

Cogent CSB337 MicroMonitor Recovery using Macraigor usbDemon

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The document has been prepared as a means to perform the MicroMonitor recovery process using the (less expensive) Macraigor USBDemon (also called the Macraigor OCDemon) instead of the BDI2000 JTAG device. This document begins by outlining the needed equipment, the software that needs to be installed, and the connections between the PC, usbDemon and CSB337 single board computer that need to be established before reprogramming of the flash can be done. Note that the CSB337 is used with its CSB3XX daughterboard for this recovery process. You *do not* need either the GNU XTools or Cygwin to perform this installation process. NOTE that if micromointor starts up fine, but the tiny file system (TFS) shows duplicate file entries or has some other kind of corruption; then it may be possible to simply reformat the tfs (i.e., using "tfs init") without following the reprogramming procedure described here.

Disclaimer

Please note that the information provided in this document is given without any guarantees. Follow these steps at your own risk.

Initial issues: parts, software and connections needed

This process makes use of the Macraigor **usbDemon2 product number USB-ARM20** (note this product is compatible with ATMEL ARM7 and ARM9 microcontrollers – the CSB337 uses a ARM9 core). For details of the usbDemon see: <http://www.macraigor.com/usbDemon.htm>.

If you do not already have the **Macraigor OCD Commander** downloaded or installed, download its software from http://www.macraigor.com/ocd_cmd.htm (note the software is available for Windows and Linux). In this tutorial, I'm using the Windows version of OCD Commander, and I'm running it on Windows XP.

You need a terminal program, such as Windows HyperTerm™ that is able to send data files using xmodem (this is needed during the flash reprogramming step).

Disconnect the CSB337 from the power before making the connections in order to reduce the possibility of further damage to your devices. Also ensure the usbDemon is not connected to the PC, otherwise the software and driver installation might not succeed.

Installing the OCD Commander

The OCD Commander comes in the form of an install program, all you need to do is double click the EXE file (it was named ocd_cmdr.exe when I downloaded it) and install the program to your hard drive. The

program shortcut should appear in Start->All Programs->Macraigor Systems->OCD Commander->OCD Commander. The program will probably ask you to reboot – do so, but don't plug in the usbDemon yet. Once your computer has rebooted and you've logged back into Windows, only then plug in the usbDemon. When you plugged in the usbDemon, a Windows "add new hardware message" should pop up. Use the automatic / recommended option (i.e., use the driver files that have already been installed when the OCD Commander was installed). Note that if you plug in the usbDemon and its green light *doesn't* glow brightly (or if it doesn't pop up the add hardware window the first time you've connected the device), then you probably need to try a different USB port (in my experience, it did not connect via a USB hub; it only worked if I connected it up to a main/root USB 2.0 port).

Reprogramming the flash memory

Initially the CSB337 should be off (i.e., not plugged in to the power). Connecting the usbDemon via the ribbon cable to the JTAG connector on the CSB337 board – see Figure 1 below). Also connect the serial connector from the PC to the CSB337 (i.e., connect to the Serial 0 port). Now you can connect up the power (you do not need the Ethernet connector in order to complete the reprogramming procedure).

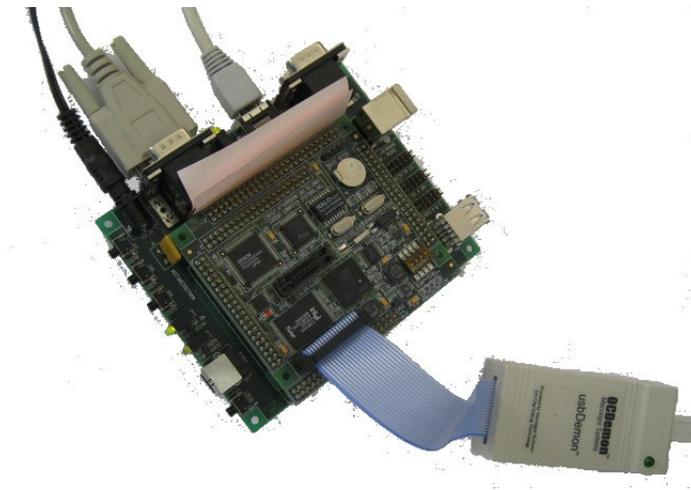


Figure 1: usbDemon connection to CSB337

Open up Windows HyperTerminal or an alternate serial terminal (which can do Xmodem file transfers). Configure the communications parameters as follows:

| Parameter | Setting |
|-----------------|-----------|
| Bits per second | 38400 bps |
| Data bits | 8 |
| Parity | None |
| Stop bits | 1 |
| Flow control | None |

Start the OCD Commander program (i.e. click on Start->All Programs->Macraigor Systems->OCD Commander->OCD Commander). Ensure that USB is selected as the connection port. Select the ARM family of processors, and choose ARM920T (see Figure 2 below).

