



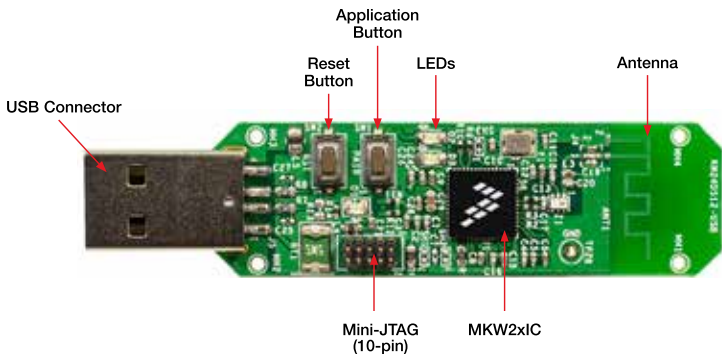
Quick Start Guide

USB Packet Sniffer/Dongle
for Kinetis MKW22D and
MKW24D Wireless MCUs



USB-KW24D512

Get to Know the USB-KW24D512



Introduction

The USB-KW24D512 Packet Sniffer/Dongle is dual use hardware in a convenient USB dongle form factor for part numbers MKW22D512 and MKW24D512. As delivered, the device is programmed with 802.15.4 packet sniffer software that interfaces with Freescale's Test Tool Protocol Analyzer as well as most commercially available 802.15.4 packet sniffer programs. Packet sniffers are essential for wireless network development allowing monitoring of over-the-air traffic. The USB-KW24D512 hardware can also be used as a development boards or re-programmed with application software as a network node.



USB-KW24D512 Features

- 50 MHz ARM® Cortex®-M4 based core
- 512KB Flash, 64KB SRAM
- Typical current consumption: 250 μ A/MHz run, 1.7 μ A RTC standby
- IEEE-802.15.4 compliant
- -102 dBm Rx sensitivity and +8 dBm Tx output power
- Peak typical current consumption: 15mA Tx and 16.5mA Rx
- Dual Personal Area Network (PAN) support in hardware
 - Run two RF networks simultaneously
- Active and passive tamper detection with RTC timestamp
- Crypto engine: DES, 3DES, AES 128-256, SHA-1, SHA-256, MD5, RNG
- USB 2.0 FS/LS H/D/OTG
- 16-bit ADC
- MCU operating range: 1.7V to 3.6V, -40C to +105C
- Supply voltage: 5VDC

Step-by-Step Instructions

In this quick start guide, you will learn how to enable and use the USB-KW24D512 device as a sniffer. You will also learn how to modify the existent firmware on the dongle for use as a development environment or network node.

The USB-KW24D512 development platform comes pre-programmed with the sniffer application to provide a demonstration of the device's capabilities.

This quick start guide will demonstrate how to sniff packets sent over the air and how to program the dongle with another application firmware.

1

Download Software and Tools

Download installation software and documentation under

“Jump Start Your Design”

at freescale.com/USB-KW24D512.



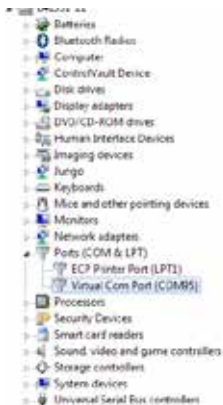
Install BeeKit Wireless Connectivity Toolkit

BeeKit is a stand-alone software application that provides a graphical user interface in which the user can create, modify, save and update wireless network solutions based on Freescale’s protocol stacks. Download BeeKit under Software and Tools at freescale.com/Wireless.

Connect the Hardware

Connect the USB-KW24D512 dongle to the PC. Allow the PC to automatically install the USB drivers if prompted.

Drivers can be found under BeeKit’s installation folder. After driver has been installed, it should be listed as a Virtual Com Port.

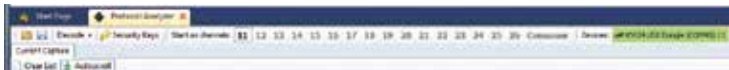


2 Enabling the Sniffer Application

1. Open Test Tool application. Go to <BeeKit installation folder>\Test Tool 12\Test Tool.exe
2. Select Protocol Analyzer



3. Start capturing packets. The USB-KW24D512 dongle should be listed as “Devices: KW24 USB Dongle (COMx) Off” as shown in the image. Click on a channel number to start monitoring packets over the air on that channel.



