

# **CS203XL-2 EPC Class 1 Gen 2 RFID Reader User's Manual**



Version 2.1

***CSL: The One-Stop-Shop for RFID  
Solutions***

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## 1. FCC and IC Statement

FCC regulatory conformance:

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.

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

**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

**NOTE:** The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

## **RF Exposure**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 30 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## **IC regulatory conformance**

This device complies with CAN ICES-3 (B)/NMB-3(B).

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

Cet appareil est conforme à la norme CAN ICES-3 (B)/NMB-3 (B).

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.

This radio transmitter [8073A-CS203XL2CA] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna Type: Patch Antenna  
Max Antenna Gain: 6.79dBi  
Impedance: 50Ohms

## **RF Exposure**

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 30 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

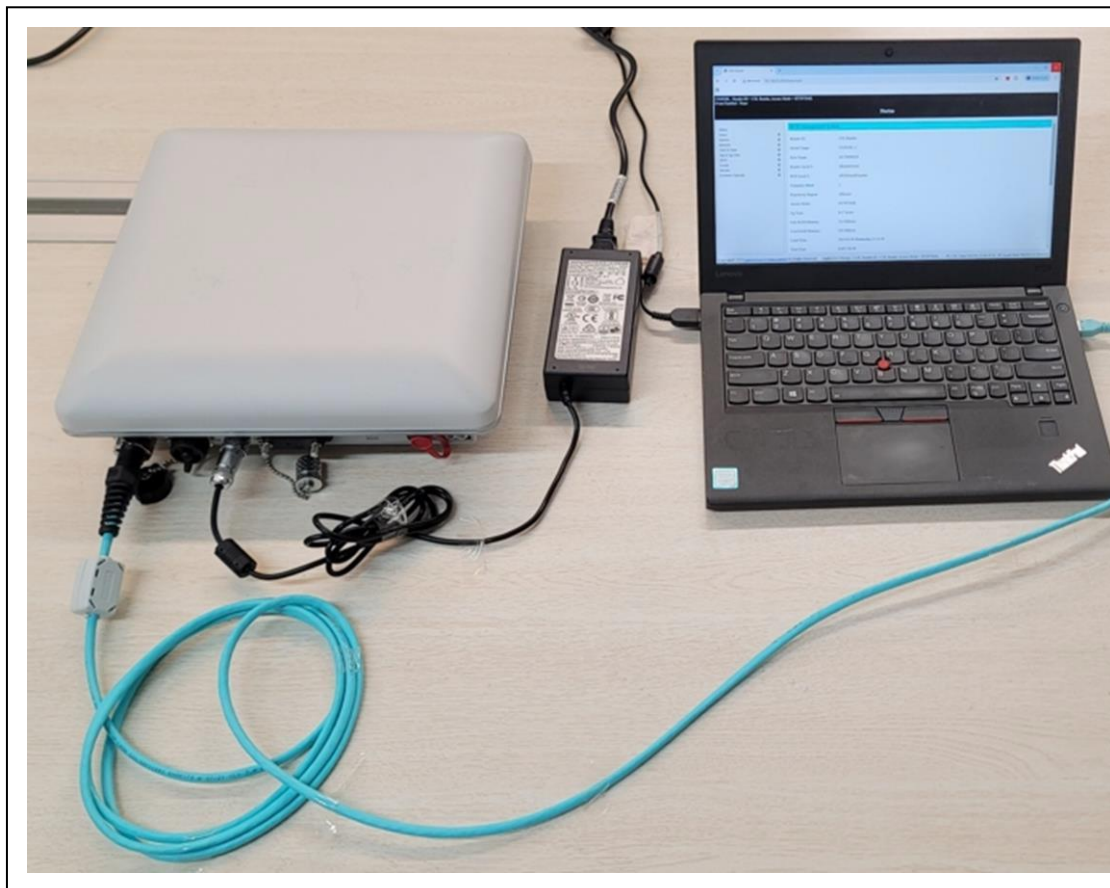
Cet équipement est conforme aux limites d'exposition aux rayonnements de la IC établies pour un environnement non contrôlé. Cet équipement doit être installé et fonctionner à au moins 30cm de distance d'un radiateur ou de votre corps.

## 2. Introduction on Features

### 2.1 CS203XL-2 RFID Fixed Reader

The CS203XL-2 RFID fixed reader is a reader designed to work with an any personal computer via the ethernet connection, where the application on the PCs would control the CS203XL-2 reader to perform RFID tag reading and GPIO port ON/OFF operation.

