PMAfob Home Automation Demo

User Guide V1.1

October 20th, 2010

Never stop thinking

PMAfob Home Automation Demo User Guide

- Overview
  - PMAfob Software
  - PMAfob Hardware
  - Receiver Software
  - Receiver Hardware
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  - Step 1: Installation of the PC-Application
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  - Step 4: Connection of the Receiver Board
  - Step 5: Handling of the PC-Application

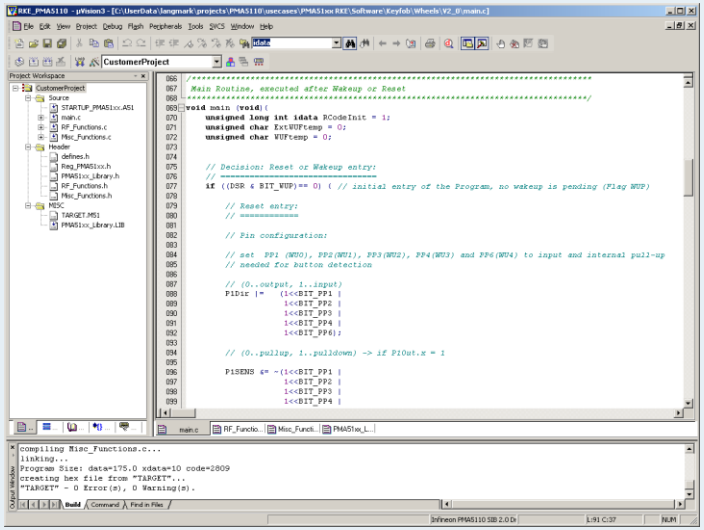
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Overview

TX

PMAfob Software Example



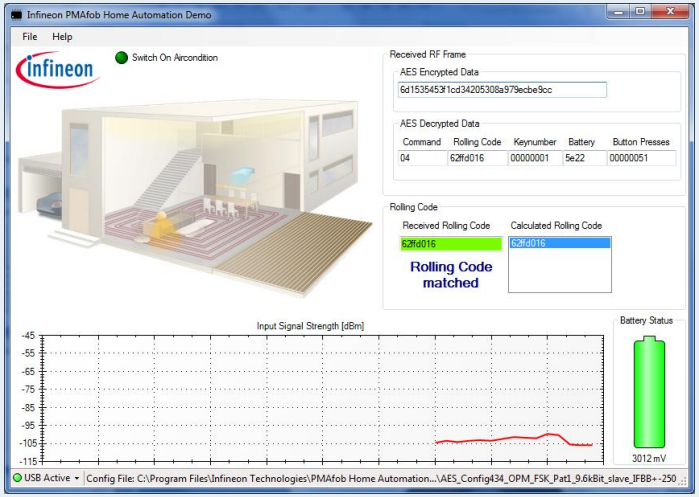


PMAfob (PMA71xx)

RF

RX

Visualization on PC



USB



TDA5230 UWLink Stick

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Overview – PMAfob Software

- Features
  - Five buttons (Handling of five external wake-ups)
  - Button stuck detection
  - Debounce buttons
  - Secure communication
    - Advanced Encryption Standard (AES) or
    - eXtended Tiny Encryption Algorithm (XTEA) encryption
    - Rolling code generation
  - Battery voltage measurement
  - Energy saving by using Power Down Mode
  - Configurable software by long button presses
- Note: An Application Note describing the PMAfob Software can be found here: http://www.infineon.com/pma

PMAfob Software
Reset Setting

- After reset (change of battery) the following configuration is used:
  - **Baudrate:** 9600 bps
  - **RF Framing:** AES
  - **Encryption**: ON
  - **Unique Key Number:** User defined unique id

PMAfob Software Configuration by long button presses

- If buttons are pressed longer then ~ 3 s, the software configuration is changed as shown in the table.
- Note: If the Framing is changed the Receiver has to be reconfigured! The PC Application only accepts encrypted frames!

PMAfob Button	Software Configuration
	Choose AES Framing.
	Choose 4 bytes of PMA unique id.
	Choose XTEA Framing.
	Choose user defined unique id.
	Switch encryption on / off: ON => baudrate: 9600 bps OFF=> baudrate: 4800 bps

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Overview – PMAfob Hardware

- Settings
  - 5 buttons enclosure
  - 434MHz band
  - 9.6kbaud Manchester code
  - FSK modulation
  - 5dBm output power
  - Frequency deviation of approx. 50kHz
  - Duty cycle setting of 34%



Keyfob enclosure



Top view



Bottom view

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Overview – Receiver Software

- Features
  - Configure TDA5230
  - Read out data from TDA5230
  - Decrypt AES or XTEA encrypted RF-Frame
  - Calculate rolling code for every PMAfob
  - Illustrate the received command
  - Illustrate signal strength (measured by TDA5230)
- NOTE:
  - The UWLink is flashed by Infineon with the appropriate firmware.
  - The firmware installer "PMAfob_DEMO_UWLink_Firmware_Vx.y.msi" is included in "PMAfob_HOME_DEMO_SW_Vx.y.zip" available at http://www.infineon.com/pma

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Overview – Receiver Hardware

- Features
  - SmartLEWIS RX – TDA5230 UWLink Stick used as Receiver Board
  - USB communication done with FTDI chip
  - Matching Network for 434MHz

- Note
  - More information about the UWLink can be found on http://www.infineon.com/uwlink
  - More information about TDA523x can be found on http://www.infineon.com/tda5230

