

Parameter and Process Data

Measuring amplifier / Strain sensors

DAB10 / DST53 / DST76



IO-Link

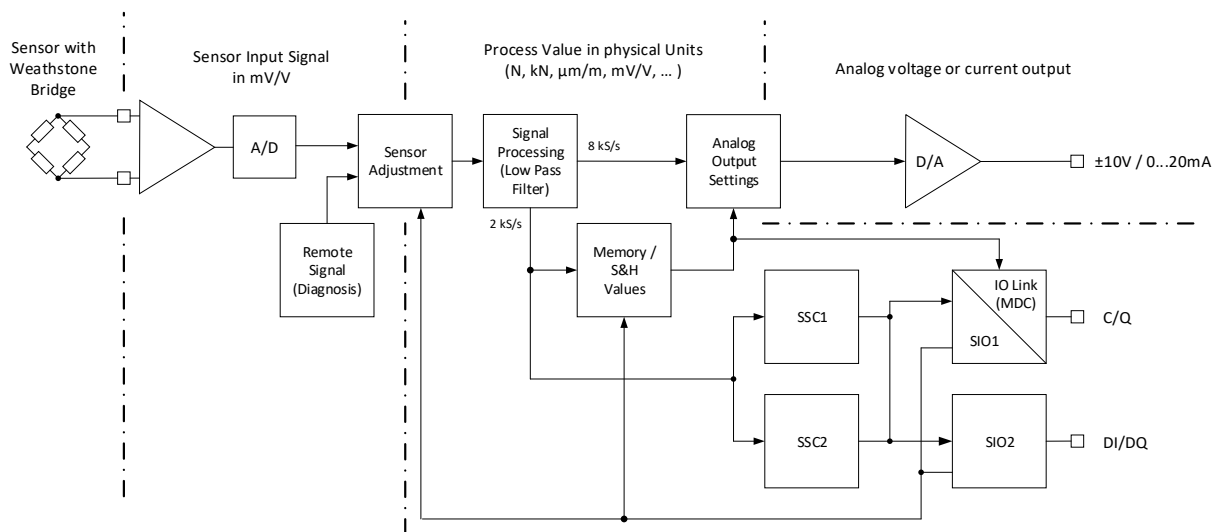
DAB10 / DST53 / DST76

Device ID

Product	Hex	Decimal	Compatible previous version
DAB10-AU DST53-AxxxU DST76-BxxxU	0x00EA67	60007	60001
DAB10-AI DST53-AxxxI DST76-BxxxI	0x00EA69	60009	60003
DAB10-AL DST53-AxxxL DST76-BxxxL	0x00EA6B	60011	60005

IO-Link Version: V 1.1
 Data Storage: Yes
 Block Parameter: Yes
 Min. Cycle Time: 1 ms
 SIO-Mode: Yes
 COM-Mode: 230'400 bit/s (COM 3)

Block diagram



PDI (PDI48.INT32_INT8)

	Process Value		Scale		Status Bits	
Type	Int 32		Int 8		8x Boolean	
Bit Offset	47	... 16	15	... 8	7	... 0
Subindex	1		2		10 ... 3	

Sub-index	Bit Offset	Name	Type	Range	Description
1	16	Process Value	int32	-2 ³¹ ... 2 ³¹ -1	<ul style="list-style-type: none"> ▪ Displayed process value = process value * 10 ^ scale exponent ▪ Fixed displayable ranges of process value: -20'000.00000 ... 20'000.00000 ▪ error codes: <-21'000 or >21'000
2	8	Scale Exponent	int8	-5	
3	0	SSC1	Boolean	0 / 1	State of SSC1
4	1	SSC2	Boolean	0 / 1	State of SSC2
5	2	Quality	Boolean	0 / 1	0: All signal conditions are ok 1: A condition is outside of specified ranges (see detailed device status)
6	3	Alarm	Boolean	0 / 1	0: Signals are valid 1: No valid signals available
7	4		Boolean	0	Not used
8	5		Boolean	0	Not used
9	6		Boolean	0	Not used
10	7		Boolean	0	Not used

