

High**PROTEC**

MRM4

MODBUS Data Point List



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English

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Build 62223

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1 Modbus Parameters

For the Modbus Protocol several parameters have to be set which are relevant for the communication between the control system (SCADA) and the device. The parameters and their setting possibilities or value ranges are shown in the tables below.

NOTICE!



The Parameters are described within the Reference Manual of the device (separate document).

1.1 Notes for the SCADA-System

When using Modbus RTU the following times have to be considered by the control system and are fixed within the device:

The dwell times (t_D) before start of a telegram must be set at least to 3.5 characters.

Examples:

- 3.5 characters 9600 Baud = 4 ms
- 3.5 characters 19200 Baud = 2 ms
- 3.5 characters 38400 Baud = 1 ms

Start of a new telegram is expected when the dwell time (t_D) is > 3.5 characters.

The fact that the probability of disruptions during transmission of a telegram increases with its length has to be taken into duly consideration and thus a query to the Slave should be possibly such that the response telegram is not much longer than 32 Bytes.

2 Specific Modbus Function Codes

For reading out data from the device or to carry out commands, the services listed in the table, also called »Function Codes«, are supported.

Function Code	Designation	Description
3	Read Holding Registers	There are single or several data words read as from a specific data word address. Only status addresses and parameter addresses can be read.
4	Read Input Registers	There are single or several data words read as from a specific data word address. Only measuring values can be read.
5	Write single Output (Bit)	All other values are illegal and will not affect the output. Via this function code acknowledgments can be executed as well as counters reseted or blockings set.
8	Loopback Test	Test function for the communication system.
16	Load Multiple Registers	There are single or several data words written as from a specific data word address.

On the following pages the Modbus functions are described in detail.

2.1 Function Code 3/4

Query

Slave address	3/4	Register address	Register address	Register number	Register number	Check-sum	Check-sum
		HI	LO	HI	LO	HI	LO

Response

Slave address	3/4	Byte number	Register 0	Register 0	...	Check-sum	Check-sum
			HI	LO		HI	LO

Register address (HI · 256 + LO) — The data word address from where reading should start.

Register number (HI · 256 + LO) — Number of data words to be read. Valid range: 1...125

Byte number — Number of subsequent Bytes containing data words.

Register — Data words read out of the device (Highbyte and Lowbyte).

2.2 Float Values IEEE 754

	Sign	Exponent	Mantissa
Value:	+1	2 ¹³	1.34199857711792
Encoded as:	0	140	2868892
Binary:	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
Decimal Representation:	10993.652		
Binary Representation:	01000110001010111100011010011100		
Hexadecimal Representation:	0x462bc69c		

For displaying a float value, it is important to save received bytes in a correct order. A float value in Modbus will be transmitted in “Big Endian” format (Motorola Format), that means the most significant byte is transmitted first.

For saving received bytes in Modbus master it must be considered which architecture is used. Is Modbus Master is a “Little Endian” architecture, the received frame needs to be swapped to corresponding memory addresses. If it is not saved in correct order it is possible that the displayed value is useless.

*

Example:

The following value is transmitted:

Modbus transmit value			
0x46	0x2b	0xc6	0x9c

Then the representation in the receiving device's internal memory has to be as follows:

Memory Addresses		Big Endian		Little Endian	
Address	Hex	10993.65		Hex	10993.65
1000	0x46			0x9c	
1001	0x2b			0xc6	
1002	0xc6			0x2b	
1003	0x9c			0x46	

2.3 Function Code 5

Query

Slave address	5	Register address	Register address	Register data	Register data	Check-sum	Check-sum
		HI	LO	HI	LO	HI	LO

Response

Slave address	5	Register address	Register address	Register data	Register data	Check-sum	Check-sum
		HI	LO	HI	LO	HI	LO

Register address (HI · 256 + LO) — Data word address to be written

Register data — Value of the data word to be written (High-byte and Low-byte).

Permitted value range:

- FF00 hex request for a single bit to be on: This often means to reset a counter, execute acknowledgments or set blockings signals.
- 0000 hex request for a single bit to be off: This often means to deactivate blocking signals or to reset single bits.

2.4 Function Code 8

Query

Slave address	8	Data Diag Code HI 0x00	Data Diag Code LO 0x00	Test data	Test data	Check-sum HI	Check-sum LO
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Response

Slave address	8	Data Diag Code HI	Data Diag Code LO	Test data	Test data	Check-sum HI	Check-sum LO
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Data Diag Code HI (high), Data Diag Code LO (Low) — Diagnostic Code (subfunction code of function code 8) for testing the communication system. The Diagnostic Code “Return Query Data” (0x00, 0x00) is being supported.

Test Data — By using the Diagnostic Code 0x00 0x00, the transmitted data is sent back to the Master unchanged.

2.5 Function Code 16

Query

Slave address	16	Register address	Register address	Register number	Register number	Byte number	Register 0	Register 0	...	Check-sum	Check-sum
		HI	LO	HI	LO		HI	LO		HI	LO

Response

Slave address	16	Register address	Register address	Register number	Register number	Check-sum	Check-sum
		HI	LO	HI	LO	HI	LO

Register address (HI · 256 + LO) — Data word address as from where writing should start.

Register number (HI · 256 + LO):

- Query: Number of data words to be written. Valid range: 1...123.
- Response: Number of data words written.

Byte number — Number of subsequent Bytes to contain data words.

Register — Data words read out of the device (High-byte and Low-byte).

2.6 Setting Date and Time

Date and time can be set by means of function code 16 and read with function code 3. If the device address 0 (broadcast address) is selected, the times of all devices connected to this bus are simultaneously reset.

NOTICE!



The devices do not respond to a broadcast command.

2.7 Supported MODBUS Error Messages

Exception Response Telegrams are described within the general "Modbus Application Protocol Specification". An exception response table with examples is shown there. The table below contains just the actually used codes. In case the device has recognized an error it will react in the following way:

Exception Code	Designation	Description
1	Illegal Function	The message received includes a function code which is not supported by the Slave.
2	Illegal Data Address	Access was sought on a data word address not included in the data module.
3	Illegal Data Value	The received message contains an invalid data structure (e. g. wrong number of data bytes).
4	Slave Device Failure	An unrecoverable error occurred while the server (or slave) was attempting to perform the requested action.

The response given by the *device* in case of a failure has the following format:

Slave Address	0x80	Exception Code	Check-sum	Check-sum
	+ Function Code		HI	LO

In the second Byte of the response the Function Code is sent with the highest Bit set to 1. This is equivalent to an addition by 0x80. The third Byte holds the Exception Code of the error message.

3 Appendix – Data Point Lists

3.1 Signals

Legend: (*) = These signals have to be acknowledged by the Scada System.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
/SG1		256	1	3	Struct			
	Removed-I	256	1	3	Bit	0x1 (1)	-	State of the module input: The withdrawable circuit breaker is Removed
	CES SG removed	256	1	3	Bit	0x2 (2)	-	Signal: Command Execution Supervision: Switching Command unsuccessful, Switchgear removed.
	Removed	256	1	3	Bit	0x4 (3)	-	Signal: The withdrawable circuit breaker is Removed
BO Slot X2		1003	1	3	Struct			
	BO 1	1003	1	3	Bit	0x1 (1)	-	Signal: Binary Output Relay
	BO 2	1003	1	3	Bit	0x2 (2)	-	Signal: Binary Output Relay
	BO 3	1003	1	3	Bit	0x4 (3)	-	Signal: Binary Output Relay
	BO 4	1003	1	3	Bit	0x8 (4)	-	Signal: Binary Output Relay

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3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	BO 5	1003	1	3	Bit	0x10 (5)	-	Signal: Binary Output Relay
	DISARMED!	1003	1	3	Bit	0x40 (7)	-	Signal: CAUTION! RELAYS DISARMED in order to safely perform maintenance while eliminating the risk of taking an entire process off-line. (Note: The Self Supervision Contact cannot be disarmed). YOU MUST ENSURE that the relays are ARMED AGAIN after maintenance
	Outs forced	1003	1	3	Bit	0x80 (8)	-	Signal: The State of at least one Relay Output has been set by force. That means that the state of at least one Relay is forced and hence does not show the state of the assigned signals.
BO Slot X2		1004	1	3	Struct			
	BO 1	1004	1	3	Bit	0x4 (3)	-	Signal: Binary Output Relay
	BO 2	1004	1	3	Bit	0x8 (4)	-	Signal: Binary Output Relay
	BO 3	1004	1	3	Bit	0x10 (5)	-	Signal: Binary Output Relay
	DISARMED!	1004	1	3	Bit	0x40 (7)	-	Signal: CAUTION! RELAYS DISARMED in order to safely perform maintenance while eliminating the risk of taking an entire process off-line. (Note: The Self Supervision Contact cannot be disarmed). YOU MUST ENSURE that the relays are ARMED AGAIN after maintenance
	Outs forced	1004	1	3	Bit	0x80 (8)	-	Signal: The State of at least one Relay Output has been set by force. That means that the state of at least one Relay is

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
								forced and hence does not show the state of the assigned signals.
CBF - 50BF, 62BF		53	1	3	Struct			
	ExBlo1-l	53	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-l	53	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	Active	53	1	3	Bit	0x4 (3)	-	Signal: active
	ExBlo	53	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Trigger1-l	53	1	3	Bit	0x10 (5)	-	Module Input: Trigger that will start the CBF
	Trigger2-l	53	1	3	Bit	0x20 (6)	-	Module Input: Trigger that will start the CBF
	Trigger3-l	53	1	3	Bit	0x40 (7)	-	Module Input: Trigger that will start the CBF
	running	53	1	3	Bit	0x80 (8)	-	Signal: CBF-Module started
	Alarm (*)	53	1	3	Bit	0x100 (9)	-	Signal: Circuit Breaker Failure
	Lockout (*)	53	1	3	Bit	0x200	-	Signal: Lockout

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
	Waiting for Trigger (*)	53	1	3	Bit	0x400 (11)	-	Waiting for Trigger
CTS - 60L		137	1	3	Struct			
	ExBlo1-l	137	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-l	137	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	Active	137	1	3	Bit	0x4 (3)	-	Signal: active
	ExBlo	137	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Alarm	137	1	3	Bit	0x10 (5)	-	Signal: Alarm Current Transformer Measuring Circuit Supervision
Ctrl		176	1	3	Struct			
	Local	176	1	3	Bit	0x1 (1)	-	Switching Authority: Local
	Remote	176	1	3	Bit	0x2 (2)	-	Switching Authority: Remote
	NonInterl	176	1	3	Bit	0x4 (3)	-	Non-Interlocking is active

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	SG Disturb	176	1	3	Bit	0x8 (4)	-	(At least one) Switchgear is disturbed.
	SG Indeterm	176	1	3	Bit	0x10 (5)	-	(At least one) Switchgear is moving (Position cannot be determined).
DI Slot X1		1000	1	3	Struct			
	DI 1	1000	1	3	Bit	0x1 (1)	-	Signal: Digital Input
	DI 2	1000	1	3	Bit	0x2 (2)	-	Signal: Digital Input
	DI 3	1000	1	3	Bit	0x4 (3)	-	Signal: Digital Input
	DI 4	1000	1	3	Bit	0x8 (4)	-	Signal: Digital Input
	DI 5	1000	1	3	Bit	0x10 (5)	-	Signal: Digital Input
	DI 6	1000	1	3	Bit	0x20 (6)	-	Signal: Digital Input
	DI 7	1000	1	3	Bit	0x40 (7)	-	Signal: Digital Input
	DI 8	1000	1	3	Bit	0x80 (8)	-	Signal: Digital Input

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
DI Slot X1		1008	1	3	Struct			
	DI 1	1008	1	3	Bit	0x10 (5)	-	Signal: Digital Input
	DI 2	1008	1	3	Bit	0x20 (6)	-	Signal: Digital Input
	DI 3	1008	1	3	Bit	0x40 (7)	-	Signal: Digital Input
	DI 4	1008	1	3	Bit	0x80 (8)	-	Signal: Digital Input
ExP[1]		49	1	3	Struct			
	ExBlo1-I	49	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	49	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	49	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Alarm-I	49	1	3	Bit	0x8 (4)	-	Module input state: Alarm
	Trip-I	49	1	3	Bit	0x10 (5)	-	Module input state: Trip
	Active	49	1	3	Bit	0x20	-	Signal: active

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(6)		
	ExBlo	49	1	3	Bit	0x40 (7)	-	Signal: External Blocking
	Blo TripCmd	49	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	49	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Alarm	49	1	3	Bit	0x200 (10)	-	Signal: Alarm
	Trip (*)	49	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	49	1	3	Bit	0x800 (12)	-	Signal: Trip Command
Exp[2]		50	1	3	Struct			
	ExBlo1-I	50	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	50	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	50	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Alarm-I	50	1	3	Bit	0x8	-	Module input state: Alarm

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(4)		
	Trip-I	50	1	3	Bit	0x10 (5)	-	Module input state: Trip
	Active	50	1	3	Bit	0x20 (6)	-	Signal: active
	ExBlo	50	1	3	Bit	0x40 (7)	-	Signal: External Blocking
	Blo TripCmd	50	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	50	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Alarm	50	1	3	Bit	0x200 (10)	-	Signal: Alarm
	Trip (*)	50	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	50	1	3	Bit	0x800 (12)	-	Signal: Trip Command
Exp[3]		51	1	3	Struct			
	ExBlo1-I	51	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	51	1	3	Bit	0x2	-	Module input state: External blocking2

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(2)		
	ExBlo TripCmd-I	51	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Alarm-I	51	1	3	Bit	0x8 (4)	-	Module input state: Alarm
	Trip-I	51	1	3	Bit	0x10 (5)	-	Module input state: Trip
	Active	51	1	3	Bit	0x20 (6)	-	Signal: active
	ExBlo	51	1	3	Bit	0x40 (7)	-	Signal: External Blocking
	Blo TripCmd	51	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	51	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Alarm	51	1	3	Bit	0x200 (10)	-	Signal: Alarm
	Trip (*)	51	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	51	1	3	Bit	0x800 (12)	-	Signal: Trip Command

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Exp[4]		52	1	3	Struct			
	ExBlo1-I	52	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	52	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	52	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Alarm-I	52	1	3	Bit	0x8 (4)	-	Module input state: Alarm
	Trip-I	52	1	3	Bit	0x10 (5)	-	Module input state: Trip
	Active	52	1	3	Bit	0x20 (6)	-	Signal: active
	ExBlo	52	1	3	Bit	0x40 (7)	-	Signal: External Blocking
	Blo TripCmd	52	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	52	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Alarm	52	1	3	Bit	0x200 (10)	-	Signal: Alarm

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip (*)	52	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	52	1	3	Bit	0x800 (12)	-	Signal: Trip Command
Fast Status Register		5000	1	3	Struct			
	Device Type	5000	1	3	Bit	0xffff (1)	-	Device type code for relationship between device name and its Modbus code. HighPROTEC: MRI4 - 1000 MRU4 - 1001 MRA4 - 1002 MCA4 - 1003 MRDT4 - 1005 MCDTV4 - 1006 MCDGV4 - 1007 MRM4 - 1009 MRMV4 - 1010 MCDLV4 - 1011
Fast Status Register		5001	1	3	Struct			
	Comm Version	5001	1	3	Bit	0xffff (1)	-	Modbus Communication version. This version number changes if something becomes incompatible between different Modbus releases.

