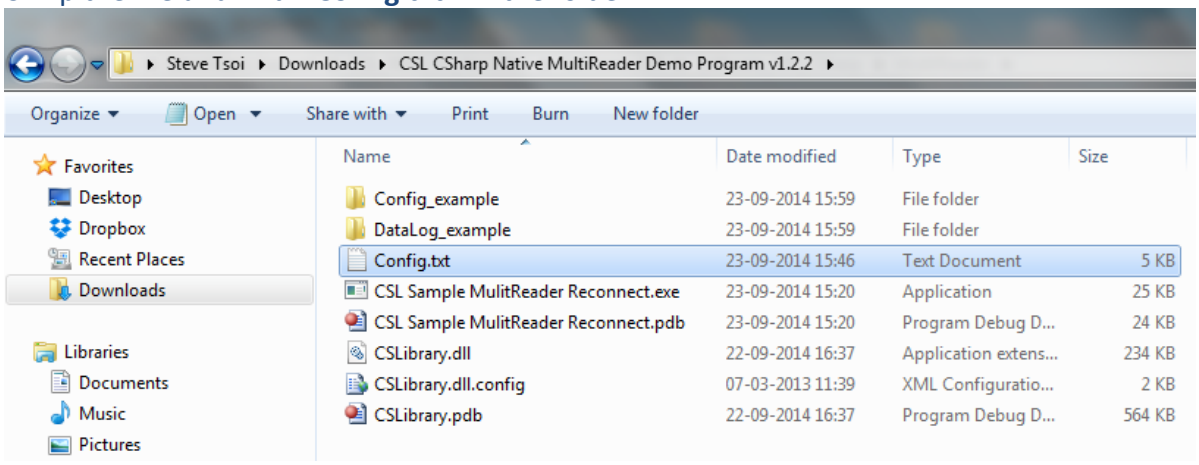
CONVERGENCE SYSTEMS LIMITED

User Guide – C# Native Multireader Demo Program Configuration (v1.2.2)

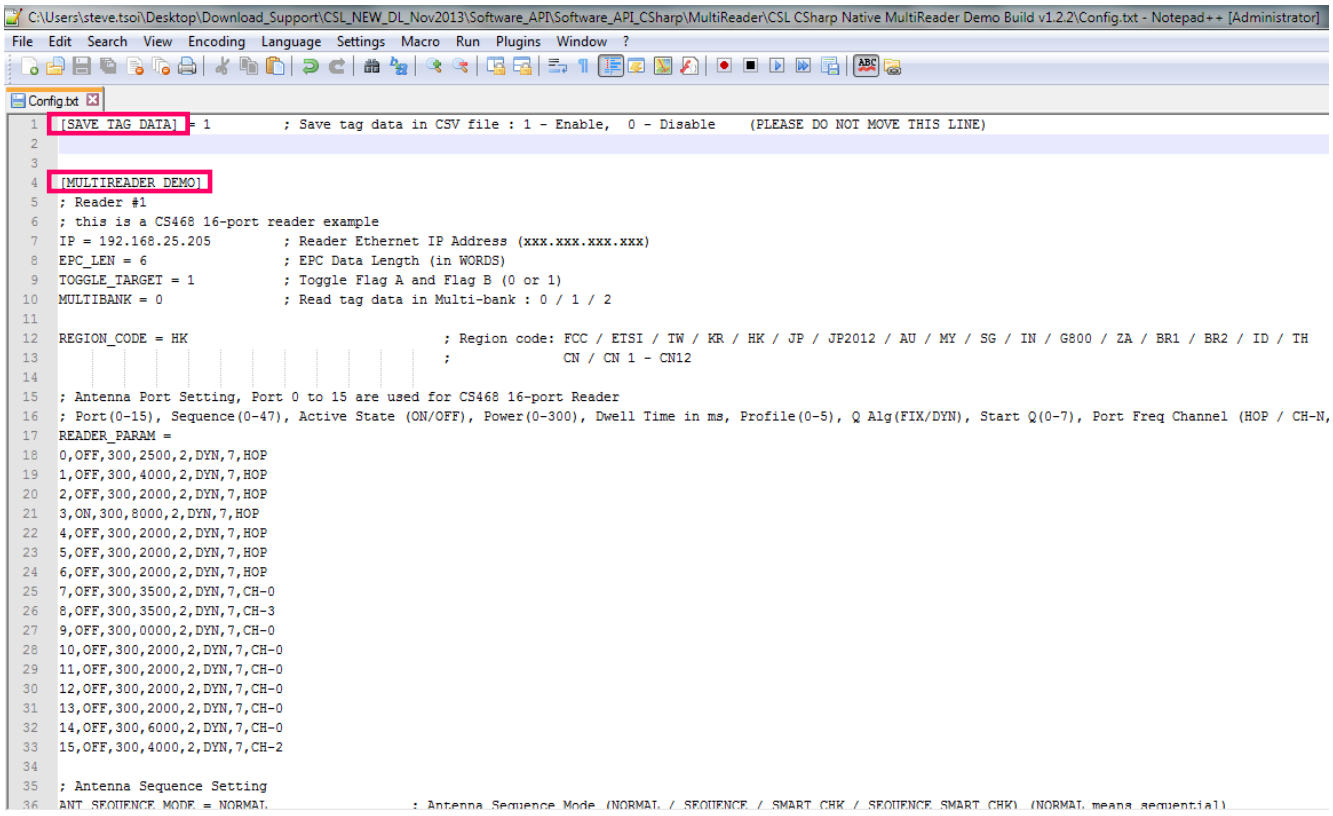
This document will guide user to set the reader configuration for CSL C# Native Multireader Demo Program.

