

46DFA DIN Rail Fiber Optic Amplifier Photoelectric Sensors



Precise Small Object Detection for Hard-to-Reach Places

Features and Benefits

- Two high-visibility displays provide feedback that simplifies set up, operation and maintenance
- ECO display mode reduces power consumption by 25%
- Teachable LED intensity adds flexibility for reliable sensing of clear or transparent objects
- Fast-response output when using IO-Link enables continuous sensor monitoring without impact on performance
- Fast-response speeds of 50 μ s, 500 μ s, 4 ms, and 32 ms
- Built-in totalizer feature simplifies counting applications
- Cross-talk protection for stable operation of multiple sensors in close proximity
- Selectable PNP and NPN output using push button reduces inventory
- Embedded IO-Link enables access to enhanced features and diagnostics
- IP40 rated enclosure

What is IO-Link?

- IO-Link is a worldwide open-standard peer-to-peer serial communication protocol (IEC 61131-9) that allows sensors to easily integrate into The Connected Enterprise.
- Benefits of IO-Link technology include:
 - Reduced inventory and operating costs
 - Increased uptime/productivity
 - Simplified design, installation, setup and maintenance
 - Enhanced flexibility and scalability



Fiber optic sensors are ideal for a variety of packaging and assembly applications including the detection of very small objects, parts verification in hard to reach areas and color mark registration. These sensors consist of a light amplifying unit and a fiber optic cable that can be installed at the detection area allowing for remote sensitivity adjustment.

The Allen-Bradley® 46DFA PHOTOSWITCH® DIN rail fiber optic amplifier is a dual display model designed for the detection of objects with the use of a standard 2.2 mm (0.09 in.) diameter fiber-optic cable. These sensors are ideal in limited spaces or applications that require detection at high speeds. Additional sensing flexibility can be achieved thanks to the wide variety of compatible fiber optic tips. Designed to be mounted side by side along a DIN rail away from the actual application, these sensors provide enhanced installation flexibility and excellent noise immunity.

Bulletin 43G glass fiber optic cables compatible with this amplifier are ideal for use in high temperature applications. For continuous movement and high-flex applications, we recommend the use of the Bulletin 43P small aperture plastic fiber cables.

The 46DFA is also a smart sensing solution with embedded IO-Link functionality that easily integrates into The Connected Enterprise. That means the 46DFA can deliver sensor health and application data directly into a control system to help minimize downtime and increase productivity.

46DFA DIN Rail Fiber Optic Amplifier IO-Link Features and Benefits

- **Triggered (output status):** indicates when the target is detected
- **Margin Low Alarm:** indicates when the target signal is marginal and about to fail
- **Proximity Alarm:** indicates if there is a target in the background that may be in close proximity to the threshold
- **Signal Strength:** provides the raw signal strength value reflected by the target (diffuse fiber) or beam blocking (transmitted beam)
- **Location Indication:** helps distinguish sensors in applications where you may need to locate them in a large machine
- **Internal Temperature:** provides the sensor's internal temperature which helps you determine if the sensor is operating close to its minimum or maximum temperature range
- **User Interface Locks:** prevents undesired or unauthorized changes of the sensor settings

Product Selection

1. Select Fiber

Approximate Dimensions [mm (in.)]	Bend Radius [mm (in.)]	Fiber Bundle Diameter [mm (in.)]	Sheathing Material	Catalog Number
Threaded Transmitted Beam Cables for Small Aperture Sensors [2.2 mm (0.09 in.)]				
	25 (1.0)	1 (0.04)	Polyethylene	43PT-NJS56FS
Threaded Bifurcated Cables (Diffuse) for Small Aperture Sensors [2.2 mm (0.09 in.)]				
	40 (1.6)	2 x 1.5 (0.06)	Polyethylene	43PR-NDS59FS

Note: Refer to Proposal Works (<https://configurator.rockwellautomation.com/#/browse>) for complete fiber selection.

2. Select Amplifier

Optical Aperture	Light Source	Sensing Distance	Output Mode	Output Type	Response Time	Connection Type	Catalog Number
2.2 mm	Visible red LED	Depends on fiber optic cable	Programmable complementary light operate and dark operate	Programmable PNP or NPN (both outputs)	Programmable 50 μ s, 500 μ s, 4 ms, 32 ms (500 μ s default)	2 m cable	46DFA-L2LBT1-A2
						4-pin M12 QD on 150 mm pigtail	46DFA-L2LBT1-F4

Product Specifications

Specifications	
Certifications	cULus and CE marked for all applicable directives
User Interface	
Status indicators	Dual display, output and operation LEDs
Adjustments	Push buttons
Sensing Performance	
Sensing range	Depends on fiber optic cable
Light source	Visible red LED 660 nm
Electrical	
Operating voltage	12...24V DC
Sensor protection	Reverse polarity and short circuit protection
Outputs	
Output type	Pin 4: PNP or NPN Pin 2: PNP or NPN
Output mode	Programmable light operate and dark operate
Response time	50 μ s, 500 μ s (Default), 4 ms, 32 ms
Load current	100 mA max

Specifications	
IO-Link	
Communications Mode	COM2
Cycle Time, minimum	3.6 ms
Process data bit length	4 bytes (32 bits)
Specifications	1.1
Vendor ID	2 (0x02)
Device ID	291 (0x123)
Mechanical	
Housing Material	Polycarbonate
Environmental	
Enclosure Rating	IP40
Operating Temperature	1 to 5 adjacent sensors: -25...+55 °C (14...131 °F) 6 or more adjacent sensors: -25...+50 °C (14 ...122 °F)
Connections	2 m cable 4-pin M12 QD on 150 mm pigtail

Cordset & Accessories

Description	Catalog Number
4-pin DC Micro (M12) Cordset, 5 m length	889D-F4AC-5
Mounting bracket, DIN rail stop	60-BDFA-STP
Mounting bracket, 46DFA DIN rail single mount	60-BDFA-DIN

Go to www.ab.com to see the full line of 46DFA DIN Rail Fiber Optic Amplifier sensors and accessories.

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