



# ACR123 User Manual

ACR123 User Manual V1.00

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## Version History

Date	By	Changes	Version
2013-03-27	Kit Au	<ul style="list-style-type: none"><li>• First Release</li><li>•</li></ul>	1.00.00



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## **1.0. Introduction**

The ACS contactless reader is a communication device between the computer and the smart card through the Serial host interface. It is compliant to the ISO14443 supporting contactless smart card and is also compliant to the MasterCard PayPass and Visa PayWave standard. The compliance to the PayPass and PayWave standard widens the supported cards and strengthens the contactless product line's salability especially in the payment industry.



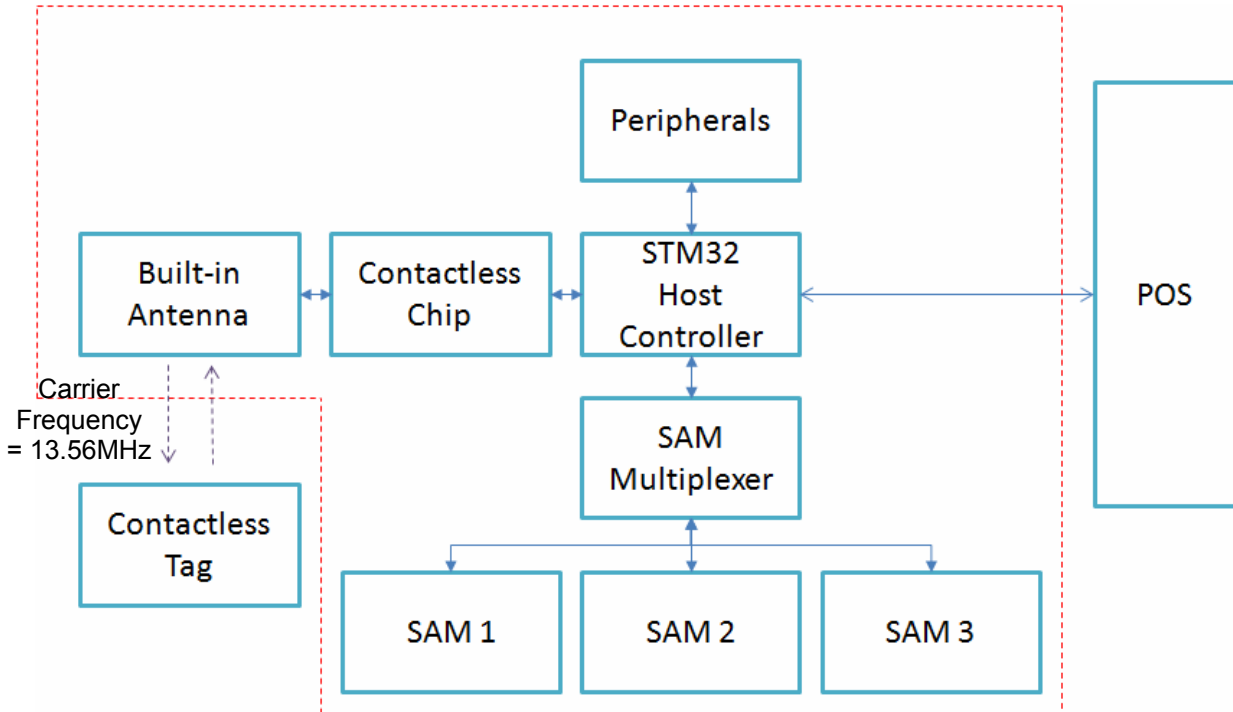
## 2.0. Features

- Supports contactless smart cards
  - ISO14443 Types A&B compatible smart card interface
  - ISO18092 Tag Support (Phase 2)
  - MasterCard PayPass and Visa PayWave Compliant Cards
  - High communication speed of up to 848 kbps
  - Reading distance of up to 100 mm
- Supports SAM contact cards
  - ISO7816-1/2/3 compatible SAM smart card interface
  - 3 SAM slots
  - Supports T0 and T1 CPU card
- Supports 4 LEDs for user interface
- Supports monotone buzzer/Speak
- Supports mono color LCD (128 x 64)
- RS232 Interface (up to 115.2 kbps) with DB9 connector/ USB2.0 Full Speed
- Power supply support USB
- Firmware upgradable
- PC-Linked OS platform support
  - Windows 98 and up
  - Mac 10.5 and up
  - Linux
- Compliance to standards
  - CE/FCC
  - VCCI
  - RoHS
  - REACH
  - EMV Level 1 and EMV Level 2
- Certifications
  - CE/FCC
  - VCCI
  - RoHS
  - REACH
  - EMV Level 1 and EMV Level 2