1. To begin, user can download the C# Native Multireader Demo Program from CSL website: http://www.convergence.com.hk/download-support-installer-csharp-multi-readers.

2. Unzip the file and find **"Config.txt"** in the folder.

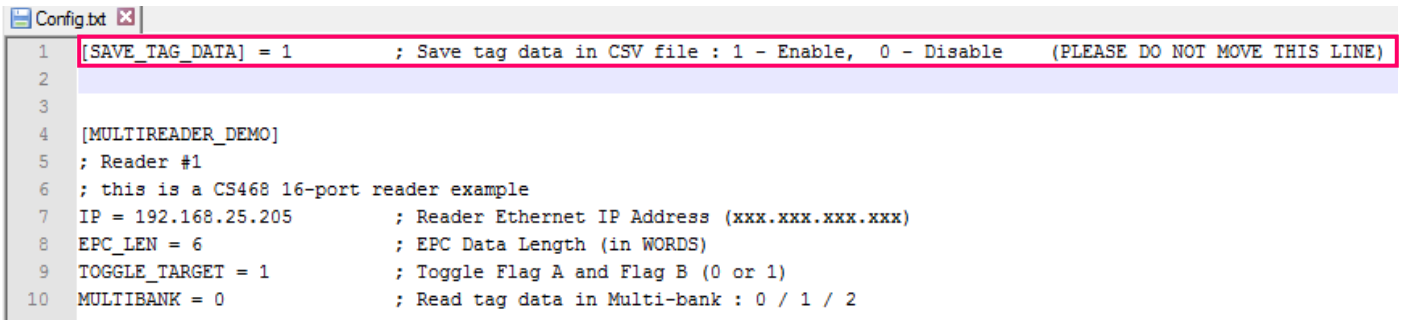


3. Open “Config.txt”. For each set of configuration **[MULTIREADER_DEMO]**, user can set the IP Address, EPC length (in Word), Toggle Target Enable / Disable (0 or 1), Multi-bank data, Region the reader operates, Antenna Port (including Port number, Port Sequence index, Port Active State, Power of antenna (in dBm /10), Dwell Time (in ms), Link Profile, Q Algorithm, Start Q value and Port Freq Channel).
   In **[SAVE_TAG_DATA]**, user can also choose to save tag data to CSV file.



[SAVE_TAG_DATA]

4. User can set “1” in [SAVE_TAG_DATA] to enable the tag data file save and “0” in [SAVE_TAG_DATA] to disable the tag data file save. The saved files are in CSV format.



