

Weather Station (GPS) AP 257/22

5WG1 257-3AB22

Product and Applications Description



The AP 257/22 weather station (GPS) contains all sensors, electronic systems for weather data analysis and the bus coupler in one compact enclosure. It measures wind speed, brightness and temperature, detects dusk / dawn and precipitation and receives the GPS signal for date and time.

Besides date and time, all measured values can be sent to the bus in the EIS5 (DPT 9) format and each can be monitored with up to 3 limit values. Limit values can be selected as parameters or as communication objects. Per day, the maximum wind speed, the maximum brightness as well as the minimum and the maximum outside temperature can be recorded and transmitted. The angles (azimuth and elevation) at which the sun is shining can be calculated from the date, the time of day and the entered location coordinates, and can also be transmitted via the bus.

The weather station not only allows for a simple solar protection control, which activates or deactivates the solar protection depending on whether the sun is shining or not. It can also activate a solar protection control for up to 8 façades. In this case, the solar protection of a façade is automatically activated only when the sun shines on the respective façade and is deactivated as soon as this is no longer possible, or the sun is no longer shining.

For each façade, this façade control can be supplemented by a shadow edge tracking control of the solar protection and a sun tracking control of horizontal / vertical slats.

With the shadow edge tracking control, the solar protection is not lowered completely but only so far that the sun can still shine into the room for a certain distance (e.g. 50 cm), which can be set by a parameter. This way the occupant of the room can look outside in the lower

part of the window, and plants on the windowsill can receive sunshine.

With externally mounted Venetian blinds, the sun tracking control of slats can avoid heat influx into the room due to sunshine and at the same time reduce electricity costs for room lighting. In this case the slats are not completely closed but set to follow the position of the sun and automatically arranged in such a way, that the sun cannot shine directly into the room. Between the slats, however, diffuse daylight can enter the room and contribute to a glare-free lighting of the room.

Besides wind alarm, frost alarm and precipitation alarm in total up to 8 alarm or error messages can be combined using a logical OR function to create a "Safety" communication object, which, in case of an alarm, moves the solar protection into its safety position.

In addition, 4 AND-gates and 4 OR-gates are available with 4 inputs each for additional logical combinations.

The weather station may also be used where GPS reception is not possible. In this case, date and time must be sent to the weather station via the bus.

For configuration, the engineering tool software ETS3 or higher should be used, to provide a graphically optimal display of the configuration menus of the weather station.

The power supply of the electronics takes place via AC 20V or DC 24V safety extra-low voltage (SELV). For the transmission of this voltage, the white / yellow twisted pair of the bus cable can be used.

Application Program

The AP 257/22 weather station must be used together with the application program "0701 CO Weather station 914201" which can be configured and loaded with the Engineering Tool Software (ETS) from version ETS2 V1.3.

It is recommended to use the engineering tool software ETS3 or higher, to provide a graphically optimal display of the configuration menus of the weather station.

Installation Instructions

If the weather station has been damaged, it must not be commissioned.

V WARNING

- The device must be mounted and commissioned by an authorised electrician.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.

Technical Specifications

Sensors

- Wind sensor:
Measuring range: 0 ... 35 m/s,
Resolution: 0.1 m/s
precision at ambient temperature -20...+50°C:
±22% of measured value with air flow from 45...315°
±15% of measured value with air flow from 90...270°
(air flow onto the front equals 180°)
- Brightness sensor:
Measuring range: 0 ... 150.000 lux,
Resolution at:

| | |
|------------------------|---------|
| 0 ... 120 lux | 1 lux |
| 121 ... 1.046 lux | 2 lux |
| 1.047 ... 52.363 lux | 63 lux |
| 52.364 ... 150.000 lux | 423 lux |

Precision: ±20% at 0 lx ... 10 klx
±15% at 10 klx ... 150 klx
- Temperature sensor:
Measuring range: -30 ... +50 °C,
Resolution: 0.1 °C
Precision: ±0,5°C at +10...+50°C,
±1°C at -10...+10°C,
±1,5°C at -25...-10°C
- Rain sensor:
Heating: approx. 1.2 W

