GLT-B Signal Isolator

I. Product Definition

The Qidian GLT-B Signal Isolator is a core module for industrial analog signal conditioning, specifically designed for standard signals such as 4-20mA and 0-10V. It performs four core functions: electrical isolation, signal conversion, noise suppression, and power distribution, effectively eliminating ground loop interference, protecting downstream equipment, and ensuring stable signal transmission.

Four Core Functions

-- Electrical Isolation: Physically breaks direct connections between input, output, and power supply, blocking ground potential differences, common-mode interference, and surge impacts.

-- Signal Conversion: Converts standard signals and supports one-to-one or one-to-many signal distribution, adapting to different interfaces of PLCs, DCS systems, and instruments.

-- Interference Suppression: Suppresses noise caused by frequency converters, motors, and cable coupling, preventing data fluctuations and distortion.

-- Power Distribution: Provides isolated power supply for two-wire transmitters, simplifying field wiring and reducing potential failure points.

II. Working Principle

The GLT-B employs a hybrid optical-electromagnetic isolation system:

Signal Input: Acquires analog signals such as 4-20mA or 0-10V from the field.

Electrical Isolation: Isolates and modulates the input signal, completely severing the electrical path.

Signal Processing: Filters, amplifies, and linearly calibrates the signal to ensure high accuracy and low drift.

Isolated Output: Reconstructs the standard output signal while providing isolated power to the transmitter.

Core Advantages of Three-Port Isolation

The input, output, and power supply are completely electrically independent, with no cross-interference:

Eliminates signal drift and the risk of circuit board burnout caused by ground loops.

Maintains stable transmission even in strong electromagnetic environments.

Complies with intrinsically safe explosion-proof and system safety standards, protecting field equipment and personnel.

III. Core Value

1. Scenarios Without Signal Isolators: Typical Pain Points

-- Signals are easily affected by ground potential differences, frequency converters, motors, and other sources of interference, resulting in fluctuations, drift, and distortion

-- No electrical isolation between the field and the control system, making PLCs, data acquisition cards, and instruments susceptible to damage from overvoltage, surges, or reverse polarity-- Multiple devices sharing a common ground create ground loops, causing system crosstalk, high failure rates, and frequent maintenance

-- Non-compliance with hazardous operating conditions and explosion-proof requirements, posing safety hazards

-- Signal mismatches and non-isolated power distribution result in complex wiring and multiple potential failure points

2. Equipping with Qidian GLT-B Signal Isolators: Core Benefits

-- Stable Signal Transmission: Eliminates ground loops and common-mode interference at the source, ensuring precise, distortion-free signals

-- Protects Downstream Equipment: Three-terminal isolation blocks overvoltage and surges, preventing damage to PLCs and instruments

-- Extends System Lifespan: Reduces electromagnetic shocks and failure frequency, enhancing the stability of continuous production line operation

--Compliant Explosion-Proof Safety: Meets industrial explosion-proof and intrinsically safe requirements, suitable for use in hazardous areas

--Simplified On-Site Installation: Integrated signal transmission and isolated power distribution reduce wiring and potential failure points

IV. Key Specifications

4.1 Basic Electrical Parameters

• Input Signal Types: 4–20 mA, 0–20 mA, 0–10 mA, 0–5 V, 1–5 V, 0–10 V. Supports customization for non-standard signals (e.g., 20–4 mA, 10–0 V, etc.) and accommodates a wide range of input requirements, including currents from –10 A to 10 A and voltages from –2000 V to 2000 V.

• Output Signal Types: 4–20 mA, 0–20 mA, 0–10 mA, 0–5 V, 1–5 V, 0–10 V,

• Channels: Default configuration is 1 input and 1 output channel; supports customization via parameter adjustment.

• Load Capacity: ≤500 Ω for current output; ≥10 kΩ for voltage output,

• Input Impedance: Current signal ≤50 Ω;

Voltage signal: ≥300 kΩ;

In passive mode, load resistance RL ≤ (U - 3) / 0.02 (where U is the loop supply voltage),

• Accuracy Class: ±0.1% F.S. (at 25°C ± 2°C)

4.2 Isolation Performance Parameters (Core Protection Advantages)

• Dielectric Strength: Input/Output/Power Supply ≥ 1500 V AC,

• Insulation Resistance: Between Input/Output/Power Supply ≥ 100 MΩ (tested at 500 V DC)

