

# Cambridge Technology Software Suite Setup

## 1 Introduction

---

Cambridge Technology distributes its latest software via downloads from the Cambridge Technology website. New users of Cambridge Technology controllers need to download and install appropriate software packages to use their controller hardware.

Cambridge Technology SMC and EC1000 controller products use Ethernet communications to communicate with host-based applications. These types of controllers contain firmware that enables this communication and also provides advanced capability in scanner and laser control. The firmware versions on these controllers must be consistent with the application software provided by Cambridge Technology.

Controllers shipped from Cambridge Technology are already loaded with firmware that is compatible with application software on the website, but from time-to-time, new software may be released that requires a firmware upgrade on controllers that may have been received prior to the new software postings. This application note describes the steps to download and install Cambridge Technology application software, and if required, update your controller firmware.

If you are only upgrading your controller firmware, please follow the instructions in Section 4 - [Upgrading the Controller Firmware](#).

## 2 Hardware Requirements

---

An IBM PC compatible PC capable of running Microsoft Windows XP or Windows 7 32-bit or 64-bit, with the following:

- An Ethernet network interface port supporting 100/1000BaseT
- 500MByte free disk space for download files and final installation storage
- 2GByte minimum RAM
- Recommended screen resolution 1280x1024 or higher

## 3 Downloading and Installing Software

---

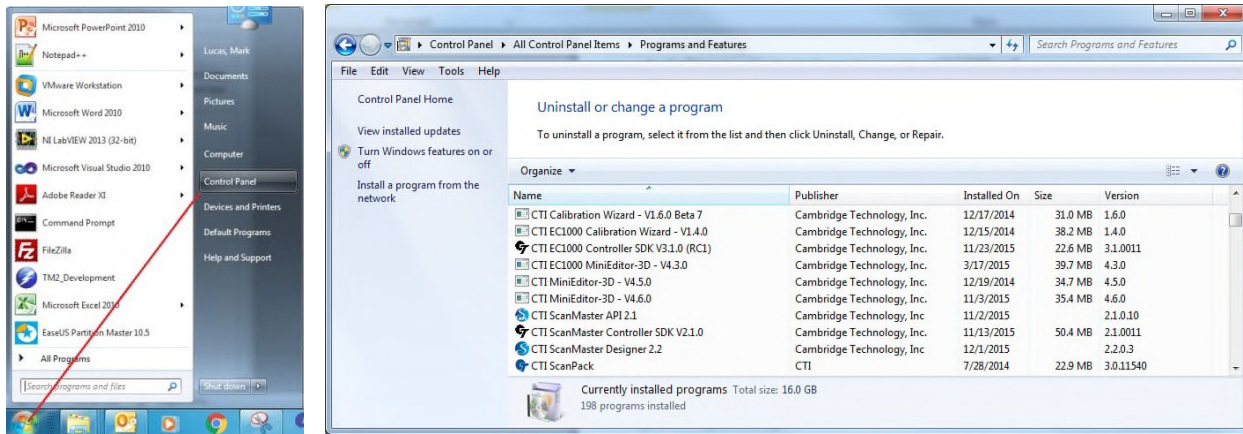
### 3.1 Before you begin

---

Before you start, ensure that all software that you intend to download and install is first uninstalled from your local computer. You do this by selecting the Windows Control Panel → Programs and Features. All Cambridge Technology software is prefixed with “CTI” (older generation) or “Cambridge Technology” (recent generation). Double click the package you want to uninstall. These would be:

- CTI (or Cambridge Technology) ScanMaster Controller SDK (if you are an SMC user)
- CTI (or Cambridge Technology) EC1000 Controller SDK (if you are an EC1000 user)
- CTI (or Cambridge Technology) ScanMaster Designer

- CTI (or Cambridge Technology) ScanMaster API



## 3.2 Accessing the Website

All software: ScanMaster Designer (SMD), ScanMaster API (SMAPI), and the controller low-level Software Development Kits (SDK) can be downloaded from our website:

[ScanMaster Controller and Designer Manuals](#)

To access our software manuals page, you must register to receive a unique password and enter the page.

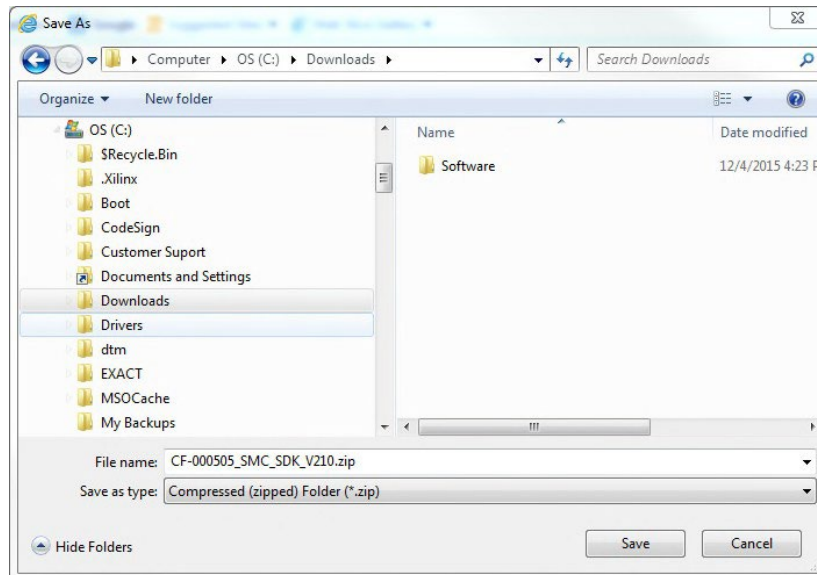
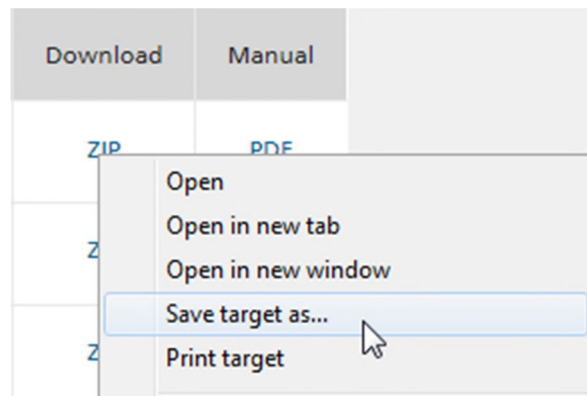
Select the ScanMaster Designer Software Packages and Manuals link.

You will be presented with a table of down-load links from which to choose from. You will need to select the download that matches your computer and operating system configuration. Installers are available for 32- and 64-bit versions of Windows as indicated in the left-hand column.

### 3.3 Downloading the Software Development Kit

The controller Software Development Kit (SDK) contains the base DLLs for developing applications using the low-level XML API. It also contains various utility programs to check controller status, manage configuration files, and upload new firmware. It is not necessary to download this package if you are only using ScanMaster Designer (SMD) or ScanMaster API (SMAPI) software from Cambridge Technology. You will need it however if you want to upgrade the controller firmware.

Begin the download by right-clicking on the “ZIP” link and selecting “Save target as...” and pick a place to download to.



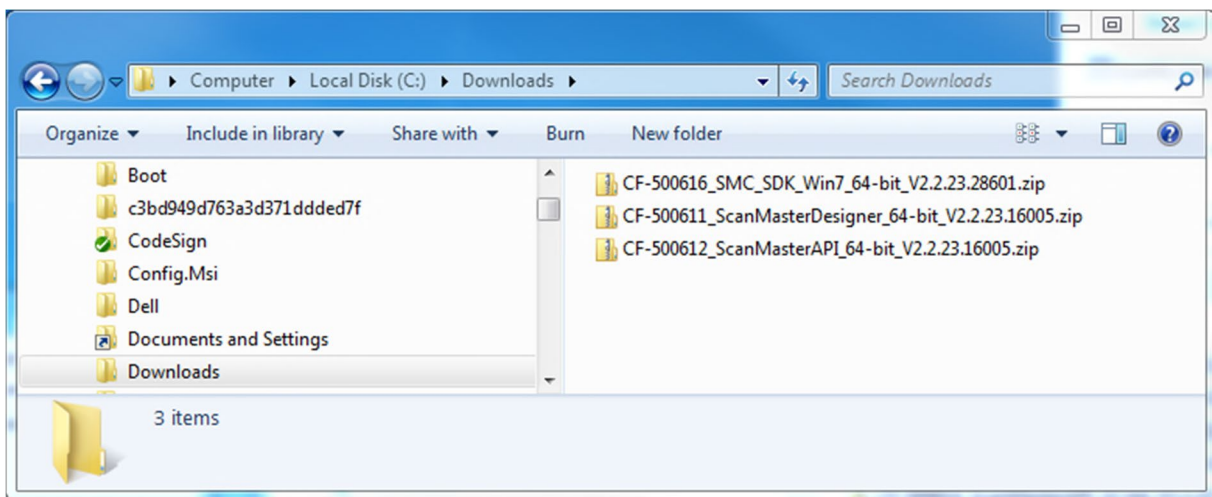
An example place to download would be C:\Downloads. Any other place will do but you need to remember the location.

### 3.4 Downloading ScanMaster Designer and ScanMaster API

Similar to section 3.3 - [Downloading the Software Development Kit](#), you should download the appropriate version ScanMaster Designer and/or ScanMaster API installation software. As mentioned above, save it in a place you will remember using the right-click “Save target as...” option.