Voltage supply

- Bus voltage: via the bus line
- KNX bus current: 9 mA
- Auxiliary power sensor electronics:
AC 20 V (AC 12...28V) 50/60 Hz or
DC 24 V (DC 12...40V) max. 185 mA at DC 12V, residual ripple < 10%, max. permissible cable length 100 m
- Power consumption: max. 2.3 VA

Operator elements

1 commissioning button: for switching over between normal mode / addressing mode

Display elements

- 1 red LED: for display of normal mode / addressing mode (off / on)
- 1 red LED: as control display for GPS reception

Connections

- Voltage supply: plug terminals for solid conductors or finely stranded conductors 0.5 ... 1.5mm²
- Bus connection: screwless bus terminal, 0.6... 0.8 mm \AA single-wire, insulation strip length 5 mm.

Mechanical data

- housing: plastic
- Dimensions :
approx. 118 mm x 96 mm x 77 mm (L x W x H)
- Weight: approx. 170 g
- Fire load: approx. 5360 kJ
- Mounting: Mast or wall mounting

Electrical safety

- Degree of pollution (according to IEC 60664-1): 2
- Type of protection (according to EN 60529): IP 44
- Overvoltage category (according to IEC 60664-1): III
- Bus: safety extra-low voltage (SELV) DC 24 V
- Device complies with EN 50090-2-2

EMC requirements

complies with EN 50090-2-2

Environmental conditions

- Climatic conditions: EN 50090-2-2
- Ambient temperature operating: - 30 ... + 50 °C
- Ambient temperature non-op.: - 30 ... + 70 °C
- Relative humidity (non-condensing): 5 % ... 93 %

Markings

KNX *EIB*

CE mark

complies with the EMC regulations (residential and functional buildings), and low voltage regulations

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| Weather Station (GPS) AP 257/22 | 5WG1 257-3AB22 |
|---------------------------------|----------------|

Location and Function of the Display and Operating Elements and of the Sensors

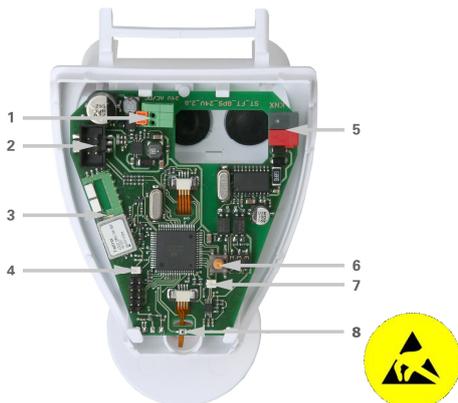


Figure 1

- 1 Spring-force auxiliary voltage terminal AC 20V / DC 24V
- 2 Slot for cable connection to the precipitation sensor in the casing lid
- 3 GPS antenna
- 4 LED for GPS signal
- 5 Bus terminal
- 6 Commissioning button
- 7 Commissioning LED
- 8 Brightness sensor



Figure 2

- 1 Rain sensor
- 2 Temperature sensor
- 3 Wind sensor
- 4 Brightness sensor

Mounting and wiring

Location

Select a position on the building where wind, rain and sunshine can be recorded by the sensors without impairment. No structural elements should be mounted above the weather station from which water could continue to drop on to the precipitation sensor even after rain or snow has stopped. The weather station should not be shaded by the building or e.g. trees. There must be at least 60 cm free space around the weather station to allow correct wind measurements and to prevent the station from being snowed in. It is recommended to install the weather station on a mast. It should be ensured that the highest point of all parts of buildings near the weather station is 60 cm below the wind sensor of the mounted weather station.

Magnetic fields, transmitters and interference fields from electrical consumers (e.g. fluorescent lamps, neon signs, switch mode power supplies etc.) can block or interfere with the reception of the GPS signal.

The weather station must be mounted on a mast (Ø approx. 50 – 55mm) or a vertical wall (see fig. 3) and be leveled horizontally across the top (see fig. 4).

The wind sensor of the weather station shall point to the cardinal point of the sun at noon, if possible. This means South in the northern hemisphere, and North in the southern hemisphere (see fig. 3).



Figure 3



Figure 4

Mounting

The supplied combined wall / mast holder is fastened to the rear side of the housing with adhesive tape on delivery.

