  Kilgore, TX	TYPE: Software Upgrade Procedure	NO: <b>FCT-1367-53</b>	REV: <b>B</b>
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## **READ THIS FIRST**

The procedure for updating the firmware on the R8000 and R8100 has changed significantly. Please read through the following procedure carefully before attempting to upgrade firmware. **This upgrade requires the use of a 4 GB (minimum) or 8 GB (recommended) USB drive.** The drive will be completely overwritten; **all data on the USB drive will be lost.** **\*\*\* Tech support (903) 985-8999 Option 2, 2 \*\*\***

### **Purpose**

This procedure upgrades the communications system analyzer software to 3.1.0.0. The update may be applied only to systems with the following system version:

3.0.1.0
---------

This procedure must be performed in its entirety for the update to apply correctly.


**Freedom recommends the user read over the entire procedure once before starting the process.**

This upgrade requires the use of a 4 GB (minimum) or 8 GB (recommended) USB drive. Larger size USB drives can be used. The drive will be completely overwritten; all data on the USB drive will be lost.

This procedure uses a third-party, open-source utility (SUPPLIED IN THE UPDATE FILE), Rufus (v.2.17), to write the downloaded drive image (ISO file) onto the USB drive. This software is released under the *GNU General Public License (GPL) version 3*. A copy of the executable is included in the downloaded ZIP file.

### **Upgrade Procedure Overview (Details to follow at STEP 1 on page 3)**

- USB Drive Setup on PC
  - Download ZIP file and extract contents to PC
  - Open Rufus utility, configure and burn ISO image to USB drive
  - Verify upgrade USB drive readiness and eject from PC
- Instrument Upgrade
  - Start R8xxx upgrade process

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- Follow onscreen instructions
- The USB will be plugged in and removed twice during upgrade
- Remove USB drive; finish upgrade and cleanup

## Conventions Used

Soft Key – Vertical and horizontal buttons along the edge of the communications system analyzer LCD screen.

### WARNING

**PERFORM THESE STEPS WITH THE COMMUNICATION SYSTEM ANALYZER POWERED BY AN UNINTERRUPTABLE POWER SUPPLY (UPS). IF POWER IS LOST DURING AN UPDATE, IT IS POSSIBLE TO DAMAGE THE ANALYZER IN A MANNER THAT REQUIRES FACTORY REPAIR.**

### WARNING


**THIS PROCEDURE REQUIRES A USB THUMB DRIVE WITH CERTAIN SECURITY FEATURES DISABLED (FOR EXAMPLE, PASSWORD PROTECTION). THE COMMUNICATION SYSTEM ANALYZER IS NOT CONFIGURED TO SUPPORT SUCH SECURITY FEATURES.**

### NOTE

**THESE INSTRUCTIONS CONCERN UNPACKING A .ZIP FILE USING WINDOWS BUILT IN ZIP FILE EXTRACTION. IF OTHER TOOLS ARE USED TO UNPACK .ZIP FILES, CERTAIN PORTIONS OF THE PROCEDURE MAY NEED TO BE ALTERED.**

### WARNING

**WHEN REMOVING A USB DRIVE FROM A COMPUTER, IT IS USUALLY CRITICAL TO USE A “SAFELY REMOVE HARDWARE” FEATURE TO PREVENT CORRUPTION OF FILES COPIED TO THE DEVICE.**

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## USB Drive Setup on PC

### STEP 1: Download and Extract the USB Files

#### Download:

From the FREEDOM website upgrades page

[www.freedomcte.com/upgrades/](http://www.freedomcte.com/upgrades/)

click the link labeled

**R8100/R8000 update 3.0.1.0 to 3.1.0.0**

to begin the download of the following ZIP file:

**R8000\_Update\_03000100\_03010000.zip**

#### Extract:

*See Appendix A for help extracting the contents of the ZIP archive file.*

The ZIP file contains two files:

- **R8000\_Update\_03000100\_03010000.iso** (drive image for the USB)
- **Rufus-2.17.exe** (Utility to burn the ISO file to the USB drive)

Copy or extract these two files to a location of your choice **on the PC** and navigate to that location.