4. Packet Analyzer output. You should be able to see and analyze the packets from other devices that are being sent over the air. Current Test Tool Analyzer is able to decode MAC and ZigBee® RF4CE packets.

| Time | Status | Protocol | EUI | ID | Decoded Message | Src Addr ID | Src Address | Dest Addr ID | Dest Address | MAC Payload |
|------|-----------------|----------|--------------|----|-----------------------------|-------------|-------------|--------------|--------------|-------------------|
| 75 | 08:08:05.852019 | 0.000000 | ZigBee RF4CE | 01 | 0x02 ZigBee RF4CE Broadcast | 00:00 | 00:00 | 00:00 | 00:00 | 00:00:00:00:00:00 |
| 76 | 08:08:05.861614 | 0.000000 | ZigBee RF4CE | 01 | 0x02 ZigBee RF4CE Frame | 00:00 | 00:00 | 00:00 | 00:00 | 00:00:00:00:00:00 |
| 78 | 08:08:05.864004 | 0.000000 | RF4CE | 01 | 0x01 RF4CE ACK | 00:00 | 00:00 | 00:00 | 00:00 | 00:00:00:00:00:00 |
| 80 | 08:08:05.867614 | 0.001750 | ZigBee RF4CE | 01 | 0x04 ZigBee RF4CE Frame | 00:00 | 00:00 | 00:00 | 00:00 | 00:00:00:00:00:00 |
| 81 | 08:08:05.867719 | 0.000000 | RF4CE | 01 | 0x02 RF4CE ACK | 00:00 | 00:00 | 00:00 | 00:00 | 00:00:00:00:00:00 |
| 82 | 08:08:05.870914 | 0.000000 | ZigBee RF4CE | 01 | 0x02 ZigBee RF4CE Frame | 00:00 | 00:00 | 00:00 | 00:00 | 00:00:00:00:00:00 |
| 83 | 08:08:05.872294 | 0.000000 | RF4CE | 01 | 0x02 RF4CE ACK | 00:00 | 00:00 | 00:00 | 00:00 | 00:00:00:00:00:00 |
| 84 | 08:08:05.875914 | 0.000000 | ZigBee RF4CE | 01 | 0x04 ZigBee RF4CE Frame | 00:00 | 00:00 | 00:00 | 00:00 | 00:00:00:00:00:00 |
| 85 | 08:08:05.876414 | 0.000000 | RF4CE | 01 | 0x02 RF4CE ACK | 00:00 | 00:00 | 00:00 | 00:00 | 00:00:00:00:00:00 |

3 Loading Other Firmware on the Board

Option A: Using Test Tool's Firmware Loader

Option B: Using IAR Embedded Workbench

Option A: Using Test Tool's Firmware Loader

1. Open Test Tool application. Go to <BeeKit installation folder>\Test Tool 12\Test Tool.exe
2. Select Firmware Loaders --> Kinetis Firmware Loader option.



3. Connect a J-Link Flash programmer to the mini-JTAG connector on the USB-KW24D512 board.



4. Browse and select the src file to upload to the board



5. Click on the "Upload" button
6. Indicate the device that is going to be flashed.



7. Click on "OK" and wait for the upload to finish.



Option B: Using IAR Embedded Workbench

1. Open a USB-KW24D512 project on IAR Embedded Workbench.
2. Compile and build the project.
3. Connect a J-Link Flash programmer to the mini-JTAG connector on the USB-KW24D512 board.



4. Ensure you have selected the J-Link/J-Trace driver under Download --> Debugger options.
5. Click on "Download and Debug" to flash the board.



6. Stop the debugging session.
7. Reset the board.

Additional Information

For more information on USB-KW24D512 hardware and software, refer to BeeKit Wireless Connectivity Toolkit Quick Start Guide (BKWCTKQSG.pdf) to load sample applications using Zigbee, BeeStack Consumer (RF4CE) and IEEE® 802.15.4 MAC protocol stacks.



Get Started

Download installation software and documentation under
“**Jump Start Your Design**” at freescale.com/USB-KW24D512.

Support

Visit freescale.com/support for a list of phone numbers within your region.

Warranty

Visit freescale.com/warranty for complete warranty information.

For more information, visit freescale.com/USB-KW24D512, freescale.com/KW2x,
or freescale.com/Kinetis/Wseries

Freescale and the Freescale logo are trademarks of Freescale Semiconductor, Inc., Reg. U.S. Pat. & Tm. Off. All other product or service names are the property of their respective owners.
© 2014 Freescale Semiconductor, Inc.



Document Number: USBKW24D512QSG REV 0
Agile Number: 926-28159 REV A