Compliance with 47 CFR 15.247(i)

> *"Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter."*

The EUT is a 2.4 GHz FHSS Transmitter installed in the Propaq 802 LTRN, FCC ID: PGUFN802FH. Monet is the project name used during development and referred to in initial documentation. The radio in Propaq 802 LTRN is a FHSS device based upon approved transmitter module manufactured by Symbol Technology. This radio will be installed inside a patient monitoring unit that can be body-worn on a neck strap (non metallic). Since the antenna could be less than 2.5cm from the body, the exposure category is general population. The low power threshold is calculated using the following equation from the TCB exclusion list issued by the FCC, July 2002:

Exposure category	Low threshold	High threshold
General population	(60/*f*GHz) mW, *d* < 2.5 cm (120/*f*GHz) mW, *d* ≥ 2.5 cm	(900/*f*GHz) mW, *d* < 20 cm
Occupational	(375/*f*GHz) mW, *d* < 2.5 cm (900/*f*GHz) mW, *d* ≥ 2.5 cm	(2250/*f*GHz) mW, *d* < 20 cm

In this case, since the radio operates in the 2.4GHz band, the low power threshold is 25mW. According to footnote 2 of the TCB Exclusion List, "Output power for portable transmitters is the higher of the conducted or radiated (EIRP) source-based time-averaged output." The communication protocol of Monet has redundant controls that limit the maximum duty cycle to 14% (see Welch Allyn's Attestation Letter, Appendix B). The antenna and antenna assembly have an overall gain of -6.8dBi, and the maximum conducted output power is 109.65mW which yields an EIRP measurement of 13.6dBm (22.9mW). Therefore, using the conducted power with the maximum duty cycle, the device has a power threshold of 15.4 mW (110 mW*duty cycle correction factor%). The power threshold is significantly lower than the low power threshold for general population. Therefore, the EUT is excluded from SAR testing. Please see the attached email from the FCC regarding source-based time averaging for this device.

The applicant's radio, FCC ID: PGUFN802FH, is compliant with the requirements of 15.247(i).

Appendix A:
Email from FCC

Subject: Re: SAR Testing of a FHSS
Date: Tue, 9 Sep 2003 16:19:00 -0400
Thread-Topic: Re: SAR Testing of a FHSS
Thread-Index: AcN3ECrsxit0MWyRSxmVKD9s4IDbvQ==
From: "Tim Harrington" <THARRING@fcc.gov>
To: <MKUO@CCSEMC.com>
Cc: "Joe Dichoso" <JDICHOSO@fcc.gov>, "Martin Perrine" <MPERRINE@fcc.gov>,
"Tim Harrington" <THARRING@fcc.gov>, <BJudge@CCSEMC.com>,
<gkiemel@nwemc.com>
X-OriginalArrivalTime: 09 Sep 2003 20:23:06.0102 (UTC) FILETIME=[2D610160:01C37710]
X-MIME-Autoconverted: from quoted-printable to 8bit by nwemc.nwemc.com id h89KNNm20852

Hi Mike et al
FHSS duty factor can be used for source-based time-averaging. Similar to FHSS public notice power test, usually hopping is disabled for SAR test. If SAR test with hopping on is needed it should be OK for TCB to approve.
Stand-alone tests maybe could be used to show duty factor or hopping effects, but should not be used for compliance at TCB.

From: Mike Kuo
To: Tim Harrington
CC: Barbara Judge, 'Greg Kiemel'
Date: 9/8/03 2:18PM
Subject: SAR Testing of a FHSS

Hi Tim:

The device in question is a FHSS device based upon approved transmitter module manufactured by Symbol Technology. This radio will be installed inside a patient monitoring unit that can be body-worn on a neck strap (non metallic). The device is named " Monet " and will be marketed by Welch Allyn. Monet is battery operated only with integral antenna. The max. RF conducted output power of radio is 112mW and the antenna gain is 2dBi (EIRP =177.5mW).

