Suntracer KNX pro
Weather station

Technical specifications and installation instructions

Article number 70900

1. Description

The **Weather Station Suntracer KNX pro** for the KNX building bus system measures temperature, wind speed, wind direction, brightness, air humidity and air pressure. It recognises precipitation and receives the GPS signal for time and location. In addition, using location coordinates and the time, it calculates the exact position of the sun (azimuth and elevation).

All values can be used for the control of limit dependent switching outputs. States can be linked via AND logic gates and OR logic gates. Multi-function modules change input data as required by means of calculations, querying a condition, or converting the data point type.
The integrated shade control system allows intelligent sun protection control of up to 12 façades.

Functions:

- **Brightness measurement** (current light strength). Measurement with 5 separate sensors, output of the current highest value (one maximum value). Separate limit values for night
- **GPS receiver**, outputting the current time and location coordinates. The **Weather Station Suntracer KNX pro** also computes the position of the sun (azimuth and elevation)
- **Shade control** for up to 12 façades with slat tracking and shadow edge tracking
- **Wind measurement**: Measurement of wind strength and wind direction (0°-360°) by ultrasound
- **Precipitation detection**: The sensor surface is heated, so that only drops and flakes are recognised as precipitation, but not mist or dew. When the rain or snow stops, the sensor is soon dry again and the precipitation warning ends
- **Temperature measurement.** Calculation of the apparent temperature (considering wind strength and air humidity)
- Frost protection for shading systems
- **Air humidity measurement** (relative, absolute)
- Bus message, whether the values of temperature and humidity are within the **comfort field** (DIN 1946). Calculation of the **dew point**
- **Air pressure measurement**
- **Weekly and calendar time switch**: All time switching outputs can be used as communication objects.
  The **weekly time switch** has 24 periods. Each period can be configured either as an output or as an input. If the period is an output, then the switching time is set per parameter or per communication object.
  The **calendar time switch** has 4 periods. Two on/off switching operations, which are executed daily, can be set for each period
- **Switching outputs** for all measured and computed values. Threshold values can be adjusted per parameter or via communication objects
- **8 AND and 8 OR logic gates**, each with 4 inputs. All switching events as well as 16 logic inputs (in the form of communications objects) can be used as inputs for the logic gates. The output of each gate can be configured optionally as 1-bit or 2 x 8-bit
- **8 multi-function modules** (computers) for changing the input data by calculations, by querying a condition or by converting the data point type
- **Summer compensation** for cooling systems. A characteristic curve matches the target temperature in the room to the external temperature and sets the minimum and maximum target temperature values.

Configuration is made using the KNX software ETS. The **product file** can be downloaded from the Elsner Elektronik website on **www.elsner-elektronik.de** in the “Service” menu.

1.0.1. Deliverables

- Weather station
- Pole extensin 50cm long, with 2 screw brackets for fixing
- 6x grub screw DIN 914 M4x10 mm stainless steel A2 with matching hex key
- Cable M8, 4 poles, 10 m
- Junction box mini 25-L and 4x 2-conductor splicing connector
- 24 V DC power supply unit PS5000
- Telescope magnet for programming

1.1. Technical specification

Housing	Plastic
Colour	White / Translucent
Assembly	Surface mount
Protection category	IP 44
Dimensions weather station	approx. 255 × 140 × 274 (W × H × D, mm)
Dimensions pole extension	Length approx. 50 cm, pipe diameter approx. 50 mm, mounting for pole 40-60 mm (screw brackets), plate approx. 130 x 110 x 3 (W × H × D, mm)
Dimensions power supply unit	approx. 108 × 95 × 69 (W × H × D, mm), 6 modules
Weight weather station	approx. 600 g
Weight pole extension	approx. 1 kg (incl. screw brackets)
Weight power supply unit	approx. 350 g
Weight connection accessories	approx. 430 g
Ambient temperature	Operation -30…+50°C, storage -30…+70°C
Auxiliary supply	24 V DC ±10% (white + / yellow GND)
Power consumption	heating off (at temperature > 7,5°C): 6 W heating on (at temperature ≤ 7,5°C): up to 40 W
Bus current	max. 10 mA
Data output	KNX +/-
BCU type	Integrated microcontroller
PEI type	0
Group addresses	max. 2000
Assignments	max. 2000
Communication objects	1,415
Temperature:	
Measurement range	-30°C … +50°C
Resolution	0.1°C
Accuracy	±0.5°C at -30°C … +25°C ±1.5°C at -30°C … +45°C
Air humidity:	
Measurement range	0% rH … 100% rH
Resolution	0.1 % rH
Accuracy	±7,5% at 0…10% rH ±4,5% at 10…90% rH ±7,5% at 90…100% rH
Pressure sensor:	
Measurement range	300 mbar … 1100 mbar
Resolution	0.1 mbar
Accuracy	±4 mbar
Wind speed:	
Measurement range	0 m/s … 35 m/s
Resolution	0.1 m/s
Accuracy	at wind speed v <5 m/s: ±0,5 m/s at wind speed v >5 m/s: ±10%
Wind direction:	
Measurement range	0...360° (from wind speed v >0,5 m/s)
Resolution	0.1°
Accuracy	±5°
Brightness:	
Measurement range	0 lux … 150,000 lux
Resolution	1 lux at 0...255 lux 4 lux at 256...2,645 lux 163 lux at 2,646...128,256 lux 762 lux at 128,257...150,000 lux
Accuracy	±15% of the measurement value at 35 lux … 150,000 lux

