

Chapter2 Series Configuration

2-1 CPU Boards

The outline specifications of MPC-2000 series CPU boards are as follows.

- MPC-1000:** A CPU board equipped with a user RS-232C 2 CHs (of which 1 CH is RS-485 enabled) input port of 16 points and an output port of 16 points. One board can perform touch panel connection, RS-485 serial communication, I/O control, and 2-axis simple pulse generation. Because its power supply capacity is low, it should be applied to a small-scale configuration of about 2~4 slots.
- MPC-N816:** A CPU board equipped with a USB memory interface, user RS-232C 1CH, RS-485 1CH, input port 16 points, and output port 8 points. One such board allows a touch panel connection, RS-485 serial communication, I/O control, and 2-axis simple pulse generation. Because the power supply capacity is low, it should be used as a standalone or small-scale configuration of 2~4 slots. Although its functions and firmware are the same as those of the MPC-1000, it is I/O connector compatible with MPC-816, an older model. Although not compatible with the MPC-816, the board can be used as an equivalent product.
- MPC-2000:** A CPU board equipped with user RS-232C 2-CH input port of 16 points and an output port of 16 points. One board can perform touch panel connection, I/O control, and time management. Point data for 14000 points with battery backup can be handled.
- MPC-2100L:** A CPU board equipped with user RS-232C 2-CH input port of 4 points and an output port of 4 points. One board can perform touch panel connection, I/O control, and time management. The execution speed is about 20% higher than that of MPC-2000.
- MPC-2200:** A CPU board equipped with a USB memory interface, user RS-232C 3CH, input port 4 points, and output port 4 points. One such board allows a touch panel connection, I/O control, and time management by RTC. The built-in CPU has been made faster, tripling the speed of the OS portion and doubling the interpreter execution speed in comparison with the MPC-2100. Point data are 20000 points, and the program area is also widely expanded. This is upper compatible with then MPC-2100L.

2-2 PG Boards

There are two kinds of boards: MPG-2314 and MPG-2541. Although both are compatible with up to 4-axis pulse generation, there are differences as described below, wherein MPG-2314 is a general-use type, and MPG-2541 is a simple type.

MPG-2314: A general-use PG board equipped with a 4-axis, maximum 4 Mpps pulse rate, up to 3-axis linear interpolation, 2-axis circular interpolation, encoder input, and the like. It also has various kinds of control input, allowing application to various purposes ranging from servo error detection to outer sense halt. One system can utilize up to 10 boards.

MPG-2541: Outputs up to 4-axis, maximum 400 Kpps pulse rate. Although 4 axes can be used asynchronously, no interpolation function is provided. In addition, error input is limit only, used for simple purposes such as simple positioning. One system can utilize up to 8 boards.
(ICs used in MPG-2541 are becoming difficult to obtain. New adoption is not recommended.)

2-3 Communication Boards

MRS-MCOM: A 3-CH serial communication board.

There are 3 CH of RS-232 ports prepared, wherein 1 CH is dedicated for RS-232C, and the remaining 2 CHs use a shared port by RS-232/422/485. Each can be used at 1200~38400 bps.

Because up to three MSR-MCOM boards can be installed, in the case of MPC-2100, up to 11 CHs of RS-232C communication can be handled including 2 CHs built in the CPU. In addition, touch panel communication "MEWNET" can be made through any of the serial ports CH1~CH5.

The USB port supports USB memory.

2-4 I/O Boards

MIO-1616: Input of 16 points, and output of 16 points (up to 8 boards can be used.)

This is an I/O board with an LED display in which input and output are mounted on one board. The input port is pulled up with a 2 mA constant-current diode, and a 2-wire sensor can be connected. While the output port has a photo-coupler (TLP127) open collector output (100 mA or lower), the outputs of J4-31 and 32 are FET (2SL1764) open drain, compatible with a large current of up to 600 mA.

MIO-N186: Input 16 points, and output 8 points (up to 10 boards can be used).

An I/O board which is connector compatible with MIO-816 with input/output mounted on a single board.

The input port may have two-line sensors with up to 1 mA leak current connected. The output port is an RN1423 open collector with an average sink current of 100 mA.