[MULTIREADER_DEMO]

5. User can input the reader IP Address in the field **"IP = "**

Config.txt

```
1
2  [MULTIREADER_DEMO]
3  ; Reader #1
4  ; this is a CS468 16-port reader example
5  IP = 192.168.25.205          ; Reader Ethernet IP Address (xxx.xxx.xxx.xxx)
6  EPC_LEN = 6                  ; EPC Data Length (in WORDS)
7  TOGGLE_TARGET = 1            ; Toggle Flag A and Flag B (0 or 1)
8  MULTIBANK = 0                ; Read tag data in Multi-bank : 0 / 1 / 2
9
10 REGION_CODE = HK                              ; Region code: FCC / ETSI / TW / KR / HK / JP
11                                               ;              CN / CN 1 - CN12
12
13 ; Antenna Port Setting, Port 0 to 15 are used for CS468 16-port Reader
14 ; Port(0-15), Sequence(0-47), Active State (ON/OFF), Power(0-300), Dwell Time in ms, Profile(0
15 READER_PARAM =
16 0,OFF,300,2500,2,DYN,7,HOP
17 1,OFF,300,4000,2,DYN,7,HOP
18 2,OFF,300,2000,2,DYN,7,HOP
```

6. User can input the reader EPC Length in the field **"EPC_LEN = "**, default value is 6 (i.e. 6 x 12 = 96 bits)

Config.txt

```
2  [MULTIREADER_DEMO]
3  ; Reader #1
4  ; this is a CS468 16-port reader example
5  IP = 192.168.25.205          ; Reader Ethernet IP Address (xxx.xxx.xxx.xxx)
6  EPC_LEN = 6                  ; EPC Data Length (in WORDS)
7  TOGGLE_TARGET = 1            ; Toggle Flag A and Flag B (0 or 1)
8  MULTIBANK = 0                ; Read tag data in Multi-bank : 0 / 1 / 2
9
10 REGION_CODE = HK                              ; Region code: FCC / ETSI / TW / KR / HK / JP
11                                               ;              CN / CN 1 - CN12
12
13 ; Antenna Port Setting, Port 0 to 15 are used for CS468 16-port Reader
14 ; Port(0-15), Sequence(0-47), Active State (ON/OFF), Power(0-300), Dwell Time in ms, Profile(0
15 READER_PARAM =
16 0,OFF,300,2500,2,DYN,7,HOP
17 1,OFF,300,4000,2,DYN,7,HOP
18 2,OFF,300,2000,2,DYN,7,HOP
```

7. User can input the reader Toggle Target in the field **"TOGGLE_TARGET ="**, default value is 1.

Config.txt

```
2  [MULTIREADER_DEMO]
3  ; Reader #1
4  ; this is a CS468 16-port reader example
5  IP = 192.168.25.205          ; Reader Ethernet IP Address (xxx.xxx.xxx.xxx)
6  EPC_LEN = 6                  ; EPC Data Length (in WORDS)
7  TOGGLE_TARGET = 1            ; Toggle Flag A and Flag B (0 or 1)
8  MULTIBANK = 0                ; Read tag data in Multi-bank : 0 / 1 / 2
9
10 REGION_CODE = HK                              ; Region code: FCC / ETSI / TW / KR / HK / JP
11                                               ;              CN / CN 1 - CN12
12
13 ; Antenna Port Setting, Port 0 to 15 are used for CS468 16-port Reader
14 ; Port(0-15), Sequence(0-47), Active State (ON/OFF), Power(0-300), Dwell Time in ms, Profile(0
15 READER_PARAM =
16 0,OFF,300,2500,2,DYN,7,HOP
17 1,OFF,300,4000,2,DYN,7,HOP
18 2,OFF,300,2000,2,DYN,7,HOP
```

8. User can set the reader to read tag data in multi-banks in the field **"MULTIBANK = "**.
   Please ensure that the availability of multi-banks for the target tag before use. The default value is 0 for target tag without multi-banks.

