

The Unofficial Guide to Installing Software on the Shumatech DRO-550

Version 2.0

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Disclaimer: Use these notes at your own risk. Although the author has made every effort to produce an accurate document, he assumes no responsibility for errors.

History

Version	description
1.0.0	Gotta start someplace
1.0.1,.2	Minor typo and format clean up
2.0	Change to “unofficial”

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¹ You are free to distribute this document but not change it.

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Reminder Card

Once you are familiar with the software install procedure, you might find this reminder card useful:

DRO-550 Software Installation Procedure

- 1. on DRO: remove all cables, push down button, connect power for 15 second, release button, remove power**
- 2. on PC: download software, plug in DRO, open SAM-BA and use it to install software, eject DRO** (see footnote on page 20)

Scope

The processor on the DRO-550² is programmed via a standard USB interface. This document explains how to get the latest version online and install it into the DRO. The first section deals with the one time task of getting and installing the program that runs on the PC which loads the DRO program into the DRO. The second section, which begins on page 14, deals with the actual loading of programs into the DRO once the PC has been set up.

Yes, this document is long but that is because we have assumed that the user has minimal experience with downloading software and program files. The work goes quickly.

Note: These directions were developed on a PC running Windows XP with Service Pack 3. If you are running a different operating system and get different screens, please let me know so I can update the document.

What you will need

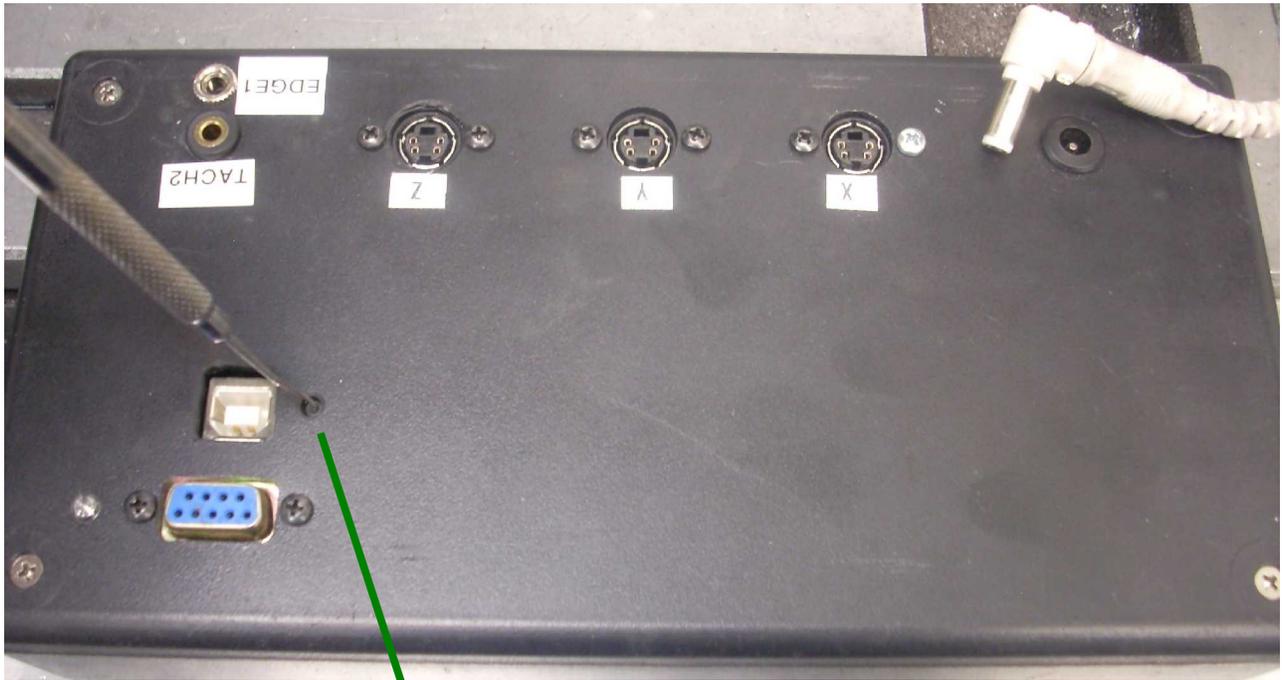
- A Personal Computer able to connect to a USB cable. I am using Windows XP with Service Pack 3.
- Access to the Internet.
- A USB cable with a USB-B connector on the end.
- Your DRO-550.
- A clear head and plenty of time to carefully go through these instructions. Lacking either of these resources can cause you to quickly go astray. It is far easier to do the steps right than clean the mess up later.



² When the DRO-350 is upgraded with the lite version of the DPU-550, the resulting machine has a subset of features found in the full DPU-550 as noted in this document.

Prepare the DRO for Connection to the PC for the First Time

1. Disconnect all cables from the DRO.



2. Push down on the reset button which is located next to the USB jack. Note that no power is being applied to the DRO.



3. While holding down the button, connect power to the DRO.
4. Keep holding down the pushbutton for 15 seconds. Then you can release it and remove the power cable.
5. The DRO has now had its program memory erased and you are ready to install the new software. You may skip the procedure on page 14 since you just did it.

Preparing the PC for Connection to the DRO for the First Time

We need to do a few things on the PC before you can plug in the DRO. First, we must get a program that will be able to grab the latest version of DRO code and install it on the DRO. Second we need to let the PC “see” the DRO and understand how to talk to it.

