

Office of Engineering and Technology

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Re: FCC ID: Z5W-104013

Applicant: Damm Cellular Systems A/S

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We are close to completing the review of this application. However, the following issues need to be clarified:

1. The test report shows 25 Watts conducted power while RF exposure analysis uses only 10 Watts. Please clarify or unify. Furthermore, the RF Exposure analysis appears to be copied from the 410-430 MHz version and thus the frequencies are incorrect.

The TR412 transceiver board is designed to be installed and will only fit into DAMM Cellular base stations either a model BS411 or a BS414. The base station equipment has a net loss of approximately 3 dB because they contain passive isolators and a physically large final bandpass filter and combiner. The transceiver modules have an output power each of 25W conducted at the output of the module, but 10W after the combiner, isolators, and filters in the Base Station rack (i.e. the antenna connector of the rack).

As to the RF exposure report it appears the wrong one was uploaded and the correct and revised one has now been uploaded.

2. The Module Approval Letter and the Notes to Installers document both appear to suggest that a modular grant allows the system to use various antenna configurations and gains. In addition, there is no instruction in the user's manual on the selection of antennas either. Note that this understanding is incorrect. Per 90.205(h), there are limits for ERP as a function of HAAT. Furthermore, per KDB 996369 D01 III)v), the modular grant will need to list the maximum antenna gain to ensure compliance with EMC and RF Exposure requirements. Currently at 200 Watts (8 modules) maximum conducted power, there is not much room for antenna gain. The current RF exposure analysis uses 3 dBi as the maximum antenna gain to arrive at the suggested separation distance. Please review requirements and provide the maximum antenna gain information. Revise RF exposure analysis and the user's manual accordingly.

The System allows the use of various antenna configurations and gains and we do not recommend any particular selection of antennas. The standard base station system fully equipped with 8 transceivers will have a maximum of 80W at the antenna, but each transceiver will be on a different frequency this makes for 10 Watts on 8 individual and different frequency carriers not 80 Watts on a single carrier or frequency (that configuration is un-implementable). Also the power of each carrier is adjustable from the lowest listed in the test report to the maximum listed. We have included a document attached as a separate exhibit containing information relative to the maximum allowed antenna gain in relation to frequency, height, and FCC requirements. As to a maximum antenna gain we believe all our requirements can be met with a 5.5 dBi maximum. A revised RF exposure report and notice to installer document are attached.

3. The user's manual, TetraFlex V7.5, on Page 2-81 (TX Power) mentions "High Power TR412", with a maximum power of 62.5 W. This is much higher than the 25 W for the standard TR412. Please clarify whether the High Power TR412 will be using the same FCC ID as the standard version.

No the higher power (TR-412H) will have a different FCC ID. Because of FCC changes, the high power (TR-412H) will be processed for approval by the TCB using the now allowed "permit but ask" kdb shortly after these TR-412s' are approved. This was done so as to better understand the requirements from the processing of this application.

4. Test report presents both "High Power" and "Low Power" data. We are still puzzled by the presentation of the low power numbers. Please further clarify 1) if the low power mode is a sustained (steady state) operating mode or just the low end of dynamic TX power control, 2) whether low power mode is associated with roll-off factor 0.35, and 3) assuming measurements were taken with the transmitter in continuous transmission mode as claimed in the report, are the data average or peak power of the pi/4-DQPSK transmit signal?

1. The power is sustained. The power is adjustable by the installer from the lowest power reported to the highest and "represents the range of power control". I think grant note code BC best describes this: "The output power is continuously variable from the value listed in this entry to 5%-10% of the value listed".
2. The test data in the report shows power output for both roll off factors and the output power is virtually identical between them. The low power shown in the report is the lowest output power available through manual adjustment/ setting.
3. The data was taken in a continuous transmit mode as described in the report and the power listed is peak power while modulated with the pi/4-DQPSK signal.

The items indicated above must be submitted before processing can continue on the above referenced application.

Failure to provide the requested information within 60 days of the original e-mail date may result in application dismissal and forfeiture of the filing fee pursuant to Section 1.1108