Radio configuration guide

Connex® Vital Signs Monitor 6000 Series, Connex® Integrated Wall System

Overview

This guide explains the following:

- Accessing the radio software upgrade files.
- Creating a simple wireless network setup to install the radio software.
- Connecting to the radio configuration tool user interface.
- Updating your radio software.
- Client and server certificate requirements.
- Loading certificates.
- Enabling certificate-based authentication.

It applies to new devices or devices returned from the Welch Allyn service department. Your network must be configured to use factory-supported SSIDs, as well as authentication and encryption schemes.

Note   This guide only applies to devices using the 1.71.03 or greater software versions and radios using the 3.00.01 or greater software versions, and radio MAC addresses that begin with 00:1A:FA.

For devices using the 2.40.01 or greater software versions and radios using the 2.00.01 or greater software versions, and radio MAC addresses that begin with 00:17:23..., refer to the Welch Allyn Service Tool for information on upgrading your radio software.

⚠ **Caution**   The instructions in this guide must be performed only by a qualified biomedical service engineer or technician who is familiar with your facility's wireless network. If you are not familiar with your facility's wireless network, perform these tasks only with the assistance of a qualified technician.

Accessing the radio upgrade software

To access the radio software, call Welch Allyn Technical Support at 1-800-535-6663 to receive the radio upgrade software files.

Creating a simple wireless network setup to install the radio software

Follow these instructions to setup a simple network with a wireless router to communicate between the radio and your PC.
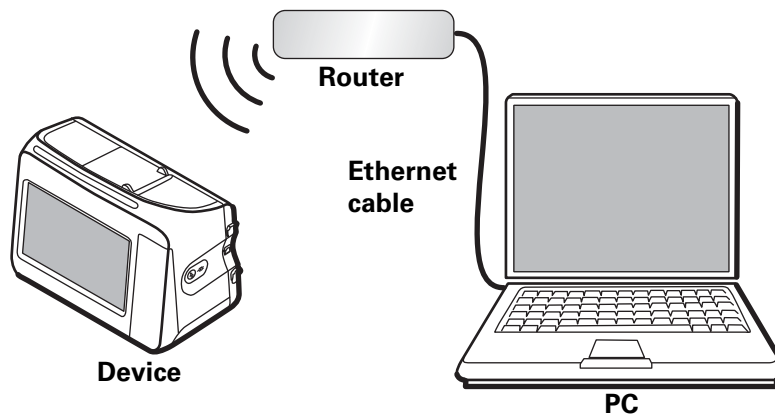
You will need the following items to upgrade the radio software on your device:

- Welch Allyn Service Tool 1.5x or later.
- USB 2.0/5-pin type A to mini-B cable.
- A PC with Windows XP SP3 or Windows 7, Internet Explorer 7 or later, and Internet access to connect to Welch Allyn PartnerConnect.
- Ethernet cable to connect the PC to the router.
- Wireless router 802.11 b/g

To create a wireless network setup, do the following:

1. Configure the following wireless settings on the router:

   a. Name: **com.welchallyn**

   b. Radio band/mode: **b/g**

   c. Security: **WPA2-PSK** or **WPA2-Personal**

      Pre-shared hex key:
      1234567890ABCDEF1234567890ABCDEF1234567890ABCDEF1234567890AB CDEF

   d. Enable the DHCP server.

   Note   The devices can only receive an IP from DHCP.

2. Restore the device radio settings to factory defaults.

   To access the radio configuration settings on the device, do the following:

   a. Touch the **Settings** tab.

   b. Touch the **Advanced** tab.

   c. Touch **Enter password**.

   d. Enter your password and touch **OK**. If your facility has configured passwords, enter that password. If not, the default password is **6345**.

   e. Touch the **Service** tab.

    f.   Touch **Radio settings** in the Restore factory defaults area to restore the radio to factory defaults.

        After the radio card is reset, it must have the following attributes:

- SSID: com.welchallyn
- Radio band: b/g
- Authentication type: WPA2-PSK

3. Ensure that the IP address is on the same subnet as the PC.

    a.   Touch the **Network** tab.

