Powering Business Worldwide

ETR-4000

Modbus® Register Maps

Version: 3.9

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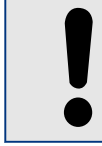
1 Modbus Parameters

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

Response

Slave address	3/4	Byte number	Register 0 HI	Register 0 LO	...	Check-sum HI	Check-sum 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 Function Code 5

Query

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

Response

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

2.3 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

Response

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

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.

2.4 Function Code 16

Query

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

Response

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

2.5 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.

2.6 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 + Function Code	Exception Code	Check-sum HI	Check-sum 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 – Register Maps

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
46[1] – I.Unbalance		**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 (5)	-	Signal: External Blocking
	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
	Pickup	82	1	3	Bit	0x80 (8)	-	Signal: Pickup Negative Sequence

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip (*)	82	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	82	1	3	Bit	0x200 (10)	-	Signal: Trip Command
46[2] – I.Unbalance		**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 (5)	-	Signal: External Blocking
	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
	Pickup	83	1	3	Bit	0x80 (8)	-	Signal: Pickup Negative Sequence

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip (*)	83	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	83	1	3	Bit	0x200 (10)	-	Signal: Trip Command
49 – Thermal		**19**	**1**	**3**	**Struct**			
	ExBlo1-I	19	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	19	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	19	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	19	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	19	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	19	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	19	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	19	1	3	Bit	0x80 (8)	-	Signal: Alarm Thermal Overload
	Trip (*)	19	1	3	Bit	0x100	-	Signal: Trip

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(9)		
	TripCmd (*)	19	1	3	Bit	0x200 (10)	-	Signal: Trip Command
50P[1] – Phase Inst. OC		**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
	Rvs Blo-I	3	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	3	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	3	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	3	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	Blo TripCmd	3	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	3	1	3	Bit	0x100	-	Signal: External Blocking of the Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(9)		
	IH2 Blo	3	1	3	Bit	0x200 (10)	-	Signal: Blocking the trip command by IH2
50P[1] – Phase Inst. OC		**4**	**1**	**3**	**Struct**			
	Pickup IA	4	1	3	Bit	0x1 (1)	-	Signal: Pickup IA
	Pickup IB	4	1	3	Bit	0x2 (2)	-	Signal: Pickup IB
	Pickup IC	4	1	3	Bit	0x4 (3)	-	Signal: Pickup IC
	Pickup	4	1	3	Bit	0x8 (4)	-	Signal: Pickup
	Trip (*)	4	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	4	1	3	Bit	0x100 (9)	-	Signal: Trip Command
50P[2] – Phase Inst. OC		**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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo TripCmd-I	5	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Rvs Blo-I	5	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	5	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	5	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	5	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	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
	IH2 Blo	5	1	3	Bit	0x200 (10)	-	Signal: Blocking the trip command by IH2
50P[2] – Phase Inst. OC		**6**	**1**	**3**	**Struct**			
	Pickup IA	6	1	3	Bit	0x1 (1)	-	Signal: Pickup IA
	Pickup IB	6	1	3	Bit	0x2 (2)	-	Signal: Pickup IB

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Pickup IC	6	1	3	Bit	0x4 (3)	-	Signal: Pickup IC
	Pickup	6	1	3	Bit	0x8 (4)	-	Signal: Pickup
	Trip (*)	6	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	6	1	3	Bit	0x100 (9)	-	Signal: Trip Command
50P[3] – Phase Inst. OC		**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
	Rvs Blo-I	7	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	7	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	7	1	3	Bit	0x20 (6)	-	Signal: External Blocking

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Rvs Blo	7	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	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
	IH2 Blo	7	1	3	Bit	0x200 (10)	-	Signal: Blocking the trip command by IH2
50P[3] – Phase Inst. OC		**8**	**1**	**3**	**Struct**			
	Pickup IA	8	1	3	Bit	0x1 (1)	-	Signal: Pickup IA
	Pickup IB	8	1	3	Bit	0x2 (2)	-	Signal: Pickup IB
	Pickup IC	8	1	3	Bit	0x4 (3)	-	Signal: Pickup IC
	Pickup	8	1	3	Bit	0x8 (4)	-	Signal: Pickup
	Trip (*)	8	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	8	1	3	Bit	0x100 (9)	-	Signal: Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
50P[4] – Phase Inst. OC		**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
	Rvs Blo-I	9	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	9	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	9	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	9	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	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
	IH2 Blo	9	1	3	Bit	0x200 (10)	-	Signal: Blocking the trip command by IH2

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
50P[4] – Phase Inst. OC		**10**	**1**	**3**	**Struct**			
	Pickup IA	10	1	3	Bit	0x1 (1)	-	Signal: Pickup IA
	Pickup IB	10	1	3	Bit	0x2 (2)	-	Signal: Pickup IB
	Pickup IC	10	1	3	Bit	0x4 (3)	-	Signal: Pickup IC
	Pickup	10	1	3	Bit	0x8 (4)	-	Signal: Pickup
	Trip (*)	10	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	10	1	3	Bit	0x100 (9)	-	Signal: Trip Command
50R[1] – Residual Inst. OC		**61**	**1**	**3**	**Struct**			
	ExBlo1-I	61	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	61	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	61	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Rvs Blo-I	61	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	61	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	61	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	61	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	Blo TripCmd	61	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	61	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	IGH2 Blo	61	1	3	Bit	0x200 (10)	-	Signal: Blocked by IH2
	Pickup	61	1	3	Bit	0x400 (11)	-	Signal: The pickup value has been exceeded.
	Trip (*)	61	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	61	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
50R[2] – Residual Inst. OC		**62**	**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	62	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	62	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	62	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Rvs Blo-I	62	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	62	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	62	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	62	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	Blo TripCmd	62	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	62	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	IGH2 Blo	62	1	3	Bit	0x200 (10)	-	Signal: Blocked by IH2
	Pickup	62	1	3	Bit	0x400	-	Signal: The pickup value has been exceeded.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(11)		
	Trip (*)	62	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	62	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
50X[1] – Meas. Inst. OC		**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
	Rvs Blo-I	15	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	15	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	15	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	15	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	Blo TripCmd	15	1	3	Bit	0x80	-	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
						(8)		
	ExBlo TripCmd	15	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	IGH2 Blo	15	1	3	Bit	0x200 (10)	-	Signal: Blocked by IH2
	Pickup	15	1	3	Bit	0x400 (11)	-	Signal: The pickup value has been exceeded.
	Trip (*)	15	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	15	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
50X[2] – Meas. Inst. OC		**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
	ExBlo TripCmd-I	16	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Rvs Blo-I	16	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	16	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	16	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	16	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	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
	IGH2 Blo	16	1	3	Bit	0x200 (10)	-	Signal: Blocked by IH2
	Pickup	16	1	3	Bit	0x400 (11)	-	Signal: The pickup value has been exceeded.
	Trip (*)	16	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	16	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
51P[1] – Phase Time OC		**11**	**1**	**3**	**Struct**			
	ExBlo1-I	11	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	11	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	11	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Rvs Blo-I	11	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	11	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	11	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	11	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	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
	IH2 Blo	11	1	3	Bit	0x200 (10)	-	Signal: Blocking the trip command by IH2
51P[1] – Phase Time OC		**12**	**1**	**3**	**Struct**			
	Pickup IA	12	1	3	Bit	0x1 (1)	-	Signal: Pickup IA
	Pickup IB	12	1	3	Bit	0x2	-	Signal: Pickup IB

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(2)		
	Pickup IC	12	1	3	Bit	0x4 (3)	-	Signal: Pickup IC
	Pickup	12	1	3	Bit	0x8 (4)	-	Signal: Pickup
	Trip (*)	12	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	12	1	3	Bit	0x100 (9)	-	Signal: Trip Command
51P[2] – Phase Time OC		**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
	ExBlo TripCmd-I	13	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Rvs Blo-I	13	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	13	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	13	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)		
	Rvs Blo	13	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	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
	IH2 Blo	13	1	3	Bit	0x200 (10)	-	Signal: Blocking the trip command by IH2
51P[2] – Phase Time OC		**14**	**1**	**3**	**Struct**			
	Pickup IA	14	1	3	Bit	0x1 (1)	-	Signal: Pickup IA
	Pickup IB	14	1	3	Bit	0x2 (2)	-	Signal: Pickup IB
	Pickup IC	14	1	3	Bit	0x4 (3)	-	Signal: Pickup IC
	Pickup	14	1	3	Bit	0x8 (4)	-	Signal: Pickup
	Trip (*)	14	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	14	1	3	Bit	0x100	-	Signal: Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(9)		
51P[3] – Phase Time OC		**106**	**1**	**3**	**Struct**			
	ExBlo1-I	106	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	106	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	106	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Rvs Blo-I	106	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	106	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	106	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	106	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	Blo TripCmd	106	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	106	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	IH2 Blo	106	1	3	Bit	0x200	-	Signal: Blocking the trip command by IH2

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
51P[3] – Phase Time OC		**107**	**1**	**3**	**Struct**			
	Pickup IA	107	1	3	Bit	0x1 (1)	-	Signal: Pickup IA
	Pickup IB	107	1	3	Bit	0x2 (2)	-	Signal: Pickup IB
	Pickup IC	107	1	3	Bit	0x4 (3)	-	Signal: Pickup IC
	Pickup	107	1	3	Bit	0x8 (4)	-	Signal: Pickup
	Trip (*)	107	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	107	1	3	Bit	0x100 (9)	-	Signal: Trip Command
51P[4] – Phase Time OC		**108**	**1**	**3**	**Struct**			
	ExBlo1-I	108	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	108	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	108	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Rvs Blo-I	108	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	108	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	108	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	108	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	Blo TripCmd	108	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	108	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	IH2 Blo	108	1	3	Bit	0x200 (10)	-	Signal: Blocking the trip command by IH2
51P[4] – Phase Time OC		**109**	**1**	**3**	**Struct**			
	Pickup IA	109	1	3	Bit	0x1 (1)	-	Signal: Pickup IA
	Pickup IB	109	1	3	Bit	0x2 (2)	-	Signal: Pickup IB
	Pickup IC	109	1	3	Bit	0x4 (3)	-	Signal: Pickup IC

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Pickup	109	1	3	Bit	0x8 (4)	-	Signal: Pickup
	Trip (*)	109	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	109	1	3	Bit	0x100 (9)	-	Signal: Trip Command
51Q[1] – I.Unbalance		**20**	**1**	**3**	**Struct**			
	ExBlo1-I	20	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	20	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	20	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	20	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	20	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	20	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	20	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Pickup	20	1	3	Bit	0x400 (11)	-	Signal: Pickup
	Trip (*)	20	1	3	Bit	0x4000 (15)	-	Signal: Trip
	TripCmd (*)	20	1	3	Bit	0x8000 (16)	-	Signal: Trip Command
51Q[1] – I.Unbalance		**75**	**1**	**3**	**Struct**			
	Rvs Blo-I	75	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Rvs Blo	75	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	IH2 Blo	75	1	3	Bit	0x400 (11)	-	Signal: Blocking the trip command by IH2
51Q[2] – I.Unbalance		**21**	**1**	**3**	**Struct**			
	ExBlo1-I	21	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	21	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	21	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	21	1	3	Bit	0x8	-	Signal: Active

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(4)		
	ExBlo	21	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	21	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	21	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Pickup	21	1	3	Bit	0x80 (8)	-	Signal: Pickup
	Trip (*)	21	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	21	1	3	Bit	0x200 (10)	-	Signal: Trip Command
51Q[2] – I.Unbalance		**76**	**1**	**3**	**Struct**			
	Rvs Blo-I	76	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Rvs Blo	76	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	IH2 Blo	76	1	3	Bit	0x400 (11)	-	Signal: Blocking the trip command by IH2

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
51R[1] – Residual Time OC		**63**	**1**	**3**	**Struct**			
	ExBlo1-I	63	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	63	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	63	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Rvs Blo-I	63	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	63	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	63	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	63	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	Blo TripCmd	63	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	63	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	IGH2 Blo	63	1	3	Bit	0x200 (10)	-	Signal: Blocked by IH2

