

Digitized Automation for a Changing World

# Delta Controller with Human Machine Interface HMC Series



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

## Standard Type HMC08



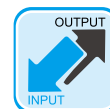
Manual Pulse Generator (MPG)



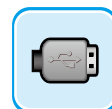
64K Colors TFT



DMCNET



Digital I/O



USB Disk



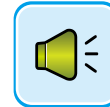
DMCNET



Ethernet



SD Card



Audio Output

## Handheld Type HMC07-N412H5CX

New



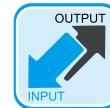
Manual Pulse Generator (MPG)



64K Colors TFT



DMCNET



Digital I/O



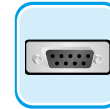
Nameplate Protection



Emergency Stop



Compact Design



DMCNET



SD Card



Safety Limit Switch

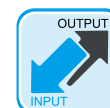
## Handheld Type HMC07-N412H5CX



64K Colors TFT



DMCNET



Digital I/O



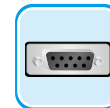
Nameplate Protection



Emergency Stop



Compact Design



DMCNET



SD Card



**Handheld Type** HMC07-R412H5CX

New



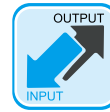
MPG 手搖輪



64K Colors TFT



DMCNET



Digital I/O



行業專用輔助鍵



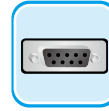
銘版防護



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

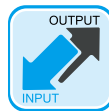
New



64K Colors TFT



DMCNET



Digital I/O



行業專用輔助鍵



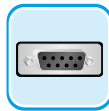
銘版防護



緊急停止按鈕



輕量化設計



串列介面

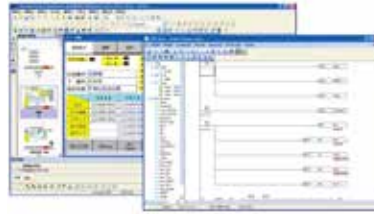


SD 卡



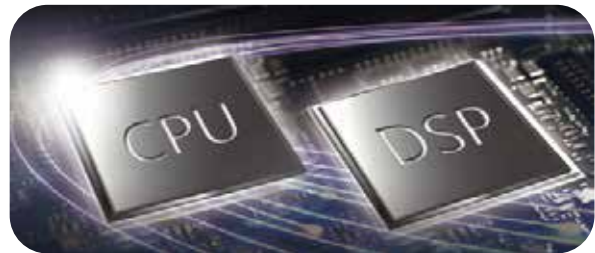
# Features

## DOPSoft for HMI Screen Editing and PLC Programming

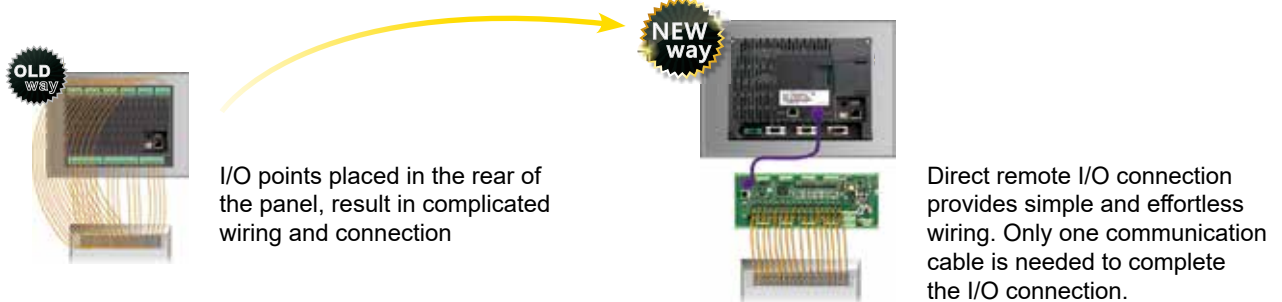


### Powerful Dual Processors

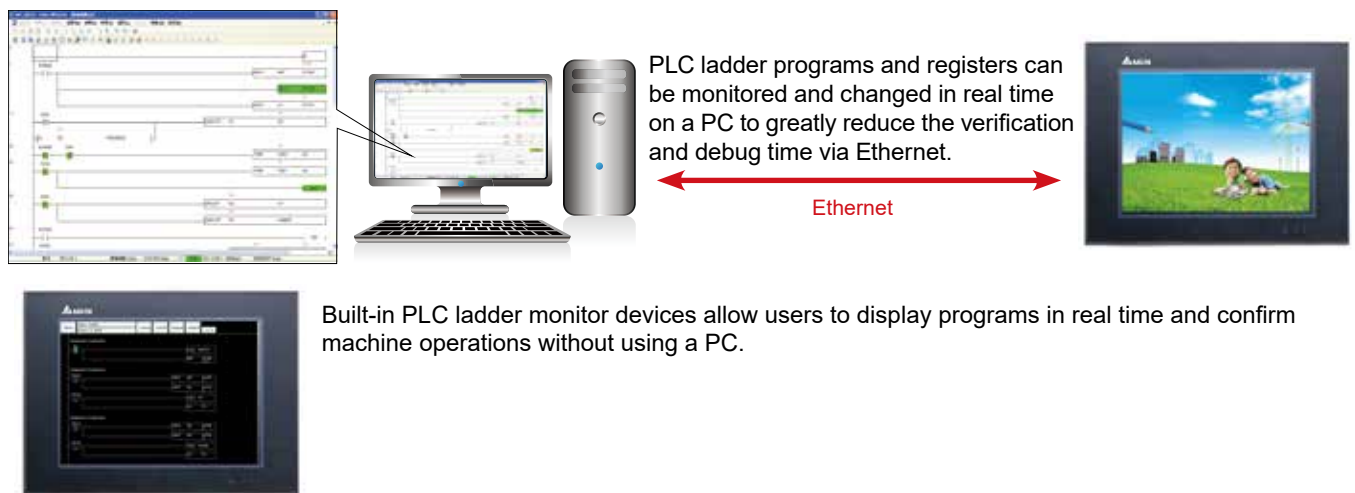
Equipped with two high-speed CPUs: one for HMI operation, and the other as a Digital Signal Processor (DSP). The DSP serves as a motion processor for sequence control, which guarantees execution efficiency and system performance. The DSP supports up to four major PLC programs simultaneously.



### Direct Remote I/O Connection



### Quick PLC Ladder Monitoring



### Full nameplate protection enhances tolerance to various conditions

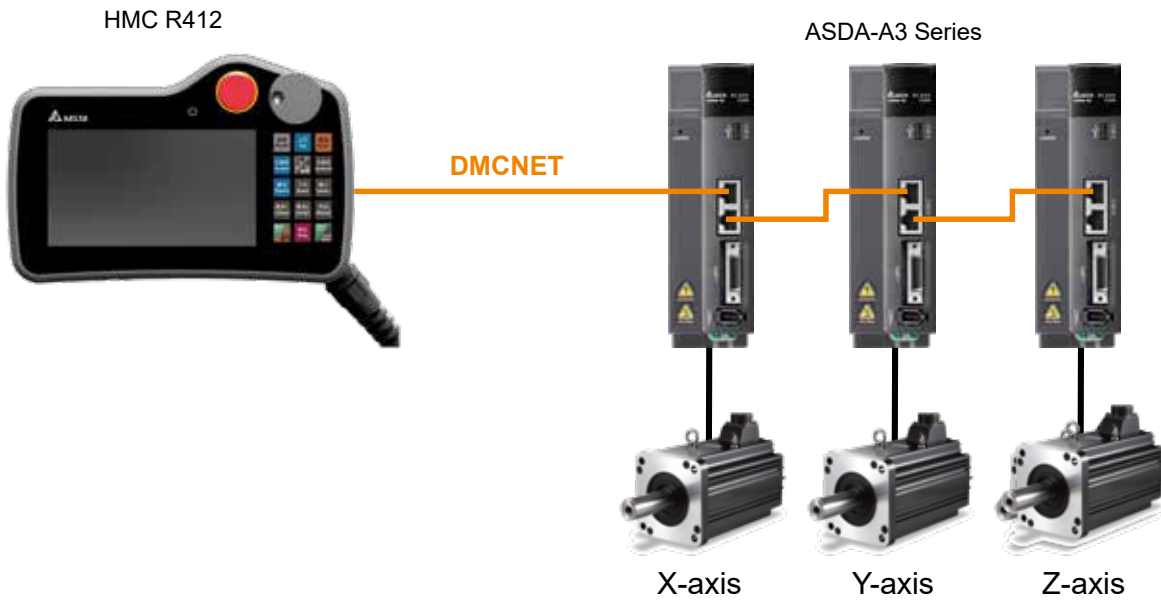
The new handheld models are equipped with full nameplate protection to prevent oil damage of the PCB and extend product life cycle.

