SR Manager Tool User Guide

1vv0300899 Rev.9 – 2014-05-08

Making machines talk.

APPLICABILITY TABLE

PRODUCT
ZE50/ZE60 2.4
ZE51/ZE61 2.4
TinyOne Pro (32kB)
TinyOne Lite 868MHz
ME50-169
ME70-169
ME50-868
LE50-433
LE50-868
LE70-868
LE70-915
LE51-868
LT70-868
NE50-433
NE50-868
NE70-868

SW Version SRManager Tool
2G.00.09.RC3

SW Version GG863-SR
231.07.2003

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Contents

1. Introduction

1.1. Scope

Scope of this document is supply an user guide for the Telit SRManagerTool software.

1.2. Audience

This User Guide is intended for Short Range Module users who want to program, manage and control the short range network activities.

1.3. Contact Information, Support

For general contact, technical support, to report documentation errors and to order manuals, contact Telit Technical Support Center (TTSC) at:

TS-SRD@telit.com
TS-NORTHAMERICA@telit.com
TS-LATINAMERICA@telit.com
TS-APAC@telit.com

Alternatively, use:

http://www.telit.com/en/products/technical-support-center/contact.php

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

http://www.telit.com

To register for product news and announcements or for product questions contact Telit Technical Support Center (TTSC).

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.

1.4. Open Source Licenses

The SRManagerTool developed by Telit make use of a modified version of Wireshark.

1.4.1.   Wireshark

Wireshark is a network packet analyzer, widely used for troubleshooting and analysis of communications protocol. It is an open source application and is released under the GNU General Public License version 2.

1.5.   Document Organization

This document contains the following chapters:

Introduction: provides a scope for this document, target audience, contact and support information, text conventions.SRManagerTool Setup: gives instructions on how to setup SRManagerTool and the equipment needed.

SRManagerTool features: describes in details the features of SRManagerTool.

Appendix 1 – How to flash the Telit M ZE51 USB dongle: describes how to flash the Telit USB dongles MEZE51.

Appendix 2 – How to flash the Telit ME50-868 USB dongle: describes how to flash the Telit USB dongles ME50-868.

Appendix 3 – How to flash the Telit NE50-868/433 USB dongle: describes how to flash the Telit USB dongles NE50-868/433.

Appendix 4 – Technology/Platform Firmware: describes technology/platform supported by SRManagerTool.

Appendix 5 – Troubleshooting: describes a list of possible troubles and their solution.

Acronyms and Abbreviations: lists acronyms and abbreviations used in the document.

1.6.   Text Conventions

Danger – This information MUST be followed or catastrophic equipment failure or bodily injury may occur.

Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.

Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.7.   Related Documents

- [1] 1vv0300859 Telit ZigBee Democase Getting Started

- [2] 1vv0300845 Telit ZigBee Democase User Guide

- [3] 1vv0300900 Telit ZigBee PRO Democase User Guide

- [4] 1vv0300901 Telit ZigBee PRO Democase Getting Started

- [5] 1vv0300819 Telit M ONE Protocol Stack User Guide

- [6] 1vv0300944 Telit Low Power Mesh Protocol Stack User Guide

- [7] 1vv0300819 Telit Mesh Democase User Guide

- [8] 1vv0300828 Telit Wireless M-Bus User Guide_Part4+Part5_ModeR2

- [9] 1vv0300935 Telit Wireless M-Bus Part 5 Mode Q User Guide

- [10] 1vv0300873 Telit Star Network Protocol Stack User Guide

- [11] 1vv0300949 Telit ZE51-2.4 RF USB Dongle User Guide

- [12] Wireshark documents:
  http://www.wireshark.org/docs/
  http://wiki.wireshark.org/IEEE_802.15.4

- [13] 1vv0300995 Telit GG863-SR Firmware upgrade procedure

- [14] 1vv0300781 Telit GE863-PRO3 Linux Software User Guide

- [15] 1vv0300953 Telit Wireless M-Bus 2010 Part4 User Guide

- [16] 1VV0301059_Frequency_Hopping_Star_Network_Protocol_Stack_User_Guide

- [17] 1VV0301109_LE51868_S_SW_User_Guide_rev2

1.8. Document History

Revision	Date	Changes
0	2010-11-18	First issue
1	2011-02-04	Section 1.7 changed, Section 2.2 changed, Section 2.3 changed, Section 2.4 changed, Section 2.5 changed, Section 3.1 changed, Section 3.2 changed, Section 3.3 changed, Section 3.4.1 changed, Section 3.4.1.1 changed, 3.4.2 Section changed, Section 3.4.3 added; Section 3.4.3.1 added.
2	2011-03-31	Section 1 changed; Section 1.7 changed; Section 2 changed, Section 3 changed; Section 3.2 changed; Section 3.3 changed; Section 3.4 changed; Section 3.4.1 added; Section 4 added; Section 5 added; Appendix 1 changed; Appendix 2 changed.
3	2011-11-10	Section 3.2 changed; Section 3.3..2 changed; Section 3.3.1 changed; Section 3.3.1.1 changed; Section 3.3.1.2 added; Section 3.3.1.3 added; Section 3.3.3.1 changed; Section 3.3.4 changed; Section 3.3.4.1 changed Section 3.3.4.2 changed; Section 3.3.4.3 added; Section 3.4 changed; Appendix 2 added; Appendix 3 added.
4	2012-03-26	Added ME50-169 in applicability table; Added NE50-433 in the applicability table; Section 2 changed; Section 2.1 added; Section 2.2 added; Section 3.1 changed; Section 3.2 changed; Section 3.3 changed; Section 3.3.4.2 changed; Section 3.4 changed; Section 3.4.1 changed; Section 3.8.1 added; Section 3.8.2 added; Appendix 1 changed.
5	2012-04-26	Section 2.2.9.1 changed; Section 2.2.9.2 changed; Section 3.2 changed; Section 3.6 changed; Section 3.9.1 changed; Section Appendix 1 changed; Section Appendix 2 changed; Section Appendix 3 changed.
5	2012-05-18	Section 1 changed; Section 2 changed; section 3.2 changed; Section 3.3.4.2 changed; Section MB Analyzer; Section 3.8.1 changed; Section 3.9.3 changed; Section 3.9.3.1 added.
5	2012-06-11	Section 2.2.9.1 changed; section 3.2 changed;
6	2012-11-12	Section 1.7 changed ; section 2.2.1 changed ; section 3.2 changed; section 3.3.1.1 changed; section 3.3.2.1 changed; section 3.8.3 changed; section Appendix 4 changed; section 8 changed; section 3.3.3.1 changed; section 8.2.5 added.
7	2013-05-15	Section 3.3.1 changed; section 3.3.1.1 changed; section 3.3.4.1 changed; section 3.5 changed.
8	2013-08-26	Section 2.1 changed; section 2.3 changed; section 3.1

		changed; section 3.3.1.1 changed.
9	2014-05-08	Section 2.3 changed; section 2.6 changed; section 3.2 changed; section 3.3.3.1 changed. Section 3.3.3 changed; section 3.3.3.1 changed. Section 3.3.2.1 changed; section 3.3.3 changed; section 3.8 changed.

2.   SRManagerTool Setup

SRManagerTool setup allows using serial or GPRS/GSM connection between tool and SR module.

Via serial connection (local) the features available are:

- Flashing
- Management
- Analyzer

Via GPRS/GSM connection (remote) the features available are:

- Analyzer (ZigBee, MBus, Mesh)
- Flashing (ZigBee, MBus)
- Management (ZigBee)

2.1.   SRManagerTool – SR module via Serial connection

1.   Connect the Board to the PC via standard USB port
2.   Connect the power supply to the board

2.2. SRManagerTool – SR module via GPRS/GSM connection

Next steps describe how to achieve remote connection between SRManagerTool and SR module.

2.2.1. Equipment

The minimum equipment is:

- The GG863-SR

- The module mounted in the GG863-SR should be programmed with one of the following firmware depending on device type:

  o ZigBee ZE51/ZE61: ZEx1.XS5.11.21-B004.s28

  o LowPowerMesh NE50-868 MHz: GC.M0S.01.01-B007.hex

  o LowPowerMesh NE50-433: GD.M0S.01.01-B005.hex

  o Wireless M-Bus ME50-868 MHz: GC.U0S.01.00-B004.hex

  o Wireless M-Bus ME50-169 MHz: GI.U0S.01.00-B005, GI.U0S.01.00-B006.hex

  o Wireless M-Bus ME70-169 MHz: GL.U0S.01.00-B006.hex

Flash SR module after step described in 2.2.6. For information on how to flash SR module in the GG863-SR refer to [13].

- The Linux USB Ethernet/RNDIS Gadget
- A PC which will be used to configure the Gateway
- A PC which will host SRManagerTool

All required software is available in the Telit website www.telit.com section Download Zone:
- Software >Short Range >Software Releases Gateways > GG863 SR
- Software > Short Range > Software Releases Short/Range

2.2.2. Connections setup

Before turning on the GG863-SR be sure to follow the connections detailed below:
- connect the antennas to RF connectors of the GG863-SR
- insert the SIM card in the card holder of the GG863-SR. The SIM must have the PIN disabled.
- plug the Mini USB cable into the GG863-SR USB Device port (B-type)
- connect the power supply adapter to main power socket

Now the device is ready to be turned on.

2.2.3.   Turning On GG863-SR

To turn on the GG863-SR, simply attach the power adapter cable to the GG863-SR and wait 30 seconds for full system startup.

Note – When the power supply cable is disconnected, it is recommended to wait approximately 5 seconds before applying the power again.

2.2.4.   Turning Off GG863-SR

To turn off the device you can simply unplug the power supply cable.

Warning – Please note that hardware power off should be done only after a proper GSM logoff. Any GSM device is requested to issue a "detach" request at turning off.

Normal shutdown sequence will take up to 8 seconds. An additional delay of up to 10 seconds is experienced as the GSM module logs off the network.

2.2.5.   Connecting GG863-SR to the local PC

To connect the GG863-SR to the local PC follow next steps:

• Turn on the GG863-SR (see section 2.2.3)

• Wait 20 seconds for the system to startup

• Plug the USB cable into the PC (A-type):

The first time you connect the GG863-SR, you will be asked for a driver "Linux USB Ethernet/RNDIS Gadget". Follow the actions described by the screenshots:

If you have already installed the Telit Linux Development Environment, you already have the Ethernet Gadget installed and you are connecting the GG863-SR to the same USB port used for EVK-PRO3, then the USB connection is automatically established. In this case you can continue reading the present document from 2.2.6.
If you are connecting the GG863-SR for the first time or to a different USB port please follow next steps.

