Meteodata 140 basic weather station

Meteodata 140	1409205

Contents

1 Functional characteristics

The weather station measures temperature, brightness from 3 directions and wind speed.
The measured values can be sent to the bus.

The weather station has the following channel types:

- 10 universal channels for wind, temperature, brightness
- 3 sun protection channels
- 4 threshold channels with per cent, EIS5 , 8- and 16-bit value)
- 6 logic channels (AND, OR, XOR)

See attachment for detailed description of the channel types.

1.1 Special features

- Sun protection area both horizontal (azimuth) and vertical (elevation) can be set exactly.
- 3 installed brightness sensors at 90° spacing.
- 2 objects for external brightness sensors.
- Shading can be temporarily interrupted via object.
- Universal channels with AND/OR linking of weather parameters.
- Threshold channels with delay with falling below and exceeding.
- Logic channels with 4 input objects + internal link that can be configured with status of the universal and threshold channels.

1.2 Important information

- As it can take several minutes to retract the sun / sight protection devices (blinds, shutters etc.), they are not immediately protected if the wind picks up suddenly.
  Therefore, take the maximum permissible wind speed specified by the manufacturer into account when configuring the wind threshold, and set the threshold below this value to be on the safe side.
- If the wind hits the facade from front on, an air pocket can build up where the wind speed is significantly below the actual wind speed.
  Therefore, the Meteodata 140 is only able to measure the prevailing wind speed directly at the installation site.
  This should be taken into account when setting the wind threshold for facades exposed to strong frontal winds.
  Mast installation can provide a remedy here.
- Temperature measurement: Temperatures are normally measured in the shade.
  In contrast, the weather station is typically installed where the sun shines.
  The measured temperature can be considerably higher than in the shade due to the effect of the sun.

2 Technical data

KNX operating voltage	21-32 V DC / ≤ 10 mA
Installation type	Wall or mast bracket
Dimensions (H x W x D)	84 x 121 x 227 mm
Connection type	KNX bus terminal
Max. cable cross-section	1.5 mm^2
Ambient temperature	-20 °C… +55 °C
IP rating	IP 44 in accordance with EN 60529
Protection class	III

Measuring ranges

Brightness	1..100,000 Lux
Temperature	-30..60 °C
Wind	2 - 30 m/s

3 The "Meteodata 140 basic V1.0" application program

3.1 Selection in the product database

Manufacturer	Theben AG
Product family	Phys. sensors
Product type	Weather stations
Programname	Meteodata 140 basic V1.0

The ETS database can be found on our downloads page: www.theben.de/en/downloads_en

Table 1

Number of communication objects:	146
Number of group addresses:	254
Number of associations:	255

3.2 Communication objects

Table 2

No.	Object name	Function	Type DPT	Flags			
0	*Brightness value at front*	*Physical value*	2 byte 9.004	C	R	-	T
1	*Brightness value left*	*Physical value*	2 byte 9.004	C	R	-	T
2	*Brightness value right*	*Physical value*	2 byte 9.004	C	R	-	T
3	*Maximum brightness value*	*Physical value*	2 byte 9.004	C	R	-	T
4	*Temperature value*	*Physical value*	2 byte 9.001	C	R	-	T
5	*Wind speed (m/s)*	*Physical value*	2 byte 9.005	C	R	-	T
	Wind speed (km/h)		2 byte 9.005	C	R	-	T
	Wind speed (Bft)		1 byte 20.014	C	R	-	T
6	*n.a.*						
7	*n.a.*						
8	*n.a.*						
9	*n.a.*						
10	*n.a.*						
11	*n.a.*						
12	*n.a.*						
13	*n.a.*						
14	*n.a.*						
15	*Temperature sensor status*	*0=OK, 1=defect*	1 bit 1.001	C	R	-	T
16	*n.a.*						

Continuation:

No.	Object name	Function	Type DPT	Flags			
17	*n.a.*						
18	*External lux value 1*	*Receive*	2 byte 9.004	C	R	W	-
19	*External lux value 2*	*Receive*	2 byte 9.004	C	R	W	-
20	*C1.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
21	*C1.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
22	*C1 lock*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
23	*C1 Brightness threshold*	*enter/view*	2 byte 9.004	C	R	W	T
		Request	2 byte 9.004	C	R	-	T
24	*C2.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
25	*C2.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
26	*C2 lock*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-
27	*C2 Brightness threshold*	*enter/view*	2 byte 9.004	C	R	W	T
		Request	2 byte 9.004	C	R	-	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
28	*C3.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
29	*C3.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
30	*C3 lock*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
31	*C3 Brightness threshold*	*enter/view*	2 byte 9.004	C	R	W	T
		Request	2 byte 9.004	C	R	-	T
32	*C4.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
33	*C4.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
34	*C4 lock*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-
35	*C4 brightness threshold*	*Request*	2 byte 9.004	C	R	-	T
		enter/view	2 byte 9.004	C	R	W	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
36	*C5.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
37	*C5.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
38	*C5 lock*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
39	*C5 Brightness threshold*	*enter/view*	2 byte 9.004	C	R	W	T
		Request	2 byte 9.004	C	R	-	T
40	*C6.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
41	*C6.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
42	*C6 lock*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
43	*C6 Brightness threshold*	*enter/view*	2 byte 9.004	C	R	W	T
		Request	2 byte 9.004	C	R	-	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
44	*C7.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
45	*C7.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
46	*C7 lock*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
47	*C7 Brightness threshold*	*enter/view*	2 byte 9.004	C	R	W	T
		Request	2 byte 9.004	C	R	-	T
48	*C8.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
49	*C8.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
50	*C8 lock*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
51	*C8 Brightness threshold*	*enter/view*	2 byte 9.004	C	R	W	T
		Request	2 byte 9.004	C	R	-	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
52	*C9.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
53	*C9.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
54	*C9 Disable*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-
55	*C9 Brightness threshold*	*enter/view*	2 byte 9.004	C	R	W	T
		Request	2 byte 9.004	C	R	-	T
56	*C10.1 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
57	*C10.2 Universal channel*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
58	*C10 Disable*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-
59	*C10 Brightness threshold*	*Request*	2 byte 9.004	C	R	-	T
		enter/view	2 byte 9.004	C	R	W	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
60	*C11 up/down*	*Drives up/down*	1 bit 1.008	C	-	-	T
61	*C11 Shutters*	*Height*	1 byte 5.001	C	R	-	T
	C11 Blinds	*Height*	1 byte 5.001	C	R	-	T
	C11 scene	*transmit*	1 byte 5.001	C	R	-	T
62	*C11 lamella*	*Position*	1 byte 5.001	C	R	-	T
63	*C11 sun control*	*Morning=1 / Evening=0*	1 bit 1.001	C	R	W	-
64	*n.a.*						
65	*C11 safety*	*Input*	1 bit 1.001	C	R	W	-
66	*C11 Dawn/dusk threshold*	*send/receive*	2 byte 9.004	C	R	W	T
67	*C11 brightness threshold*	*send/receive*	2 byte 9.004	C	R	W	T
68	*C12 up/down*	*Drives up/down*	1 bit 1.001	C	-	-	T
69	*C12 scene*	*transmit*	1 byte 18.001	C	R	-	T
	C12 Blinds	*Height*	1 byte 5.001	C	R	-	T
	C12 Shutters	*Height*	1 byte 5.001	C	R	-	T
70	*C12 Slats*	*Position*	1 byte 5.001	C	R	-	T
71	*C12 Sun control*	*Morning=1 / Evening=0*	1 bit 1.001	C	R	W	-
72	*n.a.*						
73	*C12 Safety*	*Input*	1 bit 1.001	C	R	W	-
74	*C12 Dawn/dusk threshold*	*send/receive*	2 byte 9.004	C	R	W	T
75	*C12 Brightness threshold*	*send/receive*	2 byte 9.004	C	R	W	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
76	*C13 Up/down*	*Drives up/down*	1 bit 1.001	C	-	-	T
77	*C13 Blinds*	*Height*	1 byte 5.001	C	R	-	T
	C13 Shutters	*Height*	1 byte 5.001	C	R	-	T
	C13 Scene	*transmit*	1 byte 18.001	C	R	-	T
78	*C13 Slats*	*Position*	1 byte 5.001	C	R	-	T
79	*C13 Sun control*	*Morning=1 / Evening=0*	1 bit 1.001	C	R	W	-
80	*n.a.*						
81	*C13 Safety*	*Input*	1 bit 1.001	C	R	W	-
82	*C13 Dawn/dusk threshold*	*send/receive*	2 byte 9.004	C	R	W	T
83	*C13 Brightness threshold*	*send/receive*	2 byte 9.004	C	R	W	T
84	*C14 Threshold switch input*	*0..65535*	2 byte 7.001	C	R	W	-
		EIS 5	2 byte 9.*	C	R	W	-
		Percent	1 byte 5.001	C	R	W	-
		0..255	1 byte 5.010	C	R	W	-
85	*C14 Disable*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
86	*C14.1 Threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
87	*C14.2 Threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
88	*C15 Threshold switch input*	*0..65535*	2 byte 7.001	C	R	W	-
		EIS 5	2 byte 9.*	C	R	W	-
		Percent	1 byte 5.001	C	R	W	-
		0..255	1 byte 5.010	C	R	W	-
89	*C15 Disable*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-
90	*C15.1 Threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
91	*C15.2 Threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
92	*C16 Threshold switch input*	*0..65535*	2 byte 7.001	C	R	W	-
		EIS 5	2 byte 9.*	C	R	W	-
		Percent	1 byte 5.001	C	R	W	-
		0..255	1 byte 5.010	C	R	W	-
93	*C16 Disable*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
94	*C16.1 Threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
95	*C16.2 Threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
96	*C17 Threshold switch input*	*0..65535*	2 byte 7.001	C	R	W	-
		EIS 5	2 byte 9.*	C	R	W	-
		Percent	1 byte 5.001	C	R	W	-
		0..255	1 byte 5.010	C	R	W	-
97	*C17 Disable*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-
98	*C17.1 Threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
99	*C17.2 Threshold switch input*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
100	*C18 Logic module*	*Logic input 1 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
101		*Logic input 2 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
102		*Logic input 3 in AND/OR gate*	1 bit 1.001	C	R	W	-
103		*Logic input 4 in AND/OR gate*	1 bit 1.001	C	R	W	-
104	*C18 Logic module*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-
105	*C18.1 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
106	*C18.2 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
107	*C19 Logic module*	*Logic input 1 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
108		*Logic input 2 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
109		*Logic input 3 in AND/OR gate*	1 bit 1.001	C	R	W	-
110		*Logic input 4 in AND/OR gate*	1 bit 1.001	C	R	W	-
111	*C19 Logic module*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-
112	*C19.1 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
113	*C19.2 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
114	*C20 Logic module*	*Logic input 1 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
115		*Logic input 2 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
116		*Logic input 3 in AND/OR gate*	1 bit 1.001	C	R	W	-
117		*Logic input 4 in AND/OR gate*	1 bit 1.001	C	R	W	-
118	*C20 Logic module*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
119	*C20.1 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
120	*C20.2 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
121	*C21 Logic module*	*Logic input 1 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
122		*Logic input 2 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
123		*Logic input 3 in AND/OR gate*	1 bit 1.001	C	R	W	-
124		*Logic input 4 in AND/OR gate*	1 bit 1.001	C	R	W	-
125	*C21 Logic module*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-

