

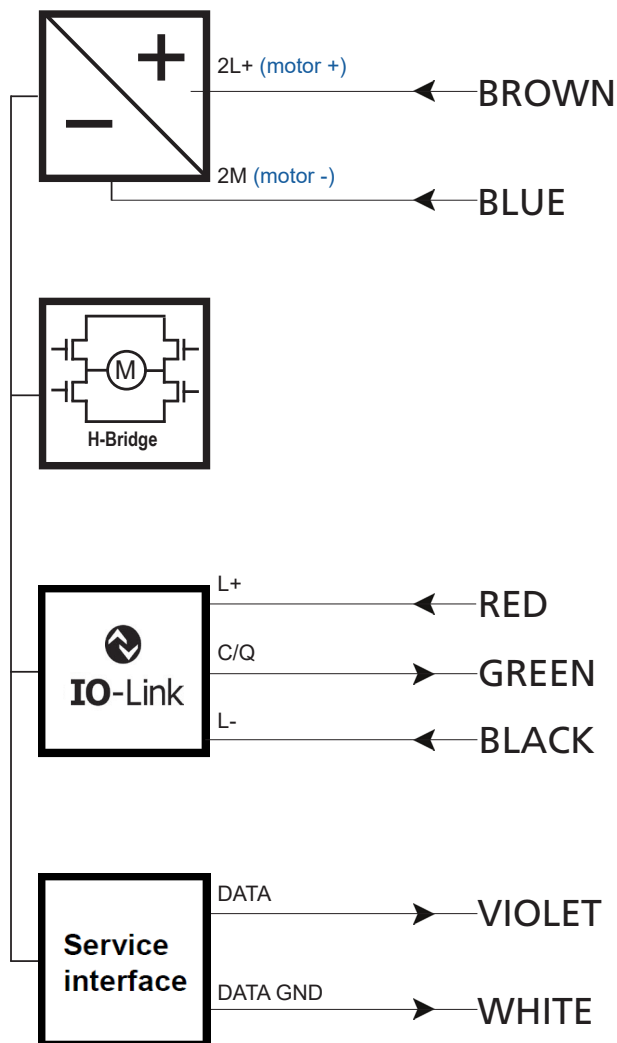
 **IO-Link**



Actuator LA25  
**IO-Link**  
*Quick start guide*

# Connection diagram

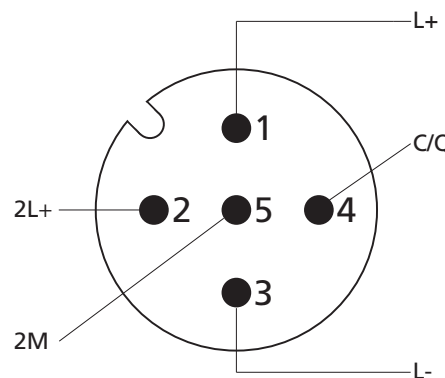
25XXXXXXXXXXAB1X=XXXXXXXXXXXXXXXX



## 2 M12 CONNECTOR

5 The LA25 with IO-Link and M12 connector is a plug-and-play solution. If flying leads is the preferred option, please be aware that the LINAK cable colours differ from the IO-Link standard. The cable colours from the actuator and the M12 port numbers are specified in the table below. In a setup where the violet and white wires are not used, we strongly recommend insulating these to avoid short circuits and eventually damaging the actuator.

	Connects to:	Actuator Flying leads:	M12 Port Class B
1	2L+	Brown	2
4	2M	Blue	5
3	L+	Red	1
	C/Q	Green	4
	L-	Black	3



Please be aware that if the power supply is not properly connected, you might damage the actuator!




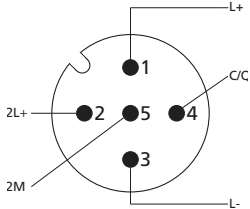
An IODD file describes the IO-Link parameters for easy PLC configuration. The newest version is available online at the official IO-Link IODDfinder.



