

KRTM 3B / KRTM 55 with IO-Link V1.1

Multicolor contrast sensor

en 01-2017/01 50135924



13.0mm
14.5mm



- RGB transmitter
- Various teach variants
- Short response time
- Switching threshold adjustment via EasyTune
- Level adaptation for glossy objects
- Keyboard lockout
- Pulse stretching 20ms
- IO-Link V1.1 with additional switching output (Dual Channel)

We reserve the right to make changes • DS_KRTM3B55_IOLink_en_50135924.fm

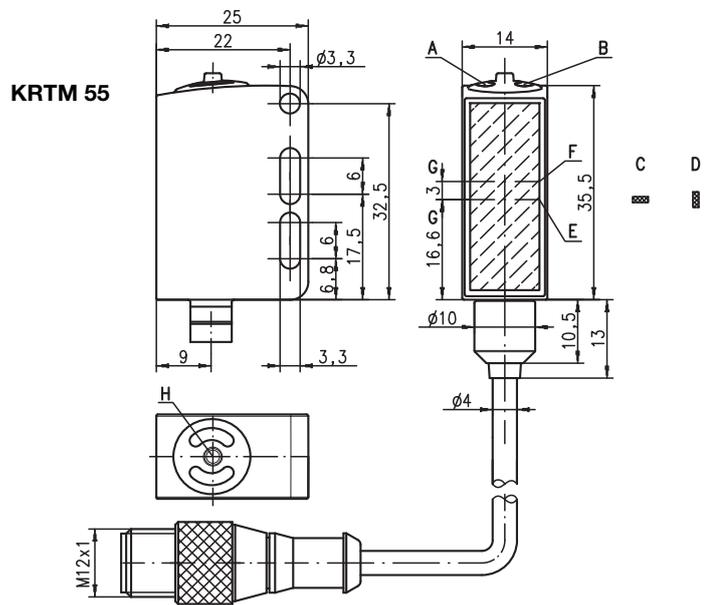
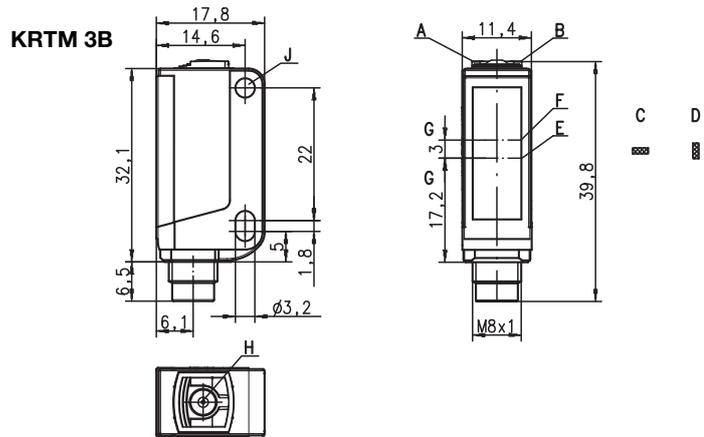


Accessories:

(available separately)

- Mounting systems (BT 3...)
- Cables with M8 or M12 connector (K-D ...)

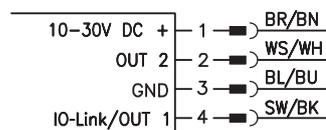
Dimensioned drawing



- A Green indicator diode
- B Yellow indicator diode
- C Light spot orientation horizontal
- D Light spot orientation vertical
- E Transmitter
- F Receiver
- G Optical axis
- H Teach button
- J Mounting sleeve

Electrical connection

Connector, 4-pin



About this document



NOTE

This document supplements the device-specific data sheets for the **KRTM 3B** and **KRTM 55** contrast sensors with information and details on the IO-Link interface.

Type overview of KRTM contrast sensors with IO-Link

With one switching output and IO-Link

Features	Order code	Part no.
Push-pull output, M8 connector, static 2-point teach	KRTM 3B/L6.1121-S8	50135163
Push-pull output, 200 mm cable with M12 connector, static 2-point teach	KRTM 55/L6.1121,200-S12	50135164

IO-Link interface

The devices have a dual-channel architecture.

