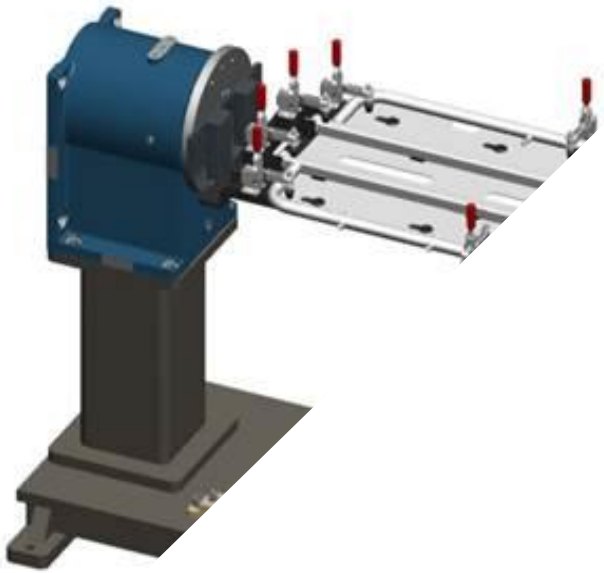
HIWIN

AHB
TOOLING & MACHINERY
COMPLETE METALWORKING SOLUTIONS

HIWIN Welding Robot System

HIWIN TECHNOLOGIES CORP.

FEATURES



Total Solution by supporting Robot and Arc Weld (MIG/TIG) Peripheral Equipment

Supportive Documentation & Training

Maximum Efficiency

Reliability

Flexible

EtherCAT

EtherCAT-based Real Time Communication

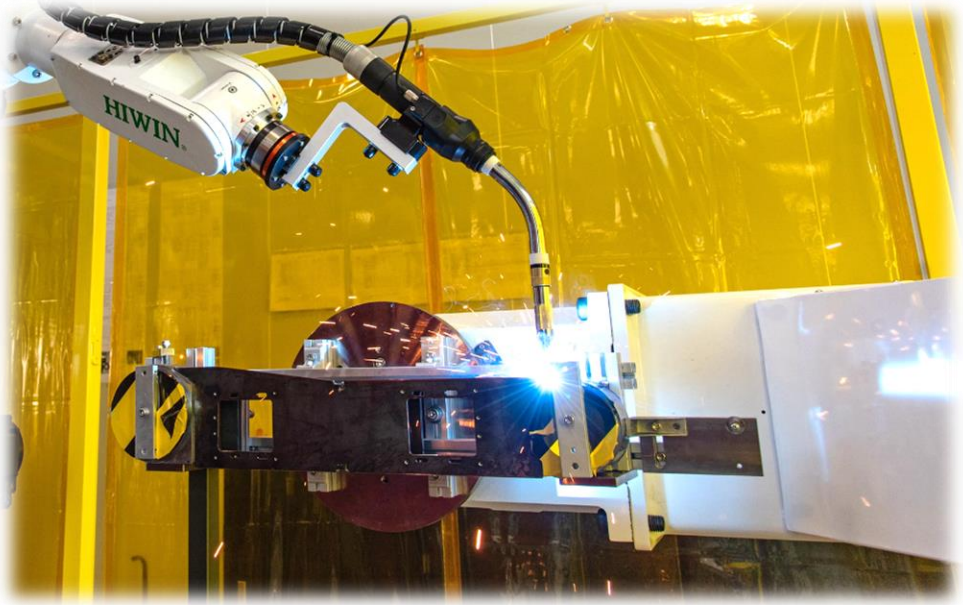
Synchronized control (interpolation) for additional three axes (6 + 3)

Robot Maker + System Integrator

Modular Design for Arc Weld (MIG/TIG) Peripheral Equipment

HIWIN®

Content



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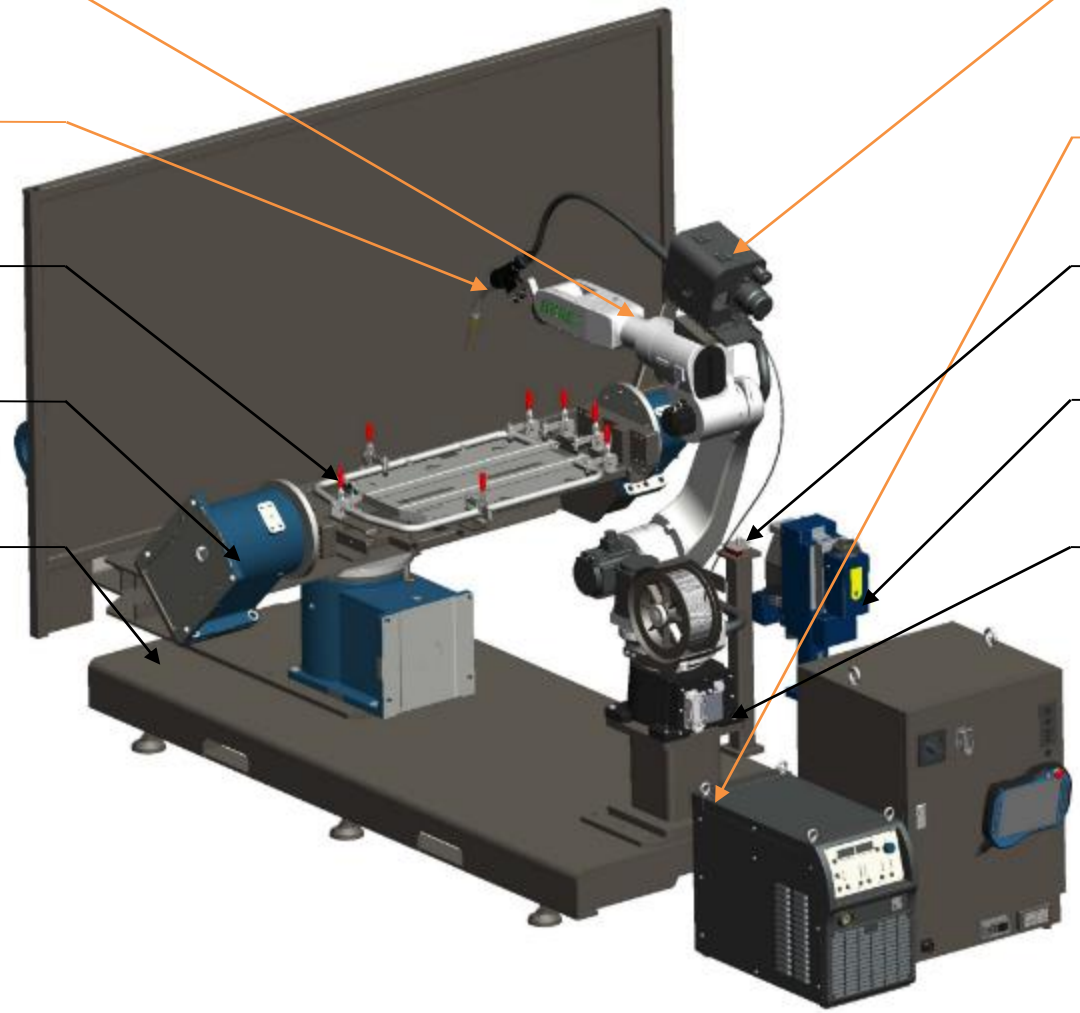
HIWIN Welding Robot System

