TL46-WE…PNP

INSTRUCTION MANUAL

CONTROLS



OUT LED (yellow)
The yellow LED indicates the output status.

DISPLAY (green 4-digit display)
In MARK mode the display indicates a value relative to the light quantity diffused by the target, in color mode on the display 'Colr' text is written.

READY LED (RDY)
The green READY LED ON indicates a normal operating condition where the received signal has a safety margin respect to the output switching value: stability condition.

DELAY LED
The green DELAY LED ON indicates the timing activation on the digital output.

KEYLOCK LED
The green KEYLOCK LED ON isn't active.

SET, + and − PUSH-BUTTONS
See the "SETTING" paragraph for the correct adjustment phase indications.

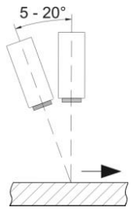
INSTALLATION

The sensor can be positioned by means of the two Ø3.5mm housing's holes or using threaded M5 holes with 6mm max. depth.
Warning: the use of excessively long screws can damage the product.

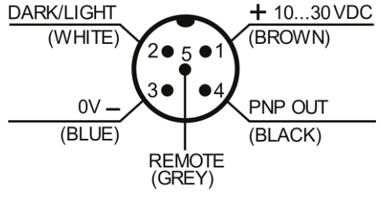
The connector can be oriented at five different positions by rotating the block. The position chosen is guaranteed by a mechanical blocking system.
The rotation can be carried out even after sensor installation as the connector block is completely self-contained inside the housing.



The operating distance is measured starting from the lens front face.
The reading direction can be changed inverting the cap and lens.
Mark detection on a reflective surface is improved adjusting the beam direction to 5° … 20° from surface axis.



CONNECTIONS



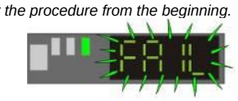
SETTING IN MARK MODE

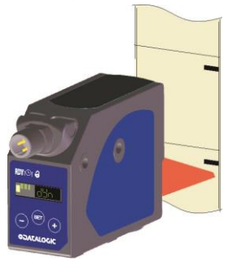
DETECTION (MARK-BACKGROUND)

- *Position mark in front of the sensor light spot and press the SET push-button until the 'SEt1' text appears.*
  The sensor detects the mark alternating the red, green and blue emissions.
  Avoid mark movements until the 'SEt2' text appears and the OUT LED blinking.
- *Position the background in front of the sensor light spot and press the SET push-button again. The sensor detects the background and automatically selects the best emission to detect the contrast.*
  Avoid background movements during this phase.
  The DARK/LIGHT operating mode is automatically selected by the sensor.
  Dark mark - light background → dark mode; light mark - dark background → light mode.



If the detection has been successful, the sensor returns to normal functioning. If it fails due to insufficient contrast, the 'FAIL' test blinks on the display. Press the SET push-button and the sensor returns to the previous setting.
Repeat the procedure from the beginning.





DYNAMIC SETTING

Use the dynamic setting to detect moving target. The sensor sets automatically the threshold value during target movement. The DARK/LIGHT mode must be set first. To select the light mode connect the DARK/LIGHT signal (white wire) to 0V or leave unconnected. To select the dark mode connect the DARK/LIGHT signal to the power supply.

- *Position the sensor spot in front of the target to detect. Press SET until the 'dYn' text blinks (4sec) and keep it pressed. The sensor detects the mark and automatically selects the best emission to detect the contrast.*
- *To end the dynamic detection procedure release the SET push-button.*



If the detection has been successful, the sensor returns to normal functioning. If it fails due to insufficient contrast, the 'Lo' text blinks on the display.

Press the SET push-button to repeat procedure until releasing the button (the 'dYn' text blinks on the display). The sensor returns to the previous setting by pressing + or −.



SWITCHING THRESHOLD SETTING

The sensor switching threshold can be adjusted as follows.
The 'AdJ' text appears pressing + on the display. Releasing the push-button, the threshold value blinks.