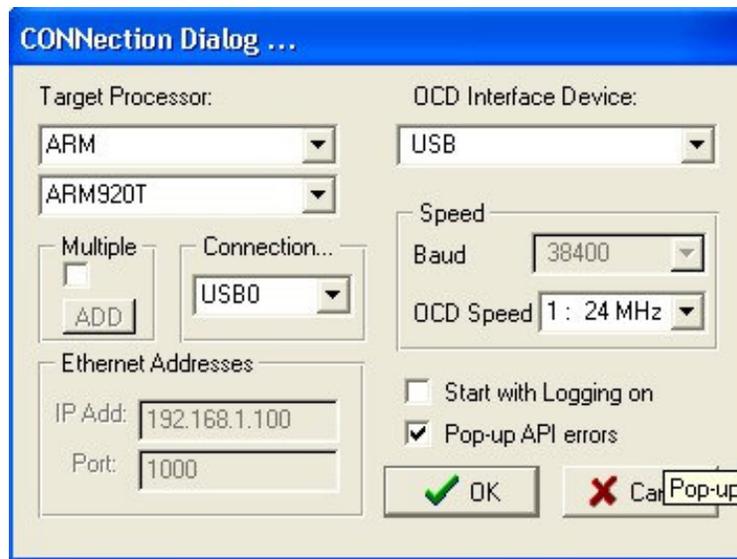


Figure 2: Connection sessions for OCD Commander

In the OCD Commander window press the RESET button at the top of the window (or enter in RESET and enter in the command box at the bottom of the main window). At this stage, if MicroMonitor is working on the CSB337 it should halt (i.e., typing input at the HyperTerminal display has no effect).

In the OCD Commander, select Commands -> Download (see Figure 3). Choose the file csb337_tst.elf and press Ok. The file should then be downloaded into the CSB337's RAM at address 0x20100000 (note this is automatically configured in the elf file provided).

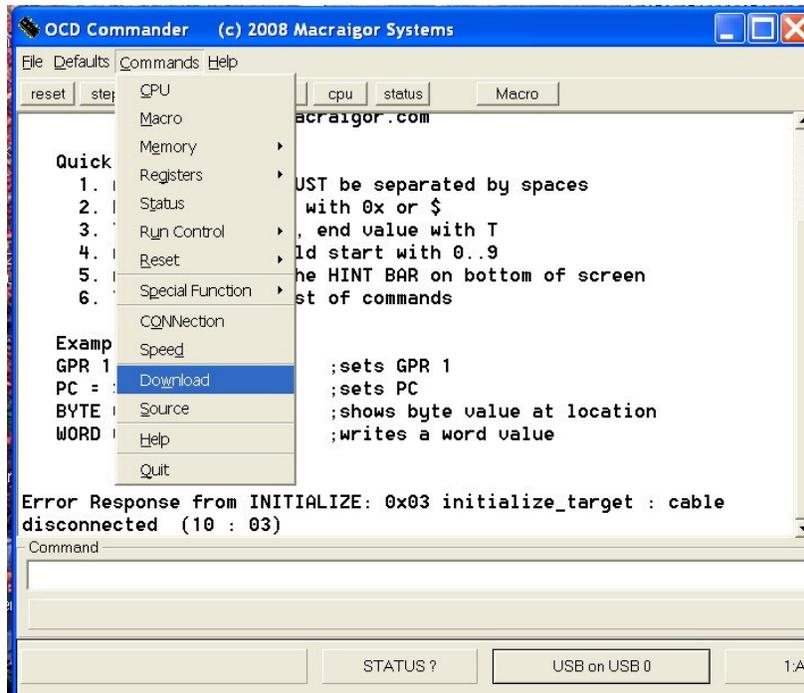


Figure 3: Select download option from menu

Once the download is completed, the OCD Commander will set the 'go' address to 0x20100070. You now just need to press the GO button at the top of the window to run the version of MicroMonitor loaded into RAM.

Change over to the HyperTerminal windows, and type in the following at the UMON prompt:

```
uMON> set APPRAMBASE 0x20400000
uMON> set BOOTROMBASE 0x10000000
uMON> xmodem -B
```

For the xmodem, select the file csb337_rom.bin as the file to send to the CSB337 (to do so, go into the menu Transfer -> Send File and then select XModem as the protocol to use for sending the file.

