



Simplifying System Integration™

73S1215F, 73S1217F Windows XP 32 USB CCID and DFU Drivers Installation Guide

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1 Introduction

This guide describes the installation of the USB-DFU driver and the USB-CCID driver. Teridian includes all necessary installation and driver files to complete this driver installation. Follow the steps described in this document to ensure a successful driver installation.

Figure 1 shows the flow of the USB-DFU and USB-CCID interface architecture.

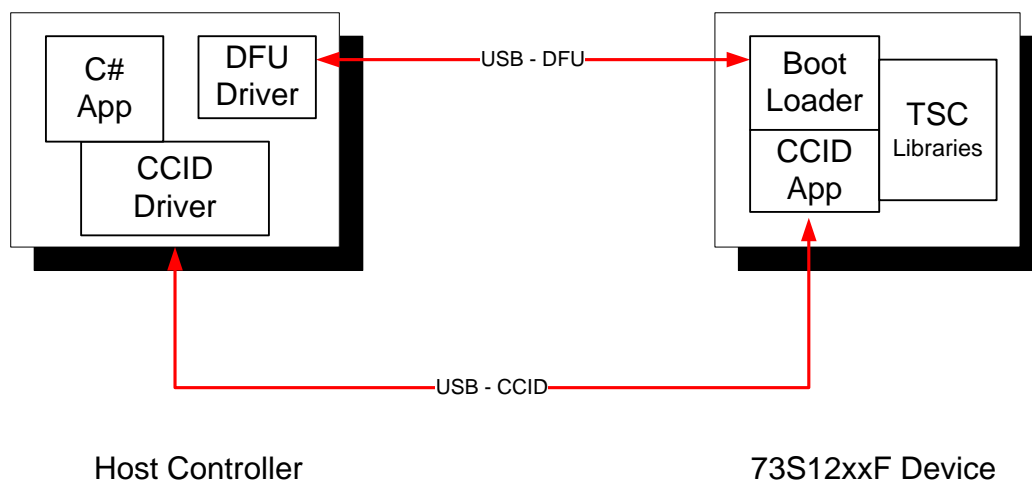


Figure 1: DFU and CCID Class Interface Architecture

The Windows® XP 32 Kernel mode DFU driver was developed using Microsoft® Device Driver Development Kit (DDK) Version (3790.1830) Windows Server 2003. For more information on the DFU driver, see the *73S1215F, 73S1217F DFU Host Driver/Application Development User's Guide*.

The USB-DFU and USB-CCID (with DFU Interface) driver files are TSCDFU.inf/TSCDFU.sys and CCIDDFUTSC.inf/CCIDDFUTSC.sys respectively. Refer to the Release Notes for all the files associated with these drivers.

2 Installation

2.1 Environments

Host Machine:

Operating System: Windows XP 32

Bus Interface: USB port

Device:

73S12xxF Evaluation Board (EVB) running either the DFU Boot Loader code or the CCID Application code. See the *73S1215F, 73S1217F Boot Loader – DFU Class Firmware Application Note* for more detailed information about the two partitions (thus two executables) of firmware code, namely the DFU Boot Loader code and the CCID Application Code.

It is important that the correct driver is matched up with the firmware code that is being executed on the 73S12xxF device. In other words, if the DFU Boot Loader code is running, the TSCDFU.sys driver should be installed. If the CCID Application code is running, the CCIDDFUTSC.sys driver is installed. Unexpected results occur if the firmware/driver pair are mismatched.

The first time the 73S12xxF EVB is connected to the Host Machine via a USB cable, there are two possible and separate instances that require fresh driver installations. If the EVB is executing the DFU Boot Loader code at power up, plugging the EVB in for the first time causes Windows to prompt the user

to install the DFU driver. If the EVB is executing the CCID Application code, a board power up causes Windows to prompt for the installation of the CCID driver. After the correct driver is installed on the Host Machine, subsequent connections of the EVB to the Host will have the correct driver loaded automatically by Windows.

2.2 Device Type as Recognized by Windows

Connect the 173S2xxF EVB to the host via a USB cable. Within a couple of seconds, Windows will recognize the device type as either a TSC12xx DFU Device or TSC12xx CCID Device, depending on what is being executed in the device's firmware. The Windows pop-up will display the appropriate device type for a few seconds, then it will show the New Hardware Found Wizard menu. Make note of the device type being recognized and displayed by Windows so that the proper installation batch file can be invoked using these steps:

- Click **Cancel** to close the New Hardware Found Wizard menu.
- Open the Device Manager and under Smart Card Readers, in the case of the CCID device type, or under Other Devices, in the case of the DFU device type.
- The CCID Device type, the DFU Device Type, and the legacy CCID Device type with no DFU support are displayed in the Device Manager as shown in Figures 2 ,3 and 4 respectively.