The switching threshold is increased or reduced by pressing + or −.
Press SET to save the new threshold value.

SETTING IN COLOR MODE

COLOR DETECTION

Position the color in front of the sensor light spot and press the SET push-button until the 'SEtc' text appears.
The sensor detects the color.
Avoid color movements until the 'SEtc' text disappears.



If the detection has been successful, the sensor returns to normal functioning. If it fails due to insufficient intensity, the 'FAIL' test blinks on the display. Press the SET push-button and the sensor returns to the previous setting.
Repeat the procedure from the beginning.



SWITCHING TOLERANCE SETTING

The sensor tolerance can be adjusted as follows.
The 'Tolx' text appears pressing + on the display. Releasing the push-button.



The tolerance level increases from "toL0" to "toL9". To detect small chromatic differences, select lower tolerance levels.

The Tolerance value is increased or reduced by pressing + or −.
Press SET to save the new Tolerance value.

SETTING IN ALL MODES

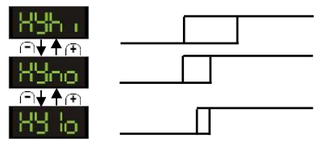
HYSTERESIS SETTING

The sensor hysteresis level is adjusted.
The 'HYSt' text appears pressing green − on the display.



When the push-button is released, the previously set value blinks.

HIGH HYSTERESIS
NORMAL HYSTERESIS
LOW HYSTERESIS



The level switches by pressing + or −.
Press SET to save the new hysteresis value.

OUTPUT OVERLOAD

The overload of the digital output is signalled by the '_SC_' text on the display. The sensor returns to normal operation when the overload condition disappears.

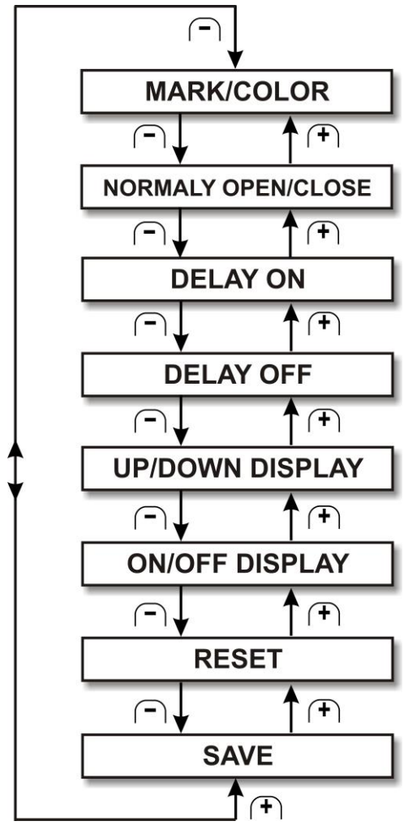


PARAMETER SETTING

Some parameters can be changed entering the menu: MARK/COLOR mode, NORMALLY OPEN/CLOSE, DELAY ON, DELAY OFF, display orientation and powering on/off, RESET and save setting.
Press + and − together until the 'Menu' text appears.



Releasing the push-button, the first Mark/Colr parameter appears.
The parameter list is shown by pressing + and −:



MARK/COLOR setting

The sensor can be configured in MARK or COLOR mode.
Select 'Mark' or 'Colr' in the parameter menu to switch the mode.



The previously set mode switches by pressing SET.

NORMALLY OPEN/CLOSE setting (only in COLOR mode)

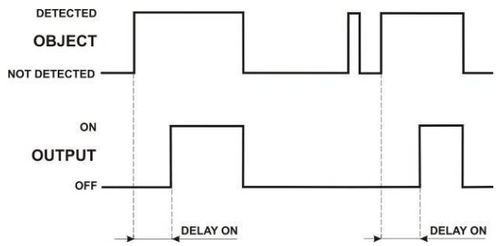
The output in color mode can be configured as normally open or normally close.
Select 'OPEn' or 'CIOS' in the parameter menu to switch the output.



