RTS Digital Matrix Intercom

Application Note

Firmware Upload Tool and Device Software Upgrade and Installation and Guide

1.0 Introduction

This document provides the user information related to the installation and usage of the **FWUT** (Firmware Upgrade Tool). FWUT is used for upgrading the firmware on the RTS-OMNEO devices. FWUT supports firmware upgrade for the following RTS-OMNEO devices.

Nr.	Device	Description	Displayed in FWUT
1	OMI	OMNEO Matrix Interface card.	OMI Tab
2	OKI	OMNEO Keypanel Interface card. This is the option interface card used with KP-32 CLD, KP-12 CLD, KP-32 Classic and RP-1000.	OKI Tab
3	OEI-2	OMNEO External Interface box. This box is used to provide an OMNEO interface to legacy keypanels.	OEI-2 Tab
4	OKP	The new KP Series keypanels with a built-in OMNEO interface. This includes all KP Series models.	OKP Tab
5	OAP	Upcoming Access Point devices used with ROAMEO beltpacks (BP) **NOTE:** The ROAMEO beltpack firmware is not supported by FWUT. However, the beltpack firmware can be uploaded via the USB port on the beltpack.	OAP Tab
6	ARNI	Audio Routed Network Interface *ARNI-S (standard)* *ARNI-E (enterprise)*	ARNI-E/S

2.0 Overview

The updating process consists of five steps:

1. Download the OMNEO Suite from the RTS website
2. Run the Setup file (“Installation Steps” on page 5)
3. Verify IPedit and AZedit are on the PC being used for the upgrade
4. Run FWUT (“Example of Upgrade Steps” on page 12).
5. Verify the installation of the firmware is successful using IPedit or AZedit

3.0 FWUT Information

IMPORTANT: Verify the FWUT and the device upgrade files are installed on the PC or laptop before upgrading the firmware to the RTS-OMNEO devices.

3.1 Installation Files

The FWUT and the device upgrade files are available with the OMNEO Suite in the following folder at *\OMNEOSuite<V.x.x>\Packages*.

The FWUT folder contains installation files for both 64- and 32-bit systems. Appropriate setup files must be chosen for installation.

Use Table 1 to determine the proper setup files needed to upgrade the RTS-OMNEO devices.

TABLE 1. Setup Files

Nr.	File Name[a]	Description
1	SetupOMNEOFirmwareUploadTool64.msi	This setup installs the FWUT tool utility.
2	SetupOMNEONiosFirmware64.msi	This setup installs files required for OMI firmware upgrade.
3	SetupOMNEOOEI2Firmware64.msi	This setup installs files required for OEI-2 firmware upgrade.
4	SetupOMNEOOKPFirmware64.msi	This setup installs files required for KP Series firmware upgrade.
5	SetupOMNEOOAPFirmware64.msi (currently unavailable)	This setup installs files required for Access Point firmware upgrade.
6	SetupOMNEOArniFirmware64.msi	This setup installs files required for ARNI firmware upgrade.
7	SetupBoschDNS-SDService64.msi	This setup installs files required for Bosch DNS-SD service used for discovery of devices in the FWUT.

a. The f ile names for a 32-bit system.

3.1.1 Installation Folder

The FWUT setup files are installed under the following folder on the PC/Laptop:

C:\Program Files\BOSCH\OMNEO\Firmware Upload Tool

The following sub-folder contains the FWUT files related to the devices (OMI, OKI, OEI-2, KP Series…):

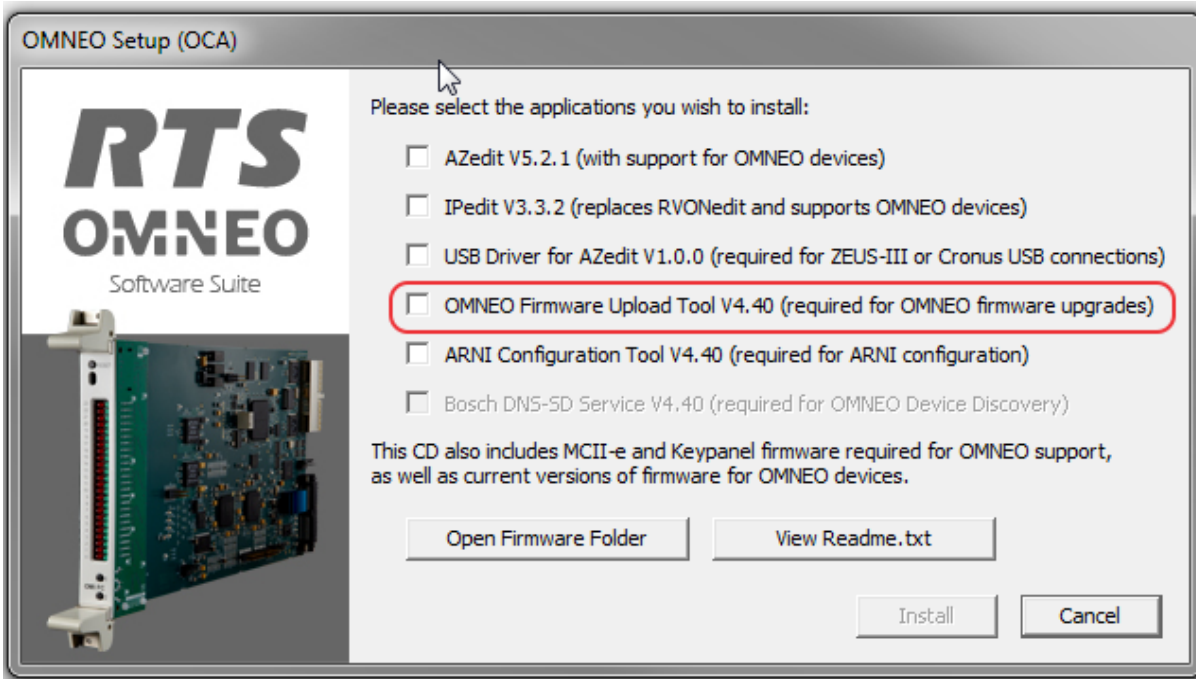
C:\Program Files\BOSCH\OMNEO\Firmware Upload Tool\Upload Plugins

3.1.2 Installation Steps

There are two options for installing the setup files:

Option 1 (Recommended) **Run the Setup.exe in the OMNEO Suite package**.
The OMNEO Setup (OCA) window appears.

