

Tools Tech Note 4
Multiple XDS510USB Emulators

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Introduction

This tech note describes steps for using multiple XDS510USB emulators connected to a single PC in a CCS environment.

Requirements

1. PC running Windows 2000 with SP3 or higher or Windows XP Professional with SP1 or higher. Windows 98, ME, NT-4 are not supported. Windows XP home is not tested.
2. USB Hub or PC with multiple USB ports. A USB hub is recommended when working in a development environment.
3. Spectrum Digital CCS driver install 2.20.03 or higher.
4. CCS 2.21 or higher.

SdConfig Setup

To support multiple XDS510USB emulators on a single PC, SdConfig and low level emulation drivers must be able to distinguish between the emulators. This is done via the XDS510USB serial number, which is unique to each emulator. To determine an emulators serial number perform the following:

1. Plug XDS510USB to the PC via USB cable. For each emulator Windows will recognize new hardware and either run the Hardware Wizard automatically or ask you to step through the process. Generally once you have one XDS510USB connected and the driver loaded you can simply tell the Hardware Wizard to find the driver that is already installed. Otherwise you can point to the install CD or to your CCS driver install directory. The XDS510USB drivers are installed into your CCS install path at <CCS_INSTALL_DIR>\specdig\xds510usb. The default install path is C:\ti\specdig\xds510usb.
2. Run SdConfig.
3. From SdConfig run “Configuration->Ports Available->Printer, USB”. If the XDS510USB emulator is found you will get an output message similar to the following:

```
** Checking for available USB ports
```

```
$$ XDS510USB connected on:
$$ EmuPortAddr=0x510
$$ EmuSerialNumber=S274657372020422
```

The important piece of information here is the “EmuSerialNumber= S274657372020422” string. You should cut and paste this string to a temporary text file and also label the XDS510USB either with the serial number or some other means to correlate the serial number to the emulator.

4. Repeat steps 1 through 3 until you have determined the serial number for each XDS510USB.

Once you have determined the serial number of each XDS510USB and marked each emulator accordingly you must now manually edit your sdopts.cfg file to instantiate each emulator. Open your sdopts.cfg file with Notepad. Sdopts.cfg is located in your Windows system directory, either “\winnt\system32” or “Windows\System32”. At the bottom of the file you will see the default configuration for a XDS510USB emulator mapped to port address 0x510.

```
# XDS510USB Port 0x510
#
[EmulatorId=510]
EmuPortAddr=0x510
EmuPortMode=USB
EmuPortSpeed=0
EmuAddOptoPod=NO
EmuDisablePolling=YES
EmuDoWaitInReset=NO
EmuProductName=XDS510USB
```

```
EmuTckDiv=1
#EmuPulseTrst=YES
```

To assign EmulatorId 510 to a specific serial number simply cut and paste one of the serial numbers from step 3 above. Now you should have the following:

```
# XDS510USB Port 0x510
#
[EmulatorId=510]
EmuPortAddr=0x510
EmuPortMode=USB
EmuPortSpeed=0
EmuAddOptoPod=NO
EmuDisablePolling=YES
EmuDoWaitInReset=NO
EmuProductName=XDS510USB
EmuTckDiv=1
#EmuPulseTrst=YES
EmuSerialNumber=S274657372020422
```

You can assign up to 2 XDS510USB emulators on a single PC. Valid EmualtorId and EmuPortAddr fields are 0x510, 0x511. Following is a complete instantiation.

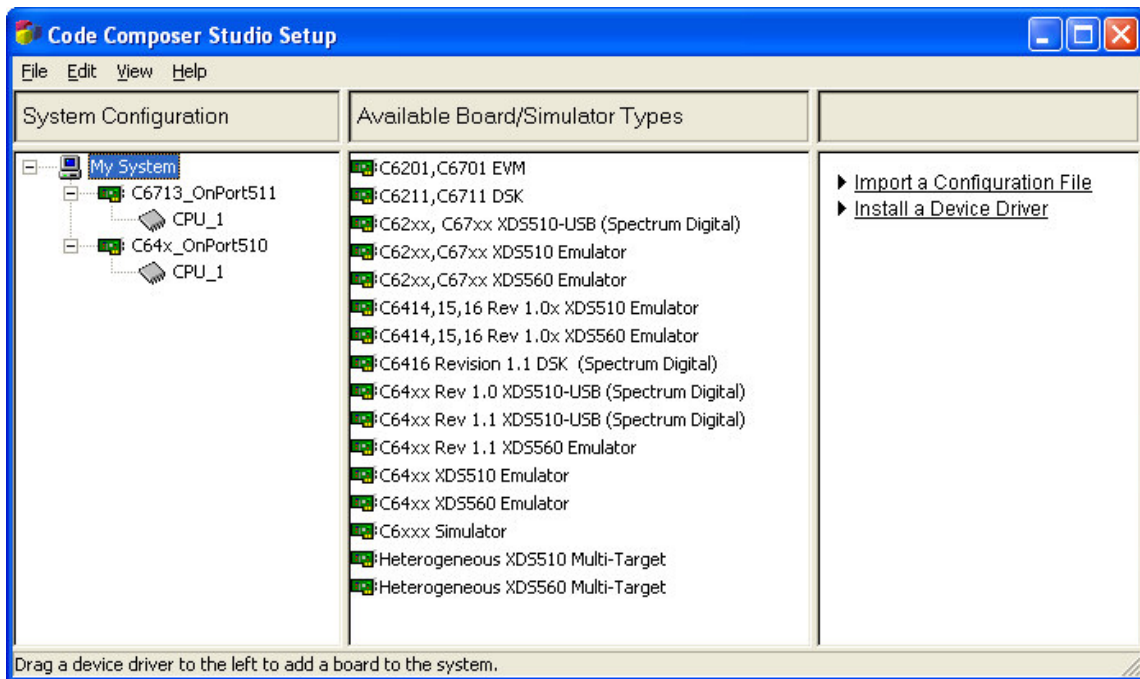
```
# XDS510USB Port 0x510
#
[EmulatorId=510]
EmuPortAddr=0x510
EmuPortMode=USB
EmuPortSpeed=0
EmuAddOptoPod=NO
EmuDisablePolling=YES
EmuDoWaitInReset=NO
EmuProductName=XDS510USB
EmuTckDiv=1
#EmuPulseTrst=YES
EmuSerialNumber=S274657372020422
```

```
# XDS510USB Port 0x511
#
[EmulatorId=511]
EmuPortAddr=0x511
EmuPortMode=USB
EmuPortSpeed=0
EmuAddOptoPod=NO
EmuDisablePolling=YES
EmuDoWaitInReset=NO
EmuProductName=XDS510USB
EmuTckDiv=1
#EmuPulseTrst=YES
EmuSerialNumber=S360447122120422
```