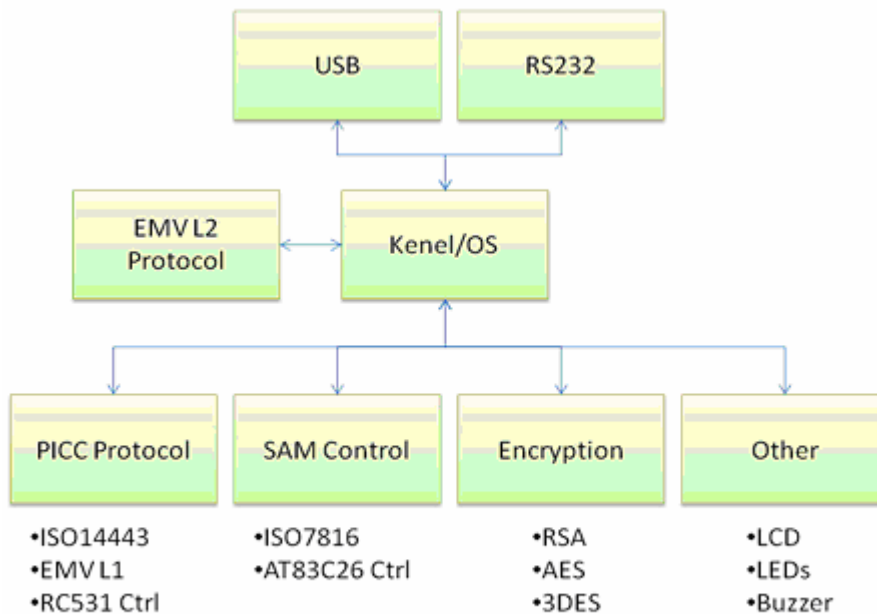
### 3.0. Architecture

STM32 be the main processor for communication with POS, control the contactless chip, SAM and Peripherals. RC531 act as a contactless chip

To perform communication between Main processor and contactless tag



For software architecture, ACR123 built-in simple OS that used for tasks management, resource management, etc. Tasks included PICC Polling, SAM checking, Serial and USB communication flow, etc.



## 4.0. ACR123 Operating Procedure

### 4.1. Driver installation Procedure

Hardware requires:

- ❖ ACR123
- ❖ PC with OS windows XP or above

Software requires:

- ❖ Driver “Microsoft CCID Driver Version 5.2.3790.2724.rar”

Steps:

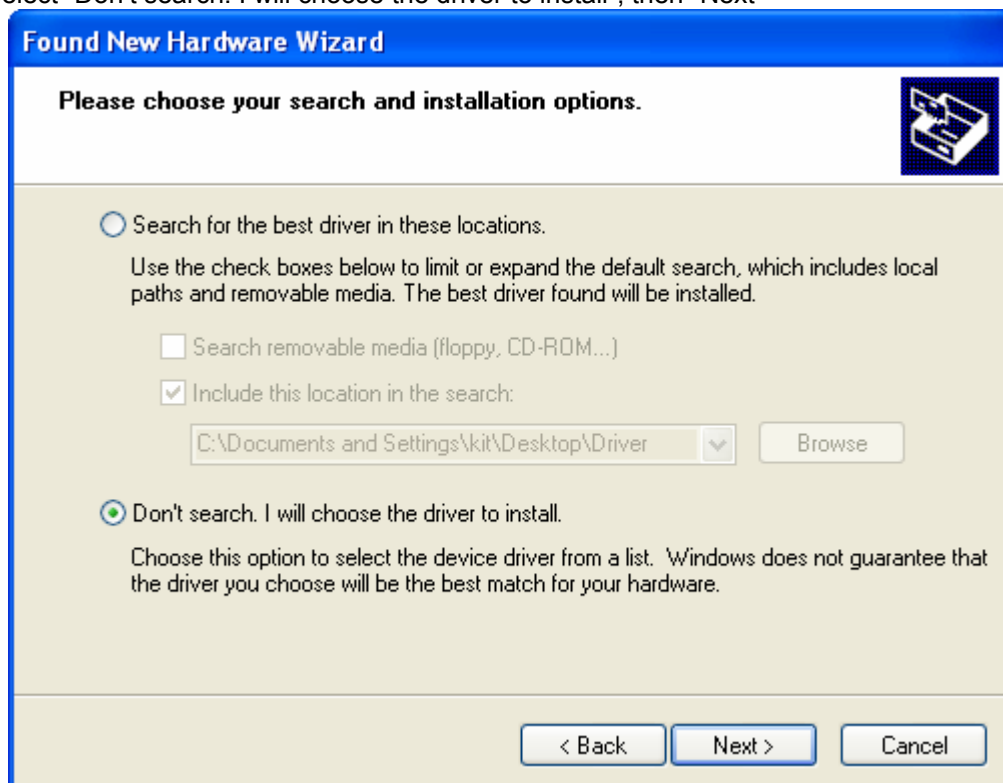
1. Extract the file “Microsoft CCID Driver Version 5.2.3790.2724.rar”
2. Plug-in the ACR123 to PC's USB
3. Wait for driver install message