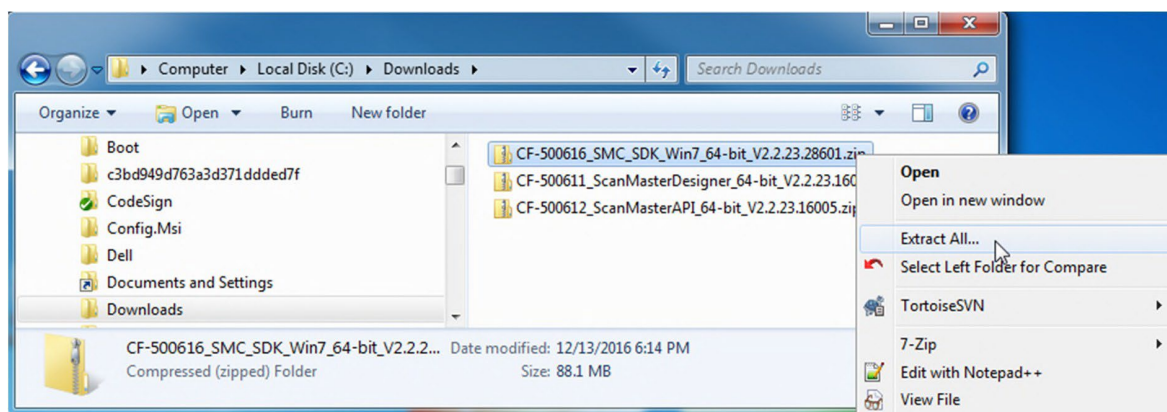
### 3.5 Installing your new software

Before you can install the downloaded software, you must extract it from the zip file first. Open a Windows Explorer and navigate to the place where you downloaded the software. In this example we have downloaded and will use the Windows 64-bit installer packages.

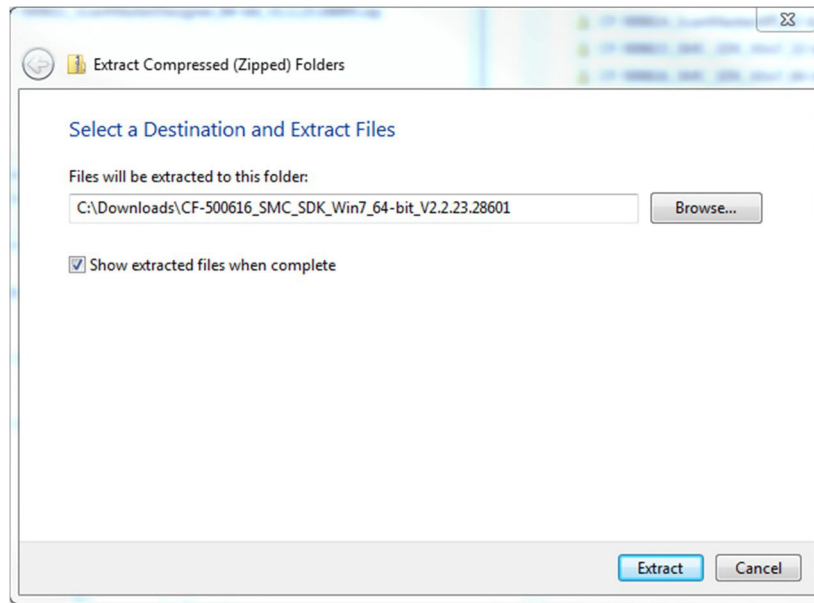


#### 3.5.1 Installing the Controller SDK

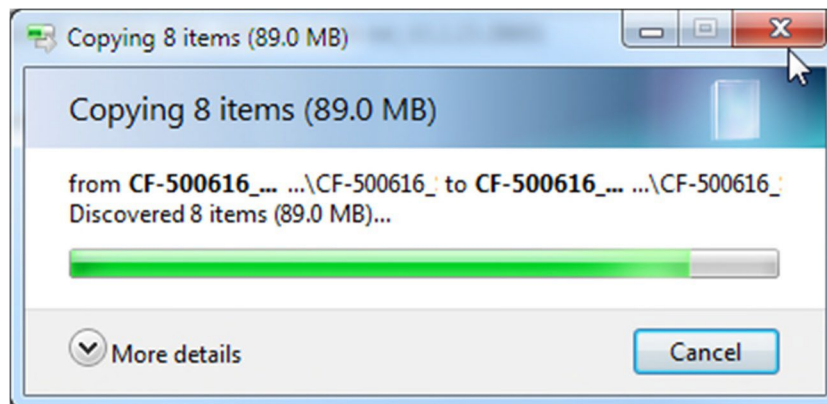
Right-click on the SDK zip file and select “Extract All”. You can change the location of the extraction first or you can accept the default.



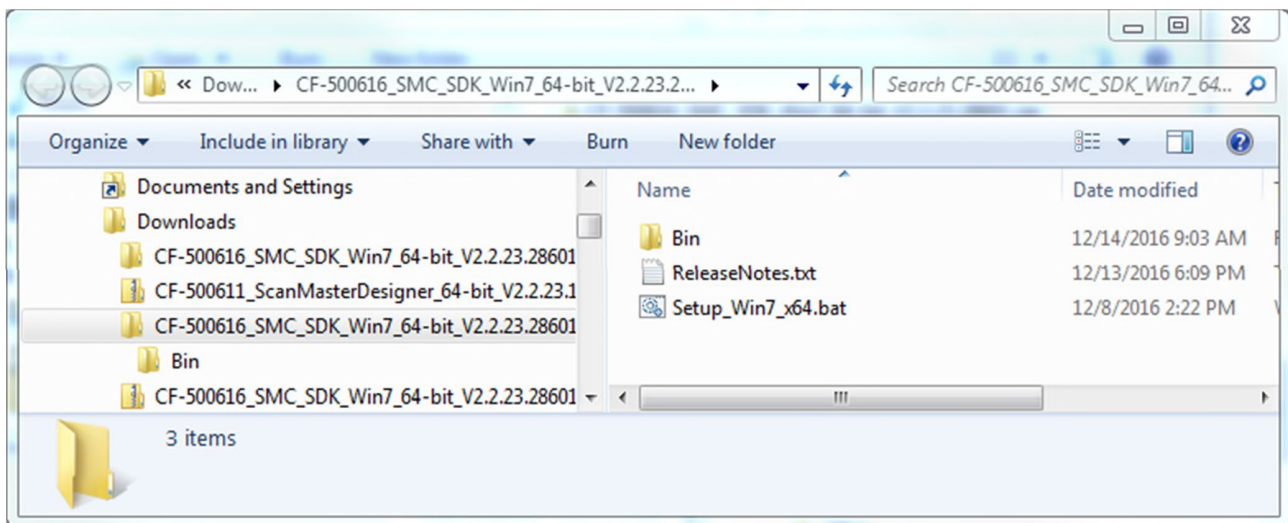




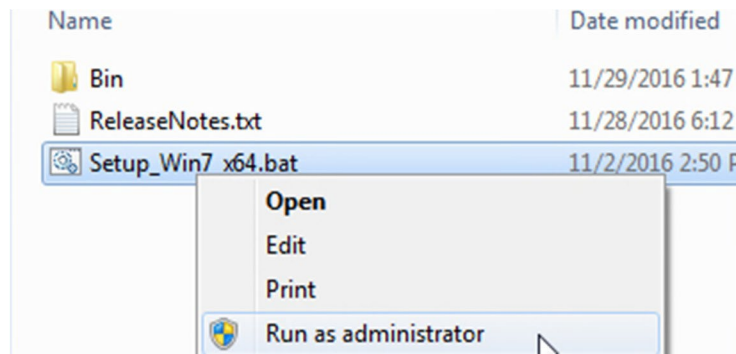
Check the “Show extracted files when complete” box and then press “Extract”.



After extraction you will be presented with a folder containing a Setup batch file.

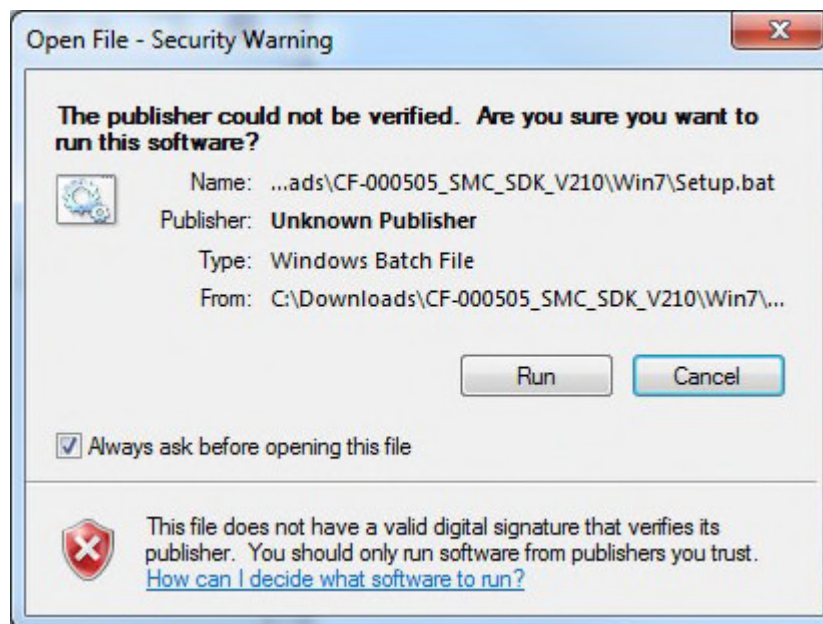


In the folder, right-click the Setup\_Win7\_x64.bat file and select “Run as administrator”.

