



6400 W. Enterprise Dr.
Mequon, WI 53092

PART 15 UNLICENSED MODULAR TRANSMITTER APPROVAL

Date: 11/09/2004

Time: 14 : 20

To: FEDERAL COMMUNICATIONS COMMISSION
7435 Oakland Mills Road
Columbia, MD 21045-0429

From: Calvin Steinweg
Sr.Project Engineering Analyst

Phone: 262-512-8467

Fax: 262-512-8300

Applicant: Rockwell Automation, Inc.
FRN: 0011744893

E-Mail: ccsteinweg@ra.rockwell.com

Subject: Justification for Limited Module Approval

Dear Ladies and/or Gentlemen:

The following is justification for the Rockwell Automation PowerFlex Wireless Interface Module application for "Limited Module Approval", set forth in the requirements and policies of the authorization of unlicensed, low power "transmitter modules" for operation under Part 15 of the Commission's Rules. "Limited Module Approval" is sought on the basis that the Rockwell Automation PowerFlex Wireless Interface Module is designed for use with only Rockwell Automation PowerFlex AC Drives.

Over the years, the Office of Engineering and Technology (OET) has, on a limited number of occasions, granted approval of modular transmitter circuitry that could be used in a variety of Part 15 devices without requiring those devices to obtain subsequent and separate FCC approvals. Such approvals have been granted in an effort to afford relief to equipment manufacturers by eliminating the requirement that a new equipment authorization be obtained for the same transmitter when it is installed in a new device. More recently, a number of manufacturers have requested information about the conditions under which such modular approvals might be granted. The Public Notice DA 00-1407, released June 26, 2000, sets forth the requirements for approval of modular transmitter equipment designs. These requirements are in addition to what is normally required for an application for an intentional radiator.

Factors considered for seeking the equipment authorization for modular transmitter:

- (a) In order to be considered a transmitter module, the device must be a complete RF transmitter, i.e., it must have its own reference oscillator (e.g., VCO), antenna, etc. The only connectors to the module, if any, may be power supply and modulation/data inputs.

The Rockwell PowerFlex Wireless Interface Module is a single printed wiring board that implements a self contained, complete wireless interface module for use with our PowerFlex AC Drive Products. The radio section on our module utilizes a National Semiconductor LMX9820A Bluetooth Serial Port Module. Its is a complete serial port to Bluetooth converter on a single BGA chip with complete RF shielding and preloaded operating firmware. The LMX9820A is driven by a 12.000MHz crystal circuit and drives a surface mount antenna. The LMX9820A is configured to operate in transparent serial mode (SPP) where the serial data is converted to the Bluetooth radio protocol internally. The only connectors to the module provide serial data connectivity to our drive products and power.

- (b) Compliance with FCC RF Exposure requirements may, in some instances, limit the output power of a module and/or the final applications in which the approved module may be employed.

The RF power output for the National Semiconductor LMX9820A Bluetooth Serial Port Module is limited to 2.5mW maximum, with a typical power output of 1.6mW. This complies with the FCC RF Exposure requirements for Mobile Devices.

- (c) While the applicant for a device into which an authorized module is installed is not required to obtain a new authorization for the module, this does not preclude the possibility that some other form of authorization or testing may be required for the device (e.g., a WLAN into which an authorized module is installed must still be authorized as a PC peripheral, subject to the appropriate equipment authorization).

The Rockwell PowerFlex Wireless Interface Module is designed to be mounted inside various plastic enclosures, or AC Drive Covers, depending on the environmental exposure requirements of the product and interface protocol. No variation in radio circuitry occurs.

- (d) In the case of a modular transceiver, the modular approval policy only applies to the transmitter portion of such devices. Pursuant to Section 15.101(b), the receiver portion will either be subject to Verification, or it will not be subject to any authorization requirements (unless it is a Scanning Receiver, in which case it is also subject to Certification, pursuant to Section 15.101(a)).

- (e) The holder of the grant of equipment authorization (Grantee) of the module is responsible for the compliance of the module in its final configuration, provided that the OEM, integrator, and/or end user has complied with all of the instructions provided by the Grantee which indicate installation and/or operating conditions necessary for compliance.

The Rockwell PowerFlex Wireless Interface Module is designed to be used with only Rockwell PowerFlex Drives as a peripheral programming device. Installation of the Module into its host enclosure is performed by Rockwell Automation and the Host enclosure meets all requirements set forth by Part 15 of the FCC Rules.

In order to obtain a modular transmitter approval, this cover letter requesting modular approval is being submitted and the numbered requirements identified below are addressed for 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 National Semiconductor LMX9820A Bluetooth Serial Port Module, implemented on the Rockwell Automation PowerFlex Wireless Interface Module, is a completely self contained radio which has its own RF shielding. No other RF shielding is required or implemented.

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 National Semiconductor LMX9820A Bluetooth Serial Port Module, implemented on the Rockwell Automation PowerFlex Wireless Interface Module, is a completely self contained radio which modulates its own RF transmitter. It controls the data flow to the transmitter section compliant with Part 15 requirements.

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 Rockwell Automation PowerFlex Wireless Interface Module regulates the 3.3V power supply that powers the National Semiconductor LMX9820A Bluetooth Serial Port Module to +/-3% over temperature and load extremes. The LMX9820 requires only 10% regulation for proper operation.

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.

The Rockwell Automation PowerFlex Wireless Interface Module employs a surface mount, permanently attached antenna, driven by the National Semiconductor LMX9820A Bluetooth Serial Port Module.

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)).

The Rockwell Automation PowerFlex Wireless Interface Module was tested standalone, with a standard 9m cable interfacing the module with its host PowerFlex Drive product.

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 Rockwell Automation PowerFlex Wireless Interface Module consists of a Printed Wiring Board which is labeled with the FCC identification number. This PWB will be mounted inside various Rockwell Automation host products by Rockwell Automation. The FCC identification number on the module will not be visible to 3rd party users once the module is mounted inside the host product, therefore the Compliance Statement is not included on the Module ID label. The host products, which consist of various plastic enclosures and drive covers, will be labeled by Rockwell Automation indicating the product contains FCC ID: SNT-2XWIMNX with full Part 15 compliance visible to 3rd party users.

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.

The Rockwell Automation PowerFlex Wireless Interface Module complies with all requirements applicable to the transmitter. All applicable Part 15 warnings are clearly stated in the User's Manual

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 Rockwell Automation PowerFlex Wireless Interface Module complies with RF exposure requirements for Mobile Equipment.