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3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Fast Status Register		5002	1	3	Struct			
	Config Bin Inp1-l	5002	1	3	Bit	0x1 (1)	-	State of the module input: Config Bin Inp
	Config Bin Inp2-l	5002	1	3	Bit	0x2 (2)	-	State of the module input: Config Bin Inp
	Config Bin Inp3-l	5002	1	3	Bit	0x4 (3)	-	State of the module input: Config Bin Inp
	Config Bin Inp4-l	5002	1	3	Bit	0x8 (4)	-	State of the module input: Config Bin Inp
	Config Bin Inp5-l	5002	1	3	Bit	0x10 (5)	-	State of the module input: Config Bin Inp
	Config Bin Inp6-l	5002	1	3	Bit	0x20 (6)	-	State of the module input: Config Bin Inp
	Config Bin Inp7-l	5002	1	3	Bit	0x40 (7)	-	State of the module input: Config Bin Inp
	Config Bin Inp8-l	5002	1	3	Bit	0x80 (8)	-	State of the module input: Config Bin Inp
	Config Bin Inp9-l	5002	1	3	Bit	0x100 (9)	-	State of the module input: Config Bin Inp
	Config Bin Inp10-l	5002	1	3	Bit	0x200	-	State of the module input: Config Bin Inp

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
	Config Bin Inp11-I	5002	1	3	Bit	0x400 (11)	-	State of the module input: Config Bin Inp
	Config Bin Inp12-I	5002	1	3	Bit	0x800 (12)	-	State of the module input: Config Bin Inp
	Config Bin Inp13-I	5002	1	3	Bit	0x1000 (13)	-	State of the module input: Config Bin Inp
	Config Bin Inp14-I	5002	1	3	Bit	0x2000 (14)	-	State of the module input: Config Bin Inp
	Config Bin Inp15-I	5002	1	3	Bit	0x4000 (15)	-	State of the module input: Config Bin Inp
	Config Bin Inp16-I	5002	1	3	Bit	0x8000 (16)	-	State of the module input: Config Bin Inp
Fast Status Register		5003	1	3	Struct			
	Config Bin Inp17-I	5003	1	3	Bit	0x1 (1)	-	State of the module input: Config Bin Inp
	Config Bin Inp18-I	5003	1	3	Bit	0x2 (2)	-	State of the module input: Config Bin Inp
	Config Bin Inp19-I	5003	1	3	Bit	0x4 (3)	-	State of the module input: Config Bin Inp

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEC)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Config Bin Inp20-I	5003	1	3	Bit	0x8 (4)	-	State of the module input: Config Bin Inp
	Config Bin Inp21-I	5003	1	3	Bit	0x10 (5)	-	State of the module input: Config Bin Inp
	Config Bin Inp22-I	5003	1	3	Bit	0x20 (6)	-	State of the module input: Config Bin Inp
	Config Bin Inp23-I	5003	1	3	Bit	0x40 (7)	-	State of the module input: Config Bin Inp
	Config Bin Inp24-I	5003	1	3	Bit	0x80 (8)	-	State of the module input: Config Bin Inp
	Config Bin Inp25-I	5003	1	3	Bit	0x100 (9)	-	State of the module input: Config Bin Inp
	Config Bin Inp26-I	5003	1	3	Bit	0x200 (10)	-	State of the module input: Config Bin Inp
	Config Bin Inp27-I	5003	1	3	Bit	0x400 (11)	-	State of the module input: Config Bin Inp
	Config Bin Inp28-I	5003	1	3	Bit	0x800 (12)	-	State of the module input: Config Bin Inp
	Config Bin Inp29-I	5003	1	3	Bit	0x1000 (13)	-	State of the module input: Config Bin Inp
	Config Bin Inp30-I	5003	1	3	Bit	0x2000	-	State of the module input: Config Bin Inp

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(14)		
	Config Bin Inp31-I	5003	1	3	Bit	0x4000 (15)	-	State of the module input: Config Bin Inp
	Config Bin Inp32-I	5003	1	3	Bit	0x8000 (16)	-	State of the module input: Config Bin Inp
Fast Status Register		5004	1	3	Struct			
	Trip Cause (*)	5004	1	3	Bit	0xffff (1)	-	Initial reason of trip. It is presented as an integer value and corresponds to the "Trip" entry in the fault record, which refers to the name of the protective module that tripped first. Look up the definition of these integer values (i. e. the mapping trip code number-->module name) in the "Cause of Trip" table within the SCADA documentation.
I2>[1] - 46		82	1	3	Struct			
	ExBlo1-I	82	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	82	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	82	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Active	82	1	3	Bit	0x8 (4)	-	Signal: active
	ExBlo	82	1	3	Bit	0x10	-	Signal: External Blocking

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(5)		
	Blo TripCmd	82	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	82	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	82	1	3	Bit	0x80 (8)	-	Signal: Alarm Negative Sequence
	Trip (*)	82	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	82	1	3	Bit	0x200 (10)	-	Signal: Trip Command
I2>[2] - 46		83	1	3	Struct			
	ExBlo1-I	83	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	83	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	83	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Active	83	1	3	Bit	0x8 (4)	-	Signal: active
	ExBlo	83	1	3	Bit	0x10	-	Signal: External Blocking

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(5)		
	Blo TripCmd	83	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	83	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	83	1	3	Bit	0x80 (8)	-	Signal: Alarm Negative Sequence
	Trip (*)	83	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	83	1	3	Bit	0x200 (10)	-	Signal: Trip Command
I<[1] - 37		167	1	3	Struct			
	ExBlo1-I	167	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	167	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	167	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Active	167	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	167	1	3	Bit	0x20	-	Signal: External Blocking

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(6)		
	Blo TripCmd	167	1	3	Bit	0x40 (7)	-	Signal: Trip Command blocked
	ExBlo TripCmd	167	1	3	Bit	0x80 (8)	-	Signal: External Blocking of the Trip Command
	Alarm	167	1	3	Bit	0x200 (10)	-	Signal: Alarm
	Trip (*)	167	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	167	1	3	Bit	0x800 (12)	-	Signal: Trip Command
I<[2] - 37		168	1	3	Struct			
	ExBlo1-I	168	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	168	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	168	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Active	168	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	168	1	3	Bit	0x20	-	Signal: External Blocking

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(6)		
	Blo TripCmd	168	1	3	Bit	0x40 (7)	-	Signal: Trip Command blocked
	ExBlo TripCmd	168	1	3	Bit	0x80 (8)	-	Signal: External Blocking of the Trip Command
	Alarm	168	1	3	Bit	0x200 (10)	-	Signal: Alarm
	Trip (*)	168	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	168	1	3	Bit	0x800 (12)	-	Signal: Trip Command
I<[3] - 37		169	1	3	Struct			
	ExBlo1-I	169	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	169	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	169	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Active	169	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	169	1	3	Bit	0x20	-	Signal: External Blocking

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(6)		
	Blo TripCmd	169	1	3	Bit	0x40 (7)	-	Signal: Trip Command blocked
	ExBlo TripCmd	169	1	3	Bit	0x80 (8)	-	Signal: External Blocking of the Trip Command
	Alarm	169	1	3	Bit	0x200 (10)	-	Signal: Alarm
	Trip (*)	169	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	169	1	3	Bit	0x800 (12)	-	Signal: Trip Command
IG[1] - 50N, 51N		15	1	3	Struct			
	ExBlo1-I	15	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	15	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	15	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Ex rev Interl-I	15	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	15	1	3	Bit	0x10	-	Signal: active

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(5)		
	ExBlo	15	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	15	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking
	Blo TripCmd	15	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	15	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Alarm	15	1	3	Bit	0x400 (11)	-	Signal: The alarm threshold has been exceeded.
	Trip (*)	15	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	15	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
IG[2] - 50N, 51N		16	1	3	Struct			
	ExBlo1-I	16	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	16	1	3	Bit	0x2 (2)	-	Module input state: External blocking2

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo TripCmd-I	16	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Ex rev Interl-I	16	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	16	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	16	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	16	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking
	Blo TripCmd	16	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	16	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Alarm	16	1	3	Bit	0x400 (11)	-	Signal: The alarm threshold has been exceeded.
	Trip (*)	16	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	16	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
IG[3] - 50N, 51N		17	1	3	Struct			

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo1-I	17	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	17	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	17	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Ex rev Interl-I	17	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	17	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	17	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	17	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking
	Blo TripCmd	17	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	17	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Alarm	17	1	3	Bit	0x400 (11)	-	Signal: The alarm threshold has been exceeded.
	Trip (*)	17	1	3	Bit	0x800	-	Signal: Trip

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(12)		
	TripCmd (*)	17	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
IG[4] - 50N, 51N		18	1	3	Struct			
	ExBlo1-I	18	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	18	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	18	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Ex rev Inter-I	18	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	18	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	18	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	18	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking
	Blo TripCmd	18	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo TripCmd	18	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Alarm	18	1	3	Bit	0x400 (11)	-	Signal: The alarm threshold has been exceeded.
	Trip (*)	18	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	18	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
IRIG-B		148	1	3	Struct			
	IRIG-B active	148	1	3	Bit	0x1 (1)	-	Signal: If there is no valid IRIG-B signal for 60 sec, IRIG-B is regarded as inactive.
	High-Low Invert	148	1	3	Bit	0x2 (2)	-	Signal: The High and Low signals of the IRIG-B are inverted. This does NOT mean that the wiring is faulty. If the wiring is faulty no IRIG-B signal will be detected.
I[1] - 50, 51		3	1	3	Struct			
	ExBlo1-I	3	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	3	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	3	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEC)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Ex rev Interl-I	3	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	3	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	3	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	3	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking
	Blo TripCmd	3	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	3	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
I[1] - 50, 51		4	1	3	Struct			
	Alarm L1	4	1	3	Bit	0x1 (1)	-	Signal: Alarm L1
	Alarm L2	4	1	3	Bit	0x2 (2)	-	Signal: Alarm L2
	Alarm L3	4	1	3	Bit	0x4 (3)	-	Signal: Alarm L3
	Alarm	4	1	3	Bit	0x8 (4)	-	Signal: Alarm

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip L1 (*)	4	1	3	Bit	0x10 (5)	-	Signal: General Trip Phase L1
	Trip L2 (*)	4	1	3	Bit	0x20 (6)	-	Signal: General Trip Phase L2
	Trip L3 (*)	4	1	3	Bit	0x40 (7)	-	Signal: General Trip Phase L3
	Trip (*)	4	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	4	1	3	Bit	0x100 (9)	-	Signal: Trip Command
I[2] - 50, 51		5	1	3	Struct			
	ExBlo1-I	5	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	5	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	5	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Ex rev Interl-I	5	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	5	1	3	Bit	0x10 (5)	-	Signal: active

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo	5	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	5	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking
	Blo TripCmd	5	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	5	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
I[2] - 50, 51		6	1	3	Struct			
	Alarm L1	6	1	3	Bit	0x1 (1)	-	Signal: Alarm L1
	Alarm L2	6	1	3	Bit	0x2 (2)	-	Signal: Alarm L2
	Alarm L3	6	1	3	Bit	0x4 (3)	-	Signal: Alarm L3
	Alarm	6	1	3	Bit	0x8 (4)	-	Signal: Alarm
	Trip L1 (*)	6	1	3	Bit	0x10 (5)	-	Signal: General Trip Phase L1
	Trip L2 (*)	6	1	3	Bit	0x20 (6)	-	Signal: General Trip Phase L2