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Pickup	63	1	3	Bit	0x400 (11)	-	Signal: The pickup value has been exceeded.
	Trip (*)	63	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	63	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
51R[2] – Residual Time OC		**64**	**1**	**3**	**Struct**			
	ExBlo1-I	64	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	64	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	64	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Rvs Blo-I	64	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	64	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	64	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	64	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Blo TripCmd	64	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	64	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	IGH2 Blo	64	1	3	Bit	0x200 (10)	-	Signal: Blocked by IH2
	Pickup	64	1	3	Bit	0x400 (11)	-	Signal: The pickup value has been exceeded.
	Trip (*)	64	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	64	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
51X[1] – Meas. Time OC		**17**	**1**	**3**	**Struct**			
	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
	Rvs Blo-I	17	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Active	17	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	17	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	17	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	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
	IGH2 Blo	17	1	3	Bit	0x200 (10)	-	Signal: Blocked by IH2
	Pickup	17	1	3	Bit	0x400 (11)	-	Signal: The pickup value has been exceeded.
	Trip (*)	17	1	3	Bit	0x800 (12)	-	Signal: Trip
	TripCmd (*)	17	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
51X[2] – Meas. Time OC		**18**	**1**	**3**	**Struct**			
	ExBlo1-I	18	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	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
	Rvs Blo-I	18	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	18	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	18	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	18	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	Blo TripCmd	18	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	18	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	IGH2 Blo	18	1	3	Bit	0x200 (10)	-	Signal: Blocked by IH2
	Pickup	18	1	3	Bit	0x400 (11)	-	Signal: The pickup value has been exceeded.
	Trip (*)	18	1	3	Bit	0x800	-	Signal: Trip

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(12)		
	TripCmd (*)	18	1	3	Bit	0x1000 (13)	-	Signal: Trip Command
87 – Phase Differential		**130**	**1**	**3**	**Struct**			
	ExBlo1-I	130	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	130	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	130	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	130	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	130	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	130	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	130	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Blo H2	130	1	3	Bit	0x80 (8)	-	Signal: Blocked by Harmonic:2
	Blo H4	130	1	3	Bit	0x100	-	Signal: Blocked by Harmonic:4

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(9)		
	Blo H5	130	1	3	Bit	0x200 (10)	-	Signal: Blocked by Harmonic:5
	H2,H4,H5 Blo	130	1	3	Bit	0x400 (11)	-	Signal: Blocked by Harmonics (Inhibit)
	Restraining	130	1	3	Bit	0x1000 (13)	-	Signal: Restraining of the differential protection by means of rising the tripping curve.
	Transient	130	1	3	Bit	0x2000 (14)	-	Signal: Temporary restraining of the differential protection afterwards the transformer is being engergized.
87 – Phase Differential		**131**	**1**	**3**	**Struct**			
	Pickup A	131	1	3	Bit	0x1 (1)	-	Signal: Pickup System Phase A
	Pickup B	131	1	3	Bit	0x2 (2)	-	Signal: Pickup System Phase B
	Pickup C	131	1	3	Bit	0x4 (3)	-	Signal: Pickup System C
	Pickup	131	1	3	Bit	0x8 (4)	-	Signal: Pickup
	Trip A (*)	131	1	3	Bit	0x10 (5)	-	Signal: Trip System Phase A
	Trip B (*)	131	1	3	Bit	0x20	-	Signal: Trip System Phase B

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(6)		
	Trip C (*)	131	1	3	Bit	0x40 (7)	-	Signal: Trip System Phase C
	Trip (*)	131	1	3	Bit	0x80 (8)	-	Signal: Trip
	TripCmd (*)	131	1	3	Bit	0x100 (9)	-	Signal: Trip Command
	Restraining: A	131	1	3	Bit	0x1000 (13)	-	Restraining: A
	Restraining: B	131	1	3	Bit	0x2000 (14)	-	Restraining: B
	Restraining: C	131	1	3	Bit	0x4000 (15)	-	Restraining: C
87 – Phase Differential		**262**	**1**	**3**	**Struct**			
	IH2 Blo A	262	1	3	Bit	0x1 (1)	-	Signal:Phase A: Blocking of the Phase Differential Protection because of second Harmonic.
	IH2 Blo B	262	1	3	Bit	0x2 (2)	-	Signal:Phase B: Blocking of the Phase Differential Protection because of second Harmonic.
	IH2 Blo C	262	1	3	Bit	0x4 (3)	-	Signal:Phase C: Blocking of the Phase Differential Protection because of second Harmonic.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	IH4 Blo A	262	1	3	Bit	0x8 (4)	-	Signal:Phase A: Blocking of the Phase Differential Protection because of fourth Harmonic.
	IH4 Blo B (*)	262	1	3	Bit	0x10 (5)	-	Signal:Phase B: Blocking of the Phase Differential Protection because of fourth Harmonic.
	IH4 Blo C (*)	262	1	3	Bit	0x20 (6)	-	Signal:Phase C: Blocking of the Phase Differential Protection because of fourth Harmonic.
	IH5 Blo A (*)	262	1	3	Bit	0x40 (7)	-	Signal:Phase A: Blocking of the Phase Differential Protection because of fifth Harmonic.
	IH5 Blo B (*)	262	1	3	Bit	0x80 (8)	-	Signal:Phase B: Blocking of the Phase Differential Protection because of fifth Harmonic.
	IH5 Blo C (*)	262	1	3	Bit	0x100 (9)	-	Signal:Phase C: Blocking of the Phase Differential Protection because of fifth Harmonic.
	CT Satur.Stab. triggered (*)	262	1	3	Bit	0x200 (10)	-	Signal: Temporary restraining of the Phase Differential Protection triggered by the detection of an external fault in case of CT saturation.
	CT Satur.Stab. A trig. (*)	262	1	3	Bit	0x400 (11)	-	Signal: Temporary restraining of the Phase Differential Protection in phase A, triggered by the detection of an external phase A fault in case of CT saturation.
	CT Satur.Stab. B trig. (*)	262	1	3	Bit	0x800 (12)	-	Signal: Temporary restraining of the Phase Differential Protection in phase B, triggered by the detection of an external phase B fault in case of CT saturation.
	CT Satur.Stab. C trig. (*)	262	1	3	Bit	0x1000 (13)	-	Signal: Temporary restraining of the Phase Differential Protection in phase C, triggered by the detection of an

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
								external phase C fault in case of CT saturation.
87GDH[1] – Unrestrained Gnd Diff		**134**	**1**	**3**	**Struct**			
	ExBlo1-I	134	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	134	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	134	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	134	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	134	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	134	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	134	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Pickup	134	1	3	Bit	0x80 (8)	-	Signal: Pickup
	Trip (*)	134	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	134	1	3	Bit	0x200	-	Signal: Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
87GDH[2] – Unrestrained Gnd Diff		**135**	**1**	**3**	**Struct**			
	ExBlo1-I	135	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	135	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	135	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	135	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	135	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	135	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	135	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Pickup	135	1	3	Bit	0x80 (8)	-	Signal: Pickup
	Trip (*)	135	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	135	1	3	Bit	0x200	-	Signal: Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
87GD[1] – Ground Differential		**132**	**1**	**3**	**Struct**			
	ExBlo1-I	132	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	132	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	132	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	132	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	132	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	132	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	132	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Pickup	132	1	3	Bit	0x80 (8)	-	Signal: Pickup
	Trip (*)	132	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	132	1	3	Bit	0x200	-	Signal: Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
87GD[2] – Ground Differential		**133**	**1**	**3**	**Struct**			
	ExBlo1-I	133	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	133	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	133	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	133	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	133	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	133	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	133	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Pickup	133	1	3	Bit	0x80 (8)	-	Signal: Pickup
	Trip (*)	133	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	133	1	3	Bit	0x200	-	Signal: Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
87H – Unrestrained Phase Diff		**136**	**1**	**3**	**Struct**			
	ExBlo1-I	136	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	136	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	136	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	136	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	136	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	136	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	136	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Pickup	136	1	3	Bit	0x80 (8)	-	Signal: Pickup
	Pickup A	136	1	3	Bit	0x100 (9)	-	Signal: Pickup System Phase A
	Pickup B	136	1	3	Bit	0x200	-	Signal: Pickup System Phase B

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
	Pickup C	136	1	3	Bit	0x400 (11)	-	Signal: Pickup System C
	Trip (*)	136	1	3	Bit	0x800 (12)	-	Signal: Trip
	Trip A (*)	136	1	3	Bit	0x1000 (13)	-	Signal: Trip System Phase A
	Trip B (*)	136	1	3	Bit	0x2000 (14)	-	Signal: Trip System Phase B
	Trip C (*)	136	1	3	Bit	0x4000 (15)	-	Signal: Trip System Phase C
	TripCmd (*)	136	1	3	Bit	0x8000 (16)	-	Signal: Trip Command
BF[1] – Breaker Failure		**53**	**1**	**3**	**Struct**			
	ExBlo1-I	53	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	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	-	Signal: External Blocking

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(4)		
	Trigger1-I	53	1	3	Bit	0x10 (5)	-	Module Input: Trigger that will start the BF
	Trigger2-I	53	1	3	Bit	0x20 (6)	-	Module Input: Trigger that will start the BF
	Trigger3-I	53	1	3	Bit	0x40 (7)	-	Module Input: Trigger that will start the BF
	Pickup	53	1	3	Bit	0x80 (8)	-	Signal: BF-Module Started (Pickup)
	Trip (*)	53	1	3	Bit	0x100 (9)	-	Signal: Breaker Failure Trip
	Lockout (*)	53	1	3	Bit	0x200 (10)	-	Signal: Lockout
	Waiting for Trigger (*)	53	1	3	Bit	0x400 (11)	-	Waiting for Trigger
BF[2] – Breaker Failure		**120**	**1**	**3**	**Struct**			
	ExBlo1-I	120	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	120	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	Active	120	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	120	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Trigger1-I	120	1	3	Bit	0x10 (5)	-	Module Input: Trigger that will start the BF
	Trigger2-I	120	1	3	Bit	0x20 (6)	-	Module Input: Trigger that will start the BF
	Trigger3-I	120	1	3	Bit	0x40 (7)	-	Module Input: Trigger that will start the BF
	Pickup	120	1	3	Bit	0x80 (8)	-	Signal: BF-Module Started (Pickup)
	Trip (*)	120	1	3	Bit	0x100 (9)	-	Signal: Breaker Failure Trip
	Lockout	120	1	3	Bit	0x200 (10)	-	Signal: Lockout
	Waiting for Trigger (*)	120	1	3	Bit	0x400 (11)	-	Waiting for Trigger
Bkr[1]		**123**	**1**	**3**	**Struct**			
	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: IA	123	1	3	Bit	0x20 (6)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded: IA

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Isum Intr trip: IB	123	1	3	Bit	0x40 (7)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded: IB
	Isum Intr trip: IC	123	1	3	Bit	0x80 (8)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded: IC
	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: Breaker Wear curve Alarm
	WearLevel Lockout	123	1	3	Bit	0x400 (11)	-	Signal: Breaker Wear Curve 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.
Bkr[1]		**177**	**1**	**3**	**Struct**			
	CinBkr-52b-I	177	1	3	Bit	0x1 (1)	-	Module Input State: Feed-back signal of the Bkr. (52b)
	CinBkr-52a-I	177	1	3	Bit	0x2 (2)	-	Module Input State: Feed-back signal of the Bkr (52a)
	Ready-I	177	1	3	Bit	0x4 (3)	-	Module Input State: Breaker Ready
	Sys-in-Sync-I	177	1	3	Bit	0x8 (4)	-	State of the module input: This signals has to become true within the synchronization time. If not, switching is unsuccessful.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Interl OPEN1-I	177	1	3	Bit	0x10 (5)	-	State of the module input: Interlocking of the OPEN command
	Interl OPEN2-I	177	1	3	Bit	0x20 (6)	-	State of the module input: Interlocking of the OPEN command
	Interl OPEN3-I	177	1	3	Bit	0x40 (7)	-	State of the module input: Interlocking of the OPEN command
	Interl CLOSE1-I	177	1	3	Bit	0x80 (8)	-	State of the module input: Interlocking of the CLOSE command
	Interl CLOSE2-I	177	1	3	Bit	0x100 (9)	-	State of the module input: Interlocking of the CLOSE command
	Interl CLOSE3-I	177	1	3	Bit	0x200 (10)	-	State of the module input: Interlocking of the CLOSE command
	SC OPEN-I	177	1	3	Bit	0x800 (12)	-	State of the module input: Switching OPEN Command, e.g. the state of the Logics or the state of the digital input
	SC CLOSE-I	177	1	3	Bit	0x1000 (13)	-	State of the module input: Switching CLOSE 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
	OPEN Cmd	177	1	3	Bit	0x4000 (15)	-	Signal: OPEN command issued to the switchgear. Depending on the setting the signal may include the OPEN command of the Prot module.
	OPEN Cmd manual	177	1	3	Bit	0x8000	-	Signal: OPEN Cmd manual

