**B&G Sensors**

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| Information regarding the B and G (brookes and gatehouse) sensors for the H2000 and the H3000 systems.  **213 MHU**  This is the standard Masthead Unit for the BandG H2000 and H3000 systems, you can change/replace the bearings of the windvane and wind cups. The bearings are according to the English (imperial) system. Read this article: <http://blog.oppedijk.com/2011/10/26/b-and-g-wind-bearings-replacement/> for info on the replacement of the 213 and 496 MHU.  Or in case of a hardware failure, remove the PCB:  <http://primus.bandg.com/icrbg/BandG%20FAQs/H2000%20FAQS/FAQ%20-%20213%20MHU%20PCB%20Swap.pdf>    If you want to repair the PCB, read this:  <http://forums.sailinganarchy.com/index.php?s=96bab55e9f2a76b0eae6f02fa7219e77&showtopic=110615>  for some tips on replacing the FETS (BF256A) and recalibrating the unit  For the wiring and the connector read this document:  <http://primus.bandg.com/icrbg/BandG%20FAQs/H3000%20FAQS/FAQ%20-%20H3000%20MHU%20wiring%20and%20tests.pdf>  **Clinometer**  The clinometer (690-00-004) used by B&G seems to be linear in it's output, here is a table with some raw measurements:   |  |  |  | | --- | --- | --- | | H 44 | 2.17 volt | heel port | | 0 | 3.15 volt | neutral (no heel) | | 19.5 H | 3.55 volt | heel starboard | | 44.1 H | 4.09 volt | heel starboard | | 51.0 H | 4.24 volt | heel starboard |   Maximum heel value displayed on the displays is around 60 degrees  The measured linear function seems to be: heel angle = 46 \* volts - 144.12 (with some offset on calibration)  So it seems like the heel angle covers 300 degrees of tilt (+/- 150 degrees), so the correct function seems to be: heel angle = 46.154 \* volts - 150  Trim should be the same. Using a clinometer improves the measurements to the Apparent Wind Angle (AWA)    Building a custom Heel and Trim sensor is quite easy, use a sensor (e.g. Memsic MX2125) and an Arduino Atmega to process the pulses and output a voltage into the B&G main processor. Should work with H3000 also. Cost about 50 euro for heel and trim (compared to 2x 800 euros for official B&G)  The formula is: outValHeel = pulseX\*0.056-116.43;    For H3000, add a Capacitor for an RC filter.  **Temperature sensor**  Sea temperature Part no: 224-00-065  <http://primus.bandg.com/icrbg/BandG%20FAQs/H2000%20FAQS/FAQ%20-%20Sea%20Temp%20resistance.pdf> Standard NTC 10K |