

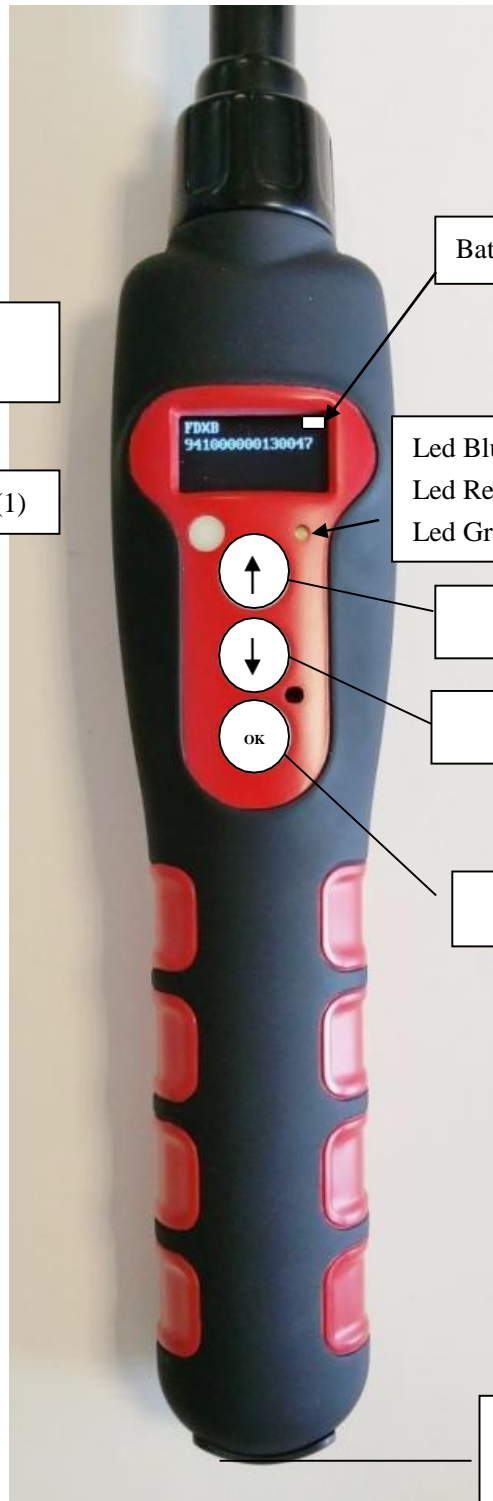
T4A 2416

Electronic RFID Reader



Display OLED
128×64 pixels

On/Off button (1)



Battery Charge Level

Led Blue: Bluetooth Activated
Led Red: Charging Battery
Led Green: Battery Charged

Scroll Up

Scroll Down

OK (enter or validate)

Mini USB
Reset Button
Charge Battery
Communication Port

Reader Characteristics

Frequency	134.2kHz read and write
Protocol	ISO11784/5 FDX-A, FDX-B, EM4102, HDX
Reading range	14-15cm (12mm×2mm, glasstag FDXB) 9-11cm (12mm x 2mm glasstag FDXA) 28-30cm ear tag FDXB (depends of the provider)
Display	128×64, White & Black, OLED
Button	4 buttons
Indication	Battery charge level, Bluetooth , Buzzer
USB port	USB virtual comport, Bluetooth virtual com.port
Power supply	Lithium battery, 5000mAh, 3.7V
Dimensions	650mm (L)×63(W)×45(H)
Weight	460g
Charging mode	Mini USB
Accessories	Mini USB cable, User manual, Battery 5000mA: 3.7Volts.
Compliances certifications	FCC - CE
Memory	Up to 800 numbers of chips

The T4S 2416 Reader is delivered with English language configured. To change the language see chapter: Menu Language

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Bluetooth T4A 2416 Reader

All readers are delivered with integrated Bluetooth technology. The Bluetooth function consumes energy. It is therefore recommended to activate this function only for the time necessary for its use. To stop Bluetooth communication, simply select the “Bluetooth” menu and disable the function. Communication via Bluetooth is limited to around ten meters and depends on the environment of your PC. To enable Bluetooth on your PC, please consult your computer user manual. Don’t forget to disable the security of Bluetooth on your PC because the Reader doesn’t ask a security code. If your PC need a code, enter 1234 or 0000.

Data Transferred by Bluetooth or USB Cable

To be able to transmit the tag numbers read or the numbers recorded in the memory (maximum 800), via Bluetooth or using the USB cable, the user needs to have installed the appropriate driver* on his PC. This driver can be downloaded free of charge from:

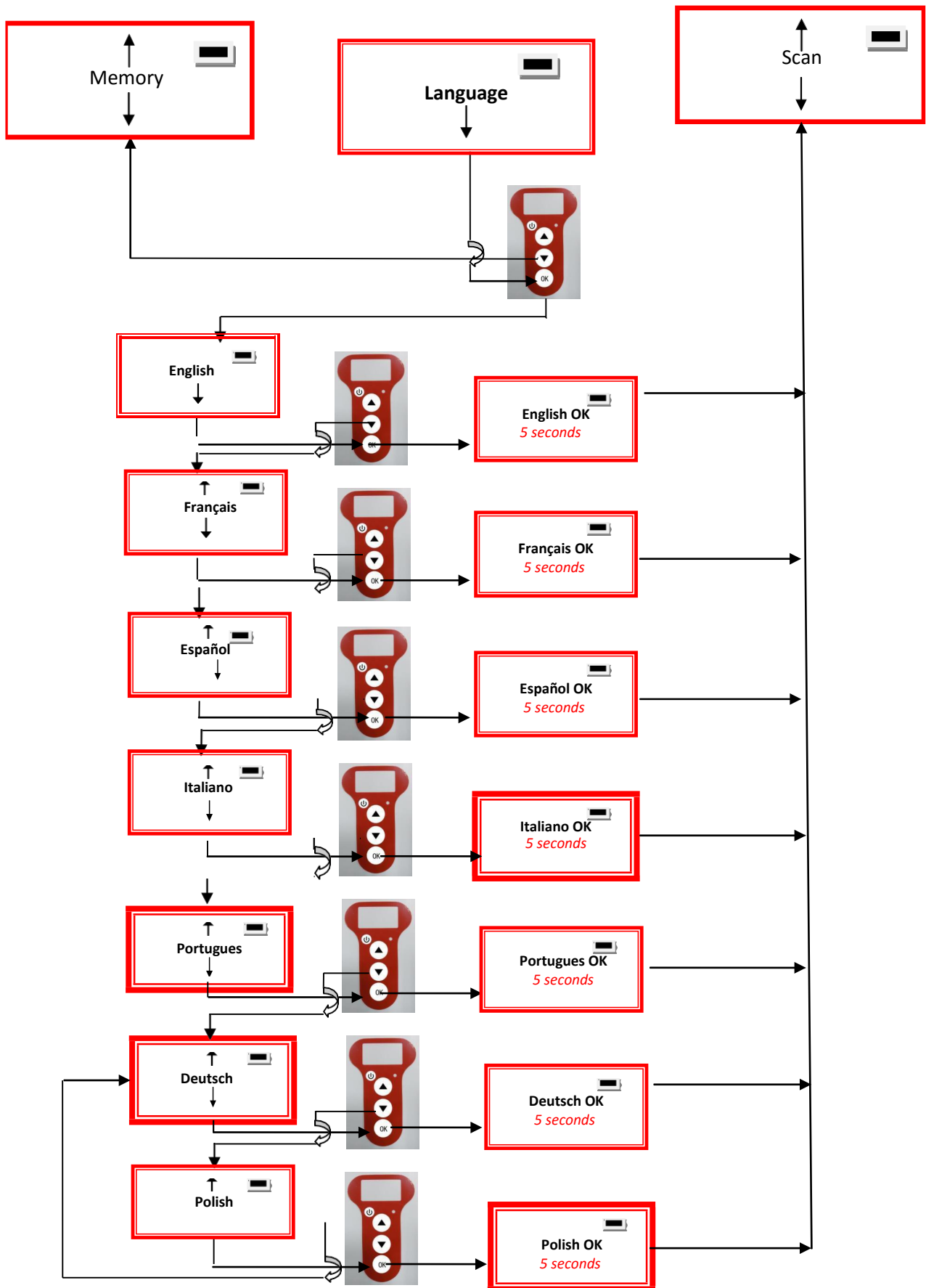
<http://download.realtrace.com/RTDriver.zip>

Once the driver is installed on your PC you will need to have application software to view and potentially record the data sent by the reader.

You can use Hyper-terminal if your operating system is XP or Realtrace Terminal with XP or Windows 7/8.

* A driver is a program enabling an operating system, in this case Windows XP or Windows 7 on a PC, to recognize a hardware peripheral and use it.

Language Function



Scan Function

Button On / Off

Scan



Reading
20 seconds max.


No transponder found!

