

# TL46



## ULTRA HIGH SPEED HIGH PERFORMING CONTRAST SENSOR FOR COLORED REGISTRATION MARK DETECTION

- Ultra Fast model up to 70 kHz and very low 3us jitter (TL46-WH...OZ)
- Color mode enhanced model (TL46-WE)
- Position mounting monitoring through IO-Link communication
- Mechanical vibration monitoring through IO-Link communication
- Wide-spectrum RGB or white LED emission
- 7 different models: basic, standard, enhanced, low jitter, color mode, basic IO-Link, ultra fast with IO-Link
- Automatic, manual and dynamic settings
- 10, 15, 20, 30, 50, 70 kHz switching frequencies
- Very low 3us jitter for fast and very precise detection (TL46-WH...OZ)
- NPN/PNP/PP and analog outputs
- IO-Link connectivity V1.1.2 with smart functions
- Standard mounting, M12 connector rotatable to 5 positions

### APPLICATIONS

- Packaging and labeling machinery
- Beverage/Food/Cosmetic/Pharmaceutical industries
- Printing machinery
- Flexographic printing machinery
- Very high precision for cutting and sealing applications

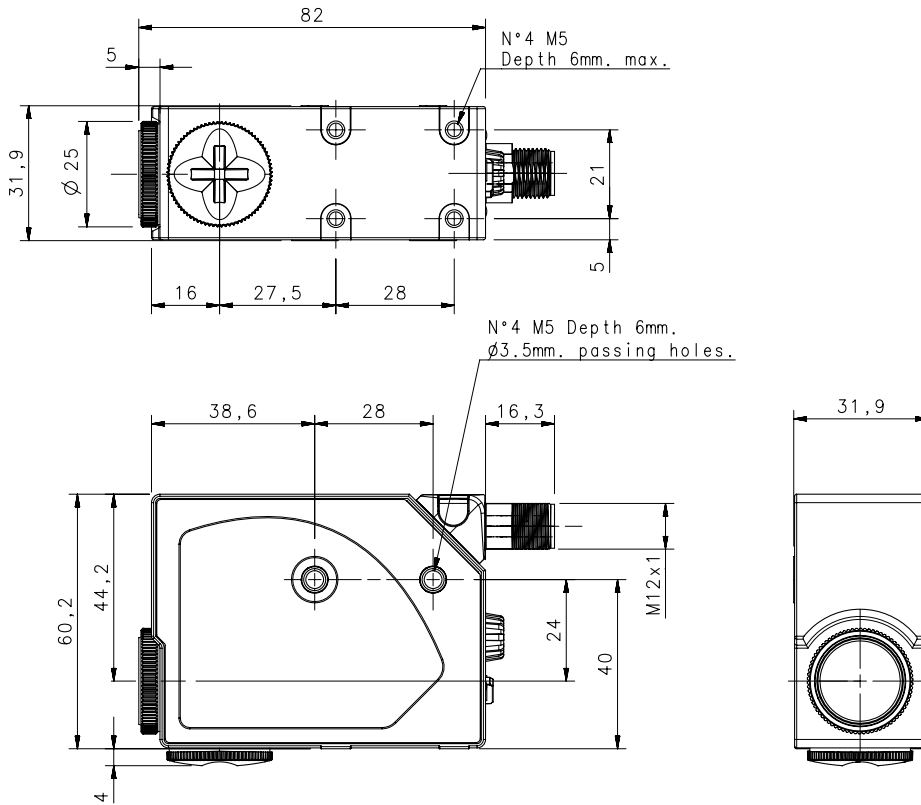
(\*\*) ATEXII 3DG

TL46	
<b>Contrast sensor</b>	9 ±3 mm
	18 mm (Lens No.18 glass)
	22 mm (Lens No.22 glass)
	28 mm (Lens No.28 glass)
	40 mm (Lens No.40 glass)
<b>Switching frequency</b>	10 kHz (mod. TL46-WE color mode)
	15 kHz (mod. TL46-W)
	20 kHz (mod. TL46-A/WL)
	25 kHz (mod. TL46-W...PZ)
	30 kHz (mod. TL46-WLF/WE contrast mode)
	50 kHz (mod. TL46-WJ)
	70 kHz (mod. TL46-WH...PZ)
<b>Jitter</b>	50 µs (mod. TL46-WE color mode)
	33 µs (mod. TL46-W)
	25 µs (mod. TL46-A/WL)
	<20 µs (mod. TL46-W...PZ)
	16 µs (mod. TL46-WLF/WE contrast mode)
<b>Light emission</b>	<7 µs (mod. TL46-WJ)
	<3 µs (mod. TL46-WH...PZ)
	RGB LED white LED Red LED
<b>Setting</b>	push buttons
	Trimmer (precise incremental encoder) mod. TL46-A
<b>Power supply</b>	10...30 V
	VDC VAC VAC/DC
<b>Output</b>	PNP
	NPN
	NPN/PNP
	relay
	Analogue out
<b>Connection</b>	0...5 V Analogue Output (TL46-A/W/WL only)
	IO-Link V1.1.2 Smart sensor profile double channel I/O (mod. TL46-WH...PZ, TL46-W...PZ)
<b>Approximate dimensions (mm)</b>	IO-Link
	cable
	connector
<b>Housing material</b>	pig-tail
	Aluminium
<b>Mechanical protection</b>	IP67

