



OPERATION MANUAL

DIGIFORCE® 9311 EtherCAT Manual

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1 For your safety

1.1 Symbols used in the instruction manual

1.1.1 Signal words



The following signal words are used in the operation manual according to the specified hazard classification.

 <b style="font-size: 24px; margin-left: 20px;">DANGER
<p>High degree of risk: indicates a hazardous situation which, if not avoided, will result in death or serious injury.</p>
 <b style="font-size: 24px; margin-left: 20px;">WARNING
<p>Moderate degree of risk: indicates a hazardous situation which, if not avoided, may result in death or serious injury.</p>
 <b style="font-size: 24px; margin-left: 20px;">CAUTION
<p>Low degree of risk: indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.</p>
<b style="font-size: 24px; margin-left: 20px;">NOTICE
<p>Property damage to the equipment or the surroundings will result if the hazard is not avoided.</p>


Note: It is important to heed these safety notices in order to ensure you handle the DigiFo® 2x11 correctly.

Important: Follow the information given in the operation manual.

1.1.2 Pictograms

Symbol	Description
	<p>Warning concerning the use and installation of the device and software.</p>
	<p>Observe the advice for protecting the instrument.</p>

1.2 Symbols and precautionary statements on the instrument

Symbol	Description
	Hazard warning Disconnect the power plug before opening – Follow safety instructions – Professional servicing only
Warning ! To prevent electrical shock do not open device.	Warning of electrical shock hazard Do not open the unit.
To prevent fire replace only with same type and rating of fuse !	Warning of fire hazard Always replace the fuse with a fuse of the same type and rating.

1.2.1 Conventions used in the instruction manual

Designation	Description
[Fx]	Function keys F1 to F3 on the touchscreen display
[Text]	Buttons on the touchscreen display
"Term"	Terms used in the instrument menus

1.3 Intended use

The DIGIFORCE® 9311 is an instrument for monitoring repetitive production processes. Its core function is to record and analyze signals from processes in which physical variables, such as force, pressure or torque, vary as a function of displacement, angle or time according to a defined curve. The resultant measurement curve is analyzed using graphical evaluation elements such as windows, envelopes and thresholds. The result of the analysis is classified as "OK" or "NOT OK" (NOK) and can be retrieved from various interfaces.

The instrument is not a substitute for a safety device; for instance it cannot be used as an emergency stop device in a press for when the pressure exceeds a set limit.

2 Trademarks and Patents

EtherCat® is a registered trademark and patented technology of Beckhoff Automation GmbH, Germany

Patents:

The EtherCAT Technology is covered, including but not limited to the following patent applications and patents: EP1590927, EP1789857, DE102004044764, DE102007017835 with corresponding applications or registrations in various other countries.

3 Technical data

3.1 Supported EtherCAT Services

- Process Data Object (PDO)
- Service Data Object (SDO)

You will find further information about EtherCAT at: www.ethercat.org.

3.2 Model 9311 device data

Bus connector	RJ45
EDS file	burster_9311.xml

4 Installation

Please note that you can download various documents such as installation guidelines and specifications about EtherCAT at www.ethercat.org

4.1 Connection of fieldbus lines

burster devices with a EtherCAT option have two **RJ 45** connectors for the fieldbus connection.

4.2 Meaning of LEDs states



LED	Status	Description
LA	OFF	Port closed
	ON / Flickering	Port open
RN	OFF	The device is in state INIT
	Blinking	The device is in state PRE-OPERATIONAL
	Single flash	The device is in state SAFE-OPERATIONAL
	ON	The device is in state OPERATIONAL
ER	OFF	No error
	Blinking	Invalid configuration, general configuration error
	Single flash	Local error
	Double flash	Process data watchdog timeout / EtherCAT watchdog timeout
BOOT	Blinking	During boot process (internal communication between EtherCAT-fieldbus-processor and DIGIFORCE® 9311 main processing unit)

The status of the LEDs is corresponding to EtherCAT specification (for detailed information please see <http://www.ethercat.de/default.htm> "EtherCAT Indicator and Labeling ETG.1300 S (R) V1.1.0").

4.3 Configuration menu in DIGIFORCE® 9311

To access the menu

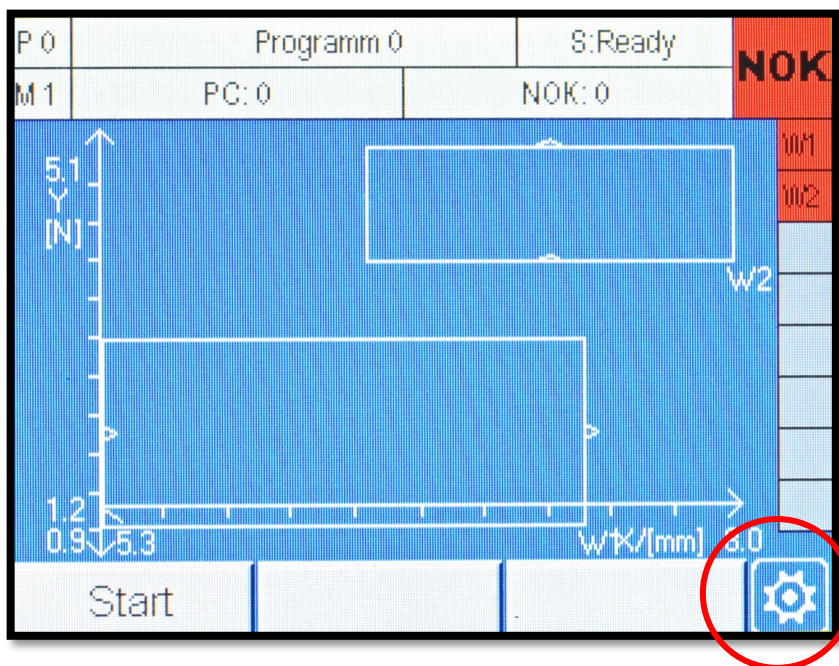
Start in measurement mode. After power on the measurement mode is always set. The display will look differently dependent on your settings or your last measurements.

You can go to "Configuration Main Menu" in measurement mode by pressing the **settings** button

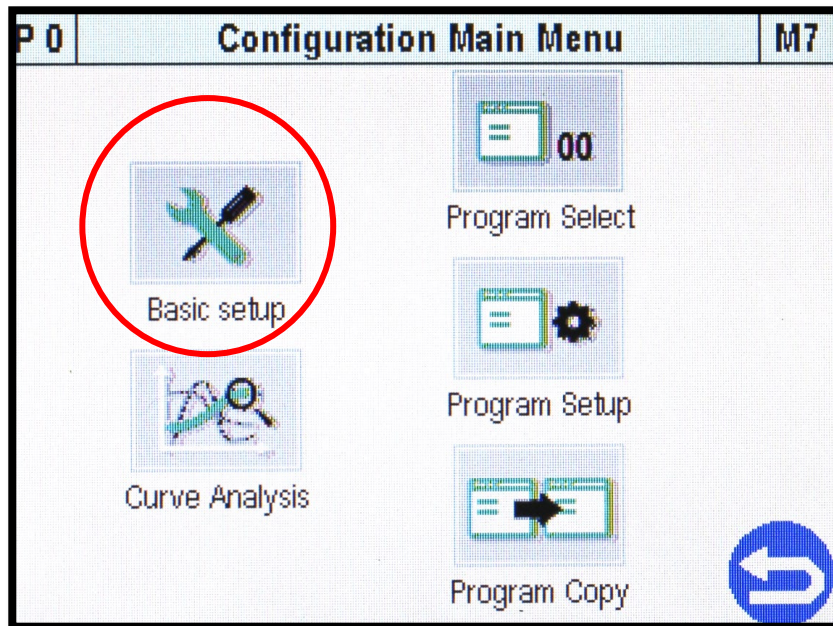


This is how it works

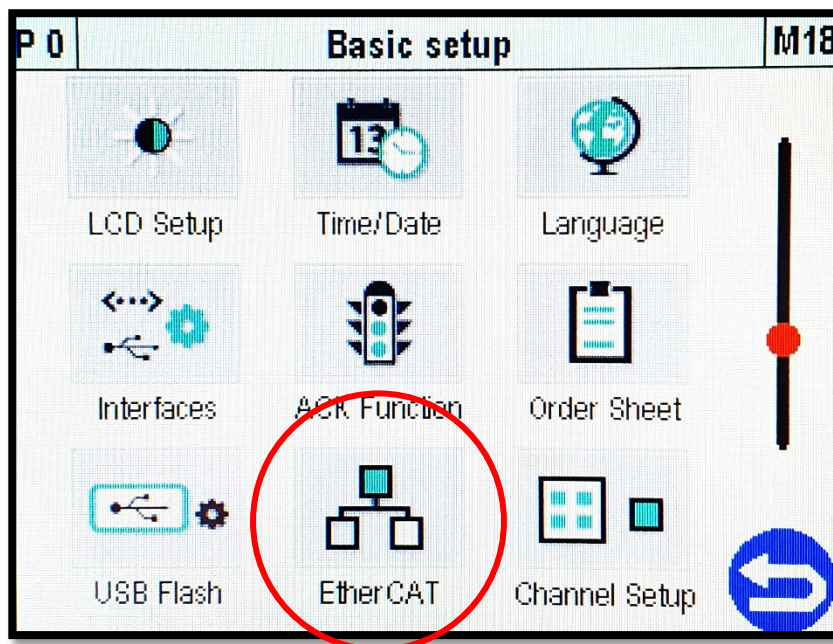
1. In measurement mode, press the **settings** button (gear wheel symbol)




- 2.
3. Go to "Basic setup menu"



- 4.
5. Scroll down to "EtherCAT" menu:



P 0	EtherCAT	M75
SW-version	EC-V202300	
Serial number	12345678910	
Control via	EtherCAT	
State machine		OP
Device ID		5



Parameters

SW-version	Version of the field bus card software
Serial number	Serial number of the fieldbus card
Control via	<p>EtherCAT: DIGIFORCE® 9311 responds solely to control signals (inputs) on the EtherCAT interface</p> <p>PLC: DIGIFORCE® 9311 responds solely to control signals (inputs) on the PLC I/O interface.</p> <p>When controlled via PLC I/O, data is still transferred in the cyclical EtherCAT Process Data Objects (PDO)</p>
State machine	<p>Status of the EtherCAT fieldbus state machine</p> <p>INIT The device is in state INIT</p> <p>PRE-OP The device is in state PRE-OPERATIONAL</p> <p>SAFE-OP The device is in state SAFE-OPERATIONAL</p> <p>OP The device is in state OPERATIONAL</p>
Device ID	Device Identification Value can be set here (used for slave identification, 0 is not valid)

5 EtherCAT – General information

5.1 General information on EtherCAT data transfer

The DIGIFORCE® 9311 with EtherCAT uses for the data transfer the EtherCAT technology CoE (CANopen over EtherCAT). There are two types of data – data which are transferred with each cycle (PDO – Process Data Objects) and data which are transferred on demand only (SDO – Service Data Objects). The SDO-Data are addressed via a combination of Index and Subindex which you will find in the tables below.

The device (Slave) is controlled using the data transferred from Master to Slave. This data always consists of three bytes for the DIGIFORCE® 9311 unit. The function of these three bytes is explained in chapter chapter “**PLC inputs – Transfer from Master to Slave**”

The DIGIFORCE® 9311 sends cyclic 92 bytes to Master. This packet contains PLC status, evaluation information and 30 measurement values, which are user selectable within the 9311 configuration and the live values of max. 3 active measurement channels.