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(16)		
Bkr[1]		**178**	**1**	**3**	**Struct**			
	CLOSE Cmd	178	1	3	Bit	0x1 (1)	-	Signal: CLOSE command issued to the switchgear. Depending on the setting the signal may include the CLOSE command of the Prot module.
	CLOSE Cmd manual	178	1	3	Bit	0x2 (2)	-	Signal: CLOSE Cmd manual
	Sync CLOSE request	178	1	3	Bit	0x4 (3)	-	Signal: Synchronous CLOSE request
	Bwear Slow Breaker	178	1	3	Bit	0x8 (4)	-	Signal: Slow Breaker Alarm
	Res Bwear Sl Breaker	178	1	3	Bit	0x10 (5)	-	Signal: Resetting the slow breaker alarm
	CES Disturbed	178	1	3	Bit	0x40 (7)	-	Signal: Command Execution Supervision: Switching Command unsuccessful. Switchgear in disturbed position.
	CES Field Interl	178	1	3	Bit	0x80 (8)	-	Signal: Command Execution Supervision: Switching Command not executed because of field interlocking.
	CES CLOSE d OPEN	178	1	3	Bit	0x400 (11)	-	Signal: Command Execution Supervision: CLOSE Command during a pending OPEN Command.
	CES SwitchgDir	178	1	3	Bit	0x800 (12)	-	Signal: Command Execution Supervision respectivly Switching Direction Control: This signal becomes true, if a switch command is issued even though the switchgear is already in the requested position. Example: A switchgear that is already OPEN should be switched OPEN

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
								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 SyncTimeout	178	1	3	Bit	0x2000 (14)	-	Signal: Command Execution Supervision: Switching Command not executed. No Synchronization signal while t-sync was running.
	CES succesf	178	1	3	Bit	0x4000 (15)	-	Signal: Command Execution Supervision: Switching command executed successfully.
Bkr[1]		**179**	**1**	**3**	**Struct**			
	Pos Disturb	179	1	3	Bit	0x1 (1)	-	Signal: Breaker Disturbed - Undefined Breaker Position. The feed-back signals (Position Indicators) contradict themselves. After expiring of a supervision timer this signal becomes true.
	Pos Indeterm	179	1	3	Bit	0x4 (3)	-	Signal: Breaker is in Indeterminate Position
	Pos OPEN	179	1	3	Bit	0x8 (4)	-	Signal: Breaker is in OPEN-Position
	Pos CLOSE	179	1	3	Bit	0x10 (5)	-	Signal: Breaker is in CLOSE-Position
	Ready	179	1	3	Bit	0x20 (6)	-	Signal: Breaker is ready for operation.
	Pos not CLOSE	179	1	3	Bit	0x40 (7)	-	Signal: Pos not CLOSE

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	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.
	CES Fail TripCmd	179	1	3	Bit	0x800 (12)	-	Signal: Command Execution Supervision: Command execution failed because trip command is pending.
	Interl OPEN	179	1	3	Bit	0x1000 (13)	-	Signal: One or more IL_Open inputs are active.
	Interl CLOSE	179	1	3	Bit	0x2000 (14)	-	Signal: One or more IL_Close inputs are active.
Bkr[1]		**256**	**1**	**3**	**Struct**			
	CES SG removed	256	1	3	Bit	0x2 (2)	-	Signal: Command Execution Supervision: Switching Command unsuccessful, Switchgear removed.
Bkr[2]		**124**	**1**	**3**	**Struct**			
	Isum Intr trip	124	1	3	Bit	0x10 (5)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded in at least one phase.
	Isum Intr trip: IA	124	1	3	Bit	0x20 (6)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded: IA
	Isum Intr trip: IB	124	1	3	Bit	0x40 (7)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded: IB
	Isum Intr trip: IC	124	1	3	Bit	0x80 (8)	-	Signal: Maximum permissible Summation of the interrupting (tripping) currents exceeded: IC
	Operations Alarm	124	1	3	Bit	0x100	-	Signal: Too many Operations. (The operations counter »TripCmd Cr« has

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(9)		exceeded the limit set at »Operations Alarm«.)
	WearLevel Alarm	124	1	3	Bit	0x200 (10)	-	Signal: Breaker Wear curve Alarm
	WearLevel Lockout	124	1	3	Bit	0x400 (11)	-	Signal: Breaker Wear Curve Lockout Level
	Isum Intr ph Alm	124	1	3	Bit	0x800 (12)	-	Signal: Alarm, the per hour Sum (Limit) of interrupting currents has been exceeded.
Bkr[2]		**180**	**1**	**3**	**Struct**			
	CinBkr-52b-I	180	1	3	Bit	0x1 (1)	-	Module Input State: Feed-back signal of the Bkr. (52b)
	CinBkr-52a-I	180	1	3	Bit	0x2 (2)	-	Module Input State: Feed-back signal of the Bkr (52a)
	Ready-I	180	1	3	Bit	0x4 (3)	-	Module Input State: Breaker Ready
	Sys-in-Sync-I	180	1	3	Bit	0x8 (4)	-	State of the module input: This signals has to become true within the synchronization time. If not, switching is unsuccessful.
	Interl OPEN1-I	180	1	3	Bit	0x10 (5)	-	State of the module input: Interlocking of the OPEN command
	Interl OPEN2-I	180	1	3	Bit	0x20 (6)	-	State of the module input: Interlocking of the OPEN command
	Interl OPEN3-I	180	1	3	Bit	0x40	-	State of the module input: Interlocking of the OPEN command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(7)		
	Interl CLOSE1-I	180	1	3	Bit	0x80 (8)	-	State of the module input: Interlocking of the CLOSE command
	Interl CLOSE2-I	180	1	3	Bit	0x100 (9)	-	State of the module input: Interlocking of the CLOSE command
	Interl CLOSE3-I	180	1	3	Bit	0x200 (10)	-	State of the module input: Interlocking of the CLOSE command
	SC OPEN-I	180	1	3	Bit	0x800 (12)	-	State of the module input: Switching OPEN Command, e.g. the state of the Logics or the state of the digital input
	SC CLOSE-I	180	1	3	Bit	0x1000 (13)	-	State of the module input: Switching CLOSE Command, e.g. the state of the Logics or the state of the digital input
	TripCmd (*)	180	1	3	Bit	0x2000 (14)	-	Signal: Trip Command
	OPEN Cmd	180	1	3	Bit	0x4000 (15)	-	Signal: OPEN command issued to the switchgear. Depending on the setting the signal may include the OPEN command of the Prot module.
	OPEN Cmd manual	180	1	3	Bit	0x8000 (16)	-	Signal: OPEN Cmd manual
Bkr[2]		**181**	**1**	**3**	**Struct**			
	CLOSE Cmd	181	1	3	Bit	0x1 (1)	-	Signal: CLOSE command issued to the switchgear. Depending on the setting the signal may include the CLOSE command of the Prot module.
	CLOSE Cmd manual	181	1	3	Bit	0x2	-	Signal: CLOSE Cmd manual

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(2)		
	Sync CLOSE request	181	1	3	Bit	0x4 (3)	-	Signal: Synchronous CLOSE request
	Bwear Slow Breaker	181	1	3	Bit	0x8 (4)	-	Signal: Slow Breaker Alarm
	Res Bwear Sl Breaker	181	1	3	Bit	0x10 (5)	-	Signal: Resetting the slow breaker alarm
	CES Disturbed	181	1	3	Bit	0x40 (7)	-	Signal: Command Execution Supervision: Switching Command unsuccessful. Switchgear in disturbed position.
	CES Field Interl	181	1	3	Bit	0x80 (8)	-	Signal: Command Execution Supervision: Switching Command not executed because of field interlocking.
	CES CLOSE d OPEN	181	1	3	Bit	0x400 (11)	-	Signal: Command Execution Supervision: CLOSE Command during a pending OPEN Command.
	CES SwitchgDir	181	1	3	Bit	0x800 (12)	-	Signal: Command Execution Supervision respectivly Switching Direction Control: This signal becomes true, if a switch command is issued even though the switchgear is already in the requested position. Example: A switchgear that is already OPEN should be switched OPEN again (doubly). The same applies to CLOSE commands.
	CES SG not ready	181	1	3	Bit	0x1000 (13)	-	Signal: Command Execution Supervision: Switchgear not ready
	CES SyncTimeout	181	1	3	Bit	0x2000	-	Signal: Command Execution Supervision: Switching Command not

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(14)		executed. No Synchronization signal while t-sync was running.
	CES succesf	181	1	3	Bit	0x4000 (15)	-	Signal: Command Execution Supervision: Switching command executed successfully.
Bkr[2]		**182**	**1**	**3**	**Struct**			
	Pos Disturb	182	1	3	Bit	0x1 (1)	-	Signal: Breaker Disturbed - Undefined Breaker Position. The feed-back signals (Position Indicators) contradict themselves. After expiring of a supervision timer this signal becomes true.
	Pos Indeterm	182	1	3	Bit	0x4 (3)	-	Signal: Breaker is in Indeterminate Position
	Pos OPEN	182	1	3	Bit	0x8 (4)	-	Signal: Breaker is in OPEN-Position
	Pos CLOSE	182	1	3	Bit	0x10 (5)	-	Signal: Breaker is in CLOSE-Position
	Ready	182	1	3	Bit	0x20 (6)	-	Signal: Breaker is ready for operation.
	Pos not CLOSE	182	1	3	Bit	0x40 (7)	-	Signal: Pos not CLOSE
	SI SingleContactInd	182	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.
	CES Fail TripCmd	182	1	3	Bit	0x800 (12)	-	Signal: Command Execution Supervision: Command execution failed because trip command is pending.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Interl OPEN	182	1	3	Bit	0x1000 (13)	-	Signal: One or more IL_Open inputs are active.
	Interl CLOSE	182	1	3	Bit	0x2000 (14)	-	Signal: One or more IL_Close inputs are active.
Bkr[2]		**257**	**1**	**3**	**Struct**			
	CES SG removed	257	1	3	Bit	0x2 (2)	-	Signal: Command Execution Supervision: Switching Command unsuccessful, Switchgear removed.
CLPU – Cold Load Pickup		**66**	**1**	**3**	**Struct**			
	ExBlo1-I	66	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking
	ExBlo2-I	66	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking
	Rvs Blo-I	66	1	3	Bit	0x4 (3)	-	Module Input State: Reverse Blocking
	Active	66	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	66	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Rvs Blo	66	1	3	Bit	0x20 (6)	-	Signal: Reverse Blocking
	enabled	66	1	3	Bit	0x200	-	Signal: Cold Load enabled

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(10)		
	detected (*)	66	1	3	Bit	0x400 (11)	-	Signal: Cold Load detected
	I<	66	1	3	Bit	0x800 (12)	-	Signal: No Load Current.
	Load Inrush	66	1	3	Bit	0x2000 (14)	-	Signal: Load Inrush
	Settle Time	66	1	3	Bit	0x4000 (15)	-	Signal: Settle Time
CT W1		**301**	**1**	**3**	**Struct**			
	Phase seq. wrong	301	1	3	Bit	0x1 (1)	-	Signal that the device has detected a phase sequence (A-B-C / A-C-B) that is different from the one that had been set at [System settings / General Settings] »Phase Sequence«.
	Phase seq. wrong	301	1	3	Bit	0x2 (2)	-	Signal that the device has detected a phase sequence (A-B-C / A-C-B) that is different from the one that had been set at [System settings / General Settings] »Phase Sequence«.
CTS[1] – CT Supervision		**137**	**1**	**3**	**Struct**			
	ExBlo1-I	137	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	137	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	Active	137	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	137	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Pickup	137	1	3	Bit	0x10 (5)	-	Signal: Pickup Current Transformer Measuring Circuit Supervision
CTS[2] – CT Supervision		**138**	**1**	**3**	**Struct**			
	ExBlo1-I	138	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	138	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	Active	138	1	3	Bit	0x4 (3)	-	Signal: Active
	ExBlo	138	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Pickup	138	1	3	Bit	0x10 (5)	-	Signal: Pickup 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