IMPORTANT: When the OMNEO Suite is installed, the main application plus all plug-ins installed automatically.



Option 2 Manually install the **individual setup files**.

3.1.3 FWUT Usage

A help file, named FirmwareUploadTool.chm, is installed along with the FWUT file. It contains information on the FWUT and its usage. It also has instructions on how to complete some of the more necessary operational procedures, such as how to run the FWUT in advanced mode from a command line.

3.2 Firmware Upgrade

When the FWUT is launched, it automatically displays all the RTS-OMNEO devices discovered in the system. The devices are listed on the separate tabs based on the Model ID. Use Table 2 to determine the Model ID of the RTS-OMNEO devices and their user-identifiable names. For more information, see “Example of Upgrade Steps” on page 12.

TABLE 2. Model ID Description

Nr.	Model ID	As displayed on FWUT Tab	Description
1	2049	OMI-Audio Device	OMI-Audio Device
2	2050	OKI	OKI
3	2051	OMI-Controller	OMI-Controller Device
6	2060	OEI-2	OEI-2
7	2070	OKP	KP Series (OMNEO keypanel)
8	2080	OAP	OMNEO Access Point

3.2.1 Firmware Upgrade Files

NOTE: FWUT only recognizes and supports files which have a .capfw extension. No other file formats (mot, bin, hex) are supported.

Each device has set of .capfw files used for upgrading the firmware.
The naming convention <*DeviceName_Firmware_Version*>*.capfw* is used in naming the files.

Table 3 displays the currently released .capfw files for RTS-OMNEO devices. For more information, see the individual device's release notes.

IMPORTANT: The selection of RSTP or noRSTP .capfw firmware file is determined by the network configuration. For more information, see the OMNEO Resource Guide available on the RTS website.

TABLE 3. Firmware Files

#	Device	Firmware Files	Description
1	OMI	OMI-Firmware_RSTP_V6.x.x.capfw OMI-Firmware_noRSTP_V6.x.x.capfw	Firmware files which upgrade the OMI card
		OMI-Firmware_FPGA_0.75.capfw	Firmware files which upgrade the FPGA on the OMI card
2	OKI	OKI-Firmware_RSTP_V6.x.x.capfw OKI-Firmware_noRSTP_V6.x.x.capfw	Firmware files which upgrade the OKI card
3	OEI-2	OEI-Firmware_RSTP_V6.x.x.capfw OEI-Firmware_noRSTP_V6.x.x.capfw	Firmware files which upgrade the OEI-2 card
The following files give details for the different OKP (KP Series) firmware file. Each firmware file is used to update a particular component. This is to provide flexibility when there is only one component to update.			
4A	OKP_Audinate_v5.xx.yyyy_Client_v2.xx-OCA.capfw		RSTP version of firmware and should be used to update all the KP Series components
4B	OKP_Audinate_NoRSTP_v5.xx.yyyy_Client_v2.xx-OCA.capfw		Non-RSTP version of firmware and should be used to update all the KP Series components
4C	OKP FPGA v5.0.0.capfw		This firmware file contains the Intercom FPGA component

NOTE: Refer to the KP Series release notes in case there is a change in the client or FPGA image.

AZedit Upgrade (Optional)

This section is specifically for the KP Series keypanels. Table 4 gives details about the files that can be upgraded via AZedit tool.

NOTE: It is recommended to run the most current version of the bootloader. The keypanel must be connected to Intercom via either an OMI card or an AIO card.

TABLE 4. Firmware Upgrades

#	Filename	Description
1	KP-Series_client_z_v2.x.x-OCA.mot	This file updates the client component of the KP Series keypanels. It **does not** contain the Dante component.
2	KP-Series-FPGA_v5.0.0.mot	This file contains the Intercom FPGA component of the KP Series keypanels. This is not Dante component
3	KP-Series_boot_v1.3.0.mot[a]	This is the firmware file for the boot loader of the keypanels. The boot loader component **cannot be** updated using the FWUT.
4	VM-chimes.mot	This file contains the default voice mail chimes.
5	VM-icons.mot	This file contains the default voice mail icons.

a. To check versions on the device, press and hold **both shaft encoders** and then press the **Menu** button on the keypad.
Service menu appears.
Select **Boot Code**.
The Boot Code version appears on the panel display.

4.0 Migration from OCP to OCA

Beginning with V6.x.x, all RTS-OMNEO device firmware has been migrated to the new OCA Platform. Previous versions up to and including V5.2.12 have been discontinued.

V6.x.x provides following features

- Adjustable Receiver Latency
- Switch between RSTP/no RSTP mode from IPedit
- Show audio connection status in IPedit between RTS-OMNEO devices and other Dante devices

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IMPORTANT: These instructions need to be followed exactly for a successful migration of the RTS-OMNEO devices. Refer to the release notes provided in the OMNEOSuiteV6.x.x for details.

All devices in the system must be updated for devices to work with each other. OCA devices cannot be used with non-OCA devices.

4.1 Mandatory Instruction

IMPORTANT: It is crucial to uninstall the existing FWUT package and reinstall the update.

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1. Uninstall the existing **version of the FWUT and its associated plug-ins**.
   a. From the Start Menu, select **Control Panel | Programs**.
   b. Click **Uninstall a program**.

   c. Uninstall the **OMNEO FWUT, NIOS, OEI2, and OKP Firmware packages**.

d. Verify the following **directories are present and that they are empty**. If there are files in the directory, then delete them.
   - C:\Program Files\Bosch\OMNEO\Firmware Upload Tool
   - C:\Program Files\Bosch\OMNEO\Firmware Upload Tool\UploadPlugins

2. Using the latest version provided in the OMNEO Suite V6.1.x or higher, upgrade the FWUT and the associated plug-ins.

NOTE: For the latest version of the OMNEO Suite, visit www.rtsintercoms.com.

