



## **OPERATIONAL/TECHNICAL DESCRIPTION**

### **Brief description of the circuit functions**

Electrical circuit consist of power supply circuit, microcontroller, sensors and RF (radio frequency) transmitter. Power supply circuit ensure required power supply voltage. There is also protection circuit for overvoltage protection. Microcontroller process data received form sensors and control RF transmitter. Sensors makes measurements of temperature, pulses form wind speed sensor and magnetic field form angle sensor. RF transmitter continuously transmit data packages on required frequency range.

### **Device operation**

Microcontroller wake up from sleep mode couple times per second for data processing, angle sensor measurement and wind speed sensor measurement. In ten minutes intervals microcontroller measure temperature and power supply voltage level. In two seconds interval microcontroller send data package over RF module in pre-defined RF parameters and FHSS (frequency hopping spread spectrum) technic.

Pseudorandom Frequency Hopping Sequence:

For FHSS are used 50 frequency channels in 150 kHz steps. Starting frequency is 908.4MHz. Every new transmitted data package is transmitted on different frequency channel with pseudorandom generated sequence channel change. After 50 transmitted data packages transmitter repeat pseudorandom sequence. This logic ensure that transmitter continuous transmit data packages uniform distributed on all 50 frequency channels.

Antenna on transmitter:

Antenna is made from single PVC insulated wire  $0.14\text{mm}^2$  and length of  $1/4$  frequency wavelength (about 8.24cm).