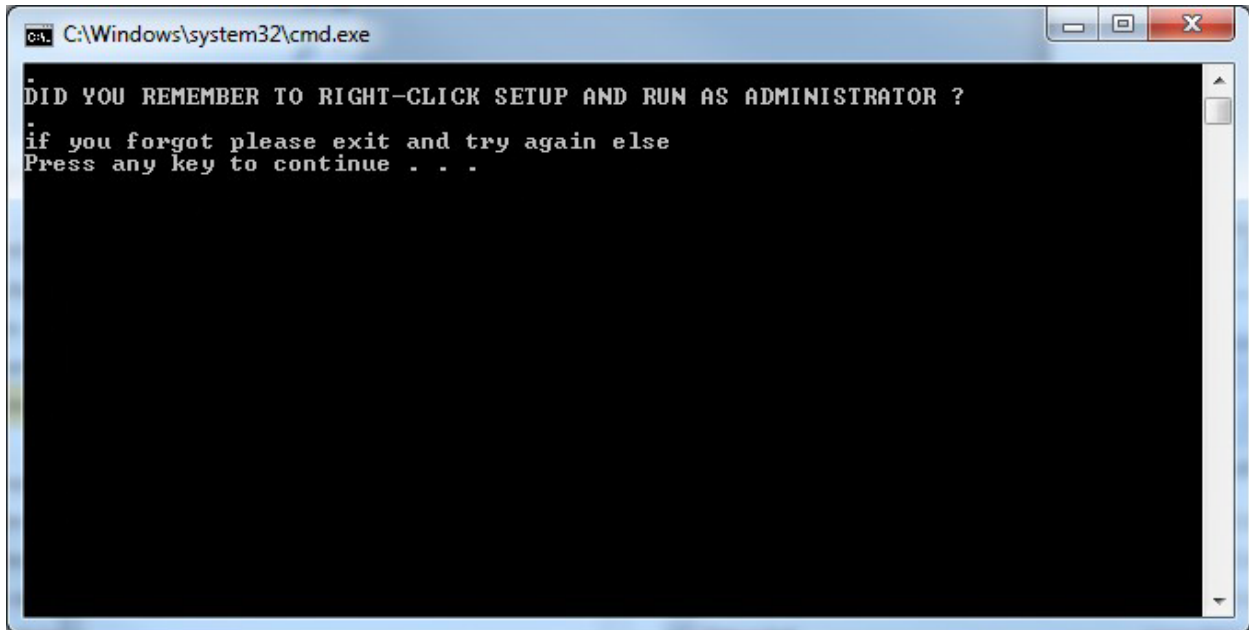


**NOTE:** Windows XP does not permit you to select “Run as administrator” and does not show it. In this case, just double-click on the Setup\_\*.bat file.

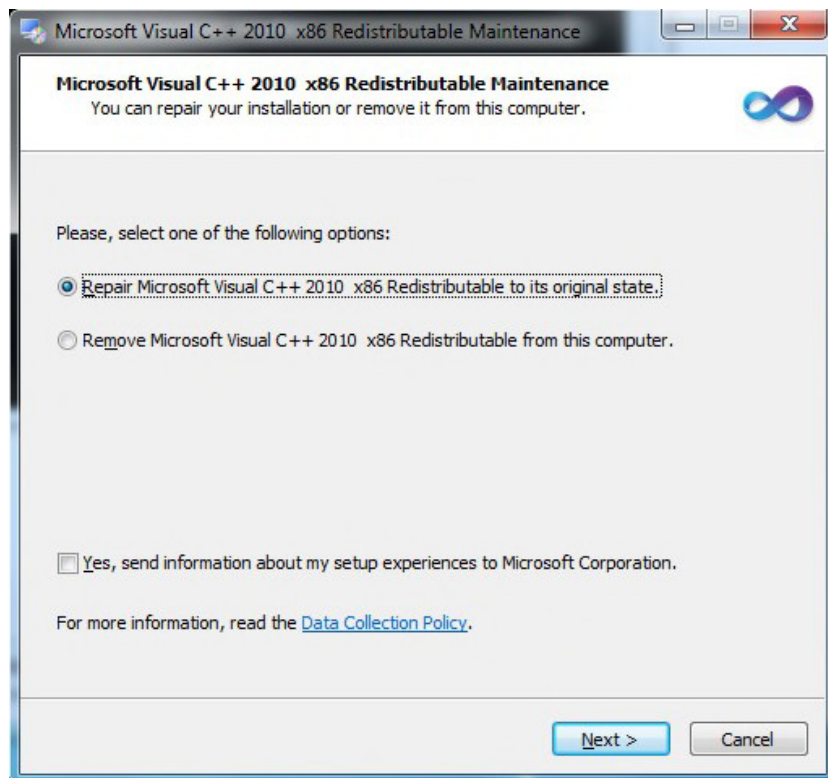
**NOTE:** You may get a security warning similar to the following. If you do, just press “Run”.



The following Cmd window will appear reminding you that you should have run the Setup.bat file as an administrator. Just click in the window and press any key.



At this point, your system will be examined to see if dependent components are already installed. If not, you will get a dialog box similar to the following:

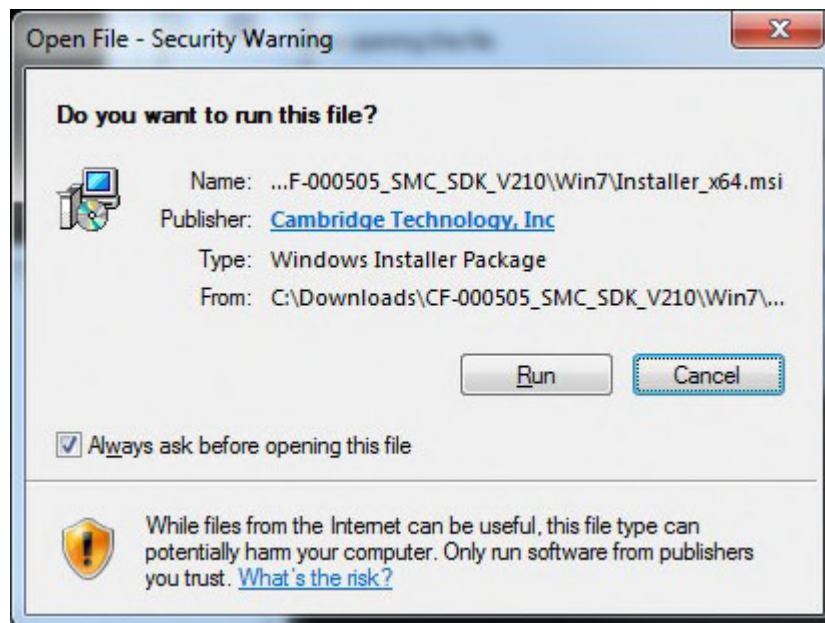


Press "Next" and the next screen should appear:



Press "Finish" to continue.

The installation will continue. A security warning may be presented. If prompted, just press "Run"



You will get the following screen:

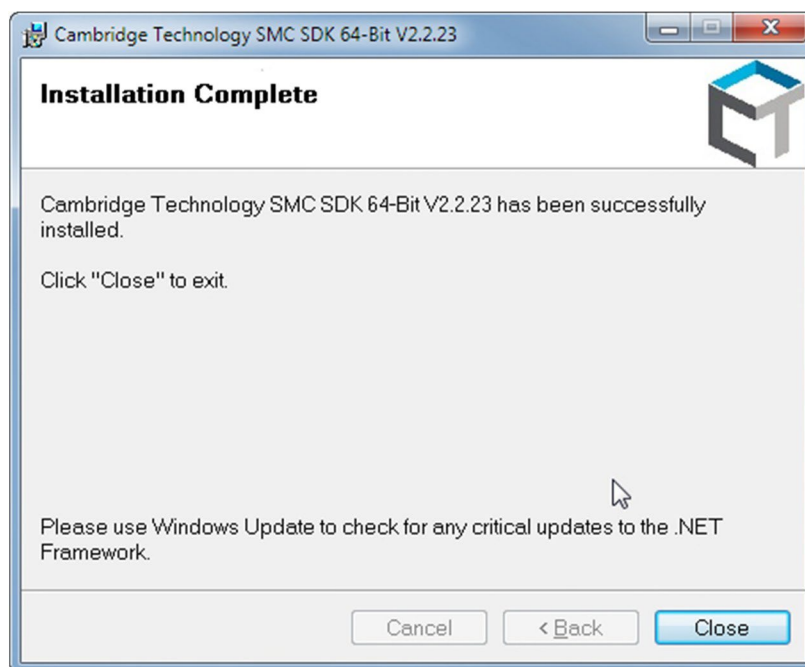


The installer will walk you through several steps. You will need to accept the license agreement, and then accept the installer settings for the rest of the questions.

**NOTE:** If you are an advanced user, you may use settings other than the defaults.

**NOTE:** During the installation, you may momentarily see a black command shell screen. This is normal and can be ignored.

