

## WIND MEASUREMENT BY MEANS OF A MULTICOPTER

### ABSTRACT

5 The invention relates to a multicopter, using which wind measurements can be carried out, and a method for wind measurement by means of a multicopter. The multicopter comprises a number  $N$  of electric motors  $MOT_n$  for driving  $N$  propellers  $PROP_n$ , a first interface (101) for providing first parameters P1 comprising: a 3D position  $r_B$  of the center of gravity B of the multicopter, the time derivatives:  $\dot{r}_B$  and  $\ddot{r}_B$ , a 3D orientation  $o_M$  of the multicopter and its time derivative  $\dot{o}_M$ , a second interface (102) for providing an aerodynamic power  $P_{a,n}$  presently generated by the respective propellers  $PROP_n$ , a first unit (103) which, on the basis of the first parameters P1, on the basis of a provided model M1 for describing dynamics of the multicopter, and an estimation determined on the basis of the model M1 of a force screw  $\tau_e$  acting externally on the multicopter, determines horizontal components  $(v_{r,x}, v_{r,y})$  of a relative speed of the multicopter in relation to the air, a second unit (104), which, on the basis of the determined horizontal components  $(v_{r,x}, v_{r,y})$  and on the basis of the aerodynamic power  $P_{a,n}$ , determines the vertical component  $(v_{r,z})$  of the relative speed  $v_r$ , a third unit (105), which, on the basis of the determined horizontal components  $(v_{r,x}, v_{r,y})$ , the vertical component  $(v_{r,z})$ , and on the basis of the parameters P1, determines the wind speed  $v_w$  in an inertial system, and a storage unit (106) for storing the wind speeds  $v_w(r_B)$  and/or a transmission unit (107) for wirelessly transmitting the wind speed  $v_w(r_B)$  to a receiver (108).

25 FIG. 2