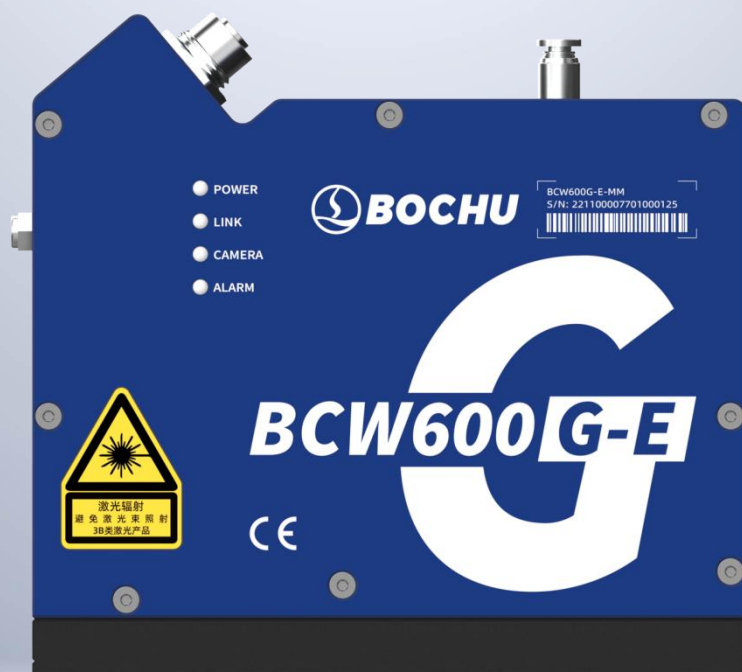




BCW600G-E Seam Tracker Installation Manual

Document Version: V1.0.0



Legal Information

About This Document

As products and technologies continue to update, the product you are using may differ from the descriptions in this document. The actual product shall prevail. BOCHU strives to ensure the accuracy and applicability of this document, but reserves the right to the final interpretation. Changes resulting from product updates or other causes may be made without prior notice.

About This Product

This system alone does not comply with the general safety requirements specified in ISO 10218 for industrial robots. Appropriate safety devices, such as safety modules, safety PLCs, and safety doors, shall be incorporated as required by the intended application. BOCHU shall not be liable for any safety incidents resulting from the absence or improper use of such safety devices. Such incidents shall not be regarded as product defects of this system.

Disclaimer

The operation of the robot or external axis and the final welding performance are affected by the welding material, welding equipment, assist gas, gas pressure, and parameter settings. All parameters shall be configured carefully according to the specific welding requirements. Improper parameter settings or operation may result in degraded welding performance, damage to the welding torch or other equipment, or personal injury. Although the FSWELD Intelligent Welding Control System provides protective functions, equipment manufacturers and end users shall strictly comply with all applicable operating procedures to minimize safety risks.

BOCHU shall not be liable for any direct or indirect loss arising from improper use of this document or this product; failure to comply with safety operating procedures; or force majeure events, including but not limited to natural disasters.

Equipment in operation may involve inherent risks. Users shall ensure that adequate fault-handling mechanisms and safety protection measures are implemented. BOCHU shall not be liable for any incidental or consequential damages arising therefrom.

Foreword

This document applies to the BCW600G-E Seam Tracker (hereinafter referred to as "BCW600G-E").

This document describes the product components, wiring, installation, and related information for BCW600G-E.

Explanation of Symbols

The symbols used in this document are described in the table below.

Symbol	Description
 Notice	Indicates supplementary information regarding the use of this product.
 Caution	Indicates that improper operations may result in minor injury or equipment damage.
 Warning	Indicates that improper operations may result in death or serious injury.
 Danger	Indicates that improper operations will result in death or serious injury.

Revision History

Version No.	Date	Description
V1.0.0	2026/07/06	First release of the installation manual for the BCW600G-E Seam Tracker.

Safety Instructions

Safety Precautions

- Before storing, installing, wiring, operating, inspecting, or maintaining the product, users must read and follow the important safety instructions below to ensure safe and proper operation.
- The "Caution," "Warning," and "Danger" safety symbols in the manual serve only as supplementary safety information and do not cover all required safety precautions.
- The product should be used in the specified environmental conditions. Failure to comply may cause malfunction. Functional abnormalities or component damage resulting from non-compliance with these specifications are not covered under the warranty.
- BOCHU provides no warranty for products that have been modified by users, and assumes no liability for any injury or loss caused by such modifications.
- BOCHU shall not be liable for personal injury, property losses, or other damages arising from improper operation of the product.

Safety Instructions

General	
 Caution	1. Only qualified personnel are permitted to install, wire, maintain, inspect, or replace components of the product. Failure to comply may result in electric shock, personal injury, or property damage.
	2. When the equipment is installed and ready for operation, ensure it has an emergency stop button that can stop the equipment immediately at any time.
	3. If a momentary power failure occurs followed by power restoration during operation, stay clear of the machine as the equipment may restart suddenly. Take measures to ensure that restarting does not pose risks to personal safety.
	4. Only qualified personnel are permitted to touch the interior of the product.
	5. Do not install, wire, or disassemble the equipment while it is connected to a power source. Failure to comply may cause electric shock, malfunction, or damage.

	6. Do not damage or forcibly pull the cable. Avoid applying excessive tension to the cable, hanging heavy objects on it, or pinching it with the enclosure or cabinet door. Failure to comply may result in electric shock, product stoppage, or heat damage.
Unpacking Inspection	
 Caution	1. Before unpacking, check whether the outer packaging is intact and free from damage, dampness, water soaking, deformation, or other abnormalities. 2. Open the package correctly. Do not strike or hammer the packaging. 3. Check the product and its accessories for any visible damage, rust, corrosion, or scratches. 4. After unpacking, carefully compare the product and its accessories against the packing slip or contract to ensure all items and documentation are complete.
 Warning	1. Do not install if you find any signs of damage, rust, or prior use on the product or its accessories during unpacking. 2. Do not install if you find water ingress, missing parts, or damaged components inside the product during unpacking. 3. Do not install if you find that product names on the packing list do not match after carefully comparing the list against the packing slip or contract.
Storage and Transportation	
 Caution	1. Store and transport the product according to its required storage and transportation conditions, ensuring that temperature, humidity, and other factors meet the specified requirements. 2. Avoid storing or transporting the product in locations exposed to water, rain, direct sunlight, strong electric fields, strong magnetic fields, or excessive vibration. 3. Properly package the product before transportation. 4. Do not ship this product mixed with other equipment or items that may cause damage to the product.
Installation	
 Warning	1. Before installation, carefully read the product manual and safety instructions. 2. Do not modify this product. 3. Do not loosen the fixing bolts on any parts or components of the product. 4. Do not install the product in environments subject to strong electric field or

	electromagnetic wave interference. 5. To install the product inside a cabinet or terminal equipment, the cabinet or terminal equipment shall be equipped with appropriate protective measures, including fire, electrical, and mechanical protective enclosures. The ingress of protection ratings shall comply with relevant IEC standards and local laws and regulations.
 Danger	1. Only qualified personnel are permitted to install, wire, maintain, inspect, or replace components of the product. 2. Ensure that installation, wiring, maintenance, inspection, and component replacement of this product are performed only by personnel who have received professional training and possess the appropriate electrical knowledge and skills. 3. Ensure that installation personnel are familiar with the product installation requirements and related technical documentation before installation. 4. When installing equipment that generates strong electromagnetic interference (such as a transformer), install a shielding protection device to prevent malfunction of the product.

Wiring

 Warning	1. Perform the wiring correctly and securely. Failure to comply may cause motor runaway, personal injury, or malfunction. 2. Be sure to install safety emergency stop circuits, interlock circuits, and limit circuits in the external control circuit of the equipment. 3. Do not connect input power to the output terminals of the product. Failure to comply may damage the equipment or even cause a fire. 4. When wiring, use cables that meet the requirements for wire gauge, shielding, and other specifications. For shielded cables, ground the shield reliably at one end. 5. After wiring, ensure that no loose screws or exposed conductors remain inside the equipment or the product.
 Danger	1. Only qualified personnel are permitted to install, wire, maintain, inspect, or replace components of the equipment. 2. Do not perform wiring while the power is connected, as it may cause electric shock. 3. Before wiring, turn off all equipment power. After turning off the power, residual voltage may remain inside the equipment's capacitors. Wait at least 10 minutes before

	performing wiring or other operations.
	4. Be sure to properly ground the equipment and the product. Failure to comply may cause electric shock.
	5. Follow the Electrostatic Discharge (ESD) protection procedures, and wear an ESD wrist strap when performing wiring and other operations to avoid damaging circuits or electronic components inside the equipment or product.
Powering on	
 Danger	1. Before powering on, make sure that the equipment and product are properly installed, with all wiring secure and accurate.
	2. Before powering on, confirm that the power supply meets the equipment requirements. Failure to comply may damage the equipment or cause a fire.
	3. When powering on, keep clear of moving parts of the equipment or product, as sudden movement may occur.
	4. After powering on, do not open the product's protective cover, as it may cause electric shock.
	5. Do not touch any wiring terminals of the product while the power is on, as it may cause electric shock.
	6. Do not disassemble any devices or components of the equipment or product while the power is on. Failure to comply may cause electric shock.
Operation and Trial Run	
 Warning	1. Follow the procedures and instructions described in the product manual for operation and trial run.
	2. During operation, do not allow foreign objects or metal items to fall into the product. Failure to comply may damage the product and equipment.
	3. Do not change any wiring while the power is on.
 Danger	1. Do not touch any wiring terminals of the equipment or product during operation, as it may cause electric shock.
	2. Do not disassemble any devices or components of the equipment or product while it is running. Failure to comply may cause electric shock.
	3. Do not check the product's temperature by direct contact, as it may cause burns.
	4. Only qualified personnel are permitted to measure signals while the product is

	running. Failure to comply may cause personal injury or lead to unintended operations that damage the equipment.
Maintenance	
 Warning	Regularly inspect and maintain the equipment and product, and keep maintenance records.
 Danger	When performing maintenance or repairs, turn off all equipment power and wait at least 10 minutes before proceeding.
Repair	
 Warning	1. Request repair service in accordance with the product warranty terms.
	2. If the equipment malfunctions or is damaged, find a qualified personnel to repair the equipment and product following the repair instructions, and keep repair records.
	3. Follow the product's consumable parts replacement instructions when replacing parts.
	4. Do not continue to use damaged equipment, as it may cause further damage.
	5. After replacing equipment, verify all wiring and reconfigure the parameters.
 Danger	1. Only qualified personnel are permitted to install, wire, maintain, inspect, or replace components of the equipment.
	2. Do not repair the equipment while the power is on, as it may cause electric shock.
	3. After turning off all equipment power, wait at least 10 minutes before performing any inspection, repair, or other operations.
Disposal	
 Warning	1. Dispose of the equipment and product in accordance with national regulations and standards to avoid property damage or personal injury.
	2. Dispose of and recycle the discarded product according to industrial waste treatment regulations to prevent environmental pollution.

Risks Associated with Laser Equipment

Risk Type	Symbol	Description
Laser Radiation		1. This equipment is classified as a Class 3B laser product . Commissioning, maintenance, and repair shall only be performed by trained and qualified personnel.
		2. Never look directly into the laser output aperture or the laser beam while the equipment is operating.
		3. Avoid exposing skin or eyes to direct laser radiation.
		4. Personnel working within the operating area shall wear appropriate laser safety eyewear.
		5. Avoid directing the laser beam onto highly reflective surfaces. If unavoidable, adjust the angle of the reflective surface to minimize hazardous reflections.
		6. Switch off the laser source promptly when the equipment is not in use.