The previously set output switches by pressing SET.

DELAY ON setting

The DELAY ON represents the output delay activation after the reference mark has entered the detection area. The delay avoids the detection of events that occur rapidly. An example can be a mark with shaded colours (light-dark-light) that can be detected twice.



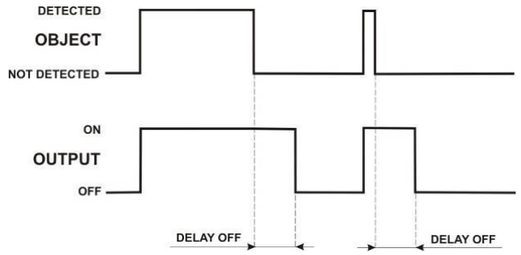
Select “dLOn” in the parameter menu to set the DELAY ON function.
The parameter programming is accessed by pressing (SET).
The previously set delay value appears on the display.



Pressing (+) or (−) the delay value is increased or decreased by one step of 1 ms until a maximum delay of 100ms. Keeping (+) or (−) pressed, the delay value is increased or decreased by incremental steps. The setting of a delay different from zero is signalled by the DELAY LED on. Press (SET) to confirm the value and return to the parameter menu.

DELAY OFF setting

The DELAY OFF represents the output delay deactivation after the reference target has left the detection area.
The delay extends the output activation allowing slower system interfacing with sensors to detect shorter pulses.



Select “dLOF” from the parameter menu to set DELAY OFF function.
The parameter programming is accessed by pressing (SET).
The previously set delay value appears on the display.



Pressing (+) or (−) the delay value is increased or decreased by one step of 1 ms until a maximum delay of 100ms. Keeping (+) or (−) pressed, the delay value is increased or decreased by incremental steps. The setting of a delay different from zero is signalled by the DELAY LED on. Press (SET) to confirm the value and return to the parameter menu.

UP/DOWN DISPLAY setting

The selection of the UP/DOWN display sets the reading direction on the display.
Select “dSUP” or “dSdn” in the parameter menu to set the UP or DOWN direction.



Press (SET) to switch the reading direction previously set.

ON/OFF DISPLAY setting

Turn off the display during normal operation to save power consumption.
Setting the OFF mode when the sensor is normally functioning, the display turns OFF. It turns on for 5s after a keyboard command. Select “dSOn” or “dSOF” in the parameter menu to set the display ON or OFF.



Press (SET) to switch the display mode previously set.

RESET of default parameters

Select “rSEt” in the parameter menu to reset the default parameters.



The “rSEt” text blinks when pressing (SET).
Releasing the push-button the sensor returns to normal functioning.
The default reset parameters are:

PARAMETER	DISPLAY	DESCRIPTION
Emission	_____	Green
MODE	_____	MARK
DARK/LIGHT mode	_____	Light
Threshold	2050	2050
Hysteresis	HYno	Medium (Normal)
Delay ON and OFF	d 0	Deactivated
Display	dSOn / dSUP	Display UP ON

NOTE: if the parameters are reset before turning the sensor off, when repowered the “rSEt” text blinks on the display for 3s before returning to normal visualisation.

Saving parameter set - “SAVE”

Select “SAVE” to save the parameter setting



The parameters are saved pressing (SET) . The display returns to normal visualisation after releasing the button.

NOTE: Set the data, the operator exits from the menu using the “SAVE” or “RESET” function. If these operations are not carried out 30s after the last setting, the sensor returns to normal mode saving the parameters changed.

ACCESSORY FUNCTIONS

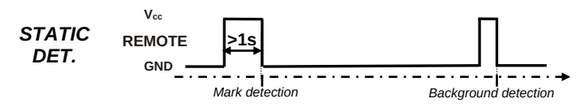
REMOTE INPUT

The REMOTE signals carries out the acquisition functions without using the (SET) push-button. The REMOTE wire connected to +Vdc is equal to pressing the (SET) push-button. Whereas, if the REMOTE wire is connected to GND or not connected, it is equal to not pressing the (SET) push-button.

