Dobot Robotics

All-in-One Welding Solution

Makes Automation Accessible
2024/06

Manual Welding Solution

High Cost, Low Efficiency

Lack of Labor:

- The shortage of welders is becoming increasingly serious.
- Young people are unwilling to learn welding, and the entire training period is long.

High Cost:

- High temperatures and sweltering heat, difficult to recruit welders.
- Skilled welders wages are higher than other industries.

Uneven Quality:

- Uneven quality of manual welding.
- Poor welding consistency.

Low Efficiency:

- Welders work 6-6.5 hours a day. Welding efficiency is low.

Case Story

This is a company that processes steel products. A set of steel structure products requires more than 200 welding seams.

Without Dobot Welding Solution

- **Production Schedule**

10 or more workers need to simultaneously complete the welding of a set of steel structure products. The workers need to squat and continuously move to complete the 200 welds.

- **Customer Pain Points:**

(1) Severe shortage of welders, making it difficult to recruit.

(2) High workload and poor environment, detrimental to employee health.

(3) Low efficiency and unstable quality of manual welding, leading to rework.

With Dobot Welding Solution

- **Solution & Achievements:**

(1) This company purchased 10 robotic arms to replace 10 welding workers, now only 2-3 staff needed to operate them for 24/7 production.

(2) Welding quality significantly improved, meeting customer's flatness and consistency requirements, e.g, vertical and horizontal welding seams.

Why Cobots Welding?

Easy to Deploy

- Compact and lightweight, requiring no modifications to the existing production line (such as installing safety wall).
- Provide various easy-to-use control methods that allow quick commissioning.

Quick Switching

- For multi-variety, small-batch tasks, as well as mobile welding tasks like on vehicles, the robots can quickly switch between different work tasks and locations.

No Professionals Required

- Supports various operation modes, allowing non-professionals to quickly get started on tasks.
- Industry-first Cobot Blocky Programming, requiring only 45 mins to master the process.
- With the specialized process package, programs can be generated simply by configuring parameters

Safety is the Priority

- PLd CAT3 safety controller, real-time monitoring, 20+ safety designs.
- Certified to ISO 13849-1, ISO 10218-1, ISO 15066.
- Flexible safety I/O configuration for customized safety solutions.

How to Choose Your Welding Solution?

Welding Machine

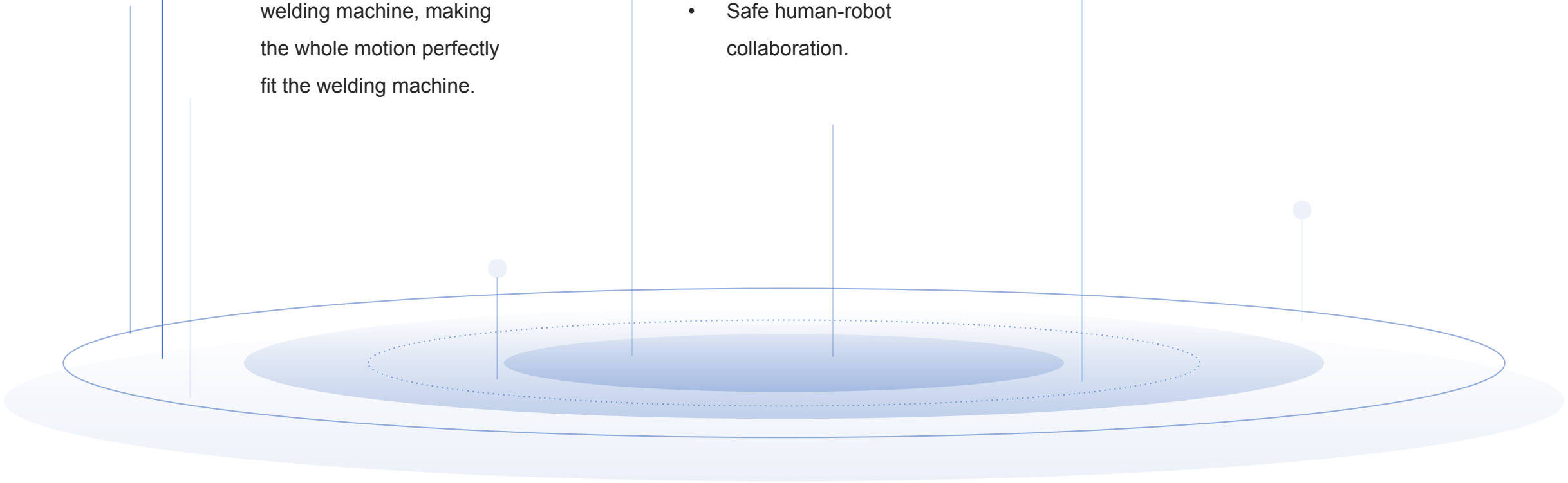
- The robot arm's end controller needs to be compatible with the welding machine, making the whole motion perfectly fit the welding machine.

Motion of Robot Arm

- Motion accuracy for robot arm.
- End-effector vibration suppression for robot arm.
- Safe human-robot collaboration.

Deployment & Adjustment

- Professionals required.
- Ease of deployment.
- Ease of task switching.