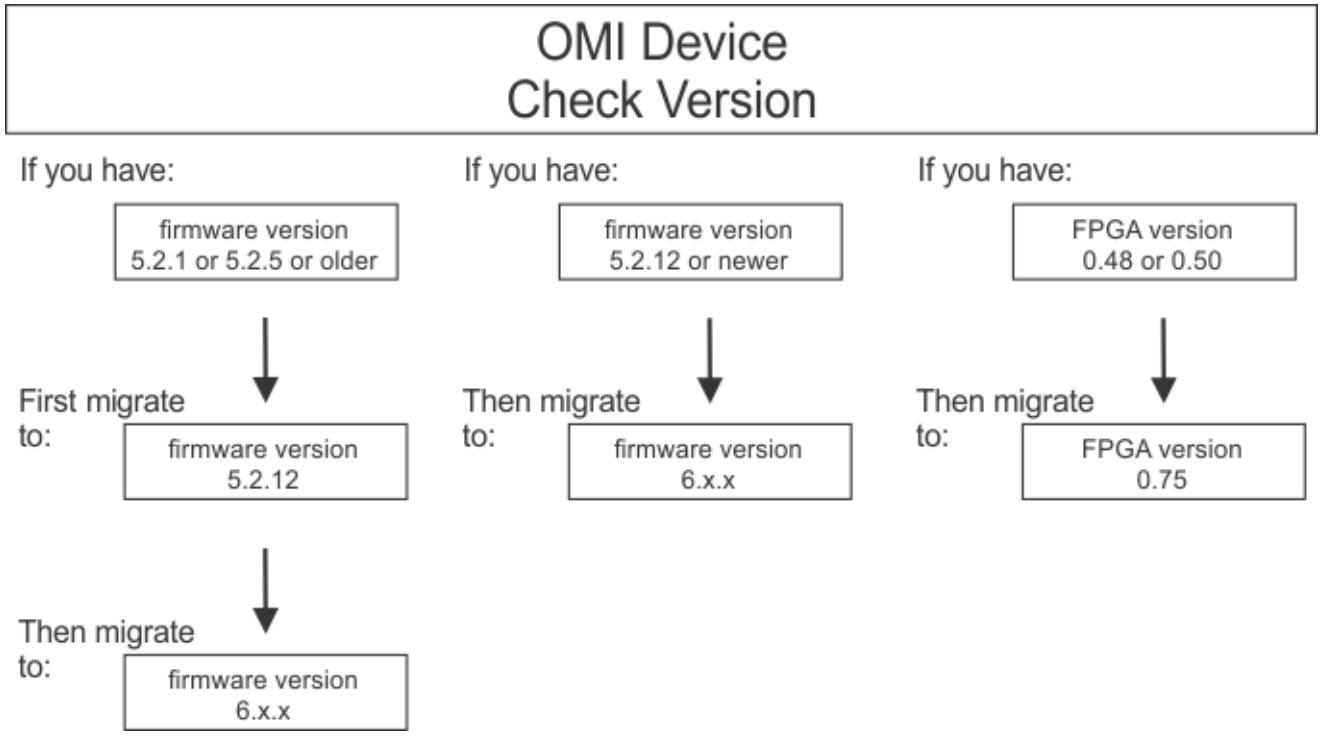
3. Verify files are present in the following directories:

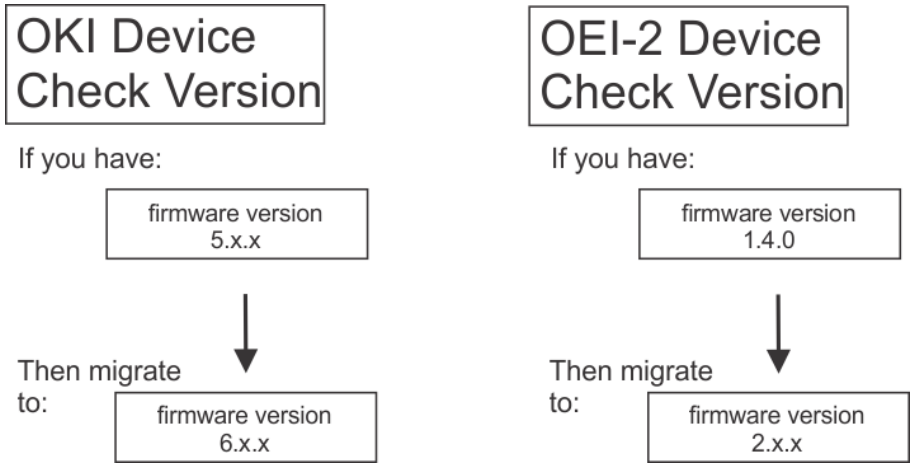
   a. C:\Program Files\Bosch\OMNEO\Firmware Upload Tool
      - OAPOCAFWUTProxy.dll
      - FpgaNiosFWUProxy.dll
      - MCUFWUTProxy.dll

   b. C:\Program Files\Bosch\OMNEO\Firmware Upload Tool\UploadPlugins
      - UploadFpgaNIOS.dll
      - UploadOKP.dll
      - UploadOEI2.dll

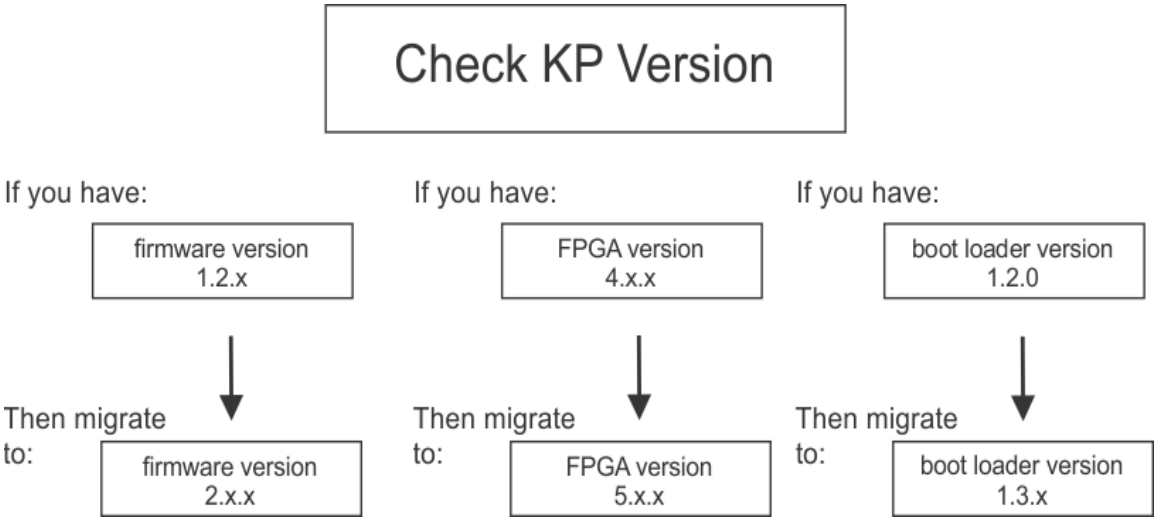
4. Using the following graphics, determine the correct migration sequence and .capfw file to use.