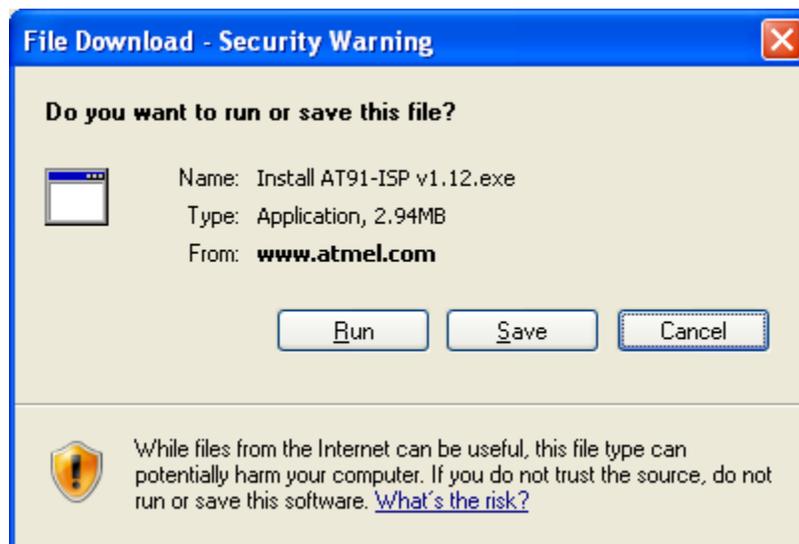
Before you begin, close all programs on your PC except the one that access the Internet. We get the programs at

http://www.atmel.com/dyn/resources/prod_documents/Install%20AT91-ISP%20v1.12.exe

I know, that is a lot to type so I have made a shorter version. Your system *may* permit the use of this equivalent “tinyurl”

<http://tinyurl.com/n93ybv>

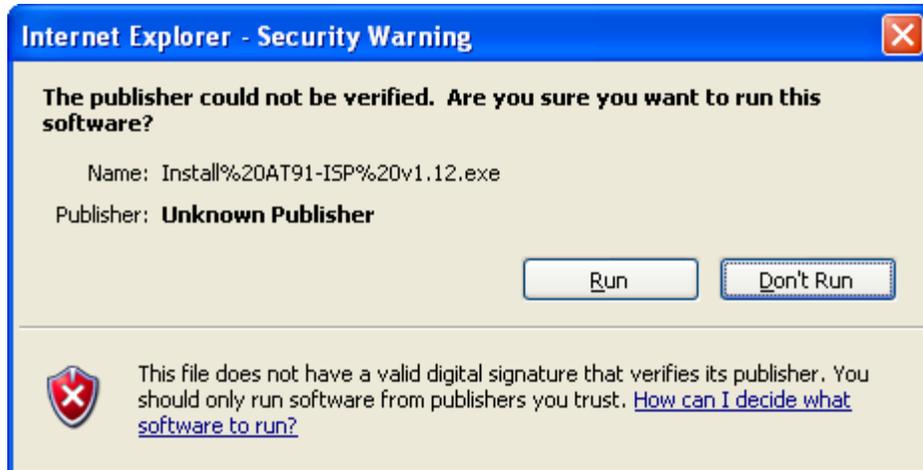
You should then see



Click on Run.

This should cause the install program to be downloaded.

You may receive a warning like this



but just hit Run.

This should bring you to the Setup Wizard:

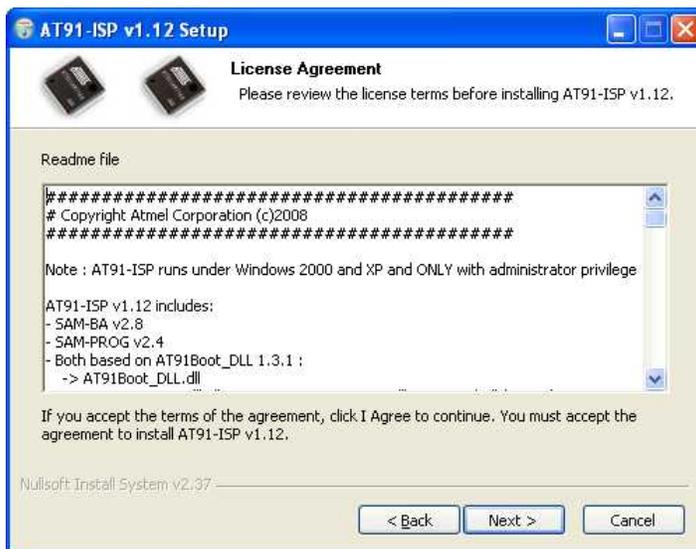


Click Next.



I just love these agreements. Either accept or you won't get the software you need. Tough choice: Doorstop or fully functional DRO. Let me assume you hit "I Agree".

They want to be sure you are sincere, so expect to see

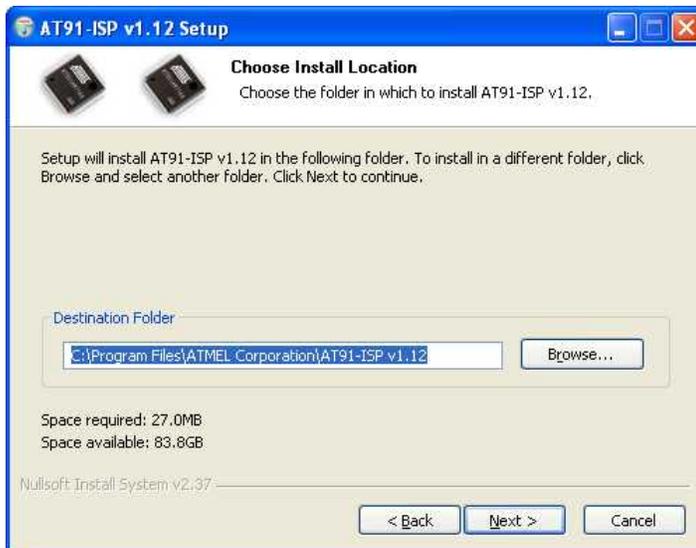


Just hit "Next". You are in this mess way too far to back out now! (just kidding)

Note in the above screen shot that "SAM-BA" and "SAM-PROG" are mentioned. The processor used in the upgrade is of the "SAM" type. SAM stands for Smart ARM³ Micro controller . The "BA" stands for Boot Assistant. We will use the Boot Assistant to load our software into our processor inside the DRO. Be sure to always select SAM-BA and **not** SAM-PROG.

