EDGE Essential Raspberry Pi RM0
Quick Start Guide

NOTE: This guide does not provide detailed installation, safety or operational instructions.

Please scan the QR Code to access the complete manuals or visit the website:
Cumberland: *http://www.cumberlandpoultry.com*
AP: *http://www.automatedproduction.com*

The EDGE Essential System is manufactured by GSI Electronics Inc., Canada.

NOTE: Search for 892-00117 to have electronic version of this document in the manuals search engine.

1 - TECHNICAL SUPPORT

For Technical support, please call the following phone numbers: For Tech Support in Canada: Dial 1-877-926-2777 and press 9 for English, followed by 1.

For Tech Support in USA: Dial 1-712-239-1011

2 - MODULE INTEGRATION

2-1. Purpose

The purpose of this document is to provide information on how to use a Raspberry Pi RM0 as a radio module when integrating into a host product.

Incorrect integration or use may infringe compliance rules meaning recertification may be required.

2-2. Module Description

The Raspberry Pi RM0 module has an IEEE 802.11b/g/n/ac 1x1 WLAN module based on the 43455 chip. The module is designed to be mounted to a PCB into a host product. The module must be placed in a suitable location to ensure radio performance is not compromised. The module must be used with pre-approved antenna only.

2-3. Integration into Products

2-3-1. Module and Antenna Placement

A separation distance greater than 20 cm will always be maintained between the antenna and any other radio transmitter if installed in the same product.

Any external power supply of 5V should be supplied to the module and shall comply with relevant regulations and standards applicable in the country of intended use.

At no point should any part of the board be altered as this will invalidate any existing compliance work. Always consult professional compliance experts about integrating this module into a product to ensure that all certifications are retained.

2-4. Antenna Information

The module is approved for use with an antenna on the host board and supports only 2.4 GHz bands when used with an external patch antenna (peak gain of 2.6 dBi). The antenna must be positioned appropriately inside the host product to ensure optimal operation. Do not place it near metal casing.

Strict adherence to the pre-approved antenna design is required. Any deviation will invalidate the module's certifications.

- The Antenna (Molex Inc., Part Number: 1461530200) is connected to the UFL connector (Taoglas RECE.20279.001E.01), which is connected to the RF switch (Skyworks Part Number: SKY13351-378LF) and directly connected to the RM0 module. *Refer to Figure 2-1.*
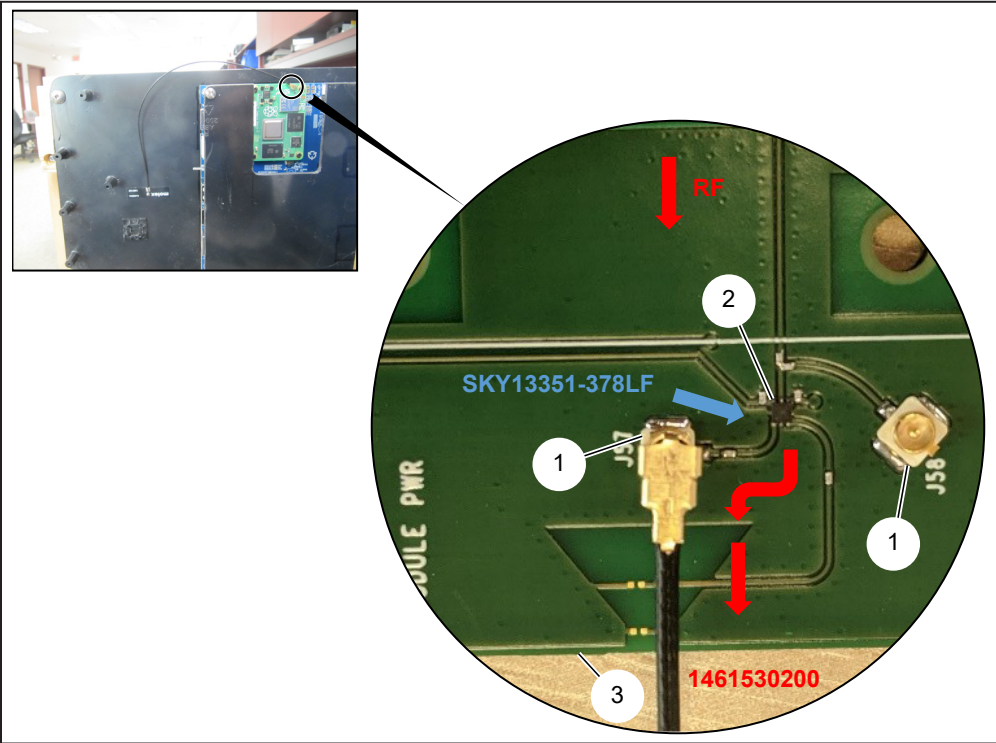