Strings should be transferred with String-Ende (null terminated string)!

You will find further information about EtherCAT at: www.ethercat.org

5.2 Explicit Device Identification

The DIGIFORCE® 9311 supports both types of Explicit Device Identification: SII Configured Station Alias and Device Identification Value (ID Value). The SII configured station alias can be set by a Slave or a configuration tool. This value is stored in the device and is loaded at power-on into the register 0x0012:0x0013. The Device Identification Value (ID Value) can be set directly in the EtherCAT menu of a display device (please refer to Configuration menu in DIGIFORCE® 9311) or with our PC Software DigiControl for a black box device. This value is loaded into the register 0x0134 on the Slave request.

5.3 ESI file

The EtherCAT Slave Information (ESI) file `burster_9311.xml` can be downloaded from the section **Fieldbus** on our website: <https://www.burster.com/en/download-area>. This ESI file contains the EtherCAT configuration information for the DIGIFORCE® 9311.

The structure, contents and encoding of this device description data is standardized so that any EtherCAT devices can be configured using configuration tools from various manufacturers.

The ESI file does not specify what data is transferred or how this data should be interpreted. The user must glean this information from the operating manual and program their Controller accordingly.

5.4 Data conversion

5.4.1 Description of the data formats in this manual

The terms PLC inputs and PLC outputs refer to the DIGIFORCE® 9311 unit. These terms are reversed when referred to the EtherCAT Master (PLC).

The function of the PLC-In / PLC-Out bits is identical to the parallel PLC I/O ports on the unit itself and can be found within the DIGIFORCE® 9311 operating manual.

The floating-point numbers ("float") mentioned are four bytes long (32 bits) and are based on the IEEE-754 standard.

Numbers that are not specifically labeled or are labeled with "d" or "dec" are decimal numbers. (Example: 1234, 1234dec, dec1234, 1234d)

Numbers that are labeled with "0x" or "hex" are hexadecimal numbers. (Example: 0x1234, hex1234, 1234hex, 1234h)

Numbers that are labeled with "b" or "bin" are binary numbers. (Example: b1100, bin1100, 1100b, 1100bin).

5.4.2 Handling problems that arise when reading floating-point numbers

This only concerns cases in which floating-point numbers need to be read from the DIGIFORCE® 9311 unit.

Floating-point numbers (data type REAL), according to IEEE 754, are encoded as four bytes for transfer. This may create problems depending on the type of PLC used.

Cause

In the DIGIFORCE® 9311, the sign byte is transferred first if using acyclic data transfer (see 6. Unconnected Explicit Messaging) and last while cyclic data transmission. Some PLCs expect this byte in the highest of the four addresses not in the lowest address. This inevitably leads to misinterpretation of the numeric value. In this case the order of the four bytes has to be changed by the PLC as shown in the figure.

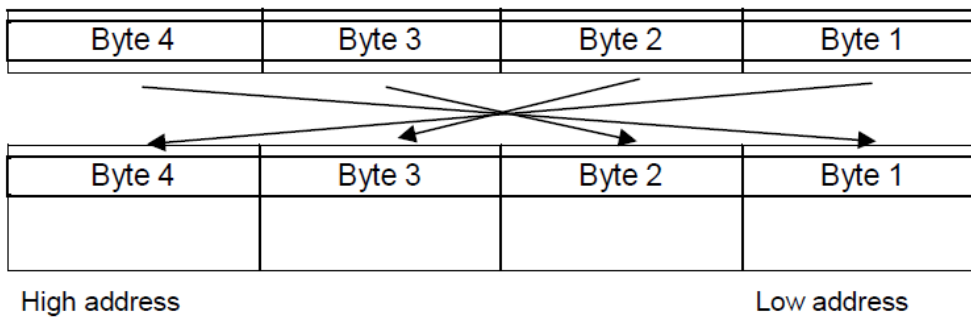


Diagram 1: Exchange of the order of bytes caused by misinterpretation of the numeric value

6 EtherCAT data protocol (PDO - Process Data Objects)

6.1 Meaning of the content of the cyclic data packet from device to the controller

Overview of the packet content:

Content	Length/Bytes	Bytes
PLC output status	2	Σ 92 bytes
Evaluation info	2	
20 evaluation values (float) , user defined values**	20x4	
2 live values (X, Y) *1	2x4	

* The user defined values contain values which are defined within the DIGIFORCE® 9311 device. The following values are available:

- General curve data
- Evaluation results of each evaluation element (e.g. window entry/exit window extended evaluation results like Min/Max window limits Xmin, Xmax, Ymin, Ymax threshold crossing point)

** The live values of the sensor channels are updated at a rate of 100 Hz. The values are only updated when the DIGIFORCE® 9311 is ready to record measurements or is actively taking a measurement.

How to define user defined values: The parameterization of the user defined values is done in the main setup menu "Setup user defined values" (Note that this setting is specific for each measurement program. For details refer to the DIGIFORCE® 9311 operation manual, section 6.3.8 User defined values.)

6.2 PLC inputs – Transfer from Master to Slave

Three bytes of PLC-In data for the DIGIFORCE® 9311 are always transferred from the EtherCAT Master to the DIGIFORCE® 9311. These bits have the same function as the parallel PLC inputs to the DIGIFORCE® 9311 unit. (See detailed documentation of these signals within the DIGIFORCE® 9311 operation manual, section 5.3.9 Assigning PLC outputs).

6.2.1 PLC inputs byte 1 - Master to Slave (DIGIFORCE® 9311)

PLC inputs Byte 1 - Master to Slave (DIGIFORCE® 9311)		
Valid values:	adjustable input #1 (P4)	Bit 0 LSB
	adjustable input #2 (P5)	Bit 1
Set reserved bits to '0'	adjustable input #3 (P6)	Bit 2
	IN_STROBE	Bit 3
	IN_AUTO	Bit 4
	reserved	Bit 5
	reserved	Bit 6
	reserved	Bit 7 MSB



NOTICE

Note that the adjustable PLC inputs #1, #2, #3 (Pin 4, 5, 6) can be assigned with different functions. The assignment can be changed within the DIGIFORCE® 9311 “Basic setup” menu (M18) under “Assignment of the PLC inputs” (for further information see DIGIFORCE® model 9311 operation manual chapter 6.1.3 “PLC inputs”).

6.2.2 PLC inputs byte 2 - Master to Slave (DIGIFORCE® 9311)

PLC inputs Byte 2 - Master to Slave (DIGIFORCE® 9311)		
Valid values:	IN_PROG0	Bit 0 LSB
	IN_PROG1	Bit 1
Set reserved bits to '0'	IN_PROG2	Bit 2
	IN_PROG3	Bit 3
	reserved	Bit 4
	reserved	Bit 5
	reserved	Bit 6

	reserved	Bit 7 MSB
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6.2.3 PLC inputs byte 3 - Master to Slave (DIGIFORCE® 9311)

PLC inputs Byte 3 - Master to Slave (DIGIFORCE® 9311)		
Valid values:	IN_START	Bit 0 LSB
	reserved	Bit 1
Set reserved bits to '0'	reserved	Bit 2
	reserved	Bit 3
	reserved	Bit 4
	reserved	Bit 5
	reserved	Bit 6
	reserved	Bit 7 MSB

6.3 PLC outputs – Transfer from Slave (DIGIFORCE® 9311) to Master

The data refers to the PLC output of the DIGIFORCE® 9311. The data described here is the data transferred from the DIGIFORCE® 9311 to the EtherCAT controller.

The function of the PLC-In / PLC-Out bits is identical to the parallel PLC I/O ports on the unit itself and can be found within the DIGIFORCE® 9311 operation manual for the unit. Also the signal timing is available within the DIGIFORCE® 9311 operation manual.

6.3.1 PLC outputs byte 1

PLC outputs Byte 1 - Slave (DIGIFORCE® 9311) to Master		
Valid values:	OUT_READY	Bit 0 LSB
	OUT_OK	Bit 1
	OUT_NOK	Bit 2
	OUT_NOK_ONL	Bit 3
	OUT_S1	Bit 4
	OUT_S2	Bit 5
	adjustable output #1 (P20)	Bit 6
	adjustable output #6 (P25)	Bit 7 MSB

6.3.2 PLC outputs byte 2

PLC outputs Byte 2 - Slave (DIGIFORCE® 9311) to Master		
Valid values:	adjustable output #2 (P21)	Bit 0 LSB
	adjustable output #3 (P22)	Bit 1
	adjustable output #4 (P23)	Bit 2
	adjustable output #5 (P24)	Bit 3
	reserved	Bit 4
	reserved	Bit 5
	reserved	Bit 6
	reserved	Bit 7 MSB



NOTICE

Note that PLC outputs [6..1] could be assigned with different functions. The assignment could be changed within the DIGIFORCE® 9311 basic setup menu "Assignment of the PLC outputs"(see DIGIFORCE® 9311 operation manual chapter 6.1.2 PLC outputs).

6.3.3 Default assignment of adjustable PLC inputs and outputs

9311 adjustable PLC inputs default assignment		
	adjustable input #1 (P4)	IN_TARA_X
	adjustable input #2 (P5)	IN_RES_STAT
	adjustable input #3 (P6)	IN_STEST
9311 adjustable PLC outputs default assignment		
	adjustable output #1 (P20)	OUT_OK_STEST
	adjustable output #2 (P21)	OUT_STROBE
	adjustable output #3 (P22)	OUT_PROG0
	adjustable output #4 (P23)	OUT_PROG1
	adjustable output #5 (P24)	OUT_PROG2
	adjustable output #6 (P25)	OUT_MEAS_ACT

NOTICE



Note that PLC inputs and outputs can be assigned with different functions. The assignment can be changed within the DIGIFORCE® 9311 “Basic setup” menu (M18) under "Assignment of the PLC inputs" or "Assignment of the PLC outputs"(see DIGIFORCE® model 9311 operation manual chapter 6.1.2 “PLC outputs”; 6.1.3 “PLC inputs”).

6.4 Evaluation info – Transfer from Slave (DIGIFORCE® 9311) to Master

The evaluation info (2 bytes) contains the evaluation result of each element.