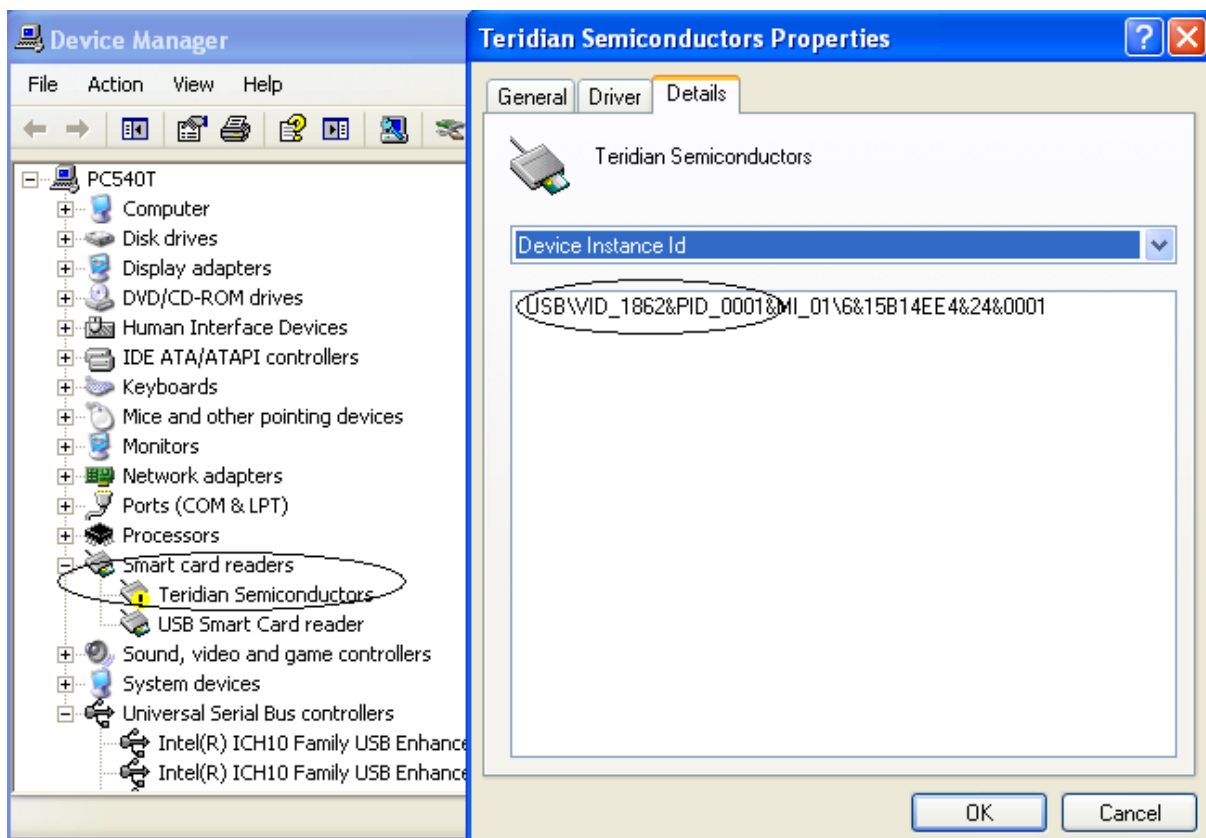


Figure 2: Device Manager (CCID + DFU Mode)

Figure 2 shows that the 73S12xxF EVB is currently running the CCID Application code.

For the DFU Boot Loader code instance, the Device Manager will show the **TSC 12xxF DFU** device under **Other Devices**. Driver details, in this case, show: USB\VID_1862&PID_1100\xxxx. See Figure 3.