Figure 2-1.   Connecting the Antenna to the RM0 Module

Ref #	Part Number	Description
1	RECE.20279.001E.01	UFL Connector
2	SKY13351-378LF	RF Switch
3	-	RM0 Module

Do not deviate from any part of the specified antenna list.

The routing to the UFL connector or switch must maintain a 50 ohms impedance with suitable ground stitching vias along the trace route. The trace length must be minimized by placing the module and antenna close together. Avoid routing the RF output trace over any other signals or power planes, ensuring it references only ground.

The antenna must be placed at the edge of the PCB with appropriate grounding around its shape. The antenna consists of the RF feed line (routed with 50 ohms impedance) and a cutout in the ground copper. To ensure proper functionality, the design's performance must be plotted, and the peak gain must be calculated to confirm it does not exceed the specified limits stated in this document. During production, the antenna's performance must be verified by measuring the radiated output power at a fixed frequency.

To test the final integration, obtain the latest test files from compliance@raspberrypi.com.

Any deviation from the defined parameters of the antenna trace, as specified in the instructions, requires the host product manufacturer (integrator) to notify the module grantee (Raspberry Pi) of the intended design change. In such cases, a Class II permissive change application must be filed by the grantee, or the host manufacturer must assume responsibility by applying for a new FCC ID, followed by a Class II Permissive Change application.

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The modular transmitter is FCC authorized only for the specific rule parts (i.e., FCC transmitter rules) listed on the grant. The host product manufacturer is responsible for ensuring compliance with any other applicable FCC rules not covered by the modular transmitter's grant of certification. If the grantee markets the product as Part 15 Subpart B compliant (when it includes unintentional-radiator digital circuitry). The final host product must still undergo Part 15 Subpart B compliance testing with the modular transmitter installed.

2-5. End Product Labelling

A label must be affixed to the exterior of all products containing the Raspberry Pi RM0 module. The label must include: "Contains FCC ID: 2AFLZRPIRM0" (for FCC) and "Contains IC: 11880A-RPIRM0" (for ISED).

2-5-1. FCC
Raspberry Pi RM0 FCC ID: 2AFLZRPIRM0

This device complies with Part 15 of the FCC Rules. 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.

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

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 or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a different circuit than the one the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for assistance.

For products available in the USA/Canada, only channels 1 to 11 are available for 2.4 GHz WLAN.

This device and its antenna(s) must not be co-located or operated in conjunction with any other antenna or transmitter except in accordance with the FCC's multi-transmitter procedures.

> **NOTE:**
> **FCC Radiation Exposure Statement:**
> - Co-location of this module with other transmitters operating simultaneously must be evaluated using the FCC multi-transmitter procedures.
> - This device complies with FCC RF radiation exposure limits for an uncontrolled environment. The host device contains an antenna and must be installed to maintain a separation distance of at least 20 cm from all persons.

2-5-2. ISED
Raspberry Pi RM0 IC: 11880A-RPIRM0

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.

For products available on the USA/Canada market, only channels 1 to 11 are available for 2.4 GHz WLAN Selection of other channels are not possible.

Pour les produits disponibles sur le marché USA/Canada, seuls les canaux 1 à 11 sont disponibles pour le réseau local sans fil 2,4 GHz. La sélection d'autres canaux n'est pas possible.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures.