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) Switch is disturbed.
	SG Indeterm	176	1	3	Bit	0x10 (5)	-	(At least one) Switch is moving (Position cannot be determined).
DI-8P 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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
ExP[1] – Ext Protection		**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 (6)	-	Signal: Active
	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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip (*)	49	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	49	1	3	Bit	0x800 (12)	-	Signal: Trip Command
ExP[2] – Ext Protection		**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 (4)	-	Module Input State: Alarm
	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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	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] – Ext Protection		**51**	**1**	**3**	**Struct**			
	ExBlo1-I	51	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	51	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	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
ExP[4] – Ext Protection		**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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	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
	Trip (*)	52	1	3	Bit	0x400 (11)	-	Signal: Trip
	TripCmd (*)	52	1	3	Bit	0x800 (12)	-	Signal: Trip Command
Ext Oil Temp		**125**	**1**	**3**	**Struct**			
	ExBlo1-I	125	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	125	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	125	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	125	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	125	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	125	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	125	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	125	1	3	Bit	0x80 (8)	-	Signal: Alarm
	Alarm-I	125	1	3	Bit	0x100 (9)	-	Module Input State: Alarm
	Trip (*)	125	1	3	Bit	0x200 (10)	-	Signal: Trip
	Trip-I (*)	125	1	3	Bit	0x400 (11)	-	Module Input State: Trip
	TripCmd (*)	125	1	3	Bit	0x800 (12)	-	Signal: Trip Command
ExtTempSuperv[1]		**127**	**1**	**3**	**Struct**			
	ExBlo1-I	127	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	127	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	127	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	127	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	127	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	127	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	127	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	127	1	3	Bit	0x80 (8)	-	Signal: Alarm
	Alarm-I	127	1	3	Bit	0x100 (9)	-	Module Input State: Alarm
	Trip (*)	127	1	3	Bit	0x200 (10)	-	Signal: Trip
	Trip-I (*)	127	1	3	Bit	0x400 (11)	-	Module Input State: Trip
	TripCmd (*)	127	1	3	Bit	0x800	-	Signal: Trip Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(12)		
ExtTempSuperv[2]		**128**	**1**	**3**	**Struct**			
	ExBlo1-I	128	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	128	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	128	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	128	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	128	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	128	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	128	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	128	1	3	Bit	0x80 (8)	-	Signal: Alarm
	Alarm-I	128	1	3	Bit	0x100 (9)	-	Module Input State: Alarm
	Trip (*)	128	1	3	Bit	0x200 (10)	-	Signal: Trip

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip-I (*)	128	1	3	Bit	0x400 (11)	-	Module Input State: Trip
	TripCmd (*)	128	1	3	Bit	0x800 (12)	-	Signal: Trip Command
ExtTempSuperv[3]		**129**	**1**	**3**	**Struct**			
	ExBlo1-I	129	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	129	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	129	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	129	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	129	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	129	1	3	Bit	0x20 (6)	-	Signal: Trip Command blocked
	ExBlo TripCmd	129	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	129	1	3	Bit	0x80 (8)	-	Signal: Alarm
	Alarm-I	129	1	3	Bit	0x100	-	Module Input State: Alarm

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(9)		
	Trip (*)	129	1	3	Bit	0x200 (10)	-	Signal: Trip
	Trip-I (*)	129	1	3	Bit	0x400 (11)	-	Module Input State: Trip
	TripCmd (*)	129	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. For Eaton E-Series: EDR-3000 - 2 EDR-5000 - 3 EMR-3000 - 4 EMR-3MP0 - 4 EMR-4000 - 5 EMR-5000 - 6 ETR-4000 - 8 ETR-5000 - 9 EGR-5000 - 12 EBR-3000 - 13
Fast Status Register		**5001**	**1**	**3**	**Struct**			

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Comm Version	5001	1	3	Bit	0xffff (1)	-	Modbus Communication version. This version number changes if something becomes incompatible between different Modbus releases.
Fast Status Register		**5002**	**1**	**3**	**Struct**			
	Config Bin Inp1-I	5002	1	3	Bit	0x1 (1)	-	State of the module input: Config Bin Inp
	Config Bin Inp2-I	5002	1	3	Bit	0x2 (2)	-	State of the module input: Config Bin Inp
	Config Bin Inp3-I	5002	1	3	Bit	0x4 (3)	-	State of the module input: Config Bin Inp
	Config Bin Inp4-I	5002	1	3	Bit	0x8 (4)	-	State of the module input: Config Bin Inp
	Config Bin Inp5-I	5002	1	3	Bit	0x10 (5)	-	State of the module input: Config Bin Inp
	Config Bin Inp6-I	5002	1	3	Bit	0x20 (6)	-	State of the module input: Config Bin Inp
	Config Bin Inp7-I	5002	1	3	Bit	0x40 (7)	-	State of the module input: Config Bin Inp
	Config Bin Inp8-I	5002	1	3	Bit	0x80 (8)	-	State of the module input: Config Bin Inp
	Config Bin Inp9-I	5002	1	3	Bit	0x100 (9)	-	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
	Config Bin Inp10-I	5002	1	3	Bit	0x200 (10)	-	State of the module input: Config Bin Inp
	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

Module (ANSI / IEEE)	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.
IH2[1] – Inrush		**22**	**1**	**3**	**Struct**			
	ExBlo1-I	22	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	22	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	Active	22	1	3	Bit	0x4 (3)	-	Signal: Active
	ExBlo	22	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Blo Phase A	22	1	3	Bit	0x10 (5)	-	Signal: Blocked Phase A

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Blo Phase B	22	1	3	Bit	0x20 (6)	-	Signal: Blocked Phase B
	Blo Phase C	22	1	3	Bit	0x40 (7)	-	Signal: Blocked Phase C
	Blo IG meas	22	1	3	Bit	0x80 (8)	-	Signal: Blocking of the ground protection module (measured ground current)
	3-ph Blo	22	1	3	Bit	0x100 (9)	-	Signal: Inrush was detected in at least one phase - trip command blocked.
	Blo IG calc	22	1	3	Bit	0x200 (10)	-	Signal: Blocking of the ground protection module (calculated ground current)
IH2[2] – Inrush		**122**	**1**	**3**	**Struct**			
	ExBlo1-I	122	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	122	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	Active	122	1	3	Bit	0x4 (3)	-	Signal: Active
	ExBlo	122	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Blo Phase A	122	1	3	Bit	0x10 (5)	-	Signal: Blocked Phase A
	Blo Phase B	122	1	3	Bit	0x20	-	Signal: Blocked Phase B

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(6)		
	Blo Phase C	122	1	3	Bit	0x40 (7)	-	Signal: Blocked Phase C
	Blo IG meas	122	1	3	Bit	0x80 (8)	-	Signal: Blocking of the ground protection module (measured ground current)
	3-ph Blo	122	1	3	Bit	0x100 (9)	-	Signal: Inrush was detected in at least one phase - trip command blocked.
	Blo IG calc	122	1	3	Bit	0x200 (10)	-	Signal: Blocking of the ground protection module (calculated ground current)
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.
Logic		**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)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE1.Out inverted	1100	1	3	Bit	0x8 (4)	-	Signal: Negated Latched Output (Q NOT)
	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
Logic		**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)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE2.Gate In1-I	1101	1	3	Bit	0x10 (5)	-	State of the module input: Assignment of the Input Signal
	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
Logic		**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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE3.Gate In2-I	1102	1	3	Bit	0x20 (6)	-	State of the module input: Assignment of the Input Signal
	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
Logic		**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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE4.Gate In3-I	1103	1	3	Bit	0x40 (7)	-	State of the module input: Assignment of the Input Signal
	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
Logic		**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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE5.Gate In4-I	1104	1	3	Bit	0x80 (8)	-	State of the module input: Assignment of the Input Signal
	LE5.Reset Latch-I	1104	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logic		**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

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE6.Reset Latch-I	1105	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logic		**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
Logic		**1107**	**1**	**3**	**Struct**			

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	LE8.Gate Out	1107	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	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
Logic		**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

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
Logic		**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 (3)	-	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
	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
Logic		**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 (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
	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
Logic		**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)
	LE12.Gate In1-I	1111	1	3	Bit	0x10 (5)	-	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
	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
Logic		**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
	LE13.Gate In2-I	1112	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
	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
Logic		**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
	LE14.Gate In3-I	1113	1	3	Bit	0x40 (7)	-	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 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
Logic		**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
	LE15.Gate In4-I	1114	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
	LE15.Reset Latch-I	1114	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logic		**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
	LE16.Reset Latch-I	1115	1	3	Bit	0x100 (9)	-	State of the module input: Reset Signal for the Latching
Logic		**1116**	**1**	**3**	**Struct**			

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	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
Logic		**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	-	Signal: Timer Output

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(2)		
	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
Logic		**1118**	**1**	**3**	**Struct**			
	LE19.Gate Out	1118	1	3	Bit	0x1 (1)	-	Signal: Output of the logic gate
	LE19.Timer Out	1118	1	3	Bit	0x2 (2)	-	Signal: Timer Output
	LE19.Out	1118	1	3	Bit	0x4 (3)	-	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
	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
Logic		**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 (2)	-	Signal: Timer Output
	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)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	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
Modbus		**1005**	**1**	**3**	**Struct**			
	Comm Cmd 1	1005	1	3	Bit	0x1 (1)	-	Communication Command
	Comm Cmd 2	1005	1	3	Bit	0x2 (2)	-	Communication Command
	Comm Cmd 3	1005	1	3	Bit	0x4 (3)	-	Communication Command
	Comm Cmd 4	1005	1	3	Bit	0x8 (4)	-	Communication Command
	Comm Cmd 5	1005	1	3	Bit	0x10 (5)	-	Communication Command
	Comm Cmd 6	1005	1	3	Bit	0x20	-	Communication Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(6)		
	Comm Cmd 7	1005	1	3	Bit	0x40 (7)	-	Communication Command
	Comm Cmd 8	1005	1	3	Bit	0x80 (8)	-	Communication Command
	Comm Cmd 9	1005	1	3	Bit	0x100 (9)	-	Communication Command
	Comm Cmd 10	1005	1	3	Bit	0x200 (10)	-	Communication Command
	Comm Cmd 11	1005	1	3	Bit	0x400 (11)	-	Communication Command
	Comm Cmd 12	1005	1	3	Bit	0x800 (12)	-	Communication Command
	Comm Cmd 13	1005	1	3	Bit	0x1000 (13)	-	Communication Command
	Comm Cmd 14	1005	1	3	Bit	0x2000 (14)	-	Communication Command
	Comm Cmd 15	1005	1	3	Bit	0x4000 (15)	-	Communication Command
	Comm Cmd 16	1005	1	3	Bit	0x8000 (16)	-	Communication Command
PSet-Switch		**59**	**1**	**3**	**Struct**			

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	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
	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 Comm	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.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	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
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
	Pickup Phase A	1	1	3	Bit	0x10 (5)	-	Signal: General Pickup Phase A
	Pickup Phase B	1	1	3	Bit	0x20 (6)	-	Signal: General Pickup Phase B
	Pickup Phase C	1	1	3	Bit	0x40 (7)	-	Signal: General Pickup Phase C
	Pickup IX or IR	1	1	3	Bit	0x80 (8)	-	Signal: General Pickup - Ground Fault
	Pickup	1	1	3	Bit	0x100	-	Signal: General Pickup

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(9)		
	Trip Phase A (*)	1	1	3	Bit	0x200 (10)	-	Signal: General Trip Phase A
	Trip Phase B (*)	1	1	3	Bit	0x400 (11)	-	Signal: General Trip Phase B
	Trip Phase C (*)	1	1	3	Bit	0x800 (12)	-	Signal: General Trip Phase C
	Trip IX or IR (*)	1	1	3	Bit	0x1000 (13)	-	Signal: General Trip Ground Fault
	Trip (*)	1	1	3	Bit	0x2000 (14)	-	Signal: General Trip
Prot		**57**	**1**	**3**	**Struct**			
	Fault No.	57	1	3	Bit	0xffff (1)	-	Waveform number
RO-4Z X2		**152**	**1**	**3**	**Struct**			
	DISARMED!	152	1	3	Bit	0x1 (1)	-	Signal: CAUTION! RELAYS DISARMED in order to safely perform maintenance while eliminating the risk of taking an entire process off-line. (Note: Zone Interlocking and Supervision Contact cannot be disarmed). YOU MUST ENSURE that the relays are ARMED AGAIN after maintenance
	Outs forced	152	1	3	Bit	0x2 (2)	-	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.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ZI OUT	152	1	3	Bit	0x4 (3)	-	Signal: Zone Interlocking OUT
	RO 1	152	1	3	Bit	0x8 (4)	-	Signal: Relay Output
	RO 2	152	1	3	Bit	0x10 (5)	-	Signal: Relay Output
	RO 3	152	1	3	Bit	0x20 (6)	-	Signal: Relay Output
	RO 4	152	1	3	Bit	0x40 (7)	-	Signal: Relay Output
RO-4Z X5		**153**	**1**	**3**	**Struct**			
	DISARMED!	153	1	3	Bit	0x1 (1)	-	Signal: CAUTION! RELAYS DISARMED in order to safely perform maintenance while eliminating the risk of taking an entire process off-line. (Note: Zone Interlocking and Supervision Contact cannot be disarmed). YOU MUST ENSURE that the relays are ARMED AGAIN after maintenance
	Outs forced	153	1	3	Bit	0x2 (2)	-	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.
	ZI OUT	153	1	3	Bit	0x4 (3)	-	Signal: Zone Interlocking OUT
	RO 1	153	1	3	Bit	0x8 (4)	-	Signal: Relay Output

