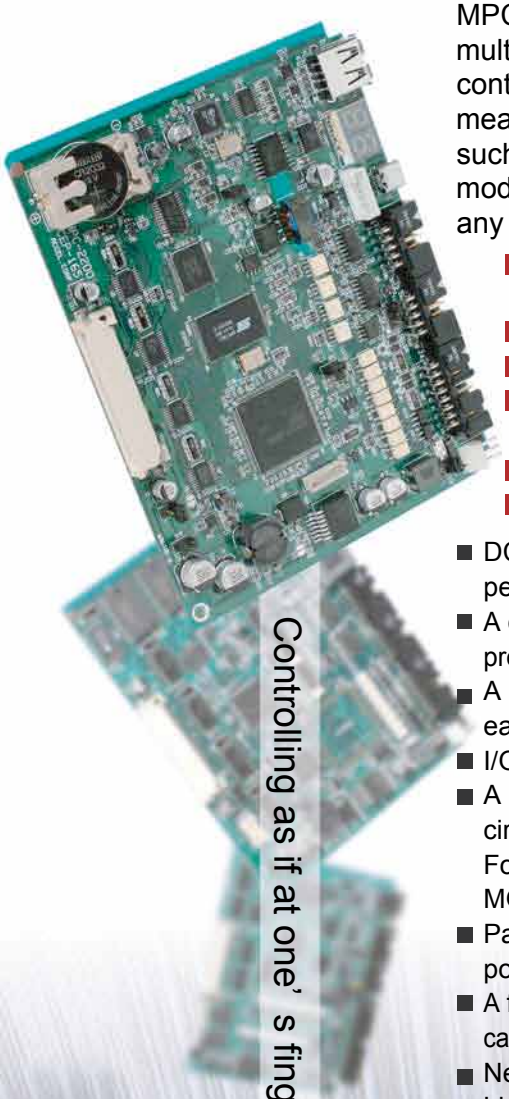
Board controller to immediately facilitate device development

MPC-2000 series

ACCEL Corporation

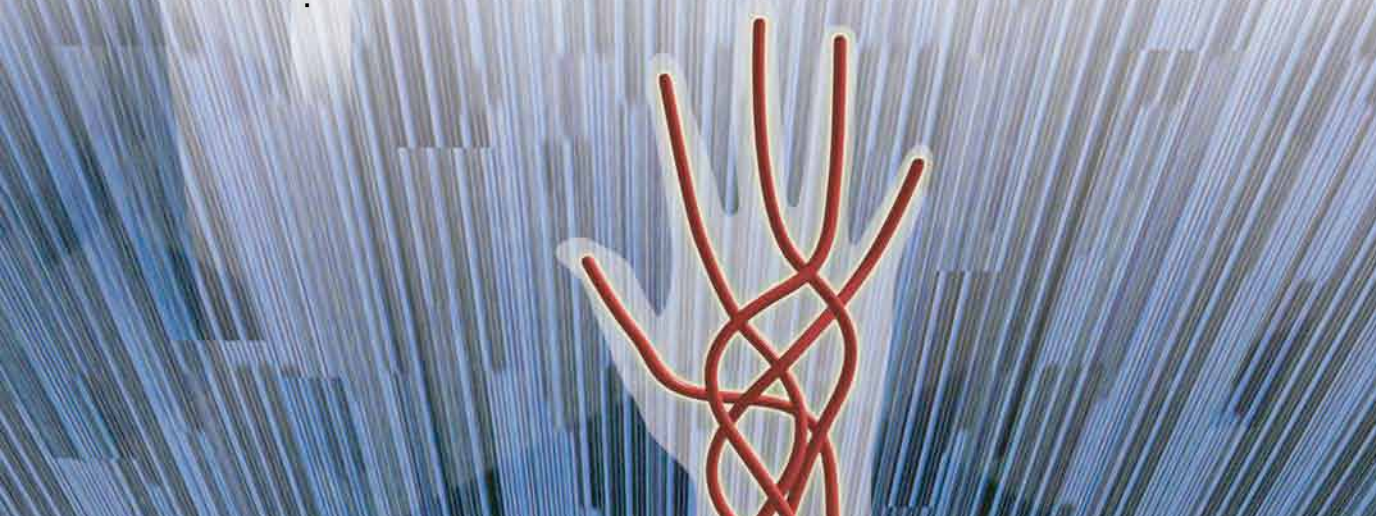


Controlling as if at one's fingertips.

