

SHIPBUILDING SOLUTIONS

One Stop. Every Panel. Made for Shipbuilding

Lincoln Electric Automation Solutions

LINCOLN
ELECTRIC

AUTOMATION



THE ESSENTIAL LINC TO HELP CUSTOMERS BUILD BETTER

Lincoln Electric is a high-performance industrial machinery and technology leader who helps customers manufacture and maintain vital equipment and infrastructure.

Lincoln Electric's innovative solutions enable higher quality and productivity across a variety of processes including welding, cutting, brazing, machining, process automation, and field repair. The Company leverages proprietary technologies and expertise in materials science, power electronics, automation, and intelligent software to help customers build better and achieve resilience in their operations.

Headquartered in Cleveland, Ohio, Lincoln Electric is the essential 'Linc' that keeps the economy running. The Company operates 71 manufacturing and automation facilities across 20 countries and serves customers in over 160 countries. For more information about Lincoln Electric and its products and services, visit the Company's website at <https://www.lincolnelectric.com>.

WHY CHOOSE LINCOLN ELECTRIC SHIPBUILDING SOLUTIONS?

ADVANCED WELDING TECHNOLOGY FOR SHIPBUILDING

Lincoln Electric develops advanced solutions tailored for shipbuilding, where components and tolerances can vary significantly. Systems like the Inrotech-Classic® and the Inrotech-MicroTwin® robotic welding system automatically identify the weld geometry and tolerances, then calculate parameters in real time—such as the required number of passes. This adaptive, on-the-fly optimization is what makes the technology applicable for almost any type of vessel.



LNG



CONTAINER SHIP



CORVETTE



ICEBREAKER



BULK CARRIER



CRUDE OIL CARRIER



OFFSHORE SUPPORT VESSEL



SUBMARINE

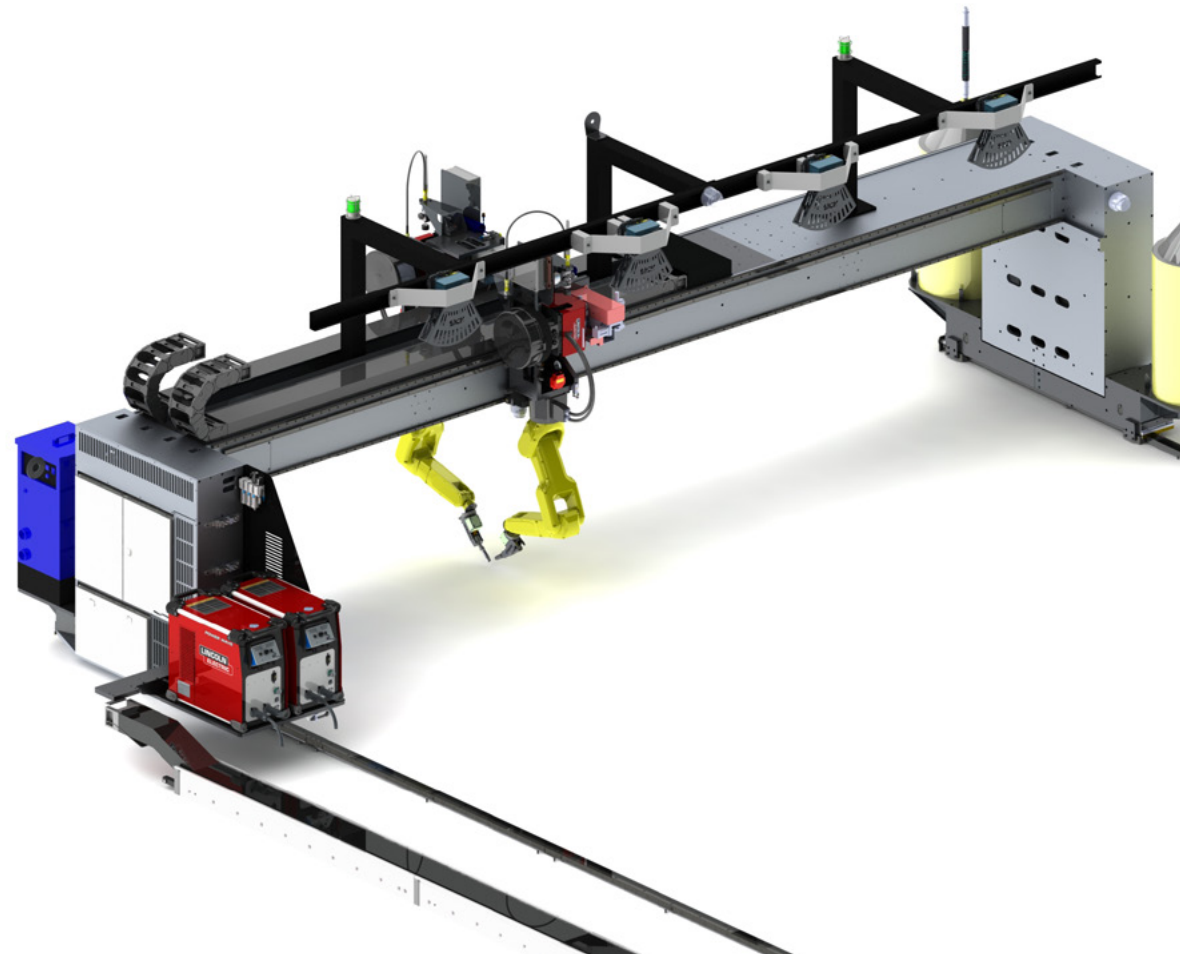
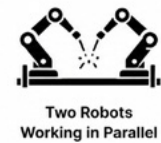
WELDING AUTOMATION FOR SHIPBUILDING & SKID STRUCTURES FOR DATA CENTERS

Inrotech-MicroTwin® SHIPBUILDING

The Inrotech-MicroTwin® is a compact, lightweight gantry equipped with two welding robots and an integrated scanning system. Originally designed for micro panels, sub-assemblies, and T-profiles in shipbuilding, the system is also well suited for repetitive fabrication such as skid structures for data centers.