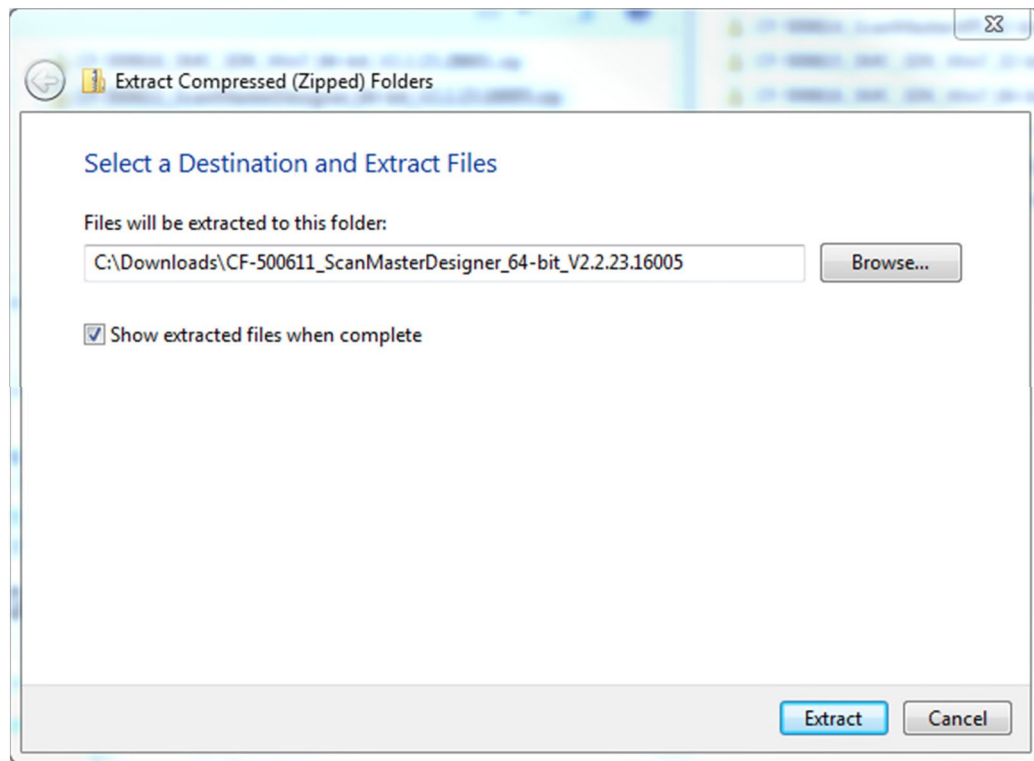
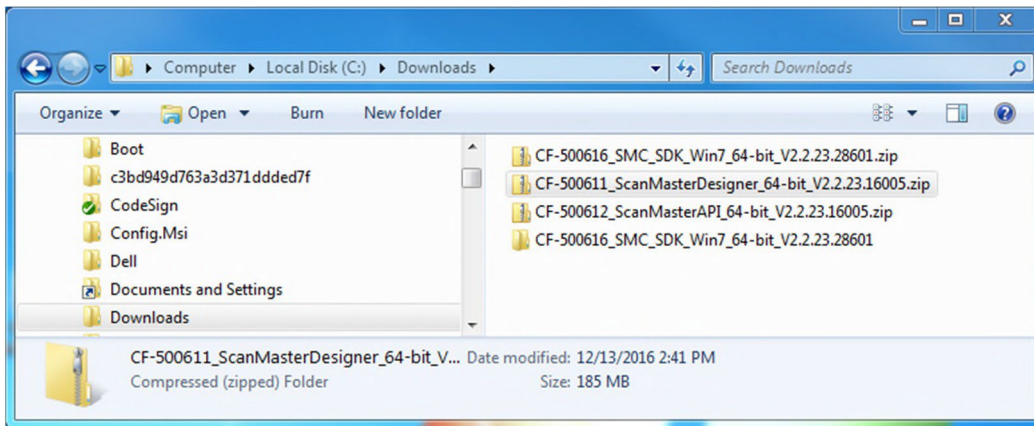
When you are done, you should get the following screen. Press "Close" and you are finished installing the Controller SDK.



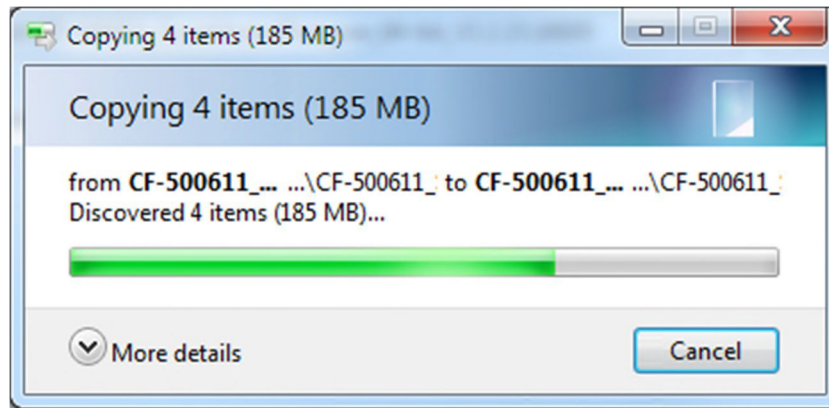


### 3.5.2 Installing ScanMaster Designer

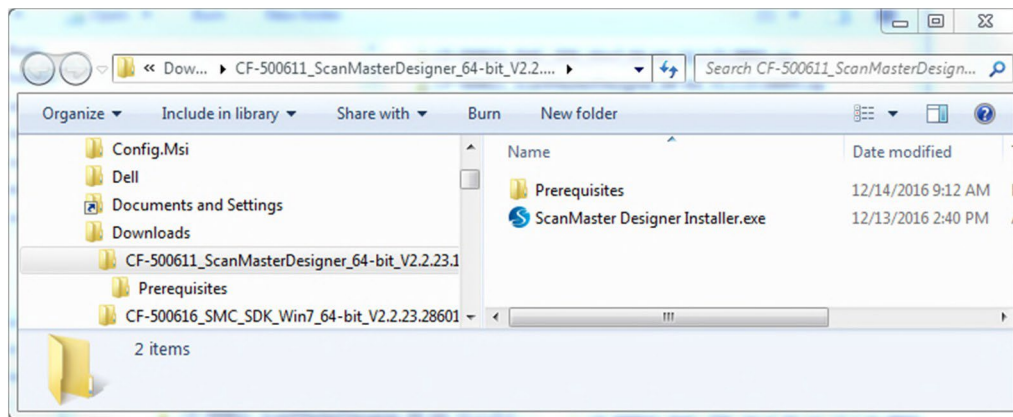
Select the ScanMaster Designer zip file you downloaded. Right-click and select “Extract All...”



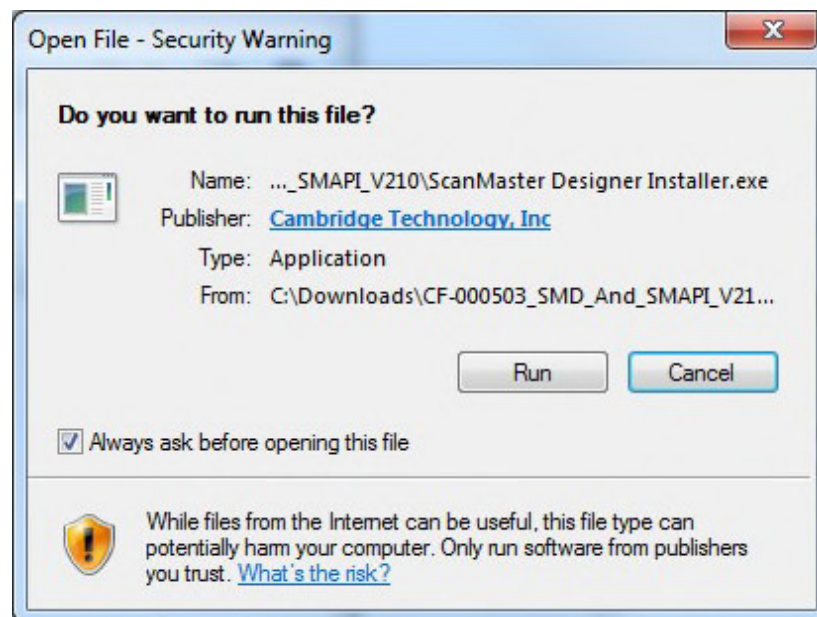
You can change the location of the extraction first or you can accept the default. Press “Extract”. You will see the following.



When extraction is complete, you will see the following folder view.



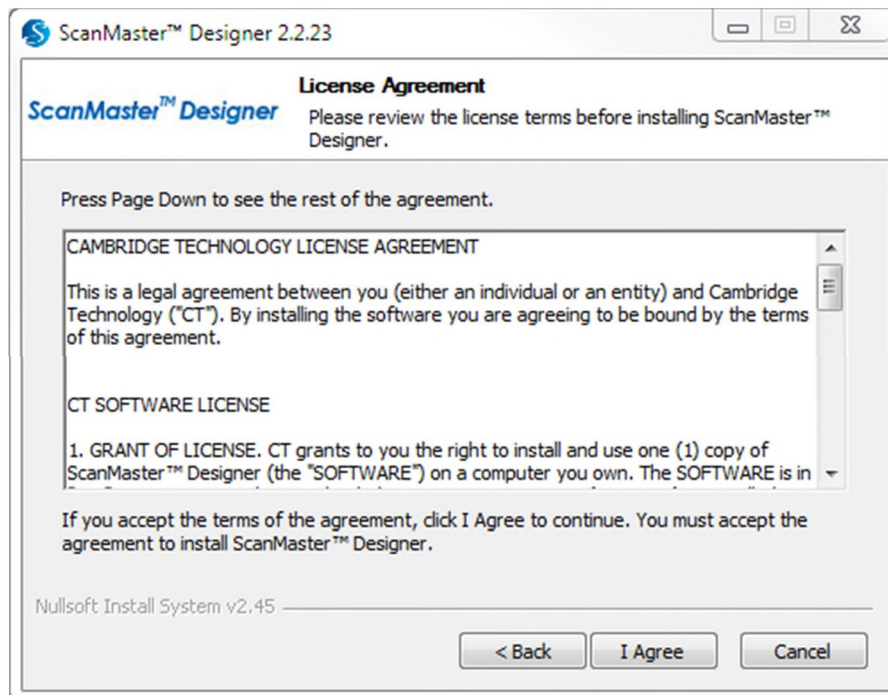
Double-click the file "ScanMaster Designer Installer.exe". A security prompt may appear. If it does, just press "Run". For Windows10, a "User Account Control" pop-up may appear. Chose "Allow".



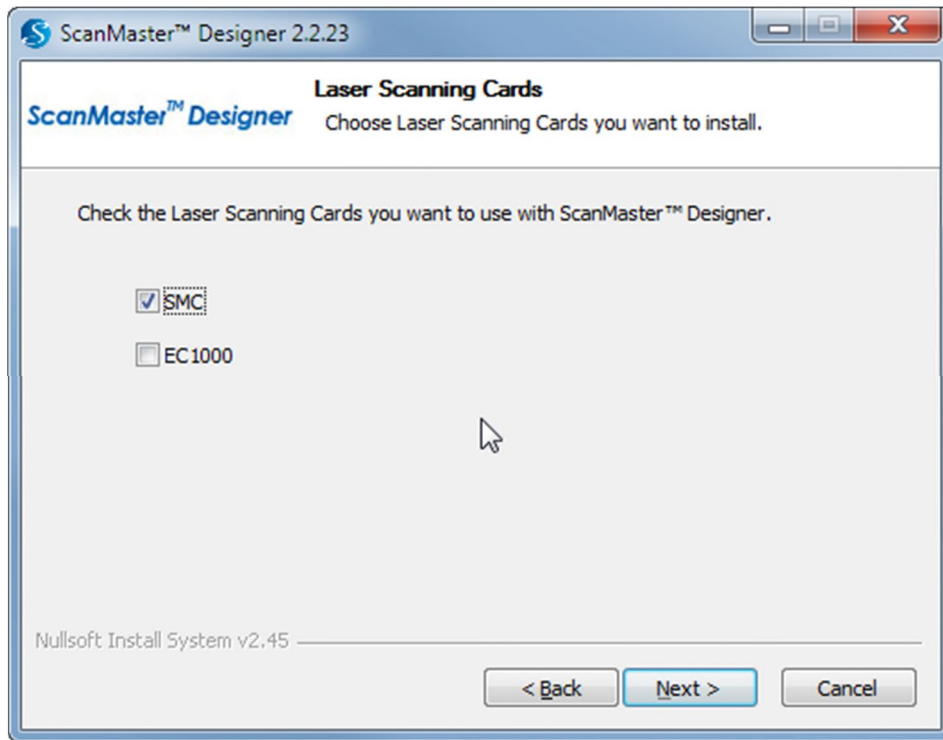
The following installer window will appear. Press “Next” when it does.