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip L3 (*)	6	1	3	Bit	0x40 (7)	-	Signal: General Trip Phase L3
	Trip (*)	6	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	6	1	3	Bit	0x100 (9)	-	Signal: Trip Command
I[3] - 50, 51		7	1	3	Struct			
	ExBlo1-I	7	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	7	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	7	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Ex rev Interl-I	7	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	7	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	7	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	7	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Blo TripCmd	7	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	7	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
I[3] - 50, 51		8	1	3	Struct			
	Alarm L1	8	1	3	Bit	0x1 (1)	-	Signal: Alarm L1
	Alarm L2	8	1	3	Bit	0x2 (2)	-	Signal: Alarm L2
	Alarm L3	8	1	3	Bit	0x4 (3)	-	Signal: Alarm L3
	Alarm	8	1	3	Bit	0x8 (4)	-	Signal: Alarm
	Trip L1 (*)	8	1	3	Bit	0x10 (5)	-	Signal: General Trip Phase L1
	Trip L2 (*)	8	1	3	Bit	0x20 (6)	-	Signal: General Trip Phase L2
	Trip L3 (*)	8	1	3	Bit	0x40 (7)	-	Signal: General Trip Phase L3
	Trip (*)	8	1	3	Bit	0x80 (8)	-	Signal: Trip

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	TripCmd (*)	8	1	3	Bit	0x100 (9)	-	Signal: Trip Command
I[4] - 50, 51		9	1	3	Struct			
	ExBlo1-I	9	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	9	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	9	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Ex rev Interl-I	9	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	9	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	9	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	9	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking
	Blo TripCmd	9	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	9	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
I[4] - 50, 51		10	1	3	Struct			
	Alarm L1	10	1	3	Bit	0x1 (1)	-	Signal: Alarm L1
	Alarm L2	10	1	3	Bit	0x2 (2)	-	Signal: Alarm L2
	Alarm L3	10	1	3	Bit	0x4 (3)	-	Signal: Alarm L3
	Alarm	10	1	3	Bit	0x8 (4)	-	Signal: Alarm
	Trip L1 (*)	10	1	3	Bit	0x10 (5)	-	Signal: General Trip Phase L1
	Trip L2 (*)	10	1	3	Bit	0x20 (6)	-	Signal: General Trip Phase L2
	Trip L3 (*)	10	1	3	Bit	0x40 (7)	-	Signal: General Trip Phase L3
	Trip (*)	10	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	10	1	3	Bit	0x100 (9)	-	Signal: Trip Command
I[5] - 50, 51		11	1	3	Struct			
	ExBlo1-I	11	1	3	Bit	0x1	-	Module input state: External blocking1

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(1)		
	ExBlo2-I	11	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	11	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Ex rev Interl-I	11	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	11	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	11	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	11	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking
	Blo TripCmd	11	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	11	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
I[5] - 50, 51		12	1	3	Struct			
	Alarm L1	12	1	3	Bit	0x1 (1)	-	Signal: Alarm L1
	Alarm L2	12	1	3	Bit	0x2	-	Signal: Alarm L2

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(2)		
	Alarm L3	12	1	3	Bit	0x4 (3)	-	Signal: Alarm L3
	Alarm	12	1	3	Bit	0x8 (4)	-	Signal: Alarm
	Trip L1 (*)	12	1	3	Bit	0x10 (5)	-	Signal: General Trip Phase L1
	Trip L2 (*)	12	1	3	Bit	0x20 (6)	-	Signal: General Trip Phase L2
	Trip L3 (*)	12	1	3	Bit	0x40 (7)	-	Signal: General Trip Phase L3
	Trip (*)	12	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	12	1	3	Bit	0x100 (9)	-	Signal: Trip Command
I[6] - 50, 51		13	1	3	Struct			
	ExBlo1-I	13	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	13	1	3	Bit	0x2 (2)	-	Module input state: External blocking2

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo TripCmd-I	13	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Ex rev Interl-I	13	1	3	Bit	0x8 (4)	-	Module input state: External reverse interlocking
	Active	13	1	3	Bit	0x10 (5)	-	Signal: active
	ExBlo	13	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Ex rev Interl	13	1	3	Bit	0x40 (7)	-	Signal: External reverse Interlocking
	Blo TripCmd	13	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	13	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
I[6] - 50, 51		14	1	3	Struct			
	Alarm L1	14	1	3	Bit	0x1 (1)	-	Signal: Alarm L1
	Alarm L2	14	1	3	Bit	0x2 (2)	-	Signal: Alarm L2
	Alarm L3	14	1	3	Bit	0x4 (3)	-	Signal: Alarm L3

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEC)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Alarm	14	1	3	Bit	0x8 (4)	-	Signal: Alarm
	Trip L1 (*)	14	1	3	Bit	0x10 (5)	-	Signal: General Trip Phase L1
	Trip L2 (*)	14	1	3	Bit	0x20 (6)	-	Signal: General Trip Phase L2
	Trip L3 (*)	14	1	3	Bit	0x40 (7)	-	Signal: General Trip Phase L3
	Trip (*)	14	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	14	1	3	Bit	0x100 (9)	-	Signal: Trip Command
Jam[1] - 51LR		165	1	3	Struct			
	ExBlo1-I	165	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	165	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	165	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Active	165	1	3	Bit	0x10 (5)	-	Signal: active

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo	165	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Blo TripCmd	165	1	3	Bit	0x40 (7)	-	Signal: Trip Command blocked
	ExBlo TripCmd	165	1	3	Bit	0x80 (8)	-	Signal: External Blocking of the Trip Command
	Alarm	165	1	3	Bit	0x200 (10)	-	Signal: Alarm
	Trip (*)	165	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	165	1	3	Bit	0x800 (12)	-	Signal: Trip Command
Jam[2] - 51LR		166	1	3	Struct			
	ExBlo1-I	166	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	166	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	166	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Active	166	1	3	Bit	0x10 (5)	-	Signal: active

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEC)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo	166	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Blo TripCmd	166	1	3	Bit	0x40 (7)	-	Signal: Trip Command blocked
	ExBlo TripCmd	166	1	3	Bit	0x80 (8)	-	Signal: External Blocking of the Trip Command
	Alarm	166	1	3	Bit	0x200 (10)	-	Signal: Alarm
	Trip (*)	166	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	166	1	3	Bit	0x800 (12)	-	Signal: Trip Command
Logics		1100	1	3	Struct			
	LE1.Gate Out	1100	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE1.Timer Out	1100	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE1.Out	1100	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE1.Out inverted	1100	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE1.Gate In1-I	1100	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE1.Gate In2-I	1100	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE1.Gate In3-I	1100	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE1.Gate In4-I	1100	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE1.Reset Latch-I	1100	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1101	1	3	Struct			
	LE2.Gate Out	1101	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE2.Timer Out	1101	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE2.Out	1101	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE2.Out inverted	1101	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE2.Gate In1-I	1101	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE2.Gate In2-I	1101	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE2.Gate In3-I	1101	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE2.Gate In4-I	1101	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE2.Reset Latch-I	1101	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1102	1	3	Struct			
	LE3.Gate Out	1102	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE3.Timer Out	1102	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE3.Out	1102	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE3.Out inverted	1102	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE3.Gate In1-I	1102	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE3.Gate In2-I	1102	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal

Module (ANSI / IEC)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE3.Gate In3-I	1102	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE3.Gate In4-I	1102	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE3.Reset Latch-I	1102	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1103	1	3	Struct			
	LE4.Gate Out	1103	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE4.Timer Out	1103	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE4.Out	1103	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE4.Out inverted	1103	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE4.Gate In1-I	1103	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE4.Gate In2-I	1103	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE4.Gate In3-I	1103	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE4.Gate In4-I	1103	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE4.Reset Latch-I	1103	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1104	1	3	Struct			
	LE5.Gate Out	1104	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE5.Timer Out	1104	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE5.Out	1104	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE5.Out inverted	1104	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE5.Gate In1-I	1104	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE5.Gate In2-I	1104	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE5.Gate In3-I	1104	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE5.Gate In4-I	1104	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE5.Reset Latch-I	1104	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1105	1	3	Struct			
	LE6.Gate Out	1105	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE6.Timer Out	1105	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE6.Out	1105	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE6.Out inverted	1105	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE6.Gate In1-I	1105	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE6.Gate In2-I	1105	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE6.Gate In3-I	1105	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE6.Gate In4-I	1105	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE6.Reset Latch-I	1105	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching

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3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Logics		1106	1	3	Struct			
	LE7.Gate Out	1106	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE7.Timer Out	1106	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE7.Out	1106	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE7.Out inverted	1106	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE7.Gate In1-I	1106	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE7.Gate In2-I	1106	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE7.Gate In3-I	1106	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE7.Gate In4-I	1106	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE7.Reset Latch-I	1106	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1107	1	3	Struct			
	LE8.Gate Out	1107	1	3	Bit	0x1	-	Signal: Output of the logic gate

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(1)		
	LE8.Timer Out	1107	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE8.Out	1107	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE8.Out inverted	1107	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE8.Gate In1-I	1107	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE8.Gate In2-I	1107	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE8.Gate In3-I	1107	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE8.Gate In4-I	1107	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE8.Reset Latch-I	1107	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1108	1	3	Struct			
	LE9.Gate Out	1108	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE9.Timer Out	1108	1	3	Bit	0x2	-	Signal: Timer Output

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3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(2)		
	LE9.Out	1108	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE9.Out inverted	1108	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE9.Gate In1-I	1108	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE9.Gate In2-I	1108	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE9.Gate In3-I	1108	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE9.Gate In4-I	1108	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE9.Reset Latch-I	1108	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1109	1	3	Struct			
	LE10.Gate Out	1109	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE10.Timer Out	1109	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE10.Out	1109	1	3	Bit	0x4	-	Signal: Latched Output (Q)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(3)		
	LE10.Out inverted	1109	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE10.Gate In1-I	1109	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE10.Gate In2-I	1109	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE10.Gate In3-I	1109	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE10.Gate In4-I	1109	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE10.Reset Latch-I	1109	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1110	1	3	Struct			
	LE11.Gate Out	1110	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE11.Timer Out	1110	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE11.Out	1110	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE11.Out inverted	1110	1	3	Bit	0x8	-	Signal: Negated Latched Output (Q NOT)

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3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(4)		
	LE11.Gate In1-I	1110	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE11.Gate In2-I	1110	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE11.Gate In3-I	1110	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE11.Gate In4-I	1110	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE11.Reset Latch-I	1110	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1111	1	3	Struct			
	LE12.Gate Out	1111	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE12.Timer Out	1111	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE12.Out	1111	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE12.Out inverted	1111	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE12.Gate In1-I	1111	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE12.Gate In2-I	1111	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE12.Gate In3-I	1111	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE12.Gate In4-I	1111	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE12.Reset Latch-I	1111	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1112	1	3	Struct			
	LE13.Gate Out	1112	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE13.Timer Out	1112	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE13.Out	1112	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE13.Out inverted	1112	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE13.Gate In1-I	1112	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal

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3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE13.Gate In2-I	1112	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE13.Gate In3-I	1112	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE13.Gate In4-I	1112	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE13.Reset Latch-I	1112	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1113	1	3	Struct			
	LE14.Gate Out	1113	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE14.Timer Out	1113	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE14.Out	1113	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE14.Out inverted	1113	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE14.Gate In1-I	1113	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE14.Gate In2-I	1113	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE14.Gate In3-I	1113	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE14.Gate In4-I	1113	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE14.Reset Latch-I	1113	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1114	1	3	Struct			
	LE15.Gate Out	1114	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE15.Timer Out	1114	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE15.Out	1114	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE15.Out inverted	1114	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE15.Gate In1-I	1114	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE15.Gate In2-I	1114	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE15.Gate In3-I	1114	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal

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3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE15.Gate In4-I	1114	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE15.Reset Latch-I	1114	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1115	1	3	Struct			
	LE16.Gate Out	1115	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE16.Timer Out	1115	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE16.Out	1115	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE16.Out inverted	1115	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE16.Gate In1-I	1115	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE16.Gate In2-I	1115	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE16.Gate In3-I	1115	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE16.Gate In4-I	1115	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE16.Reset Latch-I	1115	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1116	1	3	Struct			
	LE17.Gate Out	1116	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE17.Timer Out	1116	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE17.Out	1116	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE17.Out inverted	1116	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE17.Gate In1-I	1116	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE17.Gate In2-I	1116	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE17.Gate In3-I	1116	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE17.Gate In4-I	1116	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE17.Reset Latch-I	1116	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching

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3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Logics		1117	1	3	Struct			
	LE18.Gate Out	1117	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE18.Timer Out	1117	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE18.Out	1117	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE18.Out inverted	1117	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE18.Gate In1-I	1117	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE18.Gate In2-I	1117	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE18.Gate In3-I	1117	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE18.Gate In4-I	1117	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE18.Reset Latch-I	1117	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1118	1	3	Struct			
	LE19.Gate Out	1118	1	3	Bit	0x1	-	Signal: Output of the logic gate

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(1)		
	LE19.Timer Out	1118	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE19.Out	1118	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE19.Out inverted	1118	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE19.Gate In1-I	1118	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE19.Gate In2-I	1118	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE19.Gate In3-I	1118	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE19.Gate In4-I	1118	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE19.Reset Latch-I	1118	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logics		1119	1	3	Struct			
	LE20.Gate Out	1119	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE20.Timer Out	1119	1	3	Bit	0x2	-	Signal: Timer Output