Contents

Legal Information	I
Foreword	II
Safety Instructions	III
Chapter 1 Product Overview	1
1.1 Product List	1
Chapter 2 Hardware Wiring Instructions	2
2.1 BCW600G-E Wiring	2
2.1.1 Technical Specifications	2
2.1.2 Interface Layout	3
2.1.3 J01 Power and Communication Connector	3
2.1.4 J02 Cooling Gas Inlet	3
2.1.5 Indicator Status Description (L1 to L4)	4
2.2 BCL4500B Wiring Instructions	5
2.2.1 Technical Specifications	5
2.2.2 Interface Layout	5
2.3 System Wiring Diagram	6
Chapter 3 Installation Instructions	8
3.1 Installation Steps	8
3.2 BCW600G-E Installation Instructions	8
3.3 Protective Window Replacement	9
3.3.1 Protective Window Removal	9
3.3.2 Protective Window Installation	9

Chapter 4 Installation Specifications	10
4.1 Gas Requirements	10
4.2 Power Supply Specifications	10
4.3 Grounding Specifications	11
4.3.1 Overview	11
4.3.2 Ground Rod Specifications	11
4.3.3 Grounding Specifications	12
4.4 Cable Routing Specifications	15
4.4.1 Separation of High-voltage and Low-voltage Circuits:	15
4.4.2 Cable Routing Specifications	16
4.4.3 Towline Cable Routing	17
4.4.4 Cable Routing Specifications for BCW Series Devices	21
Chapter 5 Mounting Dimensions	22
5.1 BCW600G-E Dimensions	22
5.2 BCL4500B Dimensions	23
Chapter 6 Troubleshooting	24
6.1 About Network Communication	24
6.1.1 Camera Communication Failure on Software Startup	24
6.1.2 Camera Disconnects During Normal Use	26
6.1.3 100 Mbps Network Alert	27
6.2 About Firmware Update	28
6.2.1 Proper Operation of Firmware Update	28
6.2.2 Vision Software Crashes After Reconnecting Camera	30
6.3 About Camera Usage	31

6.3.1 Image Lagging	31
6.3.2 Point Cloud Missing	31
6.4 Preparation Before Contacting Technical Support	32

Chapter 1 Product Overview

The BCW600G-E Seam Tracker (hereinafter referred to as the "BCW600G-E") is a laser vision weld seam tracking sensor with high precision specifically designed for welding robots. It adopts non-contact scanning technology to enable accurate weld seam positioning and end point searching. In addition, it offers significant improvements in recognition accuracy, scanning frame rate, point cloud distribution uniformity, and anti-reflection performance.

1.1 Product List

The BCW600G-E Seam Tracker is a key accessory of the FW-GX system. Related components in the system include the BCW600G-E Seam Tracker, the BCL4500B Terminal Board(hereinafter referred to as the "BCL4500B"), and associated cables.

Table 1-1 BCW600G-E and Related Components

BCW600G-E Seam Tracker * 1	BCL4500B Terminal Board * 1
	
LAN-10-B-PWE Towline Cable * 1	LAN-15X Network Cable * 1
	

! Notice: Accessories, quantities, and cable lengths may vary by package and requirements. The product list above is for reference only.

Chapter 2 Hardware Wiring Instructions

This chapter describes the interface layouts and hardware wiring for BCW600G-E and BCL4500B, including BCW600G-E wiring instructions, BCL4500B wiring instructions, and system wiring diagrams. Please read this chapter carefully before wiring to ensure safe and proper operation.

2.1 BCW600G-E Wiring

2.1.1 Technical Specifications

Table 2-1 BCW600G-E Technical Parameters

Parameter	Description
Laser Classification	Class 3B
Minimum Working Distance	360 mm
Optimal Working Distance	585 mm
Maximum Working Distance	850 mm
Minimum FOV	140 mm
Optimal FOV	212 mm
Maximum FOV	299 mm
Resolution in Y Direction	0.06 mm to 0.12 mm
Resolution in Z Direction	0.18 mm to 0.79 mm
Mounting	Rear Mounting
Dimension (L × W × H)	150 mm × 45 mm × 138.4 mm (L × W × H)
Frame Rate	200 fps
Ambient Temperature	0°C to 50°C
Ambient Humidity	0 to 95% RH
Protection	IP64
Cooling	Air Cooling
Weight	Approx. 1.1 kg

2.1.2 Interface Layout

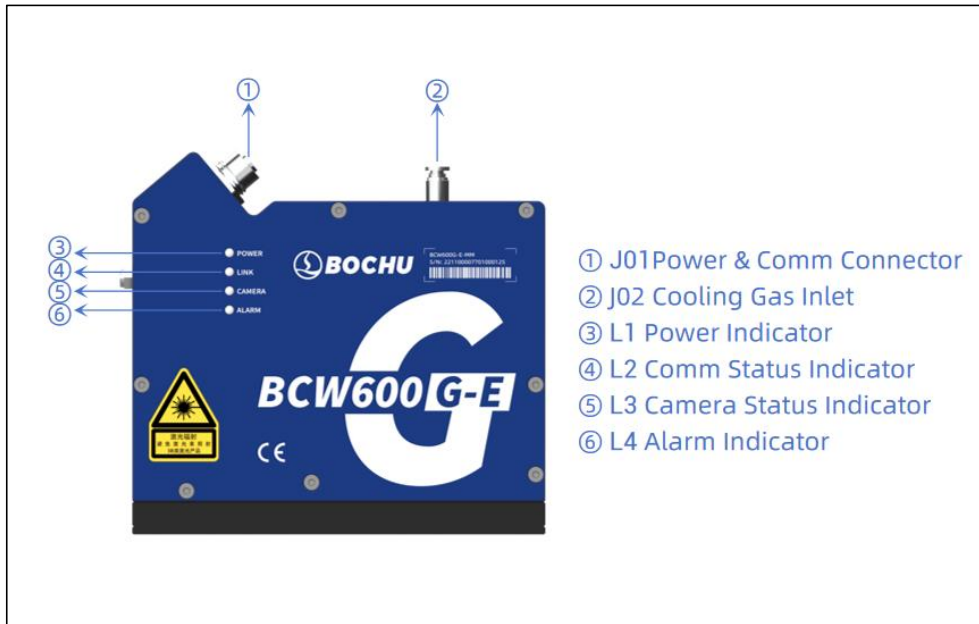


Figure 2-1 BCW600G-E interface layout

2.1.3 J01 Power and Communication Connector

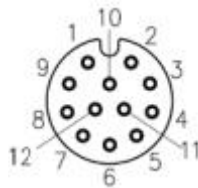


Figure 2-2 J01 Power and communication connector

The connector provides power to the BCW600G-E and enables network communication between the BCW600G-E and the CNC host. It requires the BOCHU standard LAN-10-B-PWE towline cable to connect the BCW600G-E to the OUT port of BCL4500B.

2.1.4 J02 Cooling Gas Inlet



Figure 2-3 J02 Cooling gas inlet

This connector is the cooling gas inlet for BCW600G-E (tube outer diameter: $\phi 6$). When the internal temperature of the BCW600G-E exceeds 50°C, air-cooling must be enabled (recommended pressure: 0.3 MPa) to cool the core components and ensure proper system

operation.

2.1.5 Indicator Status Description (L1 to L4)

The following is a detailed status description of BCW600G-E indicators:

Table 2-2 Status Description of BCW600G-E Indicators

Label	Description	Status	Description
POWER	Power indicator	Solid green	The power supply is working properly.
		Off	The device has no power or insufficient voltage.
LINK	Communication status indicator	Solid green	The network is connected and an IP has been assigned.
		Red	The network is not connected.
		Flashing green	The network is connected, and the device is waiting for IP assignment.
CAMERA	Camera status indicator	Solid green	The camera is initialized.
		Red	The camera fails to initialize.
		Flashing green	The camera has encountered an error.
ALARM	Alarm indicator	Green	The startup program is running normally.
		Red	Error
		Flashing red	Warning

2.2 BCL4500B Wiring Instructions

2.2.1 Technical Specifications

Table 2-3 BCL4500B Technical Parameters

Parameter Type	Description
Power Supply	24 V DC/2 A
Power	20 W (Only applicable with BCW600G-E)
Ambient Temperature	0°C to 50°C
Ambient Humidity	0 – 95% RH
Dimension	79.4 mm × 112.65 mm × 45.5 mm
Weight	Approx. 0.27 kg

2.2.2 Interface Layout

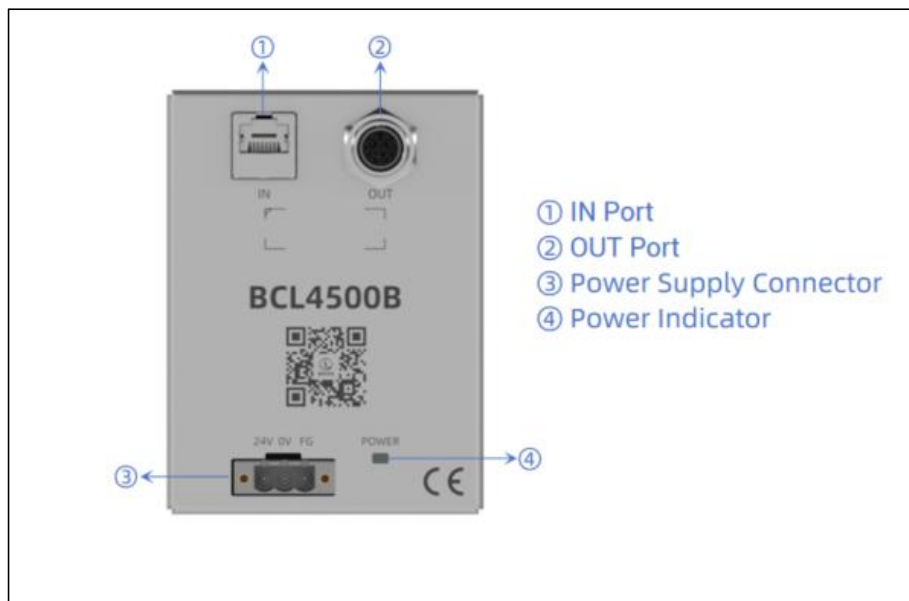


Figure 2-4 BCL4500B interface layout

- IN Port: Connects to an Ethernet cable with an RJ45 connector.
- OUT Port: Connects to the LAN-10-B-PWE towline cable.
- Power Supply Connector: Connects to 24 V, 0 V, and FG (from left to right).
- Power Indicator: Solid ON indicates normal power supply (24 V present). OFF indicates no power or insufficient voltage.

2.3 System Wiring Diagram

BCW600G-E is connected to BCL4500B via LAN-10-B-PWE towline cable. The BCL4500B provides a 24 V power input (external 24 V supply) and enables network communication (connected to the CNC host via a standard Ethernet cable).

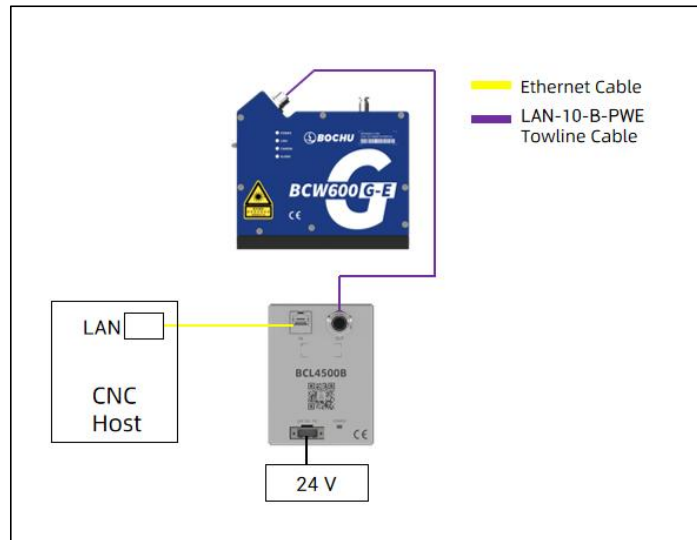


Figure 2-5 BCW600G-E wiring diagram

When replacing a BCW600P with a BCW600G-E and using the original towline cable, two Y-cables must be added. One Y-cable (BCW600PE) connects BCW600G-E to the existing BCW/LAN towline cable, while the other Y-cable (BCL4500B) connects the towline cable to BCL4500B. Finally, BCL4500B is connected to the CNC host via a Ethernet cable.