PDO (PDI8.BOOL1)

Sub-index	Bit Offset	Name	Type	Range	Description
1	0		Boolean	0	Not used
2	1		Boolean	0	Not used
3	2	Sample and Hold – Trigger	Boolean	0 / 1	Trigger for Sample and Hold, signal are being hold by the positive edge (change from “0” to “1”)
4	3	Teach-in Offset / Taring	Boolean	0 / 1	Activates teach-in offset, is active as long as this bit is set to “1”
5	4	Memory Reset	Boolean	0 / 1	Reset for max, min and peak-peak memory, signal are being reset by the positive edge (change from “0” to “1”)
6	5	Teach-in Sensitivity	Boolean	0 / 1	Activates teach-in sensitivity, is active as long as this bit is set to “1”
7	6	-	Boolean	0	Not used
8	7		Boolean	0	Not used

Identification

Index	Subindex	Access	SPDU name	Number of Bytes	Format	Default values	Description
16	0	RO	Vendor Name	64	String	Baumer Electric AG	Baumer Electric AG
17	0	RO	Vendor Text	64	String	www.baumer.com	www.baumer.com
18	0	RO	Product Name	40	String	n.a.	Specific sensor type within the sensor family
19	0	RO	Product ID	64	String	n.a.	Sensor family / Reference for IODD
86	1	RO	Part Number	8	String	n.a.	SAP material number
20	0	RO	Product Text	64	String	n.a.	
21	0	RO	Serial Number	16	String	n.a.	Baumer serial number
22	0	RO	Hardware Version	11	String	n.a.	
23	0	RO	Firmware Version	11	String	n.a.	Current firmware version
24	0	RW	Application Specific Tag	32	String	n.a.	Tag for customer use
25	0	RW	Function Tag	32	String	n.a.	Tag for customer use
26	0	RW	Location Tag	32	String	n.a.	Tag for customer use

Observation

Index	Subindex	Access	SPDU name	Number of Bytes	Format	Range of values	Default value	Description
Process Values								
216	1	RO	Process Value.Current	4	int32	±20'000	n.a.	Current process value after signal processing.
Memory Values								
216	2	RO	Process Value.Minimum	4	int32	±20'000	n.a.	Minimum process value since last memory reset.
216	3	RO	Process Value.Maximum	4	int32	±20'000	n.a.	Maximum process value since last memory reset.
216	6	RO	Process Value.Peak Peak	4	int32	0...20'000	n.a.	Peak to peak value since last memory reset. The peak to peak value corresponds to the difference of the maximum and minimum process values.
Sample and Hold Values								
88	7	RO	Process Value.Sample and Hold	4	int32	±20'000	n.a.	Held signal at the last "sample and hold" trigger.
88	8	RO	Process Value.Sample and Hold Delta	4	int32	±20'000	n.a.	Difference between the signal at the last "sample and hold" trigger and the current signal.

Parameter Sensor Adjustment

Index	Subindex	Access	SPDU name	Number of Bytes	Format	Range of values	Default value	Description
Customer Sensor Adjustment								
74	5	RW	Customer Sensor Adjustment.Process Value Unit	2	uint16		DAB: 1699 DST: 1698	Selection of the unit of the process value: 1088: kg 1092: t 1120 N 1121: MN 1122: kN 1698: $\mu\text{m/m}$ 1699: mV/V
1002	1	RW	Customer Sensor Adjustment.Nominal Process Value	4	int32	0.1...10'000	DAB: 1.0 DST: nominal strain	Nominal process value of the sensor.
1002	2	RW	Customer Sensor Adjustment.Nominal Sensitivity	4	float	± 3.0	1.0	Nominal sensitivity of the sensor in mV/V. This is the signal change of the sensor when it is loaded from 0 to nominal value defined in the register «Customer Sensor Adjustment.Nominal Process Value».
1002	3	RW	Customer Sensor Adjustment.Offset	4	float	± 3.8	0	Offset of the transducer in mV/V. This is the signal of the sensor corresponding to the process value 0.
		WO	Baumer Command					Restore Factory Adjustment. The values of section «Factory Sensor Settings» will be copied into the section «Customer Sensor Adjustment».

