



CS463-2 EPC Class 1 Gen 2 RFID 4-Port Reader User's Manual



Version 4.0

CSL: The One-Stop-Shop for RFID Solutions

1 Content

1	CONTENT.....	2
2	FCC AND IC STATEMENT.....	3
3	INTRODUCTION	6
3.1	CS463-2 RFID 4-PORT FIXED READER	6
3.2	Basic Package Content.....	7
3.3	PRODUCT SPECIFICATION	8
4	INTRODUCTION	10
4.1	BASIC HARDWARE	10
4.2	POWER SUPPLY	12
4.3	DEMO SOFTWARE ON PC.....	13
4.4	GPIO Port Signals.....	15
	APPENDIX A. FEDERAL COMMUNICATIONS COMMISSION COMPLIANCE	17
	APPENDIX B. LINK PROFILES OF CS463-2 RFID READING.....	18
	APPENDIX C. ANTENNA PORTS OPERATION DESCRIPTION	19

2 FCC and IC Statement

FCC STATEMENT

1. *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.

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

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*

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 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IC STATEMENT

IC Notice to Canadian Users

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 harmful interference

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

This device complies with RSS-247 of industry Canada. Operation is subject to the condition that this device does not cause harmful interference.

This Class B digital apparatus complies with Canadian ICES-003(Cet appareil numérique de classe B est conforme à la norme NMB-003 du Canada).

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 30cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

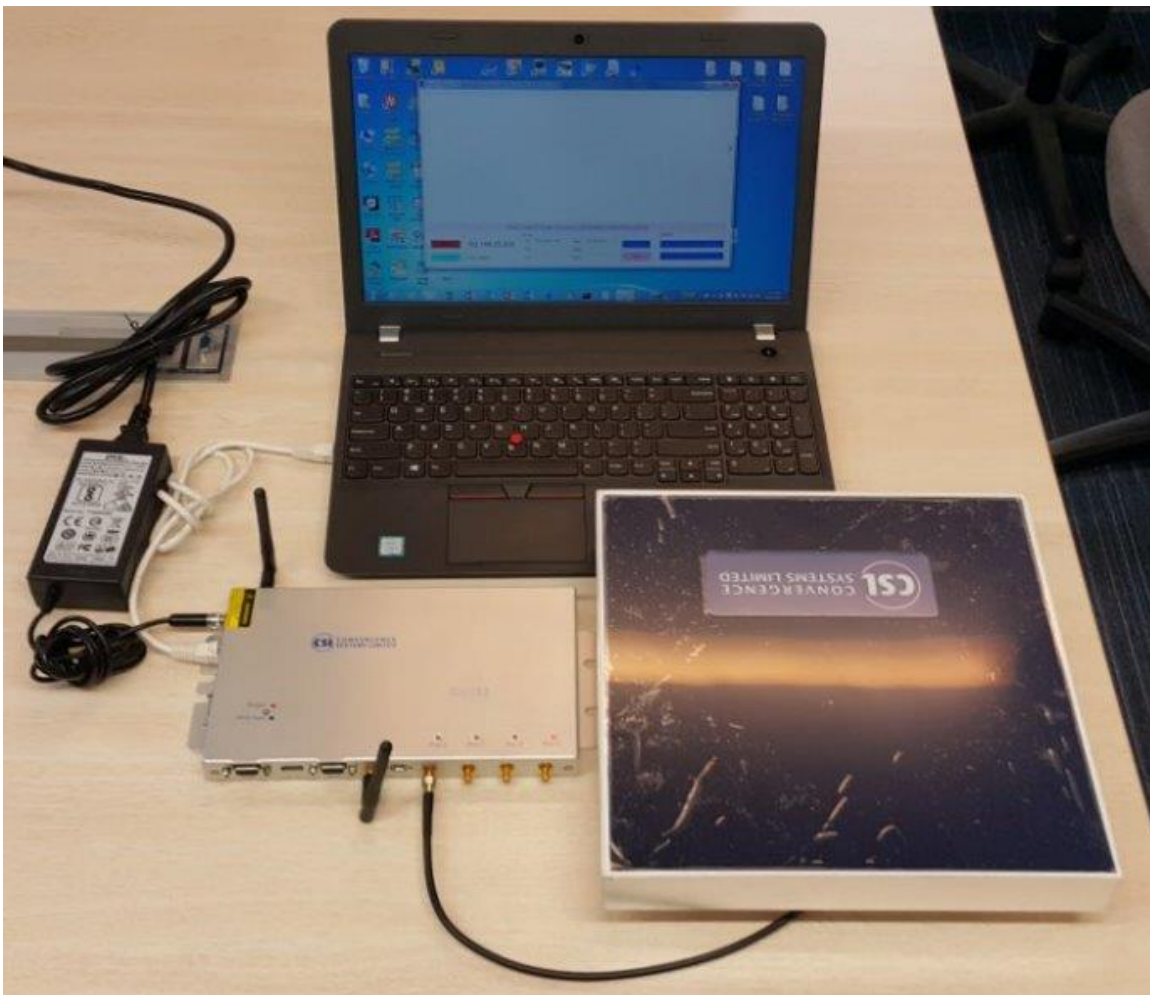
Cet équipement est conforme aux limites d'exposition aux rayonnements de la IC établies pour un environnement non contrôlé. Cet équipement doit être installé et fonctionner à au moins 30cm de distance d'un radiateur ou de votre corps.