3 ARM has had a few meanings over the years. See http://en.wikipedia.org/wiki/ARM_architecture for details.

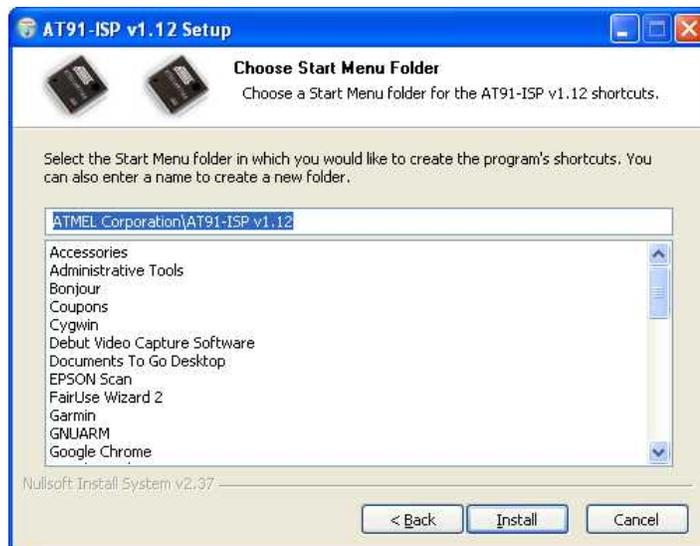
You will then be prompted to select the location of the folder that will hold the program.



I **strongly** recommend you do not change what they suggest. Just hit “Next”.

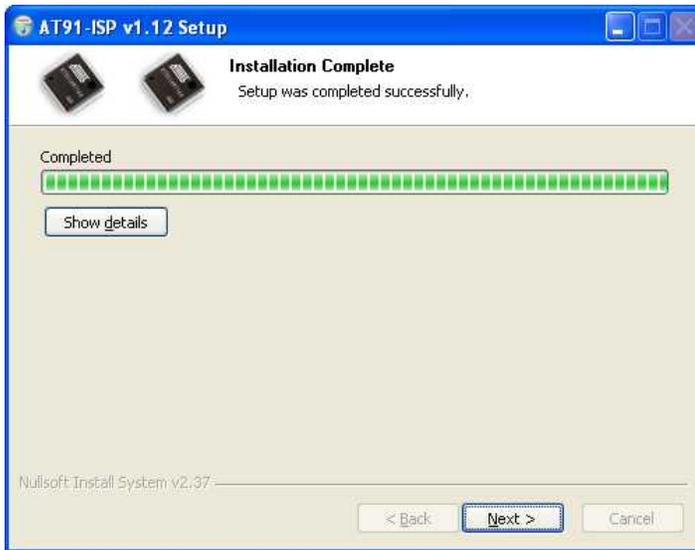
My first try at doing this install involved changing the destination folder. Things got so messed up that I had to delete all of it and start over. That does not mean that you can't figure it out, just that I didn't.

You will then be asked where you want to put the program in the Start menu.

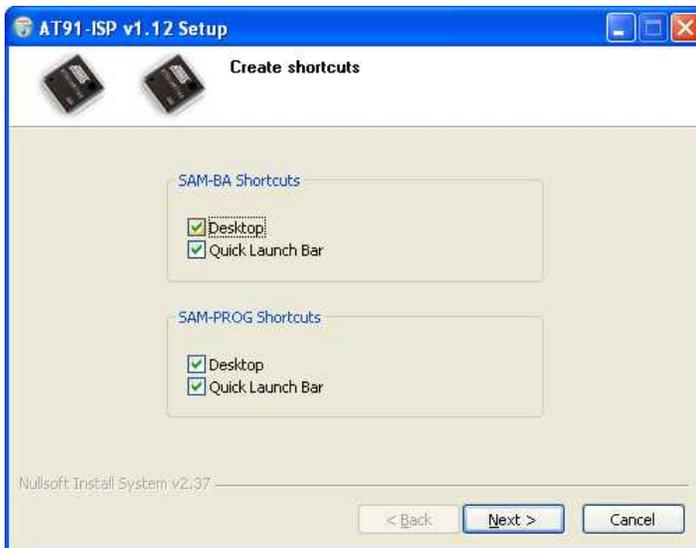


Put it somewhere now that will make sense later. If you do not choose a folder, it will go in the Start menu next to all the other programs. That is what I did initially but later created a folder called DRO for it.

After a bit of activity, you should see



which tells you the programs have been installed. Hit “Next”.



You are being given four choices related to how you want to access the SAM-BA and SAM-PROG programs. You only need to access SAM-BA, so at least un-check the boxes related to SAM-PROG. You can have a shortcut put on your desktop and/or in your Quick Launch Bar (at the bottom of the screen) to bring up SAM-BA.

Pick what you want and then click “Next”.

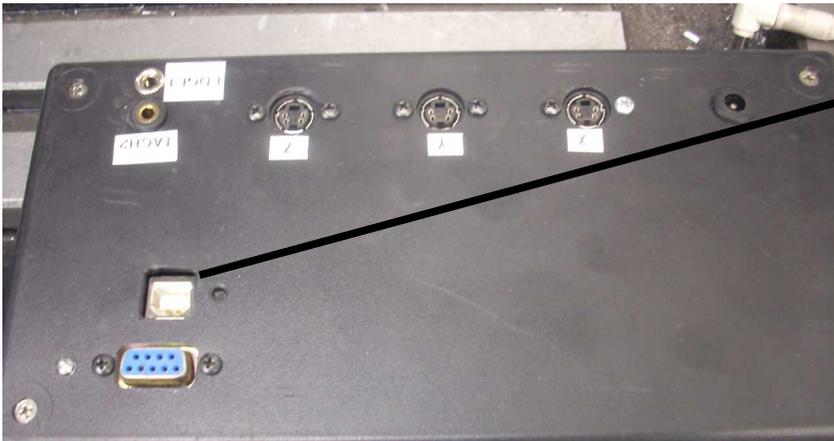
We are almost done. You should now see



When they say “strongly recommend you reboot”, obey. “Resistance is futile!” In the past I have ignored these suggestions and had other programs crash until I did as I was told.