Below photo shows the typical connection during operation of CS203XL-2 fixed reader



Note: DO NOT use any antenna not including in the shipment package or specify within the product manual. Use only the Power Adaptor Unit included in the package.

## **2.2 Product Package**

### **2.2.1 Basic Package Content**

The reader package contains:

- A CS203XL-2 fixed reader – 1 piece
- Power Adaptor Unit – 1 piece
- Ethernet Cable – 1 piece

## 2.3 Product Specification



**Figure 1 CS203XL-2 Fixed Reader**

### **Features:**

- ISO 18000-6C and EPCglobal Class 1 Gen 2 UHF RFID protocol compliant including dense reader mode
- Ultra long read range – peak at more than 18 meters for Monza R6 Dogbone tag
- Sophisticated data handling for efficient management of large streams of tag data.
- Highly configurable buffering and tag filtering modes to eliminate the redundant tag data so as to reduce LAN traffic and server loading
- Robust performance in dense-reader environments
- Excellent in transmit and receive mode – generates a different combination of unique reader-to-tag command rate, tag-to-reader backscatter rate, modulation format, and backscatter type
- Configurable parameters offer maximum throughput and optimal performance
- Supports all Gen 2 commands, including write, lock and kill



**Specifications:**

<b>Physical Characteristics:</b>	Length: 30.0 cm; Width: 30.0 cm; Height: 8.7 cm; Weight: 3700 grams
<b>Environment:</b>	Operating Temp: -20°C to 55°C Storage Temp: -40°C to 85°C Humidity: 5% to 95% non-condensing
<b>Antenna:</b>	External antenna has a RP-TNC female connector
<b>RF Power:</b>	Internal conducted power 30 dBm
<b>EIRP Power:</b>	35 dBm (max.)
<b>RFID Frequency Ranges:</b>	902 -928 MHz band
<b>Connectivity</b>	Ethernet , Debug Serial(RS232)
<b>Accessories:</b>	Ethernet cable GPIO cable
<b>Order Code:</b>	CS203XL-2
<b>Restrictions on Use:</b>	Approvals, features and parameters may vary depending on country legislation and may change without notice

## 3. Introduction on Application

### 3.1 Basic Hardware

The CSL CS203XL-2 RFID Reader is an EPCglobal Class 1 Gen 2 handheld reader product.

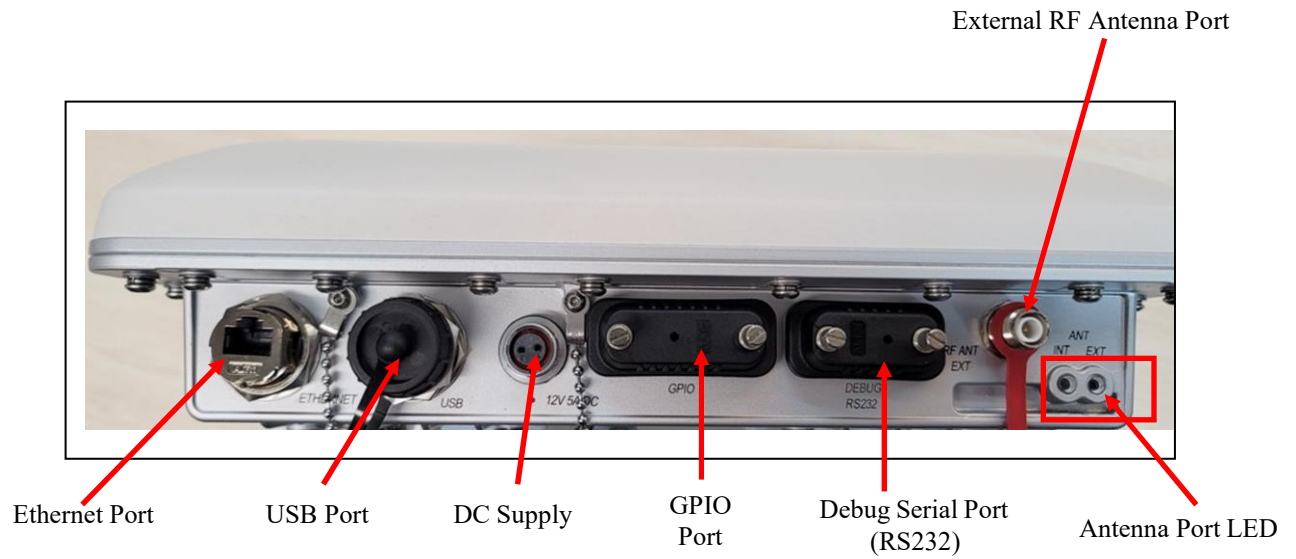
Below is the front view of the CS203XL-2 reader. There are LEDs at side to indicate the operating status