**\*\*\* DO NOT PLACE THESE FILES ON THE USB DRIVE \*\*\***


### STEP 2: Burn the ISO File to the USB Drive.

**NOTE:** The Rufus utility will only run on Microsoft Windows. If you are using a different operating system, you will need to find and use an equivalent tool to burn the ISO file to the USB drive.

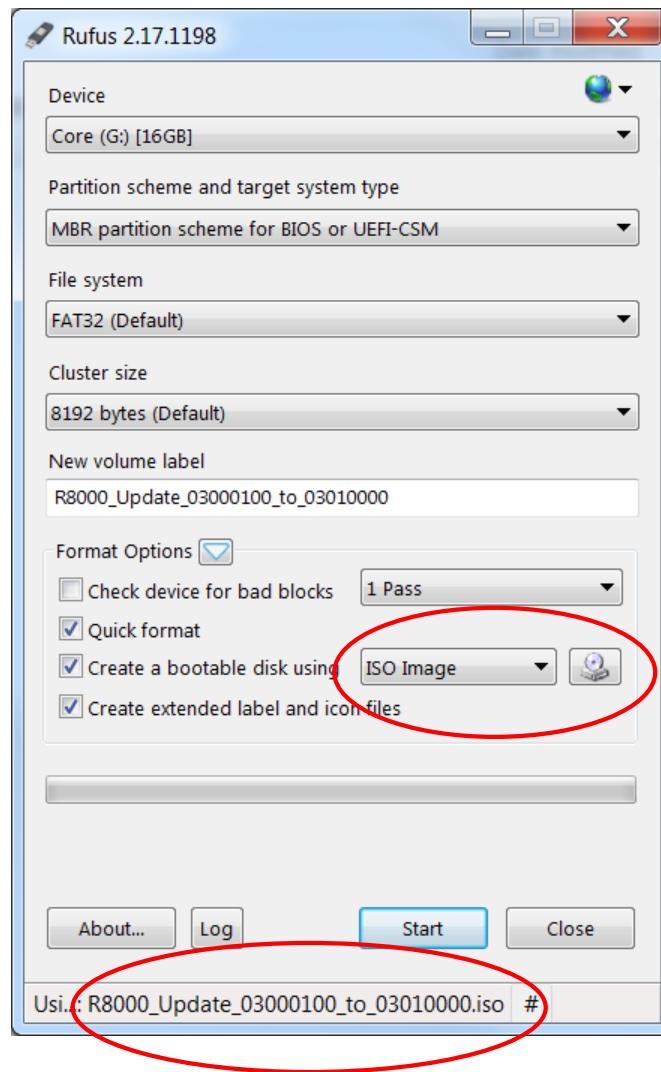
#### Open:

Plug the USB drive into the PC

Double-click on the "Rufus-2.17" file to start the Rufus utility. Depending on your operating system, you may be asked to allow the utility to run or to let it check for updates. Answer "YES" to run , but "NO" to check for updates.


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The following window will appear:



**Configure:**

- Device: **Select the USB Drive you want to use for the upgrade**
- Partition scheme and target system type:  
**Select MBR partition scheme for BIOS or UEFI-CSM**
- File system: **Select FAT32**
- Cluster size: **Select Default (The size may vary based on drive size)**
- New volume label: **This can be anything you want**
- Format Options:

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- **[Unchecked]** Check Device for Bad Blocks
- **[Checked]** Quick Format
- **[Checked]** Create a bootable disk using **ISO Image**
  - Click the disk icon and select the file  
"R8000\_Update\_03000100\_03010000.iso"
- **[Checked]** Create extended label and icon files