MPC-2000 series are board controllers providing a BASIC-like multitasking interpreter. They can realize various kinds of device control such as I/O control, positioning, robot control, and measurements/testing within a short time. No auxiliary language such as PLC Ladder is required, and programs are not be difficult to modify. There will be no freezing as in FA personal computers, or any need to use a language unsuitable for device control.

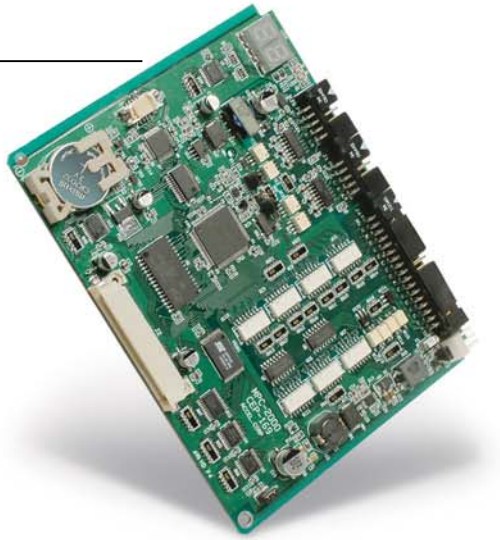
- 4 M pps pulse generation with multiple-axis control, circular interpolation, and continuous interpolation
- Touch panel communication standard (MEWNET) supported
- High-speed network, CUnet provided
- RS-232/RS-485 communication functions provided (such as Modbus)
- USB memory supported
- A/D and D/A boards provided

- DC 24V single power supply (A power-saving design of 100 mA or lower per board)
- A development environment FTMW32 (with no copy protection) allows programming and maintenance using a single notebook PC at any location.
- A multitasking BASIC-like language (32 tasks) is built-in, supporting an easy-to-read program design.
- I/O supports DC 24V solenoids. Direct connection to two-line sensors.
- A robot language is built-in. Asynchronous (MPG-2541), linear, and circular interpolation (MPG-234) are supported.
  For example, coding can be intuitively made using commands such as MOVS and MOVL. Up to 40 axes are allowed.
- Palletizing is automatically computed. Three- and four-point teaching is possible.
- A function for partially protecting each program is provided, which can prevent careless modification and allow publicizing the portions modified by the user.
- Network support MPC-2000 supports a high-speed network (CUnet). Linking dispersed controllers at a high speed via a network, information can be exchanged with a personal computer in real time.
  * CUnet is a trademark of Step Technica Co., Ltd.



MPC-2000 series

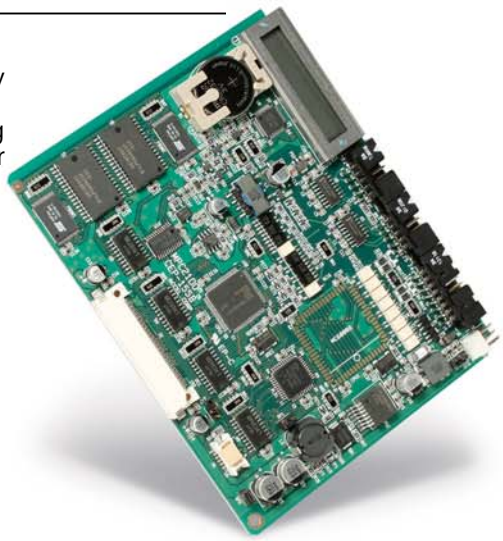
MPC-2000



Main MPU Board
A controller board providing I/O ports for controlling the user RS-232C.
Battery backup and a calendar IC are built-in, allowing use for purposes requiring time management and/or data protection.
* For small to medium scales. Usable racks are up to RACK-V8S.