Standard	Optional



Arc Weld Applications

- CO2/MIG/MAG/GMAW
- TIG/GTAW

Standard Equipment

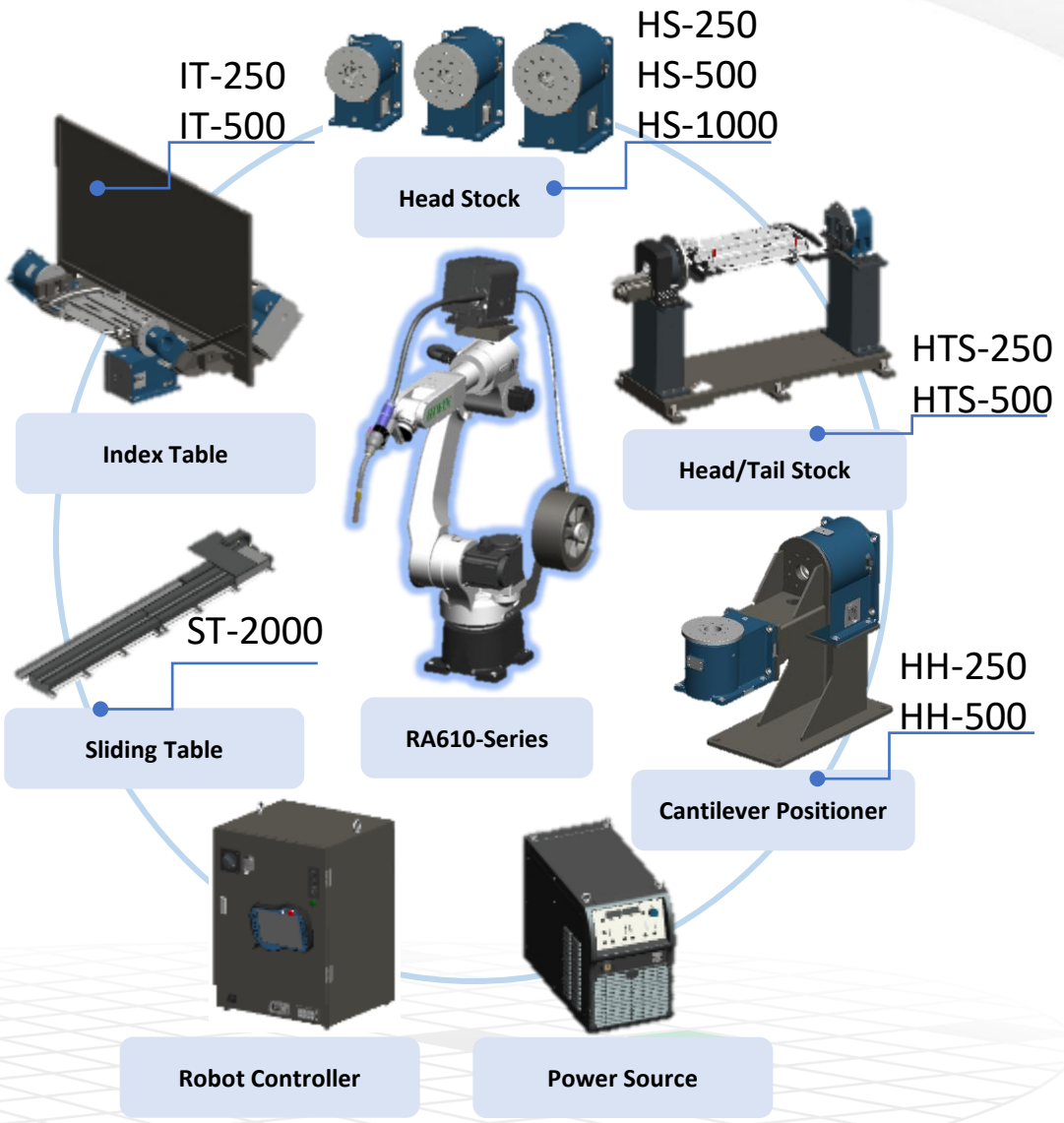
- A-1: Robot Package
- A-2: Welding power source
- A-3: Wire feeder
- A-4: Torch

Optional Equipment

- B: Peripheral devices
- C: Wire cutting & nozzle cleaning
- D: TCP recovery
- E: Work-piece & Fixture
- F: Stand
- G: System Platform

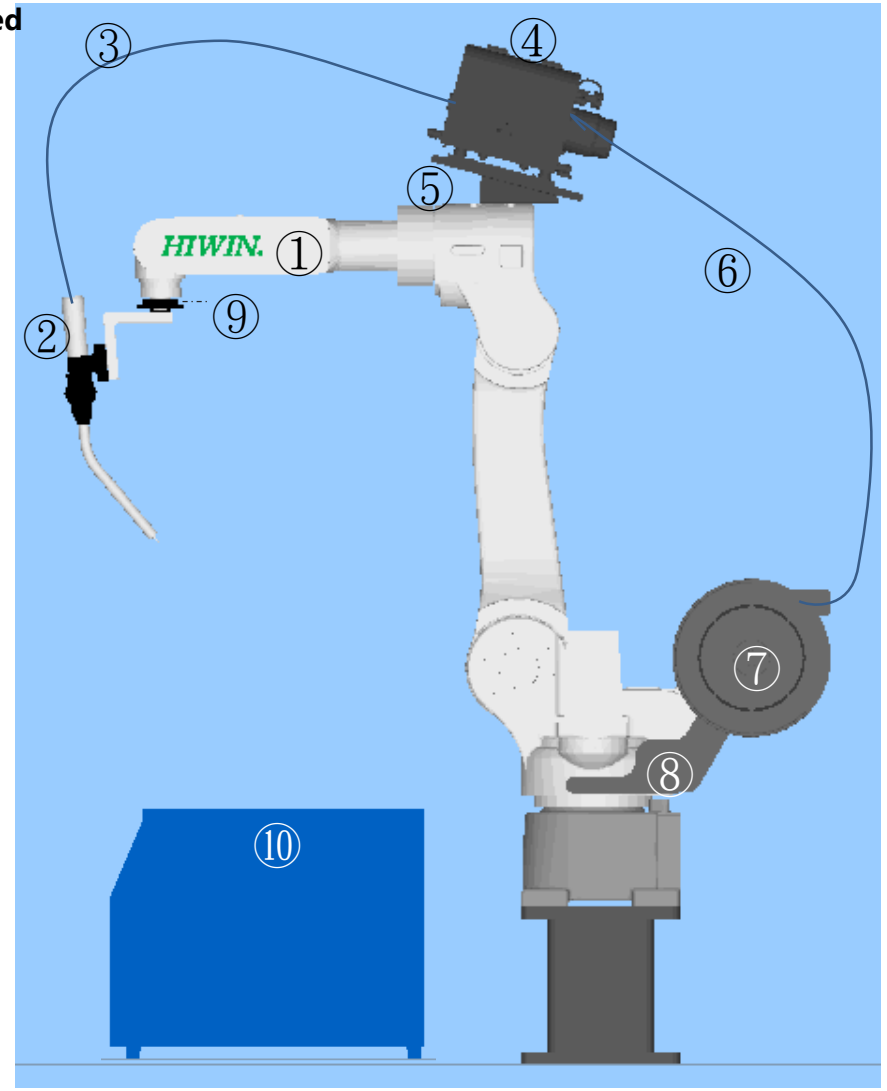
HIWIN Robot with Weld Peripherals

Model Name	RA610-1476	RA610-1869
Repeatability	±0.05 mm	±0.06 mm
Working Range	1476 mm	1869 mm
Weight	147 Kg	152 Kg
Protection rating	J5~J6: IP65 J1~J4: IP54	



MIG Solution (1/3)

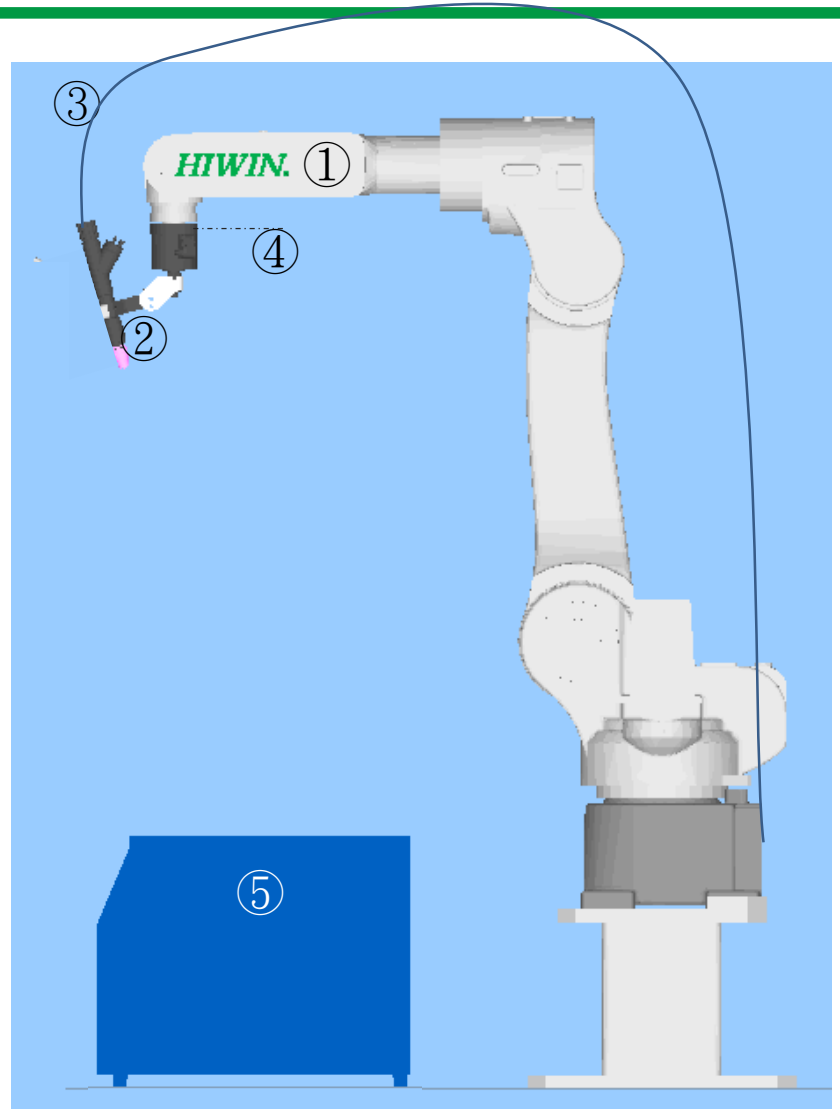
Referenced image



Item	Description	Q'TY	Supplier
①	HIWIN Robot with GC controller and built in welding software	1	HIWIN
②	MIG Weld torch with standard Shock Sensor	1	HIWIN Technical Partner (Binzel)
③	Cable of weld torch	1	
④	Wire feeder machine	1	
⑤	Supporter for wire feeder	1	HIWIN
⑥	Cable of wire feeder	1	HIWIN Technical Partner (Binzel)
⑦	Wire pool	1	
⑧	Supporter for Wire pool	1	HIWIN
⑨	Adaptor for Weld torch and HIWIN robot	1	HIWIN Technical Partner (Binzel)
⑩	Welding power source(p/s)	1	HIWIN Technical Partner (Binzel)