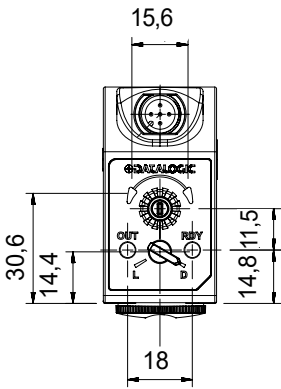
# TECHNICAL DATA

<b>Power supply</b>	10 ... 30 VDC (limit values)
<b>Ripple</b>	2 VPP max.
<b>Consumption (output current excluded)</b>	40 mA max. at 24 VDC (mod. TL46-A) 50 mA max. at 24 VDC (mod. TL46-W/WJ) 85 mA max. at 24 VDC with bargraph ON in threshold adjustment mode, 55 mA max at 24 VDC with bargraph OFF in normal functioning mode (mod. TL46-WL) 35 mA max. at 24 VDC (mod. TL46-WLF/WE) 30mA (mod. TL46-WH...PZ, TL46-W...PZ)
<b>Light emission</b>	white LED 400-700 nm (mod. TL46-A-4xx); red LED 630 nm (mod. TL46-A-6xx) blue LED 465nm/green LED 520 nm/red LED 630 nm (mod. TL46-W/WL/WLF/WE/WJ/WH...PZ/W...PZ)
<b>Detection Distance</b>	9 ±3 mm 18 mm (Lens No.18 glass) 22 mm (Lens No.22 glass) 28 mm (Lens No.28 glass) 40 mm (Lens No.40 glass)
<b>Minimum spot dimension</b>	1.5 x 5 mm; 0.8 x 4 mm (TL46-WJ, TL46-WH...PZ, TL46-W...PZ)
<b>Depth of field</b>	± 3 mm
<b>Response time</b>	100 µs (mod. TL46-WE, TL46-WH...PZ color mode) 33 µs (mod. TL46-W) 25 µs (mod. TL46-A/WL) 20 µs (mod. TL46-W...PZ) 16 µs (mod. TL46-WLF/WE contrast mode) 10 µs (mod. TL46-WJ) 6 µs (mod. TL46-WH...PZ)
<b>Switching frequency</b>	10 kHz (mod. TL46-WE, TL46WH...PZ color mode) 15 kHz (mod. TL46-W) 20 kHz (mod. TL46-A/WL) 30 kHz (mod. TL46-WLF/WE contrast mode) 50 kHz (mod. TL46-WJ) 70 kHz (mod. TL46-WH...PZ)
<b>Jitter</b>	50 µs (mod. TL46-WE, TL46-WH...OZ color mode) 33 µs (mod. TL46-W) 25 µs (mod. TL46-A/WL) 20 µs (mod. TL46-W...PZ) 16 µs (mod. TL46-WLF/WE contrast mode) <7 µs (mod. TL46-WJ) 3 µs (mod. TL46-WH...PZ)
<b>Setting</b>	SET push-buttons (mod. TL46-W/WL/WLF/WH...PZ/W...PZ) sensitivity trimmer (mod. TL46-A)
<b>Operating mode</b>	DARK/LIGHT selection by switch (mod. TL46-A); automatic DARK/LIGHT selection (mod. TL46-W/WL/WJ) automatic DARK/LIGHT selection in the target/background detection, selectable via wire in the dynamic detection (mod. TL46-WLF/WE/WH)
<b>Indicators</b>	yellow OUTPUT LED green READY LED, orange DELAY LED and KEYLOCK (mod TL46-W/WJ/W...PZ) green READY LED, 4-digit display/DELAY LED/KEYLOCK LED mod. TL46-WLF/WE/WH...PZ orange ARROWS (mod. TL46-A), DELAY LED and KEYLOCK LED 5-segment bargraph (mod. TL46-WL)
<b>Dark/light selection</b>	Switch; Automatic; Automatic/manual; remote/dynamic
<b>Delay</b>	0...20ms selectable via delay input 0...100ms programmed
<b>Auxiliary function</b>	Keylock (not available on TL46-WE) Fine Hysteresis regulation (TL46-WL/WLF/WE)
<b>Output</b>	PNP (mod. TL46-WJ); PNP or NPN; PNP/NPN (mod. TL46-W/WL/WLF/WE by part number); PP/PNP/NPN (TL46-W/WH...PZ); analog output (mod. TL46-A/W/WL)
<b>Output current</b>	100mA
<b>Saturaton Voltage</b>	= <2V
<b>Analogue Out</b>	0,5...5,5V ±10%; 2V on white target 90%; 1...3V ±10%(white 90%) ; 5,5V max
<b>Analogue out impedance</b>	2,2 kΩ (short circuit protection)
<b>Connection</b>	M12 5-pole connector
<b>Dielectric strength</b>	500 Vac, 1 min between electronics and housing
<b>Insulating resistance</b>	>20 MΩ, 500 Vdc between electronics and housing
<b>Electrical protection</b>	class 2, double insulation
<b>Protection device</b>	Reverse polarity protection, overload and short circuit protection
<b>Mechanical protection</b>	IP67
<b>Ambient light rejection</b>	according to EN 60947-5-2
<b>Vibrations</b>	0,5 mm amplitude, 10 ... 55 Hz frequency, for every axis (EN60068-2-6)
<b>Shock resistance</b>	11 ms (30 G) 6 shock for every axis (EN60068-2-27)
<b>Housing material</b>	aluminium
<b>Lens material</b>	PMMA (mod. TL46-A, TL46-W), glass (mod. TL46-W-815G/WL/WLF/WJ/WE)
<b>Operating temperature</b>	-10 ... 55 °C
<b>Storage temperature</b>	-20 ... 70 °C
<b>Weight</b>	170 g max.