Continuation:

No.	Object name	Function	Type DPT	Flags			
126	*C21.1 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
127	*C21.2 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
128	*C22 Logic module*	*Logic input 1 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
129		*Logic input 2 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
130		*Logic input 3 in AND/OR gate*	1 bit 1.001	C	R	W	-
131		*Logic input 4 in AND/OR gate*	1 bit 1.001	C	R	W	-
132	*C22 Logic module*	*Disable = 1*	1 bit 1.001	C	R	W	-
		Disable = 0	1 bit 1.001	C	R	W	-
133	*C22.1 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
134	*C22.2 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T

Continuation:

No.	Object name	Function	Type DPT	Flags			
135	*C23 Logic module*	*Logic input 1 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
136		*Logic input 2 in AND/OR/XOR gate*	1 bit 1.001	C	R	W	-
137		*Logic input 3 in AND/OR gate*	1 bit 1.001	C	R	W	-
138		*Logic input 4 in AND/OR gate*	1 bit 1.001	C	R	W	-
139	*C23 Logic module*	*Disable = 0*	1 bit 1.001	C	R	W	-
		Disable = 1	1 bit 1.001	C	R	W	-
140	*C23.1 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T
141	*C23.2 Logic module*	*Switching*	1 bit 1.001	C	R	-	T
		Value	1 byte 5.010	C	R	-	T
		priority	2 bit 2.001	C	R	-	T

3.2.1 Description of objects

3.2.1.1 Physical values

- **Object 0 "*Brightness value at front"***

Sends the current brightness value at front brightness sensor.
Only the value measured directly by the installed sensor is sent.
Received external brightness values are not considered.

- **Object 1 "*Brightness value left*"**

Sends the current brightness value at the left brightness sensor (looking at device from the front).
Received external brightness values are not considered.

- **Object 2"*Brightness value right"***

Sends the current brightness value at the left brightness sensor (looking at device from the front).
Received external brightness values are not considered.

- **Object 3 *"Maximum brightness value"***

Reports the highest measured value from objects 0, 1 and 2.
Received external brightness values are not considered.

- **Object 4 *"Temperature value"***

Depending on the configuration, sends the current temperature value either if there is a change and/or cyclically.

- **Object 5 "*Wind speed*"**

Depending on the configuration, sends the current wind speed if there is a change and/or cyclically.
The unit used, i.e. **m/s** or **km/h**, **Beaufort** can be selected on the measured values parameter page.

- **Object 6**

Not used.

- **Object 7**

Not used.

- **Object 8**

Not used.

- **Object 9**

Not used.

- **Object 10**

Not used.

- **Object 11**

Not used.

- **Object 12** *"Elevation"*

Height of the sun over the horizon.
0° corresponds to sun at lowest point on horizon (sunrise or sunset).

The actual elevation depends on the latitude and date and time.

- **Object 13** *"Azimuth"*

Horizontal angle of the sun in all directions.
0° = North
90° = East
180° = South
270° = West

- **Object 14**

Not used.

- **Object 15** *"Temperature sensor status"*

0 = Sensor OK.
1 = Error.

- **Object 16**

Not used.

- **Object 17**

Not used.

- **Object 18** *"External lux value 1"*

Receives the brightness value of another facade from another KNX sensor (e.g. Luna 133 KNX order no. 1339200).

- **Object 19** *"External lux value 2"*

Receives the brightness value of another facade from another KNX sensor (e.g. Luna 133 KNX order no. 1339200).

3.2.1.2 Universal channels C1..C10

- **Object 20** *"C1.1 Universal channel switch/value/priority"*

This is the first output object of a universal channel.
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C1.1* parameter).

Table 2

<table>
<tr><th>Telegram type</th><th>format</th><th>Sent telegrams</th></tr>
<tr><td>Switching</td><td>DPT 1.001 (On/Off)</td><td>On/Off</td></tr>
<tr><td>priority</td><td>DPT 2.001 (priority control)</td><td>2-bit telegram
<table>
<tr><th>Function</th><th>value</th></tr>
<tr><td>no priority (no control)</td><td>0</td></tr>
<tr><td>Priority OFF (control: disable, off)</td><td>2</td></tr>
<tr><td>Priority ON (control: enable, on)</td><td>3</td></tr>
</table></td></tr>
<tr><td>value</td><td>DPT 5.010</td><td>Value between 0 and 255</td></tr>
</table>

- **Object 21** *"C1.2 Universal channel switch/value/priority"*

This is the second output object of a universal channel.
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C1.2* parameter).

The telegram type can be parameterized independently of the first output object.
The same setting options are available for this purpose as for the first output object
(see table above for object 20).

The cycle time and the disabling behaviour are valid together for both objects (objects 20+21).

- **Object 22** *"C1 disable"*

Only available if the disable function is activated.

The behaviour on setting and cancelling the disable status can be selected on the *Objects* parameter page.

- **Object 23** *"C1 brightness threshold"*

Only available if the channel is configured as brightness sensor or as link of several sensors.
This object makes it possible to change the configured brightness threshold of the channel via bus telegram at any time.

- **Objects 24..59**

Objects 24 to 59 are for universal channels C2..C10 and have an identical function as with objects on channel C1.

3.2.1.3 Sun protection channels C11..C13

- **Object 60** *"C11 up/down"*

This object is used to completely open or close the sun protection devices.
0 = raise
1 = lower

- **Object 61** *"C11 send shutters/blinds height, scenes"*

The function of this object depends on the *channel* parameter *controlled by sun protection channel C11* parameter page.

