# Precipitation Sensor

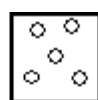# IRSS88



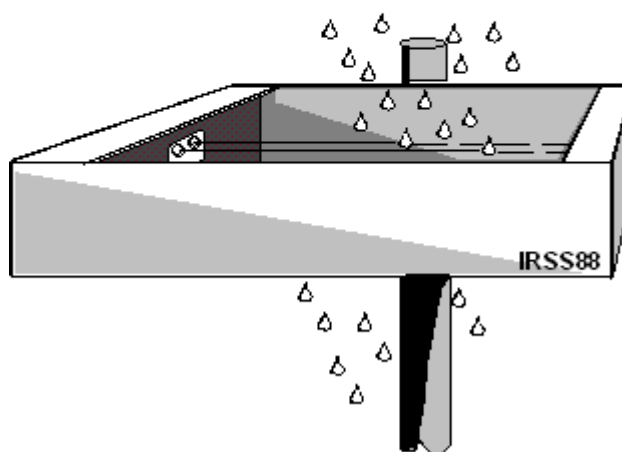DRIZZLE    RAIN    HAIL    SNOW



Subject to technical changes, modifications and errors
without prior notice.

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- **Detection of all kinds of precipitation**
- **High sensitivity**
- **Fast response**
- **Low power consumption**

- **Ruggeed, stainless steel case**
- **Ambient light resistant**
- **Waterproof**
- **High reliability**

The sensor IRSS88 (Infra-red Rain and Snow Sensor) applies advanced opto-electronical technology for detection of all kinds of atmospherical precipitation.

Two high intensity infra-red beams generate an active sensing area of about120 * 25 mm. The size of this area exhibits reliable detection even of low density and small sized particle precipitation.

The applied opto-electronical system provides fast response to particles hitting the sensing area.

The high sensitivity infra-red receivers offer noise rejection to all kinds off ambient light, even to high intensity sunlight. The metal case provides shielding against RF-EMI.

Manufactured in advanced SMD-Technology and housed in a rugged, waterproofed, stainless steel case this sensor was designed for use in extreme environment applications. Even dirt or ice doesn't affect the function.

In case of continuously interrupted IR-field for more than 4 seconds or extremly contamination a necessarily maintenance or clean-up of the IR-windows will be indicated to the user by a maintenance signal (Output 3, SACT Signal).

A wide supply voltage range and the low power dissipation of the IRSS88 allows the use of extremly long cables for long distance connections.

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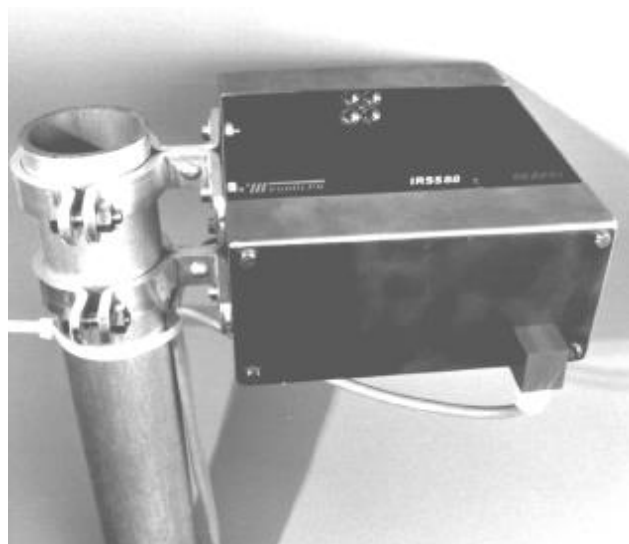
## Technical Specifications

### General

| | |
|---|---|
| Sensing principle | : Dual-beam IR-Sensor |
| Sensing area | : approx.. 120 * 25 mm |
| Operating voltage (Vcc) | : 9...15 VDC |
| Operating Current (Icc) | : 100 mA max. (typ. 88 mA) |
| Operating Temperature | : -25...+60°C |
| Case / Housing | : Stainless steel, waterproof IP 68 |
| Dimensions | : ca. 275 * 185 * 85 mm |
| Weight | : ca. 2 kg |

### Signal Outputs

Output 1 (POUT)
: One pulse/event. Active HIGH
  Vout = +9 V.. Vcc.

Output 2 (SOUT)
: Weighted signal output. Active High.
  Vout = +9 V.. Vcc.
  Selectable (suppressed) events
  before responding, from 1 to 15
  Factory selected : 4
  Weighted time intervals
  approx. 95 sec

Output 3 (SACT)
: Sensor active. Active HIGH
  Vout = +9 V.. Vcc."

