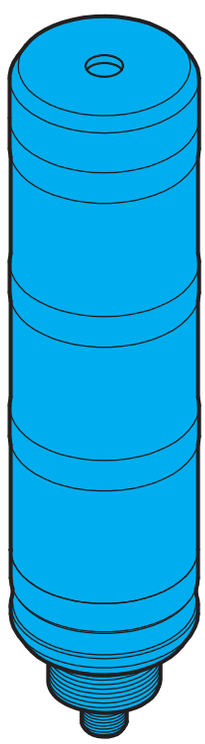
Leuze

Original operating instructions

IO-Link tower light

TL 305-IOL



The Sensor People

We reserve the right to make technical changes
EN 23/06/01 50150112

Leuze electronic GmbH + Co. KG
In der Braike 1
D-73277 Owen / Germany
Phone: +49 7021 573-0
Fax: +49 7021 573-199
http://www.leuze.com
info@leuze.de

1. Preliminary note

1.1. Preface | Purpose

This brief manual is intended to help you with the initial commissioning process for the TL 305-IOL IO-Link tower light and parameterization via Leuze Sensor Studio. The brief manual supplements the existing product documentation.

Further information: *www.leuze.com*

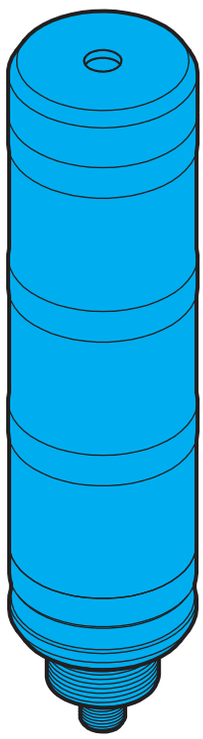


Bild 1.1. TL 305-IOL with 3 segments and buzzer

2. Overview

TL 305-IOL IO-Link tower light	TL305-3MC-IOL-M12	TL305-3MC-BZ-IOL-M12	TL305-4MC-IOL-M12	TL305-4MC-BZ-IOL-M12	TL305-5MC-IOL-M12	TL305-5MC-BZ-IOL-M12
Segments	3	3	4	4	5	5
Buzzer	None	With	None	With	None	With
Operating modes	External Trigger Mode, Segment Mode, Level Mode, Demo Mode					
Colors	User defined via IO-Link: RGB color space					
	Factory settings: red, green, yellow, blue, white, orange, pink					
Brightness / intensity	10 … 100%, freely customizable via IO-Link					
Frequency / mode	Continuous light, flashing light, cycling light					

Tabelle 2.1. Product overview: IO-Link tower light

3. General description

Signal lighting is indispensable in ensuring safety in industry or in the public sphere because it reliably provides a visual warning to and protects not only workers, but also passersby. Particularly in industry at indoor and outdoor facilities, for example, signal lighting supports occupational safety by indicating various operating states of machines and systems. Of course, tower lights can be used in other situations, too. The optical transducers help you monitor machines and complex manufacturing processes, identify emergency or hazardous situations and take action in good time if the safety of the environment, people or products is at risk. The TL 305-IOL tower light can be configured via IO-Link to suit your individual needs. The tower lights can be integrated into any machine or system using practical accessories.

4. Normal operation and areas of application

TL 305-IOL tower lights are operated with an operating voltage of 18 … 30 V.

On machines and systems with IO-Link, the tower light is connected to a class A port of the IO-Link master with a 3- to 5-pin M12 interconnection cable.

On machines and systems without IO-Link, the tower light is connected using a 5-pin cable; in this case, the pre-sets are activated via the 3 digital inputs.

Even from a great distance, the tower lights indicate the status of machines or machine segments in a clearly visible way using vibrant colors.

1.2. Reliably indicating various states

By using professional signaling, you increase safety in your applications and considerably reduce response and waiting times. Due to the different signaling stages, employees can promptly react to faults and more quickly fix any problems.