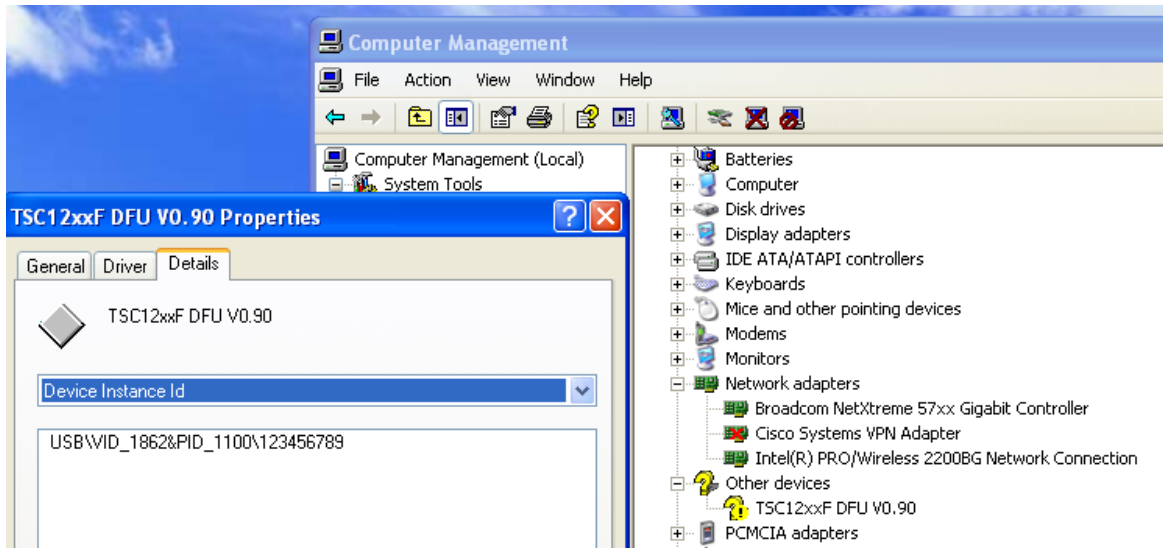


Figure 3: Device Manager (DFU Mode)

For the legacy CCID Mode, the Device Manager shows the **TSC12xxFV.09** device under **Other Devices**. Driver details, in this case, show: `USB\VID_1862&PID_0000\xxxx`. See Figure 4.

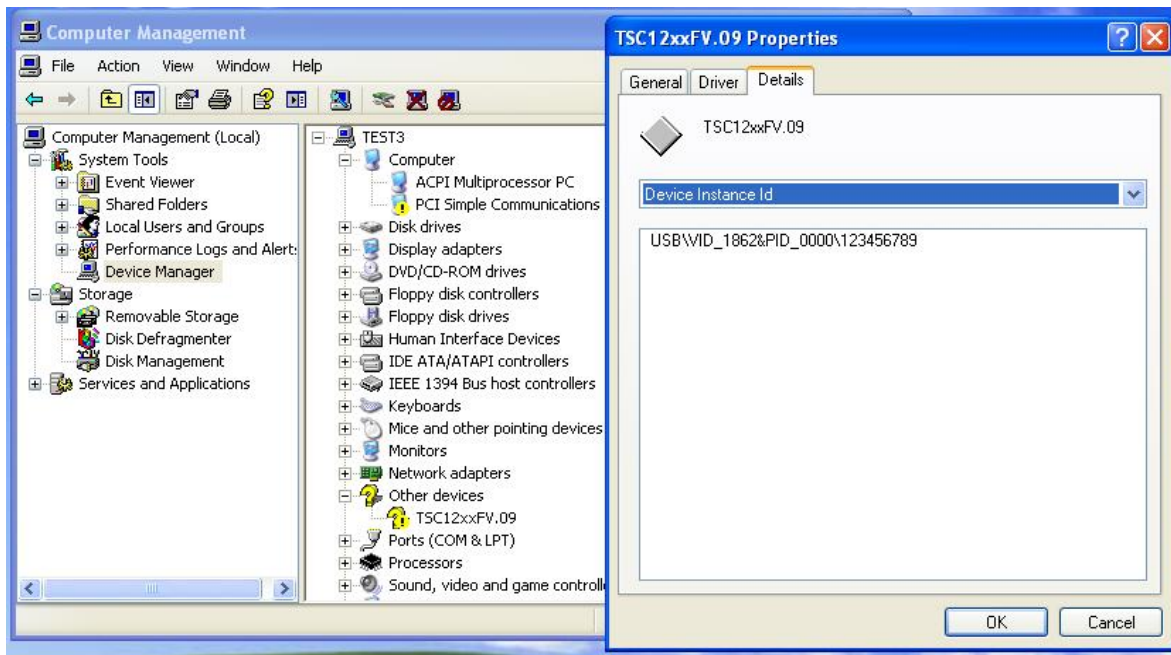


Figure 4: Device Manager (ccidtscc Device with No DFU)

2.3 Device Driver Installations

The following sections describe the steps to install the correct driver for each device type.

2.3.1 Installing ccidtsvc.sys Driver for Legacy CCID Device Type with No DFU support

Double click on device **TSC12xxFV.09** → **Details**, in Figure 2, and then select **Device Instance Id** from drop down list.

