

Integration Manual

**SANGOMA-MSMA
2V5**

13.56 MHz Multi Standard - Multi Antenna Reader/Writer

Manual version 1.1

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1. Short description

Power supply

USB : 5V (+0,25V-0,6V) via Mini USB Connector and cable

Note: it is recommended to use a clip on ferrite on the USB cable on module side.

Operating temperature: -20°C to 85°C

Storage temperature: -20°C to 85°C

Supported 13,56MHz RF standards

- ISO/IEC 14443 – ASK modulation
- ISO/IEC 15693 – ASK modulation (support depends on used RF frontend derivative)

USB host communication (via VCP Virtual COM port)

Antenna connection:

twisted tree wire cable with three pin gold plated JR header and connector on Sangoma MSMA module.

Short functional description:

Once the reader device is connected and USB power is available, the device boots up. The RF field remains switched OFF. The reader firmware has reader and RFID tag related commands implemented.

If a tag command is sent to the specified antenna port the respective channel will be activated, the RF field is switched on for the duration of the tag processing and will be automatically switched off after the tag response has been received.

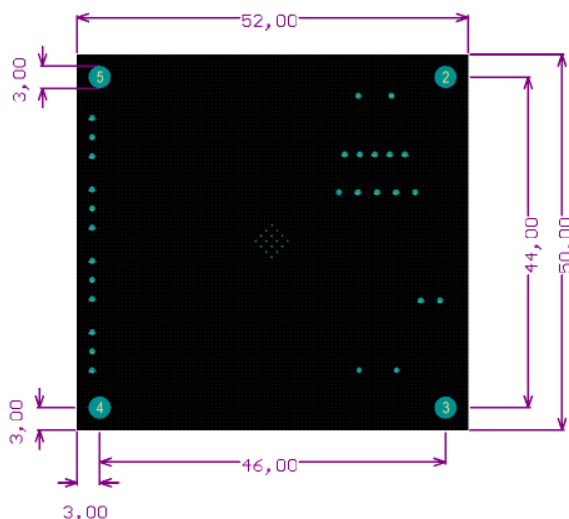
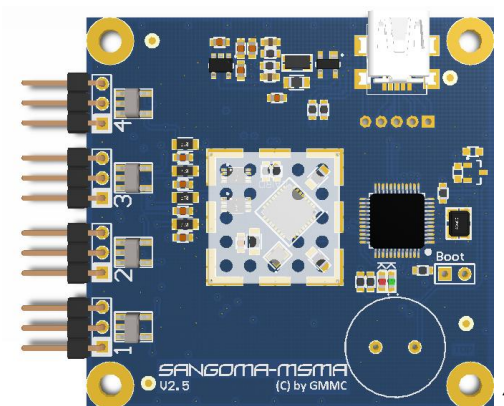
The two on board status LEDs (RED/GREEN) are disabled per default after booting the device and need to be switched on by using the "DO" command as described in the SANGOMA-MSMA user manual.

Reader module related commands do not switch on the RF field. For the full set of available commands please refer to the SANGOMA-MSMA user manual.

2. Module and antenna installation

2.1 Physical dimensions

- Outer dimensions 52mm (2,05 inch) x 50 (2,97 inch)
- Mounting holes (diameter 3mm/0,012inch).
-



- Mount the module properly into the end device.
- Mounting holes are connected to system ground – it is recommended to connect at least one mounting whole to the end-device's system ground.
- Connect the antenna(s) to the respective channels (1-4) on the module as shown in chapter "connecting antennas"

Note: the connector is symmetrical and the connector direction (0° or 180°) do not have influence on functionality or RF compliance. The antennas are connected with an unshielded 3 wire twisted cable of a length from 10 cm up to 200cm. Standard cable length are 60 and 75 cm.

- Attach power to the module via a (Mini) USB cable to the end device's application host – it is recommended to apply a click on ferrite on the USB cable on module side.

3. FCC and IC certified antennas:

There is a range of suitable antennas available for the SANGOMA MSMA module from GMMC to cover different applications, use cases and installation environments.

Four different antennas have been FCC and IC certified and can be attached to the module in any desired mix.

The FCC and RSS certified antennas and part numbers are listed below:

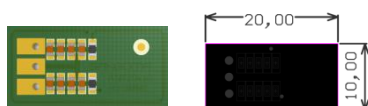
Connetor cable: unshielded twisted 3 wire cable with gold plated JR module connector.

The below antennas have been certified for a maximum antenna connection cable length of up to 200 cm.

