

CNC + PLC technology  
for high-performance  
motion applications

# FANUC

## Power Motion *i*



**60** years of CNC  
experience



# 100% FANUC experience

FANUC is the leading global manufacturer of factory automation, with more than 60 years' experience in the development of computer numerical control equipment, 3 million CNC controls installed worldwide and 65% market share in the global CNC sector. All components – controls, motors, and amplifiers – are developed, manufactured and tested to perfection in-house. **The results are superior functional reliability, the highest levels of machine availability and a mean time between failures of well over fifteen years that contributes to an extremely low cost of ownership.**





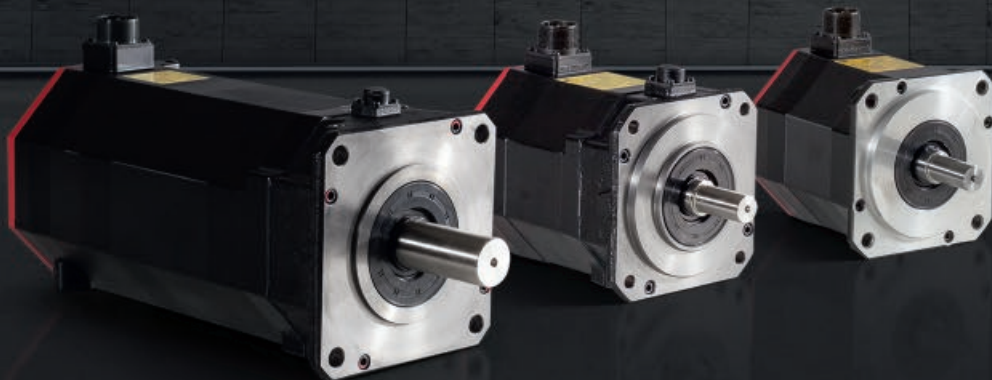


## FANUC Service

# Control your motion applications using advanced CNC technology

FANUC's Power Motion *i* is the only CNC that is dedicated to the motion control market. More versatile and cost effective than a PLC, it adds all the benefits of a high-response CNC to your motion control. The integrated ultra-fast PLC processor controls and monitors rapid and smart operation of the machine's auxiliary devices. Up to five ladder logic programs can be executed at the same time for a total of 24,000 to 300,000 steps.

**This makes it ideally suited to a wide range of applications requiring everything from positioning to high-performance, multiple-axes or complex motion applications.**



### Your benefits with Power Motion *i*

- fast synchronised motion application for up to 32 axes and 4 CNC paths
- 5 PLC paths with a total of 32 axes
- short programming times – short cycle times
- safety functions according to ISO 13849-1 Performance Level D / IEC62061 SIL 2
- integrated functions including operator safety features
- easy connectivity via smart phone or tablet PC
- easy tool-free maintenance
- low energy consumption and energy regeneration
- long life span – reduced costs per part
- 60 years of FANUC experience in CNCs





### Complete plug + play solution

Ready to use and coming with an integrated software package, Power Motion *i* features plug and play technology and connects to your machine using a minimum of cabling. The time required to program motions is reduced from one week to one day.

# Put together your perfect package of hardware, software, drives and support

Power Motion *i*'s modular system consists of hardware, software, a drive system as well as worldwide FANUC support. Its servo allows a compact machine design. Choose your entire package or just what you need for your advanced motion control application.