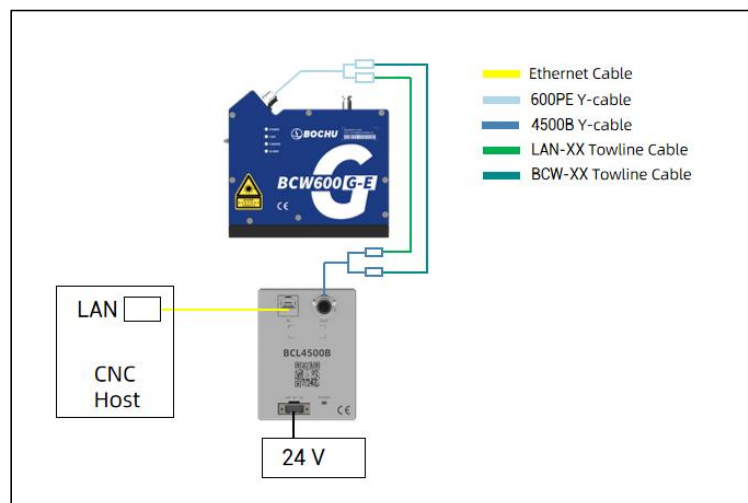


Figure 2-6 BCW600G-E wiring diagram (using the original cable)

! Notice: The BCW600G-E and BCW600P-E share the same cable specifications and are interchangeable.

The wiring diagram of the welding system is shown below. It is recommended to install BCL4500B and the HPL2720E Terminal Board inside the welding robot control cabinet, and to install the CNC host in the electrical integration cabinet.

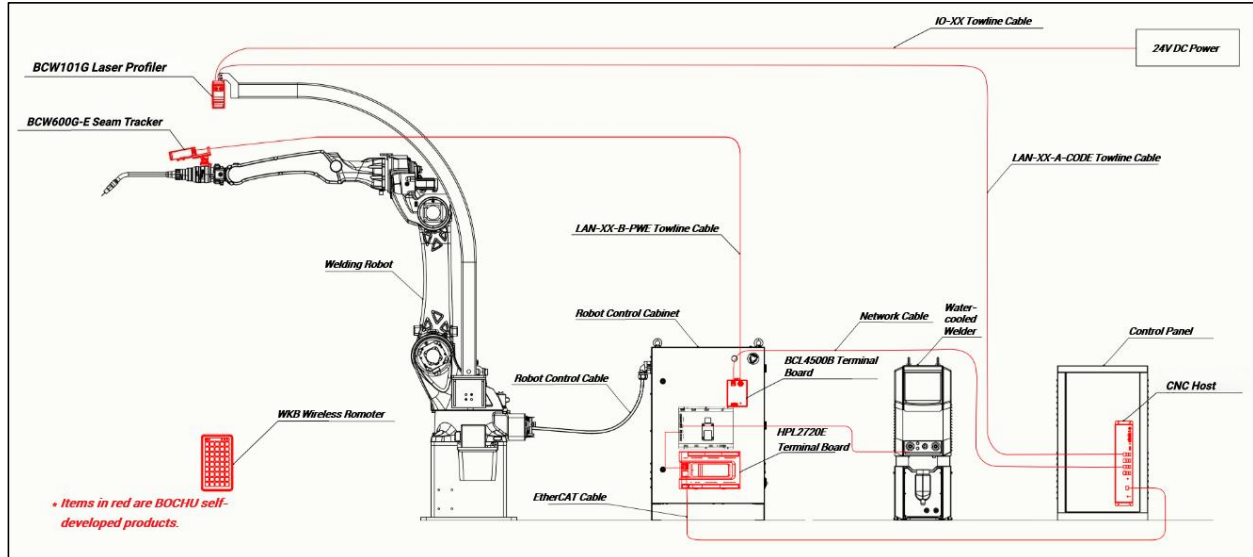


Figure 2-7 Wiring diagram of BOCHU intelligent welding system

Chapter 3 Installation Instructions

This chapter describes the main installation procedure, installation method, and protective window replacement for BCW600G-E. It covers software deployment, device installation, and protective window removal/installation, ensuring that users complete device deployment and routine maintenance in compliance with specifications.

3.1 Installation Steps

Step 1 Download the software CypWeld.

Step 2 Install BCW600G-E onto the end-effector clamp of the robot.

Step 3 Turn off power and complete all BCW600G-E related wiring.

Step 4 Power on the system, launch CypWeld, and begin operation.

3.2 BCW600G-E Installation Instructions

BCW600G-E should be mounted to the seam tracker clamp using captive screws. Follow the steps below:

Step 1 Four M4 × 12 captive screws are required for upright mounting.

Step 2 Align the mounting holes on the back of BCW600G-E with the clamp, then fasten them using four M4 × 12 captive screws.

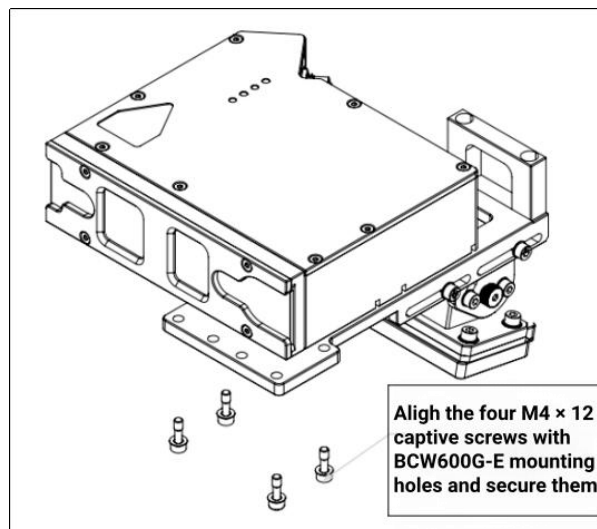


Figure 3-1 BCW600G-E installation diagram

3.3 Protective Window Replacement

3.3.1 Protective Window Removal

To remove the protective window, gently press it and slowly slide it outward until it is fully disengaged from the slot.

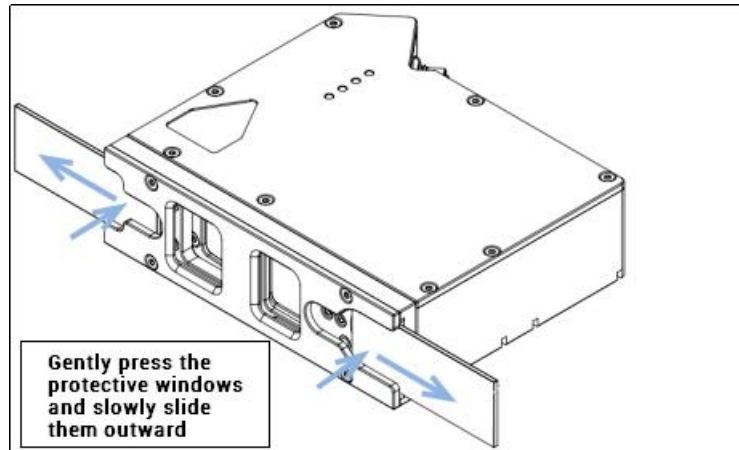


Figure 3-2 BCW600G-E protective window removal

3.3.2 Protective Window Installation

To install the protective window, align it with the slot opening beneath BCW600G-E, then gently push it along the slot until it is fully seated.

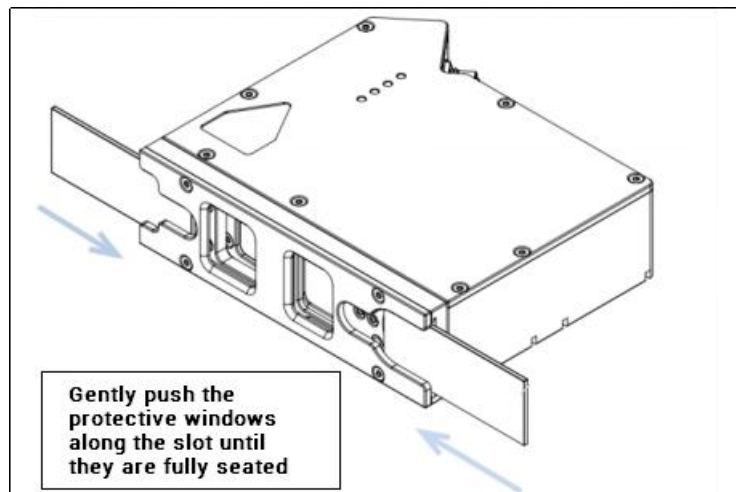


Figure 3-3 BCW600G-E protective window installation

⚠ Caution: Do not touch the optical surface of the window during operation. Hold the window only by the edges on both sides.

Chapter 4 Installation Specifications

This chapter defines the gas, power supply, grounding, and wiring specifications that must be followed during BCW600G-E operation. Please strictly adhere to the requirements in this chapter for gas source and piping configuration, and properly plan cable routing and securing methods to ensure safe and stable equipment operation.

4.1 Gas Requirements

During operation, BCW600G-E is affected by ambient thermal radiation and internal heat accumulation. To maintain stable performance, extend the service life of the protective window, and ensure scanning accuracy, cooling gas should be supplied through the cooling gas inlet.

- Gas Type: Nitrogen, argon, or other inert gases are recommended. Clean air, carbon dioxide, or other non-flammable gases may be used as alternatives if inert gases are unavailable.
Oxygen must not be used as a cooling gas for safety reasons.
- Gas Pressure: Maintain the cooling gas pressure at a stable level of **0.3 MPa**.
- Monitoring: Regularly monitor the gas pressure and flow during operation and adjust the supply if any abnormality occurs.

4.2 Power Supply Specifications

Power supply is critical to the proper operation of the system. A power failure or malfunction can result in complete system shutdown or equipment damage. In welding systems, proper wiring and isolation are essential for both AC power supplies (380 V and 220 V) and DC power supplies (24 V and 12 V).

 Danger:

1. Always power off before performing any wiring, connection, or disconnection operations.
 2. Never connect or disconnect live connectors, as doing so may result in equipment damage or serious personal injury.
-

3. Use only 24 V switching power supplies from qualified suppliers that meet the power requirements of BOCHU intelligent welding control systems. Poor-quality or underpowered supplies may compromise system stability or cause permanent damage to the equipment.

4.3 Grounding Specifications

4.3.1 Overview

- **Ground:** Ideally refers to a physical entity with zero potential and zero impedance, without any voltage drop. In practice, a grounding electrode or a group of conductive materials is used to form a reliable electrical connection with the earth. Multiple grounding points may be interconnected underground.
- **Grounding:** The act of connecting part of a system or device to the ground through a grounding wire.
- **Grounding Wire:** The conductor that connects to the grounding electrode.
- **Purpose of Grounding:** A safety measure to ensure proper functioning of electrical equipment and protect personnel safety. This section focuses on ensuring stable and reliable operation of the equipment.

4.3.2 Ground Rod Specifications



Figure 4-1 Ground rod

- **Ground Rod Material**
 - Outer section: carbon steel
 - Inner section: alloy steel
 - Thread section: stainless steel

➤ Grounding Requirements

- Use galvanized grounding screws for the welding system.
- Use copper grounding wire with a cross-sectional area of at least 10 mm², or aluminum wire with a cross-sectional area of at least 16 mm².
- The resistance between the grounded metal structure and the main grounding point shall not exceed 0.1 Ω.
- The grounding cables should be as short and thick as possible, with a ground resistance no greater than 4 Ω.

4.3.3 Grounding Specifications

- Multi-point Grounding: Use a star topology for connections; daisy chaining (serial connection) is not recommended.