TIG Solution (2/3)

Referenced image



Item	Description	Q'TY	Supplier
①	HIWIN Robot with GC controller and built in welding software	1	HIWIN
②	TIG Weld torch with standard Shock Sensor	1	HIWIN Technical Partner (Binzel)
③	Cable of weld torch	1	
④	Adaptor for Weld torch and HIWIN robot	1	
⑤	Welding power source(p/s)	1	HIWIN Technical Partner (HERO)

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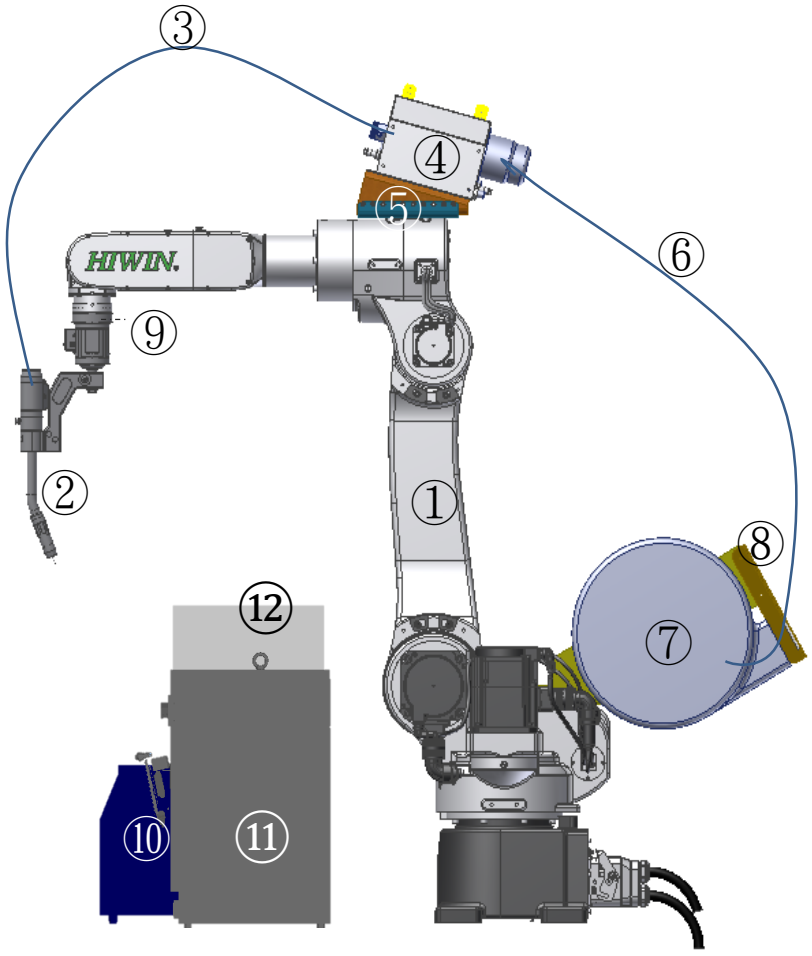
General Welding Module Solution (3/3)

Referenced image



Item	Description	Q'TY	Supplier
①	HIWIN Robot and built in welding software	1	HIWIN
②	Weld torch	1	Client
③	Cable of Weld torch	1	
④	Wire feeder machine	1	
⑤	Supporter for wire feeder	1	HIWIN happy to support it but necessary information needed.
⑥	Cable of wire feeder	1	Client
⑦	Wire pool	1	
⑧	Supporter for Wire pool	1	HIWIN happy to support it but necessary information needed.
⑨	Adaptor for Weld torch and Hiwin robot	1	
⑩	Welding power source(p/s)	1	Any weld power supply brand with Digital and Analog IO
⑪	HIWIN Robot GC controller	1	HIWIN
⑫	General welding module	1	

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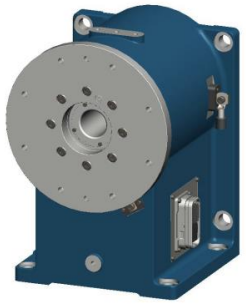
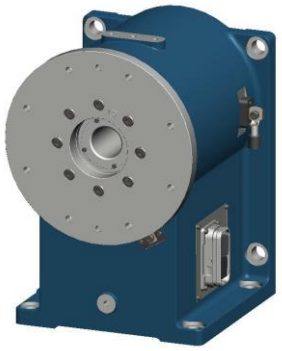
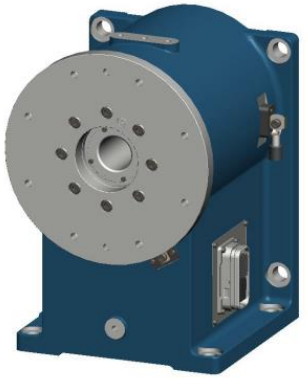
HIWIN Robot with Weld Peripherals – Head Stock

Model Name	HS-200	HS-250	HS-500	HS-1000
View				
Max. payload	200 Kg	250 kg	500 kg	1000 kg
Max. Speed of Rotation	180 °/s	115 °/s	115 °/s	100 °/s
Rated Torque of Rotation	128 N-m	229 N-m	450 N-m	1029 N-m
Repeatability	±0.03mm (R=100mm)	±0.08mm (R=300mm)	±0.08mm (R=300mm)	±0.1mm (R=300mm)
Weight	35 kg	105 kg	181 kg	242 kg

HIWIN Robot with Weld Peripherals – Head-Head Stock

Model Name	HH-250	HH-500
View		
Max. payload	250kg	500kg
Max. Speed of Rotation	115 °/s	115 °/s
Max. Speed of Tilted Angle	115 °/s	110 °/s
Rated Torque of Rotation	229N-m	450N-m
Rated Torque of Tilted Angle	167N-m	746N-m
Repeatability	±0.1mm (R=300mm)	±0.1mm (R=300mm)
Working Area	ARM=±185° PLATE=Infinite	ARM=±185° PLATE=Infinite
Weight	446kg	583kg

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MIG Welding Power Source (1/3)

Well-integrated with HIWIN Robot

- Thanks to integrated encoders, stable and accurate wire feeding can be provided
- One unit adjustment, easy to control weld parameters
- One pulse one drop mode supports low spatter feature
- Full digitalized interface with real-time and fast data feedback, which supports robot for welding monitor and arc tracking functions
- Equipped with a standard touch sensing, enabling a robot to perform a seam finding function and automatically find weld beads.

iMIG ARC

- Low Spatter Technology, decrease spatter by 80%, decrease heat input by 20%
- Welding specialist for carbon steel and galvanized steel, perfect for automotive components, electric vehicles and furniture components

iMIG PULSE

- Double-Pulse mode, ideal for fish scale welding.
- Aluminum alloy welding expert supports the minimum thickness 0.8mm of AL and provides low spatter feature

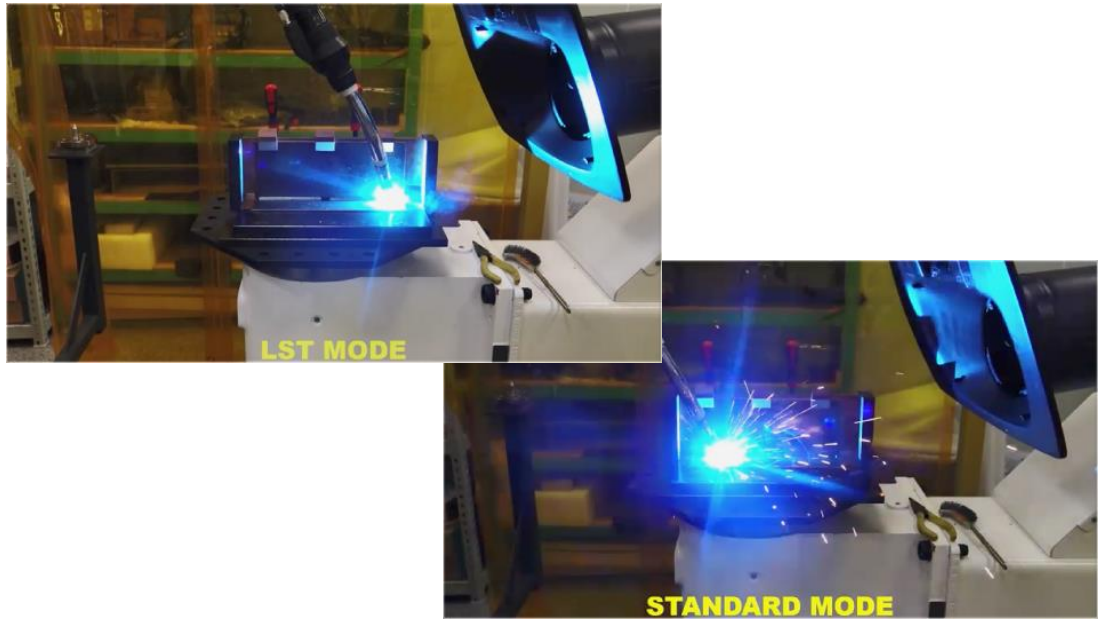
Model Name	Min.	Max.	Material					Welding Mode				Job Memory	Welding Monitor	Touch Sensing	Interface
			Fe	GI	SUS	AL	Cu	DC	S-PULSE	LST	D-PULSE				
iMIG PULSE 350RS	0.8mm (al4043)	12mm	■		■	■	■	■	■		■	100	■	■	EtherCat
iMIG ARC 350RS	0.8mm (Fe、GI)		■	■				■	■	■			■	■	
iMIG PULSE 500RS	0.8mm (al4043)	12mm up	■		■	■	■	■	■		■		■	■	

