FASTUS
Good Thinking, Good Future

INDEX LIST

Laser Displacement Sensor

CD2S Series

IO-Link setting file (IODD file) can be downloaded
from our web site.
https://www.optex-fa.com

IO-Link

OPTEX FA CO., LTD.

Communication specifications

Minimum cycle time		0.8 ms	
Baud rate		COM3 (230.4 kbps)	
M-Sequence code in Preoperate mode		TYPE_1_2	
M-Sequence code in Operate mode		Length of TYPE_2_V ON request data in bytes = 2	
ISDU Support		Yes	
IO-Link Revision		Ver.1.1	
Number of process input data bytes		6byte	
Number of process output data bytes		1 byte	
Vendor ID		DEC: 1076	HEX: 0x0434
Device ID	20822 (CD2S-30M12)	DEC: 77831	HEX: 0x013007
	20823 (CD2S-50M12)	DEC: 77832	HEX: 0x013008
	20284 (CD2S-110M12)	DEC: 77833	HEX: 0x013009
	20980 (CD2S-30)	DEC: 77831	HEX: 0x013007
	20981 (CD2S-50)	DEC: 77832	HEX: 0x013008
	20982 (CD2S-110)	DEC: 77833	HEX: 0x013009

* Refrain from installing IODD using IODD Converter versions older than Ver.1.53.

Process input data

Byte No.	Bit 7	6	5	4	3	2	1	0	Details
n+0	Measurement distance (signed, unit: µm)*1								-524287 to +524287
n+1									
n+2									
n+3									
n+4	Scale*2								CD2S-30x: -6 (0.001 mm) CD2S-50x: -6 (0.001 mm) CD2S-110x: -6 (0.001 mm)
n+5	Exposure time reached the measurement period	Estimated the waveform peak	Peak width error	Peak height error	Light level error	Peak detection error	Q2	Q1	Q1, Q2, peak detection error, light level error, peak height error, peak width error, waveform peak, exposure time [0: OFF, 1: ON]

*1 The measurement direction depends on the scale.
*2 Scale indicates 10^n.

The measurement directions in the table below have special meanings.

Measurement direction (16 bit)	Description
-2147483640	Outside the measurement range on the negative side
2147483640	Outside the measurement range on the positive side
2147483644	Outside the measurement range*1

*1 If the measurement direction is 2147483644, this is displayed when the received light waveform cannot be observed.

Process Input Data Word Assignment

Example: When using the IO-Link master UR series of OPTEX FA (default setting: ascending order (little endian))

Word No.	Byte	
	Higher order byte	Lower order byte
N+0	Process data n+4	Process data n+5
N+1	Process data n+2	Process data n+3
N+2	Process data n+0	Process data n+1

Word No.	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
N+0	Scale								Exposure time reached the measurement period	Estimated the waveform peak	Peak width error	Peak height error	Light level error	Peak detection error	Q2	Q1
N+1	Measurement distance (signed, unit: µm)															
N+2																

Process output data

Byte No.	Bit							
	7	6	5	4	3	2	1	0
n+0	Reserved							Laser ON/OFF

Details
Laser ON/OFF [0: ON, 1: OFF]

Process Output data Word Assignment

Example: When using the IO-Link master UR series of OPTEX FA (default setting: ascending order (little endian))

Word No.	Byte	
	Higher order byte	Lower order byte
N+0	N/A	Process data n+0

Word No.	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
N+0	N/A								Reserved							Laser ON/ OFF