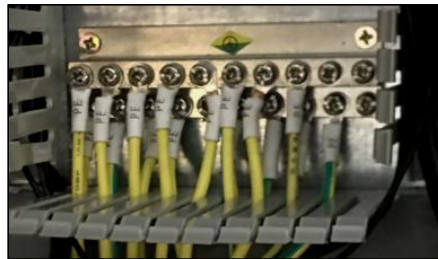


Figure 4-2 Multi-point grounding

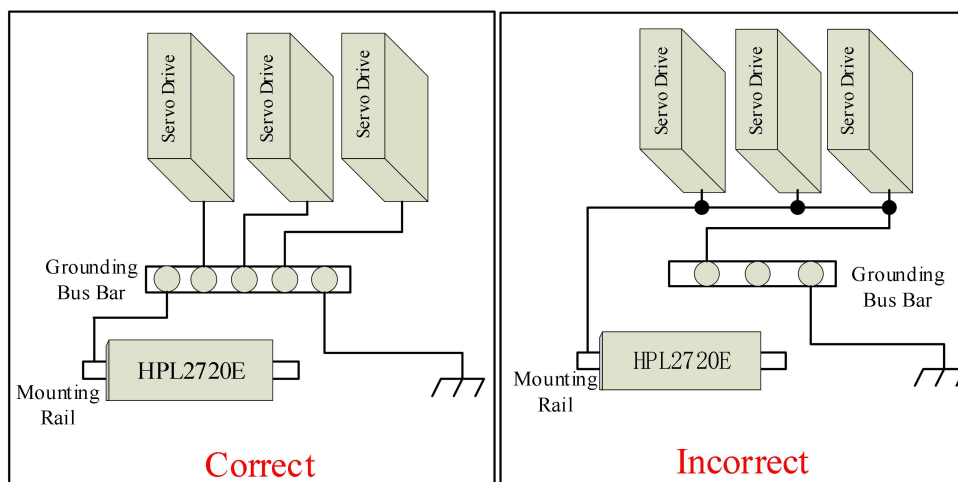


Figure 4-3 Multi-point grounding examples

- Isolated Grounding: Required for high-voltage and low-voltage systems, and for interference-prone components such as servo drives and solenoid valves.

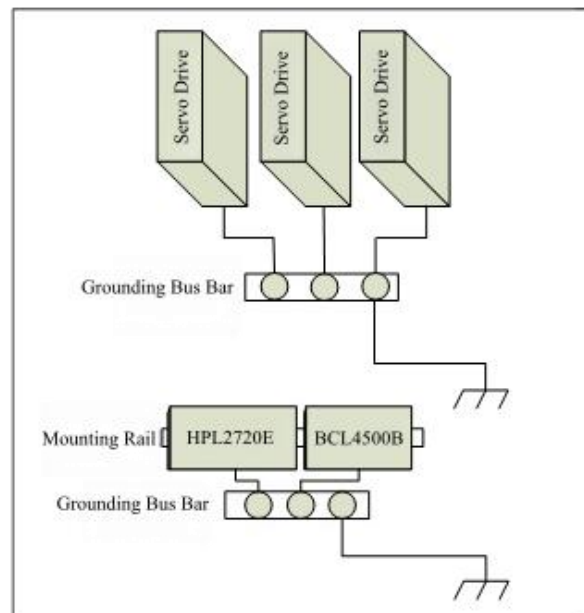


Figure 4-4 Isolated grounding

- Single-Ended and Double-Ended Grounding: Choose based on the actual signal.

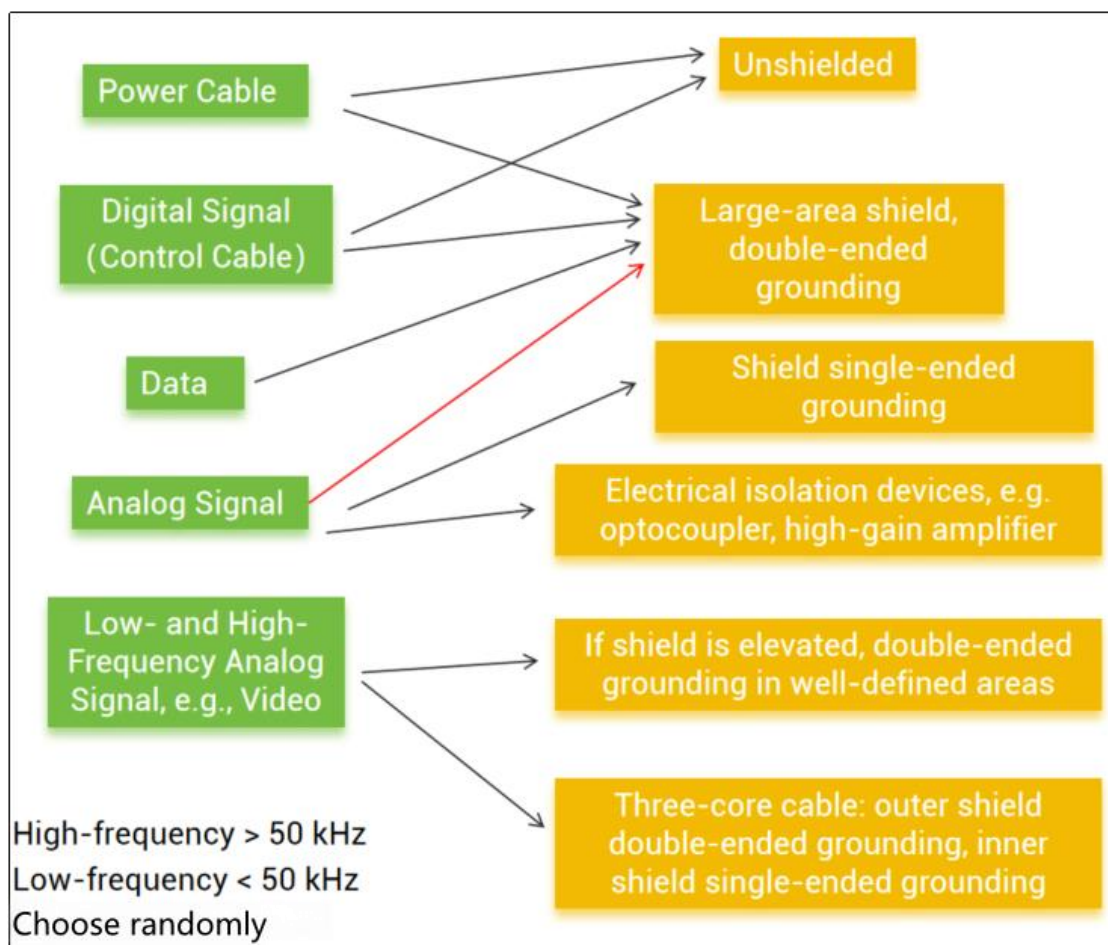


Figure 4-5 Each type of signal has a corresponding grounding method

Table 4-1 Applicable Scenarios of Single-Ended vs. Double-Ended Grounding

Single-Ended Grounding	Double-Ended Grounding
Effective for low-frequency interference	Effective for digital signals and high-frequency interference
More effective for low-frequency interference sensitive circuits (analog circuits)	Some analog modules also require dual grounding

⚠ Notice: These guidelines are for reference only. Whether single-ended or double-ended grounding is used should be based on actual field performance and system stability requirements. Choose the approach that solves the problem and ensures reliable operation.

- **Effective Grounding:** Ensure that the electrical cabinet is properly connected to the ground rod using compliant grounding conductors.

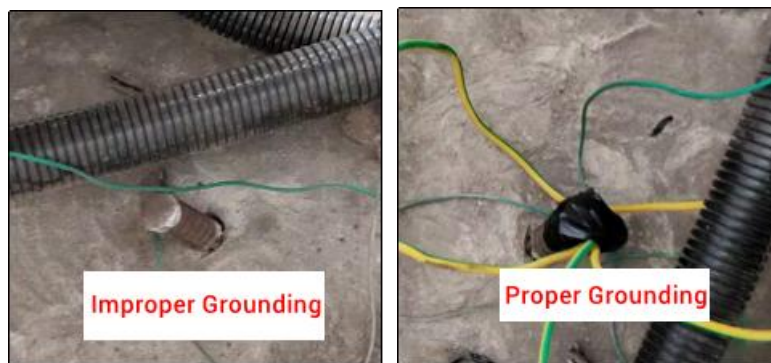


Figure 4-6 Effective grounding example

4.4 Cable Routing Specifications

Improper wiring may lead to system instability and continuous errors. Reasonable wiring and proper electrical cabinet layout are critical for long-term stable operation of the system.

4.4.1 Separation of High-voltage and Low-voltage Circuits

- Keep all cables as short as possible to minimize antenna effects.
 - High-voltage wiring (e.g., servo motor power lines) and low-voltage wiring (e.g., encoder cables, Ethernet cables) must be separated by a minimum distance of 300 mm.
 - A rigid physical barrier between the two is highly recommended. Do not route high-voltage and low-voltage cables in the same cable tray.
 - High-voltage circuits must be equipped with appropriate short-circuit protection and filtering devices.

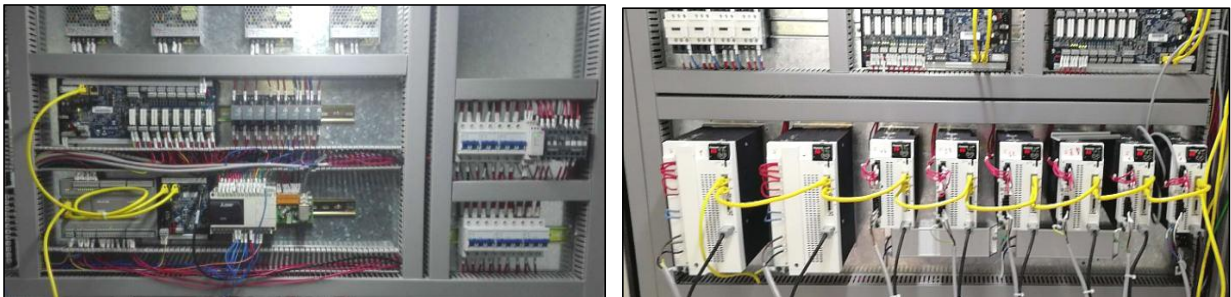


Figure 4-7 Separation of high-voltage and low-voltage circuits:

- Isolation of interference sources:
 - High-interference devices such as servos and solenoid valves must be physically separated from FW-GX system components by at least 300 mm. Use rigid dividers if possible.

- Use independent power supplies and cabling paths. Do not share the same cable tray. Maintain a parallel separation distance of at least 300 mm between their cables.



Figure 4-8 Incorrect example:
Interference-prone devices not isolated from FSWELD components

⚠ Caution: FW-GX products (HPL2720E, BCW600G-E, BCL4500B, etc.) are all low-voltage equipment, and the layout and wiring should be kept away from high-voltage equipment and high-interference loads.

4.4.2 Cable Routing Specifications

➤ Parallel and Crossed Cable Routing:

- Cables should be arranged in parallel wherever possible. Cable bundles and conduits should be routed neatly and in straight lines.
- If crossing is unavoidable, cables should intersect at 90° angles to minimize electromagnetic interference (EMI). Maintain a minimum spacing of 200 mm between power and signal cables. If spacing cannot be ensured, use shielding measures such as shielded cable trays or grounded metal plates between them.

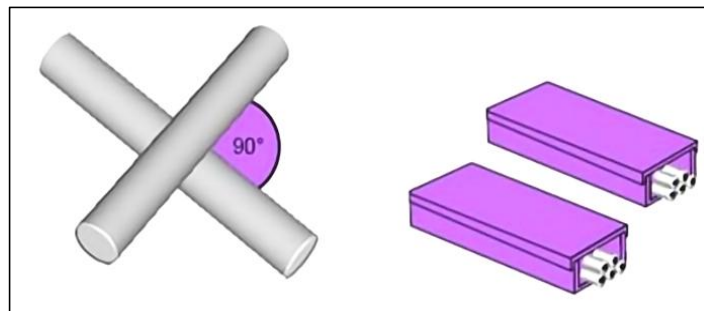


Figure 4-9 Crossed vs. parallel cable routing

- Input cables should enter the electrical cabinet from the same side. Wiring should avoid forming current loops to prevent antenna effects. Current loops between the signal source, transmission line, and load can create magnetic field antennas, causing interference. Such situations must be avoided during wiring. The wiring schematic is shown below:

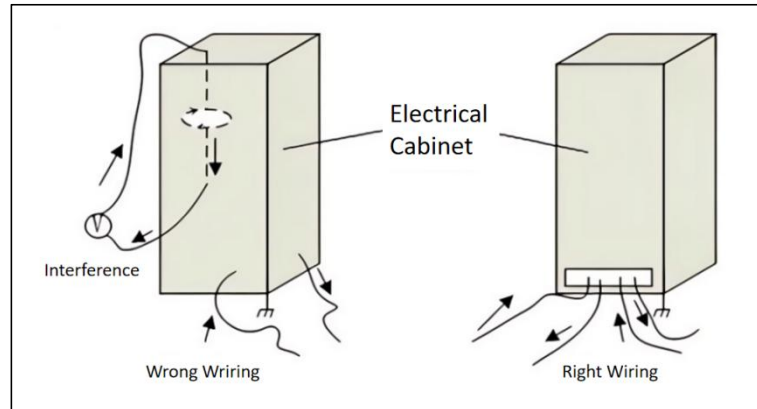


Figure 4-10 Connection and labeling

- All terminals must be securely fastened to prevent arcing.
- Each cable should be clearly labeled with accurate and legible markings.
- When using BOCHU-provided cables, select the appropriate cable type and length for the layout. Avoid excess bundling or coiling of unused cable.