### 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

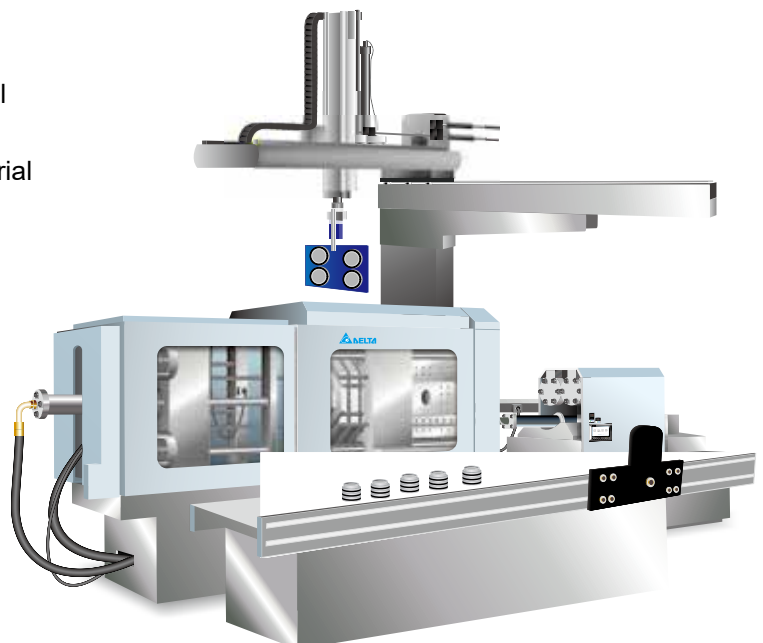


# Application

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

### Features

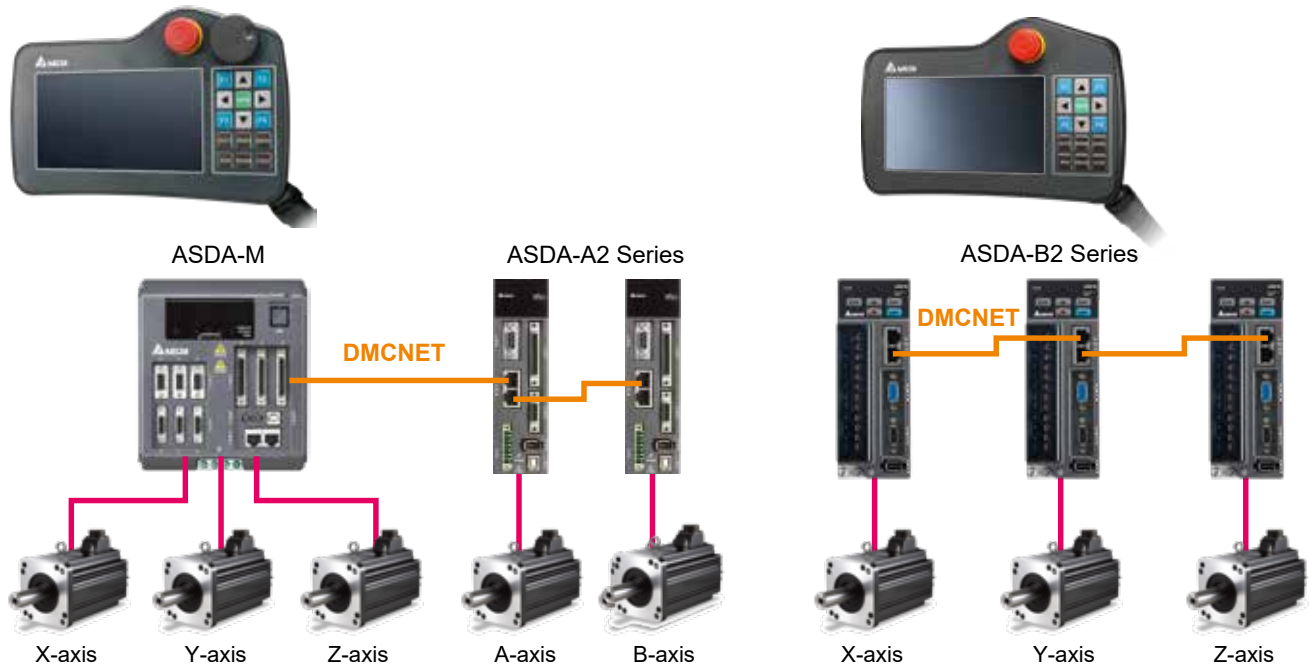
1. The HMC integrates display and remote control functions with built-in PLC
2. High speed motion control bus for Delta Industrial PC-Based Motion Control Solution DMCNET
3. High speed remote I/O modules
4. Built-in ASD-specific motion control device



# 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 (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              | 333.332        | 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) | Auto run speed (mm/s) | Jog speed (mm/s) | Torque protection (%) |
|---------|--------------------|-------------|--------------------------|-------------------------|-----------------------|------------------|-----------------------|
| X1 axis | 0.000              | 20          | 30.000                   | 30.000                  | 121.522               | 100.000          | 10.0                  |
| 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** | 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:1.0 Sec

Speed: 50 %  
Delay before: 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   | J1           | 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 11:0:11  |