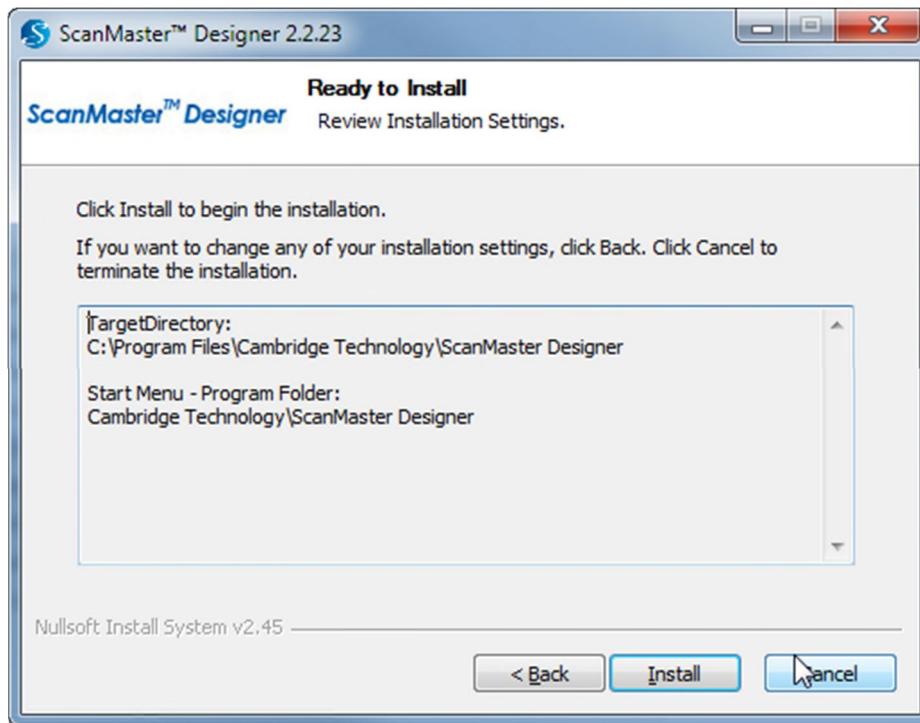
A license agreement window will appear. If you agree, press “Accept”.



Accept the installer defaults and press “Next >” until you get to the following screen:



Select the controller type that you are expecting to use. In this example we have selected the SMC. Press “Next >” again. You will get the following screen:



Press “Install” to complete the installation. When it is complete, you will be offered an opportunity to run SMD and/or see the Readme file.





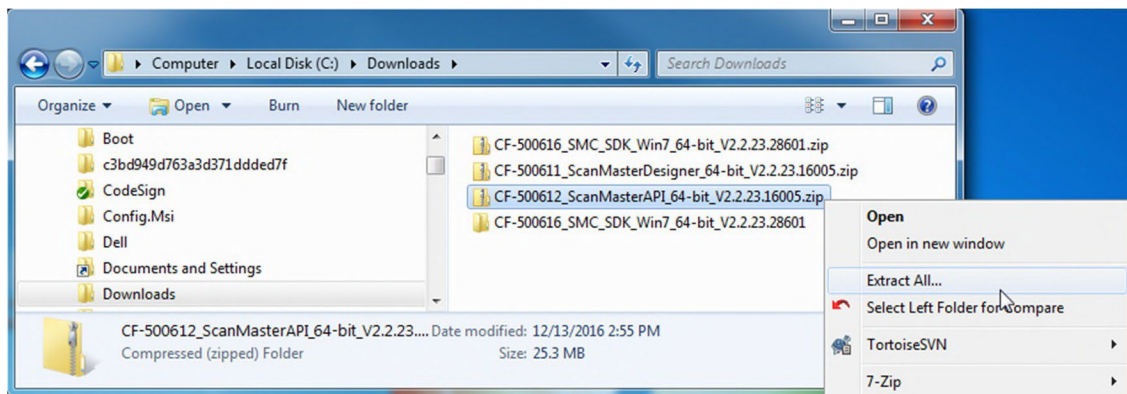
Make your choice and press “Finish”. ScanMaster Designer is now installed and ready to use.

### 3.5.3 Installing ScanMaster API

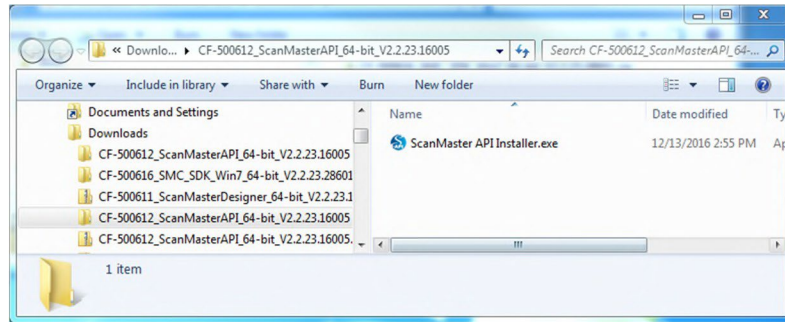
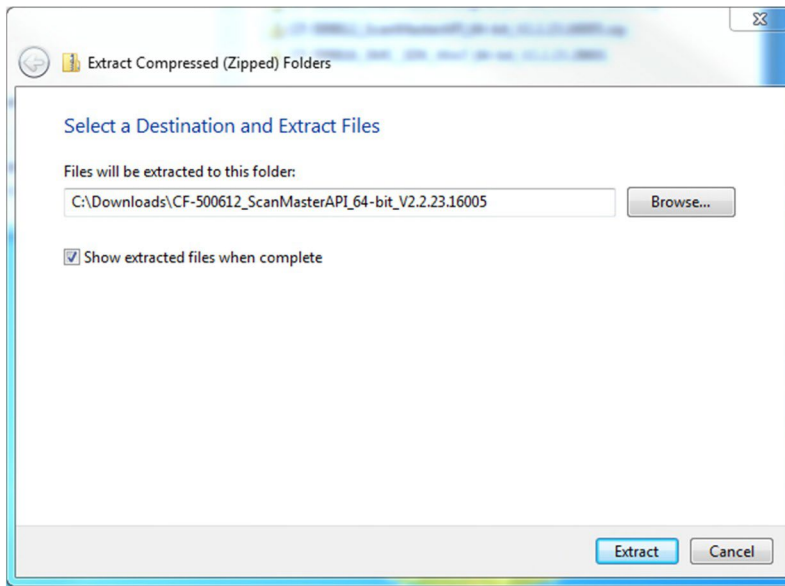
ScanMaster API provides a high-level .NET based programming tool-kit for writing your own application software to run the SMC or EC1000. If you are not planning on doing this it is not necessary to install it.

If you want to install SMAPI, you need to download the appropriate installer for your computer and operating system configuration. Please see 3.4 - Downloading ScanMaster Designer and ScanMaster API.

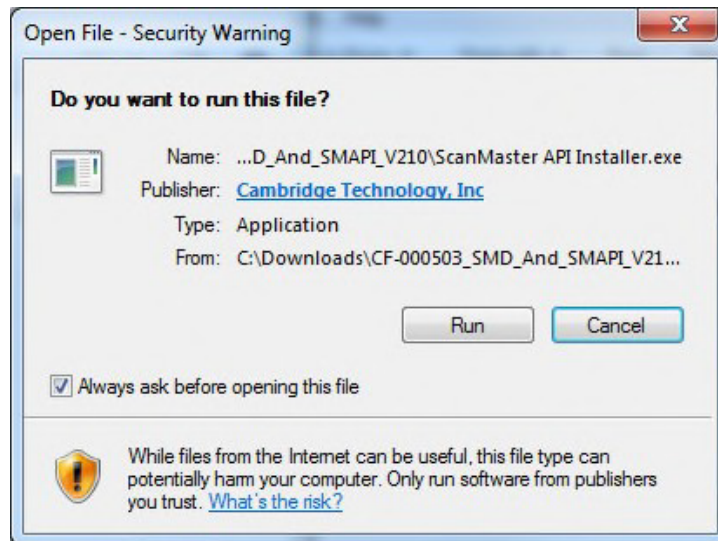
Extract the zip file in the download folder.