The IO-Link interface in accordance with specification 1.1.1 (October 2011) is provided on pin 4 (OUT 1). This allows the devices to be configured quickly and easily and, therefore, cost-effectively.

Furthermore, the sensor transmits its process data and makes diagnostic information available through it.

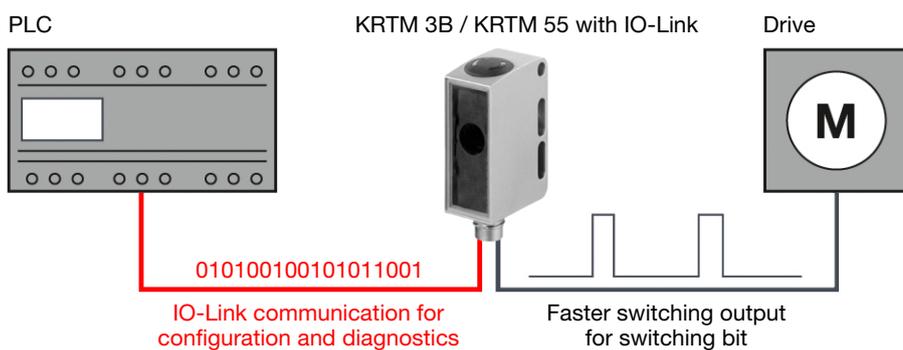
Parallel to the IO-Link communication, the sensor can output the continuous switching signal for object detection on OUT 2. The IO-Link communication does not interrupt this signal.



NOTE

In **Leuze Sensor Studio**, the following applies with regard to the designations: **Q1 = OUT 1**, **Q2 = OUT 2**.

Dual-channel operation



For diagnostics and recipe changes/format changeover (configuration of the machine in production operation), it is necessary to exchange diagnostic and configuration data with the sensor, e.g., via the IO-Link interface. For applications with high real-time requirements, it is, however, advantageous to make the fast switching output of the sensor available separately from the IO-Link communication interface for the further processing.

Notes

UL REQUIREMENTS

Enclosure Type Rating: Type 1
For Use in NFPA 79 Applications only.

Adapters providing field wiring means are available from the manufacturer. Refer to manufacturers information.

CAUTION – the use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

ATTENTION ! Si d'autres dispositifs d'alignement que ceux préconisés ici sont utilisés ou s'il est procédé autrement qu'indiqué, cela peut entraîner une exposition à des rayonnements et un danger pour les personnes.

Observe intended use!

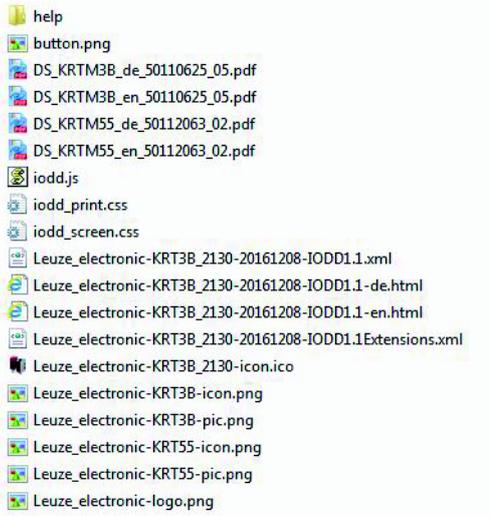
- ☞ This product is not a safety sensor and is not intended as personnel protection.
- ☞ The product may only be put into operation by competent persons.
- ☞ Only use the product in accordance with its intended use.

KRTM 3B / KRTM 55 with IO-Link V1.1

Multicolor contrast sensor

Device-specific IODD

At www.leuze.com in the download area for IO-Link sensors you will find the IODD zip file with all data required for the installation.



IO-Link parameter documentation

A complete description of the IO-Link parameters is given in the *.html files. Please double-click one of the two language variants: *IODD*-de.html for German or *IODD*-en.html for English.

