

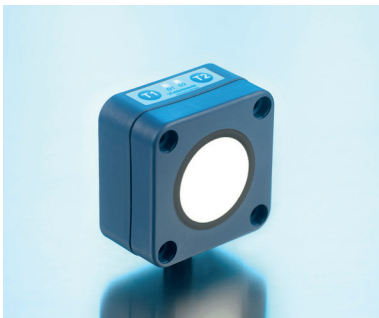


IO-Link data sheet

lcs+340/F/A S. 1 - 6

lcs+600/F/A S. 7 - 12

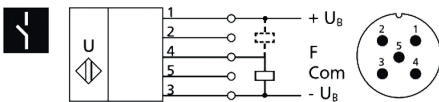
IO-Link data sheet



lcs+340/F/A

Ultrasonic proximity switch with an Push-Pull switching output and IO-Link interface

Pin assignment



Physical layer

Vendor Name	microsonic GmbH
Vendor ID	419 (0x01a3)
Product Name	lcs+340/F/A
Product ID	32480
Device ID	63 (0x00003f)
IO-Link Spezifikation	1.1
Transmission Rate	COM 2 (38.400 Bd)
Process Data Length	32 Bit PDI
Minimum Cycle Time	43.2 ms
IO-Link Port Type	A (<200mA)
SIO Mode Supported	Yes
Smart Sensor Profile	Yes, Digital Measuring Sensor
Block Parameter	Yes
Data Storage	Yes

IO-Link-Mode

The lcs+ sensors are IO-Link capable in accordance with IO-Link specification 1.1. The sensor has an IO-Link communication interface on pin 4.

Direct access to process and diagnosis data is possible via the IO-Link interface. The parameterization of the sensor is possible during operation.

Smart Sensor Profile

lcs+ sensors support the Smart Sensor Profile. The following profiles and function classes are integrated:

- › 0x000A - Device Profile: Smart Sensor
- › 0x000A - Device Profile: Digital measuring sensors
- › 0x8000 - Device Identification
- › 0x8001 - Multichannel: Binary Data Channel
- › 0x8003 - Device Diagnosis
- › 0x8004 - Teach Channel
- › 0x800A - Measurement Data Channel (standard resolution)

SSC1 configuration

The sensor has five modes:

- › Single point (SP1: switching point)
- › Window (SP1, SP2: window mode)
- › Two point (SP1, SP2: hysteresis mode)
- › Single point + set point offset (SP1 switching point + offset)
- › Window ± set point offset (SP1 two-way reflective barrier)

IODD description file

Each device has its own electronic device description, the IODD file (IO Device Description). The IODD contains comprehensive data for the purpose of better system integration:

- › Communication features
- › Device parameter with allowed values and default value
- › Identification-, processing and diagnosis data
- › Device data
- › Text description
- › Picture of the device
- › Logo of the manufacturer

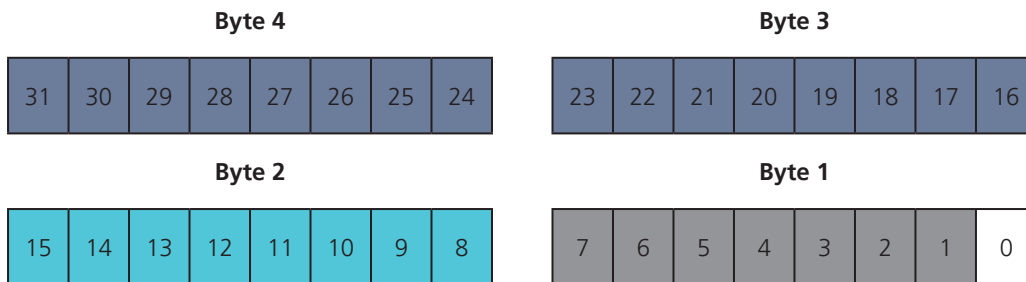
The IODD-library contains the IODD files of all IO-Link capable microsonic sensors. You will find the latest IODD files online at www.microsonic.de/IODD.

Process data

The process data are cyclically transmitted data. The length of the process data of lcs+ sensors is 4 byte.

Note

microsonic sensors with an operating range of up to 1000 mm indicate distance values with a resolution of 0.1 mm. Operating ranges greater than 1000 mm have distance values with a resolution of 1 mm.