6.4.1 Evaluation info byte 1

Evaluation info byte 1 - Slave (DIGIFORCE® 9311) to Master		
Valid values:	Global_NOK	Bit 0 LSB
	Overload_NOK	Bit 1
	Window_1_NOK	Bit 2
	Window_2_NOK	Bit 3
	Window_3_NOK	Bit 4
	Threshold_1_NOK	Bit 5
	Threshold_2_NOK	Bit 6
	Trapezoid_1_NOK	Bit 7 MSB

6.4.2 Evaluation info byte 2

Evaluation info byte 2 - Slave (DIGIFORCE® 9311) to Master		
Valid values:	Trapezoid_2_NOK	Bit 0 LSB
	Envelope_NOK	Bit 1
	Measurement w/o READY	Bit 2
	USB logging error	Bit 3
	reserved	Bit 4
	reserved	Bit 5
	reserved	Bit 6
	reserved	Bit 7 MSB

6.5 Byte reference list

Data from Master to Slave (DIGIFORCE® 9311)

Byte	Function	Section	Comments
0	PLC inputs Byte 1		
1	PLC inputs Byte 2		
2	PLC inputs Byte 3		

Data from Slave (DIGIFORCE® 9311) to Master

Byte	Function	Section	Comments
0	PLC outputs Byte 1		
1	PLC outputs Byte 2		
2	Evaluation info Byte 1		
3	Evaluation info Byte 2		
4	User-defined value_1 (1st Byte)	see DIGIFORCE® 9311 operation manual 6.3.8 User defined values	User defined value in DIGIFORCE® 9311 (32-Bit float)
5	User-defined value_1 (2nd Byte)	see above	
6	User-defined value_1 (3rd Byte)	see above	
7	User-defined value_1 (4th Byte)	see above	
8	User-defined value_2 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
9	User-defined value_2 (2nd Byte)	see above	
10	User-defined value_2 (3rd Byte)	see above	
11	User-defined value_2 (4th Byte)	see above	
12	User-defined value_3 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
13	User-defined value_3 (2nd Byte)	see above	
14	User-defined value_3 (3rd Byte)	see above	
15	User-defined value_3 (4th Byte)	see above	
16	User-defined value_4 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
17	User-defined value_4 (2nd Byte)	see above	
18	User-defined value_4 (3rd Byte)	see above	
19	User-defined value_4 (4th Byte)	see above	

Byte	Function	Section	Comments
20	User-defined value_5 (1st Byte)	see above	
21	User-defined value_5 (2nd Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
22	User-defined value_5 (3rd Byte)	see above	
23	User-defined value_5 (4th Byte)	see above	
24	User-defined value_6 (1st Byte)	see above	
25	User-defined value_6 (2nd Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
26	User-defined value_6 (3rd Byte)	see above	
27	User-defined value_6 (4th Byte)	see above	
28	User-defined value_7 (1st Byte)	see above	
29	User-defined value_7 (2nd Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
30	User-defined value_7 (3rd Byte)	see above	
31	User-defined value_7 (4th Byte)	see above	
32	User-defined value_8 (1st Byte)	see above	
33	User-defined value_8 (2nd Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
34	User-defined value_8 (3rd Byte)	see above	
35	User-defined value_8 (4th Byte)	see above	
36	User-defined value_9 (1st Byte)	see above	
37	User-defined value_9 (2nd Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
38	User-defined value_9 (3rd Byte)	see above	
39	User-defined value_9 (4th Byte)	see above	
40	User-defined value_10 (1st Byte)	see above	
41	User-defined value_10 (2nd Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
42	User-defined value_10 (3rd Byte)	see above	
43	User-defined value_10 (4th Byte)	see above	
44	User-defined value_11 (1st Byte)	see above	
45	User-defined value_11 (2nd Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
46	User-defined value_11 (3rd Byte)	see above	
47	User-defined value_11 (4th Byte)	see above	
48	User-defined value_12 (1st Byte)	see above	

Byte	Function	Section	Comments
49	User-defined value_12 (2nd Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
50	User-defined value_12 (3rd Byte)	see above	
51	User-defined value_12 (4th Byte)	see above	
52	User-defined value_13 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
53	User-defined value_13 (2nd Byte)	see above	
54	User-defined value_13 (3rd Byte)	see above	
55	User-defined value_13 (4th Byte)	see above	
56	User-defined value_14 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
57	User-defined value_14 (2nd Byte)	see above	
58	User-defined value_14 (3rd Byte)	see above	
59	User-defined value_14 (4th Byte)	see above	
60	User-defined value_15 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
61	User-defined value_15 (2nd Byte)	see above	
62	User-defined value_15 (3rd Byte)	see above	
63	User-defined value_15 (4th Byte)	see above	
64	User-defined value_16 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
65	User-defined value_16 (2nd Byte)	see above	
66	User-defined value_16 (3rd Byte)	see above	
67	User-defined value_16 (4th Byte)	see above	
68	User-defined value_17 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
69	User-defined value_17 (2nd Byte)	see above	
70	User-defined value_17 (3rd Byte)	see above	
71	User-defined value_17 (4th Byte)	see above	
72	User-defined value_18 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
73	User-defined value_18 (2nd Byte)	see above	
74	User-defined value_18 (3rd Byte)	see above	
75	User-defined value_18 (4th Byte)	see above	
76	User-defined value_19 (1st Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
77	User-defined value_19 (2nd Byte)	see above	

Byte	Function	Section	Comments
78	User-defined value_19 (3 rd Byte)	see above	
79	User-defined value_19 (4 th Byte)	see above	
80	User-defined value_20 (1 st Byte)	see above	
81	User-defined value_20 (2 nd Byte)	see above	User defined value in DIGIFORCE® 9311 (32-Bit float)
82	User-defined value_20 (3 rd Byte)	see above	
83	User-defined value_20 (4 th Byte)	see above	
84	Live value Channel X (1 st Byte)		
85	Live value Channel X (2 nd Byte)		(32-Bit float) Channel X live value Updating rate of the live values ¹⁰⁰ /sec.
86	Live value Channel X (3 rd Byte)		
87	Live value Channel X (4 th Byte)		
88	Live value Channel Y (1 st Byte)		
89	Live value Channel Y (2 nd Byte)		(32-Bit float) Channel Y live value Updating rate of the live values ¹⁰⁰ /sec.
90	Live value Channel Y (3 rd Byte)		
91	Live value Channel Y (4 th Byte)		

7 SDO – Service Data Objects

The services are described from the point of view of the Master.

The SDO EtherCAT services allow access to following DIGIFORCE® 9311 functions:

- Complete device configuration
- Transfer of component/worker/job data for logging
- Retrieval of large amounts of process and curve data
- For further information please contact our service department at service@burster.com

Note: The current EtherCAT specification does not have any error codes in case the device cannot perform a command due to its current state, e.g. an optional analogue card is not build-in. If you write some data into the device, it is recommended to read the value back and compare it with the set value to be sure the device has accepted your parameter. Additionally, the device sends an emergency message if a parameter cannot be read or written. EtherCAT Master can read out these emergency messages. One message consists of 5 bytes: **CFGERR** and means **Configuratiuon Error**. Please also use them with read commands, especially if the expected value is a 0 (zero). If the device fails to return data due to its current state, it sets all data bytes to zero and sends an emergency message.

Abbreviations

WO	Write Only
RO	Read Only
RW	Read and Write
Event!	Writing an arbitrary byte initiates action
BOOL	Data type Boolean
FLT	Data type Float, floating point number according to IEEE754, Length = 4 Byte
STR n	Data type String, String of n Bytes
U8	Data type Unsigned 8, Length = 1 Byte
U16	Data type Unsigned 16, Length = 2 Byte
U32	Data type Unsigned 32, Length = 4 Byte

7.1 Instrument configuration

7.1.1 Index 0x2000: Master Outputs

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2000	1	IN_ADJ1	0	Set	U8	1	WO
			1	Not set			
0x2000	2	IN_ADJ2	0	Set	U8	1	WO
			1	Not set			
0x2000	3	IN_ADJ3	0	Set	U8	1	WO
			1	Not set			
0x2000	4	IN_STROBE	0	Set	U8	1	WO
			1	Not set			
0x2000	5	IN_AUTO	0	Set	U8	1	WO
			1	Not set			

0x2000	9	IN_PROG0	0 1	Set Not set	U8	1	WO
0x2000	10	IN_PROG1	0 1	Set Not set	U8	1	WO
0x2000	11	IN_PROG2	0 1	Set Not set	U8	1	WO
0x2000	12	IN_PROG3	0 1	Set Not set	U8	1	WO
0x2000	17	IN_START	0 1	Set Not set	U8	1	WO

7.1.2 Index 0x2001: Master Inputs

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2001	1	OUT_READY	0xff 0	Set Not set	U8	1	RO
0x2001	2	OUT_OK	0xff 0	Set Not set	U8	1	RO
0x2001	3	OUT_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	4	OUT_NOK_ONL	0xff 0	Set Not set	U8	1	RO
0x2001	5	OUT_S1	0xff 0	Set Not set	U8	1	RO
0x2001	6	OUT_S2	0xff 0	Set Not set	U8	1	RO
0x2001	7	OUT_ADJ1	0xff 0	Set Not set	U8	1	RO
0x2001	8	OUT_ADJ6	0xff 0	Set Not set	U8	1	RO
0x2001	9	OUT_ADJ2	0xff 0	Set Not set	U8	1	RO
0x2001	10	OUT_ADJ3	0xff 0	Set Not set	U8	1	RO
0x2001	11	OUT_ADJ4	0xff 0	Set Not set	U8	1	RO
0x2001	12	OUT_ADJ5	0xff 0	Set Not set	U8	1	RO
0x2001	17	OUT_Global_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	18	OUT_Overload_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	19	OUT_Window_1_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	20	OUT_Window_2_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	21	OUT_Window_3_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	22	OUT_Threshold_1_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	23	OUT_Threshold_2_NOK	0xff 0	Set Not set	U8	1	RO

0x2001	24	OUT_Trapezoid_1_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	25	OUT_Trapezoid_2_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	26	OUT_Envelope_NOK	0xff 0	Set Not set	U8	1	RO
0x2001	27	OUT_Measurement_w_o_READY	0xff 0	Set Not set	U8	1	RO
0x2001	28	OUT_USB_logging_error	0xff 0	Set Not set	U8	1	RO
0x2001	33	OUT_User_defined_Value_1	0xff 0	Set Not set	FLT	4	RO
0x2001	34	OUT_User_defined_Value_2	0 1	Set Not set	FLT	4	RO
0x2001	35	OUT_User_defined_Value_3	0 1	Set Not set	FLT	4	RO
0x2001	36	OUT_User_defined_Value_4	0 1	Set Not set	FLT	4	RO
0x2001	37	OUT_User_defined_Value_5	0 1	Set Not set	FLT	4	RO
0x2001	38	OUT_User_defined_Value_6	0 1	Set Not set	FLT	4	RO
0x2001	39	OUT_User_defined_Value_7	0 1	Set Not set	FLT	4	RO
0x2001	40	OUT_User_defined_Value_8	0 1	Set Not set	FLT	4	RO
0x2001	41	OUT_User_defined_Value_9	0 1	Set Not set	FLT	4	RO
0x2001	42	OUT_User_defined_Value_10	0 1	Set Not set	FLT	4	RO
0x2001	43	OUT_User_defined_Value_11	0 1	Set Not set	FLT	4	RO
0x2001	44	OUT_User_defined_Value_12	0 1	Set Not set	FLT		RO
0x2001	45	OUT_User_defined_Value_13	0 1	Set Not set	FLT	4	RO
0x2001	46	OUT_User_defined_Value_14	0 1	Set Not set	FLT	4	RO
0x2001	47	OUT_User_defined_Value_15	0 1	Set Not set	FLT	4	RO
0x2001	48	OUT_User_defined_Value_16	0 1	Set Not set	FLT	4	RO
0x2001	49	OUT_User_defined_Value_17	0 1	Set Not set	FLT	4	RO
0x2001	50	OUT_User_defined_Value_18	0 1	Set Not set	FLT	4	RO
0x2001	51	OUT_User_defined_Value_19	0 1	Set Not set	FLT	4	RO
0x2001	52	OUT_User_defined_Value_20	0 1	Set Not set	FLT	4	RO
0x2001	53	OUT_Channel_X_Live_Value	0 1	Set Not set	FLT	4	RO
0x2001	54	OUT_Channel_Y_Live_Value	0 1	Set Not set	FLT	4	RO

7.1.3 General settings (Index 0x2030)

Index 0x2030, Attributes 0 to 18

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2030	0	Number of sub-indices	-		U8	1	RO
0x2030	1...9	Reserved	-	Not possible			X
0x2030	10	Device detection	<i>Digiforce Typ 9311</i>		STR18	18	RO
0x2030	11	Serial number	<i>12345678</i>		STR11	11	RO
0x2030	12	Software version	<i>V202300</i>		STR25	25	RO
0x2030	13	Version boot loader software	<i>V201500</i>		STR25	25	RO
0x2030	14	Software version Field bus interface	<i>EC-V202300</i>		STR25	25	RO
0x2030	15	Optional analog interface enabled	0 1 2 3	Strain gauge+Potent. Piezo+Potentiometer Strain gauge+Increm. Piezo+Incremental	U16	2	RO
0x2030	16	Info: Calibration date analog interface	<i>08.09.2023</i>		STR10	10	RO
0x2030	17	Station name	<i>Stat14 right</i>		STR15	15	RW
0x2030	18	reserved	-	-	-	-	-