- 1) Power On
- 2) RFID Read
- 3) Active antenna port being selected (default internal)

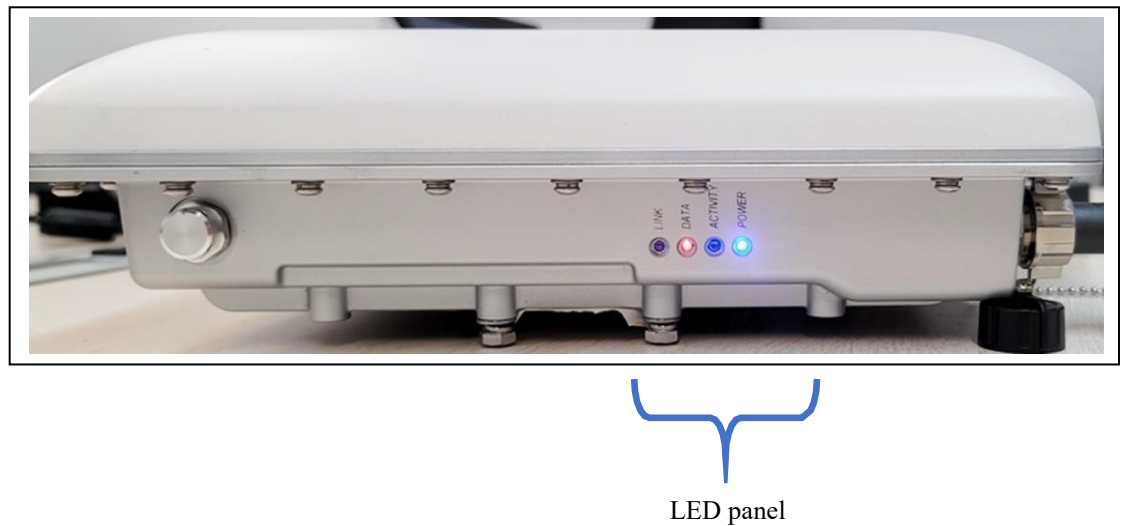


**Figure 2 CS203XL-2 Reader Front-side View**

Below is the bottom-side views of the CS203XL-2 reader.