Click the **Browse** button and search for the file linux.inf, included in the Telit package.

Click **Next**.

Click **Continue Anyway**.

Click **Finish**.

Go to **Network Connections**, right click on the device called **Linux USB Ethernet/RNDIS Gadget** and choose the menu voice **Properties**. Select the **Internet Protocol (TCP/IP)** and click on the button **Properties**; you should see the following windows:

If this configuration is not available, you have to manually insert the following values:

IP address: 192.168.121.1

Subnet mask: 255.255.255.0

then click **Ok**.

At this point, Ethernet Gadget is installed on Local PC: Local PC and GG863-SR can communicate via IP with the following addresses:

• 192.168.121.1 (Local PC)
• 192.168.121.3 (GG863-SR)

2.2.6.   Reboot GG863-SR

Before rebooting the GG863-SR you have to un-plug the USB cable from the PC if it is connected, reboot the GG863-SR, wait 20 seconds and plug the USB cable into the PC to make the connection work.

2.2.7.   Downloading files to GG863-SR

Default GG863-SR does not have some application and scripts needed to use remote feature of SRManagerTool.

Files to download are:
* SRTool_Agent
* Config_For_Gateway
* Config_For_SRManager
* _S04_Gateway
* _S04_SRManager

To equip the GG863-SR whit those files a tftp server shall be installed on the local PC.Once the tftp server is active and configured in the local PC the files can be copied to GG863-SR filesystem:

* Copy the files in the tftp server working directory
* Connect the GG863-SR with the USB cable and open a telnet session:

telnet 192.168.121.3

* Go to the root directory:

/

* For any file to copy type the command:

tftp –g –r file_name_remote server_ip_address

For example:

tftp –g –r SRTool_Agent 192.168.121.1

* Change file permission for any file copied:

chmod +x SRTool_Agent

2.2.8. Run scripts

After copying the necessary files to GG863-SR follow next step:

- By telnet session opened in section 2.2.7 run the script Config_For_SRManager:

/Config_For_SRManager

Note: to come back to default GG863-SR you should run the script Config_For_Gateway:

/Config_For_Gateway

2.2.9. Create Network Connections on remote PC

2.2.9.1. GPRS

In case of GPRS connection remote PC and GG863-SR must be assigned a public IP address, check with your mobile network operator for availability of public IP addresses with GPRS connection.

Connect remote PC to GPRS network and get the public IP, for example by the command ipconfig.

Performance of the features via GPRS are affected by speed and communication latency of the GPRS connection.
The speed of the GPRS depends on: phone/terminal used, the number of connected users per cell which is split between the banda, the distance between the terminal and the antenna closer.

Check for network upgrades of features available with certain operators.

⚠️ *An UMTS phone/terminal is strongly suggested in order to use remote features via GPRS (section 3.2)*

2.2.9.2. GSM

When GG863-SR is configured to use a dial-in connection, it waits for an incoming call and establishes a point-to-point link with the remote PC. This section describes the procedure to set up a network connection in the remote PC such that the PC dials the phone number of GG863-SR and establishes a point-to-point link. The procedure described here applies to the Windows XP operating system.

⚠️ *The features via Dial-in connection need not to drop the line*

In order to set up a data call connection the remote PC must be equipped with a dial-up modem correctly installed in the operating system.

Once the modem is connected to the remote PC and installed, a new network connection can be created:

- From the Windows XP Start menu, go to **Control Panel • Network Connections**
- Click on **File • New Connection…** to start the New Connection Wizard

- Click on **Next >**

- Select **Connect to the Internet** and click on **Next >**

- Select **Set up my connection manually** and click on **Next >**

- **Select Connect using a dial-up modem** and click on **Next >**
- If more than one modem device is installed, check the entry containing the modem to be used for network access and click on **Next >**

- Insert a name for the network connection in the **ISP Name** text box (in this example, "GG863-SR" is used as connection name) and click on **Next >**

- Insert the phone number of the GG863-SR device to connect to and click on **Next >**

- Click on **Next >**

- Type "ip_host" in the **User name** text box and "ip_gw_app" in the **Password** and **Confirm password** text boxes and click on **Next >**

- Click on **Finish** to complete the New Connection Wizard; the connection is now created and added as a new icon in the **Network Connections** window; a new window appears which allows to activate the just created connection

2.2.10.   Configuring GG863-SR

- Turn on the GG863-SR and wait 20 seconds for the system to boot

- Connect the GG863-SR to the local PC

- Wait 10 seconds

- In the local PC connected to the GG863-SR type the address:

http://192.168.121.3/cgi-bin/index.cgi

where 192.168.121.3 is one of the IP addresses of the GG863-SR.

The Home Page of the Web Administration Panel is the following:

- Set in the GG863-SR the Remote PC parameters:

1. Click on *Short Range* and then on [Connection]: type of connection between GG863-SR and remote PC.

   o Connection: **GPRS** or **DIAL-IN** (DIAL-IN → GSM)

Click **Submit,** wait until the Web Panel shows the message:

Parameter configuration was successful.

2. Click on [Server]

Fill the form:

o IP Host address: to specify only if GPRS connection is used (address got in section 2.2.9.1)

o Port: **50000** (specify the port on which the remote PC should   wait for GG863-SR registration**)**

o Connection Type: **TCP** (specify only TCP)

For example:

Click **Submit,** wait until the Web Panel shows the message:

Parameter configuration was successful

3. Click on [Mode]:

  o Automatic: **YES** (GG863-SR will try automatically (YES) or not (NO) to connect to Remote PC at next reboot)

Click **Submit,** wait until the Web Panel shows the message:

Parameter configuration was successful

4. If GPRS is used, click on *GSM* and then on GPRS Settings]:

   Fill the form with APN (Access Point Name provided by the Mobile Network Operator).

   Click **Submit,** wait until the Web Panel shows the message:

   Parameter configuration was successful

2.2.11.   SRManagerTool Connection

Go to the Web Panel:

1.   click on *Actions* and then on [Rebooting]:

Rebooting: **YES** (reboot (YES) or not reboot (NO) the GG863-SR immediately).

Click **Submit,** wait until the Web Panel shows the message:

Action performed was successful

2. Unplug the USB cable from the local PC and:

    o   <u>In case of GPRS wait at least 3 minutes before continue with step described in section 2.4.</u>

    o   <u>In case of GSM wait at least 2 minutes before continue with step described in section GSM call2.2.12.</u>

2.2.12.   GSM call

For a GSM connection follow these steps:

1. Go to the dial-in connection created in step described by section 2.2.9.2.

2. Click on **Dial**; if GG863-SR is under GSM coverage, the remote connection will be established

| ⚠ | *To terminate the remote connection between the IP host and GG863-SR, right-click on the relevant icon in the Network Connections window and click on Disconnect; to re-connect, double-click on the icon and click on Dial in the Connect window.* |

| ⚠ | *When the remote connection is established, the remote PC and GG863-SR are assigned the IP addresses 192.168.123.1 and 192.168.123.3, respectively; in order to have a working connection, these addresses must not be used by any other host directly reachable from the IP host.* |

3. Wait at least 2 minutes before continue with step described in section GSM call2.4.

2.3.   SR Modules

✓ ZE50/ZE60
✓ ZE51/ZE61
✓ TinyOnePro
✓ TinyOneLite
✓ ME50-868
✓ ME50-169
✓ ME70-169
✓ LE50-868
✓ LE50-433
✓ LE70-868
✓ LE70-915
✓ LE51-868
✓ LT70-868
✓ NE50-868
✓ NE50-433
✓ NE70-868

2.4.   Downloading

Go to the Telit DownloadZone http://www.telit.com/en/products/download-zone.php and download the file SRManagerTool-x64.msi in case of Windows 64-bit version or SRManagerTool-x86.msi in case of Windows 32-bit version.

2.5.   System Requirements

- Windows XP 32 or 64-bit version, Windows Vista 32 or 64-bit version, Windows Seven 32 or 64-bit version, Windows 8 32 or 64-bit version, Windows 8.1 32 or 64-bit version.

- Microsoft .NET Framework 3.5 SP1 or later.

2.6.   Installation

SRManagerTool is a Windows application. It is compatible with Windows XP, Windows Vista, Windows Seven, Windows 8, Windows 8.1.

In order to install SRManagerTool on your computer:

1. Run the file SRManagerTool-x64.msi or SRManagerTool-x86.msi

Next

Ready to install

Install

Finish

The SRManagerTool is now installed.

In the Desktop will appear the installer for the modified version of network packet analyzer Wireshark valid for 32-bit x86 as well as for 64-bit AMD64/x86-64 processors: Wireshark-win32-1.10.3.exe

In order to install run the installer: **Wireshark-win32-1.10.3.exe**

Information about Wireshark can be found at the link: http://www.wireshark.org/

3.　　SRManagerTool features

SRManagerTool is the PC software developed by Telit in order to flash and manage SR modules and to analyze SR networks.

3.1.　　Connection

- Run SRManagerTool.exe

- Select the type of Connection:

  If GPRS/GSM:

  o type the port configured in GG863-SR (section 2.2.10).

  o Click **Connect** and wait for the "GG863-SR Connection OK" message.

  - To abort connection attempt click **Close**.

o   The window shows GG863-SR IP and IMEI

- To switch from GPRS/GSM to Serial connection:
  - o Click on Disconnect

Between Disconnect and Connect operation wait times described in section 2.2.11 and 2.2.12

  - o Click on Serial radio button
- To swicth from Serial to GPRS/GSM:
  - o Click on **GPRS/GSM** radio button
- Once fixed the connection select the technology to apply: ZigBee, Mesh, WM-Bus or S-One
- Then select the Tool to apply

3.2.   Flashing

The Flashing tool allows to program short range modules.The Flashing window collects the following information:

• **Platforms Info**: platforms supported for each technology

• **Serial Info**: COM Port to use in order to connect the SR module to the PC

The Flashing procedure can be performed only at serial speed of 115200 bit/s.

• **Switch Prog**:

   o **Automatic**: if checked the module connected to the SRManagerTool will be automatically switched to bootloader mode, otherwise the module must be switched manually.

Automatic Switch Prog is not supported for:
   ✓ *ZE50/ZE60*
   ✓ *MBus TinyOneLite*
   ✓ *Mesh TinyOnePRO*
   ✓ *ME50-868, ME50-169 with Length option enabled in Serial Rx Format configuration register*
   ✓ *ME50-433 in case of Radio flashing*
   ✓ *NE50-868, NE50-433 with Stuffing Protocol enabled*
   ✓ *NE50-868, NE50-433 in case of module conneted to a network. For information on how to send the module in bootloader mode without moving switch prog check the related technology UserGuide*

Performance of Automatic Switch Prog is affected by the module configuration, in the worst case it may take about 5 minutes. In case of long time required a popup allows to abort the Automatic Switch Prog procedure and start the manual Switch Prog.

