GX-F ADVANCED Series
Power lies in what a fiber laser can do, not in the kilowatts it has. With the latest in artificial intelligence (AI) and gas reduction technology, the new GX-F ADVANCED Series of two-dimensional fiber lasers delivers more power while using less nitrogen.

Artificial intelligence is a branch of computer science that automates intelligent behavior and machine learning. This means the machine itself can learn from data and adjust performance without human intervention.

With the manufacturing industry suffering from a shortage of experienced workers, Mitsubishi designed this new generation of fiber lasers to minimize the need for operator input while maximizing quality and productivity.

Designed by Mitsubishi engineers and all major components built by Mitsubishi, the GX-F Series is one of the only laser systems in the industry with a single source for service and support.

**Features**
- Advanced artificial intelligence technology
- Mitsubishi-designed automated zoom head
- Nozzle changer
- AI-assisted cutting
- Augmented reality with drop and cut, part rotation, and rectangular nesting
- Visible Processing Status (VPS)
- Advanced Gas Reduction (AGR eco)
- Dynamic Drive Control (DDC)
- Diesel Reduction Control (DRC)
- Plasma Guard Control (PGC)
- High Peak Piercing (HPP)
- Mel’s Eye (Plasma, Burn and Burst Detection)
- Protective Process Window Monitoring

**Benefits**
- User-friendly, smartphone-like controls
- Major components built by Mitsubishi
- High processing stability with superior beam-quality consistency
- Beam cleaning and anti-reflection technologies
- Faster processing and more stable processing
- Reduced operator input
- No setup time between materials
- Lower operating cost translates into higher profitability
- Longer consumables life
- No material-surface scratching
- Optimized cutting speed
- On-site or remote monitoring of cutting process
- Reduced piercing time
- Remote diagnostics and predictive maintenance
- Single-source, robust training, service and support
- Five-year oscillator parts warranty
- Two-year machine tool warranty
- Two years of remote360™, Mitsubishi’s advanced machine monitoring system

MC Machinery Systems, a subsidiary of Mitsubishi, is the U.S.-based supplier and servicer of Mitsubishi Electric laser and automation systems, drawing from an extensive global source of support and innovation. Our expertise spans virtually every aspect of metalworking—from simple fabrication to CNC-driven, automated manufacturing cells. Serving industries including aerospace, mold and die, job shops, medical, and energy, MC Machinery is headquartered in the Chicago area, with technology centers in Concord, N.C.; Cypress, Calif.; Pine Brook, N.J.; Dallas, Tex.; Querétaro, Mexico; and Richmond Hill in Ontario, Canada.

LESS INPUT. MORE OUTPUT.
Mitsubishi Electric’s original AGR-eco technology can decrease nitrogen consumption by up to 77 percent.

The GX-F ADVANCED Series performs real-time electrical and assist gas consumption monitoring.

Not only that, since nozzles don’t come into contact with the material, consumables last longer.

- This also means no scratches on the material surface.
- Working material thickness can range from 1/16” to 1”.

**LOWER OPERATING COSTS MEAN HIGHER PROFITS**

Mitsubishi Electric’s proprietary optical system offers optimal control of the beam according to the material and plate thickness. The zoom head delivers speed and flexibility by automatically changing the beam size, shape and focal point for each material. It also processes plates with a wide range of thicknesses.

Because it’s not necessary to exchange the processing lens according to plate thickness and material, setup time is significantly reduced.

- Operators can switch between sheet material of different thicknesses quickly and without compromising cutting quality.
- Piercing time is reduced by as much as 60 percent, making it possible to pierce a 25-mm-thick mild steel within 0.8 seconds.

**ADVANCED ZOOM HEAD ADDS MORE VROOM**

The Mitsubishi Zoom Head Delivers Speed and Flexibility.