Teach-in Offset / Taring								
115	3	RW	Teach-in.Offset Process Value	4	int32	±20'000	0	Teach-in offset (taring) will set the offset in such a way, that the current sensor input signal corresponds to this process value. Teaching-in offset just affects the register offset and will not change the sensitivity register.
115	2	RW	Teach-in.Moving Average Filter	1	uint8		4	To increase the accuracy of the teach-in offset (taring), a moving average is implemented. The number of samples to be averaged can be set in this register. The taring duration must be at least the period indicated below. During this period the input signal must be held stable. 0: Disabled 1: 2 samples (0.250 ms) 2: 4 samples (0.5 ms) 3: 8 samples (1 ms) 4: 16 samples (2 ms) 5: 32 samples (4 ms) 6: 64 samples (8 ms) 7: 128 samples (16 ms)
Teach-in Sensitivity								
115	4	RW	Teach-in.Sensitivity Process Value	4	int32	±20'000	1	Teach-in sensitivity will set the sensitivity in such a way, that the current sensor input signal corresponds to this process value without changing the previous taught-in offset. The sensitivity and the offset register will be affected.
115	1	RW	Teach-in.Sensitivity Enable	1	uint8		0	Enables/Disables the teach-in sensitivity function. 0: Disabled 1: Enabled

Signal Processing

Input Low Pass Filter (8 kS/s)								
160	1	RW	Input Low Pass Filter.Enable	1	uint8		0	0: Disabled 1: Enabled
160	2	RW	Input Low Pass Filter.Frequency	1	uint8		3	Selection of cut-off frequency of the input low pass filter. 0: 1 kHz 1: 500Hz 2: 200Hz 3: 100Hz 4: 50Hz 5: 20Hz 6: 10Hz 7: 5Hz 8: 2Hz 9: 1Hz

Analog Output Settings

Signal Selection								
116	1	RW	Analog Output.Source	1	uint8		1	Select of the source of the process value that is shown as analog output signal 0: Off (Analog Output Alarm) 1: Current Process Value (8 kS/s) 3: Minimum Process Value (2 kS/s) 4: Maximum Process Value (2 kS/s) 5: Peak Peak Process Value (2 kS/s) 6: Sample and Hold Process Value (2 kS/s) 7: Sample and Hold Delta Process Value (2kS/s)
Signal Adjustment								
202	2	RW	Analog Output.Process Value 1	4	int32	±20'000	0.0	Process value of adjustment point 1
202	3	RW	Analog Output.Analog Signal 1	4	float	U: -11...11 I: 0...22	DAB U: 0.0 V I: 4.0 mA DST U: 0.0 V I: 12.0 mA	Analog output signal at adjustment point 1
202	4	RW	Analog Output.Process Value 2	4	int32	±20'000	DAB: 1.0 DST: nominal strain	Process value of adjustment point 2
202	5	RW	Analog Output.Analog Signal 2	4	float	U: -11...11 I: 0...22	U: 10.0 V I: 20.0 mA	Analog output signal at adjustment point 2
Signal Limits								
202	7	RW	Analog Output.Minimum	4	float	U: -11...11 I: 0...22	U: -10.5 V I: 2.0 mA	Minimum showable valid analog signal
202	9	RW	Analog Output.Maximum	4	float	U: -11...11 I: 0...22	U: 10.5 V I: 22.0 mA	Maximum showable valid analog signal
Signal Alarm								
116	3	RW	Analog Output.Alarm	4	float	U: -11...11 I: 0...22	U: 11.0 V I: 1.0 mA	Signal level of the analog output if no valid signal can be shown because of signal overflow or detected error conditions.

