Creating a bootable USB drive

How to create a bootable USB drive for restoring the OS image

Technical note
3846_en_A

1 Description

Phoenix Contact industrial PCs are shipped with DVD media to restore the factory operating system image. It is advisable to use an externally powered DVD drive when restoring the factory image to a Phoenix Contact industrial PC. Because different DVD drives use different amounts of current, relying only on the USB port to power the DVD drive may exceed the maximum amount of current that the USB port can provide. This may result in inconsistent performance of the DVD drive and possible data corruption.

If a suitable portable DVD drive isn't available, use a PC that has a built-in DVD drive to copy the contents of the DVD to create a “bootable” USB thumb drive.

1.1 Scope

This document is applicable for all Phoenix Contact industrial PCs using Windows 7 through Windows 10 operating systems. It does not apply to

– PCs with an embedded operating system.
– BL RACKMOUNT… PCs with the Windows 7 operating system.

For BL RACKMOUNT… products with the Windows 7 operating system, contact the subsidiary for support.

For BL2… and BL RACKMOUNT... products using the Windows 10 operating system, two USB flash drives, one with a minimum of 1 GB and another with at least 16 GB, are needed.

2 Preparing the USB drive

2.1 USB drive formatting

1. Using a PC other than the one needing the drive re-imaged, insert a USB drive into an available USB port.
2. With most operating systems, a pop-up window appears, prompting for an appropriate action. Note the drive letter referenced and then close the pop-up window.

If the USB drive has not been formatted, the pop-up window will directly prompt for you to format the drive.

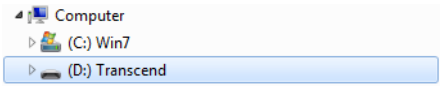

Figure 1 Available drives

3. Click the “Start” button, and then click the “Computer” icon to display all the connected drives. Right-click the drive letter noted in step 2 and select the “Format...” option.

NOTE:
Selecting the wrong drive letter and executing the format option will result in the loss of all data on the drive.

Make sure you always use the latest documentation.
It can be downloaded at phoenixcontact.net/products.

4. Select the format options

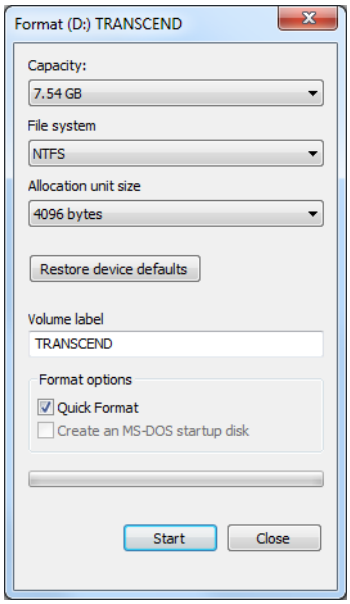

Figure 2 “Format” dialog box

– Select **NTFS** from the “File system” field.

  Exception: For BL2… and BL RACKMOUNT... products using the Windows 10 operating system, select **NTFS** for the larger drive and **FAT32** for the smaller drive.

– Leave all remaining fields set to the defaults.

5. Click the “Start” button. A “Format” warning message appears. Click the “OK” button to proceed with the procedure.

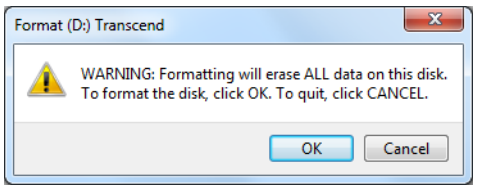

Figure 3 Format warning message

6. When the formatting is complete, click the “OK” button to close the message window.
7. For the BL2… and BL RACKMOUNT... products, repeat the process with the second USB drive.
8. Click the “Start” button and type **Command** in the “Search” field. From the search results, right-click on **Command Prompt**, and click on **Run as administrator** to open the “Administrator: Command Prompt” window.
9. At the command prompt, type **diskpart** to activate the command. The window will display some information about the DiskPart function and the computer.
10. At the command prompt, type **list volume** to display information regarding the assigned drive letters. The drive letters correspond to drives and partitions on the PC.