## Key features:

- integrated high-speed multi-path and multi-PLC
- up to 4 CNC paths and 5 PLC-programs can be supported simultaneously
- easy to create customised screens with FANUC Picture
- electronic CAM function for synchronised motion of slave axes and master axes
- various display unit options including portable and with or without a touch-screen
- easy online PLC diagnosis without the need for external programming
- CNC contains all servomotor information
- versatile connectivity

## Two types of installation

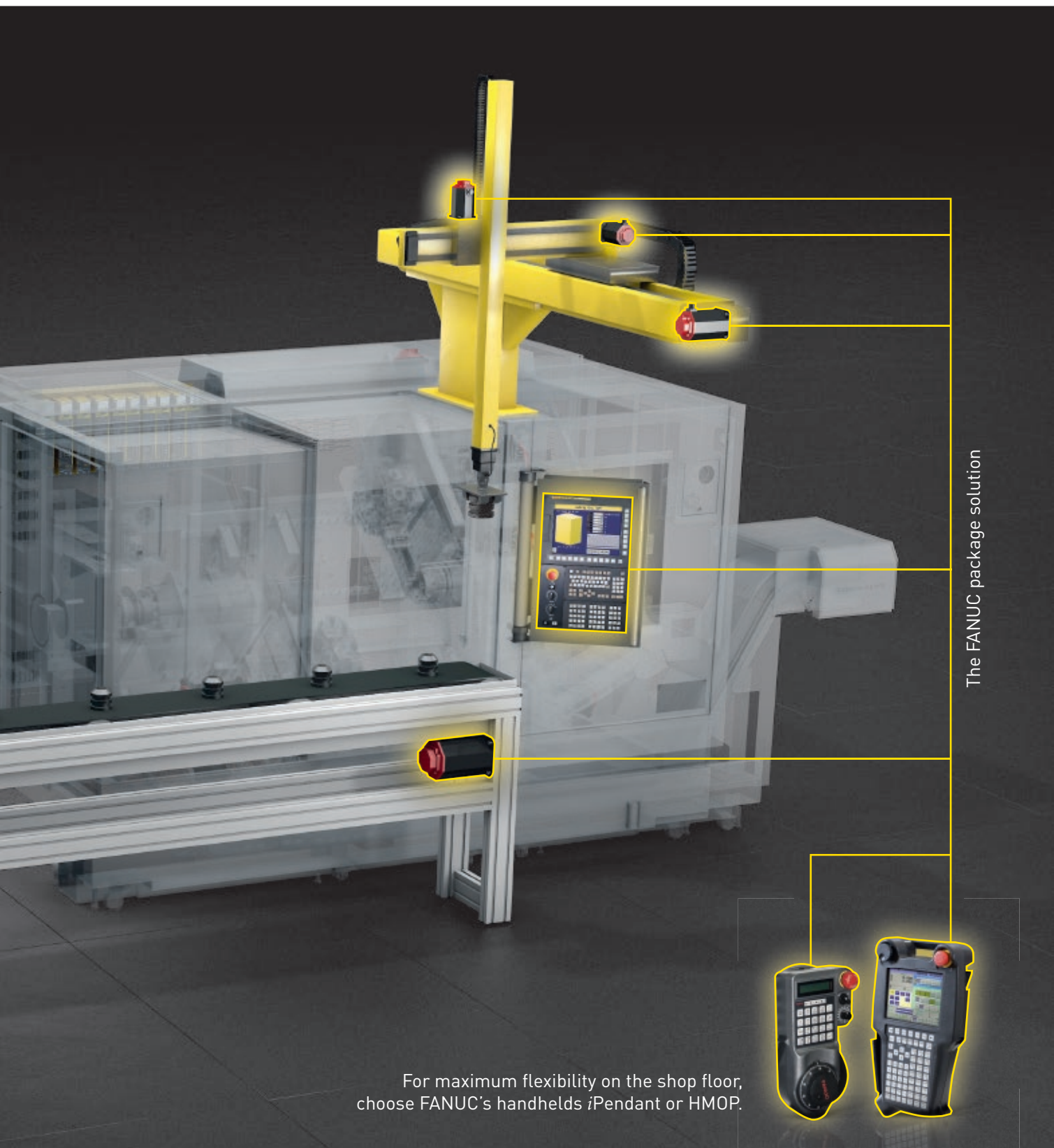
Power Motion *i* is available as an LCD-mounted or stand-alone type CNC. The LCD-mounted type benefits from a compact design and minimal wiring. The stand-alone version allows a single display to be interfaced with up to 8 stand-alone Power Motion *i* controls via Ethernet.

