

C40 2x 0-10V / 6PNP REMOTE

Item No. 0E012721

IO-Link Interface Description



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C40-DIO6AI2 - IO-Link Interface Description

i This document is intended to provide extended and detailed information about the IO-Link interface of the C40-DIO6AI2 inductive coupling system.

Information about general and most important protocol parts are already described in the devices user manual.

To keep the user manual lean and clear, further information about the available features provided through the devices IO-Link interface are described in this separate interface description. With the provided information in this document, it should be possible to operate the C40-DIO6AI2 coupling system in its full functionality.

Process Data

Input Process Data (Master ← Device)

Sub Index	Bit Offset	Data Type	Allowed Values	Name	Description
1	40	boolean	true / false	DI0	State of digital input 0
2	41	boolean	true / false	DI1	State of digital input 1
3	42	boolean	true / false	DI2	State of digital input 2
4	43	boolean	true / false	DI3	State of digital input 3
5	44	boolean	true / false	DI4	State of digital input 4
6	45	boolean	true / false	DI5	State of digital input 5
9	32	boolean	true / false	AI0 - valid	Value of analog input 0 is valid
10	33	boolean	true / false	AI0 - lowerLimit	Value of analog input 0 exceeded lower limit
11	34	boolean	true / false	AI0 - upperLimit	Value of analog input 0 exceeded upper limit
12	35	boolean	true / false	AI1 - valid	Value of analog input 1 is valid
13	36	boolean	true / false	AI1 - lowerLimit	Value of analog input 1 exceeded lower limit
14	37	boolean	true / false	AI1 - upperLimit	Value of analog input 1 exceeded upper limit
16	39	boolean	true / false	error	There is an active error condition
17	16	uint16	-	AI0	Value of analog input channel 0
18	0	uint16	-	AI1	Value of analog input channel 1

Octet 0								
bit offset	47	46	45	44	43	42	41	40
subindex	/////	/////	6	5	4	3	2	1
Octet 1								
bit offset	39	38	37	36	35	34	33	32
subindex	16	/////	14	13	12	11	10	9
Octet 2								
bit offset	31	30	29	28	27	26	25	24
subindex	17							
element bit	15	14	13	12	11	10	9	8
Octet 3								
bit offset	23	22	21	20	19	18	17	16
subindex	17							
element bit	7	6	5	4	3	2	1	0
Octet 4								
bit offset	15	14	13	12	11	10	9	8
subindex	18							
element bit	15	14	13	12	11	10	9	8
Octet 5								
bit offset	7	6	5	4	3	2	1	0
subindex	18							
element bit	7	6	5	4	3	2	1	0

Output Process Data (Master → Device)

Sub Index	Bit Offset	Data Type	Allowed Values	Name	Description
1	8	boolean	true / false	DO0	State of digital output 0
2	9	boolean	true / false	DO1	State of digital output 1
3	10	boolean	true / false	DO2	State of digital output 2
4	11	boolean	true / false	DO3	State of digital output 3
5	12	boolean	true / false	DO4	State of digital output 4
6	13	boolean	true / false	DO5	State of digital output 5

Octet 0								
bit offset	15	14	13	12	11	10	9	8
subindex	/////	/////	6	5	4	3	2	1
Octet 1								
bit offset	7	6	5	4	3	2	1	0
subindex	/////	/////	/////	/////	/////	/////	/////	/////

On-Request Data (ISDU)

Device Identification

Name	VendorName
Index	0x10
Data Type	string [64] - utf8
Access Rights	ro
Default Value	SMW-Autoblok Spannsysteme GmbH

Name	VendorText
Index	0x11
Data Type	string [64] - utf8
Access Rights	ro
Default Value	SMW-electronics GmbH

Name	ProductName
Index	0x12
Data Type	string [64] - utf8
Access Rights	ro

Name	ProductID
Index	0x13
Data Type	string [64] - utf8
Access Rights	ro

Name	ProductText
Index	0x14
Data Type	string [64] - utf8
Access Rights	ro

Name	SerialNumber
Index	0x15
Data Type	string [16] - utf8
Access Rights	ro

Name	HardwareRevision
Index	0x16
Data Type	string [64] - utf8
Access Rights	ro

Name	FirmwareRevision
Index	0x17
Data Type	string [64] - utf8
Access Rights	ro

Name	ApplicationSpecificTag
Index	0x18
Data Type	string [32] - utf8
Access Rights	rw
Default Value	* * *

Name	FunctionTag
Index	0x19
Data Type	string [32] - utf8
Access Rights	rw
Default Value	* * *

Name	LocationTag
Index	0x1A
Data Type	string [32] - utf8
Access Rights	rw
Default Value	* * *

Device Specific Parameters

Name	AI0 - Configuration
Index	0x46
Data Type	Record - 80 Bit
Access Rights	rw
Description	Configuration for analog channel 0

Sub Index	Bit Offset	Data Type	Name	Default Value	Description
1	64	int16	LowerLimitValue	0	Lower limit threshold value
2	48	int16	UpperLimitValue	10000	Upper limit threshold value
3	32	int16	Offset	0	Offset applied to the measured value
4	0	float32	Gain	1.0	Gain applied to the measured value

