

Free2move FS901-AB0A

Bluetooth enabled RFID reader

User Manual

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CHAPTER 1

Introduction to FS901

1.1 Indication for Use

Free2move FS901 is intended to be used for portable passive RFID system.

1.2 System Requirements

To install and use the components of the FS901 test application, your system must meet the following requirements:

PC Requirements:

- Windows 7 or
- Windows XP or
- Windows Vista and
- Bluetooth installed and enabled.

CHAPTER 2

FS901

The FS901 hardware has features which make it exceptional as a portable passive RFID device. The unit is designed for power saver and easy installation that without any physical cable/plug on the communication.

2.1 Hardware Features

There are 4 LEDs indicator on the top of the cover and 1 push button on the side of the cover. The pushbutton acts as an ON/OFF switch. The green LED (PWR) will lit up when the unit is powered is on or off and orange LED light (CHG) indicates the charging state. The other 2 LEDs are reserved LEDs for future/external used.

2.1 (a) Front view



2.1(b) side views



Left side view shows the USB connection with rubber protection and ON/OFF button



Right side view.

2.1(c) Final outlook



The final outlook show when the unit is turn ON, the LED on the leftmost side (PWR) turns to Green. Upon turning the unit ON, unit will be ready to use after connection thru Bluetooth is established. After the pairing with a bluetooth-enabled device such as computer, unit will be able to read passive ISO18000 - 6C tags.

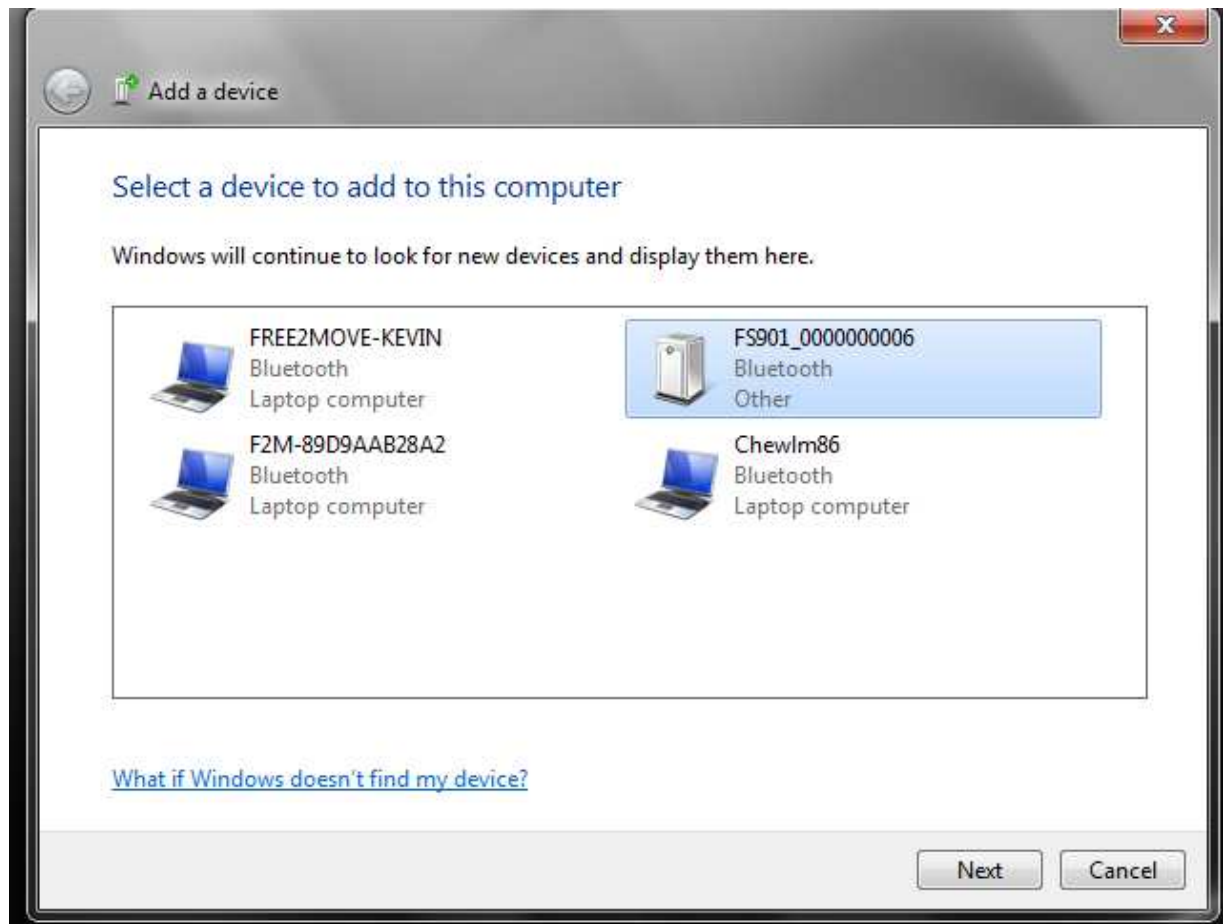
2.2 Communication Medium

FS901 uses bluetooth technology as the communication medium between FS901 computer or bluetooth enabled device. The FS901 device is equipped with Free2move's F2M03GLA bluetooth module, which has integrated high output antenna.