RS-232C : CH2 CH1 for user
IN : 16-point input (Compatible with a leak current of up to 1.5 mA.)
OUT : 16-point output
CPU : R5F70835AN80FTV(80Mhz)
ROM : 4Mbit FRASH SST
SRAM : 4Mbit Battery backup
RTC : RTC-7301
Power supply : DC24V

MPC-2100L



Main MPU Board
A controller board providing twice as large a memory area as MPC-2000, suitable for large-scale control.
Battery backup and a calendar IC are built-in, allowing use for purposes requiring time management and/or data protection.
* For medium to large scale. Usable racks are up to RACK-V16S.

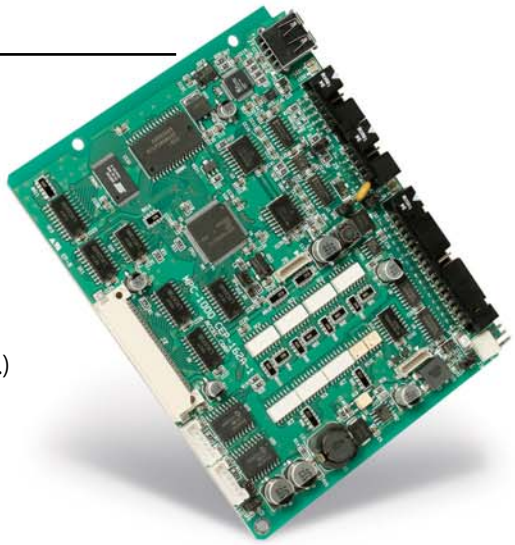
IN : 4-point input (Compatible with a leak current of up to 2mA.)
OUT : 4-point output
CPU : R5F70835AN80FTV(80Mhz)
ROM : 4Mbit FRASH SST x2
SRAM : 4Mbit Battery backup x2
RTC : RTC-7301
Power supply : DC24V

MPC-2200

A high-speed main MPU board
A controller board which is capable of twice as high speed processing and also providing twice as large a memory area as MPC-2100L.
Suitable for high-speed, large-scale control.
Battery backup and a calendar IC are built-in, allowing use for purposes requiring time management and/or data protection.
* High-speed processing. For medium to large scales. Racks up to RACK-V16S are supported.

USB A(F) : Dedicated to the USB memory
miniUSB B(F) : Program port
RS-232C : 3 CH, all of which can be used for the user.
IN : 4-point input (Compatible with a leak current of up to 1.5mA.)
OUT : 4-point output
CPU : R5F72115D160FPV(160Mhz)
ROM :16Mbit FRASH SST
SRAM : 16Mbit Battery backup
RTC : RTC-7301
Power supply : DC24V

MPC-1000



Main MPU Board
A compact controller for built-in applications, providing I/O control, pulse generation, RS-485 and RS-232 communication by a single board.
USB memory can also be connected.
* For small scale. Usable racks are up to RACK-V8S.

USB Port : Dedicated USB Memory
RS -232C : CH3 CH2 for user (CH1 may be used as RS-485.)
IN : 16-point input (Compatible with a leak current of up to 1.5 mA.)
(Eight of their points can be used as a CPU A/D converter.)
OUT : 16-point output(100mA)
CPU : R5F70835AN80FTV(80Mhz)
ROM : 4Mbit FRASH SST
SRAM : 4Mbit No battery backup
Power supply : DC24V

MPG-2314

4-Axis PG Board
The strongest 4-axis PG-IC: NOVA Electronics MCX-314A is built-in. Linear interpolation of up to 3 axes and circular interpolation of up to 2 axes are possible, and continuous interpolation is also possible.
Encoders/counters for 2 axes are built-in as standard.
Four axes can be supported by adding options.
* Up to 10 boards can be used.

Maximum pps: 4 Mpps (Circular interpolation is up to 2 Mpps.)
IN : 4-Axis(AN26C31 Differential drive)
OUT : Origin,End limit,INPOS,ALAM,Each axis
Power supply : DC24V(Pulse ports,I/O interface)

MPG-2314 has a wide range of application, which can support various kinds of functions necessary for a production facility.

