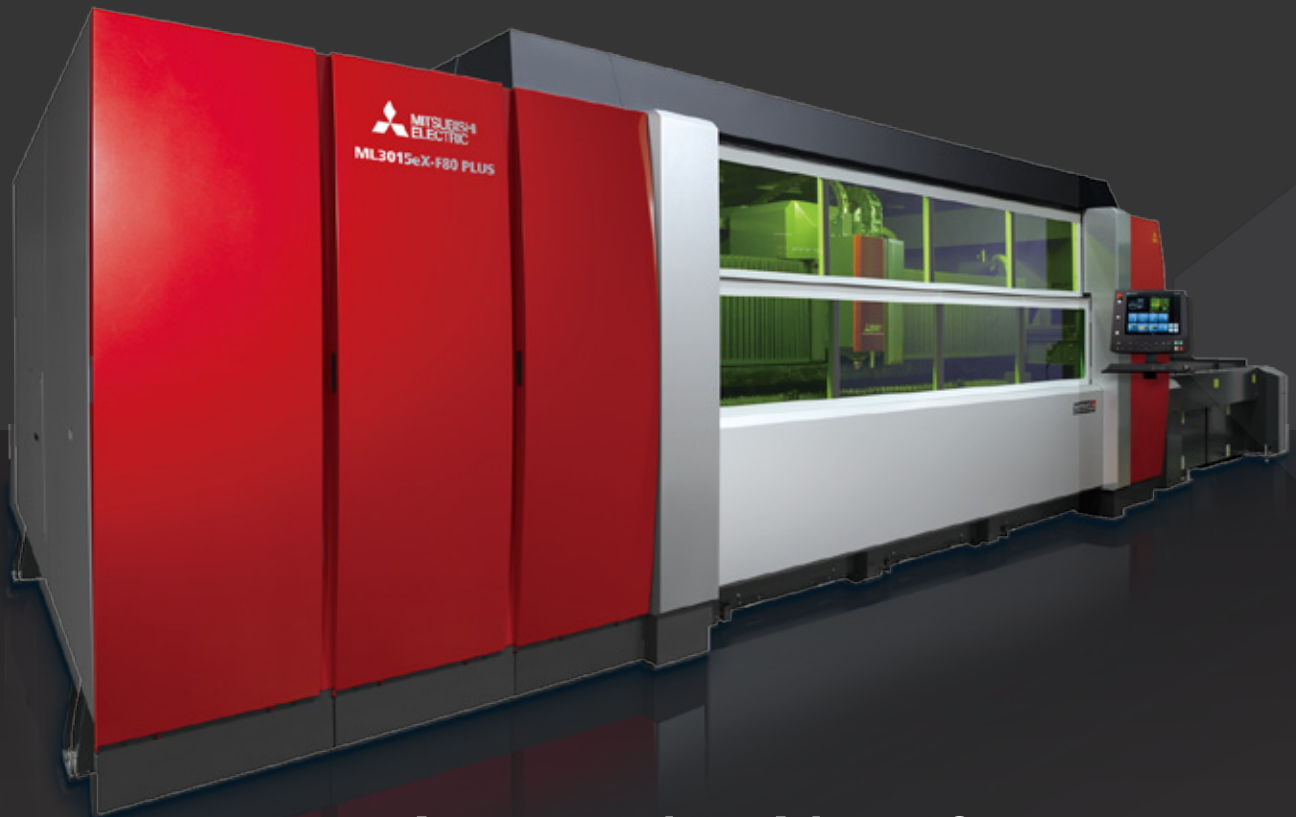


# ADVANCED<sup>0000</sup>

## eX-F SERIES





## Are you ready to Advance?

Mitsubishi's Advance 800 EX-F series is the premiere product in our FIBER line up. It features the new M800 control with enhanced industry leading functionality, but it's much more than just a new controller. Our engineers have paid close attention on how to integrate the best in electronics to enhance the laser cutting experience. Mitsubishi Electric is a world leader in industrial electronic controls and components. Part of our mission is to provide the best products and services with unsurpassed quality.

# The NEW M800 Series Control

## Take Control Of Your Cutting

Other PC-based controls can't compete with the sophistication of the new Mitsubishi 800 Series CNC control. Mitsubishi has utilized its vast experience to develop the most sophisticated and accurate controls in the Laser market. By implementing new Nano-Drive-Technology, the machine is able to achieve faster interpolation with unmatched accuracy. Our CNC controls includes a windows based 19-inch touch screen, prepared with many enhanced features for further flexibility.