## Easy customisation

Highly customisable display units with one or two 10" or 15" screens, touch or non-touch, and a number of different options to provide you with complete freedom of design for your machines.







The FANUC package solution

For maximum flexibility on the shop floor, choose FANUC's handhelds *iPendant* or HMOP.



#### **FANUC *iPendant* or HMOP**

For maximum flexibility on the shop floor, FANUC has developed the *iPendant* and HMOP handhelds. Available with or without a touch screen, the FANUC *iPendant* is ideal for teaching or operations that require you to get close to the application. Designed specifically for easy axis control (jogging), HMOP has a two-line display and comes with or without a hand wheel.

#### **Programmable as a CNC or as a robot**

The PLC is programmed by FANUC Ladder with time saving function blocks. In order to program the CNC, you can choose between ISO programming or teach programming as a robot – in this case, all teach-in operations look exactly like that of a robot controller.

# Smart ideas for your motion applications

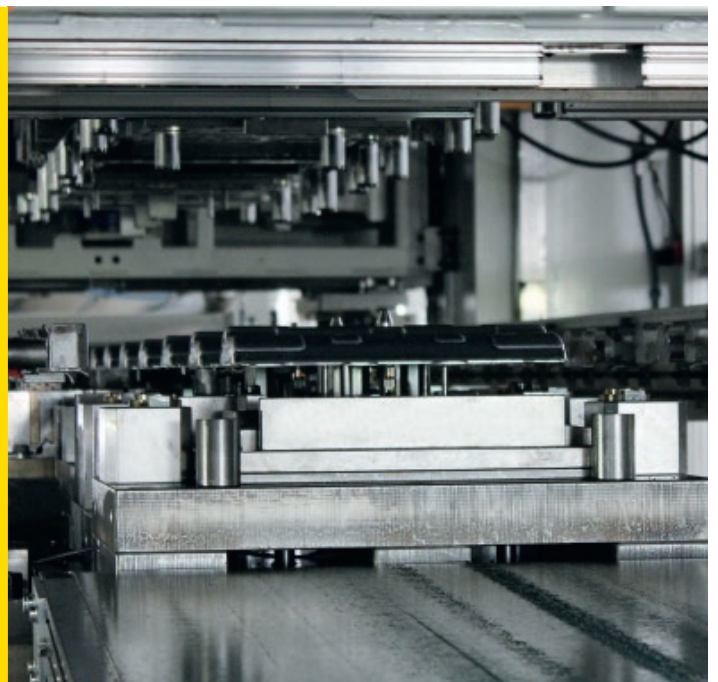
Power Motion *i* has been designed for a wide range of complex, high-performance general motion applications involving multiple axes, paths, speeds and torque controls. The biggest benefit: Power Motion *i* includes all the features of FANUC CNC technology, making it ideally suited to a wide range of industrial applications. There's so much you can do with Power Motion *i*.

**Why not ask us to show you what it can do for you?**



## Pressing

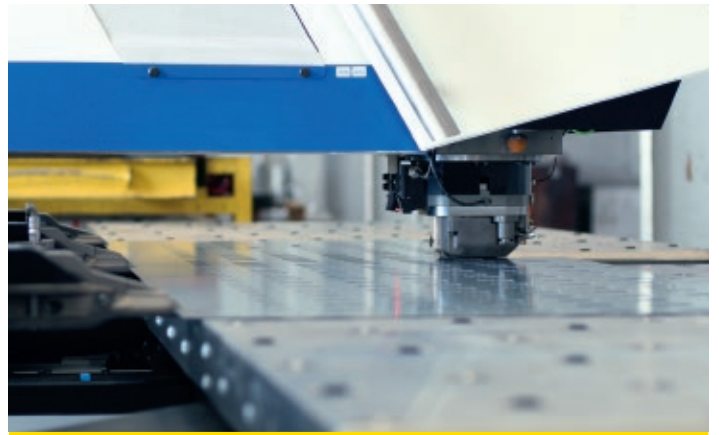
On large servo applications, such as servo presses, Power Motion *i* creates an ideal alternative to any PLC, since switching between pressure and position control is very fast and tools are controlled automatically. On small presses, it enables you to more than double the number of punches, reducing your cycle times and increasing your productivity. For automotive applications, Power Motion *i* will also control electrical drive systems, resulting in extreme precision, more reliability, better results and less material stress. This also saves energy compared to hydraulic systems and offers the additional advantage of energy regeneration. In order to meet specific industry and European standards integrated safety features are available.







