DAPPRA AUTOMATION

Installation Guide

Industrial Area Sensor & Safety Light Curtain

DPR-2440-NPN-NC

Mounting, alignment, wiring and installation reference for the 24-beam DPR-2440-NPN-NC Industrial Area Sensor and Safety Light Curtain with 40 mm optical axis pitch and 920 mm protection height.

SIL 2 / IEC 61508 | IP65 | CE / FCC / ROHS | NPN NC

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PRODUCT MODEL DPR-2440-NPN-NC	SKU SD74
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> This installation guide provides mounting, alignment, wiring and commissioning instructions for the DAPPRA DPR-2440-NPN-NC Industrial Area Sensor and Safety Light Curtain. Read all safety precautions before installation.

1. Introduction

The **DAPPRA DPR-2440-NPN-NC** is a 24-beam Industrial Area Sensor and Safety Light Curtain designed for object detection, machine protection and personnel protection. This guide describes the recommended installation, alignment and wiring procedure for the sensor pair.

PARAMETER	VALUE
Model	DPR-2440-NPN-NC
SKU	SD74
Beam Quantity	24 Beams
Optical Axis Pitch	40 mm
Protection Height	920 mm
Total Height	1006 mm
Output	NPN NC
Supply Voltage	DC24V ±20%

2. Safety Precautions

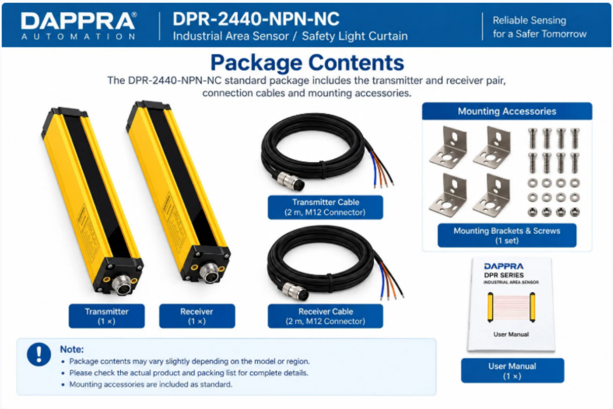
⚠ **WARNING:** This sensor is a safety-related device. Incorrect installation, wiring or configuration can result in serious injury or machine damage. Installation must be performed by qualified personnel only.

- Disconnect power before mounting or wiring the sensor.
- Verify the machine risk assessment before final installation.
- Use a safety relay or safety controller where required by the application.
- Do not modify, disassemble or bypass the sensor.
- Ensure the transmitter and receiver are mechanically protected from impact.
- Maintain the specified safety distance from the machine hazard zone.
- Follow all applicable local and international safety standards.

3. Package Contents

Verify that the following items are included in the package before installation.

- **1 × Transmitter** — Infrared beam transmitter
- **1 × Receiver** — Infrared beam receiver
- **2 m connection cables** — Pre-terminated cables
- **M12 connection** — Standard industrial connector
- **Mounting accessories** — Brackets and screws



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Package Contents

The DPR-2440-NPN-NC standard package includes the transmitter and receiver pair, connection cables and mounting accessories.

Note:
- Package contents may vary slightly depending on the model or region.
- Please check the actual product and packing list for complete details.
- Mounting accessories are included as standard.

Transmitter (1 ×)
Receiver (1 ×)
Transmitter Cable (2 m, M12 Connector)
Receiver Cable (2 m, M12 Connector)
Mounting Accessories
Mounting Brackets & Screws (1 set)
DAPPRA
DPR SERIES
INDUSTRIAL AREA SENSOR
User Manual
User Manual (1 ×)

Figure 3.1 — DPR-2440-NPN-NC standard package contents

4. Installation Preparation

Before mounting the sensor, prepare the following:

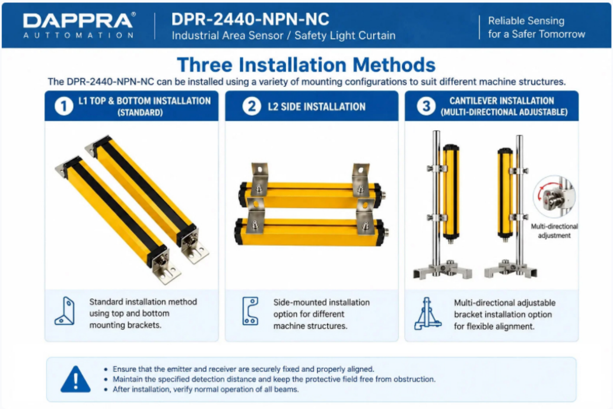
- Verify the machine opening and the required protection height.
- Confirm the mounting position and alignment reference.
- Prepare the mounting brackets and screws.
- Verify the supply voltage (DC24V ±20%).
- Check that the transmitter and receiver are correctly paired.
- Ensure the mounting surface is stable and free from vibration.