Components are placed randomly within the working area, and pressing “Start” initiates the scan and subsequent automated welding process. Welding options and sequences can easily be managed through the intuitive touch-panel HMI.

Delivered as a “plug-and-play” solution, MicroTwin is ready for operation once the rails, safety equipment, power, shielding gas, and compressed air are connected. With scanning speeds of up to 36 m² per minute, combined with dual robots and multiple working zones, the system enables efficient automated welding of repetitive structures and assemblies.





Fast, automated, and built for micro-panel production, the MicroTwin® combines dual welding robots with advanced scanning, moving along a rail system of up to 60 meters to cover large production areas with high welding capacity.

ONLY 3 INPUTS ON HMI



PLUG-AND-PLAY INSTALLATION

Installation is simple: position the gantry, connect power, air, and shielding gas, and start welding.

The modular design and rail-mounted mobility make the Inrotech-MicroTwin® System easy to relocate, scale, or reconfigure—without interrupting your production flow.



STARTING PROCESS

Make sure the HMI is ready to start

1

SCANNING

The Inrotech-MicroTwin® system scans the panels and creates a 3D topography, which automatically defines weld locations, sequences, and start-stop positions.

2

WELD PLANNING

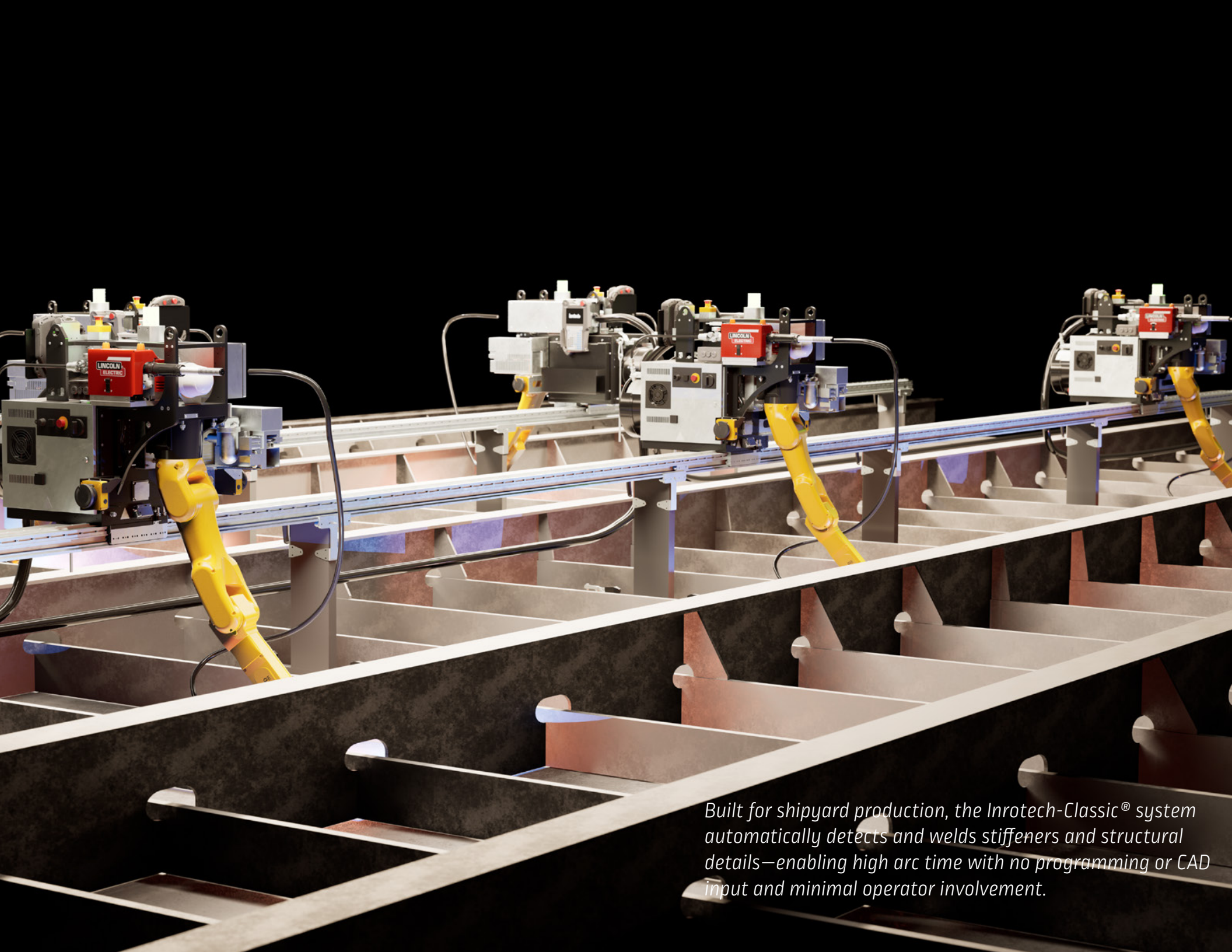
After scanning, the operator selects weld type and size, while Inrotech-SensLogic® automatically welds micro panels and stiffeners without programming.

