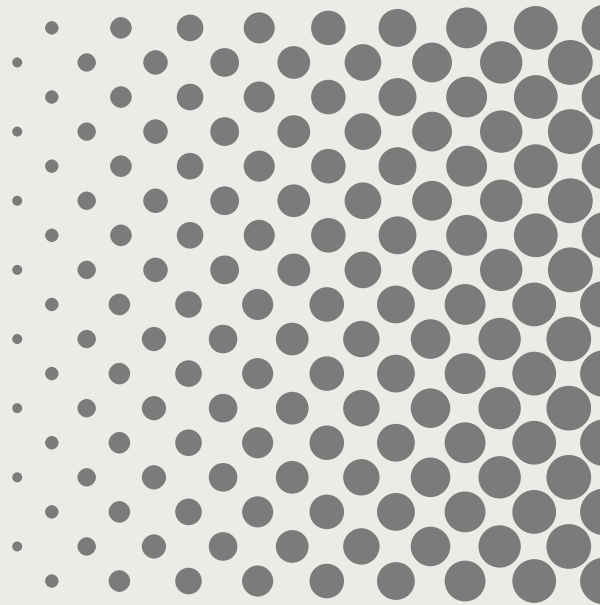


Emergency Lighting



MODBUS



English

DOCUMENTATION

SICURO
LOGICA
24

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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 GmbH decentral power systems SICURO and may be used without buying any other components.

Thereby all Stations can be connected to a building management system via Modbus for monitoring.

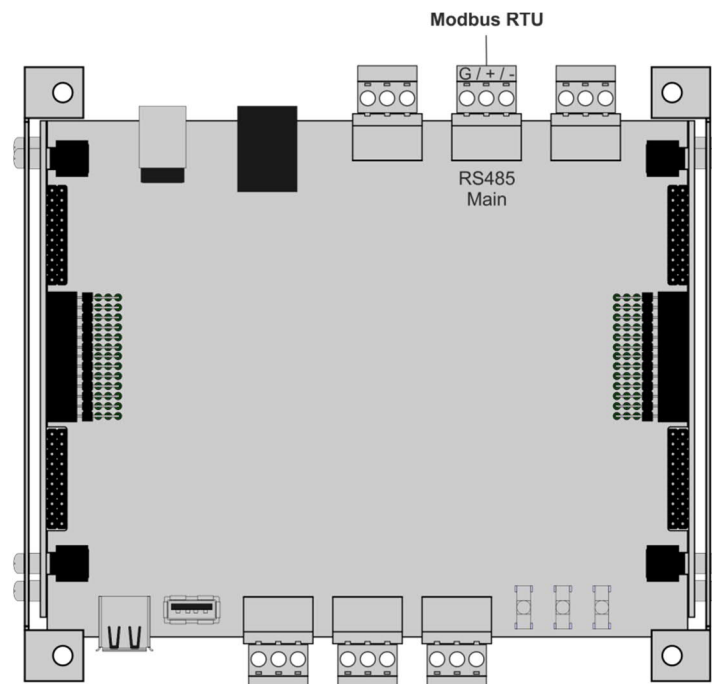
2. Connection

The Modbus-RTU protocol with a serial RS485 (2-wire) connection or Modbus-TCP can be used.

The RTU settings are as followed:

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

The connection is always at the display unit.
Indication on the display unit is “RS485 Main”.



Pic. 1 – Display unit

Modbus-TCP can be used directly via the Ethernet Port (RJ45) on the display unit.
The used Network port is 502.



For Modbus the software version v1.26.1.26 (or higher) of the station is needed!



If Modbus is used, it is not possible to use other monitoring systems as Logica Visual.

2.1. 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.

2.2. Offset

For reading the Registers an offset of “0” must be set.

3. Data and Register

Only functionscode 3 (03H) „Read Holding Registers“ is used.

A total of 21778 (5512H) Register, from 1 (0001H) to 21778 (5512H), 2 Bytes each Register, are used.



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

The reading must be done at fixed addresses and with fixed length („Readings“).

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 Register.

If the system is in a test mode (function or duration test) the Modbus function is deactivate except for 1 Register “Station in test mode”.

