

User Manual / Integration Manual

eGym RFID Board v2

Type

Standalone

FCCID: 2APOCEGYMRFID02S
IC: 23832-EGYMRFID02S

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1. SYSTEM OVERVIEW

The eGym RFID Board v2 is a reader for RFID transponders operating at 13.56 MHz; it supports standards ISO14443A, ISO14443B and ISO15693.

The board has USB as well as UART connectors which are used for communication and for power. When connected via USB the eGym RFID Board v2 will automatically establish a connection to the USB equipped host device (It may be the case that a USB driver provided by STMicroelectronics[www.st.com] must be installed). The RFID-Communication between the eGym RFID Board v2 and an RFID transponder is handled by the eGym RFID Board v2. When the communication between eGym RFID Board v2 and a RFID transponder is successful, the UID of the transponder is transmitted over the USB or UART line.

The RFID Antenna is integrated on the PCB as a printed trace.

On the backside of the board five RGB LEDs are mounted. The control of the lights and its animations are done automatically by the eGym RFID Board v2.

2. POWER SUPPLY

The eGym RFID Board v2 needs to be powered by 5 Volts supplied either via USB, i.e. standard USB power, or via the UART connector (see Chapter 3).

3. CONNECTORS

UART:

Pin	Description
1	GND
2	GPIO2
3	GPIO1
4	UART_RX
5	UART_TX
6	+5V

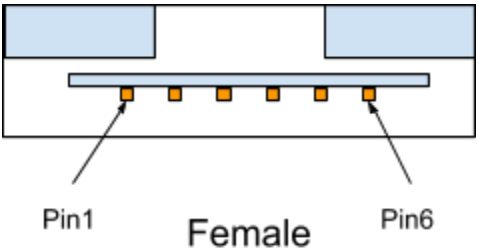
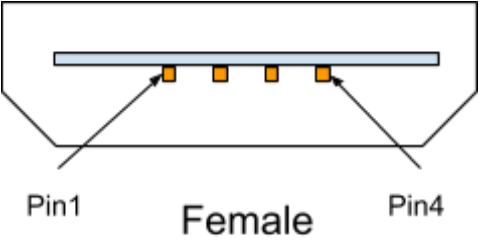


Chart 1: Pinout UART connector

USB:

For USB a standard micro-USB connector is used with standard pin-out.

Pin	Description
1	Power
2	Data1
3	Data2
4	GND



The diagram shows a female micro-USB connector with four pins. The pins are labeled Pin1, Pin2, Pin3, and Pin4 from left to right. The word 'Female' is written below the pins. Arrows point from the labels to the corresponding pins.

Chart 1: Pinout UART connector

4. MOUNTING AND PLACEMENT OF THE READER

The eGym RFID Board v2 can be mounted by using the 4 screw holes, M3 screws are recommended.