FDXB+
952 000001234567



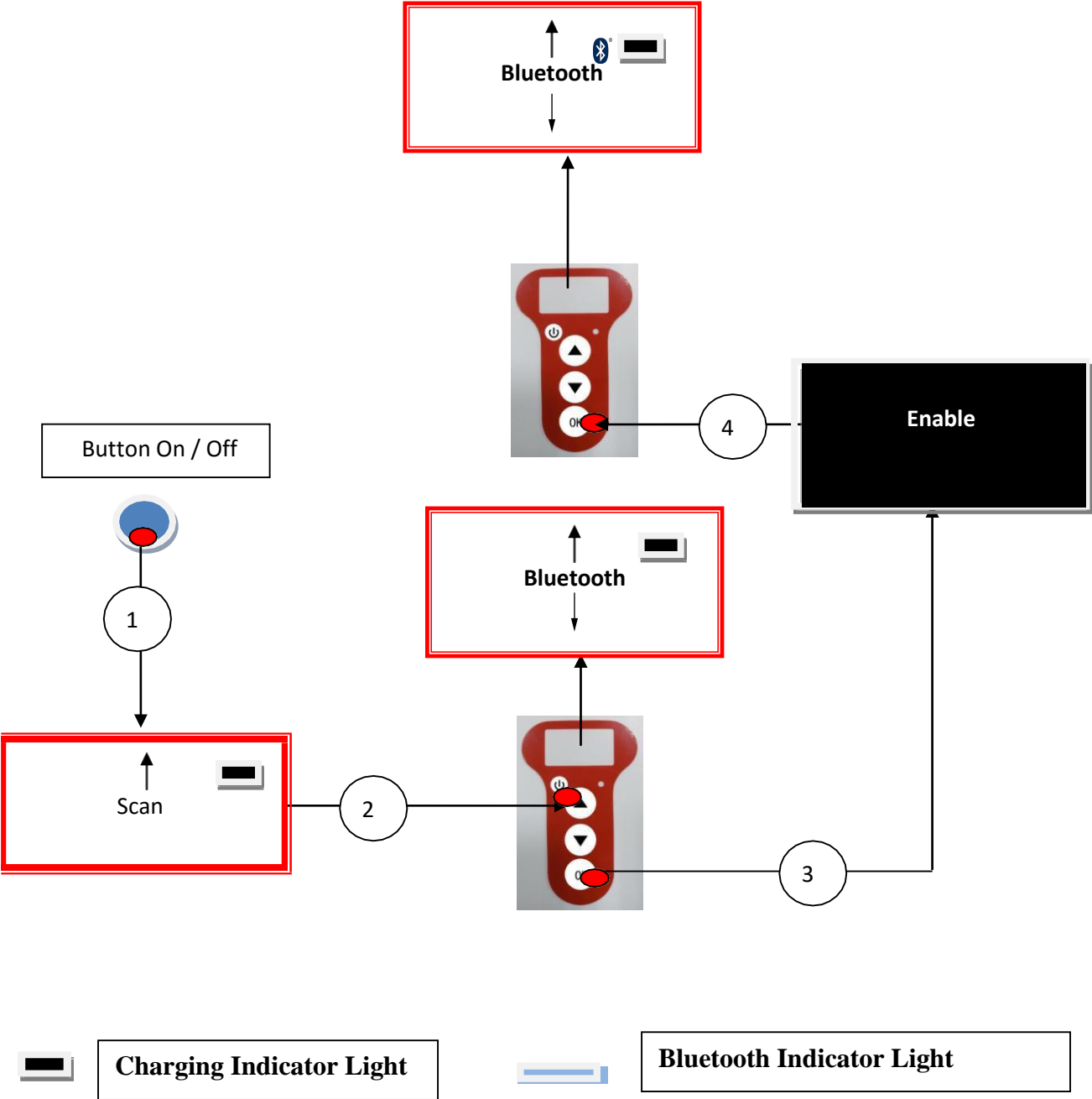
After 25 seconds

After 60 seconds

 Charging Indicator Light

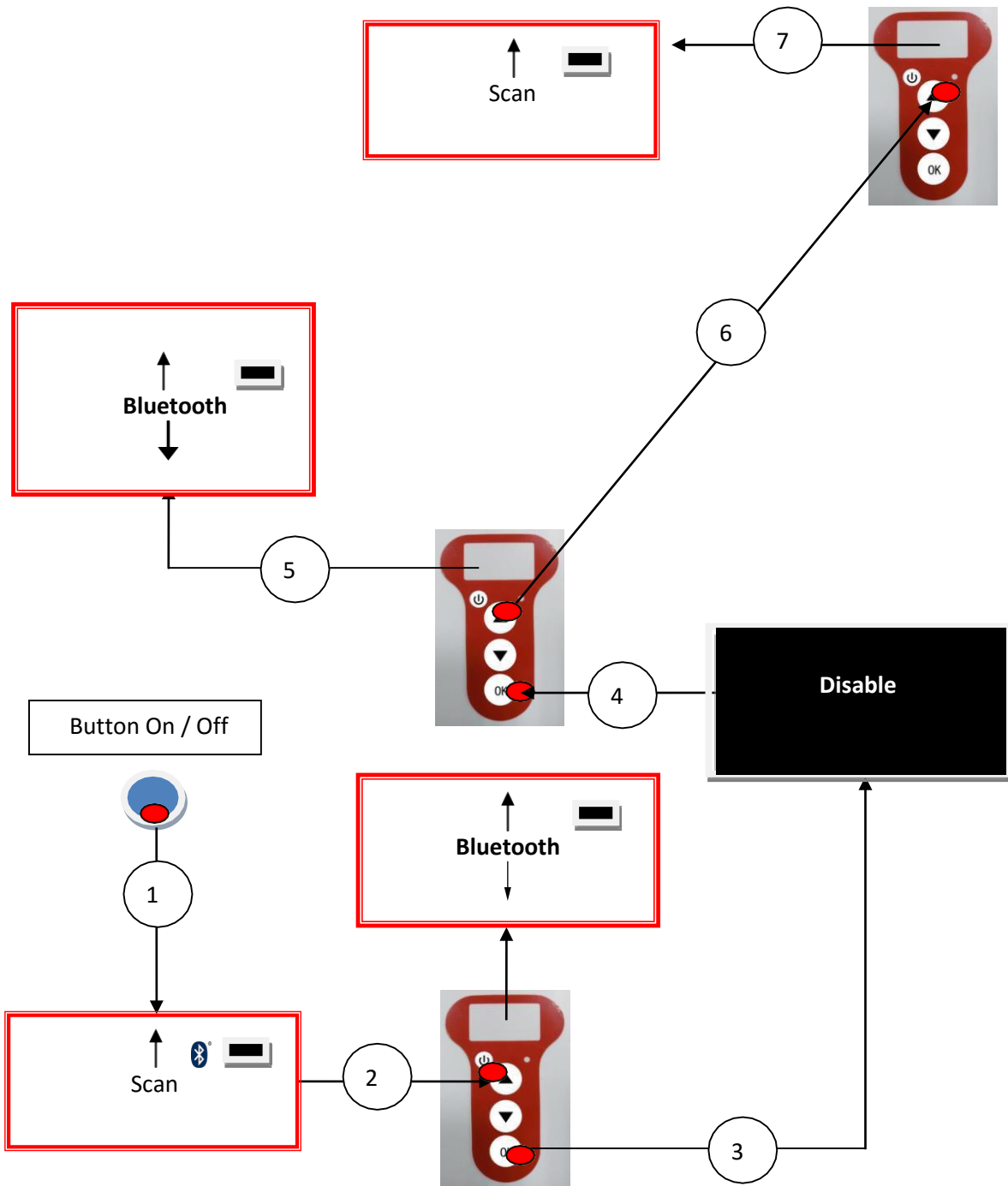
Bluetooth Function

Enable Bluetooth



Bluetooth Function

Disable Bluetooth



Using the T4A 2416 Reader Memory

The T4A 2416 Reader has a memory enabling it to store 800 identifiers (tag numbers). This function must be activated by the user if they wish to use it.

Storage of numbers read by the T4A 2416 Reader

The T4A 2416 Reader allows the user to store the numbers of the tags read in order to transfer them subsequently to a PC using the USB cable included with the reader or with Bluetooth.

To use this function, you must first activate the “Memory” function (see Memory Function: Page 10). When the Memory is activated each time a new tag is read, the reader displays the number but if the same tag is read twice by mistake the reader indicates this by emitting a characteristic beep and displaying “DUP” on the right of the screen.

This number will not be stored a second time.

If the reader is switched off, the memory function will still be activated when it is switched on again.

Deactivating the memory

The memory can be deactivated via the “Memory” menu.

Two cases may arise:

First case:

Numbers are recorded in the reader’s memory (see Memory Function: Page 12)

In this case you must transmit the list of recorded numbers actually or virtually (without plugging in the USB cable) and then erase them.

Second case:

The memory has been previously activated but no number has been recorded.

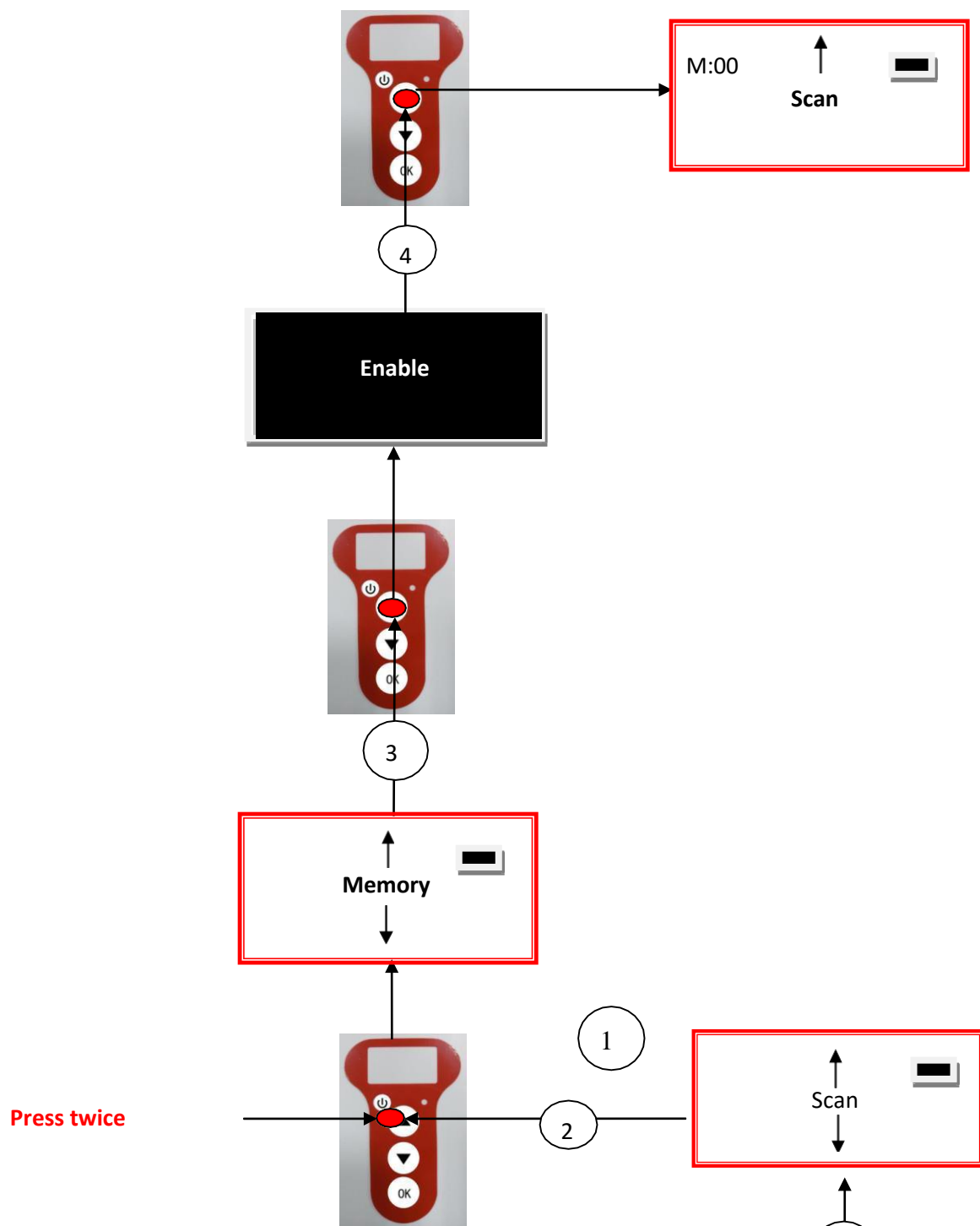
In this case simply “deactivate” the memory (see Memory Function: Page 11)

Erasing the memory

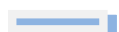
To erase the contents of the memory to avoid errors, you must select the “Memory” menu and transmit the list of recorded numbers actually or virtually (without plugging in the USB cable) and then erase them (see Memory Function: Page 12).