MIG Welding Power Source (2/3) - Low Spatter Technology

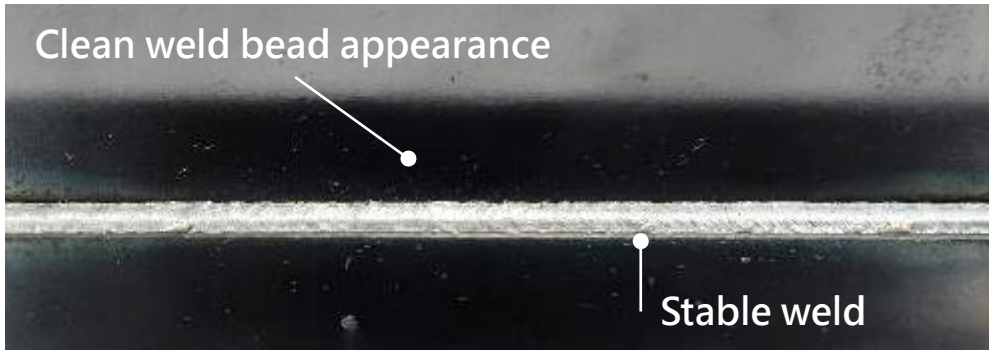
Reduce post-production time for clean weld appearance, increase productivity

- **Precise control of welding current**

Through the control of DSP and FPGA, the current is precisely controlled and the spatter is reduced by 80%. Meanwhile, low spattering and perfect result can be achieved on thin sheets by reducing the hear input and deformation.

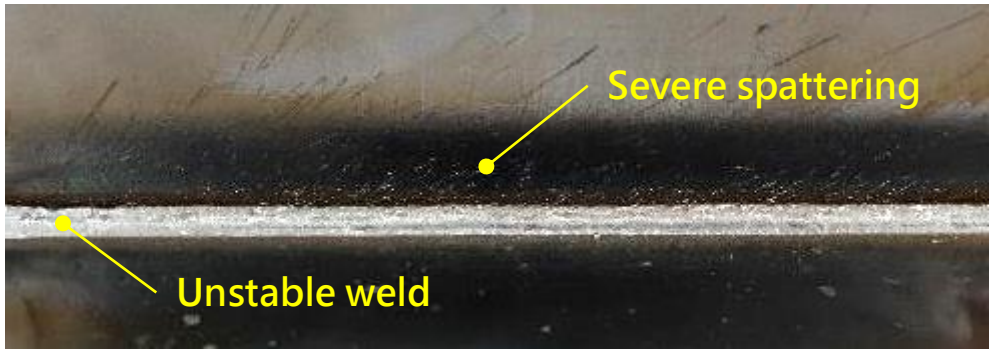


Binzel - LST Mode



Material: SS400, Plate Thickness: 3mmt, Welding Current: 110A, Welding Voltage: 17.3V, Welding Speed: 5mm/s, Gas: 80%Ar+20%CO2

General weld power/source



Material: SS400, Plate Thickness: 3mmt, Welding Current: 119A, Welding Voltage: 19.5V, Welding Speed: 5mm/s, Gas: 80%Ar+20%CO2

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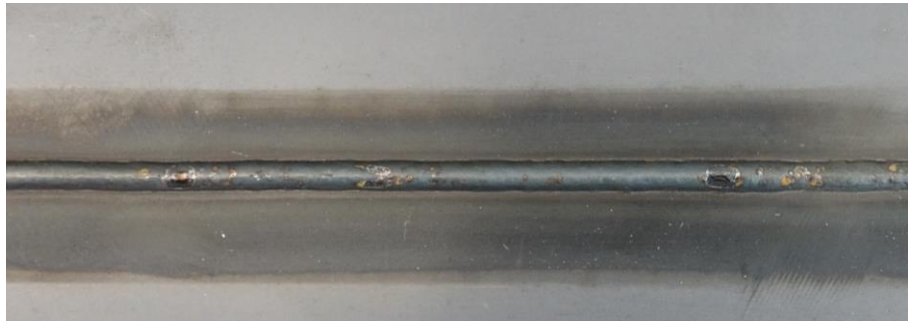
MIG Welding Power Source (3/3)– Welding Results

Carbon steel

iMIG ARC

3T, 20%CO2-80%Ar, LST, 120A, 18.7V, 39cm/min



Stainless steel

iMIG PULSE

3T, 2%O2-98%Ar, S-PULSE, 95A, 17.2V, 33cm/min

Galvanized steel

iMIG ARC

0.8T, 20%CO2-80%Ar, LST, 50A, 18.6V, 42cm/min

Aluminum alloy

iMIG PULSE

6T, 100%Ar D-PULSE, 155A, 19.8V, 45cm/min

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TIG Welding Power Source

Well-integrated with HIWIN Robot

- Full digitalization, precise welding
- Full control of welding sequence
- Built-in adjustable arc welding
- Supports three AC waves based on welding conditions
- With continuous spot welding
- Wide range of welding applications
  - Manufacture of industrial equipment, aluminum materials, plates, duct pipes, aluminum boats, etc.

Model Name	Max.	Material					Welding Mode				Job Memory	Welding Monitor	Touch Sensing	Interface
		Fe	GI	SUS	AL	Cu	DC	DC-PULSE	AC	AC-MIX				
AT-300R	12mm	■		■	■	■	■	■	■	■	100	■	OP	Modbus
DT-400R	12mm up	■		■			■	■				■	OP	

General Welding Module Solution (1/2)

Flexible with different weld power source

- **With the general welding module**, most of the welding power sources on the market are supported.
- Use 『VLT+WFS』, 『VLT+AMPS』, 『AMPS+WFS』 etc. to control welding parameters.
- Robot controller with the General welding module can be applied to **welding power sources with Analog Interface.**

Robot Controller

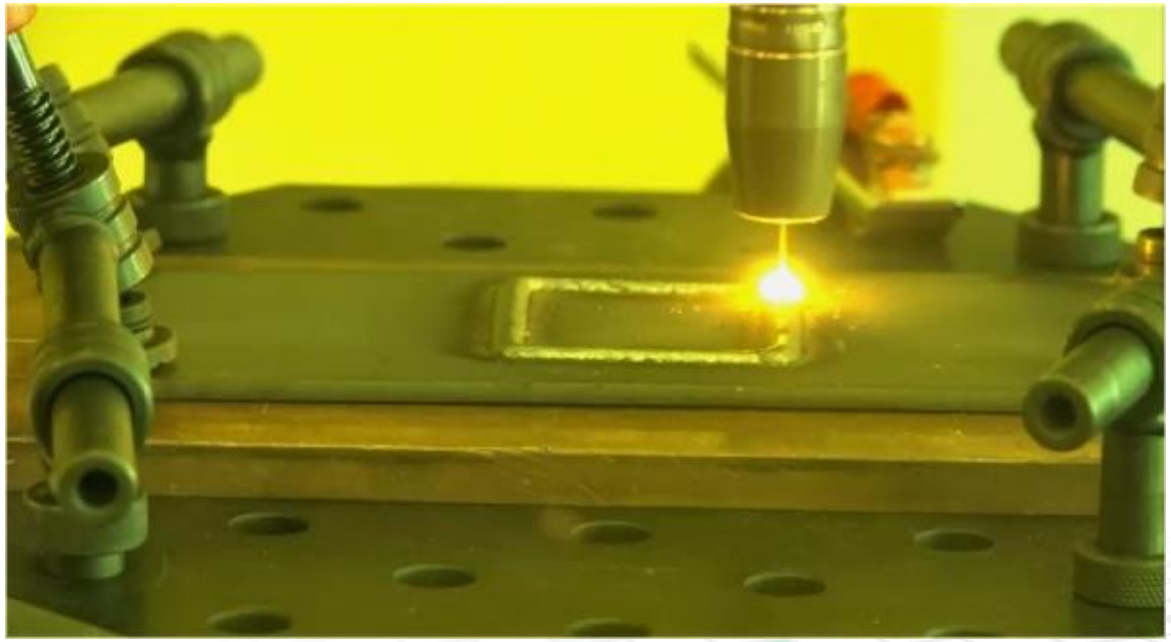
General welding module

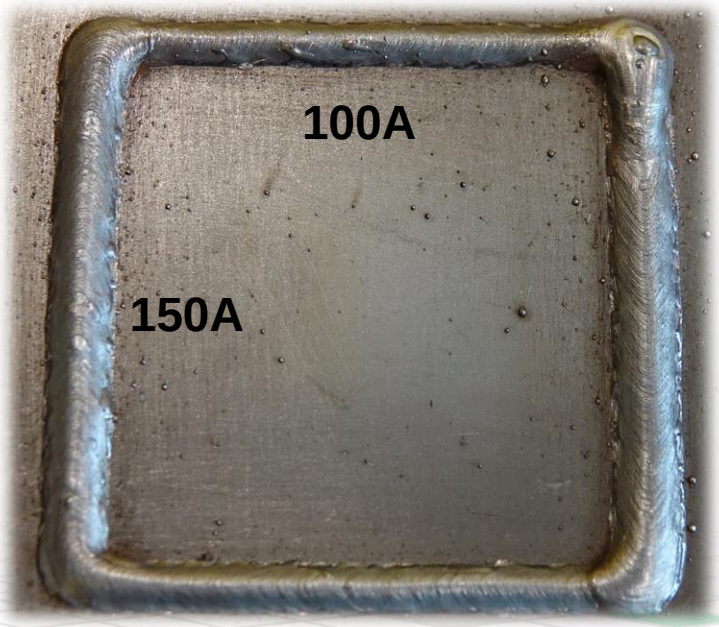
Fronius, Miller, LINCOLN ELECTRIC, Panasonic INDUSTRY, OTC DAIHEN INC., HERO POWER, Jing-Xuan, HONG KY, …And more