• Electromagnetic Compatibility Standard: Complies with IEC 61326-3

• Response Time: ≤ 100 ms,

• Temperature Drift: 40 ppm/°C

4.3 Power Supply & Power Consumption Parameters

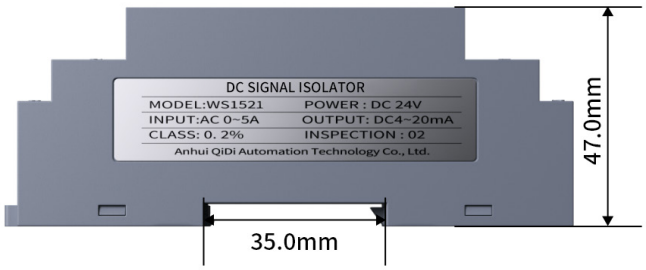
• Supply Voltage: 18–32 V DC, typical 24 V DC

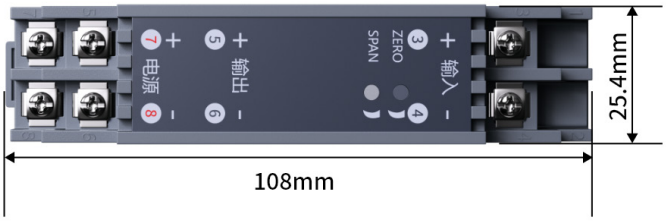
• Full-Load Power Consumption: 24 V DC supply, power consumption ≤ 1.5 W

4.4 Environmental Parameters

• Operating Temperature and Humidity: Operating temperature -20°C to +60°C, operating relative humidity 10% RH to 90% RH (at 40°C)

• Storage Temperature and Humidity: Storage temperature -40°C to +80°C, storage relative humidity 10% RH to 95% RH





Mounting method: 35mm DIN rail

Dimensions: 108mm × 47mm × 25.4mm

Indicator definitions: PWR (Power) / ALM (Alarm)

V. Common Selection Pitfalls

5.1 Ignoring Isolation Ratings

Pitfall: Assuming a general-purpose model is suitable for all scenarios, while ignoring on-site surges or high voltage.

Consequences: Signal drift, equipment burnout.

Solution: Select a model with a dielectric strength of ≥1500 V AC when installed near variable frequency drives or motors; select a model with 2000 V AC or higher for high-voltage environments.

5.2 Incorrect Signal Range Selection

Misconception: Failing to verify sensor/PLC interface types (e.g., selecting 4–20 mA instead of 0–10 V).

Consequences: Signal distortion, no output.

Solution: First verify input/output signal types, then match the range (e.g., reverse current for 20–4 mA).

5.3 Neglecting Load Matching
Common Mistake: Failing to calculate the output load impedance (e.g., current output exceeding 500Ω).
Consequences: Signal attenuation, reduced accuracy.
Countermeasure: Current output ≤ 500Ω; voltage output ≥ 10KΩ; calculate the load using the formula for passive mode.

5.4 Selecting General-Purpose Models in Explosion-Proof Environments
Common Mistake: Selecting non-explosion-proof models in hazardous areas, creating safety hazards.
Consequences: Non-compliance and increased risk of accidents.
Countermeasures: Select explosion-proof models for chemical/oil and gas applications, paired with Qidian intrinsically safe barriers.

VI. Customization Recommendations (Solutions for Special Operating Conditions)

1. Special Signal Adaptation
Non-standard signals (e.g., 10–0 V, –10 mA to 10 mA): Supports range customization and ensures precise transmission after linear calibration.
Digital Signals (RS485/4-20mA Mixed): Optional analog + digital hybrid isolated models available, compatible with multiple protocols.

2. Optimization for Non-Standard Operating Conditions
Extended Temperature Range (-40°C to +80°C): Customized wide-temperature chips for use in polar regions or high-temperature workshops.
High Corrosion / High Dust: Upgraded to IP67 protection with a sealed structure resistant to corrosion.
Long-Distance Transmission (≥1 km): Select enhanced anti-interference models to reduce signal attenuation.

3. Multi-Channel Integration Solutions
Centralized Multi-Sensor Data Acquisition: Custom 2-in/4-out or 4-in/4-out multi-channel models to reduce control cabinet space.
Redundant Backup Systems: 2-in/2-out redundant configuration ensures overall operation remains unaffected by single-channel failures.
Cross-border projects: CE/RoHS-certified models available to meet international standards.

Customization Process:
Submit requirements: Signal type, number of channels, operating conditions, and certification requirements.
Solution evaluation: Qidian's technical team matches parameters and provides a customized solution.
Small-batch validation: Prototype testing; mass production begins after performance is verified.