Conventional head requires three-step switching

Stepless switching of zoom head mechanism reduces setup time

**Advanced Gas Reduction (AGR-eco)**

- Stainless steel 6 mm
- Mild steel 6 mm

Up to 70% N₂ gas reduction with stainless steel

Up to 77% N₂ gas reduction with mild steel

Stainless steel 6 mm

Mild steel 6 mm
The “brains” behind the GX-F ADVANCED Series is the proprietary Mitsubishi Electric artificial neural network technology Maisart®, which imitates neurons in the human brain. It uses audio and light sensors to monitor the cutting process in real time, automatically adjusting parameters to optimize cutting performance.

Also used in automobiles to help prevent accidents, Maisart is the foundation of the GX-F ADVANCED Series, creating a nonstop processing system for maximum productivity.

**AI-ASSIST MAKES IT SMART**

**AI Diagnosis**
If a bad cut is detected, the machine will make the required adjustments to improve or regain the cut. The system can also optimize the cutting speed in all plates, no matter the plate quality.

**AI Nozzle Monitor**
The AI nozzle monitor uses a camera system to monitor nozzle life. If it doesn’t detect any nozzle damage during its inspection, the processing parameters are adjusted automatically.

**Nozzle Changer**
Nozzles that are determined to be defective by the nozzle monitor are automatically replaced with new ones to support continuous processing for a long period of time.

**Intuitive, User-Friendly Control**
The intelligent M800 control offers a generous 19-inch user interface. The status of the machine and work can be displayed simply on one screen or as a detailed analysis, whichever the operator desires.

Key features include:
- Intuitive, user-friendly operation similar to a smartphone
- Customizable home screen
- Real-time condition adjustment and correction
- Intelligent cutting assist
- Simple multi-part nesting
- Online job scheduling and runtime estimator
- Automatic sheet detection
- Scrap cutting
- Real-time tracking of electrical and assist gas consumption
- Micro-tabbing on the fly
- Advanced help and maintenance screens
- The operator can monitor the cutting process from the machine or remotely

**AI Diagnosis**
If a bad cut is detected, the machine will make the required adjustments to improve or regain the cut. The system can also optimize the cutting speed in all plates, no matter the plate quality.

**AI Nozzle Monitor**
The AI nozzle monitor uses a camera system to monitor nozzle life. If it doesn’t detect any nozzle damage during its inspection, the processing parameters are adjusted automatically.

Automatically changes nozzle using nozzle changer

Automatically adjusts to processing conditions

Nozzle “OK”

Nozzle faulty

Nozzle Changer
Nozzles that are determined to be defective by the nozzle monitor are automatically replaced with new ones to support continuous processing for a long period of time.
Mitsubishi Electric’s augmented reality (AR) technology displays overhead 3D images of the system at all positions without distortion, intuitively recognizing the positional relationship between materials and the processing head. The program shape can be easily placed with a drag operation, significantly reducing the setup time for off-cut materials.

**Advantages of Mitsubishi’s Fiber Laser Oscillator**

- **Dynamic power reserve**
- **Extended lifetime structure**
- **Maximum processing capabilities**
- **Compatible with Mitsubishi CNC for high-speed response control**
- **Automated beam selection for improved processing stability**
- **Stable processing of different materials means less variation in beam quality**
- **Enables N2 cutting of pure copper**
- **Integrated with remote diagnostics for preventive maintenance**
- **Total service support by MC Machinery**
- **Five-year parts warranty**

**Key Features**

- **Augmented Reality**
- **Simple Multi-Part Nesting**
- **Drop Cut**
- **Move and Rotate**
- **Renesting**
BUILT FOR AUTOMATION

The GX-F ADVANCED Series was built to seamlessly integrate with automation systems that increase productivity and reliability by automating production processes, including material loading, laser processing, laser sorting (lasorting) and material unloading.

A fully automated system means less downtime for unloading, parts removal, sorting and machine adjustments. It also means you’ll need fewer skilled operators—a significant advantage as the manufacturing industry faces a continued shortage of an experienced workforce.

And because our automation is modular and flexible, it can grow with you. With our wide range of options—including configurations that require 30 percent less floor space than typical laser automation setups—we have a solution for virtually any application.

To maximize your shop’s productivity, our laser automation experts can work with you to determine the right combination of laser, material storage, material delivery/removal and part sorting.