# Standard Control Features



Introducing Our New Graphic Interface





Maintenance Diagnostics



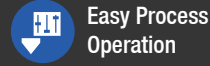
Simple and Auto Nesting



Remote Diagnostics



M-Cut (Motion Cut)



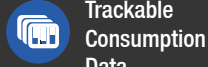
Easy Process Operation



Machine Diagnostics



Mobile App Accessibility



Trackable Consumption Data



Program Restart Functionality



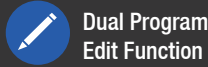
Slope Control



Advanced Start and Corner Control



Ethernet



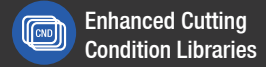
Dual Program Edit Function



Multi-Language Interface



Double Cut



Enhanced Cutting Condition Libraries



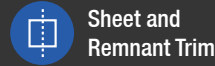
USB



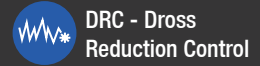
Common Macro Shape Library



Production Schedule



Sheet and Remnant Trim



DRC - Dross Reduction Control



Remote 360



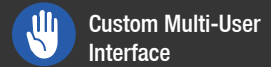
Part Time Estimation



Sheet Edge and Size Detection



Adaptive Micro-Joints



Custom Multi-User Interface



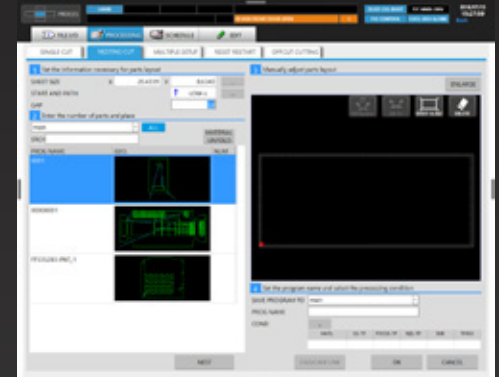
### Easy Process Operation

Gives the operator access to multiple operation screens at once. Any operation can be accessed from this page.



### On-board Maintenance Manuals

Fully illustrated maintenance and application guides.



### Auto-Nesting

Nest multiple parts easily by selecting them from the parts library.



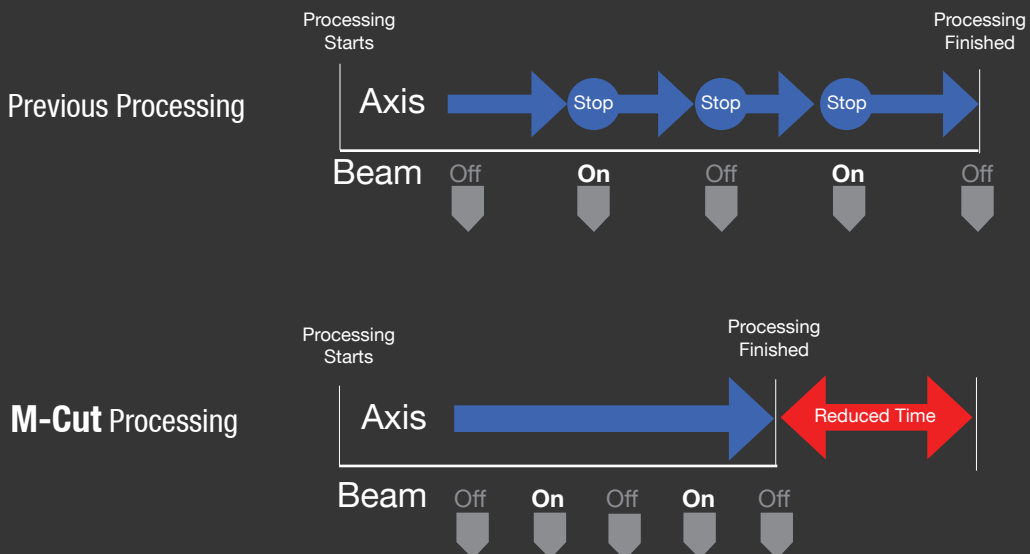
## Standard Control Features (Continued)



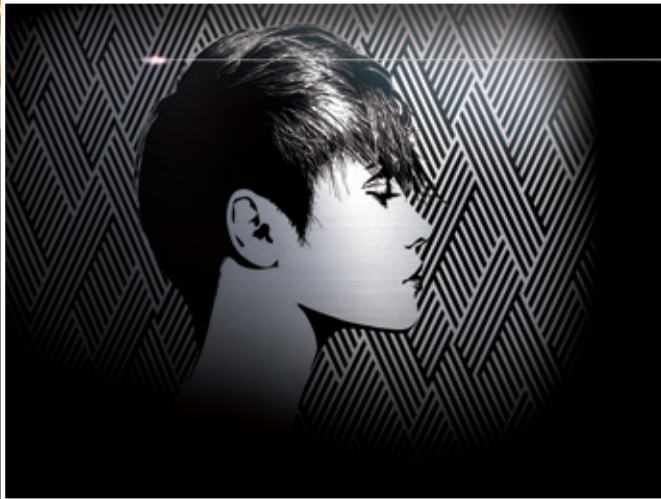
### M-Cut Advantage

For maximum production on a fiber laser, especially when running components with complex geometries, Mitsubishi has upped the traditional ante to introduce **Motion Cut** (M-Cut) technology.

New software calculates the timing to control the oscillator according to the position of the axis. A high-speed communication unit between the CNC and the control board allows for ultra-fast communication thanks to signal delay reduction. The laser power control, exclusive to fiber lasers, provides a beam On/Off time of 1 microsecond.



High-speed communication between the oscillator and control unit controls turning the beam on/off without stopping the axis, thereby reducing processing time.