※With Analog Interface

General Welding Module Solution (2/2)

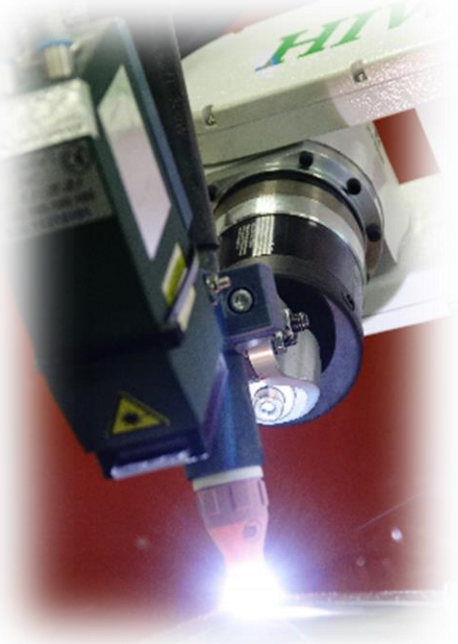
- Supports 20 Weld Procedures and 10 Weld Schedules, up to **200 parameters** can be set.
- **Fully support welding functions**, changing the parameters during the welding process to obtain a better welding result.





Weld Functions

1. HIWIN Robot Simulation (HRSim)
2. Welding Robot Software
3. Axes Synchro Control
4. Touch Sensing
5. Seam Tracking
6. Weaving
7. TCP Auto Recovery
8. Real-Time Welding Monitor
9. Touch Clean Station



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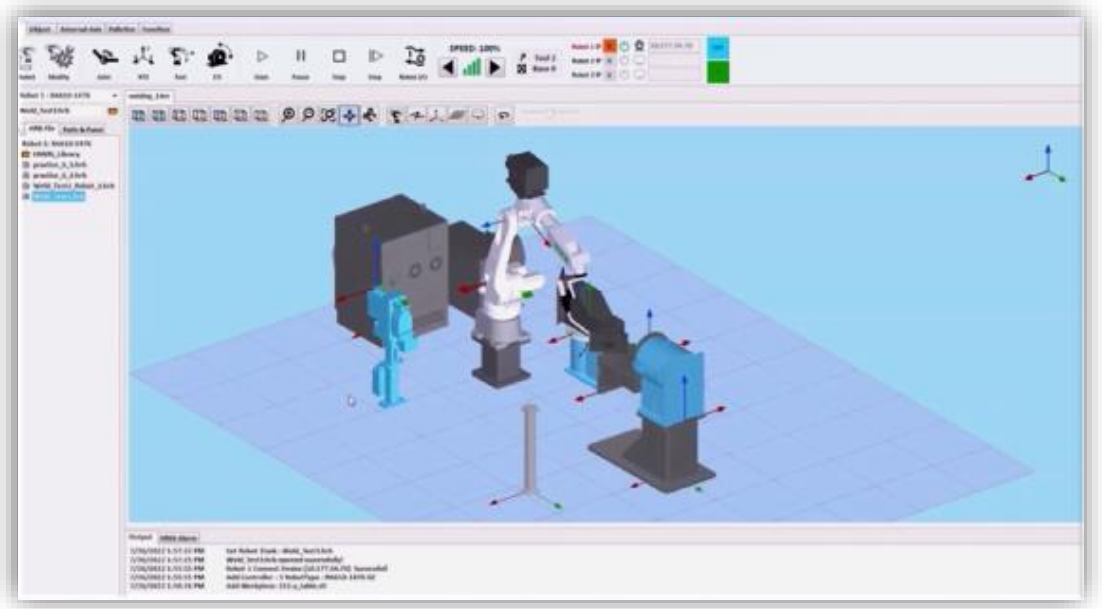
HIWIN Robot Simulation (HRSim)

Used for offline simulation to obtain welding path planning, welding cycle time and welding feasibility evaluation.



- **Convenient for modular and system setup**

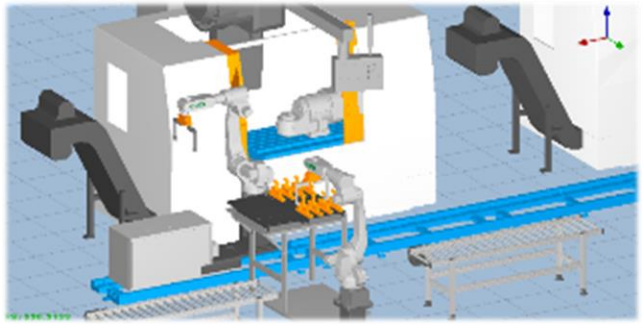
Simply clicking the mouse, users can build their own production line by uploading the CAD models. Even users with zero experience can quickly setup a system thanks to the simple interface.

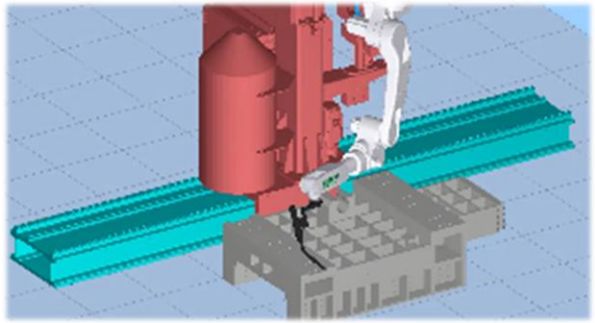
- **Easy-to-use programming**

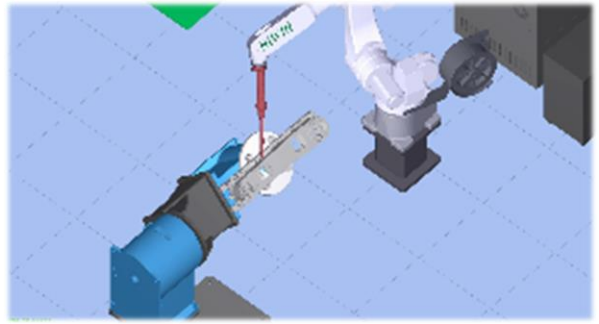
Using the same logic as the functions of the teach pendant, the simulation results can be applied directly to real robots and peripherals, greatly reducing the programming time.

- **Realistic simulation results**

“What you see is what you get”: The simulation results can be so real because it has work-piece movement, CNC open/close, cycle time, weld filling results, etc.







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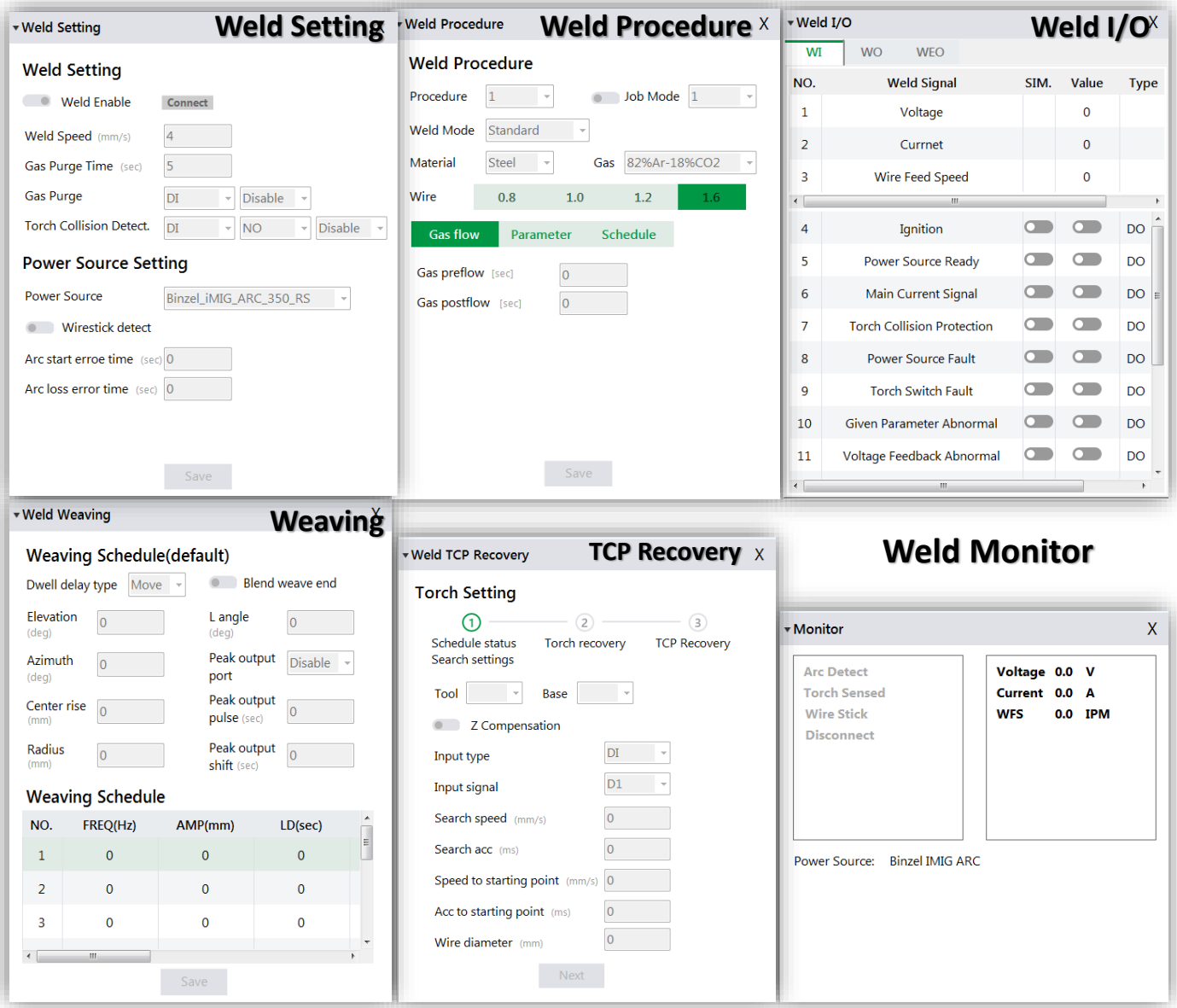
Welding Robot Software