IMPORTANT: To avoid firmware upgrade failures and incorrect firmware being installed on the devices, use the illustration below lists the path for different devices.





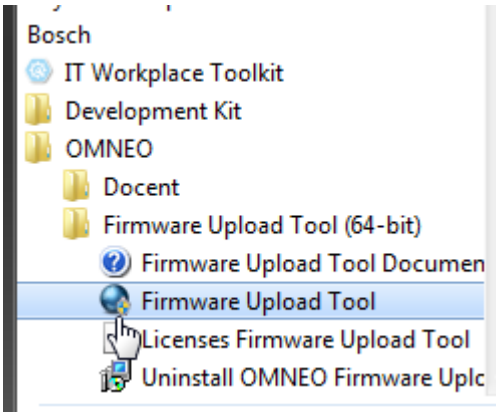
The following migration path determines the firmware files required for the KP Series panels.



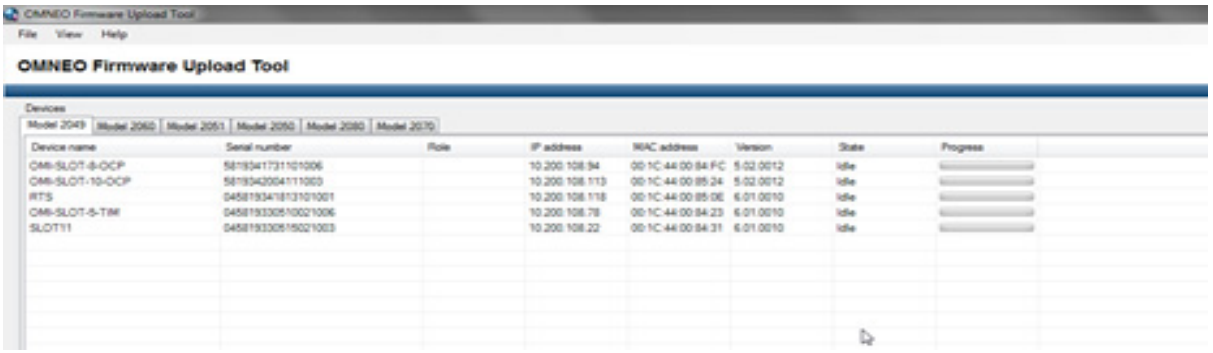
4.2 Example of Upgrade Steps

The following example shows upgrading OMI device, but this example is applicable for other device types.

1. Open the **FWUT**.

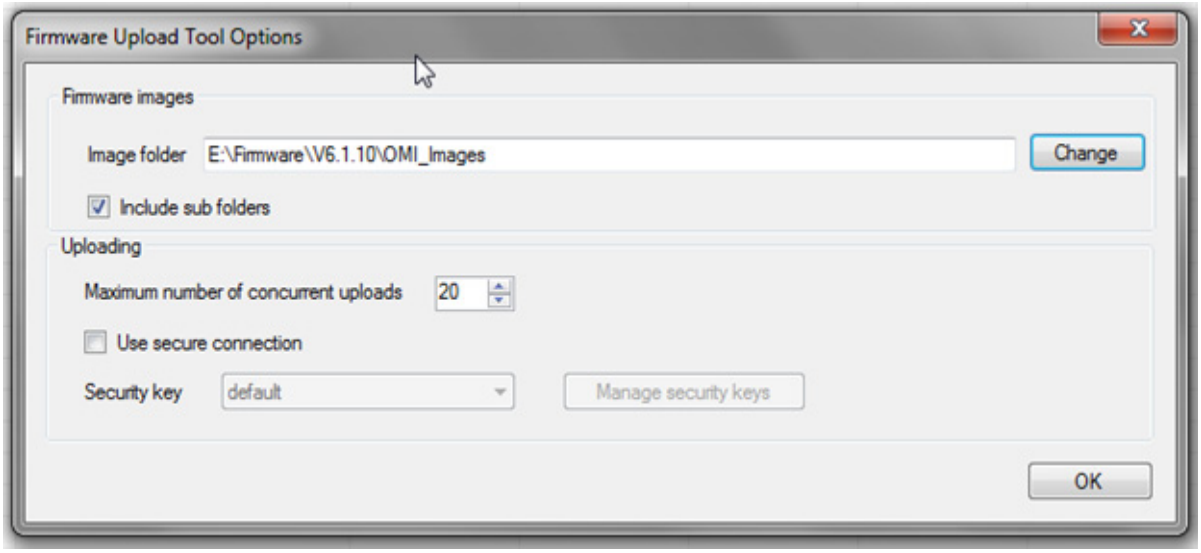


Once the FWUT is opened it displays a list of devices (shown). If this displays, it means the image folder path does not contain the firmware upgrade files (.capfw files).