## Tough Geometries

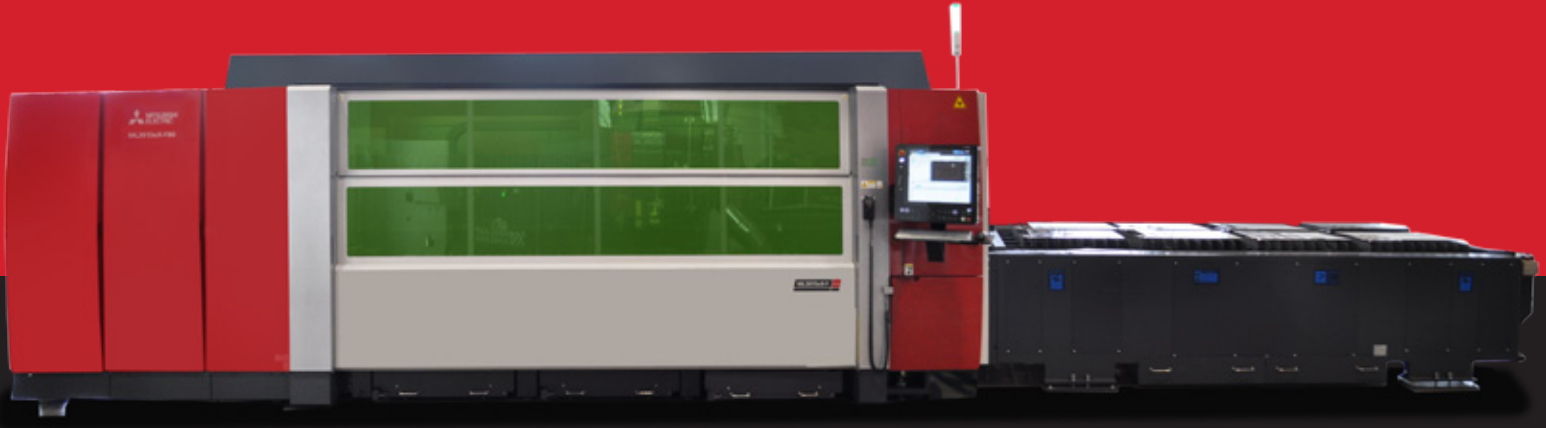
Traditional technologies worked fine for square or rectangular cutting in fiber lasers, as they relied on the axes perpendicular travel to coincide with 90 degree angles. When faced with complex or intensive geometry, traditional controls slowed down the processing due to axial stoppage at start point. The M-Cut function controls the ON/OFF timing to eliminate the need for axes to stop, and increasing process speed, and ultimately, the bottom line.

## It All Adds Up

The M-Cut Control allows an operator to cut multiple shapes without the axes having to stop which saves **time**, provides industry-leading **speed with less power input** and **greater cost efficiency per part**.



## Standard Machine Features



Coupled with the new M800 control, the eX-F utilizes many standard features to improve overall operability and user experience. The machine is automation ready and comes standard with an automatic pallet changer. Many functions on the machine are now automated to greatly reduce the need for operator intervention, and eco mode can be used to reduce energy costs. For added functionality, the machine now has an automatic safety door, LED status tower, and two high pressure gas ports.