Functions configurable via IO-Link

PC configuration and visualization is performed comfortably with the USB-IO-Link Master SET MD12-US2-IL1.1... (part no. 50121098) and the **Leuze Sensor Studio** visualization software (in the download area of the sensor at www.leuze.com).

IO-Link process data

The sensor transmits 2 bytes to the master.

Data bit																Assignment	Default settings
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
																Switching output	0 = no mark, 1 = mark detected
																Not used	Free
																Sensor operation	0 = off, 1 = on
																Switching threshold LSB	Value range 0 ... 31 (0 ... 100% in approx. 3% steps) 0% = min. switching threshold 100% = max. switching threshold
																Switching threshold	
																Switching threshold	
																Switching threshold MSB	
																Active transmitter LSB	00 = red, 01 = green or white,
																Active transmitter MSB	10 = blue, 11 = all colors on (teach-in active)
																Not used	Free
																Measurement value LSB	Value range 0 ... 31 (0 ... 100% in approx. 3% steps) 0% = min. signal level 100% = max. signal level
																Measurement value	
																Measurement value	
																Measurement value MSB	

Leuze Sensor Studio

IDENTIFICATION tab



KRTM 3B/L6.1121-S8
contrast scanner



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IDENTIFICATION
CONFIGURATION
PROCESS
DIAGNOSIS

IDENTIFICATION

- Identification
- Device Version
- IO-Link
- Tool Info
- Datasheet
- KRTM 3B
- KRTM 55

IDENTIFICATION

APPLICATION SPECIFIC TAG

Application Specific Tag

VENDOR INFORMATION

Vendor Name

Vendor Text

DEVICE INFORMATION

Product Name

Product ID

Product Text

IDENTIFICATION		 Notes
Identification	Information on the manufacturer and on the device designation	
Device version	Information on the serial number and versions	
IO-Link	Information about IO-Link	
Operating information	Information on operating the Leuze Sensor Studio configuration software	
Data sheets	Current data sheets for the KRTM 3B and KRTM 55 contrast sensors	

CONFIGURATION tab



KRTM 3B/L6.1121-S8
contrast scanner



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IDENTIFICATION
CONFIGURATION
PROCESS
DIAGNOSIS

CONFIGURATION

- General
- Switching Output
- Teach
- Teach Button
- Working Parameter
- Working Parameter Memory

GENERAL

LOCK EASYTUNE

EasyTune lock state on

LOCK BUTTON

teach button lock state on

RESET COMMANDS

Standard Command

CONFIGURATION		 Notes
General	LOCK EASYTUNE	The easy tune function is active if the check mark is set. Default: OFF
	KEY LOCK	The key on the device is locked if the check mark is set. Default: OFF
	RESET COMMAND	Resets all settings to factory settings.

KRTM 3B / KRTM 55 with IO-Link V1.1

Multicolor contrast sensor



KRTM 3B/L6.1121-S8
contrast scanner

IDENTIFICATION **CONFIGURATION** PROCESS DIAGNOSIS

CONFIGURATION

- General
- Switching Output**
- Teach
- Teach Button
- Working Parameter
- Working Parameter Memory

SWITCHING OUTPUT

SWITCHING OUTPUT 1 FUNCTION

switching output 1 function

true on mark
 true on background

SWITCHING OUTPUT 2 FUNCTION

switching output 2 function

inverted switching output 1
 equal switching output 1

TIME MODULE

timer unit

function of timer unit

on
 on delay
 off delay
 pulse stretching
 pulse suppression

time 20.0 ms

CONFIGURATION		 Notes
Switching output	FUNCTION SWITCHING OUTPUT 1	Depending on the selection, switching output 1 (OUT 1; pin 4; SW/BK) switches either on the mark or the background Default: Active on mark
	FUNCTION SWITCHING OUTPUT 2	Depending on the selection, switching output 2 (OUT 2; pin 2, WS/WH) switches either inversely to switching output 1 or identically to switching output 1. Default: Inversion of switching output 1
	TIME MODULE	One of four possible time functions is active if the check mark is set. The desired time is entered directly in milliseconds. Default: OFF Time: 20.0ms