        The IP address is displayed in the Radio window on the right.

Upgrading the radio software

You will need the following items to upgrade the radio software on your device:

- Welch Allyn Service Tool 1.5x or later.
- USB 2.0/5-pin type A to mini-B cable.
- A PC with Windows XP SP3 or Windows 7, Internet Explorer 7 or later, and Internet access to connect to Welch Allyn PartnerConnect.
- Ethernet cable to connect the PC to the router.
- Wireless router 802.11 b/g

Note   Accessing the radio configuration tool requires your device radio to be reset to factory defaults. If your device radio is not set to factory defaults, see "Restore the device radio settings to factory defaults." on page 2.

Connecting to the radio configuration tool web page

⚠️   **Caution** Only customer certificates and radio software should be changed using the radio configuration tool user interface. All other configuration changes must be completed through the device user interface. See the device directions for use for more information.

Note   Accessing the radio configuration tool requires your Welch Allyn device and your PC running the Welch Allyn Service Tool to be connected to the same subnet.
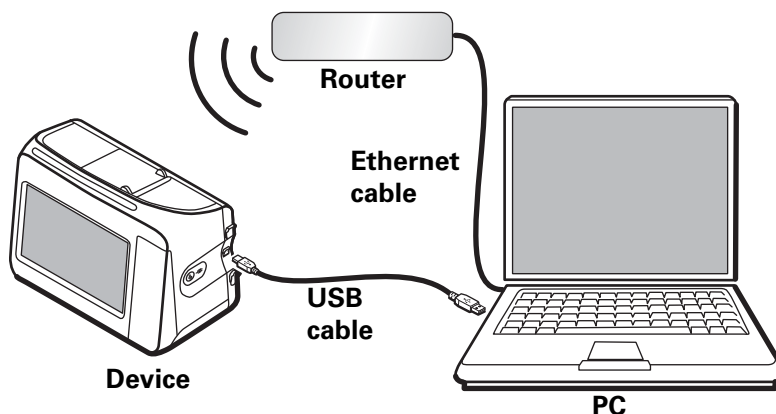
To connect to the radio configuration tool user interface

1. Use a USB cable to connect the device to a PC running the Welch Allyn Service tool.

2. Launch the service tool and log in.

Note   You must log in with a BioMed user type in order to upgrade the radio software.

3. Through the Welch Allyn Service Tool, select the device you want to upgrade.

4. Select the **Configure** tab.

5. Click **Change** in the Current Settings pane.

6. Select the **Radio** tab.

7. Copy the password from the prompt and click **Configure**.

8. Logon as **superadm**, paste the password into the Password field, and click **OK**.

    The radio configuration tool user interface is displayed.

Upgrade the radio software

Note   Before starting the upgrade, contact Welch Allyn Technical Support at 1-800-535-6663 to receive the radio upgrade software files. See "Accessing the radio upgrade software" on page 1.

To upgrade the device radio software, do the following:

1. Connect to the radio configuration tool user interface. See "Connecting to the radio configuration tool web page" on page 3.

2. Click **Radio Card Firmware upload**.

3. Click **Browse** and navigate to the directory containing the upgrade files and select **NK_*.bin**. Information about the directory will be provided by Welch Allyn Technical Support.

Note   The name of the upgrade file is always a .bin file that starts with "NK_." The numbers following the NK_ may vary depending on the radio upgrade software version you received from Welch Allyn.

4. Launch Windows Explorer and browse to the same location as the .bin file. Right-click the .txt file and open it with Notepad. Make sure that the numbers preceding .bin and .txt match.

5. Select and copy all of the text characters up to – but not including – "*NK bin."

6. Paste the copied text into the SHA1 checksum box on the radio card firmware upload page.

7. Click **Apply** to start the upgrade. The process typically takes 10 to 20 minutes, depending on your network speed. An information message appears on the device.

⚠ **Caution**   Do not shut down the PC, shut down the device or disconnect the device from the PC during this procedure.