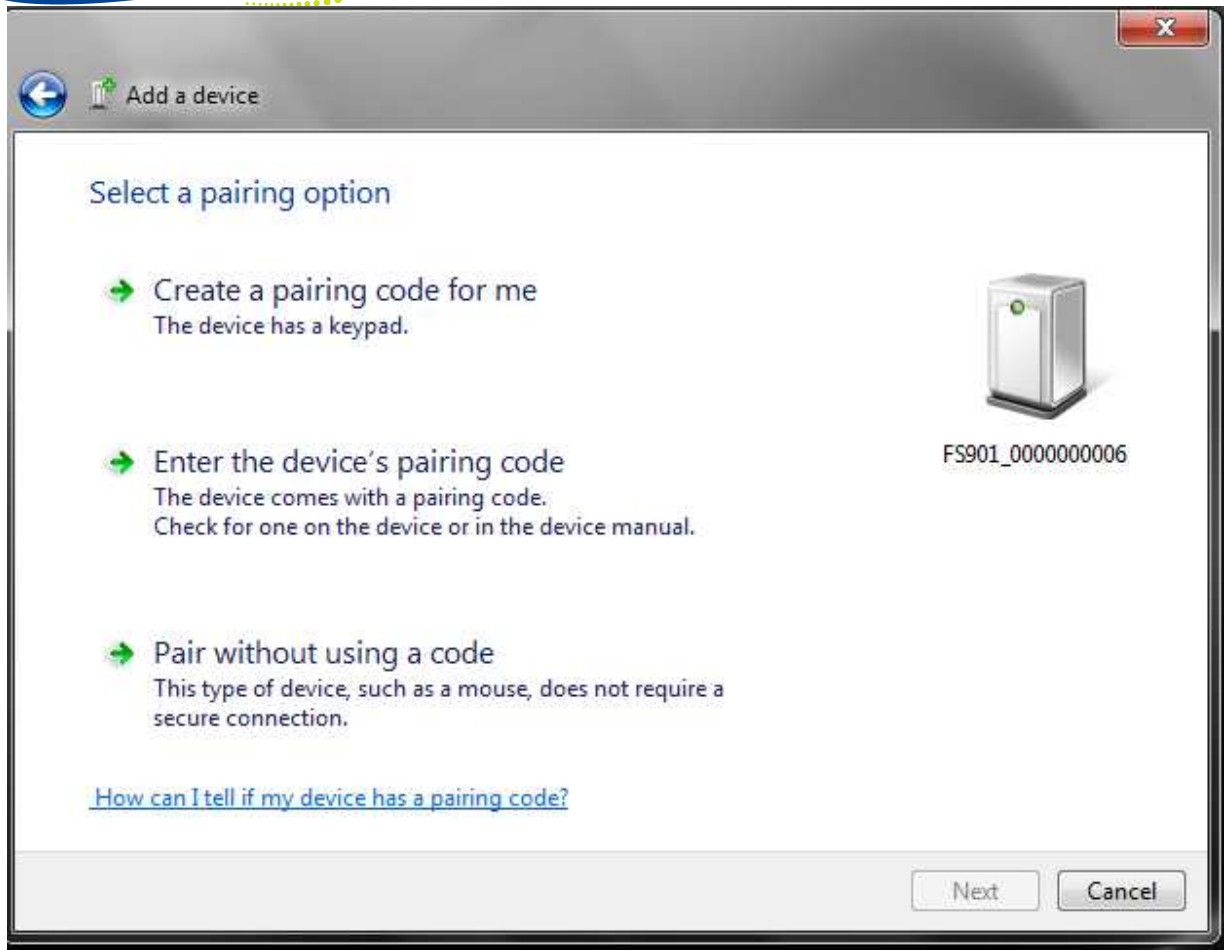
Bluetooth Connection Example using Windows 7

Go to Control Panel>Hardware and Sounds>Devices and Printers and select Add a device.