Dobot All-in-One Welding Solution

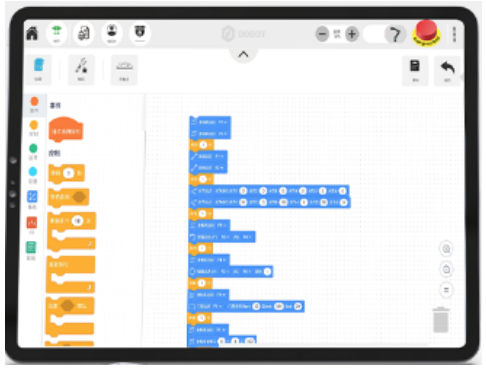
Dobot All-in-One Welding Solution flexibly matches the welding components, with the welding process package's simple setup parameters can be quickly adapted to various types of welding machines, to achieve laser, arc welding, and other welding functions, to meet the needs of enterprises with small batch and multi-species production.

01

Robot Arm

02

Welding Process Package



03

Mobile Welding Bench (Optional)

04

External accessories

- Laser Sensors
- Torque Sensors
- Gateways
- Magnetic Base
- Protective Gear
- ... ...

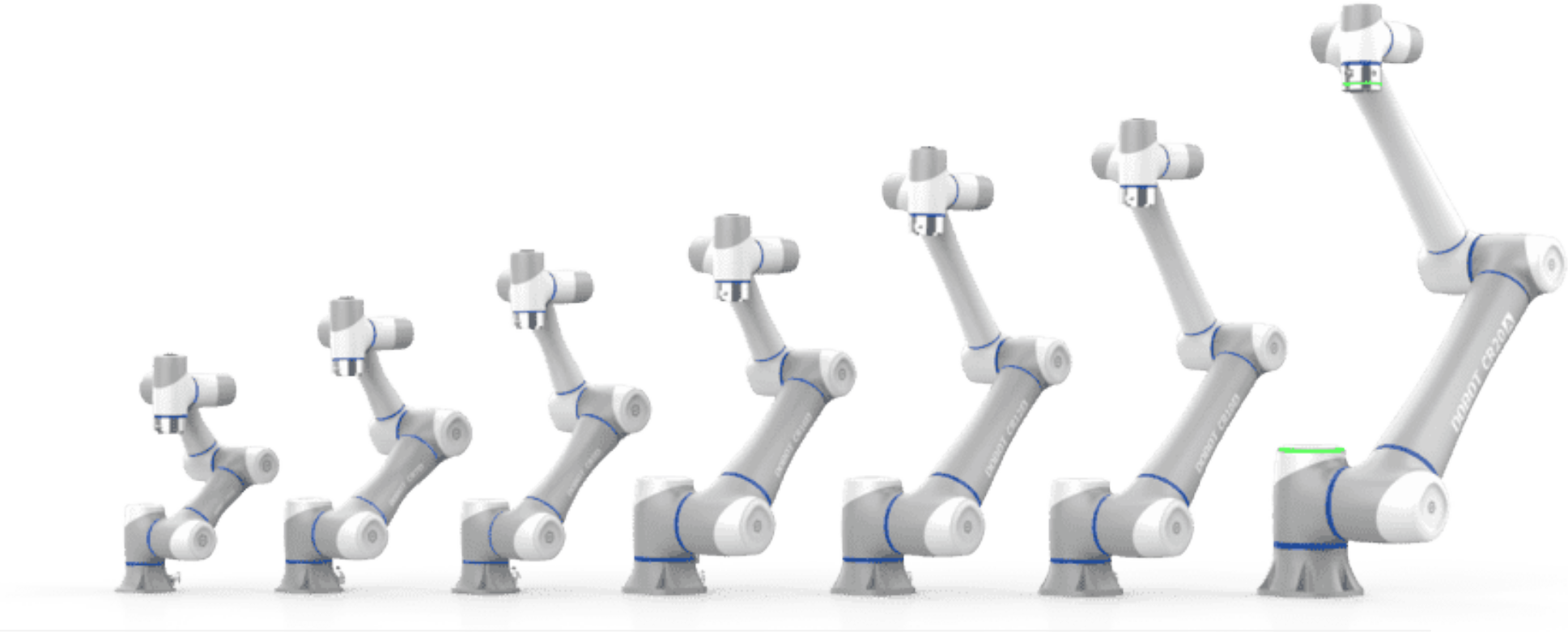
Widely Compatible with the Mainstream Welding Machines

Compatible with a variety of welding machines

No.	Welding Machine Manufacture
1	Fronius
2	EWM
3	Lincoln Digiwave
4	OTC
5	Panasonic
6	Lorch
7	Megmeet
8	Aotai
9	Flama
10	Hypertherm
11	Lincoln Powerwave
12	Miller
13	GYS
14	Kemppi
15	ESAB

*The Dobot CRA series provides analog communication to enable communication with other welding machines.

CRA Cobot Series



	CR3A	CR7A	CR5A	CR16A	CR12A	CR10A	CR20A
Repetitive Accuracy	±0.02 mm	±0.02 mm	±0.02 mm	±0.03 mm	±0.03 mm	±0.03 mm	±0.05 mm
Max Linear Speed	2 m/s	2 m/s	2 m/s	2 m/s	2 m/s	2 m/s	2 m/s
Working Radius	620 mm	800 mm	900 mm	1000 mm	1200 mm	1300 mm	1700 mm
Payloads	3 kg	7 kg	5 kg	16 kg	12 kg	10 kg	20 kg

Safety is the Priority

- **5-level Collision Detection**

Do not need a **safety wall**, creating a friendlier welding work environment.