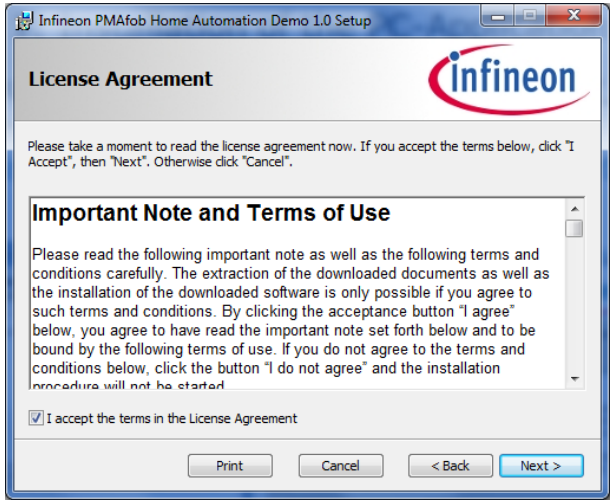
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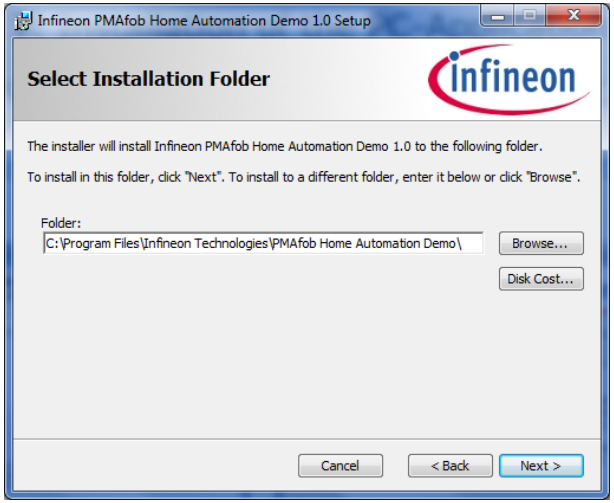
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Setup of the PMAfob Home Automation Demo

- Step 1: Installation of the PC-Application
  - Double click *PMAfob_HOME_DEMO_Rx_Vx.y.msi* and follow the onscreen installation instructions.
    This will run the PMAfob Home Automation Demo setup.



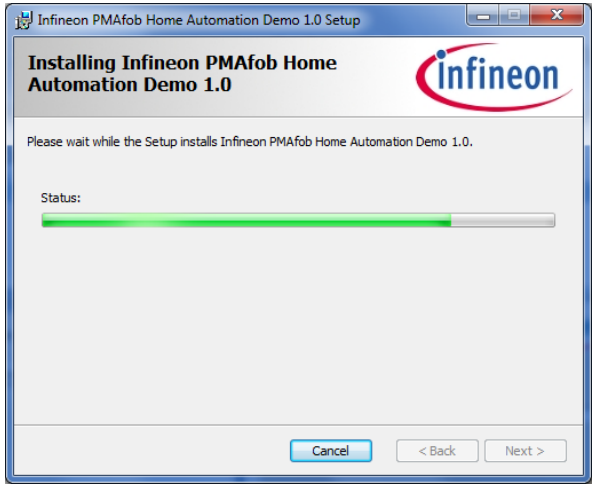


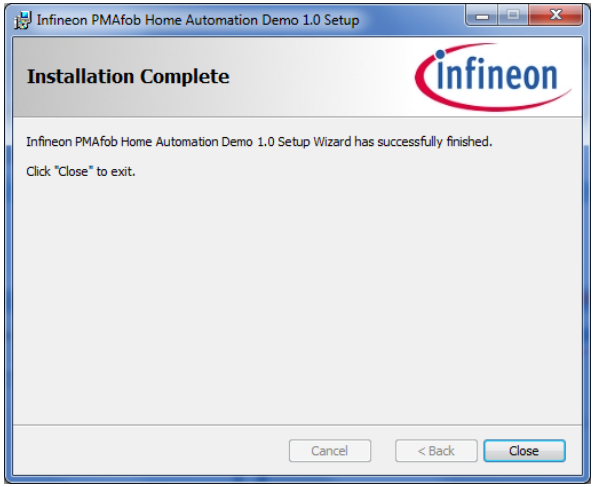


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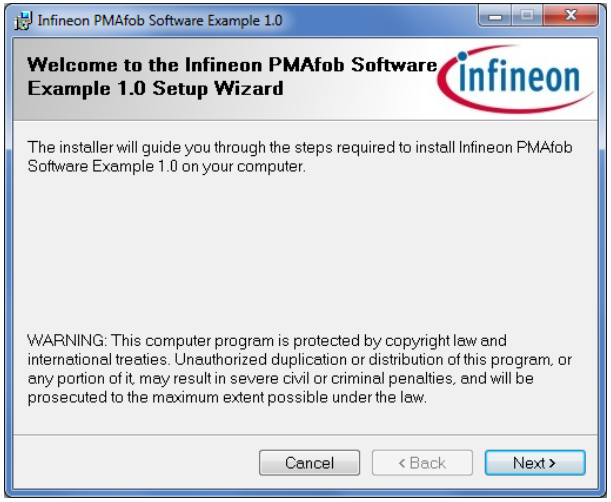


