



HÖFT & WESSEL

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Hannover, 04/18/01
KOE

Applicant's declaration concerning RF Radiation Exposure

We hereby indicate that the product
Vectron POS Base Station / US (HW8660 / US)
is considered to be a mobile transceiver.

The conducted output power is maximum 20 dBm. The internal antennas used for this mobile transmitter must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

A safety statement concerning minimum separation distances from enclosure of the Base Station will be integrated in the user's manual to provide end-users with transmitter operating conditions for satisfying RF exposure compliance.

The appropriate information can be drawn from the test report GOM20012-3598-T-47 and the accompanying calculations.

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Hannover, 04/18/01:

Signature: 
Sebastian Köhler
technical project manager

8660RFDecl.doc



RF Safety Calculation

Determination of permitted Power Density at 2.4 GHz for 100 mW / 1W according IEEE Std. C 95.1

HW 8660

Manufacturer: Höft & Wessel

1. Power density

$$S = \frac{P_r}{4 r^2 \pi}$$

P_r - radiated power

r - distance

2. Calculated power density values for 100 mW (20 dBm) and 1 W (30 dBm)

distance cm	Power density mW / cm ²	
	100 mW	1 W
20	0,02	0,2
5	0,32	3,2

Concerning the measured duty cycle of ..17.8... % the device provides an averaged radiated power of less then ..20.. mW.

3. Limit according IEEE Std. C 95.1

Frequency range 300 - 3000 MHz: $S_L = f / 1500$

For 2.4 GHz: $S_L = 1,6 \text{ mW / cm}^2$

4. Assessment

The sample complies to the MPE requirements because the radiated output power provide a power density as calculated according to the formula above, below the requested limits.

ELECTRONIC TECHNOLOGY SYSTEMS DR. GENZ GMBH

3) Provide RF safety calculations. Provide appropriate instructions to end-users to comply with the RF safety requirements. Include any RF safety distances. Indicate whether the device will be considered mobile, portable or handheld. Where is the antenna located?

Because the low transmitting power for this mobile device no significant RF exposure risk will be expected.

Please use the attached RF Safety Calculation and see attached Applicant's Declaration.

4) What is the receiver input bandwidth which must match the transmitter bandwidth.

System Receiver Input Bandwidth according manufacturers declaration:

The receiver bandwidth is 1152 kHz at -3 dB.

With this value it matches to the transmitter bandwidth of 1.35 MHz at -20 dB.

5) Each frequency must be used equally on the average by each transmitter.
Except for voice systems, each new transmission must start at a different point in the sequence so that on average the full sequence is used. Therefore, Describe where the next transmission starts when all frequencies are not used for a previous message. This is required because some transmissions may need only a few frequency hops to be completed. i.e. If the transmission started on the same frequency each time, this frequency would be used more than the others if many short transmissions were sent.

The procedure for using the hopping sequence is described under point "10.5.2 (2.3.2) Multiplexing in the Frequency Domain" in user manual.

6) The transmitter cannot coordinate its hopping sequence with the hopping sequence of other transmitters, or vice versa, for the purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters. Provide a description on how the device complies with this rule with respect to the fact that the transmitters share/coordinate free channels by transmitting free channel information to other transmitters.

The fact that the frequency hopping sequence is not coordinated to an other transmitter is noted under point "10.7.2 (Interference between two systems of the same type" in user manual).

Best Regards

Kurt Damm