

FANUC's CNC for LASER cutting machine with high-speed LASER control

# FANUC

## Series 30i/31i-LB Plus Series 0i-LF Plus



# LASER cutting machine CNC capable of high-speed, high-

## **FANUC Series 30i/31i-LB Plus**

## **FANUC Series 0i-LF Plus**

More powerful and easier to use

**Mach  
Perfor**

- Equipped with FANUC's latest CNC and servo technologies
- High-speed LASER command synchronized with axis control
- Equipped with functions required for LASER cutting as standard

Cutting condition setting function

LASER high-speed control

Power control function

Gap control, etc.

- Operation screen to support LASER processing

LASER dashboard

Programming simulation

LASER processing conditions database

- Improved basic performance (required functions are equipped as standard)

Customized functions

Multifunctional Ethernet \*30i/31i-LB Plus only

Extended memory capacity

High synchronization of  
achieves high-quality cu

▶ Power control function /

Improve productivity thro

▶ Fast Cycle-time Tech



Prevent sudden machine downtime with preventive maintenance

▶ Extensive failure prediction functions

Reduce recovery time by easily pinpointing faulty parts

▶ Diagnosis/maintenance functions

**Maximizing  
Uptime**

# precision, high-performance LASER control

ining  
mance

## Optimal CNC based on the application

axis and LASER  
tting.  
LASER high-speed control

ugh reduced cycle times.  
nology



### CNC for multi-axis, 3D LASER cutting machine

#### **FANUC Series 30i-LB Plus**

- Max. number of paths : 4 paths
- Max. total number of controlled axes : 32 axes
- Max. number of simultaneous controlled axes : 24 axes
- Max. number of connectable oscillators : 3

### CNC for core LASER cutting machine

#### **FANUC Series 31i-LB Plus**

- Max. number of paths : 4 paths
- Max. total number of controlled axes : 26 axes
- Max. number of simultaneous controlled axes : 4 axes
- Max. number of connectable oscillators : 3

### CNC for entry LASER cutting machine

#### **FANUC Series 0i-LF Plus**

- Max. number of paths : 2 paths
- Max. total number of controlled axes : 9 axes
- Max. number of simultaneous controlled axes : 4 axes
- Max. number of connectable oscillators : 1

Integrated support of the shop floor  
▶ **FANUC iHMI**

Original screen for ease of use  
▶ Comes standard with customizability functions

IoT integration  
▶ Extensive compatibility with field networks

## Ease of Use

# System Configuration

## CNC Control Unit (LCD mounted type\*/stand-alone type)

The display lineup supports a wide range of machines, from compact to large, including the FANUC *i*PC and PANEL *i*H/*i*H Pro with *i*HMI support, a 10.4" LCD unit, and more.