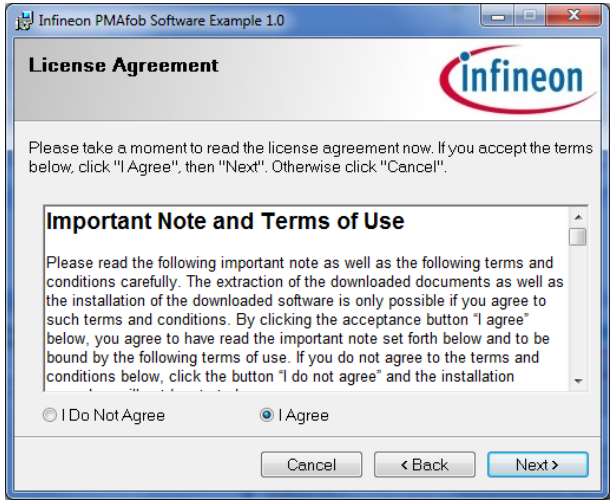
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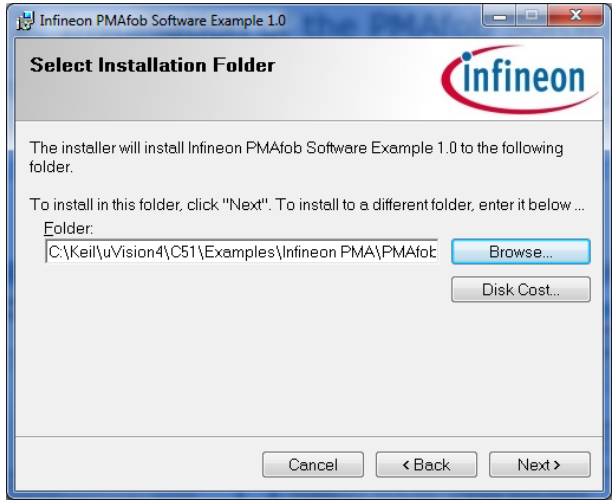
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  - Step 5: Handling of the PC-Application

Setup of the PMAfob Home Automation Demo

- Step 2: Installation of the PMAfob Software
  - Double click *PMAfob_DEMO_Tx_Sources_Vx.y.msi* and follow the onscreen installation instructions.
    This will run the PMAfob Software Example setup.

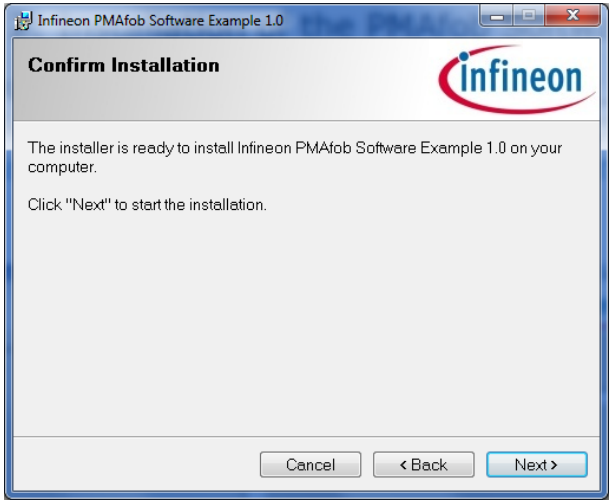


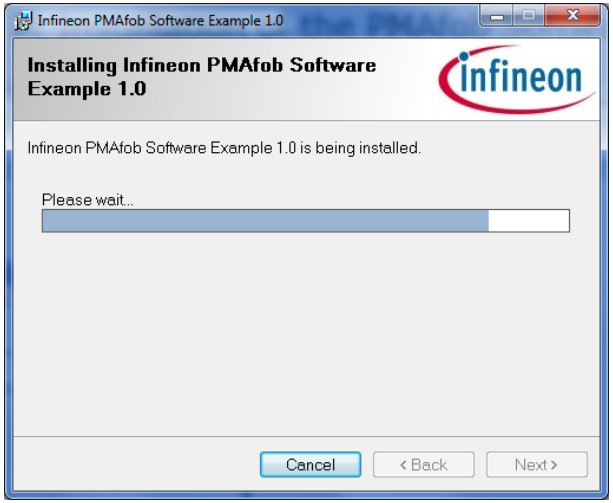


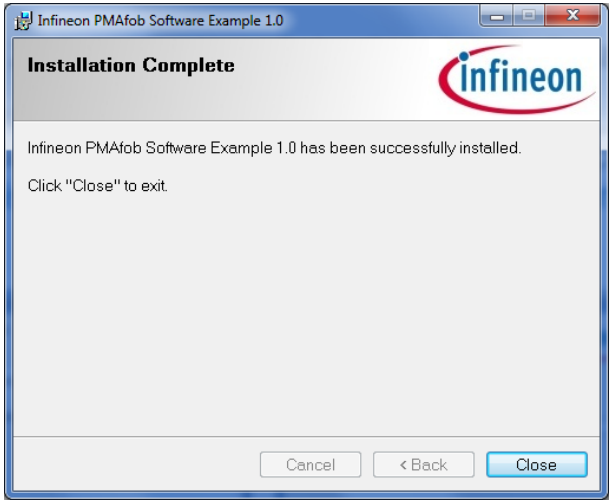


Setup of the PMAfob Home Automation Demo

- Step 2: Installation of the PMAfob Software
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    This will run the PMAfob Software Example setup.