Attention is also drawn by the loud buzzer optionally integrated into the cover of the tower light.

1.3. Signal lighting: Highly versatile

Tower lights are an indispensable part of machine and system construction. But tower lights are also found in many other areas, such as intralogistics and building services engineering.

1.4. Environmental conditions [IP degrees of protection]

TL 305 tower lights are typically suitable for industrial applications; depending on the model, they have the following IP degrees of protection: IP 67 (models without buzzer), IP 20 (models with buzzer).

5. Operating modes

TL 305-IOL IO-Link tower lights can be operated via IO-Link as well as via the integrated digital inputs. In total, 4 operating modes are available: External Trigger Mode, Segment Mode, Level Mode, Demo Mode.

1.5. External Trigger Mode

In External Trigger Mode (factory setting), 8 predefined color and lighting configurations can be activated via the 3 digital trigger inputs, even without IO-Link.

1.6. Operation via IO-Link [Segment Mode, Level Mode, Demo Mode]

1.6.1. Communication via IO-Link

IO-Link is a globally standardized I/O technology (IEC61131-9) for communication between the control system and sensors/actuators below the fieldbus level.

The well-known connection technology is used with unshielded M12 cables. The 3-conductor connection of a digital switching signal is enhanced by bidirectional communication.

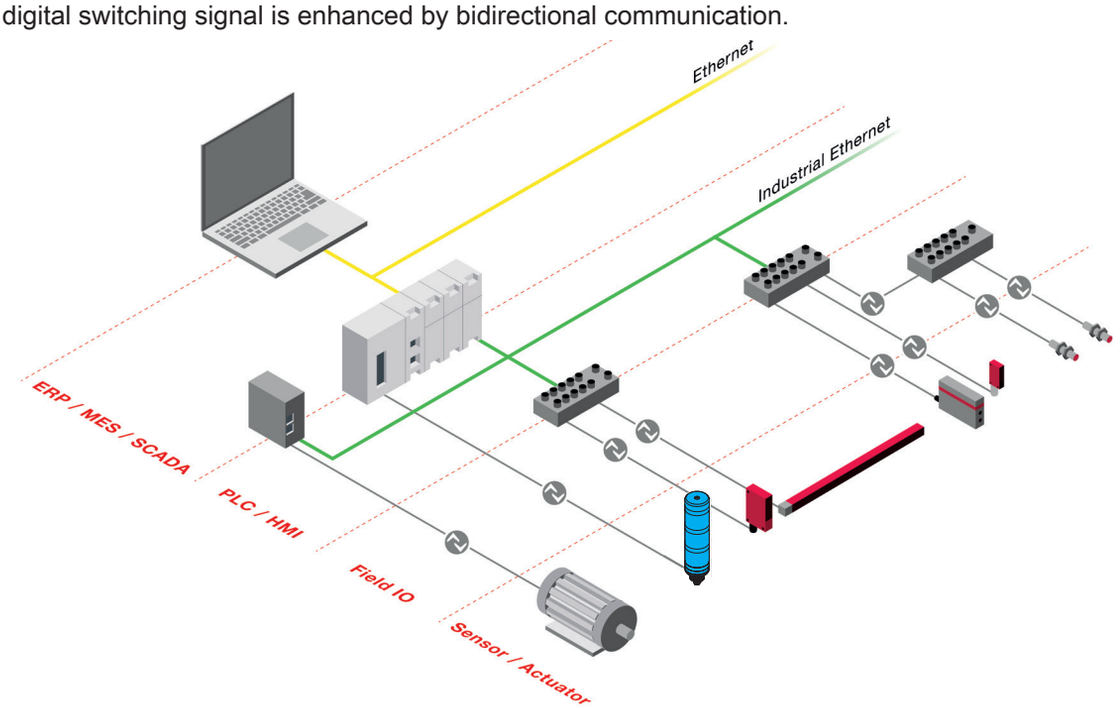


Bild 5.1. Possible system architecture

1.6.2. Segment Mode

In Segment Mode, individual segments can be activated via IO-Link process data, which enables countless color configurations. Leuze Sensor Studio can be used to set the colors, the intensity from 10 to 100% and cycling or flashing behavior for each segment.