Table 2

Channel controls	Object transmits
Shutter	Height telegram in %
Via scenes	Scene numbers 1..64
Blinds	Height telegram in %

- **Object 62** *"C11 slats"*

Sends the required slat position from 0% to 100% in 1% increments to the blinds actuator.

- **Object 63** *"C11 Sun control"*

This object is only available if the "*via object*" activation of the sun control is selected on the *sun control* parameter page.
A "1" on the object activates the sun control and the weather station sends the necessary height and position telegrams to the actuator.
The sun control is deactivated with a "0", and the drives are then no longer controlled by the weather station.

- **Object 65** *"C11 safety"*

If safety is set (= 1) then the 2 objects, C11 height and C11 slats, of the affected channel do no transmit.
The response to the start of safety is controlled by the actuator.

On cancellation of safety (=0):
During the day: The current channel status is resent after the delay timer has finished. This means that the actuator is sent the new settings from the weatherstation after the end of the safety phase.

During the night, the "*Reaction to dusk*" or "*Reaction to sun control OFF* " parameters apply depending on setting (*Activation of sun control object* or *dawn/dusk threshold*).

- **Object 66** *"C11 Dawn/dusk threshold"*

This object makes it possible to change the configured dawn/dusk threshold of the channel via bus telegram at any time.

- **Object 67** *"C11 brightness threshold"*

This object makes it possible to change the configured brightness threshold of the channel via bus telegram at any time.

- **Objects 68..83**

Objects 68 to 83 are for sun protection channels C12..C13 and have an identical function as with objects on channel C11.

3.2.1.4 Threshold switch C14..C17

- **Object 84** *"C14 Threshold switch input"*

Input object of channel: This object activates the set channel function.

Table 2

Type of threshold value object	Activation of channel function via
object type: Per cent (DPT 5.001)	Exceeding per cent value
Object type: Counter value 0..255 (DPT 5.010)	Any value in given numerical range
object type: Counter value 0..65535 (DPT 7.001)	
Object type: EIS5 e.g. CO2, brightness (DPT 9.xxx)	2 byte floating-point number

- **Object 85** *"C14 disable"*

Disable object on channel
Only visible if the disable function is activated.
The action (disable with 0 or 1) can be set via parameters.

- **Object 86** *"C14.1 Threshold value switch, switch/value/priority"*

This is the first output object of the threshold value switch.
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C14.1* parameter).

Table 2

Telegram type	format	Sent telegrams
Switching	DPT 1.001 (On/Off)	On/Off
priority	DPT 2.001 (priority control)	2-bit telegram *Function* / *value* no priority (no control) / 0 Priority OFF (control: disable, off) / 2 Priority ON (control: enable, on) / 3
value	DPT 5.010	Value between 0 and 255

- **Object 87** *"C14.2 Threshold value switch, switch/value/priority"*

This is the second output object of the threshold value switch.
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C14.2* parameter).

The telegram type can be parameterized independently of the first output object.
The same setting options are available for this purpose as for the first output object
(see table above for object 86).

The cycle time and the disabling behaviour are valid together for both objects (objects 86+87).

- **Objects 88..99**

Objects 88 to 99 are for threshold value switches C15/C17 and have an identical function as with objects on channel C14.

3.2.1.5 Logic modules C18..C23

- **Object 100** *"C18 Logic module, logic input 1 in AND/OR/XOR gate 1"*

First input object of logic module.

- **Object 101** *"C18 Logic module, logic input 2 in AND/OR/XOR gate"*

Second input object of logic module.

- **Object 102** *"C18 Logic module, logic input 3 in AND/OR/ gate"*

Third input object of logic module.
Not used with XOR link.

- **Object 103** *"C18 Logic module, logic input 4 in AND/OR/ gate"*

Fourth input object of logic module.
Not used with XOR link.

- **Object 104** *"C18 logic module disable"*

Disable object on channel
Only visible if the disable function is activated.
The action (disable with 0 or 1) can be set via parameters.

- **Object 105***"C18.1 Logic module, switch/value/priority"*

This is the first output object of the logic module.
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C18.1* parameter).

Table 2

<table>
<tr><th>Telegram type</th><th>format</th><th>Sent telegrams</th></tr>
<tr><td>Switching</td><td>DPT 1.001 (On/Off)</td><td>On/Off</td></tr>
<tr><td>priority</td><td>DPT 2.001 (priority control)</td><td>2-bit telegram
<table>
<tr><th>Function</th><th>value</th></tr>
<tr><td>no priority (no control)</td><td>0</td></tr>
<tr><td>Priority OFF (control: disable, off)</td><td>2</td></tr>
<tr><td>Priority ON (control: enable, on)</td><td>3</td></tr>
</table></td></tr>
<tr><td>value</td><td>DPT 5.010</td><td>Value between 0 and 255</td></tr>
</table>

- **Object 106** *"C18.2 Logic module, switch/value/priority"*

This is the second output object of the logic module.
The function of the object depends upon the selected telegram type
(see *Objects* parameter page, *telegram type C18.2* parameter).

The telegram type can be parameterized independently of the first output object.
The same setting options are available for this purpose as for the first output object
(see table above for object 105).

The cycle time and the disabling behaviour are valid together for both objects (objects 86+87).

- **Objects 107..141**

Objects 107 to 141 are for logic modules C19/C23 and have an identical function as with objects on channel C18.

3.3 Parameter

3.3.1 Parameter pages

Table 2

Function	Description
General	Selection of required channels.
Measured values	Settings for transmitting brightness, temperature, wind.
Universal channel C1: Function .. *Universal channel C10: Function*	Basic settings, delays, response after download etc.
*Objects**	Telegram type switch and disable response etc.
Sun protection channel C11 *Sun protection channel C12* *Sun protection channel C13*	Basic settings for sun protection functions. Object type, delays etc.
*sun control**	Type of activation and reaction with sun control On/Off.
*safety**	Response to safety telegram
Threshold channel C14: Function .. *Threshold channel C17: Function*	Type of threshold value object, delays etc.
*Objects**	Telegram type switch and disable response etc.
Logic channel C18: Function .. *Logic channel C23: Function*	Number of inputs, links etc.
*Objects**	Telegram type switch and disable response etc.

* Own parameter page for each channel.

3.3.2 Parameter description

Settings that lead to the display of other pages or functions are identified by ...
Example: *yes/no*

3.3.2.1 The "*General*" parameter page

Designation	*Values*	Description
Activate universal channel C1	***No*** *Yes..*	The universal channels can trigger telegrams based on one or more physical measurements.
Activate universal channel C2	***No*** *Yes..*	
Activate universal channel C3	***No*** *Yes..*	
Activate universal channel C4	***No*** *Yes..*	
Activate universal channel C5	***No*** *Yes..*	
Activate universal channel C6	***No*** *Yes..*	
Activate universal channel C7	***No*** *Yes..*	
Activate universal channel C8	***No*** *Yes..*	
Activate universal channel C9	***No*** *Yes..*	
Activate universal channel C10	***No*** *Yes..*	
Activate sun protection channel C11	***No*** *Yes..*	3 sun protection channels for controlling shutters, awnings or blinds etc.
Activate sun protection channel C12	***No*** *Yes..*	
Activate sun protection channel C13	***No*** *Yes..*	
Activate threshold channel C14	***No*** *Yes..*	Threshold channels switch based on received bus telegrams according to whether a value is exceeded or not achieved.
Activate threshold channel C15	***No*** *Yes..*	
Activate threshold channel C16	***No*** *Yes..*	
Activate threshold channel C17	***No*** *Yes..*	

Continuation:

Designation	*Values*	Description
Activate logic channel C18	***No*** *Yes.*.	Logic channels enable the linking of up to 4 inputs. These can be both specific logic input objects (max. 4) as well as the switching statuses of the other channels (universal, threshold or logic channels).
Activate logic channel C19	***No*** *Yes.*.	
Activate logic channel C20	***No*** *Yes.*.	
Activate logic channel C21	***No*** *Yes.*.	
Activate logic channel C22	***No*** *Yes.*.	
Activate logic channel C23	***No*** *Yes.*.	

