Fast, High Quality, Easy

Marking Flexibility

Fiber Laser Marker
MX-Z2000H-V1 series
Great for either deep or shallow engraving in metals, marking on plastics/resins or plastic films, and for fine processing.

**Mark anything** from electronic parts to automotive parts.

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**The MX-Z2000H Series Provides Benefits in Many Arenas**

**High Speed and High Quality for a Wide Variety of Applications**

**Marking Flexibility**

- **Metals**
- **Plastics/Resins**
- **Plastic Film**

Two operating modes meet the application marking demands.

- Enhanced 3D marking features.
- G-DAC enables high-speed, clear marking.
Enhanced functionality Improves Productivity

Connectivity & Traceability

- Direct finder link
- EtherNet/IP™ ready
- Traceability log
- Data can be shared with external storage

Withstands Severe Ambient Conditions and Meets International Standards

Durability/Safety

- IP65 protection
- Meets domestic and international safety standards

The OMRON Fiber Laser System

Operation Flexibility
Two Operating Modes Provide Fine Detail to Deep Engraving

Standard Mode

Our exclusive flexible pulse control (up to 1MHz, adjustable 1 - 20 pulses) enables optimum marking and processing for a variety of materials and applications, for a variety of materials and applications, including both heated and non-heated marking/processing, etc. For example, even for small character when thermal effects are problem, Fine marking is possible.

Deep engraving of metal, rough polishing, and other energy-intense processing become possible with an expanded and enhanced flexible pulse control, which provides pulse streams of up to 30 pulses. For example, deep engraving suitable for camera reading is possible even after heating process.

Optional EE Mode (Energy Enhanced Mode)

Deep engraving of metal, rough polishing, and other energy-intense processing become possible with an expanded and enhanced flexible pulse control, which provides pulse streams of up to 30 pulses. For example, deep engraving suitable for camera reading is possible even after heating process.

Omron Laser (EE Mode)

Flexible pulse laser increases output per pulse. Furthermore, by continuous irradiation, continuous irradiation transmits heat in the depth direction, enabling deep engraving.

Typical Laser

The output power per pulse of general laser is lower than that of flexible pulse laser. The heat mostly stays on the surface, resulting in a shallow engraving.

* Because this mode is an option, you need to purchase the license “EE Mode Activation Key” to enable it.
Marking 3D Objects Is Simple Even on Cones and Spheres

High-precision Z-axis Flexibility

Clean marking is now possible for 3D surfaces, such as stepped, sloped, curved, conical and spherical surfaces without any additional software.

Marking time with the same data

<table>
<thead>
<tr>
<th>Without G-DAC</th>
<th>With G-DAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>116ms</td>
<td>54ms</td>
</tr>
</tbody>
</table>

Note: Marking conditions shown to the right.
Workpiece: Aluminium
Letter height: 1mm

Marking at the same speed

Without G-DAC

With G-DAC

Note: Laser conditions: 100kHz, 100%; Workpiece: Aluminium

The focus point can be moved 170±10mm for the MX-Z2000H, and 220±10mm for the MX-Z2005H.

Mark Clearly and Cleanly Even at High Speed

(G-DAC)

G-DAC stands for the OMRON-developed Galvano Dynamic Acceleration Control.

The G-DAC feature adjusts the laser marking speed for optimum performance, based on the marking details. This speed flexibility enables high-speed, clean marking.

Note: G-DAC performance depends on the application. Be sure to test your application in advance.
**Direct Finder Link**

The MX-Z2000H series enables direct connectivity between the image processing system and the laser marker that traditionally required PLC processing. This means, there is no need for a PLC to do the linking between the vision system and the laser marker.

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**Example Application**

To mark a product in the same area everytime, an image processing system measures the position reference, transfers the position coordinates and the laser marker adjusts itself to mark in the correct place. After the laser marking is completed, the image processing system can also read a 2D code or any other inspection of the data or images just marked on the product.

**MX-Z2000H series laser marker**

- **Finder option**
- **FH series image processing device**

1. Use image processing to measure the position difference.
2. Compensate for position differences and mark correctly.

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**Notes:**
1. The optional finder feature is required to use this function.
2. As the end of April 2017, corresponding image processing system is OMRON FH series and part of FQ2 series. Please refer to finder option catalogue Q2SS-E1 to select image processing system.

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**Position-correction without the need of a PLC**

**Enhanced Functionality**

Improves Productivity

**Connectivity & Traceability**

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**FROM**

- Marker control program
- Connection settings
- FH control program
- Inspection detail settings
- FH series image processing system

**TO**

- Marker settings
- Inspection settings
- Inspection detail settings
- FH series image processing system
- Obtain results

No need for PLC programming for each device.
Easily Configure a Traceability System

**Traceability Log**

Archive marking data, and other data to a log, etc. Simplify both traceability and preventive maintenance.

