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**TURCK**

# Uprox<sup>®</sup> IO-Link Inductive Factor 1 Sensors with IO-Link



# Inductive Factor 1 Sensors with IO-Link



With the release of our new Uprox IO-Link sensors, Turck's Factor 1 sensor offering is more versatile than ever before. The flexibility of this technology turns the Uprox IO-Link sensor into the "Swiss Army knife" of Factor 1 sensors.

The functions of the two outputs can be set independently of one another (PNP, NPN, N/O contact, and N/C contact). The switching distance and hysteresis can be set individually, and the adjustable switching distance can be set separately for each output, allowing one Uprox sensor to replace two other sensors.

An integrated temperature monitor assists in preventative maintenance by detecting abnormal temperatures.

The consistent data retention of the sensor parameters is also ensured with IO-Link version 1.1. The 32-byte application specific tag can be used for systematic tool identification without any other identification sensors required. The first byte is mapped directly to the process data, and is always available in the controller without any additional IO-Link call.

The Uprox IO-Link sensor series can also be used with conventional digital inputs. In this case, the sensor operates in SIO mode, much like a conventional switching sensor.



## Switching distance

The Uprox IO-Link sensor series can be configured individually to meet the respective needs of the application. The switching distance can be changed in percentage terms within the physically defined limits.



## Output function

Any desired combination of function at both outputs is configurable using the IO-Link interface. From PNP-NC contact and NPN-NO contact, to both at the same time or complementary, anything is possible.

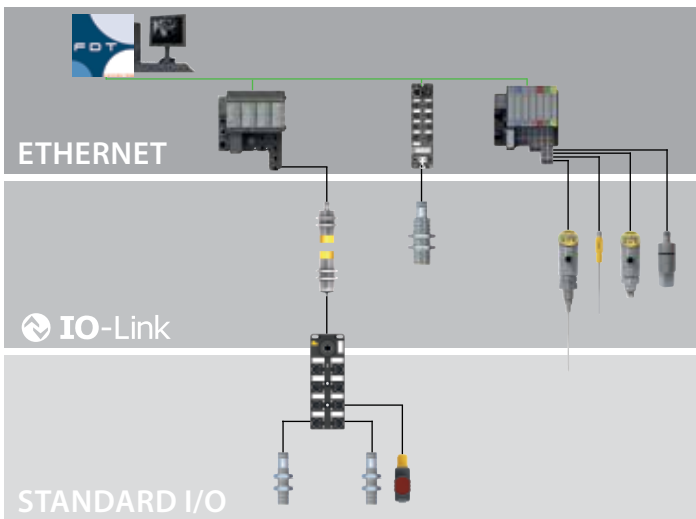


## Cost reductions

Uprox IO-Link sensors include all of the standard benefits of Uprox3 sensors, such as Factor 1 with the highest switching distances and excellent magnetic field strength.

Ease of configuration allows these sensors to be adapted to the specific needs of your application. As a result, the installation of Uprox IO-Link sensors helps reduce costs in new and existing applications.

Additionally, each adjustable switching distance can be run sequentially in combination with an IO-Link master, allowing the sensor to simulate a low-resolution analog mode.



## Production efficiency

The configurable inductive Factor 1 sensors communicate via a standard IO-Link interface, and include a structured configuration file (IODD) that is identical for all Uprox sensors. This ensures simple handling before, during, and after commissioning.

The intelligent tool identification feature using the 32-byte application specific tag allows greater efficiency in production control. The use of Uprox IO-Link sensors provides access to Turck's extensive IO-Link knowledge base, as well as our comprehensive IO-Link portfolio of sensors, I/O hubs, IO-Link masters, IO-Link software, and any related connectivity or fieldbus products.



### Input/output delay

The adjustable input and output delay between 0 and 60 seconds enables the reliable suppression of unwanted fault pulses from the application.



### Rotation speed/Pulse divider

With either the integrated start-up delay or the variable pulse divider with configurable pulse duration, Uprox IO-Link sensors are excellently suited for rotation speed measurement or monitoring of a rotationally symmetric application.



