BENDER
The Power in Electrical Safety©

ISOMETER® iso685
Device family

Modbus settings

Insulation monitoring device for IT AC systems with galvanically connected rectifiers and inverters and for IT DC systems

iso685_D00022_05_A_XXEN/01.2020

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

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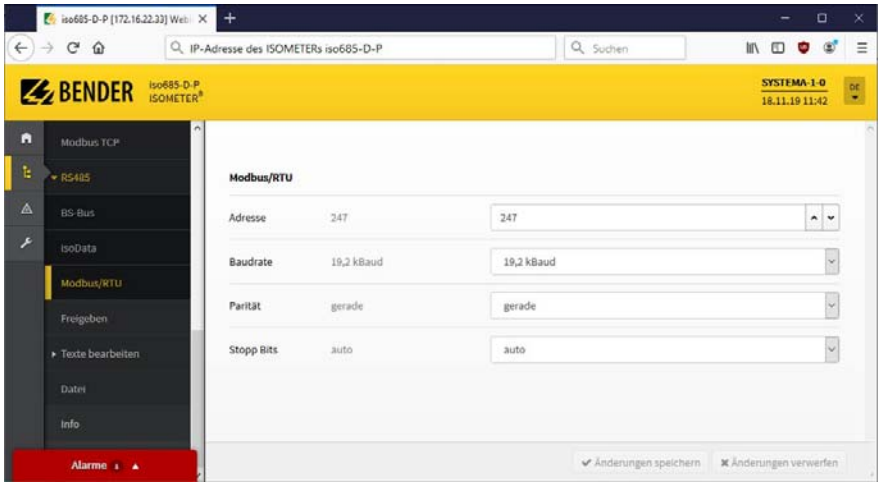
This annex provides a complete description of the Modbus register map for the ISOMETER® iso685 device family to facilitate the access to information.

Requirements

All devices in a Modbus RTU interconnection must have the same values regarding baud rate, parity and stop bits. This values can be configured via the COMTRAXX® web interface under the following menu path:

DEVICE / Menu / Settings / Interface / RS-485 / Modbus RTU



Also the keys which can be adjusted for the individual parameters are listed.

The ISOMETER®s of the iso685 device family support 4-digit address assignment and the following Modbus functions:

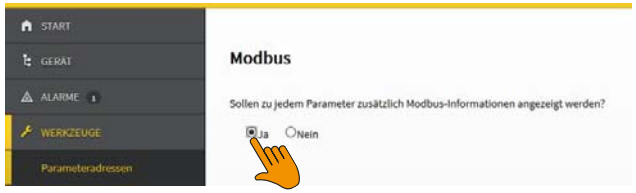
- Holding register for reading values
  (Read Holding Register; function code 0x03)
- Register for device programming
  (Preset Multiple Registers; function code 0x10)

For a complete Modbus protocol specification, visit
http://www.modbus.org.

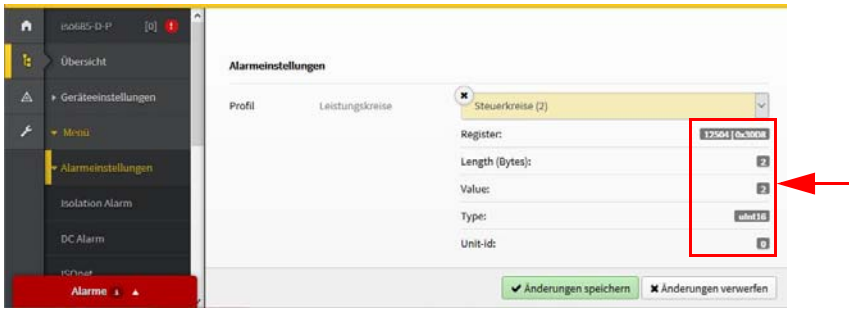
Display of the Modbus registers via the COMTRAXX® web interface

Enable display of Modbus registers. Menu path:

Tools / Parameter addresses



Parameter addresses and values are highlighted in grey.



Requests are sent to the Modbus TCP server of the iso685 using function code FC3 (read input register). The server generates a function-related response and sends it to the Modbus client.

Maximum number of Modbus TCP requests in bytes per second: 100/s

2.1 Exception code

If a request cannot be answered for whatever reason, the server sends 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	Slave device error
0x05	Acknowledgement of receipt (answer will be time-delayed)
0x06	Request not accepted (repeat request, if necessary)
0x08	Memory: Parity Error
0x0A	Gateway path not available
0x0B	Gateway error

2.2 Modbus requests

The required words of the process image can be read from the input registers in the ISOMETER® iso685 using the function code FC3. For this purpose, the start address and the number of bytes of the registers to be read have to be entered.

Example:
The insulation value is to be read from the input registers. 0x2000 is the start address. The insulation value results from the two registers to be read.

Byte	Name	Example
Byte 0,1	Transaction identifier	0x0000
Byte 2,3	Protocol identifier	0x0000
Byte 4,5	Length field	0x0006
Byte 6	Unit identifier	BCOM device address
Byte 7	Modbus function code	0x03
Byte 8,9	Register address from "Measured value information" on page 6	0x2000
Byte 10,11	Number of words byte	0x0002

2.3 Modbus responses

The responses consist of 2 bytes per register. The MSB is the first byte.

Byte	Name	Example
…	…	…
Byte 7	Modbus function code	0x03
Byte 8	Byte count	0x04
Byte 9,10	Value register 0	0x1234 (fictitious value)
Byte 11,12	Value register 1	0x2345 (fictitious value)

2.4 Structure of the exception code

Byte	Name	Example
…	…	…
Byte 7	Modbus function code	0x83
Byte 8	Exception code	0x01 or 0x02

3.1 High byte test status

Value	Description
0	No test
1	Internal test
2	External test

3.2 Low byte alarm status

Value	Description
0	No alarm
1	Prewarning
2	Fault
3	Reserved
4	Warning
5	Alarm

3.3 High byte range

Value	Description
0	=
1	<
2	>
3	Invalid

Example: Register 0x1013 (dec. 4115)

HEX	DEC	DESCR.	REG	TYPE	MODE	Comment
0x1013	4115	Test and alarm status	1	Uint16	RO	High byte test status Low byte alarm status

Register 4115	Word 0x00	
Byte value	HiByte	LoByte
Parameter	Test status	Alarm status
Example	0x1	0x0
Meaning	Internal test is run	No alarm

3.4 Low byte unit

Value	Description
0	Invalid
1	None
2	Ohm
3	Ampere
4	Volt
5	Percent
6	Hertz
7	Baud
8	Farad
9	Henry
10	Degree Celsius
11	Degree Fahrenheit
12	Second
13	Minute
14	Hour
15	Day
16	Month
17	Watt
18	var
19	VA
20	Wh
21	varh
22	Vah
23	Degree
24	Hertz per second

4.1 ISOMETER® iso685 device family

4.1.1 Device information

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x510	1296	Device model	16	String UTF 8	RO				x	x	x	x	x
0x520	1312	Article number	16	String UTF 8	RO				x	x	x	x	x
0x530	1328	Serial number	16	String UTF 8	RO				x	x	x	x	x
0x540	1344	Manufacturer	48	String UTF 8	RO				x	x	x	x	x
0x570	1392	D number Interface	1	Uint16	RO	Software number of the interface unit			x	x	x	x	x
0x571	1393	Software version Interface	1	Uint16	RO				x	x	x	x	x
0x578	1400	D number Measurement equipment	1	Uint16	RO	Software number of the measurement technology			x	x	x	x	x
0x579	1401	Software version Measurement equipment	1	Uint16	RO				x	x	x	x	x
0x580	1408	D number FP200	1	Uint16	RO	Software number of the FP200 (if applicable in the case of a sensor variant)				x	x	x	x
0x581	1409	Software version FP200	1	Uint16	RO					x	x	x	x
0x582	1410	Build number	1	Uint16	RO								
0x583	1411	Build number	1	Uint16	RO								