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

- Goto T.P. ,speed:10% ,P1
- Goto T.P. ,speed:10% ,P2
- Output(Y)ON
- Goto T.P. ,speed:10% ,P1 ,delay:1.0 Sec

Speed: 50 %  
High Speed | Low Speed

Running Information

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

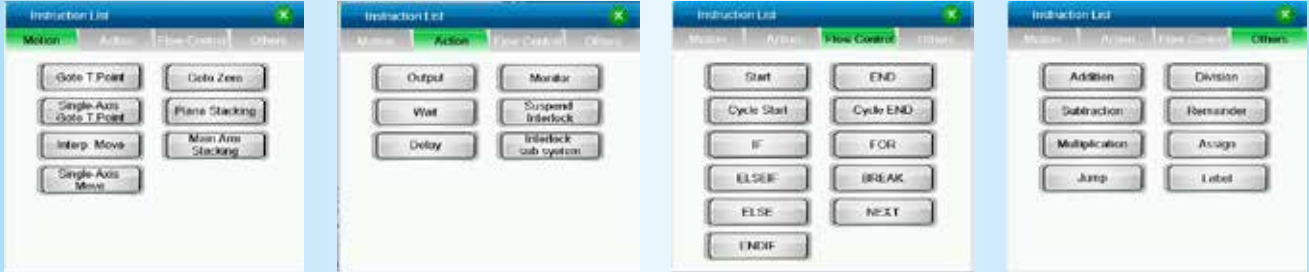
Zero Return | Run | Pause | Stop | CycleStop | Magn: 1 | Hand Wheel

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

Operate | Manual | Teach | I/O | System | Alarm | Main

# Application Cases for Quick Implementation

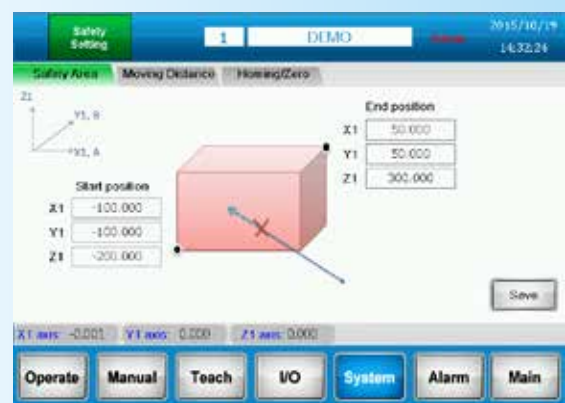
## ▶ Abundant operating instructions



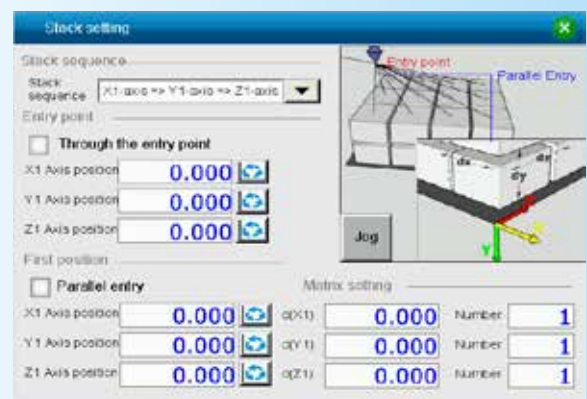
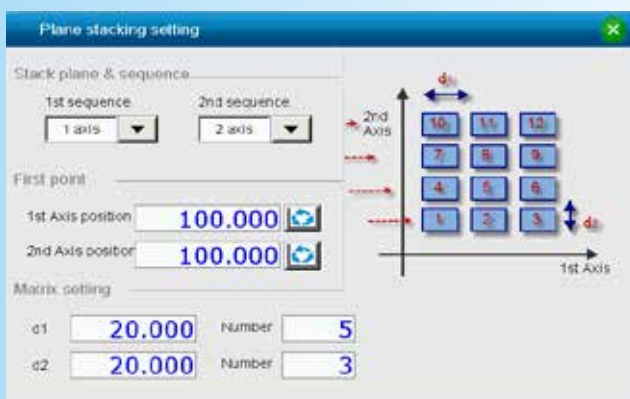
## ▶ Jog function