• **Programming Info**:

Module:

- o **Local/GG863-SR**: in case of serial connection to flash the module connected to the serial link; in case of GPRS/GSM connection to flash the module inside the GG863-SR.

- o **Remote** (except for Tiny platforms, ZE50, ZE60): to flash modules over the radio link

Radio Info:

- o **Broadcast**: to flash up to Max Number Modules (clients) through the module connected to the SRManagerTool (server) via serial or GPRS/GSM.

- o **Unicast**: to flash the module with **Serial Number** specified in the field (client) through the module connected to the SRManagerTool (server) via serial or GPRS/GSM.

⚠️	*An UMTS phone/terminal is strongly suggested in order to use the Flashing feature via GPRS (section 3.2)*
🛑	*The Remote Flashing via Dial-in connection needs not to drop the line during the flashing*
⚠️	*The Remote Flashing via GPRS/GSM should be used in emergency situations*
⚠️	*Max Number Modules To Flash: max 255 modules at a time can be flashed via Radio Broadcast.*
⚠️	*In case of no Automatic Switch Prog, after Local flashing turn the power switch OFF (SW2) and then ON (SW2) before start Radio flashing and viceversa.*

Radio Programming:

- • **LE50, ME50, NE50, LE70, ME70, NE70, LT70**:

  Radio Programming is managed for modules LE50, ME50, NE50, LE70, ME70, NE70, LT70. Modules XE50 should be equipped with bootloder GC.B00.01.06-B001, GD.B00.01.06-B001, GI.B00.01.09-B001, GL.B00.01.0B-B001, GJ.B00.01.0A-B001 or later versions, otherwise only Serial Flashing is allowed.

  In order to know the version of the bootloader see section 3.3.1 (for Mesh Technology), 3.3.2 (for WM-Bus technology), 3.3.3 (for SOne Technology):

o   Connect to the module

o   Give the command: AT/V (for WM-Bus or SOne), AT/B (for Mesh).
     The response would be formatted for example in this way:
     GC.U00.01.01-B002.GC.B00.01.06 (for WM-Bus or SOne) or
     GC.B00.01.06 (for Mesh).
     The bootloader version is:
     GC.B00.01.06

Server and Clients modules can be equipped with any of the firmware allowed for technology/platform (see Appendix 4). Turn the programming switch ON (SW4) before power ON (SW2) or put all modules in bootloader activation (see ATBL command).

- **ZE51, ZE61**:

  radio Programming is managed for modules ZE51, ZE61 equipped with bootloder B00.01.07 or later versions. For previous versions only Serial Flashing is allowed.

  In order to know the version of the bootloader see section 3.3.4 (for ZigBee technology):

  o   Connect to the module

  o   Give the command: 02 14 05
       The response would be formatted for example in this way:
       10 15 00 05 0c 46 53 2e 42 30 30 2e 30 31 2e 30 34
       The bootloader version is:
       46 53 2e 42 30 30 2e 30 31 2e 30 34
       That is:
       FS.B00.01.07

<u>**Server Module:**</u>

server module must be equipped with bootloader B00.01.07 or later versions and firmware Supervisor ZEx1 XS5.11.21-B004.s28 or later versions.

The firmware Supervisor can be flashed via Serial.

Before start Radio Programming turn the programming switch OFF (SW4) before power ON (SW2).

<u>**Client Modules:**</u>

clients modules must be equipped with bootloader B00.01.07 or later versions and any of the firmware allowed for right technology/platform (see Appendix 4). Turn the programming switch ON (SW4) before power ON (SW2) or put all modules in bootloader activation (see [2]).

- **Firmware**: the firmware file to flash in the SR module

- Select the right **Platform**
- Select the **COM port**
- Select the **Via** and **Radio Info** if needed
- Browse and select the firmware file related to the technology:

Technology/Platform firmware:

Mesh:

- platform NE50-868, Stack Low Power Mesh
- platform NE50-433, Stack Low Power Mesh
- platform NE70-868, Stack Low Power Mesh
- Platform TinyOne Pro, Stack M_ONE

ZigBee:

- platform ZE50/ZE60, Stack ZB2007
- platform ZE51/ZE61- IA/WA, Stack ZBPRO

MBUS:

- platform TinyOneLite, Protocol EN13757-4:2005
- platform ME50-868, Protocol:EN13757-4:2005 + EN13757-5 Mode R2
- platform ME50-868, Protocol:EN13757-4:2013
- platform ME50-169, Protocol:EN13757-4:2013
- platform ME70-169, Protocol:EN13757-4:2013
- platform ME50-868, Protocol EN13757-5 Mode Q

SOne:

- platform LE50-868, Stack StarNetwork
- platform LE50-433, Stack StarNetwork
- platform LE70-868, Stack StarNetwork
- platform LE70-915, Stack Frequency Hopping Star Network
- platform LE51-868, Stack SigFox plus S-One
- platform LT70-868, Stack StarNetwork

- Power the SR board OFF (SW2) (see section 2.3)

- Connect the SR board to the serial COM Port

- Turn the programming switch ON (SW4) for LE50, LE70, ME50, ME70, NE50

- Turn the programming switch ON (SW4) for ZE50, ZE60, ZE51, ZE61 in case of serial flashing

- Turn the programming switch OFF (SW4) for ZE51, ZE61 that acts as Supervisor in case of radio flashing

- Power the SR board ON (SW2) (see section 2.3)

- Click the Flashing button

Modules Responding: Serial ID and flashing result of the modules responding:

- available for LE50, LE70, LT70, LE51, ME50, ME70, NE50, ZE51, ZE61.not available for:
  - ✓ Tiny, ZE50, ZE60
  - ✓ ZE51 and ZE61 equipped with bootloader that does not support Radio Programming

Results:
- available for LE50, LE70, LT70, LE51, ME50, ME70, NE50, ZE51, ZE61
- not available for:
  - ✓ Tiny, ZE50, ZE60
  - ✓ ZE51 and ZE61 equipped with bootloader that does not support Radio Programming

A Pop up will show when flashing is finished: click OK

- Click Close button in order to return to the Main Window

⚠️	*Flashing is a critical feature that may lead to unexpected behaviour if wrong firmware is flashed.*
⚠️	*In case of connection GPRS/Dial-in the Flashing operation may take a long time*

- **Example of Radio Flashing Broadcast:**

Modules Responding Alarms:

- 1% <= SUCCESS <= 25%
- 26% <= SUCCESS <= 50%
- 51% <= SUCCESS <= 75%
- 76% <= SUCCESS <= 99%
- SUCCESS = 100%

- **Example of Radio Flashing Unicast:**

3.2.1.   Multiple Flashing Sessions

The SRManagerTool allows multiple flashing sessions.

You can use the Flashing Tool until you have COM Ports available.

For any flashing session a pop up will show when the flashing is finished

⚠️   **The main Window will have the Close button not enabled until there is a Window alive**

3.3. Management

The window Management is specific for the technology chosen.

⚠️ *The Management feature may lead to change critical parameters for normal behaviour.*

3.3.1. Management of Mesh Technology

In order to use the Management features select Serial Protocol information:

• **Serial Port:** serial port where is connected the SR Module

• **Stuffing** or **Timeout protocol**

• **Enable Flow Control**

- In order to perform a commissioning session, connect the Mesh module to the selected serial port and put the module in configuration mode as follow:
   o Switch the SR board OFF (SW2).
   o Turn the programming switch OFF (SW4) on the SR board.
   o Switch the SR board ON (SW2)
   o Turn the programming switch ON (SW4) on the SR board.

⚠	*Be care to select the Serial Port where the Mesh module is really connected, SRManagerTool can not check it and it leads to no communication.*

Once fixed the Serial Protocol Information and connected the module click the button **Connect** in order to connect to the Module.

The previous window allows to send/receive Hex or ASCII commands to/from the Mesh module.

⚠️ *In order to use correctly the Window, the right protocol must be selected.*

The Stuffing Protocol waits for 0xAB at the start of the command and 0xCD at the end of the command.

- Select the Command Type

- If the Command Type selected is HEX:

  o fill the Raw command field to send.

- If the Command Type selected is ASCII:

  o select the Type

  o <u>fill the Recipient (if the module is in configuration mode put Recipient = 00, if the module is in operative mode put the actual ASCII ClientID of the module) and Data fields to send</u>

For example:
Client Id LSB = 69 (ASCII = E), Client Id MSB = 49 (ASCII = 1) → *ASCII Client Id = E1* → *Recipient = E1*

- Click the button Send Command

- The Text Box shows the responses from the module

Examples:

Type **DATA:**

Type **HAYES**

Type **IO**

Type **PING:**

- The responses log can be saved, cleared or loaded.
- Starting from this window the user can open the configuration wizard clicking the button **Configuration Wizard** or disconnect from the Mesh module clicking the button **Disconnect** (for example to select another Serial Protocol)

3.3.1.1.   Mesh Configuration Wizard

The Configuration wizard allows configuring and reading registers of modules TinyOne Pro (modules/terminals 32 kB), NE50-868 MHz and NE50-433 MHz equipped with firmware AllInOne.

The selection of one of the three module behaviours (end point, router, and coordinator) is possible at configuration time. It is not necessary to flash the module to switch from a behaviour to another since it's all integrated in a unique firmware.

STOP **In order to configure correctly the AllInOne module it has to be in Configuration Mode (Prog switch ON).**
Once in Configuration Mode the module will be operative after about 5 seconds.

In order to verify the accuracy of data written by the user in every textbox the tool needs a specific XML file. This file is closely linked together with the Mesh firmware version. The files are provided by Telit and are stored in the folder ./ConfigTool/Mesh and the name of each file is composed in this way: Info_ML_<Maj>_<Min>.xml, where Maj and Min are the major and minor number of Mesh firmware version.

i.e.: if the firmware version is DV.M0A.03.112 the xml file name will be Info_ML_03_11.xml.

The user shall not modify the xml files; if the file is not present or corrupted the SRManagerTool returns a caution popup. In the future, when a new firmware version will be available, Telit will make available a new XML file for the SR Tool and the user will take care to put it in the correct folder. If the module is not connected to the selected serial port or it is not responding, the configuration wizard won't start and it will show an error popup.