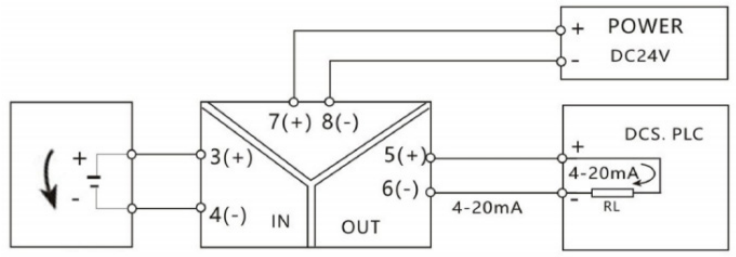
VII. Installation and Commissioning

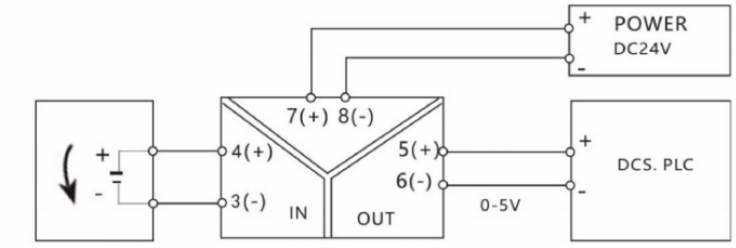
7.1 Pre-installation Preparation
7.1.1. Checking Accessories
After unpacking, check each accessory item by item to ensure nothing is missing or damaged. Proceed with subsequent operations only after verifying that everything is in order to avoid delays in installation caused by missing or damaged parts:
• Core Components: Qidian GLT-B Signal Isolator Main Unit (corresponding model, e.g., GLT-B-Ex explosion-proof type, GLT-B-M multi-channel model);
• Installation Accessories: 35mm standard DIN rail clips, mounting screws (for DIN rail installation), terminal covers;
• Supplementary Accessories: Product manual, wiring label stickers, explosion-proof seals (for explosion-proof models only);
• Troubleshooting: If any missing accessories, damage to the main unit housing, or terminal deformation is discovered, stop installation immediately and contact Qidian's official after-sales service for replacement.

7.1.2 Environmental Inspection
Before installation, verify that the on-site environment meets the equipment's operational requirements to prevent equipment failure caused by unsuitable conditions. Focus on the following four points:
• Temperature and Humidity: The operating environment temperature must be between -20°C and +60°C, with relative humidity between 10% RH and 90% RH (at 40°C). Avoid installation in areas with high temperatures, high humidity, or condensation;
• Electromagnetic Environment: Keep the device at least 30 cm away from strong sources of electromagnetic interference, such as variable frequency drives, motors, and high-voltage cables, to minimize interference with signal transmission;
• Installation Space: When installing inside a control cabinet, ensure at least 5 cm of clearance for heat dissipation. Avoid stacking the device closely with other equipment to ensure proper heat dissipation;
• Explosion-Proof Environments: In hazardous areas such as chemical plants, verify that the installation environment meets intrinsic safety requirements. Use Qidian's dedicated explosion-proof safety barriers (e.g., QD-6041 series). It is strictly prohibited to use explosion-proof equipment in non-explosion-proof environments, nor should general-purpose equipment be used in explosion-proof environments.
7.1.3 Tool List
Prepare the following tools in advance to avoid frequent work stoppages during installation and ensure proper operation:
• Basic Tools: Phillips/flathead screwdrivers, wire strippers (recommended stripping length: 3–5 mm), crimping pliers, multimeter (accuracy ≥ Class 0.5, for signal and voltage measurement), megohmmeter (for insulation testing);
• Auxiliary Tools: Cable ties, label paper (for cable identification), electrical tape, flashlight (suitable for operations inside control cabinets);
• Specialized Tools: Explosion-proof wrench (for use in explosion-proof environments to prevent sparks), rail cutter (if rails need to be cut).
7.1.4 Safety Precautions
Before construction, strictly adhere to the following safety regulations to ensure the safety of personnel and equipment and prevent accidents:
• Power-off procedure: Before installation or wiring, the relevant on-site power supply (including signal sources and power sources) must be disconnected. Hang a "Do Not Switch On, Work in Progress" sign, and proceed only after confirming the area is de-energized. Live-line work is strictly prohibited;
• Insulation protection: Operators must wear insulated gloves to avoid direct hand contact with terminals and cables, preventing electric shock;
• Explosion-proof requirements: When working in explosion-proof environments, the use of non-explosion-proof tools is strictly prohibited. Avoid impacts or sparks during installation, and ensure proper sealing after wiring;
• Cable protection: Avoid damaging the copper core of the cable when stripping. After wiring, verify that the cables are securely fastened to prevent loosening or short circuits.

