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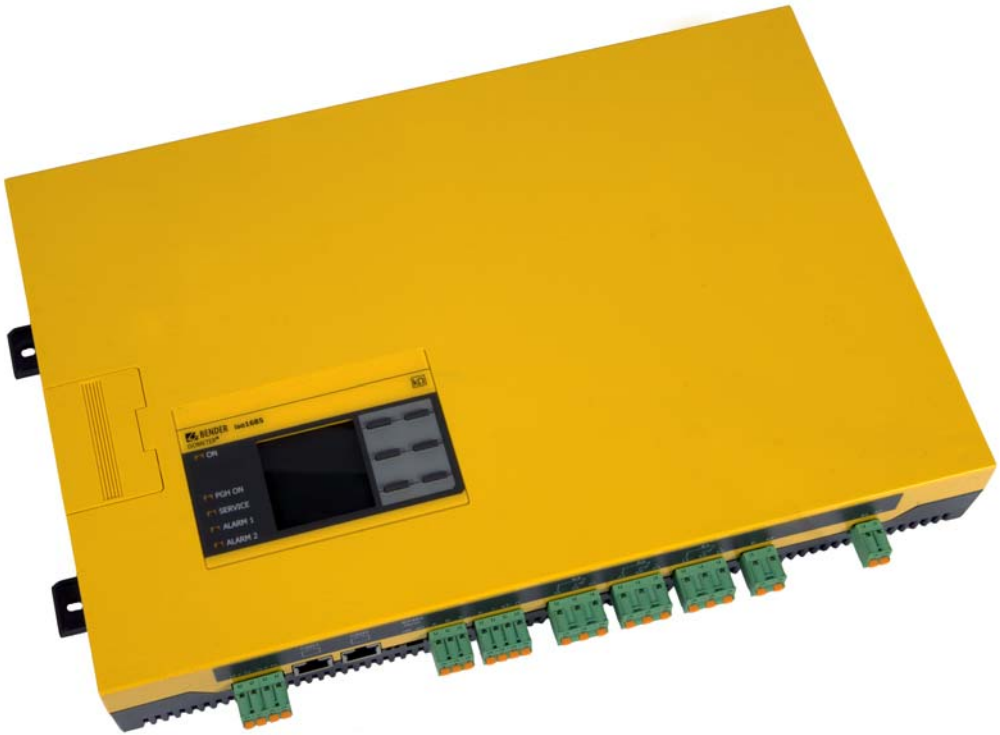
ISOMETER®
isoxx1685Dx
Device family

Modbus settings



Version 1.23 (01.05.2018)

isoxx1685Dx_D00272_00_A_XXEN/05.2018

PLEASE READ THIS MANUAL AND ALL ACCOMPANYING DOCUMENTS THOROUGHLY
AND KEEP THEM IN A SECURE PLACE FOR FUTURE REFERENCE:

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1. General information

This appendix provides a complete description of the Modbus register for the ISOMETER® isoxx1685Dx family of devices to facilitate access to information.

The adjustable parameters for individual keys are listed.

The ISOMETER® isoxx1685Dx device family supports 4-digit addressing and the following Modbus functions:

1. Holding registers for reading values
   (Read Holding Register; function code 0x03)
2. Registers for device programming
   (Preset Multiple Registers; function code 0x10)
3. The protocol parameters (modbus address, baudrate, data bits and stop bits) are described in the manual.
4. A timeout of at least 100ms must be met. (timeout is the minimum time, that the modbus master is waiting for a response from a modbus slave.)

For the complete Modbus protocol specification, visit

http://www.modbus.org.

Requests to the ISOMETER® can be made using the function code 0x03 (read multiple registers) or the command 0x10 (write multiple registers). The ISOMETER® generates a function-related answer and sends it back.

2.1 Reading out the Modbus register from the ISOMETER®

The required Words of the process image can be read out from the ISOMETER® "holding registers" using the function code 0x03. For this purpose, the start address and the number of the registers to be read out have to be entered.Up to 125 Words (0x7D) can be read out by one single request.

2.1.1 Command of the master to the ISOMETER®

In the following example, the ISOMETER® master requests the content of the register 8198 with the address 2. The register contains the measuring value of system voltage U_n.