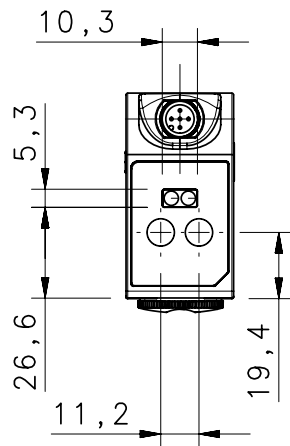
# DIMENSIONS



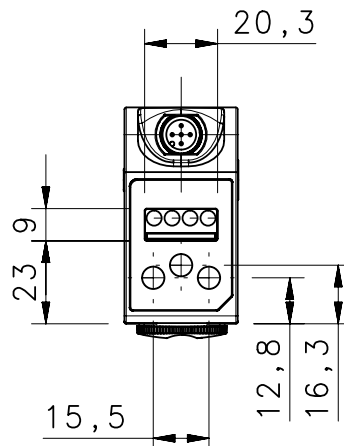
TL46-A



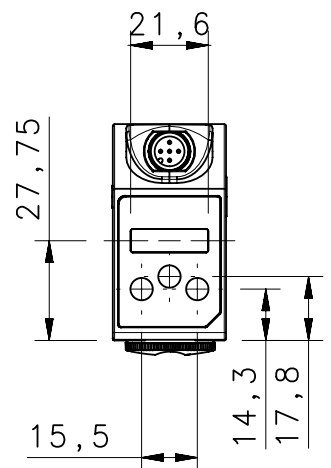
TL46-W/WJ/W...PZ



TL46-WL



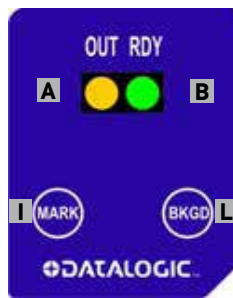
TL46-WLF/WE/WH...PZ



# INDICATORS AND SETTINGS



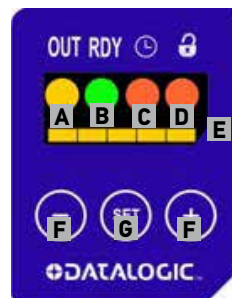
**TL46-A  
TRIMMER**



**TL46-W  
BASE**

**TL46-WJ  
LOW JITTER**

**TL46-W...PZ  
BASE IO-Link**



**TL46-WL  
STANDARD**



**TL46-WLF  
ENHANCED**

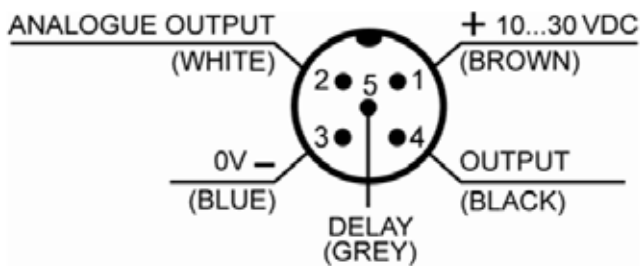
**TL46-WE  
COLOR  
ENHANCED**

**TL46-WH...PZ  
HIGH SPEED IO-Link**

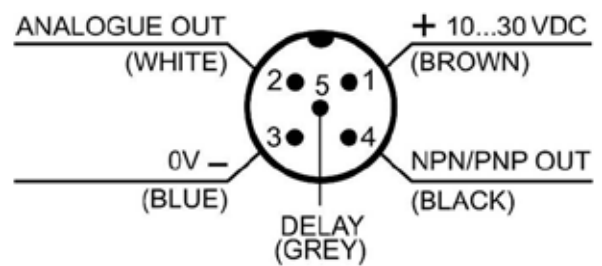
- A** yellow OUTPUT LED
- B** green READY LED
- C** orange DELAY LED
- E** orange KEYLOCK LED
- D** Bargraph
- F** +/- push-buttons
- G** SET push-button
- H** Display
- I** MARK push-button
- L** BKGD push-button
- M** Light/Dark Switch
- N** Orange Indicators Arrows
- O** Sensitivity Adjustment Knob