3 Introduction

3.1 CS463-2 RFID 4-port Fixed Reader

The CS463-2 RFID 4-port 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 CS463-2 reader to perform RFID tag reading and GPIO port ON/OFF operation.

Below photo shows the typical connection during operation of CS463-2 4-port 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.

3.2 Product Package

3.2.1 Basic Package Content

The reader package contains:

- A 4-port fixed reader
- Power Adaptor Unit
- Dipole antenna – 2 piece
- GPIO cable -- 1 piece

3.3 Product Specification



Figure 3-1 CS463-2 4-port 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:

Physical Characteristics:	Length: 272 cm; Width: 152 cm; Height: 24 cm; Weight: 720 grams
Environment:	Operating Temp: -20 ⁰ C to 50 ⁰ C Storage Temp: -40 ⁰ C to 85 ⁰ C Humidity: 5% to 95% non-condensing
Antenna:	External antenna has a RP-SMA male connector
RF Power:	Internal conducted power 30 dBm
EIRP Power:	35 dBm (With CS771S-2)
RFID Frequency Ranges:	902-928 MHz band
Connectivity	Ethernet , Serial(RS232) , USB (Host) , USB Client , WiFi 802.11b/g/n , Bluetooth 4.0
Accessories:	GPIO cable
Order Code:	CS463-2
Restrictions on Use:	Approvals, features and parameters may vary depending on country legislation and may change without notice

4 Introduction

4.1 Basic Hardware

The CSL CS463-2 handheld RFID Reader is an EPCglobal Class 1 Gen 2 handheld reader product.

Below is the top view of the CS463-2 4-port reader. There are LEDs to indicate the operating status

- 1) Power On
- 2) RFID Read
- 3) Active antenna port being selected (default port 0)



Figure 4-1 CS463-2 4-port Reader Top View

Below is the left side and rear side view of the CS463-2 reader. There are 5 LEDs on this side, from left to right, representing respectively:

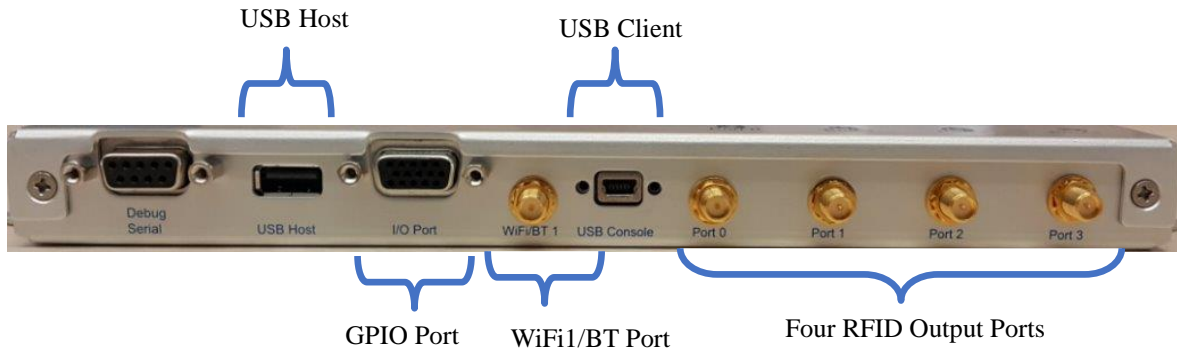


Figure 4-2a : CS463-2 Reader Front-side View

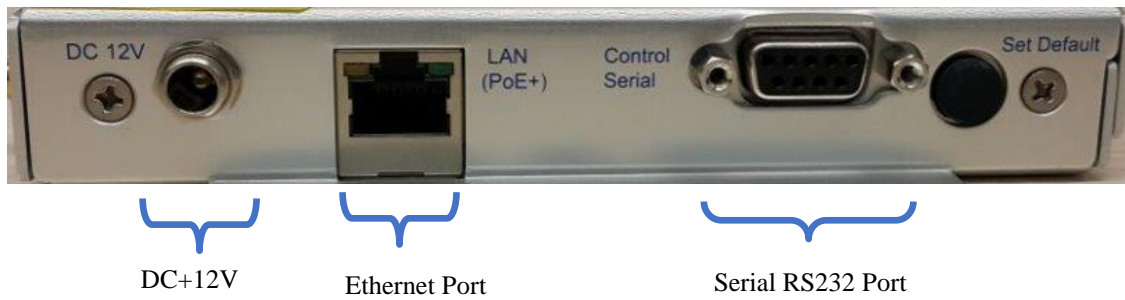


Figure 4-3b : CS463-2 Reader Left-side View



Figure 4-4c: CS463-2 Reader Rear-side View

4.2 Power Supply

1) Power Adaptor Unit

CS463-2 4-port reader can be power up with the power adaptor unit included in the package. This will guarantee that CS463-2 4-port reader can operating in the optimal condition. Below show the typical connection to use the power adaptor.



2) PoE

CS463-2 also supports the use of power over Ethernet (PoE). Below shows the typical connection of using PoE as the power supply to the CS463-2 4-port reader.



4.3 Demo Software on PC

The CS463-2 can be controlled via the Ethernet. In this case user need to connect the PC with CS463-2 with a Ethernet cable directly or via a router.

Below is the screen capture of a Demo application, which is also available for download from Convergence website (www.convergence.com.hk), on PC controlling CS463-2. Everything is self-explanatory in the application:

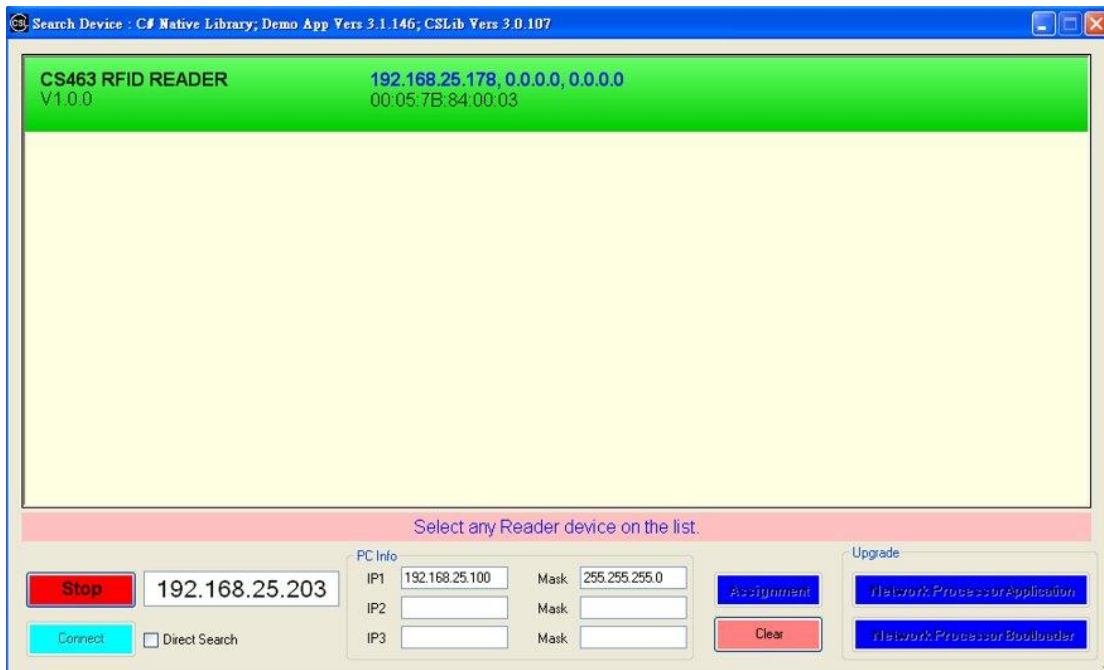


Figure 4-5 PC Application Screen – controlling CS463-2 via ethernet

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

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



Fig 4-6 Main menu of PC Demo application

For example, if user need to carry out inventory operation, it is necessary to click the “Inventory” icon in Fig 4-6. The corresponding sub-menu has been shown in Fig 4-7 below.