3.3.2.2 The "*Measured values*" parameter page

Designation	Values	Description
Send brightness value on change	*no* *of 20 %, but at least 1 lux* ***of 30 %, but at least 1 lux*** *of 50 %, but at least 1 lux* *of 10 %, but at least 1 lux*	Only send cyclically (if enabled) Send if the value has changed by 10%, 20% etc. since it was last sent. However, if a change of 10% corresponds to a brightness change < 1 lux, then the value is not sent until the change is >1 lux.
Send brightness value cyclically	***do not send cyclically*** *every min* *every 2 min* *every 3 min* *every 5 min* *every 10 min* *every 15 min* *every 20 min* *every 30 min* *every 45 min* *every 60 min*	How often should the current brightness value be resent?
Brightness adjustment sensor at front in %	*-30..30* (Default = ***0***)	Adjustment to brightness measurement if sent value deviates from actual ambient brightness. Example: Brightness = 10,000 lux Sent = 11,000 lux Adjustment value = -10 %
Brightness adjustment sensor left in %	*-30..30* (Default = ***0***)	See above.
Brightness adjustment sensor right in %	*-30..30* (Default = ***0***)	See above.
Transmit temperature in the event of change	*no* *of 0.5 °C* ***of 1.0 °C*** *of 1.5 °C* *of 2.0 °C* *of 2.5 °C*	Only send cyclically (if enabled) Send if the value has changed for example by 0.5°C or 1°C since it was last sent.

Continuation:

Designation	*Values*	Description
Temperature adjustment in 0.1°C stages (-64 ..) 63)	*-64..63* (Default = ***0***)	Adjustment to temperature measurement if sent temperature deviates from actual ambient temperature. Example: Temperature = 20°C sent temperature = 21°C Adjustment value = -10 (i.e. -10 x 0.1°C)
Send temperature cyclically	***do not send cyclically*** *every min* *every 2 min* *every 3 min* *every 5 min* *every 10 min* *every 15 min* *every 20 min* *every 30 min* *every 45 min* *every 60 min*	How often should the current temperature be sent again?
Send wind speed in	***m/s*** *km/h* *Beaufort*	Unit for wind speed 1 m/s is equivalent to 3.6 km/h 1 km/h is equivalent to 0.278 m/s Wind force 1..12. See table in attachment
Send wind speed in the event of a change	*No* ***of 10 %, but at least 0.5 m/s*** *of 20 %, but at least 0.5 m/s* *of 30 %, but at least 1 m/s* *of 50 %, but at least 1 m/s*	Only send cyclically (if enabled) Send if the value has changed by 20%, 30% or 50% since it was last sent

Continuation:

Designation	*Values*	Description
Send wind speed cyclically	***do not send cyclically*** *every min* *every 2 min* *every 3 min* *every 5 min* *every 10 min* *every 15 min* *every 20 min* *every 30 min* *every 45 min* *every 60 min* *every 10 seconds (for test purposes only)*	How often should the current wind speed be sent again?

Continuation:

Designation	*Values*	Description
Send elevation and azimuth of the sun	***only on request*** *every 5 min.* *every 15 min.* *every 30 min.*	How often should the sun height and direction telegrams be resent?

3.3.2.3 The "*Universal channel C1..C10: function*" parameter pages

The universal channels C1..C10 can be used for sub-tasks (e.g. a pure brightness threshold) or for a free combination of measured variables.

A channel is made up of up to 4 logically linked weather conditions, i.e.:

- If the brightness is above/below the threshold AND
- If the temperature is above/below the threshold AND
- If the wind speed is above/below the threshold AND

Or:

- If the brightness is above/below the threshold OR
- If the temperature is above/below the threshold OR
- If the wind speed is above/below the threshold OR

A non-relevant condition (e.g. temperature) can be omitted and is then ignored during linking.

As a result of the satisfaction or non-satisfaction of this AND/OR link, a telegram is sent to the associated channel object (e.g. channel 1.1).
If required, an additional second object (e.g. channel 1.2) can be activated and thereby a second telegram sent as well.

Each universal channel has one disabling object and one object for setting the brightness threshold.

If required, a universal channel can also be configured as a safety channel if the relevant variables, i.e. temperature and wind OR are linked.
The result of the link can be evaluated internally in the sun protection channels as a safety report.

3 sensors are available for brightness measurement

The use of a front sensor is recommended for applications in the brightness range below 100 lux, e.g. as twilight switch, as this produces a finer resolution than the other sensors in this area.

The universal channels are activated on the General parameter page.
Various parameters are available according to the set function.

Table 1: Function selection

Designation	Values	Description
Channel function	***Brightness sensor 1 .. 100,000 lux*** *temperature sensor* *wind sensor* *Link of the following sensors:*	Which of the 3 weather variables should the channel react to? The channel is to react to several weather variables. These are logically linked together (AND or OR).

Table 2: Function = Brightness sensor 1 .. 100,000 lux

Designation	Values	Description
Brightness	*Below 3 lux .. below 90,000 lx* (in 72 increments) *Over 3 lux .. over 90,000 lux* (in 75 increments, default = **10,000lux**)	The channel condition is fulfilled if the value is below the entered threshold. The channel condition is fulfilled if the value is above the entered threshold.
Source:	***Sensor at front***, *sensor left, sensor right* *maximum value of the 3 sensors*	Which of the 3 installed brightness sensors should be used for taking measurements? The values of the 3 sensors are compared with each other and only the highest value is considered.
Light hysteresis	***20 % but at least 1 lux*** *30 %, but at least 1 lux* *50 %, but at least 1 lux*	The hysteresis prevents frequent switching after small changes in brightness. Depending on the selected condition, it can be either negative or positive. **Example** with 20% hysteresis: Condition: "OVER 4,500 lux“ = fulfilled from 4,500 lux and no longer fulfilled at 4,500 lux - 20% Condition: "UNDER 4,500 lux“ = satisfied below 4500 lx and no longer satisfied at 4500 lx + 20%

Continuation:

Designation	Values	Description
Delay when brightness increases	*none* *5 s, 10 s, 20 s, 30 s, 1 min, 2 min,* ***3 min****, 5 min, 10 min, 15 min, 20 min*	Response time when it gets lighter and the selected threshold is passed as a result. This setting prevents conflicting telegrams from being sent in response to temporary fluctuations in brightness
Delay when brightness decreases	*none* *5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 3 min, 5 min,* ***10 min****, 15 min, 20 min*	Response time when it gets darker and the selected threshold is passed as a result. This setting prevents conflicting telegrams from being sent in response to temporary fluctuations in brightness
Value can be overwritten via object	***Yes*** *no*	Should it be possible to change the configured brightness threshold via bus telegrams at any time.
Overwrite value on download	***Yes*** *no*	With an ETS download, the brightness threshold currently stored in the device is deleted and overwritten with the value set in the ETS. An ETS download, does not have any effect on the brightness threshold currently stored in the device. **Exception:** Even if *no* is selected, **all** ETS parameter values are downloaded when it is first commissioned (i.e. with an empty storage device).

Table 3: Function = Temperature sensor

Designation	Values	Description
Temperature	*below –30°C to over 40°C (in 1K increments)* *over –30°C to over 40°C* Default = ***over 18 °C***	Should the condition be satisfied when the temperature is below or above the selected value?
Temperature hysteresis	***1.0 K****, 1.5 K* *2.0 K, 2.5 K*	The hysteresis prevents frequent switching after small temperature changes. It can be negative or positive depending on the selected condition (above or below xx°C) (see table above: Light hysteresis).

Table 4: Function = Wind sensor

Designation	Values	Description
Wind speed	*below 4 m/s (approx. 14 km/h) .. below 30 m/s(approx. 108 km/h)*	The channel condition is fulfilled if the value is below the entered threshold.
	***over 4 m/s (approx. 14 km/h)** .. over 30 m/s(approx. 108 km/h)*	The channel condition is fulfilled if the value is above the entered threshold.
Wind off-delay	*none*	The channel status changes immediately the wind threshold is not achieved.
	*5 s, 10 s, 20 s, 30 s, 1 min, 2 min, **3 min**, 5 min, 10 min, 15 min, 20 min*	The channel status only changes after the the set time delay period.