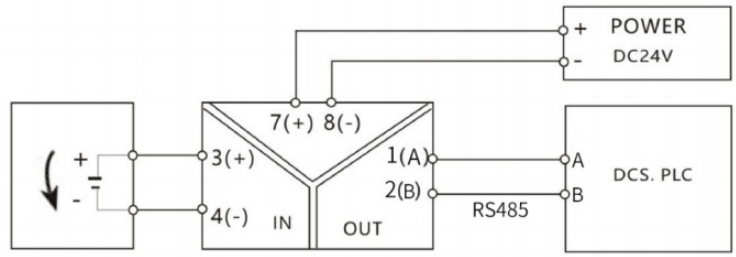
7.2 Standard Installation Steps
1. Mounting the Rail (Compatible with 35mm standard rails; universal installation method)
1. Determine the installation location: Select a suitable position inside the control cabinet, ensuring adequate space for heat dissipation and keeping it away from strong sources of interference; mark the rail mounting points;
2. Secure the rail: Fasten the 35mm standard rail to the control cabinet mounting plate with screws. Tighten the screws to ensure the rail is level and secure. The mounting surface must be clean, level, and free of oil, dust, and debris, with a flatness tolerance not exceeding 0.05mm/m;
3. Install the main unit: Align the top latches of the GLT-B isolator with the rail, press down until the latches secure the rail, and gently shake the main unit to confirm there is no looseness; if multiple devices need to be installed side by side, leave a spacing of ≥2 cm between devices to facilitate heat dissipation and future maintenance.
4. Grounding Requirements
Proper grounding is critical for reducing electromagnetic interference and ensuring equipment safety. Strictly follow the requirements below:
1. Main Unit Grounding: Connect the grounding terminal on the equipment housing (marked "PE" or with a grounding symbol) to the control cabinet grounding busbar using a grounding wire (≥1.0 mm²). The grounding resistance must be ≤4 Ω to ensure a reliable ground connection;
2. Shielded Cable Grounding: Ground the cable shield at a single end—either at the input (sensor side) or the output (PLC side). Never ground both ends simultaneously to prevent ground loop interference;
3. Grounding in Explosion-Proof Environments: Grounding for explosion-proof isolators must be integrated with the explosion-proof safety barrier grounding system to ensure continuous and reliable grounding. The grounding resistance must be ≤4Ω and comply with explosion-proof safety standards;
4. Prohibitions: Never connect the grounding terminal to the neutral wire or the equipment housing (non-grounding terminals) to prevent grounding failure.

7.3 Wiring Diagram





Note: Reverse signal input 4 (+) / 3 (-)



7.4 Power-On Debugging Procedure

After completing the wiring, follow the step-by-step debugging procedure below. Verify that each step is correct before proceeding to the next to avoid damaging the equipment or affecting signal transmission due to improper debugging.

1. No-Load Test

1. Power Supply Test: Connect the 24V DC power supply and observe the device indicator light (Power light). Under normal conditions, it should remain lit (green). If the indicator light does not illuminate, immediately disconnect the power supply and check the power supply wiring, polarity, and voltage (18–32V DC);

2. No-Load Signal Test: Disconnect the input and output cables. Use a multimeter to measure the output terminals (OUT+, OUT-). When there is no input signal, the output should be at zero (e.g., for a 4-20mA signal, the no-load output should be 4mA; for a 0-10V signal, the no-load output should be 0V). If the output is abnormal, check whether the device is damaged or if any connections are loose.

2. Signal Calibration

1. Connect the signal source: Connect the field sensor (or signal generator) to the input terminals, ensuring the connections are secure and the sensor is functioning properly;

2. Zero-point calibration: Adjust the sensor to zero (e.g., for a 4–20 mA signal, apply 4 mA input), then measure the output terminals with a multimeter. The output should match the input (4 mA), with an error not exceeding ±0.1% F.S. If there is a deviation, perform accuracy calibration;

3. Full-scale calibration: Adjust the sensor to full scale (e.g., for a 4–20 mA signal, apply 20 mA). Measure the output terminals; the output should be 20 mA, with an error not exceeding ±0.1% F.S.;

4. Mid-range verification: Adjust the sensor to the mid-range value (e.g., 12 mA), measure the output, and ensure the output is linearly stable with no jumps or distortion to verify the linearity of the signal transmission.