- **PLD Cat 3-level Controller**

Monitoring each robot joint's position, speed, torque, and other information in real-time.

- **Certifications**

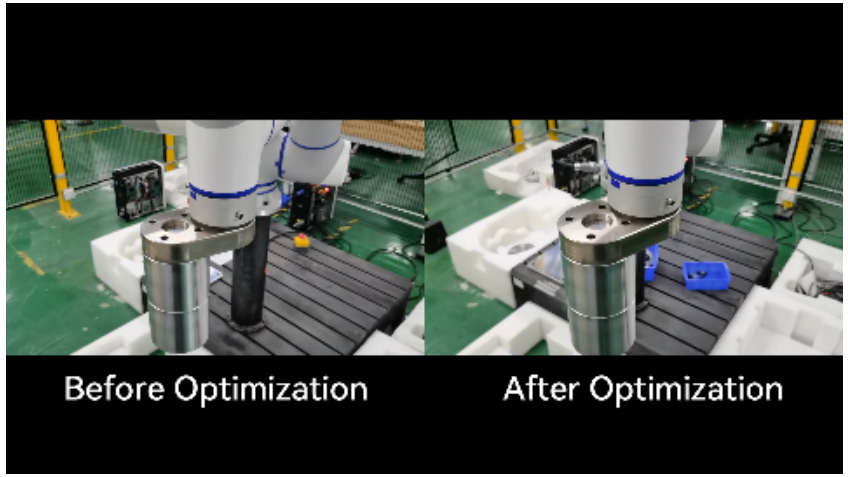
EN ISO13849-1，EN ISO13849-2 and EN ISO 10218-1 Certified.

- **Electromagnetic Brake**

Fast braking capabilities and precise position control. The robot is capable of rapid braking within 18 milliseconds, and can maintain its position within 1 mm.

Quick yet Accurate Motion Performance

Greater Efficiency: overall work cycle time improved by 25%.



Brilliant Response Speed

- 223°/s joint speeds.
- EtherCAT bus for millisecond-level responsiveness.

Precise Positioning

- Laser tracking calibration for <0.4 mm absolute positioning accuracy.
- Enabling high-precision manufacturing tasks.

Smooth, Stable Operational Process

- Proprietary vibration suppression for <0.4 mm vibration during motion.
- Enabling faster and more stable operation.
- Certified MTBF 30,000 hours reliability for long time stable operation.

Welding Process Package

Parameterized Settings

- Parameterized adaptation to the welding machines, enabling quick apply-in and startup for use.

Graphic Programming

- Blockly programming for cobots, allowing operators to plan welding paths without coding.
- Graphical programming templates to further simplify setup, requiring just 4 points to start.

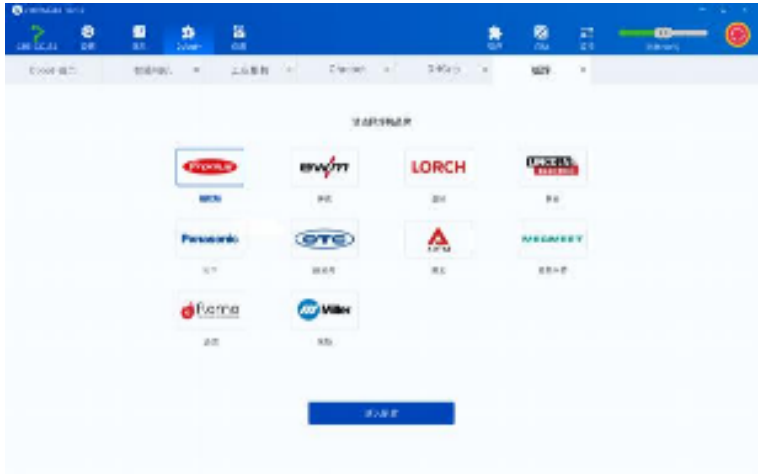
Effortless Welding Functions

- Achieves such fuctions as Arc Retry, Arc Re-ignition, Multi-pass Welding, ect.
- Allows for simple click-to-start operation, without the need for additional configuration or debugging, smooth and seamless.