Table 5: Function = Linking of the following sensors:

Designation	Values	Description
Brightness	*Yes* ***No***	Which of the 3 weather variables are to be taken into account?
Temperature	*Yes* ***No***	
Wind	*Yes* ***No***	
Type of link	***AND***	Fulfilled when the conditions of **all** the selected weather variables have been met. Example: Temperature AND brightness
	OR	Fulfilled when the conditions of **one** of the selected weather variables have been met.
Parameters for brightness		
Brightness threshold value	*Below 3 lux .. below 90,000 lx* *Over 3 lux .. over 90,000 lux* Default = ***over 10,000 lux***	See above: Function = Brightness sensor 1 .. 100,000 lux
Value can be overwritten via object	***Yes*** *no*	
Overwrite value on download	*Yes* ***no***	
Source:	***Sensor at front***, *sensor left, sensor right* *maximum value of the 3 sensors*	
Light hysteresis	***20 % but at least 1 lux*** *30 %, but at least 1 lux* *50 %, but at least 1 lux*	
Delay when brightness increases	*none* *5 s, 10 s, 20 s, 30 s, 1 min, 2 min,* ***3 min***, *5 min, 10 min, 15 min,* *20 min*	
Delay when brightness decreases	*none* *5 s, 10 s, 20 s, 30 s, 1 min, 2 min,* *3 min, 5 min,* ***10 min***, *15 min,* *20 min*	
Parameters for temperature		
Temperature threshold	*below -30 °C .. below 40 °C* *over -30 °C .. over 40 °C* Default = ***over 18 °C***	See above: Function = Temperature sensor.
Temperature hysteresis	***1.0 K***, *1.5 K* *2.0 K, 2.5 K*	

Continuation:

Designation	Values	Description
Parameters for wind		
Wind speed	*below 4 m/s (approx. 14 km/h) .. below 30 m/s(approx. 108 km/h)* ***over 4 m/s (approx. 14 km/h)*** *.. over 30 m/s(approx. 108 km/h)*	See above: Function = Wind sensor.
Wind off-delay	*none* *5 s, 10 s, 20 s, 30 s, 1 min, 2 min,* ***3 min****, 5 min, 10 min, 15 min, 20 min*	

3.3.2.4 The "*Objects*" parameter pages

All universal, threshold and logic channels have this type of parameter page.
The reaction here is configured on fulfillment or non-fulfillment of the conditions.

Table 2

<table>
<tr><th>Designation</th><th>Values</th><th>Description</th></tr>
<tr><td>Telegram type C1.1</td><td>Switching command

Priority

value</td><td>1 bit ON/OFF

2-bit
<table><tr><th>Function</th><th>value</th></tr><tr><td>Priority inactive (no control)</td><td>0 (00_{bin})</td></tr><tr><td>Priority ON
Priority ON (control: enable, on)</td><td>3 (11_{bin})</td></tr><tr><td>Priority OFF (control: disable, off)</td><td>2 (10_{bin})</td></tr></table>1-byte 0 ... 255</td></tr>
<tr><td>If all conditions are met</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has been fulfilled.</td></tr>
<tr><td>Telegram</td><td>

ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 ... 255</td><td>Type of telegram for the first channel output object with fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
<tr><td>If not all conditions are met</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has not been fulfilled.</td></tr>
<tr><td>Telegram</td><td>

ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 .. 255</td><td>Type of telegram for the first channel output object without fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
</table>

Continuation:

<table>
<tr><th>Designation</th><th>Values</th><th>Description</th></tr>
<tr><td>Should a second telegram be sent?</td><td>Yes
no</td><td>If yes has been selected, further parameters and a second transmission object appear.
It can be used to send 2 different telegrams at the same time on the same channel.
The cycle time and the disabling behaviour are apply to both objects.</td></tr>
<tr><td>Telegram type C1.2</td><td>Switching command

Priority

value</td><td>Second output object on channel
1 bit ON/OFF

2-bit<table><tr><th>Function</th><th>value</th></tr><tr><td>Priority inactive (no control)</td><td>0 (00_{bin})</td></tr><tr><td>Priority ON
Priority ON (control: enable, on)</td><td>3 (11_{bin})</td></tr><tr><td>Priority OFF (control: disable, off)</td><td>2 (10_{bin})</td></tr></table>1-byte 0 ... 255</td></tr>
<tr><td>If all conditions are met</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has been fulfilled.</td></tr>
<tr><td>Telegram</td><td>

ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 ... 255</td><td>Type of telegram for the second channel output object with fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
<tr><td>If not all conditions are met</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has not been fulfilled.</td></tr>
<tr><td>Telegram</td><td>

ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 .. 255</td><td>Type of telegram for the second channel output object without fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
</table>

Continuation:

Designation	Values	Description
Activate lock function	*Yes*	Show disable parameter and disable object
	no	No disable function
Behaviour when setting the disable function	***do not send***	No telegrams while the disable object is set.
	as with unfulfilled condition	Same reaction as set in the *When not all conditions have been fulfilled* parameter (see above).
	as with fulfilled condition	Same reaction as set in the *When all conditions have been fulfilled* parameter (see above).
Behaviour when cancelling the disable setting Behaviour when cancelling the disable setting	*do not send*	Not automatically resent when the disable setting is cancelled
	update channel	The current channel status is sent immediately as soon as the disable setting is cancelled.
Cycle time (if used)	*do not send cyclically* *every min* *every 2 min* *every 3 min* *every 5 min* *every 10 min* *every 15 min* *every 20 min* *every 30 min* *every 45 min* ***every 60 min***	How often should the telegrams for CX.1 and CX.2 be sent?
Telegram with recognised sensor error (just temperature)	***Do not send any longer*** *as with unfulfilled condition, as with fulfilled condition*	This parameter comes into effect if the temperature sensor (if used by channel) reports an error.

3.3.2.5 The "*Sun protection channel C11..C13*" parameter pages

The sun protection channels can control shutters, awnings or blinds etc.

A sun protection channel comprises:
- 1 Dawn/dusk threshold
- 1 Brightness threshold for shading
- 3 objects for actuating the drive (up/down – height % – slats %)
- 1 sun control object (morning/evening)
- 1 Object for setting the brightness threshold.
- 1 safety object

The signal for "morning" or "evening" can be issued either via the sun control object (e.g. via a timer switch) or via the dawn/dusk.

The sun protection channels are activated on the General parameter page.

Table 2

Designation	Values	Description
Channel controls	*Shutters*	For shutters, awnings etc.
	via scenes	With Up/Down and scene telegrams
	Blinds	For blinds
Source for brightness measurement	***Sensor at front***	Which of the 3 installed brightness sensors should be used for taking measurements?
	Sensor left	
	Sensor right	
	maximum value of the 3 sensors	The values of the 3 sensors are compared with each other and only the highest value is considered.
	External lux value 1 object	Use brightness value from another KNX sensor. e.g. Luna 133 (order no. 1339200) on another facade.
	External lux value 2 object	

Continuation:

Designation	Values	Description
Dawn/dusk threshold	*2 lux..500 lux* Default = ***10 lux***	Threshold for detection of rise/set.
Brightness threshold for shading	*2,000..90,000 lux* Default = ***20,000 lux***	From what brightness level is sun protection required?
Delay when brightness increases	*None,* *5 s, 10 s,* *20 s,* ***30 s****, 1 min, 2 min,* *3 min, 5 min, 10 min, 15 min,* *20 min*	Only for initial start-up and tests. Response time when it gets lighter and the threshold is passed as a result. This delay prevents conflicting responses from the drives to temporary fluctuations in brightness.
Delay when brightness decreases	*none,* *5 s, 10 s* *20 s, 30 s,* *1 min, 2 min, 3 min,* ***5 min****, 10 min, 15 min,* *20 min*	Only for initial start-up and tests. Response time when it gets darker and the threshold is exceeded as a result. This delay prevents conflicting responses from the drives to temporary fluctuations in brightness.
Drive height when brightness threshold is exceeded	*0..100 %* Default = ***10 %***	The blinds or shutters are lowered once after the threshold is exceeded.
Scene number when brightness threshold is exceeded	*1..64* Default = ***Scene 1***	The covering is lowered once after the threshold is exceeded and a scene number is sent.
Slat when brightness threshold is exceeded	*0..100 %* Default = ***50 %***	Slat position when threshold is exceeded.
Thresholds can be overwritten via object	***Yes*** *no*	With an ETS download, the brightness or dawn/dusk thresholds currently stored in the device are deleted and overwritten with the value set in the ETS.
Overwrite thresholds on download	***Yes*** *no*	With an ETS download, the brightness or dawn/dusk thresholds currently stored in the device are deleted and overwritten with the value set in the ETS. An ETS download does not affect the brightness thresholds currently stored in the device **Exception:** Even if *no* is selected **all** ETS parameter values are downloaded when it is first commissioned (i.e. with an empty storage device).