FANUC *i*PC  
24" LCD

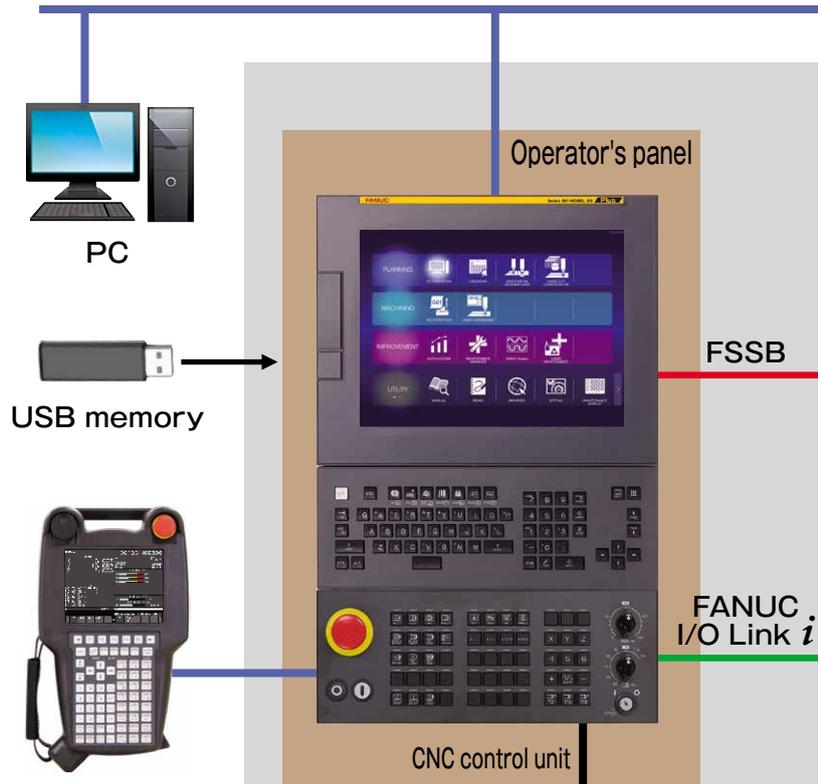
FANUC *i*PC  
21.5" LCD

FANUC *i*PC  
15"/10.4" LCD



PANEL *i*H/*i*H Pro  
19" /15" /10.4" LCD

Standard display  
10.4" LCD\*



## Handheld Unit

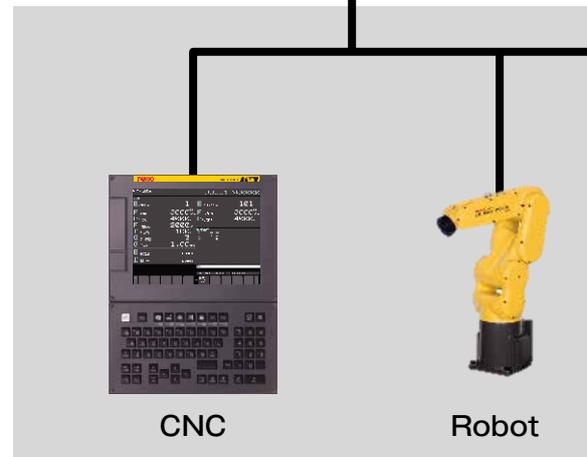
Equipped with an emergency stop button and a manual pulse generator, this handy unit line-up achieves safe manual operation of machine tools.



*i*Pendant

Handy Machine  
Operator's Panel

Portable manual  
pulse generator



\*30*i*/31*i*-LB Plus only

## I/O Unit

Wide range of I/O units compatible with various installation locations and I/O devices.

