



IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE



USER MANUAL

TABLE OF CONTENTS

GENERAL SECURITY ADVICE	3
IMPORTANT INFORMATION	3
WARNING	3
ABOUT THIS MANUAL	3
BACKGROUND	3
RELEASE NOTE	3
IMPRINT	3
COPYRIGHT	3
USER ANNOTATION	3
INTRODUCTION	4
GENERAL INFORMATION	4
INSTALLATION	5
TECHNICAL DATA	6
DIAGNOSIS LED	8
CONNECTOR PIN OUT	8
PROCESS DATA	9
INDEX OVERVIEW	10

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

General Security Advice

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Warning

Electrical equipment should be serviced only by qualified personnel. No responsibility is assumed by POSITAL for any consequences arising out of the use of this material. This document is not intended as an instruction manual for untrained people.

About this Manual

Background

This user manual describes how to install and configure an IXARC absolute rotary encoder with IO-Link interface.

Release Note

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User Annotation

The FRABA GmbH welcomes all readers to send us feedback and comments about this document. You can reach us by e-mail at info@posital.eu

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Introduction

This manual explains how to install and configure the IXARC absolute rotary encoder with IO-Link interface. Magnetic rotary encoders determine positions using the Hall effect sensor technology developed for the automotive mass market. A permanent magnet fixed to the shaft generates a magnetic field that is sampled by the Hall sensor, which translates the measured value into a unique absolute position value. To register revolutions even when no voltage is applied, energy from the turning of the shaft must suffice for proper operation. An innovative, patented technology makes this feasible even at low rotational speeds and through long standstill periods – a Wiegand wire ensures that the magnetic field can only follow the turning of the shaft in discrete steps. A coil wound on the Wiegand wire receives only brief, strong voltage. This description is not intended to replace the documentation for the product concerned.

General Information

Hazardous voltage and mechanisms, death, or serious injury due to electrical shock, burns and entanglement in moving parts, or property damage will result if safety instructions in the documentation are not followed. Do not service or touch until you have de-energized high voltage, grounded all terminals and turned off the control voltage. If the pertinent documentation is not in your hands, please ask for it by using the order key in the product catalog or contact your FRABA POSITAL contact person. Only proper trained staff aware of local safety regulations is allowed to commission and operate, or to work on and around this product after procedures contained in the documentation. Before touching electronic assemblies make sure static charges are eliminated by touching an earthed component.

Typical Applications:

- Factory Automation
- Process Automation
- Production Machinery
- Packaging Machinery

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Installation

Instructions to mechanically install and electrically connect the angular encoder



Do not remove or mount the connector while the encoder is powered on!



Do not stand on the encoder!



Do not adapt the driving shaft additionally!



Avoid mechanical load!



Do not adapt the housing additionally!

