Updating PulsON Modules with New Embedded Code

PulsON® 300 and 400 Series

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Introduction

The PulsON® Radio Update Utility has four purposes:

- It allows the user to update P400 and P300 series UWB modules with the latest embedded software release.
- While not normally recommended, the user can also downgrade modules to previous releases.
- The user can determine whether the modules have been delivered with RangeNet Lite (a node-locked version of RangeNet which supports network functions for up to 10 nodes) or with the fully licensed version (supports operation with an unlimited number of nodes).
- The user can upgrade units from RangeNet Lite to the fully licensed version.

1   Installing New Releases

The following instructions will guide the user through the process of updating either P400 or P300 series UWB modules with new embedded code through either the devices' Ethernet or USB ports.

As of this date, the P400 series of platforms includes the P400, P410, P412, and P440 units. The P300 series currently has only one device, the P330. In this document, the P400 and P300 devices are collectively referred to as UWB modules. The process of upgrading a UWB module is the same regardless of whether the user is updating the unit's embedded RCM, MRM, CAT, or RangeNet code.

All of the code required to update your unit will be found in the release subdirectory entitled "1-Embedded." This directory contains the following three files:

- **PulsON Radio Update Utility.exe:** The program used to update the unit.
- **P4XX_P3XX_Y.zip:** A zip file containing the embedded code to be downloaded to your UWB module, where "Y" is a placeholder for the version of code you will be downloading.
- **Interop.Shell32.dll:** A system file used to facilitate the process.

This document describes the process assuming that you are downloading P4XX_P3XX_170301-beta3. So for this example, the P4XX_P3XX_Y.zip file name is actually P4XX_P3XX_170301-beta3.zip. The convention used to name this file contains the software release date. The format is P4XX_P3XX_yy/mm/dd, so the release date of the embedded code is March 01, 2017.

The following instructions will guide the user through the process of updating UWB modules to embedded firmware version P4XX_P3XX_170301-beta3.

As of the date of this manual, the most current release is P4XX_170330-final.

Step 1:   Connect Update Utility to the UWB Module

Connect the UWB module to the computer via Ethernet or USB and then run the application entitled "PulsON Radio Update Utility." Based on your connection type, select either the "USB" or "IP (Ethernet)" tab.

If you selected USB, then the USB tab will display the connected unit's information as soon as the USB connection is made (see **Figure 1**) and you can proceed to step 2.
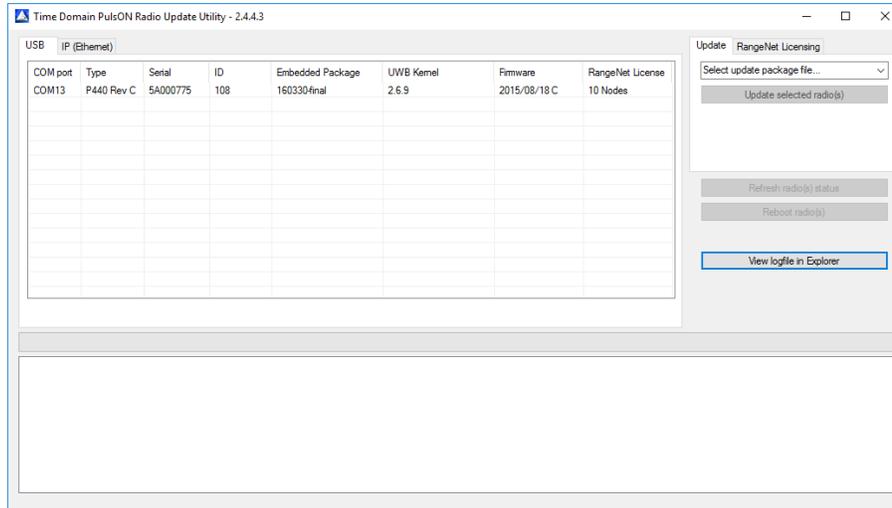