KRTM 3B / KRTM 55 with IO-Link V1.1



KRTM 3B/L6.1121-S8
contrast scanner

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IDENTIFICATION CONFIGURATION PROCESS DIAGNOSIS

CONFIGURATION

- General
- Switching Output
- Teach
- Teach Button
- Working Parameter
- Working Parameter Memory

TEACH

COLORS AT TEACH
colors at teach: all

TEACH SENSIVITY
position of switching threshold, 2-point teach, IO-Link: very close to the mark = 6%

STATIC 2-POINT TEACH
Standard Command: static 2-point teach start with background

DYNAMIC 2-POINT TEACH
Standard Command: dynamic 2-point teach start with background

COMPLETE 2-POINT TEACH
Standard Command: finalize 2-point teach

SHIFT SENSIVITY WITH EASYTUNE
Standard Command: sensivity increase by one step
Standard Command: sensivity decrease by one step

CONFIGURATION			Notes
Teach	ALLOWED COLORS DURING TEACH	With this setting, you can define the possible transmitter colors that the contrast sensor uses during teaching. Default: all (colors)	
	TEACH SENSIVITY	Determines the position of the switching threshold during 2-point teach via IO-Link. Does not change the position of the switching threshold when teaching via the teach button. Default: 50% (in the middle between mark and background = 50%)	
	STATIC 2-POINT TEACH	Click on this button to start the static 2-point teach.	
	DYNAMIC 2-POINT TEACH	Click on this button to start the dynamic 2-point teach.	
	END 2-POINT TEACH	Click on this button to end a given 2-point teach.	
	SET SENSIVITY WITH EASY TUNE	Click on one of the two buttons to perform the desired function once. When the adjustment limits are reached, an error message appears.	



KRTM 3B/L6.1121-S8
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IDENTIFICATION CONFIGURATION PROCESS DIAGNOSIS

CONFIGURATION

- General
- Switching Output
- Teach
- Teach Button
- Working Parameter
- Working Parameter Memory

TEACH BUTTON

TEACH BUTTON SENSIVITY 1
position of switching threshold, 2-point teach, button, sensivity 1: in the middle between the mark and background = 50%

TEACH BUTTON SENSIVITY 2
position of switching threshold, 2-point teach, button, sensivity 2: close to the mark = 12%

TEACH BUTTON FUNCTION

- function teach button level 0: EasyTune sensivity -
- function teach button level 1: EasyTune sensivity +
- function teach button level 2: static 2-point teach - sensivity 1
- function teach button level 3: static 2-point teach - sensivity 2
- function teach button level 4: timer module on / off

CONFIGURATION			 Notes
Teach button	TEACH BUTTON SENSITIVITY 1	Defines the position of the switching threshold on sensitivity level 1 on the teach button (push the button for 2 ... 7s). The setting is stored in the device fail-safe. Default: 50% (in the middle between mark and background = 50%)	
	TEACH BUTTON SENSITIVITY 2	Defines the position of the switching threshold on sensitivity level 2 on the teach button (push the button for 7 ... 12s). The setting is stored in the device fail-safe. Default: 12% (near the mark = 12%)	
	FUNCTIONS TEACH-BUTTON	Display of the functions assigned to the teach button. Note: Read access only , no editing functions.	

KRTM 3B / KRTM 55 with IO-Link V1.1

KRTM 3B/L6.1121-S8
contrast scanner

The screenshot shows the configuration interface for the KRTM 3B/L6.1121-S8 contrast scanner. The 'CONFIGURATION' tab is active, and the 'Working Parameter' menu item is selected in the left sidebar. The main area displays the 'WORKING PARAMETER' section, which is divided into three sub-sections: 'MEASURED VALUES', 'VOLATILE WORKING PARAMETER', and 'SAVE AND RESTORE'. The 'MEASURED VALUES' section shows 'number of marks' set to 0 and 'measured value' set to 633 mV. The 'VOLATILE WORKING PARAMETER' section shows various settings like 'active transmitter' (red), 'amplification' (150), 'background value' (61 mV), 'mark value' (2440 mV), 'high switching threshold' (1037 mV), 'low switching threshold' (915 mV), and 'background offset value' (0 mV). The 'SAVE AND RESTORE' section contains two buttons: 'save current working parameter' and 'restore last saved working parameter'.