If the Device Instance ID is USB\VID_1862&PID_0000\xxxx, the 73S12xxF is recognized as the Legacy CCID device type by Windows. Follow these steps to install the CCIDDFUTSC.sys driver:

1. In the **Driver** tab click on update driver.
2. Locate catalog file ccidtsvc-xp.cat, ccidtsvc-32.cat or ccidtsvc-64.cat in CD ROM to install on Win XP 32, Vista 32 or Vista 64 respectively. See Figure 5.
3. Click open, and windows will install driver for the device.

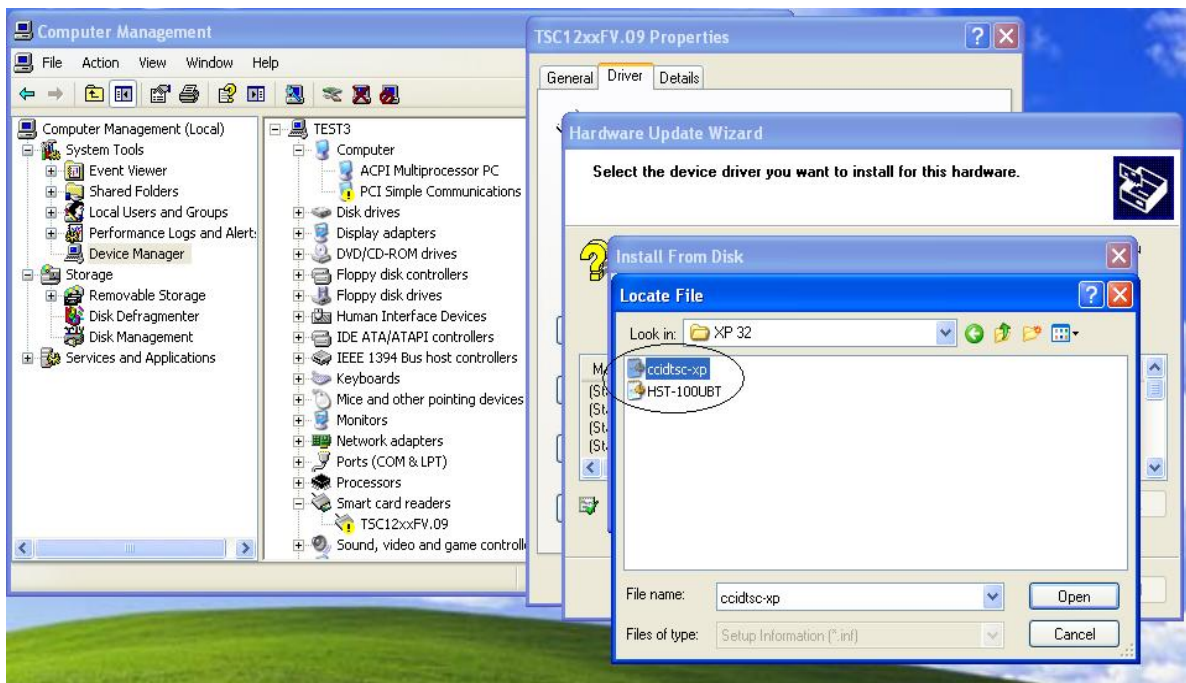


Figure 5: Locate Relevant .cat File for Installation

4. After successful installation, in device manager the device will be listed under Smart card readers with name TSC USB CCID Smart Card Reader – xp. As shown in Figure 6.

