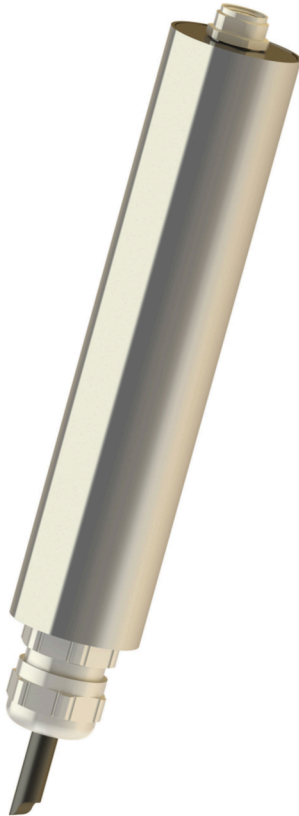


Inductive displacement measuring system

Interface: **IO-Link**

Model **IEIO25**



- **Contact-less, wear-free sensor system**
- **Digital IO-Link interface**
- **12 bit resolution**
- **Up to 200 mm measuring range**
- **Return spring up to 100 mm**
- **Stainless steel version**
- **Protection class IP66**



General functional principle

The model IEIO25 is a measuring system, which comprises an inductive linear displacement transducer and a cylindrical electronic module. Both items are supplied and calibrated as one unit. They carry identical serial numbers and should not be combined with other items of the same series.

Operating principle of electronic module

The cylindrical housing in stainless steel has an outside diameter of 25 mm. It contains the excitation circuit for the inductive transducer (oscillator and demodulator) as well as the conditioning electronics and the IO-Link interface

Linear transducer IW10/IW101 and IW120/X

The linear transducer is available for measuring ranges between 2 mm and 200 mm. The smaller IW10 is available for 2 mm to 15 mm measuring range, the larger IW120 for measuring ranges up to 200mm.

A return spring can be fitted to the item for measuring ranges ≤ 100 mm for use as a gauge. A cable with suitable connectors is required to connect the transducer to the electronic module IEIO25. This cable must be supplied by the user.

Please refer to the data sheets of the respective transducer for more details (IW10: data sheet 10278, IW120: data sheet 10214).

Inductive displacement measuring system - model IEIO25

Technical data

Electrical data

■ Sensor system:	Inductive transducer
■ Operating voltage range:	18 ... 30 VDC
■ Power consumption:	< 2.3 W
■ Switch-on current:	< 500 mA
■ Resolution position output:	4096 steps / measuring range (12 bit)
■ Measuring range:	up to 200 mm (depending on transducer)
■ Dynamic range:	100 Hz (plunger movement)
■ Absolute accuracy:	± 0.1 % .. 0.5 % of measuring range, depending on transducer
■ Repeatability:	± 0.05 % tbc.
■ Refresh time:	1 ms
■ Electrical connection:	M12 connectors (4-pole male - IO-Link) M 8 connector (8-pole female - to transducer)

Input data (to control)

- 2 bytes position data (format: unsigned)
- 2 bytes temperature data of main controller (unit: °C, resolution: 0.1 °C / digit)
- 2 bytes status word

Output data (from control)

- 1 control byte

IO-Link data

■ IO-Link Interface:	IEC 61131-9
■ Port class:	A (option: class B), class A can be connected to class B master port
■ Specification:	Version 1.1.3
■ Communication:	COM3 (230.4 kBaud)
■ Cycle time:	< 5 ms
■ Parameters:	See below (page 5)
■ Profile:	IO-Link Common Profile – Specification V1.0, Order No. 10.072
■ General guidelines:	IO-Link Design Guideline, Order No. 10.912

System data

■ On-time (rise time) of supply voltage:	500 ms (10 % to 90 %) required
■ Storage cycle time:	3 s per storage cycle
■ Set-up time:	~ 2 s in the operating temperature range

Environmental data

■ Operating (ambient) temperature range:	-10 °C to +80 °C
■ Storage temperature range:	-30 °C to +80 °C
■ Resistance:	
□ To shock:	300 m/s ² , 6 ms, (DIN EN 60068-2-27) per 100 x in 3 axes
□ To vibration:	100 m/s ² , 5 Hz ... 2000 Hz, (DIN EN 60068-2-6) per 1 h in 3 axes
■ Protection type:	IP66 (DIN EN 60529)
■ Humidity:	10 % to 95 % condensing
■ Altitude:	≤ 2000 m

Inductive displacement measuring system - model IEIO25

Technical data

EMC standards

EN 61000-6-4:2006 + A1:2011	EMC Part 6-4: Generic standards-Emission standard for industrial environments
EN 61000-6-2:2005	EMC Part 6-2: Generic standards-Immunity for industrial environments
EN 61000-4-2:2009	EMC Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test
EN 61000-4-3:2006 A1:2008 + A2:2010	EMC Part 4-3: Testing and measurement techniques - Radiated, radio frequency, electromagnetic field immunity test
EN 61000-4-4:2004	EMC Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
EN 61000-4-6:2009	EMC Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-8:2010	EMC Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test Power frequency magnetic field immunity test: 30 A/m, test criterion A 100 A/m, test criterion B
EN 61000-4-29:2000	EMC Part 4-8: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests
IEC 61326-3-2:2018	Electrical equipment for measurement, control and laboratory use - EMC requirements Part 3-2: Immunity for safety-related systems and for equipment intended to perform safety related functions (functional safety) - industrial applications with specified electromagnetic environment

Devices must be connected using shielded cables and properly connected to PE to comply with these norms.