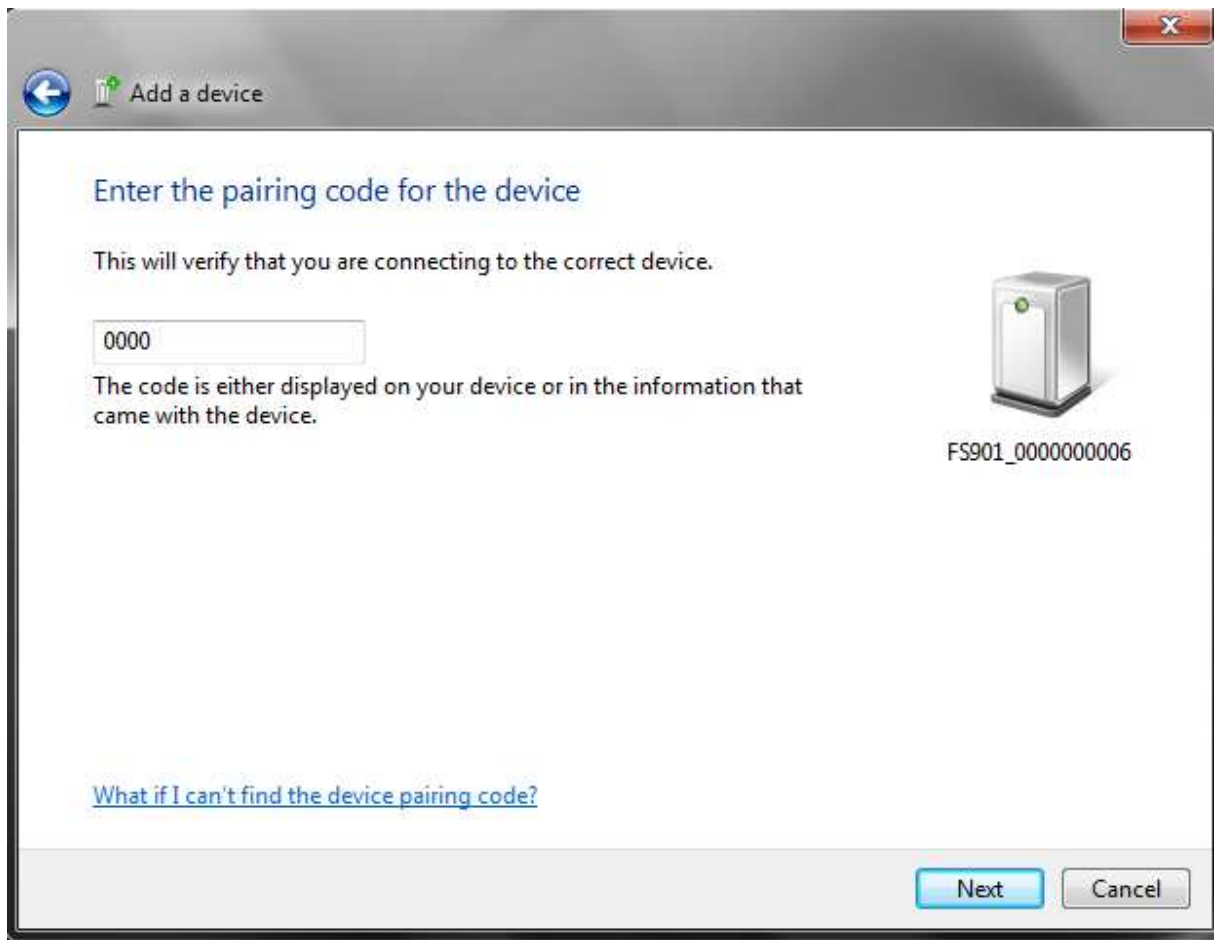
You will find a device FS901_000000xxxx, depends the Reader ID of FS901 unit.



Click next when the FS901 is selected, (in this example, FS901_0000000006). Click enter the Devices pairing code, 0000



Select the Enter the device's pairing code



Click next after the code 0000 had been entered.



If the connection is successful, then the FS901 is ready to use to read RFID tags. That's all and the reader is ready for use.

Bluetooth connection Example using Windows XP

One must have a bluetooth enabled Windows XP computer/device to be able to make connection to Gemia, FS901. If you do not have one, a bluetooth dongle could be used and set up on the computer and connected.



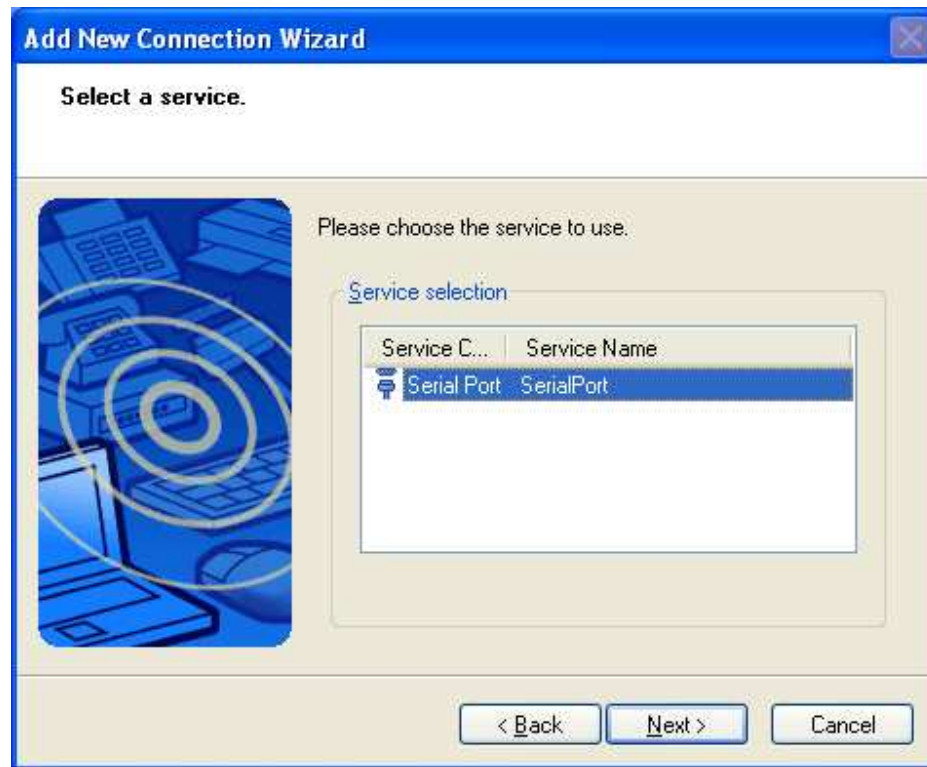
Turn on FS901 by pressing the left side ON/OFF button. Place the Gemia, FS901 next to the computer. Go to Add New Connection Wizard of Windows XP and the computer will search for Bluetooth devices.



