

REPORT	
Document Title	Report No.
SOP-23-2: Wireless Module Manual	

1. PURPOSE

The WMODHP is a direct sequence spread spectrum transceiver module designed to be used in the 2.4 GHz ISM band. This module is for internal use only and is not sold as a device on the market. The WMODHP module is integrated into the Audio Pathway System by Innovere.

2. REGULATORY INFORMATION

The integrator is responsible for testing their end-product for any additional compliance requirements with this module installed. Published FCC Module integration and RF Exposure guidance as well as label requirements should be followed in the end product. As the module does not have a RF Shield, Spurious radiated emission should be evaluated per Module integration guidance.

The end product with this module may be subject to some other form of authorization or testing requirements, e.g. FCC part 15 and ICES-003 unintentional emission test requirement. It is the integrator's responsibility to comply with all applicable rules and be properly authorized.

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

2.1. Regulatory labelling

The radio module will be labelled with the following information:

FCC ID: 2ATDA -WMODHPA
IC: 25063-WMODHPA

This label is valid for the following module variants:

Antenna	Maximum gain	Firmware power setting	Number of channels
F-style trace antenna (link)	+3.3 dBi	<= 0dBm	1 – 17
U.FL ceramic patch antenna (WPC.25A.07.0150C)	+0.5 dBi	<= 0dBm	1 – 17
U.FL sticker antenna (FXP70.07.0053A)	+1.1 dBi	<= 0dBm	1 – 17

If the FCC ID and IC number is not visible when WMODHP is installed inside a host device, then the host device must contain the FCC ID number with the statement such as the following:

Contains
FCC ID: 2ATDA –WMODHPA
IC: 25063-WMODHPA

2.2. FCC regulator statements

This device complies with Part 15.247 of the FCC unlicensed transmitter rules.

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

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- (2) This device must accept any interference received, including interference that may cause undesired operation.

2.3. IC regulator statements

This device complies with Industry Canada license-exempt RSS standard(s). 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CAN ICES-3 (B)/NMB-3(B)

3. OPERATIONAL MODES

3.1. Frequencies

The Innovere wireless module supports 17 frequency channels, with channel 1 centered at 2406 MHz and channel 17 centered at 2470 MHz. Each channel has a bandwidth of 4 MHz.

4. HARDWARE DESCRIPTION

The Innovere wireless module is a small PCB with a wireless audio chip (CC8530), an RF amplifier (CC2592), an F-type trace antenna, and a U.FL antenna connector. The antenna can be selected by populating a jumper resistor. The module is powered by an on-board voltage regulator and connects to its host using a 14-pin mezzanine connector. Clocking is done by means of a 48 MHz crystal oscillator.

Figure 1 shows the pinout of the mezzanine connector. It contains pins for power, an SPI control interface, and an I2S digital audio interface. Figure 2 shows the orientation of the mezzanine connector on the bottom of the wireless module.

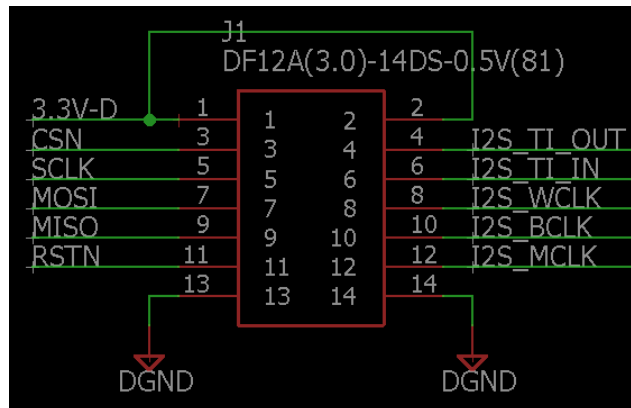


Figure 1. Mezzanine connector pinout

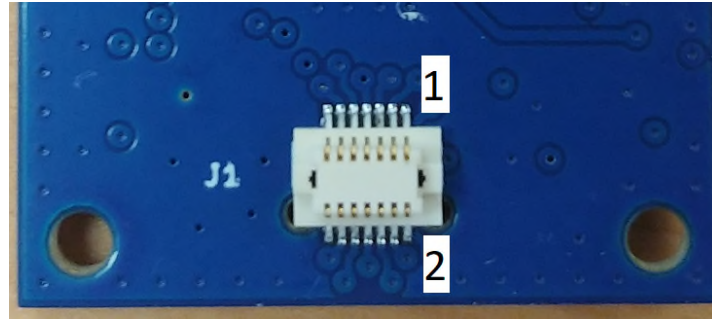


Figure 2. Location of pins 1 and 2

5. PROGRAMMING

The Purepath Wireless Configurator software is used to generate and load the wireless module configuration files used in the Innovere system. For regulatory testing, the module can be loaded with various regulatory test images using the Purepath Wireless Commander software. The wireless module is programmed by using a Purepath Wireless Audio EB evaluation board and a CC debugger.

6. SOFTWARE CONTROL

The CC8530 on the Innovere Wireless Module is configured in host control mode. In this mode, the device needs to be controlled by a host microcontroller using an SPI interface. The CC85xx Family User Guide describes the commands that are used to control the wireless module, as well as the method of sending the command packets over the SPI interface.

7. PAIRING PROCEDURE

The pairing feature of the wireless modules allows the components of the Innovere system to be modular, meaning that any individual component of the wireless pathway can be swapped out in the field without having to reprogram or reconfigure it.

Each wireless module is identified using two different names. The device ID is a 32-bit value that is hardcoded and unique for every CC8530 device. The product ID is a 32-bit value that is written into the flash memory of the CC8530 chip and is different for each individual component in the wireless pathway of the Innovere system. Every slave component of the wireless audio pathway has been configured to only recognize masters with a specific product ID depending on the component.

When the slave module is started up in pairing mode, it will scan for a network broadcast by a master module with the correct product ID. Upon finding a suitable master, the slave will attempt to connect to it, and upon a successful connection will store its unique device ID in its internal memory.

When the slave module is started up in its regular connection mode, it will scan for and connect to the master whose unique device ID is stored in its internal memory.

8. DATA SIDE CHANNEL

The data side channel (DSC) is a stream of user-specified data that is sent alongside the audio data stream in the wireless pathway. This data channel is bidirectional and can be used to send packets of generic data bytes. In the Innovere system, DSC packets are currently only sent upstream (from the slave to the master) and are used to communicate connection status and battery level. When connected to a master, the slave module will periodically feed data upstream to the master. Likewise, the master is set to periodically poll its DSC buffer for data received from the slave.

9. Version history

Version	Author(s)	Change(s) – Include CO#
000	Andy Li	CO-2019-

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