You should have closed all other programs before starting the install so hitting “Reboot now” should not cause any trouble.

Once your PC is back up and running after the reboot, we are ready to connect the DRO to the PC via the USB cable. The first time you do this, the PC will see the DRO as new hardware and call up the Hardware Wizard. If you later plug the USB cable into a different USB port on the PC, it will probably run the Hardware Wizard again. Otherwise, the Hardware Wizard only runs once.



Connect the USB cable⁴ from the PC to the DRO's USB port. No other cables should be connected to the DRO. The USB will supply power and control.

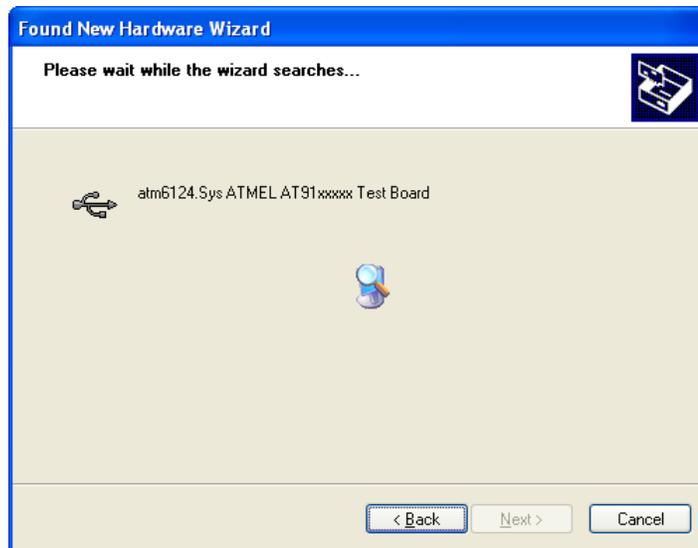
4 An alternative is to use the RS232 port if it has been connected as per the hardware install document. The communication settings are 57600 8-N-1, no flow control. The software upgrade instructions are identical to using the USB except that you select "COMx" instead of "/usb/arm0" in SAM-BA. RS232 is noticeably slower than USB. When using the RS232 port, you must power the DRO from its own plug-in power supply. The DPU-550 lite does not support this configuration.

You should see



Just click "Next".

You should then see



with the magnifying glass in the center of the window going around.

After a few seconds you will see



Click “Finish”. You will see a “balloon” in the lower right corner of the screen saying that the hardware is now ready to use.

We are now ready to run “SAM-BA”. Be careful to **not** select “SAM-PROG”.

If you let the installer create a shortcut for SAM-BA, click on it. If you just put it into the program menu, then look for an entry marked “ATMEL Corporation” unless you renamed it. Follow the sub menus until you see SAM-BA. Click on it and see



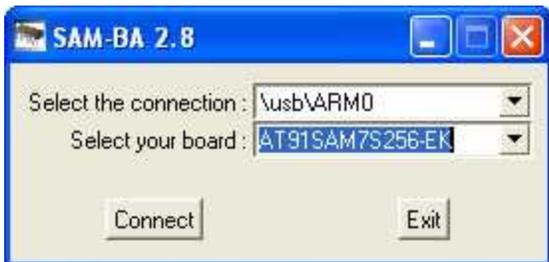
Click on the “Select the connection” menu and click on \usb\ARM0



Then click on “Select your board” and see



Click on “AT91SAM7S256-EK”.



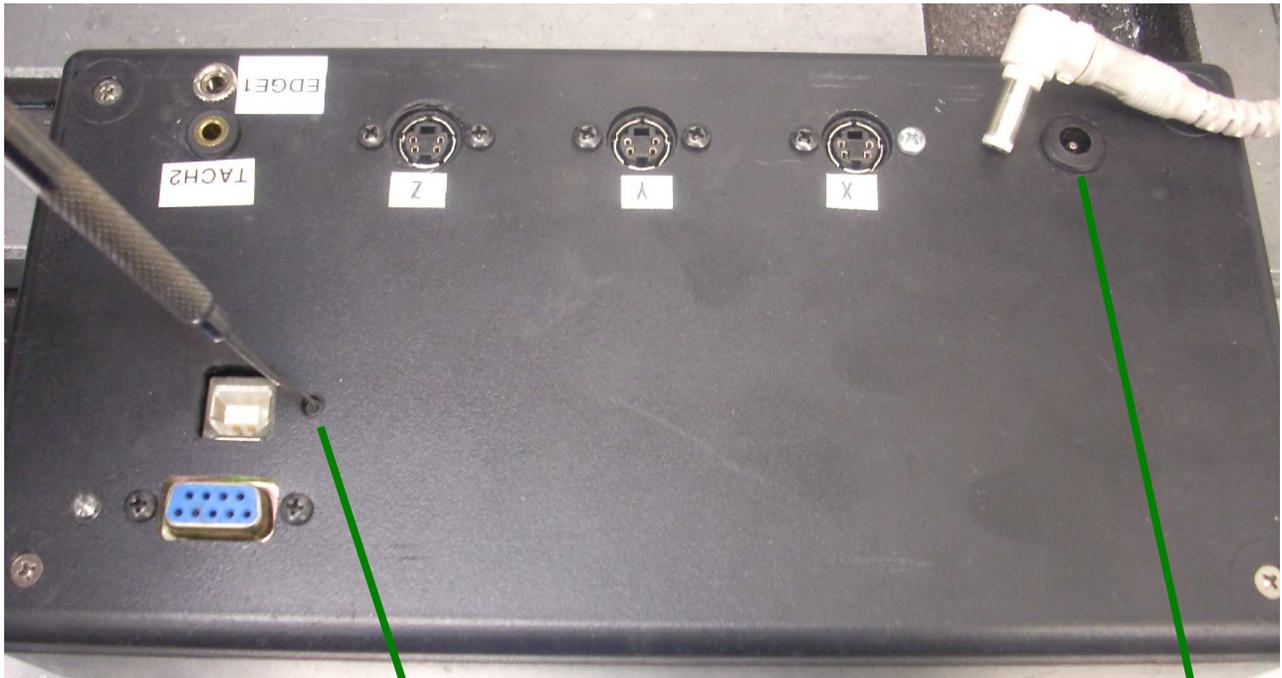
Double check that you have picked the right board type and then click “Exit”. This ends the one time PC set up procedure.