3

WELDING

During welding, the technology continuously logs welding speed, voltage, and amperage, providing operators with full process traceability and weld documentation.





Built for shipyard production, the Inrotech-Classic® system automatically detects and welds stiffeners and structural details—enabling high arc time with no programming or CAD input and minimal operator involvement.

MOBILE SOLUTION FOR WEBS & BULKHEADS

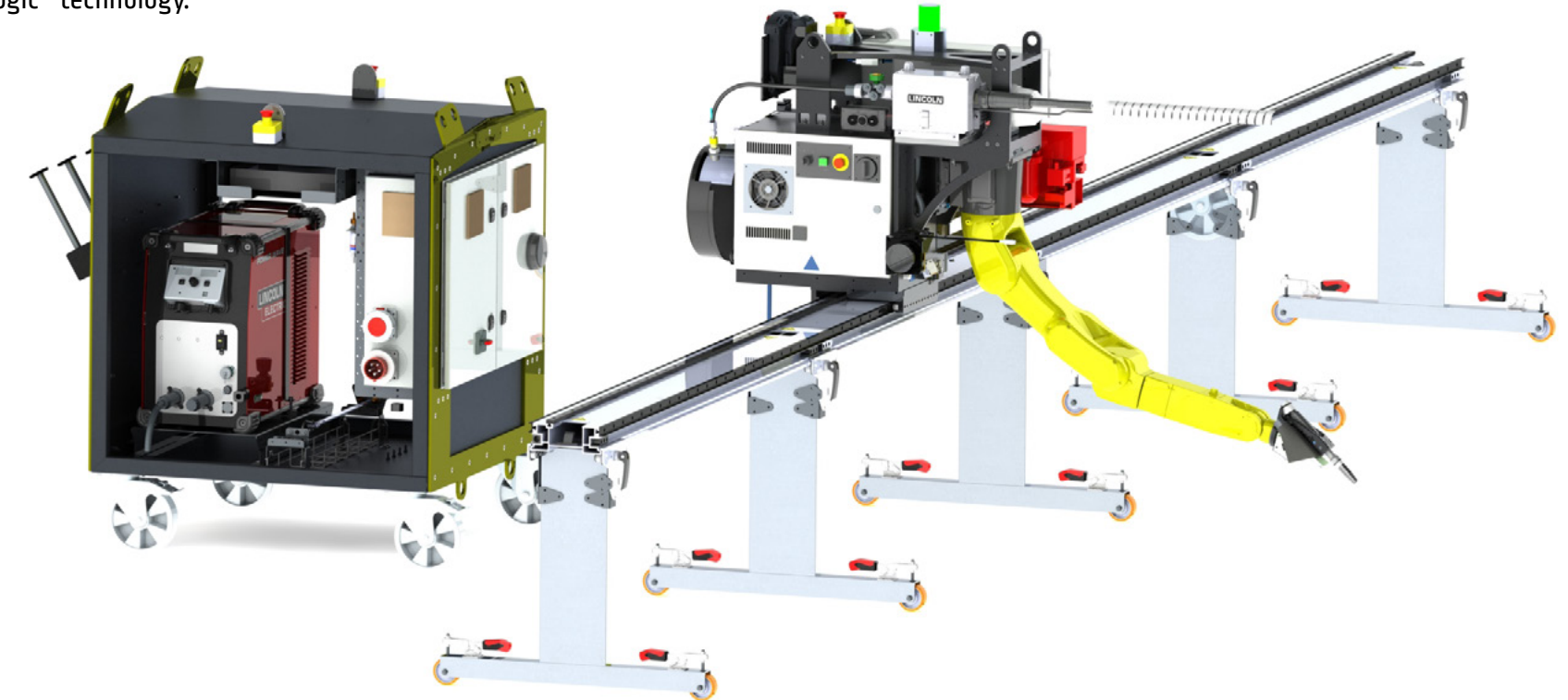
Inrotech-Classic® System SHIPBUILDING

The Inrotech-Classic® system is designed for welding webs and bulkheads in the shipbuilding industry, while its flexible design also makes it suitable for flat panels, open blocks / ship sections, deck sections, stiffeners, brackets and large steel panels.

No need to remember program, lines or codes. The operator makes use of few and simple menu options. The built-in intelligence of the system thus reduces the operator's ability to make mistakes.

The modular light weight rail system can be extended as you please. The welding robot identifies the structures and welds automatically with Inrotech-SensLogic® technology.

More details online:



WHY CHOOSE INROTECH-SENSLOGIC® TECHNOLOGY FOR SHIPBUILDING?



15+ years of Expertise

Library of sensing & welding routines built from shipbuilding and plate construction experience.



Smart Laser Sensing

1. Identify design feature
> Select adequate routines from software library.
2. Measure precise positions
> Adjust routines to match real-world dimensions.



Automated Welding Process

- > Chooses the right motion, sensing routines, and welding data.
- > Adjust in real time based on measurements.



Customized Welding Parameters

- WPS data retrieval:
- > Auto-loads customer-specific settings
 - > Includes selected wire and gas for each application.