When the Configuration Wizard is started it shows the factory values

ⓘ **The values in the window have not been read from the module**

- The button **Apply Values** allows configuring registers with desired values, after filling the different fields and selecting the radio buttons, click on the button Apply Values to configure the module:

If the Serial Protocol applied with Configuration Wizard is different from the previous selected in the Window Management (for example in Configuration Wizard is selected Stuffing protocol and in the Window Management was selected Timeout protocol or vice versa) after Apply Values *it is strongly recommended* Restart Module *before giving ATO commands by Management Window, then Connect again to the module with the Serial protocol just applied.*

In the LSB and MSB Client Id you can set the identifier for each device in the network. Note that in the Topology Network the ASCII representation of the bytes is shown for each device.
Table values:
- from 0 to 31, 127: non-printable values;
- from 32-126: printable values;
- 32: is the space character.
For example:
Client Id LSB = 69 ('E'), Client Id MSB = 49 ('1') ➔ Client Id = "E1"

- The button **Read Values** allows reading registers value from the module

- The button **Restart Module** leads sending **ATO** command to the module

| STOP | **After the ATO command the user shall reconnect to the module in order to continue the configuration, otherwise the module is in operating mode.** |

- The button **Default Values** leads sending **ATR** command:
- using this command it is possible to restore a great part of register default values; the difference with ATF command is that the module type will be not changed and the default values depend on the module type. If a module used as Coordinator receives the command ATR, restores all the default values but module type continues to have the value equals to 2 and the Client ID will be not changed (0xFF,0xFF). For the other module types the module type (register 306) does not change but the Client ID becomes 0x30, 0x30.

| STOP | **After sending this command it is mandatory to perform a module reboot clicking the button** Restart Module. |

- The button **Factory Values** leads sending the Hayes command **ATF**.
- The Hayes command ATF allows user restoring the "Factory" settings. It means that module type becomes 0x00, Network ID is 0x30, Client ID is 0x30, 0x30, and so on.

| STOP | **After sending this command it is mandatory to perform a module reboot clicking the button** Restart Module. |

- The button **Load From File** allows configuring registers with values stored in a configuration file (see for example Mesh_Coordinator_Config_Default.txt, Mesh_Router_Config_Default.txt, Mesh_EndDevice_Config_Default.txt, Mesh_AllType_Config_Factory.txt). After loaded the file click the button **Apply All** in order to set effectively the values.
- The button **Save To File** allows saving the values present in the window in a file (for example in order to save a specific configuration).

3.3.1.2.   Mesh Network Discovery

The feature **Network Discovery** shows the topology of the network and some useful information such as:

- Network ID of the network discovered
- Radio Band used for network operations

- Network Period of the network discovered

- How many devices have been discovered in the network

- How many devices are not responding during discovery

- For each device (right click): Client ID, Serial Number (if detected), Parent ID, Module Type (if detected), Low Power Mode (if detected), Periodic Wake up (if detected and applicable), firmware version and a list of commands that can be sent to remote device (see 3.3.1.3)

The topology can be get using one of the Telit modules of the network in field:

by the tool **Management** of the SRManagerTool **Connect** to the module of the network (see section 3.3.1)

	For discovering the topology it is recommended to use a device that does not receive data with high rate, otherwise the performances can be very slow and the topology can be detected with incomplete information or not detected at all.

- In the **Management** window Click button **Network Discovery**
- Appears the following window:

- The field **Waiting time** is the time to wait for each command sent during the network discovering.

⚠️	*If in the network there are sleeping devices it is recommended to type a time compliant to the registers 320, 321, 322, 340, 341 and network depth, anyway some devices can be detected with information incomplete or not detected at all.*

- click the button **Start Discovery**:

- The button **Save** allows saving the topology shown in the left window to XML file.
- The button **Load** allows loading in the right window the topology saved (XML file), for example for comparing two networks or the same network in two different times.

- An **Abort Discovery** button allows aborting the Network Discovering process:

- A progress bar shows the network **Level** discovered.

The SRManagerTool provides logging information for commands sent to remote devices.

The log can be cleared → **Clear Log**, saved (in RTF format) → **Save Log** or loaded → **Load Log**

Work offline allows registering commands without send them over the air. Commands can be sent later

The SRManagerTool allows to list the commands sent to remote devices.

➢ The list can be cleared → **Clear Command**, or saved (in xml format) → **Save Command**.

➢ The list can be reloaded → **Load Command**

➢ The list can be sent if the box **Work offline** is not checked and a Topology is displayed → **Send Command**

➢ To delete a row on the list → click on the row

3.3.1.3. Mesh Remote Commands

Right click on the node of the topology in order to list all remote commands available.

⚠️ *The performance of the commands are not guaranteed in case of node marked in the topology as "Information Incomplete".*

- **Ping-Standard**: pings the remote device sending the PING command

- **Ping-Statistic**: pings the remote device sending the PING and shows statics

- **Telemetry**: sends the Telemetry command to the remote device

- **Move**: change the parent of the remote device
  o Go to the topology and select the device you want change parent

  o Go to the Topology and double click on the new parent

⚠	*Because the Move is a critical command the module can not be switched off during it. In case of Error response the module can be associated to a parent different from "NEW parent ID" or out of the network.*

ℹ	**Information about the time needed to apply the new topology after the Move operation can be retrieved in the relating technology documentation.**

Start Discovery in order to see the new topology of the network.

3.3.2.   Management of WM-Bus Technology

In order to use the Management features you have to select Serial Protocol information:

• **Serial Port:** serial port where is connected the SR Module

• **Baudrate:** the speed of the serial port (19200 bits/s default)

• **Enable Flow Control**

• **Serial Wakeup**

• **MBus Protocol**

- Connect the WM-Bus module to the serial port selected:

  o Switch the SR board OFF (SW2).

  o Turn the programming switch OFF (SW4) on the SR board.

  o Switch the SR board ON (SW2).

Once fixed the Serial and MBus Protocol Information click the button **Connect** in order to connect to the WMBus Module.

The previous window allows to send Hex or ASCII commands to the MBus module:

- Select the Command Type
- If the Command Type selected is HEX:
    o fill the Raw Data field to send.
- If the Command Type selected is ASCII:

o   fill the Data field to send

• Click the button Send

• The Text Box shows responses from the module.

	After sent ASCII command ATO to come back in configuration mode give the command 2b 2b 2b in Hexadecimal command window.

Example:

- The responses log can be saved, cleared or loaded.

- Starting from this window the user can open the configuration wizard clicking the button **Configuration Wizard** or disconnect from the WM-Bus module clicking the button **Disconnect** (for example to select another Serial or MBus Protocol)

3.3.2.1.   WM-Bus Configuration Wizard

The Configuration wizard allows configuring and reading registers of TinyOne Lite 868 MHz, ME50 868MHz and ME50 169MHz modules.

• When the Configuration Wizard is started it shows the default values.

The values in the window have not been read from the module

ME50-868: Protocol EN13757-4:2005

ME50-868: Protocol EN13757-4:2013

ME50-169: Protocol EN13757-4:2013

ME70-169: Protocol EN13757-4:2013

ME50-868 : Protocol EN13757-4 + EN13757-5 Mode R2

ME50-868: Protocol EN13757-5 Mode Q

- The button **Apply Values** allows configuring registers with desired values, after filling the different fields and selecting the radio buttons, click on the button **Apply Values** in order to configure the module.

- The button **Read Values** allows reading registers value from the module.

- The button **Restart Module** leads to send **ATO** command to the module.

After the ATO command the user shall reconnect to the module in order to continue the configuration, otherwise the module is in operating mode.

- The button **Default Values** leads to send **ATR** command:

- using this command it is possible to restore all parameters to their default values. After ATR command the user shall **Read Values** in order to refresh the window with default values read from the module.

- The button **Load From File** allows configuring registers with values stored in a configuration file (see for example MBus_Default.txt). After loaded the file click the button Apply All in order to set effectively the values.

- The button **Save To File** allows saving the values present in the window into a file (for example in order to save a specific configuration).

- The button **Add Meter/Node, Remove Meter/Node** allows adding/removing an entry in the registered meters/nodes.

3.3.3.   Management of S-One Technology

In order to use the Management features you have to select Serial Protocol information:

- **Serial Port:** serial port where is connected the SR Module

- **Baudrate:** the speed of the serial port (19200 bits/s default)

- **Parity:** serial port parity type

- **Stop bits**: serial port stop bits

- **Flow control:** serial port flow control type

- **N. data Bits**: number of data bits.

- Connect the S-One module to the serial port selected:
  - o Switch the SR board OFF (SW2).
  - o Turn the programming switch OFF (SW4) on the SR board.
  - o Switch the SR board ON (SW2).

Once fixed the Serial Protocol Information and connected to the module click the button **Connect** in order to connect to the S-One Module.

The section SigFox is active only in case of stack SigFox plus S-One.

The previous window allows to send Hex or ASCII commands to the S-One module:

- Select the Command Type
- If the Command Type selected is HEX:
  o fill the Raw Data field to send.

- If the Command Type selected is ASCII:
  - o fill the Data field to send
- Click the button Send
- The Text Box shows the responses from the module.

Example:

⚠️	After sent the ASCII command ATO, before Disconnect the module send the command +++

⚠️	After sent ASCII command ATO or ATX to come back in configuration mode give the command 2b 2b 2b in Hexadecimal command window.

- The responses log can be saved, cleared or loaded.

- Starting from this window the user can open the configuration wizard clicking the button **Configuration Wizard** or disconnect from the S-One module clicking the button **Disconnect** (for example to select another Serial Protocol)

In case of stack SigFox plus S-One:

- The section SigFox Commands allows to send the commands: ATX,Send Payload, AT$SB, AT$SF, AT/L to the module.

- Send Payload:

- Send AT$SB:

- Send AT$SF:

3.3.3.1.   S-One Configuration Wizard

The Configuration wizard allows configuring and reading registers of the LE50-868 MHz, LE50-433 MHz, LE70-868 MHz, LE70-915 MHz, LE51-868 and LT70-868 MHz modules.

- When the Configuration Wizard is started it shows the default values.

The values in the window have not been read from the module

LE50:868:

LE50-433:

LE70-868:

LE70-915:

LE51-868:

LT70-868:

- The button **Apply Values** allows to configure registers with desired values, after filling the different fields and selecting the radio buttons, click on the button Apply Values to configure the module.

• The button **Read Values** allows to read registers value from the module.

• The button **Restart** leads to send **ATO** command to the module.
• The button **Restart SigFox** leads to send **ATX** command to the module in case of stack SigFox plus S-One.

🛑 STOP	**After the ATO or ATX command the user shall reconnect to the module in order to continue the configuration, otherwise the module is in operating mode.**

- The button **Default Values** leads to send **ATR** command:

- using this command it is possible to restore all parameters to their default values. After ATR command the user shall **Read Values** in order to refresh the window with default values read from the module.

