Title:

SX-ULPAN-EVK

Drawing Type :	Functional specifications
Drawing No.:	SC105400XB
Date :	2016/02/24

Rev.	Description	Date	Prepared	Checked	Approved
XX	First Version	Dec. 11, 14	Y.Aoyama	T.Kuwana	H.Miura
XA	Added 3.1Supported Destination	Mar. 25, 15	Y.Aoyama	T.Kuwana	H.Miura
XB	Changed to the TWR-K22 Modified the properties of document	Feb. 24, 16	Y.Aoyama	K.Yagi	K.Okuma

1. Overview

This document describes the detailed functions of SX-ULPAN-EVK (hereafter referred to as “product”).
The product is compatible with the Freescale’ Tower System with which you can evaluate the functions
XB of SX-ULPAN wireless driver on a Kinetis K22 platform.
This NXP compatible Tower System platform has 3 models; the Hosted SPI model to evaluate on Kinetis K22 environment, the Hosted UART command model to evaluate using a serial command of AT command-like from UART to control the SX-ULPAN wireless module, and the Hostless model which does not require an application on Host side.

2. Operation Environment

The product performance was checked under the following environment.

XB

CPU	Kinetis K22 (ARM Cortex-M4F)
Applicable wireless module	SX-ULPAN (QCA4004 BL3B)
Support I/F	SPI, UART
OS	NXP MQX 4.1

3. Driver Function Specifications

For details on the driver functions, refer to SX-ULPAN Functional specification (SC105390).

XA 3.1. Supported Destination

The product supports the following destinations.
CountryCode for AP mode and RegdomainCode for Station mode are as shown below.

Destination	CountryCode	RegdomainCode
Default value	US	0x4000006a
US	US	0x80000348
Japan	JP	0x80000188

Configure CountryCode and RegdomainCode for your destination via appropriate commands when using this product.

3.1.1.SX-ULPAN-EVK(US)

The default value of the US version is fixed to US as shown below. The configuration commands of CountryCode and RegdomainCode are invalidated.

Destination	CountryCode	RegdomainCode
Default value	US	0x80000348

4. Product Deliverable

4.1. Hosted SPI Application Binary

XB As one of deliverables of this product, Silex created a binary file of a network demo application (herein referred to as the Application) which operates on the NXP TWR-K22F120M (Kinetis K22 120 MHz Tower System Module).

Binary File Name:

XB

Platform	File name
TWR-K22F120M	sx-ulpan-2401-evk-twrk22f.bin

This application has functions of **throughput_demo** and **flash_config**. The application operates by changing functions depending on the platform switch status at start-up.

4.1.1.throughput_demo Function

The throughput_demo function allows managing wireless settings, controls functions using console commands, and demonstrating the wireless driver performance.

XB This function is available only when Target Firmware of SX-ULPAN wireless module is Hosted SPI model.

4.1.2.flash_config Function

The flash_config function allows rewriting Target Firmware of the wireless driver.

4.1.3.Target Firmware Rewriting Procedure

Requirements:

- SX-ULPAN-EVK
- TWR-K22F120M
- TWR-ELEV
- RS-232C cross cable
- USB A-miniB cable
- Windows PC

Tool:

- QCA4004 Firmware/Software SDK v3.3.4
  (demo/flash_config/bin/host.exe)

SX-ULPAN Target Firmware

- Target F/W binary file (flashotp.bin)

Rewriting Procedure:

1. Connect equipment as shown in Figure 1.
   Connect USB and RS-232C serial cables to the Windows PC.

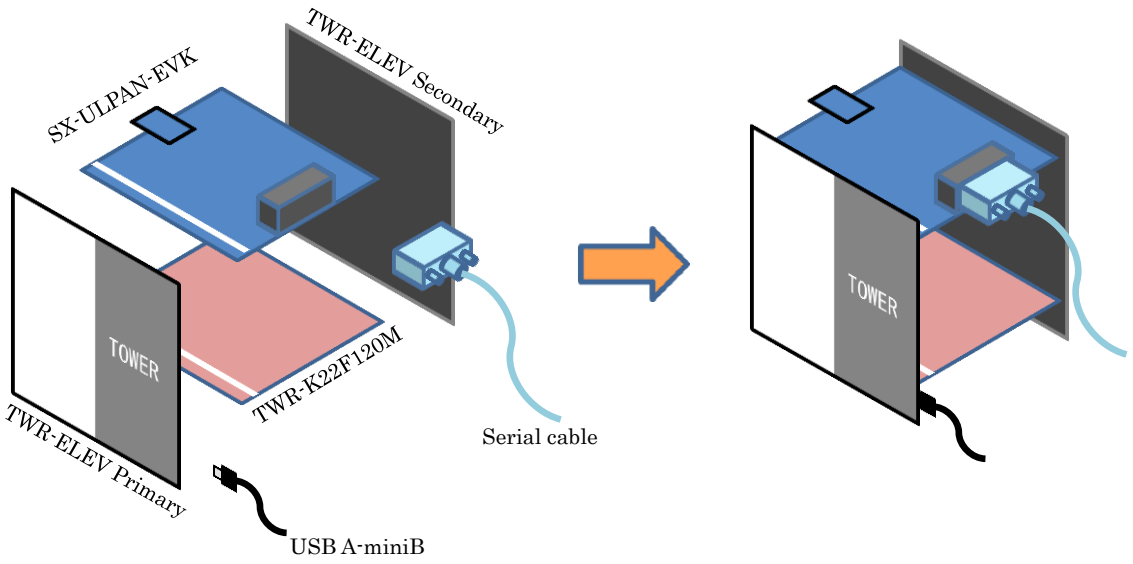

Figure 1: Connecting equipment

2. Get the QCA4004 Firmware/Software SDK v3.3.4 and install.
3. Copy SX-ULPAN Target F/W (flashotp.bin) to demo/flash_config/bin/ under the QCA4004 Firmware/ Software SDK v3.3.4 installation directory.
4. Start host.exe in the same directory.
5. Feed power to TWR-ELEV Primary by pressing down SW3 of TWR-K22F120M
6. See LED D7 (green) and D5 (orange) of TWR-K22F120M illuminate.
7. Enter the COM port, MAC address, and Target F/W binary file name by following instructions on the host.exe window. Specify the name in the absolute path or the relative path from the demo/flash_config/bin directory.
8. If “Programming Successful” is shown, writing procedure will be done.

XB

4.2. UART Command Model

The host application is not required because SX-ULPAN-2402-EVK can evaluate the function of UART command by via the RS-232C connection.