3. Accuracy Calibration Method

The device has been calibrated for accuracy prior to shipment. If signal deviation occurs on-site (exceeding ±0.1% F.S.), calibration can be performed using the following method (requires a 5½-digit or higher precision voltage/current measuring instrument):

1. Calibration Preparation: Turn on the power, connect the signal source and a high-precision multimeter (connect the multimeter to the output terminals to monitor the output signal), and let the device warm up for 5 minutes;

2. Zero Calibration: Adjust the signal source to set the input signal to zero (e.g., 4 mA). Once the signal has stabilized, press the device's calibration button (labeled "CAL") and hold it for 3 seconds until the "Input" indicator flashes. Release the button to complete the zero calibration;

3. Full-scale calibration: Adjust the signal source so that the input signal is at full scale (e.g., 20 mA). Once the signal has stabilized, press the calibration button again and hold it for 3 seconds until the "Output" indicator flashes. Release the button; full-scale calibration is complete;

4. Calibration Verification: Adjust the signal source to a mid-range value, measure the output signal, and confirm that the error is within the allowable range. After calibration is complete, exit calibration mode (some models require powering off and restarting), and the device will resume normal operation.

Note: If there is still a deviation after calibration, do not attempt repeated calibrations. Contact Qidian technical support to troubleshoot the device or sensor issues to avoid damaging the equipment due to improper operation.

7.5 Installation Precautions

- Never exceed the rated supply voltage: The device's rated supply voltage is 18–32 V DC (typically 24 V DC). Never connect it to 220 V AC or DC voltages of 36 V or higher, as this will immediately burn out internal components. Always verify that the voltage meets requirements before powering on;

- Avoid High-Voltage Interference: Never install the isolator near sources of strong electromagnetic interference, such as high-voltage cables, variable frequency drives, or motors (maintain a distance of ≥30 cm). Never bundle power cables, high-voltage cables, and signal cables together to prevent signal interference, fluctuations, or distortion that could affect transmission accuracy;

- Protection Measures for Humid Environments: In humid or condensation-prone environments (e.g., outdoor municipal water facilities, chemical workshops), the device must be installed inside a sealed control cabinet and equipped with moisture-proof devices (such as desiccants). Regularly inspect the device housing and terminals to prevent moisture intrusion, which can cause short circuits or corrosion. The IP67 protection rating can be upgraded as needed;

- Other Prohibitions: Loose connections and exposed copper cores are strictly prohibited; plugging or unplugging cables while the equipment is running is strictly prohibited; unauthorized disassembly of the equipment housing is strictly prohibited (disassembling explosion-proof equipment will compromise its explosion-proof structure and create safety hazards); using non-explosion-proof equipment in explosion-hazardous environments is strictly prohibited.

VIII. Recommendations for Daily Use and Operations & Maintenance

This module focuses on the daily operations and maintenance of the equipment, outlining key points for inspections, maintenance, servicing, and parameter management. It aims to extend the equipment's service life, ensure long-term stable operation, reduce operational and maintenance costs, and meet the demands of long-term use in industrial settings.

8.1 Key Points for Daily Inspections (Daily/Weekly)

Daily inspections should follow the principles of "quick, efficient, and comprehensive coverage," with a focus on the equipment's operating status. This ensures that anomalies are detected and addressed promptly, preventing minor issues from escalating into equipment failures

- Indicator Light Inspection: During daily inspections, check the status of each equipment's Power, Input, and Output lights to ensure they match the equipment's operating conditions (refer to Module 5 for indicator light descriptions). If abnormalities such as flashing or non-illuminated lights occur, immediately record the issue and investigate the cause (prioritize checking wiring, power supply, and signal sources) to prevent the failure from spreading.

- Signal Stability Monitoring: Weekly, review signal transmission data via the PLC and DCS systems to observe for phenomena such as signal jumps, distortion, or drift; for critical operations (e.g., chemical reactors, power monitoring), use a multimeter on-site to measure input/output signals and confirm that errors are within ±0.1% F.S., ensuring precise signal transmission.

- Temperature and Humidity Monitoring: Check the temperature and humidity of the equipment's installation environment daily to ensure the operating temperature remains between -20°C and +60°C and the relative humidity between 10%RH and 90%RH. If environmental conditions exceed these ranges, promptly adjust the control cabinet's ventilation and moisture-proofing measures (e.g., activate cooling fans, replace desiccants) to prevent damage to internal components caused by abnormal temperature or humidity.

8.2 Regular Maintenance Schedule (Monthly/Quarterly)
Regular maintenance must be performed on a scheduled basis, with a focus on equipment cleaning, wiring inspections, and accuracy re-calibration to ensure the equipment remains in good working condition over the long term. The specific schedule is as follows:

- Cleaning Schedule: Clean the equipment surface and the interior of the control cabinet once a month. Use a dry, soft cloth to wipe the equipment housing, terminals, and rails to remove dust and grease. Perform dust removal inside the equipment once a quarter (limited to non-explosion-proof models; unauthorized disassembly of explosion-proof models is strictly prohibited) to prevent dust accumulation from causing poor heat dissipation and poor terminal contact.