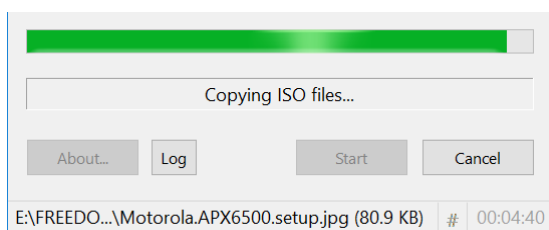
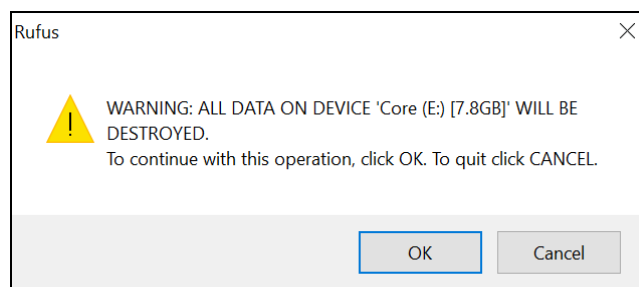
**Important:**

*Make sure the selection for "Create a bootable disk using" is ISO Image. Then "Click" the disk icon (to right of ISO Image) and select file: "R8000\_Update\_03000100\_03010000.iso"*

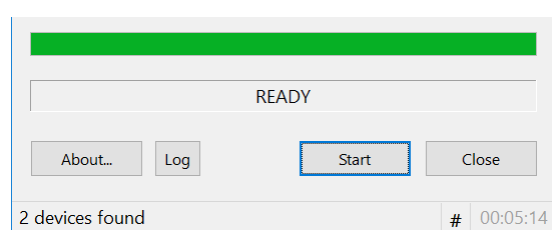
Your Rufus application window should look like the image above.

**Burn:**

After verifying all settings are correct, click **Start** to burn the ISO image onto the USB drive. You will be prompted to confirm you want to erase all files on the USB drive and replaced them with the upgrade files.




**In Progress...**



**...Complete.**

Click **Close** to exit Rufus utility.

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### STEP 3: Verify the Update USB Drive and Eject.

#### Verify:

Open the USB drive in File Explorer to view its contents.

The USB drive root directory should look like the following image:



It is possible that a few more directories will be seen at this level, like "FOUND.000" and "Sytem Volume Information". This will not effect the update.


NOTE: This USB is being built as a "bootable" USB. Some PCs or Laptops may have security software that prevents the creation of a bootable USB. If your system has this software or if you are using a "secure" USB you may need to build this USB on a non-secured computer/USB drive.

#### Eject:

Use "Safely Remove Hardware" controls to when ready to remove the USB drive from the computer. Details on how to do this vary by operating system and desktop configuration. For non-Windows operating systems, this is sometimes referred to as "unmounting" or "ejecting" the media. Refer to **Appendix B** for some examples how to "Safely Remove Hardware" on a PC that has one of several Microsoft Windows operating systems installed.


Unplug the USB drive from the PC.

USB drive preparation is complete. Proceed with instrument upgrade.

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**CAUTION:** In this state, the USB drive is a bootable drive that should only be used to upgrade an R8000 or R8100. DO NOT boot from this drive on a PC. This may result in data loss on the PC.

**After use, this USB drive should be formatted to make it non-bootable and safe to use for other purposes.**

  Kilgore, TX	TYPE: Software Upgrade Procedure	NO: <b>FCT-1367-53</b>	REV: <b>B</b>
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## Instrument Upgrade

1. Power up the analyzer using the green power button.
2. Wait approximately one minute for the analyzer boot sequence to complete.

While the product is booting a “Loading Configuration File... Please Wait” message is shown in the product display status bar. Do not proceed to the next step until the message disappears from the status bar.

3. Insert a USB drive prepared using the “USB Drive Setup on PC” procedure into an available USB port located on the front or side of the analyzer.
4. Wait about 30 seconds to allow the analyzer to identify the USB drive.
5. Press the blue **<Settings>** button located on the analyzer front panel.
6. Press the **“About...”** soft key.
7. Verify that the current “System” version is 3.0.1.0
8. Press the **“Search for Updates”** soft key.

- a. An “IMMEDIATE ACTION REQUIRED” message panel is shown.