Fig. 1: Update Utility USB window showing connection status

If you choose to connect to the unit with Ethernet, then remember to make sure that your laptop has been configured to communicate with UWB modules through static Ethernet IP addresses. For details on how to set the IP address and Subnet Mask to the correct values (192.168.1.1 and 255.255.255.0, respectively) see either (a) document *320-0328 Connecting to P440 via Ethernet* or (b) **Appendix A: Connecting with Ethernet** of either document *320-0320 P400 RangeNet User Guide* or *320-0338 P300 RangeNet User Guide*. Once the application has launched, follow these steps:

1. If not already present, then enter the radio IP address in the "Add Radio IP Address" field and click "Add." The screen shown in **Figure 2** will appear.
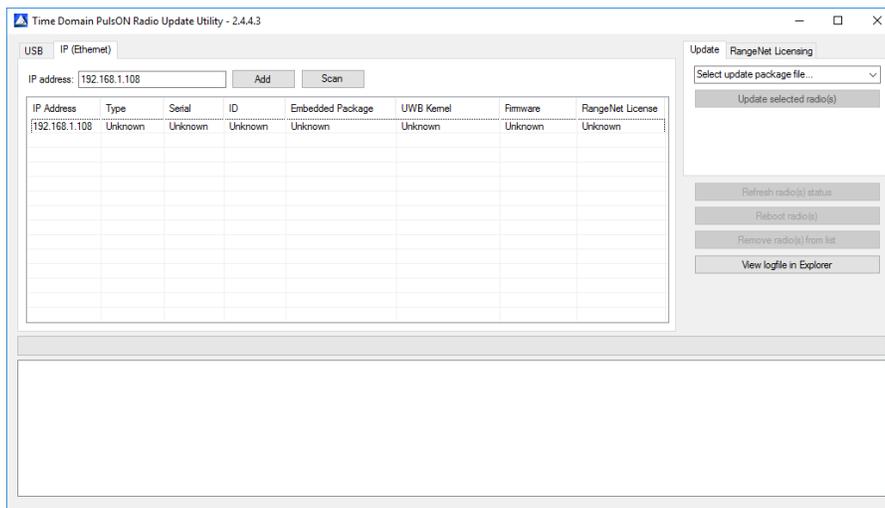

Fig. 2: Update Utility IP (Ethernet) window showing connection status

To the right of the Add button is the Scan button. If you click Scan, then the Update Utility will search for any UWB modules which might be connected to the hub. This is a pleasant convenience when connected to a hub with many units attached. However, this operation is not always reliable. Occasionally a unit will be missed. Clicking Scan a second time might recognize it. If not, it is a simple matter to enter by hand.

Important note: The Scan function will only work with units which have been loaded with170301-beta3 or a more recent version.

2. If you wish to see the status information from the connected radio, then click the line in the table containing the radio of interest and then click the Refresh radio(s) status button.

Step 2: Download the New Release Code to the UWB Module

The following instructions, with one minor exception, are the same for connections made with USB or Ethernet.

Click the Update Tab located on the right-hand side of the screen and then select the Update release package you wish to download by clicking on the appropriate entry in the drop-down menu. See **Figure 3** for an example.
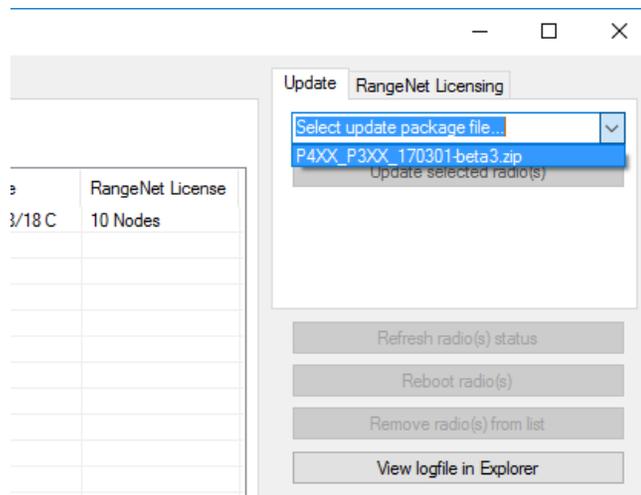

Fig. 3: Package to release is selected through the Update Tab

If not already highlighted, click to highlight the desired unit (or units) in the list on the left side of the display. This will enable the actions to be selected.