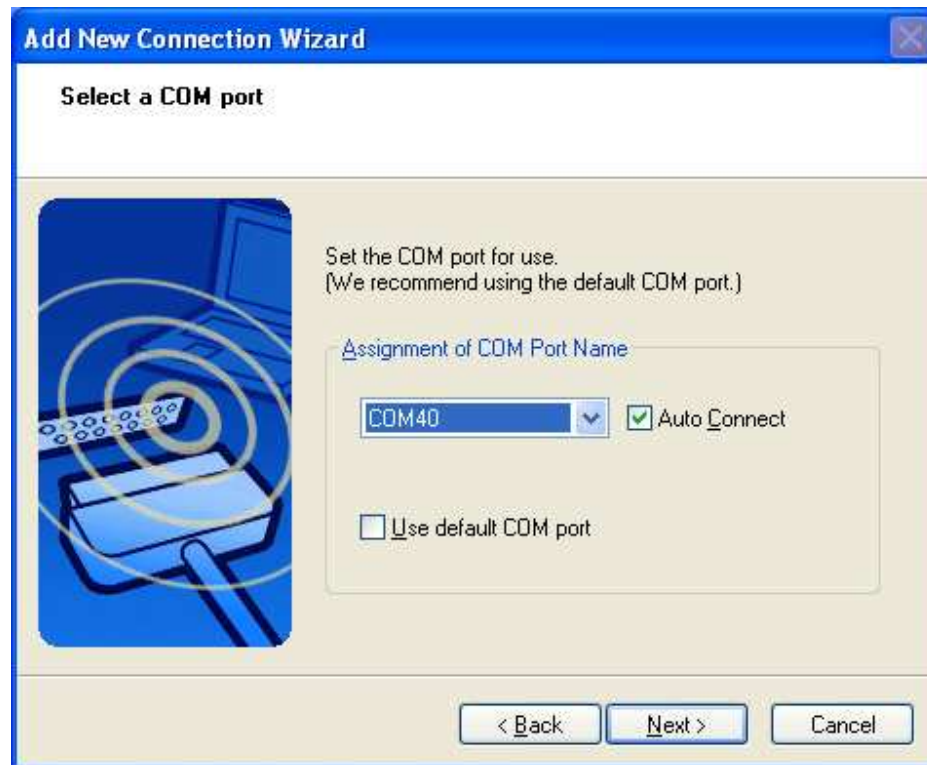
When the FS901 is detected, Click on the FS901 (in this case FS901_000000000D), click next.



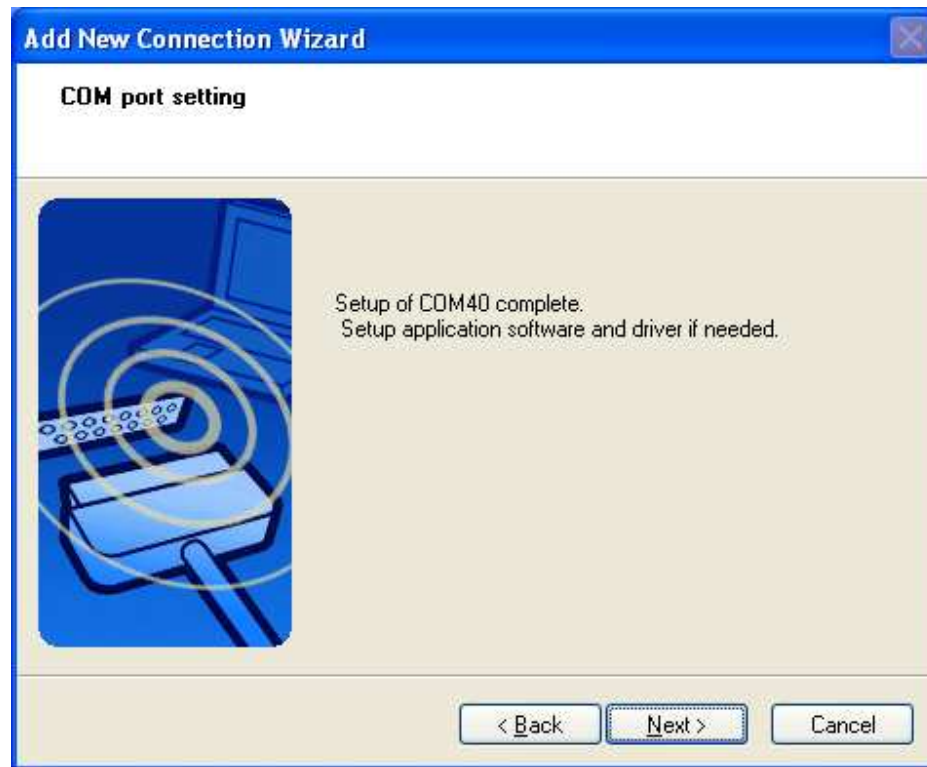
Then, the above screen is reached. Device/computer is now connecting to the Gemia unit, FS901