4.1.2 Measured values

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x1010	4112	Channel number (1)	1	Uint16	RO				x	x	x	x	x
0x1011	4113	Insulation resistance	2	Float	RO			Ω	x	x	x	x	x
0x1013	4115	Test and alarm status	1	Uint16	RO	High byte test status Low byte alarm status			x	x	x	x	x
0x1014	4116	Range and unit	1	Uint16	RO	High byte range Low byte unit			x	x	x	x	x
0x1015 - 0x1018	4117 - 4120	Internal use			RO	May be read out. Values are only relevant for internal use.			x	x	x	x	x
0x1019 - 0x101F	4121 - 4127	Internal use	1	Uint16	RO	May be read out. Values are only relevant for internal use.			x	x	x	x	x
0x1020	4128	Channel number (2)	1	Uint16	RO				x	x	x	x	x
0x1021	4129	Insulation resistance	2	Float	RO			Ω	x	x	x	x	x
0x1023 - 0x102F	4131 - 4143	See previous channel			RO				x	x	x	x	x
0x1030	4144	Channel number (3)	1	Uint16	RO				x	x	x	x	x
0x1031	4145	System leakage capacitance	2	Float	RO			F	x	x	x	x	x
0x1033 - 0x103F	4147 - 4159	See previous channel			RO				x	x	x	x	x
0x1040	4160	Channel number (4)	1	Uint16	RO				x	x	x	x	x
0x1041	4161	Voltage L1-L2	2	Float	RO	Voltage from phase L1 to phase L2		V	x	x	x	x	x
0x1043 - 0x104F	4163 - 4175	See previous channel			RO				x	x	x	x	x
0x1050	4176	Channel number (5)	1	Uint16	RO				x	x	x	x	x
0x1051	4177	Voltage L1-L3	2	Float	RO	Voltage from phase L1 to phase L3		V	x	x	x	x	x
0x1053 - 0x105F	4179 - 4191	See previous channel			RO				x	x	x	x	x
0x1060	4192	Channel number (6)	1	Uint16	RO				x	x	x	x	x
0x1061	4193	Voltage L2-L3	2	Float	RO	Voltage from phase L2 to phase L3		V	x	x	x	x	x
0x1063 - 0x106F	4195 - 4207	See previous channel			RO				x	x	x	x	x
0x1070	4208	Channel number (7)	1	Uint16	RO				x	x	x	x	x
0x1071	4209	Voltage L1-PE	2	Float	RO	Voltage from phase L1 to earth PE		V	x	x	x	x	x
0x1073 - 0x107F	4211 - 4223	See previous channel			RO				x	x	x	x	x
0x1080	4224	Channel number (8)	1	Uint16	RO				x	x	x	x	x
0x1081	4225	Voltage L2-PE	2	Float	RO	Voltage from phase L2 to earth PE		V	x	x	x	x	x
0x1083 - 0x108F	4227 - 4239	See previous channel			RO				x	x	x	x	x

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x1090	4240	Channel number (9)	1	Uint16	RO				x	x	x	x	x
0x1091	4241	Voltage L3-PE	2	Float	RO	Voltage from phase L3 to earth PE		V	x	x	x	x	x
0x1093 - 0x109F	4243 - 4255	See previous channel			RO				x	x	x	x	x
0x10A0	4256	Channel number (10)	1	Uint16	RO				x	x	x	x	x
0x10A1	4257	System frequency	2	Float	RO			Hz	x	x	x	x	x
0x10A3 - 0x10AF	4259 - 4271	See previous channel			RO				x	x	x	x	x
0x10B0	4272	Channel number (11)	1	Uint16	RO				x	x	x	x	x
0x10B1	4273	Coupling to system	2	Float	RO	0 = O.K. 101 = fault			x	x	x	x	x
0x10B3 - 0x10BF	4275 - 4287	See previous channel			RO				x	x	x	x	x
0x10C0	4288	Channel number (12)	1	Uint16	RO				x	x	x	x	x
0x10C1	4289	Coupling to earth	2	Float	RO	0 = O.K. 102 = fault			x	x	x	x	x
0x10C3 - 0x10CF	4291 - 4303	See previous channel			RO				x	x	x	x	x
0x10D0	4304	Channel number (13)	1	Uint16	RO				x	x	x	x	x
0x10D1	4305	Device error	2	Float	RO	Device error number (Example: 750 -> 7.50 communication CAN)			x	x	x	x	x
0x10D3 - 0x10DF	4307 - 4319	See previous channel			RO				x	x	x	x	x
0x10E0	4320	Channel number (14)	1	Uint16	RO				x	x	x	x	x
0x10E1	4321	Device inactive	2	Float	RO	0 = active 1 = inactive			x	x	x	x	x
0x10E3 - 0x10EF	4323 - 4335	See previous channel			RO				x	x	x	x	x
0x10F0	4336	Channel number (15)	1	Uint16	RO				x	x	x	x	x
0x10F1	4337	DC offset	2	Float	RO	DC offset in the system. 0 % = fault at DC+ 100 % = fault at DC-		%	x	x	x	x	x
0x10F3 - 0x10FF	4339 - 4351	See previous channel			RO				x	x	x	x	x
0x1100	4352	Channel number (16)	1	Uint16	RO				x	x	x	x	x

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x1101	4353	Measurement quality	2	Float	RO	Measured value quality 0 % = bad quality -->change profile 100 % = good quality -->profile matches application		%	x	x	x	x	x
0x1103 - 0x110F	4355 - 4367	See previous channel			RO				x	x	x	x	x
0x1110	4368	Channel number (17)	1	Uint16	RO				x	x	x	x	x
0x1111	4369	Minimum insulation resist-ance	2	Float	RO	Minimum measured insulation resistance		Ω	x	x	x	x	x
0x1113 - 0x111F	4371 - 4383	See previous channel			RO				x	x	x	x	x
0x1120	4384	Channel number (18)	1	Uint16	RO				x	x	x	x	x
0x1121	4385	Symmetrical alarm	2	Float	RO	Percentage of the DC fault offset 0 %-25 % -> fault at DC+ 25 %-75 % -> symmetrical fault 75 %-100 % -> fault at DC-	0…100	%	x	x	x	x	x
0x1123 - 0x112F	4387 - 4399	See previous channel			RO				x	x	x	x	x
0x1130	4400	Channel number (19)	1	Uint16	RO				x	x	x	x	x
0x1131	4401	DC- alarm	2	Float	RO	see 0x1121			x	x	x	x	x
0x1133 - 0x113F	4403 - 4415	See previous channel			RO				x	x	x	x	x
0x1140	4416	Channel number (20)	1	Uint16	RO				x	x	x	x	x
0x1141	4417	DC+ alarm	2	Float	RO	see 0x1121			x	x	x	x	x
0x1143 - 0x114F	4419 - 4431	See previous channel			RO				x	x	x	x	x
0x1150	4432	Channel number (21)	1	Uint16	RO						x	x	x
0x1151	4433	ISOnet device timeout	2	Float	RO	Device address of the device on which the timeout occurred.	0…255				x	x	x
0x1153 - 0x115F	4435 - 4447	See previous channel			RO						x	x	x
0x1160	4448	Channel number (22)	1	Uint16	RO						x	x	x
0x1161	4449	ISOnet devices incomplete	2	Float	RO	The value is always 0. Only the alarm status is changed from No alarm to Fault					x	x	x
0x1163 - 0x116F	4451 - 4463	See previous channel			RO						x	x	x
0x1170	4464	Channel number (23)	1	Uint16	RO						x	x	x
0x1171	4465	General ISOnet fault	2	Float	RO	The value is always 0. Only the alarm status is changed from No alarm to Fault					x	x	x

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x1173 - 0x117F	4447 - 4479	See previous channel			RO						x	x	x
0x1180	4480	Channel number (24)	1	Uint16	RO			V	x	x	x	x	x
0x1181	4481	DC offset voltage to earth	2	Float	RO				x	x	x	x	x
0x1183 - 0x118F	4483 - 4495	See previous channel			RO				x	x	x	x	x
0x1190	4496	Channel number (25)	1	Uint16	RO							x	
0x1191	4497	Number of active EDS channels	2	Float	RO							x	
0x1193 - 0x119F	4499 - 4511	See previous channel			RO							x	
0x11A0	4512	Channel number (26)	1	Uint16	RO							x	
0x11A1	4513	Number of EDS alarms	2	Float	RO							x	
0x11A3 - 0x11AF	4515- 4527	See previous channel			RO							x	
0x11B0	4528	Channel number (27)	1	Uint16	RO							x	
0x11B1	4529	Number of RCM alarms	2	Float	RO							x	
0x11B3 - 0x11BF	4531 - 4543	See previous channel			RO							x	
0x11C0	4544	Channel number (28)	1	Uint16	RO							x	
0x11C1	4545	Address of the first offline device	2	Float	RO	Subsystem, device address (Example: SYSTEM-1-1 > 1.001)						x	
0x11C3	4547	Test and alarm status	1	Uint16	RO	0: no error 4: EDSsync error						x	
0x11C4	4548	Range and unit	1	Uint16	RO	0: Value in float is an address 3: Value in float has no validity						x	
0x11C5	4549	Text number	1	Uint16	RO	403: EDSsync configuration inconsistent 404: BCOM connection interrupted 405: EDSsync configuration not available 406: Distribute EDSsync configuration failed 407: EDSsync configuration faulty 408: EDSsync enabled 409: EDSsync disabled 410: EDSsync devices not available						x	
0x11C6	4550	Index to text number	1	Uint16	RO	always 0						x	
0x11C7	4551	Position text number	1	Uint16	RO	always 0						x	
0x11C8	4552	Index to pos. text number	1	Uint16	RO	always 0						x	