3.1. Overview of Register

Description	Register
Main station – Luminaire Status	1 (0001H)
32 Register	32 (0020H)
Main station – Circuit Status	16897 (4201H)
128 Register	17024 (4280H)
Main station – Station Status	21249 (5301H)
11 Register	21259 (530BH)
Main station – Battery data	21777 (5511H)
2 Register	21778 (5512H)
Station in test mode	24114 (5E32H)
1 Register	

3.2. Main station – Luminaire Status

Register amount	Start	End	Data typ	Readings
32	1 (0001H)	32 (0020H)	Unsigned Int16	1x á 64 Register

First Register addresse = $512 \times X + i \times 64 + 1$; $0 \leq i \leq 7$

Main station $\rightarrow X = 0$

$i = 0 \rightarrow AK1, AK2, AK3, AK4$

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

...

Register 15 (AK1 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 16 (AK1 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

Register 17 (AK2 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 18 (AK2 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 19 (AK2 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 20 (AK2 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

...

Register 31 (AK2 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 32 (AK2 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. Main station – Circuit Status

Register amount	Start	End	Data typ	Readings
128	16897 (4201H)	17024 (4280H)	Unsigned Int16	8x á 16 Register

First Register address = $16896 + 128 \times X + i \times 16 + 1$; $0 \leq i \leq 7$

Main station $\rightarrow X = 0$

$i = 0 \rightarrow AK1, AK2, AK3, AK4$

Description:

Status overview of each single circuit and type of Card.

Register 16897 Main station (AK1 Circuit1) Status	
Bit	Description
0	AK-Bus error
1	Luminaire failure
2	Fuse failure
3	-
4	-
5	-
6	Mains supply
7	Battery supply
Hex	Description
9AH	Single monitoring EÜ

Register 16900 Main station (AK1 Circuit4) Status	
Bit	Description
0	AK-Bus error
1	Luminaire failure
2	Fuse failure
3	-
4	-
5	-
6	Mains supply
7	Battery supply
Hex	Description
9AH	Single monitoring EÜ

Register 16901 Main station (AK2 Circuit1) Status	
Bit	Description
0	AK-Bus error
1	Luminaire failure
2	Fuse failure
3	-
4	-
5	-
6	Mains supply
7	Battery supply
Hex	Description
9AH	Single monitoring EÜ

Register 16904 Main station (AK2 Circuit4) Status	
Bit	Description
0	AK-Bus error
1	Luminaire failure
2	Fuse failure
3	-
4	-
5	-
6	Mains supply
7	Battery supply
Hex	Description
9AH	Single monitoring EÜ

3.4. Main station – Station Status

Register amount	Start	End	Data typ	Readings
11	21249 (5301H)	21259 (530BH)	Unsigned Int16	1x á 11 Register

First Register address = $21248 + 16 \times X + 1$

Mainstation → $X = 0$

Beschreibung:

Main station overview regarding failure.

Register 21250 Main station Station Status	
Cause of emergency mode	
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	-
Register 21251 Main station Station Status	
Collective failure	
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	
00H	None
01H	Automatic (Mains failure)
02H	Manuel
03H	System
04H	Bus

Register 21252 Main station Station Status	
Miscellaneous failures	
0	LSSA bus error with sub-distribution
1	Last test not completed
2	-
3	-
4	-
5	Power supply voltage range
6	Power supply broken
7	Charger / charging failure
Mains failure	
8	-
9	-
10	-
11	-
12	Mains failure sub-distribution, critical circuit
13	-
14	-
15	Mains failure Phase 1
Register 21253 Main station Station Status	
0	-
1	-
2	-
3	-
4	-
5	-
6	-
7	-
Battery failure	
8	-
9	-
10	Fuse failure
11	Symmetry failure
12	-
13	-
14	-
15	-

3.5. Main station – Battery data

Register amount	Start	End	Data typ	Readings
2	21777 (5511H)	21778 (5512H)	Unsigned / Signed Int16	1x á 2 Register

First Register address = 21777 + 2 × X + 1

Main station → X = 0

Description:

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

Register	Description	Data typ
21777	Voltage	Unsigned Int16
21778	Current	Signed Int16

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

3.6. Station in test mode

Register amount	Start	End	Data typ	Readings
1	24114 (5E32H)	24114 (5E32H)	Unsigned Int16	1x á 1 Register

Description:

During a function or duration test, the Modbus will be deactivated to avoid communication problems.

If the register is activated, Modbus is deactivated and it is not possible to read any other registers till the test is finished.