

# Technical data sheet

## Color sensor

Part no.: 50152607

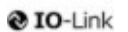
CRT648-150/L44-M12



For illustration purposes only

### Contents

- Technical data
- Dimensioned drawings
- Electrical connection
- Accessories



## Technical data

### Basic data

|             |                             |
|-------------|-----------------------------|
| Series      | 648                         |
| Application | Detection of up to 7 colors |

### Special version

|                 |                              |
|-----------------|------------------------------|
| Special version | RGB color output via IO-Link |
|-----------------|------------------------------|

### Optical data

|                                      |                                      |
|--------------------------------------|--------------------------------------|
| Operating range                      | 20 ... 150 mm                        |
| Beam path                            | Divergent                            |
| Light source                         | LED, White                           |
| LED risk group                       | Group 2 (in accordance with EN62471) |
| Light spot size [at sensor distance] | 8 mm x 8 mm [60 mm]                  |
| Type of light spot geometry          | Rectangular                          |

### Electrical data

|                      |                                                         |
|----------------------|---------------------------------------------------------|
| Protective circuit   | Polarity reversal protection<br>Short circuit protected |
| Output current, max. | 100 mA                                                  |

### Performance data

|                               |                 |
|-------------------------------|-----------------|
| Supply voltage U <sub>B</sub> | 18 ... 30 V, DC |
| Open-circuit current, max.    | 60 mA, 24 V DC  |

### Inputs

|                        |            |
|------------------------|------------|
| Number of teach inputs | 1 Piece(s) |
|------------------------|------------|

### Teach inputs

|      |             |
|------|-------------|
| Type | Teach input |
|------|-------------|

### Teach input 1

|          |                                                            |
|----------|------------------------------------------------------------|
| Function | Teach-in (deactivated by default, optionally configurable) |
|----------|------------------------------------------------------------|

### Outputs

|                                     |            |
|-------------------------------------|------------|
| Number of digital switching outputs | 3 Piece(s) |
|-------------------------------------|------------|

### Switching outputs

|      |                          |
|------|--------------------------|
| Type | Digital switching output |
|------|--------------------------|

### Switching output 1

|                     |                                                      |
|---------------------|------------------------------------------------------|
| Switching element   | Transistor, Push-pull                                |
| Switching principle | IO-Link / light switching (PNP)/dark switching (NPN) |

### Switching output 2

|                     |                                            |
|---------------------|--------------------------------------------|
| Switching element   | Transistor, PNP / NPN switchable           |
| Switching principle | Light switching (PNP)/dark switching (NPN) |

### Switching output 3

|                     |                                            |
|---------------------|--------------------------------------------|
| Switching element   | Transistor, PNP / NPN switchable           |
| Switching principle | Light switching (PNP)/dark switching (NPN) |

### Time behavior

|                     |                     |
|---------------------|---------------------|
| Switching frequency | 3 ... 3,000 Hz      |
| Response time       | ≤ 180 ms, ≥ 1500 Hz |
| Warmup time         | 5 min               |

### Interface

|      |         |
|------|---------|
| Type | IO-Link |
|------|---------|

### IO-Link

|                      |             |
|----------------------|-------------|
| COM mode             | COM2        |
| Min. cycle time      | COM2 = 4 ms |
| Specification        | V1.1        |
| Device ID            | 5303        |
| SIO-mode support     | Yes         |
| Process data, length | 6 byte      |

### Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 1 Piece(s) |
|-----------------------|------------|

### Connection 1

|                    |                                                          |
|--------------------|----------------------------------------------------------|
| Function           | Signal IN (configurable)<br>Signal OUT<br>Voltage supply |
| Type of connection | Connector, turning 270°                                  |
| Thread size        | M12                                                      |
| Type               | Male                                                     |
| Material           | Metal                                                    |
| No. of pins        | 5 -pin                                                   |
| Encoding           | A-coded                                                  |

### Mechanical data

|                            |                                                       |
|----------------------------|-------------------------------------------------------|
| Design                     | Cubic                                                 |
| Dimension (W x H x L)      | 25 mm x 50 mm x 50.5 mm                               |
| Housing material           | Metal                                                 |
| Metal housing              | Diecast zinc                                          |
| Lens cover material        | Plastic / PMMA                                        |
| Net weight                 | 150 g                                                 |
| Housing color              | matte chrome                                          |
| Type of fastening          | Through-hole mounting<br>Via optional mounting device |
| Compatibility of materials | ECOLAB                                                |

