NILES AUDIO MODULE USER'S MANUAL

The Niles Audio RF module is an 802.15.4 base RF transceiver operating in the 2.4 GHz frequency band. It is a self contained unit incorporating a transceiver, RF PA, antenna, microprocessor, and RAM. It enables mesh communications for the Niles application.
All inputs to the module are through the 8-pin header on the back of the unit, including pins for the module power at 3.3 VDC at 200 mA. The transceiver is capable of transmitting 2MCps with O-QPSK modulation, and is tested for compliance against 47CFR15.247 as a DTS type device.

SPECIFICATIONS:
Frequency Range: 2400 – 2483.5 MHz
Conducted Output Power: 18.41 dBm
Occupied Bandwidth: 2820 kHz

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

INDUSTRY CANADA STATEMENTS

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

This device has been designed to operate with the antennas listed below, and having a maximum gain of 7.0 dB. Antennas not included in this list or having a gain greater than 7.0 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

Note: The Niles RF Module will be professionally installed and will not be sold to third parties.

Approved Antennas
PCB "F" Antenna - Gain of 4.56 dBi
Wire (Whip) Antenna – Gain of 2.37 dBi
BNC Antenna Cortec Product Number AN2400-3101BN – Gain of 4.37 dBi
Heat-Shrink Antenna Cortec Model AN2400-0652BO – Gain of 1.26 dBi
PR-SMA Antenna (Straight) Hyperlink Model HG2402RD-RSF – Gain of 6.96 dBi
PR-SMA Antenna (Bent) Hyperlink Model HG2402RD-RSF – Gain of 6.36 dBi

Niles Responsibilities to comply with FCC and Industry Canada Regulations

The **ZM001, ZM002, ZM003, ZM004 and ZM005** Modules have been certified for integration into products only by Niles Audio Corporation under the following conditions:

1. The antenna(s) must be installed such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and all persons at all times.
2. The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

As long as the two conditions above are met, further transmitter testing will not be required. However, Niles Audio Corporation is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for certain configurations or co-location with another transmitter), then the FCC and Industry Canada authorizations are no longer considered valid and the FCC ID and IC Certification Number cannot be used on the final product. In these circumstances, Niles Audio Corporation will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC and Industry Canada authorization.

End Product Labeling

The Niles RF Radio Module is labeled with its own FCC ID and IC Certification Number. If the FCC ID and IC Certification Number are 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. In that case, the final end product must be labeled in a visible area with the following:

"**Contains Transmitter Module FCC ID: NFL-IRMT2006"**
"**Contains Transmitter Module IC: 6347A-IRMT2006"**
or
"**Contains FCC ID: NFL-IRMT2006"**
"**Contains IC: 6347A-IRMT2006"**

Niles Audio Corporation must only use the approved antenna(s) listed above, which have been certified with this RF Radio module.

Niles Audio Corporation will not provide information to the end user regarding how to install or remove this RF module or change RF related parameters in the user manual of the end product.

The user manual for the end product must include the following information in a prominent location:

"To comply with FCC and Industry Canada RF radiation exposure limits for general population, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and all persons at all times and must not be co-located or operating in conjunction with any other antenna or transmitter."