



## 1. Purpose

The purpose of this technical note is to analyse the use of the intentional radiator module incorporated in the DDK-X1 unit and provide the necessary technical justification that the module is being utilised in complete compliance with the testing guidance.

## 2. Overview

The DDK-X1 (also known at the C-NavX1) is a GNSS Precise Point Positioning Device with proposed FCC ID 2A29Q-DDKX1. It is considered and has been tested as an unintentional radiator that contains an intentional radiator module in the form of a Quectel EG25-G LTE modem (FCC ID 2ATM8EG25G). DDK are looking to leverage the results of this approved module in making the application for the DDK-X1 to the TCB acting on behalf of the FCC.

## 3. Analysis

The following aspects of the DDK-X1 design and use have been analysed and are discussed in this technical note:

1. Module integration
2. Antenna usage
3. Modifications

### 3.1 Module Integration

The module has been integrated in a mPCIe slot on the Gateworks GW6300 single board computer as per the module design and manufacturer's instructions. Through this interface it is supplied with power and data in accordance with the manufacturer's guide to its use and the international standards for this interface.

The antenna output of this module is connected to a SMA bulkhead on the enclosure of the DDK-X1 rear face via a 200mm long, 50Ω coaxial cable. The losses resulting from this cable length will lower the antenna gain possible from the unit.



Figure 1 – Interior of the unit showing LTE module c/w coaxial cable to bulkhead



Figure 2 – Exterior of the unit showing LTE SMA bulkhead connector

### 3.2 Antenna Usage

The DDK-X1 units are supplied with a paddle antenna, Quectel part number YE0009AA, for use with the unit. This is the manufacturer's recommended antenna for use with the module and corresponds with the antenna utilised by the manufacturer during FCC testing, including form factor, gain, frequency range and impedance.



Figure 3– Supplied Quectel antenna

This antenna is installed exterior to the unit by way of the SMA bulkhead connector.

### 3.3 Modifications

No modifications have been made to the LTE module neither physically nor how it is used in operations from what is prescribed as the manufacturer's default.



## DDK-TN-22-003 - Technical Note

### Intentional Radiator Module Technical Justification

#### 4. Conclusion

From the above analysis it is concluded by DDK and proposed to the TCB that the Quectel EG25-G LTE modem (FCC ID 2ATM8EG25G) is being used in accordance with the manufacturers guidance and previous testing. As such the emissions from said module will remain the same or see a reduction from the results of the manufacturer's testing and therefore can be utilised in the justification of the DDK-X1 being suitable for use in the U.S. market under FCC ID 2A29Q-DDKX1.