Surge protection is not provided by the device and needs to be ensured by the user.

Inductive displacement measuring system - model IEIO25

IO Link communication data

IO-Link input / output data

Input data: Encoder → Master

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
Position		Temperature		Status	

Output data: Master → Encoder

Byte 0
Control

Status bytes

Byte 4								Byte 5							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
16 bit status															

	Bit	Description
Byte 4	0 - 7	reserved
Byte 5	8	Encoder fault
	9 - 15	reserved

Control byte

Byte 1							
7	6	5	4	3	2	1	0
7	6	5	4	3	2	1	0
8 bit control							

Bit	Description
0 - 1	reserved
2	Application reset. All parameters are restored to factory default values (except I&M data). No IO-Link communication reset. Command is executed immediately on rising edge.
3	Position preset. Sets position value to "reference value" (not implemented yet) Command is executed immediately on rising edge.
4 - 7	reserved

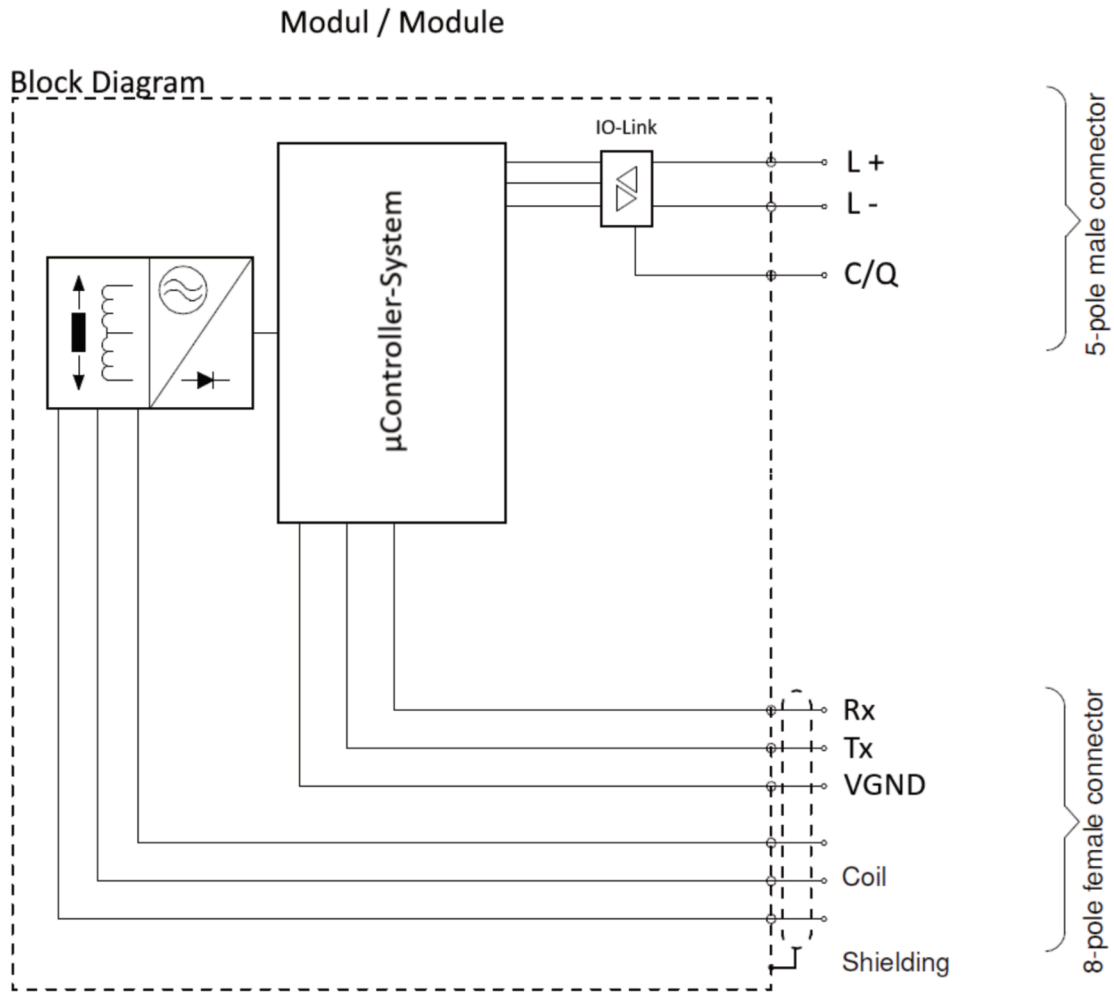
Inductive displacement measuring system - model IEIO25