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Technical Data

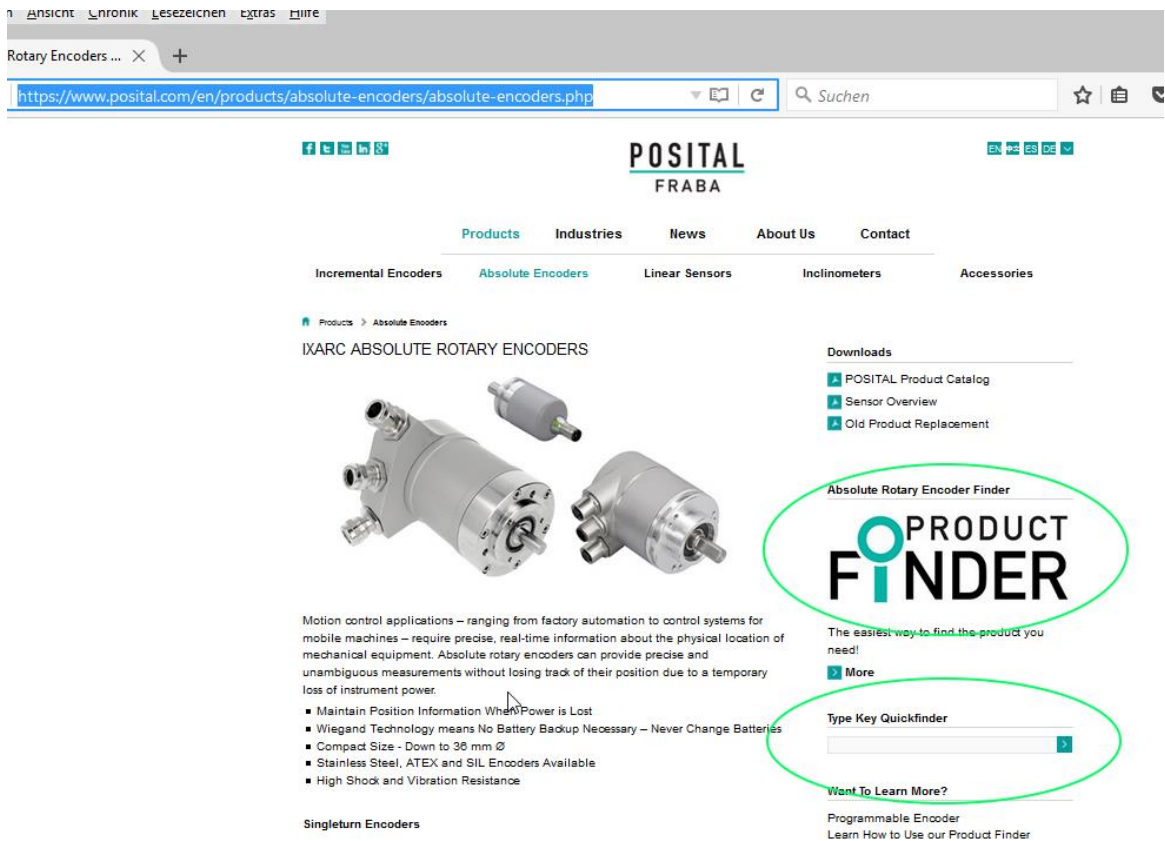
For technical data regarding

- Interface
- Electrical Data
- Sensor Data
- Environmental Condition
- Mechanical Data
- Connection Plan

please refer to the website www.posital.com.

Under 'Products' -> 'Absolute Encoders' you can either

- Use Type Key Quickfinder to directly enter a complete type key of a specific product variant or
- Click on Product Finder to filter for product variants

