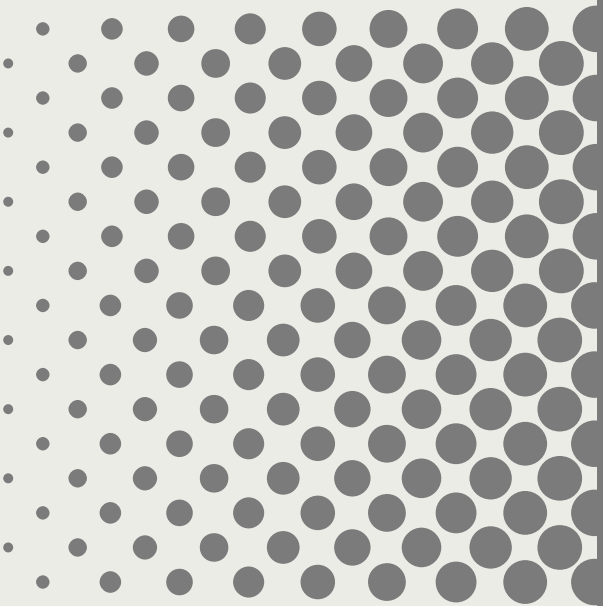
Beghelli

PRÄZISA

Emergency
Lighting



MODBUS

English

DOCUMENTATION

LOGICA 230 SICURO

Index

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1. Introduction

The Modbus protocol was developed in 1979. Simple and robust, it has since become a de facto standard communication protocol, and it is now a commonly available means of connecting industrial electronic devices.

Modbus is included in all Beghelli PRÄZISA Deutschland GmbH central power supply systems Sicuro230 and can be used without buying any other components.

2. Connection

Modbus RTU as well as Modbus TCP protocol is available on all systems.

2.1 Modbus RTU

The Modbus-RTU protocol is using a serial RS485 2-wire connection.
The serial settings are as follows:

- Baud rate: 9600
- Data bits: 8
- Stop bits: 1
- Parity: Even

The connection is on the “RS485 Main” contact on the display unit, which is pre wired on the contacts X21.4 and X21.5 (Bus from main station / Multi).

Modbus RTU must be activated inside the system menu.

2.2 Modbus TCP

Modbus TCP connection is directly on the “RJ-45” port on the display unit.
The Modbus TCP protocol is always present and there is no need to activate it.

The default Modbus TCP port 502 is used.

Only main stations are connected to Modbus. Possible substations can be read through the main station.

2.3 Slave Address

The slave address is always the address of the Main station.
Main station 01 -> Slave address 1, Main station 02 -> Slave address 2 and so on.

If an address is already in use by another Modbus device, it is possible to change the address by changing the address of the Main station.

2.4 Offset

For reading the registers a minus offset of “1” is needed.

3. Data and Register

Only functions code 3 (03H) „Read Holding Registers“ is used.
A total of 44478 registers, from 1 to 44478, is available.

Because of the internal structure of the Stations it is not possible to read all registers at once.

The readings must be done either at fixed register address with fixed length, or one register address at a time (for main station only).

Information can be found at the explanation of each register.

To not disturb the system it must be added a break of 10 seconds in between each reading.

A response time of 5 seconds should be expected to avoid not receiving an answer on some registers.

3.1 Overview of registers

Description	Register
Main station – Luminaire Status 1024 Register	1 - 1024
Substation 01 – Luminaire Status 1024 Register	1025 - 2048
…	…
Substation 32 – Luminaire Status 1024 Register	32769 - 33792
Main station – Luminaire Status eAK 1024 Register	33793 - 34816
Main station – Circuit Status 256 Register	34817 - 35072
Substation 01 – Circuit Status 256 Register	35073 - 35328
…	…
Substation 32 – Circuit Status 256 Register	43009 - 43264
Main station – Circuit Status eAK 256 Register	43265 - 43520
Reserved 256 Register	43521 - 43776
Main station – Station Status 16 Register	43777 - 43792
Substation 01 – Station Status 16 Register	43793 - 43808
…	…
Substation 32 – Station Status 16 Register	44289 - 44304
Main station - Battery data 2 Register	44305 - 44306
Substation 01 - Battery data 2 Register	44307 - 44308
…	…
Substation 32 - Battery data 2 Register	44369 - 44370
Main station – Battery monitoring 108 Register	44371 - 44478

