CYPRESS SEMICONDUCTOR CORPORATION

Details:

Cypress Control Center utility can create script files which can automatically download the firmware to the FX3 through USB. This memo describes how to create script file using control center utility and how to create inf file to enable "Automated Firmware Download from USB". The testing was done on FX3 DVK using Windows 7 x64 bit operating system.

The INF file will contains two VID/PID,

1) VID/PID1- VID/PID for the script file
2) VID/PID2- VID/PID of the firmware

The inf file binds VID/PID1 to the script file that contains the recorded sequence for downloading firmware. Upon enumeration, this firmware is downloaded to the device using the script file. The device then enumerates with VID/PID contained in downloaded firmware.
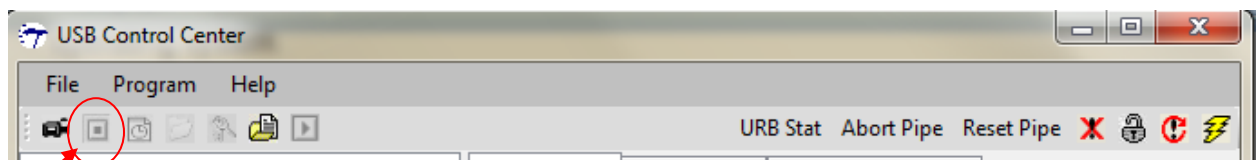
Creating script file:

You need to follow the steps mentioned below to create script file using control center.

1) Plug the USB cable to the PC. It will enumerate as Cypress Bootloader in the PC with VID_04B4 and PID_00F3.

2) When it comes up as Cypress Bootloader in the control center, click the " start recording" button located at top left of the control center window as shown below:
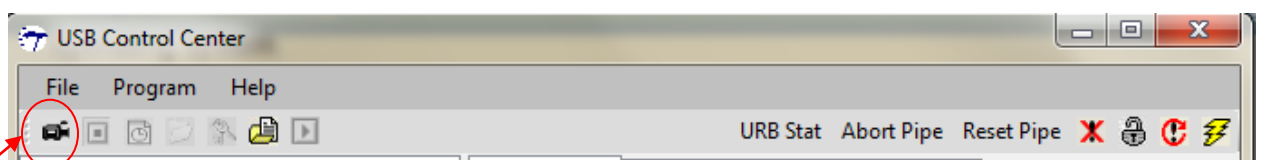
3) Click Program->FX3->RAM and navigate to your firmware, press open.

   I have tested using bulksourcesink example firmware with VID and PID 0x04B4 and 0xF1 respectively.

4) Once the device is programmed successfully, the device will enumerate with the VID and PID of the firmware used. It also need to install the driver for the new device with VID_04B4&PID_00F1.

5) Now click on the stop recording button as shown:

Stop Recoding

6) Save the script file and name it as Script.spt. Your Script is now created.

Creating INF file:

Following is the inf file which I have created for this:

```
[Version]
Signature="$WINDOWS NT$"
Class=USB
ClassGUID={36FC9E60-C465-11CF-8056-444553540000}
provider=%CYPRESS%
CatalogFile=scriptDownload.cat
DriverVer=09/10/2013,1.00.0003.000
;----------------------------------------------------------;

[SourceDisksNames]
1=%CYUSB3_Install%,,,

[SourceDisksFiles]
CYUSB3.sys = 1
Script.spt = 1

[Manufacturer]
%CYPRESS%=Cypress,NT,NTx86,NTamd64
```

;for windows 2000 non intel platforms
[Cypress.NT]
%VID_04B4&PID_1010.DeviceDesc%=MYDEVICE, USB\VID_04B4&PID_1010
%VID_04B4&PID_00F1.DeviceDesc%=CYUSB3, USB\VID_04B4&PID_00F1

;for x86 platforms
[Cypress.NTx86]
%VID_04B4&PID_1010.DeviceDesc%=MYDEVICE, USB\VID_04B4&PID_1010
%VID_04B4&PID_00F1.DeviceDesc%=CYUSB3, USB\VID_04B4&PID_00F1

[Cypress.NTamd64]

%VID_04B4&PID_1010.DeviceDesc%=MYDEVICE, USB\VID_04B4&PID_1010
; this entry contains the VID/PID programmed into the EEPROM
; to do
; replace the XXXX (two places) with your VID
; replace the YYYY (two places) with your PID

%VID_04B4&PID_00F1.DeviceDesc%=CYUSB3, USB\VID_04B4&PID_00F1
; this entry contains the VID/PID in the final firmware
; to do
; replace the XXXX1 (two places) with your VID
; replace the YYYY1 (two places) with your PID

[DestinationDirs]
CYUSB3.Files = 10,System32\Drivers
MYDEVICE.Files = 10,System32\MYDEVICE