**System Concept Example**

- **Database**: Marking data, inspection data, etc.
- **Traceability Log**: Marking data, marking time, power check results, laser operating time, etc.
- **EtherNet/IP™**: NJ series database connection, FH series image processing system

**Smoothly Integrate External Control**

**EtherNet/IP™ Compatibility**

The MX-Z2000H series is compatible with various kinds of external control. Built-in I/O connections, RS-232C, Ethernet, and EtherNet/IP™ simplify programming to control the system from a PLC.

*Please check the user’s manual before using available functions and commands.

**Marking for Small Lots with Multiple Variants**

**Data can be shared with external storage**

The MX-Z2000H series can access the marking data that is stored on an Ethernet server to keep up with the tremendous amount of data used for multi-variant, small lot productions. This simplifies the switching of marking data for each variant.
Withstands Severe Conditions and Meets International Standards

Durability/Safety

Stable Operation Even in Dusty/Wet Environments

**Durable IP65 Head**

The laser head (where the laser light is emitted) has a double glass cover to keep dust and moisture away and ensure air-tightness.

IP65 means dust-proof and wash-down capable, compatible with IEC60529. It consists of the two numbers, 6 and 5.

<table>
<thead>
<tr>
<th>Protection against water</th>
<th>Protection against solid objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>5: Protection from water, up to water projected by a nozzle against the enclosure from any direction.</td>
<td>6: Complete protection from dust.</td>
</tr>
</tbody>
</table>

The double glass cover makes it easier and safer to change the glass.

**Meets Safety Requirements and Standards**

**NEW** Built-in Safety Relay Circuit

When building a machine to meet the ISO 13849-1 (JIS-B9705-1) criteria, you have to provide safety measures for the total machine in which the laser marker is installed. The MX-Z2000H series has 2 safety relays in the controller, and sending an emergency stop signal from an external controller to the interlock terminals will absolutely stop the power supply to the laser. The safety relays installed on the back of the controller can be easily replaced in case of failure.

The laser beam can be emitted within 1 second after returning from laser shutdown by Omron’s original fiber laser system.

**Interlock System Configuration Example**

Note: Be sure to read the manual and other materials thoroughly before designing your system.

**Meets International Standards and Regulations**

The laser markers meet each standard and regulation. They can now be used internationally.

Note: For details about exact countries and areas, contact your local OMRON representative.
OMRON’s Fiber Lasers

All-fiber Lasers Provide High Quality, High Stability, Long Life

MOPA Fiber Laser

Typical solid-state lasers use mirrors to resonate and amplify the laser, and then Q-switching to output the laser. However, this approach makes it difficult to achieve a high quality and flexible laser. It also leaves something to be desired in the areas of reliability and durability. OMRON has achieved high quality, high stability, long life and flexibility by eliminating the resonator configuration and using the MOPA approach.

High Beam Quality
The closer the beam is to a perfect circle, the higher the quality of the laser. OMRON lasers have a very round, high quality beam, as shown to the right.

Corrects for Lens Distortion

High Position Resolution/Coordinate Correction

Precision positioning is now possible for fine detail, and processing area distortion is minimized. Coordinate correction is provided to eliminate errors based on installation.

Example Applications

Marking a scale
Marking on electronic parts in a tray
Operation Flexibility Increases Throughput With Less Effort

Edit the Marking Data Directly on the Laser Marker

Editing Data

There is no need to buy separate editing software, or a computer to edit data. Data editing functionality is built right into the laser marker itself, simplifying the process.

Offline Editing Software is Also Standard

You can also use a separate computer if you choose, to create and edit the print data, including graphics, with the same functionality as is built into the laser marker.

Simplifying Positioning and Other Floor Work

Optional Features

Finder (Vision Attachment)

The Finder feature enables visual positioning of small parts for marking or processing, as well as automated positioning and inspection with a vision system. This simplifies the system configuration, reducing processes, cycle time, and costs.

Laser Marking Samples

<table>
<thead>
<tr>
<th>Original Font</th>
<th>Original Font (Japanese)</th>
<th>Original Font (Roman)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0123456789789</td>
<td>ABC012 abcd ef</td>
<td>ABC012 abcd ef</td>
</tr>
<tr>
<td>0123456789</td>
<td>ABC012 abcd ef</td>
<td>ABC012 abcd ef</td>
</tr>
<tr>
<td>0123456789</td>
<td>ABC012 abcd ef</td>
<td>ABC012 abcd ef</td>
</tr>
</tbody>
</table>

