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APPLICATION EXAMPLE WEATHER STATION

Example project for the Windancer KNX-GPS weather station

EXAMPLE PROJECT FOR SMART SUN PROTECTION CONTROL WITH WEATHER STATION WINDANCER KNX-GPS

Device applications used in the sample project:

Weather station
Windancer KNX-GPS
Elsner 71236

2× Room controller with touch display
Cala Touch KNX T
Elsner 7080x

Room temperature controller and button for sun protection
Cala KNX T 201 Sunblind
Elsner 7099x

Pushbutton for temperature control, light and sun protection **KNX eTR 208 Light/ Sunblind**
Elsner 7119x

2× Actuator for drives Up/ Down **KNX S4**
Elsner 70540
for window, awning, roller shutter, blind

Download sample project here

The basic parameter descriptions can be found in the Windancer KNX(-GPS) manual.
In the project file, the following settings were made in the Windancer KNX-GPS weather station application:

01 GENERAL SETTINGS

The default settings are used here. The Auxiliary voltage status object (No. 0) is sent on change in order to be able to monitor the auxiliary voltage if required. The auxiliary voltage is required for correct precipitation detection.

02 GPS SETTINGS

Cala Touch KNX T
Date and time of the weather station are used exclusively for the screen saver of the two Cala Touch KNX T. The screen saver additionally shows the indoor and outdoor temperature - see *chapter 06 Temperature*.

03 LOCATION

Cala Touch KNX T
The weather station calculates the local time from the location and time signal. Therefore, for a correct output and reproduction of the time, the location must also be configured. The location entered here is used as long as no GPS signal has been received. The date and time are used for the screen saver of both Cala Touch KNX T - see *chapter 02 GPS Settings*.

04 RAIN

Awning

The rain output 1 of the weather station is used as a rain alarm for the awning on channel A of the blind actuator 4.2 (JA4.2 UV EG KNX S4).
The awning retracts as soon as it starts to rain and is blocked for automatic and manual functions during the rain alarm.
The awning is released again when it has not rained for 20 min. In manual mode, the awning does not perform any action (remains in safe position); in automatic mode, the awning executes the last automatic command. However, the extension can be prevented by an active wind alarm - see *chapter 07 Wind threshold value 1*.

The rain switching output (0 or 1) is sent to the blind actuator 4.2 (JA4.2 UV EG KNX S4) on change and every minute. As additional safety, the monitoring of the blocking object of the actuator is used for the rain switching output. This means that if the telegram of the rain switching output of the weather station does not arrive at the actuator for 10 min, the awning moves to a safe position. This can happen, for example, in the event of a defect in the KNX line. As a rule of thumb, the monitoring period should be at least three times as long as the transmission cycle.

Most awning motors have integrated thermal protection that switches off the motor if it becomes too hot. Therefore, the waiting time after rain is set here to 20 min. So the motor has enough time to cool down in midsummer. This is especially important in the case that after a short time a drive command follows again, e.g. a wind alarm. Then the motor can retract the awning in any case.

Window

The rain output 2 of the weather station is used as rain alarm for the window on channel B of the blind actuator 4.2 (JA4.2 UV EG KNX S4).
The window closes as soon as it starts raining and is blocked for automatic and manual functions during the rain alarm.
The window will be released again when it has not rained for 5 min. In manual mode, the window does not perform any action (remains in safe position); in automatic mode, the window performs the last automatic command. However, opening can be prevented by an active wind alarm - see *chapter 07 Wind threshold value 3*.

The rain switching output (0 or 1) is sent to the blind actuator 4.2 (JA4.2 UV EG KNX S4) on change and every minute. As additional safety, the monitoring of the blocking object of the actuator is used for the rain switching output. This means that if the telegram of the rain switching output of the weather station does not arrive at the actuator for 10 min, the window moves to a safe position. This can happen, for example, in the event of a defect in the KNX line. As a rule of thumb, the monitoring period should be at least three times as long as the transmission cycle.

05 NIGHT

Roller shutter

The night detection of the weather station, i.e. brightness below 10 lux, is linked to the weekly timer via OR logic 2:
The roller shutter moves all the way up 1 min after switching to day (switching delay), but Monday to Friday at the earliest at 7:00 o'clock, on weekends at 8:00 o'clock at the earliest.
The roller shutter moves all the way down 1 min after switching to night (switching delay) OR Monday to Friday at the latest at 22:00, on weekends at 23:00 at the latest.

If a brightness of 50 kLux is exceeded before 7:00 a.m. in the summer, the roller shutter will be raised to 80% due to the automatic shading function - see *chapter 10 Façade 1 (Settings and actions)*. There is no priority between the OR logic and the automatic shading, but the next command is always executed.

Blinds

The night detection of the weather station, i.e. brightness below 10 lux, is linked to the weekly timer via OR logic 2 as follows:
All three blinds move all the way up 1 min after switching to day (switching delay), but Monday through Friday at 7:00 at the earliest, and on weekends at 8:00 at the earliest.
All three blinds move all the way down 1 min after switching to night (switching delay) OR Monday to Friday no later than 22:00, on weekends no later than 23:00.

If a brightness of 50 kLux is exceeded before 7:00 a.m. in the summer, the blinds open their slats due to the automatic shading function - see *chapter 10 Façade 3 (Settings and actions)*. There is no priority between the OR logic and the automatic shading, but the next command is always executed.

Cala Touch KNX T (Ground floor hallway – 10.1.13)
Via the menu „Light 1" (Lock time - night) of the Cala Touch KNX T, which is located in the hallway on the ground floor, the OR logic 2 can be locked. The roller shutter and the three blinds will then no longer go up when it is daytime or 7:00/8:00 and will not go down when it is nighttime or 10:00/23:00. Use this function, for example, if you want to sleep in longer. But be careful: the automatic shading function is still active. This means that from 50 kLux brightness, the shades move as described in *Chapter 10 Shading*.

06 TEMPERATURE

Cala Touch KNX T
The outdoor temperature is used together with the date/time of the weather station and indoor temperature for the screen saver of the two Cala Touch KNX T.

Blinds
The outdoor temperature of the weather station is used for thermal protection by the two south-facing blinds on channel C and D of the blind actuator 4.1 (JA4.1 UV EG KNX S4) - see *chapter 10 Façade 3 (Settings and actions)*.

07 WIND

The three wind threshold values are used for safety functions:

Wind threshold value 1 - awning
The awning retracts as soon as the wind speed exceeds 4 m/s and is blocked for automatic and manual functions during the wind alarm.
The awning is released again when the wind falls below the threshold value of 4 m/s by the hysteresis of 30% for 5 min (switching delay), i.e. below 2.8 m/s. In manual mode, the awning does not perform any action (remains in safe position); in automatic mode, the awning performs the last automatic command. However, the extension can be prevented by an active rain alarm - see *chapter 04 Rain*.

The switching output of the wind threshold value (0 or 1) is sent to the blind actuator 4.2 (JA4.2 UV EG KNX S4) on change and every 2 min. As additional safety, the monitoring of the blocking object of the actuator is used for the wind threshold value. This means that if the switching output telegram of the wind threshold value of the weather station no longer arrives at the actuator for 10 minutes, the awning moves to a safe position.position. This can happen, for example, in the event of a defect in the KNX line. As a rule of thumb, the monitoring period should be at least three times as long as the transmission cycle.

Attention! The suitable wind threshold value depends on the measuring position of the weather station and the sensitivity of the awning! If necessary, use a different wind threshold value to retract the awning! It is better to set a low threshold value at the beginning, observe how the awning reacts and increase it later if necessary.

Wind threshold value 2 - blind
The three blinds retract as soon as the wind speed exceeds 12 m/s and are blocked for automatic and manual functions during the wind alarm.
The three blinds are released again when the wind falls below the threshold value of 12 m/s by the hysteresis of 30% for 5 min (switching delay), i.e. below 8.4 m/s. In manual mode, the blinds do not perform any action (remain in safe position); in automatic mode, the blinds perform the last automatic command.

The switching output of the wind threshold value (0 or 1) is sent to the blind actuator 4.1 (JA4.1 UV EG KNX S4) on change and every 2 min. As additional safety, the monitoring of the blocking object of the actuator is used for the wind threshold value. This means that if the switching output telegram of the wind threshold value of the weather station no longer arrives at the actuator for 10 min, the blinds move to a safe position. This can happen, for example, in the event of a defect in the KNX line. As a rule of thumb, the monitoring period should be at least three times as long as the transmission cycle.

Wind threshold value 3 - window
The window closes as soon as the wind speed exceeds 16 m/s and is blocked for automatic and manual functions during the wind alarm. The window is released again when the wind falls below the threshold value of 16 m/s by the hysteresis of 30% for 5 min (switching delay), i.e. below 11.2 m/s. In manual mode, the window does not perform any action (remains in safe position); in automatic mode, the window performs the last automatic command. However, opening can be prevented by an active rain alarm - see *chapter 04 Rain*.

The switching output of the wind threshold value (0 or 1) is sent to the blind actuator 4.2 (JA4.2 UV EG KNX S4) on change and every 2 min. As additional safety, the monitoring of the blocking object of the actuator is used for the wind threshold value. This means that if the switching output telegram of the wind threshold value of the weather station no longer arrives at the actuator for 10 min, the window moves to a safe position. This can happen, for example, in the event of a defect in the KNX line. As a rule of thumb, the monitoring period should be at least three times as long as the transmission cycle.