8. When the files are transferred and the checksum is complete, the software writes to the radio's memory. An information message appears on the device.

9. The task takes approximately 4 to 7 minutes to complete. When the flash process is complete, the monitor returns to the Advanced Settings screen.

10. If after 10 minutes the Advanced Settings screen does not appear, do the following:

    a.   Touch the power button to put the device in Standby mode.

    b.   Touch the display to exit Standby mode.

11. Restart the device by doing the following:

    a.   Touch **Exit** from the Advanced Settings screen.

    b.   Touch the **Settings** tab.

    c.   Touch the **Device** tab.

    d.   Touch **Power down**.

    e.   Press the power button on the side of the device.

12. After the radio has initialized, return to the Web Admin page and click **Device information**. Confirm that the Kernel Version field is updated with the new NK_*.bin file.

13. From the Web Admin menu, select **Load CAB file**.

14. Click **Browse** in the Cab file text box and navigate to the directory containing the Lamarr2_SPI.cab file, select the file, and click **Open**.

15. Launch Windows Explorer and browse to the same location as the CAB file. Right-click the Lamarr2_SPI.sha1 file and open it with Notepad.

16. Select and copy all of the text characters up to – but not including – "*Lamarr2_SPI.cab."

17. Paste the text into the SHA1 checksum box on the Load CAB file page.

18. Click **Apply** to start the upgrade. The process typically takes 1 to 2 minutes, depending on your network speed. An information message appears on the device.

19. When the files are transferred and the software update is complete, the radio restarts and the monitor returns to the Advanced Settings screen. Wait at least two minutes for the radio to restart and perform the post-update configuration.

20. On the PC, view the radio web page and confirm the Device Information section is updated with the new software versions.

21. If the information is correct, return to the Welch Allyn Service Tool and click **Save** to save the changes. If the information is incorrect, click **Cancel** and return to Step 13.

Certificate requirements

⚠️ **Caution** Only customer certificates and radio software should be changed using the radio configuration tool user interface. All other configuration changes must be completed through the device user interface. See the device directions for use for more information.

There are requirements for both server and client customer certificates.

Server certificate requirements

Extended usage extension: Server authentication (1.3.6.1.5.5.7.3.1)
File format: PEM

Client certificate requirements

Extended usage extension: Client authentication (1.3.6.1.5.5.7.3.2)
File format: PKCS#12

Loading customer certificates

To upgrade the certificates on your device radio, do the following:

1. Create a simple wireless network. See "Creating a simple wireless network setup to install the radio software" on page 2.

2. Connect to the radio configuration tool user interface.

3. Select the **Customer CA certificate chain** page and fill in the Custom Certificate Chain field by doing the following:

   a. Click **Browse** and navigate to the certificate file location.

   b. Select the file, and click **Open**.

   c. Click **Apply**.

   Note Do NOT force reauthentication.

4. Select the **Customer device certificate / key** page and fill in the following fields:

   a. Click **Browse** and navigate to the certificate file location.

   b. Select the file, and click **Open**.

   c. Enter your password.

   d. Click **Apply**.

   Note Do NOT force reauthentication.

5. Select **Certificate status** and scroll to the **Customer CA Certificate Chain** and **Customer Device Certificate and Private Key** fields to verify that the certificates were loaded.

Extensible Authentication Protocol (EAP) settings

Your device can use three different EAP types: TLS, TTLS, and PEAP.

Note   The Auto setting is not referenced in these instructions.

Select your EAP type through the Advanced settings screen of your device.

The following instructions describe how to set up certificates on your device based on the EAP setting you choose.

EAP-TLS

The EAP-TLS type requires both server and client certificates.

To use the EAP TLS setting, do the following:

1. Load the certificates as described in "Loading customer certificates" on page 6.

2. Select the **EAP settings** page and check the box next to Verify Server Certificate.

Note   DO NOT select your EAP Type through the radio configuration tool user interface. Use the Advanced settings screen on your device.