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(2)		
	LE20.Out	1119	1	3	Bit	0x4 (3)	-	Signal: Latched Output (Q)
	LE20.Out inverted	1119	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	LE20.Gate In1-I	1119	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	LE20.Gate In2-I	1119	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	LE20.Gate In3-I	1119	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	LE20.Gate In4-I	1119	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE20.Reset Latch-I	1119	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
MLS		170	1	3	Struct			
	ExBlo1-I	170	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	170	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	Active	170	1	3	Bit	0x4	-	Signal: active

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(3)		
	ExBlo	170	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Alarm	170	1	3	Bit	0x10 (5)	-	Signal: Alarm
	Trip	170	1	3	Bit	0x20 (6)	-	Signal: Trip
MStart		160	1	3	Struct			
	ExBlo TripCmd-I	160	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Blo TripCmd	160	1	3	Bit	0x10 (5)	-	Signal: Trip Command blocked
	Blo	160	1	3	Bit	0x40 (7)	-	Signal: Motor is blocked for starting or transition to Run mode
	ThermalBlo	160	1	3	Bit	0x80 (8)	-	Signal: Thermal block
	EmgOvr-I	160	1	3	Bit	0x100 (9)	-	State of the module input: Emergency Override. Signal has to be active in order to release the thermal capacity of the motor. Please notice that by doing this you run the risk of damaging the motor. "EMGOVR" has to be set to "DI" or "DI or UI" for this input to take effect
	InSq-I	160	1	3	Bit	0x200	-	State of the module input: Incomplete Sequence

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEI)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
MStart		161	1	3	Struct			
	RemStartBlock-I	161	1	3	Bit	0x2 (2)	-	State of the module input: Remote Motor Start Blocking
	ZSS-I	161	1	3	Bit	0x10 (5)	-	State of the module input: Zero Speed Switch
	Active	161	1	3	Bit	0x80 (8)	-	Signal: active
	Trip (*)	161	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	161	1	3	Bit	0x800 (12)	-	Signal: Trip Command
	InSq Start2Run Fail	161	1	3	Bit	0x1000 (13)	-	Signal: Fail to transit from start to run based on reported back time
	InSq Stop2Start Fail	161	1	3	Bit	0x2000 (14)	-	Signal: Fail to transit from stop to start based on reported back time
	LATBlock	161	1	3	Bit	0x4000 (15)	-	Signal: Long acceleration timer enforced
	TripPhaseReverse (*)	161	1	3	Bit	0x8000 (16)	-	Signal: Relay tripped because of phase reverse detection
MStart		162	1	3	Struct			

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	NOCSBlocked	162	1	3	Bit	0x1 (1)	-	Signal: Motor is prohibited to start due to number of cold start limits
	RemBlockStart	162	1	3	Bit	0x2 (2)	-	Signal: Motor is prohibited to start due to external blocking through digital input DI
	Run	162	1	3	Bit	0x4 (3)	-	Signal: Motor is in run mode
	Start	162	1	3	Bit	0x8 (4)	-	Signal: Motor is in start mode
	SPHBlockAlarm	162	1	3	Bit	0x10 (5)	-	Signal: Motor is prohibited to start due to starts per hour limits, would come active in the next stop
	SPHBlocked	162	1	3	Bit	0x20 (6)	-	Signal: Motor is prohibited to start due to starts per hour limits
	Stop	162	1	3	Bit	0x40 (7)	-	Signal: Motor is in stop mode
	TBSBlocked	162	1	3	Bit	0x80 (8)	-	Signal: Motor is prohibited to start due to time between starts limits
	TransitionTrip (*)	162	1	3	Bit	0x100 (9)	-	Signal: Start transition fail trip
	ZSSTrip (*)	162	1	3	Bit	0x200 (10)	-	Signal: Zero speed trip (possible locked rotor)
	ABSActive	162	1	3	Bit	0x400	-	Signal: Anti-backspin is active. For certain applications, such as pumping a fluid up a

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEI)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(11)		pipe, the motor may be driven backward for a period of time after it stops. The anti-backspin timer prevents starting the motor while it is spinning in the reverse direction.
	EmergOverrideDI	162	1	3	Bit	0x800 (12)	-	Signal: Emergency override start blocking through digital input DI
	EmergOverrideUI	162	1	3	Bit	0x1000 (13)	-	Signal: Emergency override start blocking through front panel
	ForcedStart	162	1	3	Bit	0x2000 (14)	-	Signal: Motor being forced to start
	Blo-GOCStart	162	1	3	Bit	0x4000 (15)	-	Signal: Ground Instantaneous Overcurrent Start Delay. GOC (Instantaneous Overcurrent) elements are blocked for the time programmed under this parameter
	Blo-IOCSstart	162	1	3	Bit	0x8000 (16)	-	Signal: Phase Instantaneous Overcurrent Start Delay. IOC (Instantaneous Overcurrent) elements are blocked for the time programmed under this parameter
MStart		163	1	3	Struct			
	Blo-JamStart	163	1	3	Bit	0x1 (1)	-	Signal: JAM Start Delay. JAM(Instantaneous Overcurrent) elements are blocked for the time programmed under this parameter
	Blo-I<Start	163	1	3	Bit	0x2 (2)	-	Signal: Underload Start Delay. Underload(Instantaneous Overcurrent) elements are blocked for the time programmed under this parameter
	Blo-I2>Start	163	1	3	Bit	0x4 (3)	-	Signal: Motor start block current unbalance signal
	ColdStartSeq	163	1	3	Bit	0x8	-	Signal: Motor cold start sequence flag

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(4)		
	MotorStopBlo	163	1	3	Bit	0x20 (6)	-	Signal: Motor stop block other protection functions
	Blo-Generic1	163	1	3	Bit	0x40 (7)	-	Generic Start Delay. This value can be used to block any protective element.1
	Blo-Generic2	163	1	3	Bit	0x80 (8)	-	Generic Start Delay. This value can be used to block any protective element.2
	Blo-Generic3	163	1	3	Bit	0x100 (9)	-	Generic Start Delay. This value can be used to block any protective element.3
	Blo-Generic4	163	1	3	Bit	0x200 (10)	-	Generic Start Delay. This value can be used to block any protective element.4
	Blo-Generic5	163	1	3	Bit	0x400 (11)	-	Generic Start Delay. This value can be used to block any protective element.5
	I_Transit	163	1	3	Bit	0x800 (12)	-	Signal: Current transition signal
	T_Transit	163	1	3	Bit	0x1000 (13)	-	Signal: Time transition signal
	Rotating forward	163	1	3	Bit	0x2000 (14)	-	Signal: Rotation Direction forward
	Rotating backward	163	1	3	Bit	0x4000 (15)	-	Signal: Rotation Direction reverse

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3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	STPC Blo-I	163	1	3	Bit	0x8000 (16)	-	State of the module input: With this setting a Digital Input keeps the Motor in the RUN mode, even when the motor current drops below STPC (motor stop current).
Modbus		1005	1	3	Struct			
	Scada Cmd 1	1005	1	3	Bit	0x1 (1)	-	Scada Command
	Scada Cmd 2	1005	1	3	Bit	0x2 (2)	-	Scada Command
	Scada Cmd 3	1005	1	3	Bit	0x4 (3)	-	Scada Command
	Scada Cmd 4	1005	1	3	Bit	0x8 (4)	-	Scada Command
	Scada Cmd 5	1005	1	3	Bit	0x10 (5)	-	Scada Command
	Scada Cmd 6	1005	1	3	Bit	0x20 (6)	-	Scada Command
	Scada Cmd 7	1005	1	3	Bit	0x40 (7)	-	Scada Command
	Scada Cmd 8	1005	1	3	Bit	0x80 (8)	-	Scada Command
	Scada Cmd 9	1005	1	3	Bit	0x100	-	Scada Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(9)		
	Scada Cmd 10	1005	1	3	Bit	0x200 (10)	-	Scada Command
	Scada Cmd 11	1005	1	3	Bit	0x400 (11)	-	Scada Command
	Scada Cmd 12	1005	1	3	Bit	0x800 (12)	-	Scada Command
	Scada Cmd 13	1005	1	3	Bit	0x1000 (13)	-	Scada Command
	Scada Cmd 14	1005	1	3	Bit	0x2000 (14)	-	Scada Command
	Scada Cmd 15	1005	1	3	Bit	0x4000 (15)	-	Scada Command
	Scada Cmd 16	1005	1	3	Bit	0x8000 (16)	-	Scada Command
PSet-Switch		59	1	3	Struct			
	PS 1	59	1	3	Bit	0x1 (1)	-	Signal: The currently active Parameter Set is PS 1
	PS 2	59	1	3	Bit	0x2 (2)	-	Signal: The currently active Parameter Set is PS 2

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	PS 3	59	1	3	Bit	0x4 (3)	-	Signal: The currently active Parameter Set is PS 3
	PS 4	59	1	3	Bit	0x8 (4)	-	Signal: The currently active Parameter Set is PS 4
	PSS manual	59	1	3	Bit	0x10 (5)	-	Signal: Manual Switch over of a Parameter Set
	PSS via Scada	59	1	3	Bit	0x20 (6)	-	Signal: Parameter Set Switch via Scada. Write into this output byte the integer of the parameter set that should become active (e.g. 4 => Switch onto parameter set 4).
	PSS via Inp fct	59	1	3	Bit	0x40 (7)	-	Signal: Parameter Set Switch via input function
	PS1-I	59	1	3	Bit	0x80 (8)	-	State of the module input respectively of the signal, that should activate this Parameter Setting Group.
	PS2-I	59	1	3	Bit	0x100 (9)	-	State of the module input respectively of the signal, that should activate this Parameter Setting Group.
	PS3-I	59	1	3	Bit	0x200 (10)	-	State of the module input respectively of the signal, that should activate this Parameter Setting Group.
	PS4-I	59	1	3	Bit	0x400 (11)	-	State of the module input respectively of the signal, that should activate this Parameter Setting Group.
	min 1 param changed (*)	59	1	3	Bit	0x800 (12)	-	Signal: At least one parameter has been changed

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Prot		1	1	3	Struct			
	ExBlo1-I	1	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	1	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	Active	1	1	3	Bit	0x4 (3)	-	Signal: active
	ExBlo	1	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Alarm L1	1	1	3	Bit	0x10 (5)	-	Signal: General-Alarm L1
	Alarm L2	1	1	3	Bit	0x20 (6)	-	Signal: General-Alarm L2
	Alarm L3	1	1	3	Bit	0x40 (7)	-	Signal: General-Alarm L3
	Alarm G	1	1	3	Bit	0x80 (8)	-	Signal: General-Alarm - Earth fault
	Alarm	1	1	3	Bit	0x100 (9)	-	Signal: General Alarm
	Trip L1 (*)	1	1	3	Bit	0x200 (10)	-	Signal: General Trip L1

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip L2 (*)	1	1	3	Bit	0x400 (11)	-	Signal: General Trip L2
	Trip L3 (*)	1	1	3	Bit	0x800 (12)	-	Signal: General Trip L3
	Trip G (*)	1	1	3	Bit	0x1000 (13)	-	Signal: General Trip Ground fault
	Trip (*)	1	1	3	Bit	0x2000 (14)	-	Signal: General Trip
Prot		2	1	3	Struct			
	Blo TripCmd	2	1	3	Bit	0x1 (1)	-	Signal: Trip Command blocked
	ExBlo TripCmd-I	2	1	3	Bit	0x2 (2)	-	Module input state: External Blocking of the Trip Command
	ExBlo TripCmd	2	1	3	Bit	0x4 (3)	-	Signal: External Blocking of the Trip Command
Prot		57	1	3	Struct			
	Fault No.	57	1	3	Bit	0xffff (1)	-	Fault number
RTD		143	1	3	Struct			
	ExBlo1-I	143	1	3	Bit	0x1 (1)	-	Module input state: External blocking1

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo2-I	143	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	ExBlo TripCmd-I	143	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Active	143	1	3	Bit	0x8 (4)	-	Signal: active
	ExBlo	143	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	143	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	143	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	143	1	3	Bit	0x80 (8)	-	Alarm RTD Temperature Protection
	Trip (*)	143	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	143	1	3	Bit	0x200 (10)	-	Signal: Trip Command
RTD		144	1	3	Struct			
	Windg 1 Alarm	144	1	3	Bit	0x1 (1)	-	Winding 1 Alarm RTD Temperature Protection

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEC)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Windg 1 Timeout Alarm	144	1	3	Bit	0x2 (2)	-	Winding 1 Timeout Alarm
	Windg 1 Trip (*)	144	1	3	Bit	0x4 (3)	-	Winding 1 Signal: Trip
	Windg 1 Invalid	144	1	3	Bit	0x8 (4)	-	Winding 1 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Windg 2 Alarm	144	1	3	Bit	0x10 (5)	-	Winding 2 Alarm RTD Temperature Protection
	Windg 2 Timeout Alarm	144	1	3	Bit	0x20 (6)	-	Winding 2 Timeout Alarm
	Windg 2 Trip (*)	144	1	3	Bit	0x40 (7)	-	Winding 2 Signal: Trip
	Windg 2 Invalid	144	1	3	Bit	0x80 (8)	-	Winding 2 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Windg 3 Alarm	144	1	3	Bit	0x100 (9)	-	Winding 3 Alarm RTD Temperature Protection
	Windg 3 Timeout Alarm	144	1	3	Bit	0x200 (10)	-	Winding 3 Timeout Alarm
	Windg 3 Trip (*)	144	1	3	Bit	0x400 (11)	-	Winding 3 Signal: Trip