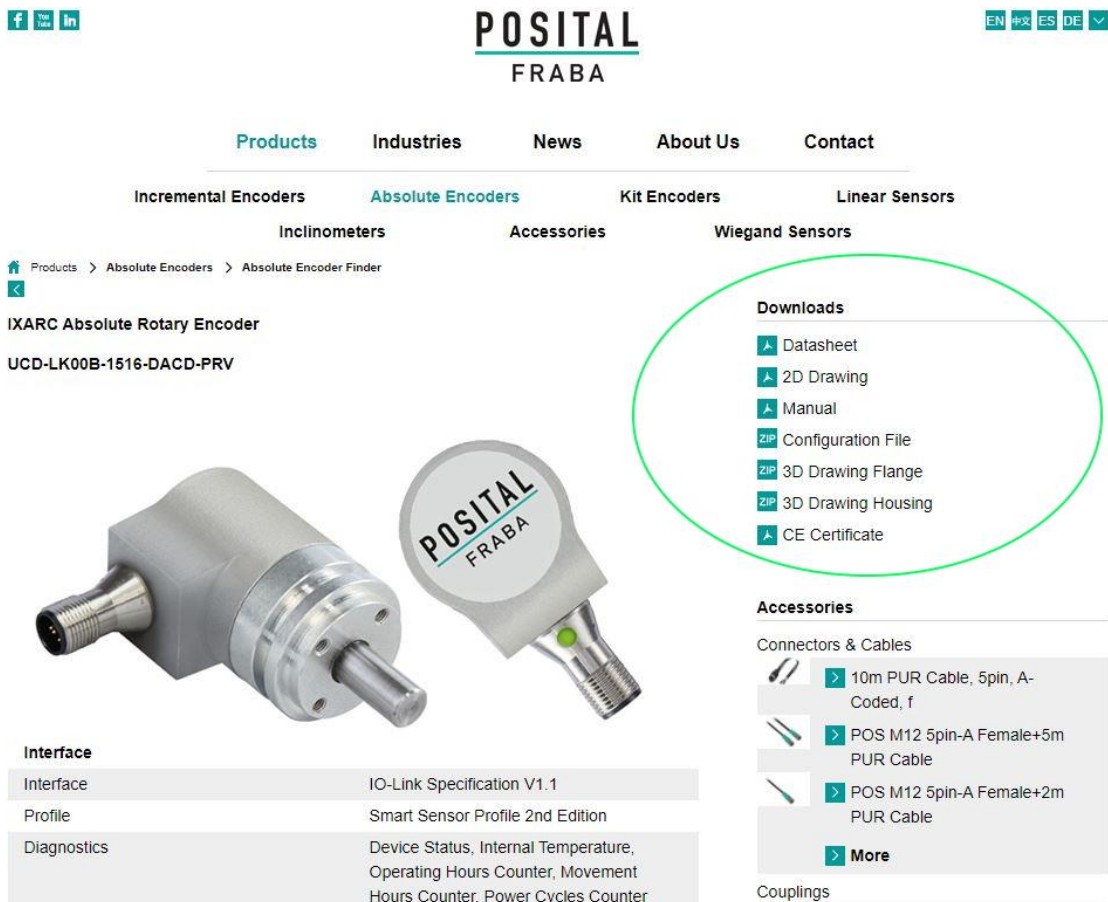


The screenshot shows the website <https://www.posital.com/en/products/absolute-encoders/absolute-encoders.php>. The page features the POSITAL FRABA logo and a navigation menu with options: Products, Industries, News, About Us, and Contact. Below the navigation, there are links for Incremental Encoders, Absolute Encoders, Linear Sensors, Inclinometers, and Accessories. The main content area is titled 'IXARC ABSOLUTE ROTARY ENCODERS' and includes a list of product images. A 'Downloads' section lists: POSITAL Product Catalog, Sensor Overview, and Old Product Replacement. A 'Product Finder' tool is highlighted with a green oval, featuring the text 'Absolute Rotary Encoder Finder' and 'PRODUCT FINDER'. Below this, there is a 'Type Key Quickfinder' search box and a 'Want To Learn More?' section with links for 'Programmable Encoder' and 'Learn How to Use our Product Finder'.

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

On the product variant detail page you can find additional relevant informations as direct download like:

- Mechanical Drawings
- Datasheet
- Manual (this document)
- Configuration File (IODD - IO-Link device description file)



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Incremental Encoders **Absolute Encoders** Kit Encoders Linear Sensors

Inclinometers Accessories Wiegand Sensors

Products > Absolute Encoders > Absolute Encoder Finder

IXARC Absolute Rotary Encoder
UCD-LK00B-1516-DACD-PRV

Interface	
Interface	IO-Link Specification V1.1
Profile	Smart Sensor Profile 2nd Edition
Diagnostics	Device Status, Internal Temperature, Operating Hours Counter, Movement Hours Counter, Power Cycles Counter

Downloads

- Datasheet
- 2D Drawing
- Manual
- Configuration File
- 3D Drawing Flange
- 3D Drawing Housing
- CE Certificate

Accessories

Connectors & Cables

- 10m PUR Cable, 5pin, A-Coded, f
- POS M12 5pin-A Female+5m PUR Cable
- POS M12 5pin-A Female+2m PUR Cable
- More**

Couplings

By using website information you have the great advantage of actual information for the specific product holding in your hands out of a portfolio of more than one million products.

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Diagnosis LED

Parameter *LED Mode* set to *Show communication*

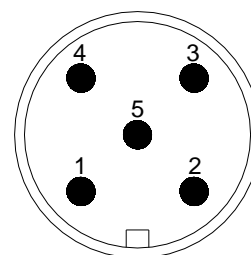
Status LED bicolored	Meaning
Green off	No power supply
Green blinking (1 Hz)	IO-Link communication active
Yellow on	DI/DO active, priority over LED green
Yellow off	DI/DO off

Parameter *LED Mode* set to *Show operating voltage*

Status LED bicolored	Meaning
Green off	No power supply
Green on	Power supply active
Yellow on	DI/DO active, priority over LED green
Yellow off	DI/DO off