Click "Update selected radio(s)." Once clicked, the utility will provide a list of messages that starts with "Unzipping…" and a progress bar indicating module update status. The time required to complete an update is approximately 1-3 minutes per module.

The process will normally complete with the message "Update process finished without error." **Figure 4** shows the message traffic associated with a typical download.
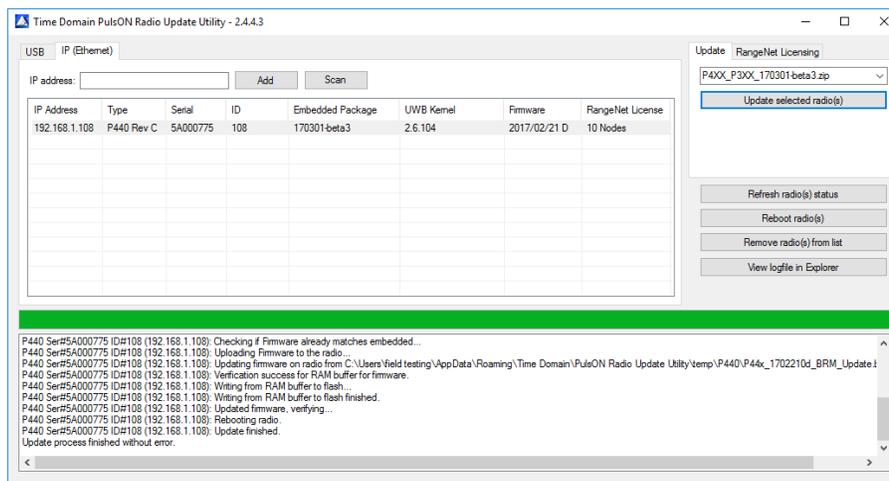

Fig. 4: Example of a successful download

Occasionally the Update Utility will fail to complete correctly, in which case it will indicate "Update process finished, but with errors." If this should happen, then check to see that the cabling is still properly connected. If so, then rerun the Update Utility. If that fails to fix the issue, click the Reboot radio button (this will reboot and disconnect the radio) and again click "Update selected radio(s)." If the unit still fails, then disconnect power to the unit and try again. If the problem still exists and you are certain that there is no cabling issue, then click on the "View logfile in Explorer" button. This will lead you to the Update Utility logfile. Copy this file to your desktop and email it with a short description of your problem to Time Domain's customer support team at support@timedomain.com.

The update process will need to be repeated for each of your UWB modules.

Note that you may update more than one unit at a time. Simply connect multiple units through a hub to the computer, entering each unit and then select all of the units to be updated before you click "Update selected radios(s)." Units are selected by using either shift and left-click or CTRL and left-click.

One Exception

Updating more than one unit at a time is a reliable and well-tested means of updating many units effortlessly through the Ethernet connection. Unfortunately, the same cannot be said of the USB connection. We have discovered that some (perhaps most) USB hubs do not interface reliably to multiple units. It can be very frustrating to have a unit disconnect itself from the hub in the middle of a download and fail to reappear, or worse yet reappear as two separate entries in the table. Also, Microsoft Windows does not reliably deal with multiple USB ports and tends to occasionally forget that they are connected. Therefore you should avoid using the USB to update multiple units.