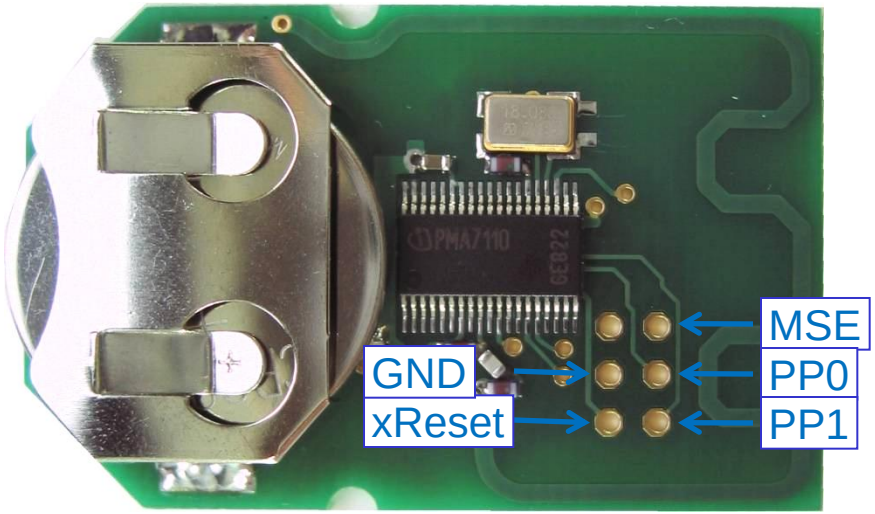


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Setup of the PMAfob Home Automation Demo

- Step 3: Configuration of the PMAfob
  - Delivery status
    - PMAfobs are delivered with PMAfob Software programmed on it.
    - AES Framing is the default selection.
  - Programming Connector

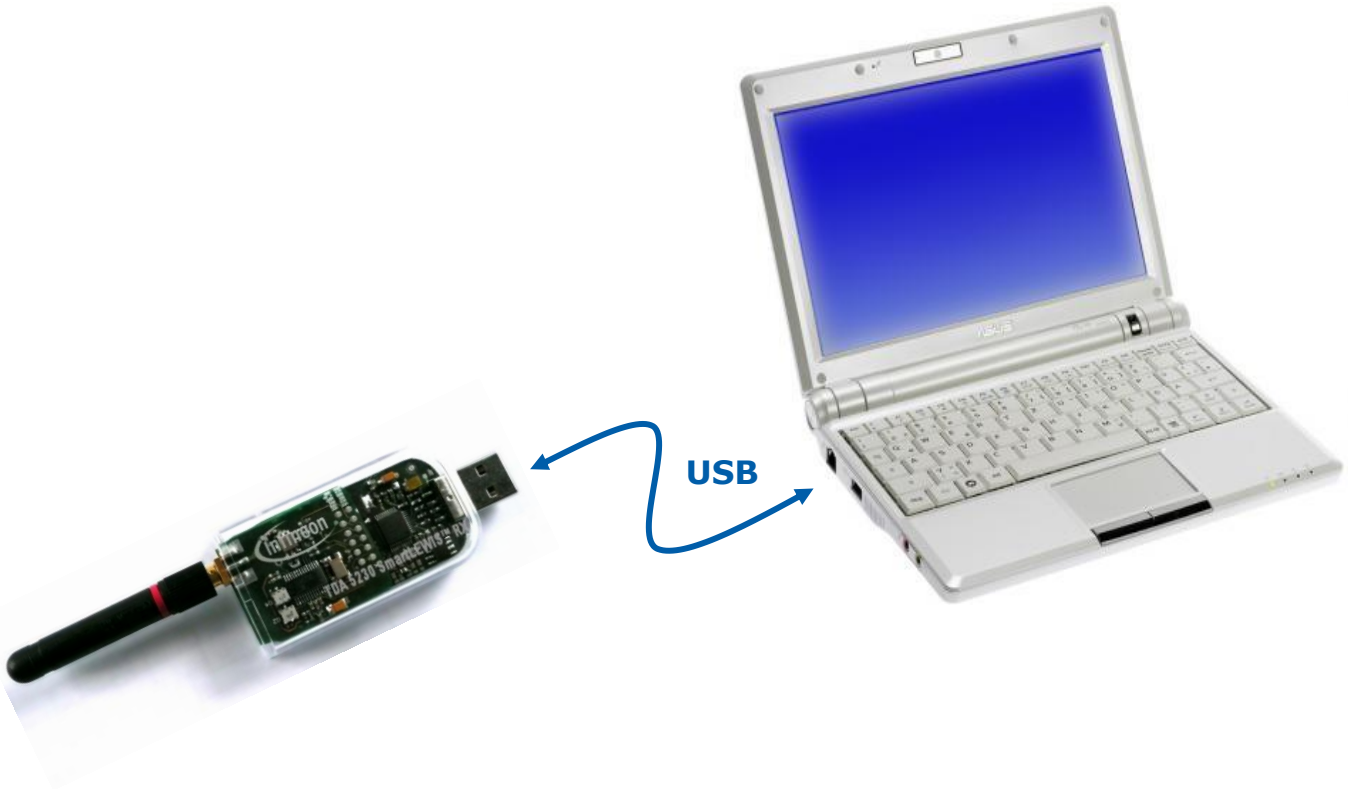


  - Note:
    - The PMAfobs can be reprogrammed using the PMA Starter Kit or PMA Evaluation Kit.
    - The PMAfob needs to be self-powered during programming (e.g.: battery)