3.3.2.6 The "*Sun control*" parameter page

Table 2

Designation	Values	Description
Activation of sun control	***Via object***	The automatic sun protection is activated via the relevant sun control object (e.g. via a timer).
	Via dawn/dusk threshold	The automatic sun control becomes active immediately after the dawn/dusk threshold is exceeded
Reaction to dawn	***Raise and sun control ON***	Automatic sun protection is activated once the dawn/dusk threshold is exceeded, (e.g.) the blinds are raised.
	Sun control. ON but do not move	Automatic sun protection is activated once the dawn/dusk threshold is activated. Only move drives when shading required.
Reaction to dusk	***Sun control OFF & raise*** *Sun control OFF & lower* *Sun control OFF but don't move*	Response of drives when dawn/dusk threshold is exceeded in the evening.
Reaction to sun control ON		only visible with *Activation of sun control via object* When the sun control object is set:
	Raise and sun control ON	Raise blinds/shutters and position accordingly if shading is required.
	Not until dawn: Raise and sun control ON	The blinds are not raised until the sun control object has been set and the dawn/dusk threshold has been exceeded.
	Sun control. ON but do not move	Only move drives when shading required.

Continuation:

Designation	Values	Description
Reaction to sun control OFF	***Sun control OFF & raise*** *Sun control OFF & lower* *Sun control OFF & shut down at dawn* *Sun control OFF but don't move*	Response of drives after switching off sun control.
With falling below brightness threshold while sun control is active	***No response*** *Raise* *Adjust slats*	If the brightness, e.g. due to heavy cloud, falls below the set threshold: Do not move drives This setting serves to calm the facade, no constant movements. To achieve the maximum light yield. With blinds: Only open the slats
Slats position.	*0..100 %* Default = ***20 %***	Slats position with falling below brightness threshold while sun control is active

3.3.2.7 The "*Safety*" parameter page

Table 2

Designation	Values	Description
Safety check triggered by		The safety status (based on wind, frost etc.) is …
	input object	triggered via object C11 (or 12/13)
	Condition C1, condition C2 *Condition C3, condition C4* *condition C5, condition C6* *condition C7, condition C8* *condition C9, condition C10*	triggered with fulfilled condition of a universal channel. The OR sensors have to be linked for this.
	Threshold channel status C14 *Threshold channel status C15* *Threshold channel status C16* *Threshold channel status C17*	triggered with fulfilled condition of a threshold channel.
	link result logic channel C18 *Link result logic channel C19* *Link result logic channel C20* *Link result logic channel C21* *Link result logic channel C22* *link result logic channel C23*	triggered with fulfilled condition of a logic channel.
Reaction to safety beginning	***No response***	No more telegrams are sent. This setting is recommended if the safety function is administered in the actuator.
	Start drive	e.g. for blinds, awnings and textile sun protection.
	Shut down drive	e.g. for roller shutters.
Reaction to safety end	*No response*	No more telegrams are sent. This setting is recommended if the safety function is administered in the actuator.
	Update position	Immediately transmit the current drive height and, if nec., slats position.
	Update scene	Immediately transmit the current scene number

3.3.2.8 The "*Threshold channel C14..C17*" parameter pages

The threshold channel block forms a separate unit, which is internally completely independent of the weather data.

Principle:
A value is received by the bus and compared with the set threshold.
Ii the value is higher than the set threshold, then the condition counts as fulfilled.
Alternatively, if the value is below it, then it counts as unfulfilled.

The response of the output objects with fulfilled or unfulfilled conditions is et on the *Objects* parameter page.

The channel status (condition fulfilled/unfulfilled) of each threshold channel can be configured as the input value for the logic channels (see below, The logic channels).

The threshold channels are activated on the General parameter page.

Table 2

Designation	Values	Description
Type of threshold value object	***object type: Per cent (DPT 5.001)*** *Object type: Counter value 0..255 (DPT 5.010)* *object type: Counter value 0..65535 (DPT 7.001)* *Object type: EIS5 e.g. CO2, brightness etc. (DPT 9.xxx)*	Value type for threshold.
Parameter for *Percent* threshold object		
Threshold value (in %)	*1..99* Default = ***50***	Desired threshold value. in per cent.
Hysteresis (as %)	*1..99* Default = ***5***	The hysteresis prevents frequent switching after small changes in readings. the hysteresis is unilaterally negative for all types of threshold, e.g. threshold 50, hysteresis 5 means: Switch on at 50 and switch off at 50 – hysteresis = 45
Parameter for threshold value object *Counter value 0..255*		
Threshold value	*1..254* Default = ***127***	Desired threshold value as 1 byte number from 1 to 254.
Hysteresis	*1..254* Default = ***5***	The hysteresis prevents frequent switching after small changes in readings.

Continuation:

Designation	Values	Description
Parameter for threshold value object *Counter value 0..65535*		
Threshold value	*1..65534* Default = ***1,000***	Desired threshold value as 2 byte number from 1 to 65534.
Hysteresis	*1..65534* Default = ***5***	The hysteresis prevents frequent switching after small changes in readings.
Parameter for threshold value object *EIS5 (e.g. CO_2, brightness…)*		
Threshold value format: (-000,00..9999).	-9999..99999 Default = ***20,0***	Desired threshold value as decimal number with sign Format: A maximum of 5 characters are permitted, including signs and commas. Examples with 5 characters: -9999 -9,99 10,35 100,6 99999 etc.
Hysteresis format: 0,00..9999	*0,00..9999* Default = ***1,0***	The hysteresis prevents frequent switching after small changes in readings. Format: Max. 4 characters, positive numbers only. Examples: 0,01 99,9 9999
Common parameters		
Delay with exceeding	***None,*** *5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 3 min, 5 min, 10 min, 15 min, 20 min*	The channel transmits immediately. The channel only transmits after set delay is completed. The channel only transmits after set delay is completed.
Delay with falling below	***none*** *5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 3 min, 5 min, 10 min, 15 min, 20 min*	The channel transmits immediately. The channel only transmits after set delay is completed. The channel only transmits after set delay is completed.

3.3.2.9 The "*Objects*" parameter pages

All universal, threshold and logic channels have this type of parameter page.
The reaction here is configured on fulfillment or non-fulfillment of the conditions.

Table 2

<table>
<tr><th>Designation</th><th>Values</th><th>Description</th></tr>
<tr><td>Telegram type C14.1</td><td>Switching command

Priority

value</td><td>1 bit ON/OFF

2-bit<table><tr><th>Function</th><th>value</th></tr><tr><td>Priority inactive (no control)</td><td>0 (00_{bin})</td></tr><tr><td>Priority ON
Priority ON (control: enable, on)</td><td>3 (11_{bin})</td></tr><tr><td>Priority OFF (control: disable, off)</td><td>2 (10_{bin})</td></tr></table>1-byte 0 ... 255</td></tr>
<tr><td>When exceeding the threshold</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has been fulfilled.</td></tr>
<tr><td>Telegram</td><td>

ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 ... 255</td><td>Type of telegram for the first channel output object with fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
<tr><td>When underrunning threshold</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has not been fulfilled.</td></tr>
<tr><td>Telegram</td><td>

ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 .. 255</td><td>Type of telegram for the first channel output object without fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
</table>

Continuation:

<table>
<tr><th>Designation</th><th>Values</th><th>Description</th></tr>
<tr><td>Should a second telegram be sent?</td><td>Yes
no</td><td>If yes has been selected, further parameters and a second transmission object appear.
It can be used to send 2 different telegrams at the same time on the same channel.
The cycle time and the disabling behaviour are apply to both objects.</td></tr>
<tr><td>Telegram type C14.2</td><td>Switching command

Priority

value</td><td>Second output object on channel
1 bit ON/OFF

2-bit<table><tr><th>Function</th><th>value</th></tr><tr><td>Priority inactive (no control)</td><td>0 (00_{bin})</td></tr><tr><td>Priority ON
Priority ON (control: enable, on)</td><td>3 (11_{bin})</td></tr><tr><td>Priority OFF (control: disable, off)</td><td>2 (10_{bin})</td></tr></table>1-byte 0 ... 255</td></tr>
<tr><td>When exceeding the threshold</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has been fulfilled.</td></tr>
<tr><td>Telegram</td><td>

ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 ... 255</td><td>Type of telegram for the second channel output object with fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
<tr><td>When underrunning threshold</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has not been fulfilled.</td></tr>
<tr><td>Telegram</td><td>

ON
OFF

no priority
priority, ON (down)
priority, OFF (up)

Telegram 0 .. 255</td><td>Type of telegram for the second channel output object without fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
</table>

Continuation:

Designation	Values	Description
Activate lock function	*Yes* ***no***	Show disable parameter and disable object No disable function
Behaviour when setting the disable function	***do not send*** *as with unfulfilled condition* *as with fulfilled condition*	No telegrams while the disable object is set. Same reaction as set in the *When threshold is not exceeded* parameter (see above). Same reaction as set in the *With exceeding the threshold* parameter (see above).
Behaviour when cancelling the disable setting Behaviour when cancelling the disable setting	*Do not send* ***update channel***	Not automatically resent when the disable setting is cancelled The current channel status is sent immediately as soon as the disable setting is cancelled.
Cycle time (if used)	*do not send cyclically* *every min* *every 2 min* *every 3 min* *every 5 min* *every 10 min* *every 15 min* *every 20 min* *every 30 min* *every 45 min* ***every 60 min***	How often should the telegrams for CX.1 and CX.2 be sent?
Telegram after reset or download	***Do not send any longer*** *as with unfulfilled condition, as with fulfilled condition*	Reaction of channel with new start.