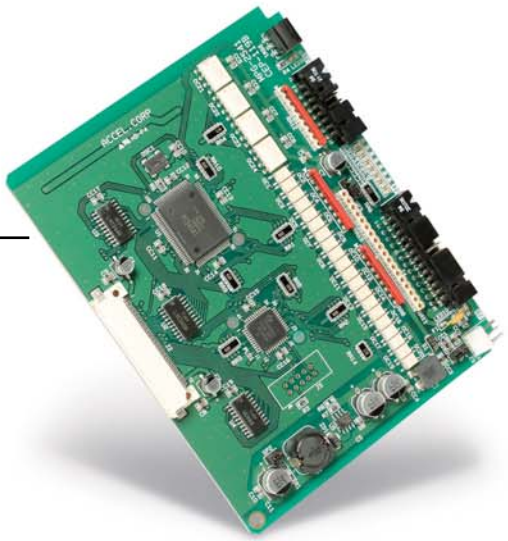
--Track control---
Tracks of various shapes can be controlled by combining arcs and lines by a continuous interpolating function.

--High-precision position control---
By providing an encoder input counter, position information such as the linear scale can be reflected on control for higher precision control.

--Real-time control---
Various kinds of real-time controls such as reading the encoder input and the number of output pulses and command interim stopping are possible. Also supported are fine controls such as adjusting the placement position according to the value of a pressure sensor.

MPG-2541

NOT RECOMMENDED

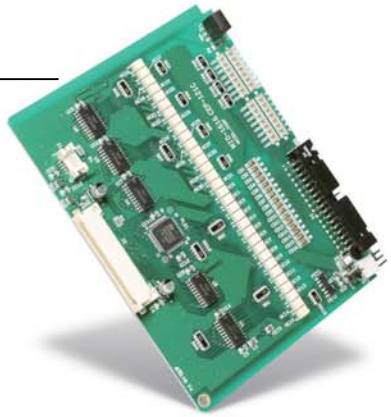


4-Axis PG Board
Its intended use is simple positioning (with no interpolating function).
* Up to 8 boards can be used.

MAXpps : 400kpps
IN : 4-Axis (TLP2630 open collector)
OUT : Origin,End limit,Each axis
Power supply : DC24V(Pulse ports,I/O interface)

MPC-2000 series

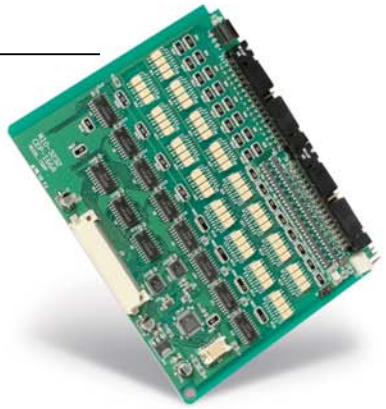
MIO-1616



I/O Board
IN : 16-point input,OUT : 16-point output
Having an LED display, system debugging is facilitated.
Although 14 points of the output port are 100 mA controls, the remaining two points are FET open drains which can control a large current.
* Up to 11 boards can be used.

IN : 16-point input (Compatible with a leak current of up to 2 mA.)
OUT : 16-point output 100mA (Two points of 31 and 32 only: 600 mA)
Power supply : DC24V

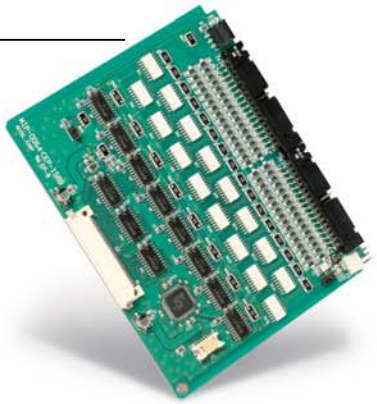
MIO-3232



I/O Board
IN : 32-point input,OUT : 32-point output
Although the output port assumes a sink current of 100 mA, RN1423 is used as the output TR, partially allowing the control of up to about 400 mA.
* Up to 8 boards can be used (up to two boards for MPC-1000 and MPC-N816).

