Help for CRUpdate.exe

August 9, 2006
Rev 1.1

Introduction

The BERTScope CR Firmware Update Utility allows you to keep the instrument compatible with the latest release of the BERTScope software.

This document describes how to:

- Install the utility, if not already pre-installed as part of a BERTScope software update.
- Install the BERTScope CR USB drivers.
- Start the Firmware Update Utility.
- Use the utility to backup and update the BERTScope CR firmware.
- Uninstall the utility, if installed as a stand-alone package.
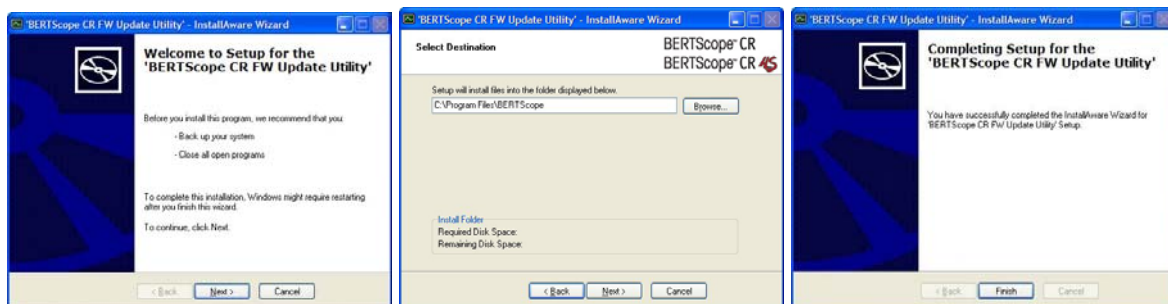- Uninstall the BERTScope CR USB drivers.

Installation

The files needed to update your BERTScope CR firmware to a compatible revision are included as a part of the BERTScope software installation. If the BERTScope software has already been installed, then connect and Power-On your BERTScope CR to install the USB driver, if you haven't already. (See the 'BERTScope CR USB Driver Installation' section below).

The BERTScope CR firmware can also be updated using an ordinary Windows 2000 or Windows XP PC with USB interface. Obtain the stand-alone Setup_CRUpdate.exe installation package from your BERTScope CR Sales Representative and install it, as described below.

Setup_CRUpdate.exe Installation Package

The BERTScope CR should remain disconnected from the BERTScope or PC until the software installation is complete.

Copy the Setup_CRUpdate.exe file to your PC, then execute it. You should see the 'Welcome' dialog below. Press the 'Next' button to continue the installation.

Although you may change the default directory for installation, it is recommended that you leave it as 'C:\Program Files\BERTScope'.

Continue selecting the 'Next' button as instructed, until the completion dialog is displayed.
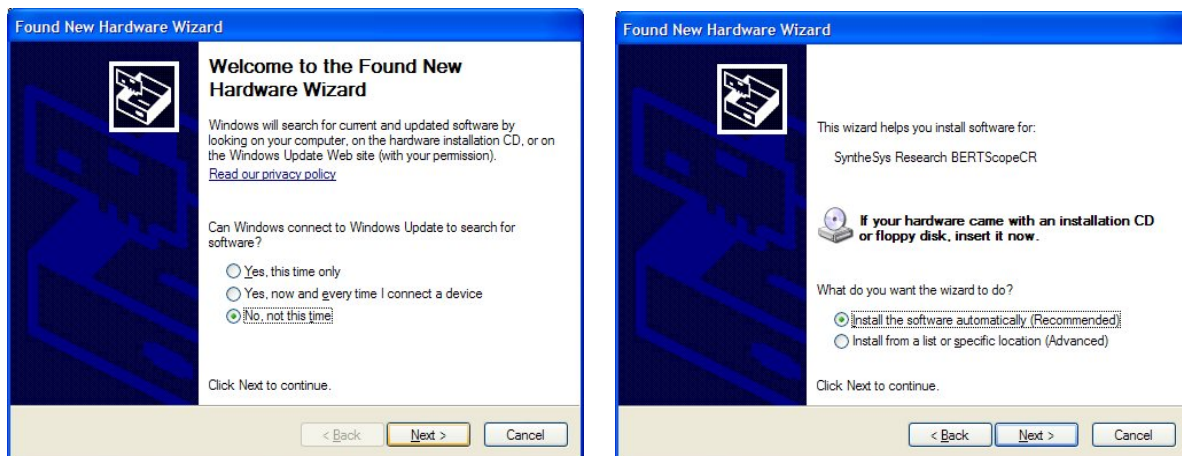
BERTScope CR USB Driver Installation

The BERTScope CR USB drivers must be installed the first time a BERTScope CR is connected to a particular USB port.