### Operation and display

|                      |                   |
|----------------------|-------------------|
| Type of display      | LC Display<br>LED |
| Operational controls | Control buttons   |

### Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -20 ... 55 °C |
| Ambient temperature, storage   | -20 ... 80 °C |

### Certifications

|                                                            |                  |
|------------------------------------------------------------|------------------|
| Degree of protection                                       | IP 67<br>IP 69   |
| Protection class                                           | II               |
| Approvals                                                  | c UL US          |
| Test procedure for oscillation in accordance with standard | EN 60947-5-2     |
| Test procedure for shock in accordance with standard       | EN 60947-5-2     |
| Standards applied                                          | EN IEC 60947-5-2 |

## Technical data

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27270907 |
| ECLASS 8.0            | 27270907 |
| ECLASS 9.0            | 27270907 |
| ECLASS 10.0           | 27270907 |
| ECLASS 11.0           | 27270907 |
| ECLASS 12.0           | 27270907 |
| ECLASS 13.0           | 27270907 |
| ECLASS 14.0           | 27270907 |
| ECLASS 15.0           | 27270907 |
| ETIM 5.0              | EC001817 |
| ETIM 6.0              | EC001817 |
| ETIM 7.0              | EC001817 |
| ETIM 8.0              | EC001817 |
| ETIM 9.0              | EC001817 |
| ETIM 10.0             | EC001817 |

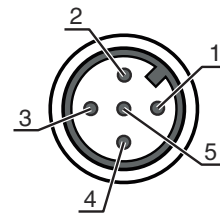
All dimensions in millimeters

- |   |                 |   |             |
|---|-----------------|---|-------------|
| A | Control buttons | E | M12 x 1     |
| B | LED(2)          | F | Transmitter |
| C | LED(1)          | G | Receiver    |
| D | Display         |   |             |

|                           |                                                          |
|---------------------------|----------------------------------------------------------|
| <b>Function</b>           | Signal IN (configurable)<br>Signal OUT<br>Voltage supply |
| <b>Type of connection</b> | Connector, turning 270°                                  |
| <b>Thread size</b>        | M12                                                      |
| <b>Type</b>               | Male                                                     |
| <b>Material</b>           | Metal                                                    |
| <b>No. of pins</b>        | 5 -pin                                                   |
| <b>Encoding</b>           | A-coded                                                  |

## Electrical connection

| Pin | Pin assignment  | Conductor color |
|-----|-----------------|-----------------|
| 1   | V+              | Brown           |
| 2   | IO2             | White           |
| 3   | V-              | Blue            |
| 4   | IO-Link / OUT 1 | Black           |
| 5   | IO3             | Gray            |



## Accessories

### Connection technology - Connection unit

|                                                                                  | Part no. | Designation           | Article        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------|----------|-----------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50144900 | MD 798i-11-82/L5-2222 | IO-Link master | Type: IO-Link master<br>Current consumption, max.: 11,000 mA<br>Switching outputs for each sensor connection: 1 Piece(s)<br>Switching output: Transistor, PNP<br>Interface: IO-Link, Automatic protocol detection, EtherNet IP, Modbus TCP, PROFINET<br>Connections: 12 Piece(s)<br>Sensor connections: 8 Piece(s)<br>Connections for voltage supply: 2 Piece(s)<br>Interface connections: 2 Piece(s)<br>Degree of protection: IP 67, IP 65, IP 69K |

### Connection technology - Connection cables

|                                                                                     | Part no. | Designation        | Article          | Description                                                                                                                                                                        |
|-------------------------------------------------------------------------------------|----------|--------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50133855 | KD S-M12-5A-V1-020 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 2.000 mm<br>Sheathing material: PVC |
|  | 50133856 | KD S-M12-5A-V1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: Yes<br>Cable length: 5.000 mm<br>Sheathing material: PVC |
|  | 50132077 | KD U-M12-5A-V1-020 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2.000 mm<br>Sheathing material: PVC  |
|  | 50132079 | KD U-M12-5A-V1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 5 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5.000 mm<br>Sheathing material: PVC  |

Accessories

Mounting technology - Rod mounts

|                                                                                   | Part no. | Designation  | Article         | Description                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------|----------|--------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 50117252 | BTU 300M-D12 | Mounting system | Design of mounting device: Mounting system<br>Fastening, at system: For 12 mm rod, Sheet-metal mounting<br>Mounting bracket, at device: Screw type, Suited for M4 screws<br>Type of mounting device: Clampable, Adjustable, Turning, 360°<br>Material: Metal |

Note



A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.