**Figure 3 : CS203XL-2 Reader bottom-side View**



**Figure 4 : CS203XL-2 Reader Left-side View**



**Figure 5: CS203XL-2 Reader Top-side View**

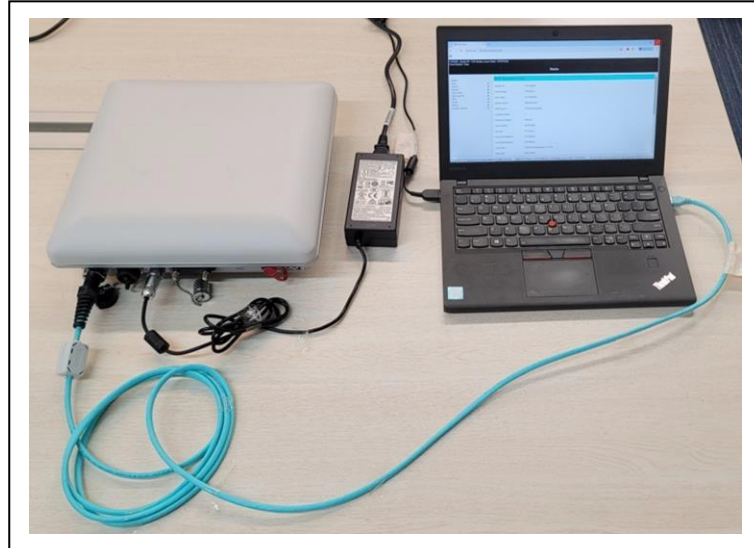


**Figure 6: CS203XL-2 Reader Rear-side View**

## 3.2 Power Supply

### Power Adaptor Unit

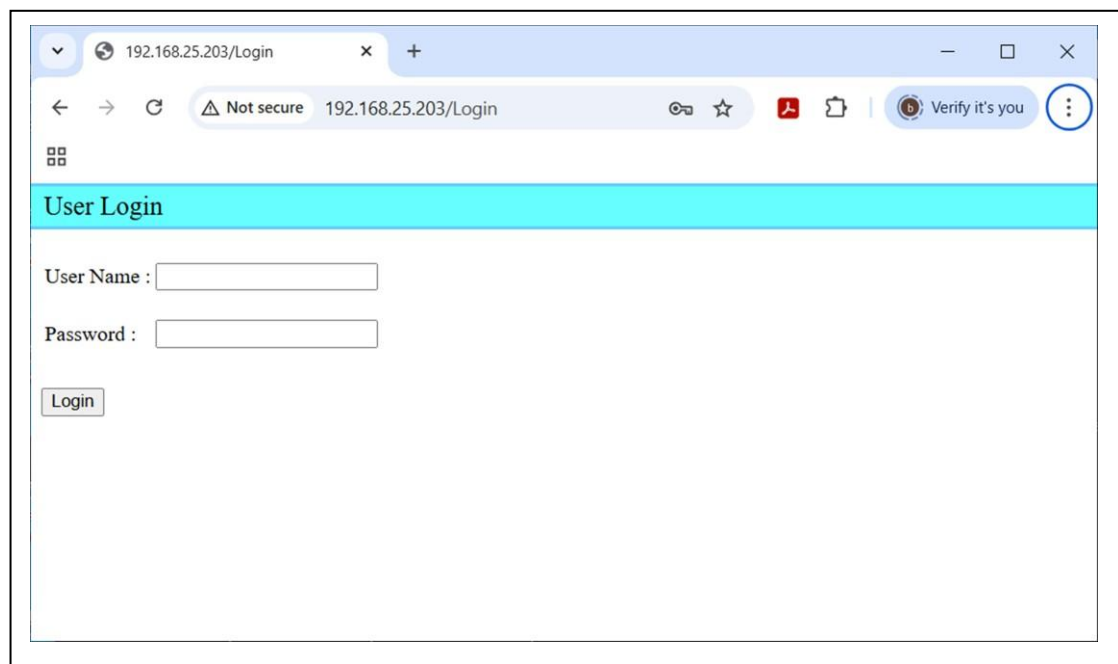
CS203XL-2 reader can be power up with the power adaptor unit included in the package. This will guarantee that CS203XL-2 reader can operating in the optimal condition with its internal built-in patch antenna. Below show the typical connection to use the power adaptor.



### 3.3 Web Browser Access on PC

The CS203XL-2 can be controlled via the Ethernet. In this case user need to connect the PC with CS203XL-2 with a Ethernet cable directly or via a router.

Below is the screen capture of a Web application, on PC controlling CS203XL-2. User can open the web browser and input the IP address of the CS203XL-2. It will show the login page. Everything is self-explanatory in the web application:



**Figure 7 PC Web Browser to connect CS203XL-2 via ethernet**

Below shows the main menu of the Web application. User can perform typical basic tag operations via this Web application as mentioned below.

- Inventory
- Tag memory bank read and write
- GPIO On/Off control
- Antenna port settings
- Output power settings