BERTScope CR USB driver installation under Microsoft Windows 2000 is automated and painless, requiring only that the user connect and power-up the new device. Windows XP, on the other hand, forces the user to navigate a blizzard of confusing dialogs. The next section details the installation of the BERTScope CR USB drivers under Windows XP.
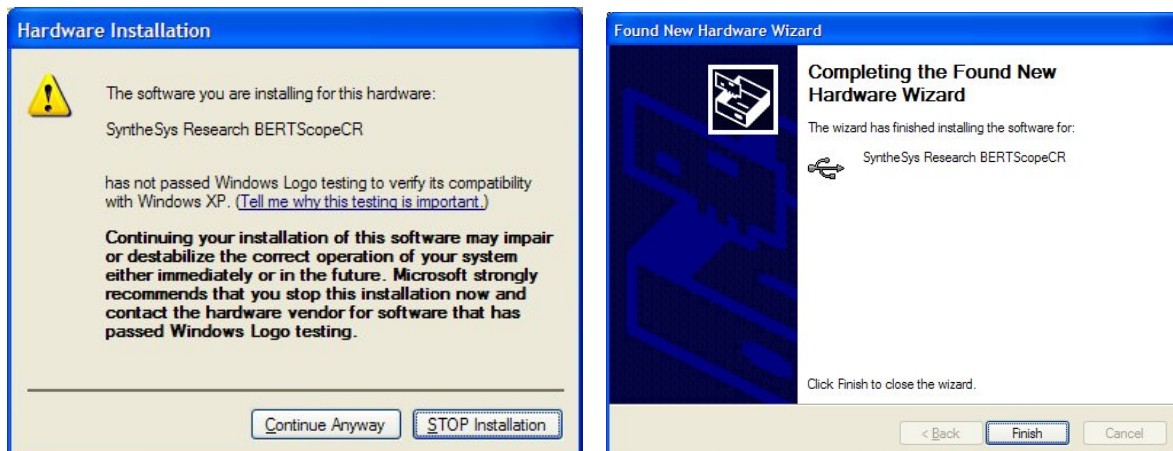
Windows XP Driver Installation

When you connect and power-on a BERTScope CR for the first time under Windows XP,

The 'Found New Hardware Wizard, Welcome' dialog automatically pops up. Select the 'No, not this time' radio button, then press the 'Next' button to continue.

Next, the 'Found New Hardware Wizard, Device ID' dialog appears, identifying the new device as a 'SyntheSys Research BERTScopeCR' (or perhaps an 'EZ-USB FX2 (68613) – EEPROM missing' – See the note at the end of this section). Select the 'Install the software automatically (Recommended)' radio button, then press the 'Next' button to continue.

At this point, Windows XP displays an ominous 'Hardware Installation' dialog that warns that Microsoft was not paid a lot of money to test this driver. Press the 'Continue Anyway' button.

Finally, Windows XP actually installs the BERTScope CR USB driver, and displays the Completion dialog. Press the 'Finish' button to complete this ordeal.

'EZ-USB FX2 (68613) – EEPROM missing' Driver ID

Early versions of the BERTScope CR 'bootloader' software don't correctly identify the device as a BERTScope CR. An 'EZ-USB FX2 (68613) – EEPROM missing' driver ID string is displayed during driver installation in this case. This problem affects only a handful of units shipped. Fixing the problem requires returning the unit to the factory, and is unnecessary.

While the BERTScope CR functions normally with these early versions of the bootloader (and, indeed, uses the exact same driver file), it has the side-effect of requiring two device driver installations per USB port – Once for the 'BERTScopeCR' ID in normal mode, and another for the 'EZUSB' ID in 'Firmware Update Mode'. This is only really evident under Windows XP, for reasons explained above.

Owners of these early BERTScope CRs planning to update firmware using Windows XP are advised to 'pre-install' the 'EZUSB' driver before attempting a firmware upgrade. To do this, you need to start the BERTScope CR in 'Firmware Update Mode' (per the next section), then install the driver (per the previous section).

Starting the BERTScope CR in 'Firmware Update' Mode

The BERTScope CR must be started in a special mode to update the its firmware.