4.4.3 Towline Cable Routing

- When removing pre-assembled cables from coils, straighten the cable along the tangent direction to prevent twisting. This operation should be performed before laying the cable to allow sufficient time for internal stress relief. Due to manufacturing limitations, the cable may not be perfectly straight, and the identification markings printed on the cable surface may appear in a slight helical pattern along its length. This is normal and should not be forcibly straightened.

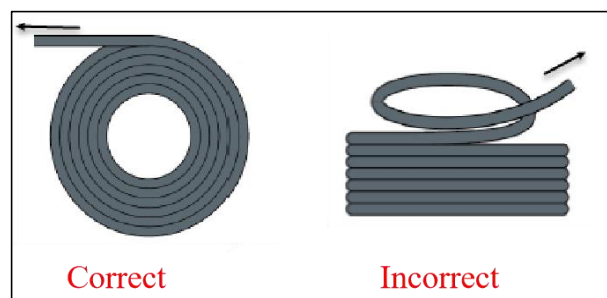


Figure 4-11 Cable releasing

- In tight spaces, never allow cables to twist during installation. Twisting stresses the internal structure and may accelerate failure. Over time, twisting may reverse (untwist) during movement, causing internal conductors to fracture.
- Lay cables loosely and flat inside the towline without crossing or overlapping. Use separators to separate individual cables. Maintain at least 10% of the cable diameter as spacing between adjacent cables or separators.

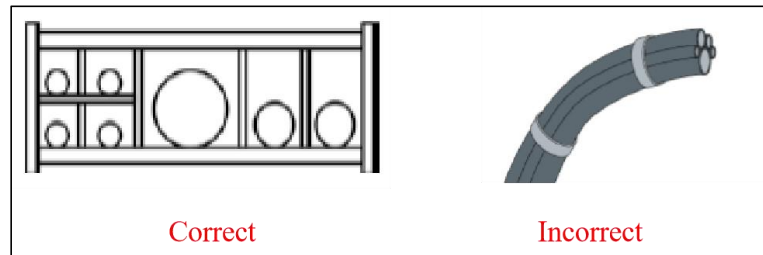


Figure 4-12 Towline laying

- The cables should be symmetrically installed based on their weight and size. Heavier or thicker cables should be placed on the outer section of the towline; lighter or thinner cables should be positioned on the inner section. Alternatively, cables can be arranged in descending order of diameter, from inside to outside. Avoid stacking cables on top of each other without separators or shelves, as this can cause friction and crosstalk between cables.
- In vertically hanging chains, allow for extra slack due to cable elongation during movement. After initial operation, check if cables run smoothly through the center line of the drag chain; adjust as necessary.
- For self-supporting chains, secure cables firmly at the moving and fixed ends using proper clamps recommended by the towline manufacturer. Avoid tightly bundling cables with zip ties—especially in high-acceleration environments, while ensuring that cables are not secured or bundled to moving parts of the towline. Ensure a generous buffer zone between the fixed point and the bending segment to prevent excessive stress or tight curvature during motion.



Figure 4-13 Self-supporting/sliding towline

- It is recommended to fix the cable on the moving point for sliding towlines. A small cable protection zone is required at the fixing point. (Refer to the instructions from the towline supplier).
- Please ensure that the cable runs along the center area with the desired bending radius. Do not apply tension to the cable (do not pull it too tightly), otherwise the friction inside the towline will cause the cable sheath to wear; do not let the cable be too loose in the towline, otherwise it will easily cause abrasion of the cable and the inner wall of the towline, or tangled with other cables.

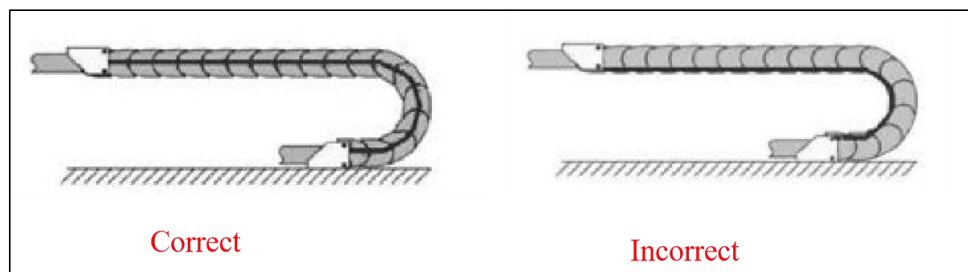


Figure 4-14 Towline laying

- If the cable does not run smoothly, check whether it is twisted along the longitudinal axis during operation. The cable should slowly rotate at a certain fixed point until it runs freely.
- Given the size of cables and towlines, their length characteristics vary considerably. During the first few hours, the cable naturally elongated. For towlines, it takes more hours for this to happen. Such a large discrepancy can be remedied by regularly checking the cable installation locations. It is recommended to do regular inspections, every three months for the first year and at every maintenance thereafter. This includes checking that the cables are completely free to move within the intended bending radius and making adjustments if necessary.

- Keep cable bundles straight and aligned as much as possible.
- If separators are unavailable, install shelves between cable bundles at intervals to prevent entanglement.
- Separate power cables (high voltage) from signal cables (low voltage). As shown in the figure below: Place power cables near the outermost edge of the towline. Place gas hoses, water hoses, and optical fibers in the middle layer. Place signal cables toward the innermost side of the towline.

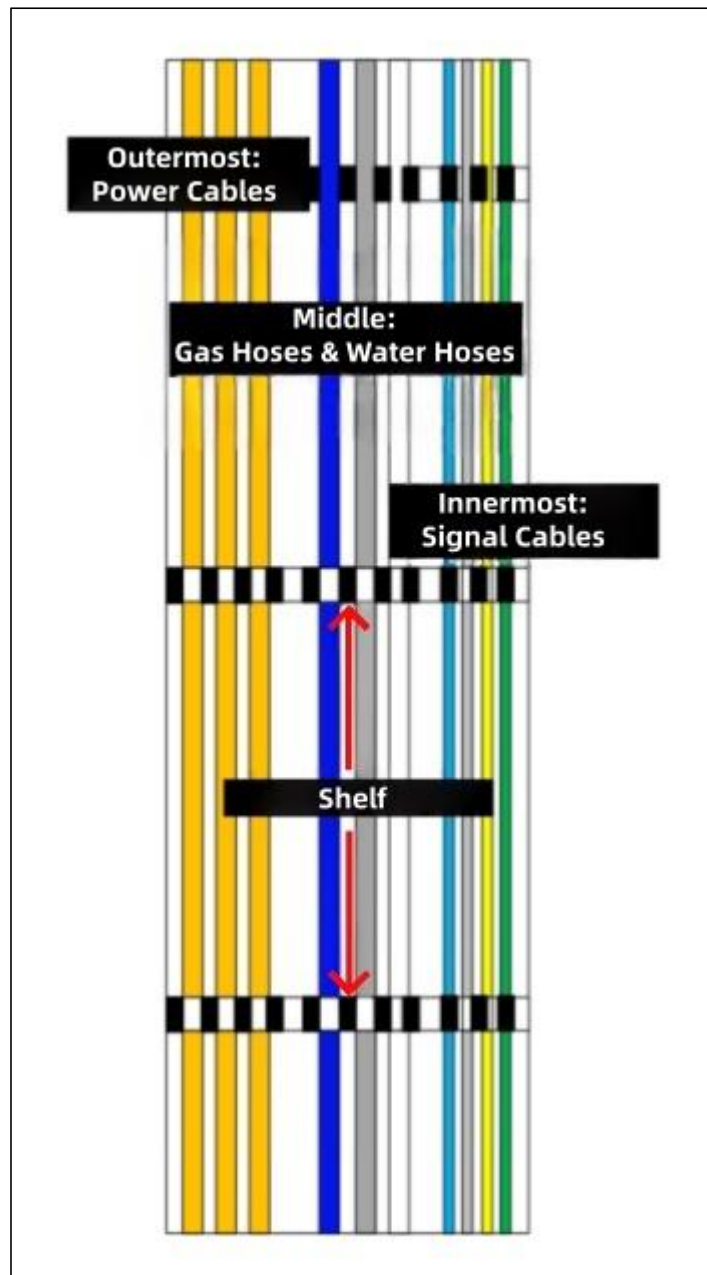


Figure 4-15 Towline cable routing layout

4.4.4 Cable Routing Specifications for BCW Series Devices

Refer to the [*BCW Product Cable Routing Guide*](#) for the BCW600G-E robot cable layout specifications.

Chapter 5 Mounting Dimensions

This chapter provides the respective dimensions of BCW600G-E and BCL4500B.

5.1 BCW600G-E Dimensions

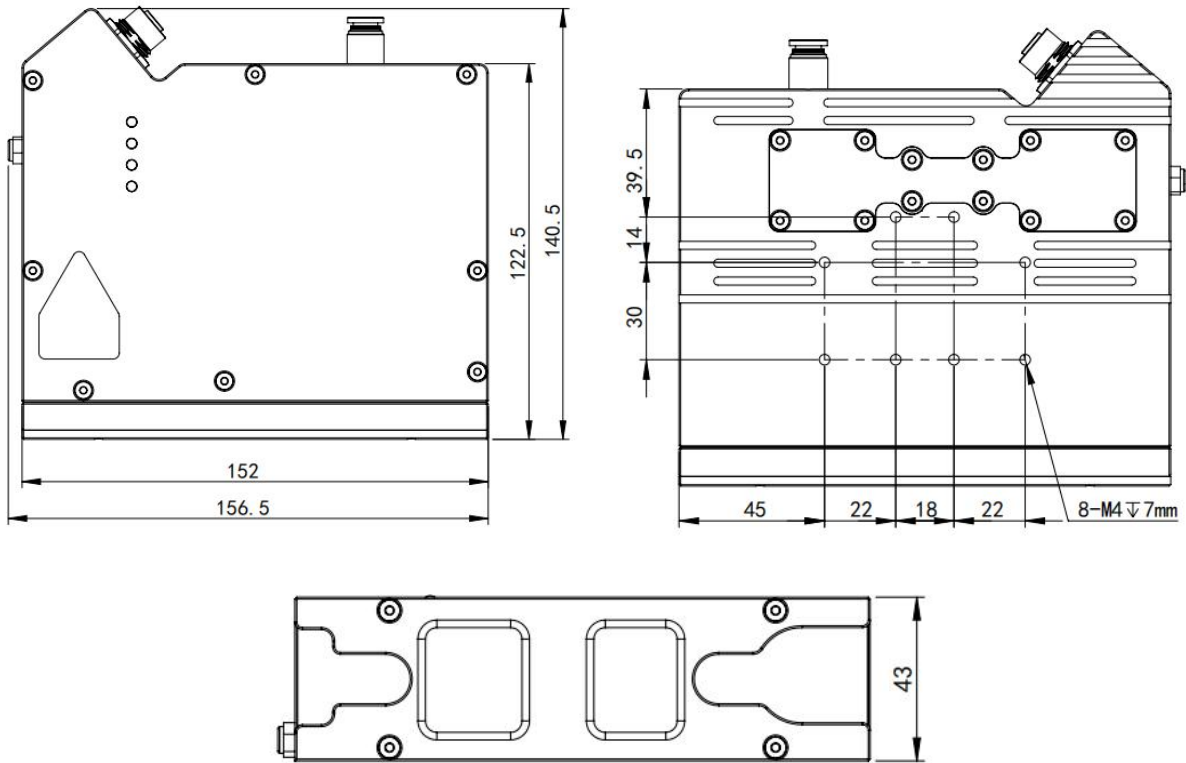


Figure 5-1 BCW600G-E dimensions (Unit: mm)