	Description	Value range
	= Switched Signal Channel 1 (SSC1) state	0-1
	= Vacant	
	= Process Data Scale	-1; 0; Default: -1
	= Process Data Measuring Value	0-32.000, -32.760-32.760, 32.764

Switched Signal Channel 1 state:

- › 0: inactive
- › 1: active

Process Data Measuring Value

- › 0-32,000: Process data measuring value
- › 32,764: No measuring value
- › -32,760: Outside the detection range (-)
- › 32,760: Outside the detection range (+)

Measurement data channel description

Index	Subindex	Term	Format	Access
16512	1	Lower Limit	UInt32	RO
	2	Upper Limit	UInt32	RO
	3	Unit Code	UInt16	RO
	4	Scale	Int8	RO

Lower Limit:

The value of the Lower Limit corresponds to the foreground suppression currently set.

Upper limit:

The value of the Upper Limit corresponds to the maximum range currently set.

Unit Code:

The Unit Code is based on the official IO-Link Unit Code:

- › 1013: [mm]

Scale:

The sensor outputs the scale of the current process data. The sensor uses the scale in accordance with the following scheme to calculate the measured values:

$$\text{Process data value} * 10^{(\text{scale})} * [\text{Unit Code}] = \text{measured value in mm}$$

Appendix IO-Link data

Index	Sub-index	Term	Data type	Access	Default value	Value range	Resolution
2		System Command	UInt8	WO		130: Restore factory settings	
12		Device Access Locks	Record	R/W			
16		Vendor Name	OctetString	RO	microsonic GmbH		
17		Vendor Text	OctetString	RO	Unser Herz schallt ultra.		
18		Product Name	OctetString	RO	Ics+340/F/A		
19		Product ID	OctetString	RO	32480		
20		Product Text	OctetString	RO	Ultrasonic Sensor		
21		Serial Number	OctetString	RO			
22		Hardware Version	OctetString	RO			
23		Firmware Revision	OctetString	RO			
24		Application Specific Tag	OctetString	R/W			
32		Error Count	UInt16	RO			
36		Device Status	UInt8	RO	0	0-4: 0: Device is OK 1: Maintenance required 2: Out of specification 3: Functional check 4: Failure	
37		Detailed Device Status	ARRAY[10]	RO			
40		Process Data Input		RO			
58		Teach-in Channel	UInt8	R/W	0	0; 1: 0: SSC1: pin 4 (push-pull) 1: SSC1: pin 4 (push-pull)	
59		Teach-in Status	UInt8	RO	0	0-3; 4; 5; 7: 0: Idle 1: Setpoint 1 (SP1) successful 2: Setpoint 2 (SP2) successful 3: Setpoint 1 and Setpoint 2 (SP12) successful 4: Waiting for command 5: Busy 7: Error	
	2	SP1 TP1	Boolean		0		
	3	SP2 TP1	Boolean		0		
60	0	SSC1 Parameter	Record				
	1	SP1 (SetPoint 1)	UInt16	R/W	3,400	350..4,998 Setpoint 1 for switching output	1 mm
	2	SP2 (SetPoint 2)	UInt16	R/W	3,900	350..4,998 Setpoint 2 for switching output	1 mm

Appendix IO-Link data

Index	Sub-index	Term	Data type	Access	Default value	Value range	Resolution
61	0	SSC1 Configuration	Record				
	1	Logic	UInt8	R/W	0	0; 1: 0: High active 1: Low active	
	2	Mode	UInt8	R/W	1	0-3; 128-129: 0: Deactivated 1: Single point (SP1: switching point) 2: Window (SP1, SP2: window mode) 3: Two point (SP1, SP2: hysteresis mode) 128: Single point + set point offset (SP1: switching point + offset) 129: Window ± set point offset (SP1: two-way reflective barrier)	
	3	Hysteresis	UInt16	R/W	50	1..4,648 Hysteresis for SP1 and SP2	1 mm
100	0	SSC1 Advanced Configuration	Record				
	1	Switch-on delay	UInt8	R/W	0	0-20	1 s
	2	Switch-off delay	UInt8	R/W	0	0-20	1 s
	3	Set point offset	UInt8	R/W	8	1-20	1%
200	0	Measurement configuration	Record				
	1	Foreground suppression	Int16	R/W	319	319..1,050	
	2	Maximum range	Int16	R/W	5,000	5,000..9,999	
220	0	Detection zone sensitivity	Record	R/W			
	1	Type	Int 8	R/W	2	1-3: 1 = Wide detection zone 2 = Standard detection zone 3 = Variable detection zone	
	2	Lowest sensitivity until	UInt 16	R/W	325	352..5,000	
	3	Highest sensitivity above	UInt 16	R/W	396	396..33,032	