To enter this mode:

- Power-Down the BERTScope CR.
- Simultaneously hold down (until otherwise instructed) the 'Lock' and 'Esc' buttons below the BERTScope CR display.
- Power-Up the BERTScope CR.
- Once the BERTScope CR displays 'WAITING FOR FIRMWARE UPDATE', you can release the 'Lock' and 'Esc' buttons.

To exit this mode:

- Press and hold down the BERTScope CR power button for approximately 5 seconds, until the unit powers off.
- Release the BERTScope CR power button.
- Press the power button again to start the unit in 'Clock Recovery' mode.

The BERTScope CR Firmware Update Utility instructs you to do these steps at the proper time. Otherwise, you would only need to enter this mode if you wish to 'pre-install' the bootloader USB driver (as described in the previous section), or repair a non-booting BERTScope CR.

Starting the BERTScope CR Firmware Update Utility

Once the software and drivers are installed, connect and power-up the BERTScope CR.

Exit the BERTScope application, if you are using your BERTScope to update the BERTScope CR firmware.
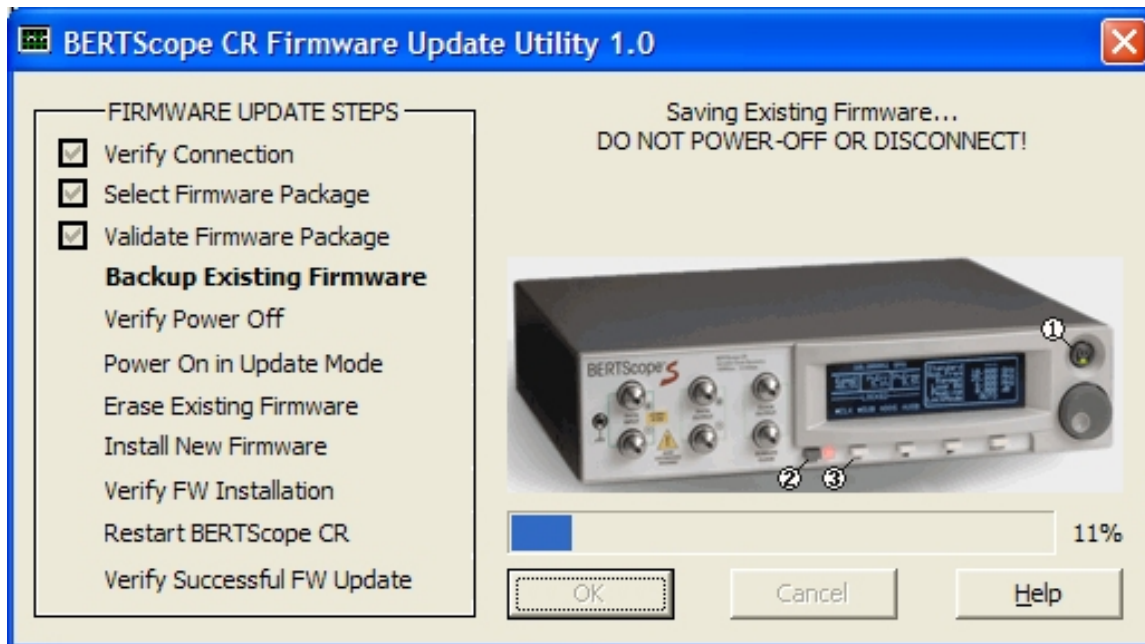
Finally, launch the Firmware Update Utility.

The easiest way to do this is to press the Windows 'Start' button, then click on the 'CRUpdate' shortcut in the '\Programs\BERTScope' folder.

Alternatively, you may use the Windows Explorer to navigate to the 'C:\Program Files\BERTScope\Program' folder, then double-click on the CRUpdate.exe file. (Of course, if you changed the default install location, go there instead).

The BERTScope CR Firmware Update Utility UI

The BERTScope CR Firmware Update Utility is a single dialog application that guides you through the firmware update process. The title and version of the utility appear on the dialog title-bar.

The dialog can be divided into the following functional regions:

Firmware Update Steps

This frame displays an overview of where you are within the entire update process.

- Bold Font Shows Current Step
- 'Disabled' (gray) Text Indicates Steps Skipped.
- Checkmark Shows Completed Steps

Message Area

Primary step-by-step communication with the user occurs here.

Bitmap of BERTScope CR showing buttons 1, 2, 3

The utility refers to the pertinent BERTScope CR buttons by number:

- Button 1: BERTScope CR Power-On/Off Button
- Button 2: BERTScope CR Lock Button
- Button 3: BERTScope CR Esc Button

The bitmap shows the BERTScope CR with the buttons labeled.