2   Downgrading to a Previous Release

Time Domain strongly recommends that you always upgrade your UWB modules to the latest version. New versions have new and valuable features that will improve performance in important and meaningful ways.

Having said that, there are times when a user may want to return to an earlier release. A common concern is that an upgrade may break compatibility with user-developed Host-based interface software. This is a valid concern. New features may include changes to one or two parameters in the interface, which can break software compatibility with the user-developed software. However, Time Domain works hard to capture any such changes in the release notes. This enables the user to quickly and easily change their software (if necessary) such that their code will work with the new release. In principle, the proper process is to install the new release and make the necessary changes to the existing user code.   In practice, there are times when this isn't feasible; in which case a downgrade is a reasonable, if less than desirable, option.

When downgrading a unit, the user must take care NOT to downgrade a unit to a version of software that precedes your original release. Doing so could break a radio because some versions of the UWB modules are not compatible with older revisions of software. In these cases, it is possible to download the old software version successfully, but afterwards the unit will not run properly.   In most cases, it is possible to successfully recover by downloading the new software release.

This is an easy mistake to make if you have a mix of P4xx units.   For example, let us assume that you have several different members of the P400 family and that you have never upgraded any of the units to a more recent version.   Let us further assume that you have a few P400s running 140301, a few P410s running 150206, and a few P440 Rev Cs running 151215. All of these units can be upgraded to version 160330. If you decide to upgrade to 160330 and then reconsider, then be careful to downgrade them properly. For example, the P400s will downgrade to their original 140301, but downgrading a P440 Rev C to any code earlier than 151201 will break it. Fortunately, when the P440 completes an illegal download, the fault light will be blinking rapidly, indicating a problem. The unit will recover if it is upgraded to 151201 or higher.

To downgrade a UWB module, perform the following steps:

1. Find release disks of interest. These might be the disks originally delivered with your UWB modules or they might be a subsequent release that was sent to you by disk or over the Internet.
2. Open the release directory entitled "1-Embedded" and copy the file "P4XX_xxx".zip file to the directory containing the most recent version of the PulsON Radio Updater Utility.
3. Connect the module to be downgraded to the Host computer and run the Update Utility. Let us assume that (a) unit 108 is currently at version 160330-final, (b) but you wish to downgrade it to 151215-final, and (c) that you have moved the P4XX_151215-final to the directory containing the 170301-beta3 release zip file. In that case, **Figure 5** shows the screen which would appear if you connected to the unit with Ethernet. At this point you should select the P4XX_151215-final.zip file from the drop-down menu, highlight the entry for unit 108 by clicking on it, and then click the "Update Selected radio(s)" button.
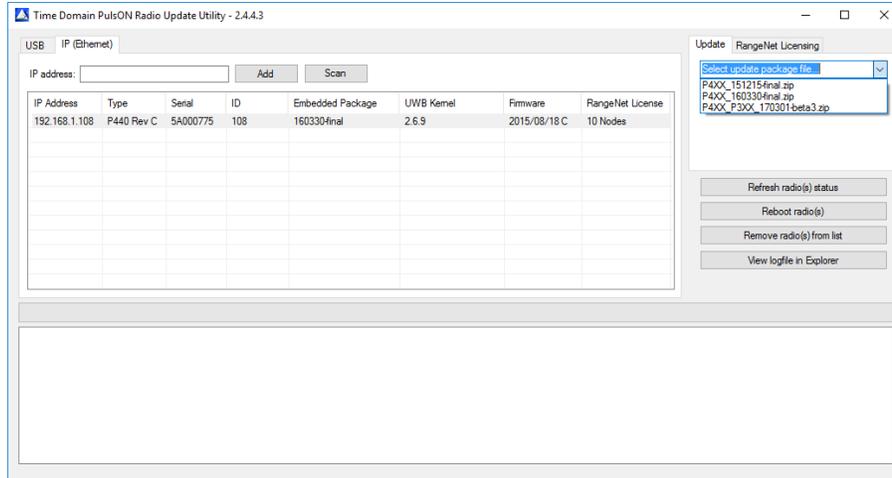