Optimized for operator's panels with its thin and space-saving design

Standard operator's panel with key input duplication

Handles the output/input of safety signals

Compatible with original operator's panels



Safety Machine  
operator's panel



I/O module for operator's panel  
supporting safety function



I/O module for  
operator's panel

Optimized for power magnetics cabinets with high scalability and

Excellent cost performance with multi-point output/input

Compact and with reduced wiring

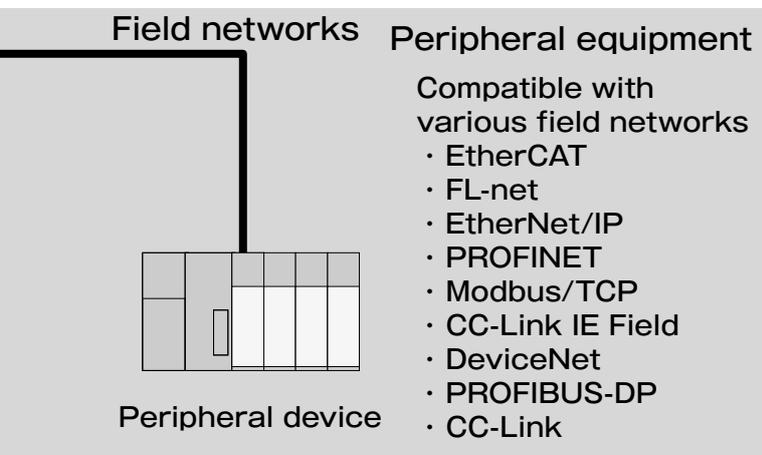
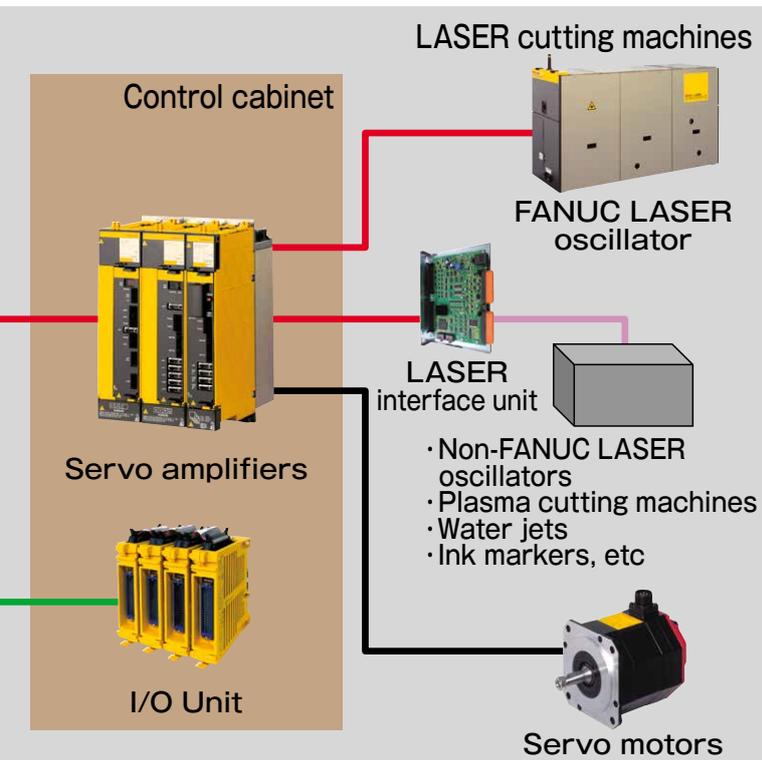


I/O unit for power  
magnetics cabinet



I/O module for  
connector panel

## Ethernet



## LASER oscillator

LASER oscillator lineup can handle a variety of LASER cutting to contribute to high-speed, high-quality cutting



**LASER C series**

This can be connected to non-LASER machines, such as non-FANUC LASER oscillators, plasma cutting machines, water jets, and ink markers. Connection requires a LASER interface unit.

## Servo Motor

Line-up to meet the various needs of LASER cutting machines and contribute to the performance improvement of feed axes



**AC SERVO MOTOR**  
*αi-B/βi-B series*



**DD MOTOR**  
*DiS-B series*



**LINEAR MOTOR**  
*LiS-B series*

## Servo Amplifier

Line-up to be flexibly available for a variety of LASER cutting machines and contribute to the downsizing of cabinets



**SERVO AMPLIFIER**  
*αi-B series*



**SERVO AMPLIFIER**  
*βiSVSP-B series*

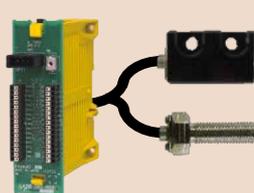
Extensive modules such as the multi-point output/input type and the analog/digital output/input module

Reduced wiring work with a dismantlable pole terminal block



**Terminal Type I/O module**

Effective for thermal displacement compensation with multi-point temperature sensor input



**Temperature sensor input unit**

Extensive modules including analog, temperature input, and high-speed counter



**I/O Unit-MODEL A**

Optimized for reduced wiring by enabling distributed setup

Can be positioned near sensors scattered inside and outside the machine cabinet

IP67 type



**I/O Unit-MODEL B**

# Superior control functions and high operability

## High synchronization between servos and LASERs

CNC sends an axis command to the servo motor and simultaneously generates and sends an laser output command to the LASER oscillator over the same FSSB connection to achieve high synchronization between the axis movement and LASER output.



