TinyOne Demokit User Guide

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CHAPTER I.   INTRODUCTION

Ⅰ.1. Aim of the Document

The aim of this document is to present the functional aspects of the Demokit dedicated to the following TinyOne modules:

- TinyOne Lite 433MHz
- TinyOne Lite 868MHz
- TinyOne Plus 868MHz
- TinyOne Plus 915MHz
- TinyOne Pro 868MHz
- TinyOne Pro 915MHz
- TinyOne 2400 MC

After a short description of the Demokit and its installation principles, its functioning will be detailed in more advanced operation modes.

Ⅰ.2. Description

The Demokit supplies the following items:

- 2 DemoBoard units (a DemoBoard = an interface board + a module on its DIP support + an antenna)
- 2 serial cables
- 2 power supply blocks (12V, 300 mA)
- 2 primary batteries (+9V)[1]
- 1 information notice

The Demokit will allow any user to test the modules that work on the 433/868/915/2400 MHz frequency band.

Ⅰ.3. Document change log

Revision	Date	Changes
ISSUE # 0	17/04/09	First Release
ISSUE # 1	17/03/10	Remove CD (all necessary material can be downloaded from Telit official web site)

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[1] Not available with TinyOne PRO demokit

I.4. Glossary

ACP	Adjacent Channel Power
BER	Bit Error Rate
Bits/s	Bits per second (1000 bits/s = 1Kbps)
CER	Character Error Rate
dBm	Power level in decibel milliwatt (10 log (P/1mW))
EMC	Electro Magnetic Compatibility
EPROM	Electrical Programmable Read Only Memory
ETR	ETSI Technical Report
ETSI	European Telecommunication Standard Institute
FM	Frequency Modulation
FSK	Audio Frequency Shift Keying
GFSK	Gaussian Frequency Shift Keying
GMSK	Gaussian Minimum Shift Keying
IF	Intermediary Frequency
ISM	Industrial, Scientific and Medical
kbps	kilobits/s
LBT	Listen Before Talk
LNA	Low Noise Amplifier
MHz	Mega Hertz (1 MHz = 1000 kHz)
PLL	Phase Lock Loop
PROM	Programmable Read Only Memory
NRZ	Non return to Zero
RF	Radio Frequency
RoHS	Restriction of Hazardous Substances
RSSI	Receive Strength Signal Indicator
Rx	Reception
SRD	Short Range Device
Tx	Transmission
SMD	Surface Mounted Device
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Controlled and Temperature Compensated Crystal Oscillator

CHAPTER II.   INSTALLATION

II.1. DemoBoard Connections

1. Connect the DemoBoard to the PC via the RS-232 connector with the provided serial cable.

2. Connect the power supply to the DemoBoard with the provided power supply.

<table>
<tr><td><i><u>CAUTION</u></i>
Two kinds of power supply are available on the DemoBoard: through the +12V block or through a +9V battery. When it is connected, the power supply has priority on the battery. The battery takes over when the power supply is disconnected
Do not use +9V battery in case of TinyPro DemoBoard because it doesn't deliver enough current.</td></tr>
</table>

3. Check that stand-by (STBY, SW1), reset (RESET, SW3) and programming (PROG, SW4) switches are turned OFF.

4. Switch the DemoBoard ON (SW2).

5. Check that the red LED lights ON when power supplying the DemoBoard.

Feature	Designation
Stand-by switch	SW1
Programming switch	SW4
Reset switch	SW3
ON/OFF switch	SW2
Red LED	LD3

Note : Refer to Appendix for switches, connectors and LEDs placement on the interface board

II.2. TinyTools Installation

The **Tiny Tools** software allows programming of TinyOne DemoBoard through the PC.

1. TinyTools file is available on the Telit official web site www.telit.com in the download zone.

2. Install the Tiny Tools software by clicking on the "TinyTools.exe" The software is automatically installed in "C:\Program Files\TinyTools\" (this directory can be changed).

CHAPTER III.   ADVANCED OPERATIONS

The following paragraph described the main aspects of the Demokit advanced operation, i.e. all operating modes, programming, evaluation, etc. More detailed information about the modules advanced operation is available its user guide (i.e. Hayes commands, registers, detailed operation, etc).

III.1. Communications Modes

The DemoBoards can operate under four different modes[2] :

  – Configuration mode : this is the mode for parametering (AT commands).

  – Transparent mode : this is the default communication protocol of the module. The module transmits the data transparently, without encapsulation or addressing. It acts as a half duplex wired serial link (type RS485).

