



TL46

High performance contrast sensor for colored registration mark detection

- Fastest and accurate low jitter model (TL46-WJ)
- Color mode enhanced model (TL46-WE)
- Wide-spectrum RGB or white LED emission
- 5 different models: basic, standard, enhanced, low jitter, color mode
- Automatic, manual and dynamic settings
- 10,15, 20, 30 or 50 kHz switching frequencies
- Very low jitter down to 7µs (TL46-WJ...)
- NPN/PNP and analog outputs
- Standard mounting, M12 connector rotatable to 5 positions



SENSORS

APPLICATIONS

- Packaging and labeling machinery
- Beverage/Food/Cosmetic/Pharmaceutical industries
- Printing machinery
- Flexographic printing machinery

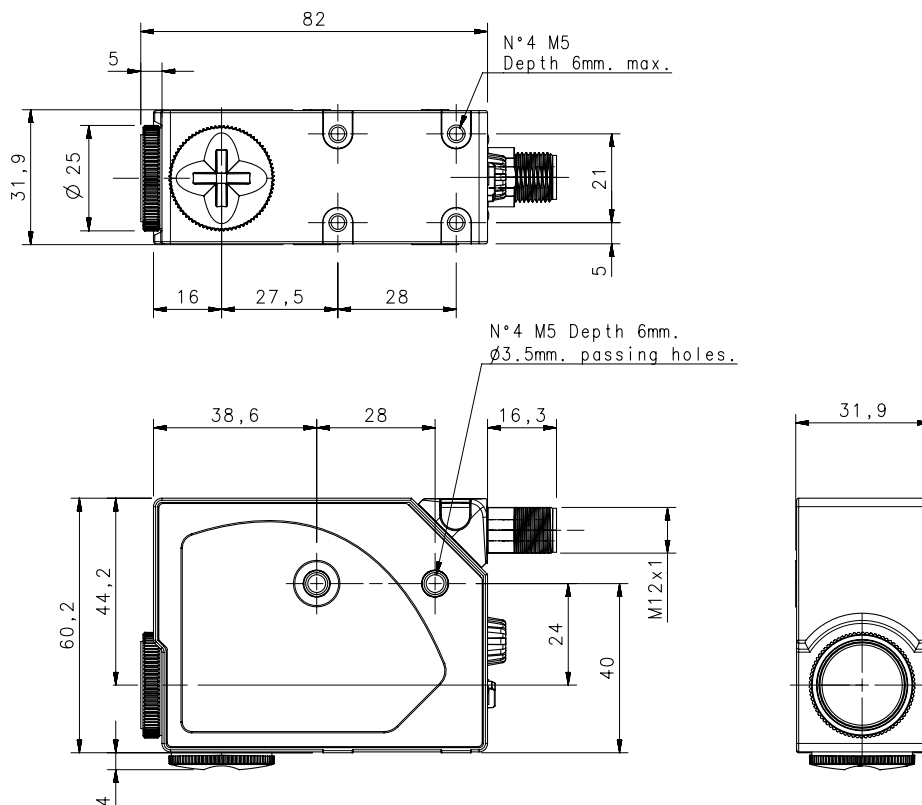


(*) ATEX II 3DG

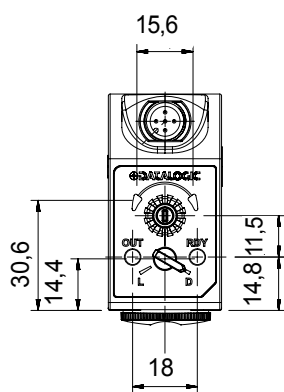
TL46		
Contrast sensor		9 ±3 mm 18 mm (Lens No.18 glass) 22 mm (Lens No.22 glass) 28 mm (Lens No.28 glass) 40 mm (Lens No.40 glass)
Switching frequency		10 kHz (mod. TL46-WE color mode) 15 kHz (mod. TL46-W) 20 kHz (mod. TL46-A/WL) 30 kHz (mod. TL46-WLF/WE contrast mode) 50 kHz (mod. TL46-WJ) < 7µs (mod. TL46-WJ)
Jitter		16µs (mod. TL46-WLF/WE contrast mode) >25µs (mod. TL46-W/WL)
Light emission		RGB LED white LED Red LED
Setting		push buttons trimmer
Power supply	Vdc	10...30 V
	Vac/dc	
Output	PNP	▪
	NPN	▪
	NPN/PNP	▪
	relay	
	other	0...5 V Analog Output
Connection	cable	
	connector	▪
	pig-tail	
Approximate dimensions (mm)		31x81x58
Housing material		Aluminium
Mechanical protection		IP67

