IO-Link Data Reference Guide: QS18 Electronic Adjustable Field

IO-Link Data Map

This document refers to the following IODD file: Banner_Engineering-QS18_EAF-20180522-IODD1.1.xml. The IODD file and support files can be found on *www.bannerengineering.com* under the download section of the product family page.

Communication Parameters

The following communication parameters are used.

Parameter	Value
IO-Link revision	V1.1
Process Data In length	8 bits
Process Data Out length	N/A
Bit Rate	38400 bps
Minimum cycle time	2.3 ms

Parameter	Value
Port class	A
SIO mode	Yes
Smart sensor profile	Yes
Block parameterization	Yes
Data Storage	Yes

IO-Link Process Data In (Device to Master)

Process Data In is transmitted cyclically to the IO-Link master from the IO-Link device.

The QS18EAF IO-Link Process Data is 8 bits in size and includes the state of the output channel and the health state of the sensor. This information is sent to the IO-Link master every 2.3 ms.

Process Data Input			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	Output State	1	0=Inactive, 1=Active
2	Marginal State	1	0=Normal, 1=Marginal

Example								
Subindex	/////	/////	/////	/////	/////	////	2	1
Bit offset	7	6	5	4	3	2	1	0
Value	N/A	N/A	N/A	N/A	N/A	N/A	0	1
Example	---	---	---	---	---	---	Normal	Active

IO-Link Process Data Out (Master to Device)

Not applicable.

Parameters Set Using IO-Link

These parameters can be read from and/or written to an IO-Link model of the QS18K6AF sensor. Also included is information about whether the variable in question is saved during Data Storage and whether the variable came from the IO-Link Smart Sensor Profile.

Unlike Process Data In, which is transmitted from the IO-Link device to the IO-Link master cyclically, these parameters are read or written acyclically as needed.

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	Smart Sensor Profile
0	1-15	Direct Parameter Page 1 (incl. Vendor ID & Device ID)				ro		
0	16	Standard Command				wo		
1	1-16	Direct Parameters Page 2				rw		
2		Standard Command	8-bit uinteger	65 = SP1 Single Value Teach 79 = S1 Exit Teach 130 = Restore Factory Settings 160 = Emitter Off 161 = Emitter On 162 = Start discovery 163 = Stop discovery		wo		y

Index	SubIndex	Name	Length	Value Range	Default	Access Rights	Data Storage?	Smart Sensor Profile
3		Data Storage Index (device-specific list of parameters to be stored)						
4-11		*reserved by IO-Link Specification*						
12		**Device Access Locks**						
12	1	Parameter Write Access Lock		0 = off 1 = on	0	rw	y	
12	2	Data Storage Lock		0 = off 1 = on	0	rw	y	
12	3	Local Parameterization Lock		0 = off 1 = on	0	rw	y	
12	4	Local User Interface Lock		0 = off 1 = on	0	rw	y	
13-15		*unused*				ro		
16		Vendor Name string		Banner Engineering Corporation		ro		
17		Vendor Text string		More Sensors. More Solutions		ro		
18		Product Name string				ro		
19		Product ID string				ro		
20		Product Text string		Adjustable Background Suppression		ro		y
21		Serial Number				ro		
22		*unused*				ro		
23		Firmware Version				ro		y
24		App Specific Tag (user defined)				rw	y	y
25-35		*reserved*						
36		Device Status	8-bit integer	0 = Device is OK 1 = Maintenance required 2 = Out of specification 3 = Functional check 4 = Failure 5..255 Reserved		ro		
37		Detailed Device Status	Array[6] of 3-octet			ro		
38-39		*reserved*						
40		Process Data Input				ro		
41-58		*unused/reserved*						
59		**Teach-In Status**						
59	1	Teach State: 4-bit Integer	4-bit integer	0 = Idle 1 = SP1 Success 4 = Wait for Command 5 = Busy 7 = Error		ro		y
59	2	SP1 TP1	1-bit integer	0 = not taught or unsuccessful 1 = successfully taught		ro		y
59	3	SP1 TP2	1-bit integer	0 = not taught or unsuccessful 1 = successfully taught		ro		y
60		**BDC1 Setpoints**						
60	1	BDC1 Setpoint SP1 (Switch point)	16-bit uinteger	QS18AF120: 27 to 130mm QS18AF250: 25 to 300mm	QS18AF120: 130mm QS18AF250: 300mm	rw	y	y
60	2	BDC1 Setpoint SP2 (SP2 is unused and must be written to 0.)	16-bit uinteger		0	rw	y	y
61		**BDC1 Configuration**						
61	1	BDC1 Switchpoint Logic	8-bit integer	0 = LO 1 = DO	0	rw	y	y
61	2	BDC1 Mode	8-bit integer	1 = Background Set 128 = Object Set	1	rw	y	y
61	3	Hysteresis	16-bit integer	Unused = 0	0	rw	y	y
62-63		*unused*						
64		BDC1 Setpoint Selection	8-bit uinteger	0 = Local 1 = Remote	0	rw	y	
65		BDC1 Current Setpoint	16-bit uinteger					
66		**BDC1 Vendor Specific Configuration**						

Index	SubIndex	Name	Length	Value Range	Default	Access Rights	Data Storage?	Smart Sensor Profile
66	1	BDC1 Delay Mode	8-bit integer	0 = Disabled 1 = On-Off Delay 2 = Oneshot	0	rw	y	
66	2	BDC1 Delay On/One-Shot Delay	32-bit integer	0-90000	0	rw	y	
66	3	BDC1 Delay Off/One-Shot Timer	32-bit integer	0-90000	0	rw	y	
66	4	BDC1 Teach Offset Mode	8-bit uinteger	0 = Auto 1 = User	0	rw	y	
66	5	BDC1 User Teach Offset	16-bit uinteger		0	rw	y	
67-68		*unused*						
69		All Time Run Time	32-bit integer			ro		
70		Resettable Run Time	32-bit integer			ro		
71		All Time Run Time Event Time	32-bit integer			rw	y	
72		Resettable Run Time Event Time	32-bit integer			rw	y	
73		Taught Distance	8-bit uinteger	0 = Not taught 1 = Taught 2 = Coerced to near limit 3 = Coerced to far limit	0	ro		
74		Pin 2 Configuration	8-bit uinteger	0 = Detection Output 1 = Complimentary Output	1	rw	y	
75		Response Speed	8-bit uinteger	0 = High Speed (450 us ON/OFF) 1 = Cross-talk Only (1.1ms ON/OFF) 2 = Robust (1.7ms ON; 1.1ms OFF)	2	rw	y	

IO-Link Events

Events are acyclic transmissions from the IO-Link device to the IO-Link master. Events can be error messages and/or warning or maintenance data.

Code	Type	Name	Description
25376 (0x6320)	Error	Parameter Error	Check data sheet and values
36000 (0x8ca0)	Warning	All-time Run Time Event	Event indicating the corresponding configured running time has elapsed
36001 (0x8ca1)	Warning	Resettable Run Time Event	Event indicating the corresponding configured running time has elapsed
36002 (0x8ca2)	Notification	POT Adjustment Event	Event indicating a user POT adjustment has taken place
36003 (0x8ca3)	Notification	Teach Completed Event	Event indicating a teach has been completed
36004 (0x8ca4)	Notification	Factory Settings Restored Event	Event indicating that the factory settings have been restored
36005 (0x8ca5)	Notification	Teach Point Coerced Event	One or more taught positions were outside the sensing range of the device
36006 (0x8ca6)	Notification	Teach Offset Causes Coercion Event	Applying the configured teach offset would place the setpoint outside the range of the device