  – Addressed Secured mode : it is a kind of multipoint network protocol. Each module can communicate with every module in the same network. All the frames are addressed, checked through a CRC and acknowledged.

  – Auto-repeat mode : this is a specific communication protocol in which the module sends back the frames it has received (radio or serial) without echoing. It allows the user to easily test the module remotely.

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[2] All DemoBoards are provided by default with standard firmware of S-one protocol stack. Telemetry firmware can be uploaded on demand

III.2. Stand-by Mode

In order to make stand-by consumption measurement on the Demo Board (e.g. for integration application), the radio module can be put in stand-by mode.

To configure the stand-by mode, only one register needs to be modified, S240 :

⇨   If S240 is set to '1' (ATS240=1<CR>), the unit is ready to be in stand-by mode.

⇨   If S240 is set to '0' (ATS240=0<CR>), the unit can not be configured in stand-by mode.

To perform the stand-by mode, the unit must be configured in stand-by mode by setting its register S240 to '1'. Then :

1. Switch the Demo Board ON.

2. Turn the stand-by switch ON.

3. Turn back the stand-by switch OFF to exit the stand-by mode.

To perform power consumption measurement, you can connect an ammeter in place of the strap on J5 connector.

Note : Refer to Appendix I for switches, connectors and LEDs placement

III.3. Programming Mode

o **_Connections_**

1. Connect the Demo Board to the PC via the RS-232 connector with the provided serial cable.

2. Connect the power supply to the DemoBoard with the provided power supply.

3. Turn the programming switch ON (SW4).

4. Switch the Demo Board ON (SW2).

o **_Software_**

1. Launch the Tiny Tools software.

2. Once the desktop is displayed, select :

   ▪ The serial port to which the Demoboard is connected
   ▪ The serial speed '19200'
   ▪ The parity 'None'

3. Click on 'Go to Tiny Tools'

4. Click on 'Serial' and choose the file to program through the 'Browse' functionality

5. Click on 'Programming'

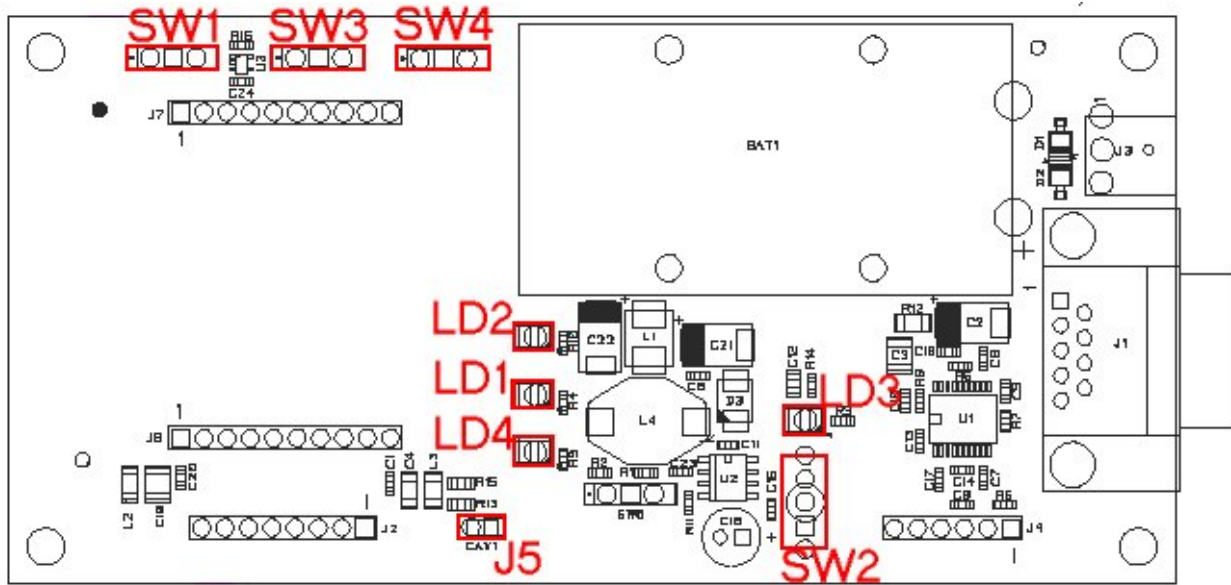6. Once the DemoBoard is programmed, close the Tiny Tools.

o **_Connections (bis)_**

1. Switch the DemoBoard OFF (SW2).

2. Turn back the programming switch OFF (SW4).

CHAPTER IV.   APPENDIX

IV.1. DemoBoard Description

IV.2. TinyOne DIP Pin Out