- The button **Load From File** allows configuring registers with values stored in a configuration file (see for example SOne_Default.txt). After loaded the file click the button Apply All in order to set effectively the values.

- The button **Save To File** allows saving the values present in the window into a file (for example in order to save a specific configuration).

3.3.4.   Management of ZigBee Technology

In order to use the Management features you have to select the following information:

- **ZB Protocol:** ZB protocol type

- **Serial Protocol (disabled in case of GPRS/GSM connection):**

  o   serial port where is connected the SR Module

  o   speed of the serial port if ZB protocol is PRO, if ZB protocol is 2007 the serial port is 115200 bits/s

⚠ *Management in case of GPRS/GSM connection is supported only for ZEx1*

- Connect the ZigBee module to the serial port selected:
  o Switch the SR board OFF (SW2).
  o Turn the programming switch OFF (SW4) on the SR board.
  o Switch the SR board ON (SW2).

Once fixed the Serial Protocol Information and connected to the SR module click the button **Connect** in order to connect to the ZigBee Module.

The previous window allows to send generic **Hex** commands or specific **Commands** to the ZigBee module.

Hex command:

- fill the Raw Data field to send.

- Click the button Send

- The Text Box shows the responses from the module.

For example:

Specific **Commands**:

- Send the following specific commands:

  o **Add/Remove Group**: add or remove group to an endpoint

o   **Application Frame Indirect**: used to communicate with a bind application of a remote device

o **Application Frame Group**: used to communicate with a group of a remote application

o **Set Installation Code (Trust Center)**: used to set an Installation code used to create a Trust Center Link Key.

o **Set Installation Code (Other Dev)**: used to set an Installation code used to create a Trust Center Link Key.

- the responses log can be saved, cleared or loaded.

- open the configuration wizard in order to configure the module with desired values clicking the button **Configuration Wizard**

- get the Topology Network clicking the button **Network Discovery**

- disconnect from the ZigBee module clicking the button **Disconnect** (for example to select another Serial Protocol)

3.3.4.1.   ZigBee Configuration Wizard

⚠️   *Configuration Wizard is disabled in case of GPRS/GSM connection*

The Configuration Wizard allows configuring and reading registers of the ZE50/ZE60 and ZE51/ZE61 (Coordinator, FFD, RFD) modules.

In order to verify the accuracy of data written by the user in every textbox the tool needs a specific XML file. This file is closely linked together with the ZigBee stack version and stack type. The files are provided by Telit and are stored in the folder ./ConfigTool/ZigBee and the name of each file is composed in this way: Info_ZB_<Type>_<Maj>_<Min>.xml, where Maj and Min are the major and minor number of stack version and Type is the stack type (PRO or 2007)

i.e.: if the stack version is EH.Z02.01.05-B002 the xml file name will be Info_ZB_2007_01_05.xml, where the 2007 type is caused by the '0' after the 'Z' in the stack version string; if after the 'Z' there is a '1' the firmware type will be PRO.

The user shall not modify the xml files; if the file is not present or corrupted the SRManagerTool returns a caution popup. In the future, when a new firmware version will be available, Telit will make available a new XML file for the SR Tool and the user will take care to put it in the correct folder. If the module is not

connected to the selected serial port or it is not responding, the configuration wizard won't start and it will show an error popup.

- When the Configuration Wizard is started it shows the default values.

The values in the window have not been read from the module

Stacks ZBPRO FS.X0x.11.00-B001.s28, FR.X0x.11.12-B002.s28, FS.X0x.11.12-B002.s28, FY.X0x.11.12-B002.s28, FX.X0x.11.12-B002.s28 are managed with some limitations relating to Serial Speed. During "Apply Values" and "Read Values" the following popups appear.

Coordinator:

RFD:

FFD:

- The button **Apply Values** allows configuring registers with desired values, after filling the different fields and selecting the radio buttons, click on the button **Apply Values** to configure the module.

Success

Registers setting completed

OK

- The button **Read Values** allows to read registers value from the module.

- The button **Hard Reset** leads to restore default values.

| STOP | **After Hard Reset the user should reconnect to the module in order to continue the configuration.** |

- The button **Soft Reset** leads to disconnect of the network.

| STOP | **After Soft Reset the user should reconnect to the module in order to continue the configuration.** |

- The button **Start Network** leads to start the network or to associate the device to the network.
- The button **Load From File** allows configuring the module with values stored in a configuration file (see for example Coordinator_Default.Config.txt, FFD_Default_Config.txt, RFD_Default_Config.txt, Coordinator_Config.txt, FFD_Config.txt, RFD_Config.txt). After loaded the file click the button **Apply Values** in order to set effectively the values.
- The button **Save To File** allows to save the values present in the window into a file (for example in order to save a specific configuration).

| ⚠️ | **At the moment due to a limitation on the ZB firmware Stack 2007 Bootloader Version and Application Version attributes are not managed.** |

3.3.4.2. ZigBee Network Discovery

The feature **Network Discovery** shows the topology of the network and some useful information such as:

- PAN-ID of the network discovered
- Channel used for network operations
- How many devices have been discovered in the network
- How many devices are not responding during discovery
- For each device (right click): Network address, Type of device (if detected), MAC address (if detected), Receiver on when idle (if detected and applicable), Father network address and a list of commands that can be sent to remote device (see 3.3.4.3)

The topology can be get in two ways:

1. Using one of the Telit modules of the network in field:
   by the tool **Management** of the SRManagerTool **Connect** to the module of the network (see section 3.3.4)

if device used for discovering receives data with high rate the performaces can be very slow.

2. Using the **Telit M ZE51 USB** dongle as an EndDevice of the Network in field:

In order to flash the **M ZE51 USB dongle**:

o Plug in the USB port of the PC the **Telit M ZE51 USB** dongle

o If needed install drivers present in the link:
  http://www.ftdichip.com/Drivers/VCP.htm

   Refer to document [11].

o By the tool **Flashing** of the SRManagerTool flash the node **Telit M ZE51** with firmware ZEx1.XS5.11.21-B004.s28 (see Appendix 1)

In order to configure the **M ZE51 USB** dongle:

o By the tool **Management** of the SRManagerTool **Connect** to the node M ZE51 (see section 3.3.4) and give the following commands:

   - 0x04 0x12 0x08 0x01 0x00 (to put the node in configuration mode)
     The response is: 0x03 0x13 0x00 0x08

   - 0x02 0x10 0x00 (to perform an Hard Reset)
     The response is: 0x02 0x11 0x00

   - 0x2b 0x2b 0x2b (to enter in command mode)
     The response is: 0x0D

   - 0x04 0x12 0x08 0x01 0x00: (to put the node in configuration mode)
     The response: is 0x03 0x13 0x00 0x08

o Configure the node with the parameters of channel and Extended PAN ID by the tool **Configuration Wizard** (see section 3.3.4.1)

o Close the **Configuration Wizard**

In order to associate the **M ZE51 USB** dongle to the network as End Device:

o   By the tool **Management** give the following commands:

-   0x01 0x16 (to associate to the network)
    the response is:
    0x07 0x77 Nwk_Addr(2 bytes Little Endian) 0xXX(do not care)
     0xYY(do not care) 0x00 0x00 0x02 0x17 0x00(be care it is 00 ➔
    SUCCESS)

-   0x02 0x14 0x96 (to get the network address of the dongle)
    The response is: 0x06 0x15 0x00 0x96 0x02 Nwk_Addr(2 bytes)

If the **M ZE51 USB** dongle is already associated to the network:

o   give the following command by the tool **Management**:

-   0x04 0x12 0x08 0x01 0x00 (to put the node in configuration mode)
    The response is: 0x03 0x13 0x00 0x08

3.   Using the **Telit GG863-SR** as an EndDevice of the Network in field:

o   In order to connect/setup the **GG863-SR** see section 2.2

o   By the tool **Flashing** of the SRManagerTool flash the GG863-SR with firmware ZEx1.XS5.11.21-B004.s28 (see section 3.2)

In order to configure the GG863-SR:

o   By the tool **Management** of the SRManagerTool **Connect** to the node (see section 3.3.4) and give the following commands:

-   0x04 0x12 0x08 0x01 0x00 (to put the node in configuration mode)
    The response is: 0x03 0x13 0x00 0x08

-   0x02 0x10 0x00 (to perform an Hard Reset)
    The response is: 0x02 0x11 0x00

- 0x2b 0x2b 0x2b (to enter in command mode)
  The response is: 0x0D

- 0x04 0x12 0x08 0x01 0x00: (to put the node in configuration mode)
  The response: is 0x03 0x13 0x00 0x08

o Configure the node with the parameters of channel and Extended PAN ID of the network by following commands:

 - 0x05 0x12 0x01 0x02 channel(2 bytes) (to set channel)

   The response is: 0x03 0x13 0x00 0x01

 - 0x0B 0x12 0xC4 0x08 ExtPanId(8 bytes) (to set Ext PAN ID)

   The response is: 0x03 0x13 0x00 0xC4

In order to associate the **GG863-SR** to the network as End Device:

o By the tool **Management** give the following commands:

 - 0x01 0x16 (to associate to the network)
   the response is:
   0x07 0x77 Nwk_Addr(2 bytes Little Endian) 0xXX(do not care)
    0xYY(do not care) 0x00 0x00 0x02 0x17 0x00(be care it is 00 → SUCCESS)

 - 0x02 0x14 0x96 (to get the network address of the dongle)
   The response is: 0x06 0x15 0x00 0x96 0x02 Nwk_Addr(2 bytes)

 If the **GG863_SR** is already associated to the network:

o give the following command:

 - 0x04 0x12 0x08 0x01 0x00 (to put the node in configuration mode)
   The response is: 0x03 0x13 0x00 0x08

- In the Management window Click button **Network Discovery**
- Appears the following window:

- The field **Time for each device** is the time to wait for each device during the network discovering.

⚠	If in the network there are sleeping devices it is recommended to type a time compliant to the maximum sleeping time in the network, otherwise some devices can be detected with information incomplete or not detected at all.
⚠	In case of GPRS/GSM connection it is recommended to use a Time for each device > 1

- click the button Start Discovery:

- The button **Save** allows saving the topology shown in the left window to XML file.
- The button **Load** allows loading in the right window the topology saved (XML file), for example for comparing two networks or the same network in two different times.

An **Abort Discovery** pop up allows aborting the Network Discovering process:

A progress bar shows the network **Level** discovered.

	Attention: do not close the Management window or Disconnect from the module used to get the topology network when the Network Discovery window is opened, otherwise the serial connection is closed and the Network Discovery Tool can not communicate with the node.

The SRManagerTool provides logging information for commands sent to remote devices.