### Signal Levels

log. HIGH
: min. 0,82(+UB)
  max. +UB"

log. LOW
: 0 V (Pull-down)

All outputs are open collector pnp types, hence pull down resistors are necessary at the end of the line to obtain valid logic levels. (Recommended values : 1 kΩ .. 10 kΩ). All outputs are short-circuit protected.

## 1. General information

The advantage of the opto-electronical sensor system IRSS88 is the very high sensitivity to detect precipitation and the ability to response immediately.
Even very small particles, like drizzle, will be reliable detected.

Compared to other sensors based on conductivity principles, the IRSS88 activates the output signals immediately when precipitation starts and deactivates the outputs when precipitation stops.

The IRSS88 supplies three different outputs:
A pulse output POUT, a weighted output SOUT and a SENSOR ACTIVE alarm output (SACT)

## 2. Outputs

All outputs are open collector pnp types, active HIGH, hence pull down resistors are necessary for valid LOW levels. The resistors (recommend values: 1 to 10 k$\Box$) should be connected at the end of the lines (view from sensor) to GND-Level. All outputs are short circuit protected.

## 2.1 Pulse output POUT

Unprocessed sensor pulse output.
When a particle passes the IR-sensing area this output is in an active HIGH-State.
Only moving parts will be detected, not fog or dust!
Otherwise the output is in LOW-State.
This output signal may be processed by the user, e. g. to classify the intensity of precipitation or the amount of precipitation.

## 2.2 Weighted output SOUT

Preprocessed sensor output. The state of this output will be updated in time intervalls of about 95 seconds.

If precipitation is detected, this output goes to HIGH-State, otherwise to LOW-State.
Subject to the updating intervall, a delay of 0...95 sec. may occur, before the output state changes.

Only moving parts will be detected, not fog or dust!
It is possible to suppress an output response for small amounts of precipitation.
The desired number of particles to be suppressed (1..15, default 4) can be selected by a rotary switch, located on the receiver board.
To get access to the rotary-switch, the dust cover must be removed.

## 2.3 Alarm output SACT

Normally this output is in a HIGH-State, informing the user, that the sensor is in a normal operating state.
In case of continuously interrupted IR-beams for more than 4 seconds, extremly contamination, lack of power or similar problems, the output goes to LOW-State to indicate that maintenance or cleaning of the IR-windows is necessary.
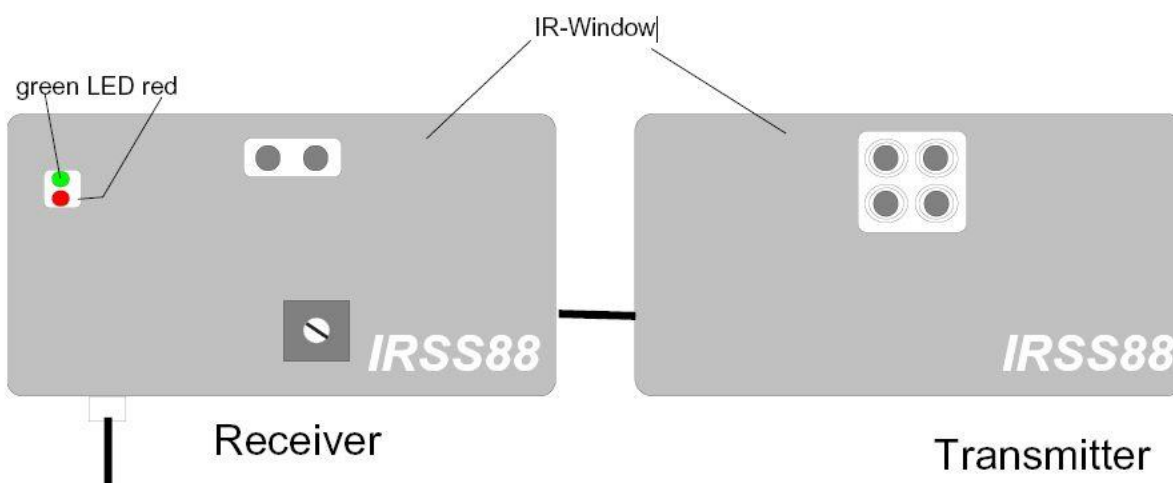


## 3. Indicators

Two LED's on the receiver-board inform the user about the state of the sensor.
The red LED is on when the  particle passes the IR-sensing area.
The green LED shows the state of output SOUT.