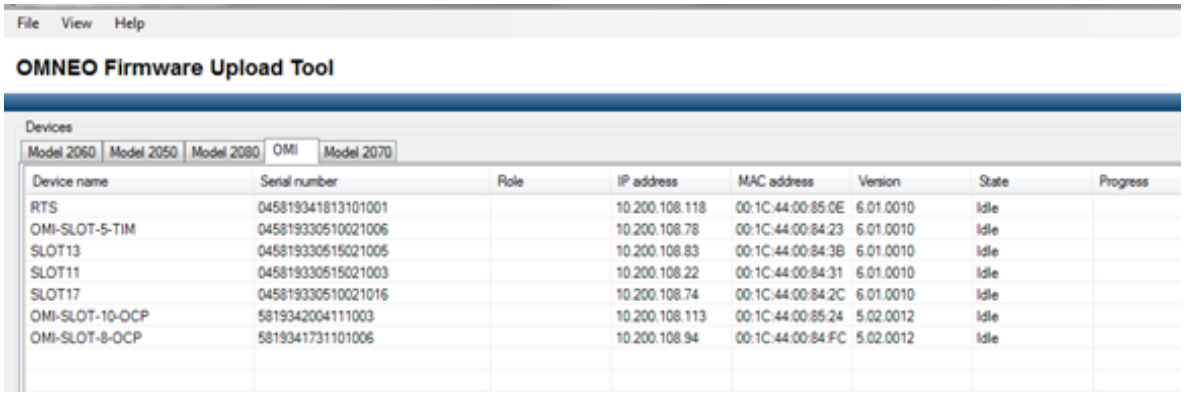
2. From the File menu, select **Options**.
   The Firmware Upload Tool Options window appears.
3. Enter the **image folder path** which contain the .capfw file.
   OR
   Click the **Change button** to navigate to the file.

In this example the image path contains folder which has OMI .capfw files.

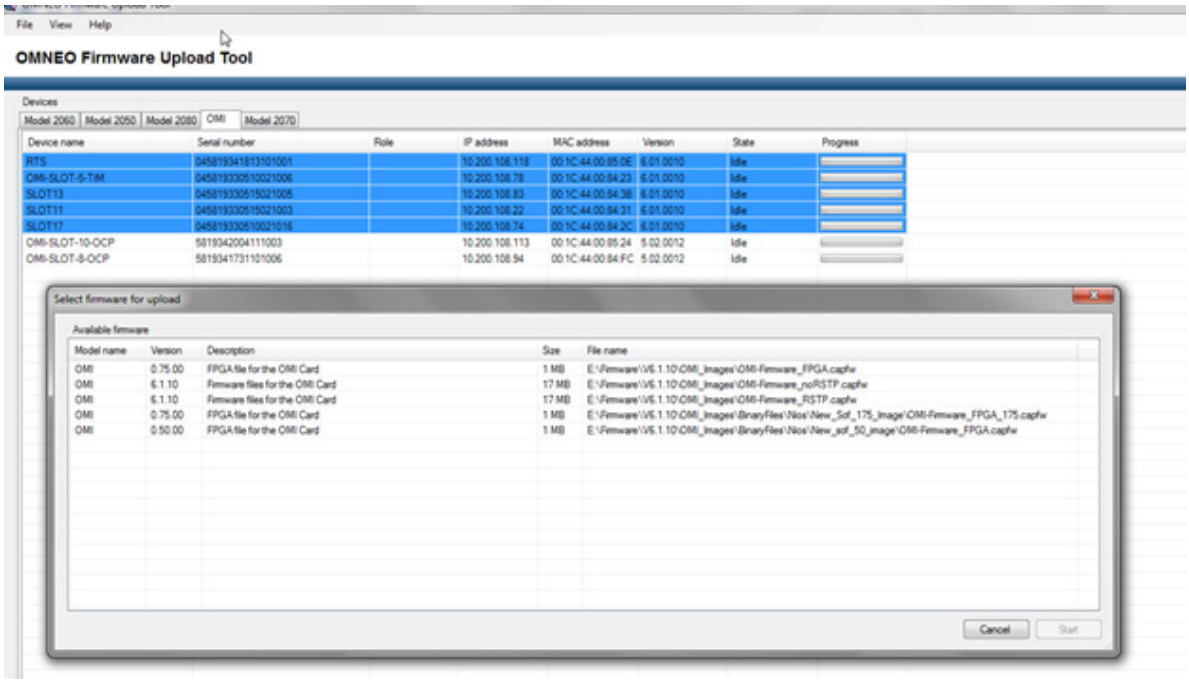


Once the image folder path is set the FWUT displays the OMI tab which contains the discovered OMI devices (shown).

4. From the OMI tab page, select the **OMI device or devices**.

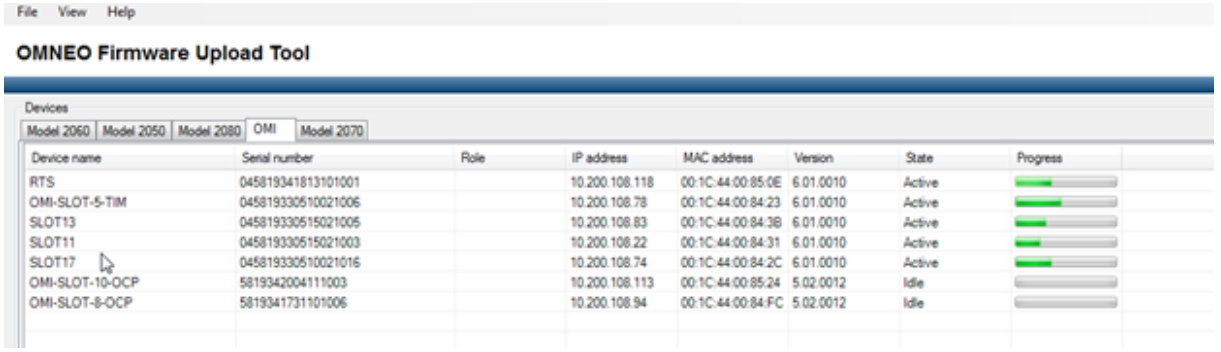


5. Click the **Upload button**.
   The Select Firmware for upload window appears displaying a list of OMI .capfw files.



6. From the Available firmware list, select the correct **OMI .capfw file**.
   The Start button activates.

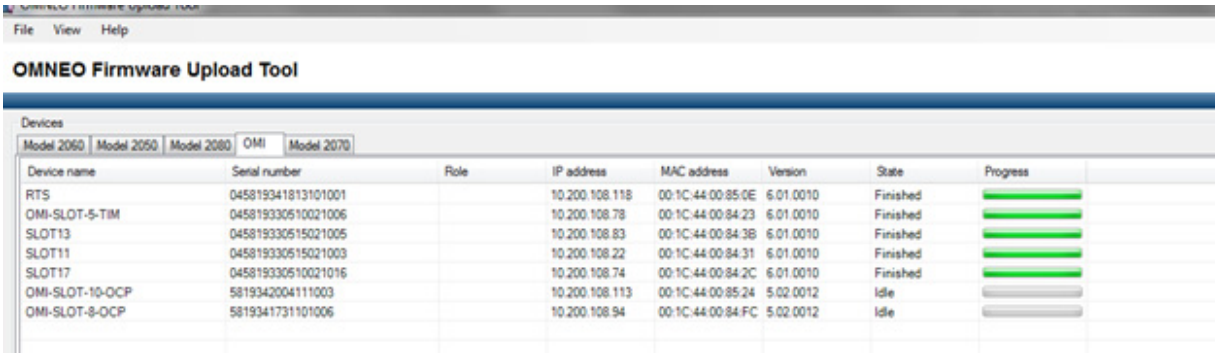
7. Click the **Start button**.
   A progression bar displays showing the progress of the firmware upgrade.