IN : 32-point input (Compatible with a leak current of up to 1 mA.)
OUT : 32-point output 100mA
Power supply : DC24V

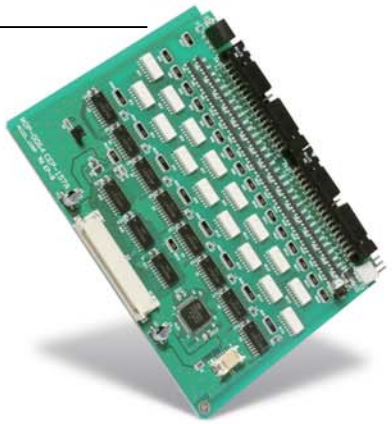
MIP-0064



Input Board
One board supports 64 points of input.
All the points are pulled up by constant-current diodes (2 mA), supporting two-line sensors.
* Up to 5 boards can be used.

IN : 64-point input (Compatible with a leak current of up to 2 mA.)
Power supply : DC24V

MOP-0064



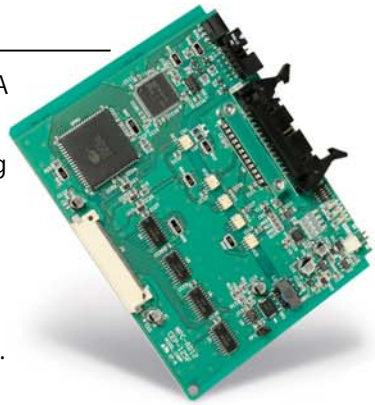
Output Board
One board supports 64 points of output.
Although a sink current of 100 mA is assumed per port, RN1423 is used as the output TR, partially allowing control of up to 400 mA.
* Up to 5 boards can be used.

OUT : 64-point input 100mA (RN1423 open collector)
Power supply : DC24V

MPC-2000 Series

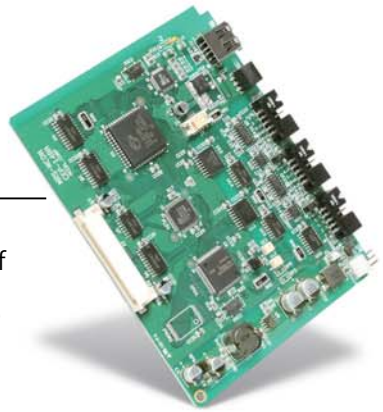
MPC-2000 Series

MPC-AD12



An AD/DA board providing 8CH of AD input and 4CH of DA output.Resolution is 12 bits for both AD and DA.
The analog circuit is isolated from the control system.
In the standard state, updating the DA value and obtaining the AD data can be performed in each channel at 1 msec intervals.
When high-speed data sampling at intervals of 1 msec or shorter is required,a special function prepared in the AD() function should be used.
The AD converter is AD7890, wherein those of 4 V and +/- 10 V range can be exchanged according to the purpose of use.
* Up to 2 boards can be used.(up to one boards for MPC-1000 and MPC-N816).

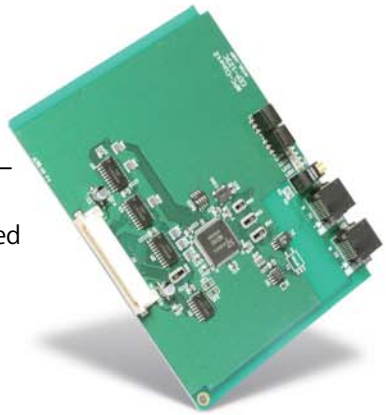
AD:input range
AD7890AN-4 0 ~ 4.091V(1mV resolution)
AD7890AN-10 -10V ~ +10V(4.88mV resolution)
DA:DA8521 12Bbit 4CH AD/DAconverter.
Output 0 ~ 4.091V(1mV resolution)
0~8.182 V (2 mV resolution) according to the DIP setting and external power supply.



MRS-MCOM

Multi-Communication Board
One board can support 3CH of serial communication and one piece of USB memory.
MRS-MCOM has dedicated CPU operation, and data are transferred to the main MPU board via a dual-port RAM.
Therefore, when using an MRS-MCOM, no interrupt load to the MPU occurs by serial communication.
* Up to 3 boards can be used.