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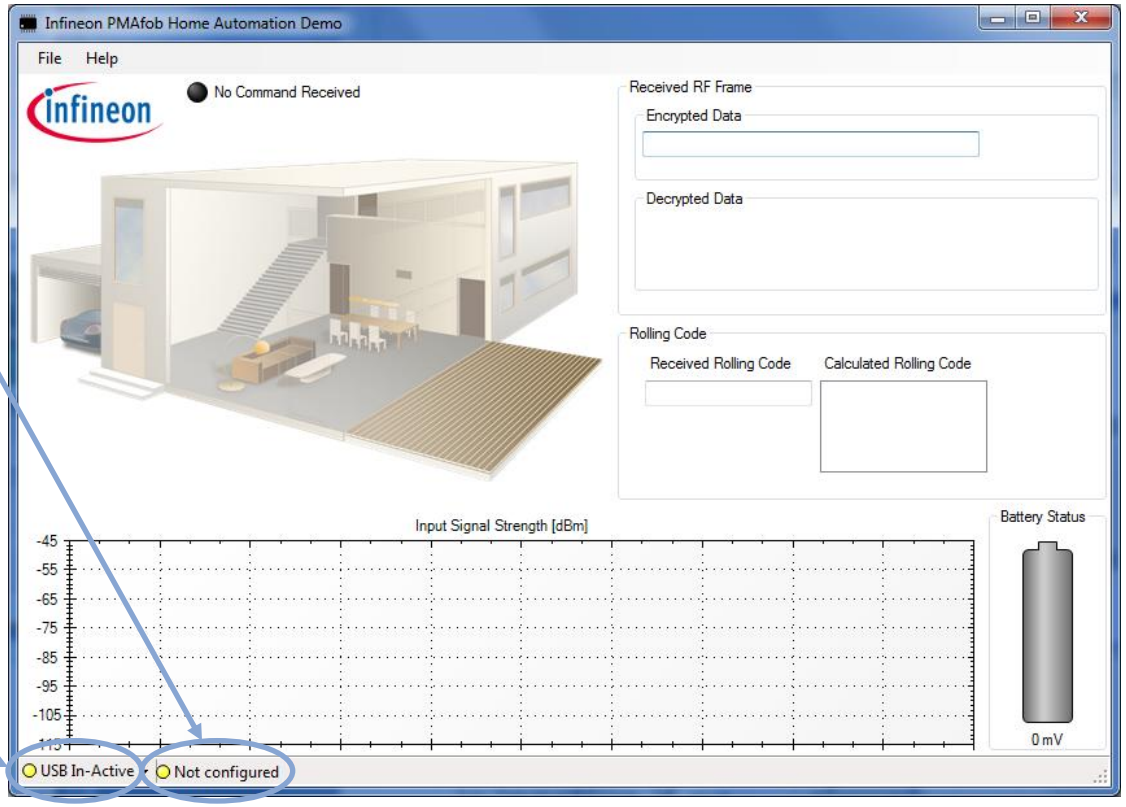
Setup of the PMAfob Home Automation Demo

- Step 4: Connection of the Receiver Board
  - Connect the Receiver Board via USB



Setup of the PMAfob Home Automation Demo

- Step 4: Connection of the Receiver Board
  - After startup the PC-Application will look like the figure below
  - Receiver Board is not configured
  - USB connection is inactive if no Receiver Board is connected