Dedicated Nano Control Drive System



Auto Pallet Changer



Industry 4.0



Auto Safety Door



Auto Gas Purge



Helical Rack and Pinion



K-Cut K-Cut



B-Cut Brilliant Cut



Automation Ready



Eco Mode



High Precision



Auto Nozzle Cleaning

## Optional Features



Scanner

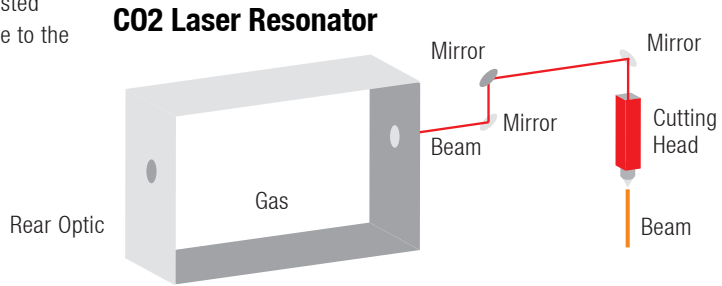


Nozzle Changer

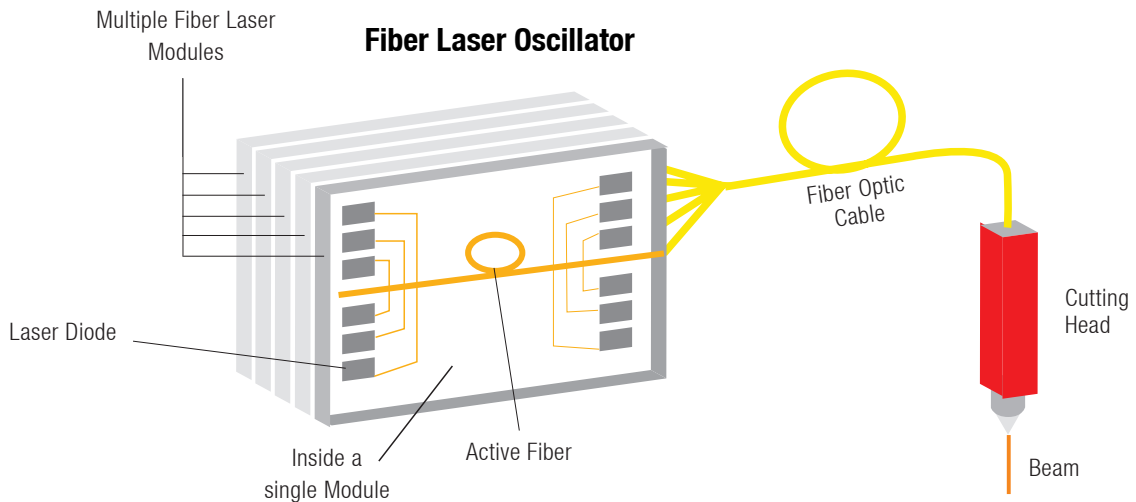


# CO2 Laser vs Fiber

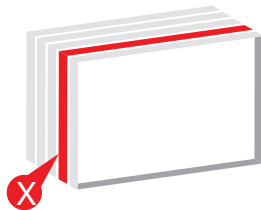
**Conventional lasers** deliver the laser beam through mirrors and adjusted optics. They can be delicate due to the precise alignment of mirrors.



**Fiber lasers** deliver the laser entirely through a flexible optical fiber cable, eliminating any need for mirrors or optics. They have a monolithic, entirely solid state, fiber-to-fiber design and, being more rugged, are able to perform in variable working environments. These features make fiber lasers easier to integrate and operate in production, medical, and other laser-based systems.



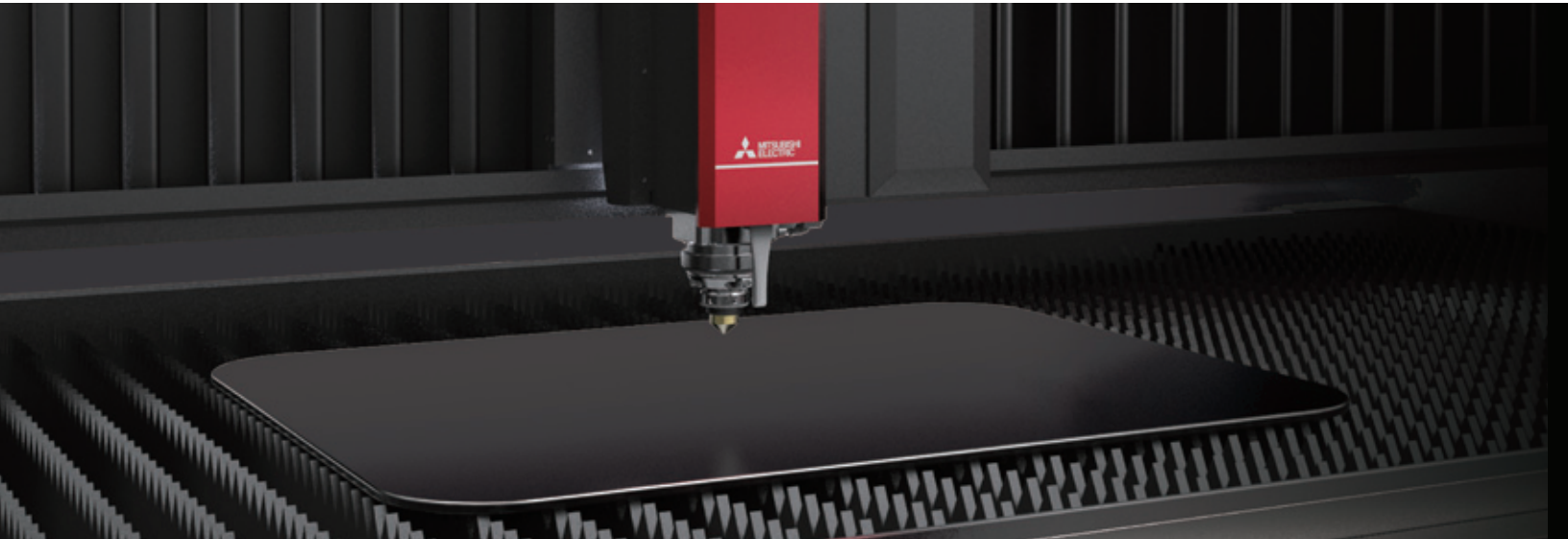
## Continuous Operation



**Hot Reserve Function** Unlike CO2 Resonators, when a failure occurs, continuous operation is possible. The Laser Diodes run at 80%, which means should failure occur, the unused diodes keep the job running.



# Standard Cutting Head Features



## The All In One Head Design

The Zoom Cutting Head features an "All In One" design with an Auto Focus range from 3.75 ~ 10 inches. This allows multiple sheet thickness cutting up to as much as **1" mild steel** with minimal setup and **no lens or cartridge change required**. The design includes:



**Auto Focus**  
Focal Range  
From 3.75 ~ 10"



**Collision Protection:**  
The Industry's  
Best Magnetic  
Breakaway Fiber Head



**Plasma Guard Control**



**Pierce Detection**



**Mel's Eye**



**Automatic Beam Mode Manipulation**  
From thick to thin based  
on the material



**Anti-Spatter Spray**



**Auto Height Calibration**



**Plasma Detection**



**Burn Detection**



## **HPP (High Peak Pierce)**

The New HPP Side Jet delivers a powerful shot of air during the pierce.