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x02
Byte 1	Function code	0x03
Byte 2, 3	Start address	0x2006
Byte 4, 5	Number of registers	0x0001
Byte 6, 7	CRC16 Checksum	0x6FF8

2.1.2 Answer of the ISOMETER® to the master

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x02
Byte 1	Function code	0x03
Byte 2	Number of data bytes	0x02
Byte 3, 4	Data	0x0060
Byte 7, 8	CRC16 Checksum	0xFC6C

2.2 Write Modbus register (parameter setting)

Registers in the device can be modified with the Modbus command 0x10 (set multiple registers). Parameter registers are available from address 12288.

2.2.1 Command of the master to the ISOMETER®

In this example, in the ISOMETER® with address 2 the content of the register address 12289 is set to 40.000 (= 40 kΩ). The value describes the prewarning response value $R1_{an}$.

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x02
Byte 1	Function code	0x10
Byte 2, 3	Start register	0x3001
Byte 4, 5	Number of registers	0x0002
Byte 6	Number of data bytes	0x04
Byte 7, 8	Data	0x0009C40
Byte 9, 10	CRC16 Checksum	0x01D6

2.2.2 ISOMETER® answer to the master

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x02
Byte 1	Function code	0x10
Byte 2, 3	Start register	0x3001
Byte 4, 5	Number of registers	0x0002
Byte 6, 7	CRC16 Checksum	0x1F3B

2.3 Exception code

If a request cannot be answered for whatever reason, the ISOMETER® will send a so-called exception code with which possible faults can be narrowed down.

Exception code	Description
0x01	Impermissible function
0x02	Impermissible data access
0x03	Impermissible data value
0x04	Internal fault
0x05	Acknowledgement of receipt (answer will be time delayed)
0x06	Request not accepted (repeat request, if necessary)

2.3.1 Structure of the exception code

Byte	Name	Example
Byte 0	ISOMETER® Modbus address	0x03
Byte 1	Function code (0x03) + 0x80	0x83
Byte 2	Data (exception code)	0x04
Byte 3, 4	CRC16 Checksum	0xE133

Register address (Hex)	Register-address (Dec)	Description	Words	Datatype	Mode	Range	Unit	Comments / Value	Standard	iso1685DP	isoLR1685DP	isoHV1685D	isoHR1685D
3.1 Device information													
0x510	1296	Device name	10	String UTF 8	RO				---	iso1685DP-4	isoLR1685DP-3	isoHV1685D-4	isoHR1685D-9
0x51A	1306	D-No. Software MU	1	UInt16	RO				---	484	538	588	601
0x51B	1307	Software-version MU	1	UInt16	RO			f.e. 206: V2.06	---				
0x51C	1308	Build-No. MU	1	Int16	RO			Build-Nr. from Build-process	---				
0x51D	1309	D-No. Software IU	1	UInt16	RO				---	485	539	589	602
0x51E	1310	Software-version IU	1	UInt16	RO			f.e. 206: V2.06	---				
0x51F	1311	Build-No. IU	1	Int16	RO			Build-Nr. from Build-process	---				
3.2 Values													
0x2000	8192	Insulation resistance	2	Float	RO		Ohm	nan: not available, code 1 during Standby	---	X	X	X	X
0x2002	8194	Leakage capacity	2	Float	RO		Farad	nan: not available	---	X	X	X	X
0x2004	8196	Prewarning (Insulation resistance)	1	UInt16	RO			0: OK 4: Warning	---	X	X	X	X
0x2005	8197	Alarm (Insulation resistance)	1	UInt16	RO			0: OK 4: Warning	---	X	X	X	X
0x2006	8198	net voltage	1	Int16	RO		V		---	X	X	X	X
0x2007	8199	Voltage U+/Earth	1	Int16	RO		V	(Code 213 during Recalib)	---	X	X	X	X
0x2008	8200	Voltage U-/Earth	1	Int16	RO		V	(Code 213 during Recalib)	---	X	X	X	X
0x2009	8201	System Frequency	1	Int16	RO		100mHz						
0x200A	8202	PGH current	1	Int16	RO		mA		---	X	X		
0x200B	8203	Temperature coupling L+	1	Int16	RO		°C		---	X	X	X	X
0x200C	8204	Temperature coupling L-	1	Int16	RO		°C		---	X	X	X	X
0x200D	8205	Temperature PGH	1	Int16	RO		°C		---	X	X		
0x200E	8206	Alarm Overtemperature coupling L+	1	UInt16	RO			0: OK 4: Warning (> 100°C)	0	X	X	X	X
0x200F	8207	Alarm Overtemperature coupling L-	1	UInt16	RO			0: OK 4: Warning (> 100°C)	0	X	X	X	X
0x2010	8208	Alarm Overtemperature PGH	1	UInt16	RO			0: OK 4: Warning (> 100°C)	0	X	X		
0x2011	8209	Connection Earth (E/KE)	1	UInt16	RO			0: OK 2: Error	0	X	X	X	X
0x2012	8210	Connection System (L1/+, L2/-)	1	UInt16	RO			0: OK 2: Error	0	X	X	X	X
0x2013	8211	Device error	1	UInt16	RO			0: no Error 0: Error code according to manual (no decimal point)	0	X	X	X	X
0x2014	8212	Status Test	1	UInt16	RO			0: no Test 1: Internal Test 2: External Test"	0	X	X	X	X