If the message panel is not shown, either the analyzer does not recognize that the USB drive is installed, or the USB drive preparation described in the “USB Drive Setup on PC” section was not successful. In some cases, using a different brand or model of USB drive may be helpful.


- b. IF the screen indicates that an Update was found, then Press the **“Continue”** soft key to proceed with the update process.
- c. ***NOTE: From this point forward the most important instructions are shown on the DISPLAY of the R8000. Do not remove USB until told by the R8000. Then plug USB back when told by the R8000. Follow the onscreen instructions exactly. Following text is supporting information.***
- d. Wait for a second “IMMEDIATE ACTION REQUIRED” message panel to be shown after the update files have transferred from the USB drive to the analyzer.

During this time, the standard operating menu is visible. While it may appear that the system is not processing the update, there is no need to navigate away from the settings screen or to press additional controls.

**IMPORTANT:** USB drive light activity ceases prior to completion of the transfer. Do not assume that the transfer has failed if the second panel does not appear immediately after the drive appears inactive.

If the panel fails to appear, a file on the USB drive is corrupt, or could not be processed, a red status bar “: code = <x>” message appears.



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The update procedure must be restarted if the transfer fails. It may be sufficient to re-run the “USB Drive Setup on PC” procedure using files previously obtained from the web site, but it may be necessary to download the files again if they are corrupted. In some cases, use of a different brand or model of USB drive may be helpful.

- e. Unplug all USB devices from the analyzer when told on screen.
  - f. Press the “**Continue**” soft key to apply the update.
9. Wait for the system software upgrade to begin.

The analyzer automatically reboots twice and then displays an “Upgrade in progress...” message.

**The following section is new in this upgrade.**

**Please proceed step-by-step to avoid confusion or errors.**

- 10. A prompt appears requesting that the USB drive be reinserted. Plug the USB into the unit at this request. An “Ok” button is displayed. Press the **ENTER** key on the front of the unit to continue.
- 11. The unit will reboot into Linux and copy the update to the unit.
- 12. A prompt will appear indicating the USB drive should be removed. The unit will auto detect that the USB drive is gone and will reboot.
- 13. The screen will display an “Upgrade in progress...” message.
- 14. Wait for the system software upgrade to complete.


The unit will reboot four (4) times during this process. When the upgrade is complete, the analyzer displays the standard user interface and resumes normal operation.

**This concludes the new instructions. The unit should be fully upgraded. Proceed to verification.**

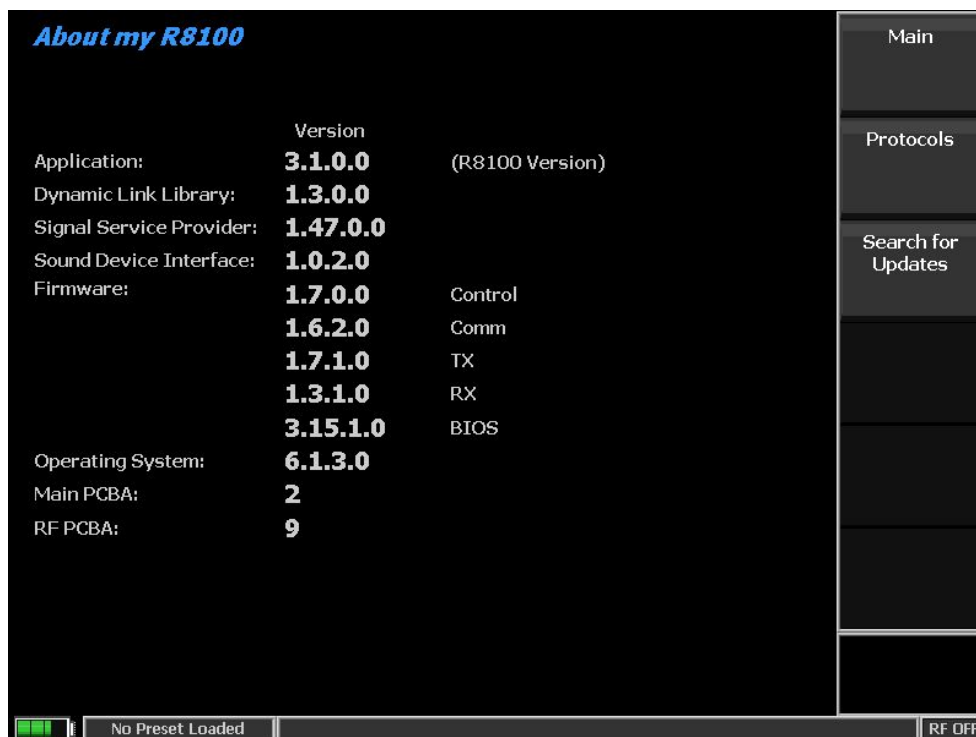
15. Verify that the product has finished rebooting.