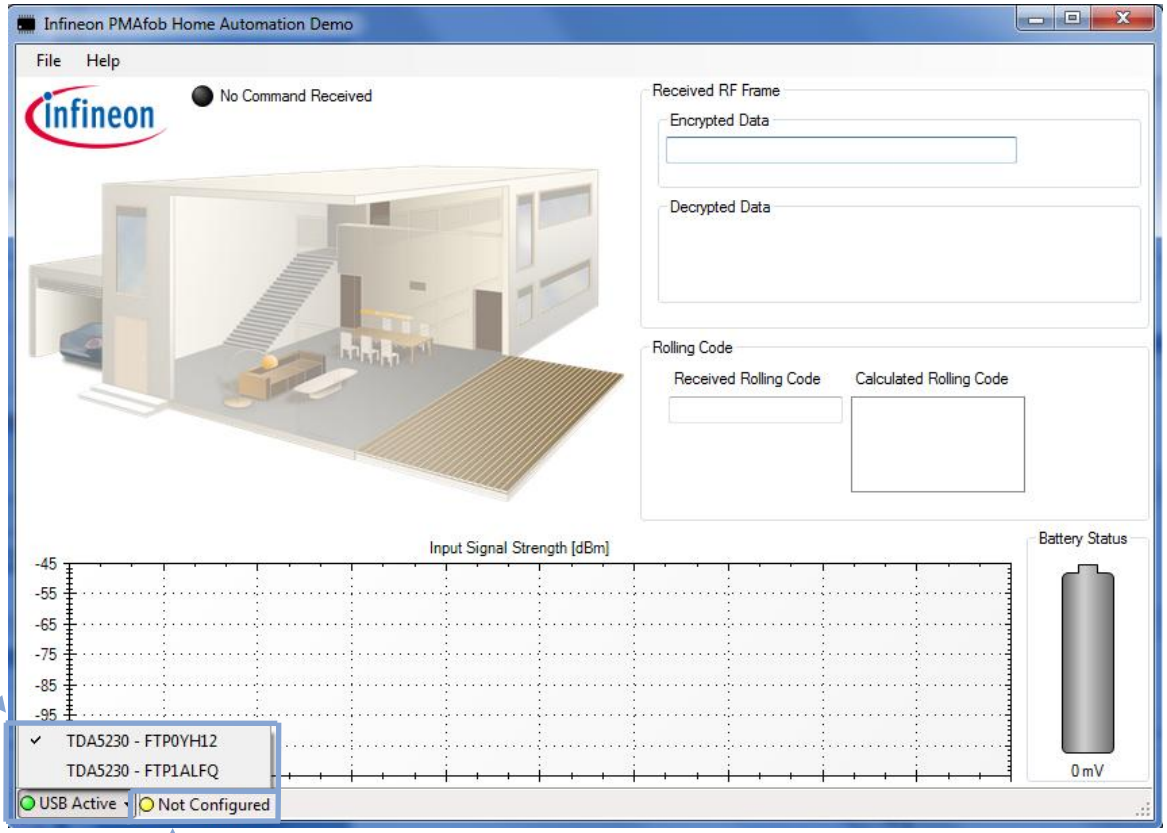


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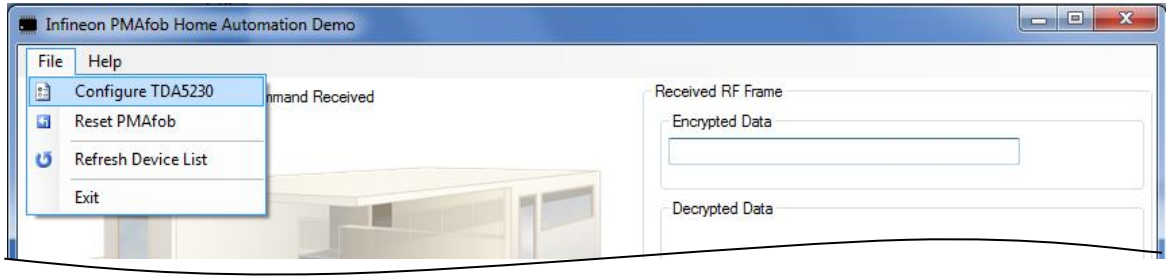
Setup of the PMAfob Home Automation Demo

- Step 5: Handling of the PC-Application
  - After connecting the Receiver Board(s) the PC-Application will look like the figure below
  - All connected Receiver Boards are listed. One is selectable
  - Receiver Board is not configured