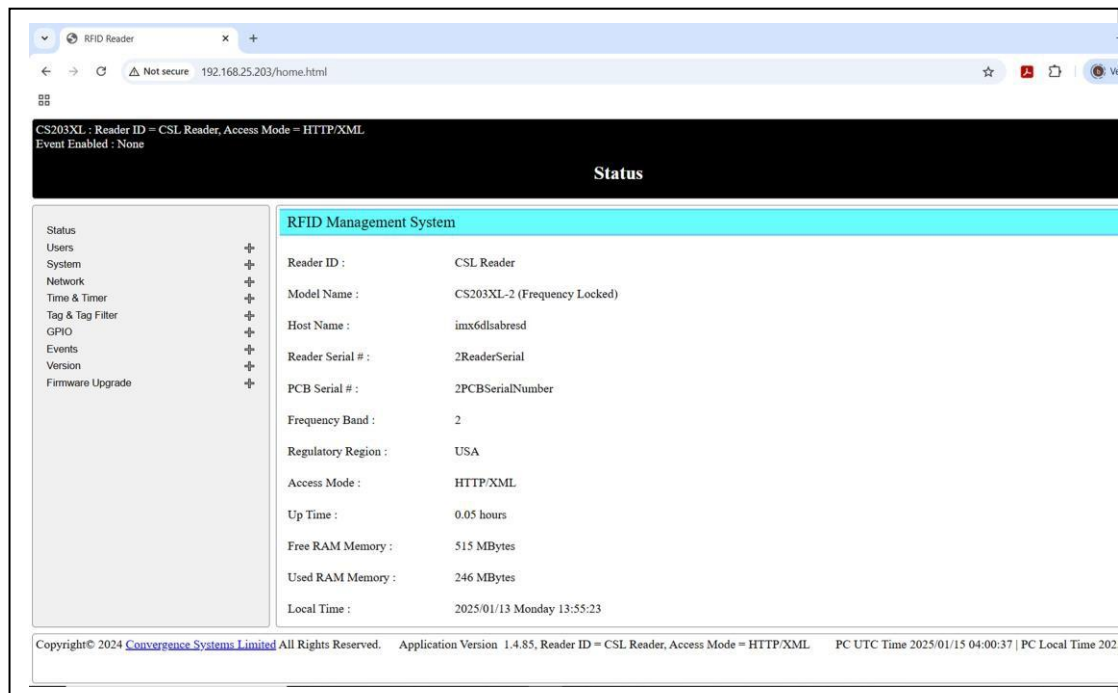


Fig 3-7 Main menu of Web application

For example, if user need to carry out inventory operation, it is necessary to click the “Tag & Filter” icon in Fig 3-7. The corresponding sub-menu has been shown in Fig 3-8 below.

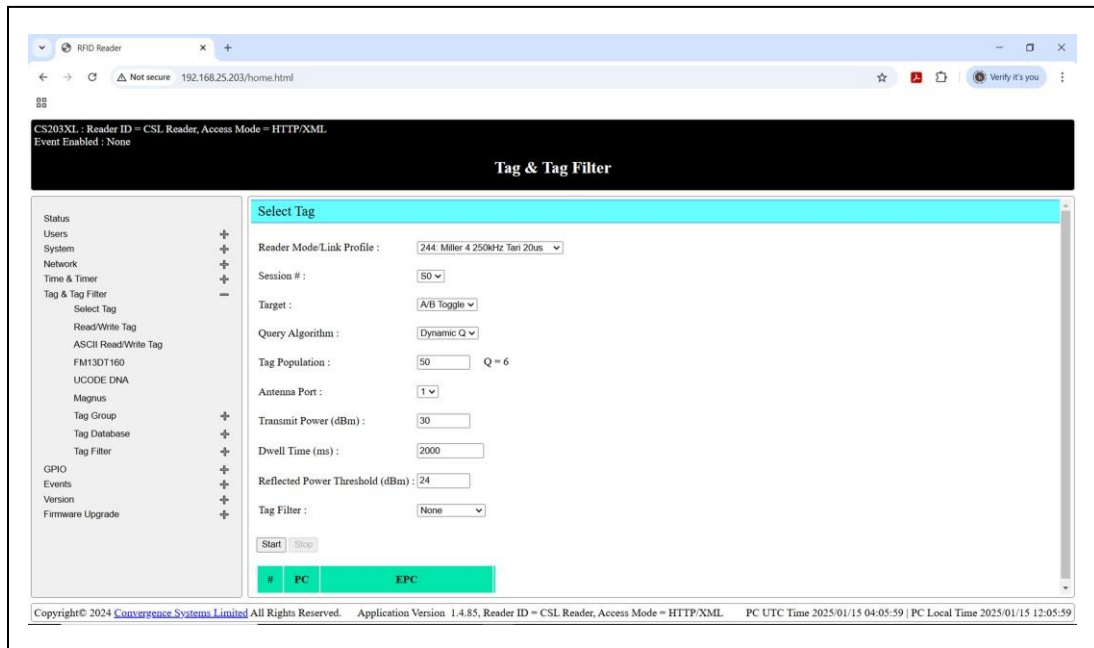


Fig 3-8 Inventory operation of Web application



### 3.4 GPIO Port Signals

Below figure shows the output and input signal for the GPIO signals.