Service Data

Name	Index number DEX (HEX)	Subin-dex No.	Read/ Write*1	Back-up	Format	Length in bytes	Default value	Setting Details	Remarks (Unit)
System Command	2 (0x02)	-	W	-	UINT	1	-	Executes the following functions depending on the written value. 65: SP1 Teach-in 66: SP2 Teach-in 80: Start firmware update sequence 81: Firmware update unlock command 1 82: Firmware update unlock command 2 126: Start device search 127: End device search 129: Reset application settings 131: Back-to-box 192: Save customer settings 193: Restore customer settings 194: Offset 195: Offset clear 196: Calibration	
Device Access Lock	12 (0x0C)	-	R/W	✓	UINT	2	0	**For read access:** bit 0: Unused bit 1: Unused bit 2: Unused bit 3: Key lock status **For write access:** bit 0: Unused bit 1: Unused bit 2: Unused bit 3: 1: Locked, 0: Unlocked	bit 4-15: System reserved
Profile	13 (0x0D)	-	R	-	UINT	12	0x0014 0x0031 0x4000 0x800C 0x8013 0x8101	Byte1-2 : Function ID 0x8101 Byte3-4 : Function ID 0x8013 Byte5-6 : Function ID 0x800C Byte7-8 : Profile ID 0x4000 Byte9-10 : Profile ID 0x0031 Byte11-12 : Profile ID 0x0014	
Process Data Input Format	14 (0x0E)	-	R	-	UINT	12	3, 32, 16 3, 8, 8 1, 8, 0		
Process Data Output Format	15 (0x0F)	-	R	-	UINT	3	1,1,0		
Vendor Name	16 (0x10)	-	R	-	STRINGS	16	-	"OPTEX FA"	
Vendor Information	17 (0x11)	-	R	-	STRINGS	64	-	www.optex-fa.com	
Product Model	18 (0x12)	-	R	-	STRINGS	18	-	CD2S-XXXXX	
Model Number	19 (0x13)	-	R	-	STRINGS	7	-	XXXXXXX	
Product Function	20 (0x14)	-	R	-	STRINGS	45	-	"Displacement Sensor"	
Serial Number	21 (0x15)	-	R	-	STRINGS	16	-	XXXXXXXXXXX	
Hardware Version	22 (0x16)	-	R	-	STRINGS	64	-	Responds with the hardware version.	
Firmware Version	23 (0x17)	-	R	-	STRINGS	64	-	Responds with the firmware version.	
User Tag Name	24 (0x18)	-	R/W	✓	STRINGS	32	*******	Reading: Responds with the set application tag. Writing: Sets the specified string as the application tag.	
Function Tag Name	25 (0x19)	-	R/W	✓	STRINGS	32	*******	Reading: Responds with the set function tag. Writing: Sets the specified string as the function tag.	
Location Tag Name	26 (0x1A)	-	R/W	✓	STRINGS	32	*******	Reading: Responds with the set location tag. Writing: Sets the specified string as the location tag.	
Error Count	32 (0x20)	-	R	-	UINT	2	0	Reads the error count.	Indicates the number of errors since the power was turned on. For the IO-Link specification, this will disappear when the power is turned off.

