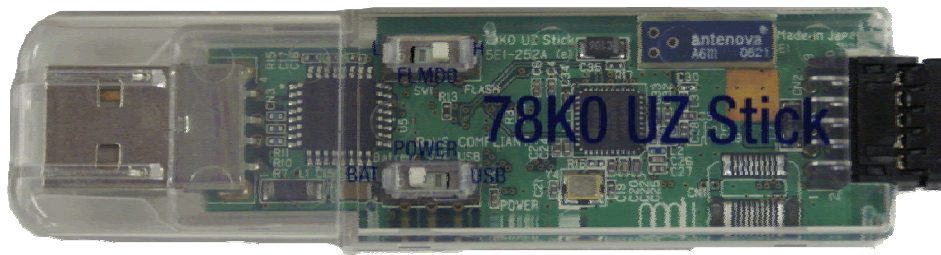


Using the NEC 78K0 UZ Stick with the Daintree Networks Sensor Network Analyzer

Application Note AN015



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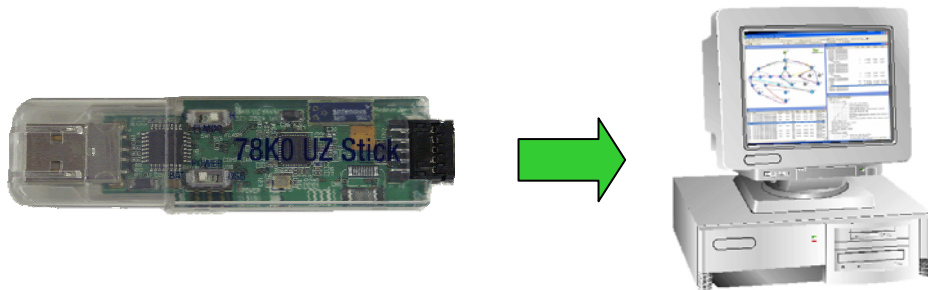
Sensor Network Analyzer Release 2.3 (2008-07-31)

About the Sensor Network Analyzer

The Daintree Networks Sensor Network Analyzer (SNA) combines a powerful protocol analyzer with network visualization, measurements and diagnostics for IEEE 802.15.4™ and ZigBee™ applications. It provides automatic display of network formation, topology changes, and router and coordinator state changes allowing rapid detection of incorrect network behavior and identification of device or network failures.

The SNA works in conjunction with Daintree's 2400E Sensor Network Adapter to provide analysis for small and large networks. With multi-node capture, analysis of large networks across wide areas (such as multiple rooms within a facility) is possible.

The SNA software is also compatible with the 78K0 UZ Stick, which is included in the NEC 802.15.4/ZigBee Development Kits. The 78K0 UZ Stick is used as a packet sniffing capture device. No additional hardware is required.



This application note describes how to use the SNA software with the 78K0 UZ Stick. You can find out more about the SNA software in general, refer to the following:

- **Quick Start Guide:** Included with the SNA application. From the SNA **Help** menu, select **Quick Start Guide**, or else from the Windows **Start** menu, select **Daintree Networks > Documentation > SNA Quick Start Guide**.
- **User Guide:** Included with the SNA application. From the SNA **Help** menu, select **User Guide**, or else from the Windows **Start** menu, select **Daintree Networks > Documentation > SNA User Guide**.
- **FAQs and other support resources:** These are available from the Daintree Networks web site at www.daintree.net/support

Getting started

In summary, getting started involves the following steps, each of which is described in detail in the following sections:

1. Install the Sensor Network Analyzer software.
2. Connect the 78K0 UZ Stick to your PC via USB and install USB Drivers.
3. Install packet sniffer firmware on the 78K0 UZ Stick.
4. Start the SNA software, and then add the 78K0 UZ Stick as a capture device.
5. Select the 78K0 UZ Stick as the current capture device.

Once connected and configured, you can use the 78K0 UZ Stick as a packet sniffer/capture node with the Sensor Network Analyzer.

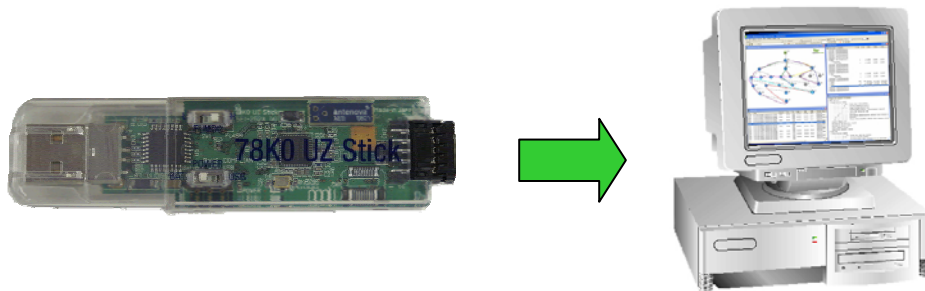
1. Installing the SNA software

This software contains the firmware driver you need for the 78K0 UZ Stick, so you need to install it before connecting the board to your PC.

1. Go to www.daintree.net/register to register your software and download the latest release.
2. Enter your email address together with the 15-digit alpha-numeric registration code from the software CD case. After you click Next, an activation code will be emailed to the address you supply.
3. Follow the link provided to download the latest release of the SNA software, plus the *Sensor Network Analyzer Quick Start Guide*. Daintree **strongly** recommends that you download the latest version of the software to ensure you have the latest functionality and fixes.
4. Follow the instructions in the *Quick Start Guide* to install and activate the software.