Appendix IO-Link data

Index	Sub-index	Term	Data type	Access	Default value	Value range	Resolution
256	0	Filter	Record				
	1	Type	UInt8	R/W	1	0-4: 0 = F00: no filter 1 = F01: standard filter 2 = F02: averaging filter 3 = F03: foreground filter 4 = F04: background filter	
	2	Strength	UInt8	R/W	0	0-9: 0 = P00 ... 9 = P09 For each measured value filter a filter strength between 0, weak filtering up to 9, strong filtering, can be selected.	
257	0	Interfering noise suppression	Record	R/W			
	1	Mode	UInt8	R/W	0	0-1: 0 = Inactive 1 = Active	
300	0	Temperature compensation	Record				
	1	Source of temperature	UInt8	R/W	1	0-1: 0: Reference temperature 1: Internal Temperatur	
	2	Reference temperature	UInt8	R/W	20	-25-70	1° C
350	0	Synchronisation and multiplex operation	Record				
	1	Mode	UInt8	R/W	1	0; 1: 0: Inactive 1: Active	
	2	Sensor operation	UInt8	R/W	0	0-10: 0: Synchronisation active 1: Multiplex address 1 2: Multiplex address 2 3: Multiplex address 3 4: Multiplex address 4 5: Multiplex address 5 6: Multiplex address 6 7: Multiplex address 7 8: Multiplex address 8 9: Multiplex address 9 10: Multiplex address 10	
	3	Multiplex number of participants	UInt8	R/W	10	2-10: 2: 2 participants 3: 3 participants 4: 4 participants 5: 5 participants 6: 6 participants 7: 7 participants 8: 8 participants 9: 9 participants 10: 10 participants	

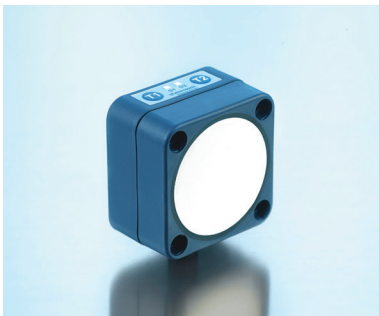
Appendix IO-Link data

Index	Sub-index	Term	Data type	Access	Default value	Value range	Resolution
370	0	Button	Record	R/W			
	1	Mode	UInt8	R/W	1	0; 1: 0: Inactive 1: Active	
1000	0	Echo diagnosis	Record	RO			
	1	Quality	Int16	RO	0		
16512	0	Measurement data channel description	Record				
	1	Lower limit	Int32	RO	319	Lower limit of the measuring range (blind zone)	
	2	Upper limit	Int32	RO	5,000	Upper limit of the measuring range (maximum range)	
	3	Unit code	Int16	RO	1013	IO-Link unit code: 1013 = [mm]	1 mm
	4	Scale	Int8	RO	0	Process data value * (10 ^{scale}) [Unit code] = measuring value in mm	

Events

Code	Type	Name	Description
16384	0x4000	Error	Temperature fault
30480	0x7710	Error	Short circuit
36000	0x8ca0	Notification	Teach-in error
36001	0x8ca1	Notification	Teach-in success

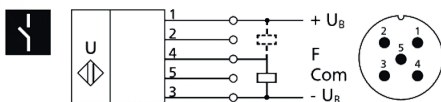
IO-Link data sheet



lcs+600/F/A

Ultrasonic proximity switch with an Push-Pull switching output and IO-Link interface

Pin assignment



Physical layer

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Vendor ID	419 (0x01a3)
Product Name	lcs+600/F/A
Product ID	32580
Device ID	64 (0x000040)
IO-Link Spezifikation	1.1
Transmission Rate	COM 2 (38.400 Bd)
Process Data Length	32 Bit PDI
Minimum Cycle Time	60.8 ms
IO-Link Port Type	A (<200mA)
SIO Mode Supported	Yes
Smart Sensor Profile	Yes, Digital Measuring Sensor
Block Parameter	Yes
Data Storage	Yes

IO-Link-Mode

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Direct access to process and diagnosis data is possible via the IO-Link interface. The parameterization of the sensor is possible during operation.

