

**Weather Station AP 257/21**
**5WG1 257-3AB21**

## Product and Applications Description



The AP 257/21 weather station (see figure 1) contains all sensors, electronic systems for weather data analysis and bus interfacing in one compact enclosure. It measures wind speed, brightness and temperature, detects dust / dawn and precipitation and receives the DCF77 radio signal for date and time.

Aside from date and time, all measured values can be sent to the bus in the EIS5 format and can be monitored respectively for 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 set location coordinates, and can also be transmitted via the bus.

The weather station not only allows for a simple sun protection control which, depending on whether the sun is shining or not, activates and deactivates the sun protection. It can also activate a sun protection control for up to 8 façades. In this case, the sun protection of a façade is only automatically activated when the sun shines on the respective façade and 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 sun protection and a sun tracking control of horizontal / vertical slats.

With the shadow edge tracking control, the sun 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 into the open 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 fall into the room and contribute to a glare-free lighting of the room.

In the parameter window "Safety", not only wind alarm, frost alarm and precipitation alarm can be set up, but up to 8 alarm or error messages can be combined using a logical OR function to create a "Safety" communication object, which can bring the sun protection into its safety position if it is triggered. In addition, 4 AND-gates and 4 OR-gates are available with 4 inputs each for additional logical combinations.

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

This weather station may even be used in places without DCF77 radio reception. In this case date and time have to be received e.g. via the internet and have been transmitted via the bus to the weather station.

## Application Program

The AP 257/21 weather station has to be used together with the application program "20701 CO Weather station 909401" which can be configured and loaded with the Engineering Tool Software (ETS) from version ETS2 V1.3. But it is recommended to use the engineering tool software ETS3, since it presents a graphically optimal display of the setting menus of the weather station.

## Installation Instructions

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



### 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 ... 70 m/s
  - Resolution: < 10% of the measurement value
- Brightness sensor:
  - Measuring range: 0 ... 99.000 lux
  - Resolution at:
 

0 ... 120 lux	1 lux
121 ... 1.046 lux	2 lux
1.047 ... 52.363 lux	63 lux
52.364 ... 99.000 lux	423 lux
- Temperature sensor:
  - Measuring range: - 40 ... + 80 °C
  - Resolution: 0.1 °C
- Rain sensor: - Heating: approx. 1.2 W

### Voltage supply

- Bus voltage: via the bus line
- Bus current: 9 mA
- Sensor electronics: AC 20 V  $\pm$ 10% or DC 24 V  $\pm$  10%, max. 100 mA, residual ripple < 10%, max. permissible cable length 100 m
- Power consumption: at AC 20 V: max. 2.2 VA; at DC 24 V: max. 2.64W
- Attention: When using a switching power supply, the quality of the DCF77 reception may be impaired.

### Operator elements

- 1 commissioning button: for switching over between normal mode / addressing mode
- 1 adjusting screw for positioning the DCF77 antenna

### Display elements

- 1 red LED: for display of normal mode / addressing mode (off / on)
- 1 red LED: as control display for DCF77 reception

### Connections

- Voltage supply: plug terminals for solid conductors or finely stranded conductors 0.5 ... 1.5mm<sup>2</sup>
- Bus connection: screw-less bus terminal, single-wire 0.6...0.8 mm  $\varnothing$ , insulation strip length 5 mm.

### Mechanical data

- housing: plastic
- Dimensions: approx. 118mm x 96mm x 77mm (LxWxH)
- Weight: approx. 145 g
- Mounting: Mast or wall mounting

### Electric safety

- Protection type (according to EN 60529): IP44
- 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

- Ambient temperature during operation: - 30 ... + 50 °C
- Storage temperature: - 20 ... + 70 °C
- rel. humidity (not condensing): 5 ... 93 %

### Markings

KNX *EIB*

### CE mark

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

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

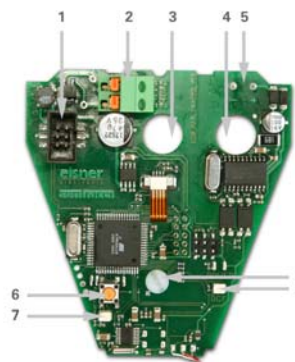


Figure 1

- 1 Slot for cable connection to the precipitation sensor in the lid of the enclosure
- 2 Plug terminal for voltage supply AC 20 V / DC 24 V
- 3 Opening for voltage supply cable
- 4 Opening for bus cable
- 5 Slot for bus terminal
- 6 Commissioning button
- 7 Commissioning LED
- 8 Adjusting screw for the DCF77 antenna
- 9 Control LED for DCF77 reception

### Mounting and wiring

#### Location

Select a position on the building where wind, rain and sunshine can be recorded by the sensors without impairment. In particular the weather station may not be shadowed by the building, trees or anything else. There must be at least 60 cm free space under the weather station to allow for correct wind measurements and to prevent the station being snowed in case of snow. The

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mounting side of the weather station should be directed to north, if possible.