Config.txt

```
[MULTIREADER_DEMO]
; Reader #1
; this is a CS468 16-port reader example
IP = 192.168.25.205          ; Reader Ethernet IP Address (xxx.xxx.xxx.xxx)
EPC_LEN = 6                  ; EPC Data Length (in WORDS)
TOGGLE_TARGET = 1            ; Toggle Flag A and Flag B (0 or 1)
MULTIBANK = 0                ; Read tag data in Multi-bank : 0 / 1 / 2

REGION_CODE = HK                                ; Region code: FCC / ETSI / TW / KR / HK / JP
                                                ;              CN / CN 1 - CN12

; Antenna Port Setting, Port 0 to 15 are used for CS468 16-port Reader
; Port(0-15), Sequence(0-47), Active State (ON/OFF), Power(0-300), Dwell Time in ms, Profile(0
READER_PARAM =
0,OFF,300,2500,2,DYN,7,HOP
1,OFF,300,4000,2,DYN,7,HOP
2,OFF,300,2000,2,DYN,7,HOP
```

9. User can input the Region / Country the reader operates in the field **"REGION_CODE = "**

Config.txt

```
[MULTIREADER_DEMO]
; Reader #1
; this is a CS468 16-port reader example
IP = 192.168.25.205          ; Reader Ethernet IP Address (xxx.xxx.xxx.xxx)
EPC_LEN = 6                  ; EPC Data Length (in WORDS)
TOGGLE_TARGET = 1            ; Toggle Flag A and Flag B (0 or 1)
MULTIBANK = 0                ; Set Read Multibank to 0 / 1 / 2

REGION_CODE = HK                                ; Region code: FCC / ETSI / TW / KR / HK / JP
                                                ;              CN / CN 1 - CN12

; Antenna Port Setting, Port 0 to 15 are used for CS468 16-port Reader
; Port(0-15), Sequence(0-47), Active State (ON/OFF), Power(0-300), Dwell Time in ms, Profile(0
READER_PARAM =
0,OFF,300,2500,2,DYN,7,HOP
1,OFF,300,4000,2,DYN,7,HOP
2,OFF,300,2000,2,DYN,7,HOP
```

User should follow the Order code of the reader when setting the Region / Country.

Below are available options for reader with different order code

Order code -1 : ETSI / IN / G800

Order code -2 : FCC / AU / BR1 / BR2 / HK / TH / SG / MY / ZA / ID

Order code -4 : AU / MY / HK / SG / TW / ID / CN / CN1 / CN2 / CN3 / CN4 / CN5 / CN6 / CN7 / CN8 / CN9 / CN10 / CN11 / CN12

Order code -7 : AU / HK / TH / SG / CN / CN1 / CN2 / CN3 / CN4 / CN5 / CN6 / CN7 / CN8 / CN9 / CN10 / CN11 / CN12

Order code -8 : JP

The Order Code is **printed at the rear panel of the CSL RFID Reader.**

The format of Order Code is shown as follow:

CS203: CS203ETHER-NXHCP

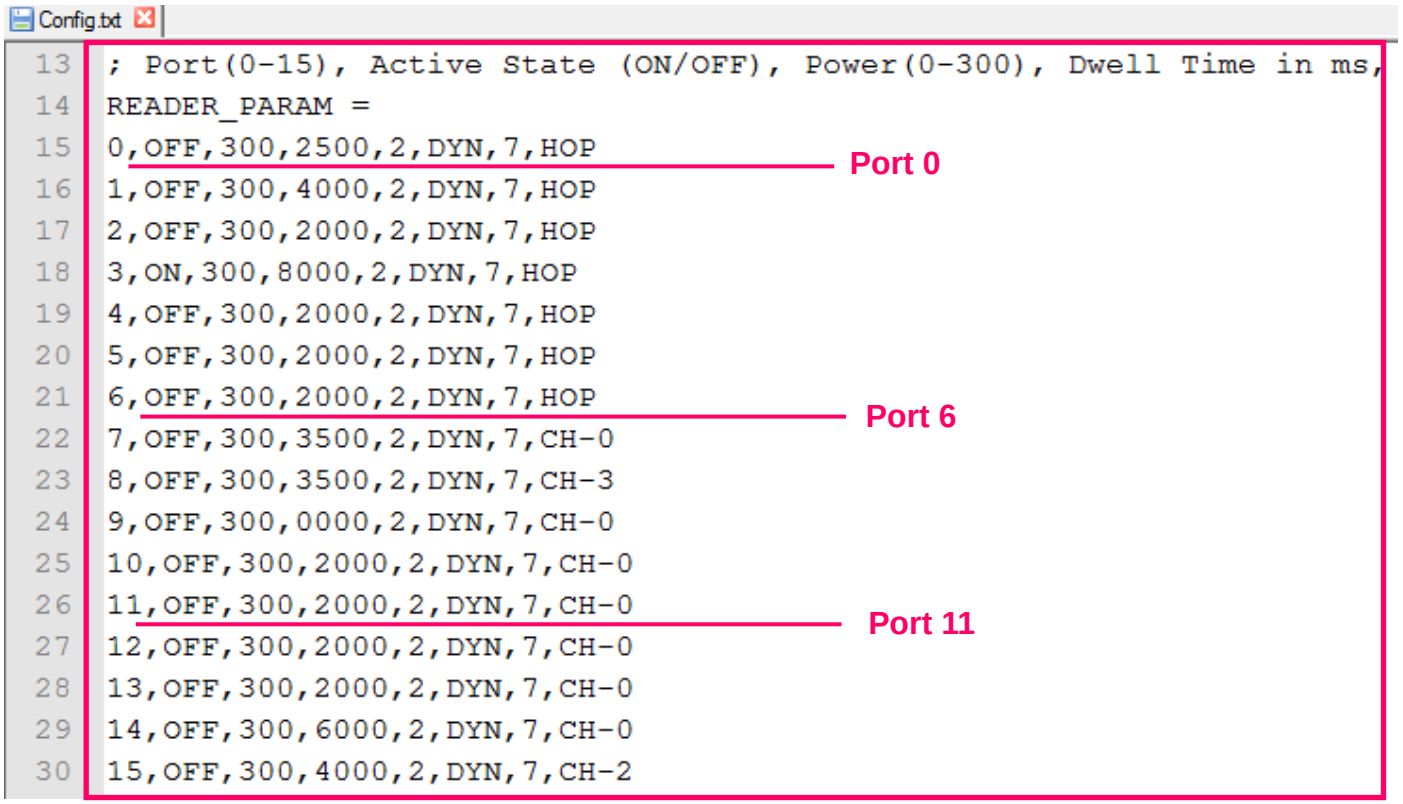
CS468: CS469-N

CS469: CS468-N

where N:

N=1: 865-868 MHz (Europe) & 865-867 MHz (India)
N=2: 902-928 MHz (USA)
N=4: 922-928 MHz (Taiwan)
N=7: 920-925 MHz (China, Australia, Malaysia, Hong Kong etc)
N=8: 915-922 MHz (Japan)

10. User can input the Antenna Port Setting in the field "**READER_PARAM = "**, each row represents one antenna port setting.



There are 8 parameters user can set in the field Antenna Port Setting:

(1) Port Number : The antenna Port number is set in this entry.
To set Antenna Port 0 parameters, choose the row "0, xx, …."
For CSL CS203 reader, ONLY Port 0 is available for use.
For CSL CS469 reader, Port 0 to 3 is available for use.
For CSL CS468 reader, Port 0 to 15 is available for use.

(2) Active State : User is required to enable the Antenna before use.
To activate the port, set it to "ON". Set the port to "OFF" when it is not used.

(3) Power : To set antenna power of the reader from 0 dBm to 30dBm with value ranging from 0 to 300.

(4) Dwell Time : When the reader is set in multi-port state, the ports are switched periodically. Dwell Time (in ms) is the duration time of each antenna port operates in each period. The default value is 2000 (i.e. 2000 ms)

(5) Profile : Different modulation profile of RFID reader (Interrogator) and the Tag can be selected by the user for different situation.

User should refer to the document EPC Radio-Frequency Identity Protocols Class-1 Generation-2 UHF RFID Protocol for Communications at 860 MHz – 960 MHz by EPCglobal when setting Link Profile.
The default setting is profile 2. It is also the recommended setting for most of the common applications. In CS468-3 (Japan) and CS468-1 (ETSI) readers, only profiles 0, 2, 3 and 5 are selectable. (Profile 0 is also not advised for CS468-3 Japanese reader)

(6) Q Algorithm (Q Alg) : Inventory Algorithm
Fixed Q Algorithm (FIX) and Dynamic Q Algorithm (DYN) are available.

(7) Start Q : Starting Q value. The value ranges from 0 to 15. Normally "7" is used for CSL reader.

(8) Port Frequency Channel : User should to check the Order code of the reader when setting Port Frequency Channel.