Register address (Hex)	Register-address (Dec)	Description	Words	Datatype	Mode	Range	Unit	Comments / Value	Standard	iso1685DP	isoLR1685DP	isoHV1685D	isoHR1685D
3.3 Parameter													
0x3000	12288	Measuring Profile	1	UInt16	R/W	1 … 5		1: Power Circuits 2: High Capacitance 3: Inverter > 10Hz 4: Inverter < 10Hz 5: Fast 2.000 µF	1	1 … 5	1 … 5	1 … 5	1 … 5
0x3001	12289	Response value Prewarning	2	UInt32	R/W	10 …100 M	Ohm (Ω)	limits depend on the respective variant	?	200 Ω … 1 MΩ Standard: 40 kΩ	20 Ω… 100 kΩ Standard: 4 kΩ	200 Ω … 1 MΩ Standard: 40 kΩ	100 kΩ …100 MΩ Standard: 15MΩ
0x3003	12291	Response value Alarm	2	UInt32	R/W	10 …100 M	Ohm (Ω)	limits depend on the respective variant	?	200 Ω … 1 MΩ Standard: 10 kΩ	20 Ω… 100 kΩ Standard: 1 kΩ	200 Ω … 1 MΩ Standard: 10 kΩ	100 kΩ …100 MΩ Standard: 3 MΩ
0x3005	12293	Failure memory	1	UInt16	R/W	1 … 2		1: On 2: Off	2	X	X	X	X
0x3006	12294	Coupling Monitoring	1	UInt16	R/W	1 … 2		1: On 2: Off	1	X	X	X	
0x3007	12295	Relay K1 (Prewarning)	1	UInt16	R/W	1 … 4		1: N/O 2: N/C 3: N/O+Test 4: N/C+Test	4	X	X	X	X
0x3008	12296	Relay K2 (Alarm)	1	UInt16	R/W	1 … 4		1: N/O 2: N/C 3: N/O+Test 4: N/C+Test	4	X	X	X	X
0x3009	12297	EDS mode	1	UInt16	R/W	0 … 3		1: Manual 2: Auto 3: 1 Cycle	2	X	X		
0x300A	12298	EDS current	1	UInt16	R/W	1 … 6		1: 1mA 2: 2,5mA 3: 5mA 4: 10mA 5: 25mA 6: 50mA"	5	X	X		
0x300B	12299	Protocol RS485-Interface	1	UInt16	R/W	1 … 2		1: BMS 2: Modbus RTU	1	X	X	X	X
0x300C	12300	Address for BMS	1	UInt16	R/W	1 … 99			2	X	X	X	X
0x300D	12301	Address for Modbus RTU	1	UInt16	R/W	1 … 247		only Modbus Slave	247	X	X	X	X
0x300E	12302	ModbusRTU Baudrate	1	UInt16	R/W	1 … 5		1: 9600 2: 19200 3: 38400 4: 57600 5: 115200	2	X	X	X	X
0x300F	12303	ModbusRTU Parity	1	UInt16	R/W	1 … 3		1: even 2: odd 3: none	1	X	X	X	X