The product conforms with the provisions of EU directives.

1.2. Notes on wind measurement

Due to very heavy rain, hail or snowfall, the ultrasonic signal can be attenuated to such an extent that no correct measured values can be output. In this case, a wind sensor error is sent and the wind speed is set to the maximum value of 35 m/s for safety reasons.

2. Installation and start-up

2.1. Installation notes

Installation, testing, operational start-up and troubleshooting should only be performed by an electrician.

CAUTION!
Live voltage!
There are unprotected live components inside the device.
- National legal regulations are to be followed.
- Ensure that all lines to be assembled are free of voltage and take precautions against accidental switching on.
- Do not use the device if it is damaged.
- Take the device or system out of service and secure it against unintentional use, if it can be assumed, that risk-free operation is no longer guaranteed.

The device is only to be used for its intended purpose. Any improper modification or failure to follow the operating instructions voids any and all warranty and guarantee claims.

After unpacking the device, check it immediately for possible mechanical damage. If it has been damaged in transport, inform the supplier immediately.

The device may only be used as a fixed-site installation; that means only when assembled and after conclusion of all installation and operational start-up tasks and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2.2. Installation location

Select an installation position on the building where the sensors can measure wind, rain and sunshine without hindrance. No structural elements should be mounted above the weather station, from which water could continue to drop on the precipitation sensor even after it has stopped raining or snowing. The weather station should not be shaded by structures or, for example, trees.

At least 60 cm of clearance must be left around the device. This facilitates correct wind speed measurement without eddies. At the same time, this prevents spray (raindrops hitting the device) or snow (snow penetration) from impairing the measurement.

Fig. 1
The ring must be at least 60 cm apart from other elements (building structure, structural parts, etc.)

Please ensure that the extended awning does not cast shade on the device, and does not protect the device against wind.

Temperature measurements can also be distorted by external influences such as warming or cooling of the building structure on which the sensor is mounted (sunlight, heating or cold water pipes). Temperature variations from such sources of interference must be corrected in the ETS in order to ensure the specified accuracy of the sensor (temperature offset).

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.

2.3. Device design

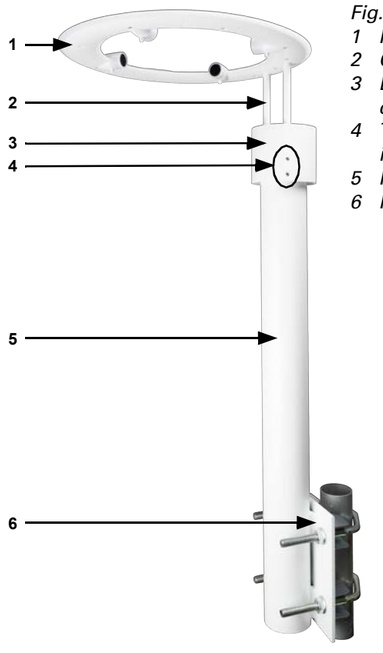


Fig. 2
1 Ring with sensors
2 Connector: ring – base
3 Base with evaluation electronics/bus-connection and connection socket
4 Threaded screws for adjusting the ring inclination
5 Pole extension
6 Mounting for pole with screw brackets

2.4. Mounting

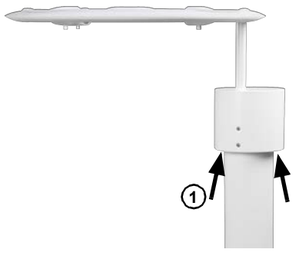
Attention!
Sensitive sensors
- Only grasp the device at the base
- Do not mechanically load (bend) the ring and connector
  Caution: Leverage effect!