We offer a service interface called **BusLink** with features like e.g. diagnostics, manual run and configuration. The newest version is available online at [LINAK.COM/TECHLINE](http://LINAK.COM/TECHLINE)

Please note: The BusLink configuration cable must be purchased separately. Item number for BusLink cable kit: 0147996 (adapter + USB2Lin)

# I/O Specifications

Input/Output	Specification	Comments
Description	IO-Link is standardised IO technology (IEC 61131-9) for the communication with actuators. The point-to-point communication is based on the long established actuator connection without additional requirements regarding the cable material. IO-Link is no fieldbus but the further development of the existing, tried-and-tested connection technology for actuators.	
Brown (M12 port 2) 2L+	Power supply motor + 24 VDC + (VCC) Connect Brown to positive	<p>Note: Do not change the power supply polarity on the brown and blue wires! Power supply GND (-) is electrically connected to the housing Current limit levels can be adjusted through BusLink</p> <p>If the temperature drops below 0°C, all current limits will automatically increase to 6A for 24V. 24V ± 10% - max. 2.5A depending on load 24V, current limit 5A</p>
Blue (M12 port 5) 2M	Power supply motor - 24 VDC - (GND) Connect Blue to negative	
Red (M12 port 1) L+	IO-Link supply + 18 - 30 VDC +	<p>On voltage: 18 to 30 V</p>  <p>M12 plug on device - pin numbering and connections.</p>
Black (M12 port 3) L-	IO-Link supply - 18 - 30 VDC - (GND)	
Green (M12 port 4) C/Q	IO-Link C/Q (data communication)	<p>IO-Link is fieldbus independent and can be integrated into all fieldbus systems worldwide. Transmission rate: 38.4 kbaud (COM 2) Max cable length: 15 meters The IODD file describes the parameters, find it here: <a href="https://ioddfinder.io-link.com">https://ioddfinder.io-link.com</a></p>
Violet	Service interface	<p>Only BusLink can be used as service interface. Make sure that the violet and white wires are not short-circuited</p>
White	Service interface GND	
Yellow	Not used	



Please note that version 1.0 of IO-Link does not support data storage. Therefore, it is recommended to disable the data storage feature on the PLC/IO-Link master.

Data storage is a recommended feature in IO-Link, which makes it easy to replace an existing device with a substitute. Data storage will be released in a later software version.

# Data - output and input

When controlling the actuator from the IO-Link master, it is important to understand the data output and input. For IO-Link, this is predefined by the official protocol (and IODD file) and the specific data is described in the tables below:

Data output			
Data name:	Field size	Resolution/encoding	
Position	16 bit	0.1 mm/bit and position lost	
Actual current consumption	8 bit	0.25 A/bit	
Status	8 bit	B0: EOS OUT B1: EOS IN B2: Over current B3: Running out B4: Running in Bitwise encoding	
Errors	8 bit	0 = No error 1 = Hall error 2 = Over voltage 3 = Under voltage 4 = Not used 5 = EOS error 6 = Not used 7 = Temperature error 8 = Heartbeat error 9 = SMPS error Numerical encoded	
Data input			
Set position (Run command)	16 bit	0x0000-0xFFEF: 0xFFFFB-0xFFFF0: 0xFFFC: 0xFFFFD: 0xFFFFE: 0xFFFFF:	Run to position (0.1 mm/bit) Reserved Clear error Run out Run in Stop
Set maximum current	8 bit	0.25 A/bit (0 = default value)	
Set speed	8 bit	0.5 %/bit	

# LINAK specific parameters

On the IO-Link master, there are standard IO-Link parameters available such as e.g. Product ID and firmware revision. There are also LINAK specific parameters available. These include configuration of the behaviour in outwards and inwards direction and historic usage data used for diagnostics:

LINAK specific parameters			
	Description:	Comment:	Resolution/encoding:
READ AND WRITE	Current limit out		0.25A/bit
	Current limit in		0.25A/bit
	Soft start time out	0 = default or min. 300 ms	1ms/bit
	Soft start time in	0 = default or min. 300 ms	1ms/bit
	Soft stop time out	0 = hard stop or min. 300 ms	1ms/bit
	Soft stop time in	0 = hard stop or min. 300 ms	1ms/bit
	Max speed	0-100 %	1%/bit
	Virtual end of stroke out		0.1mm/bit
	Virtual end of stroke in		0.1mm/bit
	READ ONLY	UIN	Unique identification number
Config PO number		Production order number	U32 number
Max. current seen			0.25A/bit
Max. temperature seen			1 °C/bit (-40 °C offset)
Lowest temperature seen			1 °C/bit (-40 °C offset)
Total run time			1s/bit
Reason for last stop		0 = none, 1 = H-bridge fault, 2 = Temperature error, 4 = Under-voltage, 8 = Over-current, 16 = Internal PSU failure, 32 = EOS fault, 64 = Hall fault, 256 = Over-voltage, 512 = Position not changing, 1024 = Current measurement HW failure	
Number of LINAK current overloads out			1time/bit
Number of LINAK current over-loads in			1time/bit
Number of customer overloads out			1time/bit
Number of customer overloads in			1time/bit
Number of end of stroke out			1time/bit
Number of end of strokes in			1time/bit
Number of starts out			1time/bit
Number of starts in			1time/bit
Total piston distance (travelled)			5m/bit

# FAQs - Troubleshooting

Based on input from our customers, here are some of the frequently asked questions that might help you to troubleshoot an actuator in an IO-Link network:

## Does the actuator support data storage (auto/manual)?

The current version of LA25 IO-Link does not support data storage. Therefore, we strongly recommend that you disable this feature on the IO-Link master side to ensure that the system works as intended.

## Where can I find the latest IODD file?

On the official IODD Finder, you can always find the latest version for LA25 - visit [ioddfinder.io-link.com](http://ioddfinder.io-link.com)

## Why is the actuator not running despite giving it a run command?

If the actuator is not running when applying a run command (0xFFFD for out and 0xFFFE for in), please check the following:

1. Make sure power is applied from the power supply
2. Send a "clear error" (0xFFFC) command before sending a run command

## Why do I get feedback (data) but the actuator is unable to run?

The LA25 is designed with a split supply PCB. This means, that an IO-Link master can receive data from the actuator, despite not supplying 24 VDC to the motor itself from a power supply.

1. Make sure power is applied from the power supply to the brown and blue wires - [see port configuration \(Class B\)](#)

### *Please note:*

*We use dual PSU inputs because the majority of IO-Link masters on the market are not able to supply enough current (A) to run the actuator at full load directly from the master.*

## Still experiencing problems with your actuator?

Please contact your local LINAK office for technical support.

# Declaration of Conformity



## MANUFACTURER'S DECLARATION OF CONFORMITY

**We:**

LINAK A/S  
Smødevænget 8, Guderup  
DK-6430 Nordborg, Denmark

**declare under our own responsibility that the product(s):**

LINAK® LA25  
"IO-Link Device"

**to which this declaration refers conform to:**

- IO-Link Interface and System Specification, V1.1, July 2013 (NOTE 1,2)
- IO Device Description, V1.1, August 2011
- IO-Link Interface and System Specification, V1.0, January 2009 (NOTE 1)
- IO Device Description, V1.0.1, March 2010

**The conformity tests are documented in the test report:**

LA25IO Physical layer test report  
LA25IO Device test

**Issued at LINAK HQ, 14/12-20**

**Authorized signatory**

**Name:** Jens Lorenzen

**Title:** Senior Project Manager R&D

**Signature:**

Reproduction and all distribution without written authorization prohibited

NOTE 1 Relevant Test specification is V1.1, July 2014

NOTE 2 Additional validity in Corrigendum Package 2015

Release March 2016

Published 14.12.2020

---

**Terms of use**

The user is responsible for determining the suitability of LINAK products for specific application. LINAK takes great care in providing accurate and up-to-date information on its products.

However, due to continuous development in order to improve its products, LINAK products are subject to frequent modifications and changes without prior notice. Therefore, LINAK cannot guarantee the correct and actual status of said information on its products.

While LINAK uses its best efforts to fulfill orders, LINAK cannot, for the same reasons as mentioned above, guarantee the availability of any particular product. Therefore, LINAK reserves the right to discontinue the sale of any product displayed on its website or listed in its catalogues or other written material drawn up by LINAK.

All sales are subject to the Standard Terms of Sale and Delivery for LINAK. For a copy hereof, please contact LINAK.