;====================================

[MYDEVICE.Files]
Script.spt
; to do
; Replace Script.spt with your script file name

[MYDEVICE.NTamd64]
CopyFiles=CYUSB3.Files, MYDEVICE.Files
AddReg=CYUSB3.AddReg

[MYDEVICE.NTamd64.HW]
AddReg=MYDEVICE.AddReg.Guid

[MYDEVICE.NTamd64.Services]

Addservice = CYUSB3, 0x00000002, CYUSB3.AddService

[MYDEVICE.AddReg.Guid]
HKR,,DriverGUID,,%CYUSB3.GUID%
HKR,,DriverEXECSCRIPT,,%MYDEVICE.EXECSCRIPT%

;====================================

[CYUSB3.Files]
CYUSB3.SYS

[CYUSB3.NTamd64]
CopyFiles=CYUSB3.Files
AddReg=CYUSB3.AddReg

[CYUSB3.NTamd64.HW]
AddReg=CYUSB3.AddReg.Guid

[CYUSB3.NTamd64.Services]
Addservice = CYUSB3, 0x00000002, CYUSB3.AddService

[CYUSB3.AddReg]
HKR,,DevLoader,,*ntkern
HKR,,NTMPDriver,,CyUsb3.sys

[CYUSB3.AddReg.Guid]
HKR,,DriverGUID,,%CYUSB3.GUID%

;====================================

[CYUSB3.AddService]
DisplayName = %CYUSB3.SvcDesc%
ServiceType = 1 ; SERVICE_KERNEL_DRIVER
StartType = 3 ; SERVICE_DEMAND_START
ErrorControl = 1 ; SERVICE_ERROR_NORMAL
ServiceBinary = %10%\System32\Drivers\CYUSB3.SYS
LoadOrderGroup = Base

[Strings]

CYPRESS="Cypress Semiconductor"
CYUSB3_INSTALL="Cypress Installation Disk"

VID_04B4&PID_1010.DeviceDesc="Before script download"
; VID/PID combination programmed into the EEPROM

; to do
; replace the XXXX with your VID
; replace the YYYY with your PID
; replace text within quotation marks

VID_04B4&PID_00F1.DeviceDesc="Streamer Example"
; VID/PID combination programmed in final firmware
; to do
; replace the XXXX1 with your unique VID
; replace the YYYY1 with your unique PID
; replace text within quotation marks

CYUSB3.SvcDesc="Cypress USB Device"
CYUSB3.GUID="{AE18AA60-7F6A-11d4-97DD-00010229B959}"
; to do
; Replace above entry with their your GUID

MYDEVICE.EXECSCRIPT="\systemroot\system32\MYDEVICE\Script.spt"
; to do
; Replace Script.spt with your script file name

If you wanted to use different VID/PID you can replace the sections which are marked as red. Please note that I have tested the same using Windows7 x64 bit system. But we have added the support for other OS and 32 bit operating system also.

For example,
If you want to test the same with different VID/PID and GUID in 32 bit operating system you need to change the vid and PID under [Cypress.NTx86] section.

Catalog file:

Once the inf file ready, then you can create a catalog file for the inf file. Catalog file is a security file which tells the system that the associated file is not a virus. It contains digital stamping.

The CatalogFile directive in the INF Version section of the driver's INF file specifies the name of the catalog file for the driver package. During driver installation, the operating system uses the CatalogFile directive to identify and validate the catalog file. The system copies the catalog file to the %SystemRoot%\CatRoot directory and the INF file to the %SystemRoot%\Inf directory.

Note: If you have more than one driver package, you should create a separate catalog file for each driver package and give each catalog file a unique file name.

The driver package attached with this memo contains catalog file. If you are providing this file to the customers, you need to tell them to add digital signature to the catalog file as customers are not allowed to use Cypress digital signature on their end products.

Test Procedure:
1) Place the inf file in the WINDOWS \inf folder.
2) Place the script file in the path mentioned in .inf file, here "\systemroot\system32\MYDEVICE\".
3) To test the automated script download, I have created a script.img file to program the I2C EEPROM:
   The script.img file contains the following bytes:
   43 59 0e b2 10 10 b4 04

4) Once the I2C EEPROM is programmed with the img file mentioned above, change boot option to I2C boot.
5) Plug the USB cable to the PC. FX3 will enumerate with VID and PID 0x04B4 and 0x1010 respectively.
6) When the above VID and PID is detected, script will automatically download the firmware to the FX3 and you can see FX3 enumerated with new VID and PID.

Note: For the above test procedure you will require a small EEPROM. If you don't want to use any EEPROM to reduce the BOM, you can use the default bootloader VID and

PID for automated firmware download. In this case you need to replace the PID: 0x1010 in the inf file with the PID of the default bootloader and change the boot option to USB.