**Packaging**



**Stamping**

### **Handling and positioning**

Often faster and offering more options than conventional solutions, when used in conjunction with rack-mounted robots, one Power Motion *i* control will manage every loading, unloading, picking and placing processes on your line. And since it's expandable, it allows you to keep adding additional equipment such as conveyors to your system. What better way of future proofing your business?



**Sawing**



**Filling**



### **Punching and bending**

Coordinated axes are essential to punching and bending machines. FANUC Power Motion *i* achieves this kind of synchronisation easily. Thanks to its high-resolution drives, it delivers incredible levels of accuracy and uses no more energy than is actually required. CNC technology means that parameters are easily altered, enabling you to respond quickly to meet changing part requirements and production changeovers. This kind of greater flexibility provides you with a real competitive advantage.

# Software functions for higher productivity



## Control functions

### **Pressure and position control function**

This function controls large servo motors or link type presses, punch/press machines, die cushion or moulding machines and enables a positional and pressure control command to be specified at the same time. The integrated servo software selects the position and pressure control automatically and controls the overshoot of pressure by decreasing and increasing the acceleration motion according to the specified position. If a PC is used, pressure data can be recorded and displayed.

### **Standard interpolation functions**

Power Motion *i* has a wide set of CNC integrated interpolation functions available such as positioning, linear interpolation, circular interpolation, helical interpolation, polar coordinate interpolation, skip function, multi-step skip, high-speed skip signal, skip position macro variable improvement, torque limit skip, and a skip function with overshoot amount specification.

### **Robot and machine tool integration function**

Making integration easy, this feature offers advanced robot/machine connectivity using I/O Link *i* or field bus systems like PROFINET IO, PROFIBUS DP, Ethernet/IP, FL-net and others – all over one cable. Interface signals between the robots and CNC are allocated automatically and robots can be operated via CNC or vice versa. CNCs feature a dedicated robot setup screen.





## Motion functions

### Multi-axes synchronous function

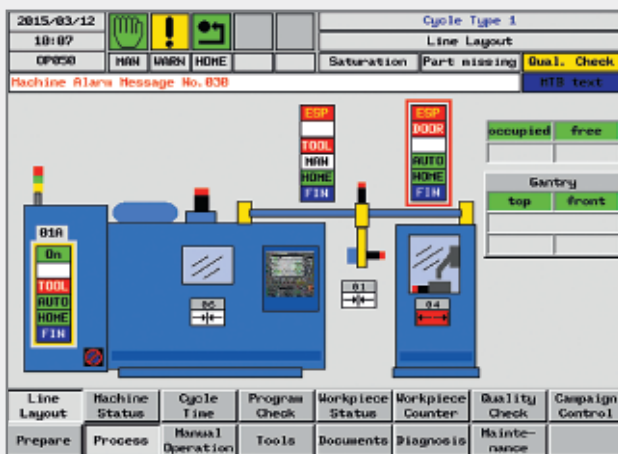
This feature allows axes to synchronously follow a reference axis to a defined speed ratio, which facilitates the simplification of gears and further allows the speed ratio to be changed freely during operation.

### Multi-axes high-speed response function

During high speed PLC execution cycles, this feature stops and starts the axes faster for more accurate synchronous control.



## Custom screen function



### FANUC PICTURE

simplifies custom screen development by using predefined icons for displaying components and operator selection buttons. Special screens and features may be created using the C Language Executor.



## Safety function

### FANUC Dual Check Safety

FANUC Dual Check Safety (DCS) function provides an enhanced level of operator safety on processes where the protection is open but the power is still on. Should an issue arise FANUC DCS quickly shuts off the power to protect the operator and enable the machine to be restarted. Special functions make creating machine documentation easy.



## Diagnostic functions

In the unlikely event an issue should arise, a wide range of diagnostic functions ensures that problems can be identified and rectified quickly and easily. Power Motion *i*'s large-scale system LSI also reduces the parts count

significantly, with the entire CNC system protected by Error Correcting Code (ECC) and modularised components making part replacement quick and easy.

# Technical data



## Power Motion *i*-A

Max. controlled axes total / per path	32 / 24
Max. feed axes total / per path	32 / 24
Max. simultaneously controlled axes / path	4
Max. controlled paths	4
<b>Type of installation</b>	
LCD version	•
Stand-alone version	•
<b>Operating units</b>	
LCD panel	8.4", 10.4", 15"
PC front-end	10.4", 15"
Touch systems	•
2nd display unit for LCD mounted	•
<i>i</i> Pendant	•
Machine operators panel	•



# Power Motion *i*-A

Part programme memory	
Integrated from ... to ...	32 KB -1 MB
Additional mass storage device CF-card	•
Additional mass storage device HD-PC-version	•
USB port	•
<b>Ethernet</b>	•
Field bus	
EtherNet/IP /ProfiNet	• / •
I/O-Link / I/O-Link <i>i</i>	• / •
ASi-Bus / Profibus / Device-Net	• / • / •
FL-Net / CC-Link	• / •
<b>Compatible drive systems</b>	<i>ai</i> , <i>Bi</i> , DiS, LiS
PMC function	
Max. number of I/O	4096 / 4096
Max. number of I/O-Link / I/O-Link <i>i</i> channels	3 / 2
Max. number of PMC channels	5
Maximum steps	300 000
FunctionBlock function	•
CNC functions	
Multi-axe-high response function	•
Dual Check Safety	•
Programmable rapid traverse overlap	•
Servo-on Synchronize function	•
Control function for Link Type Press	•
Macro Executor / C-Executor / FANUC Picture / FOCAS	• / • / • / •
Multi Axes Synchronous function	•
Tool Functions	•
Tandem Disturbance Elimination Control	•
High speed position switch for Power Motion <i>i</i>	•
Error Compensation / Volumetric Error Compensation	• / –
Positioning by optimum acceleration	•
High Speed Feedrate Override	•
Feed rate change function	•
Advanced preview control	•
Speed control with acceleration in circular interpolation	•
Software operator's panel	•
Unexpected disturbance torque detection function	•
Robot connection function	•
Pressure and position control function	•
Position control keep function	•
Nano interpolation	•



## Our strength: Service and Support

From the first step to the last, comprehensive support for your applications as well as personal customer service are major aspects of the FANUC yellow world. Our skilled and dedicated service team is there to assist you improve by building and operating efficient and highly productive machines. Special FANUC service packages, including predictive and preventive maintenance options, help to improve the performance of your machines even more.

More than  
**500**  
service  
engineers

Original spare  
parts for a  
minimum of  
**25 years**







# FANUC Academy

Our certified FANUC instructors are dedicated to helping you get the most out of your automated processes by upskilling your staff at our fully equipped training centres or at your own premises. Courses are available as standard training modules or customised training packages, designed to meet your own specific needs.

**Let's optimise your productivity.**



## Wherever you need us: we are there

With a global network of more than 210 local subsidiaries, we are always right there where you need us. Rest assured, no matter where you are in the world, your local FANUC contact will always speak your language.



**Push  
the  
button**



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