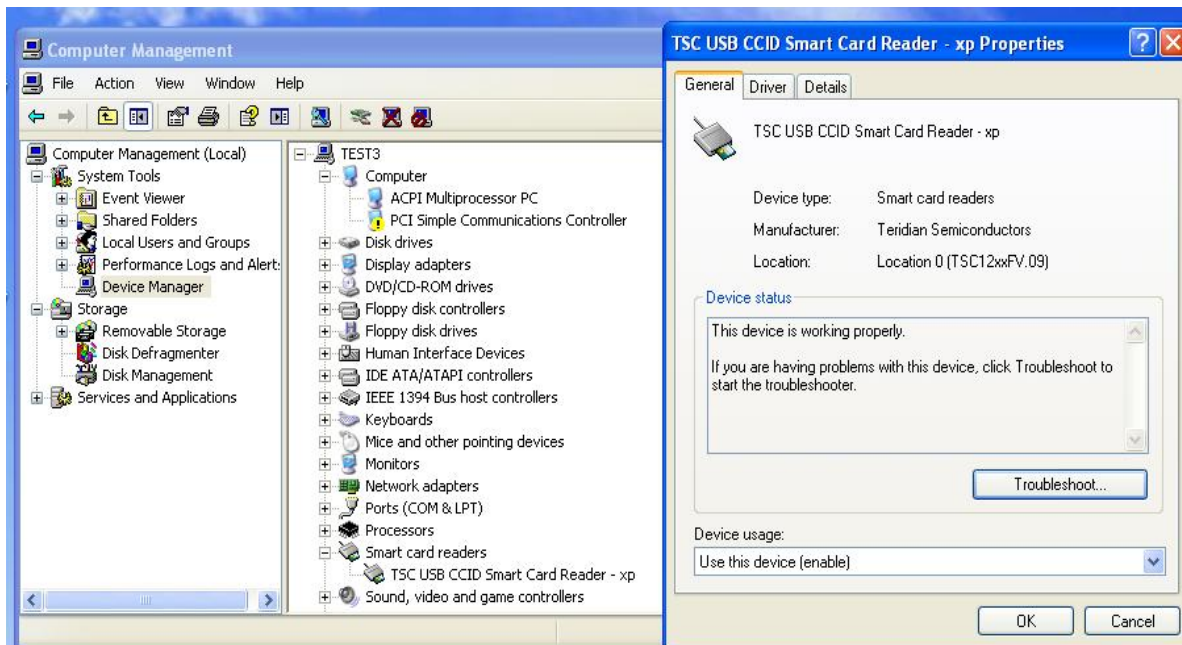


Figure 6: Device Manger Legacy CCID Driver Installed

2.3.2 Installing CCIDDFUTSC.sys Driver for the CCID Device Type

Double click on device **Teridian Semiconductor** → **Details**, in Figure 2, and select **Device Instance Id** from drop down list.

If it is USB\VID_1862&PID_0001\xxxx. This Device Instance Id shows the 73S12xxF being recognized as the CCID device type. Follow these to install the CCIDDFUTSC.sys driver:

1. Locate CCIDDFUTSCIntall.bat in the provided CD-ROM. Make sure that all these files reside in the same folder:

CCIDDFUTSC.sys
 CCIDDFUTSC.inf
 devcon.exe
 CCIDTSCDFUInstall.bat

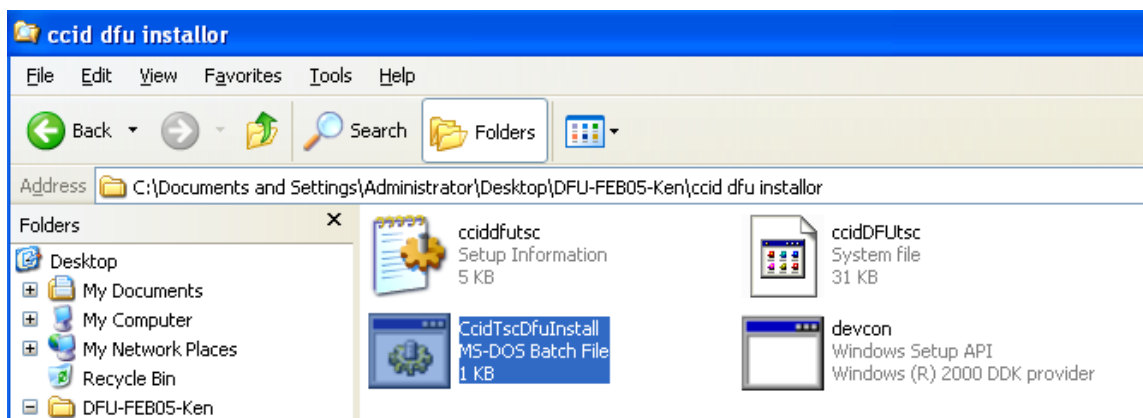


Figure 7: CCIDDFUTSC.sys Driver Installation Files

2. Invoke the CCIDTSCDFUInstall.bat by double clicking on this file.

- As the CCIDDFUTSC.sys driver has not been through Windows Driver Certification testing, a warning message will pop up a couple of times throughout the installation. Select **Continue Anyway** to continue the installation. The driver installation will complete successfully within a few minutes.



Figure 8: Windows Warning

- After the CCIDDFUTSC.sys driver installation is complete, the Windows Device Manager will show **TSC USB CCID DFU Smart Card Reader** under the **Smart card reader** option as shown in Figure 9.