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3.2 Main station – Luminaire Status

Register amount	Start	End	Data type	Readings
1024	1	1024	Unsigned Int16	16x á 64 Register

$First\ Register\ addresse = 1024 \times X + i \times 64 + 1\ ;\quad 0 \leq i \leq 15$
$Main\ station \rightarrow X = 0$
$i = 0 \rightarrow AK1, AK2, AK3, AK4;\ i = 1 \rightarrow AK5, AK6, AK7, AK8;$
$i = 2 \rightarrow AK9, AK10, AK11, AK12;\ i = 3 \rightarrow AK13, AK14, AK15, AK16;$
$i = 4 \rightarrow AK17, AK18, AK19, AK20;\ i = 5 \rightarrow AK21, AK22, AK23, AK24;$
$i = 6 \rightarrow AK25, AK26, AK27, AK28;\ i = 7 \rightarrow AK29, AK30, AK31, AK32$
$\ldots\ i = 15 \rightarrow AK61, AK62, AK63, AK64$

Description:

On single monitoring luminaires (EÜ) the failure status of each luminaire from the Main station is shown.

Possible failure:
- Bus error
- Bulb failure

Bit value 0 = No failure
Bit value 1 = Failure

Register 1 (AK1 Circuit1 Luminaire 1-16) Bus error																
Luminaire	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 2 (AK1 Circuit1 Luminaire 17-32) Bus error																
Luminaire	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 3 (AK1 Circuit1 Luminaire 1-16) Bulb failure																
Luminaire	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 4 (AK1 Circuit1 Luminaire 17-32) Bulb failure																
Luminaire	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

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Register 1023 (AK64 Circuit4 Luminaire 1-16) Bulb failure																
Luminaire	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
Bits	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 1024 (AK64 Circuit4 Luminaire 17-32) Bulb failure																
Luminaire	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

3.3 Substation X – Luminaire Status

Substation 1:

Register amount	Start	End	Data type	Readings
1024	1025	2048	Unsigned Int16	16x 64 Register

…

Substation 32:

Register amount	Start	End	Data type	Readings
1024	32769	33792	Unsigned Int16	16x 64 Register

$First\ Register\ address = 1024 \times X + i \times 64 + 1\ ;\quad 0 \leq i \leq 15$
$Substation\ X \rightarrow X = X$
$i = 0 \rightarrow AK1, AK2, AK3, AK4;\ i = 1 \rightarrow AK5, AK6, AK7, AK8;$
$i = 2 \rightarrow AK9, AK10, AK11, AK12;\ i = 3 \rightarrow AK13, AK14, AK15, AK16;$
$i = 4 \rightarrow AK17, AK18, AK19, AK20;\ i = 5 \rightarrow AK21, AK22, AK23, AK24;$
$i = 6 \rightarrow AK25, AK26, AK27, AK28;\ i = 7 \rightarrow AK29, AK30, AK31, AK32$
$\ldots\ i = 15 \rightarrow AK61, AK62, AK63, AK64$

Descirption:

On single monitoring luminaires (EÜ) the failure status of each luminaire from the Substation X is shown.

