

# Manual for Optical Fog Sensor, OFS

-Updated August 2009

## Mounting the unit:

The unit should be mounted so that the laser beam is directed approximately north (on the southern hemisphere south) and horizontal, i.e. sunlight must not reach the detector. Note the channels with mounting holes for M5 bolts in the box, see drawing. The beam should not hit anything within a distance of about 10 meters.

## Electrical supply connection:

A floating DC 11-15 Volt (nominal 12 Volt), min 200 mA, linear i.e. **not** switched power supply is connected on the 2-terminal marked plus and minus on the screen print. (red and black wire in the cable). Note that a floating power supply should be used.

## Digital output.

The digital information is presented in form as an ASCII string on the RS232 output, 2400 baud 8N1, that is transmitted "streaming" every 60 seconds. This string can be received by many loggers with RS232 inputs but also by a PC with a terminal program like Hyper Terminal (part of WINDOWS).

This is an example of an output string:

+0.00060,05000,05200,00040

- The first figure is the extinction<sup>1)</sup>, also called fog density.
- the second is the measured visibility in meters, if the measured visibility is larger than 10000 meter 10000 meter is displayed.
- the third is a measure of the monitored laser power – approx. unit is microwatts peak
- the fourth is an uncalibrated measure of the ambient light

<sup>1)</sup> The relations between visibility and extinction are the following:  
 $\text{visibility} = \text{MOR} = 3/\text{extinction}$

## Microprocessor controlled analog output.

The microprocessor also controls an analog output.

The output voltage is proportional to the visibility. 5000 meter gives 5 Volt.

If the visibility is larger than 5000 m (clear weather) the voltage is about 5 Volt.

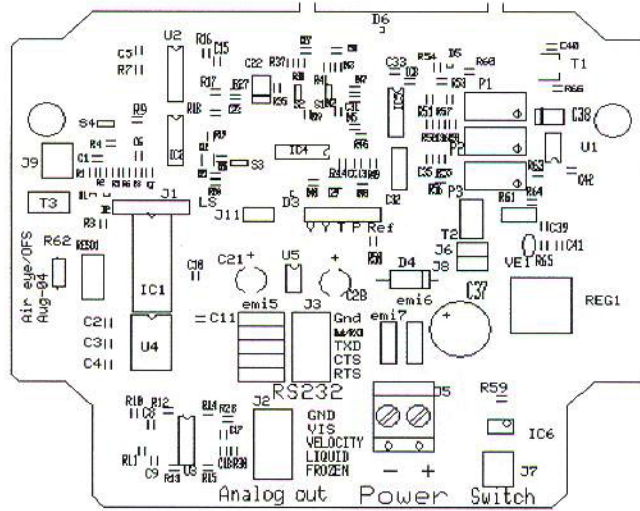
The output is updated every minute. During the first minute of operation after switch-on, the signal on the analog outputs will therefore be confusing.

### Some short data of the OFS sensor:

Box dimensions:	120*120*81 mm
Weight	about 1kg
Temp. range:	-20 to +50 deg C
Laser output power	less than 5 mW, laser safety class 3R
Laser wavelength:	650nm
Housing:	IP 65 aluminium box, openings sealed with O-rings.
Supply Voltage	12 Volt, DC (11-15), linear i e <b>not</b> switched
Current consumption	about 50 mA + 200 mA for lens heating.
Digital output	RS232, 2400 baud, 8N1, ASCII characters streaming, every 60 sec
Analog outputs	0.03-5Volt, corresponding to 30 to 5000m visibility, output impedance $\approx$ 1kohm
Optoelectronic accuracy:	Better than $\pm$ 10%
Accuracy in visibility reading:	Reading is typically within $\pm$ 25% in fog at up to 2000 meter visibility.

**Wire colors used in the delivered standard cable.**

black	Power ground in
red	12 Volt DC Power in
green	RS232 out
white	digital signal ground out, GND
blue	analog out for visibility
yellow	analog signal ground out, GND



**OFS and Air eye sensor**

