

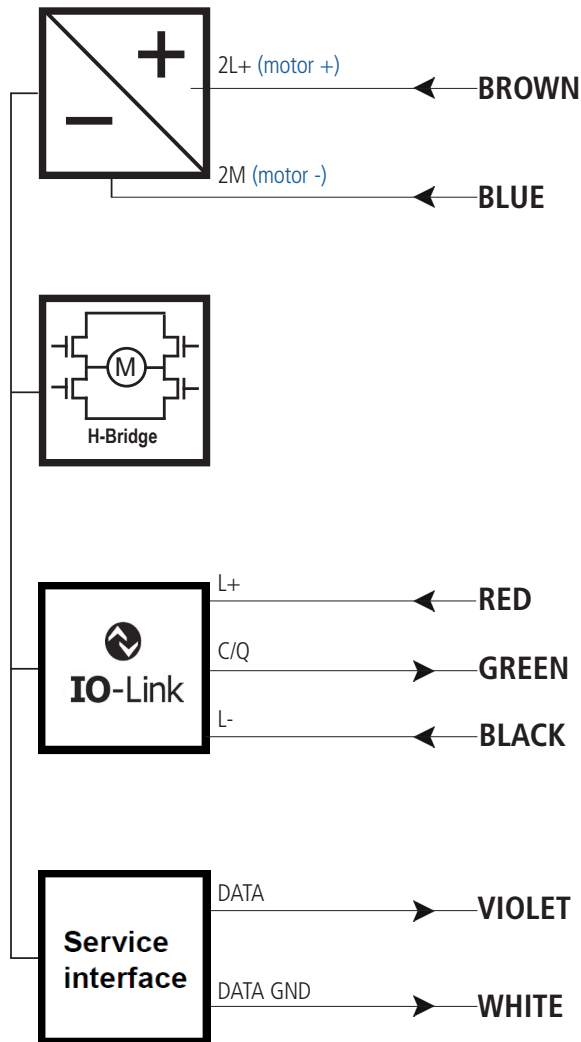
 **IO-Link**



Actuator LA25
IO-Link
Quick start guide

Connection diagram

25XXXXXXXXXXAB1X=XXXXXXXXXXXXXX



2 M12 connector

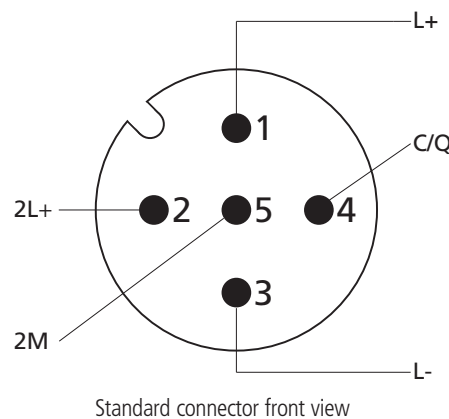
The LA25 with IO-Link and M12 connector is a plug-and-play solution.

5 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
2L+	Brown	2
2M	Blue	5
L+	Red	1
C/Q	Green	4
L-	Black	3

1
4
3



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


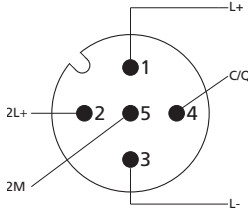


An IODD file describes the IO-Link parameters for easy PLC configuration. The newest version is available online at the official IO-Link IODDfinder.



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.
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 If the temperature drops below 0°C, all current limits will automatically increase to 6 A for 24 V. 24 V ± 10% - max. 2.5 A depending on load 24 V, current limit 5 A</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: https://ioddfinder.io-link.com</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 - output and input