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x11C9-0x11CF	4553-4575	Internal use				always 0					x	x	
0x11D0	4560	Channel number (29)	1	Uint16	RO						x	x	
0x11D1	4561	Address of the first offline device	2	Float	RO	Subsystem, device address (Example: SYSTEM-1-1 > 1,001);					x	x	
0x11D3	4563	Test and alarm status	1	Uint16	RO	0: no error 4: ISOloop error					x	x	
0x11D4	4564	Range and unit	1	Uint16	RO	0: Value in float is an address 3: Value in float has no validity					x	x	
0x11D5	4565	Text number	1	Uint16	RO	404: BCOM connection interrupted 413: ISOloop configuration inconsistent 414: ISOloop configuration not available 415: Distribute ISOloop configuration failed 416: ISOloop configuration faulty 417: ISOloop enabled 418: ISOloop disabled 419: ISOloop devices not available					x	x	
0x11D6	4566	Index to text number	1	Uint16	RO	always 0					x	x	
0x11D7	4567	Position text number	1	Uint16	RO	always 0					x	x	
0x11D8	4568	Index to position number	1	Uint16	RO	always 0					x	x	
0x11D9 - 0x11DF	4569-4575	Internal use				always 0					x	x	

4.1.3 Measured values without test status

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x2000	8192	Insulation resistance	2	Float	RO			Ω	x	x	x	x	x
0x2002	8194	Minimum insulation value	2	Float	RO	Minimum measured insulation resistance		Ω	x	x	x	x	x
0x2004	8196	System leakage capacitance	2	Float	RO			F	x	x	x	x	x
0x2006	8198	Voltage L1-L2	2	Float	RO	Voltage from phase L1 to phase L2		V	x	x	x	x	x
0x2008	8200	Voltage L1-L3	2	Float	RO	Voltage from phase L1 to phase L3		V	x	x	x	x	x
0x200A	8202	Voltage L2-L3	2	Float	RO	Voltage from phase L2 to phase L3		V	x	x	x	x	x
0x200C	8204	Voltage L1-PE	2	Float	RO	Voltage from phase L1 to earth PE		V	x	x	x	x	x
0x200E	8206	Voltage L2-PE	2	Float	RO	Voltage from phase L2 to earth PE		V	x	x	x	x	x
0x2010	8208	Voltage L3-PE	2	Float	RO	Voltage from phase L3 to earth PE		V	x	x	x	x	x
0x2012	8210	System frequency	2	Float	RO			Hz	x	x	x	x	x
0x2014	8212	Coupling to system	2	Float	RO	0 = O.K. 101 = fault			x	x	x	x	x
0x2016	8214	Coupling to earth	2	Float	RO	0 = O.K. 102 = fault			x	x	x	x	x
0x2018	8216	Device error	2	Float	RO	Device error number (Example: 750 -> 7.50 communication CAN)			x	x	x	x	x
0x201A	8218	Device inactive	2	Float	RO	0 = active 1 = inactive			x	x	x	x	x
0x201C	8220	DC offset	2	Float	RO	DC offset in the system. 0 % = fault at DC+ 100 % = fault at DC-	0…100	%	x	x	x	x	x
0x201E	8222	Measurement quality	2	Float	RO	Measured value quality 0 % = bad quality =<> change profile 100 % = good quality => profile matches application		%	x	x	x	x	x
0x2026	8230	Duration of the measuring pulse	2	Float	RO	0 % = measuring pulse has switched 100 % = measuring pulse shortly before switching		%	x	x	x	x	x

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x2028	8232	Voltage DC-PE	2	Float	RO	DC offset voltage to earth		V		x	x	x	x
0x202A	8234	IL pos	2	Float	RO	PGH current positive		A				x	
0x202C	8236	IL neg	2	Float	RO	PGH current negative		A				x	
0x2030	8240	PGH start condition	2	Float	RO	Status by which PGH was started 0 = start condition OFF 1 = start condition MANUAL 2 = start condition AUTO 3 = start condition 1CYCLE						x	

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x2100	8448	IO state	2	Uint32	RO	Bit[0]: Digital input 1 Bit[1]: Digital input 1 Bit[2]: Digital input 2 Bit[3]: Digital input 2 Bit[4]: Digital input 3 Bit[5]: Digital input 3 Bit[6]: Digital output 1 Bit[7]: Digital output 2 Bit[8]: Relay 1 alarm state Bit[9]: Relay 1 switching state (contains configuration NO/NC) Bit[10]: Relay 2 alarm state Bit[11]: Relay 2 switching state (contains configuration NO/NC)	***Digital input 1*** Bit[0] = 0 && Bit[1] = 0 --> logical 0 Bit[0] = 1 && Bit[1] = 0 --> logical 1 Bit[0] = 0 && Bit[1] = 1 --> neutral ***Digital input 2*** Bit[2] = 0 && Bit[3] = 0 --> logical 0 Bit[2] = 1 && Bit[3] = 0 --> logical 1 Bit[2] = 0 && Bit[3] = 1 --> neutral ***Digital input 3*** Bit[4] = 0 && Bit[5] = 0 --> logical 0 Bit[4] = 1 && Bit[5] = 0 --> logical 1 Bit[4] = 0 && Bit[5] = 1 --> neutral				x	x	x	x

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x2102	8450	Alarm status	2	Uint32	RO	Bit[0]: Ins. alarm 1 Bit[1]: Ins. alarm 2 Bit[2]: Connection fault (coupling || E/KE) Bit[3]: DC- alarm Bit[4]: DC+ alarm Bit[5]: Symmetrical alarm Bit[6]: Device error Bit[7]: Common alarm Bit[8]: Measurement complete Bit[9]: Device inactive Bit[10]: DC offset alarm Bit[11]: Common alarm EDS Bit[12]: PGH pulse Bit[13]: ISOnet error Bit[14]: PGH active Bit[15]: Communication error				x	x	x	x
0x2110	8464	Measured value counter	1	Uint16	RO	Is incremented by 1 when a new insulation measurement is available.				x	x	x	x
0x2FFE	12286	Current IP address	2	Uint32	RO	Currently used IP address aaa.bbb.ccc.ddd => aaa*256^3+bbb*256^2+ccc*256+ddd			x	x	x	x	x

4.1.4 EDS functions

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x2200	8704	PGH current	2	Float	RO	Maximum locating current set	0.001 … 0.05	A				x	
0x2210	8720	1. IdN percentage value	2	Float	RO	Largest percentage residual current in relation to the response value.	0 … 100	%				x	
0x2212	8722	EDS channel to previous value	1	Uint16	RO	Channel number of the channel with the largest percentage residual current.	1 … 600					x	
0x2213	8723	2. IdN percentage value	2	Float	RO	Second largest percentage residual current in relation to the response value.	0 … 100	%				x	
0x2215	8725	EDS channel to previous value	1	Uint16	RO	Channel number of the channel with the second largest percentage residual current.	1 … 600					x	
0x2216	8726	3. IdN percentage value	2	Float	RO	see 0x2213 - 0x2215 third largest IdN	0 … 100	%				x	
0x2218	8728	EDS channel to previous value	1	Uint16	RO	see 0x2213 - 0x2215	1 … 600					x	
0x2219	8729	4. IdN percentage value	2	Float	RO	see 0x2213 - 0x2215 fourth largest IdN	0 … 100	%				x	
0x221B	8731	EDS channel to previous value	1	Uint16	RO	see 0x2213 - 0x2215	1 … 600					x	
0x221C	8732	5. IdN percentage value	2	Float	RO	see 0x2213 - 0x2215 fifth largest IdN	0 … 100	%				x	
0x221E	8734	EDS channel to previous value	1	Uint16	RO	see 0x2213 - 0x2215	1 … 600					x	
0x221F	8735	6. IdN percentage value	2	Float	RO	see 0x2213 - 0x2215 sixth largest IdN	0 … 100	%				x	
0x2221	8737	EDS channel to previous value	1	Uint16	RO	see 0x2213 - 0x2215	1 … 600					x	
0x2222	8738	7. IdN percentage value	2	Float	RO	see 0x2213 - 0x2215 seventh largest IdN	0 … 100	%				x	
0x2224	8740	EDS channel to previous value	1	Uint16	RO	see 0x2213 - 0x2215	1 … 600					x	
0x2225	8741	8. IdN percentage value	2	Float	RO	see 0x2213 - 0x2215 eighth largest IdN	0 … 100	%				x	
0x2227	8743	EDS channel to previous value	1	Uint16	RO	see 0x2213 - 0x2215	1 … 600					x	
0x2250	8784	1. IdN absolute value	2	Float	RO	Largest residual current	EDS441: 0.1 … 2 EDS440: 0.1 … 20	A				x	
0x2252	8786	Response value of the channel	2	Float	RO	Response value of the channel	EDS441: 0.1 … 1 EDS440: 0.1 … 10					x	
0x2254	8788	Maximum permissible IdN	2	Float	RO	Maximum permissible residual current	EDS441: 2 EDS440: 20	A				x	
0x2256	8790	EDS channel to previous value	1	Uint16	RO	Channel number of the channel with the largest residual current.	1 … 600					x	
0x2257	8791	2. IdN absolute value	2	Float	RO	see 0x2250 - 0x2256 second largest IdN	EDS441: 0.1 … 2 EDS440: 0.1 … 20	A				x	

