

Case	Delta Industrial Automation Products for Injection Molding Machines with XYZ Three Axes Cartesian Robot Arm				
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Applicable to	HMC Series Controller with Human Machine Interface, ASDA-M-F Series AC Servo Drive, ASDA-A2-F Series AC Servo Drive, ECMA Series AC Servo Motor				
Key words	HMC, ASDA-M-F, ASDA-A2-F				

Delta Industrial Automation offers an ideal solution for applications such as XYZ three-axis tables, multi-axis Cartesian robot arms, and other machine control purposes for injection molding machines. Delta automation products provide easy-to-use, cost-saving, and highly beneficial systems that optimize your applications.

## [Injection molding machines and Robot Arms]

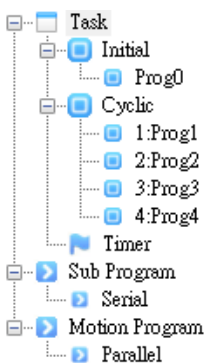
An injection molding machine is a machine for making plastic parts and for manufacturing products using the injection molding process. There are many injection molding machines currently available depending on different requirements. Most are equipped with multi-axis Cartesian robot arms that can pick and place finished plastic parts and products after clamping, injection, pressure holding, cooling and ejection operations. The robot arms are used to convey and package the products during production. They play a very important role and have become essential in the automation control of the entire production process.

## [Introduction of HMC Programs]

The programs of Controller with Human Machine Interface (HMC) can be divided into four categories:

1) Initial Task; 2) Cyclic Task; 3) Sub Program; 4) Motion Program

- 1) Initial Task: Runs only once after startup.
- 2) Cyclic Task: Creates up to four different main programs that allow users to specify different execution time according to importance. If users need to perform a certain program within a fixed period of time, please use the Timer Task which is designed for meeting this kind of requirement.
- 3) Sub Program: May increase scan time and users need to use the CALL command to accomplish the program execution.
- 4) Motion program: May not increase scan time and users can execute Motion program with the main program simultaneously by using the LAUNCH command.

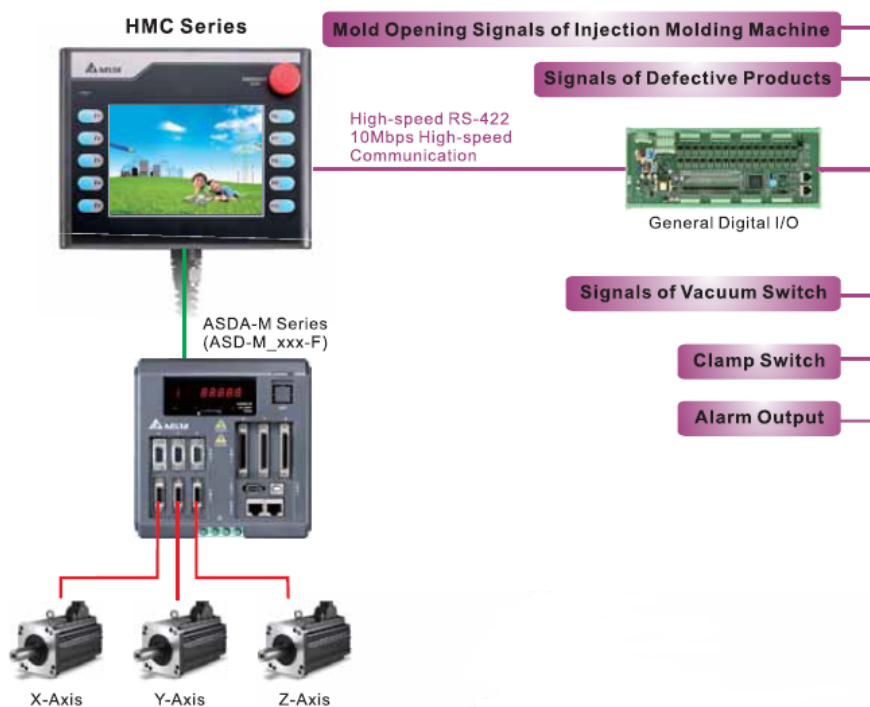


With solid experience and advanced technology, Delta Industrial Automation offers efficient and reliable solutions and service – we are your most trustworthy partner.

## [System Structure]

Using Delta's DMCNET high speed and real time communication bus, the HMC Series is capable of connecting to the ASDA-M-F Series or ASDA-A2-F three-axis servo system to provide three-axis synchronous motion control with performance better than three comparable servo drives. Connected with Delta's DMCNET motion control network, the action of each axis is easily controlled by Delta's servo system through the designated W or R devices. Delta's high resolution AC servo motors also provide smooth operations. No additional acceleration and deceleration are required and noise can be reduced. Damage to mechanical structures and maintenance costs are also greatly decreased. The entire system is smoothly linked together to provide high performance for multi-axis motion control and to avoid unnecessary waste due to calculation errors and mistakes in lead time.

The HMC provides all the existing functions of Delta's human machine interfaces (HMI). The HMI's visual interface helps users to easily realize the definition of each action. The HMC Series' real-time performance and I/O expansion flexibility in a cost-effective system structure allows users to extend the connection of various remote extension modules such as the most commonly used RS-485, general remote I/O, and the high-speed RS-422. The HMC supports Ethernet and remote control functions for whole factory automation to offer an integrated platform for different communication protocols and devices, and to effectively satisfy customer's requirements for a wide range of applications.



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## [Conclusion]

Compared to the other solutions for multi-axis Cartesian robot arms, Delta provides users with a simple and wire-saving system structure. Graphics and logic control can be completed by using the DOPSoft software. The limit switches, home and software limits of servo axes can be defined and controlled through ASDASoft software. Users do not need to purchase an external motion controller or PC-based controller to modify the programs. In addition, the HMC series can control up to 12 axes of servo units through DMCNET communication. This is an optimum combination of operator and controller that continues to bring customers advantages and benefits.

The application of Delta's industrial automation products with multi-axis Cartesian robot arms demonstrates Delta's success in providing outstanding total solutions for industries that rely on injection molding machines.

For more information on Delta's industrial automation products, please visit our website at: [www.delta.com.tw/ia](http://www.delta.com.tw/ia)