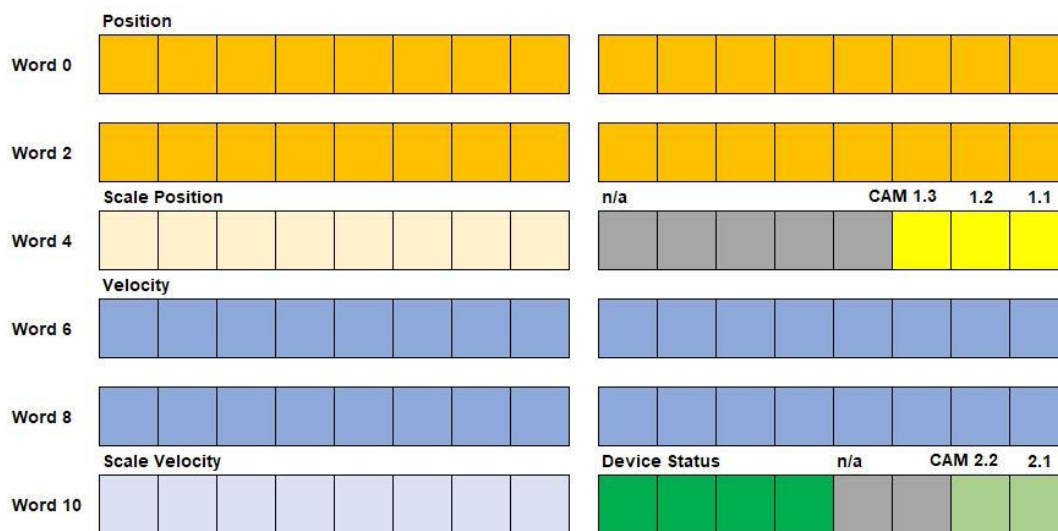
Connector pin out

Signal	5 pin round connector M12
24 V Power supply (L+)	1
Digital Input / Output (DI/DQ)	2
GND (L-)	3
IO-Link Communication (C/Q)	4
Not connected	5



IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Process Data



Scale Position: Scale factor for the process value 'Position' (from WORD 0) is always '1'

Scale Velocity: A PLC function block calculates the velocity part of the process data (from WORD 6) into the unit [rpm]

n/a: Not available area, used to cover structured process data mapping

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Index overview

The following tables list all applicable IO-Link indices.

Standard Parameter - Identification			
Parameter	Index	Sub	Data Type
Vendor Name	16	0	String
Vendor Text	17	0	String
Product Name	18		String
Product ID	19		String
Product Text	20	0	String
Serial Number	21		String
HW Revision	22		String
FW Revision	23		String
Application Specific Tag	24		String
Function Tag	25	0	String
Location Tag	26	0	String

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Standard Parameter - System								
Parameter	Index	Sub	Comments	Default	Min	Max	Data Type	Length [Bits]
System Command	2	0	(1) Upload start (2) Upload end (3) Download start (4) Download end (5) Store (6) Break (130) Restore factory settings (208) Set current position output value to configured preset value (222) Flash on (223) Flash off (228) Reset current position output value to zero (240) IO-Link 1.1 system test command 240, Event 8DFE appears (241) IO-Link 1.1 system test command 241, Event 8DFE disappears (242) IO-Link 1.1 system test command 242, Event 8DFF appears (243) IO-Link 1.1 system test command 243, Event 8DFF disappears				UInteger	8
Device Access Locks	12	0					Record	16
Data Storage		BitOffset 1					Boolean	1

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

CAM 1.1								
Parameter	Index	Sub	Comments	Default	Min	Max	Data Type	Length [Bits]
CAM 1.1 Param. SP1	60	1	Setpoint 1 (SP1 > SP2)	1000	0	2147482880	Integer	32
CAM 1.1 Param. SP2		2	Setpoint 2	0	0	2147482880	Integer	32
CAM 1.1 Config. Logic	61	1	Setpoint logic / State for target detected	1 - Low active	0 - High Active	1 - Low Active	UInteger	8
CAM 1.1 Config. Mode		2	Singlepoint = 0 to SP1, Window = SP1 to SP2	1 - Single Point	1 - Single Point	2 - Window	UInteger	8