While the product is booting a “Loading Configuration File... Please Wait” message is shown in the product display status bar. Do not proceed to the next step until the message disappears from the status bar.

- 16. Press the blue **<Settings>** button.
- 17. Press the “**About...**” soft key.
- 18. Verify that the “System” version has changed to 3.1.0.0.

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19. Press the “**Versions**” soft-key and review the list of versions.



Note: Your BIOS and PCBA numbers may vary based on instrument hardware

NOTE: If any version number is “0.0.0.0”, an additional reboot may be required to return the unit to normal operation.


20. The upgrade is complete.

21. You may use the USB to upgrade multiple instruments.


22. Once you are done with the USB drive, place it in the PC, right click the drive, and format it. This step will allow you to use the drive for other purposes.

**If you should need technical assistance before, during, or after this upgrade, please call out Technical Support hotline at (903) 985-8999 and select Option 2 “Product Support” followed by Option 2 “Technical Support.” (Option 1 will connect you with our Service Department if you need calibration or repair services.)**

For urgent support:

 Kilgore, TX	TYPE: Software Upgrade Procedure	NO: <b>FCT-1367-53</b>	REV: <b>B</b>
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- West: Doyle Wofford (602) 721-5889
- East: Chuck Cox (903) 261-6984
- Asia: Keith Yeo +65 (9155) 1168
- Latin America: Luis Riano (954) 830-5928

  Kilgore, TX	TYPE: Software Upgrade Procedure	NO: <b>FCT-1367-53</b>	REV: <b>B</b>
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## Appendix A: Extracting Files from a ZIP Archive

The procedure for extracting files from the .zip file varies from system to system, particularly when a third-party archive/unarchive tool is installed, but, for reference, a number of .zip extraction scenarios for using a built-in Windows file extraction tool are documented below:

### Windows 10 / Windows 8.1

Select "R8000\_Update\_03000100\_to\_03010000.zip" by clicking it once. A Compressed Folder Tools "Extract" menu ribbon should appear, but if it is not shown ("Extract all" is not visible), click the "Extract" menu tab to reveal it.

Click "Extract all" in the "Extract" menu ribbon.

When an "Extract Compressed (Zipped) Folders" pop-up appears, modify the path that appears in an edit box below "Files will be extracted to this folder." Select a folder location on the PC where the files will be used in the next step.

Check "Show extracted files when complete", then click the "Extract" button at the bottom of the pop-up window.

### Windows 7

Either right-click "R8000\_Update\_03000100\_to\_03010000.zip" and select "Extract all...", or, double-click the .zip file and click "Extract all files" on the task ribbon beneath the title bar. Alternatively, use "File" | "Extract all..." from the command menu next to the title bar. The <Alt> key toggles visibility of the command menu.


When an "Extract Compressed (Zipped) Folders" pop-up appears, modify the path that appears in an edit box below "Files will be extracted to this folder." Select a folder location on the PC where the files will be used in the next step.

Check "Show extracted files when complete", then click the "Extract" button at the bottom of the pop-up window.

### Windows XP

Double-click "R8000\_Update\_03000100\_to\_03010000.zip" to reveal "Folder Tasks" in the explorer window.