The log can be cleared → **Clear Log,** saved (in RTF format) → **Save Log** or loaded → **Load Log**

Work offline allows registering commands without send them over the air. Commands can be sent later

The SRManagerTool allows to list the commands sent to remote devices.

➢ The list can be cleared → **Clear Command**, or saved (in xml format) → **Save Command**.

➢ The list can be reloaded → **Load Command**

➢ The list can be sent if the box **Work offline** is not checked and a Topology is displayed → **Send Command**

➢ To delete a row on the list → click on the row

3.3.4.3.   ZigBee Remote Commands

Right click on the node of the topology in order to list all remote commands available.

- **Ping**: pings the remote device sending for four times the command IEEE Addr request. The statistics response is showed.

- **Node Descriptor**: used to inquire for the node descriptor of the remote device.

- **Active EndPoints**: used to inquire for the list of endpoints on the remote device

- **User Descriptor**: used to inquire for the user descriptor of the remote device.

- **Bind/Unbind(From-To)**: the window allows the feature of binding or unbinding two remote devices (with DstAddrMode = IEEE Address).

  o Right click on a node on the topology → Bind/Unbind(From-To), wait some seconds to retrieve information

  o Right click on another node on the topology → Bind/Unbind(From-To), wait some seconds to retrieve information

o Double click on the desired Cluster Output (green) on the Source node

o Double click on the desired cluster Input (green) on the Destination node

o Click on **Binding** or **Unbinding**. See the status of the operation in the NetworkDiscovery window.

o Click on **Reverse** in order to reverse SOURCE and DESTINATION.

o   Click on **Clear** in order to clear the Simple Descriptor showed.

Selecting another node on the topology and clicking → Bind/Unbind(From-To) its Simple Descriptor is showed and a new operation of Binding/ Unbinding can be performed.

- **BindingList**: the window shows the contents of the Binding table of one or two nodes selected.

  o   Right click on one node on the topology → BindingList, wait some seconds to retrieve information

  o   Right click on another node on the topology (optional) → BindingList, wait some seconds to retrieve information

Clear: to clear the table showed. Selecting another node on the topology and clicking → **BindingList**, its binding table is showed an another **Unbind** operation can be performed.

Refresh: to refresh the table. Wait some seconds to retrieve information

Double click on the row of the binding table to unbind → **Unbind**. See the status of the operation in the NetworkDiscovery window

Clear: to clear the content of the row selected

- **Binding/Unbinding(Table_Entry)**: the window allows the feature of adding (Binding) or deleting (Unbinding) a row on the binding table of a node. The DstAddrMode can be IEEE Address or Group Address.

  o Right click on a node on the topology **Binding/Unbind(Table_Entry)**, wait some seconds to retrieve information

o   Double click on the desired Cluster Output (green) on the node

o   Select desired DstAddrMode: IEEE Addr or Group Addr

o   Fill needed information (MAC Addr and DstEP for IEEE Addr, Group Addr (Hex) for Group Addr)

o   Click on **Binding** or **Unbinding**. See the status of the operation in the
       NetworkDiscovery window.

o   Clear: clears the Simple Descriptor showed.

o   Selecting another node on the topology and clicking →
       Binding/Unbind(IEEEAddr-GrpAddr) its Simple Descriptor is showed
       and a new operation of Binding/Unbinding can be performed.

- **PermitJoining**: used to request that a remote device allow or disallow
  association

Click **Apply** and see the status of the operation in the NetworkDiscovery window

- **Leave**: used to ask at a remote device to leave the network

Click **Apply** and see the status of the operation in the NetworkDiscovery window

- **AFDirectRequest**: used to communicate with an application of a remote device

3.4.   Analyzer

SRManagerTool uses Wireshark network protocol analyzer in order to monitor a wireless network.

The **Analyzer** window collects the following information:

- **Serial Port:** serial port where is connected the SR Sniffer node (disabled in case of GPRS/GSM connection)

- **Analyzer**: the path where is installed the Wireshark analyzer

⚠️   **Analyzer is not available for LEx0, NE70-868**

3.5.   Mesh Technology

Serial Connection:

GPRS/GSM Connection:

The **Analyzer** window is the following and collects more:

- **Source**: TinyOnePro (firmware TransparentSnifferTinyProBoard.s19), NE50-869.525 3 RSSI levels (firmware Sniffer_XE50_RSSI3.hex), NE50-869.525 255 RSSI levels (firmware Sniffer_XE50_RSSI255.hex), NE50-868-GC.M0S 3 Band (firmware GC.M0S.01.01-B005.hex for 868MHz), NE50-868-GC.M0S 13 Band (firmware GC.M0S.01.01-B007.hex for 868MHz), NE50-433-GD.M0S 8 Band (firmware GD.M0S.01.01-B005.hex for 433MHz).

- **Radio Band** and **Rx Power**: only for sniffer NE50-868-GC.M0S 3 Band, NE50-868-GC.M0S 13 Band, NE50-433-GD.M0S 8 Band

- **Rx Power Tool: starts a tool that** shows the received signal quality.

⚠️	**The sniffer TinyOnePro, NE50-869.525 3 RSSI levels and NE50-869.525 255 RSSI levels support only 869.525 MHz.**

- The button **Wireshark** starts the analyzer that captures and save packets during a monitoring session.

- Select a name for the folder where saving PCAP file with captured packets.

  The PCAP file will have the following format name: Date_Time_Captured.PCAP.

  Example: 2012-3-2_15.3.0_Captured.PCAP

	In case of Serial connection be careful to select the Serial Port where the SR Sniffer node is really connected, SRManagerTool can not check it and it leads to no packet captured.

3.6.   ZigBee Technology

Serial Conenction:

GPRS/GSM Connection:

The **Analyzer** window is the following and collects more:

- **Radio Channel**: radio channel to monitor with Wireshark.

- **Source**: source sniffer node

- **PAN-ID:** PAN-IDs to monitor with SRManagerTool relating to topology changes. The warnings about topology changes will be saved in a RTF file in the same folder where will be saved the PCAP file.

- Button **Monitor:** starts the Alarm Monitor during a monitoring session.

- The button **Wireshark** starts the analyzer that captures and save packets during a monitoring session.

- Select a name for the folder where saving PCAP file with captured packets and RTF log file with warnigs about topology changes.

  The PCAP file will have the following format name: Date_Time_Captured.PCAP.

  Example: 2012-3-2_15.3.0_Captured.PCAP

- The button **Packets Analysis** starts the analysis of the captured packets in a previous monitoring session. In order to allow this feature is mandatory to save the topology and packets exchanged in the monitored network as explained in the section 3.9.1.

3.7.   WM-Bus Technology

Serial Conenction:

GPRS/GSM Connection:

The **Analyzer** window is the following and collects more:

- **Source**: source sniffer node used
- **Mode**: Mode of operation
- **Radio Channel**: radio channel used only in case operating mode is **R2 or Q**

- The button **Wireshark** starts the analyzer that captures and save packets during a monitoring session.
- Select a name for the folder where saving PCAP file with captured packets.

  The PCAP file will have the following format name:
  Date_Time_Captured.PCAP.

  Example: 2012-3-2_15.3.0_Captured.PCAP

3.8. SR sniffer nodes

The SR sniffer node detects over-air packets.

Related to the technology, the right SR Hardware Sniffer (flashed with the right firmware) has to be connected to the serial port selected in the Analyzer Window.

3.8.1. ZigBee Technology

In order to analyze a ZigBee Network with Stack ZB2007 the following sniffer nodes can be used:

Freescale Sniffer:

- plug in the USB port the Freescale 1322X USB dongle.
- If needed install drivers supplied in the Freescale CD

Telit Sniffer M ZE51:

- Plug in the USB port of the PC the Telit M ZE51 USB dongle
- If needed install drivers present in the link: http://www.ftdichip.com/Drivers/VCP.htm
- use the SRToolManager in order to flash the dongle with the firmware ZEx1.XS5.11.21-B004.s28 (See Appendix 1)

Telit Sniffer on DemoBoard:

- use the SRManagerTool in order to flash a Telit module ZE50/ZE60 with the firmware EH.WS5.11.51-B002.s28 (See section Flashing).
- When the module is flashed:
  o Switch the SR board OFF (SW2).
  o Turn the programming switch OFF (SW4) on the SR board.
  o Switch the SR board ON (SW2).

In order to analyze a ZigBee Network with ZBPRO the following sniffer nodes can be used:

<u>**Freescale Sniffer:**</u>

- plug in the USB port the Freescale 1322X USB dongle.

- If needed install drivers supplied in the Freescale CD

<u>**Telit Sniffer M ZE51:**</u>

- Plug in the USB port the Telit M ZE51 USB dongle

- If needed install drivers present in the link:
  http://www.ftdichip.com/Drivers/VCP.htm

- Use the SRToolManager in order to flash the dongle with the firmware ZEx1.XS5.11.21-B004.s28 (See Appendix 1)

<u>**Telit Sniffer on DemoBoard:**</u>

- use the SRManagerTool in order to flash a Telit module ZE51/ZE61 with the firmware ZEx1.XS5.11.21-B004.s28 (See section3.2).

- When the module is flashed:

  o Switch the SR board OFF (SW2).

  o Turn the programming switch OFF (SW4) on the SR board.

  o Switch the SR board ON (SW2).

<u>**Telit GG863-SR:**</u>

- In order to connect/setup the GG863-SR (see section 2.2)

- Use the SRManagerTool in order to flash the GG863-SR with firmware ZEx1.XS5.11.21-B004.s28 (see section 3.2)

3.8.2.   Mesh Technology

In order to analyze a TinyOnePro Network with stack M_ONE the following sniffer node can be used:

<u>Telit Sniffer on DemoBoard:</u>

- use the SRManagerTool in order to flash a Telit module TinyOnePro with the firmware: TransparentSnifferTinyProBoard.s19 (See section Flashing).
- When the module is flashed:
  o Switch the SR board OFF (SW2).
  o Turn the programming switch OFF (SW4) on the SR board.
  o Switch the SR board ON (SW2).

In order to analyze a NE50 Network with stack Low Power Mesh the following sniffer nodes can be used:

<u>Telit Sniffer on DemoBoard NE50-869.525 3/255 RSSI levels:</u>

- use the SRManagerTool in order to flash a Telit module NE50 with the firmware (See section Flashing):
  o XE50_RSSI3.hex to read RSSI in 4 levels scale:
    RSSI = 0 $\rightarrow$ worst signal
    RSSI = 1 $\rightarrow$ bad signal
    RSSI = 2 $\rightarrow$ good signal
    RSSI = 3 $\rightarrow$ best signal
  o XE50_RSSI255.hex to read RSSI in 256 levels scale:
    RSSI < 73 $\rightarrow$ worst signal
    73 < RSSI < 83 $\rightarrow$ bad signal
    83 < RSSI < 94 $\rightarrow$ good signal
    RSSI > 94 $\rightarrow$ best signal
- When the module is flashed:
  o Switch the SR board OFF (SW2).
  o Turn the programming switch OFF (SW4) on the SR board.
  o Switch the SR board ON (SW2).