CAM 1.2								
Parameter	Index	Sub	Comments	Default	Min	Max	Data Type	Length [Bits]
CAM 1.2 Param. SP1	62	1	Setpoint 1 (SP1 > SP2)	1000	0	2147482880	Integer	32
CAM 1.2 Param. SP2		2	Setpoint 2	0	0	2147482880	Integer	32
CAM 1.2 Config. Logic	63	1	Setpoint logic / State for target detected	1 - Low Active	0 - High Active	1 - Low Active	UInteger	8
CAM 1.2 Config. Mode		2	Singlepoint = 0 to SP1, Window = SP1 to SP2	1 - Single Point	1 - Single Point	2 - Window	UInteger	8

CAM 1.3								
Parameter	Index	Sub	Comments	Default	Min	Max	Data Type	Length [Bits]
CAM 1.3 Param. SP1	16384	1	Setpoint 1 (SP1 > SP2)	1000	0	2147482880	Integer	32
CAM 1.3 Param. SP2		2	Setpoint 2	0	0	2147482880	Integer	32
CAM 1.3 Config. Logic	16385	1	Setpoint logic / State for target detected	1 - Low active	0 - High Active	1 - Low Active	UInteger	8
CAM 1.3 Config. Mode		2	Singlepoint = 0 to SP1, Window = SP1 to SP2	1 - Single Point	1 - Single Point	2 - Window	UInteger	8

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

CAM 2.1								
Parameter	Index	Sub	Comments	Default	Min	Max	Data Type	Length [Bits]
CAM 2.1 Param. SP1	16396	1	Setpoint 1 (SP1 > SP2)	(50.0)	-11990.0	12000.0	Integer	32
CAM 2.1 Param. SP2		2	Setpoint 2	(-50.0)	-12000.0	11990.0	Integer	32
CAM 2.1 Config. Logic	16397	1	Setpoint logic / State for target detected	(0) High active	(0) High active	(1) Low active	UInteger	8
CAM 2.1 Config. Mode		2	Singlepoint = 0 to SP1, Window = SP1 to SP2	(2) Window	(1) Single point	(2) Window	UInteger	8

CAM 2.2								
Parameter	Index	Sub	Comments	Default	Min	Max	Data Type	Length [Bits]
CAM 2.2 Param. SP1	16398	1	Setpoint 1 (SP1 > SP2)	(10000.0)	-11990.0	12000.0	Integer	32
CAM 2.2 Param. SP2		2	Setpoint 2	(-10000.0)	-12000.0	11990.0	Integer	32
CAM 2.2 Config. Logic	16399	1	Setpoint logic / State for target detected	(1) Low active	(0) High active	(1) Low active	UInteger	8
CAM 2.2 Config. Mode		2	Singlepoint = 0 to SP1, Window = SP1 to SP2	(2) Window	(1) Single point	(2) Window	UInteger	8

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Diagnostics								
Parameter	Index	Sub	Comments	Default	Min	Max	Data Type	Length [Bits]
Power Cycles	541	0	Number of power cycles since delivery	0	0	1000000	Integer	32
Operating Hours	542	0	Counter of the operating hours since delivery, minimum operation period counted is 15 minutes	0	0	1000000	Integer	32
Internal Temperature	543	0	Current internal temperature of the device	0	0	1000000	Integer	32
Active Events	545	0	Bit mask for current pending events				Boolean	1
Bit_31		BitOffset 31	Test Event 2. Device Status = 1 (Maintenance required)	(0) noEv	(0) noEv (1) 0x8DFF		Boolean	1
Bit_30		BitOffset 30	Test Event 1. Device Status = 1 (Maintenance required)	(0) noEv	(0) noEv (1) 0x8DFE		Boolean	1
Bit_29		BitOffset 29	Flash sequence active. Device Status = 1 (Maintenance required)	(0) noEv	(0) noEv (1) 0x8CDB		Boolean	1
Bit_15		BitOffset 15	Device temperature over-run	(0) noEv	(0) noEv (1) 0x4210		Boolean	1
Device Status	36	0	(0) Device is OK (1) Maintenance required (2) Out of specification (3) Functional check (4) Failure 5 to 255 (Reserved)	0 - Device is ok			UInteger	8
Detailed Device Status	37	0					OctetStringT	3x8
Movement Hours	4009	0	Shaft rotation in hours, minimum rotation period counted is 15 minutes	0	0	1000000	Integer	32