Index 0x2030, Attributes 19 to 35

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2030	19	Language	0 1 2 3 4 5	German English French Spanish Italian Chinese	U16	2	RW
0x2030	20	Date	<i>[dd.mm.yyyy]</i>	e.g.: 21.09.2016	STR10	10	RW
0x2030	21	Time	<i>[hh:mm:ss], 24h</i>	e.g.: 16:15:00	STR8	8	RW
0x2030	22	LCD brightness	<i>1 ... 10</i>	Integer value (10 max.)	U16	2	RW
0x2030	23	Measurement menu function key definition F1	0 1 2 3 4 5	Off Meas. program incremental Meas. program decremental Tare X Tare Y	U16	2	RW

			6 7 8 9	Measurement Start/Stop Acknowledge OK parts Acknowledge NOK parts Sensor test Edit mode			
0x2030	24	Measurement menu function key definition F2	0 1 2 3 4 5 6 7 8 9	Off Meas. program incremental Meas. program decremental Tare X Tare Y Measurement Start/Stop Acknowledge OK parts Acknowledge NOK parts Sensor test Edit mode	U16	2	RW
0x2030	25	Measurement menu function key definition F3	0 1 2 3 4 5 6 7 8 9	Off Meas. program incremental Meas. program decremental Tare X Tare Y Measurement Start/Stop Acknowledge OK parts Acknowledge NOK parts Sensor test Edit mode	U16	2	RW
0x2030	26	Display mode of function Keys	0 1	Fade out Always on	U16	2	RW
0x2030	27	Meas. menu display control GRAPHIC	0 1	Meas. menu disabled Meas. menu enabled	U16	2	RW
0x2030	28	Meas. menu display control GENERAL CURVE DATA	0 1	Meas. menu disabled Meas. menu enabled	U16	2	RW
0x2030	29	Meas. menu display control TOTAL (Off/Smiley/text)	0 1 2	Meas. menu disabled Smiley Text	U16	2	RW
0x2030	30	Meas. menu display control ENTRY/EXIT VALUES	0 1	Meas. menu disabled Meas. menu enabled	U16	2	RW
0x2030	31	Meas. menu display control USER DEFINED MEAS. VALUES	0 1	Meas. menu disabled Meas. menu enabled	U16	2	RW
0x2030	32	Meas. menu display control STATISTICS	0 1	Meas. menu disabled Meas. menu enabled	U16	2	RW
0x2030	33	Meas. menu display control ORDER SHEET	0 1	Meas. menu disabled Meas. menu enabled	U16	2	RW

0x2030	34	Show/Hide of Live Values	0 1	Show Live Values Hide Live Values	U16	2	RW
0x2030	35	Display the measurement menu, read the currently displayed measurement menu	101 102 103 104 105 106 107	M1 Displaying meas. curves M2 General curve data M3 Total Result M4 Entry/Exit M5 User defined values M6 Statistics M7 Order sheet	U16	2	RW
		<p>Note: The menu is selected here, but not yet displayed. Display only occurs through access to Index 0x2030/68.</p>					

Index 0x2030, Attributes 36 to 51

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2030	36	Access authorisation Password protection on/off	0 1	Password protection on Password protection off	U16	2	RW
0x2030	37	Access authorisation BASIC SETUP MENU	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	38	Access authorisation PROGRAM SELECTION	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	39	Access authorisation COPY PROGRAMS	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	40	Access authorisation CURVE ANALYSIS	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	41	Access authorisation CHANNEL SETTINGS	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	42	Access authorisation MEASUREMENT MODE	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	43	Access authorisation EVALUATION	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	44	Access authorisation REALTIME SWITCHPOINTS	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	45	Access authorization TEST OPERATION	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	46	Access authorisation SENSOR TEST	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	47	Access authorisation USER DEFINED VALUES	0 1	Access level disabled Access level enabled	U16	2	RW

0x2030	48	Access authorisation EXTERNAL MEMORY	0 1	Access level disabled Access level enabled	U16	2	RW
0x2030	49	Master password	0000 ... 9999		U16	2	RW
0x2030	50	Set master password to default	<i>EVENT!</i>	Writing an arbitrary byte initiates action	U8	1	WO
0x2030	51	User password	0000 ... 9999		U16	2	RW

Index 0x2030, Sub-Index 52 (Assignment adjustable PLC output 1)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2030	52	adj. PLC output 1 (P20)	0	OUT_OK_STEST	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	1	OUT_STROBE	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	2	OUT_PROG0	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	3	OUT_PROG1	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	4	OUT_PROG2	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	5	OUT_PROG3	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	6	OUT_MEAS_ACT	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	7	OUT_S3	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	8	OUT_S4	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	9	OUT_S5	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	10	OUT_S6	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	11	OUT_TEST_OP	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	12	OUT_ERROR	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	13	OUT_WARN_TARE	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	14	OUT_CONFIG	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	15	OUT_ACK_ALARM	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	16	OUT_ACK_LOCK	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	17	OUT_ACK_OK	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	18	OUT_ACK_NOK	U16	2	RW
0x2030	52	adj. PLC output 1 (P20)	19	OUT_PC_LOG	U16	2	RW

Index 0x2030, Attributes 53 to 57 (Assignment adjustable PLC outputs 2 to 6)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2030	53	adj. PLC output 2 (P21)	<i>see subindex 52</i>		U16	2	RW
0x2030	54	adj. PLC output 3 (P22)	<i>see subindex 52</i>		U16	2	RW
0x2030	55	adj. PLC output 4 (P23)	<i>see subindex 52</i>		U16	2	RW
0x2030	56	adj. PLC output 5 (P24)	<i>see subindex 52</i>		U16	2	RW
0x2030	57	adj. PLC output 6 (P25)	<i>see subindex 52</i>		U16	2	RW

Index 0x2030, Sub-Index 58 (Assignment adjustable PLC input 1)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2030	58	adj. PLC input 1 (P4)	0	IN_TARE_X	U16	2	RW
0x2030	58	adj. PLC input 1 (P4)	1	IN_TARE_Y	U16	2	RW
0x2030	58	adj. PLC input 1 (P4)	2	IN_TARE_X+Y	U16	2	RW
0x2030	58	adj. PLC input 1 (P4)	3	IN_RES_STAT	U16	2	RW
0x2030	58	adj. PLC input 1 (P4)	4	IN_STEST	U16	2	RW
0x2030	58	adj. PLC input 1 (P4)	5	IN_TEST_OP	U16	2	RW
0x2030	58	adj. PLC input 1 (P4)	6	IN_ACK	U16	2	RW
0x2030	58	adj. PLC input 1 (P4)	7	IN_ACK_OK	U16	2	RW
0x2030	58	adj. PLC input 1 (P4)	8	IN_ACK_NOK	U16	2	RW
0x2030	58	adj. PLC input 1 (P4)	9	IN_ACK_ERROR	U16	2	RW

Index 0x2030, Attributes 59 to 60 (Assignment PLC inputs 2 to 3)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2030	59	adj. PLC input 2 (P5)	<i>see subindex 58</i>		U16	2	RW

0x2030	60	adj. PLC input 3 (P6)	<i>see subindex 58</i>		U16	2	RW
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Index 0x2030, Attributes 61 to 71

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2030	61	Order sheet: Operator	<i>Michael_Mueller</i>		STR64	64	RW
0x2030	62	Order sheet: Order number	<i>AN_123456</i>		STR64	64	RW
0x2030	63	Order sheet: Batch	<i>BATCH_257-3</i>		STR64	64	RW
0x2030	64	Order sheet: Component	<i>Cylinder_rig ht</i>		STR64	64	RW
0x2030	65	Order sheet: Serial number 1	<i>SN_123456789</i>		STR64	64	RW
0x2030	66	Order sheet: Serial number 2	<i>SN_987654321</i>		STR64	64	RW
0x2030	67	Acknowledgement function on/off	0 1	Acknowledgement function off Acknowledgement function on	U16	2	RW
0x2030	68	Acknowledgement function: Acknowledge OK parts on/off	0 1	Not active User has to confirm OK parts (F-Key or PLC input)	U16	2	RW
0x2030	69	Acknowledgement function: Acknowledge NOK parts on/off	0 1	Not active User has to confirm NOK parts (F-Key or PLC input)	U16	2	RW
0x2030	70	Acknowledgement function: Buzzer volume	<i>0 ... 10</i>	10: max. volume	U16	2	RW
0x2030	71	Update display (refresh view)	<i>Event!</i>	Writing an arbitrary byte initiates action	U8	1	WO

7.1.4 Communication: Change menu, display update, fault indication (Index 0x2031)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2031	0	Number of sub-indices	-		U8	1	RO
0x2031	1 - 9	Reserved	-	-	x	x	x
0x2031	10	Go to menu	0 1	Meas. Menu Graphical test menu	U16	2	WO
0x2031	11	Initiate update of the LCD display	<i>EVENT!</i>	Writing an arbitrary byte initiates action	U8	1	WO

0x2031	12	Device fault status	0x00000001	PREFIX addressing fault	U32	4	RO
			0x00000002	Enquiry received in Device mode	U32	4	RO
			0x00000004	Blockcheck error	U32	4	RO
			0x00000008	Command fault	U32	4	RO
			0x00000010	Parameter error	U32	4	RO
			0x00000020	Timeout Receive Timer	U32	4	RO
			0x00000040	Timeout Response Timer	U32	4	RO
			0x00000080	Invalid ! or ?	U32	4	RO
			0x00000100	Invalid configuration	U32	4	RO
			0x00000400	No valid measurements are available	U32	4	RO
			0x00004000	Reading out the measurement curve was interrupted by the beginning of a new measurement	U32	4	RO
			0x00080000	No TEDS or TEDS is not valid	U32	4	RO
			0x00100000	TEDS voltage too low	U32	4	RO
			0x00200000	TEDS ID not valid	U32	4	RO
			0x00400000	TEDS Version not valid	U32	4	RO
			0x00800000	Strain gauge sensor connected but another sensor selected	U32	4	RO
			0x01000000	Standard signal sensor connected but another sensor selected	U32	4	RO
			0x02000000	Unknown error	U32	4	RO
			0x04000000	Sensor type is not valid	U32	4	RO
			0x08000000	Potentiometer sensor connected but another sensor selected	U32	4	RO
0x10000000	Direction of strain gauge is not valid	U32	4	RO			
0x20000000	USB Flash Error	U32	4	RO			

7.1.5 Program Selection/Renaming & Statistics reset (Index 0x2032)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2032	0	Number of sub-indices	-		U8	1	RO
0x2032	1 – 9	Reserved	-	-	x	x	x
0x2032	10	Set program number	0 ... 15		U16	2	RW
0x2032	11	Writing/Reading of the current program name	<i>Program name</i>		STR20	20	RW
0x2032	12	Reset statistics of a measurement program	0 ... 15	EVENT! Selection through writing the program number	U16	2	WO
0x2032	13	Reset statistics in all measurement programs	<i>EVENT!</i>	Writing an arbitrary byte initiates action	U8	1	WO