## 4. Rotary switch

The rotary-switch affects only the response function of the signal output SOUT.
It is possible to suppress particles from 1 to 15 before this output responds. The desired number of suppressed particles can be selected by a rotary switch, located on the receiver board. It can be accessed after dismounting the receiver cover.
The factory preselected rotary switch position is 4.

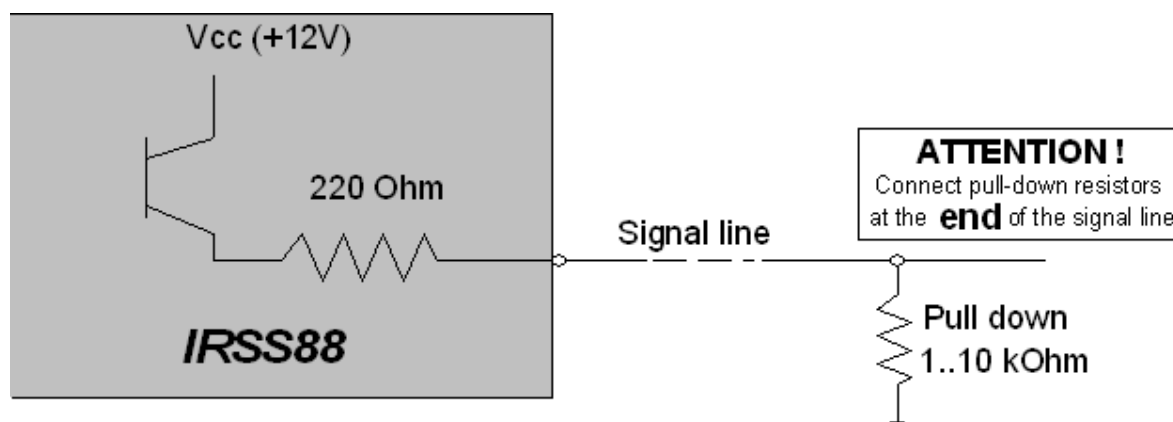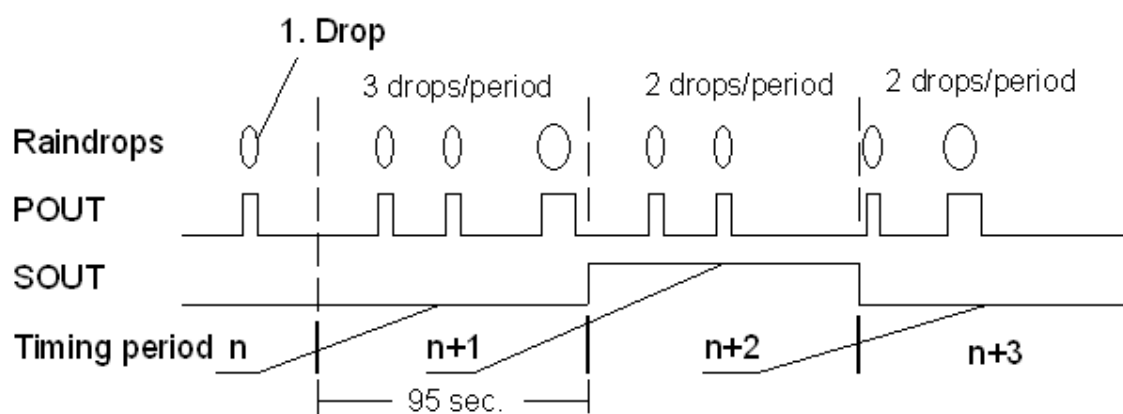## 5. Output configuration / Timing behaviour



Fig. 2-1
Output configuration



Preselected position of rotary switch :3 .
Three or more than three events per period drive SOUT
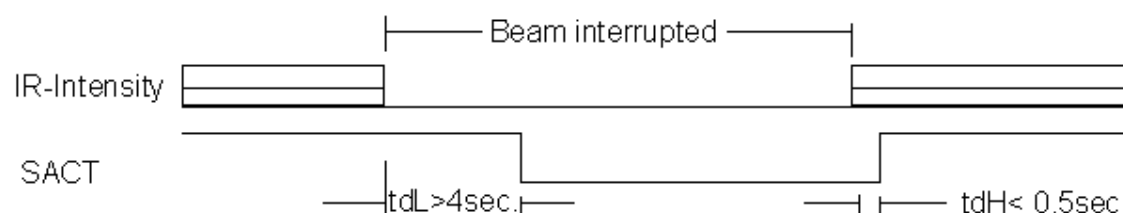to logical H-State for one period (next following period)