Name	Index number DEX (HEX)	Subin-dex No.	Read/ Write*1	Back-up	Format	Length in bytes	Default value	Setting Details	Remarks (Unit)
Device Status	36 (0x24)	-	R	-	UINT	1	0	0: Device normal 1: Maintenance required 2:Conditions outside the guaranteed operating range (supply voltage/ambient temperature) 3: Function check 4: Error	
Detailed Device Status	37 (0x25)	-	R	-	UINT	9	0	EVENT code 0x4210: Sensor high temp. 0x4220: Sensor low temp. 0x7710: Short-circuit on output line	The data format for each error status is as follows. Byte 1: Event code (low-order) Byte 2: Event code (high-order) Byte 3: Specific information bit 0-2: Source (0 = Unknown, 4 = Application) bit 4-5: Type (1 = Notification, 2 = Warning, 3 = Fault) bit 6-7: Mode (1 = Single occurrence, 2 = Resolved, 3 = Occurrence)
Process Data Input	40 (0x28)	-	R	-	INT			See "Process input data" on page 5-3.	
Process Data Output	41 (0x29)	-	R	-	INT	1	-	See "Process output data" on page 5-4.	
Teach Channel	58 (0x3A)	-	R/W	✓	UINT	1	-	1 : Q1 output 2 : Q2 output 192 : Qa output	
Teach Status	59 (0x3B)	-	R	-	UINT	1	-	bit 0-3: Teach Status bit 4: SP1 teach success/failure (1: Success, 0: Failure) bit 5: Unused bit 6: SP2 teach success/failure (1: Success, 0: Failure) bit 7: Unused	
Q1 Threshold	60 (0x3C)	0	R/W	✓	INT	8	-	Byte 1-4: SP1 threshold Byte 5-8: SP2 threshold	
SP1 Threshold		1	R/W	✓	INT	4	-5000	-524287 to +524287	CD2S-30x, Unit: nm
							-15000	-524287 to +524287	CD2S-50x, Unit: nm
							-50000	-524287 to +524287	CD2S-110x, Unit: nm
SP2 Threshold		2	R/W	✓	INT	4	5000	-524287 to +524287	CD2S-30x, Unit: nm
							15000	-524287 to +524287	CD2S-50x, Unit: nm
							50000	-524287 to +524287	CD2S-110x, Unit: nm
Q1 Settings	61 (0x3D)	0	R/W	✓	UINT	6	-	Byte1-4: Hysteresis Byte5: Teach-in Byte6: Output Mode	
Output Mode		1	R/W	✓	UINT	1	0	0: N.O. 1: N.C.	
Teach-in		2	R/W	✓	UINT	1	1	1 : 1 point 2 : Window 128 : FGS 1-point 131 : Light level error	
Hysteresis		3	R/W	✓	UINT	4	50	0 to 524287	CD2S-30x, Unit: nm
							150	0 to 524287	CD2S-50x, Unit: nm
							500	0 to 524287	CD2S-110x, Unit: nm
Q1 Tolerance	4371 (0x1113)	-	R/W	✓	UINT	4	200	0 to 524287	CD2S-30x, Unit: nm
							600	0 to 524287	CD2S-50x, Unit: nm
							2000	0 to 524287	CD2S-110x, Unit: nm
Q1 Delay Mode	1085 (0x43D)	-	R/W	✓	UINT	1	0	0: OFF 1: ON delay 2: OFF delay 3: ON/OFF delay 4: One shot	

