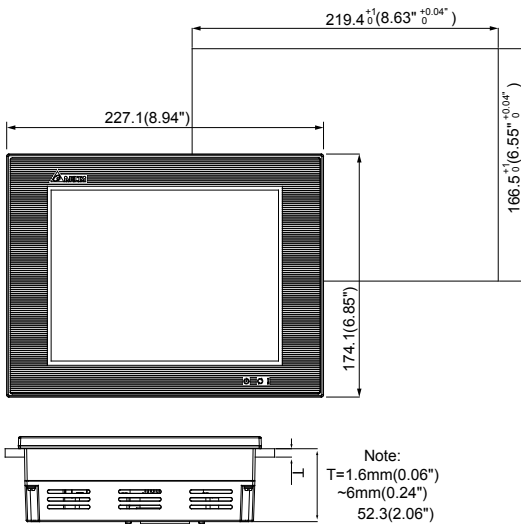
NEW

Model Name HMC07-N412 Series
HMC07-R412 Series



Model Name HMC08-N5xx Series

Model Name Remote I/O Module



Specifications

Model		HMC07-N412H5CX HMC07-R412H5CX	HMC07-N412H55X HMC07-R412H55X	HMC08-N500S52
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 > 20k hours in 25°C environment) ¹		
	Display Size (mm)	154.08 x 85.92		162 x 121.5
Axes of Control		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		1
	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		1 USB Host Ver 1.1 / 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		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 1G		
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 : 5m, X = A : 10m, X = F : 15m, X = K : 20m
- 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

Model List

Model Name	Descriptions	Note
HMC07-N412H5C5	General handheld controller for standard truss with built-in MPG and safety limit switch, 5 m cable included	(Note 1)
HMC07-N412H5CA	General handheld controller for standard truss with built-in MPG and safety limit switch, 10 m cable included	(Note 1)
HMC07-N412H5CF *	General handheld controller for standard truss with built-in MPG and safety limit switch, 15 m cable included	(Note 1) (Note 3)
HMC07-N412H5CK *	General handheld controller for standard truss with built-in MPG and safety limit switch, 20 m cable included	(Note 1) (Note 3)
HMC07-R412H5C5	Handheld controller for injection machine pick-and-place with built-in MPG and safety limit switch, 5 m cable included	(Note 2)
HMC07-R412H5CA	Handheld controller for injection machine pick-and-place with built-in MPG and safety limit switch, 10 m cable included	(Note 2)
HMC07-R412H555	Handheld controller for injection machine pick-and-place without built-in MPG and safety limit switch, 5 m cable included	(Note 2)
HMC07-R412H55A *	Handheld controller for injection machine pick-and-place without built-in MPG and safety limit switch, 10 m cable included	(Note 2) (Note 3)
HMC08-N500S52	Fix-mounted controller with human machine interface HMC08	
HMC-RIO3232RT5	DMCNET remote I/O module (16 pts relay output), 32IN / 32OUT	
HMC-RIO3232T15	DMCNET remote I/O module (all-transistor output), 32IN / 32OUT	
HM-RIO3232T12	RS-422 remote I/O module, 32IN / 32OUT (for HMC 08 only)	

**Note:

1. The physical button is in English.
2. The physical button is in Simplified Chinese & English.
3. Please contact Delta regional sales for inquiry.
(Please refer to the product images for different models)

Electrical Specifications of Remote I/O Modules

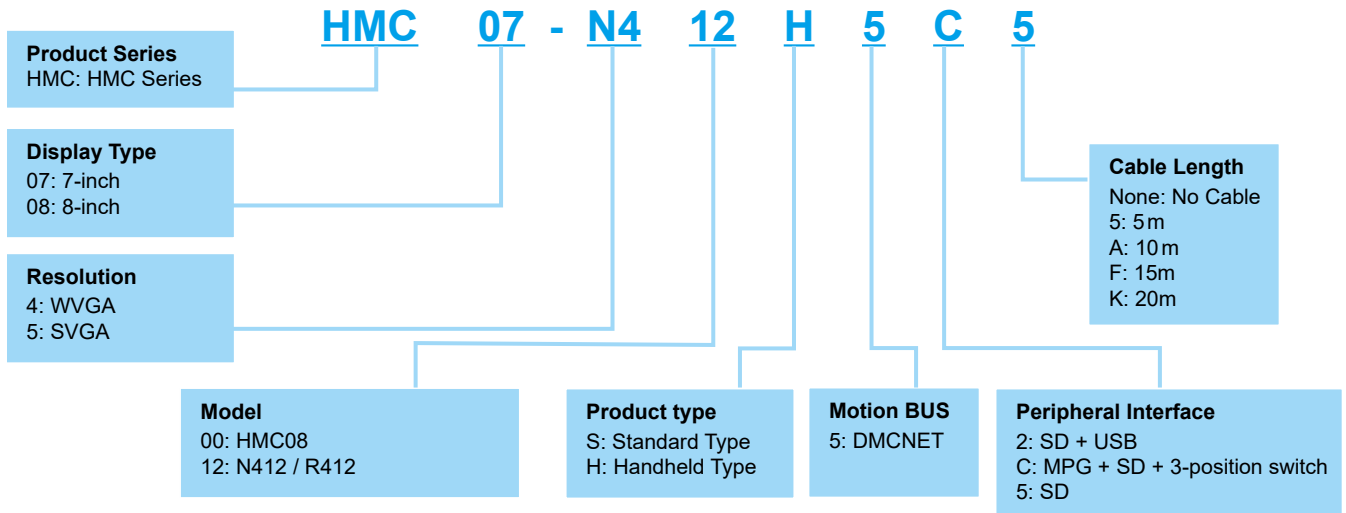
Model Name	Power Supply	Input Unit		Output Unit	
		Points	Type	Points	Type
HM-RIO3232T12 (HMC08-N500 only)	24 V _{DC}	32	NPN (Sink)	32	Transistor
Input Point Electrical Specifications				Output Point Electrical Specifications	
Input Impedance		4.7 kΩ		Max. Switching Frequency	
Max. Switching Frequency		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		-	