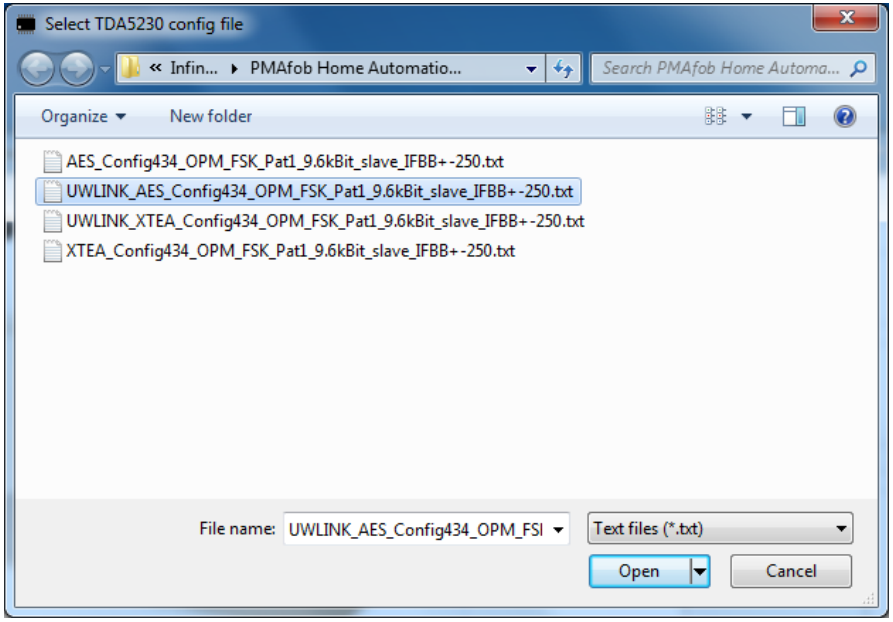


Setup of the PMAfob Home Automation Demo

- Step 5: Handling of the PC-Application
  - Select File -> Configure TDA5230

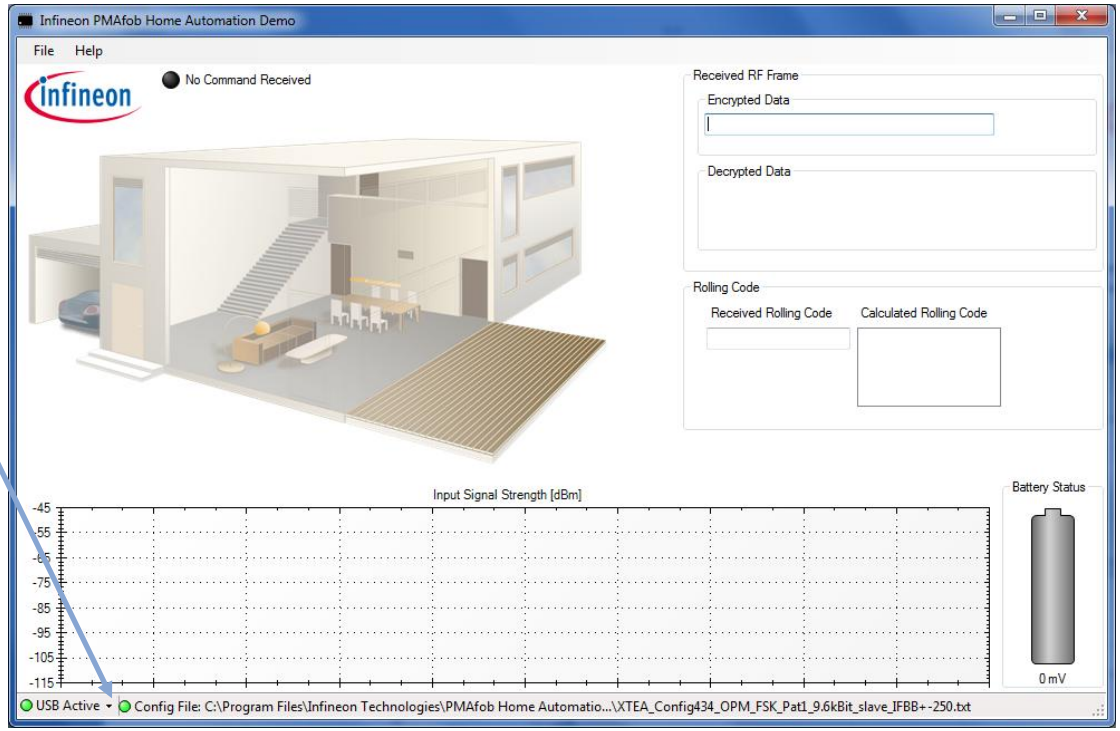


  - Choose the TDA5230 configuration file for AES or XTEA framing according to the configuration of your PMAfob (Default configuration of PMAfob is AES)
  - For SmartLEWIS RX – TDA5230 UWLink Stick use config files starting with "UWLINK_..."



Setup of the PMAfob Home Automation Demo

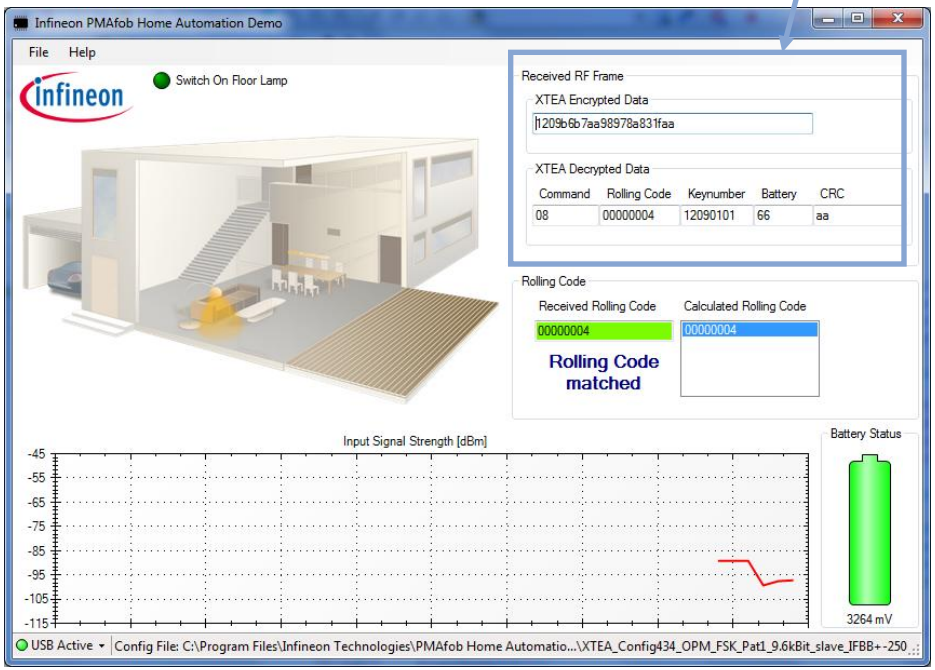
- Step 5: Handling of the PC-Application
  - After successful configuration of the Receiver Board the PC-Application looks like the figure below
  - Configuration LED is green and Config File is shown.
  - Note:
    If the Receiver Board is unplugged and reconnected again it will be automatically configured with the selected Config File



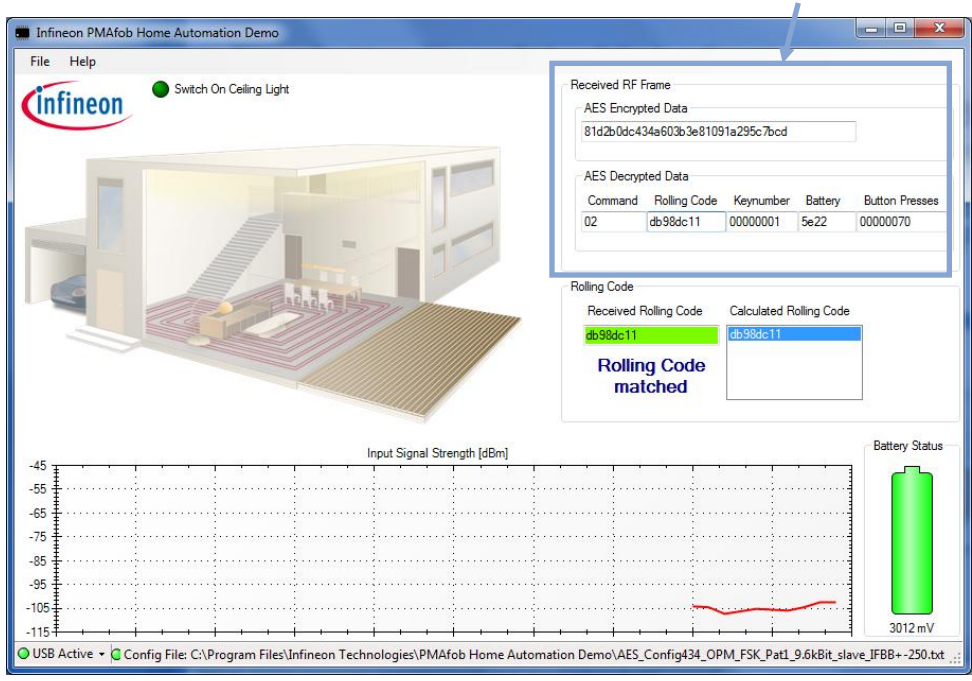
Setup of the PMAfob Home Automation Demo