1. Reduces Pierce Time.
2. Minimizes Buildup of Pierce Spatter.
3. Reduces Heat absorbed by the part.
4. Allows for smaller hole diameters.

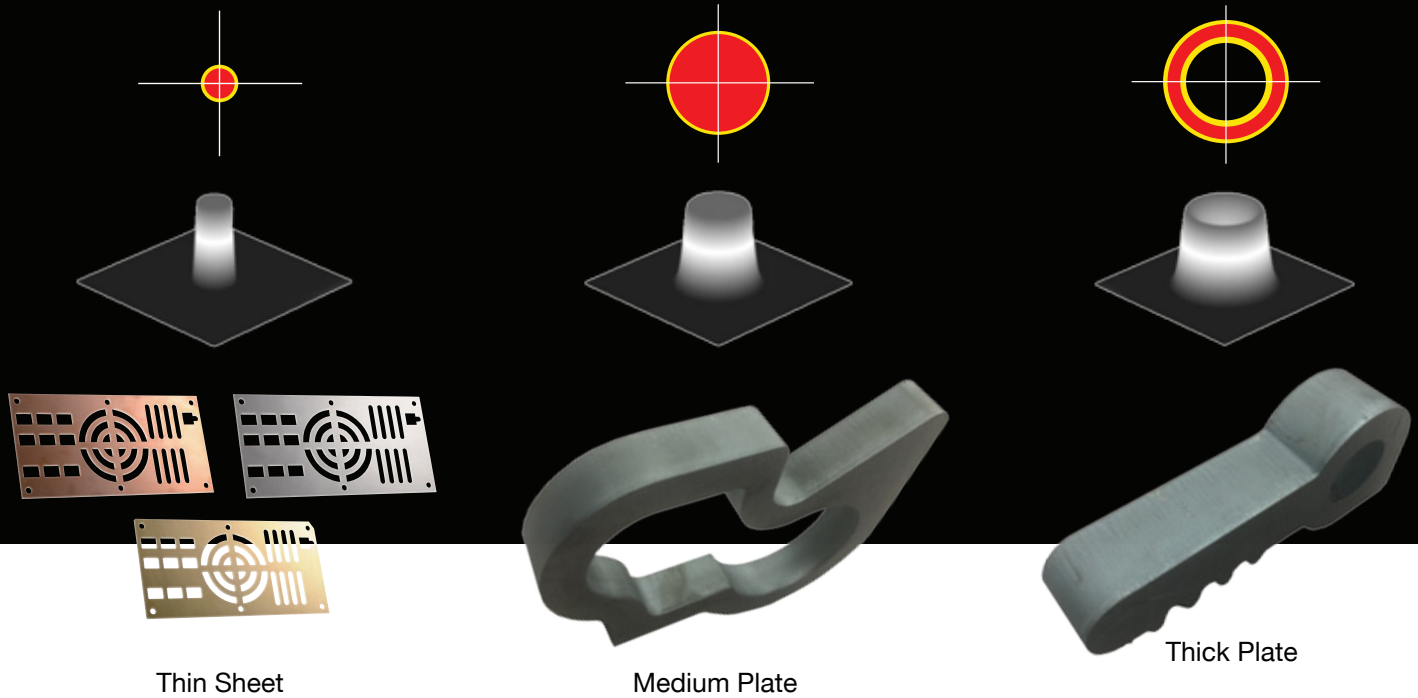


Conventional Pierce  
1" Mild Steel



HPP Pierce 1" Mild Steel

## Beam Mode and Spot Size Manipulation



Thin Sheet

Medium Plate

Thick Plate

## What's different

Head	Zoom Head	Standard Head
<b>Style</b>	All in one	F5" Lens / F8" Lens
<b>Spot size</b>	140 to 400 micron	200 or 300 micron
<b>Focus adjustment range</b>	40mm	35mm
<b>Lens move speed</b>	3000mm/min	450mm/min
<b>Lens cooling</b>	Water & Purge gas	Purge gas
<b>Spot size change</b>	Zoom Head	Lens Cartridge change

# SMARTFLEX AUTOMATION

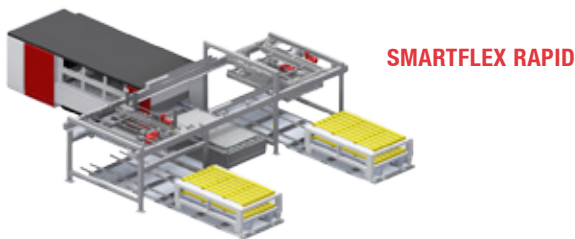
**The industrial Laser World has evolved. Faster lasers require faster automation.**

Mitsubishi's laser automation solutions have been engineered and manufactured for productivity and reliability. Your automation needs to keep up. With Mitsubishi, it will.

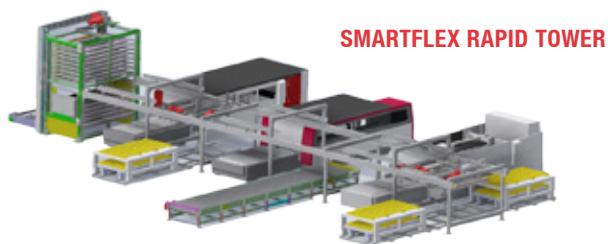
## SMARTFLEX RAPID

### OUR FASTEST AUTOMATION OPTION

SmartFlex RAPID features an industry leading 52 second load/unload cycle time. With intelligent, fully independent load and unload units, the RAPID provides unrivaled speed and flexibility for multiple lasers. Confidently serve up to 4 lasers with one line.