Name	Index number DEX (HEX)	Subin-dex No.	Read/ Write*1	Back-up	Format	Length in bytes	Default value	Setting Details	Remarks (Unit)
Q1 Delay Time	1087 (0x43F)	-	R/W	✓	UINT	2	-	0 to 10000	Unit: ms
Q2 Threshold	62 (0x3E)	0	R/W	✓	INT	8	-	Byte1-4: SP1 threshold Byte5-8: SP2 threshold	
SP1 Threshold		1	R/W	✓	INT	4	-5000	-524287 to +524287	CD2S-30x, Unit: nm
							-15000	-524287 to +524287	CD2S-50x, Unit: nm
							-50000	-524287 to +524287	CD2S-110x, Unit: nm
SP2 Threshold		2	R/W	✓	INT	4	5000	-524287 to +524287	CD2S-30x, Unit: nm
							15000	-524287 to +524287	CD2S-50x, Unit: nm
							50000	-524287 to +524287	CD2S-110x, Unit: nm
Q2 Settings	63 (0x3F)	0	R/W	✓	UINT	6	-	Byte1-4: Hysteresis* Byte5: Teach-in Byte6: Output Mode	* A hysteresis value of 0 cannot be entered.
Output Mode		1	R/W	✓	UINT	1	0	0: N.O. 1: N.C.	
Teach-in		2	R/W	✓	UINT	1	1	1 : 1 point 2 : Window 128 : FGS 1-point 131 : Light level error	
Hysteresis		3	R/W	✓	UINT	4	50	0 to 524287	CD2S-30x, Unit: nm
							150	0 to 524287	CD2S-50x, Unit: nm
							500	0 to 524287	CD2S-110x, Unit: nm
Q2 Tolerance	4372 (0x1114)	-	R/W	✓	UINT	4	200	0 to 524287	CD2S-30x, Unit: nm
							600	0 to 524287	CD2S-50x, Unit: nm
							2000	0 to 524287	CD2S-110x, Unit: nm
Q2 Delay Mode	1086 (0x43E)	-	R/W	✓	UINT	1	0	0: OFF 1: ON delay timer 2: OFF delay timer 3: ON/OFF delay timer 4: One shot	
Q2 Timer Setup	1088 (0x440)	-	R/W	✓	UINT	2	100	1 to 10000	Unit: ms
Signal Level Threshold	176 (0xB0)	-	R/W	✓	INT	2	2048	Signal level threshold when “Light level error” is selected for Q1/Q2. Q1 and Q2 have a shared threshold.	
Analog Thresh-old	630 (0x276)	0	R/W	✓	UINT	8		Byte1-4: SP2 threshold Byte5-8: SP1 threshold	
SP1 Threshold (4 mA, 0 V)		1	R/W	✓	UINT	4	-5000	-524287 to +524287	CD2S-30x, Unit: nm
							-15000	-524287 to +524287	CD2S-50x, Unit: nm
							-50000	-524287 to +524287	CD2S-110x, Unit: nm
SP2 Threshold (20 mA, 10 V)		2	R/W	✓	UINT	4	5000	-524287 to +524287	CD2S-30x, Unit: nm
							15000	-524287 to +524287	CD2S-50x, Unit: nm
							50000	-524287 to +524287	CD2S-110x, Unit: nm
Analog Output	121 (0x79)	-	R/W	✓	UINT	1	16	0: OFF 16: Current output of 4...20 mA 17: Voltage output of 0-10 V	
External Input Settings	122 (0x7A)	-	R/W	✓	UINT	1	0	0: OFF 16: Laser OFF 17: Teach-in 80: Sample hold 81: Peak hold 82: Bottom hold 85: Zero point teach-in 86: Analog teach-in	
External Input Delay	4400 (0x1130)	-	R/W	✓	UINT	1	0	0: No delay 1: Delay	
External Input Polarity	1093 (0x445)	-	R/W	✓	UINT	1	0	0: N.O. 1: N.C.	

Name	Index number DEX (HEX)	Subindex No.	Read/ Write*1	Backup	Format	Length in bytes	Default value	Setting Details	Remarks (Unit)
External Input Status	226 (0xE2)	-	R	-	UINT	1	-	bit 7 0: External input 1: No external input	
Temperature	153 (0x99)	0	R	-	INT	5	-	Byte1: Minimum temperature at this startup Byte2: Maximum temperature at this startup Byte3: Minimum temperature for the entire period Byte4: Maximum temperature for the entire period Byte5: Current temperature	Unit: °C
Current Temperature		1	R	-	INT	1	-	-128 to 127	Unit: °C
Maximum Temperature for the Entire Period		2	R	-	INT	1	-	-128 to 127	Unit: °C
Minimum Temperature for the Entire Period		3	R	-	INT	1	-	-128 to 127	Unit: °C
Maximum Temperature at This Startup		4	R	-	INT	1	-	-128 to 127	Unit: °C
Minimum Temperature at This Startup		5	R	-	INT	1	-	-128 to 127	Unit: °C
Exposure Time	177 (0xB1)	-	R	-	UINT	2	-	Responds with the exposure time.	Unit: µs
Operating Hours	190 (0xBE)	0	R	-	UINT	8	-	Byte1-4: Laser operating hours Byte5-8: Sensor operating hours	
Sensor Operating Hours		1	R	-	UINT	4	-	0 to 1000000	Unit: Hours
Laser Operating Hours		2	R	-	UINT	4	-	0 to 1000000	Unit: Hours
Device Tag	64 (0x40)	-	R/W	✓	STRINGS	32	*******	Reading:Responds with the set device tag. Writing:Sets the specified string as the device tag.	
Device ID	16000 (0x3E80)	-	R/W		UINT	4	-		Used to maintain backward compatibility during future main version upgrades
Received Light Amount	175 (0xAF)	-	R	-	UINT	2	-	Responds with the current light level.	
Firmware Version	4534 (0x11B6)	0	R	-	UINT	38		Byte1-19: Firmware build date and time Byte20-38: Firmware version	
Firmware Version		1	R	-	UINT	19		Responds with the firmware version in X.X.X format.	
Firmware Build Date and Time		2	R	-	UINT	19		Responds with the firmware build date and time.	
Event Notification Handling	227 (0xE3)	-	R/W	✓	UINT	1	-	0: All events enabled 1: All events disabled 2:Events enabled, Process data invalid flag disabled 3:Events disabled, Process data invalid flag enabled	