MDC Settings

MDC Selection									
83	1	RW	MDC Selection.Source	1	uint8		2		2: Current Process Value (2 kS/s) 3: Minimum Process Value (2 kS/s) 4: Maximum Process Value (2 kS/s) 5: Peak Peak Process Value (2 kS/s) 6: Sample and Hold Process Value (2 kS/s) 7: Sample and Hold Delta Process Value (2 kS/s)
MDC Descriptor									
16512	1	RO	MDC Descriptor.Lower Limit	4	int32	±20'000	DAB: -2.0 DST: -2 * nominal strain		Lower limit of showable process value range. (Depends on register «Customer Sensor Adjustment.Nominal Process Value». Lower Limit is -2*nominal process value)
16512	2	RO	MDC Descriptor.Upper Limit	4	int32	±20'000	DAB: 2.0 DST 2 * nominal strain		Upper limit of showable process value range. (Depends on register «Customer Sensor Adjustment.Nominal Process Value» and is 2 * nominal process value.)
16512	3	RO	MDC Descriptor.Unit Code	2	uint16		DAB: 1699 DST: 1698		Unit Code of the selected process value.
16512	4	RO	MDC Descriptor.Scale Exponent	1	int8	-5	-5		Scale Exponent x

SIO Settings

SIO 1 Settings									
78	2	RW	Settings.SIO1 Function Selection	1	uint8		10		Defines the function of SIO1 0: SSC1 (DI) 1: SSC2 (DI) 5: Quality Bit (DI) 6: Alarm Bit (DI) 10: Inactive (DO) 11: Teach-in Offset/ Taring (DO) 12: Memory Reset (DO) 13: Sample / Hold (DO) 14: Teach-in Sensitivity (DO)
78	4	RW	Settings.SIO1 Input Delay	4	uint32	0...3'600'000	3		Input delay time in milliseconds (Minimum of 3 ms is recommended to guarantee an error-free establishment of the IO-Link communication)
SIO 2 Settings									
78	12	RW	Settings.SIO2 Function Selection	1	uint8		U: 11 I: 11 L: 10		Defines the function of SIO2 0: SSC1 (DI) 1: SSC2 (DI) 5: Quality Bit (DI) 6: Alarm Bit (DI) 10: Inactive (DO) 11: Teach-in Offset/ Taring (DO) 12: Memory Reset (DO) 13: Sample / Hold (DO) 14: Teach-in Sensitivity (DO)
78	14	RW	Settings.SIO2 Input Delay	4	uint32	0...3'600'000	3		Input delay time in milliseconds

SSC 1 Settings

SSC 1 Settings								
61	2	RW	Settings.SSC1 Mode	1	uint8		1	Selects the switching behavior of SSCx: 1: 1 Point 2: Window 3: 2 Point
60	1	RW	Settings.SSC1 Setpoint 1	4	int32	±20'000	0.0	Defines the process value at which SSCx is set to active.
60	2	RW	Settings.SSC1 Setpoint 2	4	int32	±20'000	0.0	Defines the process value at which SSCx is set to inactive.
61	1	RW	Settings.SSC1 Logic	1	uint8		0	Selects the logic of SSCx: 0: Normal 1: Inverted
SSC 1 Hysteresis								
69	5	RW	Hysteresis.SSC1 Alignment Mode	1	uint8		2	Selects the hysteresis alignment mode of SSCx: 1: Left/Outer 2: Center 3: Right/Inner
69	1	RW	Hysteresis.SSC1 Width	4	uint32	0..20'000	0.001	Hysteresis width of SSCx as a percent of the nominal process value or as absolute process value.
69	4	RO	Hysteresis.SSC1 Width Mode	1	uint8		1	1: Absolute
SSC 1 Delays								
120	1	RW	Release Delay.SSC1 Enable	1	uint8		0	Enables/Disables release delay of SSCx. 0: Disabled 1: Enabled
120	2	RW	Release Delay.SSC1 Time	4	uint32	0...86'400'000	0	Release delay time of SSCx in milliseconds
121	1	RW	Response Delay.SSC1 Enable	1	uint8		0	Enables/Disables response delay of SSCx. 0: Disabled 1: Enabled
121	2	RW	Response Delay.SSC1 Time	4	uint32	0...86'400'000	0	Response delay time of SSCx in milliseconds
SSC 1 Minimum Pulse Duration								
122	1	RW	Minimal Pulse Duration.SSC1 Enable	1	uint8		0	Enables/Disables minimal pulse duration time of SSCx: 0: Disabled 1: Enabled
122	2	RW	Minimal Pulse Duration.SSC1 Time	4	uint32	0...86'400'000	0	Minimal pulse length of SSCx in milliseconds
122	3	RW	Minimal Pulse Duration.SSC1 Mode	1	uint8		1	Selects the affected pulse polarity for minimal pulse duration of SSCx: 1: Positive and negative pulses are prolonged 2: Only positive pulses are prolonged 3: Only negative pulses are prolonged