With dual automated SmartStation carts for both load and unload, the SmartFlex RAPID is as fast as it is flexible. Each SmartStation is capable of supporting 11,000lbs of raw material or finished goods.



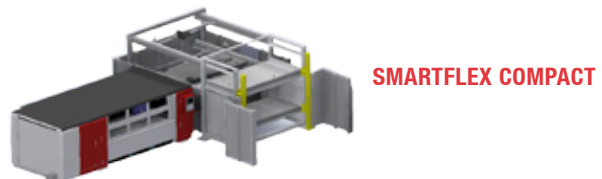
Integrate a low profile storage tower with 6,600lbs per shelf capacity and you have a full FMS system that can grow with you.

- Available with up to 22 shelves, resulting in a capacity of over 145,000lbs of raw material.
- A second or even a third storage tower can be added to drastically increase capability.
- By configuring one shelf as a second load station, changing material types for multiple lasers takes no additional time.
- Shelf spacing is 90mm (3.5") for use without skids or available at 190mm (7.5") for skid compatibility.

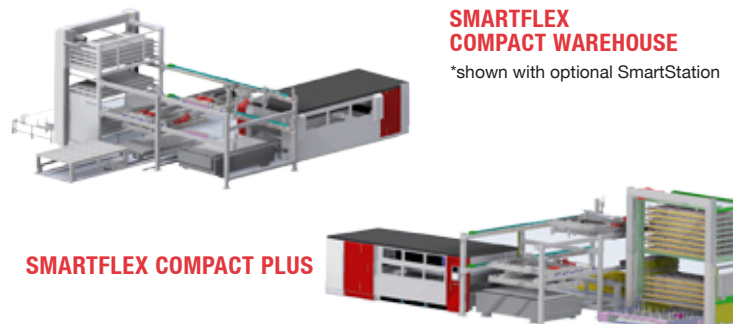
## SMARTFLEX COMPACT

### OUR INCREDIBLY FLEXIBLE SYSTEM

Mitsubishi's space saving COMPACT series of automation can fit in spaces the others can't. Extremely flexible, the SmartFlex COMPACT can even use the same tower for both raw material and finished goods, giving you options that can make you more productive. With a cycle time of only 75 seconds, this automation option is as fast as it is flexible.



With an installation footprint of less than 23'x35', the SmartFlex COMPACT is a purpose-built load/unload for maximum productivity in minimum space.



## SMARTFLEX COMPACT PLUS

The COMPACT Warehouse is specially designed to work seamlessly with the SmartFlex COMPACT Base Module to deliver options not found in most other systems. Finished sheets can be fed back into the storage tower for later use, or add a set of SmartStation carts for timelier de-nesting.

- Up to 16 shelves in a tower for maximum storage.
- Offload back to tower, SmartStation carts, conveyor, or a dedicated finished-goods tower.
- SmartFlex Compact PLUS for big storage in narrow spaces.

## GENERAL FEATURES OF BOTH

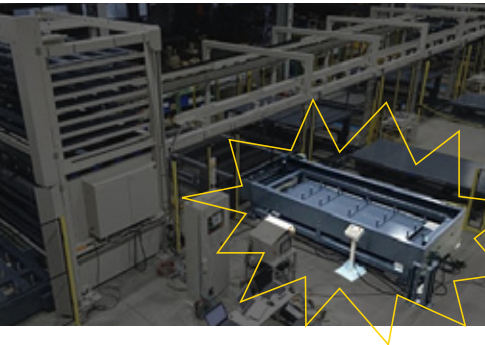
Our SmartFlex Rapid and Compact Automation designs take different approaches, but maintain standard key features such as:

- Designed to be completely modular and expandable.
- Aerial Positioning ensures accurate sheet location without time consuming cutting head edge detection.
- Automatic Sheet Separation and Thickness Detection. Never cut the wrong material again.
- Heavy Duty Load AND Unload with full 1.0" thickness capability.
- Tower shelves with 6600lbs capacity.
- Automated SmartStation Carts with a full 11000lb each weight capacity.
- Available conveyor.

## PRODUCTIVITY OPTIONS

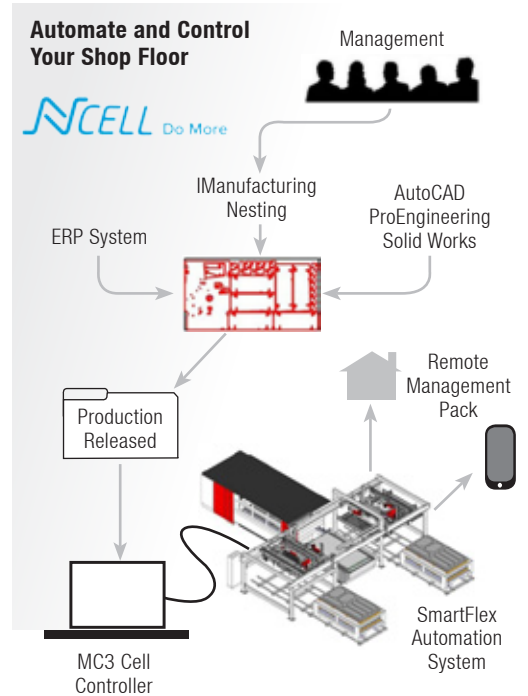


**Heavy Duty Conveyor:** At 10.5M (34.4') long, will hold 3 full 5x10 sheets of material up to 1.0" and facilitates lean manufacturing by allowing de-nesting in the same order as cutting. Also available in standard duty, non-marring belt type.