5.2 BCL4500B Dimensions

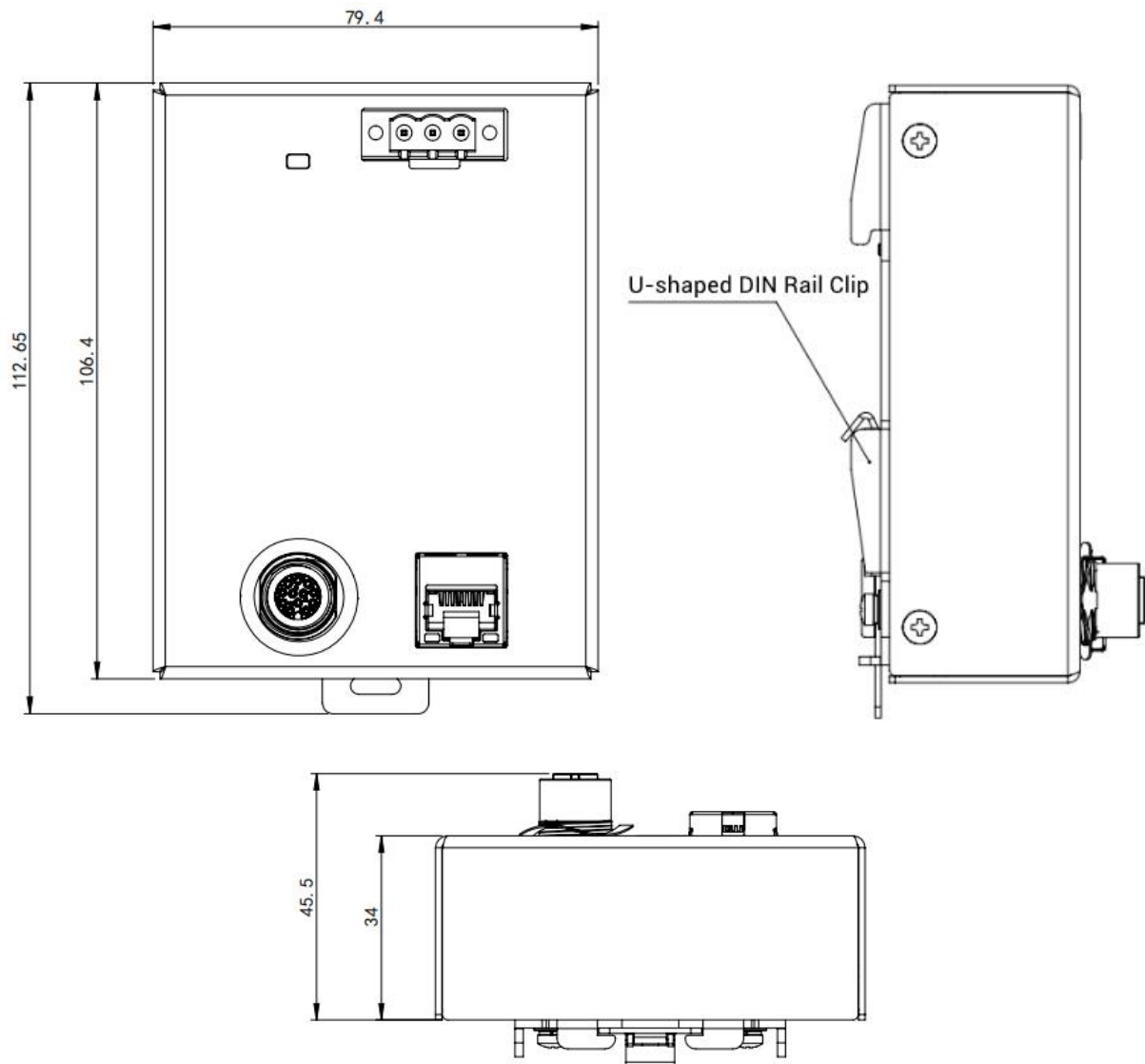


Figure 5-2 BCL4500B dimensions (Unit: mm)

Chapter 6 Troubleshooting

This chapter describes troubleshooting methods for network communication, firmware updates, and camera usage issues encountered with BCW600G-E, and specifies the fault information and log export steps to prepare before contacting BOCHU technical support.

6.1 About Network Communication

6.1.1 Camera Communication Failure on Software Startup

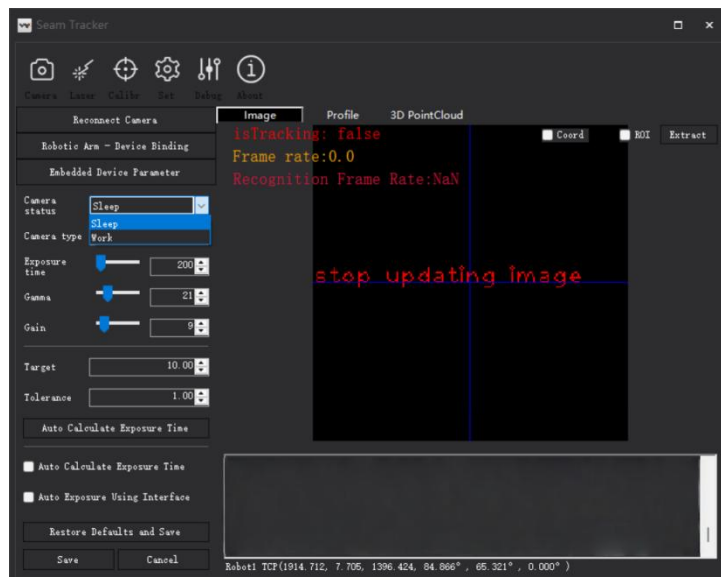


Figure 6-1 Seam tracker interface

Step 1 Check BCW600G-E indicators and ensure its LINK indicator is solid green. In the **Camera** page, confirm that **Actual Camera** is selected.

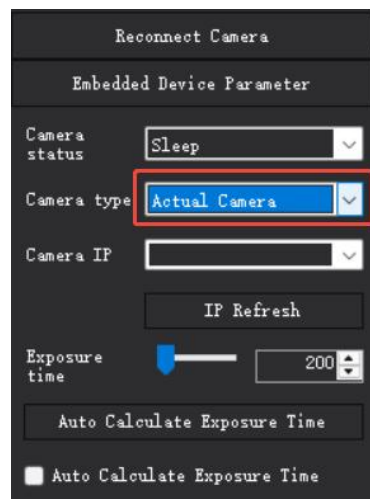


Figure 6-2 Confirm camera type

Step 2 Search IP manually. If no IP is found, check the network adapter IP configuration as shown below.

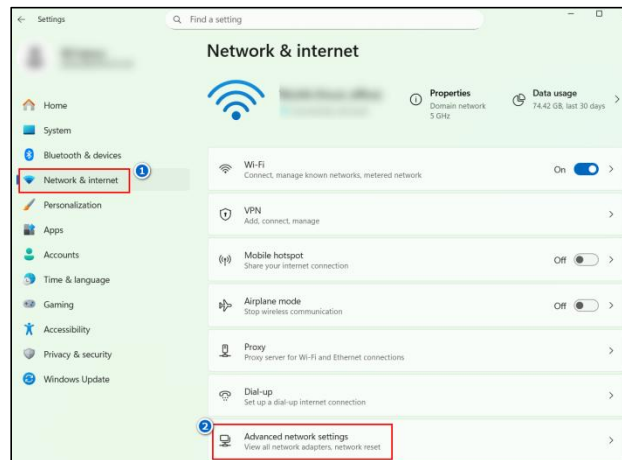


Figure 6-3 Check network adapter IP configuration

Step 3 Verify the Ethernet connection of the seam tracker. Right-click **Properties**, locate **Internet Protocol Version 4 (TCP/IPv4)**, and double-click it. In the **General** tab, confirm that **Obtain an IP address automatically** is selected.

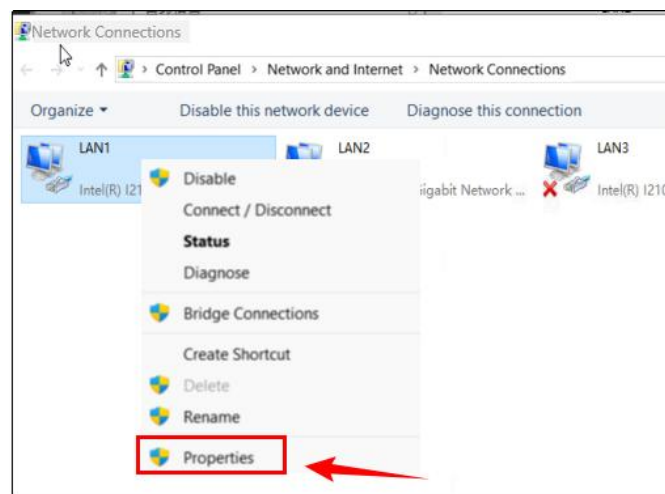


Figure 6-4 Open **Properties**

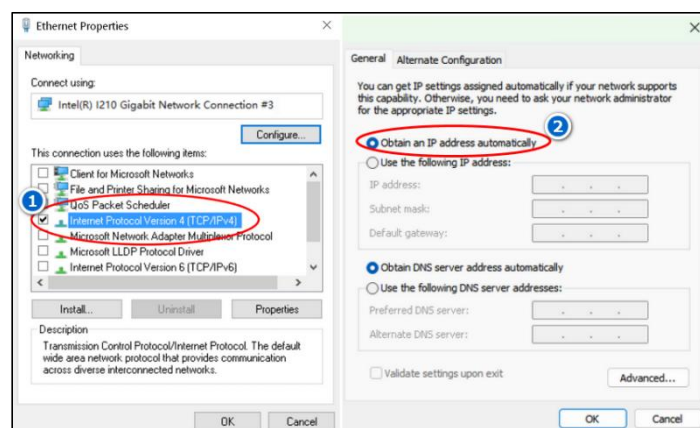


Figure 6-5 Obtain an IP addresses automatically

Step 4 After successfully detecting the IP address, click **Reconnect Camera**. If the reconnection still fails, contact BOCHU technical support for further diagnosis.

6.1.2 Camera Disconnects During Normal Use

Step 1 Check BCW600G-E indicators to rule out hardware issues.

Step 2 Confirm whether the disconnection occurred during processing. If so, click **Reconnect Camera**.

Step 3 If hardware issues have been ruled out, open **Task Manager** → **Performance** to check CPU usage. If usage is too high, terminate unnecessary processes to ensure sufficient resources for the software.

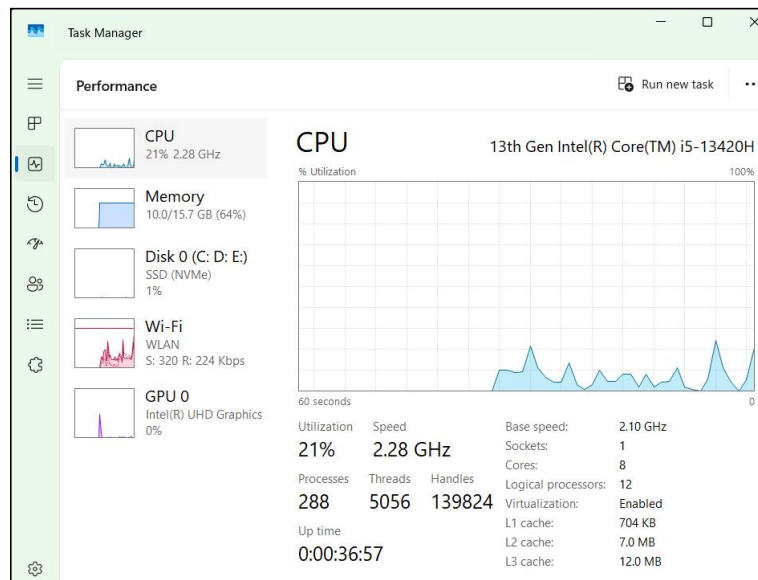


Figure 6-6 Check CPU usage

6.1.3 100 Mbps Network Alert

Step 1 Check BCW600G-E network port properties. Normal Gigabit Ethernet transmission should be 1000 Mbps (1 Gbps).