# CONNECTIONS

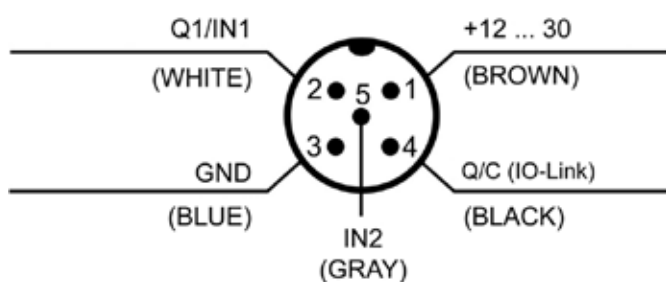
TL46-A



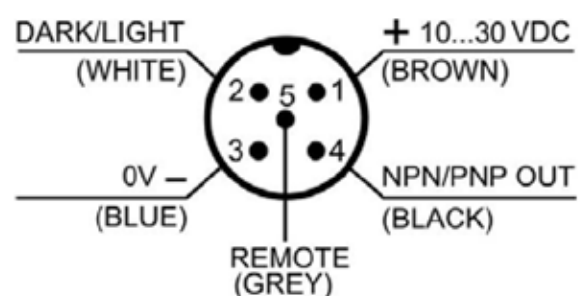
TL46-W/WL



TL46-W...PZ/WH...PZ

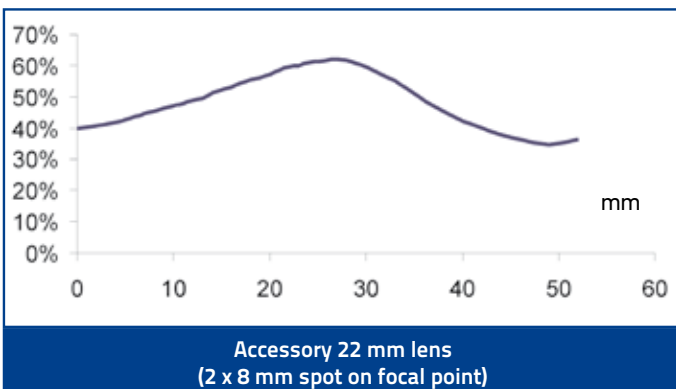