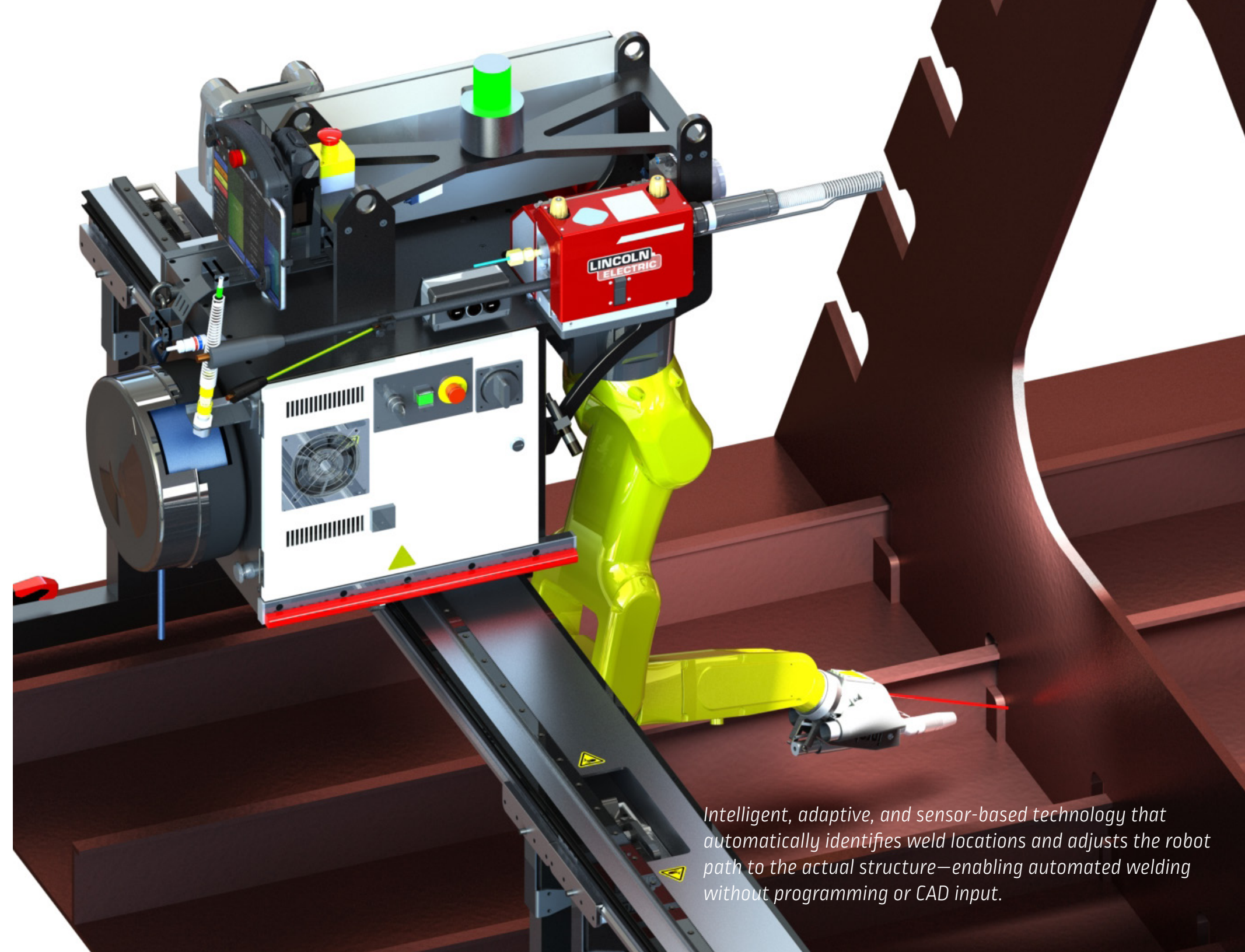
Inrotech-SensLogic® Technology

Inrotech-SensLogic® uses smart laser sensing to read the actual joint, automatically selecting and adjusting welding routines in real time. Unlike CAD-based systems that rely on ideal drawings, the technology adapts to real-world variation—eliminating the gap between design and reality.

Result:

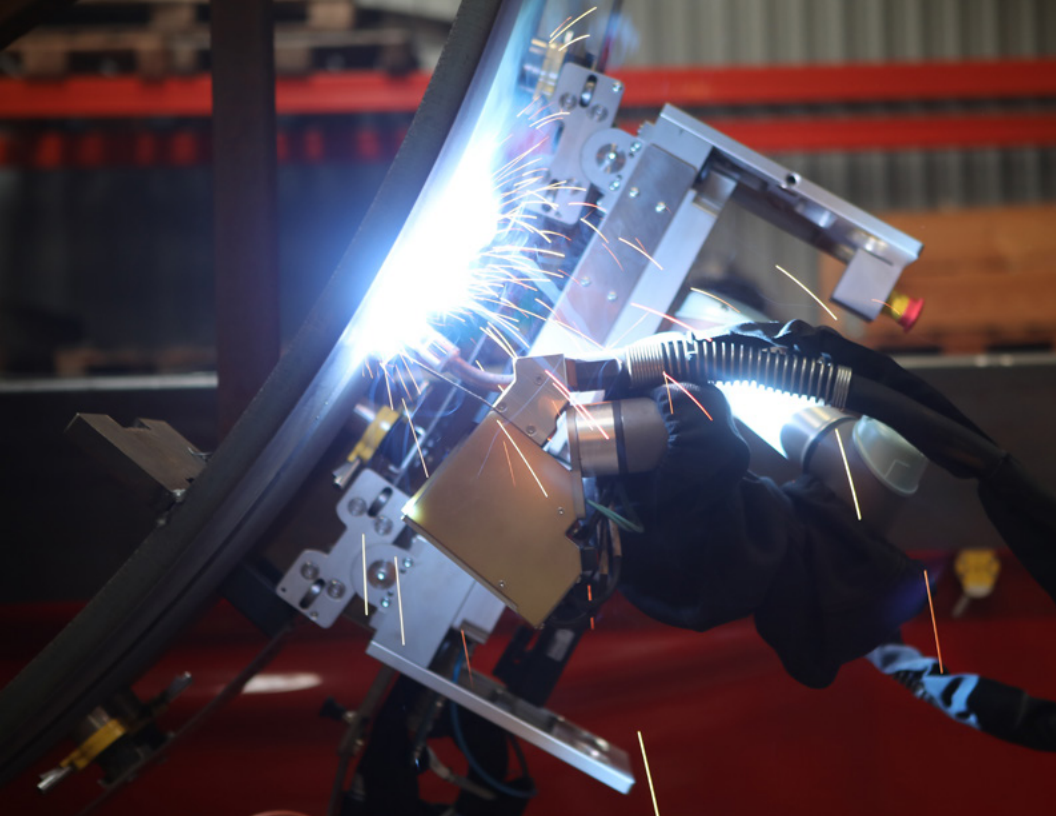
- Higher weld quality despite fit-up variation
- Less rework and fewer corrections
- No need for complex programming or perfect CAD data
- Faster, more reliable panel production