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x2259	8793	Response value of the channel	2	Float	RO	see 0x2250 - 0x2256	EDS441: 0.1 … 1 EDS440: 0.1 … 10					x	
0x225B	8795	Maximum measured value	2	Float	RO	see 0x2250 - 0x2256	EDS441: 2; EDS440: 20	A				x	
0x225D	8797	EDS channel to previous value	1	Uint16	RO	see 0x2250 - 0x2256	1 … 600					x	
0x225E	8798	3. IdN absolute value	2	Float	RO	see 0x2250 - 0x2256 third largest IdN	EDS441: 0.1 … 2 EDS440: 0.1 … 20	A				x	
0x2260	8800	Response value of the channel	2	Float	RO	see 0x2250 - 0x2256	EDS441: 0.1 … 1 EDS440: 0.1 … 10					"x	
0x2262	8802	Maximum measured value	2	Float	RO	see 0x2250 - 0x2256	EDS441: 2; EDS440: 20	A				x	
0x2264	8804	EDS channel to previous value	1	Uint16	RO	see 0x2250 - 0x2256	1 … 600					x	
0x2265	8805	4. IdN absolute value	2	Float	RO	see 0x2250 - 0x2256 fourth largest IdN	EDS441: 0.1 … 2 EDS440: 0.1 … 20	A				x	
0x2267	8807	Response value of the channel	2	Float	RO	see 0x2250 - 0x2256	EDS441: 0.1 … 1 EDS440: 0.1 … 10					"x	
0x2269	8809	Maximum measured value	2	Float	RO	see 0x2250 - 0x2256	EDS441: 2 EDS440: 20	A				x	
0x226B	8811	EDS channel to previous value	1	Uint16	RO	see 0x2250 - 0x2256	1 … 600					x	
0x226C	8812	5. IdN absolute value	2	Float	RO	see 0x2250 - 0x2256 fifth largest IdN	EDS441: 0.1 … 2 EDS440: 0.1 … 20	A				x	
0x226E	8814	Response value of the channel	2	Float	RO	see 0x2250 - 0x2256	EDS441: 0.1 … 1 EDS440: 0.1 … 10					"x	
0x2270	8816	Maximum measured value	2	Float	RO	see 0x2250 - 0x2256	EDS441: 2 EDS440: 20	A				x	
0x2272	8818	EDS channel to previous value	1	Uint16	RO	see 0x2250 - 0x2256	1 … 600					x	
0x2273	8819	6. IdN absolute value	2	Float	RO	see 0x2250 - 0x2256 sixth largest IdN	EDS441: 0.1 … 2 EDS440: 0.1 … 20	A				x	
0x2275	8821	Response value of the channel	2	Float	RO	see 0x2250 - 0x2256	EDS441: 0.1 … 1 EDS440: 0.1 … 10					"x	
0x2277	8823	Maximum measured value	2	Float	RO	see 0x2250 - 0x2256	EDS441: 2 EDS440: 20	A				x	
0x2279	8825	EDS channel to previous value	1	Uint16	RO	see 0x2250 - 0x2256	1 … 600					x	

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x227A	8826	7. IdN absolute value	2	Float	RO	see 0x2250 - 0x2256 seventh largest IdN	EDS441: 0.1 … 2 EDS440: 0.1 … 20	A				x	
0x227C	8828	Response value of the channel	2	Float	RO	see 0x2250 - 0x2256	EDS441: 0.1 … 1 EDS440: 0.1 … 10					"x	
0x227E	8830	Maximum measured value	2	Float	RO	see 0x2250 - 0x2256	EDS441: 2 EDS440: 20	A				x	
0x2280	8832	EDS channel to previous value	1	Uint16	RO	see 0x2250 - 0x2256	1 … 600					x	
0x2281	8833	8. IdN absolute value	2	Float	RO	see 0x2250 - 0x2256 eighth largest IdN	EDS441: 0.1 … 2 EDS440: 0.1 … 20	A				x	
0x2283	8835	Response value of the channel	2	Float	RO	see 0x2250 - 0x2256	EDS441: 0.1 … 1 EDS440: 0.1 … 10					"x	
0x2285	8837	Maximum measured value	2	Float	RO	see 0x2250 - 0x2256	EDS441: 2 EDS440: 20	A				x	
0x2287	8839	EDS channel to previous value	1	Uint16	RO	see 0x2250 - 0x2256	1 … 600					x	
0x22A0	8864	1. IdL value	2	Float	RO	Largest locating current IdL	0 … 0.01	A				x	
0x22A2	8866	Response value of the channel	2	Float	RO	Response value of the channel	EDS441: 0.0002 …0.001 EDS440: 0.002 … 0.01	A				x	
0x22A4	8868	EDS channel to previous value	1	Uint16	RO	Channel number of the channel with the largest locating current IdL	1 … 600					x	
0x22A5	8869	2. IdL value	2	Float	RO	see 0x22A0 - 0x22A4 second largest IdL	0 … 0.01	A				x	
0x22A7	8871	Response value of the channel	2	Float	RO	see 0x22A0 - 0x22A4	EDS441: 0.0002 …0.001 EDS440: 0.002 … 0.01	A				x	
0x22A9	8873	EDS channel to previous value	1	Uint16	RO	see 0x22A0 - 0x22A4	1 … 600					x	
0x22AA	8874	3. IdL value	2	Float	RO	see 0x22A0 - 0x22A4 third largest IdL	0 … 0.01	A				x	
0x22AC	8876	Response value of the channel	2	Float	RO	see 0x22A0 - 0x22A4	EDS441: 0.0002 …0.001 EDS440: 0.002 … 0.01	A				x	
0x22AE	8878	EDS channel to previous value	1	Uint16	RO	see 0x22A0 - 0x22A4	1 … 600					x	
0x22AF	8879	4. IdL value	2	Float	RO	see 0x22A0 - 0x22A4 fourth largest IdL	0 … 0.01	A				x	

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x22B1	8881	Response value of the channel	2	Float	RO	see 0x22A0 - 0x22A4	EDS441: 0.0002 …0.001 EDS440: 0.002 … 0.01	A				x	
0x22B3	8883	EDS channel to previous value	1	Uint16	RO	see 0x22A0 - 0x22A4	1 … 600					x	
0x22B4	8884	5. IdL value	2	Float	RO	see 0x22A0 - 0x22A4 fifth largest IdL	0 … 0.01	A				x	
0x22B6	8886	Response value of the channel	2	Float	RO	see 0x22A0 - 0x22A4	EDS441: 0.0002 …0.001 EDS440: 0.002 … 0.01	A				x	
0x22B8	8888	EDS channel to previous value	1	Uint16	RO	see 0x22A0 - 0x22A4	1 … 600					x	
0x22B9	8889	6. IdL value	2	Float	RO	see 0x22A0 - 0x22A4 sixth largest IdL	0 … 0.01	A				x	
0x22BB	8891	Response value of the channel	2	Float	RO	see 0x22A0 - 0x22A4	EDS441: 0.0002 …0.001 EDS440: 0.002 … 0.01	A				x	
0x22BD	8893	EDS channel to previous value	1	Uint16	RO	see 0x22A0 - 0x22A4	1 … 600					x	
0x22BE	8894	7. IdL value	2	Float	RO	see 0x22A0 - 0x22A4 seventh largest IdL	0 … 0.01	A				x	
0x22C0	8896	Response value of the channel	2	Float	RO	see 0x22A0 - 0x22A4	EDS441: 0.0002 …0.001 EDS440: 0.002 … 0.01	A				x	
0x22C2	8898	EDS channel to previous value	1	Uint16	RO	see 0x22A0 - 0x22A4	1 … 600					x	
0x22C3	8899	8. IdL value	2	Float	RO	see 0x22A0 - 0x22A4 eighth largest IdL	0 … 0.01	A				x	
0x22C5	8901	Response value of the channel	2	Float	RO	see 0x22A0 - 0x22A4	EDS441: 0.0002 …0.001 EDS440: 0.002 … 0.01	A				x	
0x22C7	8903	EDS channel to previous value	1	Uint16	RO	see 0x22A0 - 0x22A4	1 … 600					x	

4.1.5 IP configuration

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x2FF6	12278	MAC address	3	UTF-8	RO	MAC address of the device			x	x	x	x	x
0x2FFE	12286	Current IP address	2	Uint32	RO	Currently used IP address aaa.bbb.ccc.ddd => aaa*256^3+bbb*256^2+ccc*256+ddd	1…2		x	x	x	x	x
0x3000	12288	DHCP on/off	1	Uint16	R/W	1 = DHCP on 2 = DHCP off	1…2		x	x	x	x	x
0x3001	12289	IP address	2	Uint32	R/W	Configured IP address (is used when DHCP = off) aaa.bbb.ccc.ddd => aaa*256^3+bbb*256^2+ccc*256+ddd	0… 4.294.967.295		x	x	x	x	x
0x3003	12291	Standard gateway	2	Uint32	R/W	Configured gateway (is used when DHCP = off) aaa.bbb.ccc.ddd => aaa*256^3+bbb*256^2+ccc*256+ddd	0… 4.294.967.295		x	x	x	x	x
0x3005	12293	Subnet mask	1	Uint16	R/W	Configured subnet mask (is used when DHCP = off) Number (bytes) leading ONES in the binary subnet mask E.g.: 6 => 11111100.00000000.00000000.00000000 = 252.0.0.0	2…30		x	x	x	x	x

4.1.6 Modbus TCP

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x3006	12294	Modbus TCP on/off	1	Uint16	R/W	1 = Modbus TCP port 502 on 2 = Modbus TCP port 502 off	1…2		x	x	x	x	x
0x3007	12295	Register write access on/off	1	Uint16	R/W	1 = allow 2 = deny	1…2		x	x	x	x	x

If the Modbus TCP port is closed via Modbus TCP, it is still possible to parameterise via the already opened port.
The port is only closed after the TCP connection has been re-established.