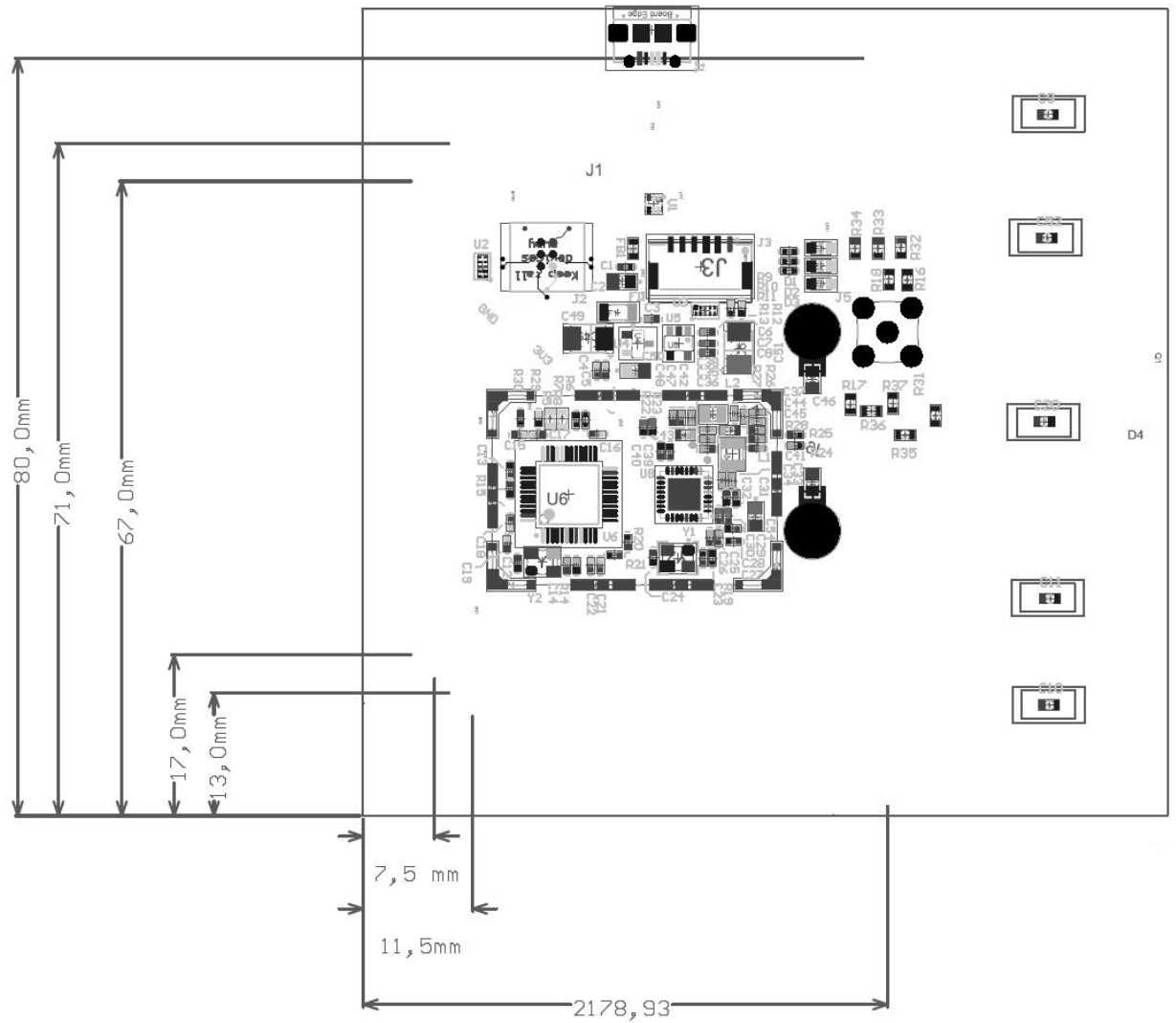


Figure 1: Top view of the eGym RFID Board v2

To provide an as-good-as-possible read range, no metal plates should be in front or behind the reader's antenna. The read range is influenced by its surrounding materials.

Due to vias on the backside of the PCB, the PCB shouldn't be directly placed on electrically conducting material.

5. SETTING UP THE DEVICE

Before the eGym RFID Board v2 may be used, the STMicroelectronics USB driver must be installed, as mentioned in Section 1.

1. Connect the eGym RFID Board v2 to a USB host device using a micro USB cable. (See Sections 2 and 3)
2. When the device is appropriately powered, the device will turn on. This is represented by LED 1 (See Figure 2) turning on.
3. Shortly after start up the device enters a bootloader, checking for available software. This is represented by LED 2 and LED 3 blinking.
4. After 2 minutes the bootloader exists and the device goes into its RFID searching state; represented by all LEDs turning off.
5. While in searching state the five RGB LEDs turn on and animate a wave animation.
6. When an RFID-Transponder, compliant to one of the RFID-Standards mentioned in Section 5, is put in front of the reader's antenna and a successful communication is established, the UID of the Tag is sent via USB or UART to the host device. The RGB LEDs flash white when a successful read out was performed.