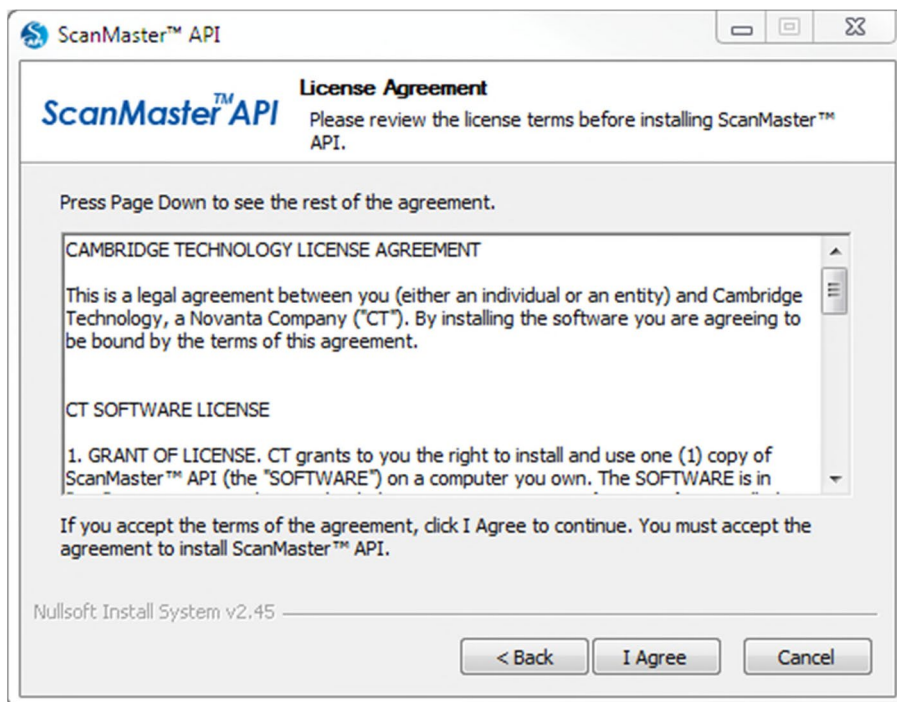
Double-click the file “ScanMaster API Installer.exe”. A security prompt may appear. If it does, just press “Run”.



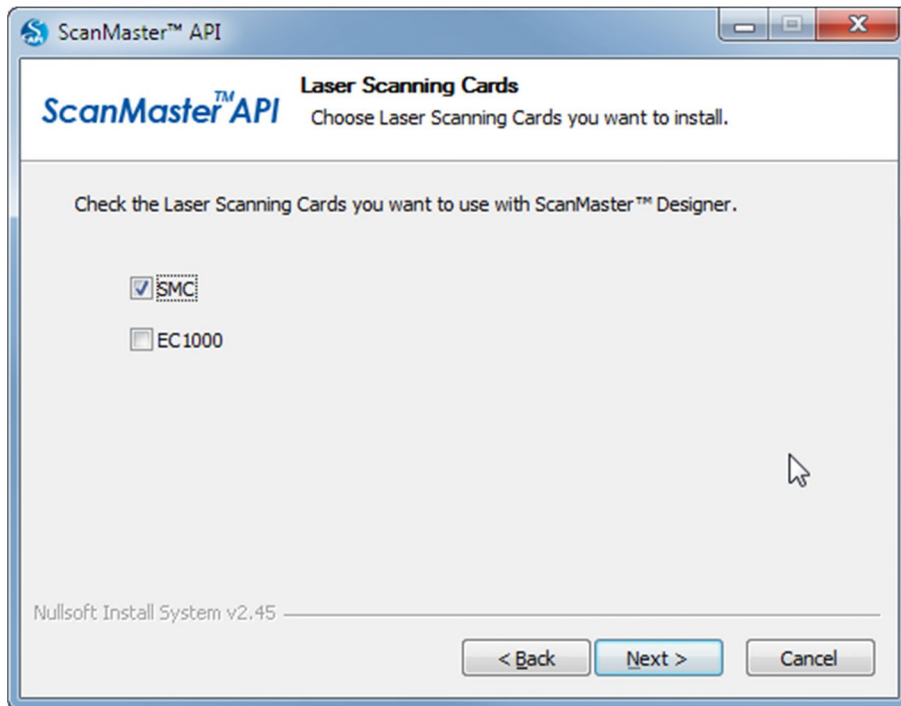
The following installer window will appear. Press “Next” when it does.



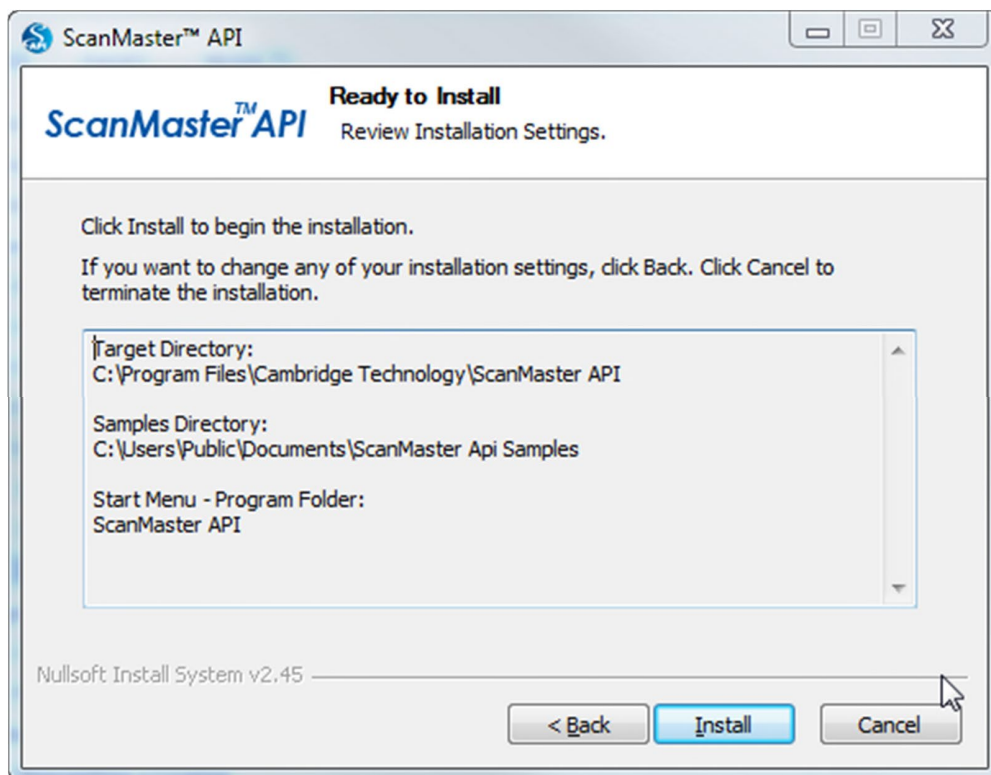
A license agreement window will appear. If you agree, press "Accept".



Accept the installer defaults and press "Next >" until you get to the following screen:

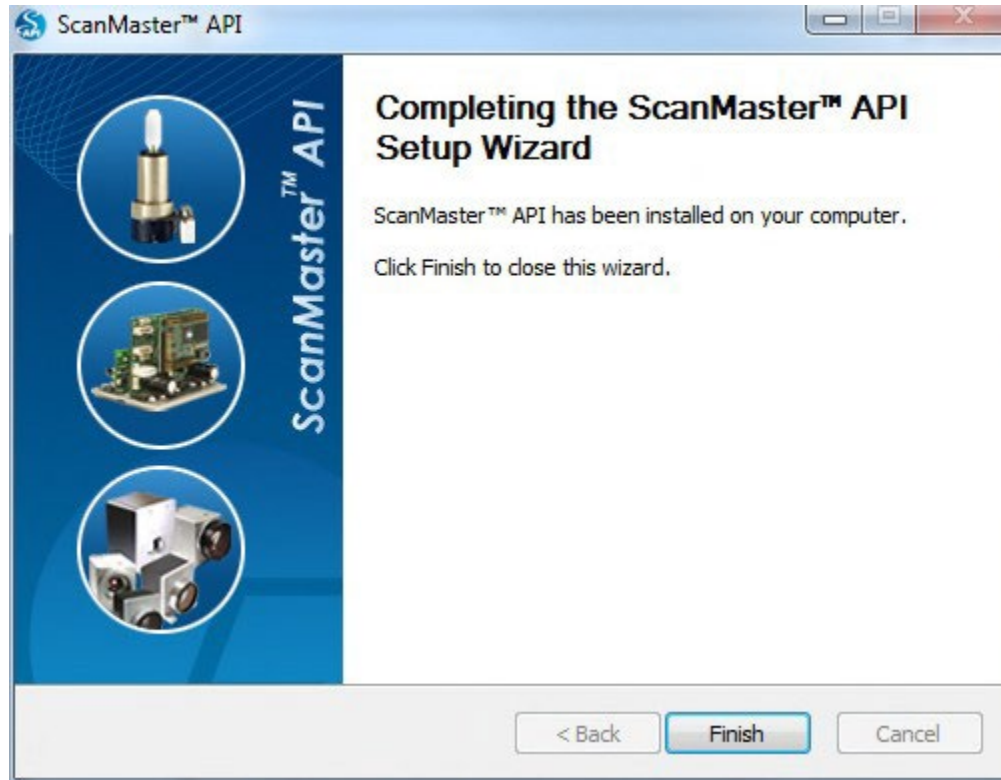


Select the controller type that you are expecting to use. In this example we have selected the SMC. Press “Next >” again. You will get the following screen:



Press “Install” to complete the installation. When it is complete, you will see the following screen. Press “Finish” to complete the installation.

**NOTE:** During the installation, you may momentarily see a black command shell screen. This is normal and can be ignored.