The version string for IO card in AZedit alternates between version and Firmware Download In Progress (shown).

009 n/a
010 n/a
011 FIRMWARE DOWNLOAD IN PROGRESS
012 n/a
013 FIRMWARE DOWNLOAD IN PROGRESS
014 n/a

The State column displays Finished.



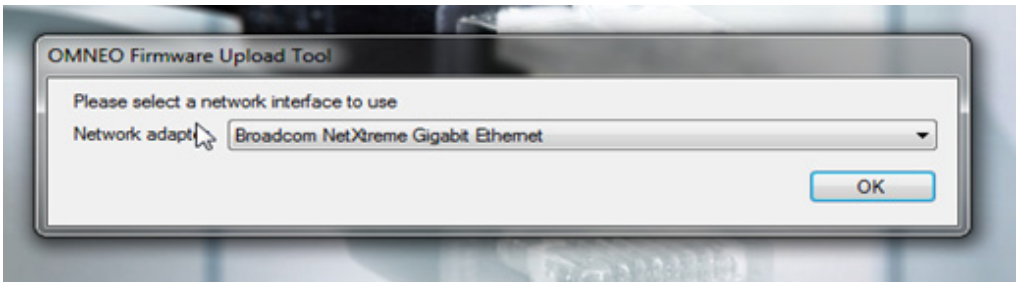
8. Verify the **version is updated in AZedit or IPedit**.

5.0 Troubleshooting Guide

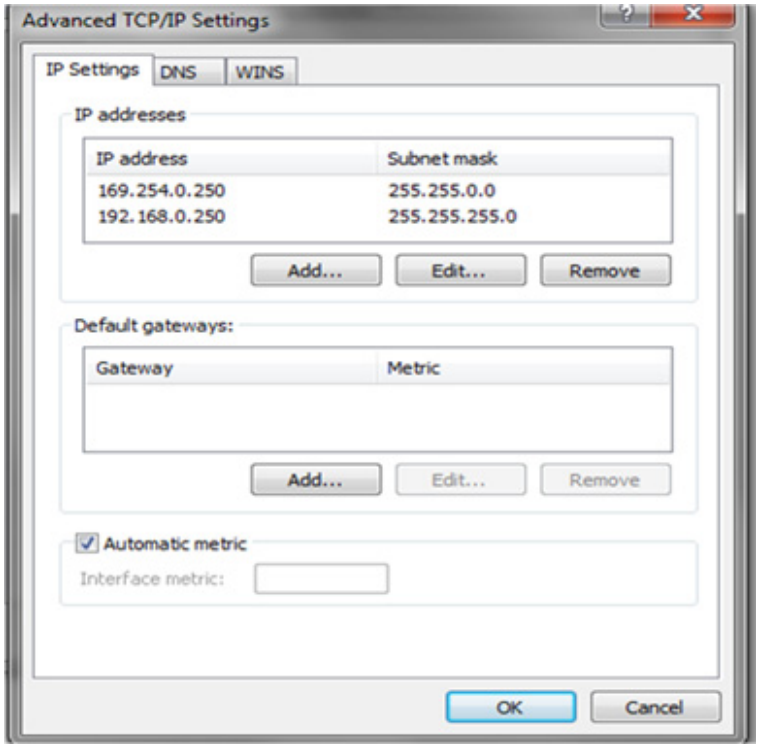
Q1. I see the device discovered in the FWUT, but when I select the file and click update, it displays *Failed* immediately.

A1. Verify the IP Address of the PC/Laptop running FWUT is in the same subnet as the devices being upgraded. Even though FWUT can discover devices in other subnets, it will fail to connect.

A2. Verify the correct adapter is selected when the FWUT is launched.



A3. Verify two IP Addresses have not been assigned to the same adapter.

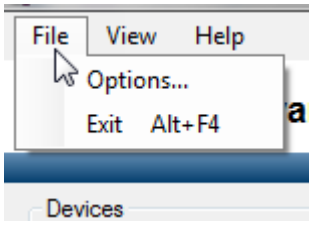


Q2. FWUT is in the same subnet as the devices, but when I select the file and click update, nothing happens.

A2. Verify the device upgrade files have been installed for that device.
These files are available in the following directory:
C:\Program Files\BOSCH\OMNEO\Firmware Upload Tool\UploadPlugins

Q3. How do I refresh the FWUT so it shows the updated status?

A3. From the File menu, select **Options**, and then click **OK**.



The Options window appears.
Click **OK**.
The Options window closes.

Q4. How do I abort a Firmware upgrade to a device from the FWUT?

A4. The FWUT does not have an Abort button. Use the Windows Task Manager to force the Firmware Upload Tool to close.

NOTE: All devices have a fail-safe mechanism implemented in them.

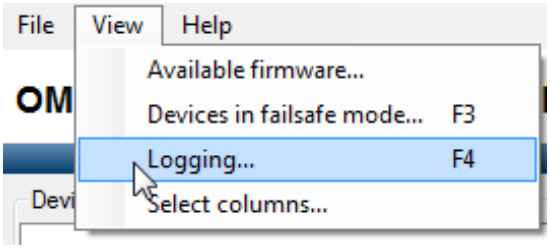
Q5. I see the device in the FWUT, but when I select the file and click update, it displays a green progress bar, but then shows *Failed* after some time.

