Harvard Technology

wireless · connected · lighting

Integrators Document for Radio Module

WMVRB-868	868MHz variant for use in Europe
WMVRB-915USA	915MHz variant for use in America / Canada
WMVRB-915ANZ	915MHz variant for use in Australia / New Zealand

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Revision History

Date	Version	Name	Description of Update
4/5/16	0.1	AMW	*Pre Release Draft*

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Product Overview

The WMVRB, known informally as the vertical radio board, is a radio module which allows wireless connectivity to be added to street lighting products which require an interface to a WiMAC installation.
The module behaves in the same way as the existing product, known as a leafnode, behaves.
A single connector provides both a power connection and a data connection.
The motherboard which accepts this module needs to communicate using the RSMS2 protocol.
The content of this protocol is confidential but parties providing integration to this module can obtain a copy of the protocol from Harvard Technology subject to entering into an appropriate information sharing agreement.

Interfaces

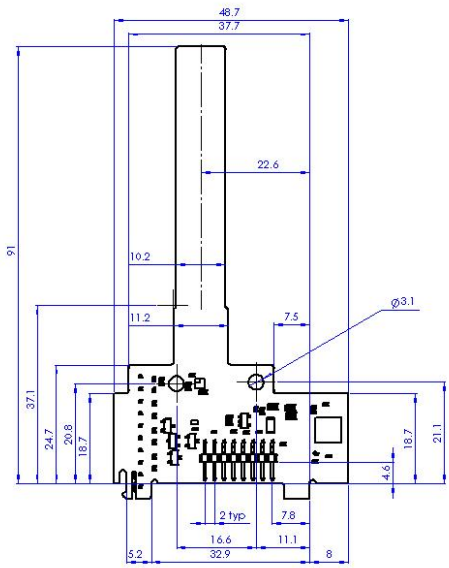
Supply: 5V to 6V power input drawing less than 100mA
Data: A TTL signal referenced to the common ground is used for communication with the motherboard

Comment [AW1]:

Comment [AW3]:

Comment [AW2]: Require

details of motherboard socket part number
drawing of motherboard socket and locating pegs



Connectivity

TBS42

Pin	Purpose		
1	Do not connect		
2	Do not connect		
3	Gnd		
4	5V		
5	Gnd		
6	Do not connect		
7	RSMS2 comms		
8	Gnd		

Regional Operating Limitations

The RF Module WMVRB-XXX must be software configured to operate in one region only, and should not permit the user to alter the region of use.

Europe

The 868MHz variant of the module must be used (WMVRB-868)
The power level cannot exceed Leafnut level 7, which is a value of 5 in the radio board configuration packet. This equates to circa 14dBm EIRP.
The 8 channel hopping scheme must be used.
In addition to the packet length restrictions below, the module shall also have a duty cycle of <=1% measured over one hour.

North America / Canada

The USA 915MHz variant of the module must be used (WMVRB-915USA)
The power level cannot exceed Leafnut level 8, which is a value of 6 in the radio board configuration packet. This equates to circa 17dBm EIRP.
The 64 channel hopping scheme must be used.

Australia / New Zealand

The Australia 915MHz variant of the module must be used (WMVRB-915ANZ)
The power level cannot exceed Leafnut level 8, which is a value of 6 in the radio board configuration packet. This equates to circa 17dBm EIRP.
The 32 channel hopping scheme must be used.

Comment [AW4]: The power level for all 3 regions needs to be defined in a new way now that we are on si106x via RSMS2

General Operating Conditions

The data packet must comply with the Leafnut protocol for the data packet being transmitted or received.
This must use a baud rate of 2400.
This packet must be no more than 92mS long.
The data packet should be transmitted no more than once in every 2 second period.
The module shall not be used on any product that will be operated at less than 20cm from a person's body[1]

Comment [AW5]: We don't actually have access to that low a level of data

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

[1] Evaluating Compliance with FCCGuidelines for Human Exposure to Radiofrequency Electromagnetic Fields
http://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet65/oet65c.pdf

Frequncy of operation

Region Required	Band Value	Required channel numbers	Range of frequencies
UK / Europe	1	0-7	868.125 – 868.475 MHz
North America / Canada	2	0-63	905.2 – 915.91 MHz
Australia / New Zealand	6	0-31	921.7 – 926.97 MHz

Labelling and documentation requirements

North America

Comment [AW6]: This whole section needs updating with the correct module id and fcc id etc.

In North America the module WMVRB-915USA should be used.
This has the following IDs
Model: WMVRB-915USA
FCC ID: 2AGAAWMVRB915
IC: 11286A-WMVRB915
Any equipment utilising this module must bear the text:
Contains FCC ID: 2AGAAWMVRB915
Contains IC: 11286A-WMVRB915
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.

Canada

In Canada the module WMVRB-915USA should be used.
This has the following IDs
Model: WMVRB-915USA
FCC ID: 2AGAAWMVRB915
IC: 11286A-WMVRB915
Any equipment utilising this module must bear the text:
Contains FCC ID: 2AGAAWMVRB915
Contains IC: 11286A-WMVRB915
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.

INDUSTRY CANADA STATEMENTS

This device complies with Industry Canada licence-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.
Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. 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 necessary for successful communication.
This radio transmitter (WMVRB-915USA) has been approved by Industry Canada to operate with the built in antenna. Alternative antennae are strictly prohibited for use with this device.

OEM Responsibilities

The WMVRB-915USA Module has been certified for integration into products only by OEM integrators 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, the OEM integrator 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 can not be met (for certain configurations or co-location with another transmitter), then Industry Canada

certification is no longer considered valid and the IC Certification Number can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Industry Canada authorization.

End Product Labeling

The WMVRB-915USA Module is labelled with its own IC Certification Number. If the IC Certification Number 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. In that case, the final end product must be labeled in a visible area with the following:

"Contains Transmitter Module IC: 11286A-WMVRB915"

or

"Contains IC: 11286A-WMVRB915"

The OEM of the WMVRB-915USA Module must only use the approved antenna(s) listed above, which have been certified with this module.

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module or change RF related parameters in the user's manual of the end product.

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

"To comply with 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."

Australia / New Zealand

In Australia, New Zealand the module WMVRB-915ANZ should be used.

This has the following IDs

Model: WMVRB-915ANZ

Europe

In Europe there are no additional marking requirements