TECHNICAL DATA	
Power supply	10 ... 30 Vdc (limit values)
Ripple	2 Vpp max.
Consumption (output current excluded)	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 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)
Light emission	white LED 400-700 nm (mod. TL46-A-4xx) red LED 630 nm (mod. TL46-A-6xx) blu LED 465nm/green LED 520 nm/red LED 630 nm (mod. TL46-W/WL/WLF/WE/WJ)
Detection Distance	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)
Minimum spot dimension	1,5 x 5 mm 0,8x4mm (TL46-WJ)
Depth of field	± 3 mm
Response time	100 µs (mod. TL46-WE color mode) 33 µs (mod. TL46-W) 25 µs (mod. TL46-A/WL) 16 µs (mod. TL46-WLF/WE contrast mode) 10 µs (mod. TL46-WJ)
Switching frequency	10 kHz (mod. TL46-WE 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)
Jitter	< 7µs (TL46-WJ) 16µs (TL46-WLF/WE contrast mode) >25µs (TL46-W/WL)
Setting	SET push-buttons (mod. TL46-W/WL/WLF/WE) sensivity trimmer (mod. TL46-A)
Operating mode	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)
Indicators	yellow OUTPUT LED green READY LED, orange DELAY LED and KEYLOCK (Mod TL46-W/WJ) green READY LED, 4-digit display/DELAY LED/KEYLOCK LED (mod. TL46-WLF/WE) orange ARROWS (mod. TL46-A), DELAY LED and KEYLOCK LED 5-segment bargraph (mod. TL46-WL)
Dark/light selection	Switch Automatic Automatic/manual; remote/dynamic
Delay	0...20ms selectable via delay input 0...100ms programmed
Auxiliary function	Keylock (not available on TL46-WE) Fine Hysteresis regulation (TL46-WL/WLF/WE)
Output	PNP (mod. TL46-WJ); PNP or NPN; PNP/NPN (mod. TL46-W/WL/WLF/WE by part number); analog output (mod. TL46-A/W/WL)
Output current	100mA
Saturaton Voltage	=<2V
Analogue Out	0,5...5,5V ±10%; 2V on white target 90% 1...3V ±10%(white 90%); 5,5V max
Analogue out impedance	2,2 kΩ (short circuit protection)
Connection	M12 5-pole connector
Dielectric strength	500 Vac, 1 min between electronics and housing
Insulating resistance	>20 MΩ, 500 Vdc between electronics and housing
Electrical protection	class 2, double insulation
Protection device	Reverse polarity protection, overload and short circuit protection
Mechanical protection	IP67
Ambient light rejection	according to EN 60947-5-2
Vibrations	0,5 mm amplitude, 10 ... 55 Hz frequency, for every axis (EN60068-2-6)
Shock resistance	11 ms (30 G) 6 shock for every axis (EN60068-2-27)
Housing material	aluminium
Lens material	mirror (mod. TL46-A), glass (mod. TL46-W/WL/WLF/WJ/WE)
Operating temperature	-10 ... 55 °C
Storage temperature	'-20 ... 70 °C
Weight	170 g max.