3.3.2.10 The "*Logic channel C18..C23"*

The logic channel block forms a separate unit, which is internally completely independent of the weather data.
The logic channels can be included for the widest range of tasks within a KNX device.

Principle:
Up to four 1 bit input values are logically linked together.

These input values can be:
- Input objects of logic channels
- Status of universal channels (fulfilled/unfulfilled)
- Status of threshold channels (fulfilled/unfulfilled)
- link result of the other logic channels (a logic channel cannot be linked with itself)

The response of the output objects with fulfilled or unfulfilled conditions is et on the *Objects* parameter page.
The logic channels are activated on the General parameter page.

Table 2

Designation	Values	Description
Type of link		Selection of logical link between the 1-bit input values (see below)..
	AND	2 to 4 inputs
	OR	
	XOR	2 inputs
Use input 1	***Yes***	Input is used
	Yes, inverted	Input acts inverted
Use input 2	***Yes***	See above, input 1
	Yes, inverted	
Use input 3	***No***	Input is hidden.
	Yes	See above.
	Yes, inverted	
Use input 4	***No***	Input is hidden.
	Yes	See above.
	Yes, inverted	

Continuation:

Designation	Values	Description
Input value for input 1	***Input object***	First input object of channel (e.g. object 100 for C18)
	Condition C1 condition C2 condition C3 condition C4 condition C5 condition C6 condition C7 condition C8 condition C9 condition C10	Status of a universal channel (fulfilled/unfulfilled)
	Threshold channel status C14 Threshold channel status C15 Threshold channel status C16 Threshold channel status C17	Status of threshold channel (threshold exceeded/not exceeded).
	Link result logic channel C18[(1)] *Link result logic channel C19*[(2)] *Link result logic channel C20*[(3)] *Link result logic channel C21*[(4)] *Link result logic channel C22*[(5)] *Link result logic channel C23*[(6)]	Link result of another logic channel (a logic channel cannot be linked with itself)
Input value for input 2	*See above, Input value for input 1*	Second input object of channel See above.
Input value for input 3	*See above, Input value for input 1*	Third input object of channel See above.
Input value for input 4	*See above, Input value for input 1*	Fourth input object of channel See above.

(1) With C18 not available, (2) With C19 not available, (3) With C20 not available
(4) With C21 not available, (5) With C22 not available, (6) With C23 not available

3.3.2.11 The "*Objects*" parameter pages

All universal, threshold and logic channels have this type of parameter page.
The reaction here is configured on fulfillment or non-fulfillment of the conditions.

Table 2

<table>
<tr><th>Designation</th><th>Values</th><th>Description</th></tr>
<tr><td>Telegram type C18.1</td><td>Switching command

Priority

value</td><td>1 bit ON/OFF

2-bit
<table><tr><th>Function</th><th>value</th></tr><tr><td>Priority inactive (no control)</td><td>0 (00_{bin})</td></tr><tr><td>Priority ON
Priority ON (control: enable, on)</td><td>3 (11_{bin})</td></tr><tr><td>Priority OFF (control: disable, off)</td><td>2 (10_{bin})</td></tr></table>1-byte 0 ... 255</td></tr>
<tr><td>If the condition is met</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has been fulfilled, i.e. link result = 1</td></tr>
<tr><td>Telegram</td><td>
ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 ... 255</td><td>Type of telegram for the first channel output object with fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
<tr><td>If the condition is not met</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has not been fulfilled, i.e. link result = 0</td></tr>
<tr><td>Telegram</td><td>

ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 .. 255</td><td>Type of telegram for the first channel output object without fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
</table>

Continuation:

<table>
<tr><th>Designation</th><th>Values</th><th>Description</th></tr>
<tr><td>Should a second telegram be sent?</td><td>Yes
no</td><td>If yes has been selected, further parameters and a second transmission object appear.
It can be used to send 2 different telegrams at the same time on the same channel.
The cycle time and the disabling behaviour are apply to both objects.</td></tr>
<tr><td>Telegram type C18.2</td><td>Switching command

Priority

value</td><td>Second output object on channel
1 bit ON/OFF

2-bit<table><tr><th>Function</th><th>value</th></tr><tr><td>Priority inactive (no control)</td><td>0 (00_{bin})</td></tr><tr><td>Priority ON
Priority ON (control: enable, on)</td><td>3 (11_{bin})</td></tr><tr><td>Priority OFF (control: disable, off)</td><td>2 (10_{bin})</td></tr></table>1-byte 0 ... 255</td></tr>
<tr><td>If the condition is met</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has been fulfilled.</td></tr>
<tr><td>Telegram</td><td>
ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 ... 255</td><td>Type of telegram for the second channel output object with fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
<tr><td>If the condition is not met</td><td>no telegram
send following telegram once
send cyclically</td><td>Send behaviour if the channel condition has not been fulfilled.</td></tr>
<tr><td>Telegram</td><td>

ON
OFF
no priority
priority, ON (down)
priority, OFF (up)
Telegram 0 .. 255</td><td>Type of telegram for the second channel output object without fulfilled condition:
For telegram type Switching command

For telegram type Priority

For telegram type Value</td></tr>
</table>

Continuation:

Designation	Values	Description
Activate lock function	*Yes*	Show disable parameter and disable object
	no	No disable function
Behaviour when setting the disable function	***do not send***	No telegrams while the disable object is set.
	as with unfulfilled condition	Same reaction as set in the *When the condition has not been fulfilled* parameter (see above).
	as with fulfilled condition	Same reaction as set in the *When the condition has been fulfilled* parameter (see above).
Behaviour when cancelling the disable setting Behaviour when cancelling the disable setting	*Do not send*	Not automatically resent when the disable setting is cancelled
	update channel	The current channel status is sent immediately as soon as the disable setting is cancelled.
Cycle time (if used)	*do not send cyclically* *every min* *every 2 min* *every 3 min* *every 5 min* *every 10 min* *every 15 min* *every 20 min* *every 30 min* *every 45 min* ***every 60 min***	How often should the telegrams for CX.1 and CX.2 be sent?
Telegram after reset or download	*Do not send any longer as with unfulfilled condition, as with fulfilled condition*	Reaction of channel with new start.

4 Typical applications

These typical applications are designed to aid planning and are not to be considered as an exhaustive list.
It can be extended and updated as required.

4.1 Simple shading control

A facade with a number of blinds should be controlled using the following functions:

- Raise at dawn (if lowered manually).
- Lower blinds and set slats to configured position when the preset brightness threshold is reached.
- Raise all blinds at dusk as well.
- A safety telegram is sent to the actuator in the event of potential frost or storms. This raises the blinds and prevents unintentional movement as long as the safety hazard applies.
- Cyclical monitoring of the safety object in the blinds actuator.