GPI : Input ports

GPO : Output ports

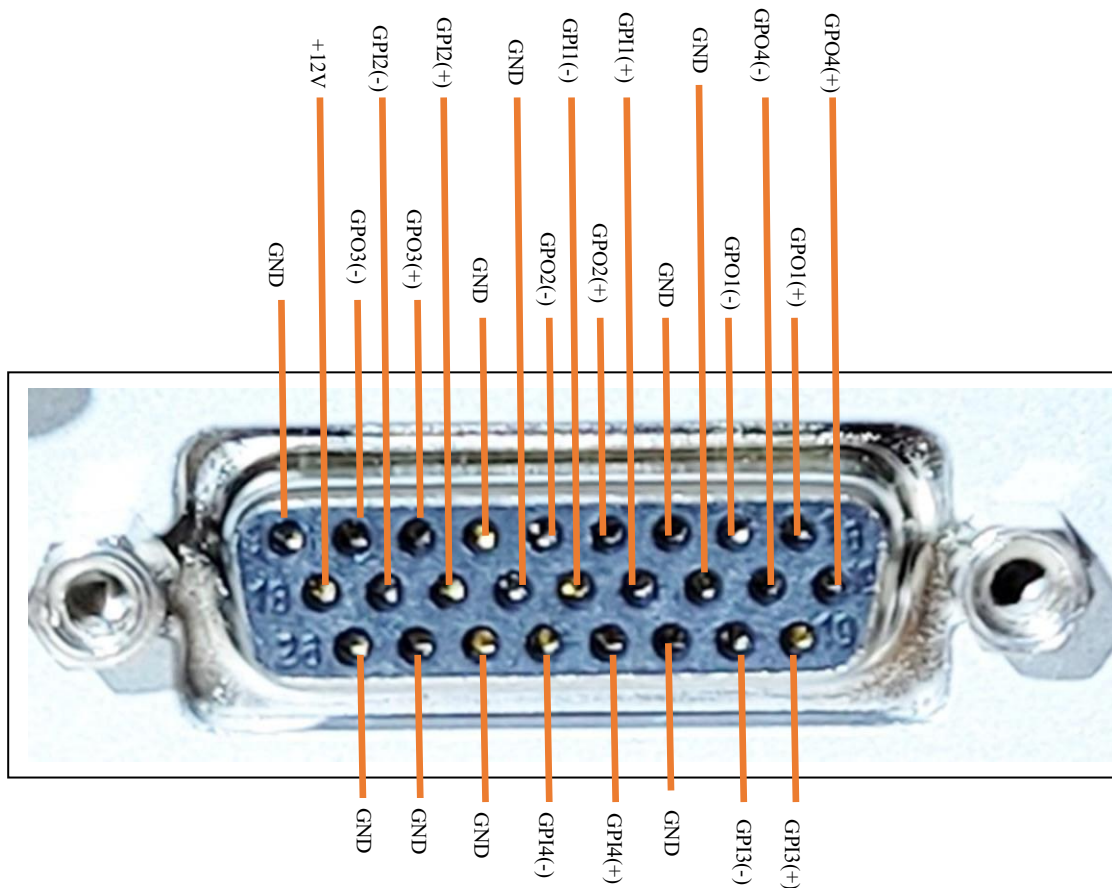


Fig 3-9 GPIO Input and Output signals

## 4. Installation

### 4.1 Mounting Information and Procedure

Below diagram (Fig 4.1) shows the mounting holes locations and dimensions. M6 Blot screws are used to fix the CS203XL-2 reader onto a mounting plate (not included in package) or the wall depends on each specific application.

