A close-up of a paper

AI-generated content may be incorrect.

A close-up of a paper

AI-generated content may be incorrect.

A close-up of a paper

AI-generated content may be incorrect.

A close-up of a paper

AI-generated content may be incorrect.

## 1. \*\*What is this product?\*\*

The Omron E3X-DA-N Series is an optical fiber photoelectric switch with a digital level indicator. It detects objects using a fiber optic sensor and can be used in automation for presence/absence detection, counting, alignment, etc.

---

## 2. \*\*Safety Precautions\*\*

\*\*Always:\*\*

- Do NOT use in explosive/ignition gas or in water.

- Do NOT disassemble/tamper with the sensor.

- Use correct voltage/current and do not reverse polarity.

- Do NOT directly short-circuit the load.

\*\*For correct use:\*\*

- Use only methacrylate resin optical fibers (no other organic solvents).

- Route fiber away from power lines and avoid sharp bends.

- Use approved cables (S-mark certified if possible).

- Avoid exceeding cable length, tension, or mechanical stress.

---

## 3. \*\*Basic Parts/Nomenclature\*\*

- Digital display: Shows incident light, sensitivity, settings, etc.

- Mode selector: SET, ADJ, RUN (for setting, adjusting, and normal operation)

- TEACH key: Used for teaching/setting the sensor.

---

## 4. \*\*How to Set Up & Use (Basic Operation)\*\*

### \*\*Step-by-step:\*\*

#### \*\*A. Teaching Automatic Sensitivity (SET Mode)\*\*

- \*\*SET mode\*\*: Used for automatic teaching (adjusting sensitivity).

- \*\*ADJ mode\*\*: For manual adjustment.

- \*\*RUN mode\*\*: For normal detection.

##### \*\*1. Maximum Sensitivity Setting\*\*

1. Set selector to \*\*SET\*\*.

2. Hold down the ▼ (Key) for 3 seconds (red indicators light up).

3. When red indicators light up, release the key – now go to \*\*RUN\*\* mode.

##### \*\*2. One-Point Teaching (No Work)\*\*

1. Hold down ▼ (Key) for 0.5–2.5 seconds.

2. When red indicators light up, go to RUN mode.

##### \*\*3. Two-Point Teaching (With/Without Work)\*\*

1. Place work in position, hold ▼ (Key) for 0.5–2.5 seconds (incident light displayed).

2. Move work away, hold ▼ (Key) again for 0.5–2.5 seconds.

3. Green indicators = OK, red = NG (re-teach needed).

##### \*\*4. Pin-Point Teaching (To Settle Position)\*\*

1. Hold ▼ (Key) for 0.5–2.5 seconds (incident light displayed).

2. Place work, hold ▼ (Key) for 3 seconds or longer.

3. Green indicators = OK, red = NG (re-teach needed).

---

#### \*\*B. Manual Sensitivity Adjustment (ADJ Mode)\*\*

1. Set selector to \*\*ADJ\*\*.

2. Use \*\*TEACH\*\* key to increase sensitivity (threshold goes higher).

3. Use \*\*MODE\*\* key to decrease sensitivity.

---

#### \*\*C. Detection (RUN Mode)\*\*

1. Set selector to \*\*RUN\*\*.

2. The display now shows the incident light level, threshold, and outputs detection.

---

## 5. \*\*Other Key Features & Settings\*\*

- \*\*Zero Reset\*\*: In RUN mode, hold ▼ (Key) for 1 second or longer to reset.

- \*\*Function Settings\*\* (SET mode, see Image 2):

- Detection function: Standard/Long distance/High speed.

- Timer: Set off-delay (0–200 ms).

- Flashing: On/Off.

- Display direction: Standard/Reverse.

- Monitor output range: Set upper/lower limits.

---

## 6. \*\*Mounting and Wiring\*\*

- Can be mounted on a DIN rail.

- For connector types, make sure chip is inserted fully.

- See wiring diagrams for NPN/PNP output connections (Image 4, bottom left).

---

## 7. \*\*Troubleshooting & Precautions\*\*

- If the output indicator flashes during teaching, check for power interruption or static electricity.

- If you change or disconnect amplifiers, always power down first.

---

## 8. \*\*Restore Default Settings\*\*

- In SET mode, press and hold ▼ (Key) for 3 seconds, then press MODE key to confirm (see Image 3, bottom right).

---

## \*\*Would you like a step-by-step on a specific setup or application scenario?\*\*

For example:

- How to detect a specific object

- How to set up for transparent materials

- How to wire for a PLC

Let me know your use case or any step you want in more detail!

Great question! Here’s what \*\*“Set Analog Output Range (if using monitor output)”\*\* means and how it relates to your application:

---

### 1. \*\*Analog Output Range and Monitor Output\*\*

- The Omron E3X-DA-N series can provide an \*\*analog voltage output\*\* (typically 1–5V) on some models.

- This output is proportional to the amount of light received by the optical fiber.

- You can \*\*set the range\*\* over which this analog output changes, to match the measurement span you care about (see “Focusing output range of the monitor” in the manual, Image 3 section 7).

---

### 2. \*\*Can You Use Just the Fiber and Amplifier for Water Level?\*\*

\*\*Yes, you can\*\*—if your application allows the optical fiber to directly sense water level (without a float/pulley).

- \*\*How it works:\*\*

The incident light amount changes as the water level moves, if the fiber is positioned so that water presence/absence, or water’s meniscus, affects the amount of light returned to the sensor.

- \*\*Analog output:\*\*

The analog output will vary continuously as the detected light changes—meaning you can use this as a continuous water level signal, \*\*if your setup allows the light signal to change with water height\*\*.

---

### 3. \*\*Pulley-Float vs. Direct Sensing\*\*

| Pulley-Float System | Direct Fiber Sensing (No Float) |

|---------------------------------------------|----------------------------------------------|

| Mechanical float moves with water level | Fiber is exposed directly to water interface |

| Fiber detects position of float (shadow) | Fiber detects light change as water rises |

| More robust to surface tension, ripples | Needs careful positioning and calibration |

| Can convert movement to analog/steps | Analog voltage directly = water level |

- \*\*With float:\*\* More reliable, especially for dirty water or where water surface is inconsistent.

- \*\*Without float:\*\* Possible, but depends on:

- The clarity of water

- How directly water level affects received light (you may need to experiment!)

---

### 4. \*\*How to Use the Analog Output\*\*

- Connect the monitor output to your analog input device (PLC, data logger, etc.).

- Set the upper/lower analog range as described in the manual (Image 3, section 7).

- Calibrate so that 1V = minimum water, 5V = maximum water (or your desired range).

- \*\*No pulley/float needed\*\* if your fiber placement reliably changes light with water level.

---

### 5. \*\*Practical Note\*\*

- If you go with \*\*direct optical sensing\*\*, do a test:

1. Insert fiber at the lowest water level, note light reading/output.

2. Raise water, note how the reading/output changes.

3. If you get a clear, repeatable analog change, you can use it for direct water level measurement!

- If not, the \*\*pulley-float\*\* system gives you a mechanical translation, which is more robust in most real-world tanks.

---

\*\*Summary:\*\*

You can skip the float if the fiber’s light response to water level is strong and repeatable. The analog output is your continuous water level signal. However, many users still prefer the float for stability and reliability.

If you want, I can walk you through the direct analog output calibration process, or provide guidance on optimizing fiber placement for direct water level sensing!