If "Folder Tasks" appears, click "Extract all files". Alternatively, use "File" | "Extract All..." from the command menu.

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When the “Compressed Folders Extraction Wizard” appears, click the “Next” button.


In the window called “Extraction Wizard”, click the “Browse” button and select a folder location on the PC where the files will be used in the next step.

Press the “OK” button.

Press “Next” (to extract the files to the USB drive).

Ensure that the “Show extracted files” checkbox is checked.

Press the “Finish” button.

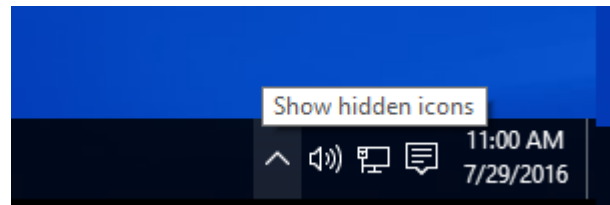
  Kilgore, TX	TYPE: Software Upgrade Procedure	NO: <b>FCT-1367-53</b>	REV: <b>B</b>
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## Appendix B: Safely Remove Hardware Examples

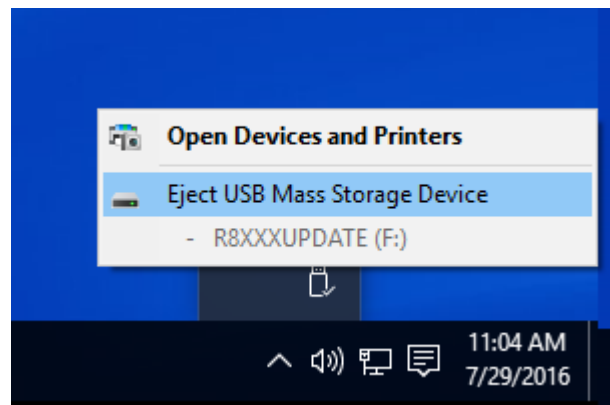
Examples of safe removal of USB storage are provided below, but the procedure can vary significantly per installed operating system and desktop configuration.

### Windows 10

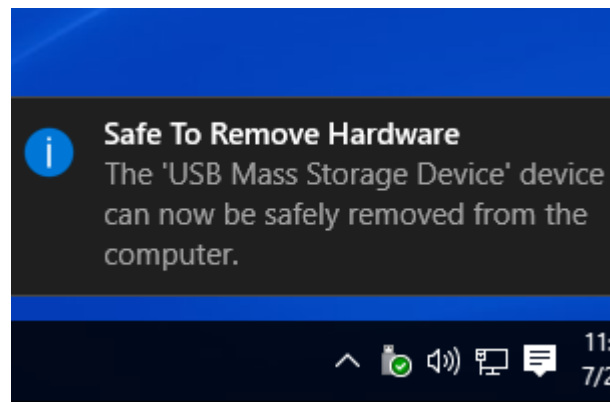
As needed, move the mouse pointer over a “Show hidden icons” widget, then click the icon to expose the “Safely Remove Hardware and Eject Media” icon.




Move the mouse pointer over the “Eject USB Mass Storage Device” widget for the drive letter of the USB media, then click it.



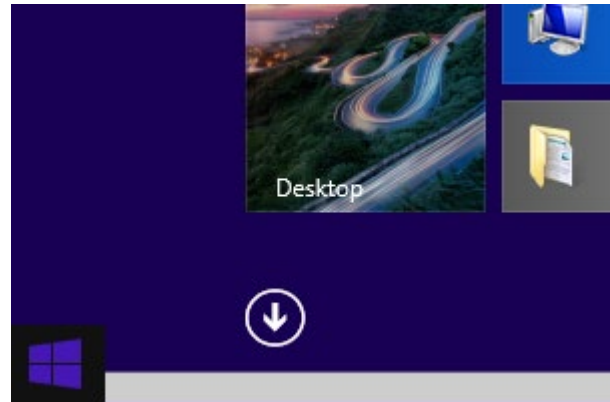
Wait for a “Safe To Remove Hardware” notification near the “Safely Remove Hardware and Eject Media” icon.