Cet appareil et son antenne(s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

> **NOTE:**
> **IC Radiation Exposure Statement:**
> - This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum separation distance of 20 cm between the device and all persons.
> - Cet équipement est conforme aux limites d'exposition au rayonnement IC RSS-102 définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance de séparation minimale de 20 cm entre l'appareil et toutes les personnes.

3 - INTEGRATION INFORMATION FOR THE OEM

It is the responsibility of the OEM/host product manufacturer to ensure continued compliance with FCC and ISED Canada certification requirements once the module is integrated into the host product. Refer to FCC KDB 996369 D04 for additional information.

The module is subject to the following FCC rule parts: 15.207, 15.209, 15.247, 15.403 and 15.407.

3-1. Host Product User Guide Text

3-1-1. FCC Compliance

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.

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

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 or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a different circuit than the one the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for assistance.

For products available in the USA/Canada, only channels 1 to 11 are available for 2.4 GHz WLAN.

This device and its antenna(s) must not be co-located or operated in conjunction with any other antenna or transmitter except in accordance with the FCC's multi-transmitter procedures.

> **NOTE:**
> **FCC Radiation Exposure Statement:**
> - Co-location of this module with other transmitters operating simultaneously must be evaluated using the FCC multi-transmitter procedures.
> - This device complies with FCC RF radiation exposure limits for an uncontrolled environment. The host device contains an antenna and must be installed to maintain a separation distance of at least 20 cm from all persons.

3-1-2. ISED Canada Compliance

This device complies with Industry Canada license-exempt RSS standards. 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.

For products available in the USA/Canada, only channels 1 to 11 are available for 2.4 GHz WLAN. Selection of other channels are not possible.

Pour les produits disponibles sur le marché USA/Canada, seuls les canaux 1 à 11 sont disponibles pour le réseau local sans fil 2,4 GHz. La sélection d'autres canaux n'est pas possible.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with Industry Canada (IC) multi-transmitter product procedures.

Cet appareil et son antenne(s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

> **NOTE:**
> **IC Radiation Exposure Statement:**
> - This equipment complies with IC RSS-102 radiation exposure limits for an uncontrolled environment. This equipment should be installed and operated with a minimum separation distance of 20 cm between the device and all persons.
> - Cet équipement est conforme aux limites d'exposition au rayonnement IC RSS-102 définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance de séparation minimale de 20 cm entre l'appareil et toutes les personnes.

3-1-3. Host Product Labelling

The host product must be labeled with the following information:

"Contains TX FCC ID: 2AFLZRPIRM0"

"Contains IC: 11880A-RPIRM0"

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.

> **IMPORTANT: The FCC Part 15 text must be placed on the host product unless the product is too small to accommodate a label with the text. It is not acceptable to include the text only in the user guide.**

3-1-4. E-Labelling

The host product can use E-labeling provided it meets the requirements of FCC KDB 784748 D02 E-labeling and ISED Canada RSS-Gen, Section 4.4.

E-labeling applies to the FCC ID, ISED Canada certification number, and FCC Part 15 text.

3-1-5. Changes in Usage Conditions of this Module

This device has been approved as a mobile device in accordance with FCC and ISED Canada requirements. This means a minimum separation distance of 20 cm must be maintained between the module's antenna and any person.

Any change in use that reduces the separation distance of ≤20 cm (portable usage) between the module's antenna and any person is considered a modification to the module's RF exposure. Such changes require an FCC Class 2 Permissive Change and an ISED Canada Class 4 Permissive Change in accordance with FCC KDB 996396 D01 and ISED Canada RSP-100.

As noted above, this device and its antenna's must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures.

If the device is co-located with multiple antennas, the module may be subject to an FCC Class 2 Permissive Change and an ISED Canada Class 4 Permissive Change in accordance with FCC KDB 996396 D01 and ISED Canada RSP-100.

In accordance with FCC KDB 996369 D03, Section 2.9, test mode configuration information is available from the module manufacturer for the host (OEM) product manufacturer.

Use of any antennas other than those specified in *Section 2-4* of this installation guide is subject to the Permissive Change requirements of the FCC and ISED Canada.