4.1.1 Devices:

- Meteodata 140 basic (1409205)
- JMG 4 S (4910250)

4.1.2 Overview

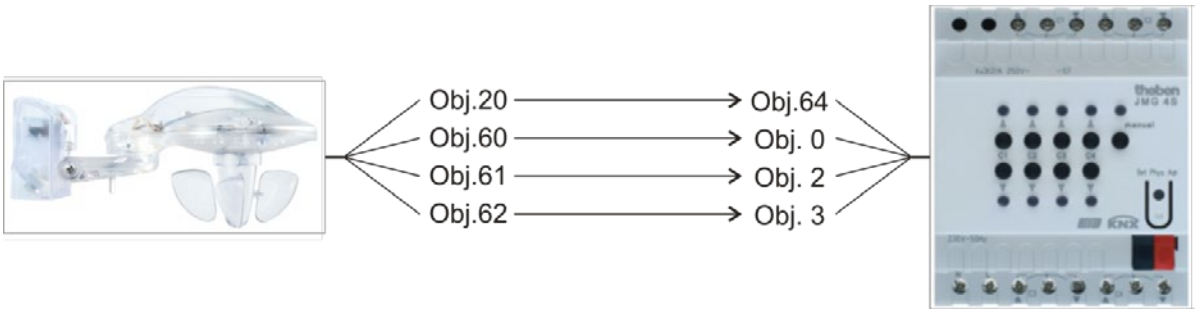

Figure 1

4.1.3 Objects and links

Table 6

No.	Meteodata 140 Object name	No.	JMG 4 S Object name	Comment
20	*C1.1 Switching universal channel*	64	*Central safety 1*	-
60	*C11 Drives up/down*	0	*C1 – Up / down*	-
61	*C11 Blinds height*	2	*C1 - % height*	-
62	*C11 lamella*	3	*% Slats*	-

4.1.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 7: Meteodata 140

Parameter page	Parameter	Setting
Universal channel 1: Function	*Channel function*	*Link of the following sensors*
	Brightness	*no*
	Temperature	*yes*
	Wind	*yes*
	Type of link	*OR*
	Temperature	*below 3 °C*
	Temperature hysteresis	*1.0 °C*
	Wind speed	*Over 14 m/s (approx. 50 km/h)*
objects	*Telegram type C1.1*	*switching command*
	If all conditions are met	*send cyclically*
	Telegram	*ON*
	If not all conditions are met	*send cyclically*
	Telegram	*OFF*
	Cycle time (if used)	*Every 10 minutes*
	Telegram with recognised sensor error	*do not send anymore*
Sun protection channel C11	*Channel controls*	*Blinds*
	Source for brightness measurement	*Sensor front*
Sun control	*Activation of sun control*	*via dawn/dusk threshold*
	Reaction to dawn	*Raise & sun control ON*
	Reaction to dusk	*Sun control OFF and raise*
Safety	*Safety check triggered by*	*condition: C1*
	Reaction to safety beginning	*no reaction*
	Reaction to safety end	*Update position*

Table 8: JMG 4 S

Parameter page	Parameter	Setting
General	*Type of basic module*	*GM is a JMG 4 S*
JMG 4 S general	*Safety objects 1-3*	*With cyclical monitoring 20 min*
GM JMG 4 S C1	*Type of curtain*	*Blinds*
	Runtime completely up	(depending on type of blinds)
	Complete turn of slat	(depending on type of blinds)
	Which safety objects function (OR-linked)	*Safety 1*
	Response in the event of bus failure	*Top end position*

4.2 Guttering heating

A heating strip mounted on the guttering should be switched on if there is risk of frost

4.2.1 Devices:

- Meteodata 140 basic (1409205)
- RMG 8 S

4.2.2 Overview

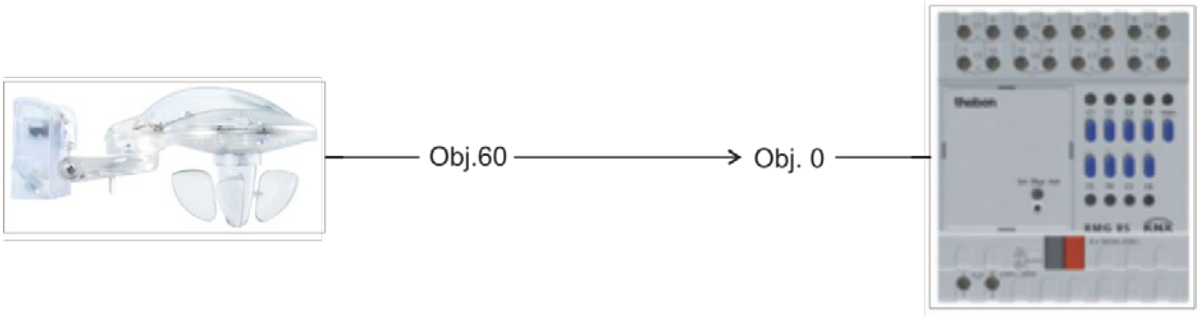

Figure 2

4.2.3 Objects and links

Table 9

No.	Meteodata 140 Object name	No.	RMG 8 S Object name	Comment
20	*C1.1 Switching universal channel*	0	*RMG 8 S channel C1 switching object*	-

4.2.4 Important parameter settings

Standard or customer-defined parameter settings apply for unlisted parameters.

Table 10: Meteodata 140

Parameter page	Parameter	Setting
Universal channel 1: Function	*Channel function*	*temperature sensor*
	Temperature	*Below 3 °C*
	Temperature hysteresis	*1,0 K*
objects	*Telegram type C1.1*	*switching command*
	If all conditions are met	*send cyclically*
	Telegram	*ON*
	If not all conditions are met	*send cyclically*
	Telegram	*OFF*
	Cycle time (if used)	*Every 60 minutes*

Table 11: RMG 8 S

Parameter page	Parameter	Setting
General	*Type of basic module*	*RMG 8 S*
RMG 8 S channel C1 function selection	*Channel function*	*Switching On/Off*
	Activation of function via	*Switching object*
Contact characteristics	*Type of contact*	*NO contact*

5 Appendix

5.1 Brightness sensors

The Meteodata 140 basic has 3 installed brightness sensors.
These are described in the ETS application software as *Sensor front*, *Sensor left* and *Sensor right*.
These designations comply with frontal view of device, in accordance with the following diagram:

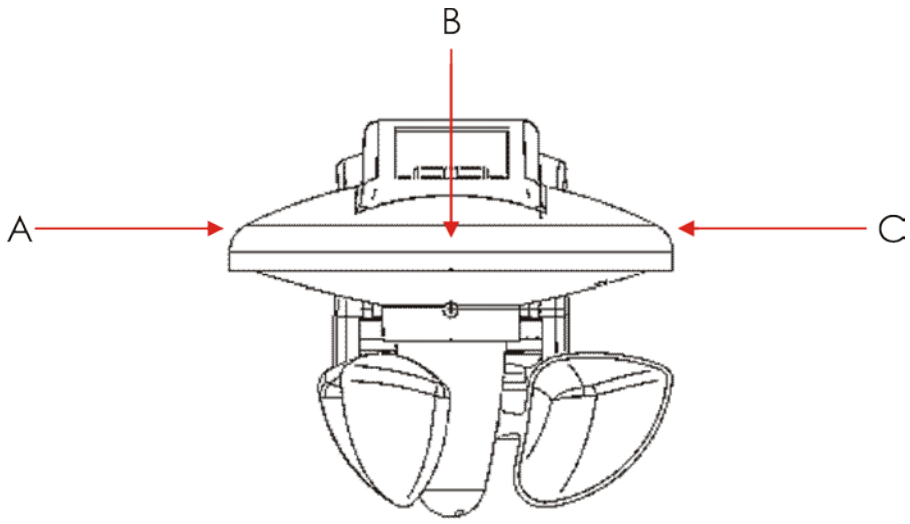

Figure 3: Brightness sensors.

Key:

A	Sensor left
B	Sensor front
C	Sensor right

5.2 The Beaufort wind force scale

Figure 4

Strength	Designation	Effect: on land
0	Calm	No air flow, smoke rises vertically
1	Quiet draw	Hardly noticeable, smoke disperses easily, weather and wind vanes stand still
2	Light breeze	Leaves rustle, wind can be felt on the face
3	Gentle breeze	Leaves and thin twigs move, flags unfurl
4	Medium breeze	Branches move, scraps of paper are lifted off the ground
5	Fresh breeze	Bigger branches and trees move, wind is clearly audible
6	Strong wind	Thick branches move, audible whistling of wires, telephone lines
7	Stiff wind	Trees shake, feel resistance walking into wind
8	Stormy wind	Big trees move, window shutters are opened, branches break off trees, great difficulty walking
9	Storm	Branches break, minor damage to houses, tiles and chimney pots are lifted off roofs, garden furniture is blown over, great difficulty in walking
10	Heavy storm	Trees are uprooted, tree trunks break, garden furniture is blown away, more serious damage to houses, rarely in the interior
11	Hurricane force storm	Violent gusts, major storm damage, major damage to forests (Windfall), roofs are torn off, cars are thrown off the road, thick walls are damaged, walking is impossible, very rarely in interior.
12	Hurricane	Heaviest storm damage and devastation, very rarely in interior

Source: Wikipedia.