Memory Function

Enable the Memory



Press twice

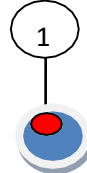


Bluetooth Enabled



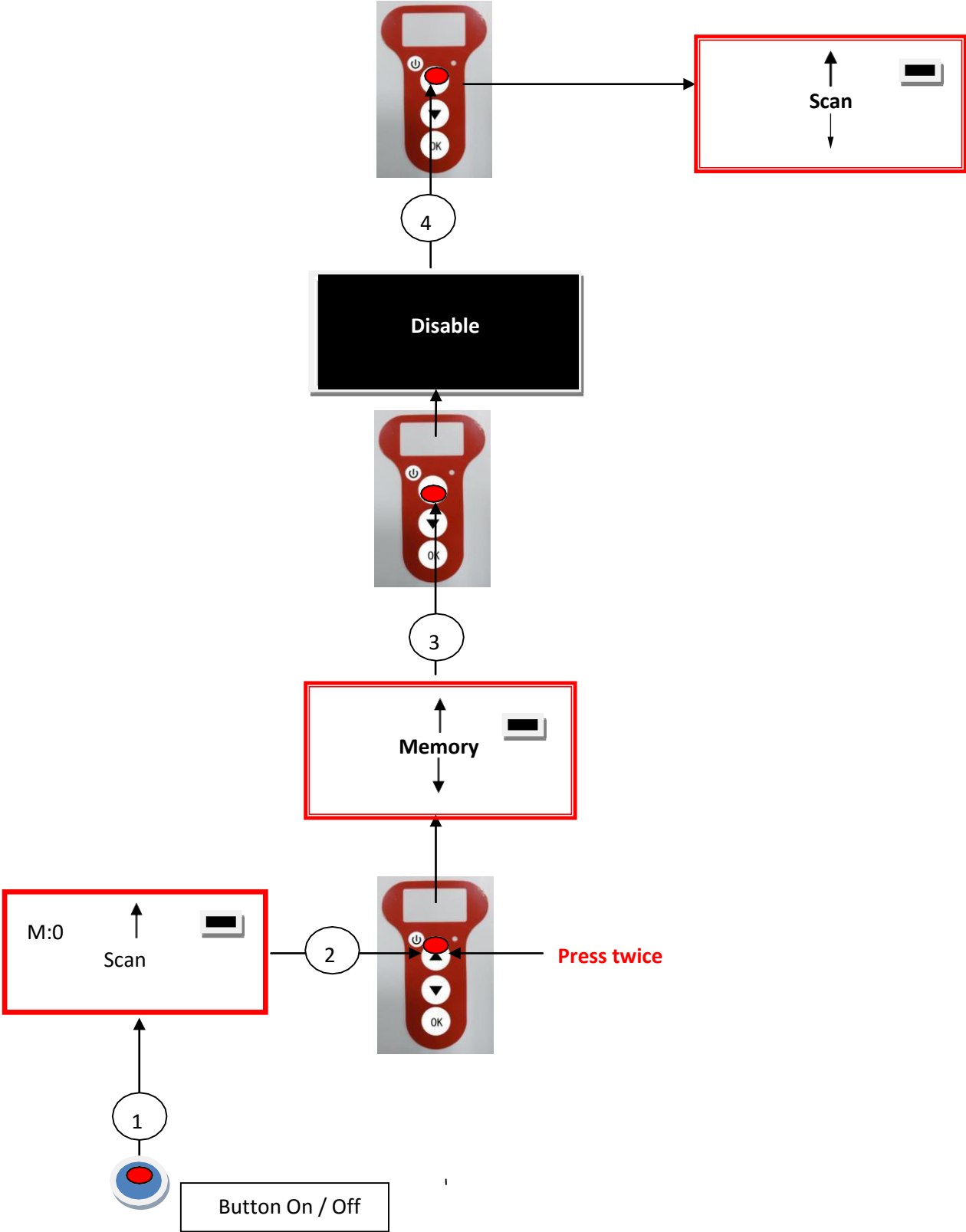
Statement of the Battery

Button On / Off



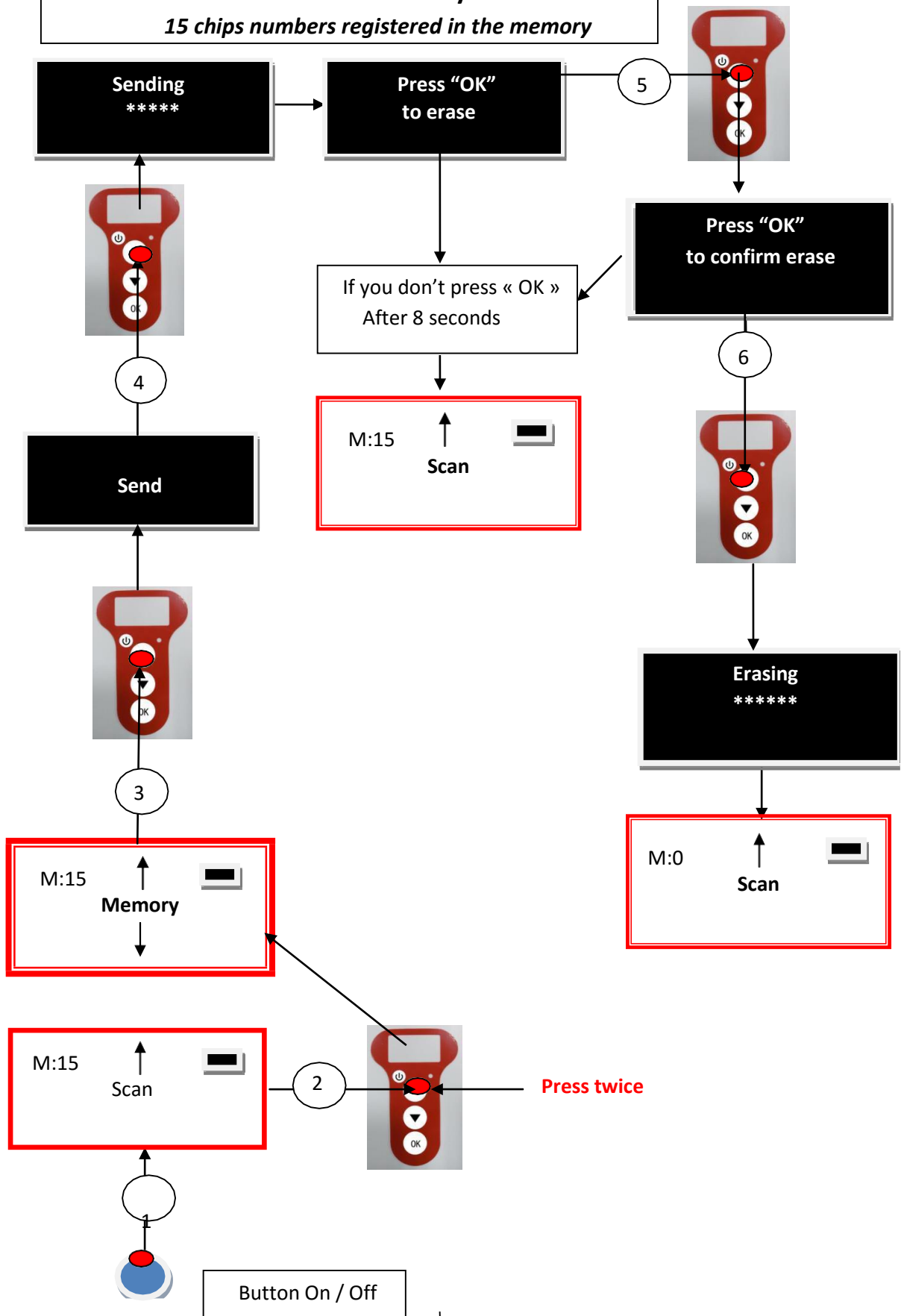
Memory Function

Disable the Memory
No chip registered



Memory Function

Disable the Memory
15 chips numbers registered in the memory



Communication between T4A 2416 and a PC

To transfer the contents of the memory you must connect the reader to a PC via the USB cable. You must then select the “Memory” menu and follow the instructions given on the display (see Memory Function: Page 12).

If the reader is connected to a PC it will transfer the number of the tag read on each reading. It is not necessary for the “Memory” function to be activated to carry out this transfer.

Caution: for the reader to communicate with a PC, you must first install the reader and have software such as Hyperterminal (Windows XP), the Terminal, etc. which enables the data to be displayed on the computerscreen and processed if necessary.

Serial link: use of the Windows « Hyperterminal »

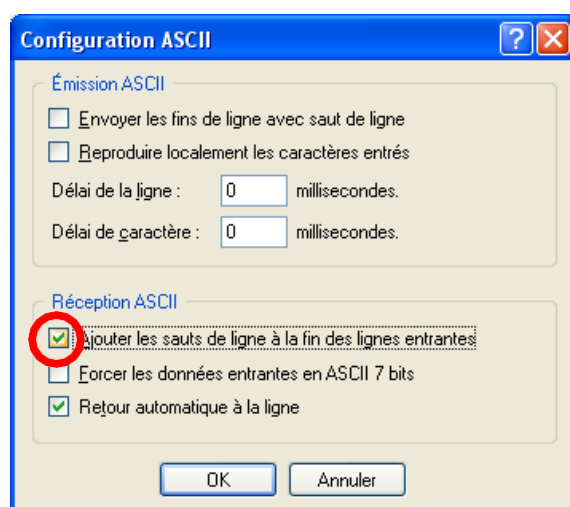
The current version of the T4A 2416 Reader, transmits the read identifiers to the PC it is connected to, either via the USB cable or its wireless link (Bluetooth). The T4A 2416 Reader does not wait for any order or acknowledgement from the PC.

Hardware configuration

The serial port for reading the data is configured as follows:

- 9600 bauds, 8 bits, 1 start bit, 1 stop bit, non-parity, and no flow control.

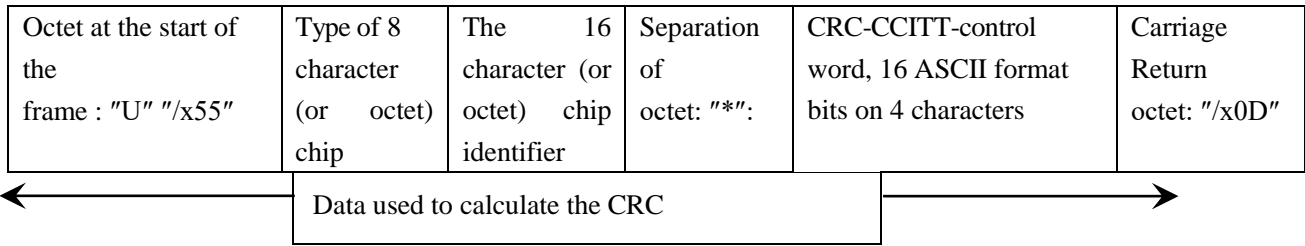
You must authorize line feeds to visualize the frames using the **hyperterminal**: click on « properties » in the « file » menu. Go to the « parameters » and then click on « ASCII Configuration... »:



The circled box above must be ticked...

Description of the frame transmitted each time a transponder is read

The T4A 2416 Reader transmits the following frame to the PC after each valid reading:

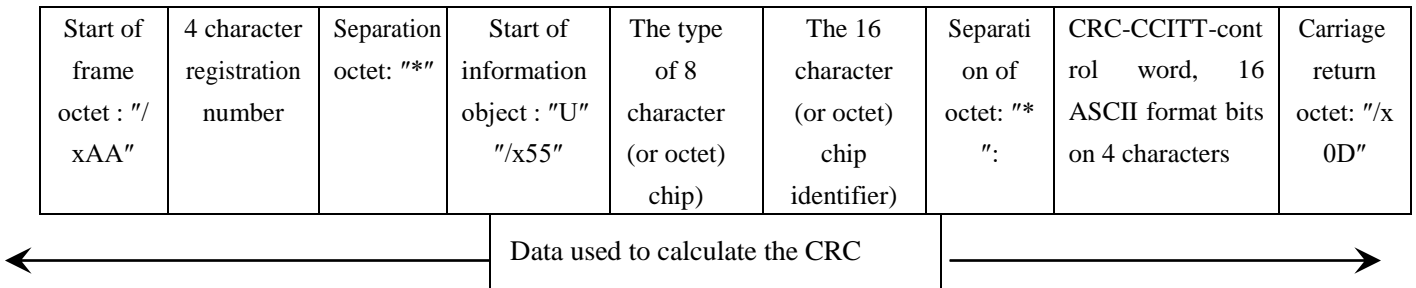


Tips: the developers of software associated with T4A 2416 Reader must use the head and separation characters to separate the information transmitted by T4A 2416 Reader calculate a control word with the data received and compare it to the word transmitted by the T4A 2416 Reader to validate the information (see appendix for the CRC-CCITT-16 bit calculation algorithm)

Description of the frames emitted when reading the databases (T4A 2416 Reader memory option)

If a T4A 2416 Reader has a memory option, when « Press SCAN to send » is displayed, the reader is ready to transmit the identifiers stored in the memory. The T4A 2416 Reader displays « Sending ! » during transmission and the reader offers the user the option of deleting the content of its database at the end of the transmission.

Format of the frames transmitted to the PC : the frame which is transmitted on each reading of a transponder is preceded by a header octet "/xAA", its 4 character registration number in the memory and a separation character "*" .



Algorithm for calculating aCRC-CCITT-16bit control word

The C ANSI function's source code enabling a control word to be calculated from a string of characters terminating with the character "/x00" is described below. The JAVA applet on the « <http://www.zorc.breitbandkatze.de/crc.html> », website enables you to also calculate the control word. Previously the fields had to be correctly completed before making the CRC calculation and a check made that the control word is equal to 0xE5CC or the "123456789" character string.

```

/*=====*/
/* Function that calculates CRC-CCITT 16 bits
/* INPUT:
/*     unsigned char *inbuffer : 8 bits input vector over which CRC checksum is calculated
/*
/*                               must terminated by 0x00
/* OUTPUT:
/*     unsigned int: 16 bits return of crc_ccitt checksum
/*=====*/
/* OVERVIEW:
/*     Width = 16 bits
/*     Truncated polynomial = 0x1021
/*     Initial value = 0xFFFF
/*     No XOR is performed on the output CRC
/* DESCRIPTION:
/*     Computing a POLY number from the crc equation.
/*     Crc s are usually expressed as an polynomial expression such as:
/*
/*      $x^{16} + x^{12} + x^5 + 1$ 
/* CHECK
/*     0xE5CC This is the checksum for the ascii string "123456789"
/* EXAMPLE
/*     http://www.zorc.breitbandkatze.de/crc.html
/*=====*/
#define crc_poly 0x1021 // Polynome du CRC-CCITT-16Bits
unsigned int crc_ccitt16 (unsigned char *inbuffer) {
    unsigned int crc_checksum = 0xffff;
    unsigned char ch;
    char i,xor_flag;
    while ( *inbuffer!=0)
    {
        ch = *inbuffer++;
        for(i=0; i<8; i++)
        {
            xor_flag=(crc_checksum & 0x8000)? 1:0;
            crc_checksum = crc_checksum << 1;
            if (ch & 0x80) crc_checksum++;
            if (xor_flag) crc_checksum = crc_checksum ^ crc_poly;
            ch = ch << 1;
        }
    }
    for(i=0; i<16; i++)
    {
        xor_flag=(crc_checksum & 0x8000)? 1:0;
        crc_checksum = crc_checksum << 1;

        if (xor_flag) crc_checksum = crc_checksum ^ crc_poly;
    }
}

```

```
}  
return (crc_checksum);  
}
```

<http://www.zorc.breitbandkatze.de/crc.html>

CRC parameters

CRC order (1..64)	16	
CRC polynom (hex)	1021	<input type="button" value="reverse!"/>
Initial value (hex)	FFFF	<input type="button" value="convert!"/> <input checked="" type="radio"/> nondirect <input type="radio"/> direct
Final XOR value (hex)	0	

reverse data bytes reverse CRC result before Final XOR

Data sequence

123456789

Result

E5CC (hex), 9 data bytes

How to know what USB port the T4A 2416 is connected to. (Windows XP)

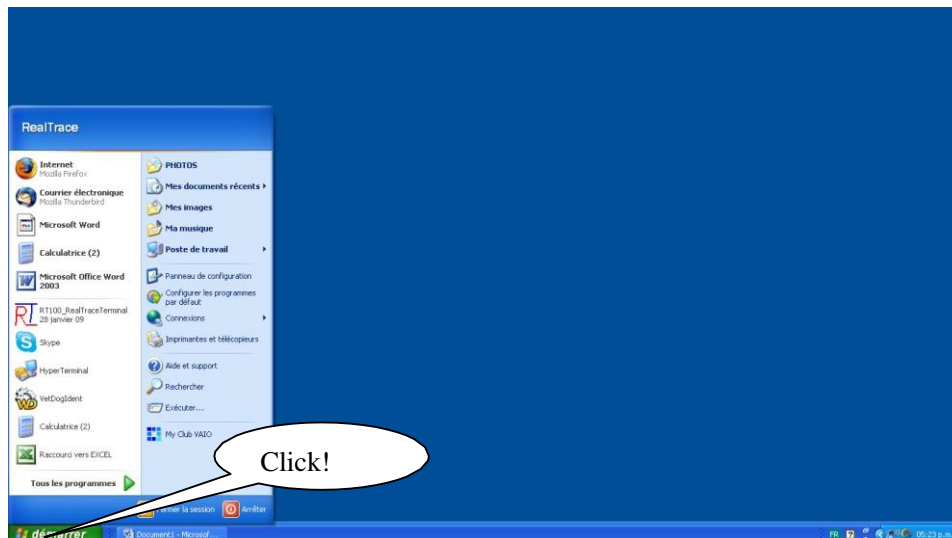
When you connect a peripheral to a USB port on a PC, the PC automatically assigns it a port number. The peripheral is often automatically recognized by the application software, thus it is not necessary to configure it. This is the case with printers, scanners, etc.