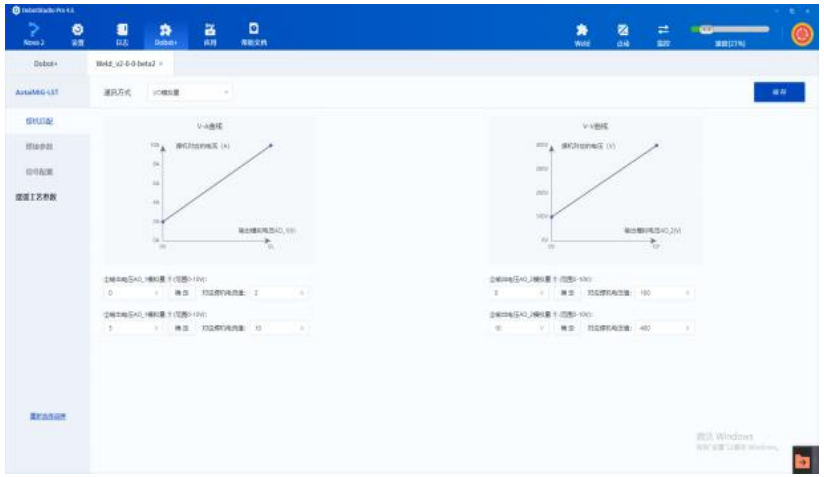
Dobot All-in-One Welding Solution

Only 4-Step to Set up

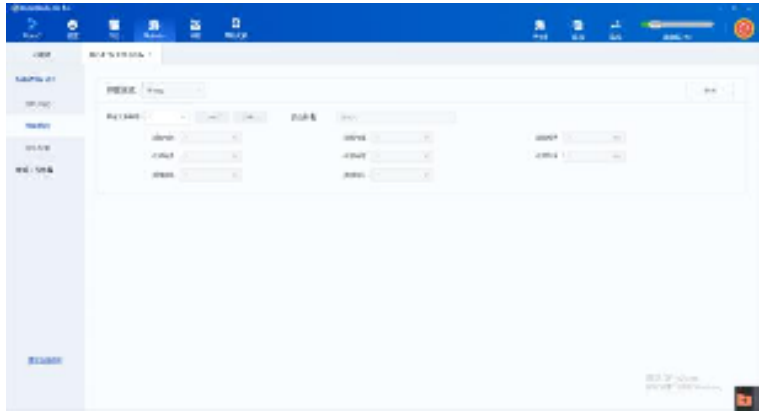
1. Select Your Welding Machine



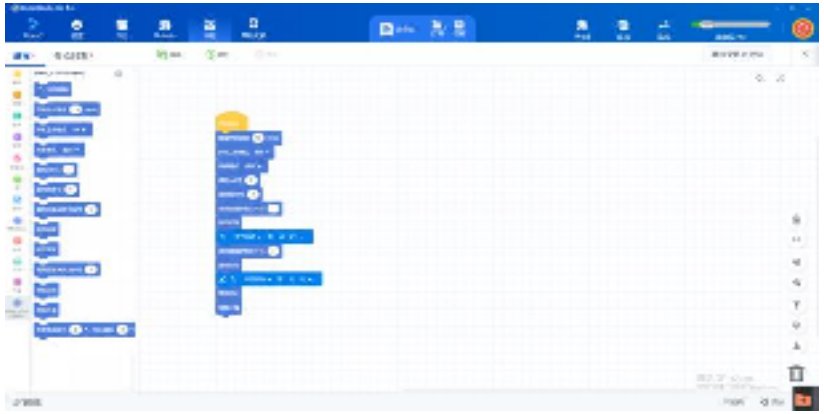
2. Signal Mode



3. Welding Parameters



4. Blocky Proganmming

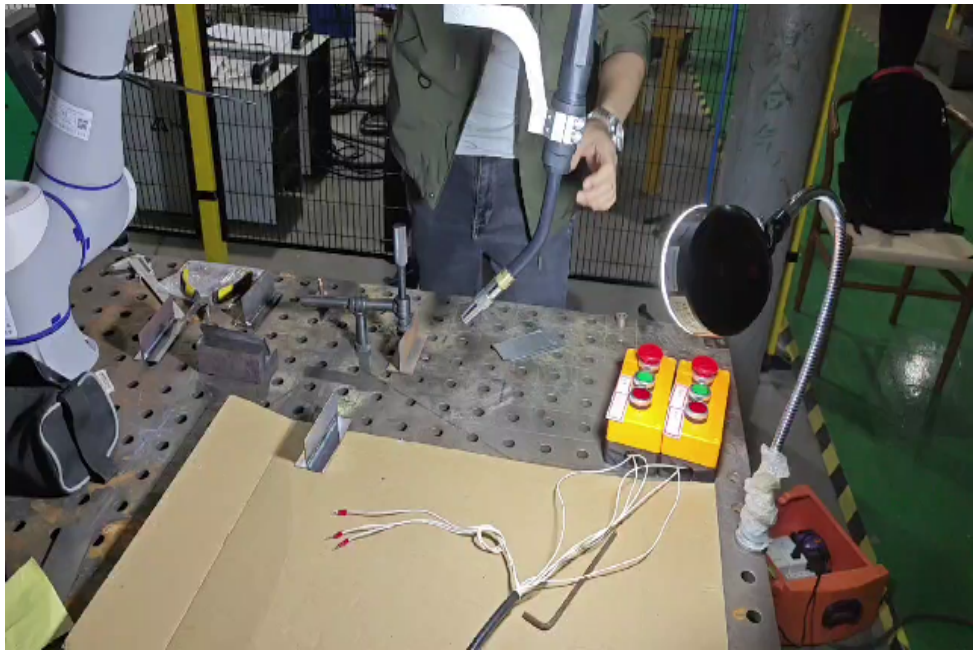


What Functions for CRA Cobot Series?