Then one will reach this screen, select a service, select Serial Port.



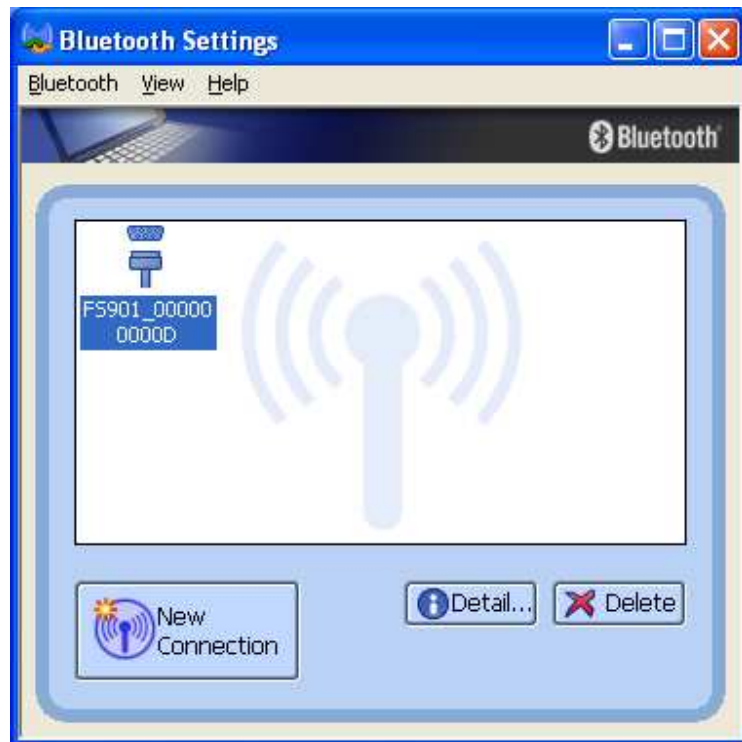
A screen to select a COM port is then reached, select the COM port name that you want Gemia FS901 to be connected. Any available COM port can be used.



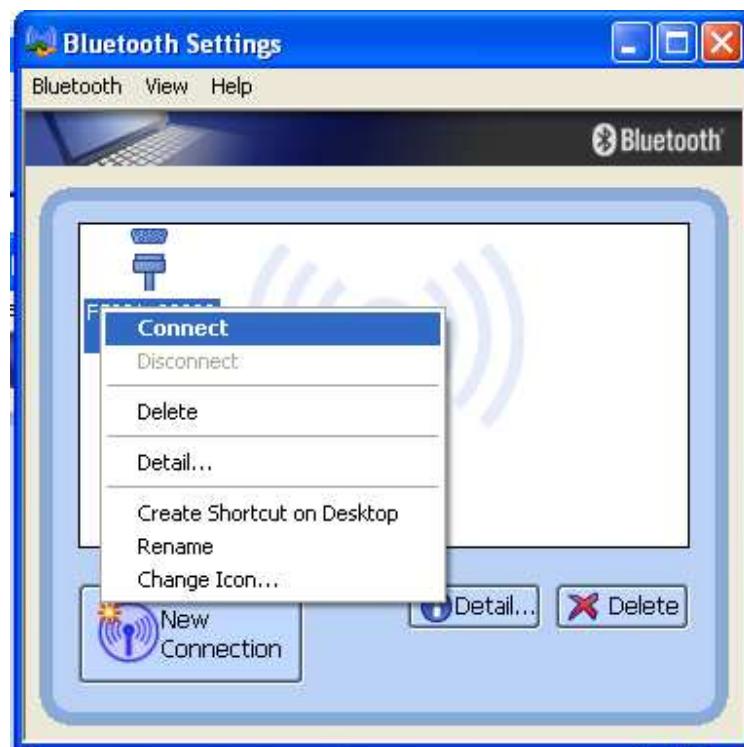
Set up for COM port name is completed, (in this case COM 40 is selected, normally COM 1 is available and used)