7.1.6 General channel settings (Index 0x2033)

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
0x2033	0	Number of sub-indices	-		U8	1	RO
0x2033	1 - 9	Reserved	-	-			X
0x2033	10	Channel settings channel X Note: First make the settings in Attributes 10, 11 then initiate with index 12!	0 1 2 3 4 5	Terminals: A, Potentiometer A, standard signal B, strain gauge B, standard signal B, Piezo Time	U16	2	RW
0x2033	11	Channel settings channel Y Note: First make the settings in Attributes 10, 11 then initiate with index 12!	0 1 2 3 4 5	Terminals: A, Potentiometer A, standard signal B, strain gauge B, standard signal B, Piezo Time	U16	2	RW
0x2033	12	Accept channel settings	<i>Event!</i>	The settings from Attributes 10, 11 are being stored. Writing an arbitrary byte initiates action.	U8	1	WO
0x2033	13	Filter channel X Note: Not available for the channel settings "Piezo"	0 1 2 3 4 5 6 7	Off 5 Hz filter 10 Hz filter 25 Hz filter 50 Hz filter 100 Hz filter 200 Hz filter 400 Hz filter	U16	2	RW

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
			8	800 Hz filter			
0x2033	14	Filter channel Y Notes: Not available for the channel settings "Piezo"	0 1 2 3 4 5 6 7 8	Off 5 Hz filter 10 Hz filter 25 Hz filter 50 Hz filter 100 Hz filter 200 Hz filter 400 Hz filter 800 Hz filter	U16	2	RW
0x2033	15	Transmitter supply channel X Note: Entry is not available for the channel settings "Piezo" Only for 'BlackBox' devices	0 1	Transmitter supply off Transmitter supply on	U16	2	RW
0x2033	16	Transmitter supply channel Y Note: Entry is not available for the channel settings "Piezo" Only for 'BlackBox' devices	0 1	Transmitter supply off Transmitter supply on	U16	2	RW
0x2033	17	Set unit channel X Note: Entry is not available for the channel settings "Time"	0 1 2 3 4 5 6 7 8 9 10 11 12	User defined unit 1 User defined unit 2 User defined unit 3 mm N kN Nm Ncm grd bar V s ms	U16	2	RW
0x2033	18	Set unit channel Y Note: Entry is not available for the channel settings "Time"	0 1 2 3 4 5 6 7 8	User defined unit 1 User defined unit 2 User defined unit 3 mm N kN Nm Ncm grd	U16	2	RW

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
			9 10 11 12	bar V s ms			
0x2033	19	Set user defined unit 1	abcd		STR4	4	RW
0x2033	20	Set user defined unit 2	abcd		STR4	4	RW
0x2033	21	Set user defined unit 3	ijkl		STR4	4	RW
0x2033	22	Returns the measured value on channel X Note: Entry is not available for the channel settings "Time"	EVENT!		FLT	4	RO
0x2033	23	Returns the measured value on channel Y Note: Entry is not available for the channel settings "Time"	EVENT!		FLT	4	RO
0x2033	24	Channel to be scaled	0 1	Channel X Channel Y	U 16	2	WO
0x2033	25	Lower scale value		Concerns the channel selected under index 24	FLT	4	RW
0x2033	26	Upper scale value		Concerns the channel selected under index 24	FLT	4	RW
0x2033	27	Lower calibration value		Concerns the channel selected under index 24	FLT	4	RW
0x2033	28	Upper calibration value		Concerns the channel selected under index 24	FLT	4	RW
0x2033	29	Perform scaling (as per index 25 ... 29)	EVENT	Entry is not available for the channel settings "Off" and "Time"	U8	1	WO
0x2033	30	Switch between program depending and global channel settings	0 1	Program depending Global Note: If changing to global settings, the individual channel setting will get lost	U16	2	RW

7.1.7 Channel settings “Standard signal” (Index 0x2034)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2034	0	Number of sub-indices	-		U8	1	RO
0x2034	1 - 9	Reserved	-	-			X
0x2034	10	Standard signal input channel X	0 1	5 V input range 10 V input range	U16	2	RW
0x2034	11	Standard signal input channel Y	0 1	5 V input range 10 V input range	U16	2	RW

7.1.8 Channel settings “Strain gauge” (Index 0x2035)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2035	0	Number of sub-indices	-		U8	1	RO
0x2035	1 - 9	Reserved	-	-			X
0x2035	10	Strain gauge input range channel X	0 1 2 3 4	2 mV/V input range 4 mV/V input range 10 mV/V input range 20 mV/V input range 40 mV/V input range	U16	2	RW
0x2035	11	Strain gauge input range channel Y	0 1 2 3 4	2 mV/V input range 4 mV/V input range 10 mV/V input range 20 mV/V input range 40 mV/V input range	U16	2	RW
0x2035	12	Strain gauge sensitivity channel X	0.01 ... 100.0	IEEE754 Float	FLT	4	RW
0x2035	13	Strain gauge sensitivity channel Y	0.01 ... 100.0	IEEE754 Float	FLT	4	RW
0x2035	14	Level (elect.) strain gauge channel X	0.01 ... 100.0	IEEE754 Float	FLT	4	RO
0x2035	15	Level (elect.) strain gauge channel Y	0.01 ... 100.0	IEEE754 Float	FLT	4	RO

7.1.9 Channel settings “Piezo” (Index 0x2036)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2036	0	Number of sub-indices	-		U8	1	RO
0x2036	1 - 9	Reserved	-	-			X
0x2036	10	Piezo input range channel X	0 1 2 3 4 5 6 7 8 9	1nC range 2nC range 5nC range 10nC range 20nC range 40nC range 80nC range 200nC range 400nC range 1uC range	U16	2	RW
0x2036	11	Piezo input range channel Y	0 1 2 3 4 5 6 7 8 9	1nC range 2nC range 5nC range 10nC range 20nC range 40nC range 80nC range 200nC range 400nC range 1uC range	U16	2	RW
0x2036	12	Piezo short-circuit on/to channel X	0 1	Do not short-circuit piezo input Short-circuit piezo input	U16	2	WO
0x2036	13	Piezo short-circuit on/to channel Y	0 1	Do not short-circuit piezo input Short-circuit piezo input	U16	2	WO

7.1.10 Tare (Index 0x2037)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2037	0	Number of sub-indices	-		U8	1	RO
0x2037	1 .. 9	Reserved	-	-			X
0x2037	10	Tare at meas. start channel X	0 1	off on	U16	2	RW
0x2037	11	Tare at meas. start channel Y	0 1	off on	U16	2	RW
0x2037	12	Standard value for tare channel X	<i>between -9999999.0 and 9999999.0</i>	Float value, Float according to IEEE754	FLT	4	RW
0x2037	13	Standard value for tare channel Y	<i>between -9999999.0 and 9999999.0</i>	Float value, Float according to IEEE754	FLT	4	RW
107	14	Tare warning on/off channel X	0 1	off on	U16	2	RW
107	15	Tare warning on/off channel Y	0 1	off on	U16	2	RW
107	16	Set tare warning limit channel X	<i>between 1.0 and 20.0</i>	Float value, Float according to IEEE754	FLT	4	RW
107	17	Set tare warning limit channel Y	<i>between 1.0 and 20.0</i>	Float value Float according to IEEE754	FLT	4	RW
107	18	Tare channel X	<i>EVENT!</i>	Writing an arbitrary byte initiates action	U8	1	WO
107	19	Delete tare channel X	<i>EVENT!</i>	Writing an arbitrary byte initiates action	U8	1	WO
107	20	Tare channel Y	<i>EVENT!</i>	Writing an arbitrary byte initiates action	U8	1	WO
107	21	Delete tare channel Y	<i>EVENT!</i>	Writing an arbitrary byte initiates action	U8	1	WO

7.1.11 Measurement mode (Index 0x2038)

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
0x2038	0	Number of sub-indices	-		U8	1	RO
0x2038	1 .. 9	Reserved	-	-			X
0x2038	10	X sampling off/on	0 1	off on	U16	2	RW
0x2038	11	X sample rate	<i>between 0.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	12	Y sampling off/on	0 1	off on	U16	2	RW
0x2038	13	Y sample rate	<i>between 0.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	14	Time sampling off/on	0 1	off on	U16	2	RW
0x2038	15	Time sample rate	<i>between 0.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	16	Set reference of curve Note: "Underrun" is not permitted if the channel concerned is set to time.	0 1 2 3 4 5	Absolute Final force Y reference line overrun Y reference line underrun Y trigger overrun Y trigger underrun	U16	2	RW
0x2038	17	Set reference line Y	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	18	Set trigger line Y	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	19	Set return point	0 1 2 3	XMIN XMAX YMIN YMAX	U16	2	RW
0x2038	20	Set "Record curve to"	0 1	Complete curve Up to return point	U16	2	RW
0x2038	21	Set start mode	0 1 2 3 4	External X internal overrun X internal underrun Y internal overrun Y internal underrun	U16	2	RW

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
0x2038	22	Set stop mode	0 1 2 3 4 5 6	External X internal overrun X internal underrun Y internal overrun Y internal underrun Timeout Defined number of measured values	U16	2	RW
0x2038	23	Set X start value for internal start	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	24	Set Y start value for internal start	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	25	Set X stop value for internal stop	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	26	Set Y stop value for internal stop	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	27	Set the "stop" timeout value	<i>between 0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2038	28	Set the "stop" number of measured values	<i>0 bis 5000</i>	Integer value	U16	2	RW

7.1.12 Evaluation window 1 (Index 0x2039)

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
0x2039	0	Number of sub-indices	-		U8	1	RO
0x2039	1 .. 9	Reserved	-	-			X
0x2039	10	Window 1 off/on	0 1	off on	U16	2	RW
0x2039	11	Window 1 limit Xmin Note: At the end, entry must be adopted through index 15.	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2039	12	Window 1 limit Xmax Note: At the end, entry must be adopted through index 15.	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2039	13	Window 1 limit Ymin	<i>between</i>	Float value Float according to IEEE754	FLT	4	RW

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
		Note: At the end, entry must be adopted through index 15.	-9999999.0 and 9999999.0				
0x2039	14	Window 1 limit Ymax Note: At the end, entry must be adopted through index 15.	between -9999999.0 and 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2039	15	Window 1 copy limit Note: Values entered into Attributes 11, 12, 13,14 are adopted	EVENT!	Writing an arbitrary byte initiates action	U8	1	WO
0x2039	16	Window 1 entry left Note: At the end, entry must be adopted through index 24.	0 1	no yes	U16	2	RW
0x2039	17	Window 1 entry right Note: At the end, entry must be adopted through index 24.	0 1	no yes	U16	2	RW
0x2039	18	Window 1 entry bottom Note: At the end, entry must be adopted through index 24.	0 1	no yes	U16	2	RW
0x2039	19	Window 1 entry top Note: At the end, entry must be adopted through index 24.	0 1	no yes	U16	2	RW
0x2039	20	Window 1 exit left Note: At the end, entry must be adopted through index 24.	0 1	no yes	U16	2	RW
0x2039	21	Window 1 exit right Note: At the end, entry must be adopted through index 24.	0 1	no yes	U16	2	RW
0x2039	22	Window 1 exit bottom Note: At the end, entry must be adopted through index 24.	0 1	no yes	U16	2	RW
0x2039	23	Window 1 exit top Note: At the end, entry must be adopted through index 24.	0 1	no yes	U16	2	RW