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- › 0x8001 - Multichannel: Binary Data Channel
- › 0x8003 - Device Diagnosis
- › 0x8004 - Teach Channel
- › 0x800A - Measurement Data Channel (standard resolution)

SSC1 configuration

The sensor has five modes:

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- › Window ± set point offset (SP1 two-way reflective barrier)

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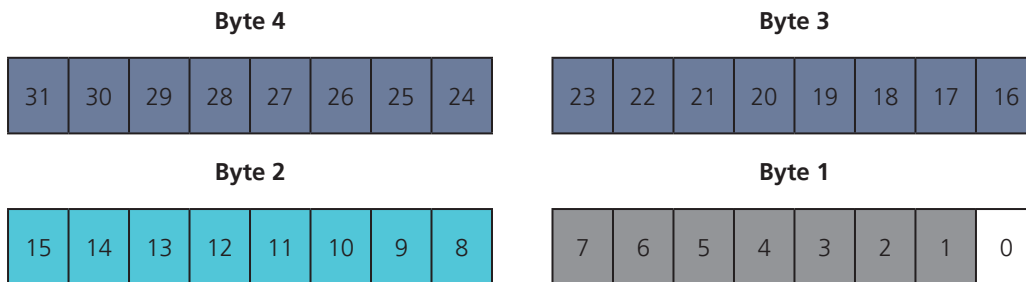
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microsonic sensors with an operating range of up to 1000 mm indicate distance values with a resolution of 0.1 mm. Operating ranges greater than 1000 mm have distance values with a resolution of 1 mm.



	Description	Value range
	Switched Signal Channel 1 (SSC1) state	0-1
	Vacant	
	Process Data Scale	-1; 0; Default: -1
	Process Data Measuring Value	0-32.000, -32.760-32.760, 32.764

Switched Signal Channel 1 state:

- › 0: inactive
- › 1: active

Process Data Measuring Value

- › 0-32,000: Process data measuring value
- › 32,764: No measuring value
- › -32,760: Outside the detection range (-)
- › 32,760: Outside the detection range (+)

Measurement data channel description

Index	Subindex	Term	Format	Access
16512	1	Lower Limit	UInt32	RO
	2	Upper Limit	UInt32	RO
	3	Unit Code	UInt16	RO
	4	Scale	Int8	RO

Lower Limit:

The value of the Lower Limit corresponds to the foreground suppression currently set.

Upper limit:

The value of the Upper Limit corresponds to the maximum range currently set.

Unit Code:

The Unit Code is based on the official IO-Link Unit Code:

- › 1013: [mm]

Scale:

The sensor outputs the scale of the current process data. The sensor uses the scale in accordance with the following scheme to calculate the measured values:

$$\text{Process data value} * 10^{(\text{scale})} * [\text{Unit Code}] = \text{measured value in mm}$$

Appendix IO-Link data

Index	Sub-index	Term	Data type	Access	Default value	Value range	Resolution
2		System Command	UInt8	WO		130: Restore factory settings	
12		Device Access Locks	Record	R/W			
16		Vendor Name	OctetString	RO	microsonic GmbH		
17		Vendor Text	OctetString	RO	Unser Herz schallt ultra.		
18		Product Name	OctetString	RO	Ics+600/F/A		
19		Product ID	OctetString	RO	32580		
20		Product Text	OctetString	RO	Ultrasonic Sensor		
21		Serial Number	OctetString	RO			
22		Hardware Version	OctetString	RO			
23		Firmware Revision	OctetString	RO			
24		Application Specific Tag	OctetString	R/W			
32		Error Count	UInt16	RO			
36		Device Status	UInt8	RO	0	0-4: 0: Device is OK 1: Maintenance required 2: Out of specification 3: Functional check 4: Failure	
37		Detailed Device Status	ARRAY[10]	RO			
40		Process Data Input		RO			
58		Teach-in Channel	UInt8	R/W	0	0; 1: 0: SSC1: pin 4 (push-pull) 1: SSC1: pin 4 (push-pull)	
59		Teach-in Status	UInt8	RO	0	0-3; 4; 5; 7: 0: Idle 1: Setpoint 1 (SP1) successful 2: Setpoint 2 (SP2) successful 3: Setpoint 1 and Setpoint 2 (SP12) successful 4: Waiting for command 5: Busy 7: Error	
	2	SP1 TP1	Boolean		0		
	3	SP2 TP1	Boolean		0		
60	0	SSC1 Parameter	Record				
	1	SP1 (SetPoint 1)	UInt16	R/W	6,000	600..7,998 Setpoint 1 for switching output	1 mm
	2	SP2 (SetPoint 2)	UInt16	R/W	7,000	600..7,998 Setpoint 2 for switching output	1 mm