A5. Verify the TFTP ports / application are blocked on the network or by the firewall.
FWUT uses TFTP to transfer files to the devices.

Q6. How do I get additional information on why the upgrade to the device failed?

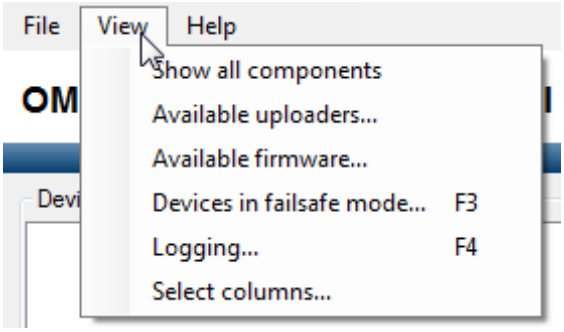
A6. FWUT log files are available in two places:

1. From the View menu, select **Logging**.
   The Logging window appears and displays the currently logged messages. The log messages in this window are lost when FWUT is closed.
   OR
   Navigate in Windows Explorer to ***C:\ProgramData\Bosch\OMNEO\FirmwareUploadLog.***
   This folder contains log file. A new log file is created every time FWUT is opened. For trouble-shooting the information in the log file is helpful.



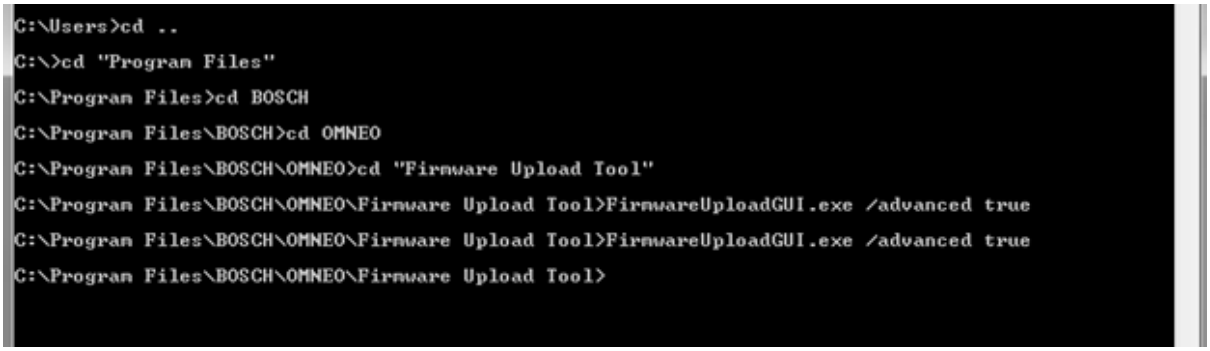
Q7.What is advanced mode of the FWUT?

A7. Advanced mode of the FWUT is exactly same as the normal mode as far as the upgrade process is concerned. In Advanced Mode, additional menu items are displayed. For more information, see the FWUT help file.



Q8. How do I run the advanced mode of the FWUT?

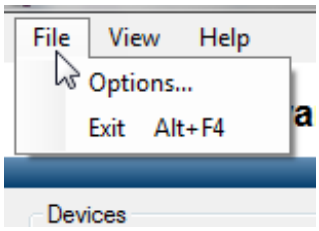
A8. Open the **DOS CMD Prompt** window.
Go to the **directory** (shown).
Type in the command **FirmwareUploadGUI.exe /advanced true**.

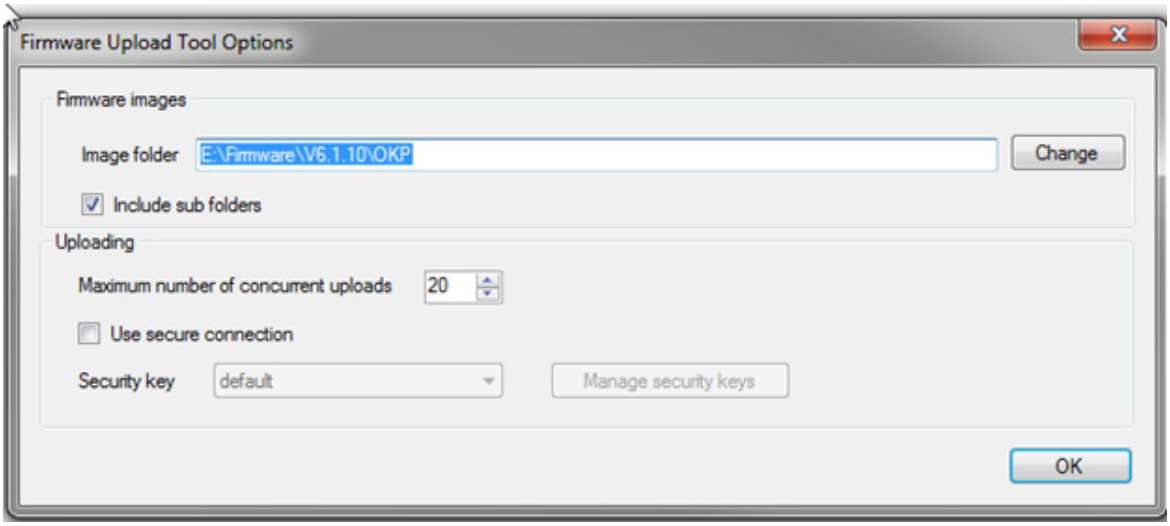


Q9. Why do I see numbers like 2050, 2049, and 2070 on the FWUT Tabs instead of the OKI, OMI, and OKP?

A9. FWUT discovers devices using Bosch DNS-SD service. The discovered devices and their names are displayed as Model ID's of the devices. For more information on Model ID, see Table 2 on page 6.The user defined names are displayed based on the firmware upgrade .capfw files. The .capfw files should be present as defined in the following path.

1. Click **File | Options**
   The Firmware Upload Tool Options window appears.





Q10. What happens if the Firmware Upgrade process is interrupted because of one of the following two conditions?

- Network Disconnection
- Accidental shutdown of devices

A10. All RTS-OMNEO devices implement a fail-safe mechanism. After timeout, the FWUT displays a ***Failed*** status. The devices themselves reset and reboot to the previous version or if they are in the boot loader mode, they stay in the boot loader mode. The recovery options are shut down the FWUT and reopen it, so that the devices are discovered again. Send the upgrade files again.