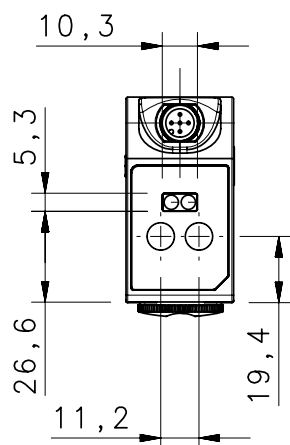
DIMENSIONS



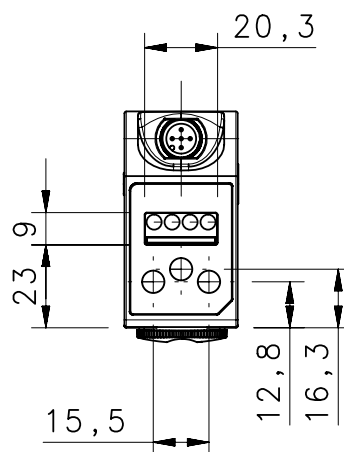
TL46-A



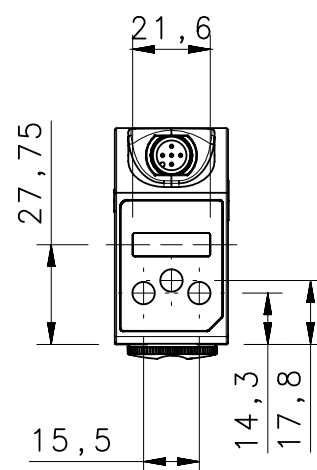
TL46-W/TL46-WJ



TL46-WL



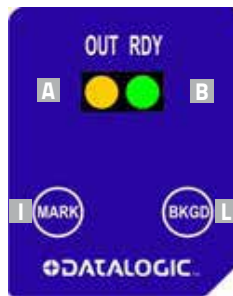
TL46-WLF/WE



INDICATORS AND SETTINGS

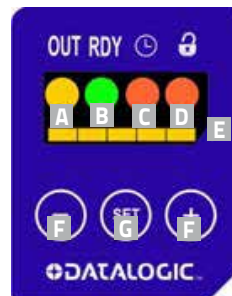


**TL46-A
TRIMMER**



**TL46-W
BASE**

**TL46-WJ
LOW JITTER**



**TL46-WL
STANDARD**



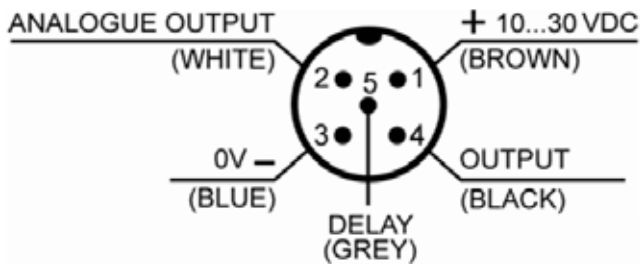
**TL46-WLF
ENHANCED**

**TL46-WE
COLOR ENHANCED**

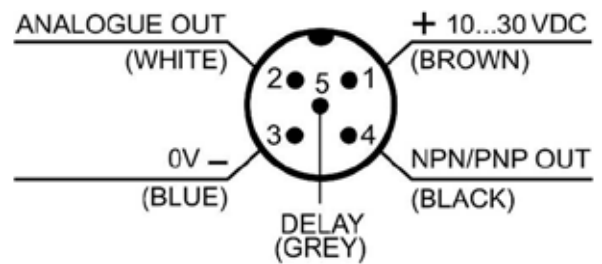
- A** yellow OUTPUT LED
- B** green READY LED
- C** orange DELAY LED
- E** orange KEYLOCK LED
- D** Bargraph
- F** +/- push-buttons
- G** SET push-button
- H** Display
- I** MARK push-button
- L** BKGD push-button
- M** Light/Dark Switch
- N** Orange Indicators Arrows
- O** Sensitivity Adjustment Knob

