

To: Joe Dichoso  
jdichoso@fcc.gov

From: David Redman, Sensors & Software Inc.  
dr@sensoft.ca  
FCC Equipment Authorization Branch  
Re: FCC ID QJQ-NOGGIN1000

Applicant: Sensors & Software Inc.  
Correspondence Reference Number: 24308  
731 Confirmation Number: EA828918  
Date of Original E-Mail: 11/8/2002

Subject:

- 1) The waiver request has been submitted to FCC and we are awaiting for the response from FCC. We will submit the approval of the waiver to you as soon as we receive it.
- 2) The space available for labeling on the unit is limited. The label text given in the document "FCC Label and Its Location" was considered to be the most important so the additional text has been put into the operating manual (Appendix C, Pg. 1) as given below:

*This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:*

- (1) this device may not cause harmful interference and*
- (2) this device must accept any interference received, including interference that may cause undesired operation.*

- 3) The pulse repetition frequency is given in the report in section 6.3.5.1 and is 92 kHz. The pulse applied to the antenna is a short monopulse (width 0.50 ns at 10% points). A plot of the pulse can be seen on page 5 of in the document N1000 Technical Description.pdf (Operational Description). The centre frequency of the pulse is 1000 MHz.

- 4) Please refer to the letter in Attestation Statements folder for the acknowledgement of the kill switch. The antennas are shielded on five sides as described in the document N1000 Technical Description, on page 3. The shield can also be seen in the internal photo folder.

Pg 3 in document:

"Shields around each antenna minimize the amount of energy that escapes into the air and damping within the shield structure minimizes the amount of energy that is reflected from the shield into the ground."

Sensors & Software Inc. GPR systems will only operate when triggered by the operator. If the system is not triggered by the operator it will cease transmitting within 10 seconds. The triggering mechanism is an odometer attached to a cart wheel or a switch that must be depressed for the transmitter to operate, as shown in the photos below.



Odometer used for triggering the Noggin 1000 transmitter.



Switch used to control Noggin 1000 transmitter. This switch must be depressed for the Noggin transmitter to operate.

5) The radiated emissions tests were performed by Sensors & software with the antenna set at 1 meter fixed as shown on the photos of test setup provided. These test results were repeated at the Ultratech OFTS with the antenna moved from 1 to 4 meters, and the results were still found to comply.

6) Please refer to Test Report folder for plots in jpeg formats. I hope you can magnify it for review.

7) Please ignore the QP measurements at 1 GHz, we did it regarding to your last request for Model Noggin 250 without considering that QP measurement is not required for frequency above 1 GHz.

Based on Ultratech's measurement on Jul 27, 2002, The peak level at 1975 MHz was 45.8 dBuV/m at 3 meters with the measuring antenna moved from 1 to 4 meters . Based on Sensors and Software 's measurement at different site, the peak level was 46.5 dBuV/m at 3 meters with the antenna set at 1 meter fixed. We performed the RMS average measurement and found it was at 36.8 dBuV/m at 3 meters and it was right on the Spectrum Analyzer Noise Floor. In fact, the level at 36.8 dBuV/m at 3 meters is not valid, it shall be recorded as below 36.87 dBuV/m.

8) As specified in Sec. 6.3.3 of the test report, the following antennas were used:

Biconical Antenna	Agilent	11955A	For measuring in 30 MHz to 300 MHz band
Log Periodic	Agilent	11966N	For measuring in 300 MHz to 5.0 GHz
Horn Antenna	EMCO	3155	For measuring in 1 GHz – 10 GHz

9) The antennas are shielded on five sides as described in the document N1000 Technical Description on page 3. The shield can also be seen in the internal photos.

Pg 3 in document:

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