Other types of application software need to have the communication port assigned by the PC indicated to them, in some cases with other information such as the communication speed, the form of the data transmitted, etc.

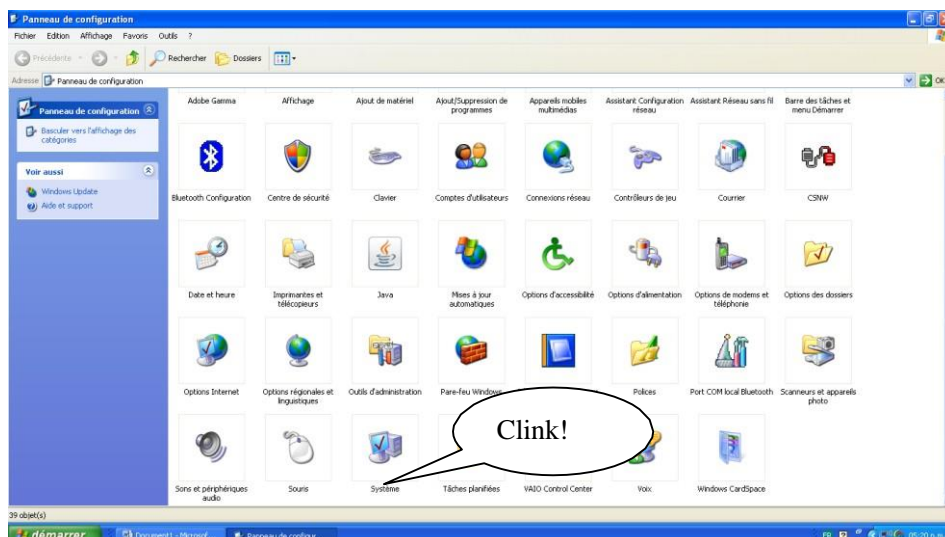
As regards the T4A 2416, it is possible that the right port will be automatically assigned by the PC to the application software, but it is also quite likely that you will have to choose it yourself from all the ports offered to you. You can of course try them one after the other, but in some cases the PC's peripheral configuration system will propose dozens of them...

In this case we suggest a more rational method which will also allow you to check that your T4A 2416's reader is correctly installed.

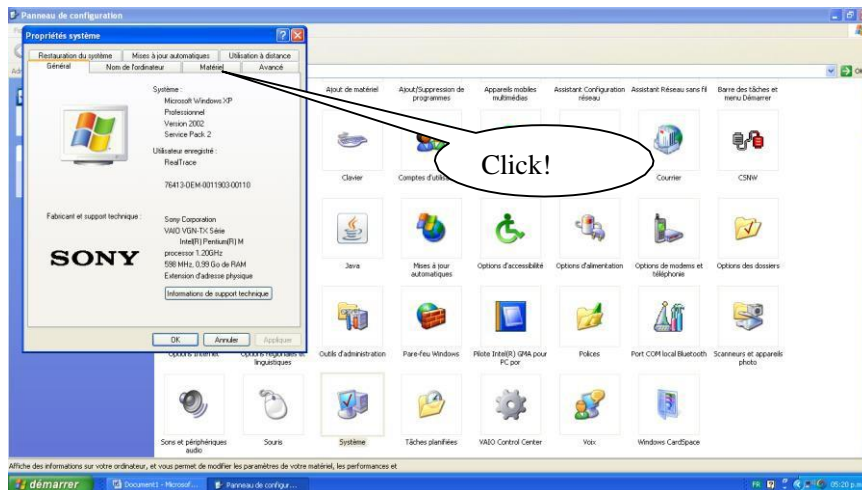
Select as shown below.



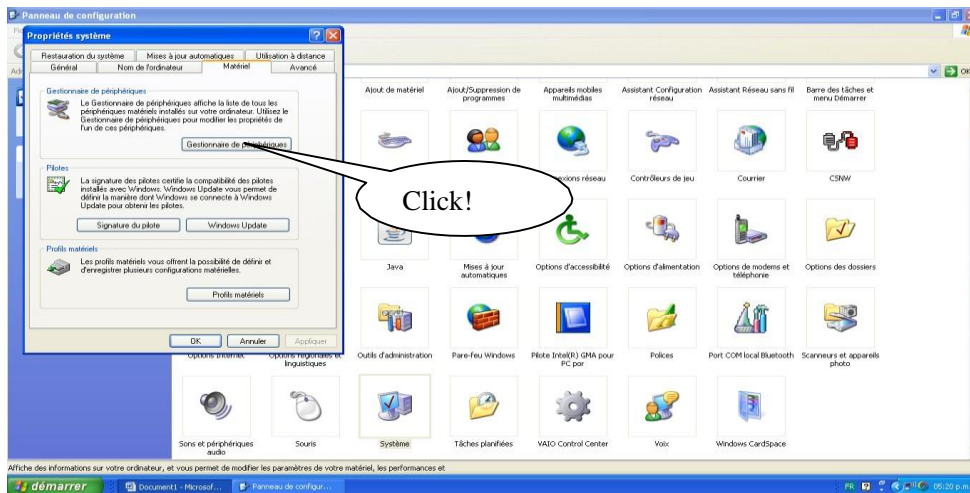
Then select « System »



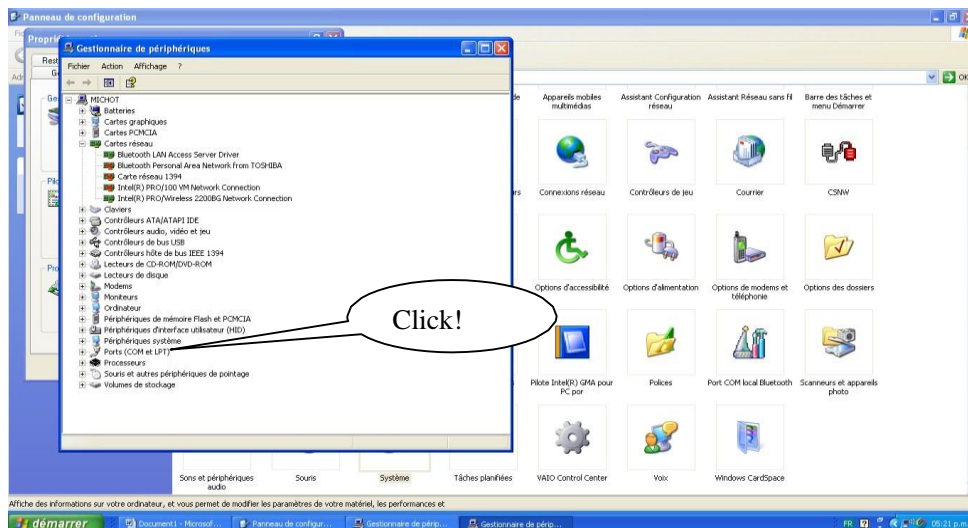
Then select « Device »



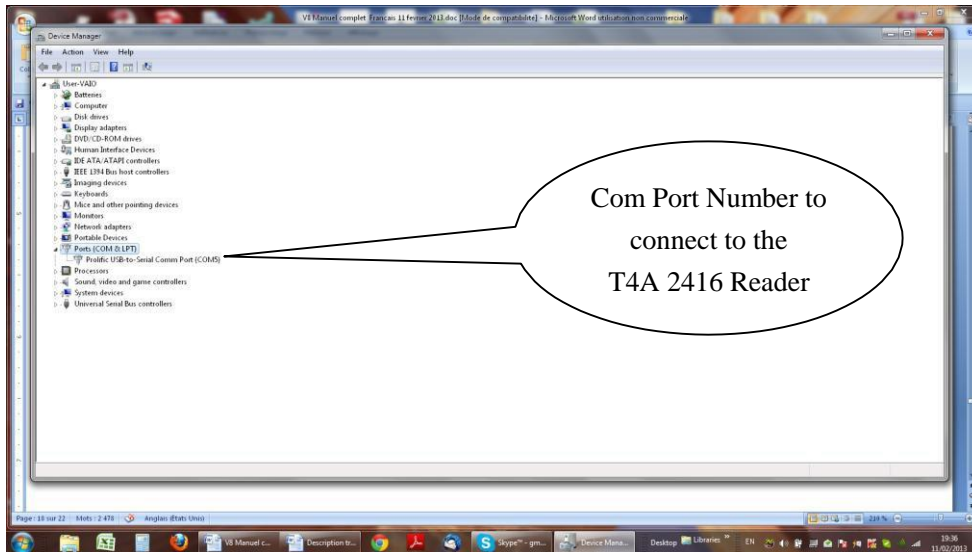
Then Select « Device Manager »



Then select « Ports (com et LPT) »

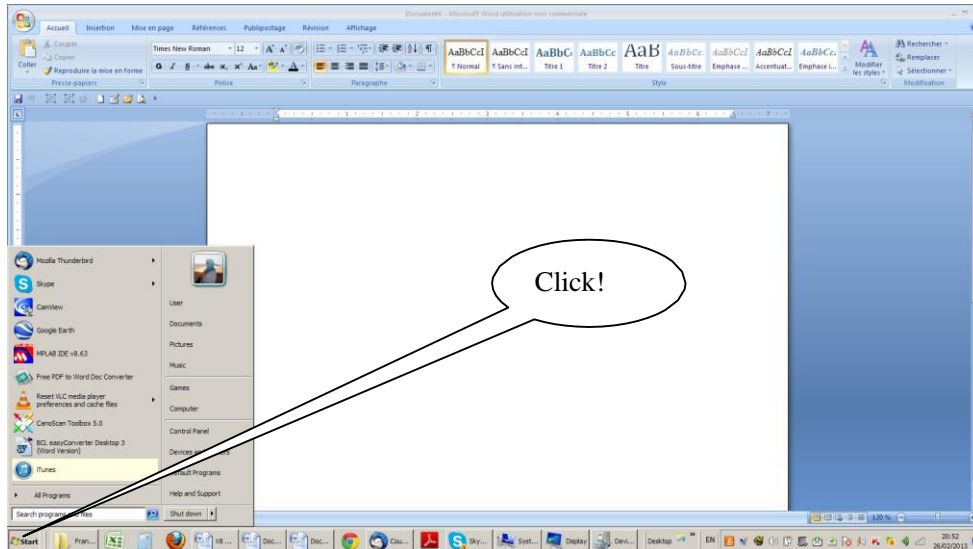


The number of the Com port is shown.