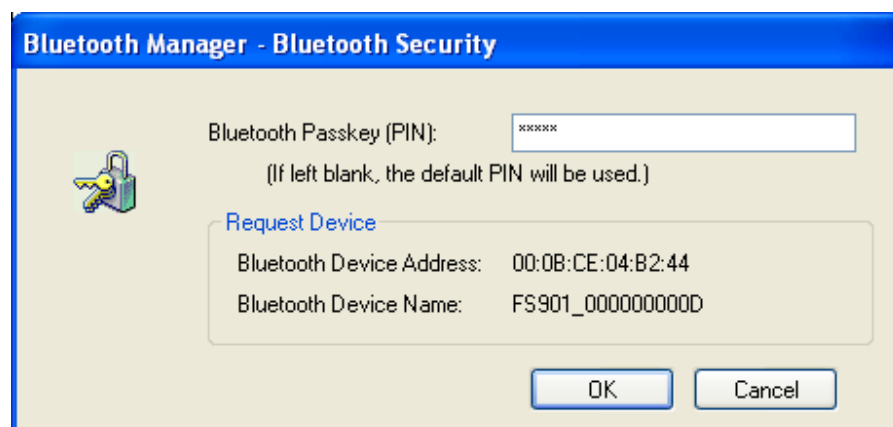
Now, enter a name and select an icon. (In this case, the connection name is FS901_000000000D).



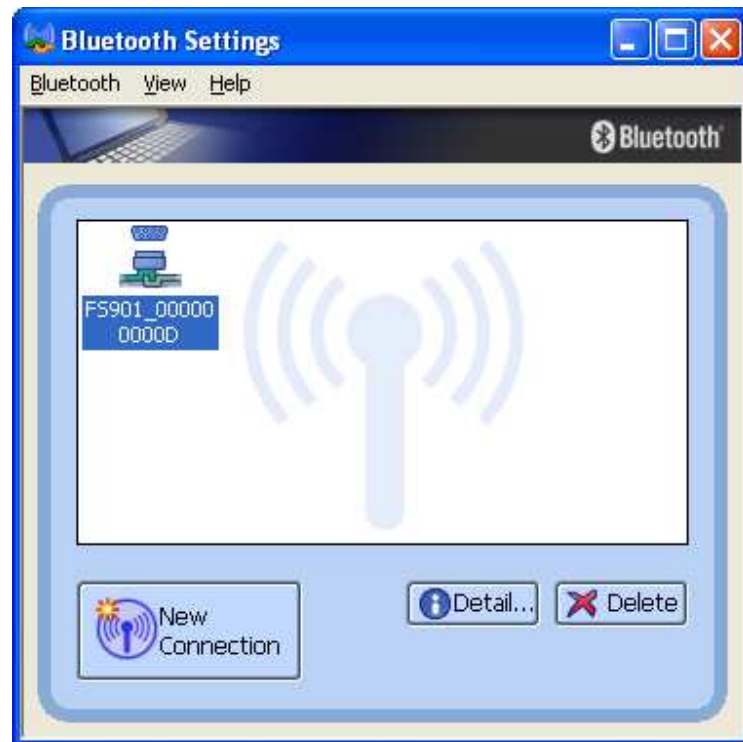
On the icon that are displayed in Bluetooth settings, right click on the Icon.



Click connect.



Enter PIN number: 0000 and Click OK



FS901, Gemia is now connected. Unit is ready to use now.
They maybe other ways or method to get connected to the Gemia, FS901.

Similarly, it is the same for device/computer with Operating System Windows Vista.

CHAPTER 3

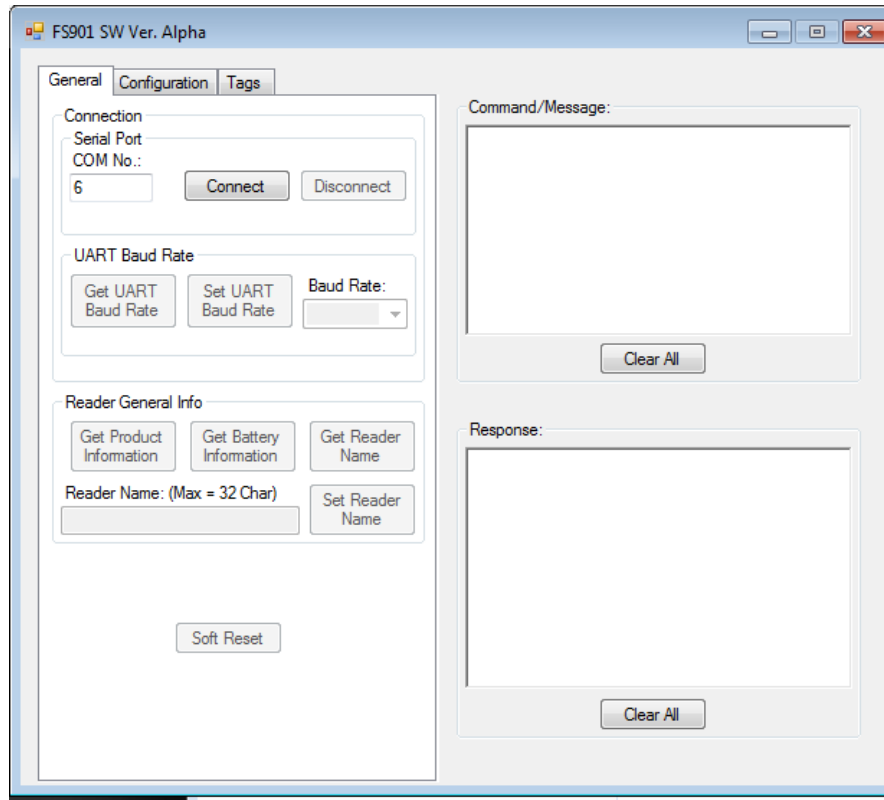
FS901 test program

The FS901 test program was designed to do a simple demo run on the computer. The test program interacts with the FS901 device and allows us to get the EPC and TID value of the EPC GEN2 TAGs.