Save the sdopts.cfg file and rerun SdConfig. You should now see that two XDS510USB emulators are available. To test the emulator connection, connect the emulator to the host and target then perform “Emulator->Reset”. See SdConfig documentation for more details on SdConfig usage. At this point you should have one or more XDS510USB emulators connected to your host and target and ready for CCS or SdFlash setup.

Code Composer Setup

To setup Code Composer to use multiple emulators simply drag and drop multiple driver installs from the Code Composer Setup “Available Board/Simulator Types” panel to the “System Configuration” panel. You can then edit each configuration where you would assign one configuration port address 0x510 and the other port address 0x511. Following is simple example of a C64xx and C6713 dual emulator configuration.



The number of emulator configurations is virtually endless with CCS. However, only a limited number of configurations are tested and they are normally with a single emulator and multiple processors.

SdFlash Setup

SdFlash does not support multiple emulation connections in a single session. Instead you run multiple instances of SdFlash. For each SdFlash instance you will have a separate configuration file (.sdp) file with the only difference being the emulator address. You can do this using the SdFlash project create features or simply save an existing project to a new name and then edit the project settings. The steps to create an alternate configuration file are as follows:

1. Open an existing SdFlash configuration for the XDS510USB.
2. From the file menu do a save as and tag the file name with _511 to signify port 511. The _511 tag is just an example, any file name is acceptable.
3. Now under the “Project->Setting->Target” menu select 511 under “Emulator Address/Id “. SdFlash reads the configuration file created by SdConfig and will list the emulators that have been configured. So if you do not have both 510 and 511 options available go back to SdConfig and make sure both ports are properly configured.
4. Save the configuration. You will now have an SdFlash configuration file for each emulator connection.

With 1 or more configuration files created you can now run multiple instances of SdFlash independently with the appropriate configuration file.

Usage Tips

The following are a few tips on usage of multiple XDS510USB emulators or mix of emulators.

1. Use SdConfig to verify the connection between each emulator and the target. When using the emulator serial number for identification SdConfig will print message showing the serial number that it is using. You should double check that this matches the emulator.
2. When running with CCS you should get one connection completely functional then add the second connection.
3. CCS will attempt to connect to each emulator and target processor specified in the “System Configuration”. So if one emulator or target has problems CCS should post a dialog that allows you to abort or ignore. If you ignore it will go to the next emulator connection in the list until each connection is attempted. The only way to prevent CCS from attempting the connection is to remove it from the list in CC Setup.
4. If you do not want to use the serial number feature of sdopts then you can simply comment out the serial number string by placing a ‘#’ in front of the string. If you do this and there are multiple emulators connected then the first driver that Windows finds will be considered port address 0x510. There is no specific connection order in Windows and it may even change overtime.
5. If you are running CCS and SdFlash side by side or multiple SdFlash (i.e. F28xx) then you should start one application and make sure it is fully connected before starting the other. This prevents any Windows USB port enumeration race conditions. Generally speaking Windows needs about 2 seconds to fully enumerate between USB connections.

Known Limitations

1. Only two XDS510USB connections are currently allowed in driver release 2.20.03. Valid ports are 0x510 and 0x511. Four ports are allowed in driver release 3.01.00. Valid ports are 0x510, 0x511, 0x512, 0x513.
2. If you attempt to start accessing two F28xx devices from two instances of SdFlash simultaneously Windows may not properly connect to each USB port. This problem generally occurs the first time you connect to the XDS510USB after plugging in the USB cable. To work around the problem run the first instance of SdFlash and do a “Device->Reset”, wait for the command to finish and then repeat on the second SdFlash instance. At this point both emulators will be configured, and this should no longer be problem until you unplug the USB cable. Preconfiguring both emulators with SdConfig and “Emulator->Reset” will also work.