FASTUS

*FASTUS is a product brand of OPTEX FA.

Digital Fiber Amplifier with IO-Link Interface

D4RF Series

IO-Link

Easy-to-Read, Easy-to-Use Fiber Sensor Amplifier

● IO-Link network supported

Various data, such as listed below, can be exchanged with control systems, via IO-Link and field networks.
Cyclic data exchange: Received light amount, Counter value, and output status
On-request data: Setting parameters, Errors, Warnings, and Maintenance data

● Easy-to-read OLED display

In addition to clear and detailed detection status and values displayed on the OLED display, the setting menu can be displayed in English, Japanese, Korean, Simplified Chinese or Spanish.

● Teach modes to suit your application requirements

Six teach modes are available: 1 point, 2 points, Auto, Through, 1-point Zone, and 2-point Zone.

● Detection on a Difference from Recorded Data in the Past

The Edge Height function of Threshold mode enables to judge detection from a difference between present and past data of an offset time.

● Stretch display mode of received light amount

When the received light amount is low, the value the displayed values can be magnified by 10 or 50, for easier perception.

● Enhanced Detection in a Long Distance

High-power LEDs in combination with a lens designed for efficiency has increased the sensing distance.
This ensures detection that is stable and resistant to dust and contamination.

● Fast response time

Response time can be selected from 6 speed modes, as fast as 16 µs.

● Fiber insertion indicators for instant verification

You can tell at a glance whether fiber wires are inserted in the correct positions.

Lineup

Type	I / O	Light Source	Model	
			Cable	Connector
Stand-alone unit (IO-Link device)	2 outputs and 1 input	4-element Red LED	D4RF-TD	–
	1 output and 1 switchable output/input		D4RF-T	D4RF-TC4

Specifications

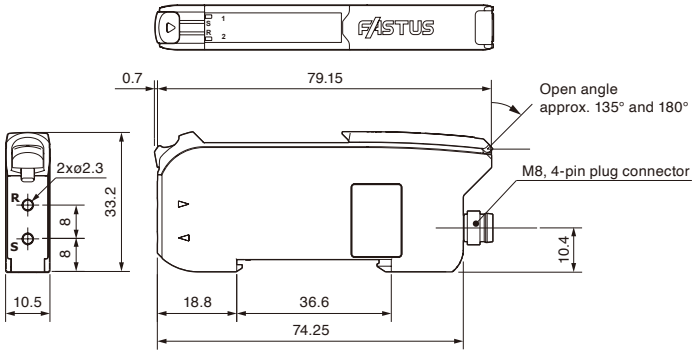
Type			Stand-alone unit (IO-Link device)
Model	1 output and	Cable type	D4RF-T
	1 switchable output/input	Connector type	D4RF-TC4
	2 outputs and 1 input	Cable type	D4RF-TD
Light source			4-element Red LED (Wavelength: 660nm)
Response time			16 µs, 70 µs, 250 µs, 500 µs, 1 ms, 2 ms, 8 ms
Teach Mode			1 point, 2 points, Auto, Through, 1-point Zone, 2-point Zone, Manual
Display	Display		OLED display 128 x 22 pixels, Menu languages : English, Japanese, Korean, Simplified Chinese, Spanish
	Indicators		2 x Output indicator (orange) Power indicator (green): Lights up when power is on (Blinks during IO-Link communication on stand-alone unit)
Interface	Control output		NPN/PNP open collector or Push-pull, selectable by setting 1 output : Max. 100mA, 2 outputs : Max. 50mA each /30 VDC residual voltage1.8V or less
	External input		Teach, Counter-reset, Emitter off or Preset loading*1
	IO-Link		Control output 1 is switchable to IO-Link
IO-Link	Revision		1.1
	Baud rate		COM 3 (230.4kbps)
	Number of process input data bytes		4 bytes
	Minimum cycle time		0.5 ms
Timer function			On delay, Off delay, On/off delay, Pulse output, On delay pulse, Adjustable 1 to 30,000 ms
Output mode			Light ON/Dark ON, selectable by setting
Connection type			Cable type: 2m, 5 wires with 2-output and 1-input models, 4 wires with 1-output and 1-swichable-output/input models, Minimum bending radius: 4 x Cable diameter Connector type: M8 4-pin plug connector
Insulation resistance			20 Megohm or more (with 500 VDC)
Rating	Supply voltage	SIO mode	12 to 30 VDC ± 10 %, including 10 % ripple (p-p)
		IO-Link mode	18 to 30 VDC ± 10 %, including 10 % ripple (p-p)
	Current consumption	Eco mode: Off	870 mW max. (29 mA or less at 30 VDC, 33 mA or less at 24 VDC, 52 mA or less at 12 VDC)
		Eco mode: On	780 mW max. (26 mA or less at 30 VDC, 29 mA or less at 24 VDC, 43 mA or less at 12 VDC)
Warm-up time			300 ms
Applicable regulations		EMC	EU EMC directive (2014/30/EU) , UK directive EMC (The Electromagnetic Compatibility Regulations 2016)
		Environment	EU RoHS directive (2011/65/EU) UK RoHS (The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012) China RoHS (MIIT Order No.32)
Applicable standards			EN 60947-5-2
NRTL certification			UL Listed, Proximity Switch Certified for US and Canada
Company standards			Noise resistance Feilen Level 4
Protection circuit			Reverse connection protection, Overcurrent protection
Environmental resistance	Ambient temperature / humidity		-25 to 55 °C/35 to 85 % RH (no freezing or condensation)
	Ambient illuminance		Sunlight: 10000 lx or less, Incandescent light: 3000 lx or less
	Vibration resistance		10 to 55 Hz, Double amplitude 1.5 mm; 2 hours in each of the X,Y and Z directions
	Shock resistance		Approx. 50 G (500 m/s²) 3 times in each of the X,Y and Z directions
	Degree of protection		IP54
Material			Housing, cover: PC
Weight			Cable model: approx. 71 g (including cable), Connector model: approx. 25 g
Included items			Mounting bracket, Instruction manual