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Windg 3 Invalid	144	1	3	Bit	0x800 (12)	-	Winding 3 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Windg 4 Alarm	144	1	3	Bit	0x1000 (13)	-	Winding 4 Alarm RTD Temperature Protection
	Windg 4 Timeout Alarm	144	1	3	Bit	0x2000 (14)	-	Winding 4 Timeout Alarm
	Windg 4 Trip (*)	144	1	3	Bit	0x4000 (15)	-	Winding 4 Signal: Trip
	Windg 4 Invalid	144	1	3	Bit	0x8000 (16)	-	Winding 4 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
RTD		145	1	3	Struct			
	Windg 5 Alarm	145	1	3	Bit	0x1 (1)	-	Winding 5 Alarm RTD Temperature Protection
	Windg 5 Timeout Alarm	145	1	3	Bit	0x2 (2)	-	Winding 5 Timeout Alarm
	Windg 5 Trip (*)	145	1	3	Bit	0x4 (3)	-	Winding 5 Signal: Trip
	Windg 5 Invalid	145	1	3	Bit	0x8 (4)	-	Winding 5 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Windg 6 Alarm	145	1	3	Bit	0x10 (5)	-	Winding 6 Alarm RTD Temperature Protection

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEC)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Windg 6 Timeout Alarm	145	1	3	Bit	0x20 (6)	-	Winding 6 Timeout Alarm
	Windg 6 Trip (*)	145	1	3	Bit	0x40 (7)	-	Winding 6 Signal: Trip
	Windg 6 Invalid	145	1	3	Bit	0x80 (8)	-	Winding 6 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	MotBear 1 Alarm	145	1	3	Bit	0x100 (9)	-	Motor Bearing 1 Alarm RTD Temperature Protection
	MotBear 1 Timeout Alarm	145	1	3	Bit	0x200 (10)	-	Motor Bearing 1 Timeout Alarm
	MotBear 1 Trip (*)	145	1	3	Bit	0x400 (11)	-	Motor Bearing 1 Signal: Trip
	MotBear 1 Invalid	145	1	3	Bit	0x800 (12)	-	Motor Bearing 1 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	MotBear 2 Alarm	145	1	3	Bit	0x1000 (13)	-	Motor Bearing 2 Alarm RTD Temperature Protection
	MotBear 2 Timeout Alarm	145	1	3	Bit	0x2000 (14)	-	Motor Bearing 2 Timeout Alarm
	MotBear 2 Trip (*)	145	1	3	Bit	0x4000 (15)	-	Motor Bearing 2 Signal: Trip

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	MotBear 2 Invalid	145	1	3	Bit	0x8000 (16)	-	Motor Bearing 2 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
RTD		146	1	3	Struct			
	LoadBear 1 Alarm	146	1	3	Bit	0x1 (1)	-	Load Bearing 1 Alarm RTD Temperature Protection
	LoadBear 1 Timeout Alarm	146	1	3	Bit	0x2 (2)	-	Load Bearing 1 Timeout Alarm
	LoadBear 1 Trip (*)	146	1	3	Bit	0x4 (3)	-	Load Bearing 1 Signal: Trip
	LoadBear 1 Invalid	146	1	3	Bit	0x8 (4)	-	Load Bearing 1 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	LoadBear 2 Alarm	146	1	3	Bit	0x10 (5)	-	Load Bearing 2 Alarm RTD Temperature Protection
	LoadBear 2 Timeout Alarm	146	1	3	Bit	0x20 (6)	-	Load Bearing 2 Timeout Alarm
	LoadBear 2 Trip (*)	146	1	3	Bit	0x40 (7)	-	Load Bearing 2 Signal: Trip
	LoadBear 2 Invalid	146	1	3	Bit	0x80 (8)	-	Load Bearing 2 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Aux1 Alarm	146	1	3	Bit	0x100	-	Auxiliary 1 Alarm RTD Temperature Protection

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(9)		
	Aux1 Timeout Alarm	146	1	3	Bit	0x200 (10)	-	Auxiliary 1 Timeout Alarm
	Aux1 Trip (*)	146	1	3	Bit	0x400 (11)	-	Auxiliary 1 Signal: Trip
	Aux1 Invalid	146	1	3	Bit	0x800 (12)	-	Auxiliary 1 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Windg Group Invalid	146	1	3	Bit	0x1000 (13)	-	Winding Group Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	MotBear Group Invalid	146	1	3	Bit	0x2000 (14)	-	Motor Bearing Group Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Timeout Alarm (*)	146	1	3	Bit	0x4000 (15)	-	Alarm timeout expired
RTD		147	1	3	Struct			
	LoadBear Group Invalid	147	1	3	Bit	0x1 (1)	-	Load Bearing Group Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Alarm LB Group	147	1	3	Bit	0x2 (2)	-	Alarm all Load Bearings
	TimeoutAlmLBGrp	147	1	3	Bit	0x4 (3)	-	Timeout Alarm all Load Bearings

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip LB Group (*)	147	1	3	Bit	0x8 (4)	-	Trip all Load Bearings
	Alarm MB Group	147	1	3	Bit	0x10 (5)	-	Alarm all Motor Bearings
	TimeoutAlmMBGrp	147	1	3	Bit	0x20 (6)	-	Timeout Alarm all Motor Bearings
	Trip MB Group (*)	147	1	3	Bit	0x40 (7)	-	Trip all Motor Bearings
	Alarm WD Group	147	1	3	Bit	0x80 (8)	-	Alarm all Windings
	TimeoutAlmWDGrp	147	1	3	Bit	0x100 (9)	-	Timeout Alarm all Windings
	Trip WD Group (*)	147	1	3	Bit	0x200 (10)	-	Trip all Windings
	Trip Group 1 (*)	147	1	3	Bit	0x2000 (14)	-	Trip Group 1
	Trip Group 2 (*)	147	1	3	Bit	0x4000 (15)	-	Trip Group 2
RTD		205	1	3	Struct			
	Alarm Any Group	205	1	3	Bit	0x1 (1)	-	Alarm Any Group

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip Any Group (*)	205	1	3	Bit	0x2 (2)	-	Trip Any Group
	TimeoutAlmAnyGrp	205	1	3	Bit	0x4 (3)	-	Timeout Alarm Any Group
	Aux2 Alarm	205	1	3	Bit	0x8 (4)	-	Auxiliary 2 Alarm RTD Temperature Protection
	Aux2 Timeout Alarm	205	1	3	Bit	0x10 (5)	-	Auxiliary 2 Timeout Alarm
	Aux2 Invalid	205	1	3	Bit	0x20 (6)	-	Auxiliary 2 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Aux2 Trip (*)	205	1	3	Bit	0x40 (7)	-	Auxiliary 2 Signal: Trip
	AuxGrpInvalid	205	1	3	Bit	0x80 (8)	-	Invalid Auxiliary Group
	Alarm Aux Group	205	1	3	Bit	0x100 (9)	-	Alarm Auxiliary Group
	TimeoutAlmAuxGrp	205	1	3	Bit	0x200 (10)	-	Timeout Alarm Auxiliary Group
	Trip Aux Group (*)	205	1	3	Bit	0x400 (11)	-	Trip Auxiliary Group
SG[1]		123	1	3	Struct			

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Isum Intr trip	123	1	3	Bit	0x10 (5)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded in at least one phase.
	Isum Intr trip: IL1	123	1	3	Bit	0x20 (6)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded: IL1
	Isum Intr trip: IL2	123	1	3	Bit	0x40 (7)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded: IL2
	Isum Intr trip: IL3	123	1	3	Bit	0x80 (8)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded: IL3
	Operations Alarm	123	1	3	Bit	0x100 (9)	-	Signal: Too many Operations. (The operations counter »TripCmd Cr« has exceeded the limit set at »Operations Alarm«.)
	WearLevel Alarm	123	1	3	Bit	0x200 (10)	-	Signal: Threshold for the Alarm
	WearLevel Lockout	123	1	3	Bit	0x400 (11)	-	Signal: Threshold for the Lockout Level
	Isum Intr ph Alm	123	1	3	Bit	0x800 (12)	-	Signal: Alarm, the per hour Sum (Limit) of interrupting currents has been exceeded.
SG[1]		177	1	3	Struct			
	Aux OFF-I	177	1	3	Bit	0x1 (1)	-	Module input state: Position indicator/ check-back signal of the CB (52b)
	Aux ON-I	177	1	3	Bit	0x2	-	Module Input State: Position indicator/ check-back signal of the CB (52a)

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(2)		
	Ready-I	177	1	3	Bit	0x4 (3)	-	Module input state: CB ready
	Interl OFF1-I	177	1	3	Bit	0x10 (5)	-	State of the module input: Interlocking of the OFF command
	Interl OFF2-I	177	1	3	Bit	0x20 (6)	-	State of the module input: Interlocking of the OFF command
	Interl OFF3-I	177	1	3	Bit	0x40 (7)	-	State of the module input: Interlocking of the OFF command
	Interl ON1-I	177	1	3	Bit	0x80 (8)	-	State of the module input: Interlocking of the ON command
	Interl ON2-I	177	1	3	Bit	0x100 (9)	-	State of the module input: Interlocking of the ON command
	Interl ON3-I	177	1	3	Bit	0x200 (10)	-	State of the module input: Interlocking of the ON command
	SCmd OFF-I	177	1	3	Bit	0x800 (12)	-	State of the module input: Switching OFF Command, e.g. the state of the Logics or the state of the digital input
	SCmd ON-I	177	1	3	Bit	0x1000 (13)	-	State of the module input: Switching ON Command, e.g. the state of the Logics or the state of the digital input
	TripCmd (*)	177	1	3	Bit	0x2000 (14)	-	Signal: Trip Command

Module (ANSI / IEEI)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	OFF Cmd	177	1	3	Bit	0x4000 (15)	-	Signal: OFF Command issued to the switchgear. Depending on the setting the signal may include the OFF command of the Prot module.
	OFF Cmd manual	177	1	3	Bit	0x8000 (16)	-	Signal: OFF Cmd manual
SG[1]		178	1	3	Struct			
	ON Cmd	178	1	3	Bit	0x1 (1)	-	Signal: ON Command issued to the switchgear. Depending on the setting the signal may include the ON command of the Prot module.
	ON Cmd manual	178	1	3	Bit	0x2 (2)	-	Signal: ON Cmd manual
	SGwear Slow SG	178	1	3	Bit	0x8 (4)	-	Signal: Alarm, the circuit breaker (load-break switch) becomes slower
	Res SGwear SI SG	178	1	3	Bit	0x10 (5)	-	Signal: Resetting the slow Switchgear Alarm
	CES Disturbed	178	1	3	Bit	0x40 (7)	-	Signal: Command Execution Supervision: Switching Command unsuccessful. Switchgear in disturbed position.
	CES Fiel Interl	178	1	3	Bit	0x80 (8)	-	Signal: Command Execution Supervision: Switching Command not executed because of field interlocking.
	CES ON d OFF	178	1	3	Bit	0x400 (11)	-	Signal: Command Execution Supervision: On Command during a pending OFF Command.
	CES SwitchDir	178	1	3	Bit	0x800	-	Signal: Command Execution Supervision respectively Switching Direction Control: This signal becomes true, if a switch

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(12)		command is issued even though the switchgear is already in the requested position. Example: A switchgear that is already OFF should be switched OFF again (doubly). The same applies to CLOSE commands.
	CES SG not ready	178	1	3	Bit	0x1000 (13)	-	Signal: Command Execution Supervision: Switchgear not ready
	CES succesf	178	1	3	Bit	0x4000 (15)	-	Signal: Command Execution Supervision: Switching command executed successfully.
SG[1]		179	1	3	Struct			
	Pos Disturb	179	1	3	Bit	0x1 (1)	-	Signal: Circuit Breaker Disturbed - Undefined Breaker Position. The Position Indicators contradict themselves. After expiring of a supervision timer this signal becomes true.
	t-Dwell	179	1	3	Bit	0x2 (2)	-	Signal: Dwell time
	Pos Indeterm	179	1	3	Bit	0x4 (3)	-	Signal: Circuit Breaker is in Indeterminate Position
	Pos OFF	179	1	3	Bit	0x8 (4)	-	Signal: Circuit Breaker is in OFF-Position
	Pos ON	179	1	3	Bit	0x10 (5)	-	Signal: Circuit Breaker is in ON-Position
	Ready	179	1	3	Bit	0x20 (6)	-	Signal: Circuit breaker is ready for operation.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Pos not ON	179	1	3	Bit	0x40 (7)	-	Signal: Pos not ON
	SI SingleContactInd	179	1	3	Bit	0x80 (8)	-	Signal: The Position of the Switchgear is detected by one auxiliary contact (pole) only. Thus indeterminate and disturbed Positions cannot be detected.
	Position Ind manipul	179	1	3	Bit	0x100 (9)	-	Signal: Position Indicators faked
	OFF incl TripCmd	179	1	3	Bit	0x200 (10)	-	Signal: The OFF Command includes the OFF Command issued by the Protection module.
	CES Fail TripCmd	179	1	3	Bit	0x800 (12)	-	Signal: Command Execution Supervision: Command execution failed because trip command is pending.
	Interl OFF	179	1	3	Bit	0x1000 (13)	-	Signal: One or more IL_Off inputs are active.
	Interl ON	179	1	3	Bit	0x2000 (14)	-	Signal: One or more IL_On inputs are active.
SSV		273	1	3	Struct			
	System Error	273	1	3	Bit	0x1 (1)	-	Signal: Device Failure
	New error (*)	273	1	3	Bit	0x8 (4)	-	Signal: A new error message has been issued.
	New warning (*)	273	1	3	Bit	0x10	-	Signal: A new warning message has been issued.