Name	Index number DEX (HEX)	Subin-dex No.	Read/ Write*1	Back-up	Format	Length in bytes	Default value	Setting Details	Remarks (Unit)
Error History	4389 (0x1125)	0	R	-	UINT	130	-	Byte1-13: 10th error history Byte14-26: 9th error history Byte27-39: 8th error history Byte40-52: 7th error history Byte53-65: 6th error history Byte66-78: 5th error history Byte79-91: 4th error history Byte92-104: 3rd error history Byte105-117: 2nd error history Byte118-130: 1st error history	
1st Error History		1	R	-	UINT	13	-	1st error history	
2nd Error History		2	R	-	UINT	13	-	2nd error history	
3rd Error History		3	R	-	UINT	13	-	3rd error history	
4th Error History		4	R	-	UINT	13	-	4th error history	
5th Error History		5	R	-	UINT	13	-	5th error history	
6th Error History		6	R	-	UINT	13	-	6th error history	
7th Error History		7	R	-	UINT	13	-	7th error history	
8th Error History		8	R	-	UINT	13	-	8th error history	
9th Error History		9	R	-	UINT	13	-	9th error history	
10th Error History		10	R	-	UINT	13	-	10th error history	
Error Counter	4390 (0x1126)	0	R	-	UINT	80	-	Byte1-8: Analog output overheat detection Byte9-16: Analog voltage output short circuit detection Byte17-24: Analog current output open circuit detection Byte25-32: Laser deterioration detection Byte33-40: Supply voltage lower limit error Byte41-48: Supply voltage upper limit error Byte49-56: IO-Link PHY high temp Byte57-64: Short-circuit on output line Byte65-72: Low temp error Byte73-80: High temp error	
High Temp Error		1	R	-	UINT	8	-	Data formats are as follows: Byte 1: Error code Byte 2-3: Number of errors Byte 4: Internal temperature at the time of last error occurrence Byte 5-8: Operating time since start at the time of last error occurrence	
Low Temp Error		2	R	-	UINT	8	-		
Short-Circuit on Output Line		3	R	-	UINT	8	-		
IO-Link PHY High Temp		4	R	-	UINT	8	-		
Supply Voltage Upper Limit Error		5	R	-	UINT	8	-		
Supply Voltage Lower Limit Error		6	R	-	UINT	8	-		
Laser De-terioration Detection		7	R	-	UINT	8	-		
Analog Current Output Open Circuit Detec-tion		8	R	-	UINT	8	-		
Analog Voltage Output Short Circuit Detection		9	R	-	UINT	8	-		
Analog Output Overheat Detection		10	R	-	UINT	8			