USB:USB memory
CH1 RS-232 dedicated : up to 38400 bps
CH2,CH3 RAS-232/422/485 shared : up to 38400 bps
Power supply : DC12V~24V(for RS232C)

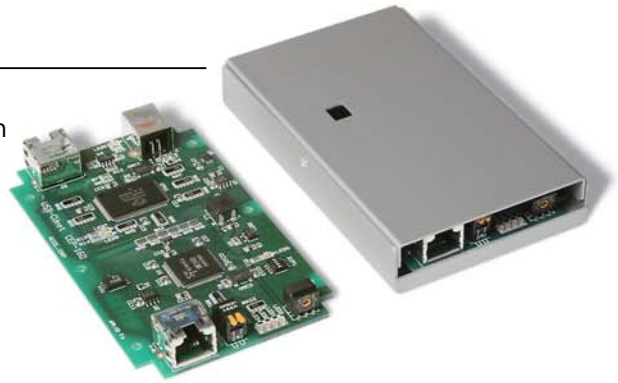


MPC-CUnet2

High-Speed Network Board
A memory-sharing board, wherein 512-bytes memory is shared on the network.
Not only memory sharing between MPC-2000s but also high-speed message communication and memory sharing with a personal computer are made possible by a USB-CUnet.

Communication : 12 Mbps, 2-line type
Pulse transfer isolation
Communication connector : RJ-45
Commercially-sold Ethernet cables (100baseT or higher) recommended

USB-CUnet



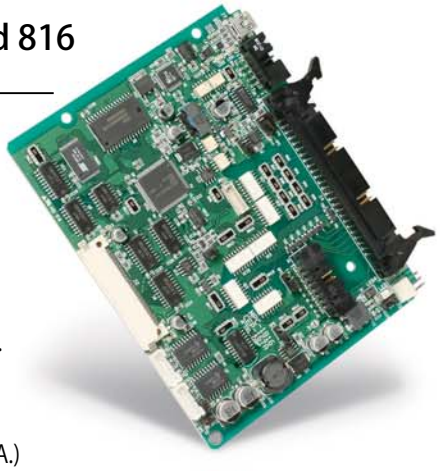
A CUnet can be used via USB 2.0.
A CUnet for a PC, which allows communication with systems equipped with an MPC-CUnet2.

*Compatible with Windows2000,XP,Vista,Win7

MPC-N816 series I/O compatible with the old 816

MPC-N816 Series

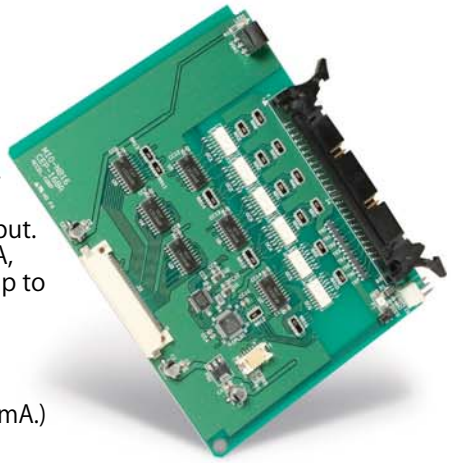
MPC-N816



Main MPU board
(Only the I/O is compatible with the 816 series.)
A compact controller for built-in applications, which provides I/O control, pulse generation, and RS-485 and RS-232 communication by a single board.
USB memory can also be connected.
Because it is compatible with the I/O connector of the old model MPC-816, replacing the 816 series is easy.
The function and firmware are the same as in the MPC-1000.
* For small scales. Usable racks are up to RACK-V8S.

USB Port : Dedicated USB Memory
RS -232C : CH3 CH2 for user
IN : 16-point input (Compatible with a leak current of up to 1.5 mA.)
OUT : 8-point output(100mA)
CPU : R5F70835AN80FTV(80Mhz)
ROM : 4Mbit FRASH SST
SRAM : 4Mbit No battery backup
Power supply : DC24V

MIO-N816

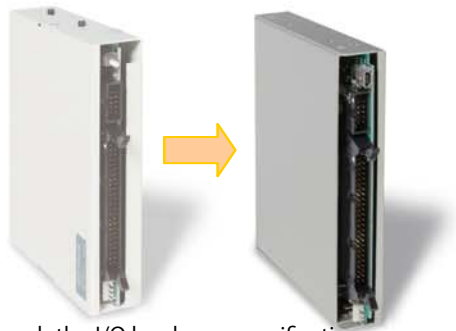


I/O Board(I/O is compatible with the 816 series.)
An I/O board having 16 points of input and 8 points of output.
Although the output port assumes a sink current of 100 mA, RN1423 is used as the TR, partially allowing the control of up to about 400 mA.
Because it is compatible with the I/O connector of the old model MIO-816, replacing the 816 series is easy.
* Up to 10 boards can be used.
IN : 16-point input (Compatible with a leak current of up to 2 mA.)
OUT : 16-point output 100mA(RN1423 open collector)
Power supply : DC24V