More details online:



Intelligent, adaptive, and sensor-based technology that automatically identifies weld locations and adjusts the robot path to the actual structure—enabling automated welding without programming or CAD input.

Compact, flexible, and rail-based, the Crawler® moves along magnetic rails mounted directly on the structure—enabling automated multipass welding in horizontal, vertical, and curved applications with high flexibility

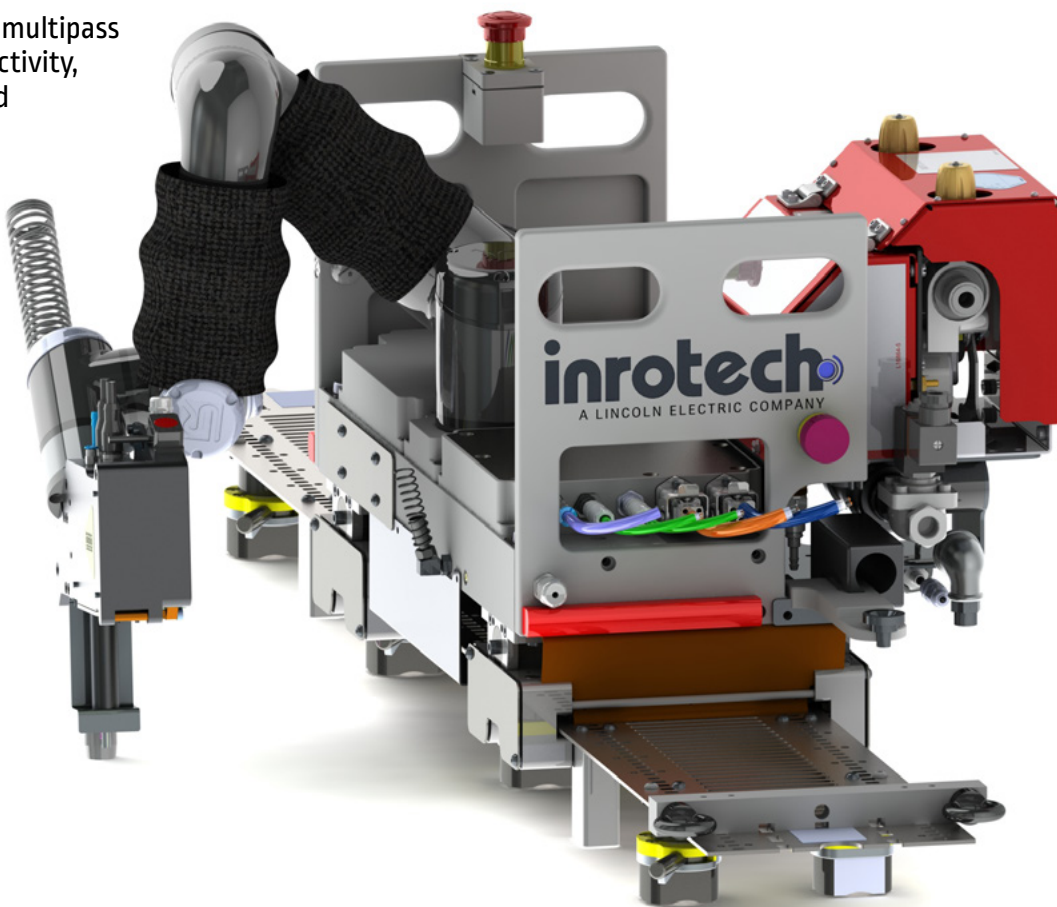


HEAVY FABRICATION MULTIPASS WELDING

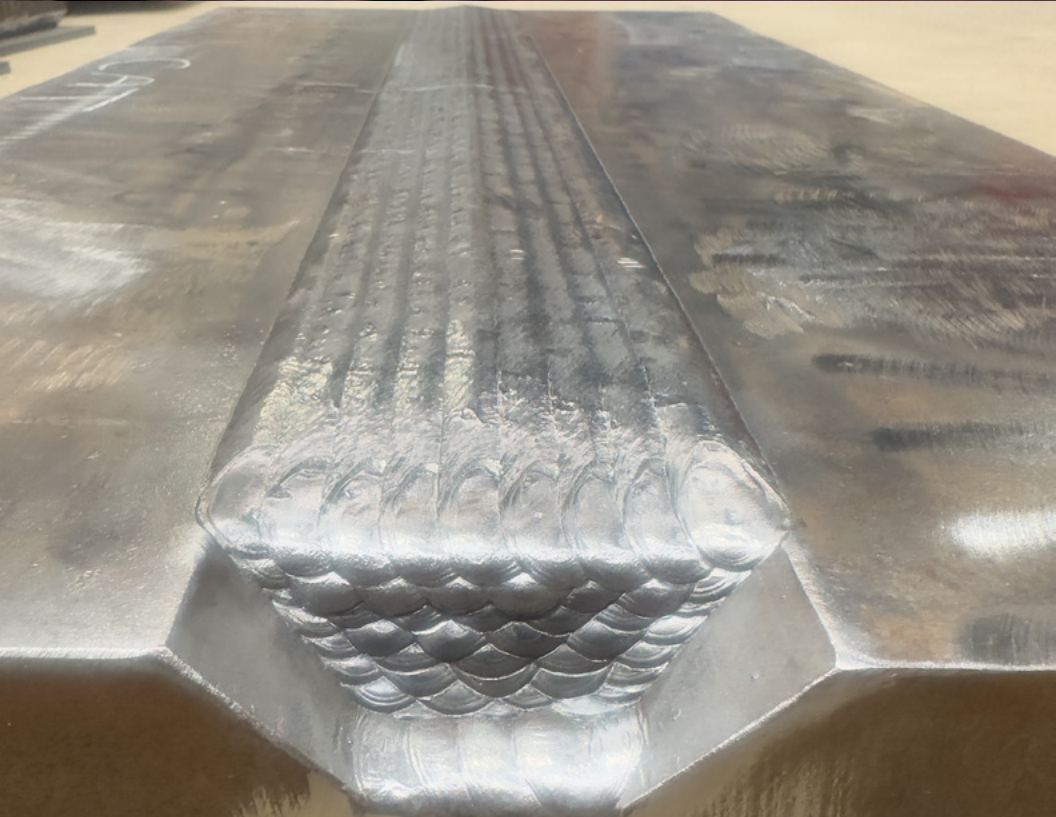
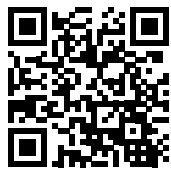
Inrotech-Crawler® System HEAVY FABRICATION & SHIPBUILDING