- Step 5: Handling of the PC-Application
  - After successful configuration of the Receiver Board pressing any button on the PMAfob will show the received data
  - Depending on the encryption you use (must be equal for PMAfob and PC-Application) the appropriate RF-Framing is displayed

XTEA-Framing



AES-Framing

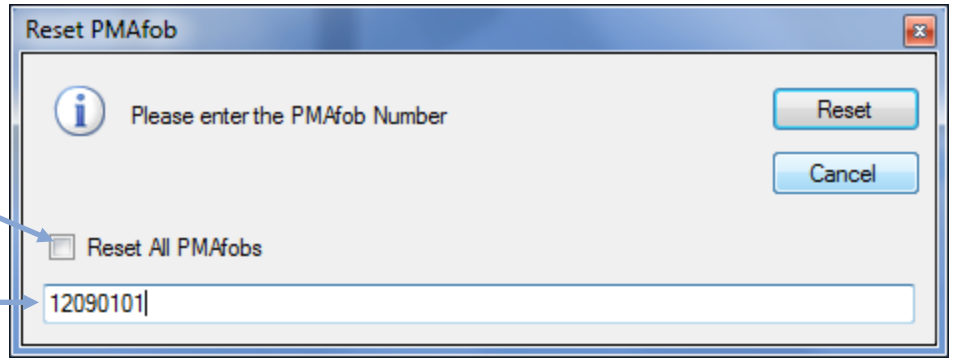


Setup of the PMAfob Home Automation Demo

- Step 5: Handling of the PC-Application
  - Select File -> Reset PMAfob

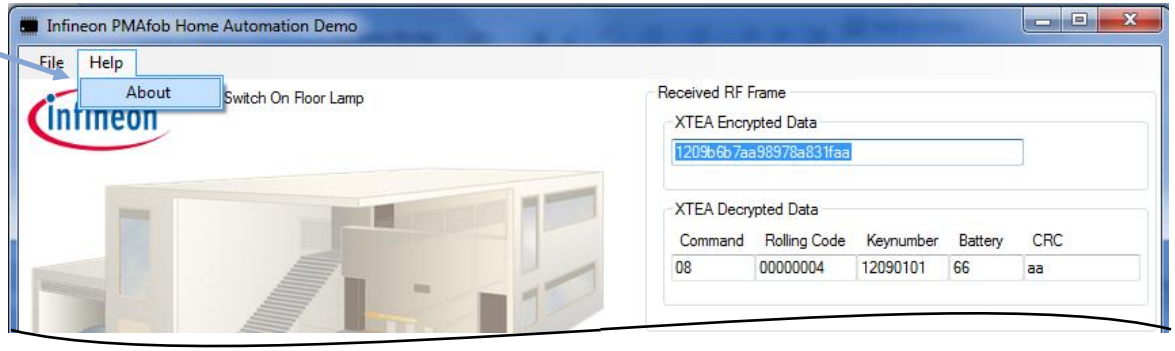


  - Reset the Rolling Code counter (Reset Button) for
    - all PMAfobs by checking "Reset All PMAfobs" or
    - a special PMAfob, by entering the *Keynumber*

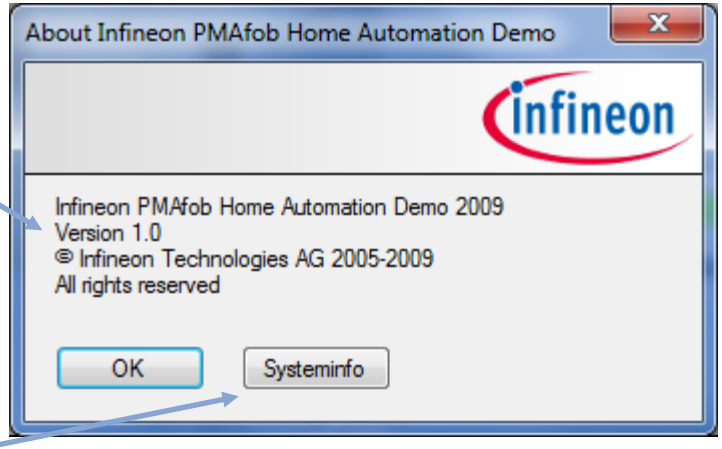


Setup of the PMAfob Home Automation Demo

- Step 5: Handling of the PC-Application
  - Select Help -> About



  - This dialog shows the currently used version



  - Press *Systeminfo* to get information about your PC system



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