Replacing MPC-816 with MPC-N816

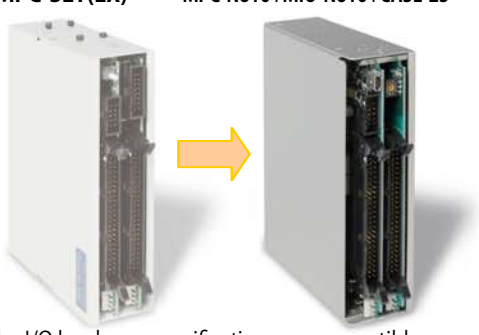
MPC-N816 and MIO-N816 are compatible with the I/O connector of the 8-bit controller MPC-816, fit for maintenance replacement and wiring without using the terminal block of the 816 series. The external form of the case is slightly smaller for the 2000 series, taking no extra space for replacement. The mounting dimensions are compatible with the 816 series. Shown below is an example of replacement support.

MPC-816XC **MPC-N816+CASE-1S**



Although the I/O hardware specifications are compatible, the output port starts at 0, and the input port at 192. When handling I/O control only, because the languages are very similar, the program can be replaced with simple modifications.

MPC-SET(EX) **MPC-N816+MIO-N816+CASE-2S**



Although the I/O hardware specifications are compatible, the output port starts at 0, and the input port at 192. If pulse generation was used in SET(EX), J6 of MPC-N816 can be used for up to 2-axis 10 Kpps. As the second board, not only an I/O board but any peripheral board of the 2000 series can be selected.

Rem 1) Power supply connectors are all of the 3P type. (Those for the old 816 series are 4P.)
Rem 2) Detailed documents concerning replacement are always made public on the MPC-2000 site. Please visit the site or directly contact our company for details.

CASE

CASE-1S
1-slot case
25Wx140Hx115D

CASE-2S
2-slots case
40Wx140Hx115D

RACK-V4S
4-slots case
75Wx140Hx120D

RACK-V8S
8-slots case
125Wx140Hx120D

RACK-V16S
16-slots case
235Wx140Hx120D

USB-RS3
programming cable

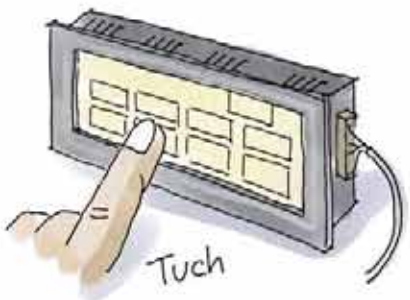
MPC-XY03
FA robot training kit**.** This is a teaching robot, providing XY axes and Z axis.

Rem 1) Dimensions are approximate values. Please confirm the actual dimensions in the DXF files available on our company's web site.

Example-1

[Touch Panel Interface]
A command line MEWNET 38400 determines the baud rate with a touch panel and initiates communication with the touch panel.
Afterwards, data are shared with the touch panel via an array variable MBK( ). Pana GT, Digital GP series, etc.

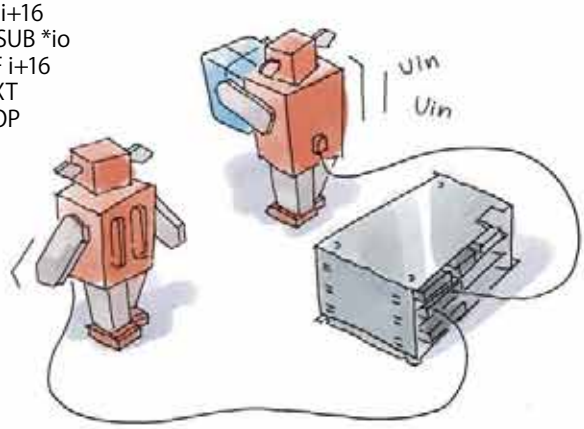
```
MEWNET 38400
DO
PAGE=MBK(50)
PRINT  "PAGE
MBK(0)=PAGE
WAIT MBK(2)==PAGE
SELECT_CASE PAGE
CASE 0
OFF 70011 : ON 70010
CASE 16
ON 70011 : ON 70010
CASE 255
END_SELECT
WAIT   MBK(2)!=MBK(50)
LOOP
```