The data gathered by Monet can only be communicated with a Welch Allyn Acuity Central Monitoring Station via a Symbol FHSS Access point. The Monet firmware and communication protocol are controlled exclusively by Welch Allyn. The communication protocol has redundant controls that limit the maximum duty cycle at 14%.

Northwest EMC will be the TCB in reviewing this application, CCS will be the subcontracted SAR lab by Northwest EMC to perform SAR evaluation.

Per the conversation with Greg Kiemel, Greg had some hallway discussion with you about Monet during the last TCB training. There are some questions we would like to discuss with you before we start the testing.

Question #1: Per OET 65 supplement C, page 17 "Duty factors related to device usage, frequency hopping or other similar transmission conditions are normally not acceptable as source-based, time averaging factors for RF evaluations." However, because the Welch Allyn communication protocol limits the maximum duty cycle (as described above), can we consider 14% duty cycle as source-based time-averaging and SAR evaluation not to be

required because the corrected output power is below the low - power threshold?

Question #2 Mode of operation: Since the radio used in Monet is manufactured by Symbol Technology, Welch Allyn does not have radio control software to enable radio to transmit continuously during SAR evaluation. As Symbol indicates, the radio control software can only be running on PC platform to set the radio in low/middle/high channel and transmit continuously. Since the Commission requires SAR evaluation to be tested on final product, SAR evaluation performed on a module level is not allowed and Welch Allyn will not be able to enable the transmitter to transmit continuously on low/middle/ high channel.

Based upon this information, CCS is proposing the following SAR measurement methodology for this device (if required):

A. SAR testing with the Monet in a hopping mode. Force Monet to transmit at the max. duty cycle of 14%. At the test, Monet will not be able to stay on low, middle or high channel during duration of tests with max. output power. However, actual device usage will be tested, i.e. the communication protocol does not allow Monet radio to preferentially dwell on any frequency channel. It requires that all 79 frequencies have equal use.

or

B. SAR testing in a no-hop mode using a PCMCIA extender cable from a notebook PC (using Symbol's software) to the radio installed in the Monet. A modification to Monet's system board would be made to remove the connector and attach the extender cable. Otherwise, the location of the antenna, radio , shielding, and other reflective objects would be nearly the same.

Question #3: Will the TCB be able to handle this application if any of these options are used?

Best Regards

Mike Kuo
Compliance Certification Services
561F Monterey Road
Morgan Hill CA 95037
Tel: (408)463-0885 x: 105
Fax: (408)463-0888
http://www.ccsemc.com

Appendix B:
Duty Cycle
Attestation Letter
from Welch Allyn
March 2004

Welch Allyn Protocol Inc.
8500 SW Creekside Place Beaverton, OR 97008 (503) 530-7500

December 8, 2005

Northwest EMC
Attention: Greg Kiemel
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

Re: Attestation concerning source-based time-averaging for PGUFN802FH

Dear Mr. Kiemel

The data gathered by Monet can only be communicated with a Welch Allyn Central Monitoring Station. The Monet firmware and the communication protocol are controlled exclusively by Welch Allyn. The communication protocol has redundant controls that limit the maximum duty cycle to14%. If the limit is exceeded the device will stop functioning. Specifically, the redundant checks are as follows:

- ◊ If the average transmit duty cycle exceeds 14% over a six-minute period (Per IEEE Std C95.3-2002) the device will stop functioning.
- ◊ Furthermore, every 30-second sample is compared with the previous sample. If multiple 30-second samples exceed the 14% duty cycle, then the device will stop functioning.

Should you have any questions about the content of this correspondence, please contact Robert Jenkins at the number listed above.

Respectfully,

Robert Jenkins
Engineer IV
Quality Regulatory Affairs

Jeffrey W. Wagner
Manager, Regulatory Affairs

Jacquie Murray
Program Manager