1.6.3. Level Mode

Level Mode is used for displaying fill levels or process progress. In Level Mode, the tower light requires an input value between 0 and 100 percent from the control system. Furthermore, there is the option of using IO-Link process data to define a background color (inactive segment) and a color for the active segment.

1.6.4. Demo Mode

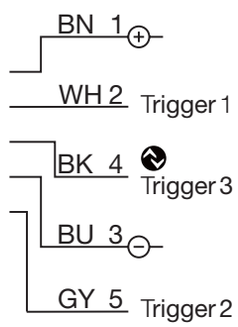
In Demo Mode, the device demonstrates the different operating functions: different colors, Level Mode, Segment Mode, cycling, flashing and – if a buzzer is present – an acoustic signal.

6. Commissioning

For initial commissioning of the TL 305-IOL tower light, you need either a control system with 3 free digital outputs and a 5-wire connection cable with an M12 socket or, if you want an IO-Link connection, you need a compatible IO-Link master and a 3-wire connection cable with an M12 socket.

1.7. Operation without IO-Link in External Trigger Mode

TL 305-IOL tower lights are delivered from the factory in External Trigger Mode. The 3 digital inputs can be used to activate the predefined pre-sets for the lights. The states that are displayed when the respective pre-sets are activated depend on the product and are described in the data sheet for the respective product. As an example, here is an excerpt from the TL 305-IOL data sheet.



Operating mode: External Trigger Mode				
Trig 1	Trig 2	Trig 3	Pre-set	Factory setting
0	0	0	1	Off
1	0	0	2	Red
0	1	0	3	Green
1	1	0	4	Yellow
0	0	1	5	Blue
1	0	1	6	White
0	1	1	7	Red slowly flashing / Buzzer intermittent (1 Hz)
1	1	1	8	Red rapidly flashing / Buzzer intermittent (2 Hz)
All trigger inputs have a delay ~50 ms. Pre-Sets can be defined via IO-Link.				

Bild 6.1. Activation of the pre-sets via the three digital inputs in External Trigger Mode

1.8. Operation with the Leuze USB IO-Link master

TL 305-IOL tower lights can be configured directly via Leuze Sensor Studio in combination with the USB IO-Link master 2.0 (part number: 50121098).

Bild 6.2. USB IO-Link master 2.0: Operation on the PC via USB

Using Sensor Studio Extension, the IO-Link devices are described and can be quickly and easily monitored and configured. The tool is used for pre-setting, testing and presenting IO-Link devices. The tool is not intended for operation in production systems.

To use the tower lights on another engineering tool, the corresponding IODD for the tower light must be used. This file can be found on the product detail page of the respective product under the "Downloads" tab.

The IODD is a ZIP file that contains the actual IODD together with corresponding graphic files in compressed form. Once the file has been imported into your engineering tool, the lighting functions can be visualized and programmed.

In addition, the IODDs can be found in the IODDfinder portal of the IO-Link Consortium: *ioddfinder.io-link.com*

For details about functionality and additional information for integrating IO-Link devices with the Leuze USB IO-Link master 2.0 (part number: 50121098), please see the operating instructions for the USB IO-Link master: *https://www.leuze.com/en-int/set-md12-us2-il1.1-zub./50121098*.

7. Parameterization and configuration

1.9. Basic functions

Among other things, TL 305-IOL tower lights have the following 3 basic functions: color configuration, locator function and reset to factory settings. The colors are configured at indexes [650 … 657] using the "Color Proportion" variable and at indexes [620 … 627] using the "Name" variable.