Example-2

[Multitasking]
Ordinary BASIC as only one program flow. However, the multitasking language built-in MPC simultaneously executes multiple programs.
In the following program, a program called main and another program called task 1 are executed in parallel.

```
FORK 1 *task1
*main
DO
FOR i0=0 TO 7
ON i0 : TIME 10 : OFF i0
NEXT
LOOP
*task1
DO
FOR i=0 TO 7
ON i+16
GOSUB *io
OFF i+16
NEXT
LOOP
```



Application Example 1

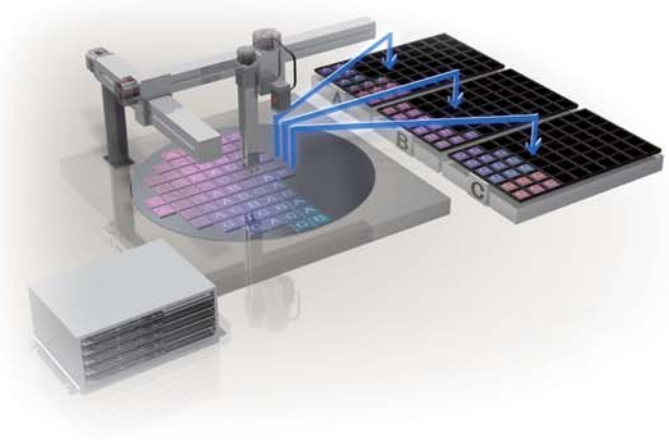
In the MPC-2000 series, the following classified control using a robot unit can be efficiently described. First, its language system which can directly process numerical values allows easy measurements and classification. The description can remain as is.

```
IF A>1000 THEN : GOSUB *A * END_IF
IF A>900 THEN : GOSUB *B * END_IF
IF A>800 THEN : GOSUB *C * END_IF
```

In addition, because it has a robot language, managing matrix-shape coordinates is as easy as just using call numbers for automatic arithmetic operations.

```
JUMP PL(1,n) : n=n+1
```

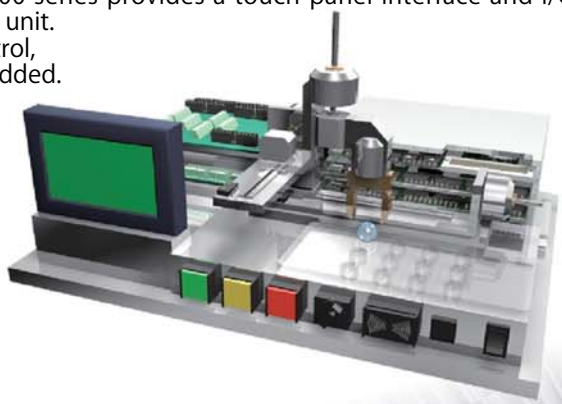
In a die picker, wafer inspection data are often handed
over in advance. A large amount of data can also be handled.
Data can be transferred at a high speed via a CUnet from a host computer which manages the data. Results data can also be transferred as well.



Application Example 2

In a desktop machine, elements such as I/O control, positioning, touch-panel operation, and measurements need to be supported in a compact space.
The main MPU board of every one of the MPC-2000 series provides a touch-panel interface and I/O control, which allows it to control devices as a single unit.
By adding peripheral boards, higher-level pulse control,
an AD/DA conversion function, and the like can be added.

In addition, because MPC-1000 also supports simple pulse generation and RS-485 communication, more complex and high-level applications can be realized with a single unit.



* The photos of products in this catalogue may be differ from the actual products.
* The specifications and external appearances of products may be changed without prior notice.
* For the detailed specifications of products, please consult our technical personnel.

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