3.1 Features

- Allow user to start search for TAGs with EPC and TID selection.
- Continuous detection of Tags allow user to have a range test on TAG.
- Not for normal reader operation, for normal operation one only need to pair the unit with computer or bluetooth enabled device and the unit is ready for use

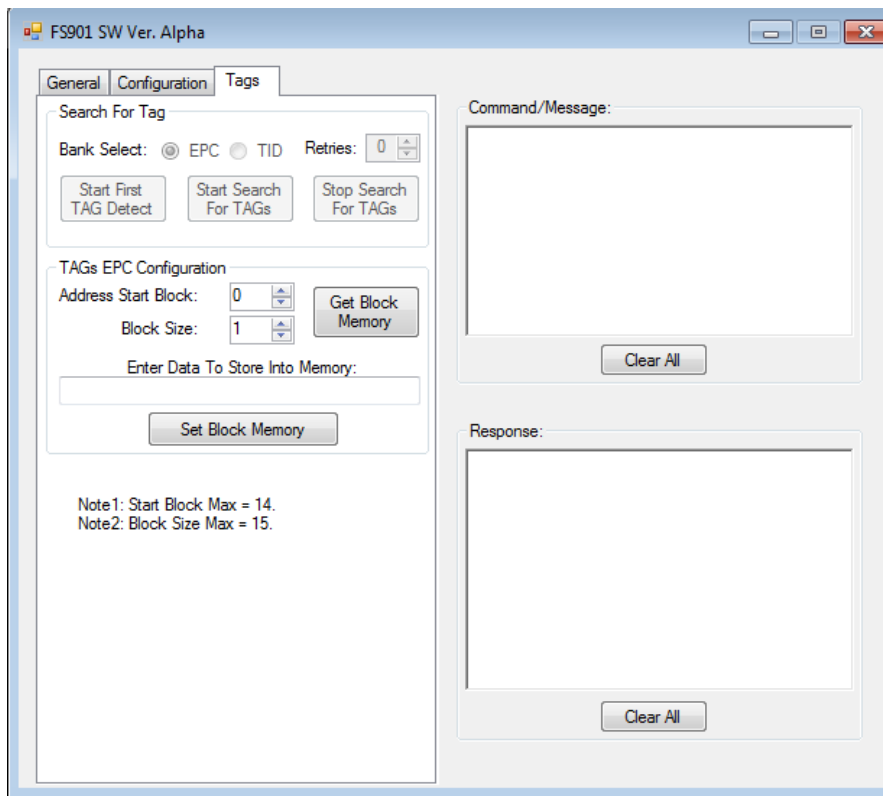
3.2FS901 Test Program User Interface



Test program User interface at General Tab

Once the Bluetooth connection had been established as explained in previous chapter, we can also use the optional test program to test out the unit.

- At the General tab, Enter the COM which the Bluetooth computer is connected to the FS901 unit. The COM number depends on the computer COM where the Bluetooth connection is connected. Press Connect Icon.
- At the Tags tab, select Start Search for Tags.
- The unit will display tags detected at the response window.



Test Program Tags tab

Once the start Search button is pressed, the unit will search for tag and will display the response on the bottom right hand side

Test Program Icon Reference (For Engineering use)

By default, it is not necessary to set these icons. Below explanations are for your reference only.

In the General tab: -

COM No: - COM port number where Gemia, FS901 is connected, press Connect to connect or Disconnect to be disconnected from device/computer

UART Baud Rate – Get UART Baud Rate – to read the existing baud rate of Gemia

Set UART Baud Rate – For setting of baud rate, click on the Baud rate, one can set baud rate 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps

Reader General info - Get Product Information, Get Battery Info, Get reader name are all displayed in numeric form and only for Engineering use.

In Configuration tab: -

Output power – Unit can be set to highest/lowest output power

Get output power – read the existing output power

Set output power – right click on the selection and select the respective output power to be set. By default, unit is set to highest output power

Modulation depth – settings of waveform Modulation depth. Kindly refer to ISO 18000-6C EPC G2 specifications on modulation depth. Modulation depth can be set 10% to 100%. By default, it is set to 100% modulation depth.

Frequency Hopping Mode – Frequency Hopping can be set either sequential hopping mode or pseudo random hopping mode. By default, unit is running on pseudo random hopping mode. Click on the selection to select the hopping mode and press set to set the required hopping mode.

Frequency – settings of Frequency. By default, unit is programmed to operate at regional approved frequency only.