Telit Sniffer on DemoBoard NE50-868-GC.M0S 3 Band:

- use the SRManagerTool in order to flash a Telit module NE50-433 with the firmware GC.M0S.01.01-B005.hex (3 Band)(See section Flashing)
- When the module is flashed:
  o Switch the SR board OFF (SW2)
  o Turn the programming switch OFF (SW4)
  o Switch the SR board ON (SW2)

Telit Sniffer on DemoBoard NE50-868-GC.M0S 13 Band:

- use the SRManagerTool in order to flash a Telit module NE50-868 with the firmware GC.M0S.01.01-B007.hex (13 Band)(See section Flashing)
- When the module is flashed:
  o Switch the SR board OFF (SW2)
  o Turn the programming switch OFF (SW4)
  o Switch the SR board ON (SW2)

Telit Sniffer on DemoBoard NE50-433-GD.M0S 8 Band:

- use the SRManagerTool in order to flash a Telit module NE50-433 with the firmware GD.M0S.01.01-B005.hex (8 Band)(See section Flashing)
- When the module is flashed:
  o Switch the SR board OFF (SW2)
  o Turn the programming switch OFF (SW4)
  o Switch the SR board ON (SW2)

Telit Sniffer on NE50-868 USB dongle NE50-868-GC.M0S 13 Band:

- Plug in the USB port of the PC the Telit NE50-868 USB dongle

- If needed install drivers present in the link:
  http://www.ftdichip.com/Drivers/VCP.htm

  o If needed use the SRToolManager in order to flash the dongle with the firmware GC.M0S.01.01-B007.hex (See Appendix 3)

3.8.3.   WM-Bus Technology

In order to analyze a TinyOneLite 868 MHz WM-Bus Network with Stack WM-Bus Protocol EN13757-4:2005 the following sniffer node can be used:

<u>**Telit Sniffer on DemoBoard:**</u>

- use the SRManagerTool in order to flash a Telit module TinyOneLite with the firmware: SnifferMBus_Board.s19 (See section Flashing).
- When the module is flashed:
    - o   Switch the SR board OFF (SW2).
    - o   Turn the programming switch OFF (SW4) on the SR board.
    - o   Switch the SR board ON (SW2).

In order to analyze a ME50-868 MHz WM-Bus Network with Stack MBus Protocol EN13757-4:2013, MBus Protocol EN13757-4 + EN13757-5 Mode R2 or MBus Protocol EN13757-5 Mode Q the following sniffer nodes can be used:

<u>**Telit Sniffer on DemoBoard:**</u>

- use the SRManagerTool in order to flash a Telit module ME50-868 with the firmware: GC.U0S.01.00-B004.hex (See section Flashing).
- When the module is flashed:
    - o   Switch the SR board OFF (SW2).
    - o   Turn the programming switch OFF (SW4) on the SR board.
    - o   Switch the SR board ON (SW2).

<u>**Telit ME50-868 USB dongle:**</u>

- Plug in the USB port of the PC the Telit ME50-868 USB dongle
- If needed install drivers present in the link:http://www.ftdichip.com/Drivers/VCP.htm

- If needed use the SRToolManager in order to flash the dongle with the firmware GC.U0S.01.00-B004.hex (See Appendix 2)

In order to analyze a ME50-169 MHz WM-Bus Network with Stack MBus Protocol EN13757-4:2013 firmware GI.U03.01.01-B001 the following sniffer node can be used:

Telit Sniffer on DemoBoard:

- use the SRManagerTool in order to flash a Telit module ME50-169 with the firmware: GI.U0S.01.00-B006.hex (See section Flashing).

- When the module is flashed:

    o Switch the SR board OFF (SW2).

    o Turn the programming switch OFF (SW4) on the SR board. Switch the SR board ON (SW2).

In order to analyze a ME50-169 MHz WM-Bus Network with Stack MBus Protocol EN13757-4:2013 firmware GI.U03.01.02-B001 or later the following sniffer node can be used:

Telit Sniffer on DemoBoard:

- use the SRManagerTool in order to flash a Telit module ME50-169 with the firmware: GI.U0S.01.00-B006.hex (See section Flashing).

- When the module is flashed:

    o Switch the SR board OFF (SW2).

    o Turn the programming switch OFF (SW4) on the SR board. Switch the SR board ON (SW2).

In order to analyze a ME70-169 MHz WM-Bus Network with Stack MBus Protocol EN13757-4:2013 the following sniffer node can be used:

Telit Sniffer on DemoBoard:

- use the SRManagerTool in order to flash a Telit module ME70-169 with the firmware: GL.U0S.01.01-B001 (See section Flashing).

- When the module is flashed:

    o Switch the SR board OFF (SW2).

    o Turn the programming switch OFF (SW4) on the SR board. Switch the SR board ON (SW2).

3.9.   Wireshark

Clicking **Wireshark** appears the User Interface of Wireshark:

3.9.1.   ZigBee Technology:

This is an example of ZigBee traffic during a monitoring session:

> **More information about the dissector can be found at the link:**
> http://wiki.wireshark.org/IEEE_802.15.4

⚠️	*To start another capturing packets session, Stop and Close Wireshark then click Wireshark to start another session from Analyzer window.*
⚠️	*SR Tools Analyzer does not detect a long size data frame (len >= 80 Bytes) when Network Security is enabled and Freescale Sniffer is used.*

- During the monitoring session the user can monitor alarms about topology changes clicking the button **Monitor**:

Alarm legend:

▮ : no warnings about possible network topology changes

▮ : warnings about possible network topology changes

The button **Log** shows messages involded in latest network topology changes.

The messages can be retrieved and inspected in the captured packets .PCAP file.

The alarm can be Cleared → **Clear Alarm**.

All Warnings about possible topology changes will be saved in .RTF file

- After the monitoring session the user can stop capturing process stopping Wireshark, sniffed packets will be saved in the .PCAP file.
- The button **Packets Analysis** starts the analysis of the captured packets in the previous monitoring session, the following window will appear:

- Select the analysis at **MAC** or **Network** level
- Click on **Load** .pcap file in order to load the file of the captured packets in a previous monitoring session
- Click on **Load Topology** in order to load the topology of the monitored network
- Click on **Select and Start** in order to select and start the process **tshark.exe** located in the folder where is installed Wireshark
- Wait same seconds

Example of analysis at MAC layer:

The table shows for each HOP the number of packets exchanged, mean and standard deviation of RSSI and LQI values (sniffed by sniffer node)

Example of analysis at Network layer:

List of HOPs where happened retransmission. Retransmission gives alarm of HOPs with trouble that should be investigated.

For each **Source-Dest** is shown the route followed. Clicking on a row on the table the route on the Topology is colored:

    ■ : Source

    ■ : Intermediate

    ■ : Dest

Example of analysis at Network layer that reports an HOP with troubles:

3.9.2.   Mesh Technology

This is an example of Mesh traffic:

| | At the moment for Mesh technology we are using Wireshark with no dissector, for this reason all raw RF packets in the network are displayed. |

3.9.2.1.   Rx Power Tool

The button **Rx Power Tool** starts a tool that shows the received signal quality, in order to decide if the geographic position is suitable or if a specific module can be used as parent.

- The tool can be used with any of the **Source** allowed
- Select **Serial Port**, **Source**, **Radio Band** and **Rx Power** (if needed)
- Click **Rx Power Tool**
  o Using a Source that returns an RSSI level in a range of 3 values (TinyOnePro, NE50-869.525 3 RSSI levels, NE50-868-GC.M0S 3 Band, NE50-868-GC.M0S 13 Band, NE50-433-GD.M0S 8 Band) appears:

o   Using a Source that returns an RSSI level in a range of 256 values (NE50-869.525 255 RSSI levels) appears:

o   Using a Source that returns the absolute value of received power in dBm (Rx Power = Abs value dBm) appears:

o   Select the **Frame Type** to analyse: **Beacon** or **All frames**

o   Click button **Start** in order to start the frames analysis

o   Click **Stop** at the end of the analysis session

• It will be possible to apply a specific filter in order to select the best parent in a specific geographic position. The possible association criteria are:

   o   RSSI level

   o   Parent Capacity

   o   Network depth

These association criteria can be selected checking the boxes in the **Filter** panel.

Network depth can be specified by **Deep** panel selecting Deep association or High association.

- Clicking **Apply Filter** button, the best parent is returned in **Result**.

The following example shows Beacons and only one possible parent:

The following example shows All frames and their received signal quality:

After clicking **Stop** button, can be calculated the signal quality for each module with a double click on a specific row as shown in the following image.

In order to start a new session click **Clear List** button, then click **Start** button.

During capturing packets process the user can stop capturing process, captured packets will be saved in the .PCAP file. To start another capturing packets process, Close Wireshark analyzer and click Wireshark from SRManagerTool.

3.9.3.   WM-Bus Technology:

In order to allow Wireshark to inspect WM-Bus packets the following steps must be followed:

From the main Wireshark menu:

- Edit → Preferences → Protocols → DLT_USER

- Encapsulation Table → Edit New

- New

  Type:

- OK

- New

  Type:

- OK

This is an example of WM-Bus traffic with Protocol EN13757-4 or EN13757-5 Mode R2:

Capturing from \\.\pipe\wireshark · Wireshark

File Edit View Go Capture Analyze Statistics Telephony Tools Help

Filter: ▼ Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Info
1	2011-06-06 11:14:32.006000			wireless M-Bus	Send user data, no reply
2	2011-06-06 11:14:59.771000			wireless M-Bus	Send user data, no reply

⊟ Frame 1: 23 bytes on wire (184 bits), 23 bytes captured (184 bits)
    Arrival Time: Jun 6, 2011 11:14:32.006000000 W. Europe Daylight Time
    Epoch Time: 1307351672.006000000 seconds
    [Time delta from previous captured frame: 0.000000000 seconds]
    [Time delta from previous displayed frame: 0.000000000 seconds]
    [Time since reference or first frame: 0.000000000 seconds]
    Frame Number: 1
    Frame Length: 23 bytes (184 bits)
    Capture Length: 23 bytes (184 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
    [Protocols in frame: user_dlt:wmbus:data]
  DLT: 148
⊟ Wireless M-Bus
    L-field: 17
  ⊞ C-field: 0x44
    M-field: ae0c
    A-field: 785634120107
    CRC-field: 0xc24f [correct]
    CRC-field: 0x7b5a [correct]
    CI-field: EN 13757-3 without header (0x78)
⊟ [wireless M-Bus blocks (7 bytes): #1(7)]
    [Frame: 1, payload: 0-6 (7 bytes)]
    [Reassembled length: 7]
⊟ Data (7 bytes)
    Data: 4d45544552310d
    [Length: 7]
  RSSI: -17

```
0000  11 44 ae 0c 78 56 34 12   01 07 c2 4f 78 4d 45 54   .D..xV4. ...OxMET
0010  45 52 31 0d 7b 5a ef                                ER1.{Z.
```

Frame (23 bytes) (null) (7 bytes)

Ready to load or capture   Packets: 2 Displayed: 2 Marked: 0   Profile: Default

This is an example of WM-Bus traffic with Protocol EN13757-5 Mode Q:

This is an example of WM-Bus traffic with Protocol EN13757-4:2013:

⚠️ During capturing packets process the user can stop capturing process in order to start another capturing packets process: Close Wireshark analyzer and click Wireshark from SRManagerTool.