Installing Software on the Shumatech DRO-550

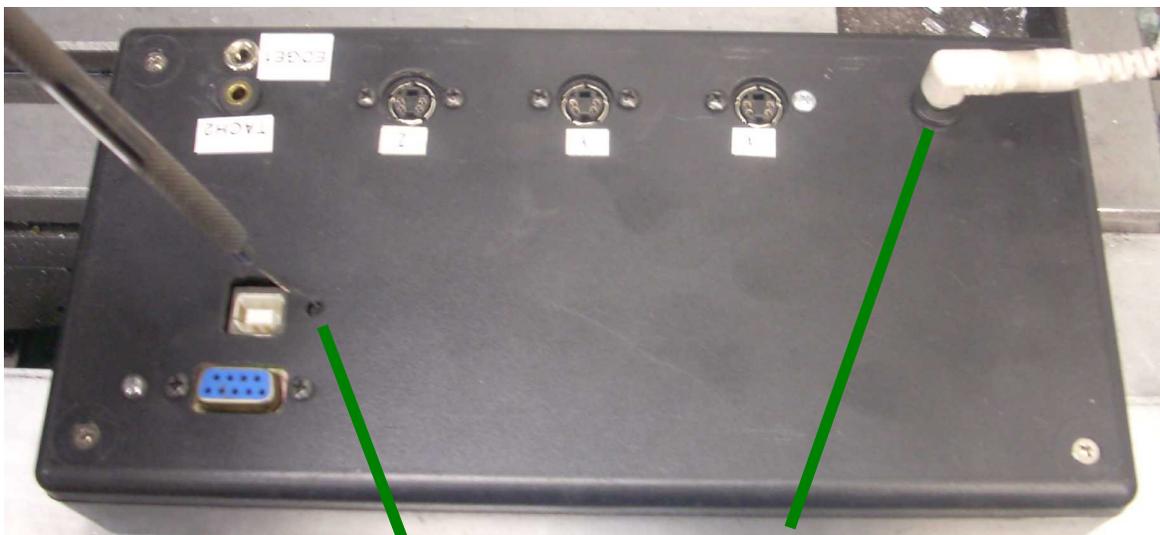
First we will prepare the DRO to accept new software. Then we will go on the Internet and get that new software. Finally, we will connect the DRO to the PC to enable the transfer.

Prepare the DRO for the New Software

1. Disconnect all cables from the DRO.



2. Push down on the reset button which is located next to the USB jack. Note that no power is being applied to the DRO.



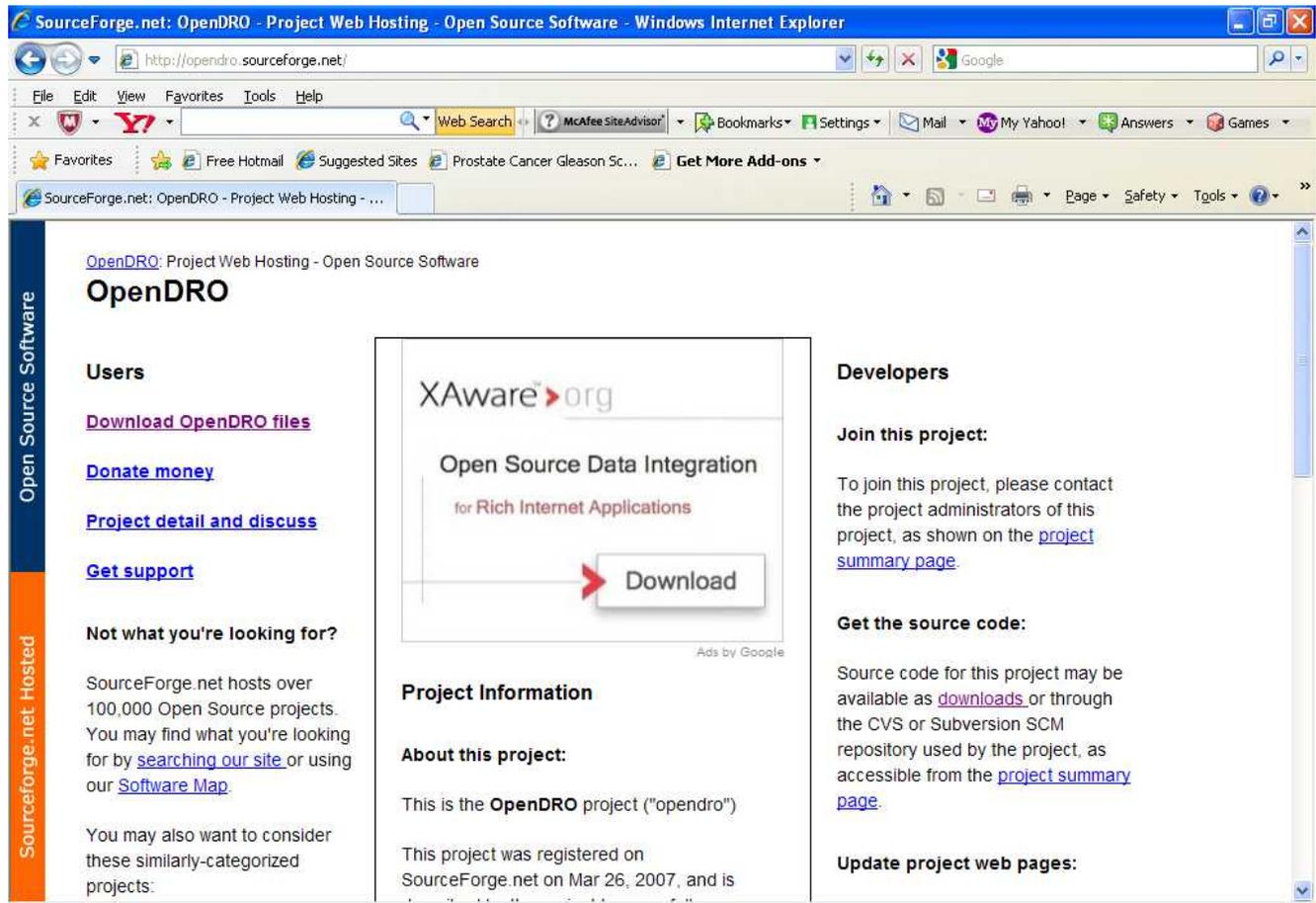
3. While holding down the button, connect power to the DRO.
4. Keep holding down the pushbutton for at least 15 seconds. Then you can release it and