> For mechanical dimensions and mounting hole locations, refer to the DPR-2440-NPN-NC CAD Drawing.

5. Mounting Methods

The DPR-2440-NPN-NC can be installed using the available DAPPRA mounting configurations. Typical installation options include:

- **Standard Mounting** — Vertical transmitter/receiver configuration
- **Side Mounting** — Side-mounted installation for compact equipment
- **Adjustable Mounting** — Flexible positioning with adjustable brackets



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Three Installation Methods

The DPR-2440-NPN-NC can be installed using a variety of mounting configurations to suit different machine structures.

① L1 TOP & BOTTOM INSTALLATION (STANDARD)

Standard installation method using top and bottom mounting brackets.

② L2 SIDE INSTALLATION

Side-mounted installation option for different machine structures.

③ CANTILEVER INSTALLATION (MULTI-DIRECTIONAL ADJUSTABLE)

Multi-directional adjustable bracket installation option for flexible alignment.

- Ensure that the emitter and receiver are securely fixed and properly aligned.
- Maintain the specified detection distance and keep the protective field free from obstruction.
- After installation, verify normal operation of all beams.

Multi-directional adjustment

Figure 5.1 — Installation options for the DPR-2440-NPN-NC Area Sensor

Mounting Steps

1. **Mark the mounting positions** — Mark the mounting holes on both sides of the machine opening according to the CAD drawing.
2. **Install the mounting brackets** — Fix the brackets securely to the machine frame.
3. **Mount the transmitter and receiver** — Attach the transmitter and receiver to the brackets, facing each other.
4. **Adjust the vertical position** — Ensure the protection height covers the required machine opening.
5. **Tighten all screws** — Verify the mounting is secure and free from vibration.

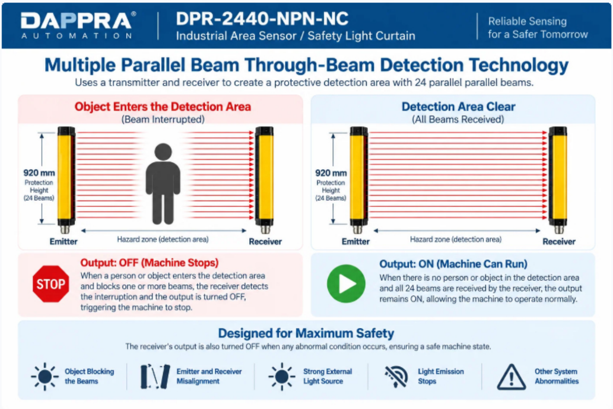
6. Transmitter & Receiver Alignment

Correct alignment between the transmitter and receiver is essential for reliable multi-beam detection. The transmitter and receiver must be aligned across the complete 920 mm sensing height.

Alignment Steps

1. **Loosen the mounting screws slightly** — Allow small adjustments of the transmitter and receiver.
2. **Power on the sensor** — Apply DC24V ±20% supply voltage.
3. **Check the alignment indicator** — Verify the receiver detects all 24 beams.
4. **Adjust the transmitter position** — Move the transmitter until the alignment indicator shows a stable state.
5. **Adjust the receiver position** — Move the receiver until all beams are detected.
6. **Tighten the mounting screws** — Secure the transmitter and receiver without disturbing alignment.
7. **Verify alignment** — Confirm all 24 beams are correctly detected across the full 920 mm protection height.

> If alignment cannot be achieved, verify that the transmitter and receiver are correctly paired, the mounting brackets are not deformed, and the supply voltage is within specification.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Multiple Parallel Beam Through-Beam Detection Technology

Uses a transmitter and receiver to create a protective detection area with 24 parallel parallel beams.

Object Enters the Detection Area
(Beam Interrupted)
920 mm
Protection
Height
(24 Beams)
Emitter
Hazard zone (detection area)
Receiver
Detection Area Clear
(All Beams Received)
920 mm
Protection
Height
(24 Beams)
Emitter
Hazard zone (detection area)
Receiver
STOP

Output: OFF (Machine Stops)

When a person or object enters the detection area and blocks one or more beams, the receiver detects the interruption and the output is turned OFF, triggering the machine to stop.

Output: ON (Machine Can Run)

When there is no person or object in the detection area and all 24 beams are received by the receiver, the output remains ON, allowing the machine to operate normally.

Designed for Maximum Safety

The receiver's output is also turned OFF when any abnormal condition occurs, ensuring a safe machine state.