Name	Index number DEX (HEX)	Subindex No.	Read/ Write*1	Backup	Format	Length in bytes	Default value	Setting Details	Remarks (Unit)
Pixel Data (0-115)	4360 (0x1108)	-	R	-	UINT	232	-	Responds with the received light waveform for pixels 0 to 115.	
Pixel Data (116-230)	4361 (0x1109)	-	R	-	UINT	232	-	Responds with the received light waveform for pixels 116 to 230.	
Pixel Data (231-346)	4362 (0x110A)	-	R	-	UINT	232	-	Responds with the received light waveform for pixels 231 to 346.	
Pixel Data (347-462)	4363 (0x110B)	-	R	-	UINT	232	-	Responds with the received light waveform for pixels 347 to 462.	
Pixel Data (463-511)	4364 (0x110C)	-	R	-	UINT	96	-	Responds with the received light waveform for pixels 463 to 511.	
Measurement Distance	229 (0xE5)	0	R	-	UINT	5	-	Byte1: Measurement distance information Byte2-5: Measurement distance data	
Measurement Distance Data		1	R	-	INT	4	-	Measurement distance data	
Measurement Distance Information		2	R	-	UINT	1	-	Measurement distance information 0: Within measurement range 1: Outside measurement range (upper limit error) 2: Outside measurement range (lower limit error) 3. No information	
Analog Value	635 (0x27B)	-	R	-	FLOAT*2	4		Responds with the analog current/voltage value being output. Current output: Responds with a real number in mA units. Voltage output: Responds with a real number in V units.	
Mask Range Settings	4367 (0x110F)	0	R/W	✓	UINT	8	-	Byte1-4: Mask near Byte5-8: Mask far	
Mask Near		1	R/W	✓	UINT	4	-5500	-5500 to 5500	CD2S-30x, Unit: nm
							-16500	-16500 to 16500	CD2S-50x, Unit: nm
							-53000	-53000 to 53000	CD2S-110x, Unit: nm
Mask Far		2	R/W	✓	UINT	4	5000	-5500 to 5500	CD2S-30x, Unit: nm
							16500	-16500 to 16500	CD2S-50x, Unit: mm
							53000	-53000 to 53000	CD2S-110x, Unit: mm
Sampling Measurement	4368 (0x1110)	-	R/W	✓	UINT	2	1000	0: Auto 333: 333 µs 500: 500 µs 1000: 1 ms 2000: 2 ms 4000: 4 ms 8000: 8 ms 16000: 16 ms	
Peak Select	4369 (0x1111)	-	R/W	✓	UINT	1	0	0: OFF 1: Negative 2: Positive	
Moving Average	4373 (0x1115)	0	R/W	✓	UINT	2	16	0: OFF 4: 4 times 16: 16 times 64: 64 times 128: 128 times	
Median Filter	4374 (0x1116)	-	R/W	✓	UINT	2	7	0: OFF 3: 3 times 7: 7 times 15: 15 times	
Measurement Display	4375 (0x1117)	0	R/W	✓	UINT	1		0: Positive 1: Negative	
Measured Value Offset	4376 (0x1118)	0	R/W	✓	INT	4	0	-400000 to 400000	Measured value offset
Error Suppression Time	4377 (0x1119)	-	R/W	✓	UINT	4		Error suppression time	
Substitute Value	4378 (0x111A)	0	R/W	✓	INT	4	999999	-999999 to 999999	Units: nm