CONNECTIONS

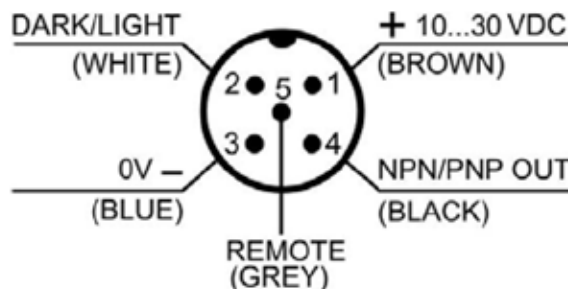
TL46-A



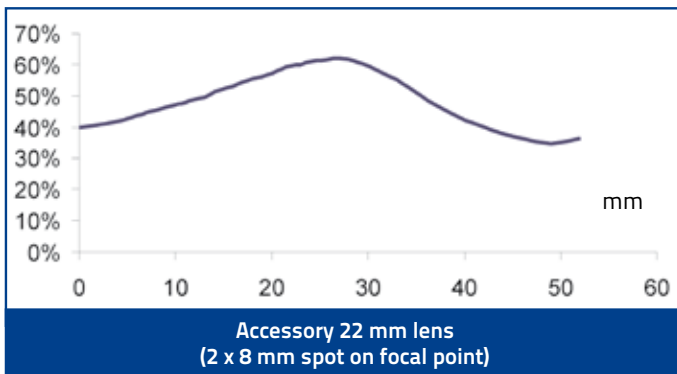
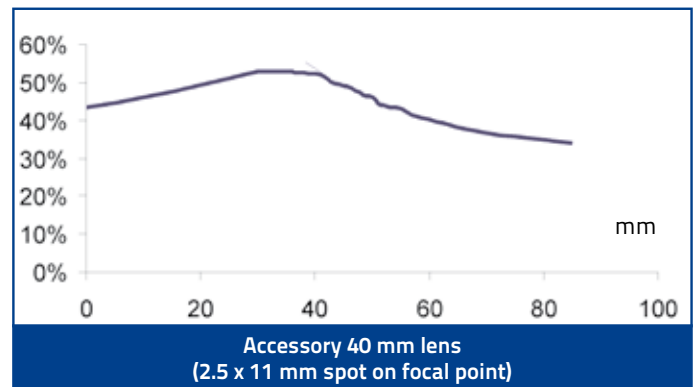
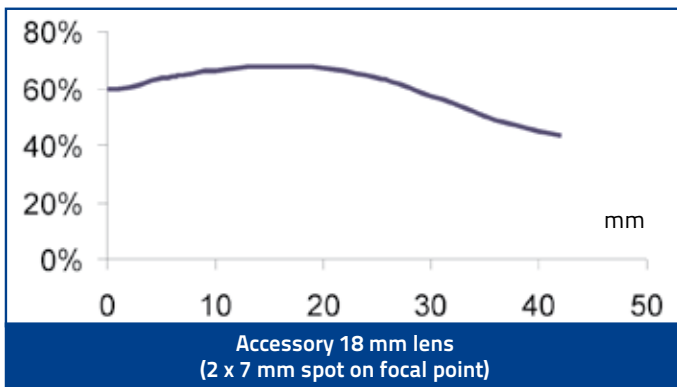
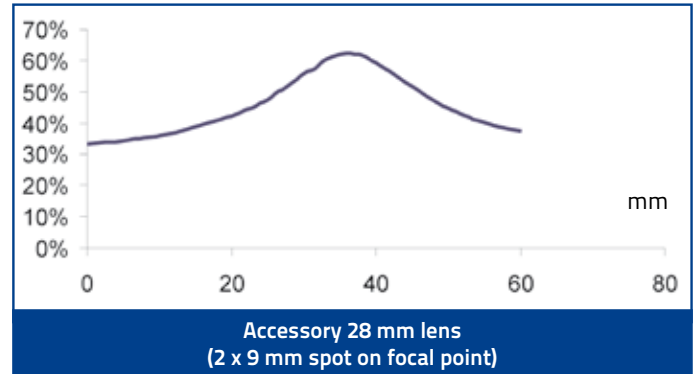
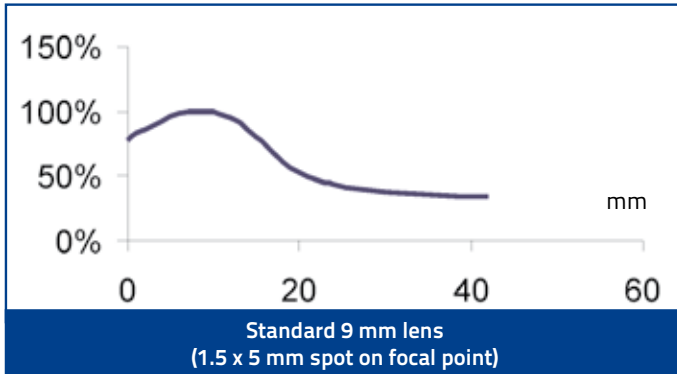
TL46-W/WL