4.1.7 ISOnet

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x3008	12296	ISOnet	1	Uint16	R/W	1 = off 2 = ISOnet via BCOM	1…2				x	x	x
0x3009	12297	Number (bytes) ISOnet devices	1	Uint16	R/W		2…20				x	x	x

4.1.8 BCOM

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x300A	12298	BCOM system name	8	String UTF 8	R/W	BCOM system name	A-Z0-9_		x	x	x	x	x
0x3012	12306	BCOM subsystem address	1	Uint16	R/W		1…255		x	x	x	x	x
0x3013	12307	Device address	1	Uint16	R/W		0…255		x	x	x	x	x
0x3014	12308	Messages timeout	2	Float	R/W	BCOM messages timeout	0.1…10	s	x	x	x	x	x
0x3016	12310	Repetition time interval	1	Uint16	R/W	Time specification when the device sends the next BCOM message to the gateway at the latest.	1…65535	s	x	x	x	x	x
0x3019	12313	DNS server IP	2	Uint32	R/W	IP address of the DNS server aaa.bbb.ccc.ddd => $aaa*256^3+bbb*256^2+ccc*256+ddd$	0… 4.294.967.295		x	x	x	x	x
0x301B	12315	DNS domain	125	String UTF 8	R/W	DNS domain	a-z0-9\.\-		x	x	x	x	x

4.1.9 Date/Time

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x3098	12440	Time	2	Unix time	R/W				x	x	x	x	x
0x309C	12444	Time zone	2	Float	R/W	Time zone offset	-12…+14	h	x	x	x	x	x
0x309E	12446	NTP on/off	1	Uint16	R/W	1 = NTP on 2 = NTP off	1…2		x	x	x	x	x
0x309F	12447	NTP server IP	2	Uint32	R/W	IP address of the NTP server aaa.bbb.ccc.ddd => $aaa*256^3+bbb*256^2+ccc*256+ddd$	0… 4.294.967.295		x	x	x	x	x
0x30A1	12449	Date format	1	Uint16	R/W	1 = d.m.y 2 = m.d.y	1…2		x	x	x	x	x
0x30A2	12450	Summertime	1	Uint16	R/W	1 = off 2 = DST 3 = CEST	1…3		x	x	x	x	x
0x30A3	12451	Time format	1	Uint16	R/W	1 = 12 h 2 = 24 h	1…2		x	x	x	x	x

4.1.10 BS bus

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x30A4	12452	BS bus address	1	Uint16	R/W		1…90		x	x	x	x	x

4.1.11 Digital inputs

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x30A5	12453	Digital input 1 function	1	Uint16	R/W	1 = off 2 = test 3 = reset 4 = deactivate device 5 = start initial measurement 6 = insulation fault location (iso685-x-P only) 7 = ISOloop	1…7		x	x	x	x	x
0x30A6	12454	Digital input 1 mode	1	Uint16	R/W	1 = active high 2 = active low	1…2		x	x	x	x	x
0x30A7	12455	Digital input 1 t(on)	2	Float	R/W	Switch-on delay for debouncing	0.1…300	s	x	x	x	x	x
0x30A9	12457	Digital input 1 t(off)	2	Float	R/W	Switch-off delay for debouncing	0.1…300	s	x	x	x	x	x
0x30AB	12459	Digital input 2 function	1	Uint16	R/W	see 0x30A5u - 0x30A9u	1…6		x	x	x	x	x
0x30AC	12460	Digital input 2 mode	1	Uint16	R/W	see 0x30A5u - 0x30A9u	1…2		x	x	x	x	x
0x30AD	12461	Digital input 2 t(on)	2	Float	R/W	see 0x30A5u - 0x30A9u	0.1…300	s	x	x	x	x	x
0x30AF	12463	Digital input 2 t(off)	2	Float	R/W	refer to 0x30A5u - 0x30A9u	0.1…300	s	x	x	x	x	x
0x30B1	12465	Digital input 3 function	1	uint16	R/W	refer to 0x30A5u - 0x30A9u	1…6		x	x	x	x	x
0x30B2	12466	Digital input 3 mode	1	Uint16	R/W	see 0x30A5u - 0x30A9u	1…2		x	x	x	x	x
0x30B3	12467	Digital input 3 t(on)	2	Float	R/W	see 0x30A5u - 0x30A9u	0.1…300	s	x	x	x	x	x
0x30B5	12469	Digital input 3 t(off)	2	Float	R/W	see 0x30A5u - 0x30A9u	0.1…300	s	x	x	x	x	x

4.1.12 Digital outputs

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x30B7	12471	Digital output 1 function 1	1	Uint16	R/W	1 = off 2 = ins. alarm 1 3 = ins. alarm 2 4 = connection fault 5 = DC- alarm 6 = DC+ alarm 7 = symmetrical alarm 8 = device error 9 = common alarm 10 = measurement complete 11 = device inactive 12 = DC offset alarm 13 = common alarm EDS (iso685-x-P only) 14 = EDS locating pulse (iso685-x-P only) 15 = communication error 16 = insulation fault location (iso685-x-P only)	1…16		x	x	x	x	x
0x30B8	12472	Digital output 1 Function 2	1	Uint16	R/W	refer to 0x30B7u	1…14		x	x	x	x	x
0x30B9	12473	Digital output 1 Function 3	1	Uint16	R/W	see 0x30B7u	1…14		x	x	x	x	x
0x30BA	12474	Digital output 1 mode	1	Uint16	R/W	1 = passive 2 = active	1…2		x	x	x	x	x
0x30BB	12475	Digital output 1 test	1	Uint16	R/W	1 = test on 2 = test off	1…2		x	x	x	x	x
0x30BC	12476	Digital output 2 Function 1	1	Uint16	R/W	refer to 0x30B7u - 0x30BBu	1…14		x	x	x	x	x
0x30BD	12477	Digital output 2 Function 2	1	Uint16	R/W	refer to 0x30B7u - 0x30BBu	1…14		x	x	x	x	x
0x30BE	12478	Digital output 2 Function 3	1	Uint16	R/W	refer to 0x30B7u - 0x30BBu	1…14		x	x	x	x	x
0x30BF	12479	Digital output 2 mode	1	Uint16	R/W	refer to 0x30B7u - 0x30BBu	1…2		x	x	x	x	x
0x30C0	12480	Digital output 2 test	1	Uint16	R/W	refer to 0x30B7u - 0x30BBu	1…2		x	x	x	x	x

4.1.13 Analogue output

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x30C1	12481	Analogue output Function	1	Uint16	R/W	1 = insulation value 2 = DC offset	1…2		x	x	x	x	x
0x30C2	12482	Analogue output mode	1	Uint16	R/W	1 = 0…20 mA 2 = 4…20 mA 3 = 0… 400 µA 4 = 0…10 V 5 = 2…10 V	1…5		x	x	x	x	x
0x30C3	12483	Analogue output Midscale	1	Uint16	R/W	1 = linear 2 = 28 kΩ 3 = 120 kΩ	1…3		x	x	x	x	x
0x30C4	12484	Analogue output test	1	Uint16	R/W	1 = test on 2 = test off	1…2		x	x	x	x	x

4.1.14 Buzzer

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x30C5	12485	Buzzer function 1	1	Uint16	R/W	1 = off 2 = ins. alarm 1 3 = ins. alarm 2 4 = connection fault 5 = DC- alarm 6 = DC+ alarm 7 = symmetrical alarm 8 = device error 9 = common alarm 10 = measurement complete 11 = device inactive 12 = DC offset alarm 13 = common alarm EDS (iso685-x-P only) 14 = EDS fault location (iso685-x-P only) 15 = communication error	1…15		x	x	x	x	x
0x30C6	12486	Buzzer function 2	1	Uint16	R/W	refer to 0x30B7u	1…14		x	x	x	x	x
0x30C7	12487	Buzzer function 3	1	Uint16	R/W	refer to 0x30B7u	1…14		x	x	x	x	x
0x30C8	12488	Buzzer test	1	Uint16	R/W	1 = test on 2 = test off	1…2		x	x	x	x	x