Iron constructions or large metal surfaces directly behind or near the weather station will degrade the reception quality of the installed DCF77 receiver. Magnetic fields, transmitters and interference fields caused by electric consumer loads can also interfere with the reception of the DCF signal or make it impossible.

The weather station must be mounted on a mast or a vertical wall (see fig. 2) and be aligned horizontally across (see fig. 3).

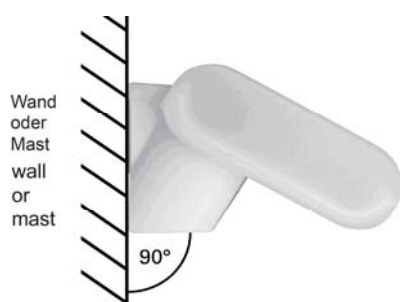


Figure 2



Figure 3

### Mounting

The supplied combined wall / mast holder is slotted into the rear of the enclosure on delivery.

To remove it, please use a screwdriver and remove the holder on the right and the left, as shown in figs. 5 and 6. Slide the holder out towards the bottom.



Figure 4



Figure 5

### 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. 6).

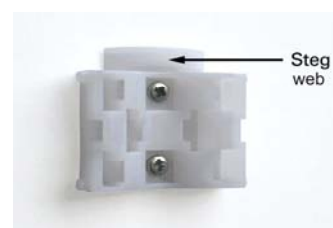


Figure 6

### 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. 7).

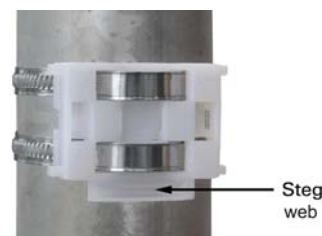


Figure 7

### View of the rear wall and drilling scheme:

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

Drilling scheme: see fig. 9.

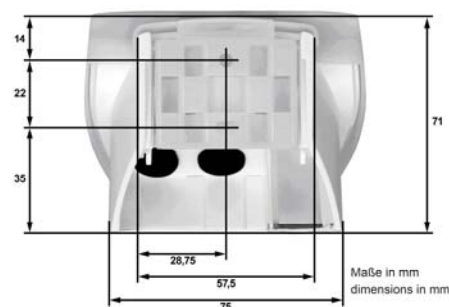


Figure 8

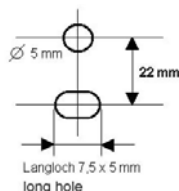


Figure 9

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. 10).

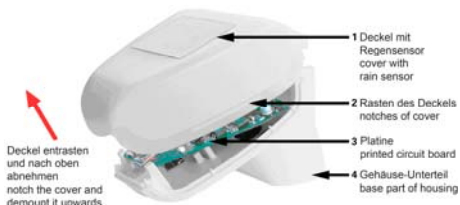


Figure 10

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 provided terminals while taking polarity into account (see fig. 2).

Aligning the DCF77 antenna:

The antenna for the DCF77 reception of date and time of day are under the circuit board inside the enclosure. With the adjusting screw (see fig. 2), the antenna can be rotated at an angle of 180° and thus aligned optimally. Reception is active if the control LED flashes regularly once a second.

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. 11 shows the correctly closed weather station from below.



Figure 11

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. 12).



Figure 12

If 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 60 seconds after initiating the supply voltage.

**Maintenance**

**The weather station should be regularly 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**

- Any faulty devices should be returned to the local Siemens office.
- If you have further questions concerning the product please contact our technical support:
  - ☎ +49 (0) 180 50 50-222 (0.14€/min. from the German landline network, deviating mobile communications prices are possible)
  - ☎ +49 (0) 180 50 50-223
  - E-Mail: support.automation@siemens.com
  - Internet: ww.siemens.com/automation/service&support