remove the power cable.

5. [] The DRO has now had its program memory erased and you are ready to install the new software.

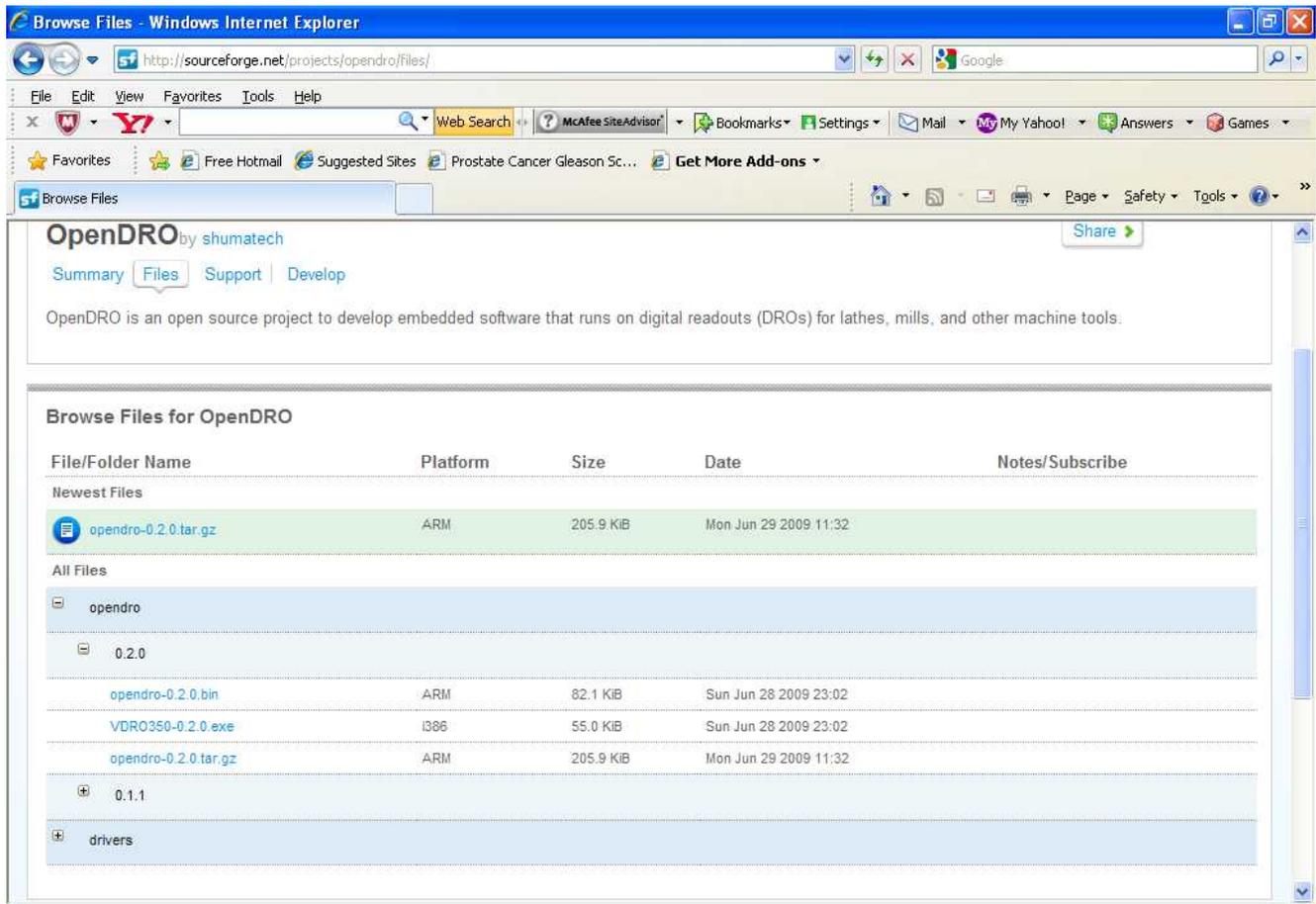
Downloading the New Software From the Web Site to the PC

1. [] Go to <http://opendro.sourceforge.net/> and see



2. [] Click on “Download OpenDRO files”. The first time you go to this site, the text will be blue. Subsequent visits will show the text in red as you see above.