No.	Module	Function	CRA
1	Manual Functions	Wire Feed	√
2		Wired Back	√
3		Gas Check	√
4		Simulated Operation	√
5		Spot Welding	√
6	End-of-arm Functions	Drag-to-teach	√
7		Save points	√
8		Anti-collision for Welding Torch	√
9		Force-control Drag	√
10	Welding Methods	Weaving Modes	√
11		Arc Retry	√
12		Wire Positioning	√
13		Wire Stick Removal	√
14		Laser Positioning	√
15		Laser Tracking	√
16		Multi-Pass Welding	√
17		Electric Arc Tracking	√

Key Feature 1: Quick Recording

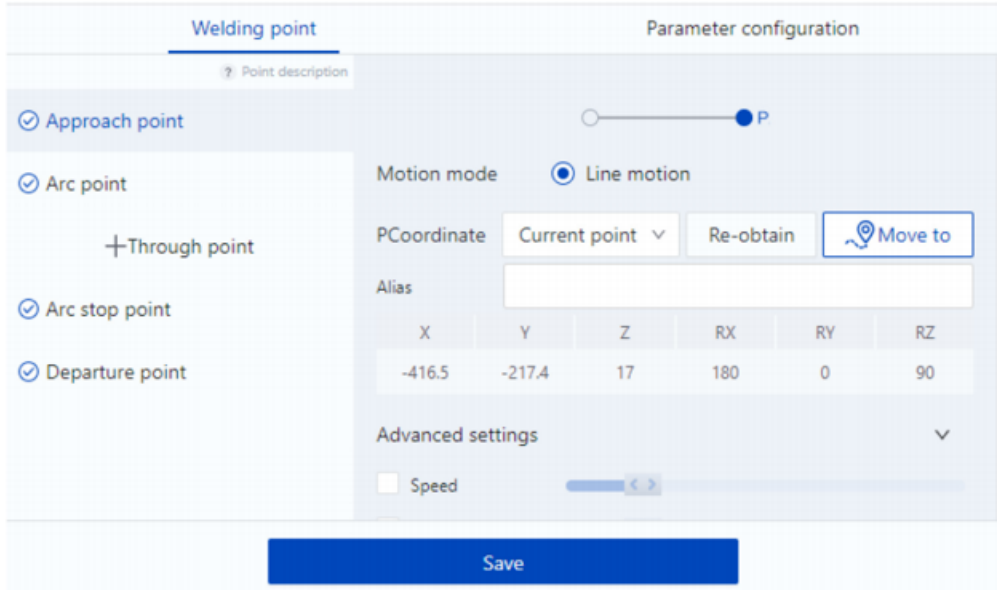
Video: Quick Recording



Quick Recording：To simplify weld stocking and programming operations

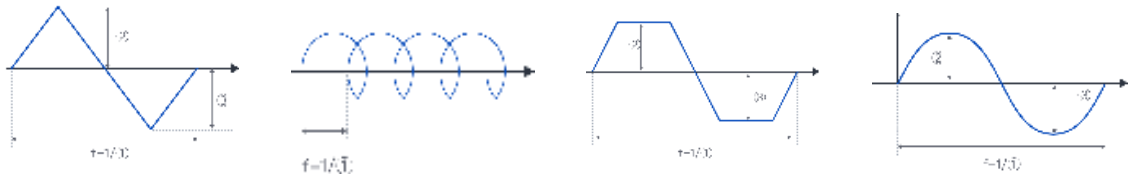
Steps：

1. Setting the appropriate input signals, either using the keypad or the process package.
2. Configure the welding parameters.
3. Record the corresponding point position and start welding.



Key Feature 2: Multiple Arc Swinging Modes, No Programming Required

Video：Multi-Soldering Styles



Triangle | Spiral | Trapezoid | Sine

- **Pendulum Arc：**

It is a method to increase the width of the weld seam to improve the strength of the weld by swinging the torch from side to side at a specific angular cycle in the direction of the weld when performing arc welding.

- **Pendulum Welding：**

1. Supports Triangle, Spiral, Trapezoid, and Sine.
2. Support left dwell right dwell time setting.
3. Support pendulum arc start direction: left start, right start.

Upgraded Functions for Handling Complex Tasks

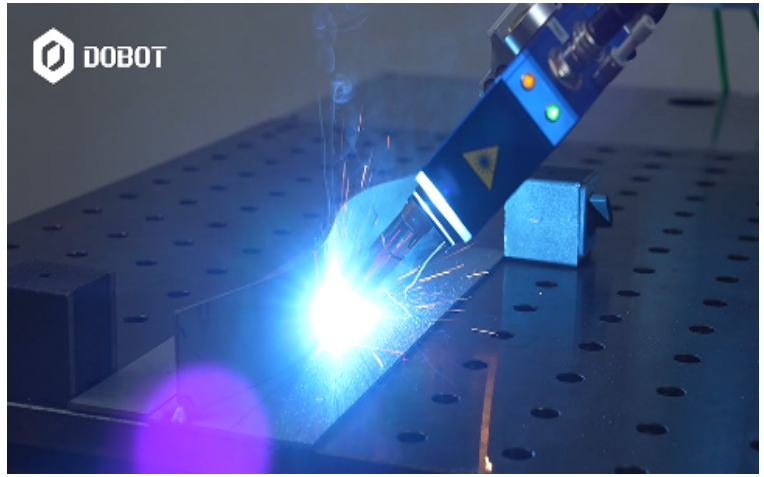
Laser Positioning

Judge the exact position of the weld by scanning the position of the workpiece weld with a laser sensor to get the position deviation of the weld.