Smart-weld designed Interface



Axes Synchro Control

- **EtherCAT** based Real Time Communication
- **Synchronized control** (interpolation) for additional three axes (6 + 3)

HIWIN

Touch Sensing

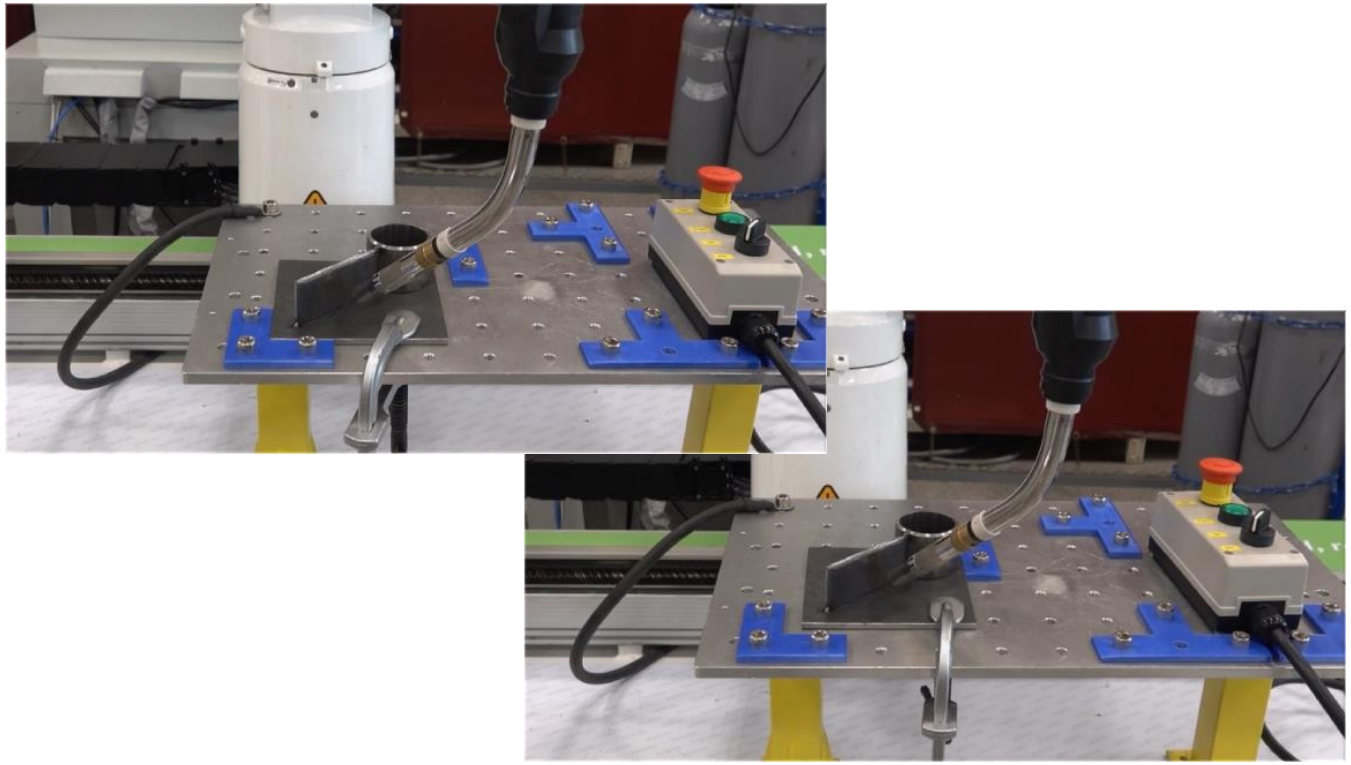
「Auto-search the position of weld bead」- Workpiece displacement, assembly, machining error compensation

- **Standard built-in functions**

No need for additional sensors, Hiwin provides the function through MIG sensing feedback

- **Multiple search planning**

Support up to 100 sets of self-define welding paths, suitable for various welding conditions



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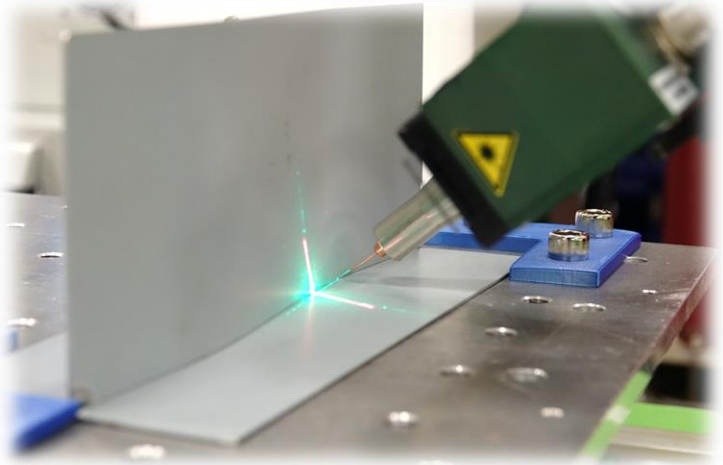
Laser Seam Sensor

「Fast Search for weld beads with high accuracy」 - Compensation for the tolerances of manufacturing and assembly



- **Quickly locate the workpieces position**

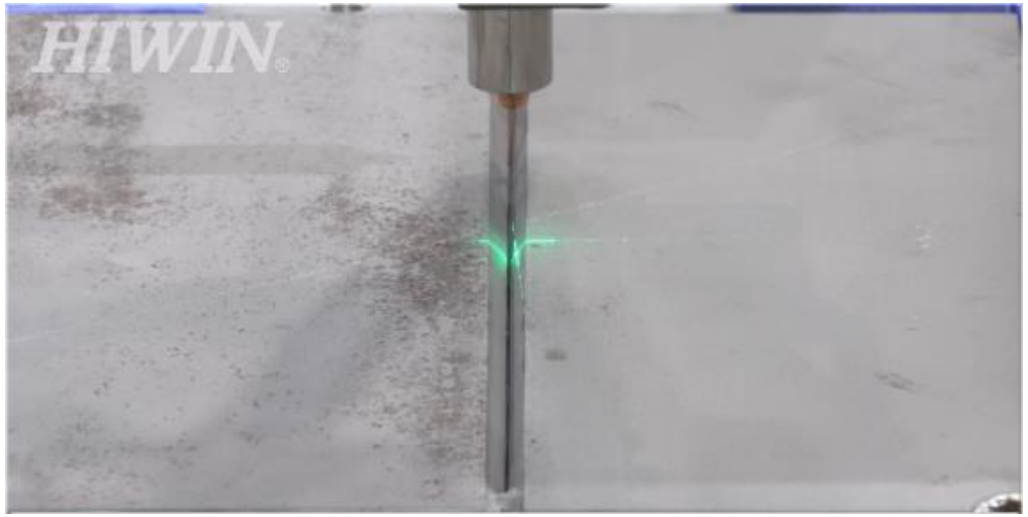
With high-speed computing laser sensor to realize weld bead analysis and positioning functions