Possible failure:
- Bus error
- Bulb failure

Bit value 0 = No failure
Bit value 1 = Failure

Register 1025 Substation 1 (AK1 Circuit1 Luminaire 1-16) Bus error																
Luminaire	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 1026 Substation 1 (AK1 Cricuit1 Luminaire 17-32) Bus error																
Luminaire	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 1027 Substation 1 (AK1 Circuit1 Luminaire 1-16) Bulb failure																
Luminaire	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 1028 Substation 1 (AK1 Circuit1 Luminaire 17-32) Bulb failure																
Luminaire	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

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Register 2047 Substation 1 (AK64 Circuit4 Luminaire 1-16) Bulb failure																
Luminaire	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 2048 Substation 1 (AK64 Circuit4 Luminaire 17-32) Bulb failure																
Luminaire	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

3.4 Main station – Luminaire Status eAK

Register amount	Start	End	Data type	Readings
1024	33793	34816	Unsigned Int16	16x á 64 Register

$First\ Register\ address = 33792 + i \times 64 + 1\,; \quad 0 \leq i \leq 15$

$i = 0 \rightarrow AK1, AK2, AK3, AK4;\ i = 1 \rightarrow AK5, AK6, AK7, AK8;$
$i = 2 \rightarrow AK9, AK10, AK11, AK12;\ i = 3 \rightarrow AK13, AK14, AK15, AK16;$
$i = 4 \rightarrow AK17, AK18, AK19, AK20;\ i = 5 \rightarrow AK21, AK22, AK23, AK24;$
$i = 6 \rightarrow AK25, AK26, AK27, AK28;\ i = 7 \rightarrow AK29, AK30, AK31, AK32$
$\ldots\ i = 15 \rightarrow AK61, AK62, AK63, AK64$

Description:

On single monitoring luminaires (EÜ), connected to an external output-card (eAK), the failure status of each luminaire from the Main station is shown.

Possible failure:
- Bus error
- Bulb failure

Bit value 0 = No failure
Bit value 1 = Failure

Register 33793 (eAK1 Circuit1 Luminaire 1-16) Bus error																
Luminaire	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 33794 (eAK1 Circuit1 Luminaire 17-32) Bus error																
Luminaire	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 33795 (eAK1 Circuit1 Luminaire 1-16) Bulb failure																
Luminaire	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Register 33796 (eAK1 Circuit1 Luminaire 17-32) Bulb failure																
Luminaire	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

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3.5 Main station – Circuit Status

Register amount	Start	End	Data type	Readings
256	34817	35072	Unsigned Int16	16x 16 Register

$First\ Register\ address = 34816 + 256 \times X + i \times 16 + 1\ ;\quad 0 \leq i \leq 15$
$Main\ station \rightarrow X = 0$
$i = 0 \rightarrow AK1, AK2, AK3, AK4;\ i = 1 \rightarrow AK5, AK6, AK7, AK8;$
$i = 2 \rightarrow AK9, AK10, AK11, AK12;\ i = 3 \rightarrow AK13, AK14, AK15, AK16;$
$i = 4 \rightarrow AK17, AK18, AK19, AK20;\ i = 5 \rightarrow AK21, AK22, AK23, AK24;$
$i = 6 \rightarrow AK25, AK26, AK27, AK28;\ i = 7 \rightarrow AK29, AK30, AK31, AK32$
$\ldots\ i = 15 \rightarrow AK61, AK62, AK63, AK64$

Description:

Status overview of each single circuit of the mounted cards in the main station as well as indication of the card types.

Register 34817 Main station (AK1 Circuit1) Status		Register 35072 Main station (AK64 Circuit4) Status	
Bit	**Description**	**Bit**	**Description**
0	AK-Bus error	0	AK-Bus error
1	Luminaire failure	1	Luminaire failure
2	Fuse failure	2	Fuse failure
3	Current to high	3	Current to high
4	Isolation failure	4	Isolation failure
5	-	5	-
6	Mains supply	6	Mains supply
7	Battery supply	7	Battery supply
Hex	**Description**	**Hex**	**Description**
7AH	Single monitoring EÜ	7AH	Single monitoring EÜ
7BH	Current monitoring SÜ	7BH	Current monitoring SÜ

3.6 Substation X – Circuit Status

Substation 1:

Register amount	Start	End	Data type	Readings
256	35073	35328	Unsigned Int16	16x 16 Register

…

Substation 32:

Register amount	Start	End	Data type	Readings
256	43009	43264	Unsigned Int16	16x 16 Register