SANGOMA-ANT2010

Physical dimensions: 20x10 mm

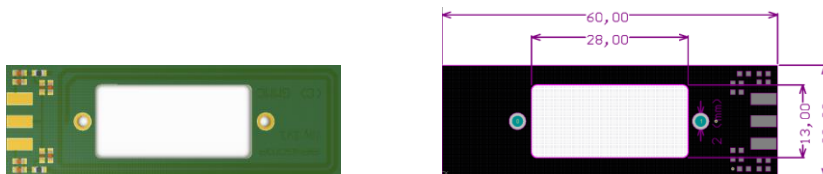
GMMC part number: SANGOMA-ANT2010



SANGOMA-Jay 1v1

Physical dimensions: 60x20 mm

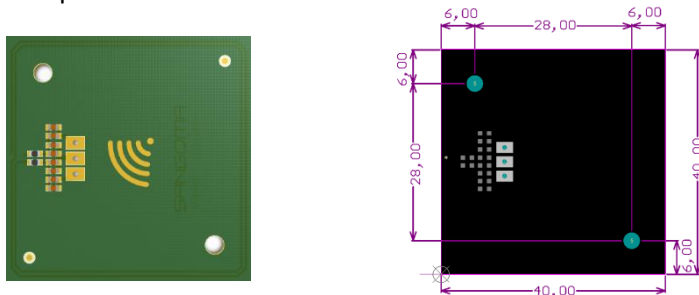
GMMC part number: SANGOMA-ANTJAY6020



SANGOMA-ANT4040

Physical dimensions: 40x40 mm

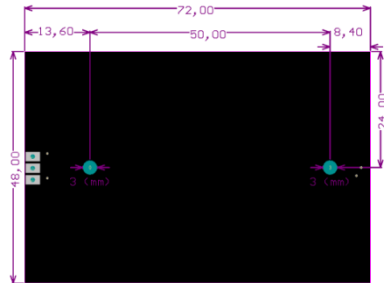
GMMC part number: SANGOMA-ANT4040¹⁾



SANGOMA-ANT7248

Physical dimensions: 72x48 mm

GMMC part number: SANGOMA-ANT7248.

Other antenna shapes / sizes upon request ¹⁾**Note:**

- 1) Please note that other than the above listed antennas have not been FCC or RSS certified.
 - a. Usage of the module with other antennas than listed above or cable length longer than 200cm (max. length) require FCC / RSS re-certification.

4. FCC and RSS compliance statements

FCC COMPLIANCE STATEMENT

NOTE:

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!

The Federal Communications Commission (FCC) warns the users that changes or modifications to the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC §15.105 (b):

Note: 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:

- 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.

RSS COMPLIANCE STATEMENT

RSS COMPLIANCE STATEMENT

This device complies with Industry Canada's licence-exempt RSSs. 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;
- 2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

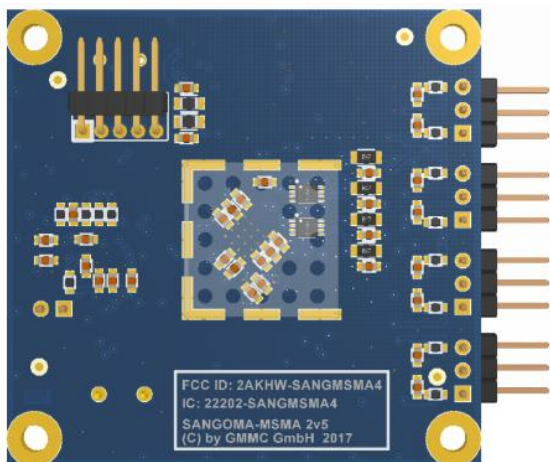
User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi)

5. FCC and IC information label location

The required FCC ID and IC identifiers are located on the silk screen on the back side of the module as shown in below image.



6. End device labeling instructions

FCC notes for a host devices. The end device must be labeled with:

Contains FCC ID: **2AKHW-SANGMSMA4**

Contains IC: **22202-SANGMSMA4**

Labelling Requirements

In addition following statement shall be placed on the device:

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.

Where the product is so small or for such use that it is not practicable to place the statement on it, the statement can be placed in a prominent location in the instruction manual.

Information to the user

- For Class A devices the manual of the host shall include the following statement:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- For Class B devices the manual of the host shall include the following statement:

Note: 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:

- 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.

Modification of equipment

The instruction manual of the host shall include the following statement: Changes or modifications made to this equipment not expressly approved by the party responsible for compliance may void the FCC authorization to operate this equipment.

Special accessories

Where special accessories such as shielded cables and/or special connectors are required to comply with the emission limits, the instruction manual shall include appropriate instructions on the first page of the text describing the installation of the device.

Final Compliance of end product

The integrator is responsible for the final compliance of the end product including this certified transmitter module. CFR 47 §15.101 give guidance in terms of applicable equipment authorization procedures of different end-products. Typically compliance to subpart 15 B (§15.107 and 15.109) Class A or B including verification of the subpart 15 C compliance (field strength of fundamental and out-of-band emissions) of the transmitter parameters apply.

Simultaneous transmission

When the host product supports simultaneous-transmission operations the host manufacturer needs to check if there are additional RF exposure filing requirements due to the simultaneous transmissions. When additional application filing for RF exposure compliance demonstration is not required (e. g. if the SANGOMA-MSMA 2V5 module in combination with all simultaneously operating transmitters complies with the RF exposure simultaneous transmission SAR test exclusion requirements), the host manufacturer may do his own evaluation without any filing, using reasonable engineering judgment and testing for confirming compliance with out-of-band, restricted band, and spurious emission requirements in the simultaneous-transmission operating modes. If additional filing is required please contact the person at GMMC GmbH responsible for certification of the SANGOMA-MSMA 2V5 module.

7. Revision history

Version	Remarks	Date	
V1.0	Initial released version	5 th April 2017	DI Michael Ganzera
V1.1	Minor corrections added	30 th April 2017	DI Michael Ganzera