## Improved availability through diagnostics

The integrated temperature measuring provides users with diagnostic features for both the sensor and application area around the sensor. User-defined temperature limits can be configured within the physical and technical minimum/maximum temperature, and can be output as alerts via the process data in the event of limit violations. These alerts help prevent possible faults in cooling systems or impending temperature damage to the system.

The ability to configure two separate switching points allows the Uprox IO-Link to replace two conventional sensors for monitoring different positions. For example, only one Uprox IO-Link sensor would be needed to indicate the open/closed brake state with integrated wear monitoring.



### Temperature monitoring

Temperature monitoring integration enables condition monitoring to be used directly at the application. Minimum and maximum temperature limits can be adjusted to customer requirements and output as a process signal.



### Identification

The 32-byte application specific tag enables each sensor to be identified individually, allowing clear monitoring of the application, sub-application, or even an individual tool.

# Uprox<sup>®</sup> IO-Link – Types and Features

IO-Link configurable features







|  |                                     |   |                        |          |           | Features |      |        |                       |       |  |
|--|-------------------------------------|---|------------------------|----------|-----------|----------|------|--------|-----------------------|-------|--|
|  |                                     |   |                        |          |           | 1 SP     | 2 SP | Analog | Rotation-<br>al speed | Pulse |  |
| <b>Switching distance S<sub>n</sub></b>    |                                     |   |                        |          |           |          |      |        |                       |       |  |
| Switching distance output 1 (pin 4)        | 20 %                                | 40 %  | 60 %                   | 80 %     | 100 %*    | ●        | ●    |        |                       | ●     |  |
| Switching distance output 2 (pin 2)        | 20 %                                | 40 %  | 60 %                   | 80 %     | 100 %*    | ●        | ●    |        |                       |       |  |
| Hysteresis                                 | Small                               |   | Normal*                |          |           | ●        |      |        |                       |       |  |
| <b>Output configuration</b>                |                                     |   |                        |          |           |          |      |        |                       |       |  |
| Output function 1 (pin 4)                  | NO contact*                         | PNP*  |                        | NPN      | Push-pull | ●        | ●    | ●      | ●                     | ●     |  |
|  | NC contact                          | PNP   |                        | NPN      | Push-pull | ●        | ●    | ●      | ●                     | ●     |  |
|  | On                                  | PNP   |                        | NPN      | Push-pull | ●        | ●    | ●      | ●                     | ●     |  |
| Output function 2 (pin 2)                  | NO contact                          | PNP   |                        | NPN      | Push-pull |          | ●    | ●      | ●                     | ●     |  |
|  | NC contact*                         | PNP*  |                        | NPN      | Push-pull |          | ●    | ●      | ●                     | ●     |  |
|  | On                                  | PNP   |                        | NPN      | Push-pull |          | ●    | ●      | ●                     | ●     |  |
|  | Off                                 | PNP   |                        | NPN      | Push-pull |          | ●    | ●      | ●                     | ●     |  |
| Temperature indicator                      |                                     |   |                        |          |           | ●        |      | ●      |                       | ●     |  |
| <b>Special functions/Unique functions</b>  |                                     |   |                        |          |           |          |      |        |                       |       |  |
| Switch-on/off delay                        | Off*                                |   |                        | 0...60 s |           | ●        |      |        |                       |       |  |
| Start-up delay                             | Off*                                |   |                        | 0...60 s |           |          |      |        | ●                     |       |  |
| Identification                             | 32-byte application-specific marker |   |                        |          |           | ●        | ●    | ●      | ●                     | ●     |  |
| Oscillation frequency F2 (only NI devices) | F1*                                 |   |                        | F2       |           | ●        | ●    | ●      | ●                     | ●     |  |
| LED mode                                   | Ub(gn)/Out-<br>put (ge)*            | Output (ge)                                   | Off                    |          |           | ●        | ●    | ●      | ●                     | ●     |  |
| Temperature indicator                      | Actual tem-<br>perature             | Alarm low temper-<br>ature                    | Alarm high temperature |          |           | ●        | ●    | ●      | ●                     | ●     |  |
| LED temperature display                    | Off*                                | 1 Hz flashing when leaving temperature limits |                        |          |           | ●        | ●    | ●      | ●                     | ●     |  |
| Pulse divider                              | 1...128                             |   |                        |          |           |          |      |        |                       | ●     |  |
| Min. pulse duration                        | 0 ms*                               | 1 ms  | 10 ms                  | 100 ms   |           |          |      |        |                       | ●     |  |