  Kilgore, TX	TYPE: Software Upgrade Procedure	NO: <b>FCT-1367-53</b>	REV: <b>B</b>
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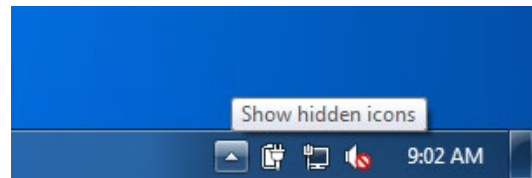
## Windows 8.1

On Windows 8.1, extra steps are sometimes needed to show the start bar where the system tray is found. Either use the keyboard Windows key to select a desktop with a start bar, or, swipe the mouse pointer to the lower left corner of the desktop to reveal a Windows button that, when clicked, acts like the Windows keyboard key.

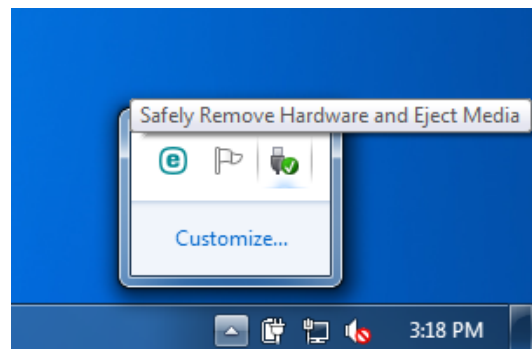


## Windows 7 / 8.1

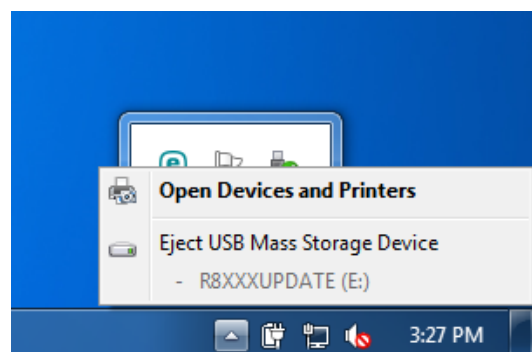
As needed, move the mouse pointer over a "Show hidden icons" widget, then click the icon to expose the "Safely Remove Hardware and Eject Media" icon.




Move the mouse pointer over the "Safely Remove Hardware and Eject Media" icon, click it to expose an "Eject USB Mass Storage Device" widget.



Move the mouse pointer over the "Eject USB Mass Storage Device" widget for the drive letter of the USB media, then click it.



  Kilgore, TX	TYPE: <p style="text-align: center;">Software Upgrade Procedure</p>	NO: <p style="text-align: center;"><b>FCT-1367-53</b></p>	REV: <p style="text-align: center;"><b>B</b></p>
	TITLE: <p style="text-align: center;"><b>R8xxx Upgrade 3.0.1.0 to 3.1.0.0</b></p>	PAGE: <p style="text-align: center;">16 OF 16</p>	

Wait for a “Safe To Remove Hardware” notification near the “Safely Remove Hardware and Eject Media” icon.



## Windows XP

As needed, move the mouse pointer over a “Show hidden icons” widget, then click the icon to expose the “Safely Remove Hardware” icon.



Move the mouse pointer over the “Safely remove Hardware” icon, click it to expose a “Safely remove USB Mass Storage Device” widget.



Move the mouse pointer over the “Safely remove USB Mass Storage Device” widget that mentions the drive letter of the USB media, then click it.



Wait for a “Safe to Remove Hardware” notification near the “Safely remove Hardware” icon.



B-See ECO	D. Bulgrien	3/16/2021	M. Mullins	3/18/2021	0330
A – Initial Release	W. Black	3/1/2018	A. Parker	3/3/2018	0173
Revision – Change	Revised By	Date	Approved By	Date	ECO#