Arial  Times New Roman

[Catalogue Reference: Q255-E1]
Specifications

### Processing laser
- **Type**: Fiber laser
- **Wavelength**: 1,062nm
- **Class**: Class 4 (IEC60825-1)
- **Average output**: 20W (Fiber laser transmitter output)
- **Output mode**: Standard mode/EE mode*2
- **Repetition frequency**: Standard mode: 1kHz to 1kHz steps/EE mode: 1kHz to 1kHz steps
- **Pulse train width/patterning**: Standard mode: 75ns-100ns (1pattern)/EE mode: 150ns-450ns (1pattern)
- **Guide laser and focus pointer**
  - **Type**: Semiconductor laser wavelength: 655nm
  - **Laser class**: Class 2 (IEC60825-1)
- **Optical specifications**
  - **Marking area**: MX-Z2000H-V1: 160x160mm, MX-Z2050H-V1: 220x220mm
  - **Working distance**: 150x120mm
  - **Working distance range**: 220x220mm
- **Scanning specifications**
  - **Scan speed**: 1-1,200mm/s
  - **Marking resolution**: 4μm
- **Detail of marking**
  - **Text**: original/normal
  - **Gcode**: CODE39/NW-7/ITF/CODE128/JAN
  - **2D code**: QR code/Micro QR code/Database/Matrix(200)/GS1 Database/Matrix(ECC200)
  - **Shape**: Fixed point/Straight line/Circle/Rectangular
  - **3D shapes**: Slope/Step/Cylinder/Truncated Cone/Sphere
  - **Image and CAD**: BMP/JPG/PNG/DXF
- **Settings**
  - **No. of data/blocks**: Marking data: 10,000 blocks: 2,048
  - **Text setting**: 0.1mm~12.0mm
- **Cables**
  - **Fiber cable**: 4.5m Minimum bending radius: 100mm
  - **Marker head control cable**: 5m Minimum bending radius: 100mm
- **External interface**
  - **Terminal block and I/O connector**: Terminal block input: 20pins/NI/FPN; terminal block output: 14pins/NI/FPN; I/O connector: 7pins/NI/FPN; interlock terminal: input/output 6pins
  - **Serial communications**: RS-232C/RS-422A
  - **Ethernet communications**: Ethernet: 10BASE-T/100BASE-TX/100BASE-T/1000BASE-T/EtherNet/IP*7
  - **Power supply voltage**: 100 to 120VAC, 50/60Hz; 200 to 240VAC, 50/60Hz
  - **Power consumption**: at 100VAC: maximum 390VA, at 200VAC: maximum 420VA
  - **Ambient conditions**
    - **Operating ambient temperature**: 0°C to 40°C, 30% to 85%RH (no condensation)
    - **Storage ambient temperature/humidity**: -10°C to 60°C, 30% to 85%RH (no condensation)
    - **Installable environment**: Indoor, 3,000m, max.
    - **Pollution degree**: 2
  - **Protection structure**: IP65
  - **Cooling method**: Forced air cooling
  - **Weight**: Marker head: Approx. 15kg, Controller: Approx. 25kg
  - **Size**: Marker head: 140×H230×D415mm (excluding projections), Controller: 225×H430×D390mm (excluding projections)
  - **Installation direction**: Marker head: All directions of up, down, left, and right (intake vent on the left side face must not be blocked) Controller: Must be installed vertically.
  - **USB interface**
    - **USB memory**: Controller front panel: Type A connector, keyboard/mouse: controller back panel: Type A connector
  - **Accessories**
- **Notes**
  - *1 Faster marking for resins and plastics films (1.8x faster than MX-Z2050H, 2x faster than MX-Z2000H. In case of the fill marking on a plastic film)
  - *2 EE mode: Energy Enhanced mode (optional)
  - *3 There are restrictions on functions and commands that can be used by each external interface. Please check the user’s manual before use.
  - *4 The operating temperature may be limited due to the processing conditions. When using their laser continuously or close to continuously for laser processing, etc., please contact OMRON in advance.
  - *5 The operating temperature may be limited due to the processing conditions. When using their laser continuously or close to continuously for laser processing, etc., please contact OMRON in advance.
  - *6 Do not use the USB interfaces for anything other than the specified applications.
  - *7 The following environment is required for using the offline editing software and font logo editor
  - - Computer with a USB 2.0 or 1.1 port
- **Items Sold Separately**
  - MX-9101: Controller power supply cable (PSE,UL) plug type B
  - MX-9202: Controller power supply cable (VDE,ULS) plug type F
  - MX-9230: EE mode activation key
  - MX-9234: USB memory: Controller front panel: Type A connector, keyboard/mouse: controller back panel: Type A connector

### External dimensions
- **Marker head** (Unit mm)
  - Width: 140mm
  - Height: 230mm
  - Depth: 8mm, Shrink 8
- **Controller**
  - Width: 225mm
  - Height: 430mm
  - Depth: 390mm

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**Notes**

- Use commercially available products for the other devices required: USB keyboard, USB mouse, and monitor (VGA 3-row 15-pin, or DVI-D input with 1,280x720 minimum resolution).
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