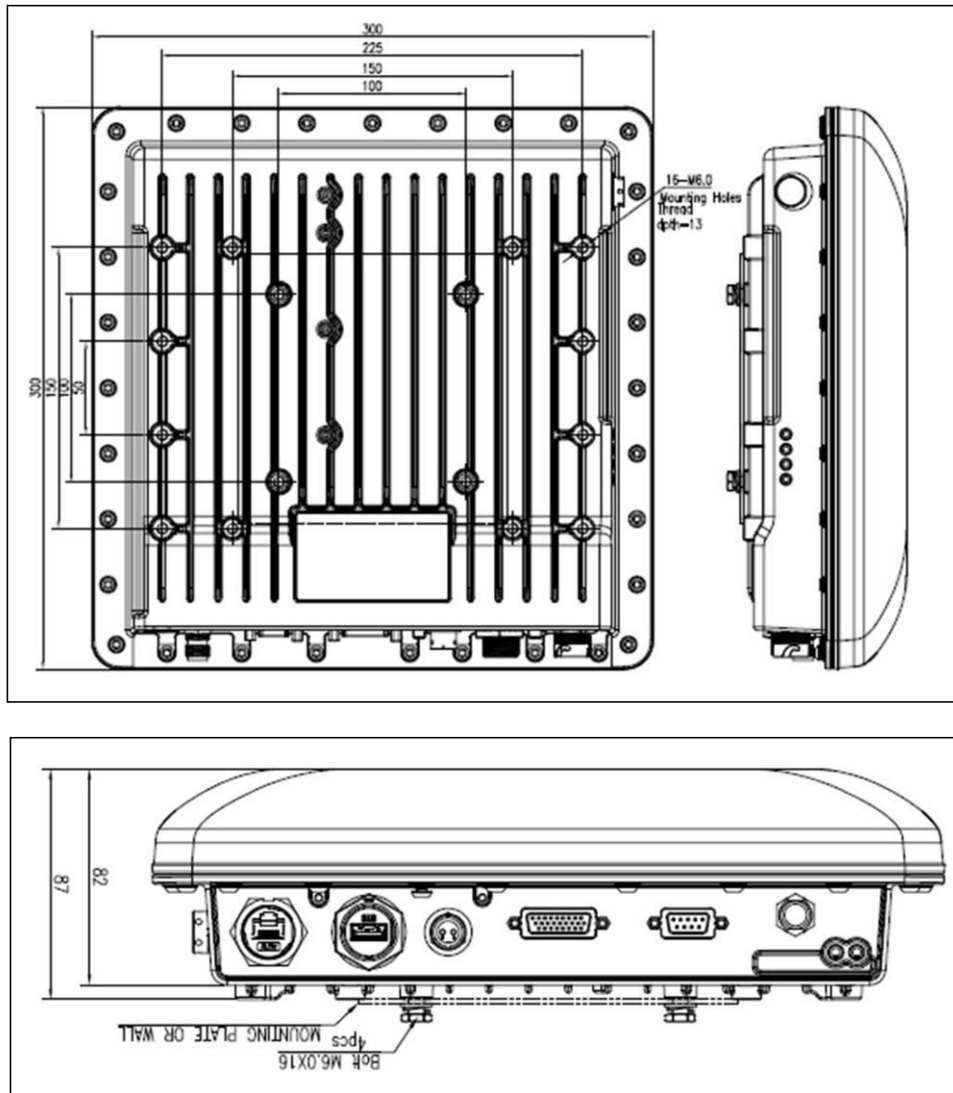


Fig 4.1 : Mounting holes locations and dimension

In Fig 4.2 and Fig 4.3, they show how to fix the CS203XL-2 reader to a mounting plating ( indicated as dotted line M ), the package included below items to achieve simple but reliable mounting. Customer can select any 4 holes to mount the CS302XL-2 depends on each specific application.