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
0x2039	24	Copy window entry/exit Note: Values entered into Attributes 16 - 23 are adopted	<i>EVENT!</i>		U8	1	WO
0x2039	25	Window 1 curve segment for evaluation	0 1 2	Forward Return Complete curve	U16	2	RW
0x2039	26	Window 1 online evaluation	0 1 2 3 4	Off left - right right - left bottom - top top - bottom	U16	2	RW
0x2039	27	Window 1 Online signal level	0 1	Low active High active	U16	2	RW

7.1.13 Evaluation window 2 (Index 0x2040)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2040	0	Number of sub-indices	-		U8	1	RO
0x2040	1 .. 9	Reserved	-	-			X
0x2040	10 ...	See Index 0x2039					

7.1.14 Evaluation window 3 (Index 0x2041)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2041	0	Number of sub-indices	-		U8	1	RO
0x2041	1 .. 9	Reserved	-	-			X
0x2041	10 ...	See Index 0x2039					

7.1.15 Evaluation trapezoid window 1 (Index 0x2042)

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
0x2042	0	Number of sub-indices	-		U8	1	RO
0x2042	1 .. 9	Reserved	-	-			X
0x2042	10	Trapezoid 1 off/on	0 1	off on	U16	2	RW
0x2042	11	Trapezoid type X/Y	0 1	Type X-Trapezoid Type Y-Trapezoid			
0x2042	12	Trapezoid 1 limit Type X: Xmin	<i>between -9999999.0 and</i>	Float value Float according to IEEE754	FLT	4	RW

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
		Type Y: Ymin Note: At the end, entry must be adopted through index 18	9999999.0				
0x2042	13	Trapezoid 1 limit Type X: Xmax Type Y: Ymax Note: At the end, entry must be adopted through index 18	<i>between</i> -9999999.0 <i>and</i> 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2042	14	Trapezoid 1 limit Type X: Ymin left Type Y: Xmin bottom Note: At the end, entry must be adopted through index 18	<i>between</i> -9999999.0 <i>and</i> 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2042	15	Trapezoid 1 limit Type X: Ymax left Type Y: Xmax bottom Note: At the end, entry must be adopted through index 18	<i>between</i> -9999999.0 <i>and</i> 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2042	16	Trapezoid 1 limit Type X: Ymin right Type Y: Xmin top Note: At the end, entry must be adopted through index 18	<i>between</i> -9999999.0 <i>and</i> 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2042	17	Trapezoid 1 limit Type X: Ymax right Type Y: Xmax top Note: At the end, entry must be adopted through index 18	<i>between</i> -9999999.0 <i>and</i> 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2042	18	Trapezoid 1 copy the limits	EVENT	Writing an arbitrary byte initiates action	U8	1	WO

Class	Attr.	Description	Value	Meaning of value	Type	Len	R/W
		Note: Values entered into Attributes 12 - 17 are adopted					
0x2042	19	Trapezoid 1 entry Type X: entry left Type Y: entry bottom Note: At the end, entry must be adopted through index 23	0 1	no yes	U16	2	RW
0x2042	20	Trapezoid 1 entry Type X: entry right Type Y: entry top Note: At the end, entry must be adopted through index 23	0 1	no yes	U16	2	RW
0x2042	21	Trapezoid 1 exit Type X: exit left Type Y: exit bottom Note: At the end, entry must be adopted through index 23	0 1	no yes	U16	2	RW
0x2042	22	Trapezoid 1 exit Type X: exit right Type Y: exit top Note: At the end, entry must be adopted through index 23	0 1	no yes	U16	2	RW
0x2042	23	Trapezoid 1 copy entry/exit Note: Values entered into Attributes 19- 22 are adopted.	<i>EVENT</i>	Writing an arbitrary byte initiates action	U8	1	WO
0x2042	24	Trapezoid 1 curve segment for evaluation	0 1 2	Forward Return Complete curve	U16	2	RW

7.1.16 Evaluation trapezoid window 2 (Index 0x2043)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2043	0	Number of sub-indices	-		U8	1	RO
0x2043	1 .. 9	Reserved	-	-			X
0x2043	10 ...	See Index 0x2042					

7.1.17 Evaluation threshold 1 (Index 0x2044)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2044	0	Number of sub-indices	-		U8	1	RO
0x2044	1 .. 9	Reserved	-	-			X
0x2044	10	Threshold 1 off/on	0 1	off on	U16	2	RW
0x2044	11	Threshold 1 type of threshold	0 1	Type X (vertical) Type Y (horizontal)	U16	2	RW
0x2044	12	Threshold 1 position Type X: X value Type Y: Y value Note: At the end, entry must be adopted through index 15.	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2044	13	Threshold 1 limit Type X: Ymin Type Y: Xmin Note: At the end, entry must be adopted through index 15.	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2044	14	Threshold 1 limit Type X: Ymax Type Y: Xmax Note: At the end, entry must be adopted through index 15.	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2044	15	Threshold 1 copy position and limits Note: Values entered into Attributes 11 - 14 are adopted	<i>EVENT</i>	Writing an arbitrary byte initiates action	U8	1	WO
0x2044	16	Threshold 1 passage	0 1	no yes	U16	2	RW

		Type X: left > right Type Y: bottom > top Note: At the end, entry must be adopted through index 18.					
0x2044	17	Threshold 1 passage Type X: right > left Type Y: top > bottom Note: At the end, entry must be adopted through index 18.	0 1	no yes	U16	2	RW
0x2044	18	Threshold 1 Copy passage Note: Values entered into Attributes 16 - 17 are adopted	<i>EVENT</i>	Writing an arbitrary byte initiates action	U8	1	WO
0x2044	19	Threshold 1 Curve segment for evaluation	0 1 2	Forward Return Complete curve	U16	2	RW

7.1.18 Evaluation threshold 2 (Index 0x2045)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2045	0	Number of sub-indices	-		U8	1	RO
0x2045	1 .. 9	Reserved	-	-			X
0x2045	10 ...	See Index 0x2044					

7.1.19 Evaluation envelope (Index 0x2047 to 0x2050)

Index/index data on request

7.1.20 Tolerance band for evaluation elements (Index 0x2051)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2051	0	Number of sub-indices	-		U8	1	RO
0x2051	1 .. 9	Reserved	-	-			X
0x2051	10	Tolerance band X Note: At the end, entry must be adopted through index 12.	<i>between 0.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2051	11	Tolerance band Y Note: At the end, entry must be adopted through index 12.	<i>between 0.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2051	12	Store tolerance bands Note: Values entered into Attributes 10 - 11 are adopted.	<i>EVENT</i>	Writing an arbitrary byte initiates action	U8	1	WO

7.1.21 Realtime switchpoints S1 (Index 0x2052)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2052	0	Number of sub-indices	-		U8	1	RO
0x2052	1 .. 9	Reserved	-	-			X
0x2052	10	Switchpoint S1 value Note: At the end, entry must be adopted through index 14.	<i>between -9999999.0 and 9999999.0</i>	Float value Float according to IEEE754	FLT	4	RW
0x2052	11	Switchpoint S1 channel Note: At the end, entry must be adopted through index 14.	<i>0 1</i>	Channel X Channel Y	U16	2	RW
0x2052	12	Switchpoint S1 level Note: At the end, entry must be adopted through index 14.	<i>0 1</i>	Low active High active	U16	2	RW
0x2052	13	Switchpoint 1 reference Note: At the end, entry must be adopted through index 14.	<i>0 1</i>	Absolute reference Trigger reference	U16	2	RW
0x2052	14	Switchpoint 1 Copy settings Note: Values entered into Attributes 10 - 13 are adopted.	<i>EVENT</i>	Writing an arbitrary byte initiates action	U8	1	WO

7.1.22 Realtime switchpoints S2 (Index 0x2053)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2053	0	Number of sub-indices	-		U8	1	RO
0x2053	1 .. 9	Reserved	-	-			X
0x2053	10..	See Index 0x2052					

7.1.23 Realtime switchpoints S3 (Index 0x2054)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2054	0	Number of sub-indices	-		U8	1	RO
0x2054	1 .. 9	Reserved	-	-			X
0x2054	10..	See Index 0x2052					

7.1.24 Realtime switchpoints S4 (Index 0x2055)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2055	0	Number of sub-indices	-		U8	1	RO
0x2055	1 .. 9	Reserved	-	-			X
0x2055	10..	See Index 0x2052					

7.1.25 Realtime switchpoints S5 (Index 0x2056)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2056	0	Number of sub-indices	-		U8	1	RO
0x2056	1 .. 9	Reserved	-	-			X
0x2056	10..	See Index 0x2052					

7.1.26 Realtime switchpoints S6 (Index 0x2057)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2057	0	Number of sub-indices	-		U8	1	RO
0x2057	1 .. 9	Reserved	-	-			X
0x2057	10..	See Index 0x2052					

7.1.27 Sensortest (Index 0x2058)

Index	Sub-Index	Description	Value	Meaning of value	Type	Le n	R/W
0x2058	0	Number of sub-indices	-		U8	1	RO
0x2058	1 .. 9	Reserved	-	-			X
0x2058	10	Sensor test Channel X on/off	0 1	off on	U16	2	RW
0x2058	11	Sensor test Channel Y on/off	0 1	off on	U16	2	RW
0x2058	12	Sensor test Channel X measure reference value	EVENT	Writing an arbitrary byte initiates action	U8	1	WO
0x2058	13	Sensor test Channel Y measure reference value	EVENT	Writing an arbitrary byte initiates action	U8	1	WO
0x2058	14	Sensor test Channel X reference value	between -9999999.0 and 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2058	15	Sensor test Channel Y reference value	between -9999999.0 and 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2058	16	Sensor test Channel X tolerance	between 0.0 and 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2058	17	Sensor test Channel Y tolerance	between 0.0 and 9999999.0	Float value Float according to IEEE754	FLT	4	RW
0x2058	18	Initiate sensor test Note: Read access initiates the sensor test and delivers the result.	0 1	NOK OK	U16	2	RO

7.1.28 Setup user-defined values (Index 0x2059)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2059	0	Number of sub-indices	-		U8	1	RO
0x2059	1 .. 9	Reserved	-	-			X
0x2059	10	User-defined values value 1	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	11	User-defined values value 2	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	12	User-defined values value 3	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	13	User-defined values value 4	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	14	User-defined values value 5	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	15	User-defined values value 6	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	16	User-defined values value 7	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	17	User-defined values value 8	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	18	User-defined values value 9	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	19	User-defined values value 10	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	20	User-defined values value 11	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	21	User-defined values value 12	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	22	User-defined values value 13	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	23	User-defined values value 14	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	24	User-defined values value 15	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	25	User-defined values value 16	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	26	User-defined values value 17	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	27	User-defined values value 18	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	28	User-defined values value 19	<i>Integer value</i>	See operand table in appendix	U16	2	RW
0x2059	29	User-defined values value 20	<i>Integer value</i>	See operand table in appendix	U16	2	RW

7.1.29 Copy/initialize measurement programs (Index 0x2060)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2060	0	Number of sub-indices	-		U8	1	RO
	1 .. 9	Reserved	-	-		X	X
0x2060	10	Meas. program number source Note: The settings from Attributes 10 - 12 are being adopted through Attributes 13, 14 or 15.	0 ... 15		U16	2	WO
0x2060	11	Meas. program number Target start Note: The settings from Attributes 10 - 12 are being adopted through Attributes 13, 14 or 15.	0 ... 15		U16	2	WO
0x2060	12	Meas. program number Target end Note: The settings from Attributes 10 - 12 are being adopted through Attributes 13, 14 or 15.	0 ... 15		U16	2	WO
0x2060	13	Copy whole program setup Note: Copy according to entries in Attributes 10 - 12.	EVENT	Writing an arbitrary byte initiates action	U8	1	WO
0x2060	14	Copy sensor setup Note: Copy according to entries in Attributes 10 - 12.	EVENT	Writing an arbitrary byte initiates action	U8	1	WO
0x2060	15	Initialize selected programs Note: Initializing according to Attributes 11 - 12.	EVENT	Writing an arbitrary byte initiates action	U8	1	WO
0x2060	16	Initialize all measurement programs and device parameters	EVENT	Writing an arbitrary byte initiates action	U8	1	WO