$First\ Register\ address = 34816 + 256 \times X + i \times 16 + 1\ ;\quad 0 \leq i \leq 15$
$Substation\ X \rightarrow X = X$
$i = 0 \rightarrow AK1, AK2, AK3, AK4;\ i = 1 \rightarrow AK5, AK6, AK7, AK8;$
$i = 2 \rightarrow AK9, AK10, AK11, AK12;\ i = 3 \rightarrow AK13, AK14, AK15, AK16;$
$i = 4 \rightarrow AK17, AK18, AK19, AK20;\ i = 5 \rightarrow AK21, AK22, AK23, AK24;$
$i = 6 \rightarrow AK25, AK26, AK27, AK28;\ i = 7 \rightarrow AK29, AK30, AK31, AK32$
$\ldots\ i = 15 \rightarrow AK61, AK62, AK63, AK64$

Description:

Status overview of each single circuit of the mounted cards in the sub station as well as indication of the card types.

Register 35073 Substation 1 (AK1 Circuit1) Status	
Bit	**Description**
0	AK-Bus error
1	Luminaire failure
2	Fuse failure
3	Current to high
4	Isolation failure
5	-
6	Mains supply
7	Battery supply
Hex	**Description**
7AH	Single monitoring EÜ
7BH	Current monitoring SÜ

Register 43264 Substation 32 (AK64 Circuit4) Status	
Bit	**Description**
0	AK-Bus error
1	Luminaire failure
2	Fuse failure
3	Current to high
4	Isolation failure
5	-
6	Mains supply
7	Battery supply
Hex	**Description**
7AH	Single monitoring EÜ
7BH	Current monitoring SÜ

3.7 Main station – Circuit Status eAK

Register amount	Start	End	Data type	Readings
256	43265	43520	Unsigned Int16	16x 16 Register

$First\ register\ address = 43264 + i \times 16 + 1\ ;\quad 0 \leq i \leq 15$

$i = 0 \rightarrow AK1, AK2, AK3, AK4;\ i = 1 \rightarrow AK5, AK6, AK7, AK8;$
$i = 2 \rightarrow AK9, AK10, AK11, AK12;\ i = 3 \rightarrow AK13, AK14, AK15, AK16;$
$i = 4 \rightarrow AK17, AK18, AK19, AK20;\ i = 5 \rightarrow AK21, AK22, AK23, AK24;$
$i = 6 \rightarrow AK25, AK26, AK27, AK28;\ i = 7 \rightarrow AK29, AK30, AK31, AK32$
$\ldots\ i = 15 \rightarrow AK61, AK62, AK63, AK64$

Description:

Status overview of each single circuit of the mounted external cards in the main station as well as indication of the card types.

Register 43265 Main station (AK1 Circuit1) Status		Register 43520 Main station (AK64 Circuit4) Status	
Bit	**Description**	**Bit**	**Description**
0	AK-Bus error	0	AK-Bus error
1	Luminaire failure	1	Luminaire failure
2	Fuse failure	2	Fuse failure
3	Current to high	3	Current to high
4	Isolation failure	4	Isolation failure
5	-	5	-
6	Mains supply	6	Mains supply
7	Battery supply	7	Battery supply
Hex	**Description**	**Hex**	**Description**
7CH	Single monitoring EÜ external	7CH	Single monitoring EÜ external
7DH	Current monitoring SÜ external	7DH	Current monitoring SÜ external

3.8 Main station – Station Status

Register amount	Start	End	Data type	Readings
16	43777	43792	Unsigned Int16	1x 16 Register

$First\ Register\ address = 43776 + 16 \times X + 1$
$Mainstation \rightarrow X = 0$

Beschreibung:

Main station overview regarding the occurring failures.