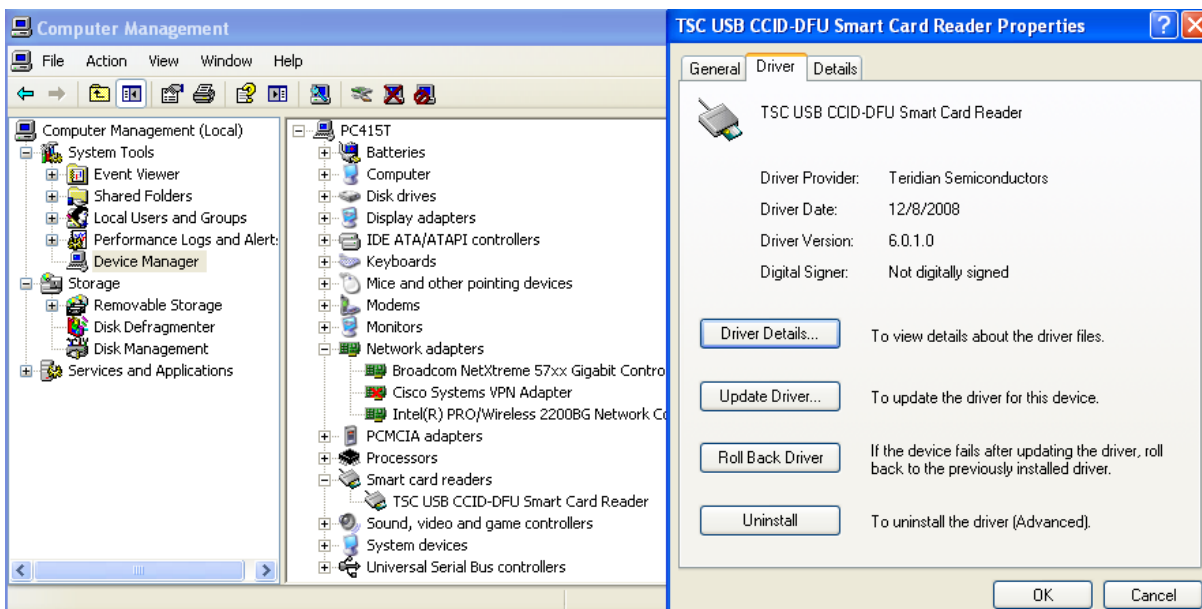


Figure 9: Device Manager after Successful Installation

2.3.3 Installing the TSCDFU.sys Driver for the DFU Device Type

Double click on device **TSC 12xx DFU Vx.xx** → Details, as shown in Figure 9 and select **Device Instance Id** from the drop down list. It shows USB\VID_1862&PID_1100\xxxx. This Device Instance Id indicates that the 73S12xxF device is currently executing the DFU Boot Loader code. Follow these steps to install the driver:

1. Locate TSCDFUInstall.bat in the provided CD-ROM and make sure you have all these files in the same directory:

TSCDFU.sys
TSCDFU.inf
devcon.exe
TSCDFUInstall.bat

2. Double click on the TSCDFU.bat icon to start installation.

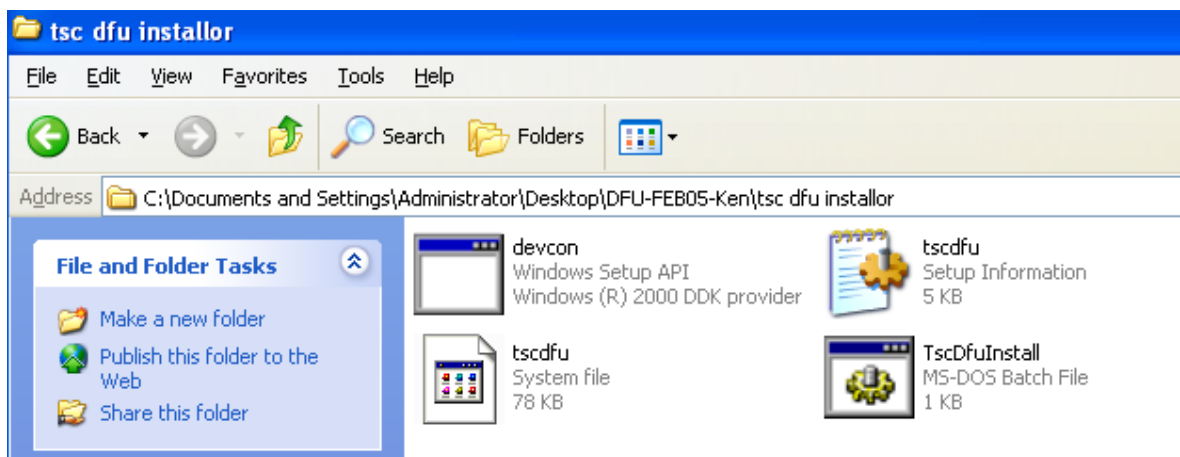


Figure 10: Run TscDfuInstall.bat

3. As the TSCDFU.sys driver has not been through Windows Driver Certification testing, a warning message will pop up. Select **Continue Anyway** to finish up the installation. The driver installation will complete successfully within a few minutes.
4. Once the TSCDFU.sys driver installation is complete, the Windows Device Manager shows:

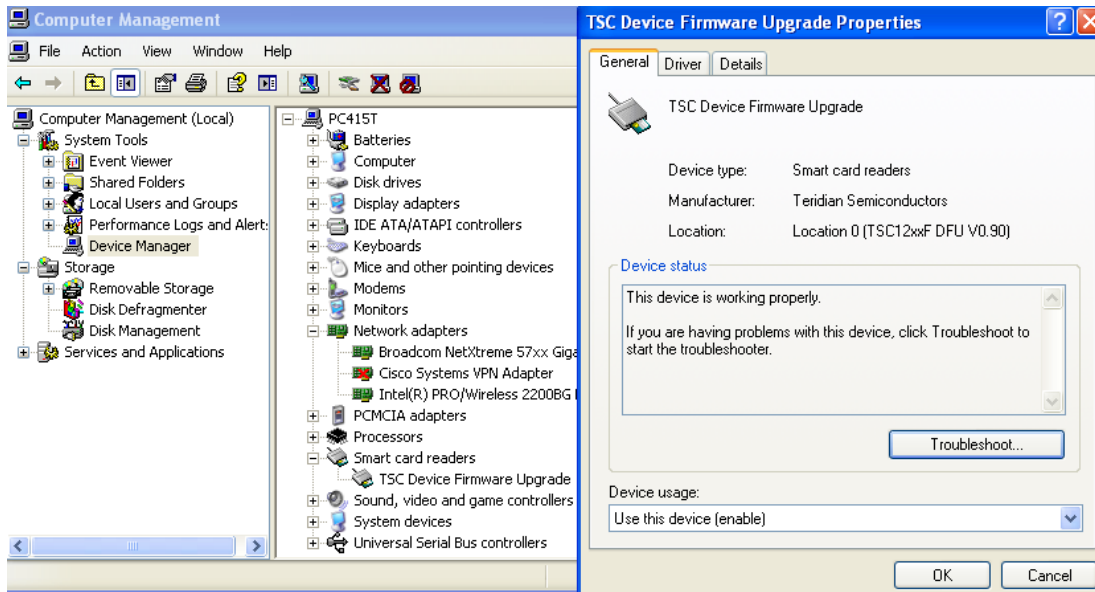


Figure 11: DFU Mode Installation Verification at Device Manager

2.4 Driver Device Instance Ids

When Windows detects the 73S12xxF device's connection, the Device Instance Id can be found via the Device Manager. This Device Instance Id can be used to identify which piece of firmware code is currently being executed in the 73S12xxF Flash.

2.4.1 USB-DFU Driver

The DFU Boot Loader code execution would be indicated via Windows' showing of Device Instance Id as: USB\VID_1862&PID_1100\xxxx. This information will be used to select the TSCDFU.sys driver installation file. The Device Instance ID can be found via the Device Manager's Driver Details as shown in Figure 12.

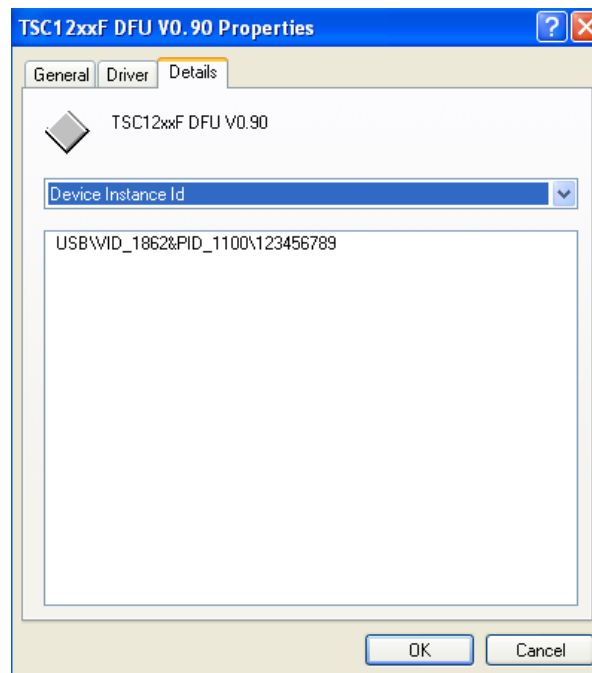


Figure 12: TSCDFU.sys Device Instance Id

2.4.2 USB-CCID Driver

The CCID Application Code execution is indicated via Windows' showing the Device Instance Id as: USB\VID_1862&PID_0001\xxxx. This information will be used to select the CCIDDFUTSC.sys driver installation file. The Device Instance ID can be found via the Device Manager's Driver Details as shown in Figure 13.