Progress Bar

Displays the progress of long operations, both graphically and numerically.

Buttons

OK and Cancel buttons are enabled and disabled as appropriate.

- OK = Proceed to the next step.
- Cancel = Abort the Firmware Update (same as Close icon at dialog top left).
- Help = Launches the online-help anytime.

Use Cases

Update Firmware

In this use case, your BERTScope CR has been working normally, but some compelling reason has come along to update its firmware. This may occur if you are connecting to a BERTScope, and its integration with the BERTScope CR requires a firmware update. Perhaps new features have been added to the firmware itself. Or, perhaps a bug in the firmware has been discovered, and requires repair.

Whatever the reason, you would proceed by connecting to the BERTScope or PC, and powering-on the BERTScope CR in normal operating mode. Start the Firmware Update Utility as described previously. Press the OK button to begin the update process.

Restore Firmware Backup

In this use case, you have previously update the firmware in your BERTScope CR, but some compelling reason has come along to revert to the original version.
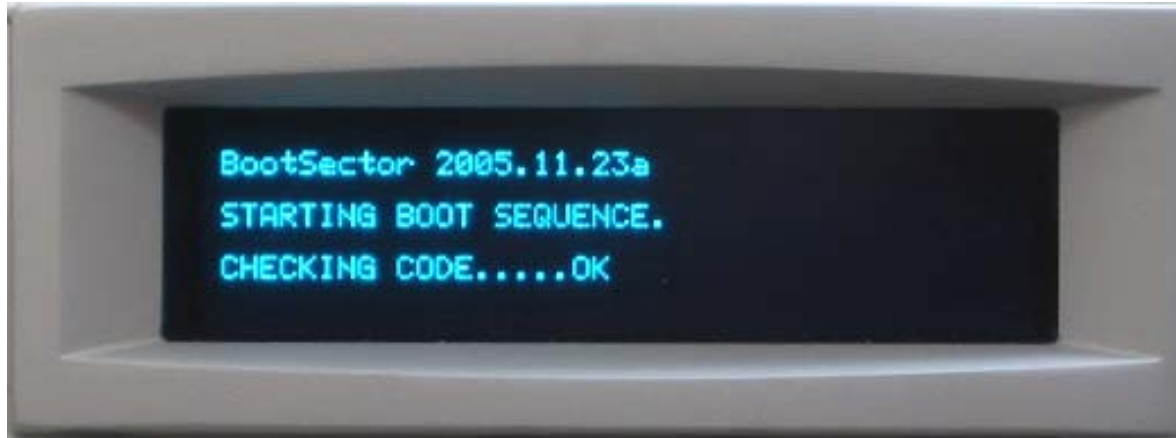
As in the previous use case, you connect to the BERTScope or PC, and power-on the BERTScope CR in normal operating mode. Start the Firmware Update Utility as described previously. Press the OK button to begin the update process.

This time, however, instead of selecting the most recent firmware package, you would select the backup package created automatically when you last updated. Backup firmware packages end with a ".FWB" extension, rather than the normal ".FWZ".

IMPORTANT NOTE:
Because of the way calibration data is upgraded at firmware update time, IT IS ONLY SAFE TO RESTORE FIRMWARE THAT HAS BEEN PREVIOUSLY INSTALLED on your BERTScope CR. To prevent loss of calibration due to an inappropriate firmware restore, backup firmware packages are tagged with the serial number of the unit that they came from. The Firmware Update Utility only allows OLDER firmware to be restored if the backup package has been tagged with the same serial number as the target BERTScope CR.

Recover From Non-Bootable State

IF YOU CAN READ THIS…..things are NOT OK.

This message appears very briefly when you first power-on your BERTScope CR. IF this "STARTING BOOT SEQUENCE" message persists for any length of time, it means the BERTScope CR has crashed when trying to run its firmware. This problem is only likely to occur if a previous firmware update was unexpectedly interrupted, or if a corrupted firmware package used.

To recover from this problem, you need to power-on the BERTScope CR in 'Firmware Update Mode' prior to starting the Firmware Update Utility. You will see that the Backup, Power-Off, and Power-On steps are disabled, as these are inappropriate or unneeded in this use case. Press OK to begin with the recovery sequence.

Firmware Update Steps

This section describes what to expect in each step of the firmware update process.

Start Message

This message welcomes you, and reminds you to close the BERTScope application (or any other Clock Recovery software client, for that matter), prior to beginning the firmware update.

Press the OK button to Continue.