Appendix IO-Link data

Index	Sub-index	Term	Data type	Access	Default value	Value range	Resolution
61	0	SSC1 Configuration	Record				
	1	Logic	UInt8	R/W	0	0; 1: 0: High active 1: Low active	
	2	Mode	UInt8	R/W	1	0-3; 128-129: 0: Deactivated 1: Single point (SP1: switching point) 2: Window (SP1, SP2: window mode) 3: Two point (SP1, SP2: hysteresis mode) 128: Single point + set point offset (SP1: switching point + offset) 129: Window ± set point offset (SP1: two-way reflective barrier)	
	3	Hysteresis	UInt16	R/W	100	1..7,398 Hysteresis for SP1 and SP2	1 mm
100	0	SSC1 Advanced Configuration	Record				
	1	Switch-on delay	UInt8	R/W	0	0-20	1 s
	2	Switch-off delay	UInt8	R/W	0	0-20	1 s
	3	Set point offset	UInt8	R/W	8	1-20	1%
200	0	Measurement configuration	Record				
	1	Foreground suppression	Int16	R/W	547	547..1,800	
	2	Maximum range	Int16	R/W	8,000	8,000..9,999	
220	0	Detection zone sensitivity	Record	R/W			
	1	Type	Int 8	R/W	2	1-3: 1 = Wide detection zone 2 = Standard detection zone 3 = Variable detection zone	
	2	Lowest sensitivity until	UInt 16	R/W	553	553..8,000	
	3	Highest sensitivity above	UInt 16	R/W	7,588	624..36,032	

Appendix IO-Link data

Index	Sub-index	Term	Data type	Access	Default value	Value range	Resolution
256	0	Filter	Record				
	1	Type	UInt8	R/W	1	0-4: 0 = F00: no filter 1 = F01: standard filter 2 = F02: averaging filter 3 = F03: foreground filter 4 = F04: background filter	
	2	Strength	UInt8	R/W	0	0-9: 0 = P00 ... 9 = P09 For each measured value filter a filter strength between 0, weak filtering up to 9, strong filtering, can be selected.	
257	0	Interfering noise suppression	Record	R/W			
	1	Mode	UInt8	R/W	0	0-1: 0 = Inactive 1 = Active	
300	0	Temperature compensation	Record				
	1	Source of temperature	UInt8	R/W	1	0-1: 0: Reference temperature 1: Internal Temperatur	
	2	Reference temperature	UInt8	R/W	20	-25-70	1° C
350	0	Synchronisation and multiplex operation	Record				
	1	Mode	UInt8	R/W	1	0; 1: 0: Inactive 1: Active	
	2	Sensor operation	UInt8	R/W	0	0-10: 0: Synchronisation active 1: Multiplex address 1 2: Multiplex address 2 3: Multiplex address 3 4: Multiplex address 4 5: Multiplex address 5 6: Multiplex address 6 7: Multiplex address 7 8: Multiplex address 8 9: Multiplex address 9 10: Multiplex address 10	
	3	Multiplex number of participants	UInt8	R/W	10	2-10: 2: 2 participants 3: 3 participants 4: 4 participants 5: 5 participants 6: 6 participants 7: 7 participants 8: 8 participants 9: 9 participants 10: 10 participants	

Appendix IO-Link data

Index	Sub-index	Term	Data type	Access	Default value	Value range	Resolution
370	0	Button	Record	R/W			
	1	Mode	UInt8	R/W	1	0; 1: 0: Inactive 1: Active	
1000	0	Echo diagnosis	Record	RO			
	1	Quality	Int16	RO	0		
16512	0	Measurement data channel description	Record				
	1	Lower limit	Int32	RO	547	Lower limit of the measuring range (blind zone)	
	2	Upper limit	Int32	RO	8,000	Upper limit of the measuring range (maximum range)	
	3	Unit code	Int16	RO	1013	IO-Link unit code: 1013 = [mm]	1 mm
	4	Scale	Int8	RO	0	Process data value * (10 ^{scale}) [Unit code] = measuring value in mm	

Events

Code	Type	Name	Description
16384	0x4000	Error	Temperature fault
30480	0x7710	Error	Short circuit
36000	0x8ca0	Notification	Teach-in error
36001	0x8ca1	Notification	Teach-in success