4. Select “Install from a list or specific location (Advanced)”, then “Next>”

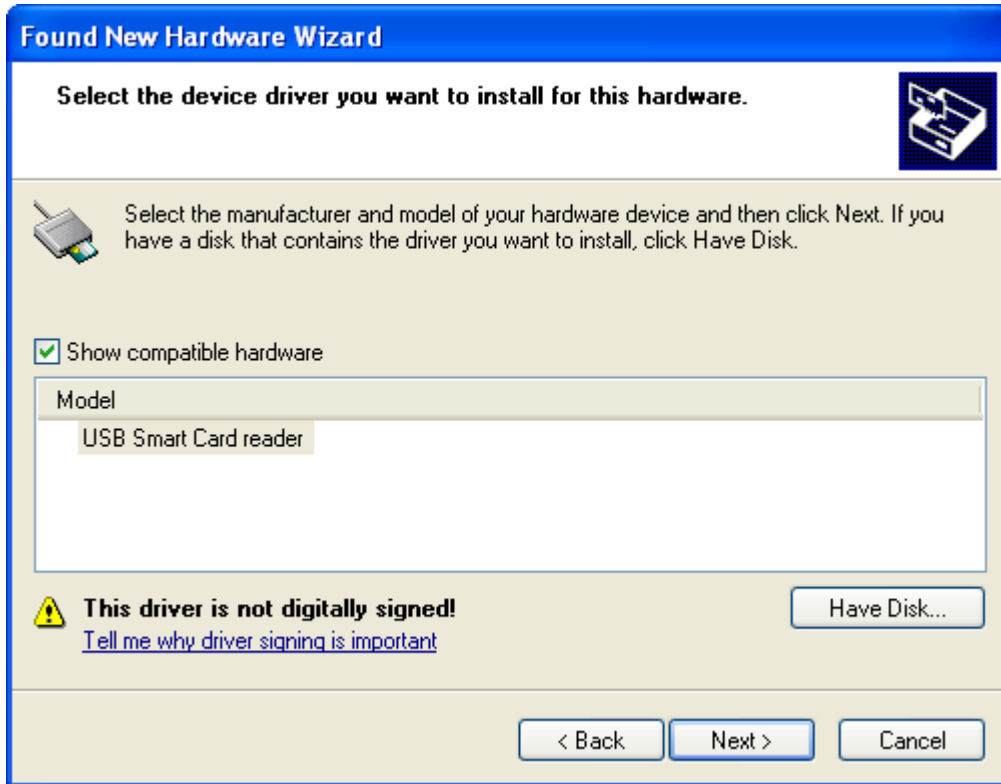


5. Select "Don't search. I will choose the driver to install", then "Next>"



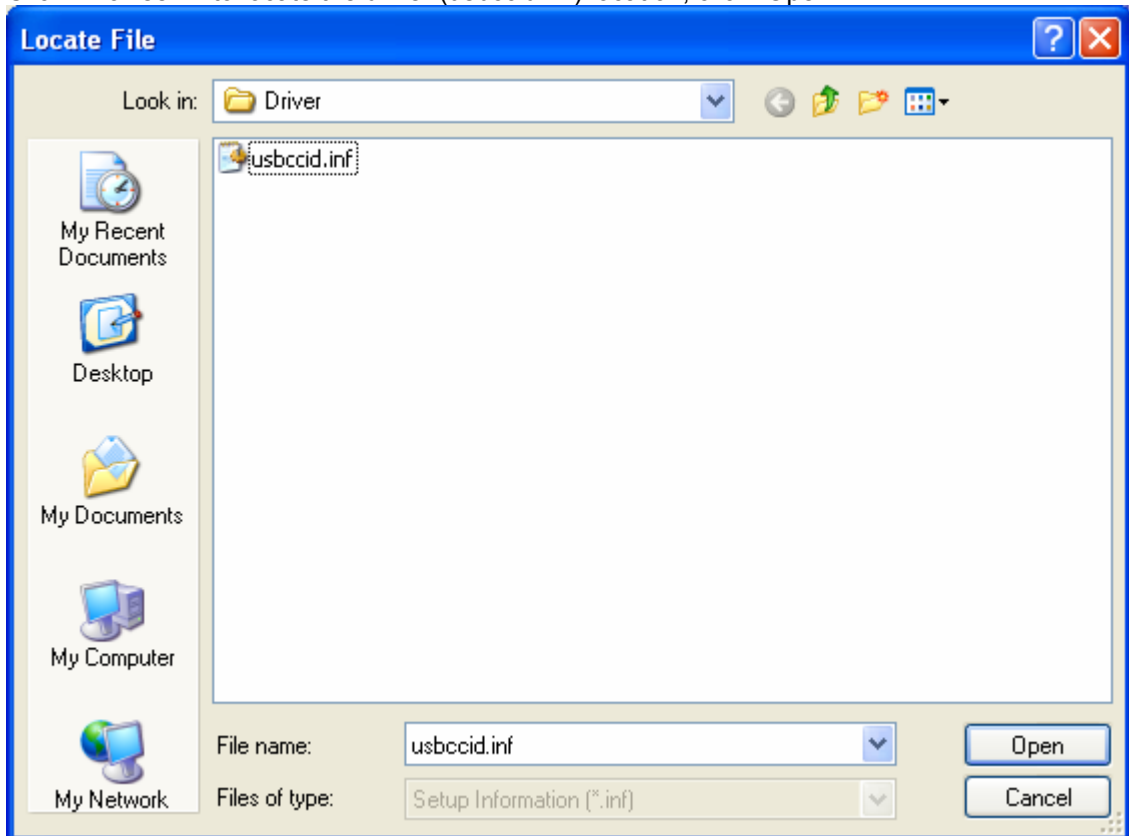
6. if present "USB Smart Card reader", select it and then "Next>"





if No, click "Have Disk..."

Click "Browse..." to locate the driver (usbccid.inf) location, click "Open"



Select "USB Smart Card reader", and then "Next>"

7. Click "Continue Anyway"



8. Wait until the below screen appear, click “Finish” to complete
9. Driver Installation Complete

## 4.2. Operation Example

Hardware requires:

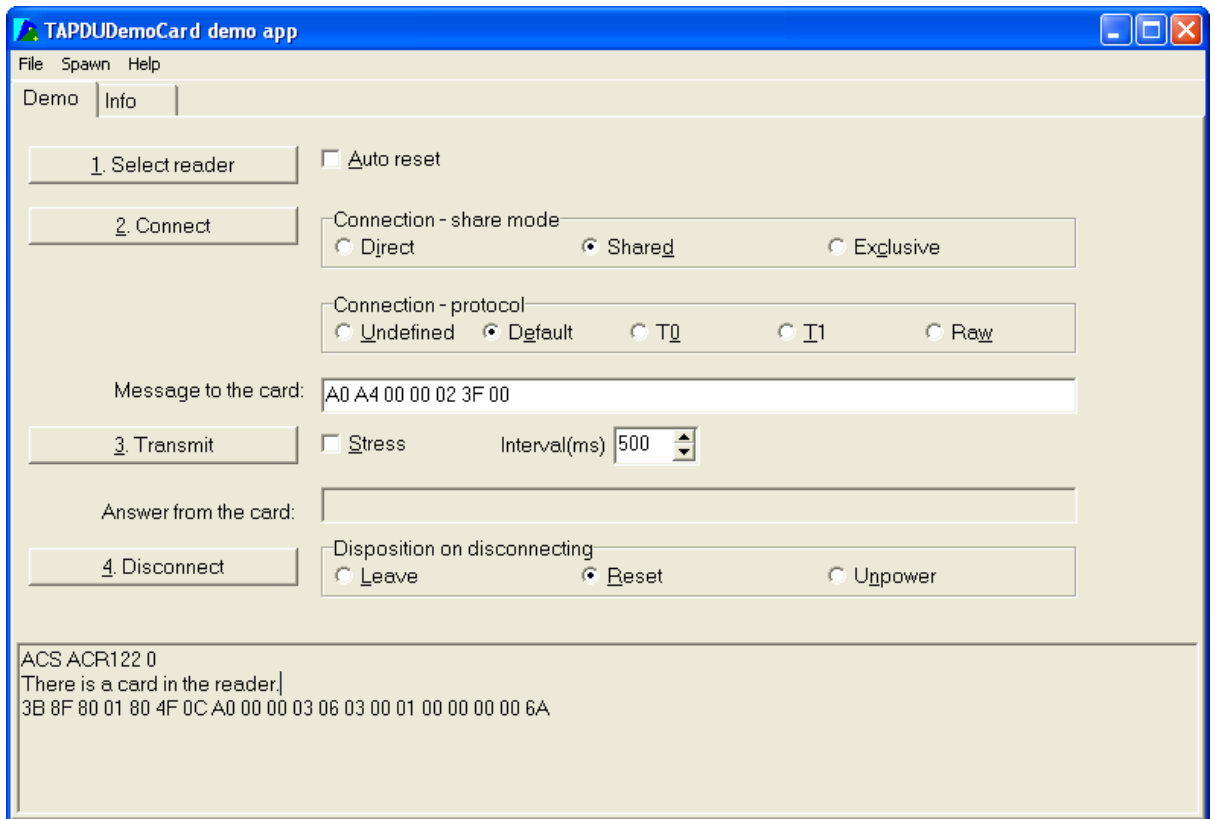
- ❖ ACR123 x 1
- ❖ PC with OS windows XP or above
- ❖ Test card x 1 (provided by ACS)

Software requires:

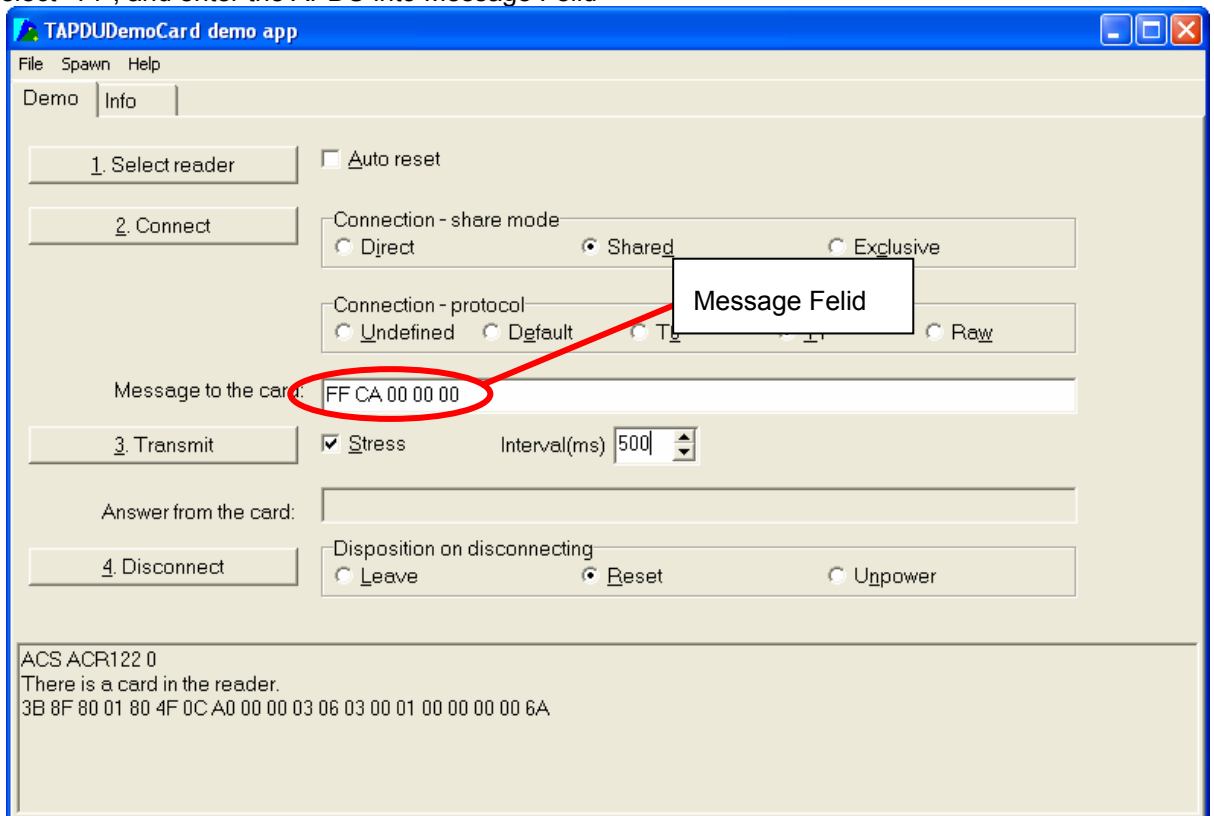
- ❖ APDU.exe (for example)