*1: Preset loading selectable only on 2-output and 1-output model

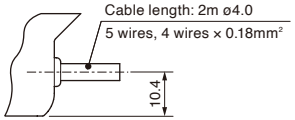
Dimensions (mm)

Amplifier

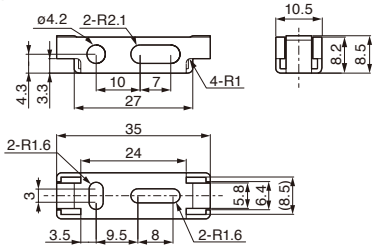
Connector models



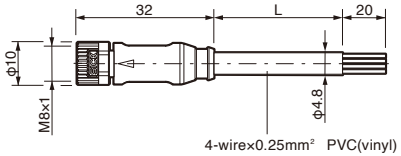
Cable models



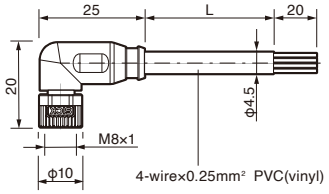
Mounting bracket



M84CN-2S, M84CN-5S, M84CN-10S



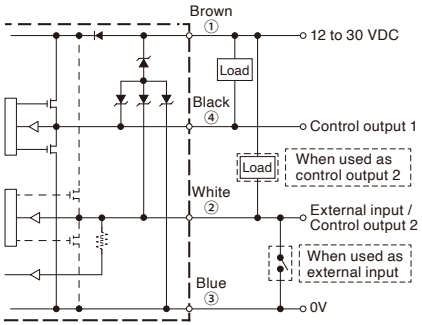
M84CN-2L, M84CN-5L, M84CN-10L



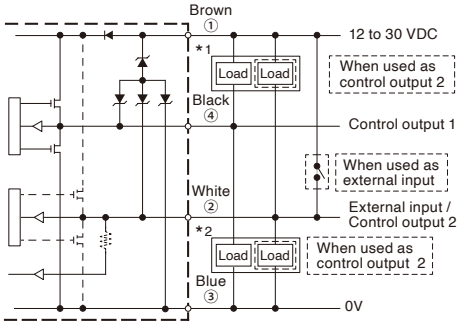
I/O circuit diagram

【1-output and 1-switchable-output/input models】

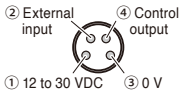
SIO mode (standard I/O mode) with NPN setting



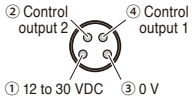
SIO mode (standard I/O mode) with PNP setting or Push-pull



M8 connector pin layout
1-output+1-input setting

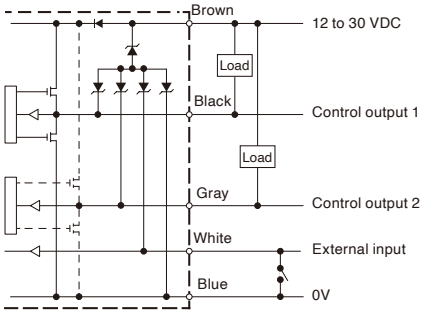


2-output setting

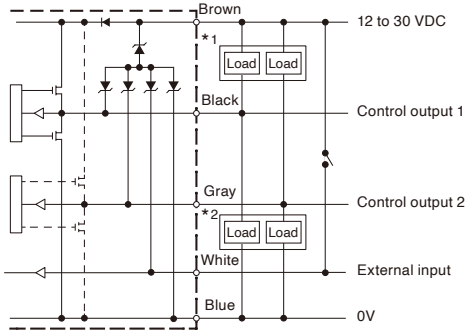


【2-outputs and 1-input model】

SIO mode (standard I/O mode) with NPN setting



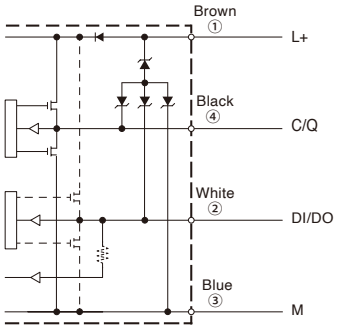
SIO mode (standard I/O mode) with PNP setting or Push-pull



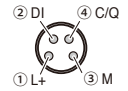
*1 When I/O polarity is set to Push-pull and the sensor is connected with plus common circuits.
*2 When I/O polarity is set to Push-pull or PNP and the sensor is connected with minus common circuits.

IO-Link

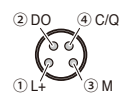
1-output and 1-switchable-output/input models



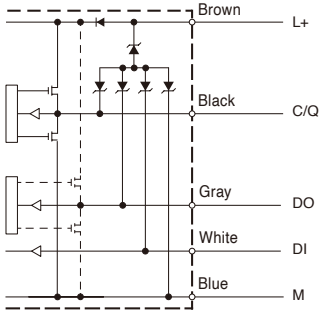
M8 connector pin layout
1-output+1-input setting



2-output setting



2-output and 1-input model



Options

Type	Model	Description
Connector cables	M84CN-2S	Straight, 2 m
	M84CN-5S	Straight, 5 m
	M84CN-10S	Straight, 10 m
	M84CN-2L	L-shaped, 2 m
	M84CN-5L	L-shaped, 5 m
	M84CN-10L	L-shaped, 10 m
End plate	BEF-EB01-W190	2 pieces
Mounting bracket	BEF-WLL180	1 piece