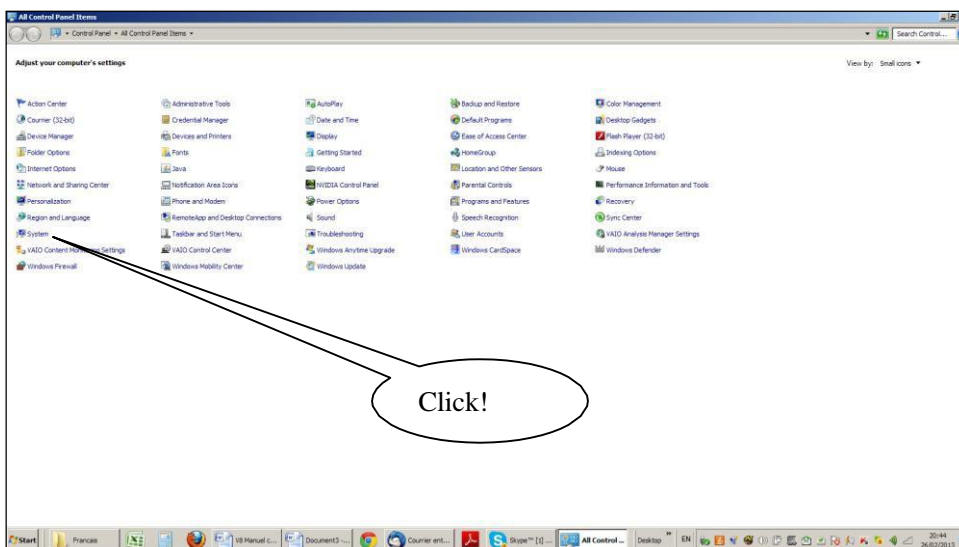


How to know what USB port the T4A 2416 is connected to. (Windows 7/8)

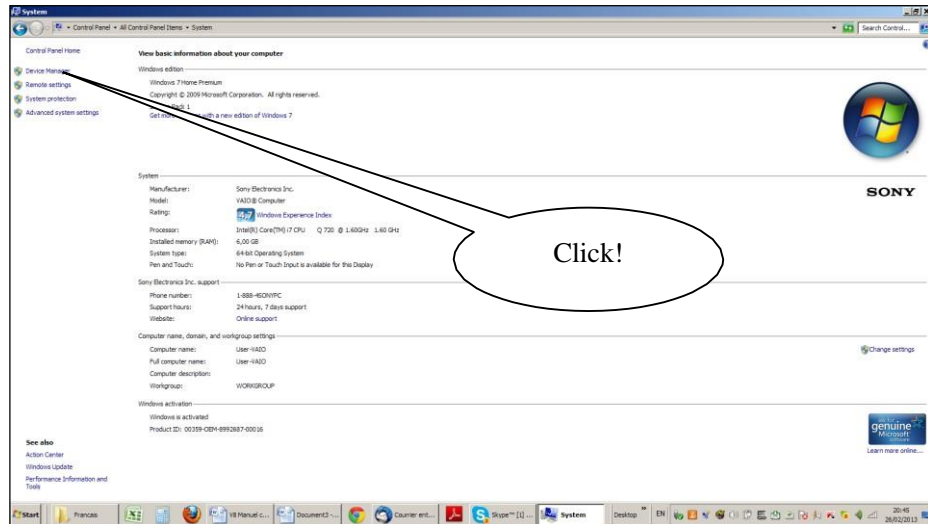
Select as shown below.



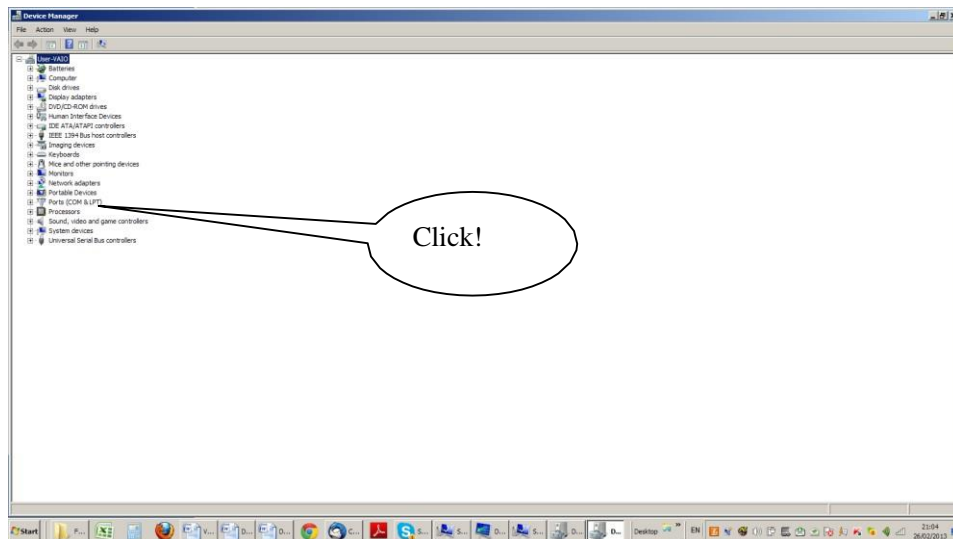
Then select « System »



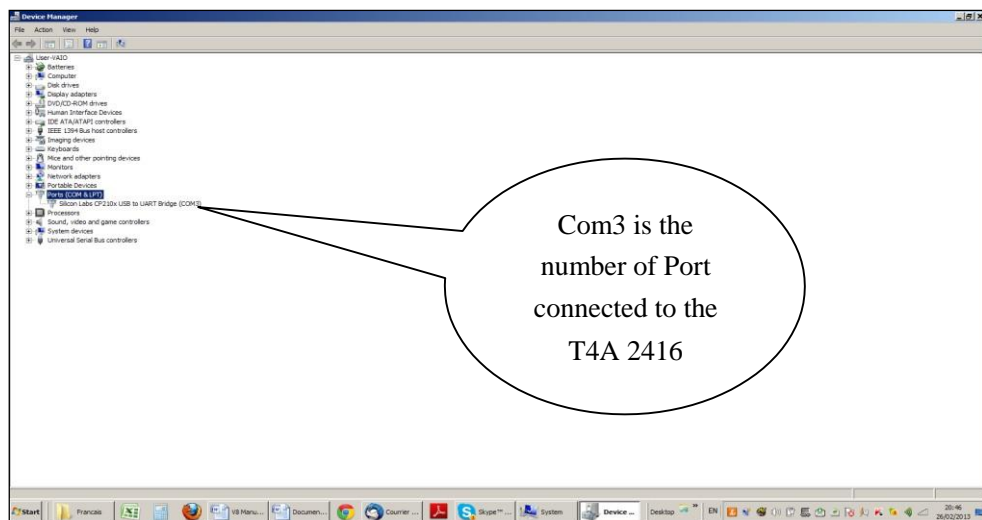
Then select « Device Manager »



Then select « Port COM et LPT »



The number of the Com port is shown.



The screens may be a little bit different. It depends of the Windows version.

The Terminal

This software is a tool supplied free of charge to all users of the RFID Reader standard (with USB cable) or Bluetooth reader.

You can download this software following this link:

<http://download.realtrace.com/RealtraceTerminal.exe>

You will find that once the communication has been established between a PC and the RFID reader both appliances which were previously paired up remain connected providing that they are separated by no more than 10 meters. The communication is cut if the distance is over 10 meters, and a search and pairing up must be performed to restore transmissions.

The communication is also cut when the RFID reader switches off after several minutes on standby to save energy in the battery.

The lost communication in both these cases is connected to the way Bluetooth technology operates as well as the Windows operating system.

The use of a lithium/ion battery has provided a significant increase in the autonomy of the reader (several thousand uses). Therefore, you can adjust the auto-power-off period as required: 2, 5, 10, or 30 minutes or if you prefer, you can switch off the timeout altogether (not recommended). This setting can be implemented the same way if Bluetooth is enabled. For your information, the reader without auto-power-off, and with **Bluetooth enabled** works for over 48 hours.

<http://download.realtrace.com/RT-Timeout.exe>

Initial parameterization of the Terminal software

Sometimes, after installing the Terminal on your PC, you will have to parameterize the communication.

Sometimes it is not necessary but as safety precaution you can verify if all is correct. Click on « *File* » then « *Properties* » then enter the USB port or Bluetooth's communication port number as well as the following data :

- *bits per second : 9600*
- *data bits : 8*
- *stop bits :1*
- *parity : none*
- *flow control : none*

Using the Terminal Software

Menu Options

Choose your language. You can choose between French, English, Spanish, and Chinese.

Select the data you want to appear:

- If you select "All data" it will show the type of chip (FDXB, HDX, FDXA) followed by the ISO "smart" number and the CRC.

Example: **UFDXB 939 000004095425*AC02**

- If you do not select "All Data" only the ISO number of the "chip", or 15 numeric characters (FDXB and HDX), or 10 Hexadecimal characters (FDX A) will be displayed.

Example: **939 000004095425**

Do not forget to declare the type of keyboard you use - AZERTY or QWERTY - if not you risk having inconsistent signs being displayed on the PC screen.

"File" menu

The "Save", "Delete" and "Exit" functions are classic.

The "Linking an application" function when selected allows you to link the data sent by the reader to the PC to a Windows application (Word, Excel, etc.) and simultaneously display in the Terminal window.

If you want to save an Excel file, a number or a list of numbers stored in the memory of the reader you must select "Linked to an application." You then have five seconds to open your application, Word, Excel, etc. After this period if no application is opened data will be sent to the Terminal and appear on the initial screen.

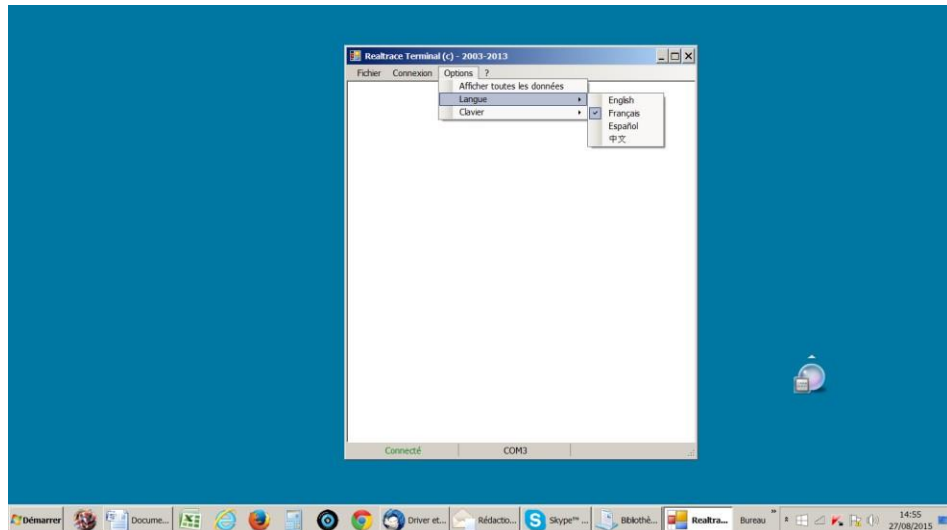
"Connection" Menu

In case of breakdown in communication between the PC and the reader simply select "Connect" to automatically reconnect.

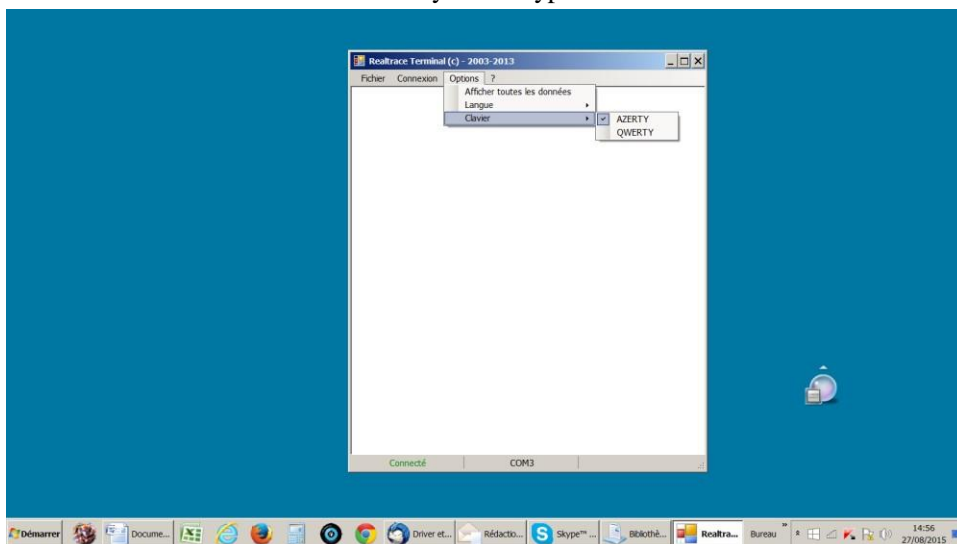
Obviously for reconnection to be possible, the reader must be turned on and be within ten meters around the PC, which must also be turned on.