IO-Link parameter list

Parameter (object/sub) - access	Value range (data length: octet / default)	Parameter description
Vendor ID (0x00) - read only	2 octets	0x0159
Device ID (0x00) - read only	3 octets	0xXXXXYY (X: 01: prototype, 00 serial product, YYYY: Number of connection assignment document)
Vendor Name (0x10) - read only	max. 64 octets	TWK-ELEKTRONIK GmbH
Vendor Text (0x11) - read only	max. 64 octets	www.twk.de/produkte
Product Name (0x12) - read only	max. 64 octets	IEIO25/x-Lxx
Product ID (0x13) - read only	max. 64 octets	IEIO
Product Text (0x14) - read only	max. 64 octets	Inductive linear displacement transducer
Serial Number (0x15) - read only	max. 64 octets	device specific
Hardware Version (0x16) - read only	max. 64 octets	device specific
Firmware Version (0x17) - read only	max. 64 octets	device specific
ApplicationSpecific Tag (0x18) - read / write	max. 32 octets	device specific (not affected by application reset)
Function- Tag (0x19) - read / write	max. 32 octets	device specific (not affected by application reset)
Location- Tag (0x1A) - read / write	max. 32 octets	device specific (not affected by application reset)
Order Number (0x40) - read only	max. 32 octets	IEIO25/x-Lxx
Customer Part Number (0x41) - read only	max. 32 octets	device specific
Manufacturing Date (0x42) - read only	max. 32 octets	yyyy/mm/dd (device specific)
Installation Date (0x43) - read / write	max. 32 octets	device specific (not affected by application reset)
Resolution [steps/ measuring range] (0x64) - read only	1 ... 4096 steps (4 / 4096)	4096
Total number of steps [steps] (0x65) - read only	1 ... 4096 steps (4 / 4096)	4096
Device error history (0x1003/01) - read / write	Per error: 0x00 .. 0xFFFF FFFF (4 / 0)	History of up to 20 device errors. Manual reset required when full.
Reference value (0x1100/02) - rw	0 ... total number of steps -1 (2 / 2048)	For calibration in application, the position value can be set to any value within the measuring range.
Operating hours (0xE1) - read only	4 octets	
Temperature indicator (0xE2) - read only	2 octets	

Inductive displacement measuring system - model IEIO25

Principle circuit diagram (simplified)



Inductive displacement measuring system - model IEIO25

Electrical connection

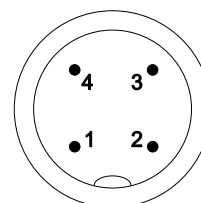
Pin configuration and numbering

Viewed looking at the contact side of connectors / sockets installed in the IEIO.
Depending on customer specifications, the use of different connectors with individual assignment is possible.
Please always note the connection assignment TY which is enclosed with each device.

Connector IO-Link Class A - S1

PIN	Connector S1 (pins - male)
1	L+ / Operating voltage + V_s
2	I/Q (DI/DO (digital I/O)) / Not used
3	L- / Operating voltage - V_s
4	C/Q / IO-Link Interface

M12 male

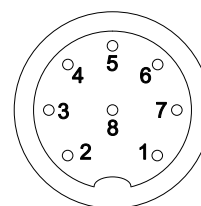


This connector can be connected to Class B port at master as well.

Connector for transducer - S2

PIN	Connector S2 (socket - female)
1	coil end
2	coil start
3	coil centre
4	shield
5	not connected
6	UART RX*
7	UART TX*
8	GND*

M8 female



* Pins 6 to 8 are used for internal programming only and may not be connected by the customer.

Cable

Cable for IO-Link interface: 3 or 5-wire (class A or B)

IO-Link specifications allow the use of untwisted and unshielded cables. To fully comply with the EMC norms stated in this data sheet, shielded cables and a proper connection to PE must be used!

Inductive displacement measuring system - model IEIO25

Order number

IEIO 25 / X - L 01 → standard version

IEIO	Inductive displacement measuring system with IO-Link interface
25	Design form: 25: Design form Ø 25 mm
X	Calibrated measuring range in mm (2 mm - 200 mm)
L	Output: IO-Link interface
01	Electrical and mechanical variants: 01: According to this data sheet xx: Further versions on customer request

Mating connectors

STK4GS60 M12, 4-pin, female, A-coded, straight - data sheet [STK14572](#)
STK4WS61 M12, 4-pin, female, A-coded, angled - data sheet [STK14675](#)

Cable

KABEL-X-232 M12 Connector Pin (M12-A coded) to M12 Connector Socket (M12-A coded)
 X: length of cable (1m / 2m / other lengths on request) - data sheet [KBL16122](#)

Documentation

- Data sheet IEIO (electronics) [16632](#)
- Data sheet linear transducer IW10/IW101 [10278](#)
- Data sheet linear transducer IW120 [10214](#)
- IODD and FW update files on request
- For more information visit www.twk.de

Inductive displacement measuring system - model IEIO25

Installation drawing

Model IEIO25/x-Lxx

Dimensions in mm