Verify Connection

This step tries to communicate with your BERTScope CR.

If it can't be found, it asks you connect it, and power it on. Press the OK button to redo the test.

If it is found, it determines whether the unit is in "Normal" or "Firmware Update Mode', then issues appropriate instructions.
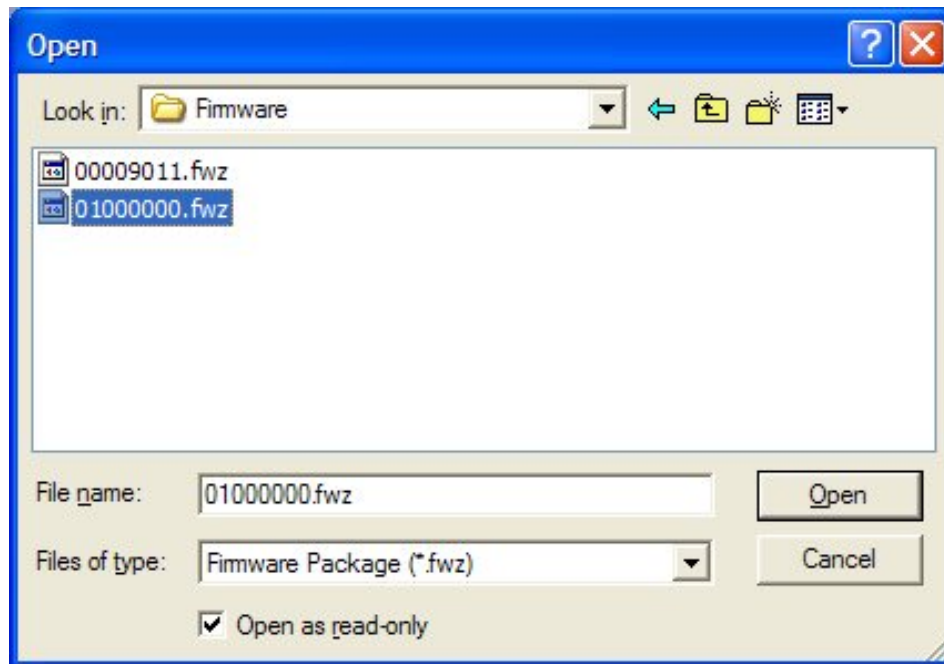
If your BERTScope CR is detected in 'Normal' mode, it displays the Device name, the Device Serial Number, and the revision number of the firmware current installed on the unit.

Press OK to continue to the next step.

Select Firmware Package

In this step, the Utility tries to find a firmware package newer than the one installed. Firmware packages are installed, by default, in the 'C:\Program Files\BERTScope\BERTScopeCR\Firmware' directory.

The software displays a message reporting the result of this search. Regardless of the result, pressing OK will bring up the Windows 'File Open' Dialog box.

If a newer firmware package was found, it will be pre-selected, and you just need to press the 'Open' button to continue.

If no newer firmware was automatically located, you can use this opportunity to select one manually.

If you want to restore a firmware backup, pull down the 'Files of type:' list, and choose 'Firmware Backup (*.fwb)' to display the available backup packages.

Once a suitable firmware package is selected, press 'Open' to continue, or 'Cancel' to abort.

The 'File Open' dialog will close, and the you will be returned to the Firmware Update Utility.

Press OK to continue to the next step.

IMPORTANT NOTE:
The utility will not let you proceed to the next step if you selected an older firmware package than is already installed.

Validate Firmware Package

This step is examines the firmware package you selected. It makes sure the file is in the expected format, is the expected firmware revision, and is not older than the installed revision unless it is a validly tagged backup.

If all these tests pass, the software moves to the next step automatically.

If any test fails, the software reports the error message, also prompting you to 'Press Cancel to Abort'.

Backup Existing Firmware

This step automatically creates a backup package of the currently installed firmware. The backup package is tagged with the serial number of the BERTScope CR connected.

Once the backup is complete, the utility automatically moves to the next step.

Verify Power Off

In this step, the utility prompts you to power-off the BERTScope CR, then press the OK button.

The software then tries to communicate with the BERTScope CR. If it can still do so, it repeats the step. Otherwise, it automatically moves to the next step.

Power-On in Update Mode

In this step, the utility prompts you to power-on the BERTScope CR in 'Firmware Update Mode', then press the OK button.

The software then tries to communicate with the BERTScope CR. If it can't do so, or the unit is in the incorrect mode, it repeats the step. Otherwise, it automatically moves to the next step.