Model Name	Power Supply	Input Unit		Output Unit	
		Points	Type	Points	Type
HMC-RIO3232RT5 (For all models)	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
-					On → Off
-				Off → On	12 μs
-				On → Off	115 μs

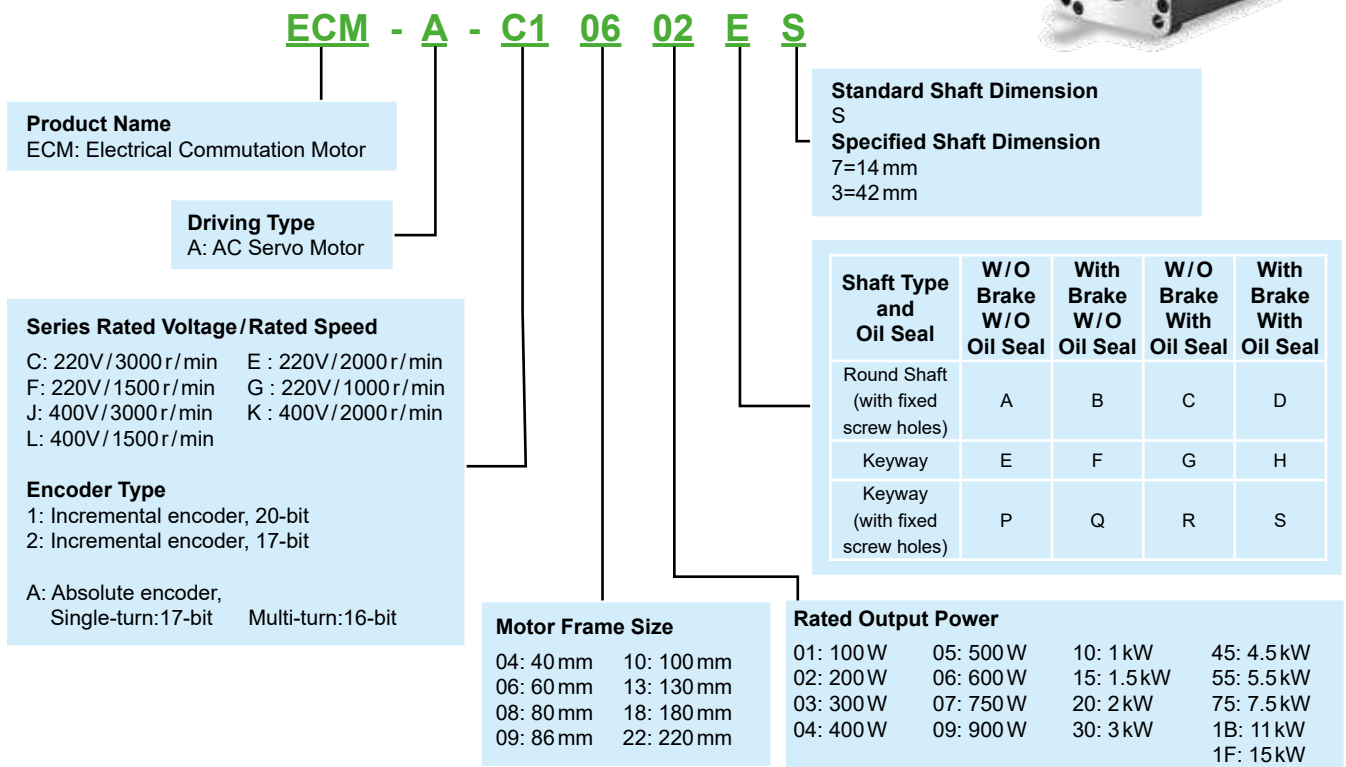
Model Name	Power Supply	Input Unit		Output Unit	
		Points	Type	Points	Type
HMC-RIO3232T15 (For all models)	24 V _{DC}	32	NPN (Sink)/ PNP (Source)	32	Transistor
Input Point Electrical Specifications				Output Point Electrical Specifications	
Input Impedance		4.7 kΩ		Max. Switching Frequency	
Active Level		> 16.5 V _{DC}		8 kHz (TR)	
Active Level	Off → On	> 16.5 V _{DC}		Maximum Loading	Resistive Load
	On → Off	< 5 V _{DC}			2A / 1 Point
-				Response Time (TR)	Off → On
-					On → Off
-				Off → On	12 μs
-				On → Off	115 μs

Model Introduction

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



Smarter. Greener. Together.

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