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Diagnostics					
Parameter	Index	Sub	Comments	Default	Value
Param Configuration Fault	546	0	Displays the wrongly set parameters	0 (OK)	786432 (Device Access Locks, Index = 12) 4063232 (CAM 1.2 Param, Index = 62) 4063233 (CAM 1.2 Param, Index = 62, Subindex = 1) 4063234 (CAM 1.2 Param, Index = 62, Subindex = 2) 1074659328 (CAM 2.2 Param, Index = 16398) 1074659329 (CAM 2.2 Param, Index = 16398, Subindex = 1) 1074659330 (CAM 2.2 Param, Index = 16398, Subindex = 2) 262799360 (Total resolution, Index = 4010) 1073807360 (CAM 1.3 Config, Index = 16385) 1073807361 (CAM 1.3 Config, Index = 16385, Subindex = 1) 1073807362 (CAM 1.3 Config, Index = 16385, Subindex = 2) 1073807363 (CAM 1.3 Config, Index = 16385, Subindex = 3) 262406144 (Resolution, Index = 4004) 91750400 (LED mode, Index = 1400) 44892160 (Active time CAM 1.2, Index = 685) 1073741824 (CAM 1.3 Param, Index = 16384) 1073741825 (CAM 1.3 Param, Index = 16384, Subindex = 1) 1073741826 (CAM 1.3 Param, Index = 16384, Subindex = 2) 1074724864 (CAM 2.2 Config, Index = 16399) 1074724865 (CAM 2.2 Config, Index = 16399, Subindex = 1) 1074724866 (CAM 2.2 Config, Index = 16399, Subindex = 2) 1074724867 (CAM 2.2 Config, Index = 16399, Subindex = 3) 1074528256 (CAM 2.1 Param, Index = 16396) 1074528257 (CAM 2.1 Param, Index = 16396, Subindex = 1) 1074528258 (CAM 2.1 Param, Index = 16396, Subindex = 2) 1074593792 (CAM 2.1 Config, Index = 16397) 1074593793 (CAM 2.1 Config, Index = 16397, Subindex = 1) 1074593794 (CAM 2.1 Config, Index = 16397, Subindex = 2) 1074593795 (CAM 2.1 Config, Index = 16397, Subindex = 3) 3932160 (CAM 1.1 Param, Index = 60) 3932161 (CAM 1.1 Param, Index = 60, Subindex = 1) 3932162 (CAM 1.1 Param, Index = 60, Subindex = 2) 44433408 (Pin 2 DI/DO mode, Index = 678) 38666240 (Pin 2 DI mode, Index = 590) 4128768 (CAM 1.2 Config, Index = 63) 4128769 (CAM 1.2 Config, Index = 63, Subindex = 1) 4128770 (CAM 1.2 Config, Index = 63, Subindex = 2) 4128771 (CAM 1.2 Config, Index = 63, Subindex = 3) 262537216 (Counting direction, Index = 4006) 3997696 (CAM 1.1 Config, Index = 61) 3997697 (CAM 1.1 Config, Index = 61, Subindex = 1) 3997698 (CAM 1.1 Config, Index = 61, Subindex = 2) 3997699 (CAM 1.1 Config, Index = 61, Subindex = 3) 33816576 (Velocity filter length, Index = 516) 262471680 (Preset, Index = 4005)

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Configuration								
Parameter	Index	Sub	Comments	Default	Min	Max	Data Type	Length [Bits]
Connector Pin 2 DI/DO Mode	590	0	Pin 2 as Digital Input or Digital Output	(14) DI – Digital Input	(14) DI – Digital Input (33) DO – Digital Output CAM 1.2		Integer	8
Connector Pin 2 DI Mode	678	0	Pin 2 as Reset or Preset when set to Digital Input	(0) Reset	(0) Reset (1) Preset			8
Active Time CAM 1.2	685	0	Minimum active time of CAM 1.2	(0) OFF	1 (0) OFF	100		16
LED Mode	1400	0	LED mode	(0) Communication	(0) Communication (1) Power			8
Singleturn Resolution	4004	0	Singleturn Resolution	4096	1	65535		16
Preset	4005	0	Preset value for position output	0	0	2147482879		32
Counting Direction	4006	0	Counting direction looking at shaft	(0) cw / clockwise	(0) cw / clockwise (1) ccw / counter-clockwise			8
Total Resolution	4010	0	Total Resolution	16777216	1	2147482880	Integer	32
Velocity Filter Length N	516	0	N last position values used to calculate average velocity	10	(10) 10 (100) 100 (1000) 1000			

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Channel Description						
Parameter	Index	Sub	Comments	Value	Data Type	Length [Bits]
MDC 1 Descr	16512		Description of 1st measurement data channel			88
Lower limit, lower value measurement range		1		(0) 0	Integer	32
Upper limit, upper value measurement range		2		(2147482880) 2147482880		32
Unit code, unit code of the measurement data		3		(1997) none		16
Scale, range shifting (10 scale)		4		(0) 0		8
MDC 2 Descr	16513		Description of 2nd measurement data channel			
Lower limit, lower value measurement range		1		(-120000) 120000	Integer	32
Upper limit, upper value measurement range		2		(120000) 120000		32
Unit code, unit code of the measurement data		3		(1085) rPm		16
Scale, range shifting (10 scale)		4		(-1) -1		8

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Events				
Code	Device Status	Name	Type	Description
36059 d / 8C DB h	1 - Maintenanc e required	Flash sequence active	Warning	Deactivate flash sequence
36350 d / 8D FE h	1 - Maintenanc e required	Test event 1	Warning	Event appears by setting index 2 to value 240, event disappears by setting index 2 to value 241
36351 d / 8D FF h	1 - Maintenanc e required	Test event 2	Warning	Event appears by setting index 2 to value 242, event disappears by setting index 2 to value 243
16928 d / 42 20 h	2 - Out of specification	Device temperature under-run	Warning	Insulate device
16912 d / 42 10 h	2 - Out of specification	Device temperature over-run	Warning	Clear source of heat
36026 d / 8C BA h	3 - Functional Check	Signal detector error / probe dropped	Error	Check device
30480 d / 77 10 h	3 - Functional Check	Short circuit	Error	Check installation
20496 d / 50 10 h	3 - Functional Check	Component malfunction	Error	Repair or exchange

IXARC ABSOLUTE MAGNETIC ROTARY ENCODER WITH IO-LINK INTERFACE

Errors		
Error code	Name	Description
32768 d / 80 00 h	Device application error - no details	Service has been refused by the device application and no detailed information of the incident is available
32785 d / 80 11 h	Index not available	Access occurs to a not existing index
32786 d / 80 12 h	Subindex not available	Access occurs to a not existing subindex
32800 d / 80 20 h	Service temporarily not available	Parameter is not accessible due to the current state of the device application
32801 d / 80 21 h	Service temporarily not available - local control	Parameter is not accessible due to an ongoing local operation at the device
32802 d / 80 22 h	Service temporarily not available - device control	Parameter is not accessible due to a remote triggered state of the device application
32803 d / 80 23 h	Access denied	Write access on a read-only parameter
32816 d / 80 30 h	Parameter value out of range	Written parameter value is outside its permitted value range
32819 d / 80 33 h	Parameter length overrun	Written parameter length is above its predefined length
32820 d / 80 34 h	Parameter length underrun	Written parameter length is below its predefined length
32821 d / 80 35 h	Function not available	Written command is not supported by the device application
32822 d / 80 36 h	Function temporarily unavailable	Written command is not available due to the current state of the device application
32832 d / 80 40 h	Invalid parameter set	Written single parameter collides with other actual parameter settings
32833 d / 80 41 h	Inconsistent parameter set	Parameter inconsistencies were found at the end of block parameter transfer, device plausibility check failed
32898 d / 80 82 h	Application not ready	Read or write service is refused due to a temporarily unavailable application