ELATEC

RFID Systems

Transponder Reader

TWN4 Legic NFC

Technical Handbook

DocRev8

Content

1. Introduction

The transponder reader TWN4 is a device for reading and writing RFID transponders. There are different versions of TWN4 devices available, which cover a large range of transponder types both in the frequency range of 125 kHz and 13.56 MHz.

2. Getting Started

2.1 Cable Connection

In order to start operating a TWN4 transponder reader, it simply has to be connected to a host.

2.2 Enumeration

Once the device has been powered up, it is waiting for completion of the enumeration by the USB host. As long as the device is not enumerated, it is entering a minimum power consumption mode, where both LEDs are turned off.

2.3 Initialization

After powering up and enumeration, the device is turning on the built-in transponder reader logic. The green LED is turned on permanently. Some transponder readers need some kind of initialization, which is performed in

this step. After successful initialization, the device sounds a short sequence, which consists of a lower tone followed by a higher tone.

2.4 Normal Operation

As soon as the device has completed the initialization, it is entering normal operation. During normal operation the device is searching for a transponder continuously.

Notice:

For secure use a minimum distance of 2 cm to the reader is recommended.

Detection of a Transponder

If a transponder is detected by the reader, following actions are performed

- Send the ID to the host. By default, the USB device sends by emulating keystrokes of a keyboard.

- Sound a beep

- Turn off the green LED

- Blink the red LED for two seconds

- Turn on the green LED

Within the two seconds timeout, where the red LED is blinking, the transponder, which just has been recognized will not be accepted again. This prevents the reader from sending identical IDs more than one time to the host.

If during the two seconds timeout of the red LED a different transponder is detected, the complete sequence restarts immediately.

Suspend Mode

The transponder reader supports the USB suspend mode. If the USB host is signaling suspend via the USB bus, the transponder reader is turning off most of its power consuming peripherals. During this operation mode, no detection of transponders is possible and all LEDs are turned off.

Once the host is resuming to normal operation mode, this is also signaled via the USB bus. Therefore, the transponder reader will resume to normal operation, too.

3. Firmware and App programming

AppBlaster provides many features to configure the multi-frequency reader TWN4 for your own special application. This is done in an easy and fast way: Easy and fast = Blast
The developer pack contains sample source codes (App), Windows driver for serial communication (CDC Driver), firmware for serial communication and for keyboard communication.
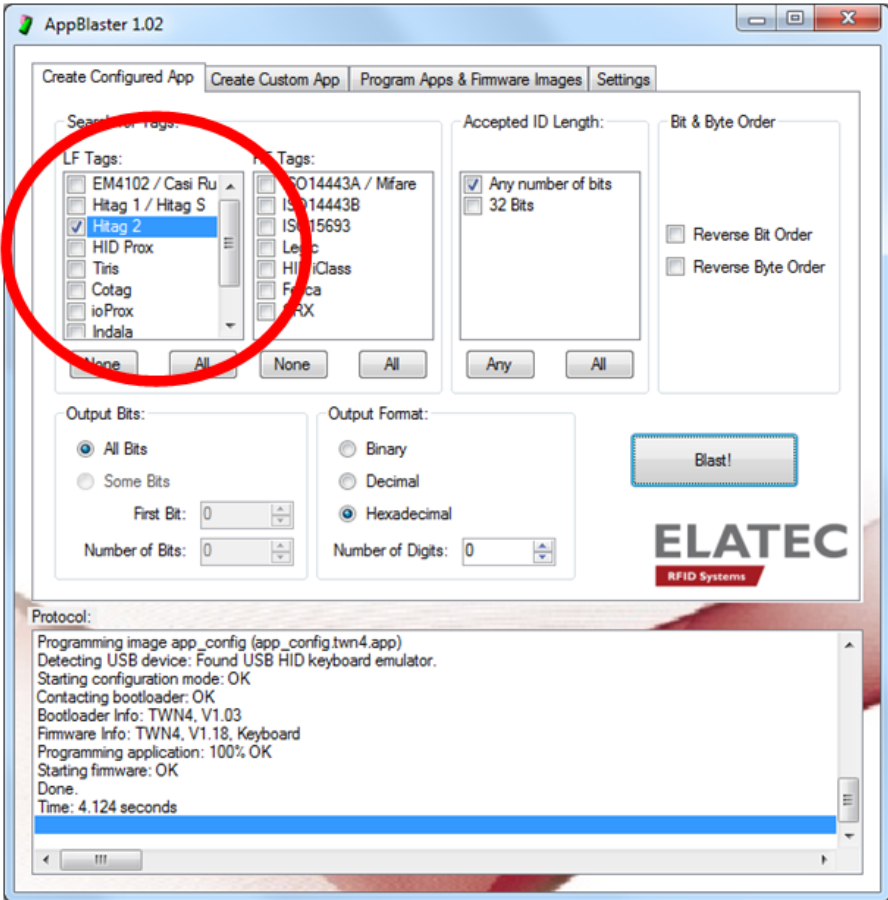
3.1 How to Blast

