

Meteodata 139 EFR Weather data receiver



Meteodata 139 EFR

1399200

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1 Functional characteristics

- Reception of local weather forecast.
- Additional reception of data and time.
- Delivery of the data via HKW Elektronik GmbH in cooperation with the Europäischen Funk-Rundsteuerung (EFR) [European Radio Ripple Control].
- Forecast data from a reputable weather service, based on the satellite-supported global weather model.
- Including weather data licence, no ongoing additional costs for the weather data.
- Range: Each about 800 kilometers around the three transmitters Mainflingen in Frankfurt am Main, Burg in Magdeburg and Lakihegy in Budapest.
- LED for status display of the reception quality.

The following data are available for each weather region:

- Air temperature
- Precipitation amount
- Precipitation probability
- Wind force
- Wind direction
- Sunshine duration
- Solar insolation
- Weather scenario as text
- Weather scenario as scene number

This data is divided up into 6 h periods for each day.

The entire forecast period extends across 4 days, as follows:

- Day (day 0)
- Tomorrow
- The day after tomorrow
- In 3 days.

A bad weather warning can be given depending on the expected wind/gust strength or precipitation amount.

The EFR time service makes the device the ideal timekeeper:

Very brief synchronisation time (approx. 2 s).

Both the standard time format (separate objects for time and date) and the DPT 19.001 time format (a common object) are supported and can be used in parallel with one another.

1.1 Special features

Optimal energy-saving options via:

- Messages about the expected solar yield, i.e. coordination between solar system and heat generator (heating boiler).
- Automatic changeover in the heating system from winter to summer mode (and reverse) based on the current weather situation taking into the external temperature and the heat of the sun (sunshine duration or solar radiation in W/m²)
- Heating and cooling support for optimal use of the solar heat e.g. for blind controls.

1.2 Information on start-up

**The EFR weather data is broadcast once every 6 hours.
There may be a delay of up to around 6 hours before the first data is received therefore.**

1.3 Liability exclusion

(1) The meteorological forecasts will be generated by the weather service based on state-of-the art technology and with customary scientific care. In accordance with the nature of weather forecasts, divergences in time and space from actual weather developments must be expected. No liability can be assumed by Theben for damage of any type resulting from this.

(2) It is not permitted to use the weather data in devices or systems in which risk to the user through use of the weather data cannot be excluded.

2 Technical data

2.1 Technical data

Operating voltage KNX	Bus voltage, ≤ 12 mA
Installation type	Wall installation
Connection type	KNX bus terminal
Ambient temperature	-20 °C ... +55 °C
Protection class	III
Protection rating	IP 54

2.2 Forecast value range

Forecast	Value range	Resolution
Air temperature	-60...+55 °C	1 °C
Precipitation	0, 0.5, 1, 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 35, 40, 50, 55, 60, > 60 mm (or l/m ²)	0.5-10 mm
Precipitation probability	0-100 %	10 %
Wind	1-12 Bft (2 km/h.. > 117 Km/h)	1 Bft
Wind direction	360°	45°
Sunshine duration	0-6 h	1 h
Solar insolation	0-1200 W/m ²	25 W/m ²
Weather scenarios (significant weather)	15 weather symbols + text	1

3 The application program "Meteodata 139 EFR V1.0"

3.1 Selection in the product database

Manufacturer	Theben AG
Product family	Phys. sensors
Product type	Meteodata 139
Program name	Meteodata 139 V1.0

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

Table 1

Number of communication objects:	166
Number of group addresses:	254
Number of associations:	255

3.2 Communication Objects

3.2.1 Overview

Table 2

No.	Name	Function	Length	C	R	W	T
0	Time	transmit	3 byte 10,001	C	R	-	T
1	Date	transmit	3 byte 11,001	C	R	-	T
2	Date/time (DPT 19.001)	transmit	8 byte 19,001	C	R	-	T
3	Time query	Receive	1 bit 1,001	C	-	W	-
4	Reception statistics	transmit	1 byte 5,001	C	R	-	T
5	Message	Rain warning	1 bit 1,001	C	R	-	T
6	Status rain warning	0= OK, 1= invalid	1 bit 1,001	C	R	-	T
7	Message	Wind warning	1 bit 1,001	C	R	-	T
8	Status wind warning	0= OK, 1= invalid	1 bit 1,001	C	R	-	T
9	Message	Bad weather alarm	1 bit 1,001	C	R	-	T
10	Bad weather alarm status	0= OK, 1= invalid	1 bit 1,001	C	R	-	T
11	Message	Ground frost warning	1 bit 1,001	C	R	-	T
12	Ground frost warning status	0= OK, 1= invalid	1 bit 1,001	C	R	-	T
13	Message	Solar yield possible	1 bit 1,001	C	R	-	T
14	Solar yield possible status	0= OK, 1= invalid	1 bit 1,001	C	R	-	T
15	Message	Summer mode heating	1 bit 1,001	C	R	-	T
16	Summer mode heating status	0= OK, 1= invalid	1 bit 1,001	C	R	-	T
17	Auxiliary heating	Report	1 bit 1,001	C	R	-	T
18	Cooling support	Report	1 bit 1,001	C	R	-	T
19	n.a.						

Continuation:

No.	Name	Function	Length	C	R	W	T
20	Forecast today 0:00-6:00	Air temperature	2 byte 9,001	C	R	-	T
21	Forecast today 0:00-6:00	Precipitation amount	2 byte 9,026	C	R	-	T
22	Forecast today 0:00-6:00	Precipitation probability	1 byte 5,001	C	R	-	T
23	Forecast today 0:00-6:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
24	Forecast today 0:00-6:00	Wind direction	14 Byte 16,001	C	R	-	T
25	Forecast today 0:00-6:00	Sunshine duration	2 Byte 7,007	C	R	-	T
26	Forecast today 0:00-6:00	Solar insolation	2 Byte 9,022	C	R	-	T
27	Forecast today 0:00-6:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
28	Forecast today 0:00-6:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T
29	Forecast today 6:00-12:00	Air temperature	2 byte 9,001	C	R	-	T
30	Forecast today 6:00-12:00	Precipitation amount	2 byte 9,026	C	R	-	T
31	Forecast today 6:00-12:00	Precipitation probability	1 byte 5,001	C	R	-	T
32	Forecast today 6:00-12:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
33	Forecast today 6:00-12:00	Wind direction	14 Byte 16,001	C	R	-	T
34	Forecast today 6:00-12:00	Sunshine duration	2 Byte 7,007	C	R	-	T
35	Forecast today 6:00-12:00	Solar insolation	2 Byte 9,022	C	R	-	T
36	Forecast today 6:00-12:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
37	Forecast today 6:00-12:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T

Continuation:

No.	Name	Function	Length	C	R	W	T
38	Forecast today 12:00-18:00	Air temperature	2 byte 9,001	C	R	-	T
39	Forecast today 12:00-18:00	Precipitation amount	2 byte 9,026	C	R	-	T
40	Forecast today 12:00-18:00	Precipitation probability	1 byte 5,001	C	R	-	T
41	Forecast today 12:00-18:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
42	Forecast today 12:00-18:00	Wind direction	14 Byte 16,001	C	R	-	T
43	Forecast today 12:00-18:00	Sunshine duration	2 Byte 7,007	C	R	-	T
44	Forecast today 12:00-18:00	Solar insolation	2 Byte 9,022	C	R	-	T
45	Forecast today 12:00-18:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
46	Forecast today 12:00-18:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T
47	Forecast today 18:00-24:00	Air temperature	2 byte 9,001	C	R	-	T
48	Forecast today 18:00-24:00	Precipitation amount	2 byte 9,026	C	R	-	T
49	Forecast today 18:00-24:00	Precipitation probability	1 byte 5,001	C	R	-	T
50	Forecast today 18:00-24:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
51	Forecast today 18:00-24:00	Wind direction	14 Byte 16,001	C	R	-	T
52	Forecast today 18:00-24:00	Sunshine duration	2 Byte 7,007	C	R	-	T
53	Forecast today 18:00-24:00	Solar insolation	2 Byte 9,022	C	R	-	T
54	Forecast today 18:00-24:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
55	Forecast today 18:00-24:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T

Continuation:

No.	Name	Function	Length	C	R	W	T
60	Forecast tomorrow 0:00-6:00	Air temperature	2 byte 9,001	C	R	-	T
61	Forecast tomorrow 0:00-6:00	Precipitation amount	2 byte 9,026	C	R	-	T
62	Forecast tomorrow 0:00-6:00	Precipitation probability	1 byte 5,001	C	R	-	T
63	Forecast tomorrow 0:00-6:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
64	Forecast tomorrow 0:00-6:00	Wind direction	14 Byte 16,001	C	R	-	T
65	Forecast tomorrow 0:00-6:00	Sunshine duration	2 Byte 7,007	C	R	-	T
66	Forecast tomorrow 0:00-6:00	Solar insolation	2 Byte 9,022	C	R	-	T
67	Forecast tomorrow 0:00-6:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
68	Forecast tomorrow 0:00-6:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T
69	Forecast tomorrow 6:00-12:00	Air temperature	2 byte 9,001	C	R	-	T
70	Forecast tomorrow 6:00-12:00	Precipitation amount	2 byte 9,026	C	R	-	T
71	Forecast tomorrow 6:00-12:00	Precipitation probability	1 byte 5,001	C	R	-	T
72	Forecast tomorrow 6:00-12:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
73	Forecast tomorrow 6:00-12:00	Wind direction	14 Byte 16,001	C	R	-	T
74	Forecast tomorrow 6:00-12:00	Sunshine duration	2 Byte 7,007	C	R	-	T
75	Forecast tomorrow 6:00-12:00	Solar insolation	2 Byte 9,022	C	R	-	T
76	Forecast tomorrow 6:00-12:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
77	Forecast tomorrow 6:00-12:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T

Continuation:

No.	Name	Function	Length	C	R	W	T
78	Forecast tomorrow 12:00-18:00	Air temperature	2 byte 9,001	C	R	-	T
79	Forecast tomorrow 12:00-18:00	Precipitation amount	2 byte 9,026	C	R	-	T
80	Forecast tomorrow 12:00-18:00	Precipitation probability	1 byte 5,001	C	R	-	T
81	Forecast tomorrow 12:00-18:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
82	Forecast tomorrow 12:00-18:00	Wind direction	14 Byte 16,001	C	R	-	T
83	Forecast tomorrow 12:00-18:00	Sunshine duration	2 Byte 7,007	C	R	-	T
84	Forecast tomorrow 12:00-18:00	Solar insolation	2 Byte 9,022	C	R	-	T
85	Forecast tomorrow 12:00-18:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
86	Forecast tomorrow 12:00-18:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T
87	Forecast tomorrow 18:00-24:00	Air temperature	2 byte 9,001	C	R	-	T
88	Forecast tomorrow 18:00-24:00	Precipitation amount	2 byte 9,026	C	R	-	T
89	Forecast tomorrow 18:00-24:00	Precipitation probability	1 byte 5,001	C	R	-	T
90	Forecast tomorrow 18:00-24:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
91	Forecast tomorrow 18:00-24:00	Wind direction	14 Byte 16,001	C	R	-	T
92	Forecast tomorrow 18:00-24:00	Sunshine duration	2 Byte 7,007	C	R	-	T
93	Forecast tomorrow 18:00-24:00	Solar insolation	2 Byte 9,022	C	R	-	T
94	Forecast tomorrow 18:00-24:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
95	Forecast tomorrow 18:00-24:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T

Continuation:

No.	Name	Function	Length	C	R	W	T
100	Forecast day after tomorrow 0:00-6:00	Air temperature	2 byte 9,001	C	R	-	T
101	Forecast day after tomorrow 0:00-6:00	Precipitation amount	2 byte 9,026	C	R	-	T
102	Forecast day after tomorrow 0:00-6:00	Precipitation probability	1 byte 5,001	C	R	-	T
103	Forecast day after tomorrow 0:00-6:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
104	Forecast day after tomorrow 0:00-6:00	Wind direction	14 Byte 16,001	C	R	-	T
105	n.b.						
106	n.b.						
107	Forecast day after tomorrow 0:00-6:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
108	Forecast day after tomorrow 0:00-6:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T
109	Forecast day after tomorrow 6:00-12:00	Air temperature	2 byte 9,001	C	R	-	T
110	Forecast day after tomorrow 6:00-12:00	Precipitation amount	2 byte 9,026	C	R	-	T
111	Forecast day after tomorrow 6:00-12:00	Precipitation probability	1 byte 5,001	C	R	-	T
112	Forecast day after tomorrow 6:00-12:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
113	Forecast day after tomorrow 6:00-12:00	Wind direction	14 Byte 16,001	C	R	-	T
114	n.b.						
115	n.b.						
116	Forecast day after tomorrow 6:00-12:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
117	Forecast day after tomorrow 6:00-12:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T

Continuation:

No.	Name	Function	Length	C	R	W	T
118	Forecast day after tomorrow 12:00-18:00	Air temperature	2 byte 9,001	C	R	-	T
119	Forecast day after tomorrow 12:00-18:00	Precipitation amount	2 byte 9,026	C	R	-	T
120	Forecast day after tomorrow 12:00-18:00	Precipitation probability	1 byte 5,001	C	R	-	T
121	Forecast day after tomorrow 12:00-18:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
122	Forecast day after tomorrow 12:00-18:00	Wind direction	14 Byte 16,001	C	R	-	T
123	n.b.						
124	n.b.						
125	Forecast day after tomorrow 12:00-18:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
126	Forecast day after tomorrow 12:00-18:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T
127	Forecast day after tomorrow 18:00-24:00	Air temperature	2 byte 9,001	C	R	-	T
128	Forecast day after tomorrow 18:00-24:00	Precipitation amount	2 byte 9,026	C	R	-	T
129	Forecast day after tomorrow 18:00-24:00	Precipitation probability	1 byte 5,001	C	R	-	T
130	Forecast day after tomorrow 18:00-24:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
131	Forecast day after tomorrow 18:00-24:00	Wind direction	14 Byte 16,001	C	R	-	T
132	n.b.						
133	n.b.						
134	Forecast day after tomorrow 18:00-24:00	Weather scenario as text	14 Byte 16,001	C	R	-	T
135	Forecast day after tomorrow 18:00-24:00	Weather scenario as scene	1 Byte 17,001	C	R	-	T

Continuation:

No.	Name	Function	Length	C	R	W	T
140	6 h forecast (Index Obj. 176)	Air temperature	2 byte 9,001	C	R	-	T
	1 day forecast 0:00-6:00 (Index Obj. 176)						
	Forecast day 3, 0:00-6:00						
141	6 h forecast (Index Obj. 176)	Precipitation amount	2 byte 9,026	C	R	-	T
	1 day forecast 00:00-6:00 (Index Obj. 176)						
	Forecast day 3, 0:00-6:00						
142	6 h forecast (Index Obj. 176)	Precipitation probability	1 byte 5,001	C	R	-	T
	1 day forecast 0:00-6:00 (Index Obj. 176)						
	Forecast day 3, 0:00-6:00						
143	6 h forecast (Index Obj. 176)	Wind force Bft	1 Byte 20,014	C	R	-	T
		Wind force km/h	2 byte 9,028				
		Wind force m/s	2 byte 9,005				
	1 day forecast 0:00-6:00 (Index Obj. 176)	Wind force Bft	1 Byte 20,014				
		Wind force km/h	2 byte 9,028				
		Wind force m/s	2 byte 9,005				
	Forecast day 3, 0:00-6:00	Wind force Bft	1 Byte 20,014				
		Wind force km/h	2 byte 9,028				
		Wind force m/s	2 byte 9,005				
144	6 h forecast (Index Obj. 176)	Wind direction	14 Byte 16,001	C	R	-	T
	1 day forecast 0:00-6:00 (Index Obj. 176)						
	Forecast day 3, 0:00-6:00						
145	6 h forecast (Index Obj. 176)	Sunshine duration	2 Byte 7,007	C	R	-	T
	1 day forecast 0:00-6:00 (Index Obj. 176)						
146	6 h forecast (Index Obj. 176)	Solar insolation	2 Byte 9,022	C	R	-	T
	1 day forecast 00:00-6:00 (Index Obj. 176)						

Continuation:

No.	Name	Function	Length	C	R	W	T
147	6 h forecast (Index Obj. 176)	Weather scenario as text	14 Byte 16,001	C	R	-	T
	1 day forecast 00:00-6:00 (Index Obj. 176)						
	Forecast day 3, 0:00-6:00						
148	6 h forecast (Index Obj. 176)	Weather scenario as scene	1 Byte 17,001	C	R	-	T
	1 day forecast 00:00-6:00 (Index Obj. 176)						
	Forecast day 3, 0:00-6:00						
149	1 day forecast 6:00-12:00 (Index Obj. 176)	Air temperature	2 byte 9,001	C	R	-	T
	Forecast day 3, 6:00-12:00						
150	1 day forecast 6:00-12:00 (Index Obj. 176)	Precipitation amount	2 byte 9,026	C	R	-	T
	Forecast day 3, 6:00-12:00						
151	1 day forecast 6:00-12:00 (Index Obj. 176)	Precipitation probability	1 byte 5,001	C	R	-	T
	Forecast day 3, 6:00-12:00						
152	1 day forecast 6:00-12:00 (Index Obj. 176)	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005	C	R	-	T
		Wind force (m/s)	2 byte 9,028	C	R	-	T
	Forecast day 3, 6:00-12:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005	C	R	-	T
		Wind force (m/s)	2 byte 9,028	C	R	-	T
153	1 day forecast 6:00-12:00 (Index Obj. 176)	Wind direction	14 Byte 16,001	C	R	-	T
	Forecast day 3, 6:00-12:00						
154	1 day forecast 6:00-12:00 (Index Obj. 176)	Sunshine duration	2 Byte 7,007	C	R	-	T
155	1 day forecast 6:00-12:00 (Index Obj. 176)	Solar insolation	2 Byte 9,022	C	R	-	T
156	1 day forecast 6:00-12:00 (Index Obj. 176)	Weather scenario as text	14 Byte 16,001	C	R	-	T
	Forecast day 3, 6:00-12:00						

Continuation:

No.	Name	Function	Length	C	R	W	T
157	1 day forecast 6:00-12:00 (Index Obj. 176)	Weather scenario as scene	1 Byte 17,001	C	R		T
	Forecast day 3, 6:00-12:00						
158	1 day forecast 12:00-18:00 (Index Obj. 176)	Air temperature	2 byte 9,001	C	R	-	T
	Forecast day 3, 12:00-18:00						
159	Forecast day 3, 12:00-18:00	Precipitation amount	2 byte 9,026	C	R	-	T
	1 day forecast 12:00-18:00 (Index Obj. 176)						
160	Forecast day 3, 12:00-18:00	Precipitation probability	1 byte 5,001	C	R	-	T
	1 day forecast 12:00-18:00 (Index Obj. 176)						
161	1 day forecast 12:00-18:00 (Index Obj. 176)	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
	Forecast day 3, 12:00-18:00	Wind force (Bft)	1 Byte 20,014				
		Wind force (km/h)	2 byte 9,005				
		Wind force (m/s)	2 byte 9,028				
162	1 day forecast 12:00-18:00 (Index Obj. 176)	Wind direction	14 byte	C	R	-	T
	Forecast day 3, 12:00-18:00						
163	1 day forecast 12:00-18:00 (Index Obj. 176)	Sunshine duration	2 byte	C	R	-	T
164	1 day forecast 12:00-18:00 (Index Obj. 176)	Solar insolation	2 byte	C	R	-	T
165	1 day forecast 12:00-18:00 (Index Obj. 176)	Weather scenario as text	14 byte	C	R	-	T
	Forecast day 3, 12:00-18:00						
166	1 day forecast 12:00-18:00 (Index Obj. 176)	Weather scenario as scene	1 byte	C	R	-	T
	Forecast day 3, 12:00-18:00						
167	1 day forecast 18:00-24:00 (Index Obj. 176)	Air temperature	2 byte	C	R	-	T
	Forecast day 3, 18:00-24:00						

Continuation:

No.	Name	Function	Length	C	R	W	T
168	1 day forecast 18:00-24:00 (Index Obj. 176)	Precipitation amount	2 byte	C	R	-	T
	Forecast day 3, 18:00-24:00						
169	1 day forecast 18:00-24:00 (Index Obj. 176)	Precipitation probability	1 byte	C	R	-	T
	Forecast day 3, 18:00-24:00						
170	1 day forecast 18:00-24:00 (Index Obj. 176)	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005	C	R	-	T
		Wind force (m/s)	2 byte 9,028	C	R	-	T
	Forecast day 3, 18:00-24:00	Wind force (Bft)	1 Byte 20,014	C	R	-	T
		Wind force (km/h)	2 byte 9,005	C	R	-	T
		Wind force (m/s)	2 byte 9,028	C	R	-	T
171	1 day forecast 18:00-24:00 (Index Obj. 176)	Wind direction	14 Byte 16,001	C	R	-	T
	Forecast day 3, 18:00-24:00						
172	1 day forecast 18:00-24:00 (Index Obj. 176)	Sunshine duration	2 Byte 7,007	C	R	-	T
173	1 day forecast 18:00-24:00 (Index Obj. 176)	Solar insolation	2 Byte 9,022	C	R	-	T
174	1 day forecast 18:00-24:00 (Index Obj. 176)	Weather scenario as text	14 Byte 16,001	C	R	-	T
	Forecast day 3, 18:00-24:00						
175	1 day forecast 18:00-24:00 (Index Obj. 176)	Weather scenario as scene	1 Byte 17,001	C	R	-	T
	Forecast day 3, 18:00-24:00						
176	Index to 6 h forecast	Period 0-15	1 Byte 5,010	C	R	W	-
	Index to 1 day forecast	Day 0..3					
177	Text message in relation to index to day	transmit	14 Byte 16,001	C	R	-	T
178	Text message in relation to index to time interval	transmit	14 Byte 16,001	C	R	-	T
179	Firmware Version	transmit	14 Byte 16,001	C	R	-	T

3.2.2 Description of objects

3.2.2.1 Date and time

- **Object 0 "Time"**

Sends the current time in EIS 3 format, depending on the configuration: only on request, cyclically or at specific times (see "Send time and date" parameter table).

- **Object 1 "Date"**

Sends the current date in EIS 4 format, depending on the configuration: only on request, cyclically or at specific times (see "Send time and date" parameter table).

- **Object 2 "Date/time"**

Sends the current date in DPT 19.001, depending on the configuration: only on request, cyclically or at specific times (see "Send time and date" parameter table).
In this format the time and date are transmitted together in a telegram.

- **Object 3 "Time query"**

The time data can be queried at any time via this object.
Receipt of a telegram (0 or 1) on this objects triggers sending of the time and date (objects 0, 1, 2).

- **Object 4 "*Reception statistics*"**

Quality of the EFR reception in per cent (0-100 %). This is the ratio of readable to non-readable telegrams.

Example: 70 means that 70 out of 100 telegrams were received clearly and without errors.

3.2.2.2 Weather warnings and status reports

- **Object 5 "*Rain warning*"**

Sends a 1 when the set precipitation amount for bad weather warning will be exceeded by the EFR forecast value received.

- **Object 6 "*Status rain warning*"**

Shows whether this message is based on valid data.

0 = Data is valid

1 = No valid data present.

The cycle time is set on the *General* parameter page.

- **Object 7 "*Wind warning*"**

Sends a 1 when the set wind or gust force for bad weather warning will be exceeded by the EFR forecast value received.

- **Object 8 "*Status wind warning*"**

Shows whether this message is based on valid data.

0 = Data is valid

1 = No valid data present.

The cycle time is set on the *General parameter* page.

- **Object 9 "*Bad weather alarm*"**

Sends a 1 when the set wind or gust force or precipitation amount for bad weather warning will be exceeded by the EFR forecast value received (see *Bad weather warning* parameter page).

- **Object 10 "*Bad weather alarm status*"**

Shows whether this message is based on valid data.

0 = Data is valid

1 = No valid data present.

The cycle time is set on the *General parameter* page.

- **Object 11 "*Ground frost warning*"**

0= No warning.

1 = Ground frost risk in the current forecast period.

- **Object 12 "*Ground frost warning status*"**

Shows whether this message is based on valid data.

0 = Data is valid

1 = No valid data present.

The cycle time is set on the General *parameter* page.

3.2.2.3 Solar yield

- **Object 13 "*Solar yield possible*"**

Information to the warm water preparation system that heat energy from the solar system can be expected today.

- **Object 14 "*Status solar yield possible*"**

Shows whether this message is based on valid data.

0 = Data is valid

1 = No valid data present.

The cycle time is set on the General *parameter* page.

3.2.2.4 Summer mode

- **Object 15 "*Summer mode heating*"**

Sends a when the set conditions are fulfilled (see *Summer mode* parameter page).

- **Object 16 "*Summer mode heating status*"**

Shows whether this message is based on valid data.

0 = Data is valid

1 = No valid data present.

The cycle time is set on the General *parameter* page.

3.2.2.5 Heating and cooling support

- **Object 17 "*Heating support*"**

1 = Active

0 = inactive

The cycle time is set on the *General* parameter page.

- **Object 18 "*Cooling support*"**

1 = Active

0 = inactive

The cycle time is set on the *General parameter* page.

- **Object 19**

n.a.

3.2.2.6 Day forecasts

4 blocks of 9 objects are used for each day weather forecast.
Every block covers a forecast period of 6 hours.

- **Object 20 "Forecast today 0:00-6:00 / Air temperature"**

Expected average air temperature for the indicated time interval.

- **Object 21 "Forecast today 0:00-6:00 / Precipitation amount"**

Expected precipitation amount for the indicated time interval.

- **Object 22 "Forecast today 0:00-6:00 / Precipitation probability"**

Precipitation probability for the indicated time interval.

- **Object 23 "Forecast today 0:00-6:00 / Wind force"**

Expected wind force for the indicated time interval.

- **Object 24 "Forecast today 0:00-6:00 / Wind direction"**

Expected wind direction for the indicated time interval.

- **Object 25 "Forecast today 0:00-6:00 / Sunshine duration"**

Expected sunshine duration in hours for the indicated time interval.

- **Object 26 "Forecast today 0:00-6:00 / Solar insolation"**

Expected average solar insolation in W/m^2 for the indicated time interval.

This is the power impinging on the collectors.

The solar system's effective output is dependent on the system's actual degree of efficiency and can deviate strongly from this value.

- **Object 27 "Forecast today 0:00-6:00 / Weather scenario as text"**

Expected weather scenario (slightly cloudy, rain shower, etc.) as text telegram for the indicated time interval.

- **Object 28 "Forecast today 0:00-6:00 / Weather scenario as scene"**

Sends the forecast as scene number between 1 and 15.

The assigned scene numbers are fixed and cannot be changed.

Table 3

No.	Weather scenario
1	Sunny / clear
2	Slightly cloudy
3	Mainly cloudy
4	Overcast
5	Heat thunderstorm
6	Heavy rain
7	Snow
8	Fog
9	Sleet
10	Showers
11	Light rain
12	Snow shower
13	Storm front
14	Low stratus
15	Snow shower

- **Objects 29-37 "Forecast today 6:00-12:00 ..."**

Same function as objects 20-28.

See above, Overview.

- **Objects 38-46 "Forecast today 12:00-18:00 ..."**

Same function as objects 20-28.

See above, Overview.

- **Objects 47-55 "Forecast today 18:00-24:00 ..."**

Same function as objects 20-28.

See above, Overview.

- **Objects 60-95: "Forecast tomorrow..."**

Objects for day 1.
Same function as objects 20-55.
See above, Overview.

- **Objects 100-135: "Forecast day after tomorrow..."**

Objects for day 2.
Same function as objects 20-55.
See above, Overview.

3.2.2.7 Indexed forecast objects for user-specific period

The use of objects 140-175 is defined with the parameter *User-specific period* (from Obj. 140) on the parameter page *Weather forecast*.

Table 4

<i>User-specific period</i>	Description
<i>Weather in 3 days</i>	Forecast for the third day. Same function as the previous object blocks, i.e. 0:00-6:00, 6:00-12:00, 12:00-18.00, 18:00-24:00. Explanation of terms <i>third day</i> or <i>day 3</i> : Today = Day 0 Tomorrow = Day 1 The day after tomorrow = Day 2 2 days after tomorrow = Day 3
<i>Select 6 h period via Obj. 176</i>	Objects 140-148 send the forecast related to an arbitrary 6 h period. This is specified as an index (0-15) by object 176 (see below, object 176). Objects 149-175 are not used.
<i>Select forecast day via Obj. 176</i>	Forecast for day x This day is selected via the index, today + 0, 1, 2, 3. Example: 1 corresponds to: today + 1 = tomorrow

- **Objects 140-148:** *"1 day forecast 0:00-6:00 (Index Obj. 176)"; "6 h forecast (Index Obj. 176)"; "Forecast day 3, 0:00-6:00"*

Forecast period according to the parameter setting *User-specific period* on the parameter page *Weather forecast*, if necessary together with the index received on Object 176.

Otherwise the same functions as objects 20-28, i.e. air temperature, precipitation, etc.

See above, Overview.

- **Objects 149-175:** *"1 day forecast ... (Index Obj. 176)"; "Forecast day 3..."*

Forecast period according to the parameter setting *User-specific period* on the parameter page *Weather forecast*, if necessary together with the index received on Object 176.

Otherwise the same functions as objects 19-45, i.e. air temperature, precipitation, etc.

See above, Overview.

Note:

The objects 149-175 are not used in the 6 h forecast (*select 6 h period via obj. 176*).

- **Object 176 "Index to 1 day forecast"; "Index to 6 h forecast"**

The index received defines the task of objects 140-175.

The object is activated by the parameter *User-specific period (from Obj.140)* on the parameter page *Weather forecast* and can have 2 different functions.

Table 5

User-specific period	Function of Obj. 176.		
Weather in 3 days	Not used.		
Select 6 h period via Obj. 176	Index to "6 hours" forecast		
	Index	Objects 140-148 send forecast for:	
	0	00:00-6:00	Today
	1	6:00-12:00	
	2	12:00-18:00	
	3	18:00-24:00	
	4	00:00-6:00	Tomorrow
	5	6:00-12:00	
	6	12:00-18:00	
	7	18:00-24:00	
	8	00:00-6:00	The day after tomorrow
	9	6:00-12:00	
	10	12:00-18:00	
	11	18:00-24:00	
	12	00:00-6:00	Day 3
	13	6:00-12:00	
14	12:00-18:00		
15	18:00-24:00		
Select forecast day via Obj. 176	Index to "24 hours" forecast		
	Index	Objects 140-175 send forecast for:	
	0	Today	
	1	Tomorrow	
	2	The day after tomorrow	
	3	Day 3	

- **Object 177 "Text message in relation to index to day"**

Sends as a text the forecast day selected via object 176 (e.g. today, tomorrow, etc.) for visualisation.

The language of the text message is set on the *General* parameter page.

- **Object 178 "*Text message in relation to index to time interval*"**

Send as a text the time interval selected via object 176 (e.g. 6:00-12:00...) for visualisation.
The language of the text message is set on the *General* parameter page.

- **Object 179 "*Firmware Version*"**

For diagnostic purposes only.

Sends the software version (firmware) of the basic device after reset of the device.
Can be read directly via the ETS.

3.3 *to select parameter*

3.3.1 Parameter pages

Table 6

Function	Description
General	Transmitter selection, time zone, language setting, cycle time for warning messages and reception statistics.
Weather forecast	Selection of location and function of the indexed forecast objects
Bad weather warning	Wind and precipitation thresholds for bad weather warning.
Solar yield	Conditions for generating the message "Solar yield possible"
Summer mode	Conditions for generating the message "Summer mode" or "Winter mode" for the heating system.
Heating and cooling support	Optimised use of solar heat
Date and time	Settings on summer time and transmission of time/date.

3.3.2 Parameter description

3.3.2.1 The "General" parameter page

<i>Designation</i>	<i>Values</i>	<i>Description</i>
<i>EFR transmitter</i>	<i>Mainflingen (near Frankfurt a. M.)</i>	Transmitter selection according to location
	<i>Burg (near Magdeburg)</i>	
	<i>Lakihegy (near Budapest)</i>	
<i>Time zone</i>	<i>UTC (London)</i>	Time zone of the location GB, Ireland, Northern Ireland, etc.
	<i>UTC + 1 h (Amsterdam, Berlin, Bern, Paris, Rome..)</i>	Central and Western Europe
	<i>UTC + 2 h</i>	Finland, Lithuania, Ukraine, Greece, etc.
	<i>UTC + 3 h</i>	Russia, etc.
<i>Language of the text messages</i>	<i>English</i>	Desired language for all forecast text telegrams.
	<i>English</i>	
	<i>French</i>	Not used, reserved for other languages.
	<i>Italian</i>	
	<i>Dutch</i>	
	<i>Spanish</i>	
	<i>RESERVE</i>	
<i>Cycle time for warning messages, solar yield and heating/cooling support.</i>	<i>every minute</i> <i>every 2 min.</i> <i>every 3 min.</i> <i>every 5 min.</i> <i>every 10 min.</i> <i>every 15 min.</i> <i>every 20 min.</i> <i>every 30 min.</i> <i>every 45 min.</i> <i>every 60 min.</i>	Common cycle time for bad weather warnings (Wind, precipitation, bad weather warning), "Solar yield possible", heating/cooling support .
<i>Reception statistics</i>	<i>do not send (only query)</i>	Query possible with ETS.
	<i>send every hour</i>	Send cyclically.
	<i>send every 12 hours</i> <i>send every 24 hours</i>	

3.3.2.2 The "Weather forecast" parameter page

Designation	Values	Description
Country	<i>Andorra, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Vatican city, Czech Republic, Denmark, Germany, France, Greece, Croatia, Italy, Kosovo, Latvia, Liechtenstein, Lithuania, Luxembourg, Hungary, Macedonia, Rep. of Moldavia, Monaco, Montenegro, Netherlands Norway, Austria, Poland, Romania, Switzerland, Albania, Slovenia, Slovakia, Serbia, Sweden, Ukraine, United Kingdom</i>	Location for the weather forecast. Important: The range of the EFR signals enables good reception in a radius of 500 to 800 km, depending on the transmitter. Reception outside of this zone will be influenced by, among other things, terrain, weather situation, time of year, etc., and should only be expected under optimal conditions.
City	List of cities for the country selected above	See appendix: list of cities
User-specific period (from obj. 140)	<i>Weather in 3 days</i> <i>Select 6 h period via Obj. 176</i> <i>Select forecast day via Obj. 176</i>	The so-called indexed forecast objects can cover 3 different forecast periods: Forecast for the 3rd day. Example: on Monday these objects send the forecast for Thursday. Objects 140-148 send the forecast related to an arbitrary 6 h period. This is specified as an index (0-15) by Object 176. Objects 149-175 are not used. Objects 140-175 send the forecast related to an arbitrary 24 h period. This is specified as an index (0-3) by Object 176.

Continuation:

<i>Designation</i>	<i>Values</i>	<i>Description</i>
<i>Unit for the sent wind force</i>	<i>km/h</i>	Send wind force in: Kilometers per hour.
	<i>m/s</i>	Meters per second.
	<i>Bft</i>	Beaufort. See appendix: The Beaufort wind force scale
<i>Report forecast values cyclically</i>	<i>No</i>	Only send in the event of a change.
	<i>Yes</i>	Send again when there are changes and at fixed intervals.
<i>Forecast telegram cycle time</i>	<i>every 10 min. every 15 min. every 20 min. every 30 min. every 45 min. every 60 min.</i>	Time interval for cyclical transmission.
<i>Report distinctive weather in ticker</i>	<i>No</i>	Weather warnings will not be shown.
	<i>Yes</i>	Applies to objects 27, 36, 45 and 54. An exclamation mark "!" before the weather report shown means: "Attention, at least one weather warning" The corresponding warning(s) will be shown alternately. The following weather warnings are possible: Strong gusts/ Storm gusts/ Hurricane gusts Rain>10 l/m2 or Rain>50 l/m2 Frost

3.3.2.3 The "Bad weather warning" parameter page

Table 7

Designation	Values	Description
WIND WARNING		
<i>Wind force</i>	1 Bft (2-5 km/h) 2 Bft (6-11 km/h) 3 Bft (12-19 km/h) 4 Bft (20-28 km/h) 5 Bft (29-38 km/h) 6 Bft (39-49 km/h) 7 Bft (50-61 km/h) 8 Bft (62-74 km/h) 9 Bft (75-88 km/h) 10 bft (89-102 km/h) 11 Bft (103-117 km/h) 12 Bft (>117 km/h)	From what level of wind force should a bad weather warning be issued?
<i>Gust force</i>	arbitrary 1 Bft (2-5 km/h) 2 Bft (6-11 km/h) 3 Bft (12-19 km/h) 4 Bft (20-28 km/h) 5 Bft (29-38 km/h) 6 Bft (39-49 km/h) 7 Bft (50-61 km/h) 8 Bft (62-74 km/h) 9 Bft (75-88 km/h) 10 bft (89-102 km/h) 11 Bft (103-117 km/h) 12 Bft (>117 km/h)	No bad weather warning because of gust force. From what level of gust force should a bad weather warning be issued?
<i>Report wind warning and status cyclically</i>	No Yes	Only send in the event of a change. Send again when there are changes and at fixed intervals.
PRECIPITATION WARNING		
<i>Precipitation amount in l/m2 (6 h)</i>	1-60	From what expected precipitation amount should a bad weather warning be issued? Unit: liters per square meter (or mm) within 6 hours.

Continuation:

Designation	Values	Description
<i>Report rain warning and status cyclically</i>	No	Only send in the event of a change.
	Yes	Send again when there are changes and at fixed intervals.
<i>Report bad weather warning cyclically (wind + rain)</i>	No	Only send in the event of a change.
	Yes	Send again when there are changes and at fixed intervals.
<i>Report ground frost cyclically</i>	No	Only send in the event of a change.
	Yes	Send again when there are changes and at fixed intervals.

3.3.2.4 The "Solar yield"

When a significant amount of solar energy can be acquired in a day it is possible to send this information to the heating system here.

This allows the available solar heat to be used optimally.

Table 8

Designation	Values	Description
<i>Relevant time of day</i>	6:00 - 12:00 6:00 - 18:00 6:00 - 24:00 12:00 - 18:00 12:00 - 24:00 18:00 - 24:00	Select time of day in which the collectors are sufficiently irradiated by the sun. This time mainly depends on the direction and the surroundings of the collectors (shadows thrown). Solar yield will then be taken into account when it is available in this time window.
<i>Measured variable</i>	<i>only sunshine duration in h</i> <i>Annual mean radiation in Wh/m²</i>	Sunshine duration in hours. Annual mean radiation in Watts per square meter.
<i>Report possible solar yield when insolation is greater than*</i>	100 W/m ² , 150 W/m ² 200 W/m ² , 250 W/m ² 300 W/m ² , 350 W/m ² 400 W/m ² , 450 W/m ² 500 W/m ² , 550 W/m ² 600 W/m ² , 650 W/m ² 700 W/m ² , 750 W/m ² 800 W/m ² , 850 W/m ²	Above which output should a possible solar yield be reported?

Continuation:

Designation	Values	Description
<i>Minimum sunshine duration</i>	1 h 2 h 3 h 4 h 5 h 6 h 7 h 8 h	Above which insolation duration should a possible solar yield be reported? The effect of this and the previous parameter should be that the heating system only receives the information "Solar yield possible" when sufficient energy is available.
<i>Send report at</i>	00:00, 2:00, 4:00, 6:00, 8:00 10:00, 12:00, 14:00, 16:00 18:00, 20:00, 22:00, 24:00	in which period should the message "Solar yield possible" be sent?
<i>Cancel message at</i>	2:00, 4:00, 6:00, 8:00 10:00, 12:00, 14:00, 16:00 18:00, 20:00, 22:00, 24:00 Do not cancel	
<i>Send solar yield and status cyclically</i>	No Yes	Only send in the event of a change. Send again when there are changes and at fixed intervals.

* only available when: Measured variable $\rightarrow$ Average insolation in W/m^2

3.3.2.5 The "Summer mode" parameter pages

Whether the current day is a summer day or not can be calculated from the forecast values and, for example, the heating can be switched off. The air temperature, the sunshine duration and the solar radiation can be used as the criteria for a summer day.

Table 9

Designation	Values	Description
<i>Initiate summer mode</i>	<i>only via temperature</i> <i>via temperature and other conditions</i>	Minimum configuration: Initiate summer and winter mode only based on the minimum and maximum temperature highs. Also include solar radiation and sunshine duration i.e. expected solar energy.
<i>Relevant time of day for recognition of summer mode*</i>	6:00 - 12:00 6:00 - 18:00 6:00 - 24:00 12:00 - 18:00 12:00 - 24:00 18:00 - 24:00	Select time of day in which the house is properly heated by the sun. The conditions for summer mode are only checked in this time window.
<i>Link temperature with*</i>	<i>sunshine duration</i> <i>Solar radiation</i>	Take temperature and sunshine duration into account Take temperature and solar radiation and sunshine duration into account.

Continuation:

Designation	Values	Description
CONDITIONS FOR THE ACTIVATION		
<i>Type of link*</i>	AND OR	Report summer mode when: all conditions are met. at least one of the configurable conditions (i.e. temperature or solar radiation or sunshine duration) is met.
<i>Over a period of</i>	today today and yesterday today and the previous 2 days today and the previous 3 days	Report summer mode as soon as all conditions are fulfilled. Only activate when the conditions are fulfilled for several days.
<i>Day maximum temperature, at least</i>	12 °C, 13 °C, 14 °C, 15 °C, 16 °C, 17 °C 18 °C, 19 °C, 20 °C 21 °C, 22 °C, 23 °C 24 °C, 25 °C, 26 °C	What temperature should be reached on the day so that the temperature condition is fulfilled?
<i>AND/OR Sunshine duration at least*</i>	1 h, 2 h, 3 h, 4 h, 5 h, 6 h	How long should the sun shine during the day so that the sunshine duration condition is fulfilled?
<i>AND/OR sunshine duration at least**</i>	100 W/m², 150 W/m² 200 W/m², 250 W/m² 300 W/m², 350 W/m² 400 W/m², 450 W/m² 500 W/m², 550 W/m² 600 W/m², 650 W/m² 700 W/m², 750 W/m² 800 W/m², 850 W/m²	How intensely should the sun shine during the day so that the solar radiation condition is fulfilled?

Continuation:

Designation	Values	Description
CONDITIONS FOR THE TERMINATION		
<i>Over a period of</i>	<i>without waiting time</i> <i>today and yesterday</i> <i>today and the previous 2 days</i> <i>today and the previous 3 days</i>	End summer mode as soon as all conditions are fulfilled. Only end when the conditions are fulfilled for several days.
<i>Day maximum temperature, smaller than</i>	12 °C, 13 °C, 14 °C, 15 °C 16 °C, 17 °C, 18 °C, 19 °C 20 °C, 21 °C, 22 °C, 23 °C 24 °C, 25 °C, 26 °C	What temperature may not be reached on the day so that the temperature condition is fulfilled?
<i>AND/OR Sunshine duration maximum*</i>	1 h, 2 h, 3 h, 4 h, 5 h, 6 h	How long may the sun shine during the day for the solar radiation condition to be fulfilled?
<i>AND/OR solar radiation maximum**</i>	100 W/m ² , 150 W/m ² 200 W/m ² , 250 W/m ² 300 W/m ² , 350 W/m ² 400 W/m ² , 450 W/m ² 500 W/m ² , 550 W/m ² 600 W/m ² , 650 W/m ² 700 W/m ² , 750 W/m ² 800 W/m ² , 850 W/m ²	Value that the solar radiation may not exceed for the condition to be fulfilled.
<i>Send the summer mode message at</i>	00:00, 2:00, 4:00, 6:00, 8:00 10:00, 12:00, 14:00, 16:00 18:00, 20:00, 22:00, 24:00	When should the message be sent?
<i>Send summer mode heating and status cyclically</i>	No	Only send in the event of a change.
	Yes	Send again when there are changes and at fixed intervals.

* only available when:

Initiate summer mode → via temperature and other conditions.

** only present when:

*Initiate summer mode → via temperature and other conditions
and link temperature with → solar radiation*

3.3.2.6 The parameter page "*Head and cooling support*"

The heating support and cooling support objects are sent so that a blinds controller can decide in advance whether in it is better to close (cooling support) or open (heating support) the blinds in unoccupied rooms.

This value will always be sent at the start of a forecast period, that is at 0:00, 6:00, 12:00 and 18:00 and will be formed from the values of the following period.

It thus applies for the next 6 hours.

Table 10

Designation	Values	Description
HEATING SUPPORT		
<i>Maximum temperature smaller than</i>	10 °C 11 °C 12 °C 13 °C 14 °C 15 °C 16 °C 17 °C 18 °C 19 °C 20 °C	At what external temperature value is the heating support desired or necessary?
<i>Sunshine detection via</i>	Sunshine duration <i>Insolation</i>	Which forecast value controls the activation of heating support?
<i>Minimum sunshine duration</i>	1 h 2 h 3 h 4 h 5 h 6 h <i>Do not take sun into account</i>	What is the minimum time that the sun must shine for heating support to activate?
<i>Minimum solar radiation</i>	100 W/m ² , 150 W/m ² 200 W/m ² , 250 W/m ² 300 W/m ² , 350 W/m ² 400 W/m ² , 450 W/m ² 500 W/m ² , 550 W/m ² 600 W/m ² , 650 W/m ² 700 W/m ² , 750 W/m ² 800 W/m ² , 850 W/m ² <i>do not take into account</i>	What is the minimum sun intensity for heating support to activate?

Continuation:

Designation	Values	Description
COOLING SUPPORT		
<i>Minimum temperature</i>	21 °C 22 °C 23 °C 24 °C 25 °C 26 °C 27 °C 28 °C 29 °C 30 °C	From which outside temperature is cooling support desired or necessary?
<i>Sunshine detection via</i>	Sunshine duration <i>Insolation</i>	Which forecast value controls the activation of cooling support?
<i>Minimum sunshine duration</i>	30 min. 1 h 2 h 3 h 4 h 5 h 6 h <i>Do not take sun into account</i>	What is the minimum time that the sun must shine for cooling support to be useful?
<i>Minimum solar radiation</i>	100 W/m ² , 150 W/m ² 200 W/m ² , 250 W/m ² 300 W/m ² , 350 W/m ² 400 W/m ² , 450 W/m ² 500 W/m ² , 550 W/m ² 600 W/m ² , 650 W/m ² 700 W/m ² , 750 W/m ² 800 W/m ² , 850 W/m ² <i>do not take into account</i>	How intensely must the sun shine for cooling support to be useful?
HEATING/COOLING SUPPORT		
<i>At 0:00</i>	<i>Cancel all</i> Send notifications	Reset heating and cooling support notifications. Send telegrams for heating/cooling support
<i>At 6:00</i>	<i>Cancel all</i> Send notifications	See above.
<i>At 12:00</i>	<i>Cancel all</i> Send notifications	See above.
<i>At 18:00</i>	<i>Cancel all</i> Send notifications	See above.

Continuation:

Designation	Values	Description
<i>Send heating/cooling support cyclically</i>	Yes No	Send telegrams for heating/cooling support cyclically.

3.3.2.7 The "Date and time" parameter page

As the time can also be sent via EFR Meteodata 139 EFR can also be used as a time signal transmitter.

Table 11

Designation	Values	Description
<i>send time and date</i>	<i>Only on request</i> <i>every minute</i> <i>every hour</i> <i>Every day at 00:00 and during summer/winter time changeover</i> <i>Every day at 00:02 and during summer/winter time changeover</i>	When should the time and date be sent? Only when a 1 or a 0 is written to object 3 (time query) Send cyclically. Only 1x per day and additionally at every summer/winter time changeover.
<i>Summer/winter time changeover</i>	<i>none</i> <i>As for Central Europe</i> <i>As for the United Kingdom</i> <i>Greece</i> <i>As for North America</i> <i>user-defined..</i>	No summer time changeover. for Germany, Central and Western Europe other than Portugal and the United Kingdom. additional country-specific switching rules Define time and date for the switch manually.
User-defined summer/winter time changeover		
<i>Start of summer time</i>	<i>First Sunday in</i> <i>Second Sunday in</i> <i>Third Sunday in</i> <i>fourth Sunday in</i> <i>last Sunday in</i>	On what Sunday in each year should the changeover to summer time take place?
<i>Month</i>	<i>January, February, March</i> <i>April, May, June</i> <i>July, August, September</i> <i>October, November,</i> <i>December</i>	In what month?

Continuation:

Designation	Values	Description
<i>Time</i>	<i>00:00 a.m.</i> <i>1:00 a.m.</i> <i>2:00 a.m.</i> <i>3:00 a.m.</i> <i>4:00 a.m.</i> <i>5:00 a.m.</i> <i>6:00 a.m.</i>	At what time?
<i>Start of winter time</i>	<i>First Sunday in</i> <i>Second Sunday in</i> <i>Third Sunday in</i> <i>fourth Sunday in</i> <i>last Sunday in</i>	On what Sunday in each year should the change back to winter time take place?
<i>Month</i>	<i>January, February, March</i> <i>April, May, June</i> <i>July, August, September</i> <i>October, November,</i> <i>December</i>	In what month?

4 Typical applications

These typical applications are designed to aid planning.

Some individual functions or devices of an overall system are only shown for illustration purposes.

Therefore these examples have no claim to completeness and may be adjusted or extended arbitrarily.

4.1 Show weather prediction on the VARIA weather forecast page*.

The weather data should be shown on the VARIA 826 S forecast page (page 1).

The desired 6 h forecast period is selected on the Varia display with the ▲ ▼ buttons. This seamlessly covers all available periods (today, tomorrow, day after tomorrow, day 3).

Table 12: Display assignment:

Heading	Weather forecast
Line 1	Validity period: day.
Line 2	6 h time interval.
Line 3	Weather scenario (e.g. "Slightly cloudy", etc.).
Line 4	Air temperature in °C
Line 5	Precipitation probability in %
Line 6	Rain amount in l/m ² or mm
Line 7	Wind force in km/h
Line 8	Continue ▲ ▼

4.1.1 Devices:

- Meteodata 139 (1399200)
- VARIA 826 S KNX (8269210/8269211) with ETS application from V1.2

4.1.2 Overview

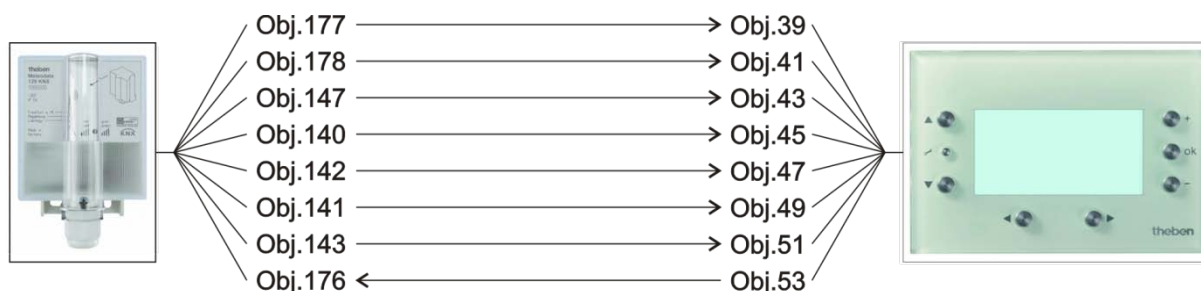


Figure 1

4.1.3 Objects and links

Table 13

No.	Meteodata 139 EFR	No.	VARIA 826		Comment
	Object name		Object name	Row	
177	<i>Text message in relation to index to day</i>	39	<i>Text in relation to index to day</i>	1	-
178	<i>Text message in relation to index to time interval</i>	41	<i>Text in relation to index to time</i>	2	-
147	<i>Weather scenario as text</i>	43	<i>Weather scenario as text</i>	3	-
140	<i>Air temperature</i>	45	<i>Air temperature</i>	4	-
142	<i>Precipitation probability</i>	47	<i>Precipitation probability</i>	5	-
141	<i>Precipitation amount</i>	49	<i>Precipitation amount</i>	6	-
143	<i>Wind force (km/h)</i>	51	<i>Wind force (km/h)</i>	7	-
176	<i>Index to 6 h forecast</i>	53	<i>Index to time</i>	(8)	Sends a number from 0-15 during activation of the ▲ ▼ buttons.

4.1.4 Important parameter settings

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

Table 14: Meteodata 139 EFR

Parameter page	to select parameter	Setting
<i>Weather forecast</i>	<i>User-specific period (from obj. 140)</i>	<i>Select 6 h period via Obj. 176</i>
	<i>Unit for the sent wind force</i>	<i>km/h</i>

Table 15: VARIA 826

Parameter page	to select parameter	Setting
<i>Select screens</i>	<i>Show page 1 for display objects</i>	<i>Yes</i>
	<i>Show weather forecast on page 1</i>	<i>Yes</i>

4.2 Show weather data with VARIA standard display page

Forecast values searched for should be shown on a VARIA display.

The desired 6 h forecast period is selected on the Varia display with the +/- buttons.

This seamlessly covers all available periods (today, tomorrow, day after tomorrow, day 3).

Table 16: Display assignment:

Heading	Weather forecast
Line 1	Validity period: day.
Line 2	Validity period: 6 h time interval.
Line 3	Weather scenario (e.g. "Slightly cloudy", etc.).
Line 4	Air temperature in °C
Line 5	Precipitation probability in %
Line 6	Rain amount in l/m ² or mm
Line 7	Wind force in km/h
Line 8	Continue +/-

4.2.1 Devices:

- Meteodata 139 (1399200)
- Varia 826 (8269200)

4.2.2 Overview

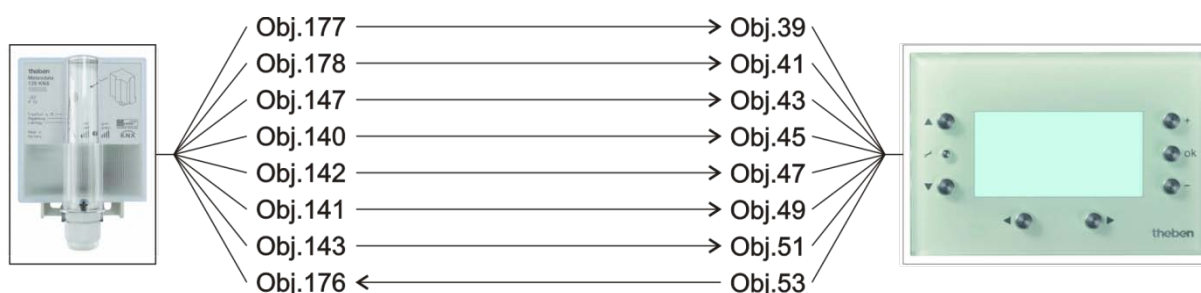


Figure 2

4.2.3 Objects and links

Table 17

No.	Meteodata 139 EFR	No.	VARIA 826		Comment
	Object name		Object name	Row	
177	<i>Text message in relation to index on day</i>	39	<i>Text string</i>	1	Range of applicability (day).
178	<i>Text message in relation to index to time interval</i>	41	<i>Text string</i>	2	Range of applicability (6 h period).
147	<i>Weather scenario as text</i>	43	<i>Text string</i>	3	Weather forecast
140	<i>Air temperature</i>	45	<i>Temperature</i>	4	in °C
142	<i>Precipitation probability</i>	47	<i>percentage value</i>	5	0-100 %
141	<i>Precipitation amount</i>	49	<i>EIS 5 value</i>	6	in l/m ² or mm
143	<i>Wind force</i>	51	<i>EIS 5 value</i>	7	in km/h
176	<i>Index to 6 h forecast</i>	53	<i>Value 0..255</i>	(8)	Sends a number from 0-15 during activation of the ▲ ▼ buttons.

4.2.4 Important parameter settings

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

Table 18: Meteodata 139 EFR

Parameter page	to select parameter	Setting
<i>Weather forecast</i>	<i>User-specific period (from obj. 140)</i>	<i>Select 6 h period via Obj. 176</i>
	<i>Unit for the sent wind force</i>	<i>km/h</i>

Table 19: VARIA 826

Parameter page	to select parameter	Setting
<i>Select screens</i>	<i>Show page 1 for display objects</i>	<i>Yes</i>
<i>Display objects page 1</i>	<i>Fade in operating instructions on page 1</i>	<i>No</i>
	<i>Page heading</i>	<i>Weather forecast*¹</i>
<i>Page 1, line 1</i>	<i>Line format</i>	<i>Object type: show text string</i>
	<i>Display before receipt of value</i>	<i>Read from object via bus</i>
<i>Page 1, line 2</i>	<i>Line format</i>	<i>Object type: show text string</i>
	<i>Display before receipt of value</i>	<i>Read from object via bus</i>
<i>Page 1, line 3</i>	<i>Line format</i>	<i>Object type: show text string</i>
	<i>Display before receipt of value</i>	<i>Read from object via bus</i>
<i>Page 1, line 4</i>	<i>Line format</i>	<i>Object type: temperature</i>
	<i>Text for line 4</i>	<i>Temperature*³</i>
	<i>Unit for display object</i>	<i>°C</i>
	<i>Authorise amendment of object value?</i>	<i>No</i>
	<i>Display before receipt of value</i>	<i>Read from object via bus</i>

Continuation:

Parameter page	to select parameter	Setting
Page 1, line 5	Line format	Object type: percentage value
	Text for line 5	Precipitation* ²
	Text at object value 0	0 %
	Authorise amendment of object value?	No
	Display before receipt of value	Read from object via bus
Page 1, line 6	Line format	Object type: EIS5
	Text for line 7	Rain amount* ⁴
	Unit	l/m (or mm)
	Authorise amendment of object value?	No
	Display before receipt of value	Read from object via bus
Page 1, line 7	Line format	Object type: EIS5
	Text for line 7	Wind force* ⁴
	Unit	kmh
	Authorise amendment of object value?	No
	Display before receipt of value	Read from object via bus
Page 1, line 1	Line format	Object type: 8-bit numeric value
	Text for line 8	Period* ²
	Unit	(not fulfilled)
	Value range	positive numbers only
	Authorise amendment of object value?	Yes
	Lower adjustable threshold value	0
	Upper adjustable threshold value	15
	Display before receipt of value	Corresponding object value after reset

*Suggested text

¹ Maximum 22 characters.

² Maximum 14 characters.

³ Maximum 12 characters.

⁴ Maximum 11 characters

4.3 Optimising domestic water heating and automatically activating summer mode.

In a heating system with OpenTherm controller and 12 m² solar collectors, Meteodata 139 should report the possible solar yield to the heating controller.

Meteodata 139 also controls summer mode automatically according to the user's specification.

4.3.1 Devices:

- Meteodata 139 (1399200)
- KNX OT Box (8559200)

4.3.2 Overview

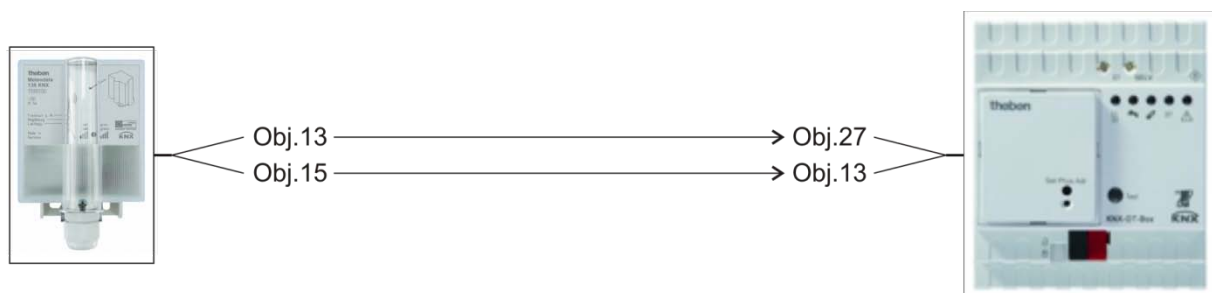


Figure 3

4.3.3 Objects and links

Table 20

No.	Meteodata 139 EFR	No.	KNX OT box	Comment
	Object name		Object name	
13	<i>Solar yield possible</i>	27	<i>Expected solar support</i>	Indicates that sufficient solar energy is expected today.
15	<i>Summer mode heating</i>	13	<i>Summer mode</i>	Automatic summer/winter time changeover

4.3.4 Important parameter settings

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

Table 21: Meteodata 139 EFR

Parameter page	to select parameter	Setting
<i>Solar yield</i>	<i>Relevant time of day</i>	Select time of day in which the collectors are sufficiently irradiated by the sun.
	All other parameters are dependent on the particular solar system (area, buffer size, etc.).	
<i>Summer mode</i>	These parameter settings are dependent on the local circumstances.	

Table 22: KNX-OT-Box

Parameter page	to select parameter	Setting
<i>Domestic water heating</i>	<i>Energy maximisation with potential solar support</i>	Yes
	<i>Domestic water set point value with solar. (in °C, 5..90)</i>	45*

Depending on the circumstances.

4.5 Retracting sun protection when there is a bad weather warning

On the blinds actuators, alongside the usual safety control with weather station, the wind warning is linked to an additional safety object.

Advantage: Optimal protection as the sun protection device does not have to wait for the bad weather to occur to be moved away. It can be done in advance.

4.5.1 Devices:

- Meteodata 139 (1399200)
- JMG 4 S (4910250)

4.5.2 Overview



Figure 4

4.5.3 Objects and links

Table 23

No.	Meteodata 139 EFR	No.	JMG 4 S	Comment
	Object name		Object name	
9	<i>Message / Bad weather alarm</i>	64	<i>Central safety 1 / für JMG 4 S</i>	Signals (if status = 1) that bad weather is expected

4.5.4 Important parameter settings

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

Table 24: Meteodata 139 EFR

Parameter page	to select parameter	Setting
<i>Bad weather warning</i>	The optimal parameter settings are dependent on the local circumstances (position, direction, etc.) and on the type of sun protection device. Accordingly, they must be defined on site.	

Table 25: JMG 4 S

Parameter page	to select parameter	Setting
<i>GM JMG 4 S C1</i>	<i>Response at safety start/end</i>	<i>Upper end position / unchanged</i>
	<i>Which safety objects function (OR-linked)</i>	<i>Safety 1</i>

5 Appendix

5.1 Locations list

Table 26

Albania
Durrës, Elbasan, Shkodër, Tiranë.
Andorra
Andorra la Vella.
Belarus
Babrujsk, Baranavicy, Barysau, Brest, Homel, Kalinkavicy, Minsk, Pinsk.
Belgium
Aalst, Antwerpen, Brugge, Bruxelles, Charleroi, Genk, Gent, Halle, Hasselt, Ixelles, Knokke-Heist, Kortrijk, Leuven, Liège, Lokeren, Mechelen, Mons, Mouscron, Oostende, Roeselare, Schaerbeek, Tournai, Verviers
Bosnia and Herzegovina
Banja Luka, Mostar, Sarajevo, Tuzla, Zenica.
Bulgaria
Burgas, Cherni Vrah, Dobric, Gabrovo, Haskovo, Jambol, Kardzali, Kazanlak, Mussala, Pazardzik, Pernik, Pleven, Plovdiv, Ruse, Sliven, Sofia, Stara Zagora, Sumen, Varna, Veliko Tarnovo.
Denmark
Ålborg, Århus, Esbjerg, Fredericia, Frederikshavn, Helsingør, Herning, Holstebro, Horsens, Kalundborg, København, Kolding, Næstved, Odense, Randers, Roskilde, Silkeborg, Slagelse, Thisted, Vejle, Viborg.
Germany
Aachen, Aalen, Altenburg, Aschaffenburg, Augsburg, Bad Homburg, Bad Kreuznach, Baden-Baden, Bamberg, Bautzen, Bayreuth, Bergen, Berlin, Bielefeld, Bochum, Bonn, Brandenburg, Braunschweig, Bremen, Bremerhaven, Brocken, Celle, Chemnitz, Cottbus, Cuxhaven, Darmstadt, Deggendorf, Delmenhorst, Dessau, Detmold, Dortmund, Dresden, Duisburg, Düren, Düsseldorf, Eberswalde, Eisenach, Eisenhüttenstadt, Elmshorn, Emden, Erfurt, Erlangen, Essen, Feldberg/Schwarzwald, Fichtelberg, Finow, Flensburg, Frankfurt am Main, Frankfurt an der Oder, Freiberg, Freiburg, Friedrichshafen, Fulda, Fürth, Gelsenkirchen, Gera, Gießen, Göppingen, Görlitz, Goslar, Gotha, Göttingen, Greifswald, Grosser Arber, Gütersloh, Hagen, Halle, Hamburg, Hameln, Hamm, Hanau, Hannover, Heidelberg, Heilbronn, Herford, Herne, Hildesheim, Hof, Hohenpeissenberg, Hoyerswerda, Ingolstadt, Iserlohn, Jena, Kaiserslautern, Karlsruhe, Kassel, Kempten, Kiel, Koblenz, Köln, Konstanz, Krefeld, Landau in der Pfalz, Landshut, Lebenstedt, Leipzig, Leverkusen, Lingen, Lippstadt, Lübeck, Lüdenscheid, Ludwigsburg, Ludwigshafen, Lüneburg, Magdeburg, Mainz, Mannheim, Marburg, Minden, Mönchengladbach, Mülheim, München, Münster, Neubrandenburg, Neumünster, Neustadt an der Weinstraße, Neuwed, Norderstedt, Nordhausen, Nordhorn, Nürnberg, Oberhausen, Offenbach, Offenburg, Oldenburg, Osnabrück, Paderborn, Pforzheim, Pirmasens, Pirna, Plauen, Potsdam, Pritzwalk, Ramsau, Recklinghausen, Regensburg, Remscheid, Reutlingen, Rheine, Rostock, Saarbrücken, Schluchsee, Schwäbisch Gmünd, Schwedt, Schweinfurt, Schwerin, Siegen, Sindelfingen, Solingen, Speyer, Stendal, Stralsund, Stuttgart, Suhl, Trier, Tübingen, Ulm, Villingen, Wasserkuppe, Weimar, Wendelstein, Wesel, Wiesbaden, Wilhelmshaven, Wismar, Wittenberg, Wolfenbüttel, Wolfsburg, Worms, Wuppertal, Würzburg, Zugspitze, Zwickau.

Continuation:

France
Aix-en-Provence, Aix-les-Bains, Albi, L'Alpe d'Huez, Amiens, Angers, Angoulême, Annecy, Arras, Aurillac, Auxerre, Avignon, Ballon d'Alsace, Bastia, Belfort, Besançon, Béziers, Bordeaux, Boulogne-sur-Mer, Bourges, Brest, Brive-la-Gaillarde, Caen, Calais, Cannes, Châlons-en-Champagne, Chalon-sur-Saône, Chambéry, Chamonix - Mont Blanc, Charleville-Mézières, Chartres, Châteauroux, Cherbourg, Clermont-Ferrand, Colmar, Courchevel, Digne-les-Bains, Dijon, Dunkerque, Gap, Grand Ballon, Grenoble, la Guerche-sur-L'aubois, La Plagne, la Rochelle, Laval, le Havre, le Mans, Les 2 Alpes, Les Trois Vallées, Lille, Limoges, Lorient, Lourdes, Lyon, Marseille, Méribel, Metz, Millau, Montbéliard, Montluçon, Montpellier, Mulhouse, Nancy, Nantes, Nevers, Nice, Nîmes, Orléans, Oyonnax, Paris, Pau, Perpignan, Poitiers, Quimper, Reims, Rennes, Roanne, Rouen, Saint-Brieuc, Saint-Chamond, Saint-Etienne, Saint-Jean-Pied-de-Port, Saint-Nazaire, Saint-Quentin, Saverne, Strasbourg, Tarbes, Toulon, Toulouse, Tourcoing, Tours, Troyes, Valence.
Greece
Arta, Kalamaria, Kavala, Larissa, Thessaloniki, Volos, Xanthi.
Italy
Acqui Terme, Ancona, Andria, Aosta, Bari, Barletta, Bergamo, Bologna, Bolzano, Brescia, Brindisi, Brixen, Brunico, Campobasso, Como, Cortina d'Ampezzo, Cosenza, Cremona, Ferrara, Firenze, Foggia, Foligno, Forlì, Genova, L'Aquila, La Spezia, Lecce, Mantova, Meran, Merano, Mestre, Milano, Modena, Molfetta, Mondovì, Monte Terminillo, Monza, Napoli, Novara, Padova, Parma, Pavia, Perugia, Pesaro, Pescara, Piacenza, Pisa, Policoro, Potenza, Pozzuoli, Prato, Ravenna, Reggio nell'Emilia, Rimini, Roma, Salerno, Salsomaggiore Terme, San Remo, Savona, Siena, Taranto, Tivoli, Torino, Trento, Treviso, Trieste, Udine, Varese, Venezia, Vercelli, Verona, Viareggio, Vicenza, Vigevano.
Kosovo
Pristina.
Croatia
Osijek, Rijeka, Split, Zagreb.
Lettland
Jelgava, Liepaja, Riga.
Liechtenstein
Eschen, Vaduz
Lithuania
Alytus, Kaunas, Klaipeda, Panevezys, Siauliai, Vilnius.
Luxembourg
Esch-Sur-Alzette, Luxembourg.
Macedonia
Bitola, Skopje, Veles.
Moldavia
Balti, Chisinau, Tighina, Tiraspol.

Continuation:

Monaco
Monaco.
Montenegro
Podgorica.
Netherlands
Alkmaar, Almelo, Almere, Alphen aan den Rijn, Amersfoort, Amsterdam, Apeldoorn, Arnhem, Assen, Bergen, Bergen op Zoom, Breda, Bussum, Den Haag, Den Helder, Deventer, Doetinchem, Dordrecht, Drachten, Ede, Eindhoven, Emmen, Enschede, Groningen, Haarlem, Heerlen, Helmond, Hilversum, Hoogeveen, Ijmuiden, Leeuwarden, Leiden, Lelystad, Maastricht, Nijmegen, Oss, Oude Tonge, Roermond, Roosendaal, Rotterdam, Sittard, Spijkenisse, Tilburg, Utrecht, Venlo, Weert, Zeist, Zoetermeer, Zutphen, Zwolle.
Norway
Bergen, Drammen, Fagernes, Fredrikstad, Hamar, Kristiansand, Maurset, Notodden, Oslo, Stavanger.
Austria
Bad Gastein, Bregenz, Eisenstadt, Graz, Hahnenkamm/Ehrenbachhöhe, Hochfilzen, Innsbruck, Ischgl, Kitzbühel, Klagenfurt, Klosterneuburg, Leoben, Linz, Obergurgl, Obertauern, Patscherkofel, Pitztal, Salzburg, Sankt Pölten, Semmering, Sölden, Sonnblick, St Anton am Arlberg, St Johann in Tirol, Steyr, Tuxertal, Villach, Villacheralpe, Wels, Wien, Wiener Neustadt.
Poland
Bedzin, Belchatow, Biala Podlaska, Bialystok, Bielsko-Biala, Bydgoszcz, Bystrzyca Kłodzka, Bytom, Chelm, Dabrowa Gornicza, Debno, Elblag, Elk, Gdansk, Gdynia, Gliwice, Glogow, Gniezno, Gorzow Wielkopolski, Grudziadz, Inowroclaw, Jelenia Gora, Kalisz, Katowice, Kielce, Konin, Kostrzyn, Koszalin, Krakow, Kutno, Legionowo, Legnica, Leszno, Lodz, Lomza, Lubin, Lublin, Mielec, Nowy Sacz, Olsztyn, Opole, Ostroleka, Ostrow Wielkopolski, Ostrowiec Swietokrzyski, Pabianice, Piekary Slaskie, Pila, Piotrkow Trybunalski, Plock, Poznan, Pruszkow, Pulawy, Radom, Radomsko, Ruda Slaska, Rzeszow, Siedlce, Siemianowice Slaskie, Skarzysko-Kamienna, Slupsk, Stalowa Wola, Stargard Szczecinski, Starogard Gdanski, Suwalki, Swidnica, Swietochlowice, Szczecin, Tarnow, Tarnowskie Gory, Tczew, Tomaszow Mazowiecki, Torun, Walbrzych, Warszawa, Wielun, Wloclawek, Wroclaw, Zamosc, Zgierz, Zielona Gora.
Romania
Arad, Bacau, Baia Mare, Birlad, Braila, Brasov, Bucuresti, Buzau, Cluj-Napoca, Comanesti, Constanta, Craiova, Drobeta-Turnu Severin, Galati, Hunedoara, Iasi, Lipova, Liski, Medias, Onesti, Oradea, Piatra-Neamt, Pitesti, Ploiesti, Resita, Rimnicu Vilcea, Satu Mare, Sebes, Sibiu, Suceava, Timisoara, Tirgu Mures, Turda, Varfu Omu, Vatra Dornei.
Sweden
Borås, Borlänge, Eskilstuna, Gävle, Göteborg, Halmstad, Helsingborg, Jönköping, Kalmar, Karlstad, Linköping, Lund, Malmö, Norrköping, Örebro, Södertälje, Stockholm, Trollhättan, Uppsala, Västerås, Växjö, Visby.

Continuation:

Switzerland
Andermatt, Basel, Bern, Bettmeralp, Biel, Chur, Crans-Montana, Davos Platz, Engelberg, Fribourg, Genève, Gotthard, Interlaken, Lausanne, Leukerbad / Loeche-les-Bains, Luzern, muerren, Neuchâtel, Saas Fee, Sankt Gallen, Sankt Moritz, Schaffhausen, Sion, Thun, Titlis, Verbier, Winterthur, Zermatt, Zürich.
Serbia
Kragujevac, Nis, Novi Sad, Pancevo, Subotica, Zrenjanin, Beograd.
Slovakia
Banska Bystrica, Bratislava, Kosice, Lomnický Stit, Martin, Nitra, Poprad, Presov, Prievidza, Trencin, Trnava, Zilina.
Slovenia
Celje, Jesenice, Koper, Kranj, Ljubljana, Maribor, Murska Sobota, Nova Gorica, Novo Mesto, Ptuj, Velenje.
Czech Republic
Brno, Ceske Budejovice, Chomutov, Decin, Frydek-Mistek, Havirov, Hradec Kralove, Jihlava, Karlovy Vary, Karvina, Kladno, Liberec, Most, Olomouc, Opava, Ostrava, Pardubice, Plzen, Praha, Prerov, Prostějov, Sniezka, Teplice, Usti nad Labem, Zlin.
Ukraine
Bila Cerkva, Cerkasy, Cernihiv, Cernivci, Cherson, Chmel'nyc'kyj, Drohobyc, Ivano-Frankivs'k, Izmail, Kam'janec'-Podil's'kyj, Kirovohrad, Korosten', Kyjiv, Luc'k, L'viv, Mukaceve, Mykolaiv, Odesa, Pervomaj's'k, Pervomaj's'k, Rivne, Ternopil', Uman', Uzhorod, Vinnycja, Vyskiv, Zytomyr.
Hungary
Békéscsaba, Budapest, Debrecen, Dunaújváros, Eger, Érd, Győr, Hódmezővásárhely, Kaposvár, Kecskemét, Miskolc, Nagykanizsa, Nyíregyháza, Ózd, Pécs, Salgótarján, Sopron, Szeged, Székesfehérvár, Szolnok, Szombathely, Veszprém, Zalaegerszeg.
Vatican city
Vatican city.
United Kingdom
Aberdeen, Barrow-in-Furness, Basildon, Bath, Bedford, Birmingham, Blackburn, Blackpool, Bournemouth, Bradford, Brighton, Bristol, Cambridge, Cardiff, Carlisle, Chelmsford, Cheltenham, Colchester, Coventry, Crawley, Darlington, Derby, Doncaster, Dover, Dudley, Dundee, Eastbourne, Edinburgh, Exeter, Fareham, Gateshead, Gloucester, Gosport, Great Yarmouth, Grimsby, Guildford, Harrogate, Harwich, Hastings, Hemel Hempstead, Huddersfield, Ipswich, Kingston upon Hull, Leeds, Leicester, Lincoln, Liverpool, London, Luton, Lytham Saint Anne's, Maidstone, Manchester, Mansfield, Margate, Merthyr Tydfil, Middlesbrough, Milton Keynes, Newbury, Newcastle-under-Lyme, Newcastle-upon-Tyne, Newport, Newport, Northampton, Norwich, Nottingham, Nuneaton, Oxford, Peterborough, Plymouth, Poole, Port Talbot, Portsmouth, Preston, Reading, Reigate, Rochdale, Rugby, Saint Helens, Scunthorpe, Sheffield, Shrewsbury, South Shields, Southampton, Southend-on-Sea, Southport, Stafford, Staines, Stoke-on-Trent, Stourbridge, Sunderland, Swansea, Swindon, Telford, Torquay, Tynemouth, Wakefield, Watford, Windsor, Wolverhampton, Worcester, Worthing, York.

5.2 The Beaufort wind force scale

Figure 5

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.

5.3 Solar radiation and energy amount

The amount of energy can be calculated directly from the solar radiation and the sunshine duration.

$$W = P * t$$

W = Energy in Wh (Watt hours)

W

P = Solar radiation in W (Watt)

N

tT = Time in h

→ Applies to 1m² collector surface:

$$\text{Energy (Wh/m}^2\text{)} = \text{Insolation (W/m}^2\text{)} * \text{Duration (h)}$$

Example:

Expected average solar radiation = 600 W/m²

Expected sunshine duration = 4 h

Earnings:

$$\begin{aligned} W &= 600 \text{ W/m}^2 * 4 \text{ h} \\ &= 2400 \text{ Wh/m}^2 \\ &= 2.4 \text{ kWh/m}^2 \end{aligned}$$

→ Applies to entire collector surface:

$$\text{Energy (Wh)} = \text{Insolation (W/m}^2\text{)} * \text{Duration (h)} * \text{Total surface (m}^2\text{)}$$

Example:

Expected average solar radiation = 600 W/m²

Expected sunshine duration = 4 h

Collector area = 12 m²

Yield:

$$\begin{aligned} W &= 600 \text{ W/m}^2 * 4 \text{ h} * 12 \text{ m}^2 \\ &= 31200 \text{ Wh} \\ &= 31.2 \text{ kWh} \end{aligned}$$

Orders of magnitude:

1 kWh is the energy required to heat:

- 10 liters of water by approx. 86 K
- 100 liters of water by approx. 8.6 K
- 1000 liters of water by approx. 0.86 K

at a theoretical degree of efficiency of 100%.

Important:

Solar radiation designates the heat power that can impinge on the surface of a solar collector **that is aligned vertically to the sun.**

In practice only part of this energy can be used:

The energy that is actually usable depends on the losses through the installation position of the collectors (alignment, dirt, shadows thrown, etc.) and the system's degree of efficiency.

Depending on their type, thermal solar collectors can achieve efficiency levels of 60 - 75 % (Source: Wikipedia).

Example: With a solar radiation of 600 W/m^2 and a 75% degree of efficiency a heating output of $0.75 * 600 \text{ W/m}^2 = 450 \text{ W/m}^2$ results on the solar collector.

6 Operating instructions



1. Designated use

The Meteodata 139 weather forecast receiver supplies the locally measured temperature along with a weather forecast (e.g. wind strength, air temperature, precipitation as well as date and time) from the weather service, which is received over longwave. In cooperation with the Europäischen Funk-Rundsteuerung (EFR) [European Radio Ripple Control], HKW-Elektronik GmbH transmits weather forecasts for the European area. The forecast data is created by a reputable weather service, based on the satellite-supported global weather model. It is sent approximately every 6 hours; it is important, therefore, that the device is always ready for operation. The date and time are sent every 2 secs. The weather forecast receiver is suitable for wall mounting in buildings.

ETS (Engineering Tool Software) enables application programs to be selected, specific parameters and addresses to be assigned and transferred to the device.

2. Safety instructions

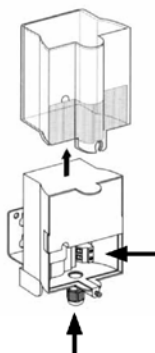
NOTICE

- Installation should only be carried out by a professional electrician!

Please note the provisions of EN 50428 for switches or similar installations for use in building system technology regarding the correct installation of bus lines and start-up of devices. Tampering with, or making modifications to, the device will invalidate the guarantee.

3. Connection and physical address

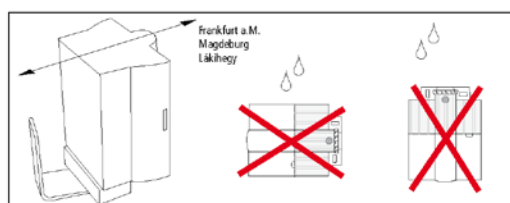
- Remove cover.
- Push cable through the cable gland into the terminal area.
- Connect the cable that has been introduced to the bus terminal.
- Take note of polarity when connecting.
- Push bus terminal all the way down.
- Using a screwdriver, press the program button of the physical address. The programming LED lights up. The device is in program mode.



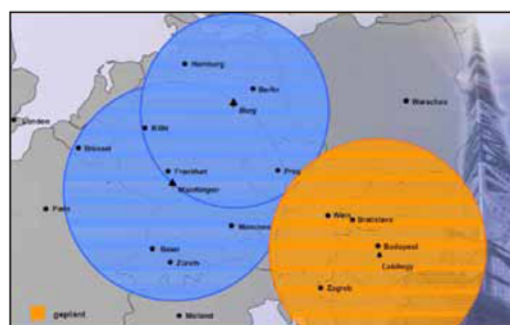
4. Orient and install Meteodata 139 KNX

Best reception is achieved by installing on outside of buildings pointing towards the nearest broadcaster.

- Take topographic circumstances into account (mountains,
- Only fit device in vertical position.
- Avoid installation in the vicinity of:
 - Switch mode power supplies
 - Radio transmitters
 - Metallic objects

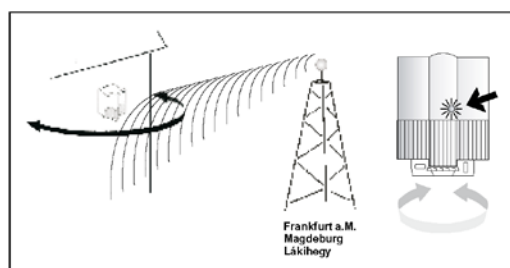
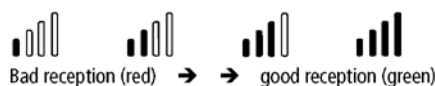


You can orient the device either towards Frankfurt a.M., Magdeburg or towards Lakihegy (Budapest, in preparation).



Depending on the reception quality, the red LED (bad reception) or the green LED (good reception) flash.

- Orient the device so that the green LED lights up permanently (best reception). When the reception is very bad the red LED lights up.



5. Technical data

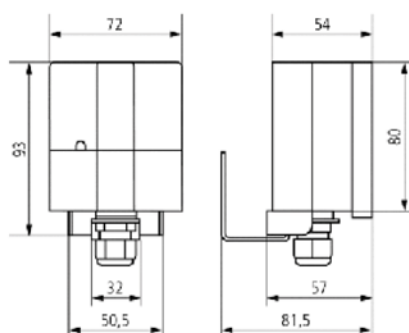
- Current consumption KNX bus: ≤ 12 mA
- Operating voltage: Bus voltage KNX
- Power consumption: max. 360 mW
- Permissible ambient temperature: -20 °C ... $+55$ °C
- Protection class: III
- Protection rating: IP 54 in accordance with EN 60529
- Cable: JSTY 2 x 2 x 0.8 mm (bus cable)
- Radio standard: EFR
- Reception frequency: 129 – 139 kHz



Powered by HKW

Observe additional technical data on the device rating plate!
Technical changes reserved.

The ETS database is available at www.theben.de
Please refer to the KNX Handbook for detailed functional descriptions.



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