Terminal Menu

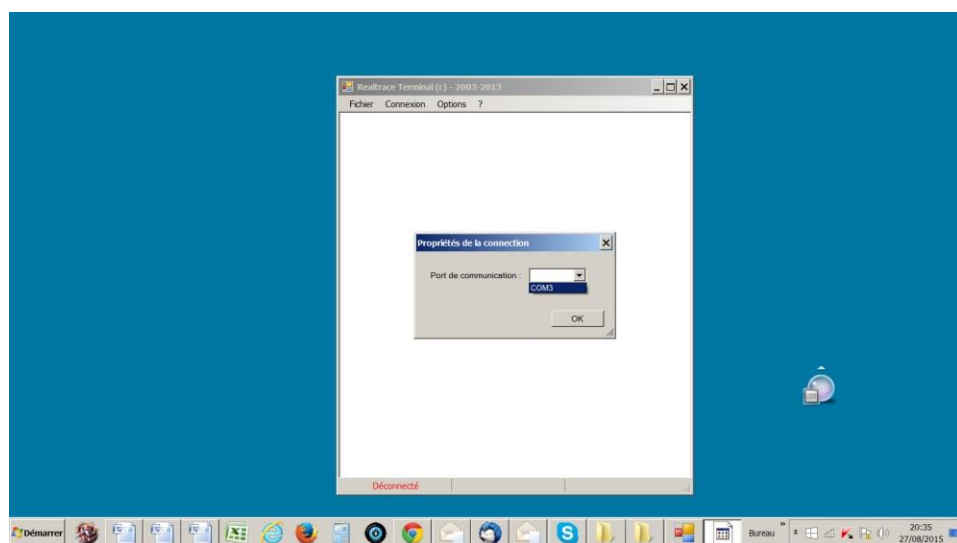
Language Selection



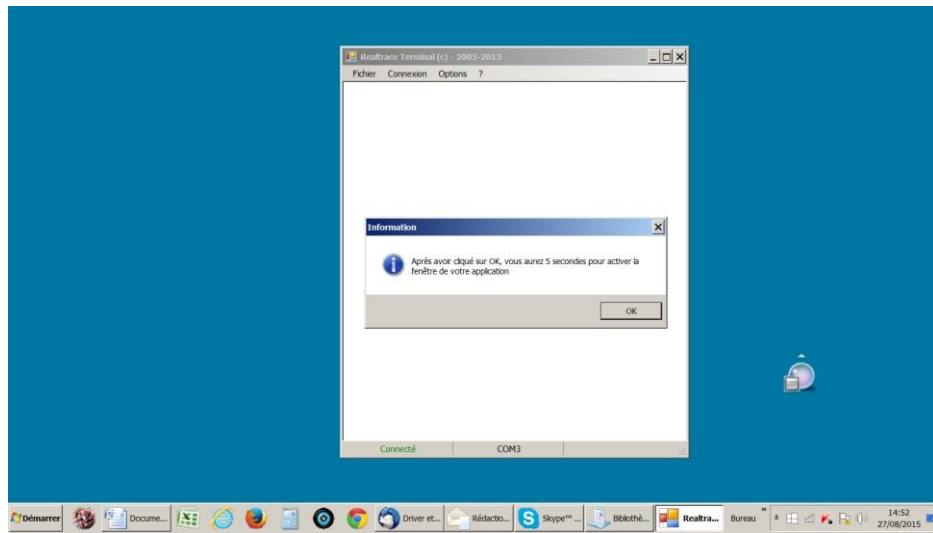
Keyboard Type



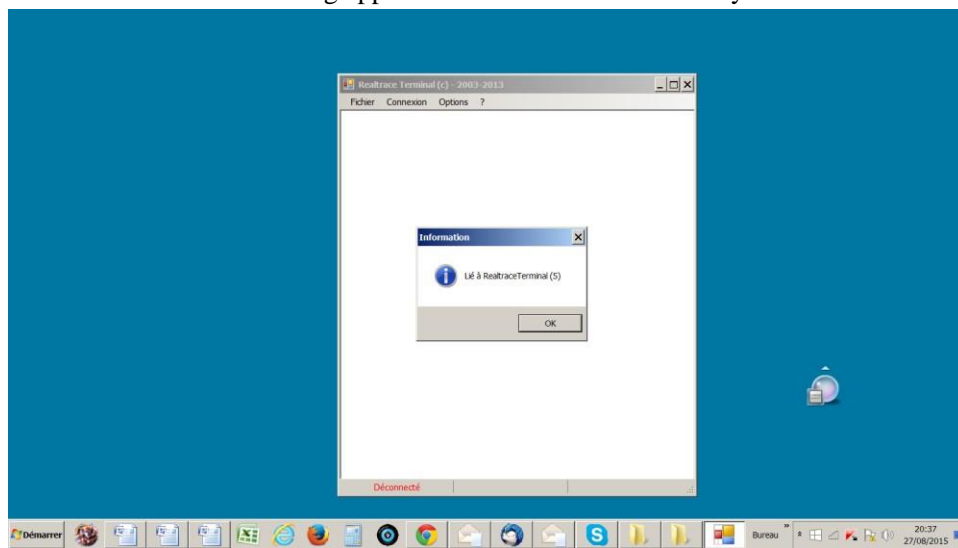
Communication Port Selection



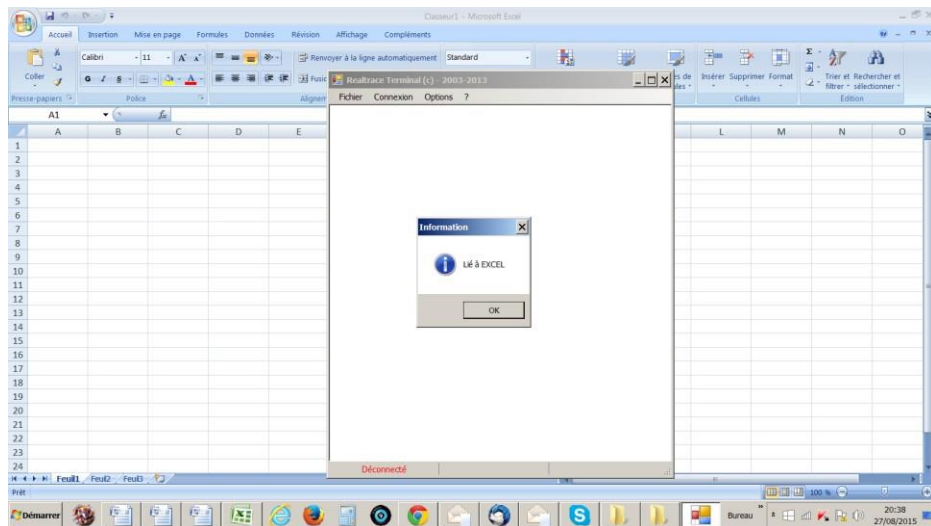
Linking an application



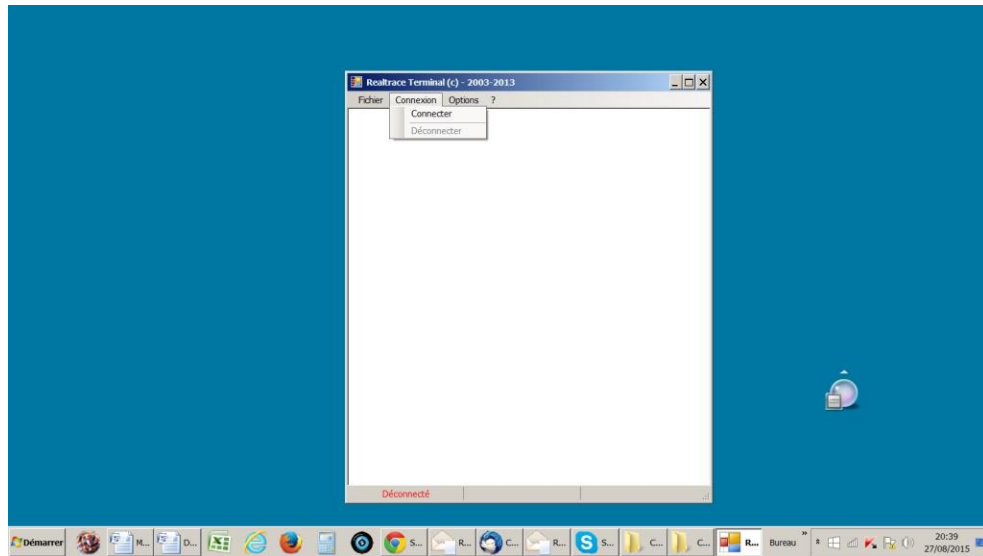
Selecting application after the 5-second delay



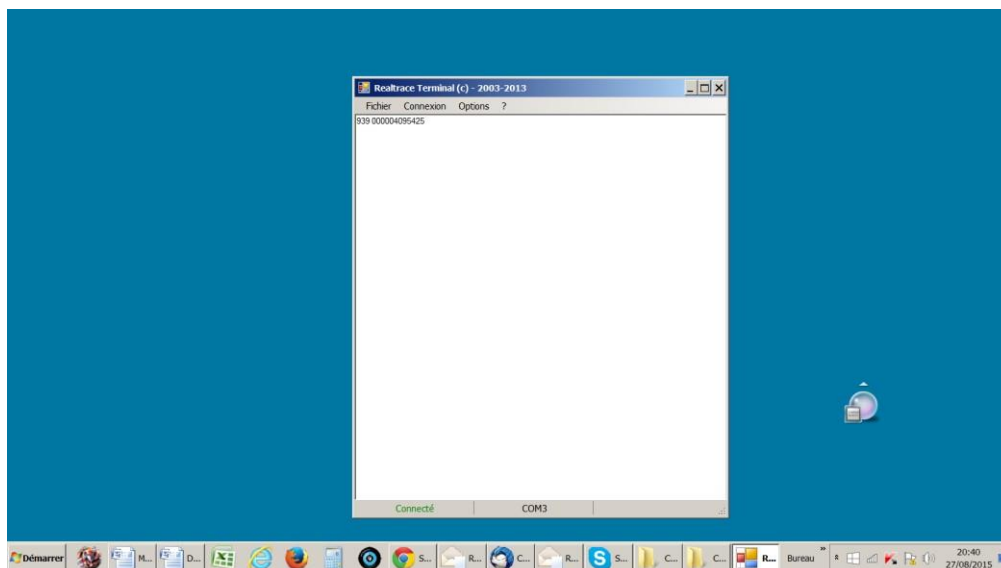
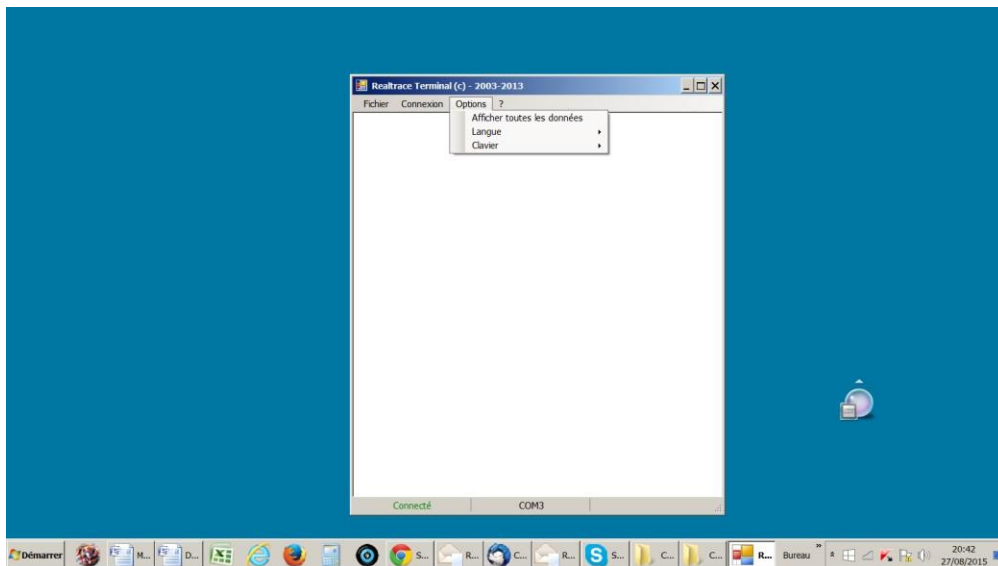
Application open within 5 seconds: Excel



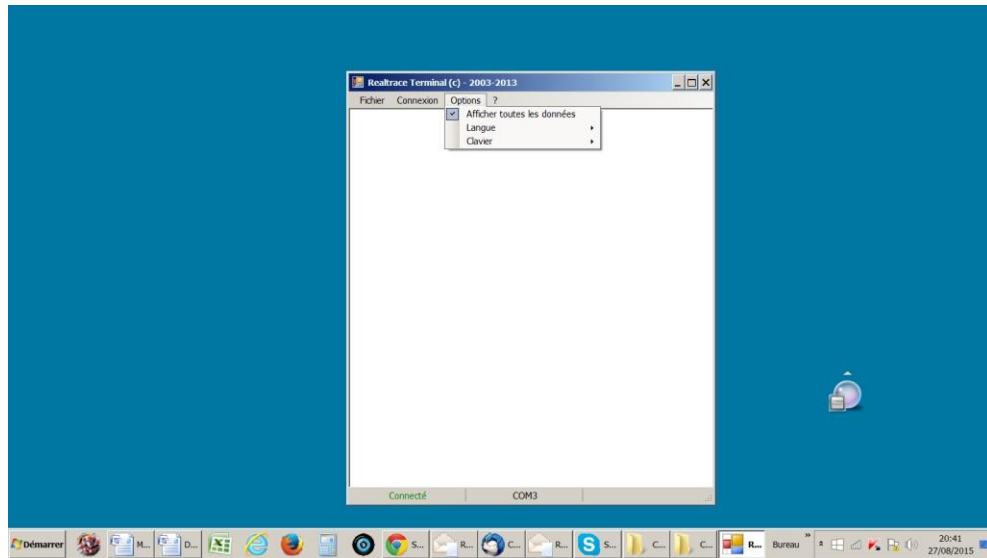
Connect!