SSC 2 Settings

SSC 2 Settings								
63	2	RW	Settings.SSC2 Mode	1	uint8		1	Selects the switching behavior of SSCx: 1: 1 Point 2: Window 3: 2 Point
62	1	RW	Settings.SSC2 Setpoint 1	4	int32	±20'000	0.0	Defines the process value at which SSCx is set to active.
62	2	RW	Settings.SSC2 Setpoint 2	4	int32	±20'000	0.0	Defines the process value at which SSCx is set to inactive.
63	1	RW	Settings.SSC2 Logic	1	uint8		0	Selects the logic of SSCx: 0: Normal 1: Inverted
SSC 2 Hysteresis								
69	15	RW	Hysteresis.SSC2 Alignment Mode	1	uint8		2	Selects the hysteresis alignment mode of SSCx: 1: Left/Outer 2: Center 3: Right/Inner
69	11	RW	Hysteresis.SSC2 Width	4	uint32	0...20'000	0.001	Hysteresis width of SSCx as a percent of the nominal process value or as absolute process value.
69	14	RO	Hysteresis.SSC2 Width Mode	1	uint8		1	1: Absolute
SSC 2 Delays								
120	11	RW	Release Delay.SSC2 Enable	1	uint8		0	Enables/Disables release delay of SSCx. 0: Disabled 1: Enabled
120	12	RW	Release Delay.SSC2 Time	4	uint32	0...86'400'000	0	Release delay time of SSCx in milliseconds
121	11	RW	Response Delay.SSC2 Enable	1	uint8		0	Enables/Disables response delay of SSCx. 0: Disabled 1: Enabled
121	12	RW	Response Delay.SSC2 Time	4	uint32	0...86'400'000	0	Response delay time of SSCx in milliseconds
SSC 2 Minimum Pulse Duration								
122	11	RW	Minimal Pulse Duration.SSC2 Enable	1	uint8		0	Enables/Disables minimal pulse duration time of SSCx: 0: Disabled 1: Enabled
122	12	RW	Minimal Pulse Duration.SSC2 Time	4	uint32	0...86'400'000	0	Minimal pulse length of SSCx in milliseconds
122	13	RW	Minimal Pulse Duration.SSC2 Mode	1	uint8		1	Selects the affected pulse polarity for minimal pulse duration of SSCx: 1: Positive and negative pulses are prolonged 2: Only positive pulses are prolonged 3: Only negative pulses are prolonged

Diagnosis

Remote Operation

Index	Subindex	Access	SPDU name	Number of Bytes	Format	Range of values	Default value	Description
Remote Signal								
248	1	RW	Remote Operation Signal.Enable	1	uint8		0	Enables the remote operation mode. If enabled the sensor signal is interrupted and replaced with a remote signal that can be set in register "Remote Operation.Signal Physical Input Signal" 0: Disabled 1: Enabled
248	2	RO	Remote Operation Signal.Selection	1	uint8		1	Selects the signal that can set in the register "Remote Operation Signal.Physical Input Signal": 1: Physical Input Signal (mV/V)
248	3	RW	Remote Operation Signal.Physical Input Signal	4	float	±3.8	0.0	If the remote operation is enabled, the selected signal can be set by writing the corresponding value into this register.

Auxiliary Signals

Measured Temperatures								
209	1	RO	CPU Temperature.Current	4	float	-90...150° C		Current temperature of the CPU.
Internal Signals								
88	1	RO	Process Value.Physical Input Signal	4	float	±4.0	n.a.	Passive signal of the calibrated sensor in mV/V.