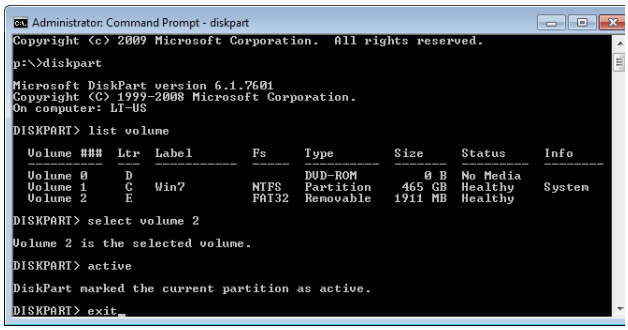

Figure 4 “Administrator: Command Prompt” window

11. At the command prompt, type **select volume #** where **#** is the desired volume that corresponds to the drive letter to be formatted. For example, Figure 4 shows volume 2 selected as it corresponds to drive E.
12. At the command prompt, type **active** to make the partition bootable.
13. Type **exit** to close the “Administrator: Command Prompt” window.
14. Use a file manager tool to copy the bootable drive image from the DVD or other storage medium to the USB drive.

If it is stored as an iso file, it must be extracted (unzipped) on the USB drive to function.

Ensure that the file manager tool is configured to show all hidden files and folders.

For BL2… and BL RACKMOUNT... products using the Windows 10 operating system:

a) Copy all directories from the extracted iso file to the small USB (>1 GB) drive except for the “RestoreTool” directory.

b) Copy the all directories from the extracted iso file to the larger USB (>16 GB) drive.

15. Close any windows and programs referencing the USB drive. Click the “Safely Remove Hardware and Eject Media” icon in the Notification area to eject the USB drive.

3 Booting a PC from a USB drive

An actual (physical) keyboard must be attached to one of the USB ports to allow access to the quick-boot menu.

1. Ensure that the PC is not powered (off).
2. Insert the USB drive containing the drive image into an available USB port. For BL2… and BL RACKMOUNT... products, insert both USB drives and boot from the smaller (FAT32) drive.
3. Apply power to the PC.
4. Press the <F12> key during the boot process to access the quick-boot menu.
5. Use the arrow keys to highlight the port from which to boot.
6. Press the <Enter> key to reinitiate the boot process from the selected USB port.
7. Follow any prompts that may appear. When the process is complete, remove power from the PC, remove the USB drive, and restart the PC.

4 Troubleshooting

If the USB drive is connected to a USB 3.0 (blue) port, the system may not read the files correctly. If so, insert the USB drive into a USB 2.0 (black) port.

If a “missing bootmgr” error appears, it is most likely missing from the files copied to the USB drive or the iso file wasn't unzipped to the thumb drive. Check the files on another PC and verify that the bootmgr file is present. If not, extract the files from the iso file and copy them to the USB drive again.

If the boot process doesn't work, it’s possible that the BIOS is not properly communicating with or reading the USB drive. If so, try a different USB drive, or clean the current drive of all contents, and then reformat the drive.

4.1 Cleaning the drive

1. Place a USB drive that is ≥16 GB into a PC with Windows 7 or greater operating system.
2. Open a command prompt with administrator rights (see step 8. in “USB drive formatting” on page 1.
3. Type the command **diskpart** and press the <Enter> key.
4. Type the command **lis vol** and press the <Enter> key.

Review results and look for the volume that is the type **Removable**.

5. Type the command **sel vol #**, where the **#** represents the drive letter, and press the <Enter> key.
6. Type the command **clean** and press the <Enter> key.
7. Type the command **cre par pri** and press the <Enter> key.
8. Type the command **assign** and press the <Enter> key.
9. Type the command **exit** and press the <Enter> key.
10. Repeat the formatting process (see “Preparing the USB drive” on page 1).