Simple view: only ISO number



Showing all data.



Display message on reader startup!

Setting the reader

Through its hardware design, the T4A 2416 reader was intended to be easier to update, allowing distributors and users to benefit immediately from upgrades that could better respond to market demands.

Now you can customize your reader through your PC by connecting to the http:// links that are listed below, but be careful:

The T4A 2416 customizer that is provided for customizing the welcome message upon starting the reader only works from version VM14_v05

T4A 2416 Timeout, which can set the time before automatic shutdown, only works from version VM14_v6

1 - Display message on reader startup (T4A 2416 Customizer)

This message could be your company name, customer name, date of sale or other text of your choice given that you have two 16-character lines.

Upon starting the reader, the T4A 2416 displays the recorded message for 4 seconds.

2 - Setting the reader power timeout. (T4A 2416 Timeout)

The use of a lithium/ion battery has provided a significant increase in the autonomy of the reader (several thousand uses). Therefore, you can adjust the auto-power-off period as required: 2, 5, 10, or 30 minutes or if you prefer, you can switch off the timeout altogether (not recommended). This setting can be implemented the same way if Bluetooth is enabled. For your information, the reader without auto-power-off, and with **Bluetooth enabled** works for over 48 hours.

How to benefit from these options.

1-Just load the program option you are interested in on your PC, using the following links:

For the greeting:

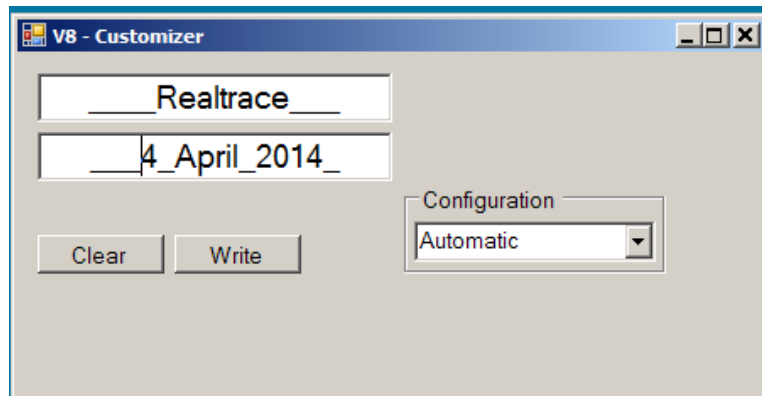
<http://download.realtrace.com/RT-Customizer.exe>

To set the power timeout

<http://download.realtrace.com/RT-Timeout.exe>

2 - Connect the reader to the PC via USB cable

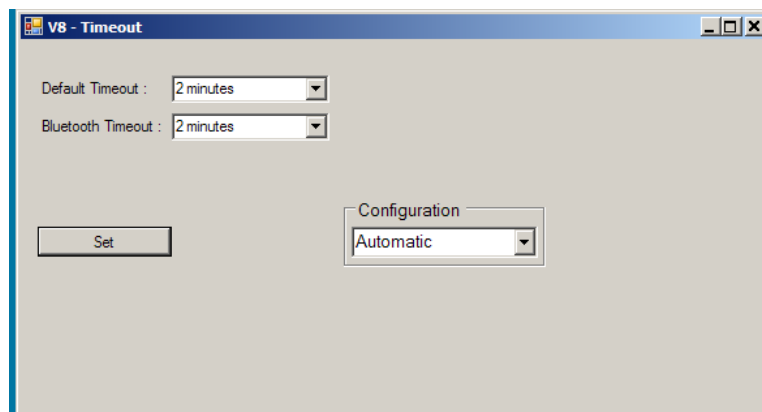
3- Start the reader and open the program on the PC



For example, you can use this date as the validity of the start of the guarantee period

4 - Enter the fields on the screen and confirm (Write). The communication port is configured automatically.

The new settings will be implemented upon the next launch of the T4A 2416 reader.



PS: Customizing each reader takes a few seconds.

Program Instructions for Mobile Devices

"Android" for users of RFID readers

Models T4A 2013 & T4A 2416

This program, originally developed for the T4A 2013, is also compatible with T4A 2416 readers.

The main function of these readers is to read the number of ISO chips implanted in animals but they each have their own specific elements to meet the different needs of users.

The compact, high-performance **T4A 2013** (reading a glasstag of more than 10 cm) was the first player on the market to offer the possibility to write additional information in the ISO "chip" (telephone, vaccinations, etc.).

The **T4A 2416** allows, due to its length, an increase in the distance at which an animal's "chip" can be read. There exists a short version of the reader (65cm) and a long version (95cm). This version is intended for reading at a safe distance when reading aggressive dogs or caged animals through the bars. The long version is also used in fish farms, the front part being perfectly watertight.

The **T4A 2013** inaugurates the generation of connected drives. Its operation is linked to the use of an Android mobile device. A version of the program for iPhone is under consideration.

With the power of the phone, the T4A 2013 reader becomes a mobile connected tool.

The information about the "chip" is stored in the phone memory. Each reading of the "chip" can be linked to the ISO number, the date and time of the reading, location, a photo of the animal as well as variable data such as name, address, etc...

These data are saved in the phone memory, but they can be transferred to an external database.

The V8M also allows additional data to be written to the "chips": phone number and email address*.

Furthermore, after reading a "chip" and recording the data in a database, it is possible to recover this additional information via connection to a server.

The following information relates to the functions offered by the standard supplied software for free (Play Store).

This entirely complete, free version can be used as a management tool. Upon special request it can be adapted to your needs.

Which phones are supported?

In theory, all "Android" devices. To benefit from all the services offered by the V8M it is necessary that the phone has Bluetooth, WiFi and GPS.

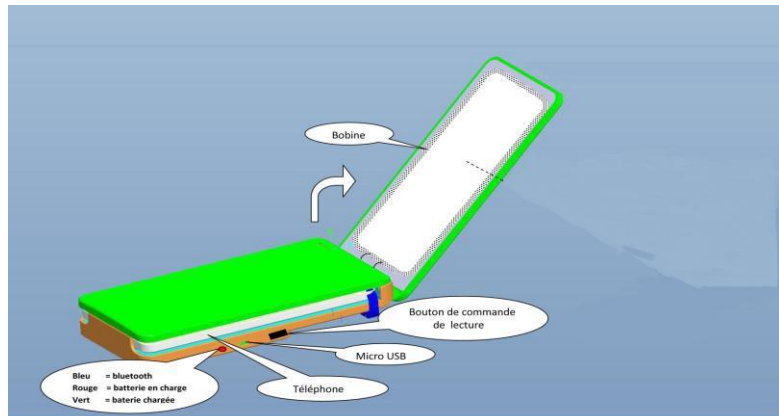
How do I obtain the free V8M software?

You must log in to "Play Store" and download the V8M program onto your device before installing. A V8 icon will appear on your phone's screen after installation is completed.

How much does it cost?

Using the program is free since you only use the Bluetooth communication between the reader and your device and possibly WIFI.

Discovering the program!



Once opened, the Reader is intended to connect to the mobile phone in order to allow you a free hand. It may be fixed using the Velcro provided or by using the reader's transparent strap. We recommend the Velcro, sticking the soft part on the phone.

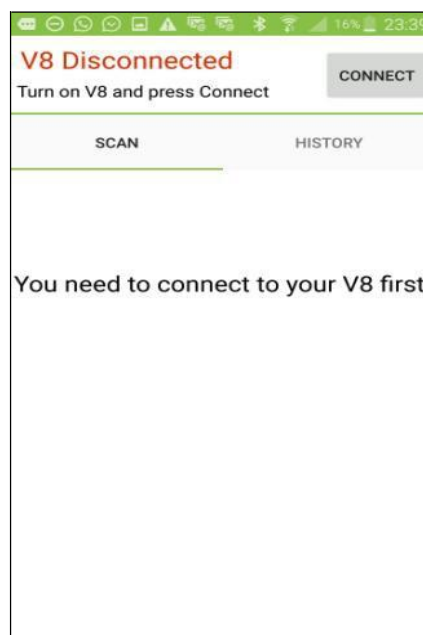
Note that you do not have to join the two devices which is furthermore not possible if you use a T4A 2013 or the T4A 2416 wand.

The distance between the two devices must not exceed ten meters in order to ensure good Bluetooth transmission.

Preparing the device and the V8M:

- 1 - Enable Bluetooth (reader and telephone)
- 2 - If you have a WI FI connection it is recommended to activate it. This will allow you to have faster access to Google Maps.
- 3 - Open the V8M program.

Upon opening the V8M program, the following screen will appear:



In red on the top left of the screen "V8 Disconnected" and "Turn on V8 and press Connect" informs you that the Reader is not connected to the phone and that you need to turn on your reader.

The Reader turns on by pressing the button on the underside of the reader for three seconds. It switches off automatically after 30 seconds if the communication with the phone is halted.

When turned on, a "LED" blue on the right edge of the player flashes.

As the reader communicates with the device via Bluetooth, it is necessary to pair the devices.

1 - Select "connect"

The following messages are displayed:

Fig.1

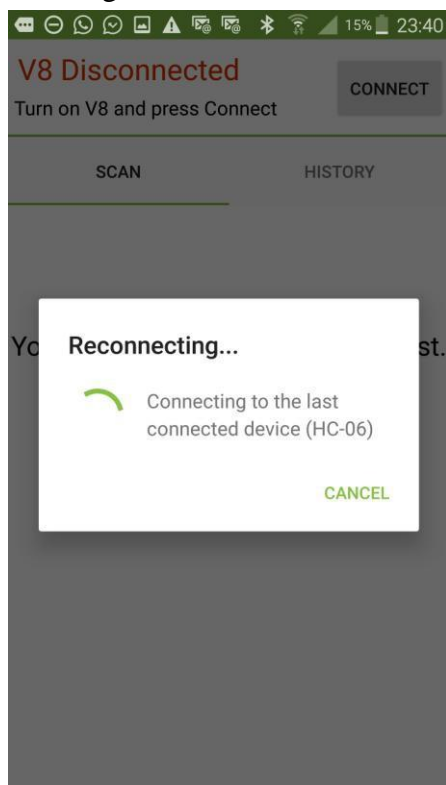


Fig.2

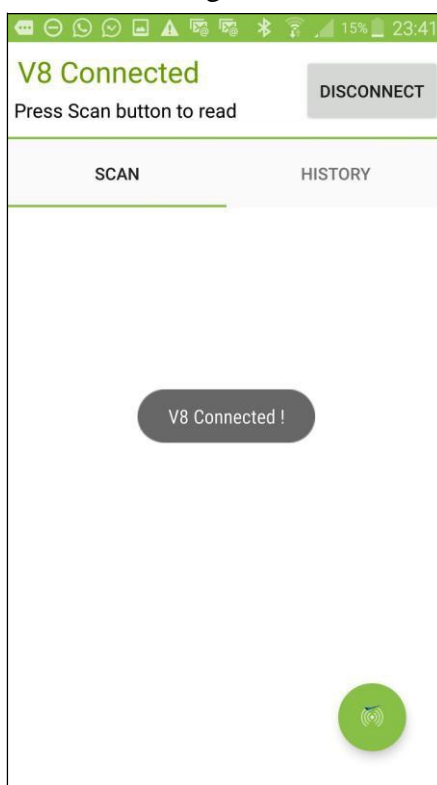
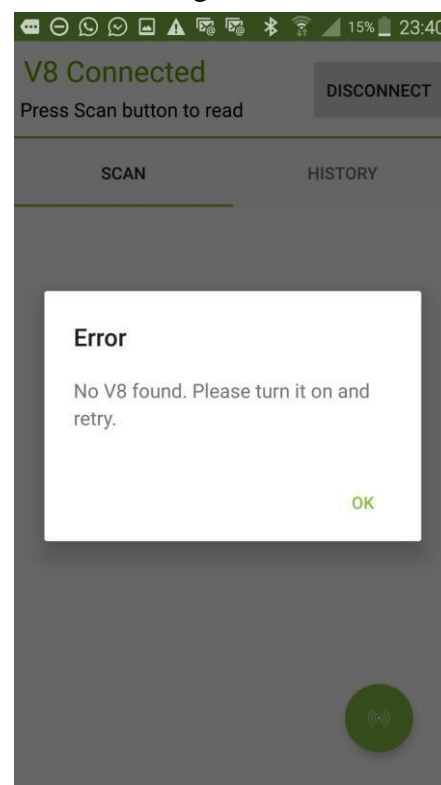


Fig.3



The phone will look for the last drive with which it was connected (Fig 1)

Case 1: If it is the same reader that is used, pairing is immediate. And the message "V8 connected" is displayed (Fig2).