The Inrotech-Crawler® system travels on flexible titanium rails, magnetically attaching to large steel structures—flat, curved, vertical, overhead—ideal for welding pipes, tanks, vessels, ship hulls, bridges and more.

The Crawler brings adaptive, automated, high-quality multipass welding directly to large structures—enhancing productivity, precision, and flexibility—without requiring specialized programming or setups.



More details online:

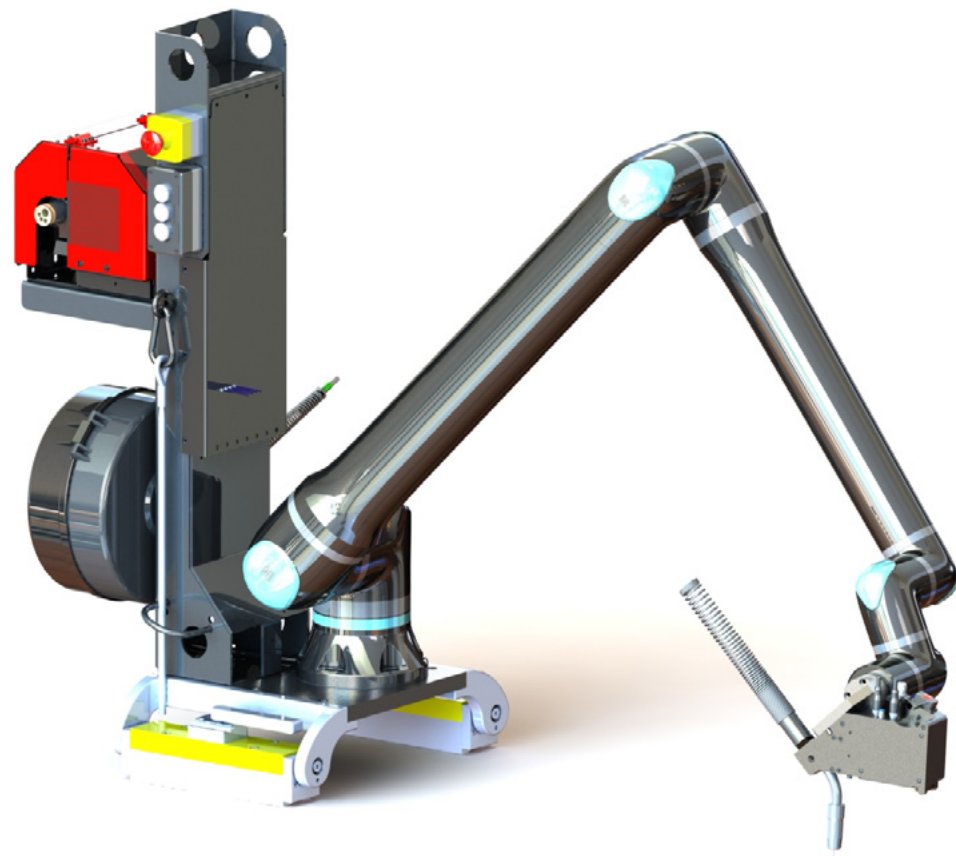


ADAPTIVE MULTIPASS WELDING, ANYWHERE

Inrotech-Groovit™ System • MAGNETIC • MOBILE • INTELLIGENT

Inrotech-Groovit™ system is an intelligent welding solution built on a proven weldplanner technology platform. It brings fully adaptive welding directly to the shop floor, simplifying robotic welding without programming, CAD input, or robotic expertise.