## 4 Upgrading the Controller Firmware

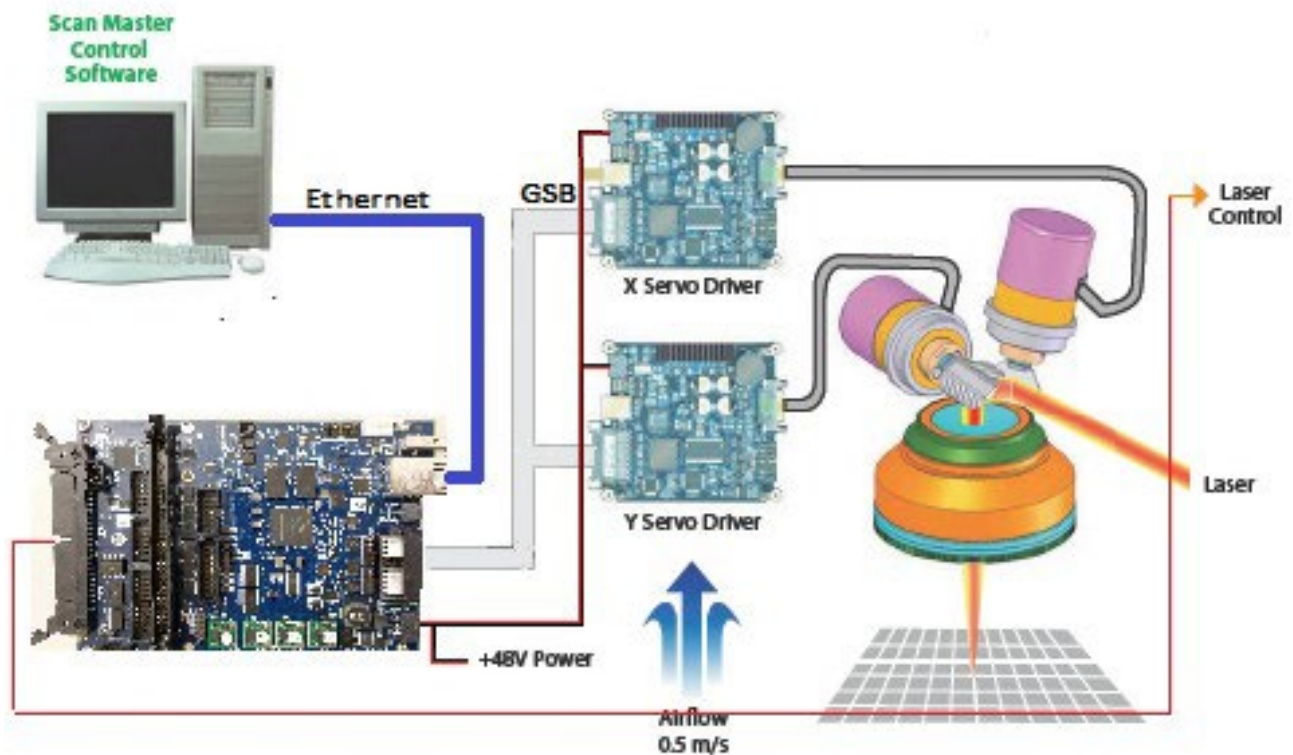
---

The controller firmware needs to be updated only when you have a controller with an older version of firmware and you want to use it with newer ScanMaster Designer or ScanMaster API software. It is not necessary to update new controllers as they are matched to the ScanMaster Designer version on the website as of the date of shipment. If you are unsure of the versions, it is OK to update the firmware using this procedure.

**NOTE:** Before attempting an upgrade, please follow the instructions in Section 3.1 - Before you begin, Section 3.3 - [Downloading the Software Development Kit](#), and Section 3.5.1 - [Installing the Controller SDK](#).

The following diagram illustrates the components of a fully functional SMC based controller driven scanning system. For the purposes of updating the firmware however, it is only necessary to be able to power-up the controller and have it connected to the PC via Ethernet cable.





## 4.1 Configuring your network

**NOTE:** Make sure to upgrade the Network Adaptor Driver in your computer to the latest version before doing the firmware upgrade.

The SMC and EC1000 use Ethernet to communicate to the host PC. You can use either of the following methods to connect the SMC to the PC via an Ethernet cable:

- **Direct** – The SMC is directly linked to the PC through an Ethernet cable. Both the PC and the SMC must be on the same subnet and have static IP addresses.
- **Network** – The SMC is connected to a network hub in an intranet, and the PC is connected to the same intranet. Even if there is a DHCP server on the network permitting automatic IP assignment, both the SMC and the PC should be set to non-conflicting Static IP address when the firmware upgrade is performed. Check with your system administrator if unsure what to do in this situation.

The SMC is shipped using a Static IP address of 192.168.100.20. In order for you to communicate with it, the PC must be set to the same IP subnet, i.e. the network adapter of the PC must have an IP address of 192.168.100.xxx, where xxx is a number other than 20.

In addition, the SMC expects to run using 100Mbps / half-duplex and will configure itself this way. For best performance, the PC network adapter should be configured the same way. See Section 6.4 - [Network Settings](#) for more details about changing the PC network adapter settings.



The EC1000 is shipped using Automatic IP addressing expecting a node on the network to assign IP addresses automatically. In the case of a point-to-point network similar to what is shown above, the host PC must also use automatic IP addressing. In this situation, the EC1000 and PC will automatically self-assign an IP address of the form 169.254.xxx.yyy after an interval of time that may last up to 30 seconds. These addresses will change every time the PC or board is rebooted. Although the firmware loader for the EC1000 can handle this situation, it is advisable to switch to Static IP addressing before starting the upgrade. This makes it easier to recover in the unlikely event of a failure during the firmware updating process.

**NOTE:** The SMC will not work in Automatic IP addressing mode with Direct connectivity so Static IP addressing must be used in this configuration.

See Section 6.4 - [Network Settings](#) for more details about changing the PC network adapter settings, however a thorough explanation of the steps how to do this is beyond the scope of this application note. If you are unsure of how to do this, please consult with you site system administrator.

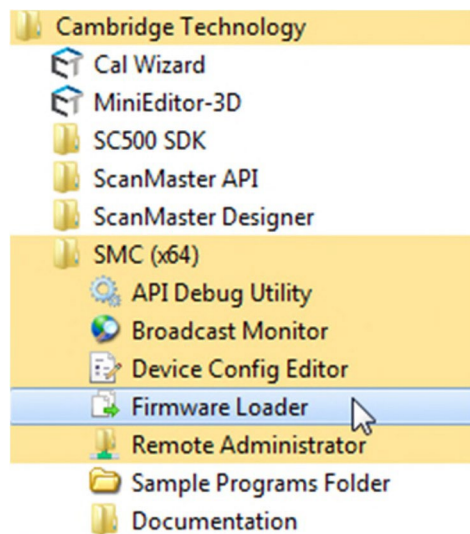
**NOTE:** If you are attempting an upgrade of an SMC from firmware version 2.0 to version 2.2 and have previously changed the IP address of the SMC to a subnet other than 192.168.100.xxx, you **must** change it back to 192.168.100.xxx before you start.

## 4.2 Running the Firmware Loader

---

**NOTE:** If you are upgrading V2.0 firmware to V2.2, please follow the procedure in application note AN00012 - How to upgrade SMC firmware to V2.2 with the new SD card.

The Firmware Loader is launched via the Windows Start Icon:



When SMC Firmware Loader runs for the first time, Windows will ask for firewall permission. Make sure that you select both of the check boxes in the following screen. Then left-click the **Allow access** button. After this selection, you need to restart the Firmware Loader.

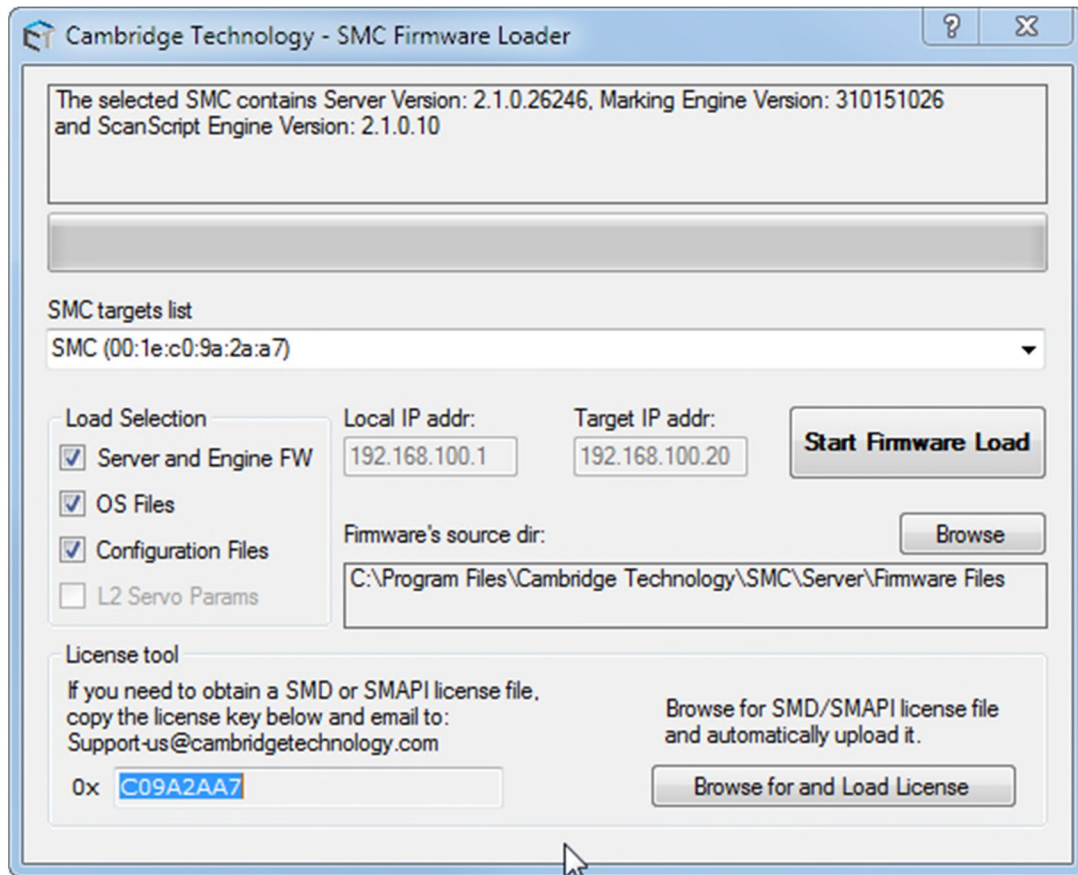


**NOTE:** All Cambridge Technology software requires the user to set firewall permission in order to access the software.

After the loader launches, it will survey the network looking for broadcast messages from attached SMC and EC1000 controllers. In the case where only one controller is discovered, it reads the current firmware version information and displays it. If multiple controllers are present, you must select the right one from the SMC targets list.