Use the pole extension to attach the device to a vertical pole, horizontal railing or wall.

Fig. 3: Detail pole mounting with screw brackets

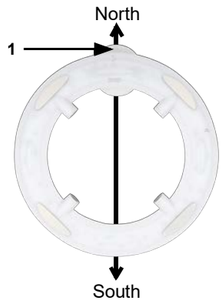
When screwing to the wall, use fixing material suitable for the underground (dowels, screws).

Always use the pole extension to allow air to circulate in the base of the device. The space between the base and the pole (Fig. 4, No. 1) must also be maintained. Ventilation of the base is necessary for correct temperature and humidity measurement (sensors are located in the base).



Place the weather station with the base on the pole extension.

Fig. 4: Weather station on pole extension

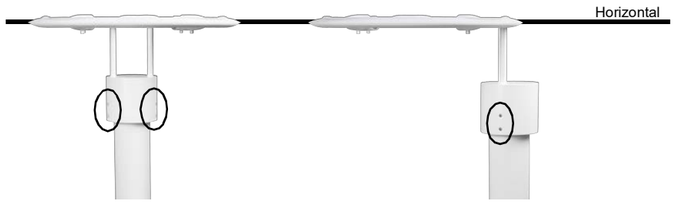


Align the device with the north-south axis. The base (Fig. 5, No. 1) must be in the north, the ring facing south.

Fig. 5: View from top

Place the ring horizontally. Adjust the inclination with the 6 grub screws in the base. Wind can only be detected correctly when the ring is in a horizontal position.

Fig. 6: Front and side view



2.4.1. Position of the sensors

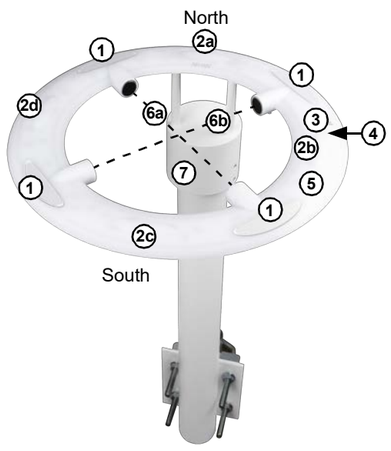
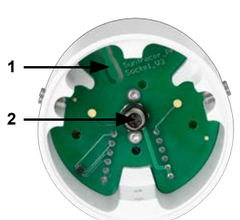


Fig. 7

1 *Precipitation sensors (4 areas with conduction paths)*
2 *Brightness sensors under plastic domes, directed to*
  a - North
  b - East
  c - South
  d - West and up (sky)
3 *Pressure Sensor*
4 *Magnet-PRG-Button (magnetic switch) for adressing the device*
5 *GPS-module*
6 *Wind sensor with ultrasonic measuring sections*
  a - Northeast/Southwest
  b - Southeast/Northwest
7 *Temperature and air humidity sensor in base*

2.5. Connection

The connection to the KNX bus and the auxiliary voltage is made via the socket in the base.



Screw the M8 connector of the connection cable to the connection socket

Fig. 8: View from below (base)
1 Groove for cable feed-through (closed)
2 Connection socket

The cable can be routed in the pole extension or between the base and the pole out of the housing.

Fig. 9: Cable routing in pole extension

Fig. 10 a: cable routing between base and pole

Clamp the cable into the groove in the circuit board (Fig 8, No. 1) to lead it outwards. To do this, break the middle piece out of the groove.

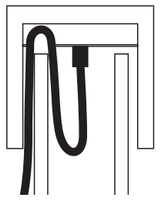


Fig. 10 b: Cross section of the base

Lead the cable between base and pole to the outside.

Connect the loose end of the connection cable to KNX bus and auxiliary voltage. Use the connection sockets and clips included for this purpose.

KNX bus:	*Auxiliary votage:*
+ red	*+ yellow*
- black	*- white*

Adjust the voltage to 24 V DC by turning the adjusting screw on the power supply unit (Fig. 11, No. 1) all the way to the left.

Overvoltage protection installed on site is recommended.

2.5.1. Connection scheme

Fig. 11