Below are the frequency setting for reader with different order code

Order code -1 : Fixed Frequency
Order code -2 : Hopping Frequency
Order code -4 : Hopping Frequency
Order code -7 : Hopping Frequency
Order code -8 : Fixed Frequency

The Order Code is **printed at the rear panel of the CSL RFID Reader.**

The format of Order Code is shown as follow:

CS203: CS203ETHER-NXHCP

CS468: CS469-N

CS469: CS468-N

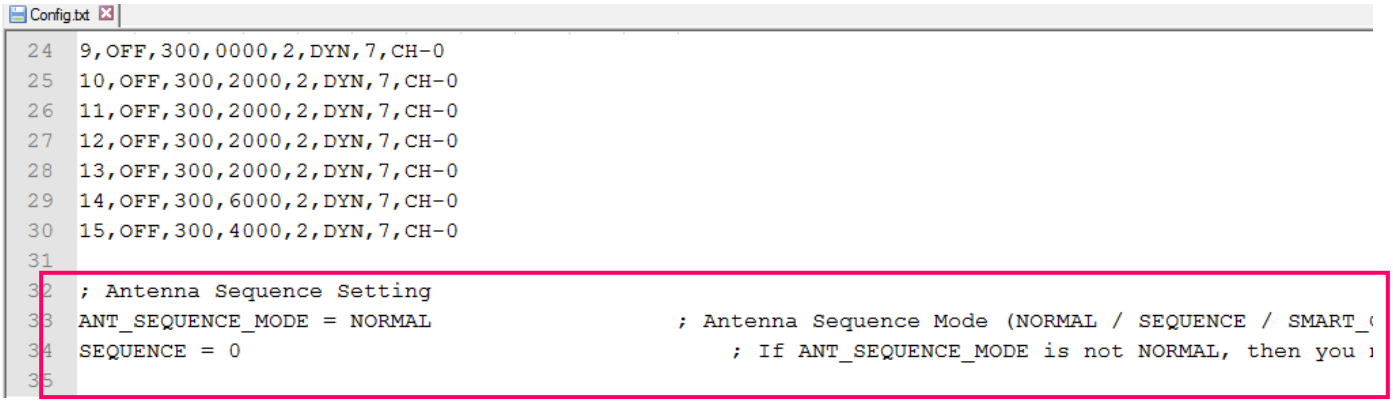
where N:

N=1: 865-868 MHz (Europe) & 865-867 MHz (India)
N=2: 902-928 MHz (USA)
N=4: 922-928 MHz (Taiwan)
N=7: 920-925 MHz (China, Australia, Malaysia, Hong Kong etc)
N=8: 915-922 MHz (Japan)

Set "HOP" for reader using in those regions / countries where UHF Frequency Hopping is allowed.

Set "CH-0" / "CH-1" … / "CH-N" for the reader using in those regions / countries where UHF Fixed Frequency is allowed. Each region / country has different channel numbers. Please refer to "UHF Frequency Regulations - GS1" (http://www.gs1.org/docs/epcglobal/UHF_Regulations.pdf)

11. User can input the Antenna Port Setting in the field **"ANT_SEQUENCE_MODE = "** and **"SEQUENCE = "**.



In the field **"ANT_SEQUENCE_MODE = "**, user can choose sequence mode for the reader **CS468 (0 to 15)** and **CS469 (0 to 3)**. This setting is **NOT APPLICABLE for CS203**

Normal Mode (NORMAL) – The antenna port switching follows the normal port number sequence (e.g., 0, 1, 2, 3, 4, 5, 6 … 14, 15 and then repeat from 0 again)

Sequence Mode (SEQUENCE) – User-defined antenna port switching sequence (e.g. one can define 0, 15, 1, 14, 2, 13, 3 … 7, 8 and then repeat)

SmartCheck Mode (SMART_CHK) – Reader detects if there is any tag on each antenna. If there is no tag detected, the reader will switch to next antenna port immediately.

Sequence and SmartCheck Mode (SEQUENCE_SMART_CHK) – Combination of Sequence mode and SmartCheck mode.

12. User can configure the field **"SEQUENCE = "** when the option **"Sequence"** or **"Sequence and Smart Check"** mode is chosen. User can input the port number in sequence (e.g. **"SEQUENCE = 7, 3, 1, 9 …"**) when the ports are set in **ACTIVE** state.