Name	AI1 - Configuration
Index	0x47
Data Type	Record - 80 Bit
Access Rights	rw
Description	Configuration for analog channel 1

Sub Index	Bit Offset	Data Type	Name	Default Value	Description
1	64	int16	LowerLimitValue	0	Lower limit threshold value
2	48	int16	UpperLimitValue	10000	Upper limit threshold value
3	32	int16	Offset	0	Offset applied to the measured value
4	0	float32	Gain	1.0	Gain applied to the measured value

Name	AI0 - RawValue
Index	0x48
Data Type	int16
Access Rights	ro
Description	Raw value of analog channel 0

Name	AI1 - RawValue
Index	0x49
Data Type	int16
Access Rights	ro
Description	Raw value of analog channel 1

Name	AIGND - Value
Index	0x50
Data Type	int16
Access Rights	ro
Description	Measured value used for ground shift compensation

Name	UserData
Index	0x84
Data Type	int32 [8]
Access Rights	rw
Description	Memory to store arbitrary user specific data

Diagnostics- and Maintenance

Name	Device Status
Index	0x24
Data Type	uint8
Access Rights	ro
Allowed Values	0 => OK 1 => Maintenance Required 2 => Out Of Specs 3 => Functional Check 4 => Failure
Description	Device status is reported according to IO-Link Specification. (IO-Link Interface and System specification v1.1.3 p. 249)

Name	ErrorCount
Index	0x20
Data Type	uint16
Access Rights	ro
Description	Reports the number of errors since device startup

Name	ErrorCode
Index	0x60
Data Type	uint32
Access Rights	ro
Description	Internal error code used to identify an active error state. Common warnings or error events are reported to the user by IO-Link events and through the DetailedDeviceStatus parameter. Nevertheless, error can happen, that are not covered by predefined IO-Link events. For further analysis this error code can help the customer service to identify the root cause of the failure.

Name	DetailedDeviceStatus[0..31]
Index	0x25
Data Type	{uint8 [3]} [32]
Structure	Byte[0]: EventQualifier / Byte[1..2] EventCode
Access Rights	ro

Description	List, that holds all active errors and warnings. All warnings and errors that occur disappear during operation are reported via the IO-Link Events mechanism. This list do also contain an snapshot of all currently active events. The events and their corresponding sub-index is listed in the table below.
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Sub-Index	Event Name	Type	Description
1	Undervoltage	error	Output voltage is below specified lower limit
2	Overvoltage	error	Output voltage is over specified upper limit
3	Overcurrent	error	Output load is to high
4	– RESERVED –	-	-
5	Overtemperature	warning	Internal device temperature below specified range
6	Undertemperature	warning	Internal device temperature over specified range
7	– RESERVED –	-	-
8	– RESERVED –	-	-
9	Overload D0	error	Overload condition for digital output 0
10	Overload D1	error	Overload condition for digital output 1
11	Overload D2	error	Overload condition for digital output 2
12	Overload D3	error	Overload condition for digital output 3
13	Overload D4	error	Overload condition for digital output 4
14	Overload D5	error	Overload condition for digital output 5
15	– RESERVED –	-	-
16	– RESERVED –	-	-
17	– RESERVED –	-	-
18	– RESERVED –	-	-
19	Invalid Process Data	warning	Device does not provide valid process data
20	– RESERVED –	-	-
21	– RESERVED –	-	-
22	– RESERVED –	-	-
23	– RESERVED –	-	-

24	– RESERVED –	-	-
25	– RESERVED –	-	-
26	– RESERVED –	-	-
27	– RESERVED –	-	-
28	– RESERVED –	-	-
29	– RESERVED –	-	-
30	– RESERVED –	-	-
31	– RESERVED –	-	-
32	Internal Device Error	error	Vendor specific error code - contact customer support

Name	Voltage U24
Index	0x51
Data Type	int16
Access Rights	ro
Unit	V
Scale	1/1000
Description	Output voltage

Name	Current I24
Index	0x52
Data Type	int16
Access Rights	ro
Unit	A
Scale	1/1000
Description	Output current

Name	Temperature
Index	0x53
Data Type	int8
Access Rights	ro
Unit	°C
Description	Internal device Temperature

Name	Uptime
Index	0x54
Data Type	uint32
Access Rights	ro
Unit	h
Scale	1/3600
Description	Uptime since power reset

Name	OperatingHours
Index	0x55
Data Type	uint32
Access Rights	ro
Unit	h
Scale	1/3600
Description	Overall operating time

Name	PowerCycles
Index	0x56
Data Type	uint32
Access Rights	ro
Description	Total number of power cycles over lifetime

Name	PowerCycles
Index	0x57
Data Type	uint32
Access Rights	ro
Description	Total amount of coupling cycles over lifetime

System Commands

Name	SystemCommand
Index	0x02
Data Type	uint8
Access Rights	wo
Allowed Values	129: Application Reset 131: Back-to-Box
Description	Execution of system commands

Document History

Version	Comment	Date	Editor
0.1.0	Initiale Schnittstellenbeschreibung	20.01.2024	D. Belles