- Unpack the developer pack into an empty directory on your hard disk
- Connect a TWN4 to the PC
- Start program AppBlaster.exe
- At the beginning you might have to do a firmware update. You achieve this in the tab sheet "Program Apps & Firmware Images". Choose the 'Kx' version for keyboard emulation and 'Cx' version for virtual COM port (CDC).
- Connecting first time to TWN4 requires installation of drivers. This is done automatically as long as you use keyboard emulation. CDC requires installation of drivers, which are part of the developer pack.
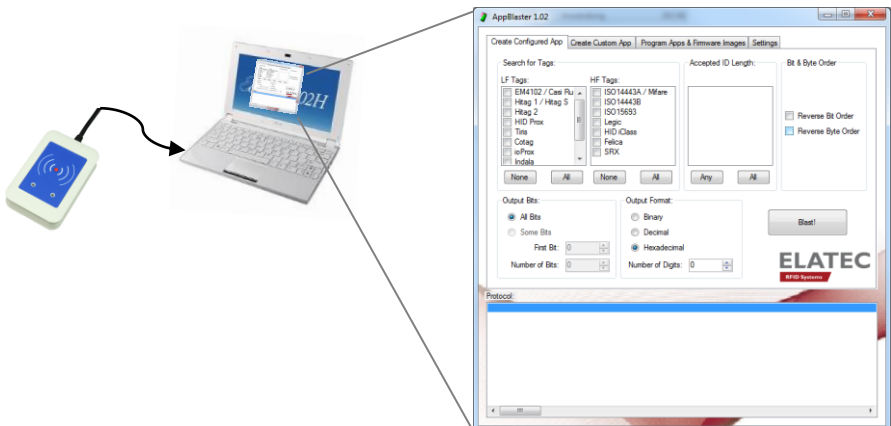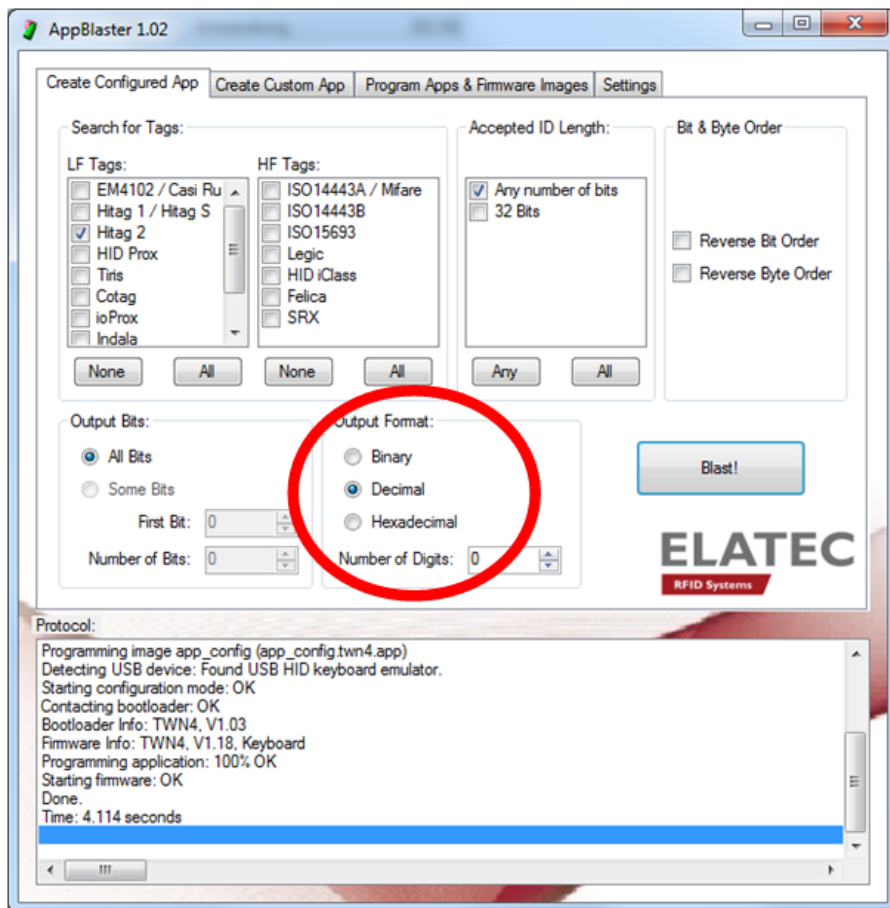
Now you are ready to configure your first application:

   1)   Select transponder type:

2) Change output format (binary, decimal, hexadecimal):
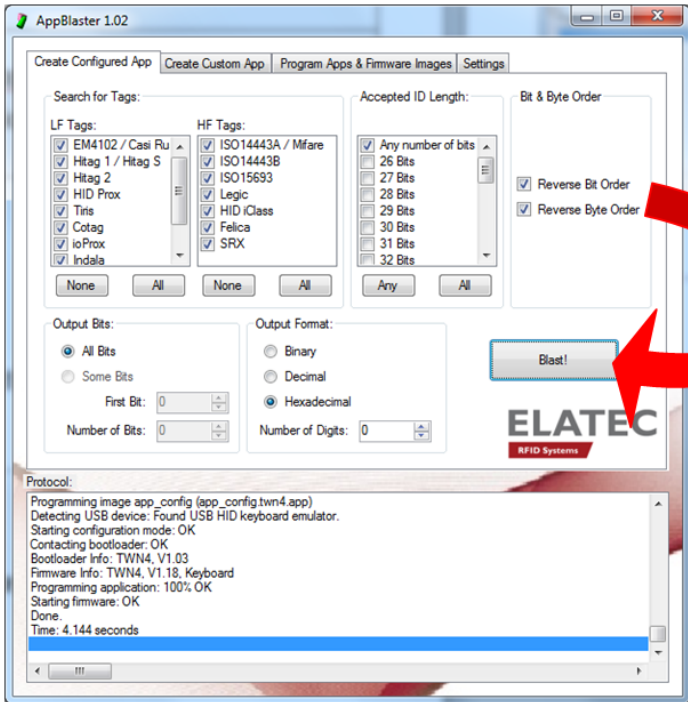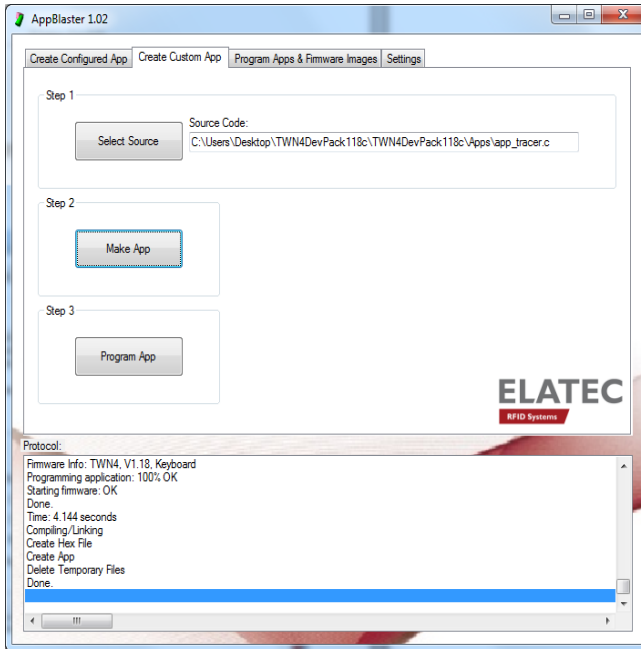
3) Endian conversion

4) Transfer selected configuration to connected TWN4 → Blast!

Only 3 steps to create custom App: Take sample source codes or create your own!