- Wiring Tightness Inspection: Inspect the equipment's terminal blocks once a month. Use a screwdriver to gently tighten the terminal screws and check for loose, disconnected, or damaged cables. Conduct a thorough inspection of grounding terminals and shielded cable connections once every quarter to ensure reliable grounding and good shield contact, thereby preventing signal interference or equipment failure caused by loose wiring.

- Accuracy Retest Recommendations: Perform an accuracy retest on the equipment once every 6 months. Follow the procedures in Module 5, "Accuracy Calibration Methods," and use a high-precision multimeter to verify the linearity and error of the input/output signals. If the accuracy exceeds ±0.1% F.S., calibrate the equipment promptly to ensure precise signal transmission and meet industrial control requirements.

8.3 Long-Term Maintenance Tips (Ongoing Implementation)

Based on the equipment's operating environment, implement long-term maintenance measures to mitigate the effects of dust, humidity, and electromagnetic interference, thereby extending the equipment's service life and reducing operational and maintenance costs:
- Dust and Moisture Protection: Keep control cabinets sealed to prevent dust and moisture from entering. In outdoor or humid environments (such as municipal water utilities or chemical workshops), regularly replace the desiccant inside the control cabinet. Inspect the equipment housing and terminals for rust or condensation every three months, and address any issues promptly.
- Interference Mitigation: Regularly verify the distance between the equipment and strong sources of electromagnetic interference (such as variable frequency drives, motors, and high-voltage cables), ensuring it is no less than 30 cm. If on-site interference is severe, install shielding enclosures around the equipment or replace cables with enhanced interference-resistant types to minimize the impact of interference on signal transmission. Regularly inspect the grounding of shielded cables to prevent interference caused by grounding failures.
- Protection in Extreme Environments: In high-temperature environments (e.g., metallurgical furnaces), install cooling devices (such as heat sinks or cooling fans) to ensure proper heat dissipation; - In low-temperature environments (e.g., outdoor cold conditions), install insulation within the control cabinet to prevent equipment from failing to start due to low temperatures; - In explosion-proof environments, regularly inspect explosion-proof seals to ensure proper sealing, and conduct quarterly checks on the interlocking status of explosion-proof safety barriers and isolators to ensure compliance with explosion-proof regulations.

IX. Troubleshooting & Emergency Response

This module focuses on common equipment malfunctions, providing quick troubleshooting steps, step-by-step solutions, and emergency protocols to help on-site personnel independently diagnose and resolve issues, thereby minimizing downtime losses. It also outlines guidelines for after-sales service requests to ensure rapid restoration of equipment operation.
9.1 List of Common Faults
Based on practical experience in industrial settings, this section compiles five categories of high-frequency faults for the GLT-B Signal Isolator, covering core abnormal scenarios such as signal issues, indicator lights, and alarms, to facilitate rapid troubleshooting:
• Fault 1: No Output (No signal acquisition by PLC/DCS; no corresponding signal detected at output terminals when measured with a multimeter);
• Fault 2: Signal Drift (Significant fluctuations in the output signal, with errors exceeding ±0.1% F.S., and no discernible pattern);
• Fault 3: Indicator Light Abnormalities (Power, Input, or Output lights are off, flashing, or have abnormal brightness, inconsistent with the device's operating conditions);
• Fault 4: Alarm Triggered (The device's built-in alarm terminals activate, or the associated system indicates an isolator fault);
• Fault 5: Interference and distortion (output signal exhibits noise, jumps, or does not linearly correspond to the input signal, with obvious distortion).

9.2 Analysis of Fault Causes
For the common faults listed above, we analyze the root causes by considering the device structure, installation conditions, and operational maintenance status. The explanations are categorized by fault type to facilitate quick identification of troubleshooting directions:
• Causes of No Output: Incorrect power supply wiring (reversed polarity, abnormal voltage); loose, disconnected, or reversed wiring at input/output terminals; sensor failure (no input signal); power distribution equipment not properly connected to the transmitter; damage to internal components.
• Causes of Signal Drift: Ambient temperature and humidity exceeding the device's operating range; poor grounding (failure of host grounding or shielding wire grounding); Aged or damaged signal cables; device accuracy drift not calibrated in a timely manner; signal fluctuations caused by strong electromagnetic interference.
• Abnormal Indicator Lights: Unstable power supply (voltage fluctuations, power outage); input signal overload or short circuit; output terminal short circuit or load exceeding rated range; internal circuit failure; damage to the indicator light itself.
• Alarm Triggering: Input signal exceeds device range (overload); output load short circuit or overload; internal equipment overheating (poor heat dissipation); seal failure in explosion-proof environments, or abnormal safety barrier interlocking; equipment failure triggering its own protection mechanism.
• Causes of interference and distortion: Insufficient distance between the equipment and strong electromagnetic interference sources (frequency converters, motors, high-voltage cables); signal cables not using shielded twisted-pair wire, or shielding not properly grounded; ground loops caused by multiple devices sharing a common ground; signal cables bundled with high-voltage power cables.