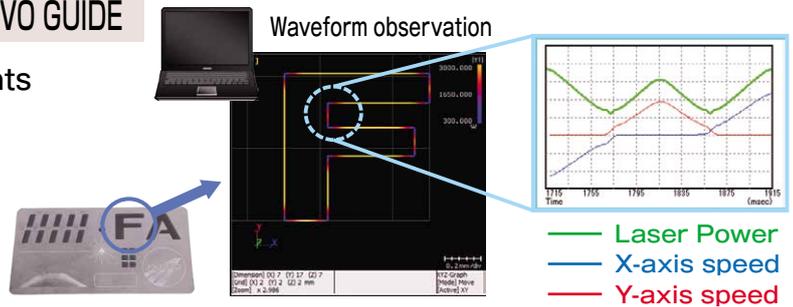
High-speed, high-precision cutting and marking of rotating workpiece ("FANUC" character marking: 120m / min)



## LASER output can be visualized by the FANUC SERVO GUIDE

### Strong support for LASER cutting adjustments

The servo guide measures the servo waveforms, laser power waveforms, and PMC signals, to comprehensively handle adjustment tasks. The LASER output status can be viewed with color-coding by the servo guide 3D display function.



## Equipped with functions required for LASER cutting as standard

### Example LASER program

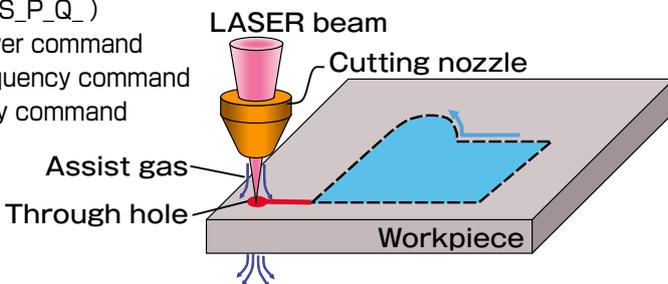
- E1 } Set the cutting conditions for cutting and piercing. Can be managed with the cutting condition database.
- E101 }
- G13 : The nozzle approaches the workpiece to maintain a constant distance regardless of the shape of the workpiece.
- G32 L2 : Controls the assist gas to improve processing quality and processing performance.(Piercing data)
- G24 : Shaping the through hole before starting cutting allows for a stable cutting start.
- G32 L1 : Controls the assist gas to improve processing quality and processing performance.(Cutting data)
- G01 X\_Y\_ : The workpiece is cut along the cutting path.

### Piercing (To make a through hole before cutting)

Changes LASER output step by step when piercing to optimize the power level, achieving stable piercing in the shortest time.

G24 (S\_P\_Q\_)

- S : Power command
- P : Frequency command
- Q : Duty command



During piercing



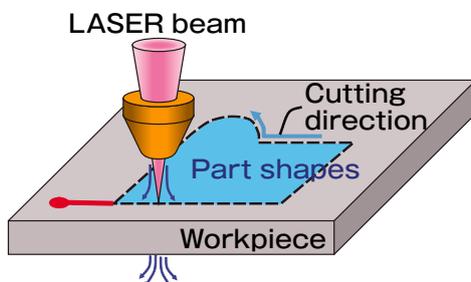
Through-hole shaping

### Cutting

The optimal cutting conditions will vary as the cutting speed changes at slender corners or when starting cutting. Power control functions are available to control LASER output coordinated with the speed of the controlled axis.

G01 X\_Y\_ (S\_P\_Q\_)