## ▶ Security zone setting

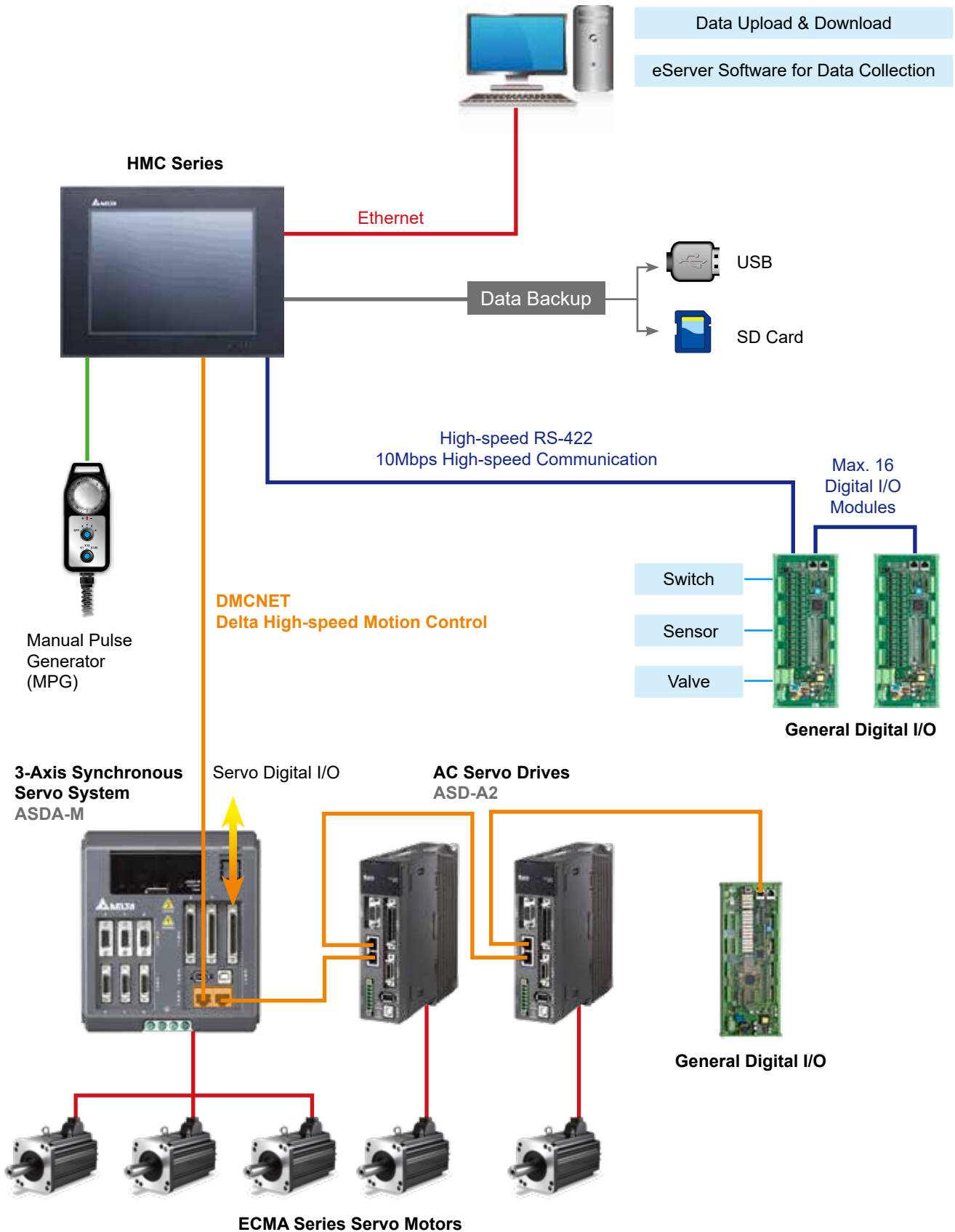


## ▶ Various stacking instructions





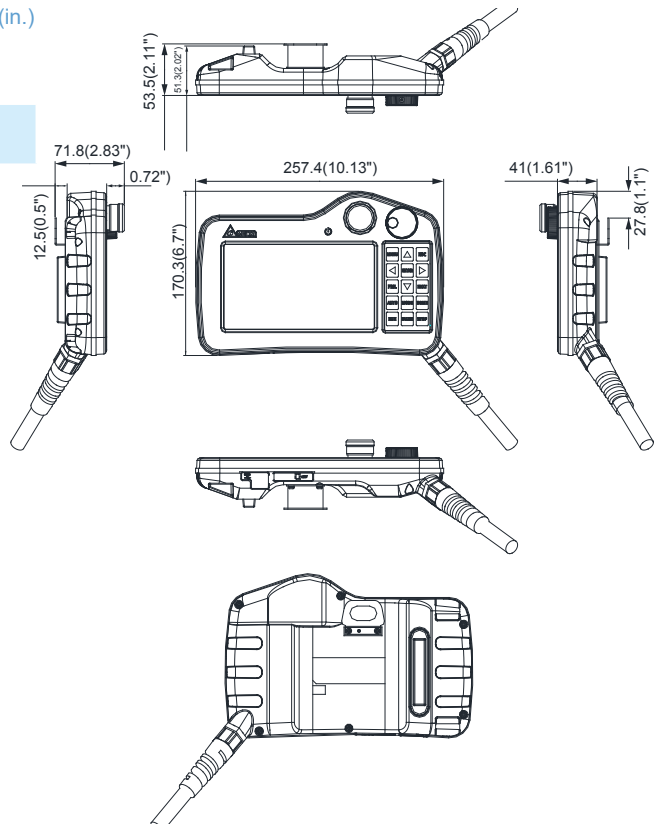
# Complete Total Solution



# Dimensions Dimensions are in mm (in.)

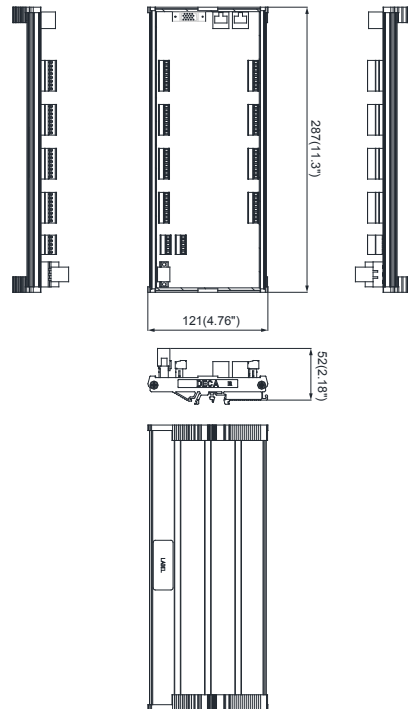
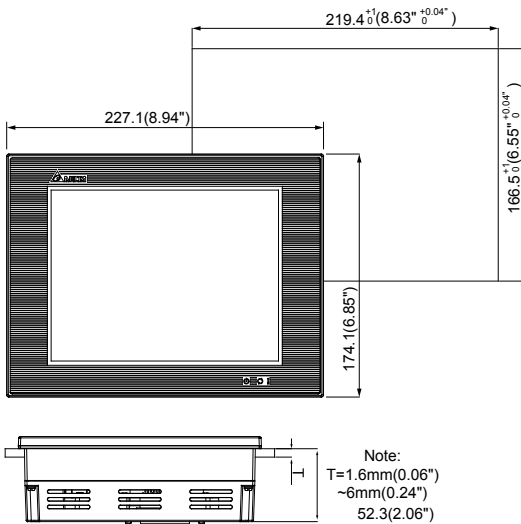
**NEW**

**Model Name** HMC07-N412 Series  
HMC07-R412 Series



**Model Name** HMC08-N5xx Series

**Model Name** Remote I/O Module



# Specifications

| Model                         |                     | HMC07-N412H5CX<br>HMC07-R412H5CX   | HMC07-N412H55X<br>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) <sup>1</sup>  |                                  |  |
|                               | 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<br>(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 <sup>2</sup> )  |                                  | RS-232 / RS-422 / RS-485 <sup>2</sup>    |
|                               | 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<br>Output: 2 contacts<br>B-contact (normally closed) x 2<br>Rated voltage: DC 30V<br>Max. rated current: 500 mA<br>Min. load allowed: 5VDC / 1 mA |                                  | N/A                                      |
| 3-Position Operation Switch   |                     | Only for internal register,<br>no output signal  | N/A                              | N/A                                      |
| Manual Pulse Generator (MPG)  |                     | Only for internal register,<br>no output signal  | N/A                              | N/A                                      |
| function Key                  |                     | 15   |                                  | N/A                                      |
| Cable Length                  |                     | The X in HMC model name indicates cable length <sup>3</sup>  |                                  | N/A                                      |
| Perpetual Calendar            |                     | Built-in   |                                  |  |
| Cooling Method                |                     | Natural cooling  |                                  |  |
| Safety Certification          |                     | CE   |                                  | CE / UL                                  |
| Protection Rating             |                     | IP54   |                                  | IP65                                     |