9.3 Step-by-Step Troubleshooting Guide
For each type of fault, this guide provides "Troubleshooting Steps → Repair Measures → Emergency Workarounds." The steps are clear and highly practical, allowing on-site personnel to resolve issues independently following the process. If the problem cannot be resolved, a service request should be submitted:
1. No Output Fault
1. Troubleshooting Steps: ① Disconnect power and inspect power connections to ensure positive and negative terminals are not reversed and voltage is within the 18–32 V DC range; ② Inspect input/output terminal connections to ensure no loose, disconnected, or reversed connections, and that cable copper cores are not exposed; ③ Use a multimeter to measure the sensor output signal to confirm sensor functionality; ④ For power distribution units, verify that the transmitter is correctly connected to the power distribution terminals.
2. Remedial Actions: □ Correct the power supply wiring and adjust the supply voltage to the standard range; □ Re-tighten terminal screws, repair damaged cables, and correct reversed terminal connections; □ Replace the faulty sensor; □ Adjust the wiring of power distribution equipment to ensure the transmitter is correctly connected to the power distribution terminals.

3. Emergency Workaround: If internal components are damaged and cannot be repaired on-site, temporarily replace the isolator with a spare unit of the same model to restore production line operation. Contact after-sales support later to address the faulty equipment.

2. Signal Drift Fault
1. Troubleshooting Steps: ① Check the temperature and humidity of the installation environment to ensure they fall within the range of -20°C to +60°C and 10% RH to 90% RH; ② Check the grounding of the main unit and the shielding wire to ensure reliable grounding (ground resistance ≤ 4Ω); ③ Inspect the signal cables for aging or damage, and verify that they are routed away from strong interference sources; ④ Re-measure the device's accuracy using a high-precision multimeter to confirm whether it exceeds ±0.1% F.S.
2. Remedial Actions: ① Adjust the temperature and humidity in the control cabinet (activate cooling and replace desiccant); ② Reconnect the grounding terminals and shielding wires to ensure reliable grounding; ③ Replace aged or damaged signal cables and reroute them away from strong interference sources; ④ Calibrate the equipment according to the calibration method in Module 5.
3. Emergency Workaround: If on-site interference cannot be quickly eliminated, temporarily install a shielding enclosure or adjust the equipment's installation location to ensure basic signal stability first, followed by optimization of anti-interference measures.

3. Indicator Light Malfunctions
1. Troubleshooting Steps: ① Observe the type of indicator light abnormality (not lit, flashing, abnormal brightness) and make a preliminary judgment by referring to the indicator light instructions in Module 5; ② Check the power supply to confirm that the voltage is stable and the connections are secure; ③ Check whether the input signal is overloaded or the output terminals are short-circuited; ④ Power off and restart the device to observe if the indicator lights return to normal.
2. Troubleshooting Steps: ① Stabilize the power supply and tighten the power connections; ② Adjust the input signal to fall within the device's measurement range; troubleshoot for short circuits at the output terminals and replace faulty loads; ③ If the issue persists after powering off and restarting, inspect the internal circuitry and contact after-sales support to replace the indicator light or faulty components if necessary.
3. Temporary Workaround: If the indicator light is damaged but the device can still transmit signals normally, you may temporarily ignore the indicator light malfunction, keep a record of the issue, and replace the indicator light during the next scheduled shutdown; if the device cannot operate normally, immediately replace it with a spare unit.

4. Alarm Triggered Fault
1. Troubleshooting Steps: ① Review the alarm message to identify the alarm type (overload, short circuit, overheating, etc.); ② Check the input signal range to ensure there is no overload; ③ Inspect the output load to identify short circuits or overload issues; ④ Check the device's heat dissipation to ensure there is no dust buildup and sufficient ventilation space; ⑤ In explosion-proof environments, inspect the seals and the status of the safety barrier interlock.
2. Remedial Actions: ① Adjust the input signal to fall within the specified range; ② Resolve short circuits or overloads in the output load and replace faulty components; ③ Clean dust from the equipment, ensure adequate ventilation space, and install additional cooling devices if necessary; ④ In explosion-proof environments, replace damaged seals, verify the interlocking of safety barriers and isolators, and ensure compliance with explosion-proof regulations.
3. Emergency Workaround: If the alarm is triggered and cannot be quickly resolved, immediately shut down the power, identify the root cause (e.g., short circuit, overload), and restart the device after resolution; if the issue cannot be resolved, replace the device with a spare to prevent the fault from escalating.