4.1.15 Relays

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x30C9	12489	Relay 1 test	1	Uint16	R/W	1 = test on 2 = test off	1…2		x	x	x	x	x
0x30CA	12490	relay 1 operating mode	1	Uint16	R/W	1 = N/C 2 = N/O	1…2		x	x	x	x	x
0x30CB	12491	Relay 1 function 1	1	Uint16	R/W	see 0x30B7u	1…14		x	x	x	x	x
0x30CC	12492	Relay 1 function 2	1	Uint16	R/W	see 0x30B7u	1…14		x	x	x	x	x
0x30CD	12493	Relay 1 function 3	1	Uint16	R/W	see 0x30B7u	1…14		x	x	x	x	x
0x30CE	12494	Relay 2 test	1	Uint16	R/W	1 = test on 2 = test off	1…2		x	x	x	x	x
0x30CF	12495	relay 2 operating mode	1	Uint16	R/W	1 = N/C 2 = N/O	1…2		x	x	x	x	x
0x30D0	12496	Relay 2 function 1	1	Uint16	R/W	see 0x30B7u	1…14		x	x	x	x	x
0x30D1	12497	Relay 2 function 2	1	Uint16	R/W	see 0x30B7u	1…14		x	x	x	x	x
0x30D2	12498	Relay 2 function 3	1	Uint16	R/W	see 0x30B7u	1…14		x	x	x	x	x

4.1.16 Insulation alarm

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x30D3	12499	Response value 1	2	Uint32	R/W	Std: 1000…10000000 HR: 10000…3000000000	Std.: 1K - 10M HR: 1k - 3G	Ω	x	x	x	x	x
0x30D5	12501	Response value 2	2	Uint32	R/W	Std: 1000…10000000 HR: 10000…3000000000	Std.: 1K - 10M HR: 1k - 3G	Ω	x	x	x	x	x
0x30D7	12503	System type	1	Uint16	R/W	1 = DC 2 = AC 3 = 3AC	1…3		x	x	x	x	x
0x30D8	12504	Profile	1	Uint16	R/W	1 = power circuits 2 = control circuits (not HR) 3 = generator (not HR) 4 = high capacitance 5 = converter > 10 Hz 6 = converter < 10 Hz 7 = customer-specific 8 = service profile [can only be read out if profile parameters have been changed in the service menu]	1… 8 7... 8 from V. 1.23		x	x	x	x	x
0x30D9	12505	Coupling monitoring	1	Uint16	R/W	1 = coupling monitoring on 2 = coupling monitoring off	1…2		x	x	x	x	x
0x30DA	12506	Coupling device	1	Uint16	R/W	1 = no coupling device 2 = AGH150W4-AK160 3 = AGH204S-AK80 4 = AGH204S-AK160 5 = AGH520S 6 = AGH676S-4	1…6		x	x	x		
0x30DB	12507	Fault memory	1	Uint16	R/W	1 = fault memory on 2 = fault memory off	1…2		x	x	x	x	x
0x30DC	12508	Start-up delay	1	Uint16	R/W		0…120	s	x	x	x	x	x
0x30DD	12509	Activate/Deactivate device	1	Uint16	R/W	1 = activates the device 2 = deactivates the device	1…2		x	x	x	x	x
0x30DE	12510	DC alarm	1	Uint16	R/W		20…1000	V	x	x	x	x	x
0x30DF	12511	DC alarm on/off	1	Uint16	R/W	1 = DC alarm on 2 = DC alarm off	1…2		x	x	x	x	x

4.1.17 Insulation fault location - PGH settings

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x30E0	12512	EDS current	1	UInt16	R/W	1 = 1 mA 2 = 1.8 mA 3 = 2.5 mA 4 = 5 mA 5 = 10 mA 6 = 25 mA 7 = 50 mA	1…7					x	
0x30E1	12513	EDS mode	1	Uint16	R/W	1 = manual 2 = auto 3 = 1 cycle	1…3					x	
0x30E2	12514	Portable EDS (Yes/No)	1	Uint16	R/W	1 = on 2 = off	1…2					x	
0x30F0	12528	RS-485 protocol	1	Uint16	R/W	1 = BS bus 2 = isoData 3 = Modbus RTU	1…3			x	x	x	x
0x30F5	12533	isoData mode	1	Uint16	R/W	1 = mode 1 2 = mode 2 3 = mode 3	1…3			x	x	x	x
0x30F6	12534	ISOsync	1	Uint16	R/W	1 = on 2 = off	1…2						x
0x30F8	12536	EDSsync	1	Uint16	R/W	1 = on 2 = off	1…2					x	
0x30F9	12537	ISOloop	1	Uint16	R/W	1 = on 2 = off	1…2				x	x	
0x30FA	12538	Share ISOloop measured value	1	Uint16	R/W	1 = on 2 = off	1…2				x	x	
0x30FB	12539	Modbus RTU address	1	Uint16	R/W		1…247			x	x	x	x
0x30FC	12540	Modbus RTU baud rate	1	Uint16	R/W	1 = 9600 2 = 19200 3 = 38400 4 = 56700 5= 115200	1…5	Baud		x	x	x	

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	Range	Unit	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x30FD	12541	Modbus RTU parity	1	Uint16	R/W	1 = even 2 = uneven 3 = none	1…3			x	x	x	
0x30FE	12542	Modbus RTU stop bits	1	Uint16	R/W	1 = 1 2 = 2 3 = auto	1…3			x	x	x	
x030FF	12543	Scan channels	1	Uint16	R/W	1 = auto 2= manual	1…2						
0x3110	12560	EDSsync failure monitoring	1	Uint16	R/W	1 = on 2 = off	1…2					x	
0x3111	12561	EDSsync configuration	1	Uint16	R/W	1 = automatic 2= manual	1…2					x	

4.1.18 Control commands

Hexadecimal register address	Decimal register address	Description	Number of registers	Data type	Mode	Comment	isoRW685W-D	iso685(W)-D/S	iso685(W)-D/S-B	iso685(W)-D/S-P	isoHR685(W)-D/S-I-B
0x4803	18435	Test	1	Uint16	W	Value "64260" must be entered to run a test	x	x	x	x	x
0x4804	18436	Reset	1	Uint16	W	Value "65025" must be entered to perform a reset	x	x	x	x	x
0x4901	18689	Initial measurement start	1	Uint16	W	Value "65025" must be entered to start init. measurement	x	x	x	x	x
0x4902	18690	EDS start	1	Uint16	W	Value "65025" must be entered to initiate EDS start				x	
0x4903	18691	EDS stop	1	Uint16	W	Value "65025" must be entered to initiate EDS stop				x	
0x4904	18692	Request ISOnet priority	1	Uint16	W	Value "65025" must be entered to request ISOnet		x	x	x	
0x4905	18693	Yield ISOnet priority	1	Uint16	W	Value "65025" must be entered to yield ISOnet		x	x	x	
0x4906	18694	Start EDS scan	1	Uint16	W	Value "65025" must be entered to start EDS scan				x	
0x4907	18695	Acknowledge EDS failure	1	Uint16	W	Value "65025" must be entered to acknowledge "EDS failure" messages				x	

4.2 EDSxxx insulation fault locators

4.2.1 EDS device info

- Start address: 0x7FF0 (32752)

Parameter	RegOffset	Mode	Data type	Values
1. EDS type	0	R	Uint16	Bit 0 - 44x Bit 1 - 44xxAB Bit 2 - 46x Bit 3 - 49x Bit 4 -44x IOM Bit 5 -44xAB IOM (Specifies which EDS types are connected to the ISOMETER®.)
2. Number (bytes) devices	1	R	Uint16	
3. Number (bytes) channels	2	R	Uint16	

Parameter	RegOffset	Mode	Data type	Values
4. Number (bytes) relays	3	R	Uint16	
5. Number (bytes) buzzer	4	R	Uint16	
6. Number (bytes) DigOut	5	R	Uint16	
7. Number (bytes) inputs	6	R	Uint16	
8. EDS scan	7	R	Uint16	0 - no scan 1 - scan running
9. Number of IOM channel relays	8	R	Uint16	

4.2.2 EDS device parameters

- Device: 1-50
- Start address: 0x8000 (32768)
- Device offset: 0xA(10)

