

Marconi Commerce Systems is requesting Limited (see question 4) Modular Approval for FCC ID. N6SMRIR4. The following provides responses to the 8 questions that are specified in PART 15 UNLICENSED MODULAR TRANSMITTER APPROVAL (DA 00-1407 Released: June 26, 2000).

In order to obtain a modular transmitter approval, a cover letter requesting modular approval must be submitted and the numbered requirements identified below must be addressed in the application for equipment authorization.

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.

The sheet metal hardware of the "card cage" illustrated in Marconi P/N T20606 G2 was designed for mechanical protection and physical assembly. The UHF Receiver (part of Marconi P/N Q13563 04) has three metal cans (one overall and two internal) to reduce EMI effects of 903 MHz receiver circuitry. The two 134 kHz RF modules mounted on the LF transmitter module (Marconi P/N Q13579 01) has "L-shaped" metal guards protecting the circuitry. The metal guard is used as a heat sink and to provide mechanical protection. The Regulator Board (Marconi P/N T20314 G1) has its own shield to reduce EMI effects of the power supply circuitry and to provide mechanical protection.

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.

The modular transmitter has three data lines (two internal and one external) in the system. Two RS-232 internal lines connect the DCB (Marconi P/N Q13563 02) to each bezel board (includes the Texas Instruments microreader). These lines pass transponder serial numbers and on/off commands of the recognition light. There are no commands from the DCB that can change performance and RFID functionality of the microreader. One RS-485 line connects each transmitter module to the Gateway Board of the fuel dispenser. It passes transponder serial number and authentication code to the Gateway Board for communication to the point-of-sale (POS) system for credit verification. Once the credit is verified, the POS system instructs the transmitter module to keep the recognition light on or to shut it off.

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.

The T20606 G2 card cage assembly includes a power supply which provides power to all components of the modular transmitter system. It down converts 120 VAC to 24 VAC using a Class II step-down energy limited transformer (Marconi P/N R20719 G1). The 24 VAC is rectified and buck converted to +22.5 VDC and +5 VDC via a switching power supply (Marconi P/N T20314 G1).

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.

This device does not meet the unique connector requirements identified in Section 15.203 and 15.204(c). However, this system was designed and will be marketed for commercial use only. Only professionals will install the device. It will never be sold or used in residential applications. In the commercial environments such as retail fueling, technicians have to be trained and licensed to install and service both electrical and mechanical hardware. Therefore, the device should be considered for a “limited modular approval.”

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)).

As the photographs and report indicates, the device was tested in a stand-alone configuration and not inside another device. It does not contain any ferrites that will not be marketed with the module. The device was tested with cables of a length typical of actual use that are greater than 10 centimeters long. The device (the Gateway Board, P/N T20128) that was connected to the interface port of the modular transmitter was unmodified and is commercially available.)

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.

The modular transmitter will be labeled with its own FCC ID number on the “card cage”. This label is not visible when it is installed inside another device, therefore an exterior label is provided with the required text. A separate file in this submission shows labels (with verbiage) as well as their locations on the product.

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.

Intentional radiator N6SMRIR4 meets the requirements of Section 15.209. No special instructions are required to insure this intentional radiator continues to comply with the FCC rules other than the statement that modifications may not be made to this device “without the written consent of Marconi Commerce Systems. Unauthorized modifications may void the authority granted under Federal Communications Commission Rules permitting the operation of this device”. This statement is located in the installation manual, which has been sent as part of this grant submittal.

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.

The modular transmitter operates at 134.2 kHz with less than 0.5 Watt ERP and is, therefore,

excluded from Section 1.1307(b) of the FCC rules and the RF exposure requirements (300 kHz – 100 GHz, per FCC OET Bulletin 65).

If compliance with one or more of the numbered requirements, listed above, cannot be demonstrated, it may be possible to obtain a “Limited Modular Approval” (LMA). This will be issued in those instances where the Grantee can demonstrate that it will retain control over the final installation of the device, such that compliance of the end product is assured. In such a case, an operating condition on the grant of equipment authorization for the module would state that the module is only approved for use when installed in devices produced by a specific manufacturer, typically the Grantee. If LMA is sought, the application for equipment authorization must make this fact clear. It must also specifically state how control of the end product, into which the module will be installed, will be maintained, such that full compliance of the end product is always ensured.

If approved, the grant of equipment authorization for a transmitter module will have either the word “module” or “modular” added to the Remarks section on the grant. Absent this specific reference, the authorized device will not be considered an approved transmitter module and its use in any new device would require a separate FCC approval of that device.