3. [] Click on the file that starts with “opendro” and ends with “.bin”⁵. When I did it, I found

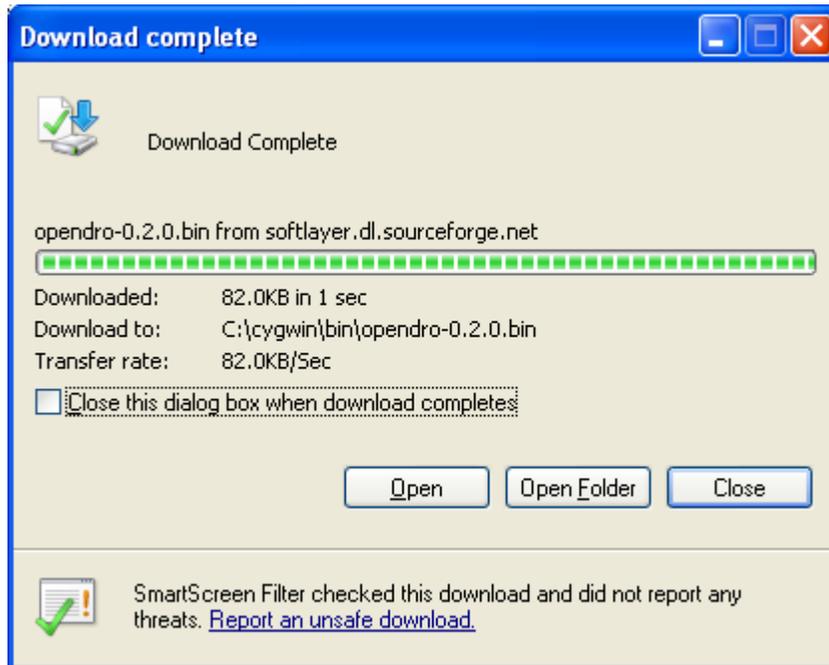


I clicked on opendro-0.2.0.bin. Always select the .bin file with the highest version number. For example, pick opendro-1.0.0.bin over opendro-0.2.0.bin.

4. [] You will be prompted to provide the location to save this file. Put it in some sensible place so you can find it later. You may want to write down the file name to insure that you later install the right one. Click “Save”.

5 The DRO program is written in a high level language which is processed by a program called a compiler. It generates a file that is compatible with our processor. This file is called a “binary” hence the .bin extension. You can also see a file with “tar.gz” as the extension. This is a collection of files that make up the high level language DRO program. Advanced users can modify these files and change the behavior of the DRO. By running it through the compiler, they will generate a new .bin file.

5. [] In less than two seconds (on a cable modem) you will see



6. [] Click on “Close”. The file is now stored on your PC. You are now ready to go to the next procedure which will move the file from the PC to the DRO.

Downloading the New Software from the PC to the DRO-550

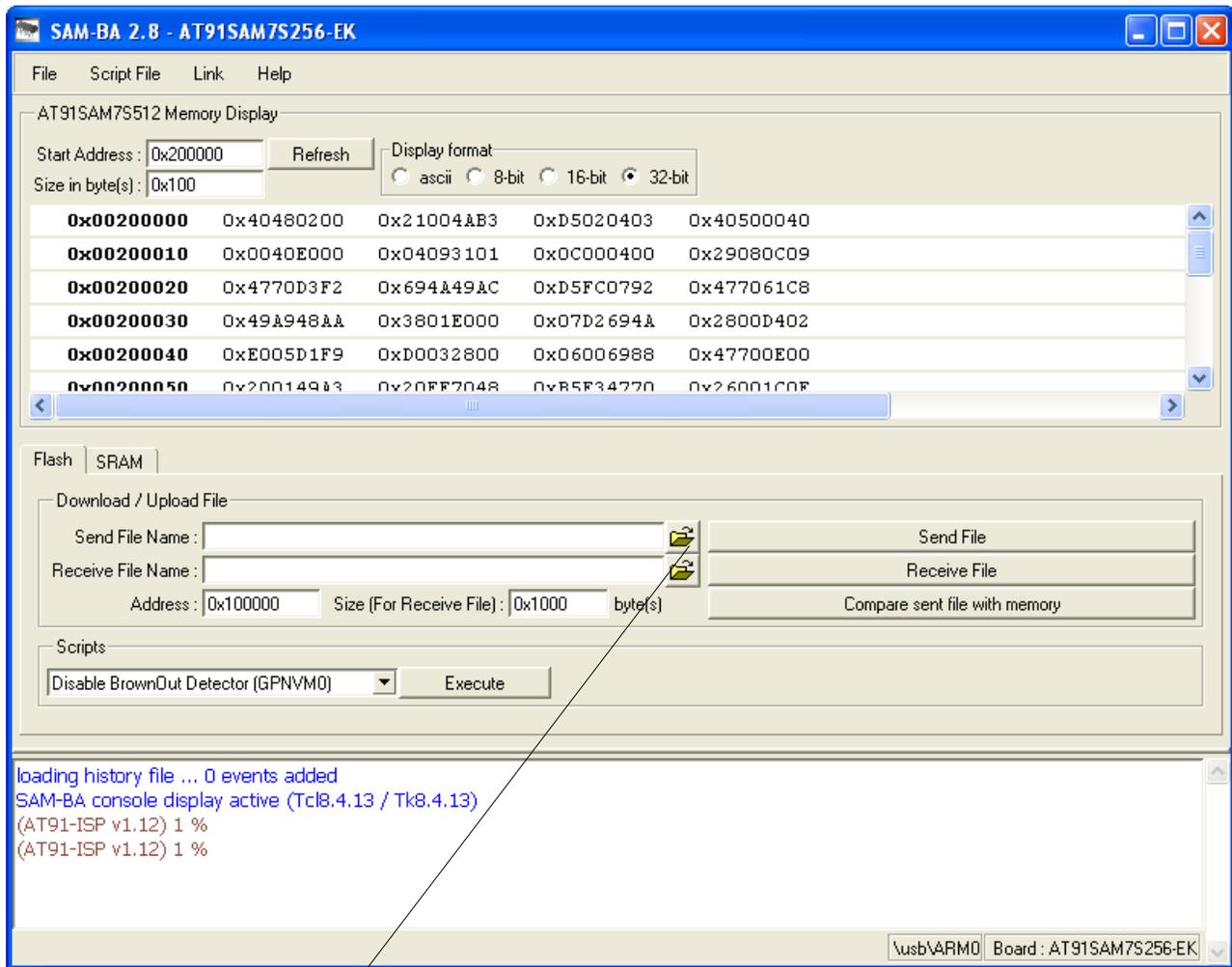
1. [] With the newly erased DRO in hand as produced by the procedure found on page 14, connect it to the USB cable going to the PC. No other cables should be connected.
2. [] Start up “SAM-BA” either by clicking on a shortcut or finding it in the menu. On the menu, look for the ATMEL Corporation entry and follow the sub menus to “SAM-BA v2.8”.
3. [] You should now see



if you set up the program and USB correctly. If you do not see this window, revisit the first half of this document. If you get the window but the menu items are not as shown, click each down arrow and select the correct items.