**Break In Station:** Allows loading or unloading of the laser independent from the Automation, giving you maximum flexibility. Want to break into production schedule for a hot job?

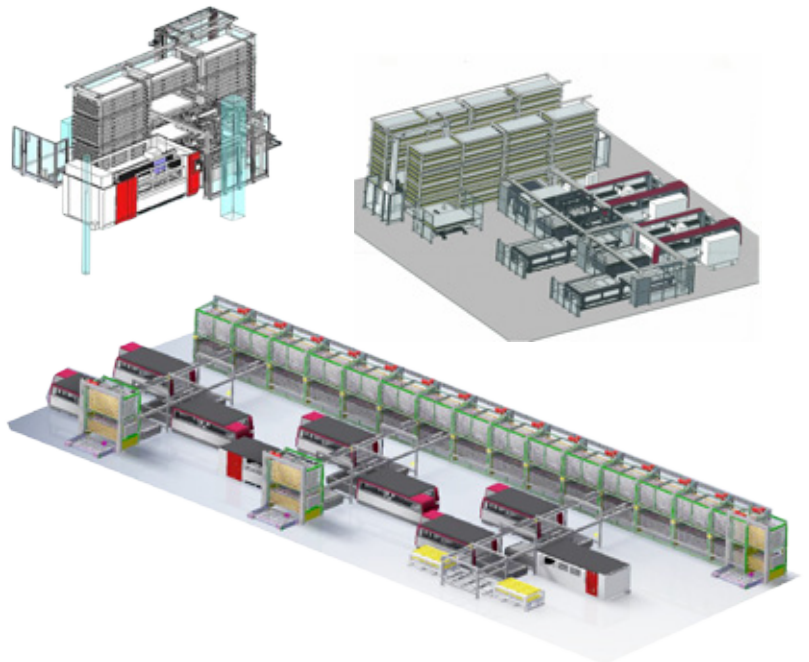
...Try **THAT** with another system...



## SMARTFLEX RIVER

Virtually unlimited storage and machine capability. Start small or go big: the capacity is limited only by your requirements and imagination. Ask us how this custom system can work in your shop.

- Single or double line.
- Design machine access from any bay for the flexibility to fit any shop.
- Max 25 shelves per bay.
- Integrate our SmartFlex RAPID or COMPACT style systems.
- Return finished goods to the RIVER when integrated with our COMPACT style feed system.
- Load weight 2720kg (6,000 lbs).
- Available with optional 190mm (7.5") shelf spacing for pallet compatibility.





## WHERE ARE YOU WHEN YOUR PARTS ARE FINISHED?

Receive live notifications straight to your phone when jobs are completed or interrupted.



A new level of support for your Mitsubishi machine.



### IMPROVE EFFICIENCY

View a realtime dashboard display of your machine's runtime vs. idle & stop time. Compare your machine's performance by shift, day, week, and month.



### ALERTS & NOTIFICATIONS

Set up e-mail or mobile notifications to see critical alarms, machine stoppages, job completion and maintenance warnings.



### PROACTIVE SUPPORT

MC Machinery will receive automatic notifications of critical and trending alarms allowing us to provide a proactive response to your service needs.

You can allow our technicians to remote into your machine control to fix and diagnose problems as they happen.

✓ Available for existing Mitsubishi Laser and EDM machines

# remote360<sup>®</sup>

[mcmachinery.com/remote360](http://mcmachinery.com/remote360)

**GET CONNECTED!**

630-616-5673

[remote360@mcmachinery.com](mailto:remote360@mcmachinery.com)



# THE INDUSTRY'S MOST RESPONSIVE SERVICE AND SUPPORT

With more than 200 employees, our regionalized Service Network is the most advanced and responsive team in the industry. We're here for you with phone support, operation training, on-site service, parts inventory and a robust, interactive website. With 20 locations throughout North America, and more scheduled to open, we can respond promptly to your service needs. For the best on-site customer service capabilities, we have more than 25 vans 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. No other company has a greater depth of experience and resources than Mitsubishi and MC Machinery Systems. Access 24/7 support with our interactive website, a detailed interactive parts catalog, printable machine manuals and software.



**OVER 60 SERVICE LOCATIONS IN NORTH AMERICA**



## Financing Solutions

**MAC FUNDING CORPORATION**

a subsidiary of  Mitsubishi Corporation

### Simple, Fast & Easy

Being a fellow Mitsubishi Corporation company, MAC Funding is an integral part of MC Machinery Systems. We work closely with MC Machinery to ensure every transaction is fast and simple, saving you time, effort, and most importantly money.