In the Tags tab: -

Bank select – select which bank to read from.

EPC – Electronic Product Code, as per defined on ISO 18000 – 6C

TID – Tag ID information, as per defined on ISO 18000 – 6C

Retries - Number of attempt to read the first detectable tag. Signal is transmitted out from FS901 and then the reflected signal is read from the tag. Max attempt that can be set is 255. The retries selection is only for Start first TAG detect use only.

Start first TAG detect – FS901 search first for tag and the number of retries depends on the settings. When the first tag is detected, the responses are displayed and stop automatically.

Start Search for tags - FS901 to search for tag continuously until stop search for tags is pressed.

Stop Search for tags - FS901 will stop to search for tag.

TAGs EPC configuration – The memory block of the tags can be read, Address start block and block size. Kindly refer to ISO 180000 6C EPC G2 Specification.

Set block Memory – data can be entered into memory of the tags, this is for Engineering use only.

After Use Care

There are a few things that one should do after using FS901 RFID reader

After each usage:

1. Check the Battery remaining before closing, charge unit if needed.
2. Switch off the FS901 device.

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

[EN 60950-1: 2006](#)

Safety of Information Technology Equipment

[EN50371: \(2002-03\)](#)

Generic standard to demonstrate the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (10 MHz - 300 GHz) -- General public

[EN 300 220-2 V2.1.2 \(2007-06\)](#)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW; Part 2: Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

[EN 300 328 V1.7.1: \(2006-10\)](#)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

[EN 301 489-1 V1.8.1: \(2008-04\)](#)

Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

[EN 301 489-17 V1.3.2 \(2008-04\)](#)

Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment

[EN 301 489-3 V1.4.1 \(2002-08\)](#)




Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz





This device is a 2.4 GHz wideband transmission system (transceiver), intended for use in all EU member states and EFTA countries, except in France and Italy where restrictive use applies.

In Italy the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying public access to telecommunications and/or network services.

This device may not be used for setting up outdoor radio links in France and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 – 2483.5 MHz. For detailed information the end-user should contact the national spectrum authority in France.



 Český [Czech]	[Free2move Scientific] tímto prohlašuje, že tento [FS901] je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
 Dansk [Danish]	Undertegnede [Free2move Scientific] erklærer herved, at følgende udstyr [FS901] overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
 Deutsch [German]	Hiermit erkläre [Free2move Scientific], dass sich das Gerät [FS901] in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
 Eesti [Estonian]	Käesolevaga kinnitab [Free2move Scientific] seadme [FS901] vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
 English	Hereby, [Free2move Scientific], declares that this [FS901] is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
 Español [Spanish]	Por medio de la presente [Free2move Scientific] declara que el [FS901] cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
 Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ [Free2move Scientific] ΔΗΛΩΝΕΙ ΟΤΙ [FS901] ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
 Français [French]	Par la présente [Free2move Scientific] déclare que l'appareil [FS901] est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
 Italiano [Italian]	Con la presente [Free2move Scientific] dichiara che questo [FS901] è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo [Free2move Scientific] deklarē, ka [FS901] atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo [Free2move Scientific] deklaruoja, kad šis [FS901] atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
 Nederlands [Dutch]	Hierbij verklaart [Free2move Scientific] dat het toestel [FS901] in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
 Malti [Maltese]	Hawnhekk, [Free2move Scientific], jiddikjara li dan [FS901] jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
 Magyar [Hungarian]	Alulírott, [Free2move Scientific] nyilatkozom, hogy a [FS901] megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
 Polski [Polish]	Niniejszym [Free2move Scientific] oświadcza, że [FS901] jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami

	Dyrektywy 1999/5/EC.
 Portuguese [Portuguese]	[Free2move Scientific] declara que este [FS901] está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
 Slovensko [Slovenian]	[Free2move Scientific] izjavlja, da je ta [FS901] v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	[Free2move Scientific] týmto vyhlasuje, že [FS901] spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
 Suomi [Finnish]	[Free2move Scientific] vakuuttaa täten että [FS901] tyypinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
 Svenska [Swedish]	Härmed intygar [Free2move Scientific] att denna [FS901] står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

APPENDIX

Warnings

This appendix lists various warnings that should be followed when using FS901 devices. It would be a good idea to periodically review each warning to ensure its safe use for you

Shock hazard.

Do not disassemble the internal FS901 modules. It contains no operator serviceable components and dangerous high voltages may be present.

Possible electrical interference.

Equipment operating in close proximity may emit strong electromagnetic or radio frequency interference (RFI) which could affect the performance of FS901 device. Avoid operating FS901 device near cauterizers, diathermy equipment, or cellular phones. Maintain equipment separation of at least four feet and do not rapidly key EMS radios on and off.

Battery care.

Do not place battery on the hot surface or damage with the sharp component, it may cause the battery burning or explosion when the FS901 switch on.

Improper use.

Improper use of FS901 device may cause injury to the user. Only use FS901 device as directed in this user's manual.

FCC statement

Federal Communication Commission Interference Statement

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 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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this 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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.