Register 43777 - Reserved	
Register 43778 Main station Station Status	
Cause of emergency mode – Low Byte	
Bit/Hex	**Description**
00H	No Emergency mode
01H	Mains failure
02H	Follow-up time after emergency mode
03H	Function test
04H	Duration test
05H	-
06H	-
07H	-
08H	-
09H	-
0AH	Insulation test
Bus failure – High Byte	
0	-
1	-
2	-
3	-
4	Substation bus failure
5	Charger bus failure
6	Output-card bus failure
7	LSSA bus failure

Register 43779 Main station Station Status	
Collective failure – Low Byte	
0	Emergency mode failure, no emergency possible
1	Failure last F-/D-Test
2	Luminaire/Circuit-Failure
3	System blocked
4	Deep discharge
5	Battery failure
6	Charger failure
7	Mains failure
Emergency mode triggering – High Byte	
00H	None
01H	Automatic (Mains failure)
02H	Manuel
03H	System
04H	Bus
Register 43780 Main station Station Status	
Miscellaneous – Low Byte	
0	LSSA sub-distribution monitoring bus failure
1	Last test not completed
2	-
3	-
4	-
5	Power supply voltage out of range
6	Power supply failure
7	Charger / charging failure
Mains failure – High Byte	
8	-
9	-
10	-
11	-
12	Mains failure sub-distribution, critical circuit
13	Mains failure Phase 3
14	Mains failure Phase 2
15	Mains failure Phase 1

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Register 43781 Main station Station Status	
Failure control device – Low Byte	
0	-
1	-
2	-
3	-
4	-
5	-
6	Protocol memory full
7	-
Battery failure – High Byte	
8	-
9	-
10	Fuse failure
11	Symmetry failure
12	Isolation failure Minuspol
13	Isolation failure Pluspol
14	-
15	-
Register 43782 - Reserved	
Register 43783 - Reserved	
Register 43784 - Reserved	
Register 43785 - Reserved	
Register 43786 Main station Station Status	
Collective failure substation 16 - 30	
0	Substation 16 failure
1	Substation 17 failure
2	Substation 18 failure
3	Substation 19 failure
4	Substation 20 failure
5	Substation 21 failure
6	Substation 22 failure
7	Substation 23 failure
8	Substation 24 failure
9	Substation 25 failure
10	Substation 26 failure
11	Substation 27 failure
12	Substation 28 failure
13	Substation 29 failure
14	Substation 30 failure
15	-

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Register 43787 Main station Station Status	
Collective failure substation 1 - 15	
0	-
1	Substation 01 failure
2	Substation 02 failure
3	Substation 03 failure
4	Substation 04 failure
5	Substation 05 failure
6	Substation 06 failure
7	Substation 07 failure
8	Substation 08 failure
9	Substation 09 failure
10	Substation 10 failure
11	Substation 11 failure
12	Substation 12 failure
13	Substation 13 failure
14	Substation 14 failure
15	Substation 15 failure
Register 43788 - Reserved	
Register 43789 - Reserved	
Register 43790 - Reserved	
Register 43791 - Reserved	
Register 43792 - Reserved	

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3.9 Substation X – Station Status

Substation 1:

Register amount	Start	End	Data type	Readings
16	43793	43808	Unsigned Int16	1x 16 Register

Substation 32:

Register amount	Start	End	Data type	Readings
16	44289	44304	Unsigned Int16	1x 16 Register

$First\ Register\ address = 43776 + 16 \times X + 1$
$Substation\ X \rightarrow X = X$

Description:

Substation X overview regarding occurring failures.

Register 43793 - Reserved	
Register 43794 Substation 1 Station Status	
Cause of emergency mode – Low Byte	
Bit/Hex	**Description**
00H	No Emergency mode
01H	Mains failure
02H	Follow-up time after emergency mode
03H	Function test
04H	Duration test
05H	-
06H	-
07H	-
08H	-
09H	-
0AH	Isolation test
Bus failure – High Byte	
0	-
1	-
2	-
3	-
4	-
5	-
6	Output-card bus failure
7	LSSA bus failure