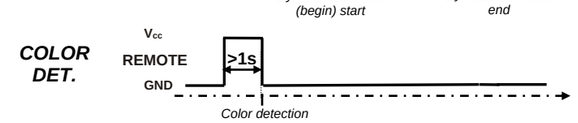
REMOTE	*(SET) PUSH-BUTTON*
0V	NOT PRESSED
+Vdc	PRESSED

- *The duration of the REMOTE wire connection to +Vdc determines the acquisition type:*

MARK MODE



COLOR MODE

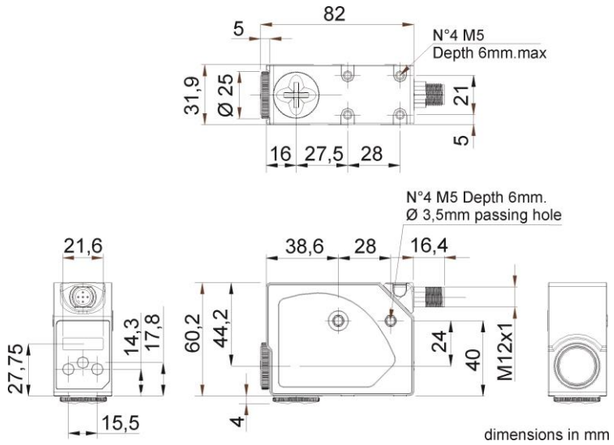


DARK/LIGHT input (only in MARK mode)

The DARK/LIGHT signal allows the operator to select the DARK/LIGHT operating mode for dynamic detection.
In the LIGHT mode, the output is active with light marks on dark backgrounds.
In the DARK mode, the output is active with dark marks on light backgrounds.
The connection of the DARK/LIGHT wire to Vdc sets the DARK mode.
If connected to 0V or not connected set the LIGHT mode.

DARK/LIGHT	*MODE*
0V	LIGHT
+VDC	DARK

DIMENSIONS



dimensions in mm

TECHNICAL DATA

Power supply:	10…30 Vdc limit values
Ripple:	2 Vpp max.
Current consumption (output current excluded):	35 mA max. @ 24 Vdc
Output:	PNP output 30 Vdc max. (short-circuit protection)
Output current:	100 mA max.
Output saturation voltage:	≤ 2 V
Response time:	16 μs (MARK mode), 100us (COLOR mode)
Switching frequency:	30 kHz (MARK mode), 10KHz (COLOR mode)
Indicators:	4-digit display (GREEN) / OUT LED (YELLOW) / READY LED (GREEN) / DELAY LED (GREEN)
Push-buttons:	push-buttons : -, SET, +
Delay	0…100 ms programmed default configuration without delay
Dark/light selection:	Automatic in the target/background detection selectable via wire in the dynamic detection, selectable via MENU in the color detection
Operating temperature:	-10 … 55 °C
Storage temperature:	-20 … 70 °C
Electric shock protection:	double insulation ⧈
Operating distance:	9 mm
Depth of field:	± 3 mm
Minimum spot dimension:	1.5x5 mm
Emission type:	blue (465 nm) / green (520 nm) / red (630 nm) in MARK mode the selection is automatic
Ambient light rejection:	according to EN 60947-5-2
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for each axis (EN60068-2-6)
Shock resistance:	11 ms (30 G) 6 shocks for each axis (EN60068-2-27)
Housing material:	Aluminium
Lens material:	Glass (*)
Mechanical protection:	IP67
Connections:	M12 5-pole connector
Weight:	170 g. max.
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C

(*) It’s available on request, PMMA plastic lens with 9mm focus.

The sensors are NOT safety devices, therefore they MUST NOT be used in the safety control of the machines where installed.

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Helpful links at www.datalogic.com: **Contact Us, Terms and Conditions, Support**.

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