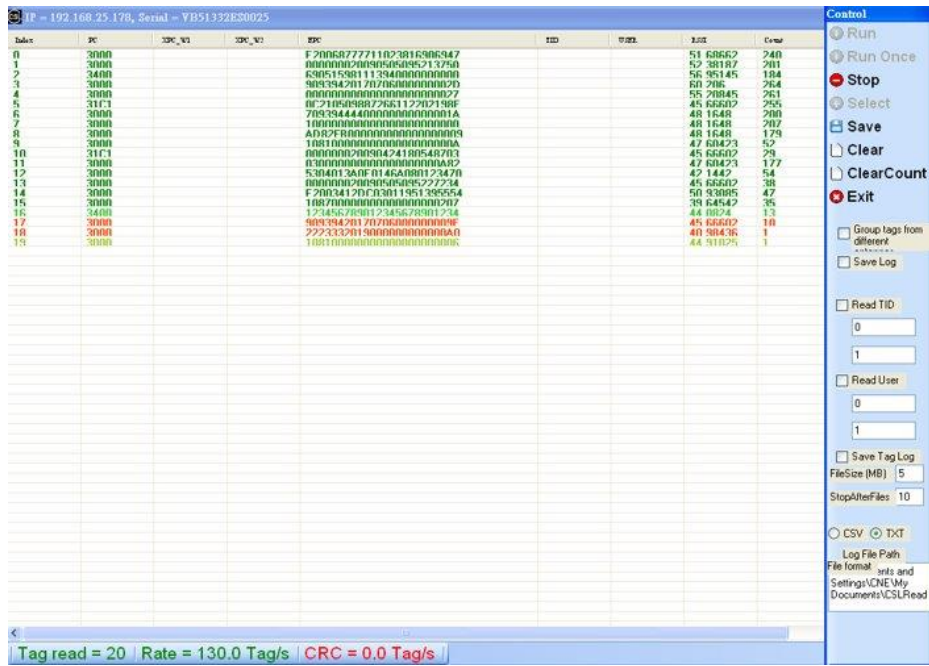


Fig 4-7 Inventory operation using PC Demo application

4.4 GPIO Port Signals

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

GPI : Input ports

GPO : Output ports

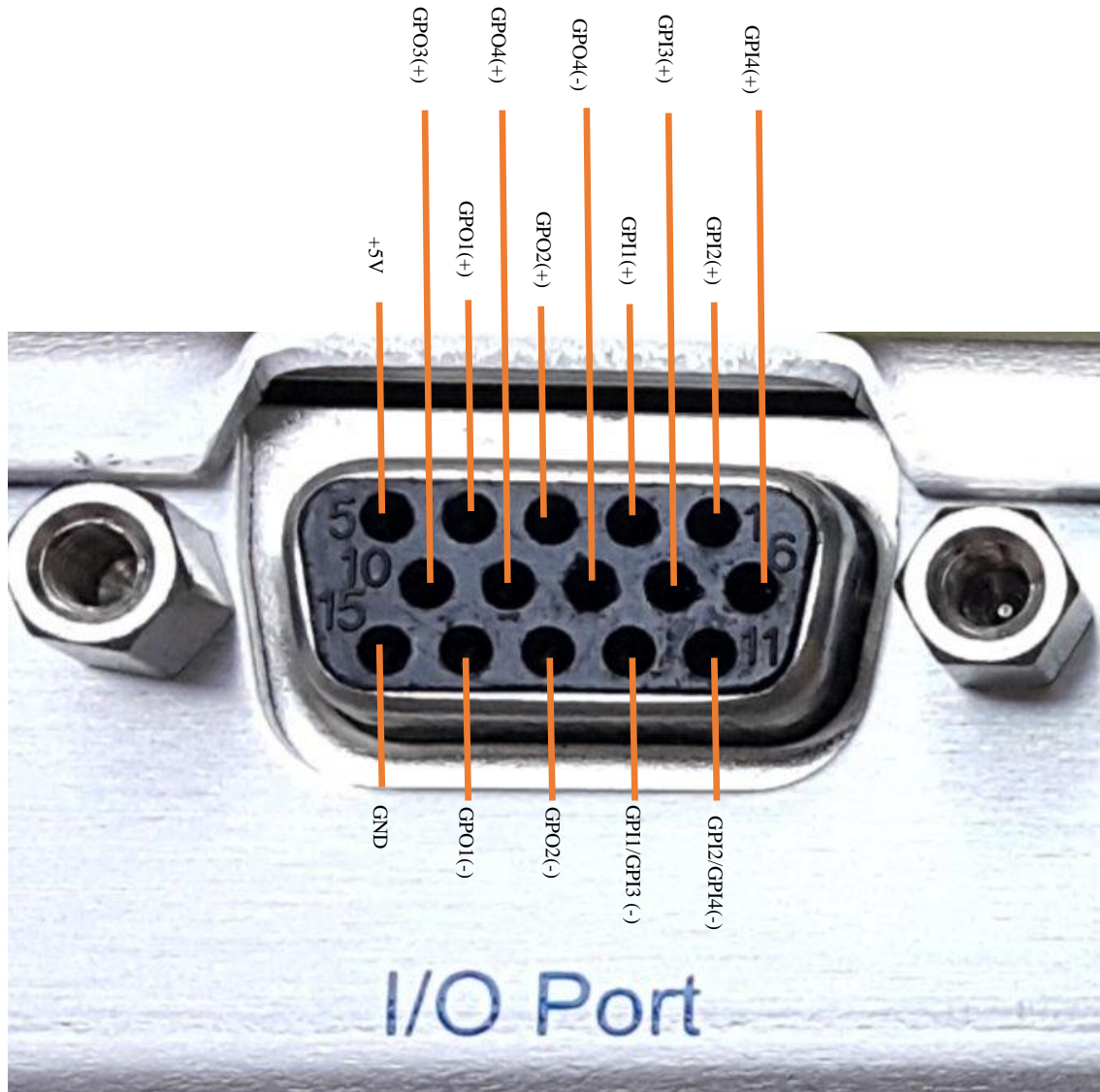


Fig 4-8 GPIO Input and Output signals

Appendix A. Federal Communications Commission Compliance

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 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 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
- Consult the dealer or an qualified radio/TV technician for assistance

FCC NOTICE:

To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Note:

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

Appendix B. Link Profiles of CS463-2 RFID Reading

Link Profile	0	1	2	3
R-T Modulation	DSB-ASK	PR-ASK	PR-ASK	DSB-ASK
Tari (μ s)	25.00	25.00	25.00	6.25