- S : Power command
- P : Frequency command
- Q : Duty command



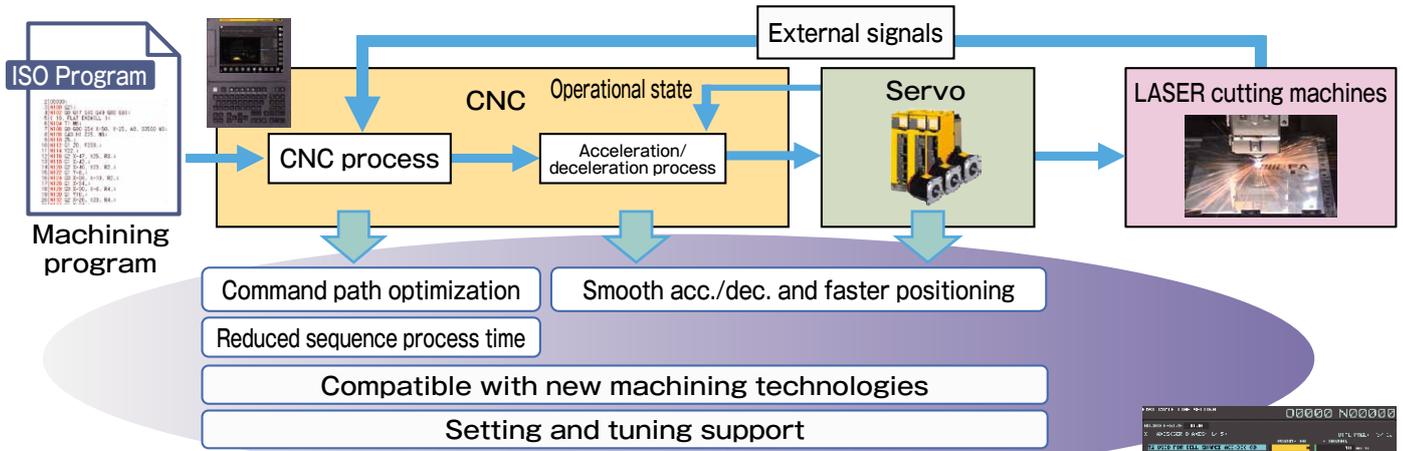
Cutting in progress



Cutting sample

# Fast Cycle-time Technology

Fast Cycle Time Technology refers to CNC and servo technologies that achieve reduced cycle times. It reduces cycle times of machining programs through methods such as accelerating and decelerating depending on the operational state and reducing the sequence processing time for external signals.



## Fast Cycle-time setting

Easily reduce cycle times

The Fast Cycle-time setting compares the currently set parameter setting to the FANUC default setting, allowing you to easily use the setting that most effectively reduces cycle time.



## Information necessary for LASER cutting is centered on the LASER dashboard screen

The iHMI LASER dashboard screen is primarily for LASER cutting HMI.

The CNC status display, LASER cutting conditions display, shape previews, and other information required for cutting are concentrated in a single screen. The LASER dashboard screen allows you to see the shape before cutting, progress during cutting, and cutting conditions without requiring any screen transitions. You can also easily set up your own screen transitions by allocating launcher soft keys to the required screens.



Can allocate desired screens with launcher soft keys

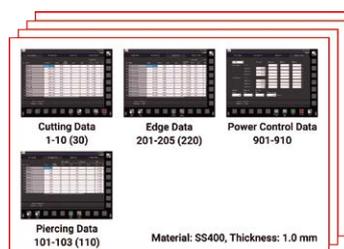
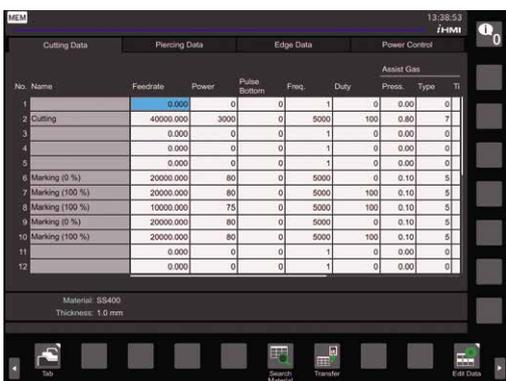
The program management slide previews the cutting shape of the program selected with the cursor, allowing you to select programs while checking the cutting shape.



Program management slide

## Cutting conditions database can manage multiple cutting conditions

The LASER cutting conditions database is an application that saves cutting condition settings for each material and board thickness for retrieval with iHMI. Cutting condition settings saved on the PANEL iH/iH Pro database (can be saved for each material and board thickness, maximum 1000 items.) can be retrieved and forwarded to CNC memory cutting condition settings.



Select the cutting condition setting and forward to CNC memory



# Service & Support

## Excellent Maintenance Services

FANUC service team delivers customer trust and confidence based on direction of service “Maximizing Uptime”, “Global Service” and “Lifetime maintenance”.

### **Service First**

Conforming to the spirit of “Service First”, FANUC provides lifetime maintenance to its products for as long as they are used by customers, through more than 260 service locations supporting more than 100 countries and regions throughout the world.

#### Maximizing Uptime



## FANUC ACADEMY

FANUC ACADEMY operates versatile training courses to develop skilled engineers effectively in several days.



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