| Voltage                       |                     | DC + 24V <sub>DC</sub> (± 15%) <sup>4</sup> (Supplied by SELV circuits isolated from MAINS by double insulation)   |                                  |  |
| Voltage Endurance             |                     | Between DC24 terminal and FG terminal: AC500V, 1 min   |                                  |  |
| Power Consumption             |                     | 6W <sup>5</sup>  |                                  | 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<br>(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                     |
|-------------------------|--|--------------------------|
| <b>HMC07-N412H5C5</b>   | General handheld controller for standard truss with built-in MPG and safety limit switch, 5 m cable included               | ( Note 1 )               |
| <b>HMC07-N412H5CA</b>   | General handheld controller for standard truss with built-in MPG and safety limit switch, 10 m cable included              | ( Note 1 )               |
| <b>HMC07-N412H5CF *</b> | General handheld controller for standard truss with built-in MPG and safety limit switch, 15 m cable included              | ( Note 1 )<br>( Note 3 ) |
| <b>HMC07-N412H5CK *</b> | General handheld controller for standard truss with built-in MPG and safety limit switch, 20 m cable included              | ( Note 1 )<br>( Note 3 ) |
| <b>HMC07-R412H5C5</b>   | Handheld controller for injection machine pick-and-place with built-in MPG and safety limit switch, 5 m cable included     | ( Note 2 )               |
| <b>HMC07-R412H5CA</b>   | Handheld controller for injection machine pick-and-place with built-in MPG and safety limit switch, 10 m cable included    | ( Note 2 )               |
| <b>HMC07-R412H555</b>   | Handheld controller for injection machine pick-and-place without built-in MPG and safety limit switch, 5 m cable included  | ( Note 2 )               |
| <b>HMC07-R412H55A *</b> | Handheld controller for injection machine pick-and-place without built-in MPG and safety limit switch, 10 m cable included | ( Note 2 )<br>( Note 3 ) |
| <b>HMC08-N500S52</b>    | Fix-mounted controller with human machine interface HMC08  |                          |
| <b>HMC-RIO3232RT5</b>   | DMCNET remote I/O module (16 pts relay output), 32IN / 32OUT   |                          |
| <b>HMC-RIO3232T15</b>   | DMCNET remote I/O module (all-transistor output), 32IN / 32OUT   |                          |
| <b>HM-RIO3232T12</b>    | 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