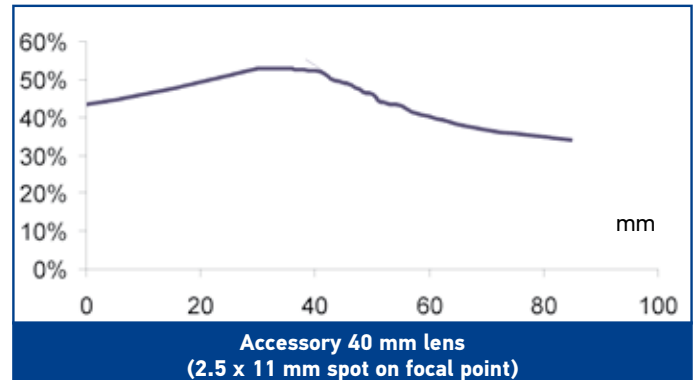
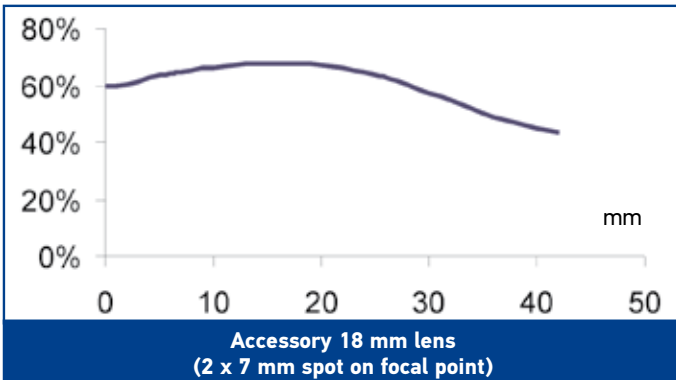
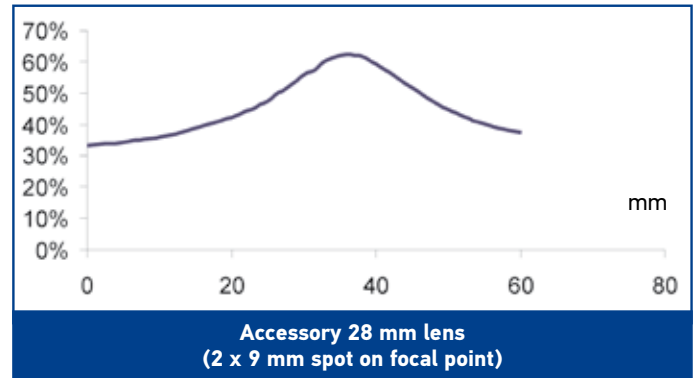
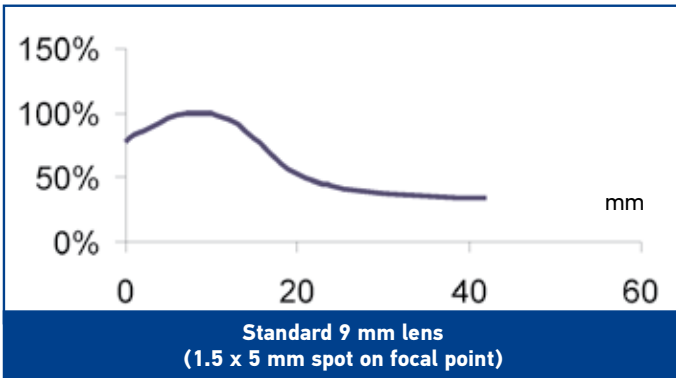