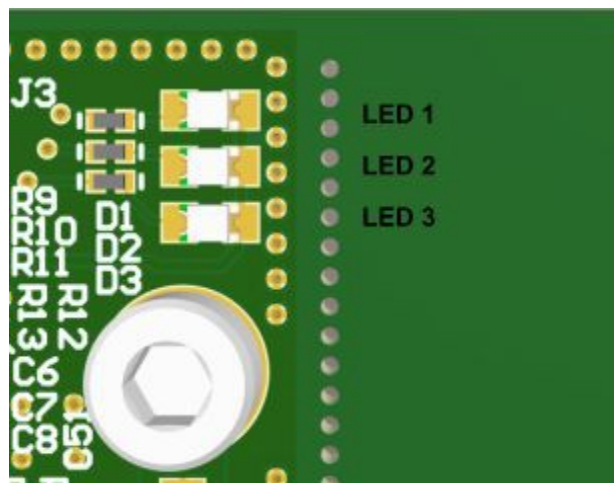


Figure 2: Mounted LEDs on the PCB

6. Technical Description:

Nominal voltage:	5 V
Voltage supply range:	4.75 V - 5.25 V
Temperature range:	-20 °C - +50 °C
RFID- Frequency:	13.56 MHz
Type of antenna:	PCB loop antenna
Supported RFID standards:	ISO14443A, ISO14443B, ISO15693

7. PRODUCT LABELING:

Printed on PCB:

eGym

Version 02

HVIN: eGym RFID Board v2

FCC ID: 2APOCEGYMRIFID02S

IC:23832-EGYMRIFID01S

8. NOTES:

USA:

FCC notes for a host subject to SDoC:

For a host device assembled with the certified module and subject to 47 CFR Part 15 of digital devices, the following statements have to be included in the user manual and the host device has to be labelled as noted below. If the host device is subject to other authorization procedures or parts the appropriate requirements of these authorization procedures or parts apply.

The end device must be labeled with:

Contains FCC ID: 2APOCEGYMRFID02S

Contains IC: 23832-EGYMRFID02S

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.

Information for the OEM (Integrator):

Co-location of this module with other transmitters that operate simultaneously are required to be evaluated using the FCC multi-transmitter procedures.

The host integrator must follow the integration instructions provided by the module manufacturer and ensure that the composite-system end product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules and to KDB Publication 996369.

The host integrator installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation and should refer to guidance in KDB 996369.

Information to the user:

(The instruction manual of the host shall include the following statement)

A compliance statement as applicable, e.g., for devices subject to part 15 of CFR 47 as specified in §15.19(a)(3), that the product complies with the rules; and the identification, by name, address and telephone number or Internet contact information, of the responsible party, as defined in §2.909. The responsible party for Supplier's Declaration of Conformity must be located within the United States.

Example for SDoC:

<p style="text-align: center;">Supplier's Declaration of Conformity</p> <p>Unique Identifier: (e.g., Trade Name, Model Number)</p> <p>Party issuing Supplier's Declaration of Conformity ABC Cooperation Street Address City, State Postal Code Country Telephone number or internet contact information</p> <p>Responsible Party - U.S. Contact Information Street, Address City, State Postal Code United States Telephone number or internet contact information</p> <p>FCC Compliance Statement (for products subject to Part 15)</p> <p>This device complies with Part 15 of 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.</p>

The compliance information statement shall be included in the user's manual or as a separate sheet. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form. The information may be provided electronically as permitted in §2.935.

NOTE: The Commission does not have a required SDoC format. This is an example only and is provided to illustrate the type of information that may be supplied with the product at the time of marketing or importation for meeting the FCC SDoC requirement.

Compliance statement:

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.

For class B devices:

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.

For class A devices:

FCC §15.105 (b):

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.

CANADA:

This device complies with Industry Canada's license-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.

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.

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. the RF 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 eGym responsible for certification of the RF module.