Register 43795 Substation 1 Station Status	
Collective failure – Low Byte	
0	Emergency mode failure, no emergency possible
1	Failure last F-/D-Test
2	Luminaire/Circuit-Failure
3	System blocked
4	Deep discharge
5	Battery failure
6	Charger failure
7	Mains failure
Emergency mode triggering – High Byte	
00H	None
01H	Automatic (Mains failure)
02H	Manuel
03H	System
04H	Bus
Register 43796 Substation 1 Station Status	
Miscellaneous – Low Byte	
0	LSSA sub-distribution monitoring bus failure
1	Last test not completed
2	-
3	-
4	-
5	Power supply voltage out of range
6	Power supply failure
7	Charger / charging failure
Mains failure – High Byte	
8	-
9	-
10	-
11	-
12	Mains failure sub-distribution, critical circuit
13	Mains failure Phase 3
14	Mains failure Phase 2
15	Mains failure Phase 1

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Register 43797 Substation 1 Station Status	
Failure control device – Low Byte	
0	-
1	-
2	-
3	-
4	-
5	-
6	Protocol memory full
7	-
Battery failure – High Byte	
8	-
9	-
10	Fuse failure
11	Symmetry failure
12	Isolation failure Minuspol
13	Isolation failure Pluspol
14	-
15	-
Register 43798 - Reserved	
Register 43799 - Reserved	
Register 43800 - Reserved	
Register 43801 - Reserved	
Register 43802 - Reserved	
Register 43803 - Reserved	
Register 43804 - Reserved	
Register 43805 - Reserved	
Register 43806 - Reserved	
Register 43807 - Reserved	
Register 43808 - Reserved	

3.10 Main station – Battery data

Register amount	Start	End	Data type	Readings
2	44305	44306	Unsigned / Signed Int16	1x á 2 Register

$First\ Register\ address = 44304 + 2 \times X + 1$
$Main\ station \rightarrow X = 0$

Description:

Overview of the Battery data (current and voltage) of the installed batteries at the main station.

Register	Description	Data type
44305	Voltage	Unsigned Int16
44306	Current	Signed Int16

Multiply the decimal value of the register with 0.1V / 0.1A to receive the actual value of the batteries.

3.11 Substation X – Battery data

Substation 1:

Register amount	Start	End	Data type	Readings
2	44307	44308	Unsigned / Signed Int16	1x á 2 Register

Substation 32:

Register amount	Start	End	Data type	Readings
2	44369	44370	Unsigned / Signed Int16	1x á 2 Register

$First\ Register\ address = 44304 + 2 \times X + 1$
$Substation\ X \rightarrow X = X$

Description:

Overview of the Battery data (current and voltage) of the installed batteries send from the mains station to the substation.

3.12 Main station – Battery monitoring

Register amount	Start	End	Data type	Readings
108	44371	44478	Unsigned Int16	3x 36 Register

$First\ Register\ address = 44370 + 36 \times X + 1$
$Blocks\ \ 1 - 18 \rightarrow X = 0$
$Blocks\ 19 - 36 \rightarrow X = 1$
$Blocks\ 37 - 54 \rightarrow X = 2$

Description:

Status of each single battery block connected (if battery monitoring system is installed) at the Main station.

Each battery block has 2 registers.

Register 44371 Main station - Battery monitoring	
Block 1 - Voltage	
Bit	**Description**
0-7	Voltage 1 (Low Byte)
8-15	Voltage 2 (High Byte)
Register 44372 Main station - Battery monitoring	
Block 1 - Status	
Bit	**Description**
0	-
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	Equalization – 1=active; 0=not active
9	End of charging – 1=reached; 0=not reached
10	Failure – over voltage
11	Failure – under voltage
12	Failure - wiring
13	-
14	Failure - communication
15	-

Register 44405 Main station - Battery monitoring	
Block 18 - Voltage	
Bit	**Description**
0-7	Voltage 1 (Low Byte)
8-15	Voltage 2 (High Byte)
Register 44406 Main station - Battery monitoring	
Block 18 - Status	
Bit	**Description**
0	-
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	Equalization – 1=active; 0=not active
9	End of charging – 1=reached; 0=not reached
10	Failure – over voltage
11	Failure – under voltage
12	Failure - wiring
13	-
14	Failure - communication
15	-

Battery block voltage = Voltage 2.Voltage 1

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