Application Scenarios:

- Short weld seams
- Where laser tracking would cause interference

Laser Tracking

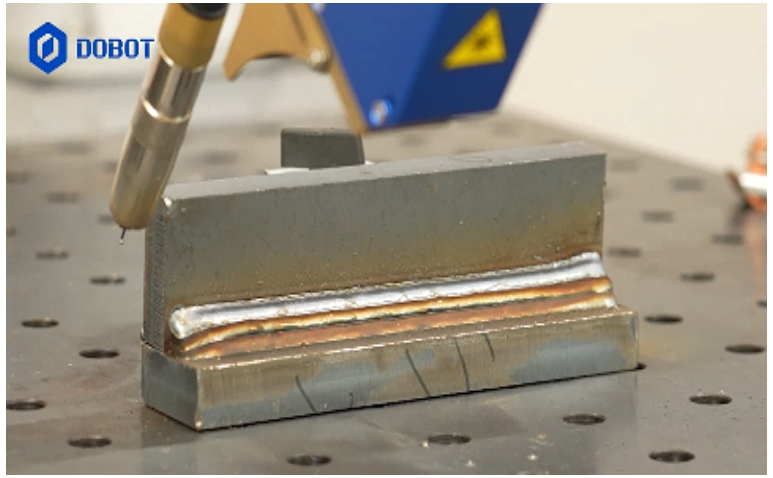


The position deviation between the pendant and the position detected by the laser tracking sensor is calculated and then compensated to ensure the correct trajectory.

Application Scenarios:

- Long and large workpieces
- Thermally deformed workpieces

Multi-Pass Welding



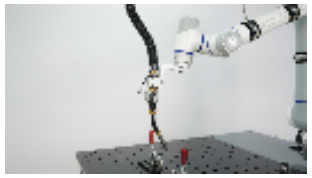
Repeatedly welding the same area in order to increase the width of the weld.

Application Scenarios:

- Thick plate welding

Welding Workstation (Optional)

- Lightweight design, weighing only 40kg, dramatically reduces deployment difficulties and costs.
- Small footprint, easy installation, and ability to work in tight scenarios.



DOBOT CR/CRA robot arm

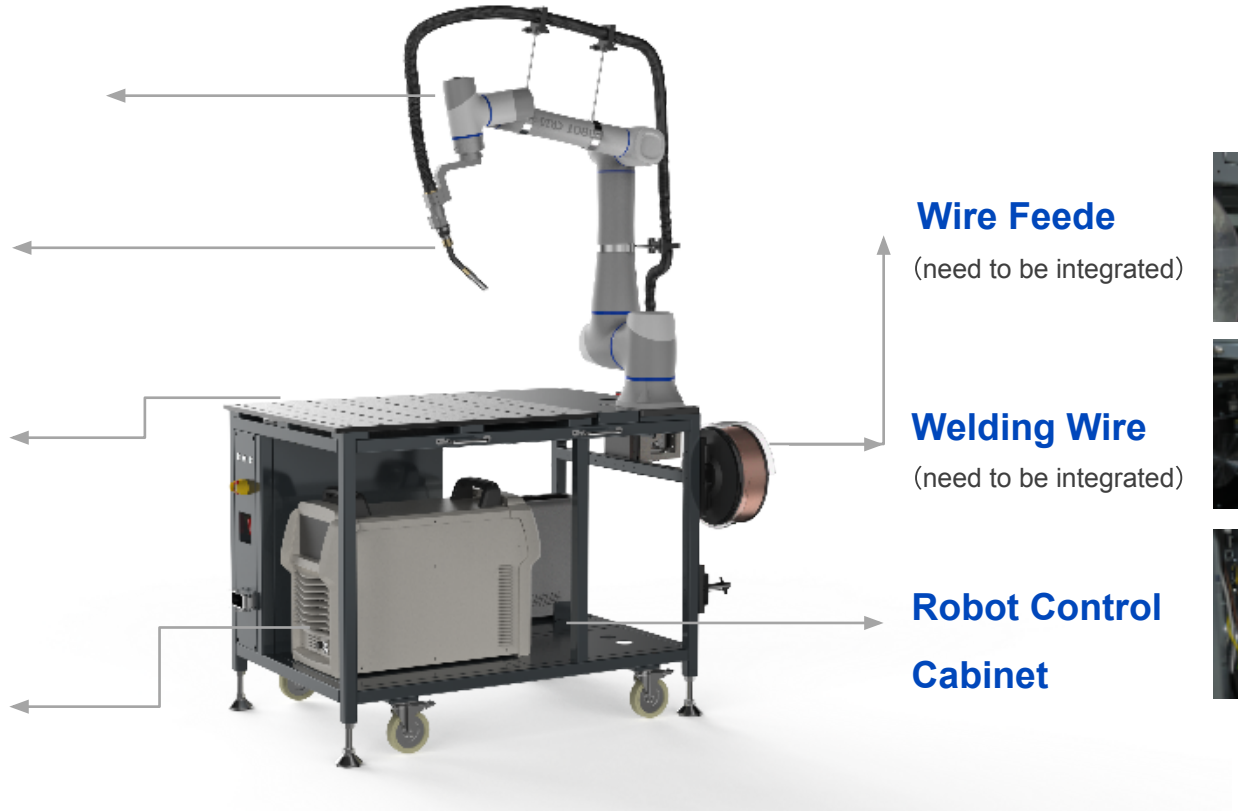
Welding torch

(need to be integrated)