The locator function at index [126=Locator Start, 127=Locator Stop] and the reset to factory settings with the values [200 … 207] are at subindexes 16 and are located under the "Standard command" standard variable index=2 id=V_SystemCommand.

The locator function is at 126 for Locator Start and 127 for Locator Stop; this function enables you to quickly find the integrated product in the system.

The factory settings are restored by using the permissible value 130 as the subindex.

1.9.1. Color configuration and name

In the color configuration, it is possible to configure 8 different colors; the "Color Proportion" variables are located at the indexes=650 to 657 and have the id=V_ColorRGB0 to V_ColorRGB7. The colors red, green and blue are located at the subindexes=1, 2, 3 and are indicated with values 0 to 100.

The "Name" variables are located at the indexes=620 to 627 and have the id=V_ColorName0 to V_ColorName7. The color names can be freely changed and have a data type of 32-octet string UTF-8.

Variable “Color Proportion” index=650 id=V_FarbeRGB0

description: Color Proportion

data type: 24-bit Record

access rights: rw

dynamic

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	decription
1	16	8-bit UInteger	0 … 100	0				Red	Red Proportion
2	8	8-bit UInteger	0 … 100	0				Green	Green Proportion
3	0	8-bit UInteger	0 … 100	0				Blue	Blue Proportion

octet	0	1	2
bit offset	23–16	15–8	7–0
sub index	1	2	3
element bit	7–0	7–0	7–0

Configuration color 0 (color 000)

Variable “Name” index=620 id=V_FarbeBezeichnung0

description: Designation freely selectable

data type: 32-octet String UTF-8

default value: „Aus/Off (Factory Setting)“

access rights: rw

dynamic

octet	0	1	2	3	4	5	6	7
bit offset	255–248	247–240	239–232	231-224	223–216	215–208	207–200	199–192

octet	8	9	10	11	12	13	14	15
bit offset	191–184	183–176	175–168	167–160	159–152	151–144	143–136	135–128

octet	16	17	18	19	20	21	22	23
bit offset	127–120	119–112	111–104	103–96	95–88	87–80	79–72	71–64

octet	24	25	26	27	28	29	30	31
bit offset	63–56	55–48	47–40	39–32	31–24	23–16	15–8	7–0

Trigger pre-set 1 (TRIG1=0, TRIG2=0, TRIG3=0)

For example, for FarbeBezeichnung0, the index is located at the value 620. At index=620, the color is off or dark by default (factory setting).

1.9.2. Standard commands

For the locator function and factory setting, the "Standard command" standard variable is located at index=2 with the id=V_SystemCommand. The permissible values are 126 for Locator Start and 127 for Locator Stop, as well as 130 for restoring to factory settings. To reset to factory settings for FarbeBezeichnung0…7, the permissible values are located between [200…207].

Standard Variable “System Command” index=2 id=V_SystemCommand

description: Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.

data type: 8-bit UInteger

allowed values: 126 = Locator Start, 127 = Locator Stop, 130 = Restore Factory Settings, 161 = Function Test, 162 = Function Test stop, 200 = Reset to Factory Settings Color 0, 201 = Reset to Factory Settings Color 1, 202 = Reset to Factory Settings Color 2, 203 = Reset to Factory Settings Color 3, 204 = Reset to Factory Settings Color 4, 205 = Reset to Factory Settings Color 5, 206 = Reset to Factory Settings Color 6, 207 = Reset to Factory Settings Color 7, 240 = IO-Link 1.1 system test command 240, Event 8DFE appears, 241 = IO-Link 1.1 system test command 241, Event 8DFE disappears, 242 = IO-Link 1.1 system test command 242, Event 8DFF appears, 243 = IO-Link 1.1 system test command 243, Event 8DFF disappears

access rights: wo

modifies other variables

octet	0	
bit offset	7–0	
element bit	7–0	

The locator function enables you to quickly find the integrated product in the system.