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(5)		
	Active	273	1	3	Bit	0x20 (6)	-	Signal: active
Sgen		1012	1	3	Struct			
	ExBlo1-l	1012	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	Ex ForcePost-l	1012	1	3	Bit	0x2 (2)	-	State of the module input:Force Post state. Abort simulation.
	Running	1012	1	3	Bit	0x10 (5)	-	Signal: Measuring value simulation is running
	State	1012	1	3	Bit	0xe0 (6)	-	Signal: Wave generation states: 0=Off, 1=PreFault, 2=Fault, 3=PostFault, 4=InitReset
	Ex Start Simulation- l	1012	1	3	Bit	0x100 (9)	-	State of the module input:External Start of Fault Simulation (Using the test parameters)
	ExBlo2-l	1012	1	3	Bit	0x200 (10)	-	Module input state: External blocking2
	Manual Start	1012	1	3	Bit	0x400 (11)	-	Fault Simulation has been started manually.
	Manual Stop	1012	1	3	Bit	0x800 (12)	-	Fault Simulation has been stopped manually.
	Started	1012	1	3	Bit	0x1000	-	Fault Simulation has been started

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(13)		
	Stopped	1012	1	3	Bit	0x2000 (14)	-	Fault Simulation has been stopped
Sys		154	1	3	Struct			
	Maint Mode Active	154	1	3	Bit	0x1 (1)	-	Signal: Arc Flash Reduction Maintenance Active
	MaintMode Manually	154	1	3	Bit	0x2 (2)	-	Signal: Arc Flash Reduction Maintenance Manual Mode
	Maint Mode DI	154	1	3	Bit	0x4 (3)	-	Signal: Arc Flash Reduction Maintenance Digital Input Mode
	Maint Mode SCADA	154	1	3	Bit	0x8 (4)	-	Signal: Arc Flash Reduction Maintenance SCADA Mode
	Maint Mode Inactive	154	1	3	Bit	0x10 (5)	-	Signal: Arc Flash Reduction Maintenance Inactive
	Maint Mode-I	154	1	3	Bit	0x20 (6)	-	Module Input State: Arc Flash Reduction Maintenance Switch
	SNTP active	154	1	3	Bit	0x80 (8)	-	Signal: If there is no valid SNTP signal for 120 sec, SNTP is regarded as inactive.
	Setting Lock Bypass	154	1	3	Bit	0x100 (9)	-	Signal: Short-period unlock of the Setting Lock
SysA		173	1	3	Struct			

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo-I	173	1	3	Bit	0x1 (1)	-	Module input state: External blocking
	ExBlo	173	1	3	Bit	0x2 (2)	-	Signal: External Blocking
	Alm Current avg (Demd)	173	1	3	Bit	0x4 (3)	-	Signal: Alarm: Averaged demand current exceeded
	Active	173	1	3	Bit	0x8 (4)	-	Signal: active
	Alarm I THD	173	1	3	Bit	0x10 (5)	-	Signal: Alarm Total Harmonic Distortion Current
	Trip Current avg (Demd) (*)	173	1	3	Bit	0x1000 (13)	-	Signal: Trip: Averaged demand current exceeded
	Trip I THD (*)	173	1	3	Bit	0x2000 (14)	-	Signal: Trip Total Harmonic Distortion Current
TCS - 74TC		150	1	3	Struct			
	ExBlo1-I	150	1	3	Bit	0x1 (1)	-	Module input state: External blocking1
	ExBlo2-I	150	1	3	Bit	0x2 (2)	-	Module input state: External blocking2
	Active	150	1	3	Bit	0x4 (3)	-	Signal: active

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo	150	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Alarm	150	1	3	Bit	0x10 (5)	-	Signal: Alarm Trip Circuit Supervision
	Not Possible	150	1	3	Bit	0x20 (6)	-	Not possible because no state indicator assigned to the breaker.
	Aux ON-I	150	1	3	Bit	0x100 (9)	-	Module Input State: Position indicator/ check-back signal of the CB (52a)
	Aux OFF-I	150	1	3	Bit	0x200 (10)	-	Module input state: Position indicator/ check-back signal of the CB (52b)
ThR		164	1	3	Struct			
	ExBlo1-I	164	1	3	Bit	0x1 (1)	-	Module input state: External blocking
	ExBlo2-I	164	1	3	Bit	0x2 (2)	-	Module input state: External blocking
	ExBlo TripCmd-I	164	1	3	Bit	0x4 (3)	-	Module input state: External Blocking of the Trip Command
	Active	164	1	3	Bit	0x8 (4)	-	Signal: active
	ExBlo	164	1	3	Bit	0x10 (5)	-	Signal: External Blocking

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3.1 Signals

Module (ANSI / IEEI)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Blo TripCmd	164	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	164	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	164	1	3	Bit	0x80 (8)	-	Signal: Alarm
	Trip (*)	164	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	164	1	3	Bit	0x200 (10)	-	Signal: Trip Command
	Alarm Pickup	164	1	3	Bit	0x400 (11)	-	Signal: Alarm Pickup
	Alarm Timeout	164	1	3	Bit	0x800 (12)	-	Signal: Alarm Timeout
	Load above SF	164	1	3	Bit	0x1000 (13)	-	“Load above Service Factor”: If the current exceeds the set value of “UTC” (“Ultimate trip threshold”) then the used thermal capacity counts up and the state “Load above SF” is becoming true. If the current is below the “UTC” value this state is false.
	RTD effective	164	1	3	Bit	0x2000 (14)	-	This state becomes true if the following conditions are all fulfilled: - the state “Load above SF” is true, - the Winding Temperature Trip has been activated in the RTD module,

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
								- for at least one temperature a valid value above 0°C (32°F) is being displayed.
TimeSync		54	1	3	Struct			
	synchronized	54	1	3	Bit	0x1 (1)	-	Clock is synchronized.
URTD		1007	1	3	Struct			
	Windg1 Superv	1007	1	3	Bit	0x1 (1)	-	Signal: Windg1, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	Windg2 Superv	1007	1	3	Bit	0x2 (2)	-	Signal: Windg2, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	Windg3 Superv	1007	1	3	Bit	0x4 (3)	-	Signal: Windg3, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	Windg4 Superv	1007	1	3	Bit	0x8 (4)	-	Signal: Windg4, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	Windg5 Superv	1007	1	3	Bit	0x10 (5)	-	Signal: Windg5, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	Windg6 Superv	1007	1	3	Bit	0x20 (6)	-	Signal: Windg6, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	MotBear1 Superv	1007	1	3	Bit	0x40 (7)	-	Signal: MotBear1, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)

3 Appendix - Data Point Lists

3.1 Signals

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	MotBear2 Superv	1007	1	3	Bit	0x80 (8)	-	Signal: MotBear2, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	LoadBear1 Superv	1007	1	3	Bit	0x100 (9)	-	Signal: LoadBear1, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	LoadBear2 Superv	1007	1	3	Bit	0x200 (10)	-	Signal: LoadBear2, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	Aux1 Superv	1007	1	3	Bit	0x400 (11)	-	Signal: Aux1, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)
	Superv	1007	1	3	Bit	0x800 (12)	-	Signal: URTD Channel Supervision. The value "1" reports a detected channel failure of at least one channel. (The value "0" means that all RTD channels are healthy.)
	Aux2 Superv	1007	1	3	Bit	0x1000 (13)	-	Signal: Aux2, Channel Supervision. The value "1" reports a detected channel failure. (The value "0" means that this RTD channel is healthy.)

3.2 Measuring Values

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT	IL1	20100	2	4	Float IEE754		A	Measured value: Phase current (fundamental)
CT	IL2	20102	2	4	Float IEE754		A	Measured value: Phase current (fundamental)
CT	IL3	20104	2	4	Float IEE754		A	Measured value: Phase current (fundamental)
CT	IG meas	20106	2	4	Float IEE754		A	Measured value (measured): IG (fundamental)
CT	I0	20114	2	4	Float IEE754		A	Measured value (calculated): Zero current (fundamental)
CT	I1	20116	2	4	Float IEE754		A	Measured value (calculated): Positive phase sequence current (fundamental)
CT	I2	20118	2	4	Float IEE754		A	Measured value (calculated): Unbalanced load current (fundamental)
CT	IG calc	20160	2	4	Float IEE754		A	Measured value (calculated): IG (fundamental)
CT	phi IG calc	20200	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IG calc Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT	phi IG meas	20202	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IG meas Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.

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3.2 Measuring Values

Module (ANSI / IEEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT	phi IL1	20204	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IL1 Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT	phi IL2	20206	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IL2 Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT	phi IL3	20208	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IL3 Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT	IL1 THD	20210	2	4	Float IEE754		A	Measured value (calculated): IL1 Total Harmonic Current
CT	IL2 THD	20212	2	4	Float IEE754		A	Measured value (calculated): IL2 Total Harmonic Current
CT	IL3 THD	20214	2	4	Float IEE754		A	Measured value (calculated): IL3 Total Harmonic Current
CT	%IL1 THD	20216	2	4	Float IEE754		%	Measured value (calculated): IL1 Total Harmonic Distortion
CT	%IL2 THD	20218	2	4	Float IEE754		%	Measured value (calculated): IL2 Total Harmonic Distortion
CT	%IL3 THD	20220	2	4	Float IEE754		%	Measured value (calculated): IL3 Total Harmonic Distortion
CT	IL1 RMS	20316	2	4	Float IEE754		A	Measured value: Phase current (RMS)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT	IL2 RMS	20318	2	4	Float IEE754		A	Measured value: Phase current (RMS)
CT	IL3 RMS	20320	2	4	Float IEE754		A	Measured value: Phase current (RMS)
CT	IG meas RMS	20322	2	4	Float IEE754		A	Measured value (measured): IG (RMS)
CT	IG calc RMS	20324	2	4	Float IEE754		A	Measured value (calculated): IG (RMS)
CT	%(I2/I1)	20376	2	4	Float IEE754		%	Measured value (calculated): I2/I1, phase sequence will be taken into account automatically.
CT	phi I0	20378	2	4	Float IEE754		°	Measured value (calculated): Angle Zero Sequence System Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT	phi I1	20380	2	4	Float IEE754		°	Measured value (calculated): Angle of Positive Sequence System Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT	phi I2	20382	2	4	Float IEE754		°	Measured Value (calculated): Angle of Negative Sequence System Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT	I1 max	21074	2	4	Float IEE754		A	Maximum value positive phase sequence current (fundamental)
CT	I1 min	21076	2	4	Float IEE754		A	Minimum value positive phase sequence current (fundamental)
CT	I2 max	21080	2	4	Float IEE754		A	Maximum value negative sequence current (fundamental)

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3.2 Measuring Values

Module (ANSI / IEEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT	I2 min	21082	2	4	Float IEE754		A	Minimum value unbalanced load current (fundamental)
CT	IL1 avg RMS	21130	2	4	Float IEE754		A	IL1 average value (RMS)
CT	IL2 avg RMS	21132	2	4	Float IEE754		A	IL2 average value (RMS)
CT	IL3 avg RMS	21134	2	4	Float IEE754		A	IL3 average value (RMS)
CT	IL1 max RMS	21136	2	4	Float IEE754		A	IL1 maximum value (RMS)
CT	IL2 max RMS	21138	2	4	Float IEE754		A	IL2 maximum value (RMS)
CT	IL3 max RMS	21140	2	4	Float IEE754		A	IL3 maximum value (RMS)
CT	IL1 min RMS	21142	2	4	Float IEE754		A	IL1 minimum value (RMS)
CT	IL2 min RMS	21144	2	4	Float IEE754		A	IL2 minimum value (RMS)
CT	IL3 min RMS	21146	2	4	Float IEE754		A	IL3 minimum value (RMS)
CT	IG calc max RMS	21456	2	4	Float IEE754		A	Measured value (calculated):IG maximum value (RMS)
CT	IG calc min RMS	21458	2	4	Float IEE754		A	Measured value (calculated):IG minimum value (RMS)
CT	IG meas max RMS	21462	2	4	Float IEE754		A	Measured value: IG maximum value (RMS)
CT	IG meas min RMS	21464	2	4	Float IEE754		A	Measured value: IG minimum value (RMS)
CT	%(I2/I1) max	21468	2	4	Float IEE754		%	Measured value (calculated): I2/I1 maximum value, phase sequence will be taken into account automatically
CT	%(I2/I1) min	21470	2	4	Float IEE754		%	Measured value (calculated): I2/I1 minimum value, phase sequence will be taken into account automatically
CT	IL1 Peak (Demand)	21784	2	4	Float IEE754		A	IL1 Peak value, RMS value
CT	IL2 Peak (Demand)	21786	2	4	Float IEE754		A	IL2 Peak value, RMS value
CT	IL3 Peak (Demand)	21788	2	4	Float IEE754		A	IL3 Peak value, RMS value