Welding platform

Welding machine power supply

(need to be integrated)



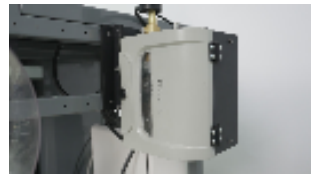
Wire Feede

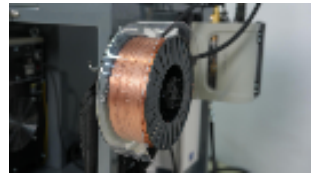
(need to be integrated)

Welding Wire

(need to be integrated)

Robot Control Cabinet





Other External Accessories

Laser Sensors

- The main hardware is for laser positioning and laser tracking.
- It has completed the integration with supported vendors, allowing it to be easily accessed and used within the Dobot software.

IL-SN1

SMT 090 SF 00
SMT 130 SF 00
SMT 250 SF 00
SMT 350 SF 00

IL-HSP

HSP 090 SD 00
HSP 100 SD 02
HSP 100 SD 03
HSP 150 SD 05
HSP 250 SD 00
HSP 350 SD 00

IL-SPD

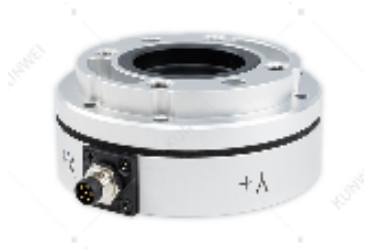
SPD 150 SD 01
SPD 180 SK 00
SPD 250 SD 00
SPD 350 SD 00

IL-WDV

WDV 300 SH 00

Torque Sensors

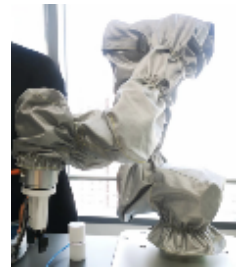
- The dragging motion is smoother, which is beneficial for welding applications that require drag-and-drop positioning, more convenient.



Others

- **Gateways**

- **Magnetic Base**



- **Protective Gear**

TCP/IP Secondary Development

Supports secondary development using TCP/IP, allowing users to develop their own welding software and integrate it with the hardware solution.

CP/IP protocol functions for welding:

- Welding Speed Command.
- Arc Swinging Command.
- Multi-Pass Welding Commands.
- Tracking Commands.
- Tracking Offset Commands.
- Welding Pause and Trajectory Resume Commands.
- Real-Time Feedback of Machine Status.
- and Other Parameters.

TCP/IP Secondary Development

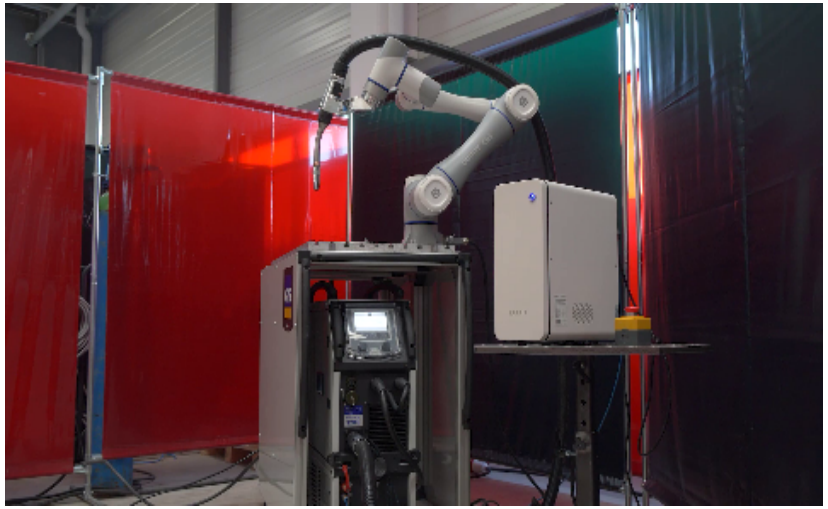
Case Studies

1. Bed Frame Welding

- **Welding Machine**：Magmaweld
- **Communication Mode**：Modbus/ DeviceNet
- **Straight and right angle**

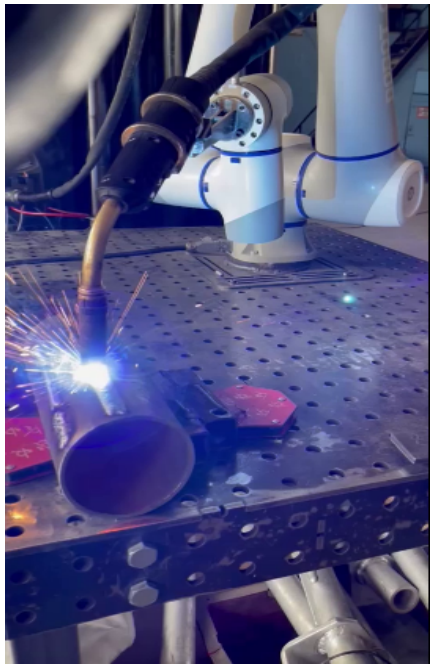
2. Carbon steel seam

- **Welding Machine**：GYS
- **Communcation Mode**：Modbus – TCP
- **Straight and right angle**



