



Digi International
11001 Bren Road East
Minnetonka, MN 55343
952-912-3444 tel
952-912-4991 central fax

Federal Communication Commission
Equipment Authorization Division, Application Processing Branch
7435 Oakland Mills Road
Columbia, MD 21048

12-12-2010

RE: FCC ID: MCQ-50M1699 / IC: 1846A-50M1699 submittal as modular device

1. The modular transmitter must have its own RF shielding. This is intended to ensure that the module does not have to rely upon the shielding provided by the device into which it is installed in order for all modular transmitter emissions to comply with FCC Part 15 and Industry Canada limits. It is also intended to prevent coupling between the RF circuitry of the module and any wires or circuits in the device into which the module is installed. Such coupling may result in non-compliant operation.

The ConnectCore Wi-i.Mx51 module is designed such that all RF components and circuitry are placed on the top surface of the PCB. No RF related circuitry is present on the bottom surface of the PCB. A formed metal shield is soldered onto the top of the PCB and covers all RF components and circuitry.

2. The modular transmitter must have buffered modulation/data inputs (if such inputs are provided) to ensure that the module will comply with Part 15 and Industry Canada requirements under conditions of excessive data rates or over-modulation.

All of the user data that is to be transmitted over the modular transmitter is buffered by the ConnectCore Wi-i.Mx51 baseband controller. The user's data is packetized and transmitted at data rates that are completely controlled by the baseband controller and its software. The user has no access to either the baseband controller or its software.

3. The modular transmitter must have its own power supply regulation. This is intended to ensure that the module will comply with Part 15 and Industry Canada requirements regardless of the design of the power supplying circuitry in the device into which the module is installed.

All critical RF circuitry runs on a locally regulated power supply which allows the module to function within specification with worst case input voltages ranging from 3V (module will enter a non-operative state if the Vin drops to <3.7V) (Vin >4.8V will cause a catastrophic failure of the processor and the unit will cease to function). The optimal Vin voltage range is between 3.7V – 4.8V. (optimal 4.2V)



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4. The modular transmitter must comply with the antenna requirements of FCC Sections 15.203 and 15.204(c) and Industry Canada requirements. The antenna must either be permanently attached or employ a "unique" antenna coupler (at all connections between the module and the antenna, including the cable). Any antenna used with the module must be approved with the module, either at the time of initial authorization or through a Class II permissive change. The "professional installation" provision of FCC Section 15.203 may not be applied to modules.

The ConnectCore Wi-i.Mx51 module has one antenna configuration: usage of two U.FL antenna connectors. Transmission is made only on one antenna – the second one is foreseen for receive diversity. The antennas specified for the ConnectCore Wi-i.Mx51 module is:

- ANT-DB1-RAF-RPS

5. The modular transmitter must be tested in a stand-alone configuration, i.e., the module must not be inside another device during testing. This is intended to demonstrate that the module is capable of complying with FCC Part 15 and Industry Canada emission limits regardless of the device into which it is eventually installed. Unless the transmitter module will be battery powered, it must comply with the AC line conducted requirements found in FCC Section 15.207. AC or DC power lines and data input/output lines connected to the module must not contain ferrites, unless they will be marketed with the module (see FCC Section 15.27(a)). The length of these lines shall be length typical of actual use or, if that length is unknown, at least 10 centimeters to insure that there is no coupling between the case of the module and supporting equipment. Any accessories, peripherals, or support equipment connected to the module during testing shall be unmodified or commercially available (see FCC Section 15.31(i)).

The ConnectCore Wi-i.Mx51 module is designed to be compliant with all relevant FCC requirements without any additional shielding or filtering of any sort. As tested, the ConnectCore Wi-i.Mx51 module was mounted on top of a carrier board which provided the +4.2VDC to power the module and an RS232 line transceiver to allow serial data traffic. The carrier board drives the +4.2V from an on-card DC to DC converter which is in turn powered by an external +12VDC power supply which is mains powered. There are no additional filters associated with the module/carrier board. Nor is there any additional shielding associated with this setup – beyond the shield that is soldered to the module.



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6. The modular transmitter must be labeled with its own FCC ID / IC number, and, if the FCC ID / IC number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: XYZMODEL1 / IC: XXX-YYYY" or "Contains FCC ID: XYZMODEL1 / IC: XXX-YYYY." Any similar wording that expresses the same meaning may be used. The Applicant may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement. In the latter case, a copy of these instructions must be included in the application for equipment authorization.

The ConnectCore Wi-i.Mx51 module will have the FCC/IC ID numbers placed on a label. Information contained on that label is shown in a separated document. In the Hardware Reference Manual, a paragraph explains what the end user must document outside of the device.

7. The modular transmitter must comply with any specific rule or operating requirements applicable to the transmitter and the manufacturer must provide adequate instructions along with the module to explain any such requirements. A copy of these instructions must be included in the application for equipment authorization. For example, there are very strict operational and timing requirements that must be met before a transmitter is authorized for operation under FCC Section 15.231 and Industry Canada specifications. For instance, data transmission is prohibited, except for operation under FCC Section 15.231(e), in which case there are separate field strength level and timing requirements. Compliance with these requirements must be assured.

The modular transmitter complies fully with the operational requirements in 15.247 and 15.407 (RSS-210 Annexes 8 and 9).

8. The modular transmitter must comply with any applicable RF exposure requirements. For example, FCC Rules in Sections 2.1091, 2.1093 and specific Sections of Part 15, including 15.319(i), 15.407(f), 15.253(f) and 15.255(g), require that Unlicensed PCS, UNII and millimeter wave devices perform routine environmental evaluation for RF Exposure to demonstrate compliance. In addition, spread spectrum transmitters operating under Section 15.247 are required to address RF Exposure compliance in accordance with Section 15.247(b)(4). Modular transmitters approved under other Sections of FCC Part 15, when necessary, may also need to address certain RF Exposure concerns, typically by providing specific installation and operating instructions for users, installers and other interested parties to ensure compliance. Refer to Industry Canada RSS-GEN Section 7.1.1 and 7.1.2 for Industry Canada requirements.

The ConnectCore Wi-i.Mx51 module complies with the mobile RF exposure limits for humans as called out in FCC 2.1310 and RSS-102. A separate RF exposure evaluation is provided.

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