1. M6x14 x 8pcs
2. M6 Spring Washer x 8pcs
3. M6 flat Washer x 8pcs

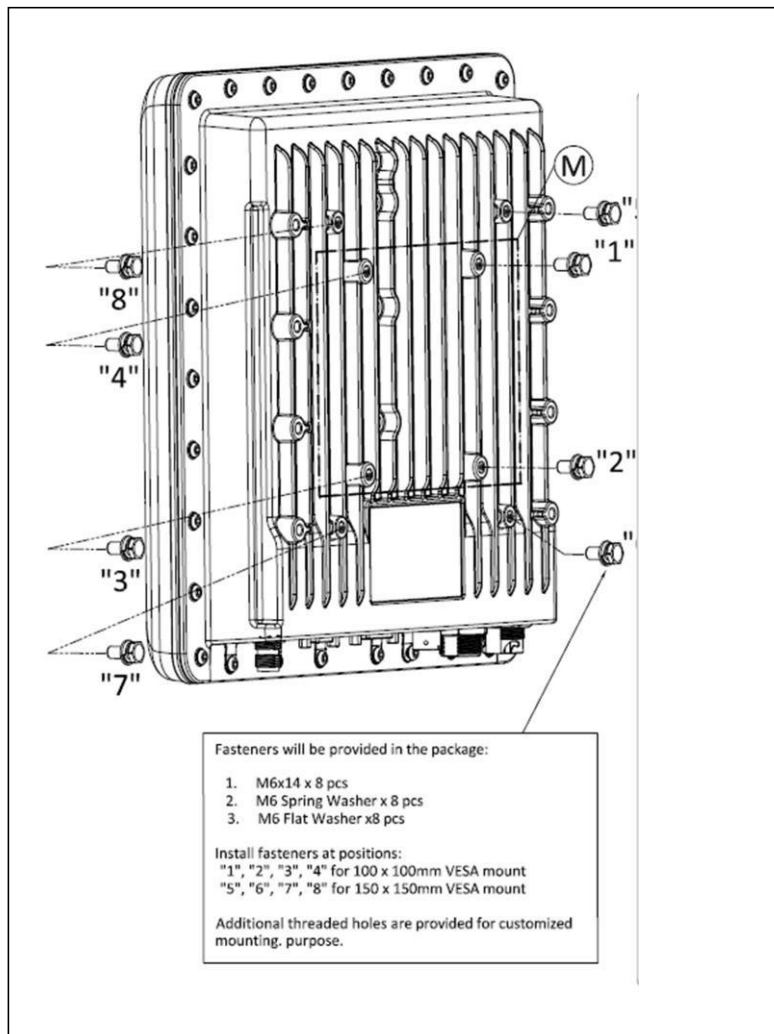


Fig 4.2

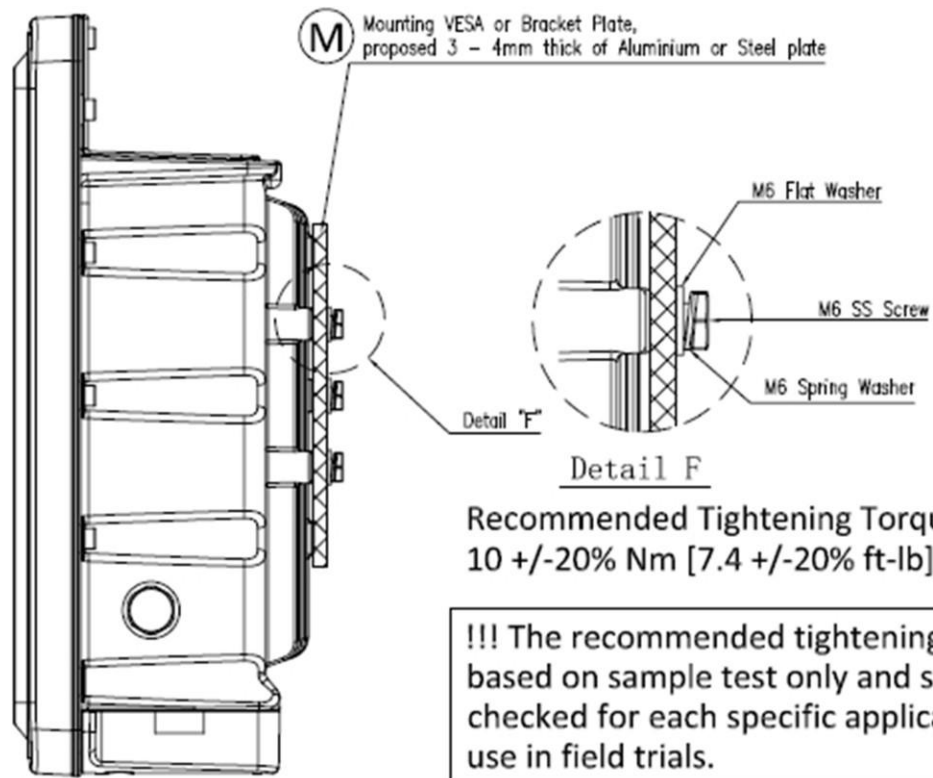


Fig 4.3

## Appendix A: Frequency Channel Table

### FCC Band Channels

Channel number	Frequency (MHz)	Channel number	Frequency (MHz)	Channel number	Frequency (MHz)
1	902.75	18	911.25	35	919.75
2	903.25	19	911.75	36	920.25
3	903.75	20	912.25	37	920.75
4	904.25	21	912.75	38	921.25
5	904.75	22	913.25	39	921.75
6	905.25	23	913.75	40	922.25
7	905.75	24	914.25	41	922.75
8	906.25	25	914.75	42	923.25
9	906.75	26	915.25	43	923.75
10	907.25	27	915.75	44	924.25
11	907.75	28	916.25	45	924.75
12	908.25	29	916.75	46	925.25
13	908.75	30	917.25	47	925.75
14	909.25	31	917.75	48	926.25
15	909.75	32	918.25	49	926.75
16	910.25	33	918.75	50	927.25
17	910.75	34	919.25		

## Appendix B. Antenna ports operation description

CS203XL-2 is a 2 port reader, one of the port 1 is connected to the internal patch antenna, where the ports are switched on in time one by one. At any time only 1 port is switched on and the RF power comes out only at that port. The rest of the ports are turned off so that no energy comes out from the other ports.

Time Slot	Antenna Port Status	
	Antenna Port 1 (Internal)	Antenna Port 2 (External)
1	On	Off
2	Off	On

The Antenna should be set up at least 2 meters apart and in different directions is shown as below:

