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**Monarch®**  
Products & Services

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Ref: 9855RFMP with ThingMagic M5e

Reference: DA 00-1407 Released: June 26, 2000 PART 15 UNLICENSED MODULAR TRANSMITTER  
APPROVAL FCC TCB

To Whom It May Concern:

Below are the eight elements a module is required to meet to comply with Part 15, Unlicensed Modular Approval notice, DA 00-1407, Dated June 26, 2000. Also included are my arguments on why our module meets the requirements.

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 Part 15 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.
  - a. The Transmitter provided by ThingMagic is provided with an enclosure that provides the required shielding.
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 requirements under conditions of excessive data rates or over-modulation.



- a. The inputs are buffered and the data is processed by a microprocessor in the ThingMagic M5e, thereby eliminating excessive data rates or over modulation.
3. The modular transmitter must have its own power supply regulation. This is intended to ensure that the module will comply with Part 15 requirements regardless of the design of the power supplying circuitry in the device into which the module is installed.
  - a. We provide an I/O board that regulates the supply voltage from 24 volts down to the 5 volts the ThingMagic M5e module needs.
4. The modular transmitter must comply with the antenna requirements of Section 15.203 and 15.204(c). 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 Section 15.203 may not be applied to modules.
  - a. The antenna uses MMCX connectors. In this application the customer will never change the antenna. The reason is, if they change it to a higher gain antenna, they will program more than one tag at a time, which will prevent their RFID tags from working properly.
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 Part 15 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 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 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 Section 15.31(i)).



- a. Avery Dennison Retail Information Services LLC tested the RFID module inside one of our printer during the tests at Siemic due to the need to confirm it could be co-located with another transmitter. During the tests it was powered by the printers 24VDC power supply, using the Avery Dennison I/O board to further reduce the supply voltage to 5VDC (see note in item 3 above). The dual regulation will provide a stable operating voltage for the module.
6. The modular transmitter must be labeled with its own FCC ID number, and, if the FCC ID 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” or “Contains FCC ID: XYZMODEL1.” Any similar wording that expresses the same meaning may be used. The Grantee 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.
  - a. This module will only be used in Avery Dennison RIS LLC printers and will be under Avery Dennison RIS LLC control. We will include the required external label as well as label the module.
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 Section 15.231. For instance, data transmission is prohibited, except for operation under Section 15.231(e), in which case there are separate field strength level and timing requirements. Compliance with these requirements must be assured.
  - a. All of the timing is controlled by software in the ThingMagic M5e unit and is not adjustable by the user.
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 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.

- a. Through testing at Siemic, has confirmed our compliance with RF Exposure limits.

If you have any questions or concerns, please contact me by email at [jim.bacher@averydennison.com](mailto:jim.bacher@averydennison.com); phone at 1-937-865-2020; or by fax at 1-937-865-2048.

Sincerely,

A handwritten signature in black ink that reads 'James A Bacher'.

James A Bacher  
Senior Engineer  
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cc: Dave Best