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	RO 2	153	1	3	Bit	0x10 (5)	-	Signal: Relay Output
	RO 3	153	1	3	Bit	0x20 (6)	-	Signal: Relay Output
	RO 4	153	1	3	Bit	0x40 (7)	-	Signal: Relay Output
RTD		**143**	**1**	**3**	**Struct**			
	ExBlo1-I	143	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	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	-	Alarm RTD Temperature Protection

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(8)		
	Trip (*)	143	1	3	Bit	0x100 (9)	-	Signal: Trip
	TripCmd (*)	143	1	3	Bit	0x200 (10)	-	Signal: Trip Command
RTD		**144**	**1**	**3**	**Struct**			
	W1-A Alarm	144	1	3	Bit	0x1 (1)	-	Winding1 Phase A Alarm RTD Temperature Protection
	W1-A Timeout Alarm	144	1	3	Bit	0x2 (2)	-	Winding1 Phase A Timeout Alarm
	W1-A Trip (*)	144	1	3	Bit	0x4 (3)	-	Winding1 Phase A Signal: Trip
	W1-A Invalid	144	1	3	Bit	0x8 (4)	-	Winding1 Phase A Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	W1-B Alarm	144	1	3	Bit	0x10 (5)	-	Winding1 Phase B Alarm RTD Temperature Protection
	W1-B Timeout Alarm	144	1	3	Bit	0x20 (6)	-	Winding1 Phase B Timeout Alarm
	W1-B Trip (*)	144	1	3	Bit	0x40 (7)	-	Winding1 Phase B Signal: Trip
	W1-B Invalid	144	1	3	Bit	0x80	-	Winding1 Phase B Signal: Invalid Temperature Measurement Value (e.g

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(8)		caused by an defective or interrupted RTD Measurement)
	W1-C Alarm	144	1	3	Bit	0x100 (9)	-	Winding1 Phase C Alarm RTD Temperature Protection
	W1-C Timeout Alarm	144	1	3	Bit	0x200 (10)	-	Winding1 Phase C Timeout Alarm
	W1-C Trip (*)	144	1	3	Bit	0x400 (11)	-	Winding1 Phase C Signal: Trip
	W1-C Invalid	144	1	3	Bit	0x800 (12)	-	Winding1 Phase C Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	W2-A Alarm	144	1	3	Bit	0x1000 (13)	-	Winding2 Phase A Alarm RTD Temperature Protection
	W2-A Timeout Alarm	144	1	3	Bit	0x2000 (14)	-	Winding2 Phase A Timeout Alarm
	W2-A Trip (*)	144	1	3	Bit	0x4000 (15)	-	Winding2 Phase A Signal: Trip
	W2-A Invalid	144	1	3	Bit	0x8000 (16)	-	Winding2 Phase A Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
RTD		**145**	**1**	**3**	**Struct**			
	W2-B Alarm	145	1	3	Bit	0x1 (1)	-	Winding2 Phase B Alarm RTD Temperature Protection
	W2-B Timeout Alarm	145	1	3	Bit	0x2	-	Winding2 Phase B Timeout Alarm

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(2)		
	W2-B Trip (*)	145	1	3	Bit	0x4 (3)	-	Winding2 Phase B Signal: Trip
	W2-B Invalid	145	1	3	Bit	0x8 (4)	-	Winding2 Phase B Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	W2-C Alarm	145	1	3	Bit	0x10 (5)	-	Winding2 Phase C Alarm RTD Temperature Protection
	W2-C Timeout Alarm	145	1	3	Bit	0x20 (6)	-	Winding2 Phase C Timeout Alarm
	W2-C Trip (*)	145	1	3	Bit	0x40 (7)	-	Winding2 Phase C Signal: Trip
	W2-C Invalid	145	1	3	Bit	0x80 (8)	-	Winding2 Phase C Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Amb 1 Alarm	145	1	3	Bit	0x100 (9)	-	Ambient 1 Alarm RTD Temperature Protection
	Amb 1 Timeout Alarm	145	1	3	Bit	0x200 (10)	-	Ambient 1 Timeout Alarm
	Amb 1 Trip (*)	145	1	3	Bit	0x400 (11)	-	Ambient 1 Signal: Trip
	Amb 1 Invalid	145	1	3	Bit	0x800 (12)	-	Ambient 1 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Amb 2 Alarm	145	1	3	Bit	0x1000 (13)	-	Ambient 2 Alarm RTD Temperature Protection
	Amb 2 Timeout Alarm	145	1	3	Bit	0x2000 (14)	-	Ambient 2 Timeout Alarm
	Amb 2 Trip (*)	145	1	3	Bit	0x4000 (15)	-	Ambient 2 Signal: Trip
	Amb 2 Invalid	145	1	3	Bit	0x8000 (16)	-	Ambient 2 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
RTD		**146**	**1**	**3**	**Struct**			
	Aux 1 Alarm	146	1	3	Bit	0x1 (1)	-	Auxiliary 1 Alarm RTD Temperature Protection
	Aux 1 Timeout Alarm	146	1	3	Bit	0x2 (2)	-	Auxiliary 1 Timeout Alarm
	Aux 1 Trip (*)	146	1	3	Bit	0x4 (3)	-	Auxiliary 1 Signal: Trip
	Aux 1 Invalid	146	1	3	Bit	0x8 (4)	-	Auxiliary 1 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Aux 2 Alarm	146	1	3	Bit	0x10 (5)	-	Auxiliary 2 Alarm RTD Temperature Protection
	Aux 2 Timeout Alarm	146	1	3	Bit	0x20 (6)	-	Auxiliary 2 Timeout Alarm

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Aux 2 Trip (*)	146	1	3	Bit	0x40 (7)	-	Auxiliary 2 Signal: Trip
	Aux 2 Invalid	146	1	3	Bit	0x80 (8)	-	Auxiliary 2 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Aux 3 Alarm	146	1	3	Bit	0x100 (9)	-	Auxiliary 3 Alarm RTD Temperature Protection
	Aux 3 Timeout Alarm	146	1	3	Bit	0x200 (10)	-	Auxiliary 3 Timeout Alarm
	Aux 3 Trip (*)	146	1	3	Bit	0x400 (11)	-	Auxiliary 3 Signal: Trip
	Aux 3 Invalid	146	1	3	Bit	0x800 (12)	-	Auxiliary 4 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	WD W1 Group Invalid	146	1	3	Bit	0x1000 (13)	-	Winding W1 Group Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	WD W2 Group Invalid	146	1	3	Bit	0x2000 (14)	-	Winding W2 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**			
	Amb Group Invalid	147	1	3	Bit	0x1	-	Ambient Group Signal: Invalid Temperature Measurement Value (e.g

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(1)		caused by an defective or interrupted RTD Measurement)
	Alarm Amb Group	147	1	3	Bit	0x2 (2)	-	Alarm all Windings of group Ambient
	TimeoutAlmAmbGrp	147	1	3	Bit	0x4 (3)	-	Timeout Alarm of group Ambient
	Trip Amb Group (*)	147	1	3	Bit	0x8 (4)	-	Trip all Windings of group Ambient
	Alarm WD W2 Group	147	1	3	Bit	0x10 (5)	-	Alarm all Windings of group W2
	TimeoutAlmWDW2Grp	147	1	3	Bit	0x20 (6)	-	Timeout Alarm of group W2
	Trip WD W2 Group (*)	147	1	3	Bit	0x40 (7)	-	Trip all Windings of group W2
	Alarm WD W1 Group	147	1	3	Bit	0x80 (8)	-	Alarm all Windings of group W1
	TimeoutAlmWDW1Grp	147	1	3	Bit	0x100 (9)	-	Timeout Alarm of group W1
	Trip WD W1 Group (*)	147	1	3	Bit	0x200 (10)	-	Trip all Windings of group W1
	Voting Trip Grp 1 (*)	147	1	3	Bit	0x2000 (14)	-	Voting Trip Group 1

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Voting Trip Grp 2 (*)	147	1	3	Bit	0x4000 (15)	-	Voting Trip Group 2
RTD		**205**	**1**	**3**	**Struct**			
	Alarm Any Group	205	1	3	Bit	0x1 (1)	-	Alarm Any Group
	Trip Any Group (*)	205	1	3	Bit	0x2 (2)	-	Trip Any Group
	TimeoutAlmAnyGrp	205	1	3	Bit	0x4 (3)	-	Timeout Alarm Any Group
	Aux4 Alarm	205	1	3	Bit	0x8 (4)	-	Auxiliary 4 Alarm RTD Temperature Protection
	Aux4 Timeout Alarm	205	1	3	Bit	0x10 (5)	-	Auxiliary 4 Timeout Alarm
	Aux4 Invalid	205	1	3	Bit	0x20 (6)	-	Auxiliary 4 Signal: Invalid Temperature Measurement Value (e.g caused by an defective or interrupted RTD Measurement)
	Aux4 Trip (*)	205	1	3	Bit	0x40 (7)	-	Auxiliary 4 Signal: Trip
	AuxGrpInvalid	205	1	3	Bit	0x80 (8)	-	Invalid Auxiliary Group
	Alarm Aux Group	205	1	3	Bit	0x100 (9)	-	Alarm Auxiliary Group

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	TimeoutAlmAuxGrp	205	1	3	Bit	0x200 (10)	-	Timeout Alarm Auxiliary Group
	Trip Aux Group (*)	205	1	3	Bit	0x400 (11)	-	Trip Auxiliary Group
SOTF – Switch Onto Fault		**65**	**1**	**3**	**Struct**			
	ExBlo1-I	65	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking
	ExBlo2-I	65	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking
	Ext SOTF-I	65	1	3	Bit	0x4 (3)	-	Module Input State: External Switch Onto Fault Alarm
	Rvs Blo-I	65	1	3	Bit	0x8 (4)	-	Module Input State: Reverse Blocking
	Active	65	1	3	Bit	0x10 (5)	-	Signal: Active
	ExBlo	65	1	3	Bit	0x20 (6)	-	Signal: External Blocking
	Rvs Blo	65	1	3	Bit	0x40 (7)	-	Signal: Reverse Blocking
	enabled	65	1	3	Bit	0x800 (12)	-	Signal: Switch Onto Fault enabled. This Signal can be used to modify Overcurrent Protection Settings.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	I<	65	1	3	Bit	0x2000 (14)	-	Signal: No Load Current.
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 (5)	-	Signal: A new warning message has been issued.
	Active	273	1	3	Bit	0x20 (6)	-	Signal: Active
Sgen		**1012**	**1**	**3**	**Struct**			
	ExBlo1-I	1012	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	Ex ForcePost-I	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-I	1012	1	3	Bit	0x100 (9)	-	State of the module input:External Start of Fault Simulation (Using the test parameters)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	ExBlo2-I	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 (13)	-	Fault Simulation has been started
	Stopped	1012	1	3	Bit	0x2000 (14)	-	Fault Simulation has been stopped
Sudden Press		**126**	**1**	**3**	**Struct**			
	ExBlo1-I	126	1	3	Bit	0x1 (1)	-	Module Input State: External Blocking1
	ExBlo2-I	126	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	126	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking of the Trip Command
	Active	126	1	3	Bit	0x8 (4)	-	Signal: Active
	ExBlo	126	1	3	Bit	0x10 (5)	-	Signal: External Blocking
	Blo TripCmd	126	1	3	Bit	0x20	-	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
						(6)		
	ExBlo TripCmd	126	1	3	Bit	0x40 (7)	-	Signal: External Blocking of the Trip Command
	Alarm	126	1	3	Bit	0x80 (8)	-	Signal: Alarm
	Alarm-I	126	1	3	Bit	0x100 (9)	-	Module Input State: Alarm
	Trip (*)	126	1	3	Bit	0x200 (10)	-	Signal: Trip
	Trip-I (*)	126	1	3	Bit	0x400 (11)	-	Module Input State: Trip
	TripCmd (*)	126	1	3	Bit	0x800 (12)	-	Signal: Trip Command
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 Comm	154	1	3	Bit	0x8 (4)	-	Signal: Arc Flash Reduction Maintenance Comm Mode