Fig. 5: Example of downgrading

4. Starting the downgrade will provoke the reminder shown in **Figure 6**. This is your last chance to abort the download.
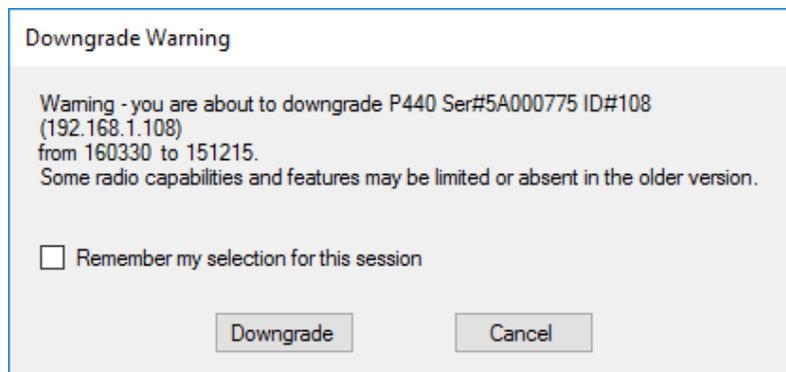

Fig. 6: Downgrade Warning

If you are downloading multiple units at the same time, then click the box labelled "Remember my selection for this session." This will prevent the Downgrade Warning from appearing before each unit downgrade.

3   License Determination

By now you have surely noticed that the column on the far right indicates whether the RangeNet license is restricted to 10 nodes or if it is unlimited. **Figure 7** shows four units connected. Units 108, 201, and 204 are limited to operation with 10 nodes. This is the RangeNet Lite version. Unit 205 is operating with an unlimited RangeNet license and can be used with any number of units.
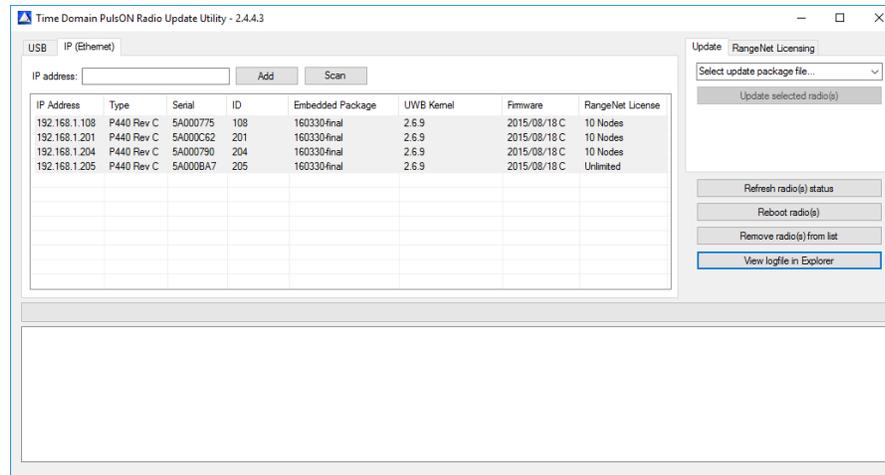
Fig. 7: Unit 205 has an unlimited license while units 108, 201, and 204 are restricted to networks of 10 nodes or fewer

4   Upgrading from RangeNet Lite to an Unlimited License

At some point you may want to upgrade from RangeNet Lite to an unlimited License. To do so you will need to receive an "Unlimited License File" from Time Domain.   This file will contain the serial numbers of each UWB module which you currently own, as well as a unit-specific key.   Units you purchase in the future will be shipped from the factory preset for unlimited use.

To upgrade units you currently own, follow these steps. This example assumes that the name of your license file will be "TimeDomain_RangeNetLicense_Unlimited.txt."

