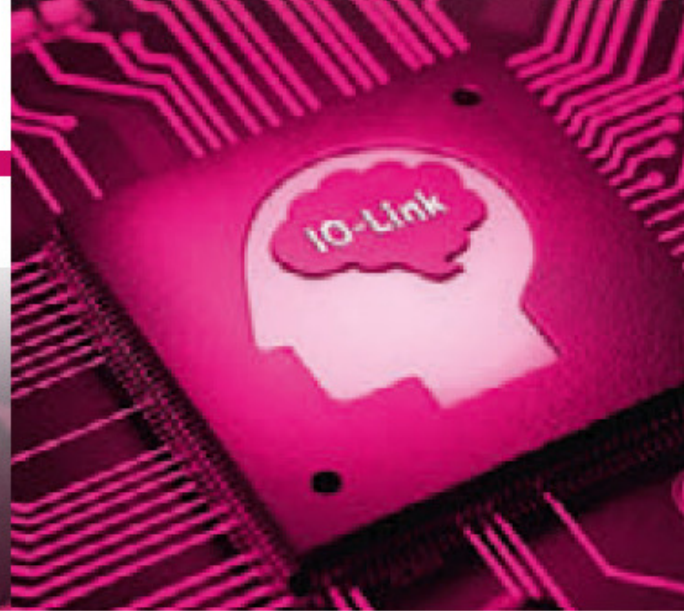


## The Smart Connector Digital valve control with IO-Link communication



### Valve connector innovation

## Smart Connector

According to the digitization of the „last meters“ in the automation technology, *nass magnet* as an expert for pneumatic valve actuators presents the innovative valve driver with IO-Link interface, implemented in a DIN interface connector.

Connected valves can be remotely controlled and monitored via the network using this peer to peer interface.

Using with a master, diagnostic data for the connector, solenoid coil and valve system can be retrieved, monitored and connected to **cloud-based** systems.

For the use in extreme environmental conditions *nass magnet* also offers robust versions of the smart connector in the protection classes IP65/IP67.



## Innovation in the valve connectors

### Quick and simple M12 connection

In order to speed up conventional cable installation, IO-Link connectors from *nass magnet* are marketed with a pre-assembled M12 connector. Due to M12 connector it can now be easily connected to a control unit or to a master, thus completely eliminating the need for on-site cable assembly.

The cable used is an unshielded 3 core signal cable. The advantage is that digital signals are less sensitive to interference than conventional analog signals.

### Status monitoring Smart data transfer

Using IO-Link protocol, the connector continuously communicates with **process data** with the master and allows electrical signals from the connected valve system to be checked. This makes it possible to detect whether the valve system is electrically pulled whether it is energized.

By **asynchronous, on-request data transfer** can several condition variables be reached like supply voltage, output current, switch on resistance of the coil and their actual power consumption.

The connector with IO-Link from *nass magnet* is using communication mode COM 2. This enables the transmission of the actual process signal as well as the transmission of switching signals and diagnostic messages. COM 2 has a transmission rate of 38.4 kbaud and can transmit 8-8 bits of process data to the controller every 2.8 ms.

### Integrated Switching cycle counter

The device has two built-in counters as a limit for warnings.

### Industry 4.0 Preventive maintenance

To monitor the product lifecycle, the smart connector can **detect and store** switching cycles. To **observe the whole lifecycle** there is one counter, which can not be reseted. And there is another one which can be set up by the user like in your car.

There is a possibility to every counter and to almost every measured parameter to set up a limit. **In case of reaching this threshold an automatic event can be generated** to handle them in higher levels.

Thanks to the switching cycle counter in connectors, failures can be prevented and product life cycles analyzed.

## Power-saving PWM mode

To **reduce the power consumption** of the connected solenoid coil, smart connector offers PWM mode. The Pulse Width Modulation mode allows to regulate the output current.

Switch on time can be set up to maximum 2.000 milliseconds to ensure the perfect pull-in of the valve. In this phase the coil recives the full power. After switch-on time, the PWM mode is activated.

The required power reduction can be achieved by adjusting the duty cycle parameter. The PWM operation works also in off-line\* modes.  
\*without using IO-Link communication

## Smart automatic Diagnostic data

The IO-Link connector has numerous diagnostic data:

- Supply voltage
- Output current
- Load resistance
- Power consumption of the solenoid coil
- Own temperature
- Switch-on time of the valve

## Status signal Multicolor RGB LED

**Customize your connector!**

Different output states can have different LED colors.

The „Find me“ mode

The *nass magnet* smart connector can be switched to a „Find me“ mode. This mode is useful if the solenoid coil, the valve system or the connector itself (assuming it is still electrically powered) should fail. An integrated RGB LED now indicates the location of the connector to be checked by the maintenance service by flashing in 7 different colors.

## Data storage Configuration memory

The configured parameters of the connector are stored in the data storage and can be read out from the affected connector and transferred to the replacement product in case of a failure.

It will **save time and cost** in case of replacement.

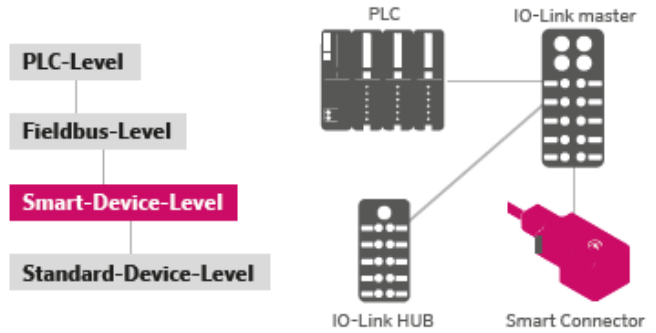
## Two different Operating modes

### 1. IO-Link mode

Operation and control via the IO-Link master

### 2. Standard mode

The valve connector operates in two-wire mode with preset PWM and/or switch-on and switch-off timer function



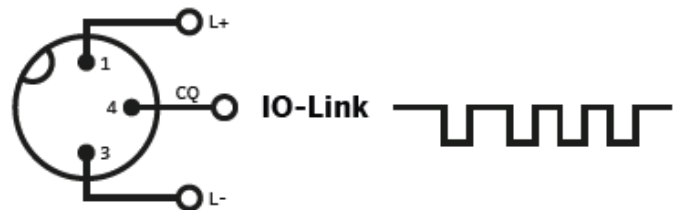
## Overview

### Technical data

Series .....	Type A according to DIN EN 175301-803
Connection .....	M12-connector (3-pole)
Nominal voltage .....	24 V DC (10-30 V DC)
Output power .....	max. 500 mA (depending on the master)
Internal consumption .....	< 10 mA
Interface .....	IO-Link V1.1
IO-Link master port type .....	Class A
Cycle time .....	2.8 ms
Process data .....	1/1 byte

## Pin layout

- Pin 1 - 24 V
- Pin 3 - 0 V
- Pin 4 - Switching and communication power (C/Q)  
(IEC 60974-5-2)



CQ = Switching and communication power