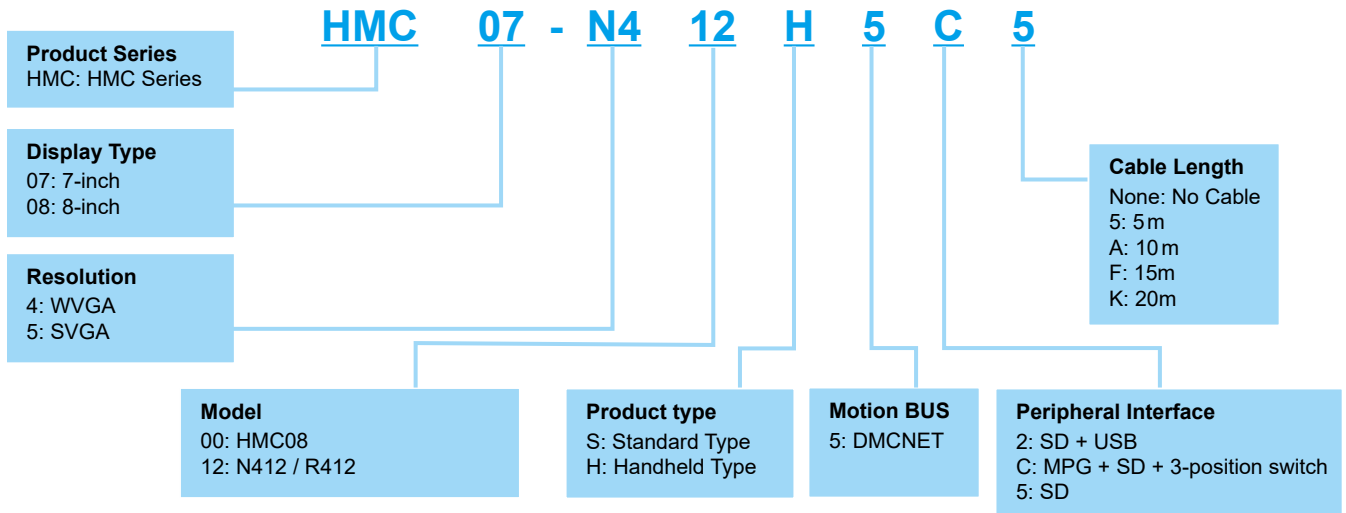
| Model Name                            | Power Supply       | Input Unit             |            | Output Unit                            |            |
|---------------------------------------|--------------------|------------------------|------------|--|------------|
|                                       |                    | Points                 | Type       | Points                                 | Type       |
| HM-RIO3232T12<br>(HMC08-N500 only)    | 24 V <sub>DC</sub> | 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 <sub>DC</sub> |            | Response Time (Relay)                  | On → Off   |
|                                       | On → Off           | < 5 V <sub>DC</sub>    |            |  | 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<br>(For all models)    | 24 V <sub>DC</sub> | 32                     | NPN (Sink)/<br>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)<br>8 kHz (TR)             |   |
| Active Level                          | Off → On           | > 16.5 V <sub>DC</sub> |                             | Response Time (Relay)                  | Resistive Load                                |
|                                       | On → Off           | < 5 V <sub>DC</sub>    |                             |  | 300 mA / 1 Point (TR)<br>2A / 1 Point (Relay) |
| -                                     |                    |                        |                             | Response Time (TR)                     | Off → On                                      |
| -                                     |                    |                        |                             |  | On → Off                                      |