- **No Programming Required** – Simply select the weld start and end points.
- **Automatic Weld Planning** – The robot automatically generates the complete welding program.
- **WPS-Based Execution** – Welding parameters are generated according to the customer's qualified WPS.
- **Fully Autonomous Welding** – The robot completes the entire weld from start to finish.
- **Simple Operator Workflow** – Minimal operator input, no robot programming expertise required.



Small, flexible, and powered by a smart weldplanner system, the Groovit™ automatically scans the weld groove and calculates the optimal welding process—enabling adaptive multipass welding without programming or CAD drawings.



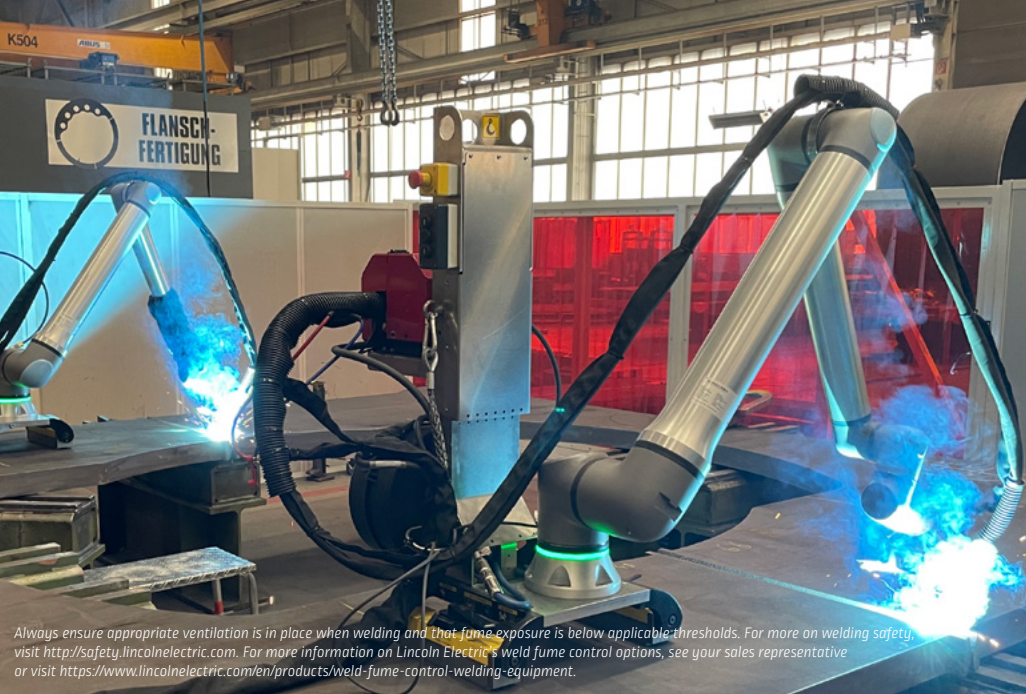
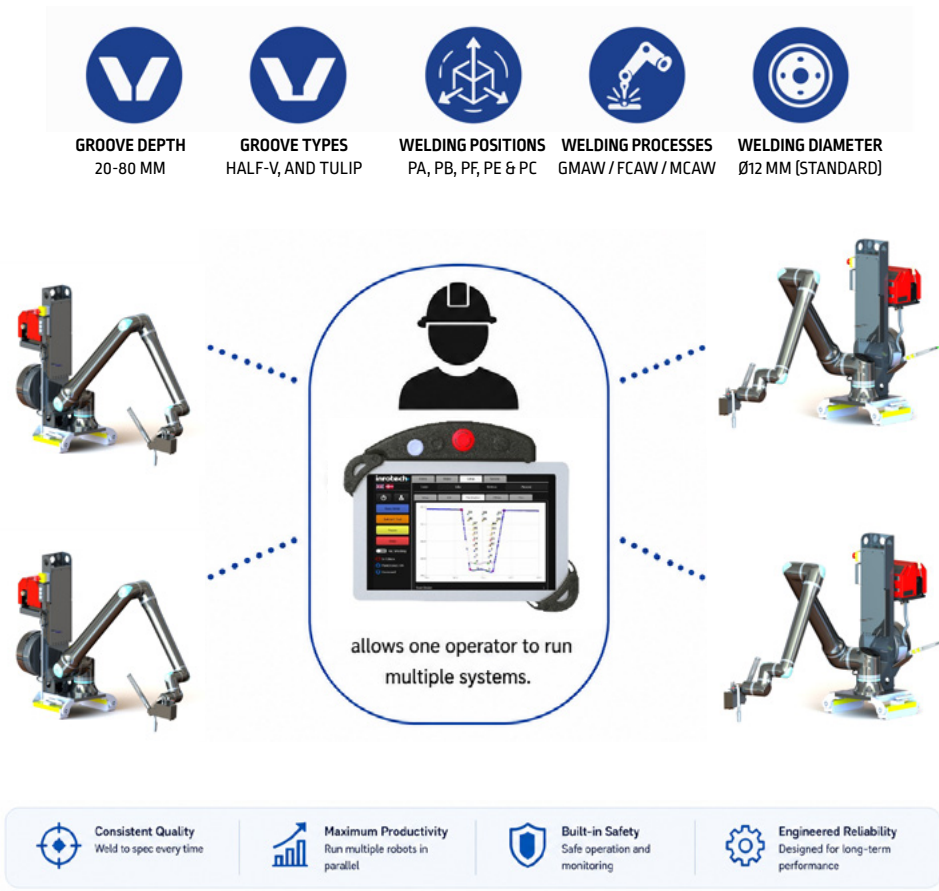
Always ensure appropriate ventilation is in place when welding and that fume exposure is below applicable thresholds. For more on welding safety, visit <http://safety.lincolnelectric.com>. For more information on Lincoln Electric's weld fume control options, see your sales representative or visit <https://www.lincolnelectric.com/en/products/weld-fume-control-welding-equipment>.