\*Factory default







| <b>Process data [Bit]</b> |      |                   |                   |                   |          |           |            |                |
|---------------------------|------|-------------------|-------------------|-------------------|----------|-----------|------------|----------------|
| 0                         | 1    | 2                 | 3                 | 4                 | 5        | 6         | 7          | 8-15           |
| Out1                      | Out2 | Sp 2 <sup>0</sup> | Sp 2 <sup>1</sup> | Sp 2 <sup>2</sup> | Start-up | low temp. | high temp. | 1. byte of AST |

| <b>Technical data</b>                       |  |
|---|--|
| Assured switching distance                  | ≤ (0.81 × S <sub>n</sub> ) mm              |
| Repetition accuracy                         | ≤ 2 % of full scale                        |
| Temperature drift                           | ≤ ± 10 %                                   |
| Ambient temperature                         | -25...+70 °C                               |
| Operating voltage                           | 10...30 VDC                                |
| DC rated operational current                | ≤ 150 mA                                   |
| No-load current I <sub>0</sub>              | ≤ 20 mA                                    |
| Short-circuit protection                    | Yes/cyclic                                 |
| Wire breakage / reverse polarity protection | yes/completely                             |
| Switching frequency                         | 0.5 kHz                                    |
| IO-Link specification                       | IO-Link specified according to version 1.1 |
| Vibration resistance                        | 55 Hz (1 mm)                               |
| Shock resistance                            | 30 g (11 ms)                               |
| Degree of protection                        | IP68                                       |


## Uprox®3 IO-Link – Barrel sensors

|   | Design | Type code              | ID number | Total length | Electrical connection | Maximum switching distance  |
|---|--------|------------------------|-----------|--------------|-----------------------|---|
|  | M12    | BI6U-M12-IOL6X2-H1141  | M1644873  | 52 mm        | Connector, M12 x 1    | 6 mm   |
|  | M18    | BI10U-M18-IOL6X2-H1141 | M1644875  | 52 mm        | Connector, M12 x 1    | 10 mm  |
|  | M30    | BI20U-M30-IOL6X2-H1141 | M1644882  | 62 mm        | Connector, M12 x 1    | 20 mm  |

## Uprox®3 IO-Link – Barrel sensors, PTFE-coated

|   | Design | Type code               | ID number | Total length | Electrical connection | Maximum switching distance  |
|---|--------|-------------------------|-----------|--------------|-----------------------|---|
|    | MT12   | BI6U-MT12-IOL6X2-H1141  | M1644874  | 52 mm        | Connector, M12 x 1    | 6 mm     |
|    | MT18   | BI10U-MT18-IOL6X2-H1141 | M1644876  | 52 mm        | Connector, M12 x 1    | 10 mm    |
|  | MT30   | BI20U-MT30-IOL6X2-H1141 | M1644883  | 62 mm        | Connector, M12 x 1    | 20 mm  |

## Uprox® IO-Link – Rectangular sensors

|   | Design | Type code               | ID number | Total length    | Electrical connection | Maximum switching distance |
|---|--------|-------------------------|-----------|-----------------|-----------------------|----------------------------|
|  | CK40   | NI50U-CK40-IOL6X2-H1141 | M1625871  | 40 x 40 x 65 mm | Connector, M12 x 1    | 50 mm                      |

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