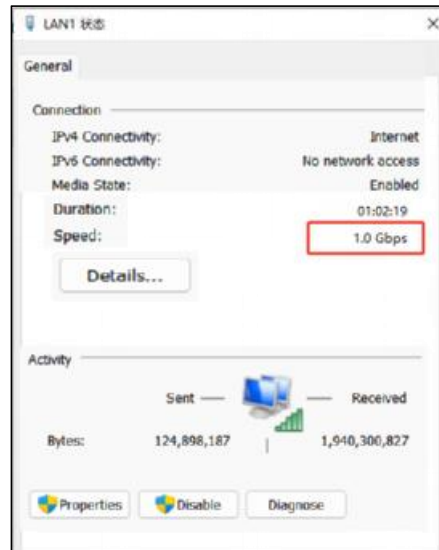


Figure 6-7 Check transmission speed

Step 2 The transmission speed can also be checked via **Task Manager** → **Performance** → **Ethernet**.

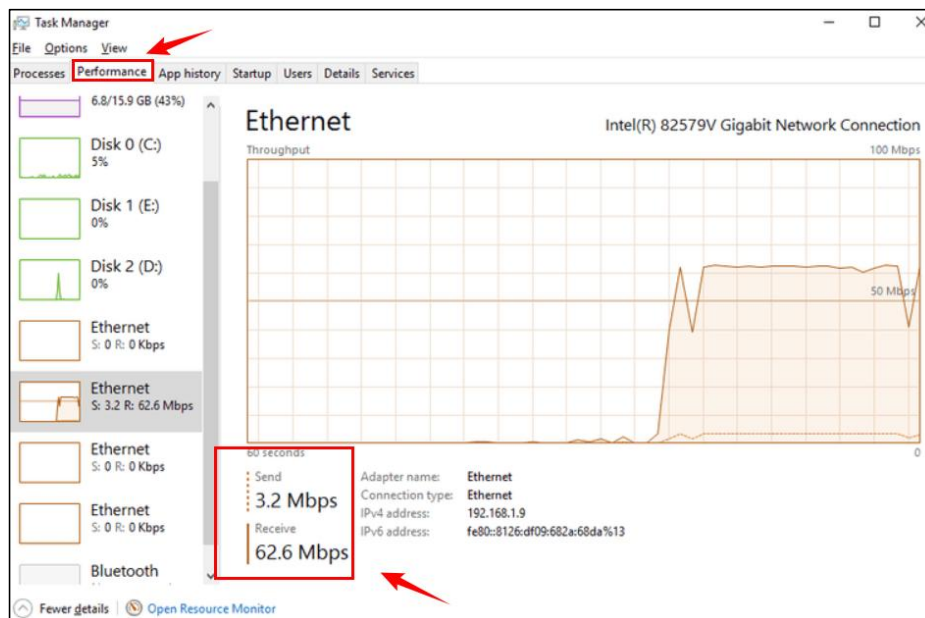


Figure 6-8 Check transmission speed

Step 3 For 100 Mbps network, you need manually replace the network port on the CNC host and check the network status. This section only provides instructions to verify the transmission speed.

6.2 About Firmware Update

6.2.1 Proper Operation of Firmware Update

6.2.1.1 Automatic Update

After installing BCVWeldTrack, launch CypWeld. It will automatically detect the server version. If the version is lower than the minimum required version, the update program will run automatically. Wait for the update to complete as prompted.



Figure 6-9 Automatic update

6.2.1.2 Manual Update

Manual firmware update requires normal communication between BCW600G-E and the vision software. The update procedure is the same as that for BCW600P-E, and both models share the same firmware update package. The following steps describe how to update from version 25.1.5 to 25.3.1 using the BCW600P-E as an example:

Step 1 In the seam tracker interface, navigate to **Camera** → **Embedded Device Parameter** → **Page 2** → **Update**, and select the corresponding firmware package.

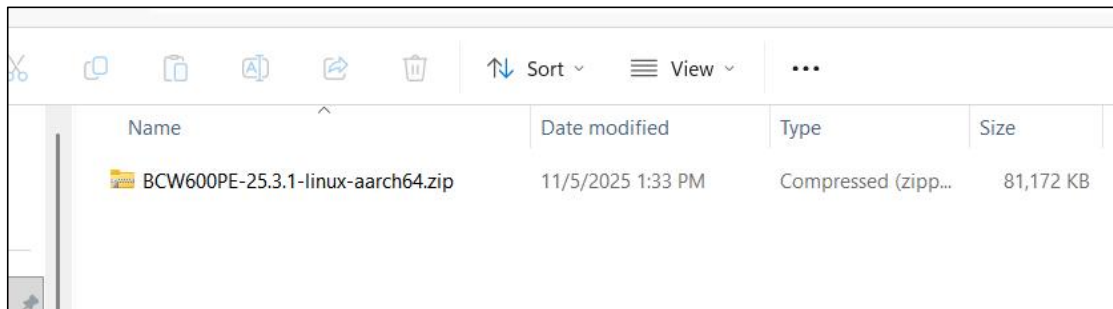
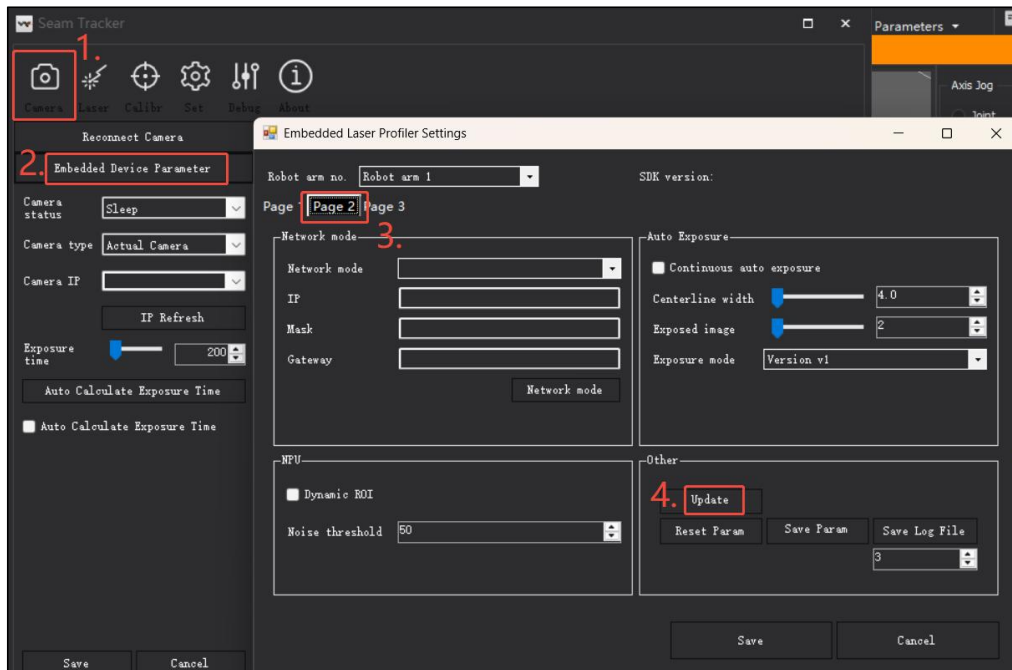


Figure 6-10 Select firmware update

Step 2 Wait until the server version (highlighted in red below) updates to the target version.
Then click **Reconnect Camera** after the CypWeld camera disconnection alert clears.

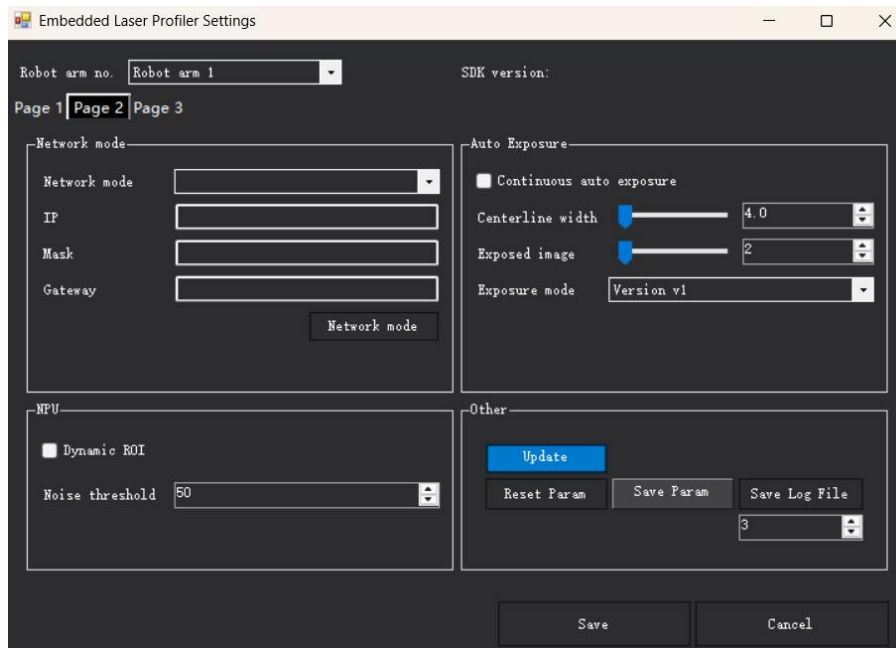


Figure 6-11 Firmware update

6.2.2 Vision Software Crashes After Reconnecting Camera

After a firmware update, if the camera disconnection alert in CypWeld persists, clicking **Reconnect Camera** may cause the vision software to crash. Restart the software to attempt communication recovery. If restarting does not resolve the issue, contact BOCHU technical support for further diagnosis.

6.3 About Camera Usage

6.3.1 Image Lagging

Step 1 Check for network alert. Confirm whether a 100 Mbps network alert is present. If so, refer to [Section 6.1.3 100 Mbps Network Alert](#).

Step 2 Check logs and CPU usage. If the log shows **Send buffer full**, verify CPU utilization. If it is too high, terminate unnecessary processes to free up resources.

Step 3 Check the indicators. Ensure the ALARM indicator is solid green (normal state).

6.3.2 Point Cloud Missing

Step 1 Verify whether the exposure time is set too high and verify the frame rate. Current workpiece templates are fixed at 100 fps (± 10 fluctuation is acceptable).

Step 2 If abnormal termination occurs due to missing point cloud, follow the steps below:

1. Check whether the auto exposure value in the vision software is too low. It is recommended to switch to a fixed exposure value of 3000 and rescan.
2. In **Offline Programming Parameter**, set **Scan positioning strategy** to **Laser View Field First**. These workpieces require high initial positioning accuracy; keep deviation within 20 mm and use automatically planned positioning parameters

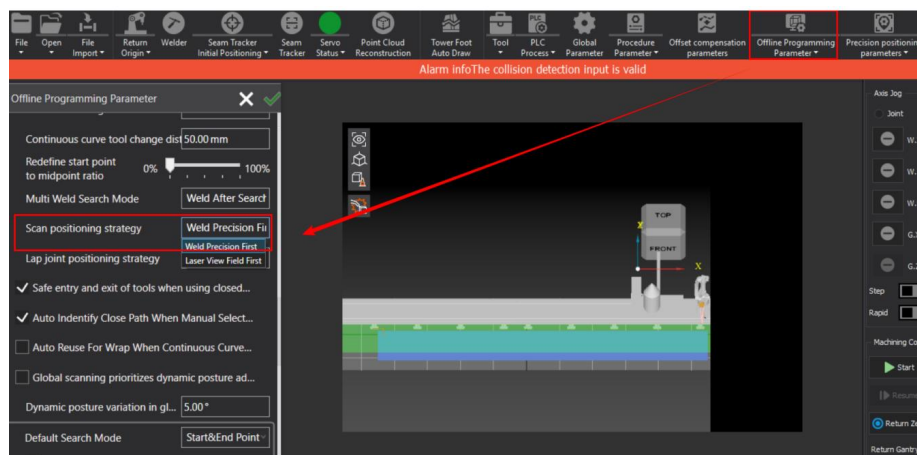


Figure 6-12 Set laser view field first

Step 3 If none of the above resolves the issue, contact BOCHU technical support for further assistance.