Fig. 2-2
Output Behaviour and Timing
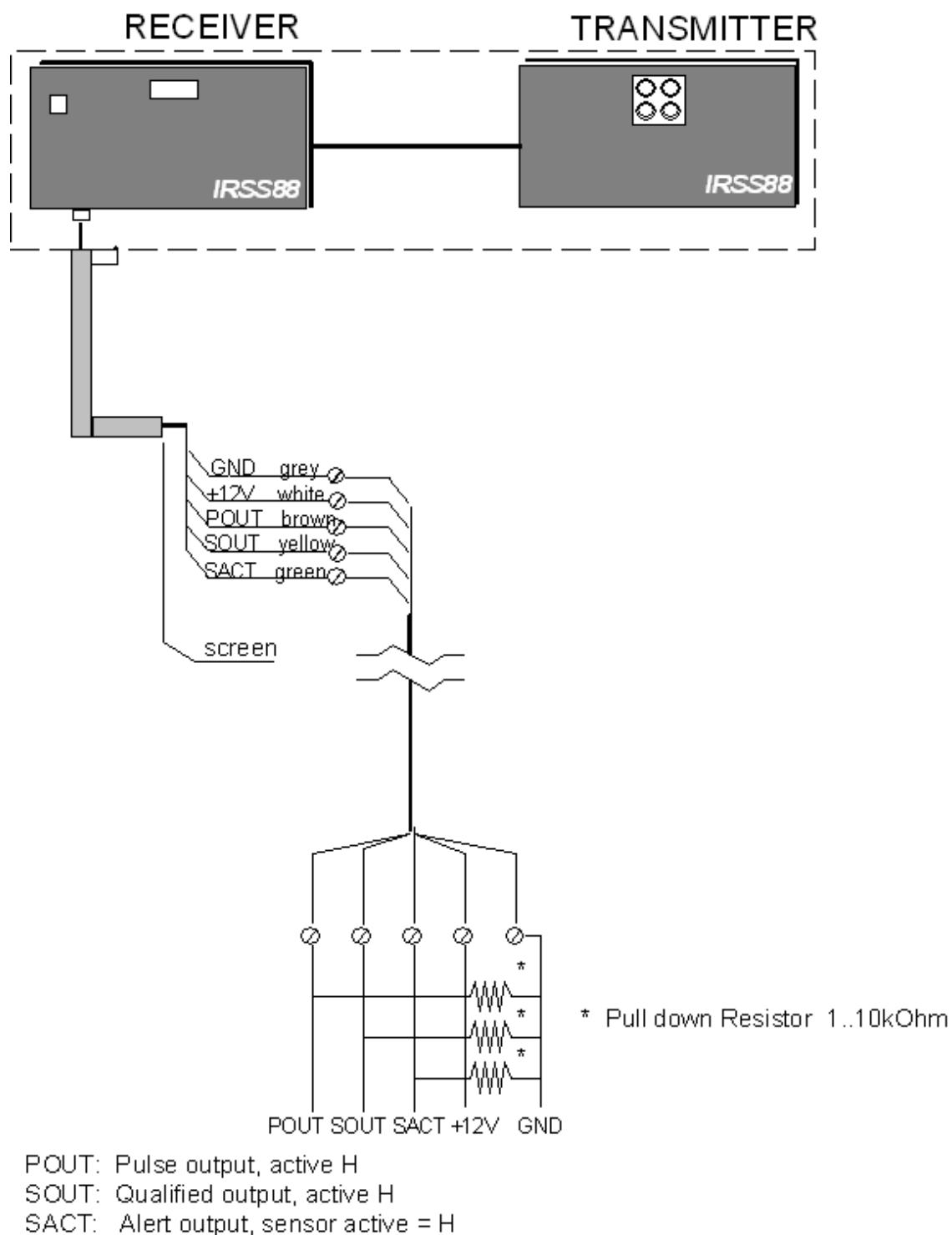
## 6. Electrical connection



RECEIVER          TRANSMITTER

IRSS88            IRSS88

GND    grey
+12V   white
POUT   brown
SOUT   yellow
SACT   green

screen

\* Pull down Resistor 1..10kOhm

POUT SOUT SACT +12V GND

POUT: Pulse output, active H
SOUT: Qualified output, active H
SACT: Alert output, sensor active = H

**Fig. 1-2**
**Short distance cable connections**