Device Status

Notifications / Warnings / Errors								
36	0	RO	Device Status	1	uint8		n.a.	0: Device is operating properly 1: Maintenance-Required (lowest priority) 2: Out-of-Specification 3: Functional-Check (remote mode) 4: Failure (highest priority)
37	0	RO	Detailed Device Status [1...10]	10 x 3	uint8[3]			List of detailed warnings and errors.
Device monitoring								
211	1	RO	Operation Time.Power-on	4	uint32	0...32 ² -1	n.a.	Operation time since power-on in seconds
211	3	RO	Operation Time.Lifetime	4	uint32	0...32 ² -1	n.a.	Operation time lifetime in seconds
224	2	RO	Number of power-on Cycles.Lifetime	4	uint32	0...32 ² -1	n.a.	Number of power-on cycles lifetime
226	3	RO	Number of Tarings.Lifetime	4	uint32	0...32 ² -1	n.a.	Number of taring lifetime

Sensor Adjustment

Factory Sensor Adjustment								
1001	4	RO	Factory Sensor Adjustment.Process Value Unit	2	uint16		DAB: 1699 DST: 1698	Value of the register «Customer Sensor Adjustment.Process Value Unit» during factory adjustment as reference and for reloading
1001	1	RO	Factory Sensor Adjustment.Nominal Process Value	4	int32	0.1...10'000	DAB: 1.0 DST: nominal strain	Value of the register «Customer Sensor Adjustment.Nominal Process Value» during factory adjustment as reference and for reloading.
1001	2	RO	Factory Sensor Adjustment.Nominal Sensitivity	4	float	±3.0	1.0	Value of the register «Customer Sensor Adjustment.Nominal Sensitivity» during factory adjustment as reference and for reloading.
1001	3	RO	Factory Sensor Adjustment.Offset	4	float	±3.8	0	Value of the register «Customer Sensor Adjustment.Offset» during factory adjustment as reference and for reloading.

Error Handling

Description	Condition	Device Status				Cyclic Data			Analog Output
		Value	Detailed Hex	Detailed Dez	Typ	Quality Bit	Alarm Bit	Process Value	
Process value outside of nominal range	> 1 · Nominal process value	1	0xE4, 0x18, 0x00	6144	Warning	1	Not affected (n. a.)	Not affected (n. a.)	Not affected (n. a.)
	< -1 · Nominal process value		0xE4, 0x18, 0x01	6145					
Process value out of measurable range	> 2 · Nominal process value	4	0xF4, 0x18, 0x02	6146	Error	n. a.	1	Out of Range (+) (+21'001)	Alarm
	< -2 · Nominal process value		0xF4, 0x18, 0x03	6147				Out of Range (-) (-21'001)	
Analog output out of range	> Analog output maximum	2	0xE4, 0x18, 0x04	6148	Warning	1	n. a.	n. a.	Alarm
	< Analog output minimum		0xE4, 0x18, 0x05	6149					
Input signal out of range	Outside of ±3.8 mV/V	4	0xF4, 0x18, 0x06	6150	Error	n. a.	1	Out of Range (+) / Out of Range (-) (±21'001)	Alarm
	Short / open wire		0xF4, 0x18, 0x07	6151					
Parameters are set, so that nominal process value range is outside of measurable input range.	120% Nominal value → >3.8mV/V	2	0xE4, 0x18, 0x08	6152	Warning	1	n. a.	n. a.	n. a.
	-120% Nominal value → <-3.8mV/V		0xE4, 0x18, 0x09	6153					
Primary supply voltage over-/underrun	>30V	2	0xE4, 0x51, 0x10	20752	Warning	1	n. a.	Potentially out of specification	
	<18V		0xE4, 0x51, 0x11	20753					
Simulation active	Input signal is set remotely	3	0xE4, 0x8C, 0x01	35841	Warning	1	Simulated		
Component malfunction		4	0xF4, 0x50, 0x10	20496	Error	n. a.	1	No Data (21'100)	Alarm