PREMIER TRAINING, SERVICE AND SUPPORT

Regionalized Service Network

With our industry-leading regionalized service network, we have the most experienced, knowledgeable and responsive employees in the industry. We’re here for you with phone support, operation training, on-site service, parts inventory and a robust, interactive website.

- With regionalized locations throughout North America, we can respond promptly to your service needs.
- We have the largest fleet of service vehicles in the field—three times more than any other company in the industry.
- From installation and on-site training to support and service throughout the life of your system, our national service network is just a phone call away.
- You’ll have access to 24/7 support, a detailed interactive parts catalog, printable machine manuals and software.

Application Support

The value of our support stretches well beyond service, parts and training. Our experienced and creative team members put their knowledge and problem-solving skills to work for you—offering application and engineering support that includes creating specialized shop-floor setups that work harder and get better results. Whether developing integrated manufacturing cells from the ground up or adding specific solutions to complement existing operations, our pre-sales, sales, installation and application support staff can help you eliminate bottlenecks, improve accuracy and drive throughput.

remote360™ Machine Monitoring

The GX-F ADVANCED Series has a two-year machine tool warranty for parts and labor and a five-year oscillator parts warranty. Also included is two years of the remote360 machine monitoring software system.

remote360 is a robust production monitoring and support solution offering real-time data to help increase productivity, improve efficiency and reduce downtime. It provides:

- Email and mobile notifications of stoppages, completions and maintenance warnings
- Dashboard display of runtime performance by shift, day, week and month
- Proactive support with real-time monitoring and remotely connected service technicians

Watch a video of the ASTES4 in action

APPLICATION SUPPORT
# SPECIFICATIONS

## MACHINE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Available Platform</th>
<th>ML 3015 GX-F ADVANCED</th>
<th>ML 4020 GX-F ADVANCED</th>
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<tbody>
<tr>
<td>X – Axis Stroke</td>
<td>122” (3100 mm)</td>
<td>161.41” (4100 mm)</td>
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<tr>
<td>Y – Axis Stroke</td>
<td>61.61” (1565 mm)</td>
<td>82.67” (2100 mm)</td>
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<td>Z – Axis Stroke</td>
<td>4.72” (120 mm)</td>
<td>4.72” (120 mm)</td>
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<tr>
<td>Maximum Processing Feed Rate</td>
<td>3937 in/min (100 m/min)</td>
<td>3937 in/min (100 m/min)</td>
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<tr>
<td>Maximum Work Piece Weight</td>
<td>2094 lbs. (950 kg)</td>
<td>3637 lbs. (1650 kg)</td>
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<tr>
<td>Table Pass Height</td>
<td>35” (890 mm)</td>
<td>35” (890 mm)</td>
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<tr>
<td>Rapid Travel Speed</td>
<td>6700” in/min (170 m/min) simultaneous</td>
<td>6700” in/min (170 m/min) simultaneous</td>
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<tr>
<td>Repeatability</td>
<td>±0.00039” (0.0099 mm)</td>
<td>±0.00039” (0.0099 mm)</td>
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<tr>
<td>Machine Weight</td>
<td>20,723 lbs. (9400 kg)</td>
<td>29,843 lbs. (13,537 kg)</td>
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## OSCILLATOR SPECIFICATIONS

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<th>Manufacturer</th>
<th>Mitsubishi Electric</th>
<th>Mitsubishi Electric</th>
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<tr>
<td>Excitation Method</td>
<td>Ytterbium Doped Fiber</td>
<td>Ytterbium Doped Fiber</td>
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<td>Wavelength</td>
<td>1.07µm</td>
<td>1.07µm</td>
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<td>Available Output Power (CW)</td>
<td>4 kW, 6 kW, 8 kW, 10 kW</td>
<td>4 kW, 6 kW, 8 kW, 10 kW</td>
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<td>Processing Head</td>
<td>Zoom</td>
<td>Zoom</td>
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<td>Delivery Method</td>
<td>100µm Fiber Cable</td>
<td>100µm Fiber Cable</td>
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