CONFIGURATION		Note: Click on  to start the cyclical updating of the process data (e.g., measurement values)	 Notes
Working parameters	MEASUREMENT VALUES	Displays the number of marks (= number of detected switching processes -> value can be edited); displays the current analog signal level in mV	
	VOLATILE WORKING PARAMETERS	The displayed parameters correspond to the current device settings and can be edited. The parameters are only stored in the device if the " Save current working parameters " button was clicked.	
	SAVE AND RESTORE	Click on the button to perform the respective described action.	

KRTM 3B/L6.1121-S8
contrast scanner

The screenshot shows the configuration interface for the KRTM 3B/L6.1121-S8 contrast scanner. The 'CONFIGURATION' tab is active, and the 'Working Parameter Memory' menu item is selected in the left sidebar. The main area displays the 'WORKING PARAMETER MEMORY' section, which is titled 'SAVE AND LOAD WORKING PARAMETER'. It features a 'working parameter memory index' dropdown menu set to 0. Below the dropdown are two buttons: 'save current working parameter to memory index' and 'load saved working parameter from memory index'.

CONFIGURATION		 Notes
Working parameters memory	SAVE AND LOAD WORKING PARAMETERS	The function can be used to store working parameters in a defined memory space (enter 0 ... 29). First select the desired memory space and then click on one of the two buttons. The described action is then performed.

KRTM 3B / KRTM 55 with IO-Link V1.1

Multicolor contrast sensor

PROCESS tab

KRTM 3B/L6.1121-S8 contrast scanner

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IDENTIFICATION CONFIGURATION **PROCESS** DIAGNOSIS

PROCESS DATA

OBJECT COUNT	number of marks	0
PROCESS DATA	active transmitter	red
	measurement value	625 mV
	switching threshold	1016 mV
	sensor ready	on
	switching signal	no mark

KRTM 3B/L6.1121-S8 contrast scanner

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IDENTIFICATION CONFIGURATION **PROCESS** DIAGNOSIS

PROCESS DATA

sensor ready

switching signal

measurement value: 625

switching threshold: 1016

DIAGRAM

PROCESS		Note: Click on  to start the cyclical updating of the process data.	 Notes
Process values	MARK COUNTER	Displays the number of marks (= number of detected switching processes -> values can be edited).	
	PROCESS DATA	Displays the respective specified values	
Diagram		Displays the plot of the sensor signal and switching threshold as a function of time. In addition, the state of the switching output is displayed (corresponds to the yellow LED on the device).	

DIAGNOSTICS tab



KRTM 3B/L6.1121-S8
contrast scanner

IDENTIFICATION CONFIGURATION PROCESS **DIAGNOSIS**

DIAGNOSIS

Diagnosis Values

DIAGNOSIS VALUES

MEASURED VALUES

number of marks	0
measured value	623 mV

WORKING PARAMETER

active transmitter	red
amplification	150
background value	61 mV
mark value	2440 mV
high switching threshold	1281 mV
low switching threshold	1159 mV
background offset value	0 mV

TEACH

position of switching threshold, 2-point teach, IO-Link: in the middle between the mark and background - 50%

Standard Command: static 2-point teach start with background

Standard Command: dynamic 2-point teach start with background

Standard Command: finalize 2-point teach

Standard Command: sensivity increase by one step

Standard Command: sensivity decrease by one step

DIAGNOSTICS		Note: Click on  to start the cyclical updating of the diagnostic values.	 Notes
Diagnostic values	MEASUREMENT VALUES	Displays the number of marks (= number of detected switching processes -> values can be edited) and the signal level in the sensor.	
	WORKING PARAMETERS	Displays the specified values -> read access only.	
	TEACH	Corresponds to the settings under CONFIGURATION / Teach	