Device 1

Parameter	Mode	Data type	RegOffset	Bits	Decimal	Meaning
				Bus type / Bus address / Channel type / Number of bytes of the channels		
				31 30 29 28 27 26 25 24 / 23 22 21 20 19 18 17 16 / 15 14 13 12 11 10 9 8 / 7 6 5 4 3 2 1 0		
1. Bus type	R	Uint32	0	0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1	BS
				0 0 0 0 0 0 1 0	2	BB
2. Bus address				0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1-90	Device address
				…		
3. Channel type				0 0 0 0 0 0 0 0	0	Not available
				0 0 0 0 0 0 0 1	1	EDS440
				0 0 0 0 0 0 1 0	2	EDS441
				0 0 0 0 0 0 1 1	3	EDS440xLAB
				0 0 0 0 0 1 0 0	4	EDS441xLAB
				0 0 0 0 0 1 0 1	5	EDS460
				0 0 0 0 0 1 1 0	6	EDS461
				0 0 0 0 0 1 1 1	7	EDS490
				0 0 0 0 1 0 0 0	8	EDS491
				0 0 0 0 1 0 0 1	9	EDS440x-IOM
				0 0 0 0 1 0 1 0	10	EDS441x-IOM
				0 0 0 0 1 0 1 1	11	EDS440xAB IOM
				0 0 0 0 1 1 0 0	12	EDS441xAB IOM
4. Number of channels				0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1	6 channels
				0 0 0 0 0 0 1 0	2	12 channels

Device 1

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
5. Fault memory	R/W	Uint16	2	0	Not available
				1	On
				2	Off
6. Trigger (44x/460/490)	R/W	Uint16	3	0	Not available
				1	Com
				2	Auto
7. System type (46x/49x)	R/W	Uint16	4	0	Not available
				1	DC
				2	AC
				3	3AC
8. Frequency (46x/49x)	R/W	Uint16	5	0	Not available
				1	50 Hz
				2	60 Hz
				3	400 Hz
				4	DC
Reserved		Uint16	6		
Reserved		Uint16	7		
Reserved		Uint16	8		
Reserved		Uint16	9		

Device 2

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
Bus type	R	Uint16	10	*	*
Bus address	R	Uint16	11	*	*
…*	…*	…*	…*	…*	…*

* see table device 1
For devices 3…21 see table device 1

4.2.3 Channel parameters

- Channel: 1-600
- Start address: 0x8200 (33280)
- Device offset: 0x14 (20)

Channel 1

Parameter	Mode	Data type	RegOffset	Bits	Decimal	Meaning
				Bus type (31 30 29 28 27 26 25 24) / Bus address (23 22 21 20 19 18 17 16) / Device channel (15 14 13 12 11 10 9 8) / Channel type (7 6 5 4 3 2 1 0)		
1. Bus type	R	Uint32	0	0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1	BS
				0 0 0 0 0 0 1 0	2	BB
2. Bus address				0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1-90	Device address
				…		
3. Device channel				0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1-12	Device channel
				…		
4. Channel type				0 0 0 0 0 0 0 0	0	Not available
				0 0 0 0 0 0 0 1	1	EDS440
				0 0 0 0 0 0 1 0	2	EDS441
				0 0 0 0 0 0 1 1	3	EDS440xLAB
				0 0 0 0 0 1 0 0	4	EDS441xLAB
				0 0 0 0 0 1 0 1	5	EDS460
				0 0 0 0 0 1 1 0	6	EDS461
				0 0 0 0 0 1 1 1	7	EDS490
				0 0 0 0 1 0 0 0	8	EDS491

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
5. Active	R/W	Uint16	2	0	Not available
				1	On
				2	Off
6. CT type	R/W	Uint16	3	0	Not available
				1	Type A (44x)
				2	Type AB (441-LAB)
				3	W/WR (46x/49x)
				4	WS (46x/49x)
7. CT monitoring	R/W	Uint16	4	0	Not available
				1	On
				2	Off

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
8. IΔL	R/W	Float	5	< 0	Not available 2 mA - 10 mA (4x0) 200 µA - 1 mA (4x1)
9. IΔN	R/W	Float	7	< 0	Not available 100 mA - 10 A (440) 100 mA - 1 A (441)
10. Converter (46x/49x)	R/W	Uint16	9	0 1 2	Not available On Off
11. t(on) (46x/49x)	R/W	Float	10	< 0	Not available 0 s 6 s 12 s 18 s 24 s
12. t(off) (46x/49x)	R/W	Float	12	< 0	Not available 0 s 6 s 12 s 18 s 24 s
13. Operating mode (49x)	R/W	Uint16	14	0 1 2 3 4	Not available N/O N/C N/O-T N/C-T
Reserved Reserved Reserved Reserved Reserved	R R R R R	Uint16 Uint16 Uint16 Uint16 Uint16	15 16 17 18 19	- - - - -	

Channel 2

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
Bus type	R	Uint16	20	*	*
Bus address	R	Uint16	21	*	*
…*	…*	…*	…*	…*	…*

* see table channel 1
For channels 3…252 see table channel 1.

4.2.4 Relay parameters

- Relays: 1-100
- Start address: 0xB100 (45312)
- Relay offset: 0xF (15)

Relay 1

Parameter	Mode	Data type	RegOffset	Bits	Decimal	Meaning
				Bus type: 31 30 29 28 27 26 25 24 / Bus address: 23 22 21 20 19 18 17 16 / Relay number: 15 14 13 12 11 10 9 8 / Channel type: 7 6 5 4 3 2 1 0		
1. Bus type	R	Uint32	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 1 0	0 1 2	Not connected BS BB
2. Bus address				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 …	0 1-90	Not connected Device address
3. Relay number				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 …	0 1-2	Not connected Relay
4. Channel type				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 1 0	0 1 2	Not available EDS44x EDS46x/49x

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
5. Operating mode	R/W	Uint16	2	0 1 2	Not available N/O N/C
6. Test	R/W	Uint16	3	0 1 2	Not available On Off
7. Function 1 (44x)	R/W	Uint16	4	0 1 2 3 4 5 6	Not available Off IΔL IΔN Device error Connection fault Common alarm

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
8. Function 2 (44x)	R/W	Uint16	5	0 1 2 3 4 5 6	Not available Off IΔL IΔN Device error Connection fault Common alarm
9. Function 3 (44x)	R/W	Uint16	6	0 1 2 3 4 5 6	Not available Off IΔL IΔN Device error Connection fault Common alarm

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
10. Alarm	R/W	Uint16	7	0	Not available
				1	On
				2	Off
11. Device error	R/W	Uint16	8	0	Not available
				1	On
				2	Off
Reserved	R	Uint16	9	-	
Reserved	R	Uint16	10	-	
Reserved	R	Uint16	11	-	
Reserved	R	Uint16	12	-	
Reserved	R	Uint16	13	-	
Reserved	R	Uint16	14	-	

Relay 2

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
Bus type	R	Uint16	15	*	*
Bus address	R	Uint16	16	*	*
…*	…*	…*	…*	…*	…*

* see table relay 1
For relays 3…42 see table relay 1.

4.2.5 Buzzer parameters

- Buzzers: 1-50
- Start address: 0xB700 (46848)
- Buzzer offset: 0xA(10)

Buzzer 1

Parameter	Mode	Data type	RegOffset	Bits																Decimal	Meaning
				Bus type								**Bus address**									
				15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
1. Bus type	R	Uint16	0	0	0	0	0	0	0	0	0									0	Not connected
				0	0	0	0	0	0	0	1									1	BS
				0	0	0	0	0	0	1	0									2	BB
2. Bus address												0	0	0	0	0	0	0	0	0	Not connected
												0	0	0	0	0	0	0	1	1-90	Device address

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
3. Test	R/W	Uint16	3	0	Not available
				1	On
				2	Off
4. Function 1	R/W	Uint16	4	0	Not available
				1	Off
				2	IΔL
				3	IΔN
				4	Device error
				5	Connection fault
				6	Insulation fault location
				7	Common alarm
5. Function 2	R/W	Uint16	5	0	Not available
				1	Off
				2	IΔL
				3	IΔN
				4	Device error
				5	Connection fault
				6	Insulation fault location
				7	Common alarm

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
6. Function 3	R/W	Uint16	6	0	Not available
				1	Off
				2	IΔL
				3	IΔN
				4	Device error
				5	Connection fault
				6	Insulation fault location
				7	Common alarm
Reserved	R	Uint16	7	-	
Reserved	R	Uint16	8	-	
Reserved	R	Uint16	9	-	
Reserved	R	Uint16	10	-	
Reserved	R	Uint16	11	-	

Buzzer 2

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
Bus type	R	Uint16	10	*	*
Bus address	R	Uint16	11	*	*
…*	…*	…*	…*	…*	…*

* see table buzzer 1
For buzzers 3…21 see table buzzer 1

4.2.6 Digital output parameters

- Buzzers: 1-100
- Start address: 0xB900 (47360)
- DigOut offset: 0xA(10)

Digital output 1

Parameter	Mode	Data type	RegOffset	Bits	Decimal	Meaning
				Bus type: 15 14 13 12 11 10 9 8 / **Bus address**: 7 6 5 4 3 2 1 0		
1. Bus type	R	Uint16	0	0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1	BS
				0 0 0 0 0 0 1 0	2	BB
2. Bus address	R	Uint16	0	0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1-90	Device address
				…		