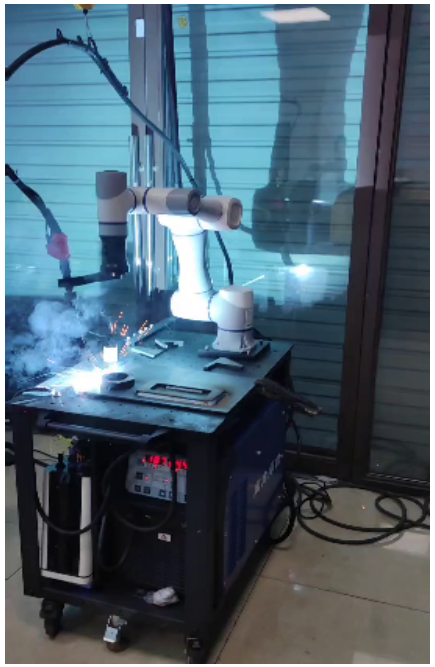
3. Cylindric surface

- **Welding Machine**：Lincoln
- **Communication Mode**：Modbus - TCP
- **Cylindric surface**



4. Circular arc

- **Welding Machine**：Aotai
- **Communication Mode**：Analog I/O
- circular arc



Case Studies

1. Straight & Circular Arch

- **Welding Machine**: Panasonic
- **Communication Mode**: Modbus/DeviceNet
- **Straight and circular arch**

2. Cooperation With OTC

- **Welding Machine**: OTC Daihen
- **Communication Mode**: Modbus/DeviceNet

3. Mobile Welding Station

- **Welding Machine**: Magmaweld
- **Communication Mode**: Modbus/DeviceNet

Sevices & Supports

Get dedicated support you need to optimize Dobot robots.

Dobot offers lifecycle services including product selection, deployment, repair, warranty, and online diagnostics. Technical experts provide real-time support to quickly resolve issues and maximize production uptime.

- Customer Support 24/7
- Full Lifecycle Services from Selection to Diagnostics
- Online/Offline Training and On-Site Support
- Standard 12-Month Warranty, Extendable to 5 Years
- Loaner Units Minimize Downtime
- Remote Monitoring and Fault Diagnosis

Sevices & Supports

Training System

Dobot offers a progressive curriculum of training courses from basic to advanced levels, helping customers systematically understand the operating principles, usage methods, and maintenance of robots. Trainees who pass the assessment upon completion will receive a customer service engineer certification and training certificate.

On-Site Training

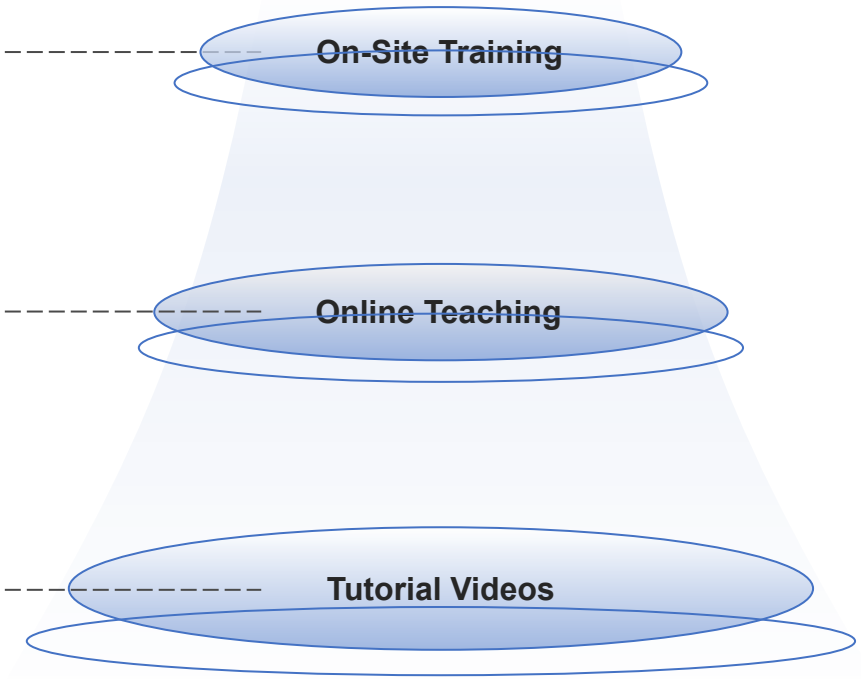
Integrates theory and practice, enabling trainees to comprehensively master professional robotic skills.

Online Teaching

Experienced tutors share industry insights, enabling in-depth learning of robotic application knowledge.

Tutorial Videos

Beginner training enables learners to quickly master collaborative robot basics.



Thank you.

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