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	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.
	Program Mode Bypass	154	1	3	Bit	0x100 (9)	-	Signal: Short-period bypass of the Program Mode.
SysA		**173**	**1**	**3**	**Struct**			
	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 Demd	173	1	3	Bit	0x4 (3)	-	Signal: Alarm Current demand value
	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 Demd (*)	173	1	3	Bit	0x1000 (13)	-	Signal: Trip Current demand value

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Trip I THD (*)	173	1	3	Bit	0x2000 (14)	-	Signal: Trip Total Harmonic Distortion Current
TCM[1] – Trip Coil Monitor		**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
	ExBlo	150	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Pickup	150	1	3	Bit	0x10 (5)	-	Signal: Pickup Trip Circuit Supervision
	Not Possible	150	1	3	Bit	0x20 (6)	-	Not possible because no state indicator assigned to the breaker.
	CinBkr-52a-I	150	1	3	Bit	0x100 (9)	-	Module Input State: Feed-back signal of the Bkr (52a)
	CinBkr-52b-I	150	1	3	Bit	0x200 (10)	-	Module Input State: Feed-back signal of the Bkr. (52b)
TCM[2] – Trip Coil Monitor		**151**	**1**	**3**	**Struct**			
	ExBlo1-I	151	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	151	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking2
	Active	151	1	3	Bit	0x4 (3)	-	Signal: Active
	ExBlo	151	1	3	Bit	0x8 (4)	-	Signal: External Blocking
	Pickup	151	1	3	Bit	0x10 (5)	-	Signal: Pickup Trip Circuit Supervision
	Not Possible	151	1	3	Bit	0x20 (6)	-	Not possible because no state indicator assigned to the breaker.
	CinBkr-52a-I	151	1	3	Bit	0x100 (9)	-	Module Input State: Feed-back signal of the Bkr (52a)
	CinBkr-52b-I	151	1	3	Bit	0x200 (10)	-	Module Input State: Feed-back signal of the Bkr. (52b)
TimeSync		**54**	**1**	**3**	**Struct**			
	synchronized	54	1	3	Bit	0x1 (1)	-	Clock is synchronized.
URTD		**1007**	**1**	**3**	**Struct**			
	W1-A Superv	1007	1	3	Bit	0x1 (1)	-	Signal: Winding1 Phase A, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	W1-B Superv	1007	1	3	Bit	0x2 (2)	-	Signal: Winding1 Phase B, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)
	W1-C Superv	1007	1	3	Bit	0x4 (3)	-	Signal: Winding1 Phase C, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)
	W2-A Superv	1007	1	3	Bit	0x8 (4)	-	Signal: Winding2 Phase A, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)
	W2-B Superv	1007	1	3	Bit	0x10 (5)	-	Signal: Winding2 Phase B, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)
	W2-C Superv	1007	1	3	Bit	0x20 (6)	-	Signal: Winding2 Phase C, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)
	Amb1 Superv	1007	1	3	Bit	0x40 (7)	-	Signal: Ambient1, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)
	Amb2 Superv	1007	1	3	Bit	0x80 (8)	-	Signal: Ambient2, 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	0x100 (9)	-	Signal: Auxiliary1, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)
	Aux2 Superv	1007	1	3	Bit	0x200 (10)	-	Signal: Auxiliary2, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)
	Aux3 Superv	1007	1	3	Bit	0x400	-	Signal: Auxiliary3, Channel Supervision. The value “1” reports a detected

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(11)		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.)
	Aux4 Superv	1007	1	3	Bit	0x1000 (13)	-	Signal: Auxiliary4, Channel Supervision. The value “1” reports a detected channel failure. (The value “0” means that this RTD channel is healthy.)
Wired Inputs		**171**	**1**	**3**	**Struct**			
	TOCa M1-I	171	1	3	Bit	0x1 (1)	-	State of the module input: Main 1 Breaker Connected
	TOCa M2-I	171	1	3	Bit	0x2 (2)	-	State of the module input: Main 2 Breaker Connected
	TOCa T-I	171	1	3	Bit	0x4 (3)	-	State of the module input: Tie Breaker Connected
	43/10 M1-I	171	1	3	Bit	0x8 (4)	-	State of the module input: Main 1 Breaker Selected To Trip
	43/10 M2-I	171	1	3	Bit	0x10 (5)	-	State of the module input: Main 2 Breaker Selected To Trip
	43/10 T-I	171	1	3	Bit	0x20 (6)	-	State of the module input: Tie Breaker Selected To Trip
	43 A-I	171	1	3	Bit	0x40 (7)	-	State of the module input: System in Auto

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	43 M-I	171	1	3	Bit	0x80 (8)	-	State of the module input: System In Manual
	43 P1-I	171	1	3	Bit	0x100 (9)	-	State of the module input: Preferred Source 1
	43 P2-I	171	1	3	Bit	0x200 (10)	-	State of the module input: Preferred Source 2
	52a M1-I	171	1	3	Bit	0x400 (11)	-	State of the module input: Main 1 Breaker Closed
	52a M2-I	171	1	3	Bit	0x800 (12)	-	State of the module input: Main 2 Breaker Closed
	52a T-I	171	1	3	Bit	0x1000 (13)	-	State of the module input: Tie Breaker Closed
	52b M1-I	171	1	3	Bit	0x2000 (14)	-	State of the module input: Main 1 Breaker Open
	52b M2-I	171	1	3	Bit	0x4000 (15)	-	State of the module input: Main 2 Breaker Open
	52b T-I	171	1	3	Bit	0x8000 (16)	-	State of the module input: Tie Breaker Open
Wired Inputs		**172**	**1**	**3**	**Struct**			
	Bkr Trouble-I	172	1	3	Bit	0x1 (1)	-	Breaker Trouble

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
ZI[1] – Zone Interlocking		**139**	**1**	**3**	**Struct**			
	ExBlo1-I	139	1	3	Bit	0x2 (2)	-	Module Input State: External Blocking1
	ExBlo2-I	139	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	139	1	3	Bit	0x8 (4)	-	Module Input State: External Blocking of the Trip Command
	Bkr Blo	139	1	3	Bit	0x10 (5)	-	Signal: Blocked by Breaker Failure
	Active	139	1	3	Bit	0x20 (6)	-	Signal: Active
	ExBlo	139	1	3	Bit	0x40 (7)	-	Signal: External Blocking
	Blo TripCmd	139	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	139	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Ground OUT	139	1	3	Bit	0x200 (10)	-	Signal: Zone Interlocking Ground OUT
	Ground Pickup	139	1	3	Bit	0x400 (11)	-	Signal: Zone Interlocking Ground Pickup

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
	Ground Trip (*)	139	1	3	Bit	0x800 (12)	-	Signal: Zone Interlocking Ground Trip
	Phase OUT	139	1	3	Bit	0x1000 (13)	-	Signal: Zone Interlocking Phase OUT
	Phase Pickup	139	1	3	Bit	0x2000 (14)	-	Signal: Zone Interlocking Phase Pickup
	Phase Trip (*)	139	1	3	Bit	0x4000 (15)	-	Signal: Zone Interlocking Phase Trip
	IN	139	1	3	Bit	0x8000 (16)	-	Signal: Zone Interlocking IN
ZI[1] – Zone Interlocking		**140**	**1**	**3**	**Struct**			
	OUT	140	1	3	Bit	0x1 (1)	-	Signal: Zone Interlocking OUT
	Pickup	140	1	3	Bit	0x2 (2)	-	Signal: Pickup Zone Interlocking
	Trip (*)	140	1	3	Bit	0x4 (3)	-	Signal: Zone Interlocking Trip Logic
	TripCmd (*)	140	1	3	Bit	0x8 (4)	-	Signal: Zone Interlocking Trip Command
ZI[2] – Zone Interlocking		**141**	**1**	**3**	**Struct**			
	ExBlo1-I	141	1	3	Bit	0x2	-	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
						(2)		
	ExBlo2-I	141	1	3	Bit	0x4 (3)	-	Module Input State: External Blocking2
	ExBlo TripCmd-I	141	1	3	Bit	0x8 (4)	-	Module Input State: External Blocking of the Trip Command
	Bkr Blo	141	1	3	Bit	0x10 (5)	-	Signal: Blocked by Breaker Failure
	Active	141	1	3	Bit	0x20 (6)	-	Signal: Active
	ExBlo	141	1	3	Bit	0x40 (7)	-	Signal: External Blocking
	Blo TripCmd	141	1	3	Bit	0x80 (8)	-	Signal: Trip Command blocked
	ExBlo TripCmd	141	1	3	Bit	0x100 (9)	-	Signal: External Blocking of the Trip Command
	Ground OUT	141	1	3	Bit	0x200 (10)	-	Signal: Zone Interlocking Ground OUT
	Ground Pickup	141	1	3	Bit	0x400 (11)	-	Signal: Zone Interlocking Ground Pickup
	Ground Trip (*)	141	1	3	Bit	0x800 (12)	-	Signal: Zone Interlocking Ground Trip
	Phase OUT	141	1	3	Bit	0x1000	-	Signal: Zone Interlocking Phase OUT

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(13)		
	Phase Pickup	141	1	3	Bit	0x2000 (14)	-	Signal: Zone Interlocking Phase Pickup
	Phase Trip (*)	141	1	3	Bit	0x4000 (15)	-	Signal: Zone Interlocking Phase Trip
	IN	141	1	3	Bit	0x8000 (16)	-	Signal: Zone Interlocking IN
ZI[2] – Zone Interlocking		**142**	**1**	**3**	**Struct**			
	OUT	142	1	3	Bit	0x1 (1)	-	Signal: Zone Interlocking OUT
	Pickup	142	1	3	Bit	0x2 (2)	-	Signal: Pickup Zone Interlocking
	Trip (*)	142	1	3	Bit	0x4 (3)	-	Signal: Zone Interlocking Trip Logic
	TripCmd (*)	142	1	3	Bit	0x8 (4)	-	Signal: Zone Interlocking Trip Command

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
49 – Thermal	Thermal Cap Used	20110	2	4	Float IEE754		%	Measured value: Thermal Capacity Used
49 – Thermal	Time To Trip	20112	2	4	Float IEE754		s	Measured value (calculated/measured): Remaining time until the thermal overload module will trip
49 – Thermal	Thermal Cap max	21086	2	4	Float IEE754		%	Thermal Capacity maximum value
87 – Phase Differential	IdA H2	20280	2	4	Float IEE754		%	Measured Value (Calculated): Differential Current Phase A Harmonic:2
87 – Phase Differential	IdB H2	20282	2	4	Float IEE754		%	Measured Value (Calculated): Differential Current Phase B Harmonic:2
87 – Phase Differential	IdC H2	20284	2	4	Float IEE754		%	Measured Value (Calculated): Differential Current Phase C Harmonic:2
87 – Phase Differential	IdA H4	20286	2	4	Float IEE754		%	Measured Value (Calculated): Differential Current Phase A Harmonic:4
87 – Phase Differential	IdB H4	20288	2	4	Float IEE754		%	Measured Value (Calculated): Differential Current Phase B Harmonic:4
87 – Phase Differential	IdC H4	20290	2	4	Float IEE754		%	Measured Value (Calculated): Differential Current Phase C Harmonic:4
87 – Phase Differential	IdA H5	20292	2	4	Float IEE754		%	Measured Value (Calculated): Differential Current Phase A Harmonic:5
87 – Phase Differential	IdB H5	20294	2	4	Float IEE754		%	Measured Value (Calculated): Differential Current Phase B Harmonic:5
87 – Phase Differential	IdC H5	20296	2	4	Float IEE754		%	Measured Value (Calculated): Differential Current Phase C Harmonic:5
87 – Phase Differential	IdA	20352	2	4	Float IEE754		Ib	Measured Value (Calculated): Differential Current Phase A
87 – Phase Differential	IdB	20354	2	4	Float IEE754		Ib	Measured Value (Calculated): Differential Current Phase B