Erase Existing Firmware

This step is completely automatic. The utility moves to the next step when complete.

Install New Firmware

This step is completely automatic.

New firmware is sent to the BERTScope CR over the USB cable.

'DO NOT POWER-OFF OR DISCONNECT!' is displayed in the dialog.

A progress bar keeps you informed and entertained.

The utility automatically moves to the next step when complete.

Verify Firmware Installation

This step is completely automatic.

The new firmware is read back from the BERTScope CR to the Update Utility, where it is checked for corruption.

'DO NOT POWER-OFF OR DISCONNECT!' is displayed in the dialog.

A progress bar keeps you informed and entertained.

The utility automatically moves to the next step when complete.

Restart BERTScope CR

For most BERTScope CRs, this step is automatic. Those few with very old bootloaders, however, can't reboot automatically. To cover this case, the utility displays:

If BERTScope CR doesn't restart in 10 seconds,

Press BERTScope CR button 1 until Power-Off.

Then, when this condition is detected:

 Press BERTScope CR button 1 to Power-On,

then Press OK to Continue, or Cancel to Abort

Pressing OK takes you to the next step.

Verify Successful FW Update

If the BERTScope CR is NOT detected in 'Normal' mode, it asks you to connect and power-on the BERTScope CR. Otherwise, the software automatically goes to the next step.

Finish Message

The Firmware Update Utility displays the new firmware revision. It also instructs you to 'Press Cancel to Exit' the utility and close the dialog.

Uninstalling the Firmware Update Utility

If you installed the Firmware Update Utility with the stand-alone Setup_CRUpdate.exe install package, then you may uninstall the utility. To do this, either:

- Execute the Setup_CRUpdate.exe file again, or
- Start the cached uninstaller with the 'Add or Remove Programs' applet from the Windows Control Panel.

In either case, just select the 'Uninstall' option, and follow the prompts.
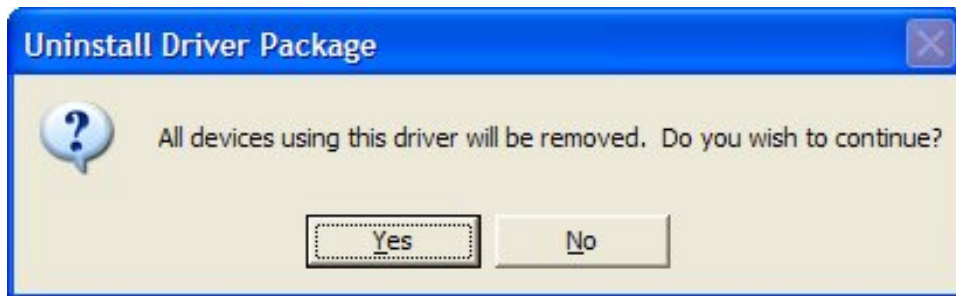
IMPORTANT NOTES:
- The uninstall program will not delete your 'BERTScopeCR\Firmware' directory if any backup packages exist there. IT IS STRONGLY RECOMMENDED THAT YOU ARCHIVE ANY FIRMWARE BACKUP PACKAGES, noting the serial number of the BERTScope CR from which they came.
- The uninstall program will not uninstall the BERTScope CR drivers, nor delete the 'BERTScopeCR\Driver' directory. If you wish to uninstall the BERTScope CR USB drivers, see the next section.

Uninstalling the BERTScope CR USB Drivers

If you are using a BERTScope to update your BERTScope CR firmware, then YOU DO NOT WANT TO DO THIS! The BERTScope needs the BERTScope CR drivers to operate correctly. The same goes for any other PC that is used to control a BERTScope CR on a routine basis.

If, however, you have used your laptop PC (for example) to update the BERTScope CR firmware -- and wish to clean up completely afterward -- here is what to do:

- Connect and power-on the BERTScope CR.
- Execute the "Uninstall.cmd" file, found in your 'BERTScopeCR\Driver' directory.
- Hit any key to continue when prompted by the uninstall script.

- Hit the 'Yes' button on the 'Uninstall Driver Package' dialog, when it appears, to complete the uninstall process.
- Power-Off and disconnect the BERTScope CR.

Once you have archived all firmware backup packages to another location, then it is safe to delete the entire installation tree ('C:\Program Files\BERTScope*', by default).

Contact Information

Technical Support
SyntheSys Research, Inc.
3475-D Edison Way
Menlo Park, CA 94025
Voice: (650) 364-1853
Fax: (650) 364-5716

tech_support@bertscope.com