Select Source → choose an App (example: app_tracer.c) → select Make App → select Program App

Difference sample "app_standard" and "app_tracer":
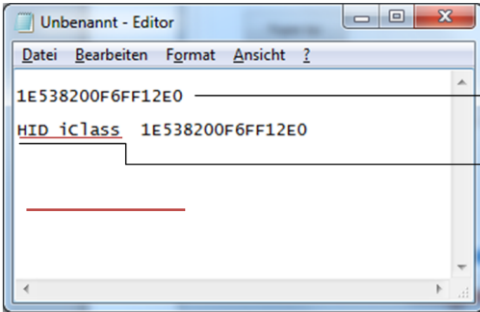
app_standard = UID only

app_tracer = Transponder Type + UID

Sample "app_dump":
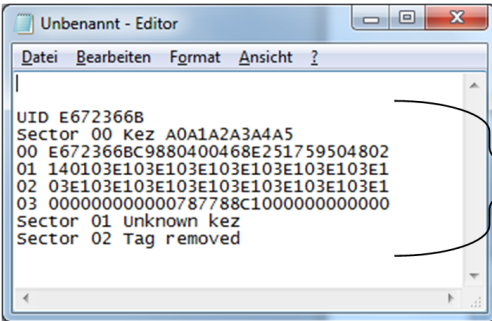
app_dump = all information

Only 2 steps to program apps (.app) and firmware images (.bix).
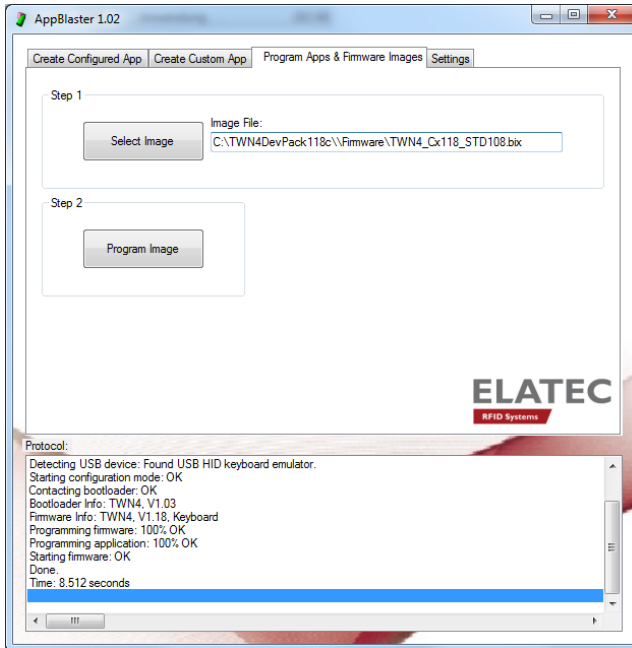
Select Image → choose Firmware → select Program image.

3.2 System Requirements

Operating System: Windows XP, Vista, 7 (32-/64-bit).
Processor (CPU): 2 GHz (Minimum)
Hard Disk: Up to 200 MB of available space may be require.
RAM: 2 GB (Minimum)

4. Service Address

In case of any technical questions, please contact:

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Zeppelinstr. 1
82178 Puchheim
Germany

Phone: +49 (0) 89 5529961 0
Fax: +49 (0) 89 5529961 29
Email: info-rfid@elatec.com

5. Regulatory Information

5.1 CE Declaration of Conformity

This product conforms to the following standards:

RED: EN 300 330 V2.2.1

                        EN 301 489-1 V2.1.1
                        EN 301 489-3 V2.1.1

Safety: EN 60950-1:2006 + A11:2009 + A1:2010
                        +A12:2011 + AC:2011 + A2:2013

RoHS II: EN 50581:2012

5.2 FCC Statement

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Section 15.21 Information to user
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

Section 15.105 (b)
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

5.3 IC (Industry Canada) Statement

"This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. The requirements according to RSS 102 are kept. Device can be used without restriction."

"Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. Les exigences selon RSS 102 sont gardées. L'appareil peut être utilisé sans restriction."

5.4 NCC (National Communication Commission) Statement

第十二條

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無 線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

6. Trademarks

All referenced brands, product names, service names and trademarks mentioned in this document are the property of their respective owners.