The factory settings are restored by using the permissible value 130 as the subindex.

8. Operating modes

TL 305-IOL tower lights have 4 operating modes, which can be set using the "Device Control" parameter:

- External Trigger Mode (delivery state)
- Segment Mode
- Level Mode
- Demo Mode

The operating modes can only be selected individually and cannot be combined. The operating mode is set using the "Device Control" parameter.

Variable “Device Control” index=602 id=V_Geraetesteuerung

description: Device Control

data type: 8-bit UInteger

allowed value: 1=External Trigger, 2=Segment-Mode (PD), 3=Level-Mode (PD), 4=Demo-Mode

default value: 1

access rights: rw

octet	0	
bit offset	7–0	
element bit	7–0	

For device control, the index=602 and the permissible values are 1=External Trigger Mode, 2=Segment Mode, 3=Level Mode and 4=Demo Mode. Typically, the default value or standard value=1 (External Trigger Mode).

1.10. External Trigger Mode [standard operation]

TL 305-IOL tower lights are delivered in External Trigger Mode. This is the standard operating mode upon delivery. In this operating mode, each color of each segment is represented by a separate switching signal.

Pre-set color for each segment simulation

Variable “Selection” index=604 id=V_TriggerSimulation

description: Simulation of all eight selectable presets in external trigger mode parallel to an IO-Link connection

data type: 8-bit UInteger

allowed value: 0=0 (Simulation off), 1=Pre-Set 1, 2=Pre-Set 2, 3=Pre-Set 3, 4=Pre-Set 4, 5=Pre-Set 5, 6=Pre-Set 6, 7=Pre-Set 7, 8=Pre-Set 8

default value: 0

access rights: rw

excluded from data storage

octet	0	
bit offset	7–0	
element bit	7–0	

For the simulation of all 8 selectable pre-sets in External Trigger Mode, the index has the value 604 and the permissible base values for the pre-sets are [0-8]: 0=(Simulation off), 1=Pre-Set 1, 2=Pre-Set 2, 3=Pre-Set 3, 4=Pre-Set 4, 5=Pre-Set 5, 6=Pre-Set 6, 7=Pre-Set 7, 8=Pre-Set 8.

Typically, the default value or base value=0.

1.10.1. Parameterization [parameter data]

External Trigger Mode means that you can use digital inputs to switch predefined colors directly. The 3 trigger inputs of the tower lights can be used to select the 8 predefined trigger pre-sets.

For a trigger pre-set selection [pre-set 0 … 7], light functions (light color, intensity and mode) and the buzzer function are pre-set for each segment [1 … 12] (depending on the model) at the factory. However, there is the option of simply using IO-Link to freely and individually parameterize the trigger pre-sets.

Recommended procedure for commissioning:

- Configure colors
- Configure pre-sets
- Simulate pre-sets

Buzzer function

For models with a buzzer, a buzzer can also be configured in addition to the colors. In doing so, you can decide whether the buzzer should emit a continuous tone or a slow or fast intermittent tone.

Variable “Buzzer” index=700 id=V_SegmentPre-Set1_Buzzer

description: intermittent slow (1Hz) / intermittent fast (2,5 HZ)

data type: 8-bit UInteger

allowed value: 0=off, 1=on (cont), 2=intermittent slow, 3=intermittent fast

default value: 0

access rights: rw

octet	0	
bit offset	7–0	
element bit	7–0	

Pre-set for each segment

In the pre-set segment configuration, the previously configured colors can be assigned to the individual pre-sets or segments. In addition, you can configure the light intensity and have the active segment light up continuously, cycle or flash.