SCALING WELDING CAPACITY WITH INROTECH-GROOVIT

Inrotech-Groovit™ is designed to increase welding capacity without increasing operator resources. One operator can manage multiple Groovit systems, allowing several multipass welding operations to run in parallel.

With automated groove scanning, pass planning and execution, Groovit reduces the need for continuous operator involvement while supporting consistent weld quality.

The system handles groove depths from 20–80 mm, multiple welding positions and common welding processes, making it a flexible solution for demanding thick-section welding applications.



Always ensure appropriate ventilation is in place when welding and that fume exposure is below applicable thresholds. For more on welding safety, visit <http://safety.lincolnelectric.com>. For more information on Lincoln Electric's weld fume control options, see your sales representative or visit <https://www.lincolnelectric.com/en/products/weld-fume-control-welding-equipment>.

Flexible Multipass Welding Where it's Needed.

Multipass welding on large structures.

Inrotech-Groovit™ brings robotic welding directly to the workpiece. The robot is manually positioned and secured with a magnetic base, allowing welding to be performed within the robot's working envelope before repositioning for the next section.

By scanning the actual groove geometry, the system can account for variations in the joint and adapt the multipass welding strategy accordingly.

CAN SAVE VALUABLE TIME

ONE-PERSON JOB

HELPS REDUCE ERRORS

IMPROVE SAFETY FOR OPERATORS

WELDING COBOT

We have combined our welding expertise and automation experience with your real-world needs to create the Cooper Welding Cobot Series. Easily deployed and programmed to weld in minutes, operators can quickly automate tasks for improved productivity and throughput.

Advanced welding capabilities, such as touch sensing, multi-pass and thru-arc seam tracking offer additional solutions for more critical and/or heavy-duty welding applications. Intelligent contact-sensing technology allows Cooper to safely work side-by-side with welding operators, helping reduce the need for traditional perimeter fencing depending on the application and safety assessment. Our drag-and-drop programming and smart, tech-at-the-torch technology allows for straightforward robotic programming without complex training. The Cooper Cobot- CRX-10iAL reliability is backed by FANUC – Guaranteed eight years of less maintenance on motors, reducers, sensors, cables,

More details online:



Small, lightweight, and intuitive to use, the **Cooper®** Cobot works alongside humans to open up new opportunities for optimizing welding processes and increasing efficiency.

Always ensure appropriate ventilation is in place when welding and that fume exposure is below applicable thresholds. For more on welding safety, visit <http://safety.lincolnelectric.com>. For more information on Lincoln Electric's weld fume control options, see your sales representative or visit <https://www.lincolnelectric.com/en/products/weld-fume-control-welding-equipment>.



HIGH PERFORMANCE WELDING SYSTEM

Power Wave® R450 Robotic Power Source



Rating
450A @ 100%, 500A @ 60%

Processes – Basic
MIG, TIG, Flux-Cored

Processes – Advanced
High Performance Pulse Modes for: Steel, Stainless Steel, Aluminum, and Nickel

Output

CC

CV

DC

Input

3

PHASE

50/60

Hz

POWER WAVE® R450 - SPECIFICATIONS

Product Number	Voltage/Phase/Hertz	Rated Output Current /Voltage/Duty Cycle	Input Current @ Rated Output	Output Range	Dimensions H x W x L in (mm)	Weight lbs (kg)
	Input Power					
K3451-1 Power Wave® R450	208/230/380-415/460/575/3*/50/60	GMAW: 550/41.5/40% GMAW: 450/36.5/100% GTAW-DC: 550/32/40% GTAW-DC: 450/28/100%	40% Duty Cycle: 80/73/41/37/29	5-550A	22.5 x 14 x 24.8 [571 x 355 x 630]	150 [68]
K3451-2 Power Wave® R450 with Wireless Connectivity Module	208/230/1/50/60*		100% Duty Cycle: 60/54/30/27/21			

* Single phase rating has reduced output characteristics. Contact Lincoln Electric for more information.

More details online:





UNITED STATES

Bettendorf, IA
Chattanooga, TN
Cleveland, OH (2)
Coldwater, OH
Columbus, OH
Fort Collins, CO
Fort Loramie, OH

UNITED STATES

Ladson, SC
Macomb, MI
Orrville, OH
Plymouth, MI
Reno, NV
Shelby Township, MI

AUSTRIA

Scheifling

AUSTRALIA

Padstow

BRAZIL

Caxias do Sul
Guarulhos

CANADA

Mississauga, ON
Waterdown, ON
Waterloo, ON

CHINA

Beijing
Shanghai

DENMARK

Odense

FRANCE

Parthenay

GERMANY

Essen
Saarbrücken

INDIA

Pune

MEXICO

Saltillo

SOUTH KOREA

Siheung-si

SPAIN

Valencia

The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

CUSTOMER ASSISTANCE POLICY

The business of Lincoln Electric is manufacturing and selling high quality welding equipment, automated welding systems, consumables, cutting equipment, and educational products. Our challenge is to meet the needs of our customers, who are experts in their fields, and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or technical information about their use of our products. Our employees respond to inquiries to the best of their ability based on information and specifications provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment, or to provide engineering advice in relation to a specific situation. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or communications. Moreover, the provision of such information or technical information does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or technical information, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose or any other equivalent or similar warranty is specifically disclaimed.

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