X	1.00	0.50	0.50	0.50
PW (Pulse Width in usec)	12.50	12.50	12.50	3.13
RTcal (usec)	75.00	62.50	62.50	15.63
TRcal (usec)	200.00	85.33	71.11	20.00
DR (Divide Ratio)	8	64/3	64/3	8
T-R Modulation	FM0	Miller-4	Miller-4	FM0
TRExt	1	1	1	1
LF (kbps)	40	250	300	400
Data Rate (kbps)	40	62.5	75	400

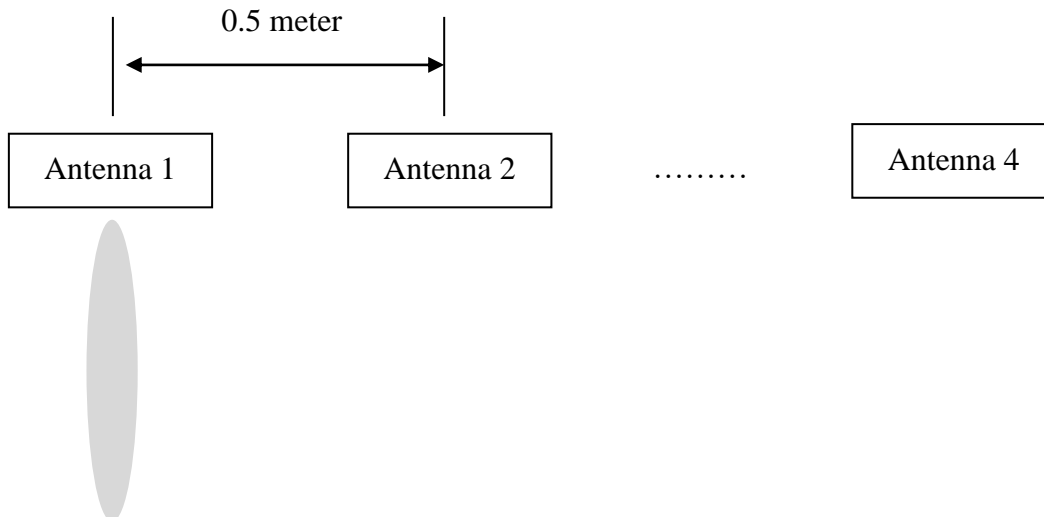
Appendix C. Antenna ports operation description

CS463-2 is a 4 port reader 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.

The control logic of the antenna is shown as below table

Time Slot	Antenna Port Status			
	P0	P1	P2	P3
1	On	Off	Off	Off
2	Off	On	Off	Off
3	Off	Off	On	Off
4	Off	Off	Off	On

The Antenna should be set up 0.5 meter apart is shown as below:



Energy coming out of 1 antenna (note that CS463-2 is switched on in time one by one so that at any 1 moment in time ONLY 1 antenna is turned on)