08 BRIGHTNESS

The brightness threshold value of 50 kLux is used for the integrated shading control, see *chapter 10 Shading*.

09 TWILIGHT

The twilight threshold values are not used.

10 SHADING

4 façades and the thermal protection temperature are used for different actions:

Façade 1 (settings and actions) - Shutter
The shutter moves to 80% if the brightness threshold value of 50 kLux is exceeded for 2 min while the sun is shining on the façade from the east (azimuth: 0° to 180°). See also *chapter 08 Brightness*.
The shutter retracts when the brightness threshold value of 50 kLux is undershot by the hysteresis of 30% for 25 min, i.e. below 35 kLux.
The shutter does not react to rain or wind.

Façade 2 (settings and actions) - Blind east without sun position tracking
The blind moves to movement position 100% and slat position 75% if the brightness threshold value of 50 kLux is exceeded for 2 min while the sun is shining on the façade from the east (azimuth: 0° to 180°). See also *chapter 08 Brightness*.
The slats move to 0% when the brightness threshold value of 50 kLux is undershot by the hysteresis of 30% for 10 min, i.e. below 35 kLux.
The blind retracts when the brightness remains below this 35 kLux for a further 20 min.
In the event of a wind alarm, the blind will retract in any case - see *chapter 07 Wind threshold value 2*.

Façade 3 (settings and actions) - south blinds (2×) with slat tracking
The blinds move to the 100% movement position and the slats follow the position of the sun when the brightness threshold value of 50 kLux is exceeded for 2 min while the sun is shining on the façade from the south (azimuth: 90° to 270°). See also *chapter 08 Brightness*.
The slats move to 0% when the brightness threshold value of 50 kLux is undershot by the hysteresis of 30% for 10 min, i.e. below 35 kLux.
The blinds retract when the brightness remains below this 35 kLux for another 20 min.
If the outdoor temperature exceeds 35 °C, the blinds move to the 100% movement position and the 100% slat position. This thermal protection is maintained until the temperature falls below 35 °C by the hysteresis of 5 °C, i.e. below 30 °C. In case of wind alarm, the blinds retract in any case - see *chapter 07 Wind threshold value 2*.

Façade 4 (settings and actions) - awning
The awning moves to movement position 70% if the brightness threshold value of 50 kLux is exceeded for 2 min while the sun is shining on the façade from the south (azimuth: 90° to 270°). See also *chapter 08 Brightness*.
The awning retracts when the brightness threshold value of 50 kLux is undershot by the hysteresis of 30% for 30 min, i.e. below 35 kLux. In the event of a wind or rain alarm, the awning will retract in any case - see *chapter 07 Wind threshold value 1*.

11 CALENDAR TIMER

The calendar timer is not used.

12 WEEKLY TIMER

The weekly timer is linked to the night detection via OR logic 2 - see *chapter 05 Night*.

13 LOGIC

The OR logic 1-3 is used:

OR Logic 1 - Awning
The rain alarm 1 is linked to the wind alarm 1: If at least one alarm is active, a 1 is sent.
In case of rain alarm 1 or wind alarm 1, the manual operation of the awning is blocked and if there is no more alarm, the awning executes the last automatic command.

OR Logic 2 - Time/Night switching
The weekly timer is linked to the switching output Night - see *chapter 05 Night*.

OR Logic 3 - Window
The rain alarm 2 is linked to the wind alarm 3: If at least one alarm is active, a 1 is sent. In case of rain alarm 2 or wind alarm 3, manual operation of the window is blocked.

Assignment of the actuator channels:

Actuator JA4.1 UV EG KNX S4

- Roller shutter (channel A)
- Blind east (Channel B)
- Blind south 1 (channel C)
- Blind south 2 (channel D)

Actuator JA4.2 UV EG KNX S4

- Awning (Channel A)
- Window (Channel B)

KNX eTR 208 Light/Sunblind

103	Drive long term	1/0/50	Channel A - Manual long term	101
104	Drive long term	1/0/51	Channel A - Manual short term	102

Actuator **KNX S4**

301	Channel B - Manual long term	1/0/50	Drive long term	101
302	Channel B - Manual short term	1/0/51	Drive short term	102

Cala KNX T 201 Sunblind

0/0/55	Wind TV 2: SO	59		
0/0/55	Fac. 2: Security (1=ac.)	124		
0/0/55	Wind TV 2: SO	59		
0/0/55	Fac. 3: Security (1=ac.)	129		