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
3. Test	R/W	Uint16	1	0	Not available
				1	On
				2	Off
4. Function 1	R/W	Uint16	2	0	Not available
				1	Off
				2	IΔL
				3	IΔN
				4	Device error
				5	Connection fault
				6	Common alarm
5. Function 2	R/W	Uint16	3	0	Not available
				1	Off
				2	IΔL
				3	IΔN
				4	Device error
				5	Connection fault
				6	Common alarm

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
6. Function 3	R/W	Uint16	4	0	Not available
				1	Off
				2	IΔL
				3	IΔN
				4	Device error
				5	Connection fault
				6	Common alarm
Reserved	R	Uint16	5	-	
Reserved	R	Uint16	6	-	
Reserved	R	Uint16	7	-	
Reserved	R	Uint16	8	-	
Reserved	R	Uint16	9	-	

Digital output 2

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
Bus type	R	Uint16	10	*	*
Bus address	R	Uint16	11	*	*
…*	…*	…*	…*	…*	…*

* see table Digital output 1
For digital outputs 3…21 see table Digital output 1

4.2.7 Digital input parameters

- Inputs: 1-100
- Start address: 0xBB00 (47872)
- DigIn offset: 0xA(10)

Digital input 1

Parameter	Mode	Data type	RegOffset	Bits	Decimal	Meaning
				Bus type: 31 30 29 28 27 26 25 24 / Bus address: 23 22 21 20 19 18 17 16 / Digital input number: 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0		
1. Bus type	R	Uint32	0	0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1	BS
				0 0 0 0 0 0 1 0	2	BB
2. Bus address				0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1-90	Device address
				…		
3. Digital input number				0 0 0 0 0 0 0 0	0	Not connected
				0 0 0 0 0 0 0 1	1	Input
				0 0 0 0 0 0 1 0	2	Input

Parameter	Mode	Data type	RegOffset	Decimal	Meaning
4. Mode	R/W	Uint16	2	0 1 2	Not available Active high Active low
5. ton	R/W	Float	3	< 0 x in s	Not available
6. ton	R/W	Uint16	5	< 0 x in s	Not available
7. Function	R/W	Uint16	7	0 1 2	Not available Off TEST

Digital input 2

Parameter	Mode	Data type	Reg Offset	Decimal	Meaning
Bus type	R	Uint16	10	*	*
Bus address	R	Uint16	11	*	*
…*	…*	…*	…*	…*	…*

* see table Digital input 1
For digital inputs 3…21 see table Digital input 1.

4.2.8 Measured value IΔL

- Measured value IΔL: 1-600
- Start address: 0xD000 (53248)
- Measured value offset: 0x4 (4)

Measured value 1

Parameter	Mode	Data type	Reg Offset
Measured value	R	Float	0
Alarm/ Unit/ Range/ Test *	R	Uint16	2
Internal use	R	Uint16	3

The registers for a measured value must be read out in one access.

* see

Reading out the parameters Alarm, Unit, Range and Test

Word 0x00		0x01		0x02		0x03	
HiByte	LoByte	HiByte	LoByte	HiByte	LoByte	HiByte	LoByte
Floating point value (Float)				AT&T	R&U	Channel description	

Every analogue BS device channel can contain alarm messages, operating messages, measured values, test messages and descriptive text. Both analogue and digital information can be transmitted.

- AT&T = Alarm type and test type (internal/external)
- R&U = Range and unit

Display in case of failed measuring current transformers and EDS devices (example)

If individual measuring current transformers fail, they are not detected and not displayed. The detected measuring current transformers are displayed in the original order.

If an EDS device fails, all associated measuring current transformers are not recognised and are not displayed. The "detected" measuring current transformers are displayed in a new order.

Device	Channels	Detected channels after channel scan if channel 15 fails	Detected channels after channel scan if EDS 1 fails
EDS 1	1…12	1…12	–
EDS 2	13…24	13, 14, , 16…24	1…12
EDS 3	25…36	25…36	13…24

A&T = Alarm type and test type (internal/external)

Bit	Bits								Meaning
	7 Test external	6 Test internal	5 Status	4 Reserved	3 Reserved	2 Alarm	1 Fault	0	
Alarm type						0	0	0	No alarm
						0	0	1	Prewarning
						0	1	0	Device error
						0	1	1	Reserved
						1	0	0	Alarm
						1	0	1	Alarm
Reserved						1	1	0	Reserved
						…	…	…	Reserved
						1	1	1	Reserved
Test	0	0							No test
	0	1							Internal test
	1	0							External test

- The alarm type is coded by the bits 0 to 2.
- The bits 3 and 4 are reserved and always have the value 0.
- Bit 5 usually has the value 0 and represents the digital value of the status.
- This column is relevant for the SMI472 only.
- Bit 6 or 7 is usually set when an internal or external test has been completed.
- Other values are reserved.
- The complete byte is calculated from the sum of the alarm type and the test type.

R&U = Range and unit

Bit	Bits								Meaning
	7	6	5	4	3	2	1	0	
Unit				0	0	0	0	0	Invalid (init)
				0	0	0	0	1	No unit
				0	0	0	1	0	Ω
				0	0	0	1	1	A
				0	0	1	0	0	V
				0	0	1	0	1	%
				0	0	1	1	0	Hz
				0	0	1	1	1	Baud
				0	1	0	0	0	F
				0	1	0	0	1	H
				0	1	0	1	0	°C
				0	1	0	1	1	°F
				0	1	1	0	0	Second
				0	1	1	0	1	Minute
				0	1	1	1	0	Hour
				0	1	1	1	1	Day
				1	0	0	0	0	Month
				…	…	…	…	…	Reserved
				1	1	1	1	0	CODE
				1	1	1	1	1	Reserved
				…	…	…	…	…	Reserved
				1	1	1	1	1	Reserved
Range of validity	0	0							Actual value
	0	1							The actual value is lower
	1	0							The actual value is higher
	1	1							Invalid value

The units of the bits 0 to 4 are coded.

Bits 6 and 7 describe the validity range of a value. Bit 5 is reserved.

The complete byte is calculated from the sum of the unit and the range of validity.

Caution!
If the unit byte refers to CODE, the recorded value or status will result in a text message.
The floating point value contains an internal CODE but no valid measured value.

Measured value 2

Parameter	Mode	Data type	RegOffset
Measured value	R	Float	4
…*	…*	…*	…*

* see table measured value 1
For measured values 3…252 see table measured value 1.

4.2.9 Measured value IΔn

- Measured value IΔn: 1-600
- Start address: 0xDA00 (55808)
- Measured value offset: 0x4 (4)

Measured value 1

Parameter	Mode	Data type	RegOffset
Measured value	R	Float	0
Alarm/ Unit/ Range/ Test *	R	Uint16	2
Internal use	R	Uint16	3

* For information on reading out the parameters Alarm, Unit, Range and Test, refer to the chapter "Reading out the parameters Alarm, Unit, Range and Test" on page 43.

Measured value 2

Parameter	Mode	Data type	Reg Offset
Measured value	R	Float	4
…*	…*	…*	…*

* see table measured value 1
For measured values 3…252 see table measured value 1.

4.2.10 IOM channel relays

- Channel relays: 1-600
- Start address: 0xE400 (58368)
- Channel offset: 0xA(10)

Channel relay 1

Parameter	Mode	Data type	RegOffset	Meaning
1. Bus type	R	Uint32	0	0 - not connected 1 - BS 2 - BB
2. Bus address	R	Uint32	0	0 - not connected 1-90 device address
3. Channel relay number	R	Uint32	0	0 - not connected 1-12 channel relay number
4. Test	R/W	Uint16	2	0 - not available 1 - on 2 - off
5. Operating mode	R/W	Uint16	3	0 - not available 1 - N/O 2 - N/C
6. Function 1	R/W	Uint16	4	0 - not available 1 - off 2 - IdL 3 - IdN 4 - connection fault
7. Function 2	R/W	Uint16	5	0 - not available 1 - off 2 - IdL 3 - IdN 4 - connection fault
8. Function 3	R/W	Uint16	6	0 - not available 1 - off 2 - IdL 3 - IdN 4 - connection fault
Reserved	R	Uint16	7	-
Reserved	R	Uint16	8	-
Reserved	R	Uint16	9	-

Channel relays 2…600

Parameter	Mode	Data type	RegOffset	Meaning
1. Bus type	R	Uint32	10	0 - not connected 1 - BS 2 - BB
2. Bus address	R	Uint32	10	0 - not connected 1-90 device address
3. Channel relay number	R	Uint32	10	0 - not connected 1-12 channel relay number
… (see channel relay 1)				
1. Bus type	R	Uint32	490	0 - not connected 1 - BS 2 - BB
2. Bus address	R	Uint32	490	0 - not connected 1-90 device address
3. Channel relay number	R	Uint32	490	0 - not connected 1-12 channel relay number
… (see channel relay 1)				
Reserved	R	Uint16	497	-
Reserved	R	Uint16	498	-
Reserved	R	Uint16	499	-

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