



**Helicomm**

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# **Cover Letter for the FCC ID RF2IPLinkP220 Module**

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PROPRIETARY & CONFIDENTIAL



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## Revision and Iteration History

Version	Publication Date	Authors	Summary of Changes and Updates
1.1	9/24/06	Leon Gateno	Original
1.2	11/30/05	Leon Gateno	Update.

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## 1 Introduction

FCC ID RF2IPLINKP220 is a module hence Helicomm would like to apply for modular approval. This document will explain how Helicomm plans to comply with the 8 requirements for a modular approval.

Note: In this document System Designer refers to the design house that will use our module on their system.

The FCC ID RF2IPLINKP220 module is sold to companies that should be aware of the FCC.

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## 2 List of Requirements

The following are the 8 requirements to meet modular approval. Also included is a brief discussion of how we plan to comply with this modular approval.

### 2.1 First Requirement

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 FCC ID RF2IPLINKP220 is enclosed in its own shield. Second, the board provides a ground plane to any traces in both top and bottom layers, hence minimum radiation of the signal by the trace. Third, the unit is no bigger than 40mm by 20mm. In order to get coupling of any significance, the interfering signal has to have a frequency greater than 1 GHz. No exposed signals carry such frequencies. All traces affected by such frequencies are completely isolated. Power supply traces filter out frequencies above 1GHz.

The only RF input/output to the module is via the antenna. This input /output frequency via the antenna is filtered by passive filters and the antenna. The frequency range is from 2.4 to 2.485GHz.

### 2.2 Second Requirement

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 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.

Chip rate for this system is fixed there for the over modulation will not occur. Also, the system is set up to shut down if it receives any data rates greater or lower than the standard data rate.

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## 2.3 Third Requirement

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.

All of the critical circuits in the Transceivers have their own regulator. Also, there is filtering capacitors to reduce the noise coming into the unit. Also, under every trace that has power there is ground this will act as a filter.

## 2.4 Fourth Requirement

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.

Helicomm, only offers one antenna. This antenna is a soldered antenna. The antenna is a Chip Antenna it has an average gain of 0dBi. It has a Donut like pattern.

## 2.5 Fifth Requirement

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 unit will be battery power. The module is housed on a test board. This board is a typical application. Also, the test board is not shielded.

## 2.6 Sixth Requirement

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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.

Each unit shipped from Helicomm will have a label with the FCC ID. It is the responsibility of the System Designer to provide the end user with the FCC ID. Helicomm will put a warning in its manual to advise the system designer. The statement will be the following:

If the you the user plans to enclose the RF2IPLinkP220. Please add the following label on the exterior at plane site: Contains one of the following modules RF2IPLINKP220.

## 2.7 Seventh Requirement

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.

When testing the unit, the unit was set up to run under its reasonable worst case. If the System designer modifies the signal such that it violets FCC rules, the system designer will have to recertify the unit. Helicomm plans to add a statement on the user manual alerting the user that any modifications to the board may require re-certification to the unit.

In order to make modifications to the module, specialized and expensive test equipment is required as well as skilled labor. The skilled labor required to modify the circuit should be train to submit changes to the FCC and TCB.

## 2.8 Eighth Requirement

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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.

When testing the unit, the unit was set up to run under its reasonable worst case. The antenna we are certifying has a gain of less than 0dBi. If the System designer modifies the signal such that it violates FCC rules, the system designer will have to recertify the unit. Helicomm plans to add a statement on the user manual alerting the user that any modifications to the board may require re-certification to the unit.

In order to make modifications to the module, specialized and expensive test equipment is required as well as skilled labor. The skilled labor required to modify the circuit should be trained to submit changes to the FCC and TCB.

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