- **Excellent position accuracy**

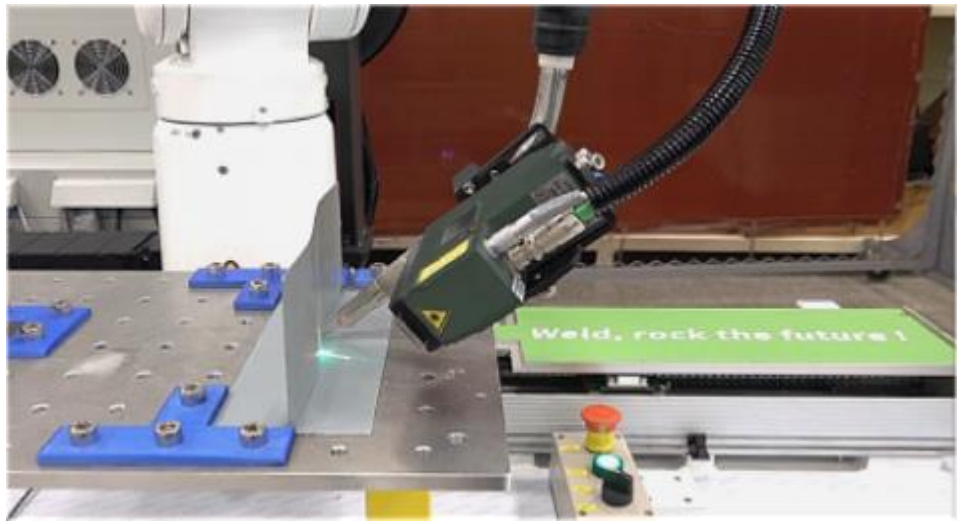
With patented high-precision laser technology, it provides a weld bead search accuracy of 0.05mm

- **Flexible use**

Perfect for various base metals, as well as support for minimum thickness of 0.8mm



Seam search



Real-time seam tracking

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Weaving

Parametric weaving settings

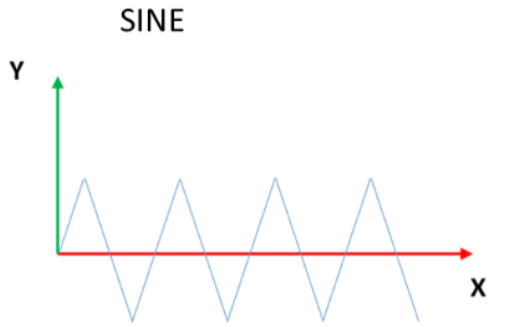
to quickly adjust weaving paths

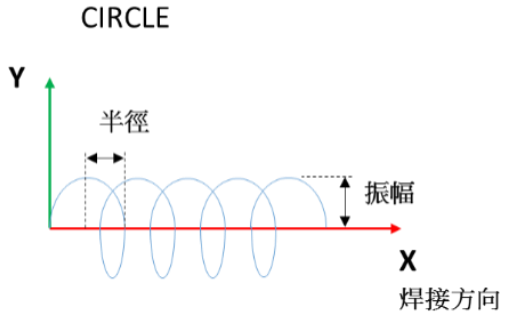
Control the path of electrode

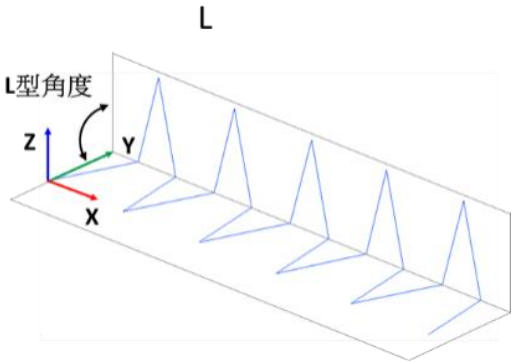
to improve the weld bead width and metal fill

Three weaving functions

based on different weld bead design are provided







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TCP Auto Recovery

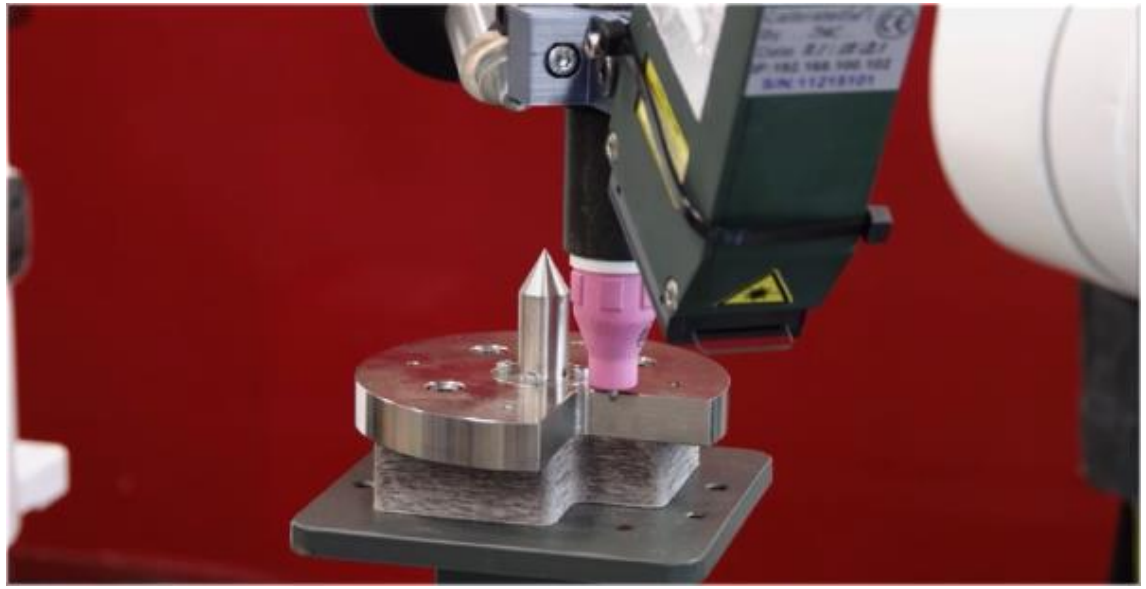
「Ensure the repeatability every time welding」- Maintain welding quality in a long run

- **Avoid the weld bead deviation**

Automatically correct weld bead deviation to ensure that the welding torch stays on the correct track

- **Ensure the weld bead quality**

Automatically correct welding torch height for consistent weld quality



HIWIN.

Real-Time Welding Monitor

「Quickly analyze the cause of poor welding results」 -

Reduce idle time, increase productivity and quality

- **Real-time data with visual graphs**

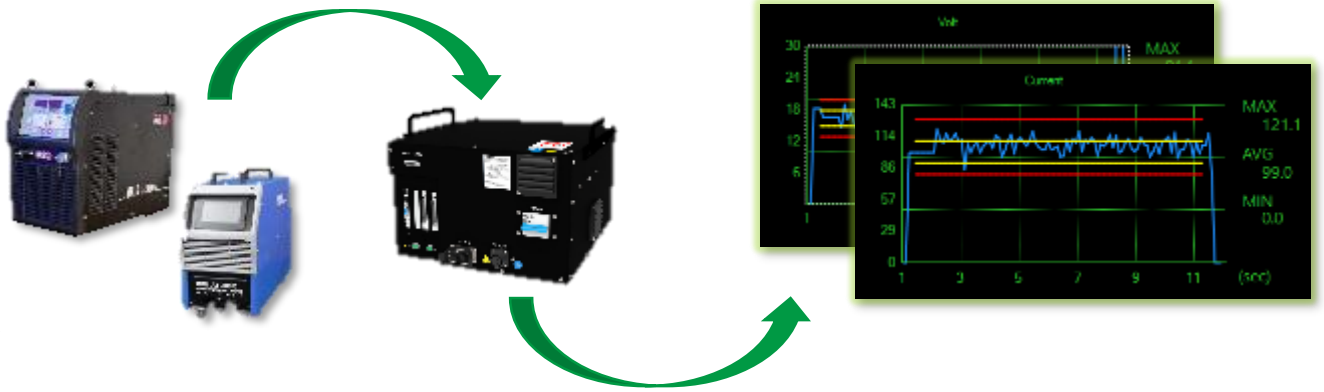
Integrated with EtherCAT technology, real-time display of welding parameter charts.

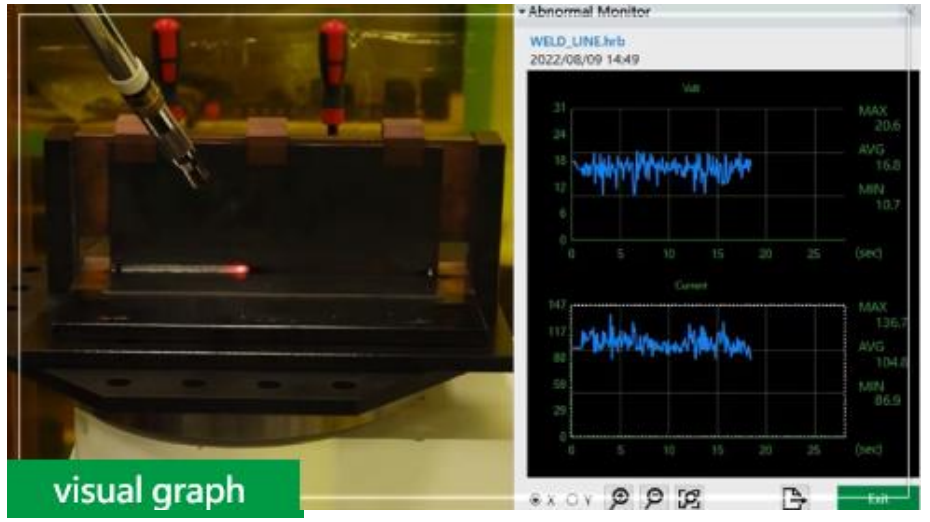
- **Abnormal error and stop function**

Freely set the alarm threshold of welding parameters to safely stop the welding process