1. Copy the License File into the directory where you keep the Radio Update Utility.

2. Connect the unit(s) you wish to upgrade to the Host computer and open the Radio Update Utility.

3. Connect to the unit(s) as you would for updating a new release.

4. Click on the RangeNet Licensing tab and then select the file "TimeDomain_RangeNetLicense_Unlimited.txt" from the drop-down window. This is illustrated in **Figure 8.**
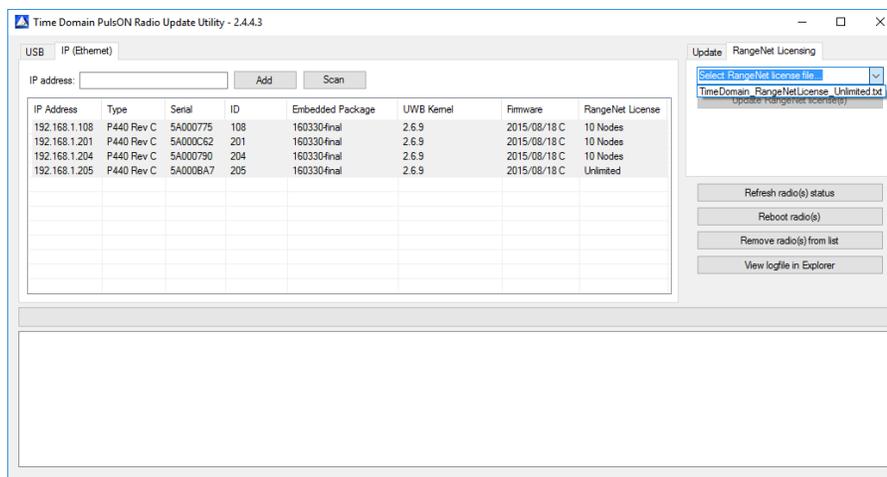
Fig. 8: Example of how to upgrade your RangeNet license on a particular unit

5. Click to highlight the unit you wish to upgrade.

6. Click the "Update RangeNet License(s)" button. Once clicked, a completion message will
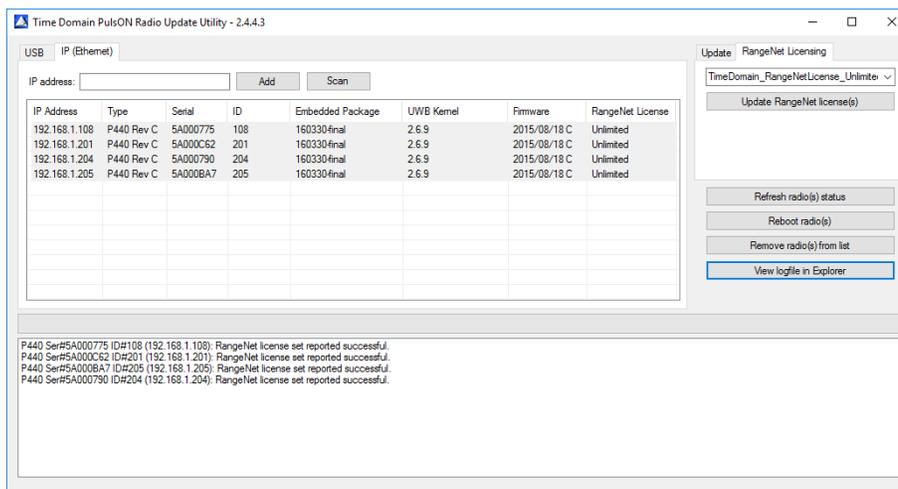   appear and your RangeNet License will change from "10 Nodes" to "Unlimited."

Fig. 9: Example of a successful license upgrade

You can upgrade the units one by one, or you can connect many units to a hub and upgrade them all
at once.   However, if you do so, please use an Ethernet hub. USB hubs are subject to erratic
behavior.