

RADIO BRIGHTNESS SENSOR WS 2500-19

Instructions manual

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1. General information and function

The WS 2500-19 radio brightness sensor represents a high-quality measuring system, which enables brightness information to be accurately monitored and transmitted by radio to a suitable weather station such as the **WS 2500** without the use of wires.

It is required for displaying the current brightness and the number of hours of sunshine on the aforementioned weather stations.

Features of the WS 2500-19 at a glance:

- Monitoring of the ambient brightness at the sensor location.
- Power supply by integral solar cell with battery backup for hours of darkness
- Digital data transfer by radio
- Supplied complete with earth spike

The sensing system of the WS 2500-19 works exclusively with radio data transmission. You can set up or mount the **WS 2500-19** up to 100 m (depending on local conditions, see section on "Range") from the base station.

Please read these instructions carefully from start to finish before initial start-up to avoid functional breakdown and faulty operation and to ensure that the unit is properly mounted.

Intended use

The brightness sensor is intended for use in the open air with a maximum humidity of 99 % and in a temperature range between -19.9 °C and +70 °C.

The unit is protected against the ingress of dust and sprayed water. It can optionally be mounted on the ground using the earth spike provided or on a tubular mast with a diameter of up to 16 mm. The manufacturer cannot accept any liability for the consequences of improper use and incorrect installation; any claims under the warranty shall not be valid.

2. Safety and maintenance information

- Do not dismantle the unit. It has been coded and assembled in the factory and does not contain any parts that you can repair yourself.
- When installing the sensor on masts, roofs and the like, please take into account the regulations on lightening protection and install the sensor in such locations so that it cannot fall and cause damage.
- The base address of the sensor is preset and can only be changed by the manufacturer so that the sensor must be returned to the factory if necessary.
- A change of address is only required, when two neighbouring brightness sensors are mounted within the range of the base station.

Disposal information - please note!

This unit contains a chemical energy store and must not under any circumstances be disposed of in the normal household or electronic waste when it has reached the end of its useful life.

Please hand it in to your local special waste collection point.

Servicing

- Clean any deposits of dirt from the sensor head at regular intervals in order to maintain the accuracy of the brightness measurement. The solar cell should also be cleared of any deposits at the same time.
The frequency of cleaning is dependent upon the location, how often it rains and the local air contamination (industry, presence of dust). In particular, when the unit is mounted on the earth spike, regular cleaning is necessary to remove contamination due to rain splashing up from the ground.

- Use only a soft, dry linen cloth for cleaning the housing, the solar cell and the sensor head. In the case of severe contamination, the cloth can be dampened with water and a mild washing up liquid if necessary.

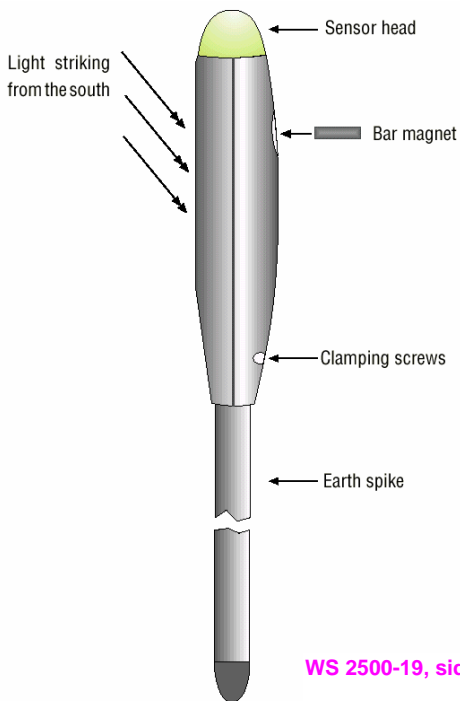
Under no circumstances must aggressive cleaning chemicals or other cleaning agents such as alcohol, petrol, acetone etc. be used. These can cause irreparable damage to the surface of the housing, the solar cell and the sensor head.

- Do not apply excessive force to the solar cell when cleaning. It is made of glass and can easily break.

3. Installation/Commissioning

- The sensor is primarily intended for mounting on the ground using the earth spike provided.
- To do this, it must be carefully pushed onto the earth spike as far as the stop and the lower clamping screws in the sensor housing (see drawing) must be carefully tightened.
- The spike is then stuck vertically into the ground. When doing so, do not press on the sensor head or touch the solar cell. Depending on the firmness of the ground, the earth spike should be inserted so that the sensor is 20-30 cm above the ground to avoid it becoming dirty due to mud splashing up onto it (the least contamination occurs on thick grass).
- If possible the sensor should be turned so that the solar cell points to the south in order to ensure that operation using the solar power supply is as long as possible. The location must be as free from shadows as possible and the sun able to shine directly onto the measuring head.
- To commission the sensor, the bar magnet supplied must be inserted into the opening in the sensor housing provided for the purpose (see drawing). The sensor now begins the start phase (5 minutes with a transmission interval of 2 s followed by a receive interval of 157.5 s). For more information on the exact process and the interaction with the weather station, please read the instruction manual for the weather station used.
- The commissioning instructions apply similarly when the unit is mounted on a mast. The sensor must either be placed on and

screwed to a mast head with a maximum diameter of 16 mm or mounted as described on the earth spike, which must be screwed/clamped safely to the mast or support.



4. Storage information

The sensor receives its operating voltage from a solar cell, that charges an internal battery to provide power for periods of darkness and bad weather.

If one of these sensors is out of action for some time and does not receive any light this has no affect on the internal battery, provided the magnet designed to activate the operating voltage is removed. Therefore the sensor can be stored for several months in its packaging, for example.

5. Range

The free field range, i.e. the range of line of sight contact between the transmitter and the receiver is 100 m under optimum conditions. Walls and even reinforced concrete structures can be penetrated, which does, however, reduce the range.

A reduced range can have the following causes:

- High frequency interference of all kinds.
- Buildings of all types or vegetation.
- Particularly when mounted on roofs, the range can be adversely affected by metal roofs or roof insulation made from aluminium laminated glass wool.
- The distance of the transmitter or receiver from conductive surfaces or objects (even to the human body or the ground) has an effect on the transmission characteristics and therefore the range.
- Wide band interference in built up areas can reach levels that reduce the signal-noise ratio throughout the frequency band which reduces the range.
- Devices working on adjacent frequencies can also affect the receiver.
- Badly shielded PCs can radiate into the receiver and reduce the range.

6. Technical data

Transmission frequency: 433.92 MHz

Range in free field: max. 100 m

Measuring ranges (automatic changeover):

..... 0 to 3.12 klx

..... 3.12 to 25.0 klx
..... 25.1 to 200 klx
Resolution: 3 digits
Accuracy: $\pm 10\%$ (± 4 digits)
Transm. interval, normal mode: .. 157.5 s (Address 7)
Transmission interval, initialisation mode: approx. 2 s
Duration start mode: 5 min
Power supply: ...integral solar cell with battery backup
Dimensions, sensor (\varnothing x L): 53 x 190 mm
Length of earth spike (sensor fitted): 330 mm