The file will take a minute or thereabout to transfer. When it is complete, you will receive a prompt showing "OK?". At this point, the program is asking if the bin file needs to be written to flash. Answer y to the question. The red LED should not light up on the CSB337 indicating that the flash is being programmed (this takes about 30 seconds). If the LED did *not* light up, then perform the 'unlocking flash sectors' procedure described later in this document and repeat the above programming procedure.

Once the LED has turned off, press the reset button to do a hardware reset of the CSB337 and it should then load the new version of Micromontior that was written to flash. Note that you will be asked to input a MAC address the network device; just type enter to use the default.

Unlocking the flash sectors

If the reprogram procedure described above was not successful (e.g., the red LED did not come on to indicate reprogramming occurred), then try the steps below in order to unlock sectors of flash memory. This procedure is based on the one provided by MicroCross titled “MicroMonitor Disaster Recovery Using the BDI2000” (available at: http://www.microcross.com/disaster_recovery.pdf).

First it is necessary to determine the range of flash memory banks that are used, and then a flash unlock command needs to be applied to that memory range from within MicroMonitor running on the CSB337. The command “flash info” run from MicroMonitor will list the flash memory banks. Take note of the first and last sector and then issue the flash unlock command (see next page).

```
UMON> flash info
Device = INTEL-28F640
Base addr   : 0x10000000
Sectors     : 64
Bank width  : 2
Sector      Begin          End            Size          SWProt?  Erased?
0           0x10000000 0x1001ffff 0x020000    yes      no
1           0x10020000 0x1003ffff 0x020000    yes      no
2           0x10040000 0x1005ffff 0x020000    yes      yes
3           0x10060000 0x1007ffff 0x020000    yes      yes
4           0x10080000 0x1009ffff 0x020000    no       no
5           0x100a0000 0x100bffff 0x020000    no       no
6           0x100c0000 0x100dffff 0x020000    no       no
7           0x100e0000 0x100fffff 0x020000    no       no
8           0x10100000 0x1011ffff 0x020000    no       no
9           0x10120000 0x1013ffff 0x020000    no       no
10          0x10140000 0x1015ffff 0x020000    no       no
11          0x10160000 0x1017ffff 0x020000    no       no
12          0x10180000 0x1019ffff 0x020000    no       no
13          0x101a0000 0x101bffff 0x020000    no       no
14          0x101c0000 0x101dffff 0x020000    no       no
15          0x101e0000 0x101fffff 0x020000    no       no
16          0x10200000 0x1021ffff 0x020000    no       no
17          0x10220000 0x1023ffff 0x020000    no       yes
18          0x10240000 0x1025ffff 0x020000    no       yes
19          0x10260000 0x1027ffff 0x020000    no       yes
           ... sectors 20 to 61 omitted ...
62          0x107c0000 0x107dffff 0x020000    no       yes
63          0x107e0000 0x107fffff 0x020000    no       yes
uMON>
```

Example output of flash info command run on a CSB337

From the example output above the range is from 0 to 63 (this is probably the same for your platform, but rather check to make sure). Issue the command “flash unlock 0-63” in MicroMonitor to unlock this entire range. This may take a few seconds to complete; a ticker display should be visible in the terminal indicating progress is happening). If the ticker doesn’t move this indicates the unlock algorithm has

hung. Once the unlock has completed, enter in the command “xmodem -B” in order to reprogram the (not unlocked) flash as is described earlier in the ‘Reprogramming the flash memory’ section of this document.

If the flash programming working (i.e., the red LED came on to indicate the flash was programmed), but after resetting the CSB337 the boot loaded did not start successfully (e.g., the system immediately hang, or just nonsense characters or blanks were output from the com port) then it may be that either the boot program was written to the wrong address in flash (you can check this with the wrong address; the address should be 0x10000000 and you can confirm it with the flash info command), or the bin file that was used was the incorrect one (e.g., not for the csb337 platform, or was somehow corrupted). If repeating the reprogramming procedure doesn’t work, then it may be a hardware fault (e.g., the flash chip is corrupted, or one of the tracks is damaged or shorted – check over the board in the relevant areas to see if there are any obvious faults; if not there is probably something more seriously wrong with the board).

Reformatting the Flash tiny file system

Note that if Micromonitor starts, but the flash file system is somehow corrupted (e.g., duplicated file entries or odd file names), then you can probably fix the problem just by reformatting the tiny file system instead of reprogramming the flash with micromonitor. The tiny file system can be reformatted by issuing the command “tfs init” in MicroMonitor.