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

Data output		
Data name:	Field size	Details
MSB	Reserved	8 bit Always write 0xFF
	Reserved	8 bit Always write 0xFF
	Reserved	8 bit Always write 0xFF
	Errors	8 bit 0 = No error 1 = Hall error 2 = Over voltage 3 = Under voltage 4 = Not used 5 = End stop signal error 6 = Not used 7 = Temperature error 8 = Heartbeat error 9 = SMPS error <i>Numerical encoded</i>
	Status	8 bit B0: End stop signal out B1: End stop signal in B2: Over current B3: Running out B4: Running in <i>Bitwise encoding</i>
	Actual current consumption	8 bit 0x00 - 0xFF [0-255]: Measured current (0.25 A/bit)
LSB	Position	16 bit 0x0000 - 0xFFEF [0-65519]: Actual position (0.1 mm/bit) 0xFFFF [65535]: Position lost
	Data input	
Data name:	Field size	Details
MSB	Reserved	Always write 0xFF
	Reserved	Always write 0xFF
	Reserved	Always write 0xFF
	Reserved	Always write 0xFF
	Set speed	8 bit 0x00 - 0xFF [0-255]: >200 = max Speed (0.5 %/bit)
	Set maximum current	8 bit 0x00 - 0xFF [0-255]: 0 = default Max. current (0.25 A/bit)
LSB	Set position (Run command)	16 bit 0x0000 - 0xFFEF [0-65519]: Run to position (0.1 mm/bit) 0xFFFFB - 0xFFFF0 [65520-65531]: Reserved 0xFFFFC [65532]: Clear error 0xFFFFD [65533]: Run out 0xFFFFE [65534]: Run in 0xFFFFF [65535]: Stop

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		0.25 A/bit
	Current limit in		0.25 A/bit
	Soft start time out	0 = default or min. 300 ms	1 ms/bit
	Soft start time in	0 = default or min. 300 ms	1 ms/bit
	Soft stop time out	0 = hard stop or min. 300 ms	1 ms/bit
	Soft stop time in	0 = hard stop or min. 300 ms	1 ms/bit
	Max speed	0-100 %	1 %/bit
	Virtual end of stroke out		0.1 mm/bit
	Virtual end of stroke in		0.1 mm/bit
	READ ONLY	UIN	Unique identification number
Config PO number		Production order number	U32 number
Max. current seen			0.25 A/bit
Max. temperature seen			1 °C/bit (-40 °C offset)
Lowest temperature seen			1 °C/bit (-40 °C offset)
Total run time			1 s/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			1 time/bit
Number of LINAK current overloads in			1 time/bit
Number of customer overloads out			1 time/bit
Number of customer overloads in			1 time/bit
Number of end of stroke out			1 time/bit
Number of end of strokes in			1 time/bit
Number of starts out			1 time/bit
Number of starts in			1 time/bit
Total piston distance (travelled)			5 m/bit

Checklist - First time installation

To guide you through the process of integrating the first LA25 IO-Link in your system, here is a checklist with the most important steps to consider:

- Configure the IO-Link master to "Type B / Class B"**
- Disable data storage on the IO-Link master**
- Make sure that the amperage rating of the IO-Link master port is sufficient (min. 2 A)**
If not, we strongly recommend to power the motor separately ([read more here](#))
- Plug in the M12 connector or wire up the actuator with flying leads to the master**
- Make sure you receive data from the actuator (indicating that communication is OK)**
- Make sure that the data order is correct (IODD file should make this easier)**
Read more about this [here](#)
- Send a "clear error command" (0xFFFC or 65532)**



Start moving!

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

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

If the actuator is not running when applying a run command (0xFFFD/65533 for out and 0xFFFE/65534 for in), please check the following:

1. Make sure power is applied from the power supply
2. Send a "clear error" (0xFFFC/65532) 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 \(Class B\)](#)
2. If the actuator is powered directly from the master, this must meet the amp requirements as specified on the product label (max. 2.5 amps on a standard LA25)

Why does the PLC show a reversed data order?

On most PLCs and IO-Link masters, the IODD file will ensure the correct order of data input/output bytes according to the table above. However, some controllers may reverse the data order. Please make sure the correct The Most Significant Byte [MSB] and Least Significant Byte [LSB] is matching your configuration.

If you experience maximum feedback data values (position, current and/or speed), 0xFF [255] for byte data types and 0xFFFF [65535] for integer data types, the order is most likely reversed.

What has the highest priority - process or diagnostic data?

Commonly referred to as cyclic and acyclic data. For example, current cut-off value in amps can be set in both cyclic and acyclic data. In this case the lowest value determine when the actuator will stop.

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:

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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

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