- MIO-3232:** Input 32 points, and output 32 points (up to 8 boards can be used).
An I/O board with input/output mounted on a single board. The input port may have two-line sensors up to 1 mA leak current connected. The output port is an RN1423 open collector with an average sink current of 100 mA.
- MIP-0064:** Dedicated input of 64 points (up to 5 boards can be used.)
All input ports are pulled up with a 2 mA constant-current diode. By this a 2-wire sensor can be connected to any of the ports.
- MOP-0064:** Dedicated output of 64 points (up to 5 boards can be used.)
The output port of MOP-0064 is an RN1423 open collector. Although up to about 200 mA can be used, return current from all the ports become concentrated on the GND of the power supply connector, and attention should be paid to the current capacity.

2-5 AD/DA Boards

- MPC-AD12:** An 8-ch 12-bit AD and 4-ch 12-bit DA board (up to 2 boards can be used.)
AD/DA analog section is an isolation A/D and D/A isolated from CPU.
Input/output range is 0~4.095 V with AD: 8 channels and DA: 4 channels.
AD input range can be changed to +/-10 V (AD7890-10) or 0~2.5 V (AD7890-2) by exchanging the built-in ADIC (AD7890). DA output can be changed to 0~8.19 V by supplying an external power supply of 10~12 V and selecting a multiplying factor with DIP switches. Each AD channel is sampled at every 1 msec, and the average value is constantly calculated. Reference: AD() function, SET_AD command

Rem) MPC-AD12 consume 200 mA current in the standard state. Therefore, there is a tendency towards current shortage in a system with MPC-1000,N816 as the CPU. In this case, use should be made of a CPU with MPC-2000,2200 or 5 V power of the AD/DA section should be supplied from the outside. If the onboard power supply of MPC-AD12 is stopped, the consumed current will become 100 mA or lower. When combining MPC-2000 and MPC-AD12 (onboard power supply enabled), please consider a configuration with a total of three boards as the limit.

2-6 Network Boards

- MPC-CUnet2:** MPC-CUnet2 is a network board compatible with CUnet (manufactured by StepTechnica) in an MPC-2000 system. CUnet can share 512 byte memory in real me (within 2.5 msec). In addition, because it also provides a mail communication function, it can have various data exchanged under a network. The number of stations is up to 64, and commercial Ethernet cables can be used as the connection cables.

- USB-CUnet:** This is an USB-type CUnet interface, which links with a PC via USB 2.0. Prepared as the compatible software are device drivers, a runtime library, an operation check monitor CUnet Monitor, and the like. USB-CUnet shares memory with MPC-2000 and enables reference/rewrite of the point data area of MPC-2000.

2-7 Rack

There are five kinds with 1 slot (CASE-1S), 2 slots (CASE-2S), 4 lots (RACK-V4S), 8 slots (RACK-V8S), and 16 slots (RACK-V16S).

Although there is no special restriction of the board insertion position, the CPU should be placed on the left side to facilitate heat dissipation.

When using 16 slots, the consumed electric power will become 40 W overall including I/O control and the like. Therefore, heat exhaustion by air flow needs to be considered.

Input boards sustain the largest heat loss. An input board has 4 mA current flowing per point when it is on. Therefore, if all the points are in input board MIP-0064, about 0.25 A of current is consumed, with a heat loss of 6 W occurs.

Therefore, consideration should be given to the air flow inside an apparatus and the rack should be located in a place without air stagnation.

2-8 Other

USB-RS: A genuine USB serial converter for the MPC-2000 series, allowing data transfer at almost the same speed as the baud rate. In addition, the RS-232 side and the USB side are isolated, allowing safe use even in 200 V apparatuses.

* CPU boards other than the MPC-2200 have program ports in the RS-232C specification, requiring a USB-serial converter for notebook PCs and the like without an RS-232C port.

DF13-C8: Cable dedicated to a compact 8-pin connector mounted on the MPG-2314 and the MPC-1000.

In the MPG-2314 it is used for U and Z axis counter input.

In the MPC-1000 it is used for pulse differential output or onboard AD input.