3. Verify that the device's date and time are correct and fall within the validity date and time of your certificate.

4. Access the radio configuration settings on your device.

   a. Touch **Settings**.

   b. Touch **Advanced**.

   c. Enter your password in the Advanced setting code field and touch **OK**. If your facility has configured passwords, enter that password. If not, the default password is **6345**.

   d. Touch **Network**.

   e. Touch **Radio**.

5. Select **WPA2-AES** in the Authentication type menu.

6. Select **TLS** in the EAP Type menu.

7. Enter your EAP identity. The default identity is "vitalsigns."

8. Click **Configure radio**.

EAP-TTLS and PEAP-MSCHAPv2

The EAP-TTLS and PEAP-MSCHAPv2 types allow both server and client side certificates. Follow the instructions below based on which certificates you want to use.

To use EAP-TTLS or PEAP-MSCHAPv2 with no server certificate, do the following:

1. Access the radio configuration settings on your device.

   a. Touch **Settings**.

   b. Touch **Advanced**.

    c.   Enter your password in the Advanced setting code field and touch **OK**. If your facility has configured passwords, enter that password. If not, the default password is **6345**.

    d.   Touch **Network**.

    e.   Touch **Radio**.

2. Select **WPA2-AES** in the Authentication type menu.

3. Select **TTLS** or **PEAP** in the EAP Type menu.

4. Enter your EAP identity. The default identity is "vitalsigns."

5. Enter your EAP password. The default password is "password."

6. Click **Configure radio**.

To use EAP-TTLS or PEAP-MSCHAPv2 with only a server certificate, do the following:

1. Load the CA certificate chain as described in "Loading customer certificates" on page 6. However, skip Step 3.

2. Select the **EAP settings** page and check the box next to Verify Server Certificate.

Note   DO NOT select your EAP Type through the radio configuration tool user interface. Use the Advanced settings screen on your device.

3. Verify that the device's date and time are correct and fall within the validity date and time of your certificate.

4. Access the radio configuration settings on your device.

    a.   Touch **Settings**.

    b.   Touch **Advanced**.

    c.   Enter your password in the Advanced setting code field and touch **OK**. If your facility has configured passwords, enter that password. If not, the default password is **6345**.

    d.   Touch **Network**.

    e.   Touch **Radio**.

5. Select **WPA2-AES** in the Authentication type menu.

6. Select **TTLS/PEAP** in the EAP Type menu.

7. Enter your EAP identity. The default identity is "vitalsigns."

8. Enter your EAP password. The default password is "password."

9. Click **Configure radio**.

To use EAP-TTLS or PEAP-MSCHAPv2 with both server and client certificates, do the following:

1. Load the certificates as described in "Loading customer certificates" on page 6.

2. Select the **EAP settings** page and check the box next to Verify Server Certificate.

Note   DO NOT select your EAP Type through the radio configuration tool user interface. Use the Advanced settings screen on your device.

3.   Verify that the device's date and time are correct and fall within the validity date and time of your certificate.

4.   Access the radio configuration settings on your device.

   a.   Touch **Settings**.

   b.   Touch **Advanced**.

   c.   Enter your password in the Advanced setting code field and touch **OK**. If your facility has configured passwords, enter that password. If not, the default password is **6345**.

   d.   Touch **Network**.

   e.   Touch **Radio**.

5.   Select **WPA2-AES** in the Authentication type menu.

6.   Select **TTLS** or **PEAP** in the EAP Type menu.

7.   Enter your EAP identity. The default identity is "vitalsigns."

8.   Enter your EAP password. The default password is "password."

9.   Click **Configure radio**.

Fast-roaming settings

The default fast-roaming setting is OKC/PKC. The radio also supports PMK caching.

To change your fast-roaming settings, do the following:

1.   Create a simple wireless network. See "Creating a simple wireless network setup to install the radio software" on page 2.

2.   Connect to the radio configuration tool user interface.

3.   Select the **EAP settings** page.

Under Roaming Type, select **PMK caching** or **OKC/PKC** (default).