6.4 Preparation Before Contacting Technical Support

Step 1 Prepare CypWeld diagnostic information: Click **Help** → **Save Fault Info**, and export logs for the time range when the issue occurred (avoid excessive file size).

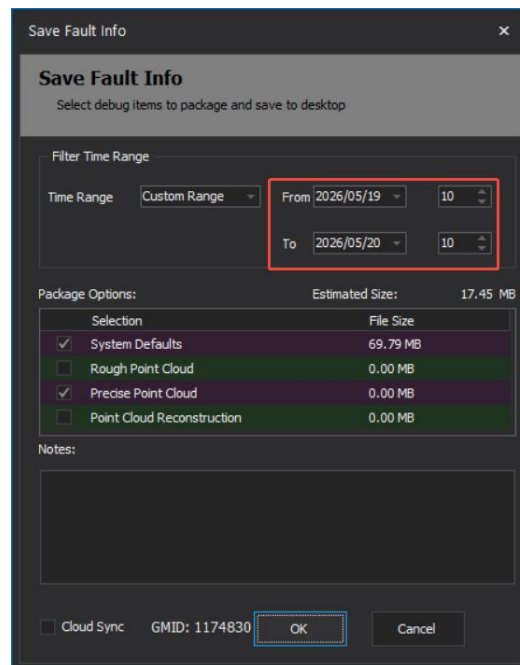


Figure 6-13 Save Fault Info

Step 2 Prepare seam tracker low-level log data. Follow the steps below (using a seam tracker with IP address 10.1.62.202 as an example):

1. Open a web browser and enter **10.1.62.202:3000** (use a standard colon). On the login page, enter **admin** for both username and password, then click **Skip**.

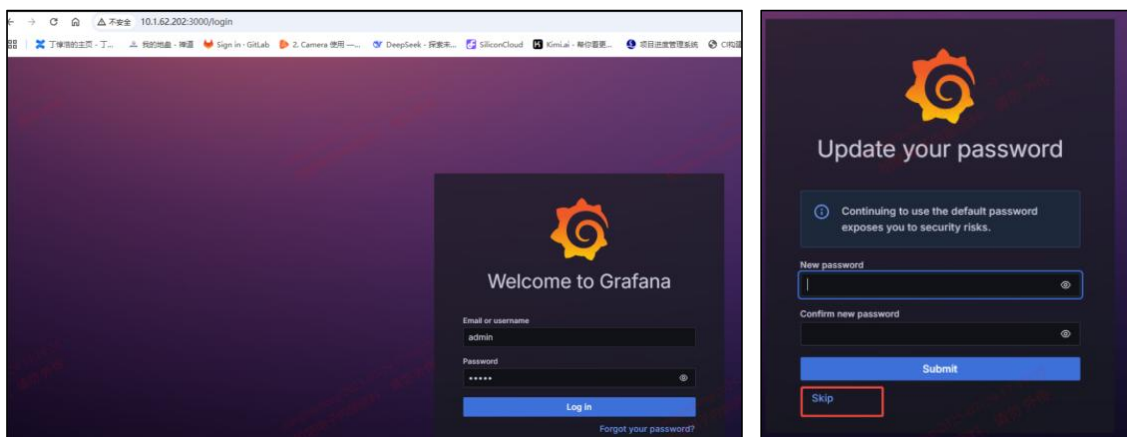


Figure 6-14 Login page

2. To view logs, navigate to **Dashboards** → **Demo** → **New dashboard**.

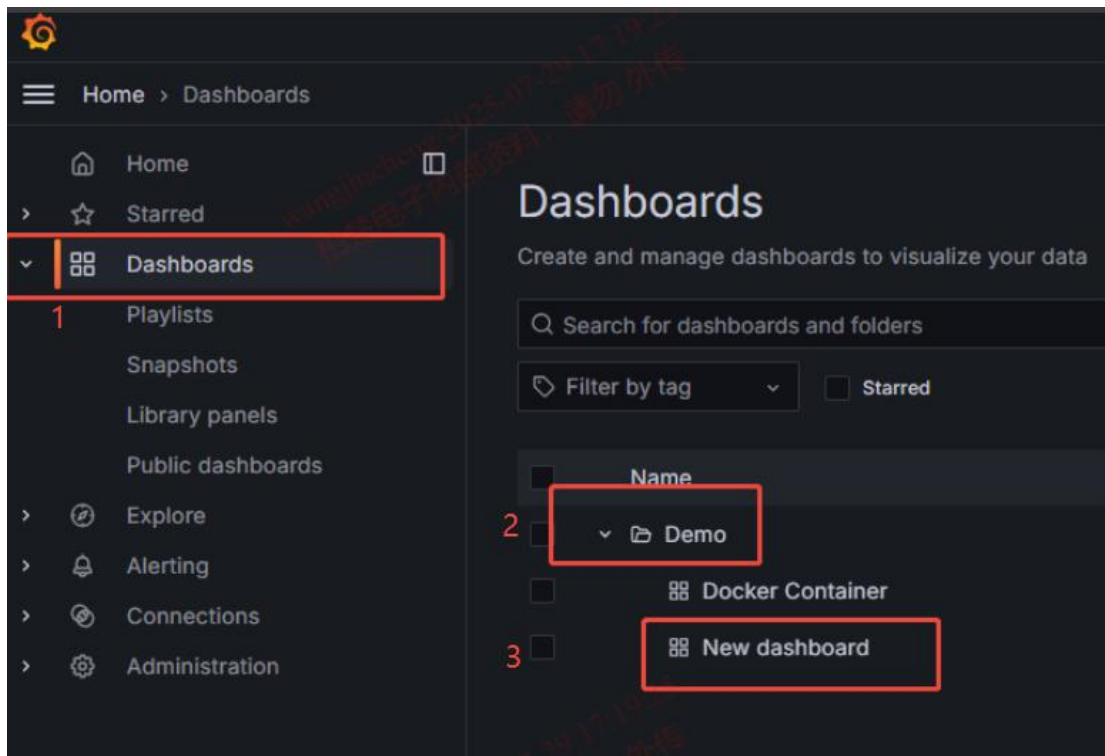


Figure 6-15 View logs

3. To save and export logs, select the time range from when the issue occurred until the time of export.

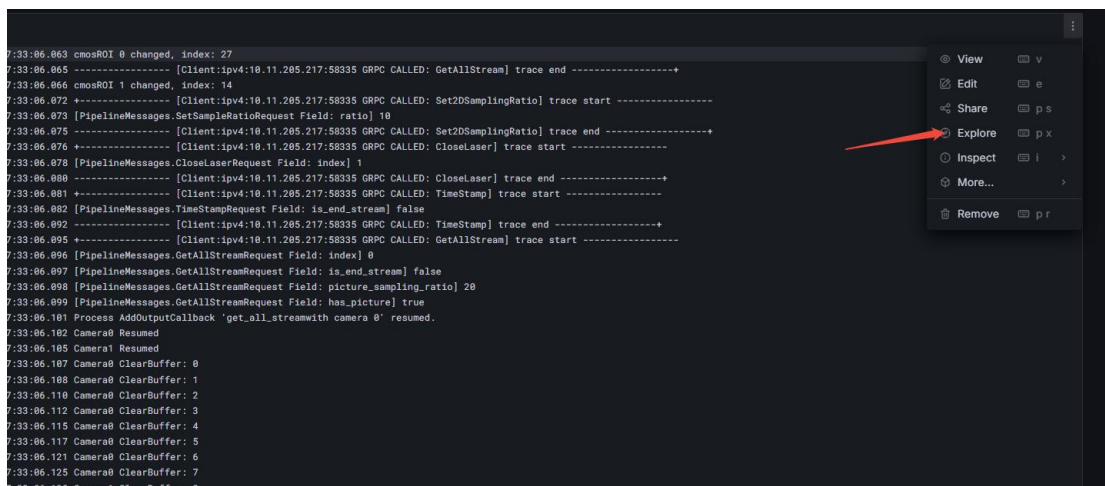


Figure 6-16 Select log time range-1

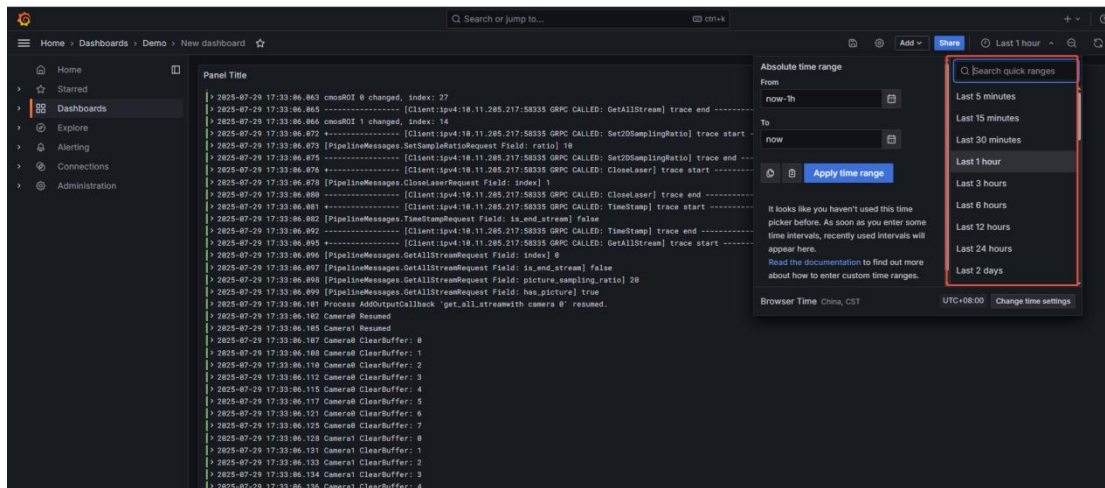


Figure 6-17 Select log time range-2

4. Choose ***txt** format to download and export the seam tracker low-level log data.

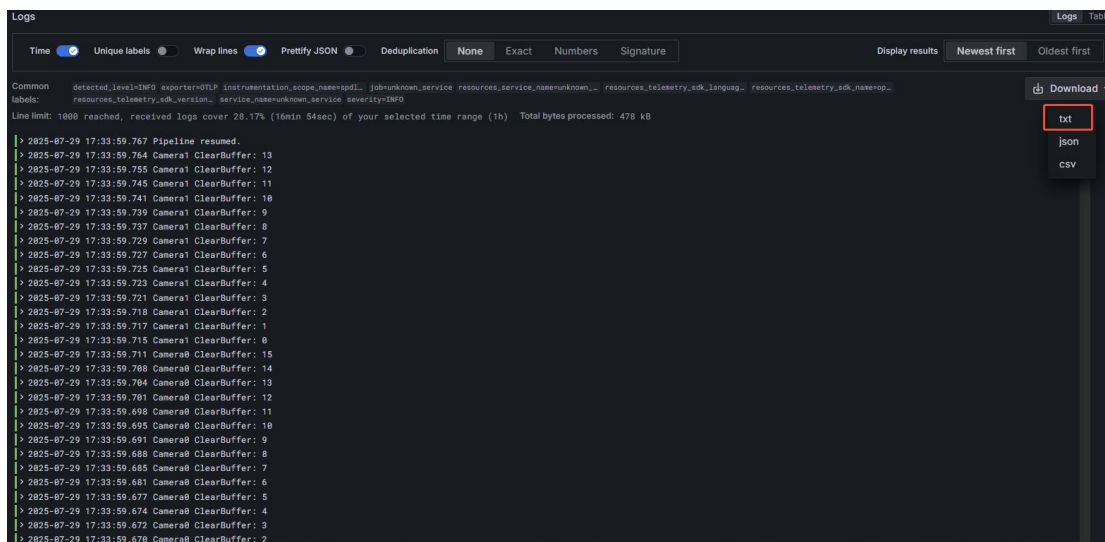


Figure 6-18 Select download format



Shanghai BOCHU Electronic Technology Co., Ltd.

No. 1000, South Lanxianghu Road, Minhang District, Shanghai City, China

Web: www.bochu.com

Tel: +86(21)64309023

Email: Support@bochu.com