TL46-WLF/WE/WJ



# READING DIAGRAMS

FOR ALL MODELS



VERTICAL SPOT

HORIZONTAL SPOT



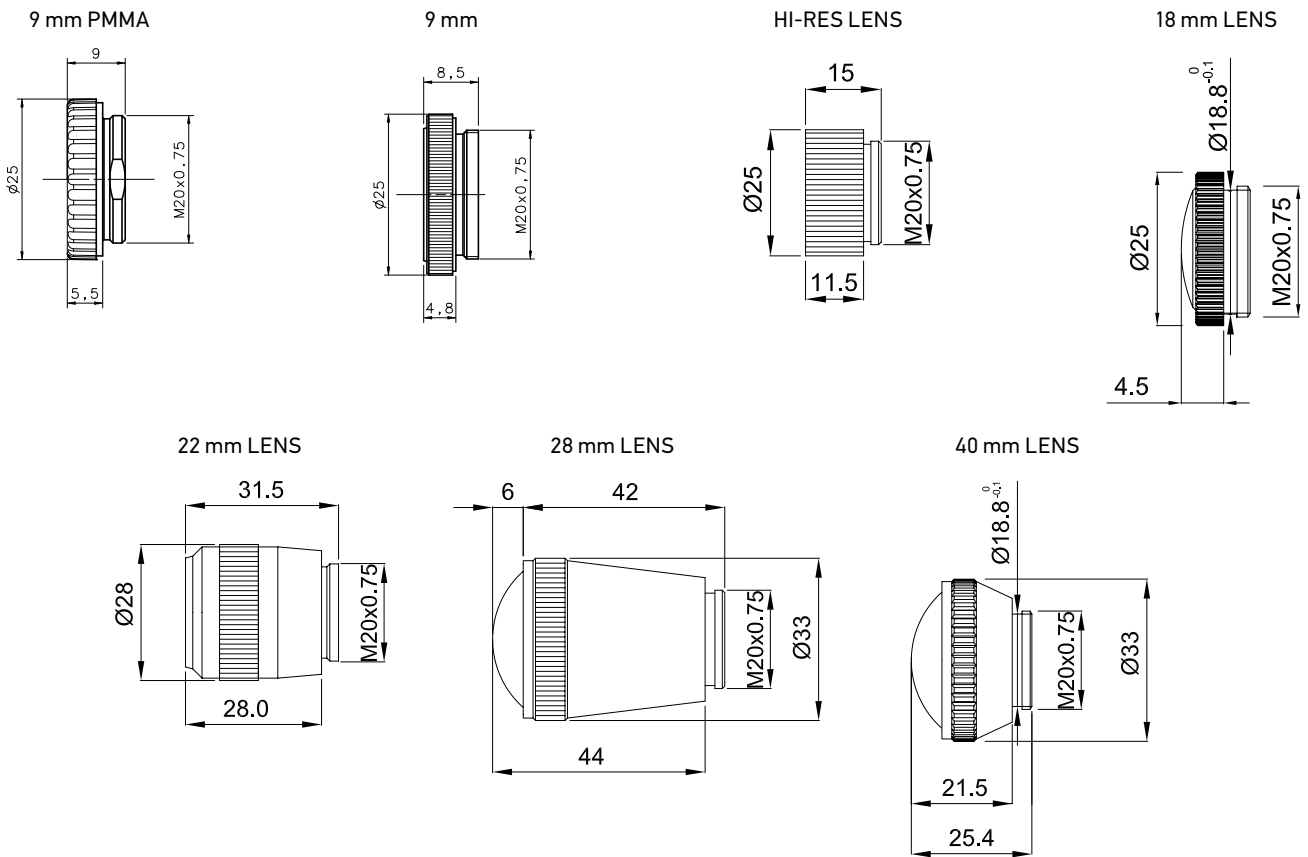
Horizontal spot is present in the TL46 models with final '-L' suffix