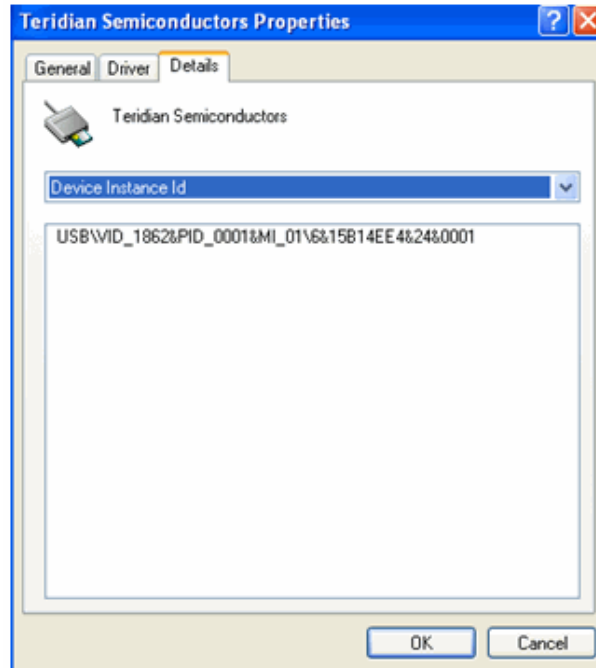


Figure 13: CCIDDFUTSC.sys Device Instance

2.4.3 Legacy USB-CCID Driver (no DFU support)

The Legacy CCID Application Code execution is indicated via Windows' showing the Device Instance Id as: USB\VID_1862&PID_0000\xxxx. This information will be used to select the CCIDDFUTSC.sys driver installation file. The Device Instance ID can be found via the Device Manager's Driver Details as shown in Figure 14.

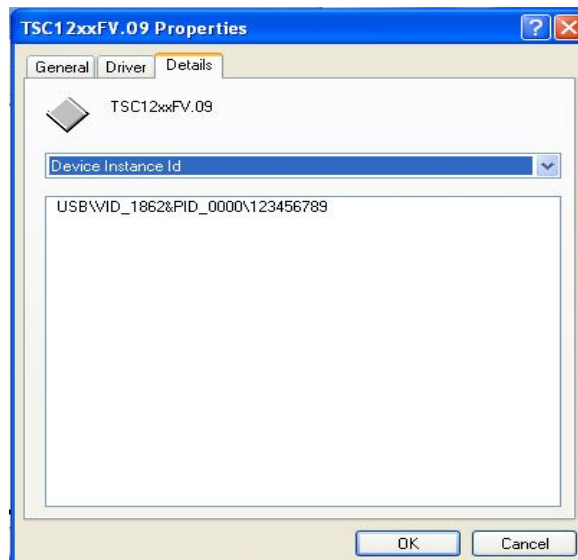


Figure 14: ccidtsc.sys Device Instance

2.5 Trouble Shooting

When the 73S12xxF device is connected to the Host but there is no pop-up message of any kind, it does not look like Windows recognizes there is a USB device connected.

If LED0 on the 73S12xxF device is blinking, the DFU Boot Loader code is running and the device is waiting for a USB reset signal from the Host. Do one or all of the following:

1. Make sure the AC Adaptor connected to the 73S12xxF has the appropriate voltage output.
2. Power cycle the device a couple of times.
3. Try another USB cable or connect the device to a different USB port on the Host.
4. Try a different Host machine.

If LED0 is not on, it could be that the device just has a blank part (no firmware code). Contact a Teridian representative for further assistance.

If LED0 is on but Windows shows the **Unrecognized USB Device** message. Power cycle the device a couple of times. If the problem remains, force the DFU Boot Loader code to run as follows:

1. Power OFF the 73S12xxF EVB.
2. Connect USRIO 5 to a 3.3 volt pin (to bring USRIO 5 high).
3. Power On the 73S12xxF EVB.

If the TSCDFU.sys driver enumerates successfully, ground USRIO before the next power cycle.

3 Related Documentation

The following 73S12xxF documents are available from Teridian Semiconductor Corporation:

71S1215F Data Sheet

71S1217F Data Sheet

73S12xxF Smart Card Terminal Controller Family Software User's Guide

73S12xxF Evaluation Board User's Guide

Teridian Flash Programming Tool

73S1215F, 73S1217F Boot Loader – DFU Class Firmware Application Note

73S1215F, 73S1217F Windows XP 32 USB CCID and DFU Drivers Installation Guide

73S1215, 73S1217F CCID Application Note

4 Contact Information

For more information about Teridian Semiconductor products or to check the availability of the 73S12xxF, contact us at:

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Revision History

Revision	Date	Description
1.0	4/27/2009	First publication.