Variable “Seg 1” index=701 id=V_SegmentPre-Set1_1

description: Segment Preset

data type: 24-bit Record

access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	decription
1	16	8-bit UInteger	0=Color 000, 1=Color 001, 2=Color 010, 3=Color 011, 4=Color 100, 5=Color 101, 6=Color 110, 7=Color 111	0				Color	Color
2	8	8-bit UInteger	0 … 100	100				Intensity	Intensity
3	0	8-bit UInteger	0=static, 1=cycling, 2=flashing	0				Mode	Mode

octet	0	1	2
bit offset	23–16	15–8	7–0
sub index	1	2	3
element bit	7–0	7–0	7–0

1.10.2. Application example

To activate the color red in External Trigger Mode, the following pin assignment is connected:

- Pin 2 (TRIG 1)=VDD, high level > 8.0 V

- Pin 5 (TRIG 2)=GND, low level < 5.0 V
- Pin 4 (TRIG 3)=GND, low level < 5.0 V

For the color green, the following pin assignment is required:

- Pin 2 (TRIG 1)=GND, low level < 5.0 V
- Pin 5 (TRIG 2)=VDD, high level > 8.0 V
- Pin 4 (TRIG 3)=GND, low level < 5.0 V

1.11. Segment Mode

If the tower light is fully integrated into the IO-Link communication, it is advisable to operate the product in Segment Mode.

In Segment Mode, individual segments can be activated via IO-Link process data, which enables countless color configurations. Using Leuze Sensor Studio, the previously configured colors and static, cycling or flashing lighting behavior can be assigned to the segments.

1.11.1. Parameterization [parameter data]

Depending on the selected number of segments, the various color combinations can be displayed. The intensity [10 … 100] and Dynamic Mode [cycling or flashing] can also be set up freely.

The "Selection Number of Segments 1=1" setting applies the selected color to all the lighting.

Selection number of segments

Variable “Selection Number of Segments” index=610 id=V_AuswahlSegmentAnzahl

description: Selection of the number of segments in segment mode (PD)

data type: 8-bit UInteger

allowed value: 1=1, 5=5

default value: 5

access rights: rw

Selection number of segments for TL 305-IOL tower light with 5 segments

Dynamic Mode for each segment

In Segment Mode, for example, the result for segment 1 is index=681, the result for the intensity is subindex=1 and the values are [10 … 100]. Typically, the factory setting=100.

For Dynamic Mode, the subindex=2 and the possible values are 1=cycling and 2=flashing. Typically, the factory setting=1.

Variable “Seg 1” index=681 id=V_SegmentModus1

description: Segment

data type: 16-bit Record

access rights: rw

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	decription
1	8	8-bit UInteger	10 … 100	100				Intensity	Intensity
2	0	8-bit UInteger	1=Cycling, 2=Flashing	1				Dynam-ic-Mode	Dynam-ic-Mode

octet	0	1
bit offset	15–8	7–0
sub index	1	2
element bit	7–0	7–0

1.11.2. Process data and application example

The process data of the devices is transferred cyclically in a data telegram; the device defines the process data size. For each device, it is possible to have process data from 0 to 32 bytes each for the input and the output. In Segment Mode, the process data can be used to assign the 8 preconfigured colors to the individual segments or to activate the preconfigured colors. Furthermore, the (static or dynamic) lighting mode can be selected for each segment. In addition, for products with a buzzer, the buzzer can be activated.

The ProcessDataOut "PD for Segment Mode" is under the id=PDOUT_Segment at V_DeviceControl = 2. For example, the color setting for segment 3 is at subindex 6 and the buzzer is at subindex 7.