Case 2: If it is another player looking for pairing, this may require 30 to 40 seconds.

Case 3: If the connection is not made, an error message "No V8 found. Please turn it on and retry " is displayed (Fig.3). This could be:

- A failure to charge the reader's battery,
- A failure when turning on the V8M reader,
- An incorrect Bluetooth setting on your phone.

Comments

1 - To facilitate the pairing in Case 2, if other Bluetooth devices are in the environment, it is advisable to put the device on top of the Reader because the device pairs with the Reader with the strongest Bluetooth signal.

2 - To save battery, the reader is intended to turn off automatically after 30 seconds if it is not paired or if that pairing was lost. If you have difficulty re-pairing remember to check that the reader is still turned on.

Once the phone and the player are connected the screen displays "**V8 connected**", the reader's blue "LED" becomes constant and the phone screen informs you that you can start playback of a chip "**Press Scan button to read.**"

If both devices are connected, a green button appears at the bottom of the screen. By selecting this button you activate the reader's scanning (reading) that will search for a "chip" in its environment at a distance of about 13 - 15cm (Fig 4).

Fig.2

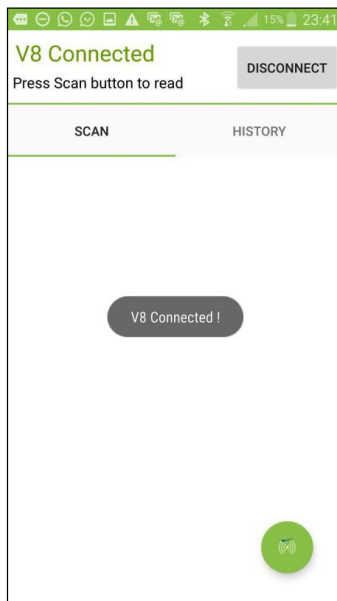
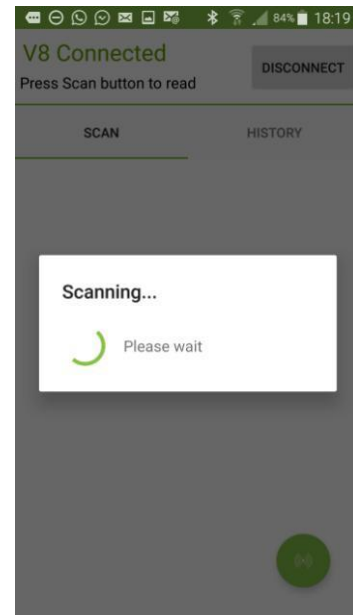


Fig. 4



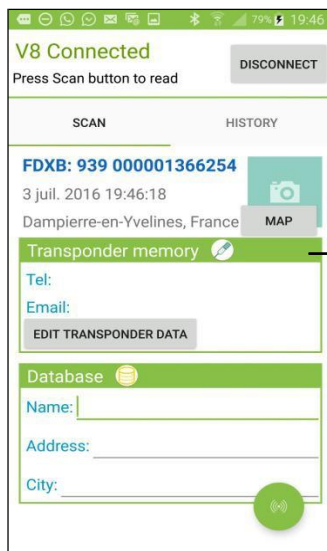
Upon reading a "chip", the reader emits a "beep" and the screen displays, as appropriate:

Case 1: The chip is new and therefore not registered in the phone's database:

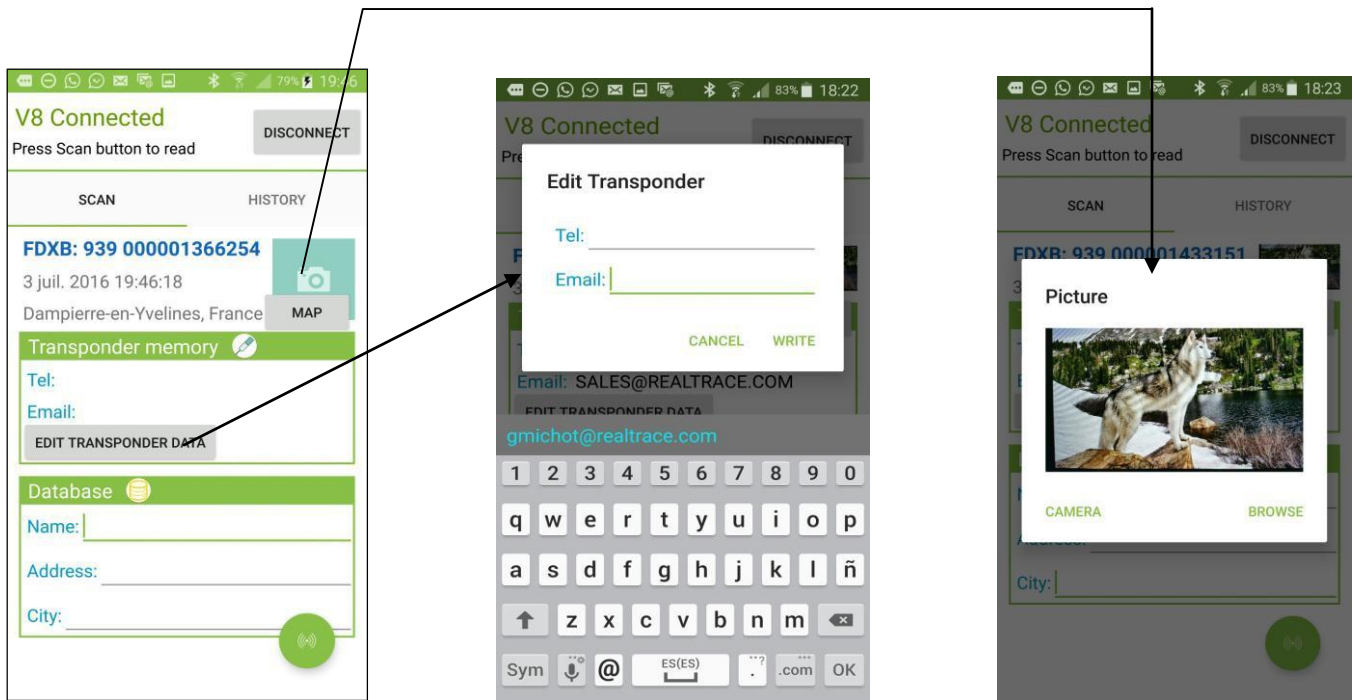
- ISO number of the chip,
- The date and time and the location of reading,
- If you request it, "MAP" the location via Google Maps.
- You can enter a name, an address and a city. These data will be saved in the phone's database.
- You can associate a picture with the number of this "chip", either from your "Gallery" or one that you take with your phone.
- A "Transponder Memory" field allows you to enter a phone number and email.

These data will be listed in the chip*.

Case 1



Note: The information relating to the location via the phone's GPS is not immediately available when the phone starts and the Android program is opened. You may need to wait a few minutes while the phone is located...



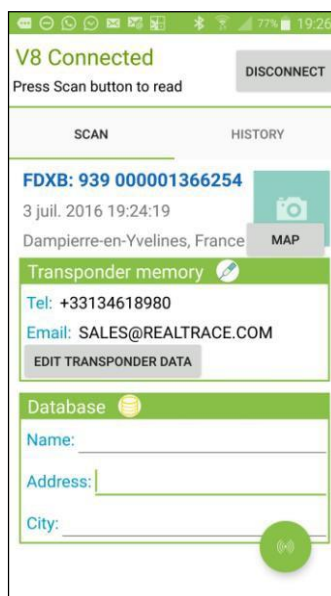
Comments:

- 1 - The reader attempts to write the phone and Email to the chip several times, taking around 10 seconds. If writing to the memory of the chip succeeds, the phone emits a "beep", otherwise it emits three "beeps".
- 2 - The email address must be entered in upper case.

Case 2: The "chip" is new, so it is not in the phone database, but it has additional data contained in its memory.

The screen will display the same information as in the previous case but the "Transponder Memory" field will show the data recorded in the "chip".

Case 2



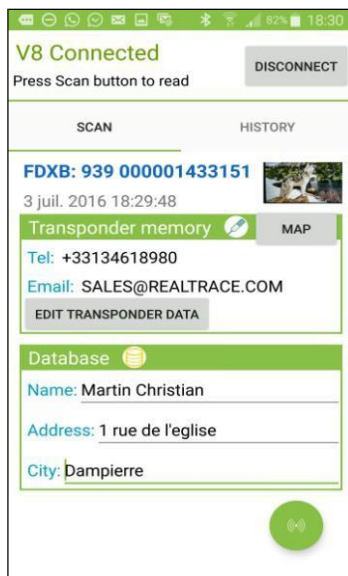
Case 3a: The "Chip" being read is in the device`s database:

- Chip ISO number, date and time, location
- And, the additional data (telephone database) and further data (written in the chip) that were recorded during the initial programming of the "chip".

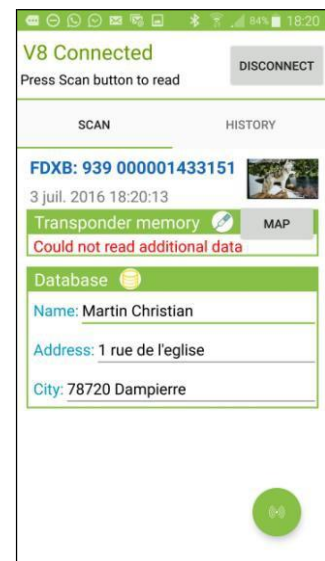
Case 3b: The "Chip" being read is in the telephone's database:

- Chip ISO number, date and time, location, date and time,
- Data stored in the phone database,
- Additional data on the chip is not read either because the chip was too far from the reader when reading, or because the chip has no free memory.

Case 3a



Case 3b



Notes: The Reader allows the reading of 13 / 15cm ISO chips.

Writing data into the "chip" requires more energy than reading and is therefore possible only at a distance of around 6-8cm.

When playing an ISO "Chip" further than 8cm away, only the identifying number of the chip will be read.

*The reading of potential data recorded in the "chip" is not possible beyond this distance and the following message will be displayed: **"Could not read additional data."***

On the other hand, if additional information had been stored in the phone database at the first reading this will be displayed on the screen when re-reading the "chip".

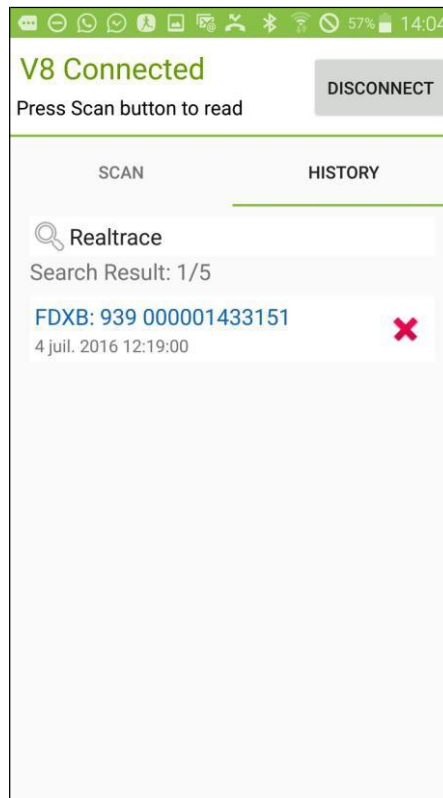
The "History" Function

Viewing the phone database.

If you have an animal, you can just read his "chip" and if it was registered the listing will appear on the screen.

You can also search for either the name or the "Chip" number if known. After having found the "chip", select the number displayed in blue and the card will appear on the screen...

Example: search using the name "Realtrace"



Finally if you want to delete records press the red cross corresponding to the "chip". You will be asked to confirm the delete request. After having confirmed you will still have the option to cancel the deletion by selecting **quickly** the "Dismiss" message in the bottom right of the screen.