Mounting on a wall:

Fasten the holder vertically with the even side to the wall, with the crescent-shaped bar to the top (see fig. 5).

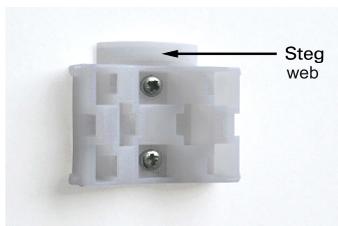


Figure 5

Mounting on a mast / pole:

Fasten the holder vertically with the curved side to the mast / pole and the bar to the bottom (see fig. 6).

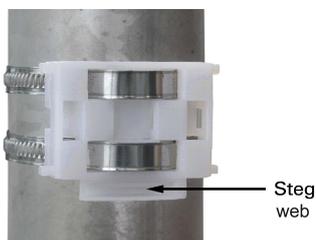


Figure 6

View of the rear wall and drilling scheme:

Dimensioning of the rear of the enclosure with holder: see fig. 7,
drilling scheme: see fig. 8.

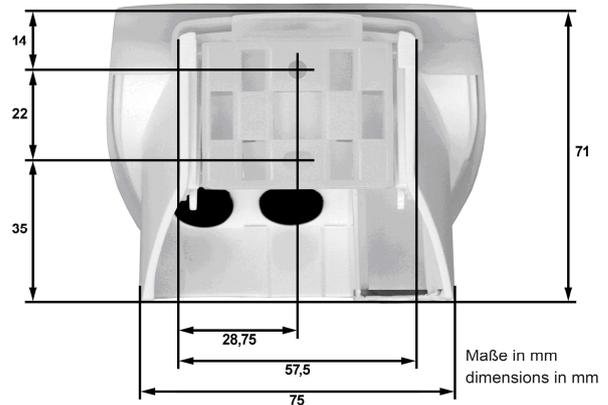


Figure 7

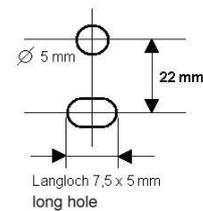


Figure 8

Preparing the weather station:

The lid of the weather station with the rain sensor is slotted in on the right and the left at the lower edge. Remove the lid from the weather station (see fig. 9).



Figure 9

Be careful not to tear open the cable connection between the circuit board in the bottom part and the rain sensor in the lid (cable with plug).

Guide the bus connection through the rubber seals at the bottom part of the weather station and connect the cable pairs for the voltage supply and the bus to the

Weather Station (GPS) AP 257/22

5WG1 257-3AB22

provided terminals while taking polarity into account (see fig. 1).

Fastening the weather station:

Close the enclosure by putting the lid over the lower part. The lid must snap into place on the left and the right with a clear "click". Check that the lid and lower part are properly snapped into place! Fig. 10 shows the correctly closed weather station from below.



Figure 10

Now slide the enclosure into the mounted holder from above. The pegs of the holder must slot into the rails of the enclosure (see fig. 11).



Figure 11

When needed, the weather station can be pulled out of the holder in an upwards direction.

Notes:

Do not open the weather station if water (rain) can get into the inside. A few drops are enough to damage the electronics.

Take care that the connections are correctly made. A wrong connection can destroy the electronics of the weather station.

During assembly care should be taken that the temperature sensor (small circuit board on the lower part of the enclosure) is not damaged. The cable connection between the circuit board and the rain sensor may not be torn off or bent while making the connection.

The wind measurement value is first transmitted 30 seconds after initiating the supply voltage.

Maintenance

The weather station should be regularly (twice per year) checked for soiling and cleaned if necessary. In case of strong pollution, the wind sensor may cease to function, rain may be reported permanently or no more sun may be detected.

During maintenance and cleaning, the weather station should always be separated from the bus and the supply voltage for safety purposes.

General Notes

- The operating instructions must be handed over to the client.
 - Any faulty device is to be sent together with a return delivery note to the local Siemens office.
 - If you have further questions concerning the product, please contact our technical support:
 - +49 (911) 895-7222
 - 7 +49 (911) 895-7223
 - * support.automation@siemens.com
- www.siemens.com/automation/support-request