ProcessData id=PD–Segment (condition V_Geraetesteuerung =2)
ProcessDataOut “PD for Segment-Mode” id=PDOUT_Segment

bit length: 64

data type: 64-bit Record (subindex access not supported)

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	decription
1	63	Boolean	false=static, true=dynamic					Mode Seg 1	
2	60	3-bit UInteger	0=Color 000, 1=Color 001, 2=Color 010, 3=Color 011, 4=Color 100, 5=Color 101, 6=Color 110, 7=Color 111					Color Seg 1	
3	59	Boolean	false=static, true=dynamic					Mode Seg 2	
4	56	3-bit UInteger	0=Color 000, 1=Color 001, 2=Color 010, 3=Color 011, 4=Color 100, 5=Color 101, 6=Color 110, 7=Color 111					Color Seg 2	
5	55	Boolean	false=static, true=dynamic					Mode Seg 3	
6	52	3-bit UInteger	0=Color 000, 1=Color 001, 2=Color 010, 3=Color 011, 4=Color 100, 5=Color 101, 6=Color 110, 7=Color 111					Color Seg 3	
7	51	Boolean	false=static, true=dynamic					Mode Seg 4	
8	48	3-bit UInteger	0=Color 000, 1=Color 001, 2=Color 010, 3=Color 011, 4=Color 100, 5=Color 101, 6=Color 110, 7=Color 111					Color Seg 4	
9	47	Boolean	false=static, true=dynamic					Mode Seg 5	
10	44	3-bit UInteger	0=Color 000, 1=Color 001, 2=Color 010, 3=Color 011, 4=Color 100, 5=Color 101, 6=Color 110, 7=Color 111					Color Seg 5	
11	0	2-bit UInteger	0=off, 1=on (cont), 2=intermittent slow, 3=intermittent fast					Buzzer	

In Segment Mode, the number of segments [1 … 12] of lighting (depending on the model) can be easily displayed and the preconfigured colors [000 … 111] selected for each segment can be visualized.

A variety of information can be clearly depicted using the segments. The Segment Mode setting causes the lighting to accept only the commands for color changes and activation via the I/O-Link connection.

In Segment Mode, the tower lights can be used to display process progress. Thus the machine operator can immediately detect the current status of manufacturing processes and act accordingly in the event of error messages.

1.12. Level Mode

In Level Mode, it is possible to use IO-Link process data to define a background color [inactive segment], which can be used, for example, as a corporate identity color. In addition, the fill levels and machine status can be displayed using the active segments [foreground color] with a predefined color selection.

1.12.1. Parameterization [parameter data]

Segment behavior

Variable “Mode” index=616 id=V_LevelModus

description: Mode

data type: 8-bit UInteger

allowed value: 0=Segments increasing, 1=Segments moving

default value: 0

access rights: rw

octet	0	
bit offset	7–0	
element bit	7–0	

For Level Mode, the index=616 and the permissible values are 0=segments increasing, 1=segment migrating.

Level display direction

With the Level Mode of the tower light, the display direction [Bottom>Top or Top>Bottom] can also be selected and displayed.

Variable “Direction Of Display” index=615 id=V_LevelAnzeigerichtung

description: Direction Of Display

data type: 8-bit UInteger

allowed value: 0=Bottom > Top, 1=Top > Bottom

default value: 0

access rights: rw

octet	0	
bit offset	7–0	
element bit	7–0	

Dynamic Mode for each segment

Furthermore, it is possible to define a foreground color with the index=617 [active segment level] and a background color with the index 618 [inactive segment level]. For example, the background color can be set as a corporate identity color.

Variable “Dynamic-Mode active Segment” index=617 id=V_LevelAktivesSegment

description: Dynamic mode active segment (foreground color)

data type: 8-bit UInteger

allowed value: 1=Cycling, 2=Flashing

default value: 1

access rights: rw

octet	0	
bit offset	7–0	
element bit	7–0	

Variable “Dynamic-Mode inactive Segment” index=618 id=V_LevelInaktivesSegment

description: Dynamic mode inactive segment (background color)

data type: 8-bit UInteger

allowed value: 1=Cycling, 2=Flashing

default value: 1

access rights: rw

octet	0	
bit offset	7–0	
element bit	7–0	

1.12.2. Process data and application example

Process data (e.g. analog values) are transferred cyclically. In Level Mode, the process data transfers the analog value [0 … 100] as an input, for example so that fill levels and process progress can be displayed. The 8 preconfigured colors can be freely set for the active segments [foreground color] as well as for the inactive segments [background color]. Furthermore, the (static or dynamic) lighting mode can be selected. In addition, the buzzer can be activated. The tone mode [continuous, or slow or fast intermittent] of the buzzer can also be freely selected.