- **Complete record of welding parameter data**

Maximum. 100 records are saved, easy to view, save and even back up to the computer, which can be used for manufacturing analysis and quality management





Torch clean Station

「Keep weld torch in good condition」- Save time on torch cleaning and maintenance

- **One-stop torch maintenance**

Ensure weld quality and stability with automatic torch cleaning, weld rod cutting and low-spatter spraying

- **low-spatter spraying**

Reduce cycle time and protect the environment with less usage, fast and even spraying

- **High reliability**

Superior construction and full coverage components provide full protection and high durability

HIWIN

Customer Examples

1. Base Support Component
2. High Precision Link Rod
3. MIG for Stainless steel
4. MIG for Aluminum
5. Oil & Gas Elbow
6. Electric Scooter
7. Welding Consumable Manufacturer

High Precision Link Rod

Base Support

MIG for Stainless steel

HIWIN®

Customer Examples

Base Support Component

- Welding on Tee Joint
- Material Thickness 6mm
- With cantilever positioner

High Precision Link Rod

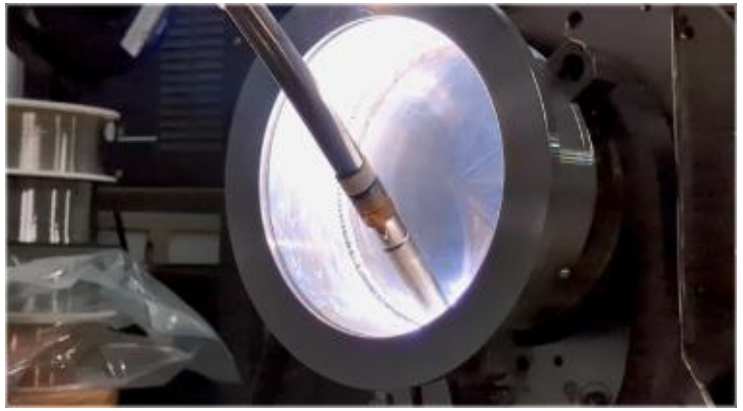
- Welding on Tee Joint
- Material Thickness 5mm
- With cantilever positioner

MIG for Stainless steel

- Welding on Tee Joint
- Material Thickness 2mm
- With welding table

MIG for Aluminum

- Welding on Tee Joint
- Material Thickness 6mm
- With 1-axis positioner



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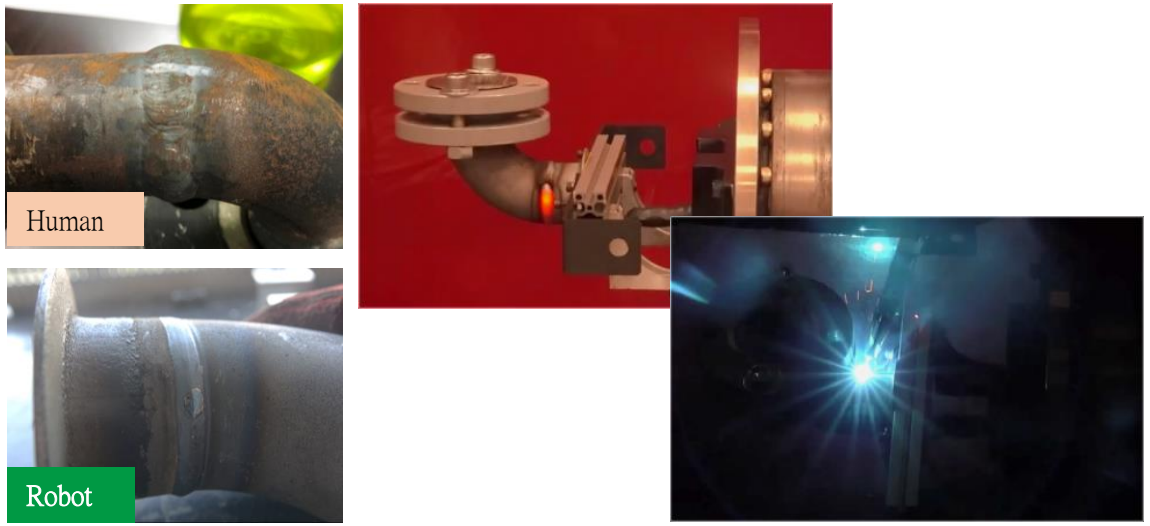
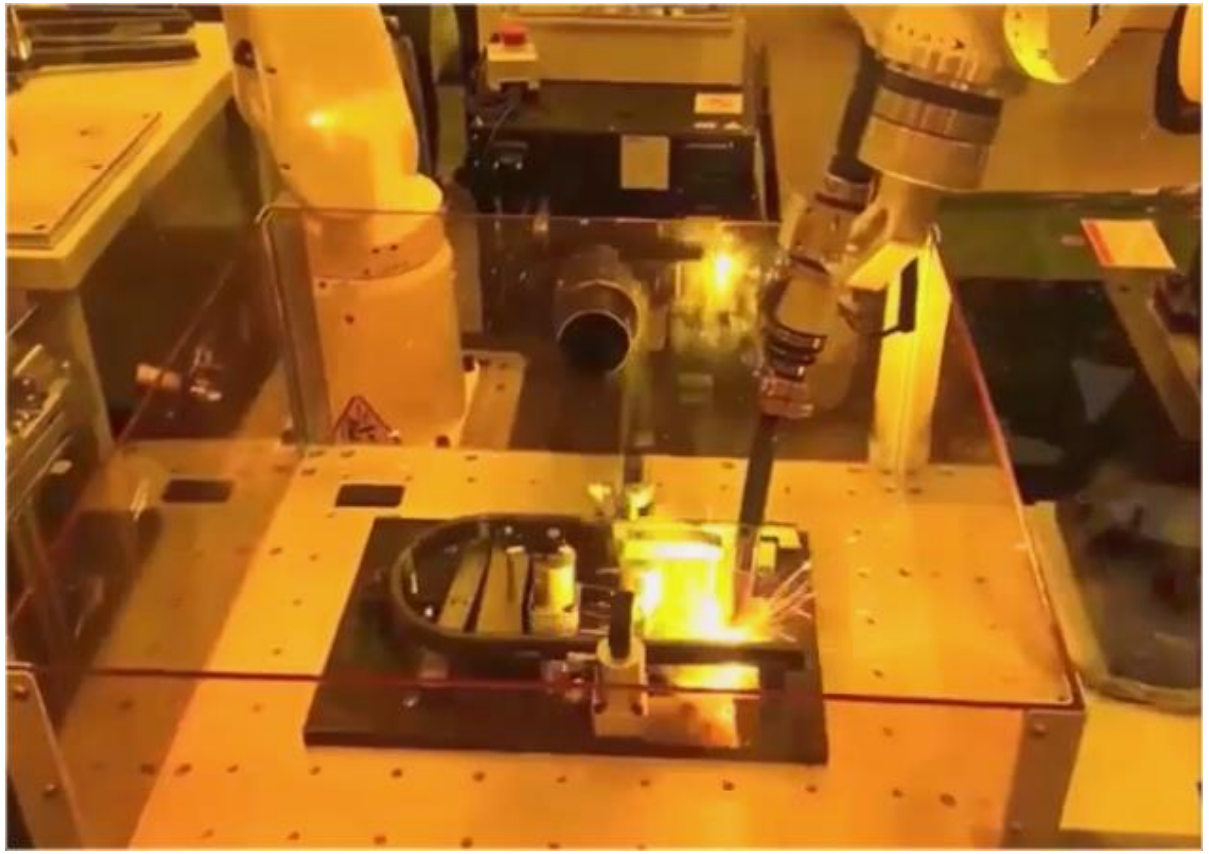
Customer Examples

Oil & Gas Elbow

- Welding on Butt Joint
- 2 inch Carbon steel pipe (Thickness 4mm)
- With 1-axis positioner



Electric scooter



HIWIN®

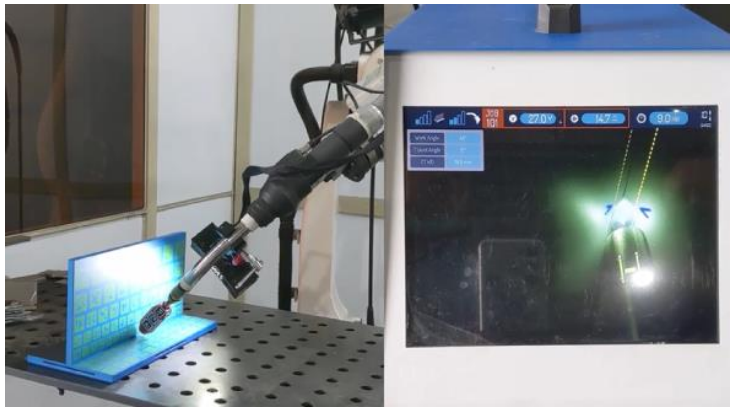
Customer Examples

Collaboration with a leading welding consumable manufacturer

- Extensive expertise on welding
- Provide welding parameter verification

AR Weld system

Welding domain



Weld Robot System

Robotics Welding

Parameter verification

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Thank you!