7.1.30 Reference curve (Index 0x2061 to 0x2063)

Index/index data on request

7.1.31 Test operation (Index 0x2064)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2064	0	Number of sub-indices	-		U8	1	RO
0x2064	1...9	Reserved					
0x2064	10	Current measurement value channel X	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2064	11	Current measurement value channel Y	<i>Float value</i>	Float according to IEEE754	FLT	4	RO

7.1.32 Zoom and autoscale (Index 0x2065)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2065	0	Number of sub-indices	-		U8	1	RO
0x2065	1...9	Reserved	-	-		X	X
0x2065	10	Switching autoscale/fix scale	0 1	Autoscale off Autoscale on	U16	2	RW
0x2065	11	Fix scale Xmin Note: At the end, entry must be adopted through index 15.	<i>Float value</i>	Float according to IEEE754	FLT	4	RW
0x2065	12	Fix scale Xmax Note: At the end, entry must be adopted through index 15.	<i>Float value</i>	Float according to IEEE754	FLT	4	RW
0x2065	13	Fix scale Ymin Note: At the end, entry must be adopted through index 15.	<i>Float value</i>	Float according to IEEE754	FLT	4	RW
0x2065	14	Fix scale Ymax Note: At the end, entry must be adopted through index 15.	<i>Float value</i>	Float according to IEEE754	FLT	4	RW
0x2065	15	Store fix scale Note: Values entered into Attributes 11 - 14 are adopted.	<i>EVENT!</i>	Writing an arbitrary byte initiates action	U8	1	WO

7.1.33 USB-Logging (Index 0x2066)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2066	0	Number of sub-indices	-		U8	1	RO
0x2066	1...9	Reserved	-	-		X	X
0x2066	10	USB-Logging on/off	0 1	off on	U16	2	RW
0x2066	11	Designation of file name	0 1	Program name Order sheet	U16	2	RW
0x2066	12	State of USB-Drive	0 1 2 3	State couldn't be read Not attached Attached but not mounted Attached and mounted	U16	2	RO
0x2066	13	Free space on USB-Drive	String	If USB Drive is not attached or not mounted (see subindex 12) "0,000 MB" will be returned	STR 15	15	RO
0x2066	14	Format USB Drive	String "formatusb"	"formatusb" works as a password here	STR 9	9	WO
0x2066	15	READY-Control	0 1	off on	U16	2	RW

7.1.34 TEDS-Sensors (Index 0x2067)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2067	0	Number of sub-indices	-		U8	1	RO
0x2067	1...9	Reserved	-	-		X	X
0x2067	10	Connector	0 1	A B	U16	2	WO
0x2067	11	Direction Note: applicable for strain gauge sensors only	0 1	Preferred direction Against preferred direction	U16	2	WO
0x2067	12	Read TEDS electronic data sheet from Connector specified at Sub-Index 10 with measurement direction according to Sub-Index 11	EVENT!	Writing an arbitrary byte initiates action	U8	1	WO

7.1.35 Reserved Classes (Index 0x2068...0x2078)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2076 ... 0x2078	XX	Not possible	-	-	X	X	X

7.2 Measurement results

7.2.1 Status of measurement (Index 0x2079)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2079	0	Number of sub-indices	-		U8	1	RO
0x2079	1...9	Reserved				X	X
0x2079	10	Index of the last measured value of the current curve Caution: The number of the pair of values is shown on the display. The index begins at 0, the number at 1!	16 Bit Integer value	0 means that there is no measurement curve	U16	2	RO
0x2079	11	Running measurement curve counter [only relevant for Digicontrol usage]	32 Bit Integer value	This counter is incremented by 1 when a measurement curve is newly acquired in any menu	U32	4	RO
0x2079	12	Amount of curves in current array of curves	0...10	Integer value between 0 and 10	U16	2	RO

7.2.2 Further information for current measurement curve (Index 0x2080)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2080	0	Number of sub-indices	-		U8	1	RO
0x2080	1...9	Reserved	-	-		X	X
0x2080	10	Piece Counter	32 Bit Integer value		U32	4	RO
0x2080	11	NOK counter (sum)	32 Bit Integer value		U32	4	RO
0x2080	12	Total evaluation	0 1	NOK OK	U16	2	RO
0x2080	13	Sub-Index of the curve's return point Caution: The number of the pair of values is shown on the display. The index begins at 0, the number at 1!	16 Bit Integer value		U16	2	RO
0x2080	14	Index of the last measured value of the curve Caution: The number of the pair of values is shown on the display. The index begins at 0, the number at 1!	16 Bit Integer value		U16	2	RO
0x2080	15	Status overdrive of the A/D converter	0 1	No overdrive Overdrive	U16	2	RO
0x2080	16	Date of recording	String in format dd.mm.yyyy		STR 10	10	RO
0x2080	17	Time of recording hh:mm:ss	String in format hh:mm:ss		STR 8	8	RO
0x2080	18	Unit channel X	String with max. 4 characters, e.g. "N" or "inch"		STR 4	4	RO
0x2080	19	Unit channel Y	String with max. 4 characters, e.g. "N" or "inch"		STR 4	4	RO

7.2.3 General curve data (Index 0x2081)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2081	0	Number of sub-indices	-		U8	1	RO
0x2081	1...9	Reserved	-	-		X	X
0x2081	10	X-minimum, X-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	11	X-minimum, Y-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	12	X-maximum, X-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	13	X-maximum, Y-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	14	Y-minimum, X-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	15	Y-minimum, Y-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	16	Y-maximum, X-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	17	Y-maximum, Y-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	18	First value X-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	19	First value Y-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	20	Last value X-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	21	Last value Y-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	22	Return point X-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2081	23	Return point Y-coordinate	<i>Float value</i>	Float according to IEEE754	FLT	4	RO

7.2.4 Request measurement results of user-defined values (Index 0x2082)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2082	0	Number of sub-indices	-		U8	1	RO
0x2082	1...9	Reserved	-	-		X	X
0x2082	10	User-defined value 1 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	11	User-defined value 1 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	12	User-defined value 1 unit	<i>String with max. 4 characters,</i>	See operand table in appendix.	STR 4	4	RO

			<i>e.g. "N" or "inch"</i>				
0x2082	13	User-defined value 2 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	14	User-defined value 2 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	15	User-defined value 2 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	16	User-defined value 3 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	17	User-defined value 3 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	18	User-defined value 3 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	19	User-defined value 4 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	20	User-defined value 4 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	21	User-defined value 4 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	22	User-defined value 5 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	23	User-defined value 5 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	24	User-defined value 5 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	25	User-defined value 6 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	26	User-defined value 6 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	27	User-defined value 6 unit	<i>String with max. 4 characters,</i>	See operand table in appendix.	STR 4	4	RO

			<i>e.g. "N" or "inch"</i>				
0x2082	28	User-defined value 7 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	29	User-defined value 7 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	30	User-defined value 7 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	31	User-defined value 8 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	32	User-defined value 8 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	33	User-defined value 8 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	34	User-defined value 9 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	35	User-defined value 9 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	36	User-defined value 9 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	37	User-defined value 10 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	38	User-defined value 10 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	39	User-defined value 10 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	40	User-defined value 11 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	41	User-defined value 11 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	42	User-defined value 11 unit	<i>String with max. 4 characters,</i>	See operand table in appendix.	STR 4	4	RO

			<i>e.g. "N" or "inch"</i>				
0x2082	43	User-defined value 12 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	44	User-defined value 12 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	45	User-defined value 12 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	46	User-defined value 13 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	47	User-defined value 13 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	48	User-defined value 13 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	49	User-defined value 14 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	50	User-defined value 14 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	51	User-defined value 14 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	52	User-defined value 15 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	53	User-defined value 15 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	54	User-defined value 15 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO
0x2082	55	User-defined value 16 name	<i>String with the designator of the value</i>	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	56	User-defined value 16 measurement value	<i>Float value</i>	Float according to IEEE754	FLT	4	RO
0x2082	57	User-defined value 16 unit	<i>String with max. 4 characters,</i>	See operand table in appendix.	STR 4	4	RO

			e.g. "N" or "inch"				
0x2082	58	User-defined value 17 name	String with the designator of the value	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	59	User-defined value 17 measurement value	Float value	Float according to IEEE754	FLT	4	RO
0x2082	60	User-defined value 17 unit	String with max. 4 characters, e.g. "N" or "inch"	See operand table in appendix.	STR 4	4	RO
0x2082	61	User-defined value 18 name	String with the designator of the value	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	62	User-defined value 18 measurement value	Float value	Float according to IEEE754	FLT	4	RO
0x2082	63	User-defined value 18 unit	String with max. 4 characters, e.g. "N" or "inch"	See operand table in appendix.	STR 4	4	RO
0x2082	64	User-defined value 19 name	String with the designator of the value	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	65	User-defined value 19 measurement value	Float value	Float according to IEEE754	FLT	4	RO
0x2082	66	User-defined value 19 unit	String with max. 4 characters, e.g. "N" or "inch"	See operand table in appendix.	STR 4	4	RO
0x2082	67	User-defined value 20 name	String with the designator of the value	Designator = "0" means that no value is defined for this value number	STR 16	16	RO
0x2082	68	User-defined value 20 measurement value	Float value	Float according to IEEE754	FLT	4	RO
0x2082	69	User-defined value 20 unit	<i>String with max. 4 characters, e.g. "N" or "inch"</i>	See operand table in appendix.	STR 4	4	RO

7.2.5 Read-out X-coordinates of current measurement curve (Index 0x2083)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2083	0	Number of sub-indices	-		U8	1	RO
0x2083	1...9	Reserved	-	-		X	X
0x2083	10	Index of the last coordinate; if 0, there is no curve	<i>Integer value</i> 0...4999		U32	4	RO
0x2083	11	Read curve values The values are read as a binary array. The floating point numbers are encoded accordinally to IEEE754 und being transferred without any separators. The last curve index should be read at index 10. Number of curve values = last index + 1	-	-			RO

7.2.6 Read-out Y-coordinates of current measurement curve (Index 0x2084)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2084	0	Number of sub-indices	-		U8	1	RO
0x2084	1...9	Reserved	-	-		X	X
0x2084	10...	See Index 0x2083				X	X

7.2.7 Evaluation results window 1 (Index 0x2085)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2085	0	Number of sub-indices	-		U8	1	RO
0x2085	1...9	Reserved	-	-		X	X
0x2085	10	Window 1 evaluation results OK/NOK	0 1	NOK OK	U16	2	RO
0x2085	11	Window 1 NOK counter	32bit-Integer value >= 0		U32	4	RO
0x2085	12	Window 1 entry of curve X-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2085	13	Window 1 entry of curve Y-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2085	14	Window 1 exit of curve X-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2085	15	Window 1 exit of curve Y-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2085	16	Window 1 absolute maximum in window X-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2085	17	Window 1 absolute maximum in window Y-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2085	18	Window 1 absolute minimum in window X-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2085	19	Window 1 absolute minimum in window Y-coordinate	Float value	Float according to IEEE754	FLT	4	RO