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
87 – Phase Differential	IdC	20356	2	4	Float IEE754		Ib	Measured Value (Calculated): Differential Current Phase C
87 – Phase Differential	IrA	20358	2	4	Float IEE754		Ib	Measured Value (Calculated): Restraint Current Phase A
87 – Phase Differential	IrB	20360	2	4	Float IEE754		Ib	Measured Value (Calculated): Restraint Current Phase B
87 – Phase Differential	IrC	20362	2	4	Float IEE754		Ib	Measured Value (Calculated): Restraint Current Phase C
87 – Phase Differential	IdAH2max	21342	2	4	Float IEE754		%	Maximum Value IdAH2
87 – Phase Differential	IdBH2max	21348	2	4	Float IEE754		%	Maximum Value IdBH2
87 – Phase Differential	IdCH2max	21354	2	4	Float IEE754		%	Maximum Value IdCH2
87 – Phase Differential	IdAH4max	21360	2	4	Float IEE754		%	Maximum Value IdAH4
87 – Phase Differential	IdBH4max	21366	2	4	Float IEE754		%	Maximum Value IdBH4
87 – Phase Differential	IdCH4max	21372	2	4	Float IEE754		%	Maximum Value IdCH4
87 – Phase Differential	IdAH5max	21378	2	4	Float IEE754		%	Maximum Value IdAH5
87 – Phase Differential	IdBH5max	21384	2	4	Float IEE754		%	Maximum Value IdBH5
87 – Phase Differential	IdCH5max	21390	2	4	Float IEE754		%	Maximum Value IdCH5
87GD – Ground Differential	IdG W1	20364	2	4	Float IEE754		A	Measured Value (Calculated): Ground Differential Current Winding 1
87GD – Ground Differential	IrG W1	20366	2	4	Float IEE754		A	Measured Value (Calculated): Ground Restraint Current Winding 1
87GD – Ground Differential	IdG W2	20368	2	4	Float IEE754		A	Measured Value (Calculated): Ground Differential Current Winding 2

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
87GD – Ground Differential	IrG W2	20370	2	4	Float IEE754		A	Measured Value (Calculated): Ground Restraint Current Winding 2
Bkr[1]	TripCmd Cr	20006	2	4	Float IEE754		-	Counter: Total number of trips of the switch.
Bkr[1]	Isum trip IA	20182	2	4	Float IEE754		A	Summation of the tripping currents phase
Bkr[1]	Isum trip IB	20184	2	4	Float IEE754		A	Summation of the tripping currents phase
Bkr[1]	Isum trip IC	20186	2	4	Float IEE754		A	Summation of the tripping currents phase
Bkr[1]	Bkr Wear Level	24080	2	4	Float IEE754		%	Wear level of the breaker. (100% means that the breaker has to be maintained.)
Bkr[1]	Isum Intr per hour	24082	2	4	Float IEE754		kA	Sum per hour of interrupting currents.
Bkr[2]	TripCmd Cr	20012	2	4	Float IEE754		-	Counter: Total number of trips of the switch.
Bkr[2]	Isum trip IA	20190	2	4	Float IEE754		A	Summation of the tripping currents phase
Bkr[2]	Isum trip IB	20192	2	4	Float IEE754		A	Summation of the tripping currents phase
Bkr[2]	Isum trip IC	20194	2	4	Float IEE754		A	Summation of the tripping currents phase
Bkr[2]	Bkr Wear Level	24084	2	4	Float IEE754		%	Wear level of the breaker. (100% means that the breaker has to be maintained.)
Bkr[2]	Isum Intr per hour	24086	2	4	Float IEE754		kA	Sum per hour of interrupting currents.
CT W1	IA Fund.	20100	2	4	Float IEE754		A	Measured value: Phase current (Fundamental)
CT W1	IB Fund.	20102	2	4	Float IEE754		A	Measured value: Phase current (Fundamental)
CT W1	IC Fund.	20104	2	4	Float IEE754		A	Measured value: Phase current (Fundamental)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT W1	IX meas Fund.	20106	2	4	Float IEE754		A	Measured value (measured): IX (Fundamental)
CT W1	I0 Fund.	20114	2	4	Float IEE754		A	Measured value (calculated): Zero current (Fundamental)
CT W1	I1 Fund.	20116	2	4	Float IEE754		A	Measured value (calculated): Positive phase sequence current (Fundamental)
CT W1	I2 Fund.	20118	2	4	Float IEE754		A	Measured value (calculated): Unbalanced load current (Fundamental)
CT W1	IA H2	20120	2	4	Float IEE754		%	Measured Value: Ratio of 2nd harmonic over fundamental of IA
CT W1	IB H2	20122	2	4	Float IEE754		%	Measured Value: Ratio of 2nd harmonic over fundamental of IB
CT W1	IC H2	20124	2	4	Float IEE754		%	Measured Value: Ratio of 2nd harmonic over fundamental of IC
CT W1	IG H2 meas	20126	2	4	Float IEE754		%	Measured Value: Ratio of 2nd harmonic over fundamental of IG (measured)
CT W1	IR calc Fund.	20160	2	4	Float IEE754		A	Measured value (calculated): IR (Fundamental)
CT W1	Angle IR calc	20200	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IR calc Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT W1	Angle IX meas	20202	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IX meas Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT W1	Angle IA	20204	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IA

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
								Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT W1	Angle IB	20206	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IB Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT W1	Angle IC	20208	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IC Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT W1	IA THD	20210	2	4	Float IEE754		A	Measured Value (Calculated): IA Total Harmonic Current
CT W1	IB THD	20212	2	4	Float IEE754		A	Measured Value (Calculated): IB Total Harmonic Current
CT W1	IC THD	20214	2	4	Float IEE754		A	Measured Value (Calculated): IC Total Harmonic Current
CT W1	%IA THD	20216	2	4	Float IEE754		%	Measured Value (Calculated): IA Total Harmonic Distortion
CT W1	%IB THD	20218	2	4	Float IEE754		%	Measured Value (Calculated): IB Total Harmonic Distortion
CT W1	%IC THD	20220	2	4	Float IEE754		%	Measured Value (Calculated): IC Total Harmonic Distortion
CT W1	IA RMS	20316	2	4	Float IEE754		A	Measured value: Phase current (RMS)
CT W1	IB RMS	20318	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 W1	IC RMS	20320	2	4	Float IEE754		A	Measured value: Phase current (RMS)
CT W1	IX meas RMS	20322	2	4	Float IEE754		A	Measured value (measured): IX (RMS)
CT W1	IR calc RMS	20324	2	4	Float IEE754		A	Measured value (calculated): IR (RMS)
CT W1	%(I2/I1)	20376	2	4	Float IEE754		%	Measured value (calculated): I2/I1, phase sequence will be taken into account automatically.
CT W1	Angle I0	20378	2	4	Float IEE754		°	Measured Value (calculated): Angle of 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 W1	Angle 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 W1	Angle 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 W1	IG H2 calc	20500	2	4	Float IEE754		%	Measured value (calculated): Ratio of 2nd harmonic over fundamental of IG (calculated)
CT W1	I1 max Fund.	21074	2	4	Float IEE754		A	Maximum value positive phase sequence current (Fundamental)
CT W1	I1 min Fund.	21076	2	4	Float IEE754		A	Minimum value positive phase sequence current (Fundamental)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT W1	I2 max Fund.	21080	2	4	Float IEE754		A	Maximum value negative sequence current (Fundamental)
CT W1	I2 min Fund.	21082	2	4	Float IEE754		A	Minimum value unbalanced load current (Fundamental)
CT W1	IA avg RMS	21130	2	4	Float IEE754		A	IA average value (RMS)
CT W1	IB avg RMS	21132	2	4	Float IEE754		A	IB average value (RMS)
CT W1	IC avg RMS	21134	2	4	Float IEE754		A	IC average value (RMS)
CT W1	IA max RMS	21136	2	4	Float IEE754		A	IA maximum value (RMS)
CT W1	IB max RMS	21138	2	4	Float IEE754		A	IB maximum value (RMS)
CT W1	IC max RMS	21140	2	4	Float IEE754		A	IC maximum value (RMS)
CT W1	IA min RMS	21142	2	4	Float IEE754		A	IA minimum value (RMS)
CT W1	IB min RMS	21144	2	4	Float IEE754		A	IB minimum value (RMS)
CT W1	IC min RMS	21146	2	4	Float IEE754		A	IC minimum value (RMS)
CT W1	IR calc max RMS	21456	2	4	Float IEE754		A	Measured value (calculated): IR maximum value (RMS)
CT W1	IR calc min RMS	21458	2	4	Float IEE754		A	Measured value (calculated): IR minimum value (RMS)
CT W1	IX meas max RMS	21462	2	4	Float IEE754		A	Measured value: IX maximum value (RMS)
CT W1	IX meas min RMS	21464	2	4	Float IEE754		A	Measured value: IX minimum value (RMS)
CT W1	%(I2/I1) max	21468	2	4	Float IEE754		%	Measured value (calculated): I2/I1 maximum value, phase sequence will be taken into account automatically

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT W1	%(I2/I1) min	21470	2	4	Float IEE754		%	Measured value (calculated): I2/I1 minimum value, phase sequence will be taken into account automatically
CT W1	IA Peak demand	21784	2	4	Float IEE754		A	IA Peak value, RMS value
CT W1	IB Peak demand	21786	2	4	Float IEE754		A	IB Peak value, RMS value
CT W1	IC Peak demand	21788	2	4	Float IEE754		A	IC Peak value, RMS value
CT W2	I0 Fund.	20222	2	4	Float IEE754		A	Measured value (calculated): Zero current (Fundamental)
CT W2	I1 Fund.	20224	2	4	Float IEE754		A	Measured value (calculated): Positive phase sequence current (Fundamental)
CT W2	I2 Fund.	20226	2	4	Float IEE754		A	Measured value (calculated): Unbalanced load current (Fundamental)
CT W2	IR calc Fund.	20228	2	4	Float IEE754		A	Measured value (calculated): IR (Fundamental)
CT W2	IX meas Fund.	20230	2	4	Float IEE754		A	Measured value (measured): IX (Fundamental)
CT W2	IA Fund.	20232	2	4	Float IEE754		A	Measured value: Phase current (Fundamental)
CT W2	IB Fund.	20234	2	4	Float IEE754		A	Measured value: Phase current (Fundamental)
CT W2	IC Fund.	20236	2	4	Float IEE754		A	Measured value: Phase current (Fundamental)
CT W2	IG H2 meas	20238	2	4	Float IEE754		%	Measured Value: Ratio of 2nd harmonic over fundamental of IG (measured)
CT W2	IA H2	20240	2	4	Float IEE754		%	Measured Value: Ratio of 2nd harmonic over fundamental of IA
CT W2	IB H2	20242	2	4	Float IEE754		%	Measured Value: Ratio of 2nd harmonic over fundamental of IB
CT W2	IC H2	20244	2	4	Float IEE754		%	Measured Value: Ratio of 2nd harmonic over fundamental of IC

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT W2	IR calc RMS	20248	2	4	Float IEE754		A	Measured value (calculated): IR (RMS)
CT W2	IX meas RMS	20250	2	4	Float IEE754		A	Measured value (measured): IX (RMS)
CT W2	IA RMS	20252	2	4	Float IEE754		A	Measured value: Phase current (RMS)
CT W2	IB RMS	20254	2	4	Float IEE754		A	Measured value: Phase current (RMS)
CT W2	IC RMS	20256	2	4	Float IEE754		A	Measured value: Phase current (RMS)
CT W2	Angle IR calc	20258	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IR calc Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT W2	Angle IX meas	20260	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IX meas Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT W2	Angle IA	20262	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IA Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT W2	Angle IB	20264	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IB Reference phasor is required to calculate the angle. This is the first