Weather station
Windancer KNX-GPS

59	Wind TV 2:	0/0/55	Channel B - Bl. 3 - Wind bl. obj.	391
59	Wind TV 2: SO	0/0/55	Channel C - Bl. 3 - Wind bl. obj.	591
59	Wind TV 2: SO	0/0/55	Channel D - Bl. 3 - Wind bl. obj.	791
116	Facade 1: Mov. pos.	0/1/16	Channel A - Manual mov. pos.	103
121	Facade 2: Mov. pos.	0/1/26	Channel B - Manual mov. pos.	303
122	Facade 2: Slat pos.	0/1/27	Channel B - Manual slat pos.	304
126	Facade 3: Mov. pos.	0/1/36	Channel C - Manual mov. pos.	503
126	Facade 3: Mov. pos.	0/1/36	Channel D - Autom. mov. pos.	707
127	Facade 3: Slat pos.	0/1/37	Channel C - Manual slat pos.	504
127	Facade 3: Slat pos.	0/1/37	Channel D - Autom. slat pos.	708
233	OR Logic 2: 1Bit SO	0/1/0	Channel A - Manual long term	101
233	OR Logic 2: 1Bit SO	0/1/0	Channel B - Manual long term	301
233	OR Logic 2: 1Bit SO	0/1/0	Channel C - Manual long term	501
233	OR Logic 2: 1Bit SO	0/1/0	Channel D - Manual long term	701

Actuator **KNX S4**

501	Channel C - Manual long term	1/2/50	Drive1 long term	44
502	Channel C - Manual short term	1/2/51	Drive 1 short term	45
503	Channel C - Manual mov. pos.	1/2/52	Drive 1 mov. pos.	46
504	Channel C - Manual slat pos.	1/2/53	Drive1 slat pos.	47
511	Channel C - act. Mov. pos.	1/2/54	Drive 1 mov. pos.	46
512	Channel C - act. Slat pos.	1/2/55	Drive 1 slat pos.	47
701	Channel D - Manual long term	1/2/60	Drive 2 long term	49
702	Channel D - Manual short term	1/2/61	Drive 2 short term	50
703	Channel D - Manual mov. pos.	1/2/62	Drive 2 mov. pos.	51
704	Channel D - Manual slat pos.	1/2/63	Drive 2 slat pos.	52
711	Channel D - act. Mov. pos.	1/2/64	Drive 2 mov. pos.	51
712	Channel D - act. Slat pos.	1/2/65	Mov. 2 Slat pos.	52
710	Channel D - Autom. lock object	1/2/70	Light 1 switch	34
709	Channel D - Switch from M to A	1/2/69	Light 2 switch	37
700	Channel D - Status A/M	1/2/68	Light 2 switch	37

Cala Touch KNX T
(10.1.12)

1	GPS date	0/0/10	Date	17
2	GPS time	0/0/11	Time	18
14	Measured temperature	0/0/40	Screen saver outdoor temp.	29
59	Wind TV 2: SO	0/0/55	Drive 1 Operating lock	48
59	Wind TV 2: SO	0/0/55	Drive 2 Operating lock	53
229	OR Logic 1: 1 Bit SO	0/1/46	Drive 3 Operating lock	58

0/1/46	OR Logic 1: 1 Bit SO	229		
0/1/46	Fac. 4: Security (1=ac.)	134		

7	Rain: SO 1	0/0/20	Channel A - Bl. 4 - Rain bl. obj.	199
8	Rain: SO 2	0/0/21	Channel B - Bl. 4 - Rain bl. obj.	399
53	Wind TV 1: SO	0/0/53	Channel A - Bl. 3 - Wind bl. obj.	191
65	Wind TV 3: SO	0/0/57	Channel B - Bl. 3 - Wind bl. obj.	391
131	Facade 4: Mov. pos.	0/1/45	Channel A - Manual mov. pos.	103

Actuator **KNX S4**

101	Channel A - Manual Long term	1/3/100	Drive 3 long term	54
102	Channel A - Manual short term	1/3/101	Drive 3 short term	55
103	Channel A - Manual mov. pos.	1/3/102	Drive 3 mov. pos.	56
111	Channel A - act. mov. pos.	1/3/103	Drive 3 mov. pos.	56

301	Channel B - Manual long term	1/4/50	Drive 1 long term	44
302	Channel B - Manual short term	1/4/51	Drive 1 short term	45
303	Channel B - Manual mov. pos.	1/4/52	Drive 1 mov. pos.	46
311	Channel B - act. Mov. pos.	1/4/53	Drive 1 mov. pos.	46

Cala Touch KNX T
(10.1.13)

1	GPS date	0/0/10	Date	17
2	GPS time	0/0/11	Time	18
14	Measured temperature	0/0/40	Screen saver outdoor temp.	29
237	OR Logic 3: 1 Bit SO	0/1/2	Drive 1 operating lock	48
236	OR Logic 2: Out. block	0/1/1	Light 1 switch	34