7.2.8 Evaluation results window 2 (Index 0x2086)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2086	0	Number of sub-indices	-		U8	1	RO
0x2086	1...9	Reserved	-	-		X	X
0x2086	10...	See Index 0x2085				X	X

7.2.9 Evaluation results window 3 (Index 0x2087)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2087	0	Number of sub-indices	-		U8	1	RO
0x2087	1...9	Reserved	-	-		X	X
0x2087	10...	See Index 0x2085				X	X

7.2.10 Evaluation results threshold 1 (Index 0x2088)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2088	0	Number of sub-indices	-		U8	1	RO
0x2088	1...9	Reserved	-	-		X	X
0x2088	10	Threshold 1 evaluation result OK/NOK	0 1	NOK OK	U16	2	RO
0x2088	11	Threshold 1 NOK counter	32bit-Integer value ≥ 0		U32	4	RO
0x2088	12	Threshold intersection point X-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2088	13	Threshold intersection point Y-coordinate	Float value	Float according to IEEE754	FLT	4	RO

7.2.11 Evaluation results threshold 2 (Index 0x2089)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2089	0	Number of sub-indices	-		U8	1	RO
0x2089	1...9	Reserved	-	-		X	X
0x2089	10...	See Index 0x2088				X	X

7.2.12 Evaluation results trapezoid window 1 (Index 0x2090)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2090	0	Number of sub-indices	-		U8	1	RO
0x2090	1...9	Reserved	-	-		X	X
0x2090	10	Trapezoid 1 evaluation result OK/NOK	0 1	NOK OK	U16	2	RO
0x2090	11	Trapezoid 1 NOK counter	32bit-Integer value ≥ 0		U32	4	RO
0x2090	12	Trapezoid 1 entry coordinate X-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2090	13	Trapezoid 1 entry coordinate Y-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2090	14	Trapezoid 1 exit coordinate X-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2090	15	Trapezoid 1 exit coordinate Y-coordinate	Float value	Float according to IEEE754	FLT	4	RO

7.2.13 Evaluation results trapezoid window 2 (Index 0x2091)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2091	0	Number of sub-indices	-		U8	1	RO
0x2091	1...9	Reserved	-	-		X	X
0x2091	10...	See Index 0x2090				X	X

7.2.14 Evaluation results envelope (Index 0x2092)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2092	0	Number of sub-indices	-		U8	1	RO
0x2092	1...9	Reserved	-	-		X	X
0x2092	10	Envelope 1 evaluation result OK/NOK	0 1	NOK OK	U16	2	RO
0x2092	11	Envelope 1 NOK counter	32bit-Integer value >= 0		U32	4	RO
0x2092	12	Envelope 1 entry coordinate X-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2092	13	Envelope 1 entry coordinate Y-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2092	14	Envelope 1 exit coordinate X-coordinate	Float value	Float according to IEEE754	FLT	4	RO
0x2092	15	Envelope 1 exit coordinate Y-coordinate	Float value	Float according to IEEE754	FLT	4	RO

7.2.15 Combined results (common curve data and evaluation elements – Index 0x2093)

Index	Sub-Index	Description	Value	Meaning of value	Type	Len	R/W
0x2093	0	Number of sub-indices	-		U8	1	RO
0x2093	1...9	Reserved	-			X	X
0x2093	10	Combined results: general curve data Y	The data is bit coded and transmitted as STRUCT. X-minimum, X-coord. (FL) X-minimum, Y-coord. (FL) X-maximum, X-coord. (FL) X-maximum, Y-coord. (FL) Y-minimum, X-coord. (FL)		STRUCT OF FLOATS	56	RO

			Y-minimum, Y-coord.(FL) Y-maximum, X-coord. (FL) Y-maximum, Y-coord.(FL) First value X-coord. (FL) First value Y-coord. (FL) Last value X-coord. (FL) Last value Y-coord. (FL) Return point X-coord. (FL) Return point Y-coord. (FL)			
0x2093	11	Combined results: window 1	<i>The data is bit coded and transmitted as STRUCT.</i> Evaluation result (UINT32): 0 : NOK 1 : OK Entry X-coordinate (FL) Entry Y-coordinate (FL) Exit X-coordinate (FL) Exit Y-coordinate (FL) Absolute max X-coord. (FL) Absolute max Y- coord.(FL) Absolute min X- coord. (FL) Absolute min Y- coord. (FL) Window Xmin coord. (FL) Window Xmax coord. (FL) Window Ymin coord. (FL) Window Ymax coord. (FL)		STRUCT	52 RO
0x2093	12	Combined results: window 2	<i>See Subindex 11</i>		STRUCT	52 RO
0x2093	13	Combined results: window 3	<i>See Subindex 11</i>		STRUCT	52 RO
0x2093	14	Combined results: threshold 1	<i>The data is bit coded and transmitted as STRUCT:</i> Evaluation result (UINT32): 0 : NOK 1 : OK Threshold type (UINT32): 0 : Type X-Threshold 1 : Type Y-Threshold Threshold pass X (FL) Threshold pass Y (FL) Type X : Position X value (FL) Type Y : Position Y value (FL) Type X : Ymin value (FL) Type Y : Xmin value (FL) Type X : Ymax value (FL) Type Y : Xmax value (FL)		STRUCT	28 RO
0x2093	15	Combined results: threshold 2	<i>See Subindex 14</i>		STRUCT	28 RO

0x2093	16	Combined results: trapezoid window 1	<p><i>The data is bit coded and transmitted as STRUCT:</i></p> <p>Evaluation result (UINT32) 0: NOK 1: OK</p> <p>Threshold type (UINT32) 0: Type X-Trapezoid 1: Type Y-Trapezoid</p> <p>Entry X-coord. (FL) Entry Y-coord. (FL) Exit X-coord. (FL) Exit Y-coord. (FL)</p> <p>Type X: Xmin (FL) Type Y: Ymin (FL) Type X: Xmax (FL) Type Y: Ymax (FL) Type X: Ymin left (FL) Type Y: Xmin bottom (FL) Type X: Ymax left (FL) Type Y: Xmax bottom (FL) Type X: Ymin right (FL) Type Y: Xmin top (FL) Type X: Ymax right (FL) Type Y: Xmax top (FL)</p>	STRUCT	48	RO
0x2093	17	Combined results: trapezoid window 2	<i>See Subindex 16</i>	STRUCT	48	RO
0x2093	18	Combined results: envelope	<p><i>The data is bit coded and transmitted as STRUCT:</i></p> <p>Evaluation result (UINT32): 0: NOK 1: OK</p> <p>Entry X-coordinate (FL) Entry Y-coordinate (FL) Exit X-coordinate (FL) Exit Y-coordinate (FL) Envelope start (FL) Envelope end (FL) Delta min (FL) Delta max (FL)</p>	STRUCT	36	RO

8 Appendix

8.1 Operand Table

Number	ID of operand
0	OFF
100	General curve data – Start X
101	General curve data – Start Y
102	General curve data – End X
103	General curve data – End Y
104	General curve data – Abs. Xmax X-coordinate
105	General curve data – Abs. Xmax Y-coordinate
106	General curve data – Abs. Xmin X-coordinate
107	General curve data – Abs. Xmin Y-coordinate
108	General curve data – Abs. Ymax X-coordinate
109	General curve data – Abs. Ymax Y-coordinate
110	General curve data – Abs. Ymin X-coordinate
111	General curve data – Abs. Ymin Y-coordinate
112	General curve data – Return point X-coordinate
113	General curve data – Return point Y-coordinate
200	Window 1 – Entry X
201	Window 1 – Entry Y
202	Window 1 – Exit X
203	Window 1 – Exit Y
204	Window 1 – Abs. minimum X
205	Window 1 – Abs. minimum Y
206	Window 1 – Abs. maximum X
207	Window 1 – Abs. maximum Y
208	Window 1 – Coordinate Xmin
209	Window 1 – Coordinate Xmax

210	Window 1 – Coordinate Ymin
211	Window 1 – Coordinate Ymax
300	Window 2 – Entry X
301	Window 2 – Entry Y
302	Window 2 – Exit X
303	Window 2 – Exit Y
304	Window 2 – Abs. minimum X
305	Window 2 – Abs. minimum Y
306	Window 2 – Abs. maximum X
307	Window 2 – Abs. maximum Y
308	Window 2 – Coordinate Xmin
309	Window 2 – Coordinate Xmax
310	Window 2 – Coordinate Ymin
311	Window 2 – Coordinate Ymax
400	Window 3 – Entry X
401	Window 3 – Entry Y
402	Window 3 – Exit X
403	Window 3 – Exit Y
404	Window 3 – Abs. minimum X
405	Window 3 – Abs. minimum Y
406	Window 3 – Abs. maximum X
407	Window 3 – Abs. maximum Y
408	Window 3 – Coordinate Xmin
409	Window 3 – Coordinate Xmax
410	Window 3 – Coordinate Ymin
411	Window 3 – Coordinate Ymax
500	Trapezoid window 1 – Entry X

501	Trapezoid window 1 – Entry Y
502	Trapezoid window 1 – Exit X
503	Trapezoid window 1 – Exit Y
504	Trapezoid window 1 – Coordinate Type X: Xmin Type Y: Ymin
505	Trapezoid window 1 – Coordinate Type X: Xmax Type Y: Ymax
506	Trapezoid window 1 – Coordinate Type X: Ymin left Type Y: Xmin bottom
507	Trapezoid window 1 – Coordinate Type X: Ymax left Type Y: Xmax bottom
508	Trapezoid window 1 – Coordinate Type X: Ymin right Type Y: Xmin top
509	Trapezoid window 1 – Coordinate Type X: Ymax right Type Y: Xmax top
600	Trapezoid window 2 – Entry X
601	Trapezoid window 2 – Entry Y
602	Trapezoid window 2 – Exit X
603	Trapezoid window 2 – Exit Y
604	Trapezoid window 2 – Coordinate Type X: Xmin Type Y: Ymin
605	Trapezoid window 2 – Coordinate Type X: Xmax Type Y: Ymax
606	Trapezoid window 2 – Coordinate Type X: Ymin left Type Y: Xmin bottom
607	Trapezoid window 2 – Coordinate Type X: Ymax left Type Y: Xmax bottom
608	Trapezoid window 2 – Coordinate Type X: Ymin right Type Y: Xmin top
609	Trapezoid window 2 – Coordinate Type X: Ymax right Type Y: Xmax top
700	Threshold 1 – Pass X

701	Threshold 1 – Pass Y
702	Threshold 1 – Coordinate Type X: Position X value Type Y: Position Y value
703	Threshold 1 – Coordinate Type X: Ymin value Type Y: Xmin value
704	Threshold 1 – Coordinate Type X: Ymax value Type Y: Xmax value
800	Threshold 2 – Pass X
801	Threshold 2 – Pass Y
802	Threshold 2 – Coordinate Type X: Position X value Type Y: Position Y value
803	Threshold 2 – Coordinate Type X: Ymin value Type Y: Xmin value
804	Threshold 2 – Coordinate Type X: Ymax value Type Y: Xmax value
900	Envelope – Entry X
901	Envelope – Entry Y
902	Envelope – Exit X
903	Envelope – Exit Y
904	Envelope – Coordinate Start X
905	Envelope – Coordinate End X

9 Error Codes

Error Code	Description
0xC065003A	Subindex does not exist (read access)
0xC0CF8013	Subindex does not exist (write access)
0xC0CF8006	Object is read only and can not be written
0xC0CF8010	Data type does not match
0xC0CF8011	Data length is too long
0xC0650028	Timeout
0xC065002F	Object is write only and can not be read