5. Interference and Distortion Faults
1. Troubleshooting Steps: □ Check the distance between the equipment and sources of strong electromagnetic interference to ensure it is no less than 30 cm; □ Verify that signal cables are shielded twisted-pair cables and that the shielding is grounded at one end; □ Inspect the grounding configuration of multiple devices to identify ground loop interference; □ Check whether signal cables are bundled with high-voltage power cables.
2. Remedial Actions: ① Relocate the equipment away from strong sources of electromagnetic interference; ② Replace the cables with shielded twisted-pair cables and ensure the shield is reliably grounded at one end; ③ Optimize the grounding system to prevent ground loops caused by multiple devices sharing a common ground; ④ Separate signal cables from power cables and avoid bundling them together.
3. Temporary Workaround: If on-site interference is severe, temporarily use an interference suppressor or shorten the signal cable length to ensure basic signal stability. Subsequently, optimize the cabling and implement interference suppression measures.

9.4 After-Sales Repair Guidelines (For Rapid Support When Self-Troubleshooting Fails)
If on-site personnel are unable to diagnose and resolve the fault using the methods described above, or if they determine that internal components of the equipment are damaged, follow the guidelines below to request after-sales repair to ensure rapid technical support and minimize downtime:
1. Criteria for Determining a Malfunction (Clarifying Conditions for Service Requests)
• After on-site troubleshooting, it is confirmed that the power supply, wiring, environment, and load are all normal, but the equipment still fails to operate properly;
• The equipment shows obvious damage (such as a cracked housing, burnt terminals, smoke, or unusual odors), or internal components are faulty;
• After calibration, the accuracy still fails to meet the ±0.1% F.S. error requirement, or signal drift and interference cannot be eliminated through on-site measures;
• For explosion-proof equipment, faults that compromise explosion-proof performance, such as seal failure or abnormal safety barrier interlocking.

2. Repair Request Process (Standardized Procedures, Improved Efficiency)
1. Fault Documentation: Record in detail the equipment model, installation date, fault symptoms (e.g., no output, flashing indicator lights), troubleshooting process and results, and take photos of the equipment's fault condition (e.g., indicator lights, terminal blocks);
2. Submit a Service Request: Submit the service request via the contact information below, providing the fault record and photos, and describing the on-site conditions (e.g., industry, ambient temperature and humidity, whether it is an explosion-proof environment);
3. Technical Coordination: Qidian after-sales technicians will respond within 1–2 hours to provide further troubleshooting guidance via phone or video. If the issue cannot be resolved remotely, an on-site service visit will be scheduled;
4. Fault Resolution: After-sales personnel will conduct on-site troubleshooting and repairs, or replace faulty equipment/components. After repairs, accuracy will be retested to ensure the equipment operates normally;
5. After-Sales Follow-up: Once the issue is resolved, after-sales personnel will follow up to confirm the equipment is operating normally and answer any follow-up maintenance questions.

3. Contact Information (Quick After-sales Support)
• Official After-sales Hotline:19715617532 (Weekdays 9:00 AM–6:00 PM; leave a message on holidays; we will respond as soon as possible on the next business day);
• Official Email: sales008@qd-zdk.com(Submit repair requests and relevant documentation; we will reply within 24 hours);
• On-site Service: If on-site service is required, please specify this when submitting the repair request. Our after-sales staff will arrange for personnel from the nearest service center to visit your location based on your location.

4. Warranty Coverage (Clarification of Warranty Rights)
• Warranty Period: The Qidian GLT-B Signal Isolator comes with a 1-year warranty, effective from the date of successful equipment acceptance;
• Warranty Coverage: During the warranty period, free repair or replacement services will be provided for failures caused by inherent equipment quality issues (such as component malfunctions or accuracy deviations);
• Exclusions: Equipment failures caused by human error (e.g., incorrect wiring, overvoltage, unauthorized disassembly), environmental factors (e.g., damage due to high temperature or humidity), or force majeure (e.g., earthquakes, lightning strikes) will require paid repairs;
• Extended Warranty Service: After the warranty period expires, you may contact Qidian directly to arrange for an extended warranty and continue to receive the same level of after-sales support.