2. Connecting the 78K0 UZ Stick

1. Connect the 78K0 UZ Stick to a spare USB port of your PC.



The first time you connect this board to your PC, a Found New Hardware wizard will open (USB Serial Port).

2. If asked **Can Windows connect to Windows Update to search for software?** select **No, not this time** and then click **Next**.
3. Select to **Install from a list or specific location**, and then click **Next**.

4. Select to **Search for the best driver in these locations**.
5. Select to **Include this location in the search** and then click **Browse** and select the **Daintree Networks\Drivers\NEC** directory.
6. Click **Next**. The wizard will locate and start installing the required driver.
7. When a message warns that the software has not passed Windows Logo testing, click **Continue Anyway**.
8. A message will be displayed indicating the new hardware is ready for use.


3. Installing the sniffer firmware

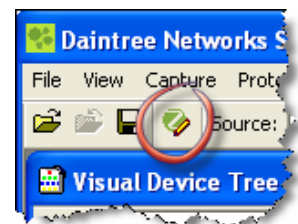
The NEC 78K0 UZ Stick requires dedicated packet sniffer firmware to run with the Daintree Networks Sensor Network Analyzer.

1. Ensure the NEC 78K0 UZ Stick is connected to your PC via USB.
2. Install the software flash writer, **PG-FPL3**, available on the CD provided with the 78K0 UZ Stick. Instructions are provided in the **78K0 UZ Stick Evaluation Kit Tutorial Guide** provided on the CD included with the 78K0 UZ Stick.
3. Use the software flash writer, **PG-FPL3**, to program sniffer firmware into the 78K0 UZ Stick, using the instructions provided in Chapter 3 of the **78K0 UZ Stick Evaluation Kit Tutorial Guide**. Ensure that:
 - o Power switch is set to USB (On)
 - o FLMD0 switch is set to HIGH
 - o Select the PRM file as described in the Tutorial Guide.
 - o At the **Load** step select the sniffer firmware file **Daintree Networks\Firmware\NEC\UZSniffer_78k0.hex** and download the firmware
4. After successfully loading the firmware, reset the 78K0 UZ Stick switches as follows:
 - o Set Power switch is set to BAT (Off).
 - o Then set FLMD0 switch is set to LOW
 - o Then switch power switch back to USB (On).

Once the above steps are complete, the Sniffer firmware is ready to use.

4. Adding the 78K0 UZ Stick as an SNA capture device

1. If you have not already done so, start the SNA software.
2. From the **Settings** menu, select **Device Manager**, or click the Device Manager icon from the main SNA toolbar.
3. On the Device Manager **Summary** tab, click  and then select **Add Serial**.



4. On the Add Serial dialog box **Serial Settings** tab, enter the following values:
 - **Type:** Generic Protocol Version 2
 - **Version:** 2
 - **COM Port:** Enter the virtual COM port assigned in Windows Device Manager (as described below)
 - **Baud:** 115200
 - **Data Bits:** 8
 - **Parity:** None
 - **Stop Bits:** 1
 - **Flow Control:** None
 - **Timestamp:** 100
 - **15.4 Band:** 2450
 - **Mode:** Disabled for this board
5. Click the **User Settings** tab, and then enter the following values:
 - **User Label:** 78K0 UZ Stick
 - **Image:** Not required
6. Click **OK** to save the new definition. When you return to the Device Manager Summary tab, you'll notice that the 78K0 UZ Stick has been added to your list of devices.

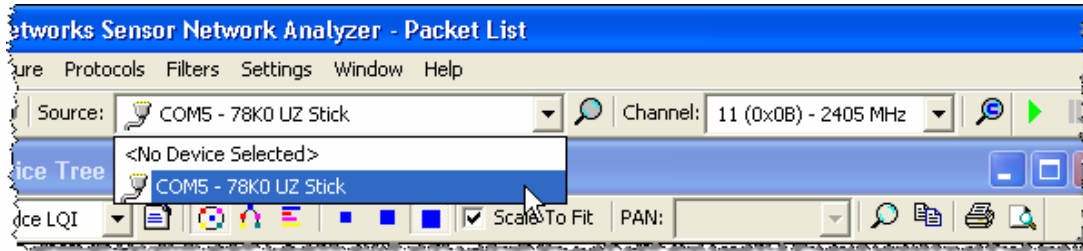
Find the virtual COM port


1. Open Windows **Control Panel**, and then double-click the **System** icon.
2. On the System Properties dialog box, select the **Hardware** tab, and then click the **Device Manager** button.
3. Expand **Ports (COM & LPT)** to find the COM port for to your board (USB Serial Port).




5. Selecting the 78K0 UZ Stick as the current capture device

1. In the SNA main window, select the 78K0 UZ Stick from the **Source** list.



If the 78K0 UZ Stick is not available from the list, click  to get the SNA software to search/scan for capture devices and refresh the Source list.

2. Select the **Channel** on which you want to capture traffic.

Click  to start the capture.

Known limitations

If the 78K0 UZ Stick is in use by the SNA application, it cannot be used concurrently by any other application.

Where to next?

We recommend that you start exploring the SNA menus to get an understanding of the full capabilities of this product.

Detailed descriptions of all options are available in the *Sensor Network Analyzer User Guide*, which you can open from the SNA **Help** menu and the Windows **Start** menu. You can also find FAQs and other supporting information on the Daintree web site at www.daintree.net/support

The Daintree web site includes other useful information, such as

- www.daintree.net/solutions for product information including data sheets and an animated tour
- www.daintree.net/purchase to purchase Daintree products online
- www.daintree.net/contact to contact the Daintree sales or support teams