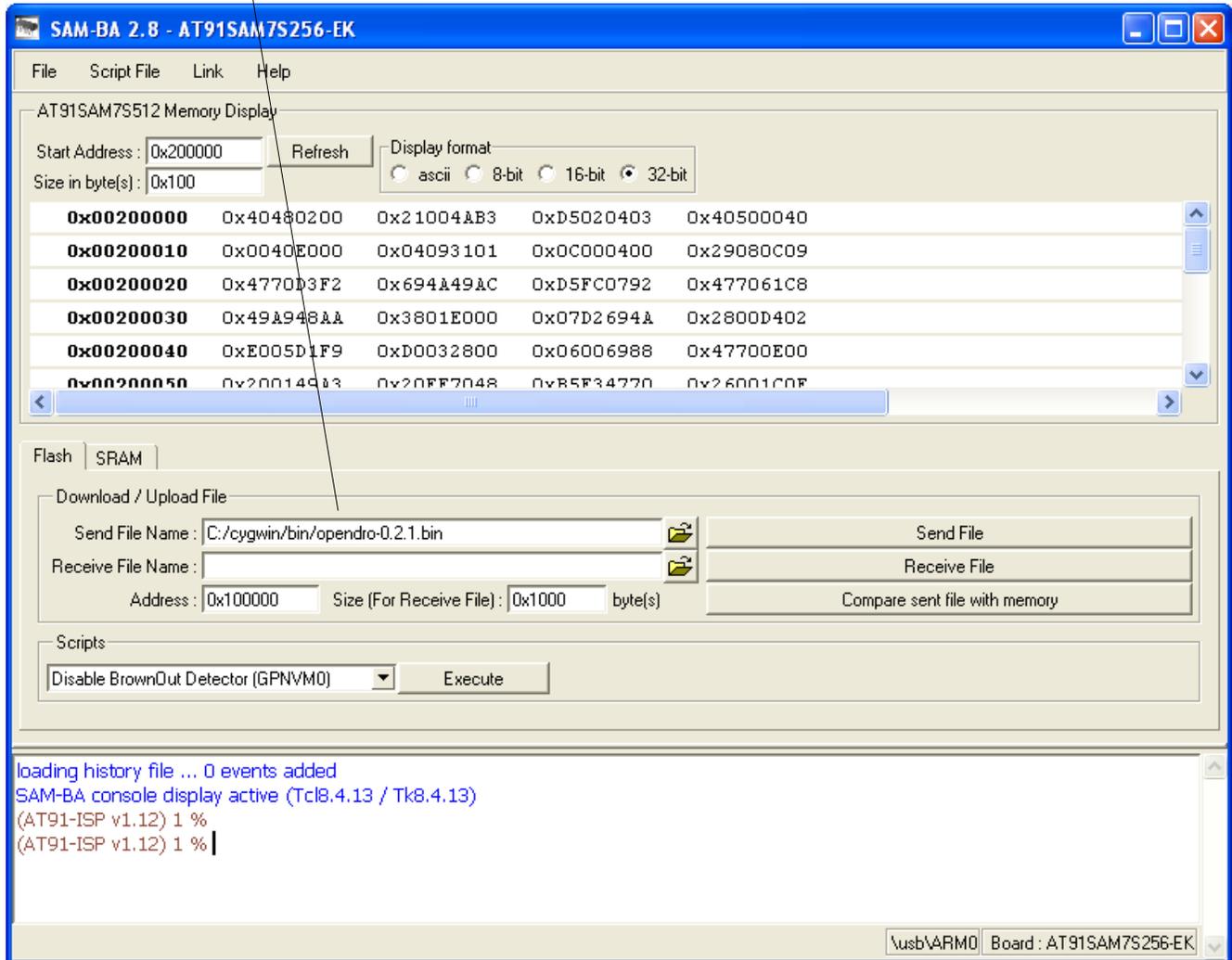
4. [] Click on “Connect”.

5. [] The SAM-BA window should now come up



6. [] Click on the folder icon to the right of the "Send File Name:" small window.

7. [] Navigate to the location that holds the “.bin” file that you just downloaded. Click on it. The path to this file should appear in the small window to the left of the folder you clicked.



8. [] Click on “Send File”.
9. [] You will see



10. [] Click “Yes”.

11. [] Then you will see



12. [] Click on “No”.

13. [] In a blink of an eye, the file has been loaded into the DRO.

14. [] If you like, click on “Compare sent file with memory” to verify that the file arrived safely.



Click “OK”. If you get a warning message saying the file and Memory area content do not match, try doing the download to the DRO again.

15. [] Close the program by selecting “File” found in the upper left corner of the window and then click “Quit”.

16. [] You can now “eject”⁶ the DRO from the PC. In the lower right hand corner of the monitor's screen, you will find a small icon that looks like a green arrow pointing to the left over a gray plate. Move your cursor over it and you should see a square yellow tag that says “Safely Remove Hardware”. Left click on the icon and you should see “Safely remove ATMELAT91xxxxxTest Board”. Left click on this text and the software should come back with a message saying it is now safe to unplug the device.

17. [] Disconnect the DRO from the USB cable.

18. **Congratulations!** You can now bring your updated DRO back into your shop and reconnect all cables.

Acknowledgement

I would like to thank Larry Gill for reviewing this document. I could not ask for a better friend.

⁶ This tells the PC that you want to pull the cable so it should stop talking with the DRO. Failure to do this step can cause damage to both SAM-BA and the program you just loaded into the DRO.