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1 Overview

This document provides instructions for performing OTAP (Over The Air Provisioning) of the Telecom Design TD1202 module.

1.1 Scope

The TD1202 module contains a bootloader functionality integrated into its firmware, that enables software upgrades ("provisioning") over either the UART RXD/TXD signals or using the integrated radio transceiver.

Using a host PC software provided by Telecom Design, it is possible to perform a local update of a single unit by attaching it to the computer using an UART cable directly.

It is also possible to perform a remote update of multiple units using a TD1202 module containing a dedicated firmware that acts as a master radio transmitter for updating several slave devices over radio.

1.2 Organization

As it is useful in both cases, the procedure for local updates will be described first, followed by the procedure for remote updates.

1.3 Relevant Documents

Additional information on the TD1202 module and on its dedicated evaluation board can be found in:

- *TD1202 Datasheet*
- *TD1202 EVB User's Guide*
- *TD1202 Reference Manual*

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2 TD1202 Module Connection

The TD1202 module contains in the firmware a bootloader that is automatically activated at boot time. If either a serial UART or radio acquisition request is recognized during a short duration of 200 ms, the module then enters into update mode instead of proceeding with the normal firmware operation.

In order to indicate its update status, the bootloader requires a LED attached to the TD1202 module “TIM2” terminal. Such a LED is integrated onto the TD1202 EVB board, and it is highly recommended that it is also integrated onto any custom board, as its purpose is to provide the user with a feedback about the update operation. Beside this role during updates, this LED can be used for other purposes by the firmware.

The LED has the following behavior:

- The LED is normally OFF
- The LED flashes briefly once at boot time during 200 ms to indicate that the bootloader is launched
- The LED is turned ON if an acquisition request is received, and during the whole update process until finished for firmwares < SOFT1278
- The LED is turned ON if an acquisition request is received, and flashes OFF briefly during the update process until finished for firmwares >= SOFT1278
- The LED is turned OFF at the end of a successful update process

For a local update, a serial cable consisting of only the TXD/RXD signal is required.

For a remote update, a 50 Ω antenna is required.

The connection schematic is thus the following:

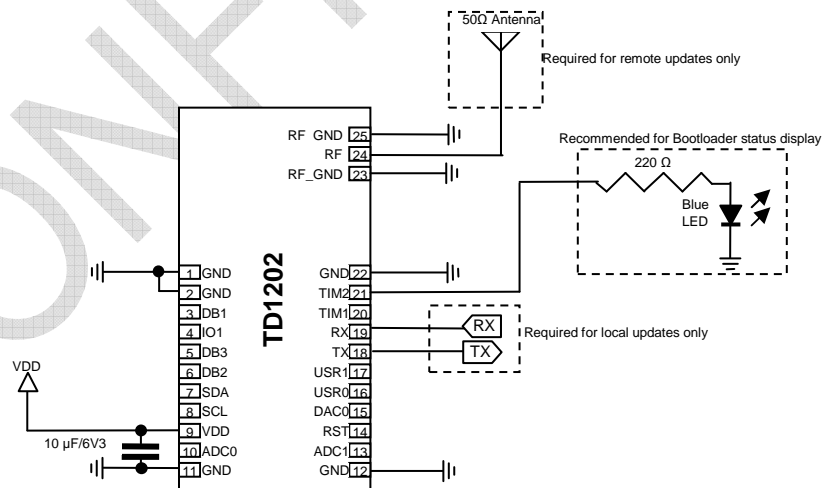


Figure 1- TD1202 connections for OTAP

3 Local Update

The local update procedure allows updating a single TD1202 module attached directly to a PC using a serial cable.

3.1 Prerequisites

The following items are required in order to perform a local update:

- A PC running Windows XP, Vista or 7
- An USB to TTL serial cable, such as the TTL-232R-3V3 delivered as part of the TD1202 EVB
- The “**TDLoader.exe**” Windows executable program, Version 1.02 or higher. This utility can be obtained from <http://developers.insgroup.fr/td1202/download.html>
- The TD1202 module to update
- The firmware for updating the TD1202 module itself

3.2 Procedure Description

In order to perform a local firmware upgrade, please:

- Attach the USB to TTL serial cable to the PC USB Host port
- As the update utility will require the (virtual) port corresponding to the newly attached device, the best way to get it is to use Window’s “**Device Manager**” from the Control Panel:
 - Click on the “**System**” icon and select the “**Hardware**” tab
 - Press the “**Device Manager...**” button
 - Locate and unfold the “**Ports (COM & LPT)**” entry into the device tree list: you should see an “**USB Serial Port (COMx)**” entry corresponding to the newly attached TD1202 module. If unsure, you can safely unplug/replug the USB cable to observe the changes into the “**Device Manager**” window
 - Write down this “**COMx**” information, so you can provide it later to the serial terminal emulation software
 - Close Windows’s “**Device Manager**” window
- Launch the “TD1202Loader.exe” utility. This will open a dialog window similar to this:



Figure 2- TD1202 Loader Dialog

- Provide the COM port number, as obtained from the “**Device Manager**” above
- Paste the firmware file absolute file name or browse to it using the “**Browse...**” button
- Press the “**Acquire**” button to start the local upgrade process, you should see:

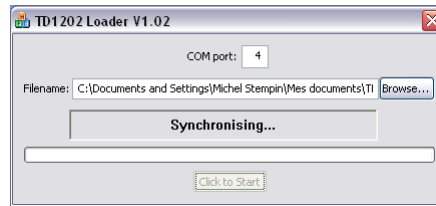


Figure 3- TD1202 Loader Synchronizing

- If not already done, connect the TD1202 module to the FTDI USB cable, the LED will turn on to indicate the beginning of the update process
- If the TD1202 Loader cannot get synchronized with the TD1202 module, or the LED flashes but does not stay on, try to unplug/replug the cable on the module side and retry the procedure
- For firmwares < SOFT1278, during the upgrade process, the LED stays on to indicate the update process is active and you should see the progression bar changing:



Figure 4- TD1202 Loader Local Upgrade

- For firmwares \geq SOFT1278, during the upgrade process, the LED blinks off shortly to indicate the Flash update process is active and you should see the progression bar changing as above
- While the update process is active, **DO NOT REMOVE POWER FROM THE TD1202 MODULE**, as it may lead to a partially updated firmware and the device may not be able to reboot correctly
- At the end of the update process, the LED turns off and you should see:

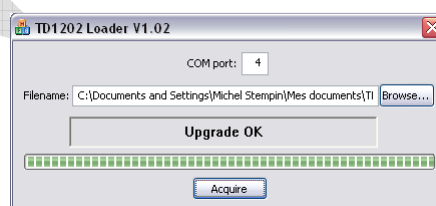


Figure 5- TD1202 Loader Finished

The module should be updated and ready to use. If this is not the case, try repeating the above points, making sure that the correct COM port and firmware file are used, and that the TD1202 module is properly restarted (indicated by the LED turning on).

4 Remote Update

The remote update procedure allows updating multiple TD1202 modules using the TD1202 built-in radio transceiver.

Note: This procedure is reserved for use in a controlled radio environment, such as within a factory, but it is not designed to perform field updates.

4.1 Prerequisites

The following items are required in order to perform a local update:

- A PC running Windows XP, Vista or 7
- An USB to TTL serial cable, such as the TTL-232R-3V3 delivered as part of the TD1202 EVB
- The “**TDLoader.exe**” Windows executable program, Version 1.02 or higher. This utility can be obtained from <http://developers.insgroup.fr/td1202/download.html>
- The TD1202 module to use as a master transceiver
- The “**LoaderTransmitter.hex**” transmission firmware to put into the TD1202 master module. This firmware can be obtained from the same location as above
- The TD1202 modules to update
- The firmware for updating the TD1202 modules themselves

Note that the slave TD1202 modules to update should get a separate power supply, either by an additional USB to TTL serial cable, such as the TTL-232R-3V3 delivered as part of the TD1202 EVB, or any other mean depending on the way the TD1202 module is integrated into the customer device.

4.2 Procedure Description

- First, the TD1202 module used as a master module must be updated using the local update procedure described in section 3 above. The firmware file to be used is the dedicated “**LoaderTransmitter.hex**” firmware
- Press the “**Acquire**” button to start acquiring all remote modules to update by radio, you should see:



Figure 6- TD1202 Loader Acquiring Remote Modules

- Power on all the TD1202 modules to update, their LED will turn on to indicate that the modules are ready to accept update requests
- Once all the modules are ready, press the “**Click to Start**” button, the LEDs stay on to indicate the update process is active and you should see the progression bar changing:

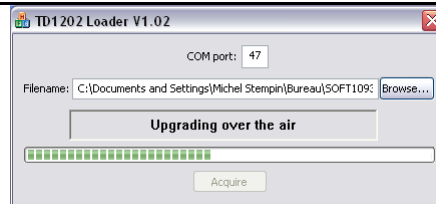


Figure 7- TD1202 Loader Remote Upgrade

- While the update process is active, **DO NOT REMOVE POWER FROM THE TD1202 MODULES**, as it may lead to a partially updated firmware and the devices may not be able to reboot correctly
- At the end of the process, the LED will turn off to indicate the end of the update process and you should see:

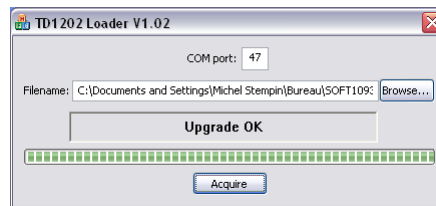


Figure 8- TD1202 Loader Finished

- If some modules do not finish their update successfully, they will keep the LED on. **DO NOT REMOVE POWER FROM THEM**, and restart the “Acquire” and “Click to Start” steps in the utility program until all modules are successfully updated

DOCUMENT CHANGE LIST

Revision 1.0

- First Release

Revision 1.1

- Changed contact information

Revision 1.2

- Added LED blinking behavior during Flash writing for firmwares \geq SOFT1278

Revision 1.3

- Changed the update software name
- Changed contact information

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NOTES:

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