TL46-WLF/WE/WJ



READING DIAGRAMS



VERTICAL SPOT HORIZONTAL SPOT

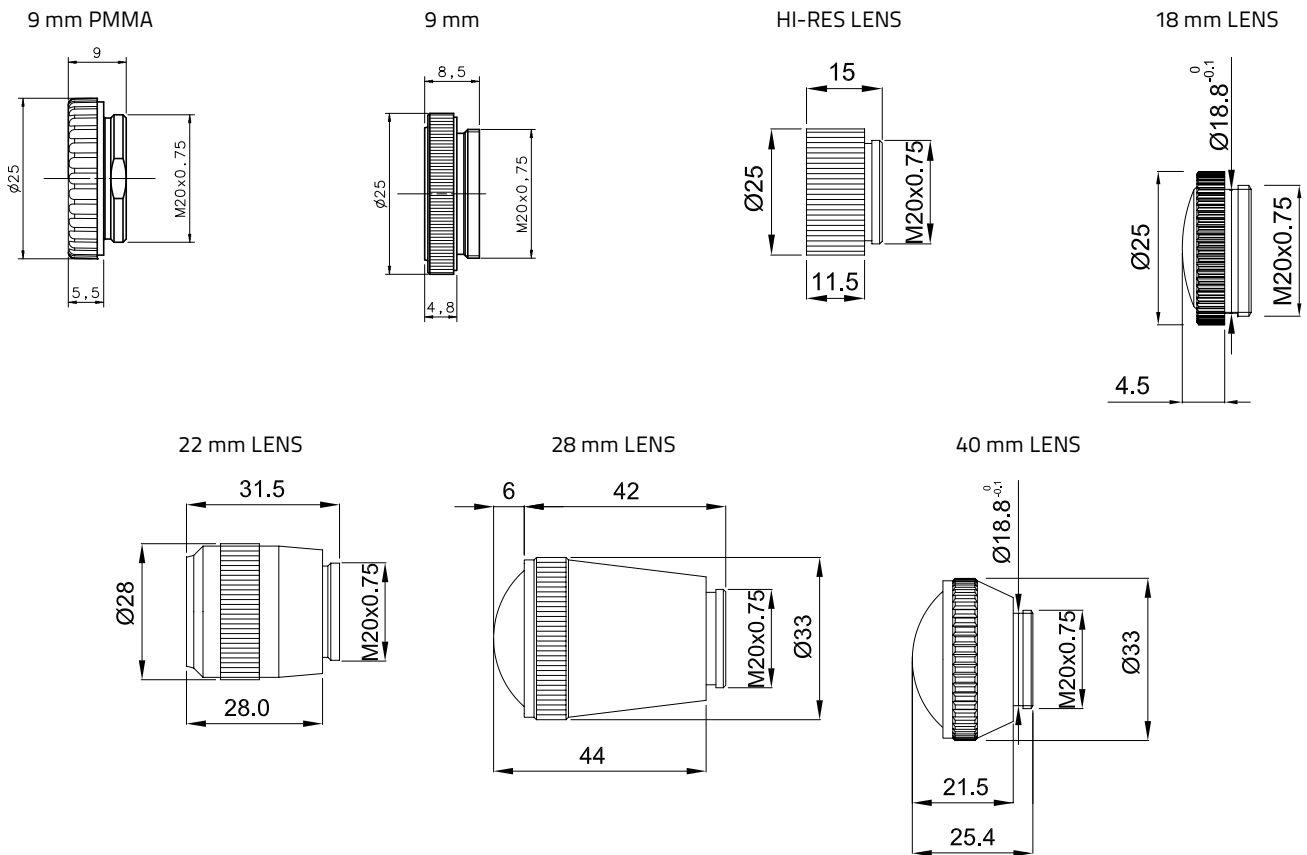


Horizontal spot is present in the TL46 models with final '-L' suffix

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
		Push buttons 4 LEDs bargraph	R.G.B. vertical spot	TL46-WL-815	954601020
			R.G.B. horizontal spot	TL46-WL-815L	954601030
			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		NPN	R.G.B. vertical spot	TL46-WE-815	954601130
			R.G.B. vertical spot	TL46-WE-825	954601140

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