Register address (Hex)	Register-address (Dec)	Description	Words	Datatype	Mode	Range	Unit	Comments / Value	Standard	iso1685DP	isoLR1685DP	isoHV1685D	isoHR1685D
0x3010	12304	ModbusRTU Stop Bits	1	UInt16	R/W	1 … 3		1: 1 2: 2 3: Automatic	1	X	X	X	X
0x3011	12305	Digital Input 1: Mode	1	UInt16	R/W	1 … 2		1: Active High 2: Active Low	1	X	X	X	X
0x3012	12306	Digital Input 1: t(on)	1	UInt16	R/W	1 … 3000	100ms	Range: 0,1 … 300 sec	1	X	X	X	X
0x3013	12307	Digital Input 1: t(off)	1	UInt16	R/W	1 … 3000	100ms	Range: 0,1 … 300 sec	1	X	X	X	X
0x3014	12308	Digital Input 1: Function	1	UInt16	R/W	1 … 5		1: off 2: TEST 3: RESET 4: Deactivate Device (*5: Iso Fault Location)	2	X	X	X	X
0x3015	12309	Digital Input 2: Mode	1	UInt16	R/W	1 … 2		1: Active High 2: Active Low	1	X	X	X	X
0x3016	12310	Digital Input 2: t(on)	1	UInt16	R/W	1 … 3000	100ms	Range: 0,1 … 300 sec	1	X	X	X	X
0x3017	12311	Digital Input 2: t(off)	1	UInt16	R/W	1 … 3000	100ms	Range: 0,1 … 300 sec	1	X	X	X	X
0x3018	12312	Digital Input 2: Function	1	UInt16	R/W	1 … 5		1: off 2: TEST 3: RESET 4: Deactivate Device (*5: Iso Fault Location)	4	X	X	X	X
0x3019	12313	Buzzer TEST	1	UInt16	R/W	1 … 2		1: On 2: Off	2	X	X	X	X
0x301A	12314	Buzzer Function 1	1	UInt16	R/W	1 … 8		1: off 2: Prewarning 3: Alarm 4: Connection Fault 5: Device error 6: Common alarm 7: Device inactive (*8: Common alarm EDS)"	1	X	X	X	X
0x301B	12315	Buzzer Function 2	1	UInt16	R/W	1 … 8		1: off 2: Prewarning 3: Alarm 4: Connection Fault 5: Device error 6: Common alarm 7: Device inactive (*8: Common alarm EDS)"	1	X	X	X	X

Register address (Hex)	Register-address (Dec)	Description	Words	Datatype	Mode	Range	Unit	Comments / Value	Standard	iso1685DP	isoLR1685DP	isoHV1685D	isoHR1685D
0x301C	12316	Buzzer Function 3	1	UInt16	R/W	1 … 8		1: off 2: Prewarning 3: Alarm 4: Connection Fault 5: Device error 6: Common alarm 7: Device inactive (*8: Common alarm EDS)"	1	X	X	X	X
0x301D	12317	RTC Time Hour	1	UInt16	R/W	0 … 23				X	X	X	X
0x301E	12318	RTC Time Minute	1	UInt16	R/W	0 … 59				X	X	X	X
0x301F	12319	RTC Time Second	1	UInt16	R/W	0 … 59				X	X	X	X
0x3020	12320	RTC Date Day	1	UInt16	R/W	1 … 31				X	X	X	X
0x3021	12321	RTC Date Month	1	UInt16	R/W	1 … 12				X	X	X	X
0x3022	12322	RTC Date Year	1	UInt16	R/W	2014 … 2063				X	X	X	X
0x3023	12323	RTC Time Format	1	UInt16	R/W	1 … 2		1: 12h 2: 24h"	2	X	X	X	X
0x3024	12324	Daylight Saving Time	1	UInt16	R/W	1 … 3		1: aus 2: DST 3: CEST	2	X	X	X	X
0x3025	12325	Standby (Decoupling net)	1	UInt16	R/W	1 … 2		1: active 2: inactive (standby)	1	X	X		
0x3026	12326	System frequency	1	UInt16	R/W	1 … 2		1: <= 460 Hz 2: > 460 Hz	1	X	x	X[1]	
3.4 Control-commands													
0x3100	12544	Factory setting	1	UInt16	WO			Factory setting: 0xFF00		X	X	X	X
0x3101	12545	Start Test	1	UInt16	WO			Start Test: 0xFF00		X	X	X	X
0x3102	12546	Reset (Memory)	1	UInt16	WO			Reset (Memory): 0xFF00		X	X	X	X
0x3103	12547	EDS Start	1	UInt16	WO			EDS Start: 0xFF00		X	X	X	X
0x3104	12548	EDS Stop	1	UInt16	WO			EDS Stop: 0xFF00		X	X		

[1] from D0588 V2.11

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