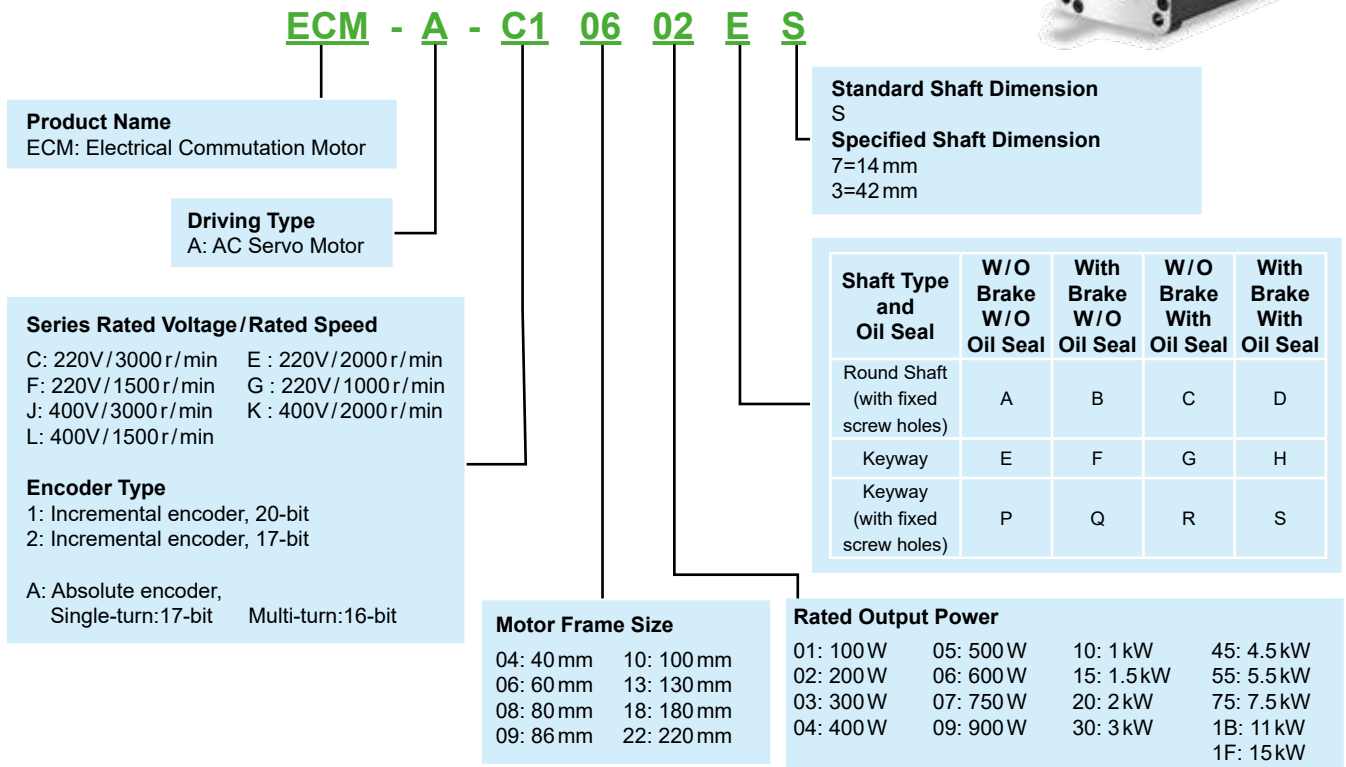
| Model Name                            | Power Supply       | Input Unit             |                             | Output Unit                            |                |
|---------------------------------------|--------------------|------------------------|-----------------------------|--|----------------|
|                                       |                    | Points                 | Type                        | Points                                 | Type           |
| HMC-RIO3232T15<br>(For all models)    | 24 V <sub>DC</sub> | 32                     | NPN (Sink)/<br>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 <sub>DC</sub> |                             | 8 kHz (TR)                             |                |
| Active Level                          | Off → On           | > 16.5 V <sub>DC</sub> |                             | Maximum Loading                        | Resistive Load |
|                                       | On → Off           | < 5 V <sub>DC</sub>    |                             |  | 2A / 1 Point   |
| -                                     |                    |                        |                             | Response Time (TR)                     | Off → On       |
| -                                     |                    |                        |                             |  | On → Off       |

# 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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