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT - fault value	IL1	50100	2	4	Float IEE754		A	Measured value: Phase current (fundamental) , as stored in the Fault Recorder
CT - fault value	IL2	50102	2	4	Float IEE754		A	Measured value: Phase current (fundamental) , as stored in the Fault Recorder
CT - fault value	IL3	50104	2	4	Float IEE754		A	Measured value: Phase current (fundamental) , as stored in the Fault Recorder
CT - fault value	IG meas	50106	2	4	Float IEE754		A	Measured value (measured): IG (fundamental) , as stored in the Fault Recorder
CT - fault value	I0	50114	2	4	Float IEE754		A	Measured value (calculated): Zero current (fundamental) , as stored in the Fault Recorder
CT - fault value	I1	50116	2	4	Float IEE754		A	Measured value (calculated): Positive phase sequence current (fundamental) , as stored in the Fault Recorder
CT - fault value	I2	50118	2	4	Float IEE754		A	Measured value (calculated): Unbalanced load current (fundamental) , as stored in the Fault Recorder
CT - fault value	IG calc	50160	2	4	Float IEE754		A	Measured value (calculated): IG (fundamental) , as stored in the Fault Recorder
CT - fault value	phi IG calc	50200	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IG calc Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude. , as stored in the Fault Recorder
CT - fault value	phi IG meas	50202	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IG meas Reference phasor is required to calculate the angle. This is the first measured

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3.2 Measuring Values

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
								voltage (or current) channel with sufficiently high amplitude. , as stored in the Fault Recorder
CT - fault value	phi IL1	50204	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IL1 Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude. , as stored in the Fault Recorder
CT - fault value	phi IL2	50206	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IL2 Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude. , as stored in the Fault Recorder
CT - fault value	phi IL3	50208	2	4	Float IEE754		°	Measured value (calculated): Angle of Phasor IL3 Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude. , as stored in the Fault Recorder
CT - fault value	IL1 RMS	50316	2	4	Float IEE754		A	Measured value: Phase current (RMS) , as stored in the Fault Recorder
CT - fault value	IL2 RMS	50318	2	4	Float IEE754		A	Measured value: Phase current (RMS) , as stored in the Fault Recorder
CT - fault value	IL3 RMS	50320	2	4	Float IEE754		A	Measured value: Phase current (RMS) , as stored in the Fault Recorder
CT - fault value	IG meas RMS	50322	2	4	Float IEE754		A	Measured value (measured): IG (RMS) , as stored in the Fault Recorder

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT - fault value	IG calc RMS	50324	2	4	Float IEE754		A	Measured value (calculated): IG (RMS) , as stored in the Fault Recorder
CT - fault value	%(I2/I1)	50376	2	4	Float IEE754		%	Measured value (calculated): I2/I1, phase sequence will be taken into account automatically. , as stored in the Fault Recorder
Date and Time		20000	6	4	Struct			
	y	20000	6	4	Short	Word 0 (1)	-	year
	m	20000	6	4	Short	Word 1 (17)	-	month
	d	20000	6	4	Short	Word 2 (33)	-	days
	h	20000	6	4	Short	Word 3 (49)	-	hours
	min	20000	6	4	Short	Word 4 (65)	-	minute
	ms	20000	6	4	Short	Word 5 (81)	-	milliseconds
Exp[1]	NumberOfAlarms	24018	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
Exp[1]	NumberOfTripCmds	24020	2	4	Float IEE754		-	Number of trip commands since the last reset

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3.2 Measuring Values

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Exp[2]	NumberOfAlarms	24022	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
Exp[2]	NumberOfTripCmds	24024	2	4	Float IEE754		-	Number of trip commands since the last reset
Exp[3]	NumberOfAlarms	24026	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
Exp[3]	NumberOfTripCmds	24028	2	4	Float IEE754		-	Number of trip commands since the last reset
Exp[4]	NumberOfAlarms	24030	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
Exp[4]	NumberOfTripCmds	24032	2	4	Float IEE754		-	Number of trip commands since the last reset
I2>[1] - 46	nRevTrips	21614	2	4	Float IEE754		-	Number of reverse spinning trips since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.
I2>[1] - 46	NumberOfAlarms	21724	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
I2>[1] - 46	NumberOfTripCmds	21726	2	4	Float IEE754		-	Number of trip commands since the last reset
I2>[2] - 46	NumberOfAlarms	21730	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
I2>[2] - 46	NumberOfTripCmds	21732	2	4	Float IEE754		-	Number of trip commands since the last reset
I<[1] - 37	NumberOfTripCmds	21642	2	4	Float IEE754		-	Number of trip commands since the last reset
I<[1] - 37	NumberOfAlarms	21648	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
I<[2] - 37	NumberOfTripCmds	21644	2	4	Float IEE754		-	Number of trip commands since the last reset
I<[2] - 37	NumberOfAlarms	21650	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
I<[3] - 37	NumberOfTripCmds	21646	2	4	Float IEE754		-	Number of trip commands since the last reset
I<[3] - 37	NumberOfAlarms	21652	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
IG[1] - 50N, 51N	NumberOfAlarms	21690	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
IG[1] - 50N, 51N	NumberOfTripCmds	21692	2	4	Float IEE754		-	Number of trip commands since the last reset
IG[2] - 50N, 51N	NumberOfAlarms	21694	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
IG[2] - 50N, 51N	NumberOfTripCmds	21696	2	4	Float IEE754		-	Number of trip commands since the last reset
IG[3] - 50N, 51N	NumberOfAlarms	21698	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
IG[3] - 50N, 51N	NumberOfTripCmds	21700	2	4	Float IEE754		-	Number of trip commands since the last reset
IG[4] - 50N, 51N	NumberOfAlarms	21702	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
IG[4] - 50N, 51N	NumberOfTripCmds	21704	2	4	Float IEE754		-	Number of trip commands since the last reset
IRIG-B	Edges	20298	2	4	Float IEE754		-	Edges: Total number of rising and falling edges. This signal indicates if a signal is available at the IRIG-B input.

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3.2 Measuring Values

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
IRIG-B	NoOfFrameErrors	20300	2	4	Float IEE754		-	Total Number of Frame Errors. Physically corrupted Frame.
IRIG-B	NoOfFramesOK	20302	2	4	Float IEE754		-	Total Number valid Frames.
I[1] - 50, 51	NumberOfAlarms	21666	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
I[1] - 50, 51	NumberOfTripCmds	21668	2	4	Float IEE754		-	Number of trip commands since the last reset
I[2] - 50, 51	NumberOfAlarms	21670	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
I[2] - 50, 51	NumberOfTripCmds	21672	2	4	Float IEE754		-	Number of trip commands since the last reset
I[3] - 50, 51	NumberOfAlarms	21674	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
I[3] - 50, 51	NumberOfTripCmds	21676	2	4	Float IEE754		-	Number of trip commands since the last reset
I[4] - 50, 51	NumberOfAlarms	21678	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
I[4] - 50, 51	NumberOfTripCmds	21680	2	4	Float IEE754		-	Number of trip commands since the last reset
I[5] - 50, 51	NumberOfAlarms	21682	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
I[5] - 50, 51	NumberOfTripCmds	21684	2	4	Float IEE754		-	Number of trip commands since the last reset
I[6] - 50, 51	NumberOfAlarms	21686	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
I[6] - 50, 51	NumberOfTripCmds	21688	2	4	Float IEE754		-	Number of trip commands since the last reset

Module (ANSI / IEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Jam[1] - 51LR	NumberOfTripCmds	21580	2	4	Float IEE754		-	Number of trip commands since the last reset
Jam[1] - 51LR	NumberOfAlarms	21662	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
Jam[2] - 51LR	NumberOfTripCmds	21582	2	4	Float IEE754		-	Number of trip commands since the last reset
Jam[2] - 51LR	NumberOfAlarms	21664	2	4	Float IEE754		-	Number of alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
MStart	ABK Rem.Time	20466	2	4	Float IEE754		s	This is the remaining anti-backspin time.
MStart	IL1 Ib	20468	2	4	Float IEE754		Ib	Measured value: Phase current as multiple of Ib
MStart	IL2 Ib	20470	2	4	Float IEE754		Ib	Measured value: Phase current as multiple of Ib
MStart	IL3 Ib	20472	2	4	Float IEE754		Ib	Measured value: Phase current as multiple of Ib
MStart	NOCS Remaining	20474	2	4	Float IEE754		-	This counter shows the number of remaining permitted cold starts.
MStart	SPH Remaining	20476	2	4	Float IEE754		-	SPH Remaining
MStart	TBS Rem.Block.Time	20478	2	4	Float IEE754		s	In case that the Motor is blocked by TBS functions, the remaining blocking time is shown.
MStart	I3 PRMS avg	20510	2	4	Float IEE754		A	Average RMS current of all 3 phases
MStart	I3 P (%Ib) avg	20512	2	4	Float IEE754		Ib	Average RMS current of all 3 phases as percentages of Ib
MStart	SPH Rem.Block.Time	20894	2	4	Float IEE754		min	In case that the Motor is blocked by an SPH blocking, the remaining blocking time is shown until the next motor start is permitted.
MStart	HighestRunI	21584	2	4	Float IEE754		A	Highest running phase current. The time stamp indicates the point in time when the

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3.2 Measuring Values

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
								maximum current has occurred. Resettable with »Sys . Res OperationsCr« or »Sys . Res All«.
MStart	HighestStartI	21586	2	4	Float IEE754		A	Highest starting phase current. The time stamp indicates the point in time when the maximum current has occurred. Resettable with »Sys . Res OperationsCr« or »Sys . Res All«.
MStart	OCNT	21588	2	4	Float IEE754		-	Motor Operation count since last reset. Resettable with »Sys . Res OperationsCr« or »Sys . Res All«.
MStart	RunTime	21590	2	4	Float IEE754		h	Motor Operation time since last reset. Resettable with »Sys . Res OperationsCr« or »Sys . Res All«.
MStart	TOCS	21592	2	4	Float IEE754		-	Total Motor Operation count since last reset. Resettable with »Sys . Res TotalCr« or »Sys . Res All«.
MStart	TRunTime	21594	2	4	Float IEE754		h	Motor Operation (Motor run time) time since last reset. Resettable with »Sys . Res TotalCr« or »Sys . Res All«.
MStart	nEmrgOvr	21596	2	4	Float IEE754		-	Number of emergency overrides since last reset. Resettable with »Sys . Res OperationsCr« or »Sys . Res All«.
MStart	nInSqTrips	21598	2	4	Float IEE754		-	Number of incomplete sequence trips since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.
MStart	nTRNTrips	21606	2	4	Float IEE754		-	Number of transition trips since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.
MStart	nZSWTrips	21608	2	4	Float IEE754		-	Number of zero speed switch trips since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.
MStart	nSPHBlocks	21654	2	4	Float IEE754		-	Number of start per hour blocks since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
MStart	nTBSBlocks	21656	2	4	Float IEE754		-	Number of time between start blocks since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.
MStart	Highest%I2/I1	21722	2	4	Float IEE754		%	Highest %I2/I1 value since last reset. The time stamp indicates the point in time when the maximum unbalanced load has occurred. Resettable with »Sys . Res OperationsCr« or »Sys . Res All«.
MStart	I3P Fla Demand	21734	2	4	Float IEE754		Ib	RMS current of all 3 phases calculated in a fixed demand window as percentages of Ib
MStart	IL1 avg Ib	21736	2	4	Float IEE754		Ib	IL1 average value as multiple of Ib
MStart	IL1 max Ib	21738	2	4	Float IEE754		Ib	IL1 maximum value as multiple of Ib
MStart	IL1 min Ib	21740	2	4	Float IEE754		Ib	IL1 minimum value as multiple of Ib
MStart	IL2 avg Ib	21742	2	4	Float IEE754		Ib	IL2 average value as multiple of Ib
MStart	IL2 max Ib	21744	2	4	Float IEE754		Ib	IL2 maximum value as multiple of Ib
MStart	IL2 min Ib	21746	2	4	Float IEE754		Ib	IL2 minimum value as multiple of Ib
MStart	IL3 avg Ib	21748	2	4	Float IEE754		Ib	IL3 average value as multiple of Ib
MStart	IL3 max Ib	21750	2	4	Float IEE754		Ib	IL3 maximum value as multiple of Ib
MStart	IL3 min Ib	21752	2	4	Float IEE754		Ib	IL3 minimum value as multiple of Ib
MStart - fault value	I3 PRMS avg	50510	2	4	Float IEE754		A	Average RMS current of all 3 phases , as stored in the Fault Recorder
Modbus	Mapped Meas 1	23000	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 2	23002	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 3	23004	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.

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3.2 Measuring Values

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Modbus	Mapped Meas 4	23006	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 5	23008	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 6	23010	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 7	23012	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 8	23014	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 9	23016	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 10	23018	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 11	23020	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 12	23022	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 13	23024	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 14	23026	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.

Module (ANSI / IEEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Modbus	Mapped Meas 15	23028	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
Modbus	Mapped Meas 16	23030	2	4	Float IEE754		-	Mapped Measured Values. They can be used to provide measured values to the Modbus Master.
RTD	HottestWindingTemp	20504	2	4	Float IEE754		°C	The actual value for the hottest winding temperature.
RTD	Hottest MotBearTemp	20506	2	4	Float IEE754		°C	The actual value for the hottest motor bearing temperature.
RTD	Hottest LoadBearTemp	20508	2	4	Float IEE754		°C	The actual value for the hottest load bearing temperature.
RTD	HighestLbTemp	21618	2	4	Float IEE754		°C	Highest load bearing temperature since the last reset. Resettable via »Sys . Res OperationsCr« oder »Sys . Res All«.
RTD	HighestMbTemp	21620	2	4	Float IEE754		°C	Highest motor bearing temperature since the last reset. Resettable via »Sys . Res OperationsCr« oder »Sys . Res All«.
RTD	HighestWdTemp	21622	2	4	Float IEE754		°C	Highest motor winding temperature since the last reset. Resettable via »Sys . Res OperationsCr« oder »Sys . Res All«.
RTD	nAuxAlarms	21624	2	4	Float IEE754		-	Number of auxiliary temperature alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
RTD	nAuxTrips	21626	2	4	Float IEE754		-	Number of auxiliary temperature trips since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.
RTD	nChannelFails	21628	2	4	Float IEE754		-	Number of RTD channel failures. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
RTD	nLbAlarms	21630	2	4	Float IEE754		-	Number of load bearing temperature alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.