ProcessData id=PD_Level (condition V_Geraetesteuerung =3)
ProcessDataOut “PD for Level-Mode” id=PDOUT_Level

bit length: 64

data type: 64-bit Record (subindex access not supported)

subindex	bit offset	data type	allowed values	default value	acc. restr.	mod. other var.	excl. from DS	name	decription
1	56	8-bit UInteger	0 … 100					Analog Value for Level Indicator	
2	51	Boolean	false=static, true=dynamic					Mode active Segment	
3	48	3-bit UInteger	0=Color 000, 1=Color 001, 2=Color 010, 3=Color 011, 4=Color 100, 5=Color 101, 6=Color 110, 7=Color 111					Color Selection active Segment	
4	40	7-bit UInteger	10 … 100					Intensity active Segment	
5	35	Boolean	false=static, true=dynamic					Mode inactive Segment	
6	32	3-bit UInteger	0=Color 000, 1=Color 001, 2=Color 010, 3=Color 011, 4=Color 100, 5=Color 101, 6=Color 110, 7=Color 111					Color Selection inactive Segment	
7	24	7-bit UInteger	10 … 100					Intensity inactive Segment	
8	0	2-bit UInteger	0=off, 1=on (cont), 2=intermittent slow, 3=intermittent fast					Buzzer	

The ProcessDataOut "PD for Level Mode" is under the id=PDOUT_Level at V_Gerätesteuerung = 3. As an example, the "Intensity active Segment" is at subindex 4 with the permissible values [10 … 100].

The fill levels and/or machine status are displayed using the active segments [foreground color] with preconfigured color selection for the respective process. In accordance with the color selection predefined by the user, fill levels in the process can be displayed more efficiently with lit LED segments. The allocation of the analog value depends on the number of segments available.

9. Troubleshooting

1.13. Error display

Code	Additional code	Name	Description
128 (0x80)	0 (0x00)	Application error in device – no details	Access was denied by device. No detailed information available
128 (0x80)	17 (0x11)	Index not present	Access to a non-existent index
128 (0x80)	18 (0x12)	Subindex not present	Access to a non-existent subindex
128 (0x80)	32 (0x20)	Service currently not available	Currently the parameter cannot be accessed. The device does not permit this in the current status.
128 (0x80)	35 (0x23)	Access denied	Write access to a write-protected parameter
128 (0x80)	48 (0x30)	Parameter value outside the valid range	Written parameter value lies outside the permissible value range.
128 (0x80)	49 (0x31)	Parameter value above the permissible limit	Written parameter value lies above the permissible value range.
128 (0x80)	50 (0x32)	Parameter value below the permissible limit	Written parameter value lies below the permissible value range.
128 (0x80)	51 (0x33)	Parameter length too long	Written parameter value is longer than permitted.
128 (0x80)	52 (0x34)	Parameter length too short	Written parameter value is shorter than permitted.
128 (0x80)	53 (0x35)	Function not available	Written command is not supported by the device.
128 (0x80)	54 (0x36)	Function currently not available	Written command is not supported by the device in the current state.
128 (0x80)	64 (0x40)	Invalid parameter set	Written individual parameter value conflicts with the other parameter settings.
128 (0x80)	65 (0x41)	Inconsistent parameter set	Inconsistencies were detected at the end of the block parameter transfer. The device plausibility check failed.
128 (0x80)	130 (0x82)	Application not ready	Access was denied because the device is not currently ready.

Tabelle 9.1. Error types for TL 305-IOL tower lights