Q11. What is OMI-Controller and OMI-Audio Device? How do I upgrade them?

A11. The OMI IO card has two upgradable components – OMI-Controller and OMI-Audio Device. These components have different roles and communicate internally with each other over the SPI bus.
The OMI-Controller manages the Intercom functionality and audio routes.
The OMI-Audio manages all the audio.

Q12. The OMI-Controller version is different from the Audio device version, how do I sync it?

A12. The simplest way is upgrade/downgrade the Audio Device version to that of the OMI-Controller. The steps to do this is as follows.

1. Open the **FWUT**.
2. From the File menu, select **Options** and then select the **image folder path which contains only the OMI_AudioDevice<version>.cap**.
3. Click **OK**.
   The OMI-Audio Device tab appears.
4. Select the **OMI device** for which there is a mismatch.
5. Click the **Upgrade button**.
6. Click the **Send button**.
   Once the upgrade is successfully completed, both versions are synced.

Q13.I have selected OMI-Firmware .capfw, the controller is showing new version on AZEdit/IPEdit but the FWUT stills shows updating?

A13. As mentioned earlier OMI has 2 components OMI-Controller and OMI-Audio Device, the FWUT upgrades the OMI-Controller first. Once the OMI-Controller is updated, the OMI card resets. The FWUT reconnects with the OMI card and then starts the upgrade of the OMI-Audio Device. Till the OMI-Audio device upgrade is not completed the FWUT will show as updating.

Q14. I have selected OMI-Firmware.capfw, the upgrade was successful but only Audio Device got updated and not the OMI-Controller?

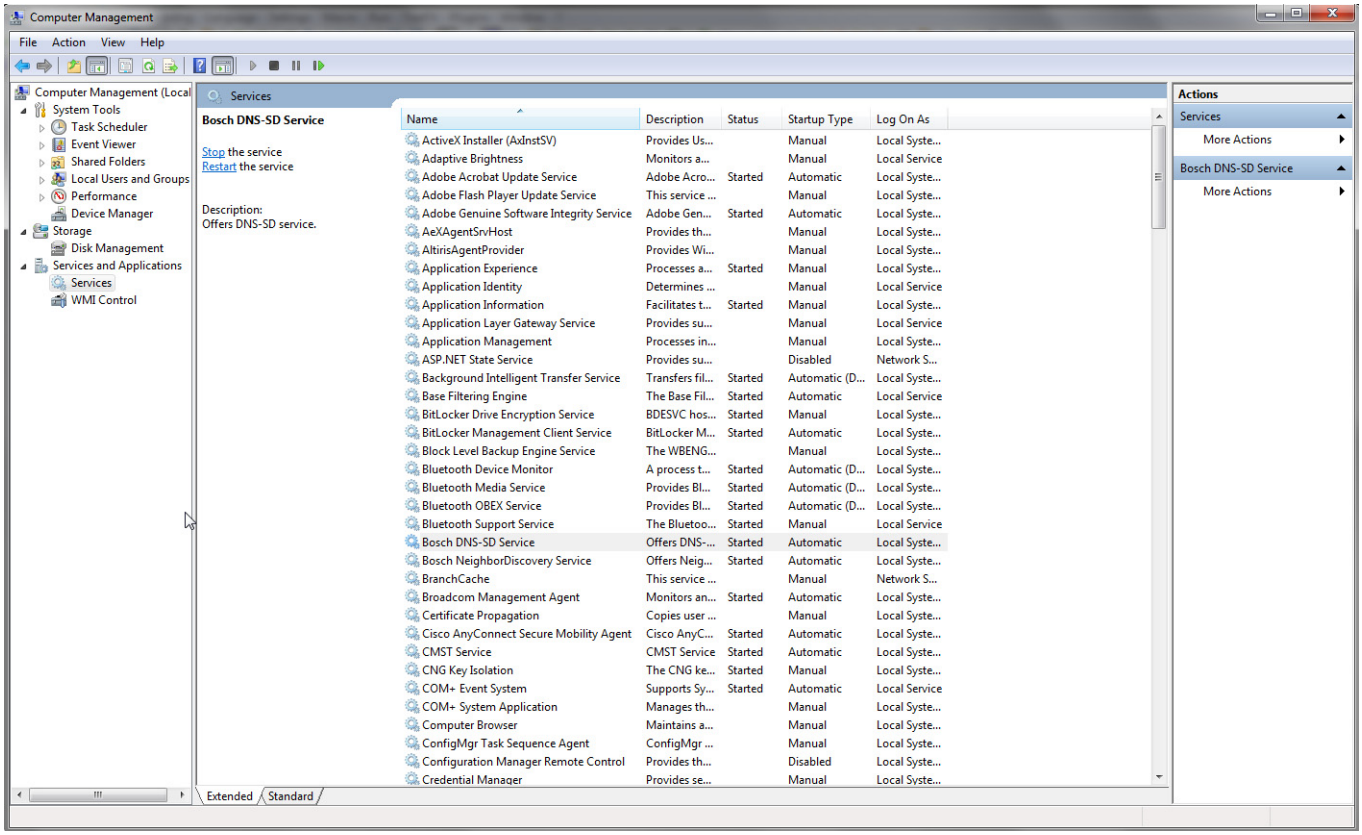
A14. The primary reason for this is the SetupOMNEONiosFirmware64.msi is not installed. Verify the OMI Plug-in files are correctly installed. For more information, see “Firmware Upgrade Files” on page 7.

Q15. I have installed all the FWUT packages correctly, still I do not see any devices

A15. Check if the Bosch DNS-SD service is installed. If installed, is it running?

To **verify the Bosch DNS-SD**, do the following:

1. Verify the Bosch DNS-SD files are available in the folder: C:\Program Files\BOSCH\DNS-SD.
2. Verify the Bosch DNS-SD service status is displayed as Started.



Q16: The OMI card Version string shows Hardware Failure? Is the OMI card not working?

A16: No, this means that OMI-Controller is not able to communicate with the OMI-Audio Device. This could be because of Version Mismatch, mismatch of IP address of OMI-Controller and OMI-Audio Device.