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3.2 Measuring Values

Module (ANSI / IEEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
RTD	nLbTrips	21632	2	4	Float IEE754		-	Number of load bearing temperature trips since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.
RTD	nMbAlarms	21634	2	4	Float IEE754		-	Number of motor bearing temperature alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
RTD	nMbTrips	21636	2	4	Float IEE754		-	Number of motor bearing temperature trips since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.
RTD	nWdAlarms	21638	2	4	Float IEE754		-	Number of winding temperature alarms since last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
RTD	nWdTrips	21640	2	4	Float IEE754		-	Number of winding temperature trips since last reset. Resettable with »Sys . Res TripCr« or »Sys . Res All«.
RTD	Hottest Aux Temp	21820	2	4	Float IEE754		°C	The actual value for the hottest Auxiliary temperature.
RTD	HighestAuxTemp	21822	2	4	Float IEE754		°C	Highest Auxiliary temperature since the last reset. Resettable via »Sys . Res OperationsCr« oder »Sys . Res All«.
SG[1]	TripCmd Cr	20006	2	4	Float IEE754		-	Counter: Total number of trips of the switchgear.
SG[1]	Sum trip IL1	20182	2	4	Float IEE754		A	Summation of the tripping currents phase
SG[1]	Sum trip IL2	20184	2	4	Float IEE754		A	Summation of the tripping currents phase
SG[1]	Sum trip IL3	20186	2	4	Float IEE754		A	Summation of the tripping currents phase
SG[1]	Bkr Wear Level	20516	2	4	Float IEE754		%	Wear level of the circuit breaker. (100% means that the circuit breaker has to be maintained.)
SG[1]	Isum Intr per hour	20518	2	4	Float IEE754		kA	Sum per hour of interrupting currents.
ThR	I2T Used	20482	2	4	Float IEE754		%	Thermal capacity used.
ThR	I2T Remained	20484	2	4	Float IEE754		%	Thermal capacity remained.

Module (ANSI / IEC)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
ThR	nAlarms	21658	2	4	Float IEE754		-	Number of alarms since the last reset. Resettable with »Sys . Res AlarmCr« or »Sys . Res All«.
ThR	NumberOfTripCmds	21660	2	4	Float IEE754		-	Number of trip commands since the last reset
ThR - fault value	I2T Used	50482	2	4	Float IEE754		%	Thermal capacity used. , as stored in the Fault Recorder
URTD	Aux2	20328	2	4	Float IEE754		°C	Auxiliary2
URTD	Windg1	20330	2	4	Float IEE754		°C	Winding 1
URTD	Windg2	20332	2	4	Float IEE754		°C	Winding 2
URTD	Windg3	20334	2	4	Float IEE754		°C	Winding 3
URTD	Windg4	20336	2	4	Float IEE754		°C	Winding 4
URTD	Windg5	20338	2	4	Float IEE754		°C	Winding 5
URTD	Windg6	20340	2	4	Float IEE754		°C	Winding 6
URTD	MotBear1	20342	2	4	Float IEE754		°C	Motor Bearing 1
URTD	MotBear2	20344	2	4	Float IEE754		°C	Motor Bearing 2
URTD	LoadBear1	20346	2	4	Float IEE754		°C	Load Bearing 1
URTD	LoadBear2	20348	2	4	Float IEE754		°C	Load Bearing 2
URTD	Aux1	20350	2	4	Float IEE754		°C	Auxiliary1
URTD	RTD Max	20486	2	4	Float IEE754		°C	Maximum temperature of all channels.
URTD	Windg1 max	21194	2	4	Float IEE754		°C	Winding1 Maximum Value
URTD	Windg2 max	21196	2	4	Float IEE754		°C	Winding2 Maximum Value
URTD	Windg3 max	21198	2	4	Float IEE754		°C	Winding3 Maximum Value
URTD	Windg4 max	21200	2	4	Float IEE754		°C	Winding4 Maximum Value
URTD	Windg5 max	21202	2	4	Float IEE754		°C	Winding5 Maximum Value

3 Appendix - Data Point Lists

3.2 Measuring Values

Module (ANSI / IEEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
URTD	Windg6 max	21204	2	4	Float IEE754		°C	Winding6 Maximum Value
URTD	MotBear1 max	21206	2	4	Float IEE754		°C	Motor Bearing1 Maximum Value
URTD	MotBear2 max	21208	2	4	Float IEE754		°C	Motor Bearing2 Maximum Value
URTD	LoadBear1 max	21210	2	4	Float IEE754		°C	Load Bearing1 Maximum Value
URTD	LoadBear2 max	21212	2	4	Float IEE754		°C	Load Bearing2 Maximum Value
URTD	Aux1 max	21214	2	4	Float IEE754		°C	Auxiliary1 Maximum Value
URTD	Aux2 max	21800	2	4	Float IEE754		°C	Auxiliary2 Maximum Value
URTD - fault value	Aux2	50328	2	4	Float IEE754		°C	Auxiliary2 , as stored in the Fault Recorder
URTD - fault value	Windg1	50330	2	4	Float IEE754		°C	Winding 1 , as stored in the Fault Recorder
URTD - fault value	Windg2	50332	2	4	Float IEE754		°C	Winding 2 , as stored in the Fault Recorder
URTD - fault value	Windg3	50334	2	4	Float IEE754		°C	Winding 3 , as stored in the Fault Recorder
URTD - fault value	Windg4	50336	2	4	Float IEE754		°C	Winding 4 , as stored in the Fault Recorder
URTD - fault value	Windg5	50338	2	4	Float IEE754		°C	Winding 5 , as stored in the Fault Recorder
URTD - fault value	Windg6	50340	2	4	Float IEE754		°C	Winding 6 , as stored in the Fault Recorder
URTD - fault value	MotBear1	50342	2	4	Float IEE754		°C	Motor Bearing 1 , as stored in the Fault Recorder
URTD - fault value	MotBear2	50344	2	4	Float IEE754		°C	Motor Bearing 2 , as stored in the Fault Recorder
URTD - fault value	LoadBear1	50346	2	4	Float IEE754		°C	Load Bearing 1 , as stored in the Fault Recorder
URTD - fault value	LoadBear2	50348	2	4	Float IEE754		°C	Load Bearing 2 , as stored in the Fault Recorder
URTD - fault value	Aux1	50350	2	4	Float IEE754		°C	Auxiliary1 , as stored in the Fault Recorder
Values	Build	20008	2	4	Float IEE754		-	Build Number
Values	Operating hours Cr	20010	2	4	Float IEE754		h	Operating hours counter of the protective device

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Values	Hours Counter	20514	2	4	Float IEE754		h	Resettable device operation hours counter. Resettable with »Sys . Res TotalCr« or »Sys . Res All«.

3.3 Commands

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Acknowledge	LEDs	22000	1	5	0xFF00		-	LEDs
Acknowledge	Binary Outputs	22001	1	5	0xFF00		-	Binary Outputs
Acknowledge	Scada	22002	1	5	0xFF00		-	Scada
Acknowledge	Device	22003	1	5	0xFF00		-	Device
Acknowledge	Ack TripCmd	22005	1	5	0xFF00		-	Signal: Acknowledge Trip Command
Reset	Modbus diagnosis counter	22006	1	5	0xFF00		-	Modbus diagnosis counter
Reset	Res Sum trip	22012	1	5	0xFF00		-	Reset summation of the tripping currents
Scada Cmd	Assbl Scada Cmd 1	22020	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 2	22021	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 3	22022	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 4	22023	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 5	22024	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 6	22025	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 7	22026	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 8	22027	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 9	22028	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Scada Cmd	Assbl Scada Cmd 10	22029	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 11	22030	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 12	22031	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 13	22032	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 14	22033	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 15	22034	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Scada Cmd	Assbl Scada Cmd 16	22035	1	5	0xFF00=On, 0x0000=Off		-	Assignable Scada Command
Fault rec	Res all rec	22040	1	5	0xFF00		-	Reset all records
PSet-Switch	Scada PS1	22050	1	5	0xFF00		-	Scada Setting Group1
PSet-Switch	Scada PS2	22051	1	5	0xFF00		-	Scada Setting Group2
PSet-Switch	Scada PS3	22052	1	5	0xFF00		-	Scada Setting Group3
PSet-Switch	Scada PS4	22053	1	5	0xFF00		-	Scada Setting Group4
Maint Mode	Maint Mode SCADA	22054	1	5	0xFF00=On, 0x0000=Off		-	Signal: Arc Flash Reduction Maintenance SCADA Mode
Res I2T Used	Res I2T Used	22055	1	5	0xFF00		-	Reset thermal capacity used.
Res OperationsCr	Res OperationsCr	22056	1	5	0xFF00		-	Reset all counters in history group operations
Res AlarmCr	Res AlarmCr	22057	1	5	0xFF00		-	Reset all counters in history group alarms
Res TripCmdCr	Res TripCmdCr	22058	1	5	0xFF00		-	Reset all counters in history group Trip Commands
Res TotalCr	Res TotalCr	22059	1	5	0xFF00		-	Reset all counters in history group total

3 Appendix - Data Point Lists

3.3 Commands

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Res All	Res All	22060	1	5	0xFF00		-	Reset of all Counters
SG	SG ControlCmd1	22100	1	5	0xFF00=On, 0x0000=Off		-	Control Command Switchgear

3.4 Settings

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Date and Time		32500	6	3 16	Struct			
	y	32500	6	3 16	Short	Word 0 (1)	-	year
	m	32500	6	3 16	Short	Word 1 (17)	-	month
	d	32500	6	3 16	Short	Word 2 (33)	-	days
	h	32500	6	3 16	Short	Word 3 (49)	-	hours
	min	32500	6	3 16	Short	Word 4 (65)	-	minute
	ms	32500	6	3 16	Short	Word 5 (81)	-	milliseconds
Fault rec		50000	9	3 16	Struct			
	RecordNo	50000	9	3 16	Short	Word 0 (1)	-	Record Number
	Trip Cause	50000	9	3 16	Short	Word 1 (17)	-	Code for the trip cause. In case of several simultaneous trip causes the primary cause is selected. If there is another trip later then the new trip cause overwrites the previous one. The codes for the trip cause are documented in the SCADA documentation.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Pickup Cause	50000	9	3 16	Short	Word 2 (33)	-	Code for last Pickup cause corresponds to fault record: See scada doc for correlation between pickup reason and code
	Fault No.	50000	9	3 16	Short	Word 3 (49)	-	Fault number
	No. of Grid Faults	50000	9	3 16	Short	Word 4 (65)	-	Number of grid faults: This is a counter for all faults (i.e. General Alarms »Prot . Alarm«), but except faults during a running cycle of the Automatic Reclosure module (signal »AR . running«). (Remark: The »Fault No.« counts every new fault independent of AR cycles. This means that for protective devices without AR module these two counters are equivalent.)
	Time stamp:	50000	9	3 16	long long	Word 5- Word 8 (81)	-	Timestamp in milliseconds since 1970

3.5 Cause of Trip

Cause of trip reason is provided on two different Modbus addresses:

- At address 5004 the “last primary trip cause” is available. This means, in case of several simultaneous trip causes the primary cause is selected. If there is another trip later then the new trip cause overwrites the previous one. The trip cause can be read as long as a trip reason is present. In addition, the content of this register can be latched. The trip cause is latched in the same way as other trip signals, that means if the corresponding latching setting in Modbus is active, the content of the register is fixed until it is acknowledged by command.
- At address 50000 and up the last trip and alarm reason is available with related record, fault, net number and time stamp. Any saved record can be requested by sending the record number to the corresponding register. Be aware that the content of these registers can only be read entirely and that the content changes every time a new fault occurs in the fault recorder.

All required fault values must be defined within a SCADApter (HptSMap) mapping file. The default datapoint list cannot be used in this case. All data-points that are needed for communicating with the substation must be defined as a HptSMap mapping file. (See also the separate SCADApter User Manual.)

If not a specific fault is selected, last fault value is presented on these addresses.

The following table is showing the “trip cause code” and its relation to the “trip cause reason”.

Trip Cause	Description	Module
1	NORM	
1201		IG[1]
1202		IG[2]
1203		IG[3]
1204		IG[4]
1306		ExP[1]
1307		ExP[2]
1308		ExP[3]
1309		ExP[4]

Trip Cause	Description	Module
2101		Jam[1]
2102		Jam[2]
2901		I2>[1]
2902		I2>[2]
3201		I[1]
3202		I[2]
3203		I[3]
3204		I[4]
3205		I[5]
3206		I[6]
3701		ThR
3901		I<[1]
3902		I<[2]
3903		I<[3]
4201		RTD

High **PROTEC**

MRM4

MODBUS - DATA POINT LIST



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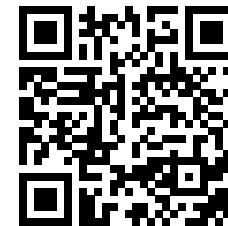
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