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
								measured voltage (or current) channel with sufficiently high amplitude.
CT W2	Angle IC	20266	2	4	Float IEE754		°	Measured Value (Calculated): Angle of Phasor IC Reference phasor is required to calculate the angle. This is the first measured voltage (or current) channel with sufficiently high amplitude.
CT W2	IA THD	20268	2	4	Float IEE754		A	Measured Value (Calculated): IA Total Harmonic Current
CT W2	IB THD	20270	2	4	Float IEE754		A	Measured Value (Calculated): IB Total Harmonic Current
CT W2	IC THD	20272	2	4	Float IEE754		A	Measured Value (Calculated): IC Total Harmonic Current
CT W2	%IA THD	20274	2	4	Float IEE754		%	Measured Value (Calculated): IA Total Harmonic Distortion
CT W2	%IB THD	20276	2	4	Float IEE754		%	Measured Value (Calculated): IB Total Harmonic Distortion
CT W2	%IC THD	20278	2	4	Float IEE754		%	Measured Value (Calculated): IC Total Harmonic Distortion
CT W2	%(I2/I1)	20488	2	4	Float IEE754		%	Measured value (calculated): I2/I1, phase sequence will be taken into account automatically.
CT W2	Angle I0	20490	2	4	Float IEE754		°	Measured Value (calculated): Angle of 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 W2	Angle I1	20492	2	4	Float IEE754		°	Measured Value (calculated): Angle of Positive Sequence System Reference phasor is required to calculate the angle. This is the first

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
								measured voltage (or current) channel with sufficiently high amplitude.
CT W2	Angle I2	20494	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 W2	IG H2 calc	20502	2	4	Float IEE754		%	Measured value (calculated): Ratio of 2nd harmonic over fundamental of IG (calculated)
CT W2	IA avg RMS	21256	2	4	Float IEE754		A	IA average value (RMS)
CT W2	IA max RMS	21258	2	4	Float IEE754		A	IA maximum value (RMS)
CT W2	IA min RMS	21260	2	4	Float IEE754		A	IA minimum value (RMS)
CT W2	IB avg RMS	21262	2	4	Float IEE754		A	IB average value (RMS)
CT W2	IB max RMS	21264	2	4	Float IEE754		A	IB maximum value (RMS)
CT W2	IB min RMS	21266	2	4	Float IEE754		A	IB minimum value (RMS)
CT W2	IC avg RMS	21268	2	4	Float IEE754		A	IC average value (RMS)
CT W2	IC max RMS	21270	2	4	Float IEE754		A	IC maximum value (RMS)
CT W2	IC min RMS	21272	2	4	Float IEE754		A	IC minimum value (RMS)
CT W2	I1 max Fund.	21276	2	4	Float IEE754		A	Maximum value positive phase sequence current (Fundamental)
CT W2	I1 min Fund.	21278	2	4	Float IEE754		A	Minimum value positive phase sequence current (Fundamental)

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
CT W2	I2 max Fund.	21282	2	4	Float IEE754		A	Maximum value negative sequence current (Fundamental)
CT W2	I2 min Fund.	21284	2	4	Float IEE754		A	Minimum value unbalanced load current (Fundamental)
CT W2	IR calc max RMS	21756	2	4	Float IEE754		A	Measured value (calculated): IR maximum value (RMS)
CT W2	IR calc min RMS	21758	2	4	Float IEE754		A	Measured value (calculated): IR minimum value (RMS)
CT W2	IX meas max RMS	21762	2	4	Float IEE754		A	Measured value: IX maximum value (RMS)
CT W2	IX meas min RMS	21764	2	4	Float IEE754		A	Measured value: IX minimum value (RMS)
CT W2	%(I2/I1) max	21768	2	4	Float IEE754		%	Measured value (calculated): I2/I1 maximum value, phase sequence will be taken into account automatically
CT W2	%(I2/I1) min	21770	2	4	Float IEE754		%	Measured value (calculated): I2/I1 minimum value, phase sequence will be taken into account automatically
CT W2	IA Peak demand	21930	2	4	Float IEE754		A	IA Peak value, RMS value
CT W2	IB Peak demand	21932	2	4	Float IEE754		A	IB Peak value, RMS value
CT W2	IC Peak demand	21934	2	4	Float IEE754		A	IC Peak value, RMS value
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	-	Days

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
						(33)		
	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
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.
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.
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.
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.

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
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.
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	Hottest WD W1	20504	2	4	Float IEE754		°C	Hottest winding on side W1

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
RTD	Hottest WD W2	20506	2	4	Float IEE754		°C	Hottest winding on side W2
RTD	Hottest Amb	20508	2	4	Float IEE754		°C	Hottest Ambient Temperature
RTD	Hottest Aux	21820	2	4	Float IEE754		°C	The actual value for the hottest Auxiliary temperature.
Statistics	IdG W1 max	21938	2	4	Float IEE754		A	Measured Value (Calculated): Ground Differential Current Winding 1 Maximum Value
Statistics	IrG W1 max	21944	2	4	Float IEE754		A	Measured Value (Calculated): Ground Restraint Current Winding 1 Maximum Value
Statistics	IdG W2 max	21950	2	4	Float IEE754		A	Measured Value (Calculated): Ground Differential Current Winding 2 Maximum Value
Statistics	IrG W2 max	21956	2	4	Float IEE754		A	Measured Value (Calculated): Ground Restraint Current Winding 2 Maximum Value
Statistics	IdA max	21962	2	4	Float IEE754		Ib	Measured Value (Calculated): Differential Current Phase A Maximum Value
Statistics	IdB max	21968	2	4	Float IEE754		Ib	Measured Value (Calculated): Differential Current Phase B Maximum Value
Statistics	IdC max	21974	2	4	Float IEE754		Ib	Measured Value (Calculated): Differential Current Phase C Maximum Value
Statistics	IrA max	21980	2	4	Float IEE754		Ib	Measured Value (Calculated): Restraint Current Phase A Maximum Value
Statistics	IrB max	21986	2	4	Float IEE754		Ib	Measured Value (Calculated): Restraint Current Phase B Maximum Value
Statistics	IrC max	21992	2	4	Float IEE754		Ib	Measured Value (Calculated): Restraint Current Phase C Maximum Value

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
URTD	Aux4	20328	2	4	Float IEE754		°C	Measured Value: Auxiliary Temperature
URTD	W1-A	20330	2	4	Float IEE754		°C	Measured Value: Winding Temperature
URTD	W1-B	20332	2	4	Float IEE754		°C	Measured Value: Winding Temperature
URTD	W1-C	20334	2	4	Float IEE754		°C	Measured Value: Winding Temperature
URTD	W2-A	20336	2	4	Float IEE754		°C	Measured Value: Winding Temperature
URTD	W2-B	20338	2	4	Float IEE754		°C	Measured Value: Winding Temperature
URTD	W2-C	20340	2	4	Float IEE754		°C	Measured Value: Winding Temperature
URTD	Amb1	20342	2	4	Float IEE754		°C	Measured Value: Ambient Temperature
URTD	Amb2	20344	2	4	Float IEE754		°C	Measured Value: Ambient Temperature
URTD	Aux1	20346	2	4	Float IEE754		°C	Measured Value: Auxiliary Temperature
URTD	Aux2	20348	2	4	Float IEE754		°C	Measured Value: Auxiliary Temperature
URTD	Aux3	20350	2	4	Float IEE754		°C	Measured Value: Auxiliary Temperature
URTD	RTD Max	20486	2	4	Float IEE754		°C	Maximum temperature of all channels.
URTD	W1-A max	21194	2	4	Float IEE754		°C	Measured Value: Winding Temperature Maximum Value
URTD	W1-B max	21196	2	4	Float IEE754		°C	Measured Value: Winding Temperature Maximum Value
URTD	W1-C max	21198	2	4	Float IEE754		°C	Measured Value: Winding Temperature Maximum Value

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
URTD	W2-A max	21200	2	4	Float IEE754		°C	Measured Value: Winding Temperature Maximum Value
URTD	W2-B max	21202	2	4	Float IEE754		°C	Measured Value: Winding Temperature Maximum Value
URTD	W2-C max	21204	2	4	Float IEE754		°C	Measured Value: Winding Temperature Maximum Value
URTD	Amb1 max	21206	2	4	Float IEE754		°C	Measured Value: Ambient Temperature Maximum Value
URTD	Amb2 max	21208	2	4	Float IEE754		°C	Measured Value: Ambient Temperature Maximum Value
URTD	Aux1 max	21210	2	4	Float IEE754		°C	Measured Value: Auxiliary Temperature Maximum Value
URTD	Aux2 max	21212	2	4	Float IEE754		°C	Measured Value: Auxiliary Temperature Maximum Value
URTD	Aux3 max	21214	2	4	Float IEE754		°C	Measured Value: Auxiliary Temperature Maximum Value
URTD	Aux4 max	21800	2	4	Float IEE754		°C	Measured Value: Auxiliary Temperature Maximum Value
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

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	Relay Outputs	22001	1	5	0xFF00		-	Relay Outputs
Acknowledge	SCADA	22002	1	5	0xFF00		-	SCADA Communication
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 Isum trip	22012	1	5	0xFF00		-	Reset summation of the tripping currents
Reset	Bkr[2]	22013	1	5	0xFF00		-	Breaker
Comm Cmd	Assbl Comm Cmd 1	22020	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 2	22021	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 3	22022	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 4	22023	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 5	22024	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 6	22025	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 7	22026	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 8	22027	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 9	22028	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command

Module (ANSI / IEEE)	Name Function	Start Register Address	No. of Modbus Registers	Function code	Format	Bit Mask (Bit position)	Unit	Description
Comm Cmd	Assbl Comm Cmd 10	22029	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 11	22030	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 12	22031	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 13	22032	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 14	22033	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 15	22034	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Comm Cmd	Assbl Comm Cmd 16	22035	1	5	0xFF00=On, 0x0000=Off		-	Assignable Communication Command
Fault rec	Res all rec	22040	1	5	0xFF00		-	Reset all records
PSet-Switch	Comm PS1	22050	1	5	0xFF00		-	Communication Setting Group1
PSet-Switch	Comm PS2	22051	1	5	0xFF00		-	Communication Setting Group2
PSet-Switch	Comm PS3	22052	1	5	0xFF00		-	Communication Setting Group3
PSet-Switch	Comm PS4	22053	1	5	0xFF00		-	Communication Setting Group4
Maint Mode	Maint Mode Comm	22054	1	5	0xFF00=On, 0x0000=Off		-	Signal: Arc Flash Reduction Maintenance Comm Mode
Bkr	SG ControlCmd1	22100	1	5	0xFF00=On, 0x0000=Off		-	Control Command Switchgear
Bkr	SG ControlCmd2	22101	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)	-	Waveform 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 Pickups »Prot . Pickup«), 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 (ErSMap) 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 ErSMap 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
0	**?**	**49, 87, 87GDH[1], 87GDH[2], 87GD[1], 87GD[2], 87H, RTD, ZI[1], ZI[2]**
1	**NORM**	
2	**EXTERNAL**	**ExP[1], ExP[2], ExP[3], ExP[4], Ext Oil Temp, ExtTempSuperv[1], ExtTempSuperv[2], ExtTempSuperv[3], Sudden Press**
3	**PH IOC**	**50P[1], 50P[2], 50P[3], 50P[4]**
4	**IG IOC**	**50X[1], 50X[2]**
6	**IR IOC**	**50R[1], 50R[2]**
7	**PH TOC**	**51P[1], 51P[2], 51P[3], 51P[4], 51Q[1], 51Q[2]**
8	**IG TOC**	**51X[1], 51X[2]**

Trip Cause	Description	Module
10	**IR TOC**	**51R[1], 51R[2]**
17	**I UNBAL**	**46[1], 46[2]**

3.6 Fast Status Register

At registers ≥5000 an area is provided where common status indicator bits can be read from one location. See the Register Maps for information that is available in general.

At registers 5002 and 5003 the user has the option to collect arbitrary device status information. The purpose is to get a custom set of device states in a single request. Some of these positions are already pre-configured.

The following table lists the pre-configured states:

General Function	Bit Position	Short Description	Long Description
Relay Health	0	Health status	
General Trips / General Pickups	1	Pickup	General pickup of any type – not element-specific.
	2	Trip	General Trip of any type – not element-specific.
	3		
	4		
	5		
	6		
	7		
Breaker [*]	8	Pos Open	Breaker is in Open position.
	9	Pos Close	Breaker is in Closed position.
	10	Pickup	Breaker failure detected and timer in progress.
	11	Trip	Breaker failure detected and trip initiated.
	12	Lockout	Breaker failure lockout.
	13		
	14		
	15		

General Function	Bit Position	Short Description	Long Description
Sgen status	16	Running	Test simulation signal generation “Running”.
ARMS [**]	17	Maintenance	Maintenance mode active.
Motor [***]	18	Motor Relay Ready – (stopped)	
	19	Motor Relay Start	
	20	Motor Relay Running	

[*] Only available in devices with Breaker Control.

[**] Only available in devices that support Maintenance mode.

[***] Only available in Motor Relays.

Modbus Datapoints IL02602006E

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