### Fast Track

For loans up to \$350,000, a signed loan application is all we need! The easy, one page application allows you to be approved within 24 hours. We also offer pre-approvals, allowing you to have your financing in place before you even decide on a machine!

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## ABOUT MC MACHINERY SYSTEMS

MC Machinery Systems customers get the best of both worlds: A single source for a diverse arsenal of manufacturing technologies and our expansive and knowledgeable support network. Our expertise spans virtually every aspect of metalworking—from simple fabrication to CNC-driven, automated manufacturing cells.





## APPLICATION SUPPORT

The value of our support stretches well beyond service, parts, and training. Our smart, experienced and creative team members put their knowledge and problem solving skills to work for you—offering application and engineering support that goes above and beyond what most suppliers can provide.

Having the widest range of manufacturing technology and expertise gives us the ability to create 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.

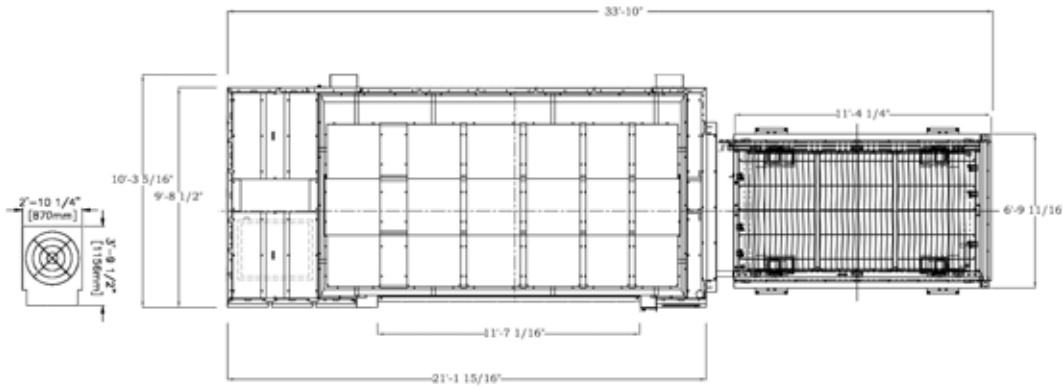
## MITSUBISHI CORPORATION

As part of the global Mitsubishi Corporation, MC Machinery Systems draws from an extensive global source of support and innovation. Mitsubishi Corporation employs more than 60,000 people around the world, across a wide spectrum of industries including machine tools and controls, automotive, aerospace, industrial machinery, elevator, energy, metals, chemical, food and textile. This diversity, strength and stability trickles down to MC Machinery Systems customers—who benefit from Mitsubishi's massive global R&D efforts and widespread knowledge base.

To learn more about Mitsubishi Corporation, visit [www.mitsubishicorp.com](http://www.mitsubishicorp.com).



## 3015 Advanced eX-F Layout



\*All machines in this brochure may be pictured with optional equipment.

### Processing Machine Specifications

Model Name		3015eX-F		
Machine structure		X/Y - Precision Rack & Pinion - Z=Precision Ball Screw		
Travel drive method		X-Y-Z simultaneous 3 axes (Z axis height control is also possible)		
Specifications and Performance	Max. workpiece size (inch)	120.1 x 60.0 (3050mm x 1525mm)		
	Table pass height	34.6 (879mm)		
	Processing access	Powered Manual Door		
	Pallet changer	Provided (Automation Ready)		
	Stroke	X-axis stroke (inch)	122 (3,100 mm)	
		Y-axis stroke (inch)	61 (1,565 mm)	
	Speed	Z-axis stroke (inch)	5.9 (150 mm)	
		Rapid travel speed (X, Y) (inch / min)	3940 (single axis), 5550 (simultaneous)	
	Precision	Max. processing feedrate (inch / min)	3937 IPM (50 m/min)	
		Positioning precision (inch)	.0019/20 (0.05/508mm)	
Drive motor type		Intelligent AC Servo		
Max. workpiece weight (lb)		2050 (930 kg)		
Machine unit dimensions (W x H x D) (inch)		408.3 x 88.6 x 116.2		
Machine system weight (lb)		28090 (12741kg)		

### Resonator Specifications

Item		YLS-4000	YLS-6000	YLS-8000
Excitation method		Yb doped on Fiber		
Performance	Laser Power			
	Rated Output Power (Watts)	4000	6000	8000
	Power stability	(±) 1%		
	Beam Characteristics	Beam mode	Multi-Mode	
Beam outer diameter (µm)		140-400 micron (Zoom)		
Wave length (µm)		1.07		
Frequency setting range (Hz)		100-3000 (100-3000 with power control)		
Duty range (%)		0-100		
Output power adjustable range (%)		0-100		
Machine power requirements		28 KVA 3Ø 208 VAC +5% 60Hz 82 Full Load Amps	30 KVA 3Ø 208 VAC +5% 60Hz 88 Full Load Amps	36 KVA 3Ø 208 VAC +5% 60Hz 104 Full Load Amps
Chiller power requirements		22 KVA 3Ø 208 VAC +10% 60Hz 66 Full Load Amps	22 KVA 3Ø 208 VAC +10% 60Hz 66 Full Load Amps	24 KVA 3Ø 208 VAC +10% 60Hz 71 Full Load Amps



**MC MACHINERY SYSTEMS, INC.**