Object Blocking the Beams
Emitter and Receiver Misalignment
Strong External Light Source
Light Emission Stops
Other System Abnormalities

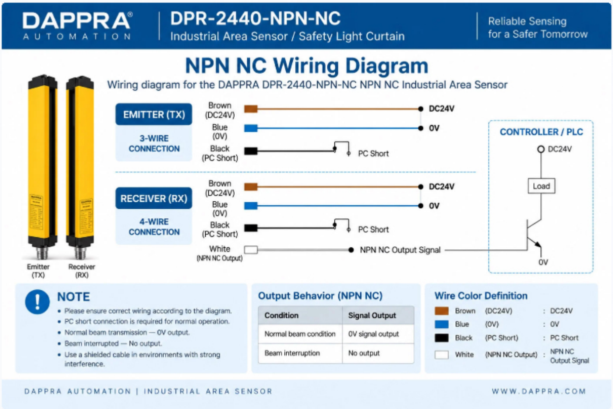
Figure 6.1 — Alignment reference for the DPR-2440-NPN-NC

7. Electrical Wiring

The DPR-2440-NPN-NC uses an **NPN transistor output** with **Normally Closed (NC)** signal logic.

ELECTRICAL CONFIGURATION	SPECIFICATION
Supply Voltage	DC24V ±20%
Output Type	NPN
Signal Logic	NC (Normally Closed)
Control Interface	Suitable for compatible PLC and control-system inputs

For the specified NC configuration, normal beam transmission produces a 0V output and beam interruption results in no output. The wiring should follow the DPR Series configuration and the electrical requirements of the connected control system.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NPN NC Wiring Diagram
Wiring diagram for the DAPPRA DPR-2440-NPN-NC NPN NC Industrial Area Sensor
EMITTER (TX)
3-WIRE CONNECTION
Brown (DC24V)
DC24V
Blue (0V)
0V
Black (PC Short)
PC Short
RECEIVER (RX)
4-WIRE CONNECTION
Brown (DC24V)
DC24V
Blue (0V)
0V
Black (PC Short)
PC Short
White (NPN NC Output)
NPN NC Output Signal
CONTROLLER / PLC
DC24V
Load
0V
Emitter (TX)
Receiver (RX)
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NOTE

- Please ensure correct wiring according to the diagram.
- PC short connection is required for normal operation.
- Normal beam transmission — 0V output.
- Beam interrupted — No output.
- Use a shielded cable in environments with strong interference.

Output Behavior (NPN NC)

Condition	Signal Output
Normal beam condition	0V signal output
Beam interruption	No output

Wire Color Definition

🟫	Brown	(DC24V)	: DC24V
🟦	Blue	(0V)	: 0V
⬛	Black	(PC Short)	: PC Short
⬜	White	(NPN NC Output)	: NPN NC Output Signal

Figure 7.1 — Wiring diagram for the DPR-2440-NPN-NC NPN NC Industrial Area Sensor

Wiring Notes

- Use shielded cable where electromagnetic interference is present.
- Keep the sensor cable separate from high-voltage power cables.
- Verify polarity before applying power.
- Connect the output to a compatible PLC or control-system input.
- Use a safety relay or safety controller where required by the application.

8. Function Check & Test

After installation and wiring, perform the following function checks before putting the machine into normal operation.

1. **Verify power supply** — Confirm DC24V ±20% is applied correctly.
2. **Check alignment** — Confirm all 24 beams are detected across the full protection height.
3. **Test beam interruption** — Interrupt each beam with a test object and verify the output changes state.
4. **Test the machine stop function** — Verify the machine stops correctly when the sensor output changes.
5. **Test the reset function** — Verify the machine can only restart after the sensing field is clear.
6. **Record the test results** — Document the installation and test results for future reference.

9. Troubleshooting

SYMPTOM	POSSIBLE CAUSE	ACTION
Sensor does not power on	Incorrect supply voltage or wiring	Verify DC24V ±20% and wiring polarity
Alignment indicator unstable	Misalignment or vibration	Re-align transmitter and receiver; check mounting
Output does not change	Beam interruption not detected	Verify object size, beam path and output wiring
False detection	Environmental interference or contamination	Clean lens; check for reflective surfaces or strong light
Intermittent detection	Loose wiring or unstable mounting	Tighten connections and mounting screws

10. Maintenance

Regular maintenance helps ensure reliable long-term operation of the DPR-2440-NPN-NC.

- Clean the transmitter and receiver lens periodically with a soft, dry cloth.
- Do not use abrasive cleaners or solvents.
- Verify alignment after any mechanical impact or maintenance activity.
- Check mounting screws and cable connections regularly.
- Perform a functional test after any maintenance activity.

11. Technical Support

For technical assistance, product information or purchasing support, contact DAPPRA Automation.

DAPPRA Automation
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