## MODEL SELECTION AND ORDER INFORMATION

OPTIC FUNCTION	SETTING & INDICATORS	OUTPUT	EMISSION	MODEL	ORDER No.		
Contrast sensor	Trimmer 2 LEDs	PNP	WHITE vertical spot	TL46-A-415	954601070		
		NPN	WHITE vertical spot	TL46-A-425	954601080		
		PNP	RED vertical spot	TL46-A-615	954601090		
		NPN	RED vertical spot	TL46-A-625	954601100		
	Push-buttons 2 LEDs	PNP/NPN		R.G.B. vertical spot	TL46-W-815	954601000	
				R.G.B. horizontal spot	TL46-W-815L	954601010	
				R.G.B. vertical spot	TL46-W-815G*	954601060	
		IO-Link PP/PNP/NPN		R.G.B. vertical spot	TL46-W-815-PZ	954600005	
			PNP/NPN		R.G.B. vertical spot	TL46-WL-815	954601020
					R.G.B. horizontal spot	TL46-WL-815L	954601030
Push buttons 4 LEDs display	PNP/NPN		R.G.B. vertical spot	TL46-WLF-815	954601040		
			R.G.B. horizontal spot	TL46-WLF-815L	954601050		
Contrast low jitter sensor	Push buttons 4 LEDs display	PNP		R.G.B. vertical spot	TL46-WJ-815	954601110	
				R.G.B. horizontal spot	TL46-WJ-815L	954601120	
Color contrast sensor	Push buttons 4 LEDs display	PNP	R.G.B. vertical spot	TL46-WE-815	954601130		
		NPN	R.G.B. vertical spot	TL46-WE-825	954601140		
High Performance Contrast sensor	Push buttons 4 LEDs display	IO-Link PP/PNP/NPN	R.G.B. vertical spot	TL46-WH-815-PZ	954600004		

(\*) Glass lens version of TL46-W model

# ACCESSORIES



MODEL	DESCRIPTION	ORDER No.
Lens No.9	glass lens with 9 mm focus	95ACC2670
Lens No.9 PMMA	plastic lens with 9 mm focus	95ACC2540
Lens Hi-Res	additional focussing glass lens with 9 mm focus (*)	95ACC1050
Lens No.18	glass lens with 18 mm focus	95ACC2680
Lens No.22	glass lens with 22 mm focus	95ACC1100
Lens No.28	glass lens with 28 mm focus	890000194
Lens No.40	glass lens with 40 mm focus	95ACC2740

\* focussing lens to screw between the sensor and the normal 9 mm lens

# CABLES

TYPE	DESCRIPTION	LENGTH	MODEL	ORDER No.
Axial M12 Connector	5-pole, grey, P.V.C.	3 m	CS-A1-03-G-03	95ACC2110
		5 m	CS-A1-03-G-05	95ACC2120
		10 m	CS-A1-03-G-10	95ACC2140
	5-pole, U.L., black, P.V.C	3 m	CS-A1-03-U-03	95ASE1170
		5 m	CS-A1-03-U-05	95ASE1180
		10 m	CS-A1-03-U-10	95ASE1190
		15 m	CS-A1-03-U-15	95ASE1200
		25 m	CS-A1-03-U-25	95ASE1210
		50 m	CS-A1-03-U-50	95A252700

## DATALOGIC PRODUCT OFFERING



DS-TL46-EN Rev A 20201027