Name	Index number DEX (HEX)	Subindex No.	Read/ Write*1	Backup	Format	Length in bytes	Default value	Setting Details	Remarks (Unit)
Error Mode	4379 (0x111B)	-	R/W	✓	UINT	1	-	Error Mode setting 0: Display substitute value 1: Keep previous value 2: Keep previous value + Timer	
Calibration Factor	4381 (0x111D)	-	R/W	✓	Floating point*2	4	-	Specify a range from -2.0 to 2.0. However, 0 cannot be specified.	
Peak Width	4384 (0x1120)	-	R	-	UINT	2	-	Received light waveform peak width	
Peak Selection Threshold	4397 (0x112D)	-	R/W	✓	UINT	2	250	Light level threshold for Peak Select	
MDC Overview	16512 (0x4080)	0	R	-	UINT	11	-	Byte1-4: Minimum MDC value Byte5-8: Maximum MDC value Byte9-10: Unit code Byte11: Scale value	
Minimum MDC Value		1	R	-	INT	4	-	25000 (50 mm type) 35000 (50 mm type) 60000 (110 mm type)	Minimum value of the numerical expression handled in the process data
Maximum MDC Value		2	R	-	INT	4	-	35000 (30 mm type) 65000 (50 mm type) 160000 (110 mm type)	Maximum value of the numerical expression handled in the process data
Unit Code		3	R	-	UINT	2	1010	1010 = m	
Scale Value		4	R	-	INT	1	-6	-6 (0.01)	CD2S-30x CD2S-50x CD2S-110x
Signal Quality Information	4399 (0x112F)	0	R	-	UINT	1	-	Bit 5: Peak detection error Bit 4: Signal level error Bit 3: Peak height error Bit 2: Peak shape error Bit 1: Peak interference error Bit 0: Exposure time error	
Peak Detection Error		1	R	-	UINT	1	-	0: Low 1: High	
Signal Level Error		2	R	-	UINT	1	-	0: Low 1: High	
Peak Height Error		3	R	-	UINT	1	-	0: Low 1: High	
Peak Shape Error		4	R	-	UINT	1	-	0: Low 1: High	
Peak Interference Error		5	R	-	UINT	1	-	0: Low 1: High	
Exposure Time Error		6	R	-	UINT	1	-	0: Low 1: High	
Adjusted Measurement Value	4396 (0x112C)	-	R/W	✓	INT	4		-10000 to 10000	The reference measurement value before Span Teach adjustment is set using “System Command: 196.”

Name	Index number DEX (HEX)	Subin-dex No.	Read/ Write*1	Back-up	Format	Length in bytes	Default value	Setting Details	Remarks (Unit)
Display	234 (0xEA)	0	R/W		UINT	5	-	Byte1: No of Decimal Places Byte2: Language Byte3: Rotate display Byte4: Energy saving mode Byte5: Display brightness	
Display Brightness		1	R/W		UINT	1	30	10: 10% 20: 20% 30: 30% 40: 40% 50: 50% 60: 60% 70: 70% 80: 80% 90: 90% 100: 100%	
Energy Saving Mode		2	R/W		UINT	2	300	0: OFF 10: 10 sec 20: 20 sec 60: 60 sec 300: 300 sec 1200: 1200 sec 3600: 3600 sec	
Rotate Display		3	R/W		UINT	1	0	0: 0° 1: 180°	
Language		4	R/W	✓	UINT	1	3	0: English 1: German 2: Spanish 3: Japanese 4: Simplified Chinese 5: Traditional Chinese 6: Korean	
No of Decimal Places		5	R/W	✓	UINT	1	-	0: 0 1: 0.1 2: 0.01 3: 0.001	

*1 R: Read only, W: Write only, R/W: Read/Write
*2 Floating point representation is in accordance with the IEEE734 standard.

Events and Errors

Events

Code		Description
DEC	HEX	
16912	0x4210	High temp error
16928	0x4220	Low temp error
30480	0x7710	Short-circuit on output line
36001	0x8CA1	Setting value change notification

Error function

Code		Description
DEC	HEX	
32768	0x8000	Application error
32785	0x8011	Invalid index specified
32786	0x8012	Invalid subindex specified
32803	0x8023	Access denied
32816	0x8030	Parameter out of range
32817	0x8031	Parameter upper limit error
32818	0x8032	Parameter lower limit error
32819	0x8033	Parameter length upper limit error
32820	0x8034	Parameter length lower limit error
32832	0x8040	Invalid parameter

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