3.9.3.1.   Protocol EN13757-4:2013 Network Monitor

After starting Wireshark and during its activity, the Tool **Network Monitor** allows to load the Topology of networks based on Protocol EN13757-4:2013 and to monitor the activity of the Meter nodes:

	During network monitoring is strongly recommended to put the Sniffer node as close as possible to the Other node.

- Click **Network Monitor**

- Click Sliding **(>)** button in order to expand the window
- Add manually Manufacturer Id, Address and Transmission Interval of the nodes in the network: For example:
  - **Other**: M_B0 = 1; M_B1 = 2; A_B0 = 3; A_B1 = 4; A_B2 = 5; A_B3 = 6; A_B4 = 7; A_B5 = 0;
  - **Meter 1**: M_B0 = 1; M_B1 = 2; A_B0 = 3; A_B1 = 4; A_B2 = 5; A_B3 = 6; A_B4 = 7; A B5 = 1; Transmission Interval = 10 sec;
  - **Meter 2**: M_B0 = 1; M_B1 = 2; A_B0 = 3; A_B1 = 4; A_B2 = 5; A_B3 = 6; A_B4 = 7; A_B5 = 2; Transmission Interval = 15 sec;
  - **Meter 3**: M_B0 = 1; M_B1 = 2; A_B0 = 3; A_B1 = 4; A_B2 = 5; A_B3 = 6; A_B4 = 7; A_B5 = 3; Transmission Interval = 20 sec;
  - **Meter 4**: M_B0 = 1; M_B1 = 2; A_B0 = 3; A_B1 = 4; A_B2 = 5; A_B3 = 6; A_B4 = 7; A_B5 = 4; Transmission Interval = 25 sec;

	Transmision Interval is the time interval within which it is expected the Meter nodes send packets to Other node.

- Click **Create Topology**: before starting the monitoring, all Meters are colored in red because packets have not yet been detected.
- The Topology can be Saved

- **Right click on the nodes in order to list information available**

- Click **Start Monitoring:** nodes that send packets during the time (**Trasmission Interval (s)**) expected are colored in green, otherwise in red. In this way the user can see which nodes are regularly transmitting or not.

- The monitoring can be Stopped/Started

4.   Appendix 1 – How to flash the Telit M ZE51 USB dongle

The Telit M ZE51 USB dongle can be flashed through an automatic or manual procedure:

1. Plug in the USB port the Telit M ZE51 USB dongle

2. If needed install drivers present in the link:
   http://www.ftdichip.com/Drivers/VCP.htm

   Refer to document [11].

Automatic Procedure:

3. Open the tool **Flashing**

4. Check Switch Prog **Automatic**

5. Select **Local/GG863-SR**

6. Flash the firmware   ZEx1.XS5.11.21-B004.s28, Platform ZE51/ZE61

7. Close the tool **Flashing**

8. Unplug the Telit M ZE51 USB dongle

9. Plug in the USB port of the PC the Telit M ZE51 USB dongle

Manual procedure:

3. By the tool **Management** of the SRManagerTool **Connect** to the Node M ZE51 (see section 3.3.4)

4. Give the following commands:

   0x04 0x12 0x08 0x01 0x00 (to put the node in configuration mode)
    the response is: 0x03 0x13 0x00 0x08

   0x01 0xFF (to jump in the bootloader)

5. Close the tool **Management**

6. Open the tool **Flashing**

7. Uncheck Switch Prog **Automatic**

8. Select **Local/GG863-SR**

9. Flash the firmware   ZEx1.XS5.11.21-B004.s28, Platform ZE51/ZE61

10. Close the tool **Flashing**

11. Unplug the Telit M ZE51 USB dongle

12. Plug in the USB port of the PC the Telit M ZE51 USB dongle

5.   Appendix 2 – How to flash the Telit ME50-868 USB dongle

TheTelit ME50-868 USB dongle can be flashed through an automatic or manual procedure:

1. Plug in the USB port of the PC the Telit ME50-868 USB dongle
2. If needed install drivers present in the link: http://www.ftdichip.com/Drivers/VCP.htm

Automatic Procedure:
3. Open the tool **Flashing**
4. Check Switch Prog **Automatic**
5. Select **Local/GG863-SR**
6. Flash the firmware GC.U0S.01.00-B004.hex

7. Close the tool **Flashing**

8. Unplug the Telit ME50-868 USB dongle

9. Plug in the USB port of the PC the Telit ME50-868 USB dongle

Manual procedure:

3. By the tool **Management** of the SRManagerTool **Connect** with right baud rate to the Node ME50-868 USB dongle (see section 3.3.2)

4. Give the following commands in ASCII Type:

   ATBL (switch to bootloade
   the response can be: OK or ERROR

5. If the response is OK close the tool **Management** else repeat from point 1

6. Open the tool **Flashing**

7. Uncheck Switch Prog **Automatic**

8. Select **Local/GG863-SR**

9. Flash the firmware GC.U0S.01.00-B004.hex

10. Close the tool **Flashing**

11. Unplug the Telit ME50-868 USB dongle

12. Plug in the USB port of the PC the Telit ME50-868 USB dongle

6.   Appendix 3 – How to flash the Telit NE50-868/433 USB dongle

Follow this steps in order to flash the Telit NE50-868/433 USB dongle:

1. Plug in the USB port of the PC the Telit NE50-868/433 USB dongle

2. If needed install drivers present in the link:
    http://www.ftdichip.com/Drivers/VCP.htm

Automatic Procedure:

3. Open the tool **Flashing**

4. Check Switch Prog **Automatic**

5. Select **Local/GG863-SR**

6. flash the firmware GC.M0S.01.01-B007.hex (868)/GD.M0S.01.01-B005.hex (433).

7. Close the tool **Flashing**

8. Unplug the Telit ME50-868 USB dongle

9. Plug in the USB port of the PC the Telit ME50-868/433 USB dongle

Manual procedure:

3. By the tool **Management** of the SRManagerTool **Connect** to the Node NE50-868/433 USB dongle (see section 3.3.1)

4. Give the following commands in Hexadecimal Command Type:

    o 2b 2b 2b (ConfigMode) ➔ response OK or ERROR

        \If the response is OK give the command:
        41 54 42 4C 0D (ATBL ➔ switch to bootloader) ➔ response OK or ERROR
        If the response is OK close the tool **Management** else repeat from point 1

5. Open the tool **Flashing**

6. Uncheck Switch Prog **Automatic**

7. Select **Local/GG863-SR**

8. Flash the firmware GC.M0S.01.01-B007.hex (868)/GD.M0S.01.01-B005.hex (433).

9. Close the tool **Flashing**

10. Unplug the Telit NE50-868/433 USB dongle

11. Plug in the USB port of the PC the Telit NE50-868/433 USB dongle

7.   Appendix 4 – Technology/Platform Firmware

Mesh:
• **platform NE50-868, Stack Low Power Mesh**
• **platform NE50-433, Stack Low Power Mesh**
• **platform NE70-868, Stack Low Power Mesh**
• **Platform TinyOne Pro, Stack M_ONE**

ZigBee:
• **platform ZE50/ZE60, Stack ZB2007**
• **platform ZE51/ZE61- IA/WA, Stack ZBPRO**

MBUS:
• **platform TinyOneLite, Protocol EN13757-4:2005**
• **platform ME50-868, Protocol:EN13757-4:2005 + EN13757-5 Mode R2**
• **platform ME50-868, Protocol:EN13757-4:2013**
• **platform ME50-169, Protocol:EN13757-4:2013**
• **platform ME70-169, Protocol:EN13757-4:2013**
• **platform ME50-868, Protocol EN13757-5 Mode Q**

SOne:
• **platform LE50-868, Stack StarNetwork**
• **platform LE50-433, Stack StarNetwork**
• **platform LE70-868, Stack StarNetwork**
• **platform LE70-915, Stack Frequency Hopping StarNetwork**
• **platform LE51-868, Stack SigFox plus S-One**
• **platform LT70-868, Stack StarNetwork**

8. Appendix 5 – Troubleshooting

8.1. COM Port Error

Sometimes can happen that the serial COM port results busy even if no applications are using it. In this case the SRManagerTool is not able to open the port.

To solve this issue follow this steps:

1. Open Device Manager
2. Select the COM Port with trouble
3. Disable it
4. Enable it

8.2. Error Messages

8.2.1. Offset and length were out of bounds…

Rarely when trying to connect to SR module can happen the error message: "Offset and length were out of bounds

for the array or count is greather than the number of elements from index to the end of the source collection", in this case wait some seconds and try to connect again to the module.

8.2.2. CHECKSUM_ERR

Rarely when trying to flash a SR module can happen the error message: "CHECKSUM_ERR", in this case:

- Power the SR board OFF (SW2) (see section 2.3)
- Turn the programming switch ON (SW4) on the SR board (see section 2.3)
- Power the SR board ON (SW2) (see section 2.3)
- Click the Flashing button

8.2.3. The module does not respond

Rarely when trying to use the management and configuration wizard tool can happen the error message: "The module does not respond", in this case: close

the configuration wizard, disconnect from the module, wait some seconds and try to connect again to the module.

8.2.4.   The operation has timed out

The SRManagerTool gives the error "The operation has timed out" when the module does not respond in the expected time.

This behaviour can happen for several reason:

* The module is switched to bootloader and can not respond to commands
* The module does not respond

8.2.5.   Some Windows are not displayed properly

If some windows are not displayed properly try changing the Screen resolution.

9.   Acronyms and Abbreviations

SR: Short Range

WM-Bus: Wireless M-Bus