Steps:

1. Plug in the reader into the PC
2. Place the Card on the top of the reader
3. Open “APDU.exe”



4. Select "T1", and enter the APDU into Message Field



5. Press "Connect"
6. Press "Transmit" to start the testing
7. Complete the operation



## Appendix A. Parameter sheet

### Device

ACR123 Smart Card Reader/Writer

### Power supply

Supply voltage..... Regulated 5V DC

Supply current..... <500mA

### Serial Interface

Type ..... RS232/RS485

Connector ..... supplied together with the reader

Speed..... 9600bps – 250Kbps

### Universal Serial Bus Interface

Type ..... USB, four lines: +5V, GND, D+ and D-

Connector ..... supplied together with the reader

Speed..... Full Speed Device, 12 Mbps

### SAM Smart Card Interface

Standard ..... ISO 7816 1/2/3, T=0 and T=1

Supply current..... max. 50mA

Smart card voltage..... 5V / 3V / 1.8V

Smart card read / write speed ..... 9600 – 344kbps

Short circuit protection ..... +5V / GND on all pins

CLK frequency ..... 4.0MHz

### Contactless Smart Card Interface

Standard..... ISO 14443 A & B Parts 1-4

Protocol ..... ISO14443 T=CL for ISO14443-4 compliant cards and T=CL Emulation for MIFARE 1K/4K

Smart card read / write speed ..... 106 kbps, 212 kbps, 424 kbps and 848 kbps

### Operating Frequency for Contactless Cards Access

Operating Frequency ..... 13.56 MHz

### Antenna

Antenna Size..... 75mm x 75mm

Operating distance..... up to 50 mm (Depend on Card Type)

### Built-in peripherals

1 x Speaker

4 x Single Color LED

4 x Tri-Color Antenna LED Backlight

1 x Micro SD

1 x LCD (128\*64 FSTN Type) with backlight

### Case

Dimensions ..... 159.0 mm (L) x 100.0 mm (W) x 21.0mm (H) [without Cradle]

..... 177.4mm (L) x 100.0mm (W) x 94.5mm (H) [with Cradle]



Color ..... Black

**Operating Conditions**

Temperature ..... 0 - 50° C

Humidity ..... 10% - 80%

**Cable Connector**

Length ..... 2.0m (USB)

**Standard/Certifications**

CE, FCC

EN300330

EN55022 & EN55024

EN55014

EMV L1 & EMV L2

**OS**

Windows 98, ME, 2K, XP, 7

**OEM**

OEM-Logo possible, customer-specific colors, casing, and card connector

**FCC Caution:**

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

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.

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