**NOTE:** The images shown below are for SMC firmware updates. The EC1000 SDK has a separate but very similar tool.

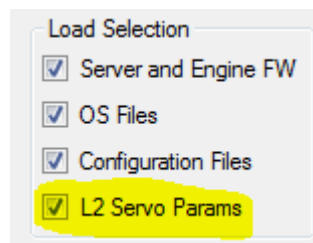
**NOTE:** If the firmware loader is unable to detect a connected controller, then check the procedures in Section 6 - [Troubleshooting](#), to help resolve the issue.



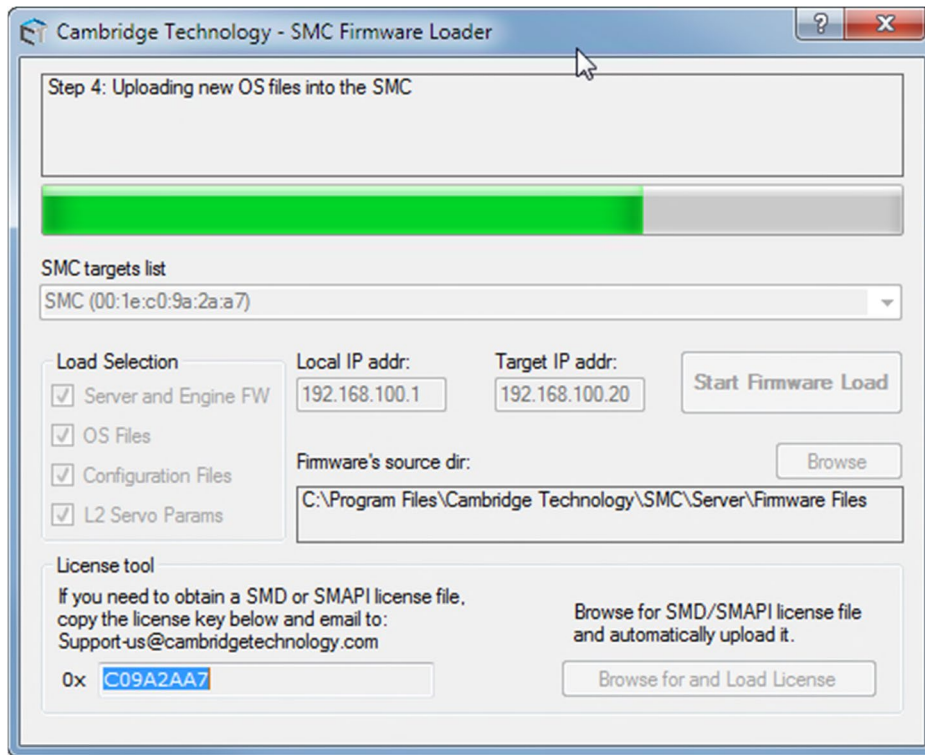
If you are not using a Lightning II digital servo you may skip the next step.

If have a Lightning II digital servo system attached to your SMC, you should plug a USB cable from the X-Axis board to the PC now.

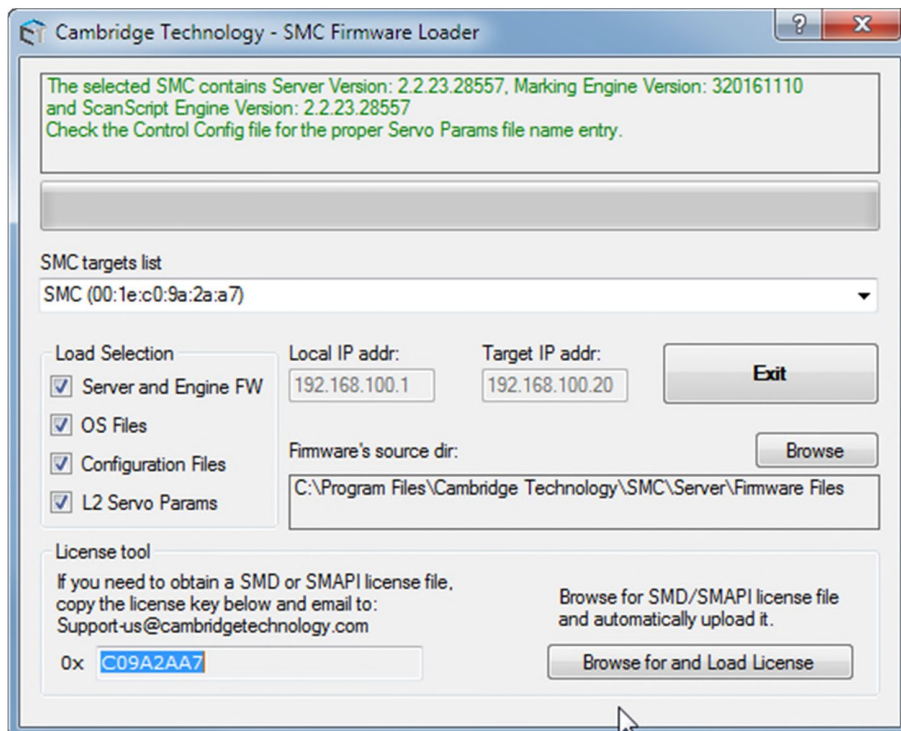
When you plug in the USB cable, the L2 Servo Params check-box will be enabled. You should check this box.



Press "Start Firmware Load". As the controller's files are backed up and new firmware loaded, you will see a series of status updates similar to the following:



When the process completes, you will see a screen similar to the following. Press “Exit” to finish the process.



## 5 Getting a License

---

SMD and SMAPI are licensed software packages. License enforcement is done by the controller when you attempt to run a job. You can prepare a job without a license, but you cannot run it. If you are not licensed to use SMD for executing a job, you will get a licensing error reported in the SMD Output window. Although there is no additional charge for using SMAPI, it still requires a license.

All SMC boards shipped with Version 2.1 firmware or later will already have an appropriate license installed based on your purchase. Boards with Version 2.0 firmware must have the license installed during the upgrade procedure to Version 2.2. This is true for both SMD and SMAPI.

**NOTE:** The following instructions are valid only for the Firmware Loader that is part of V2.1 Controller SDK or later. Please ensure that you are using this version.

### 5.1 Requesting a License

---

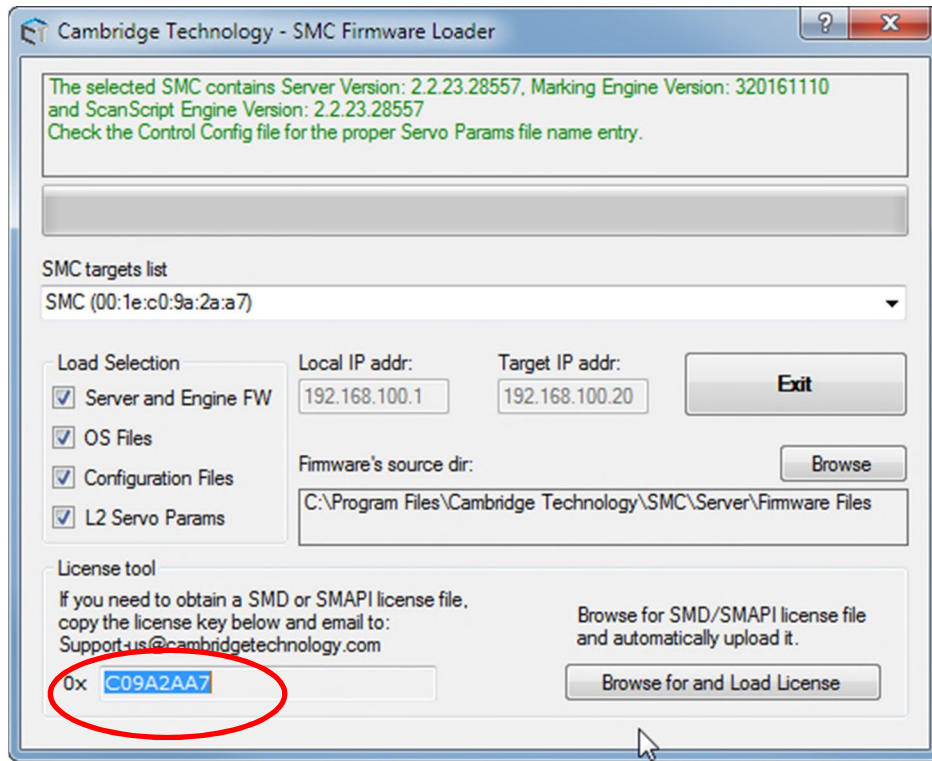
If you are upgrading from V2.0 or are requesting an upgrade to a ScanMaster Designer license, Cambridge Technology Customer Service will need two items of information to send you a license file:

1. The sales order number from your controller purchase.
2. The internal license key number from the controller.

For SMC or EC1000, run the corresponding firmware loader application for the controller you are using (see Section 4.2 - [Running the Firmware Loader](#)). For the SMC, you may also access the key using the configuration editor (see step 4 - [Select device configuration](#)).

Once the Firmware loader is running and the appropriate controller selected, note the license key number found in the lower left corner. Send this number along with the original Sales Order number to [Cambridge Technology Technical Support](#). You will receive a license file in an e-mail.

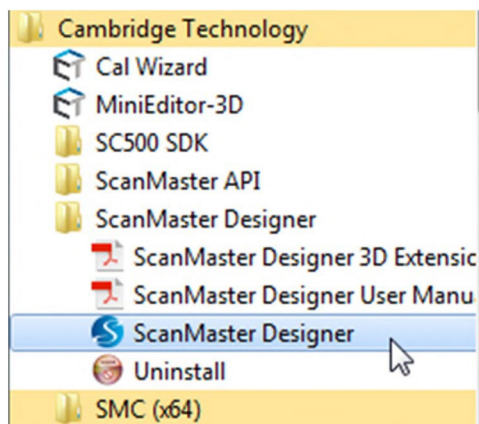




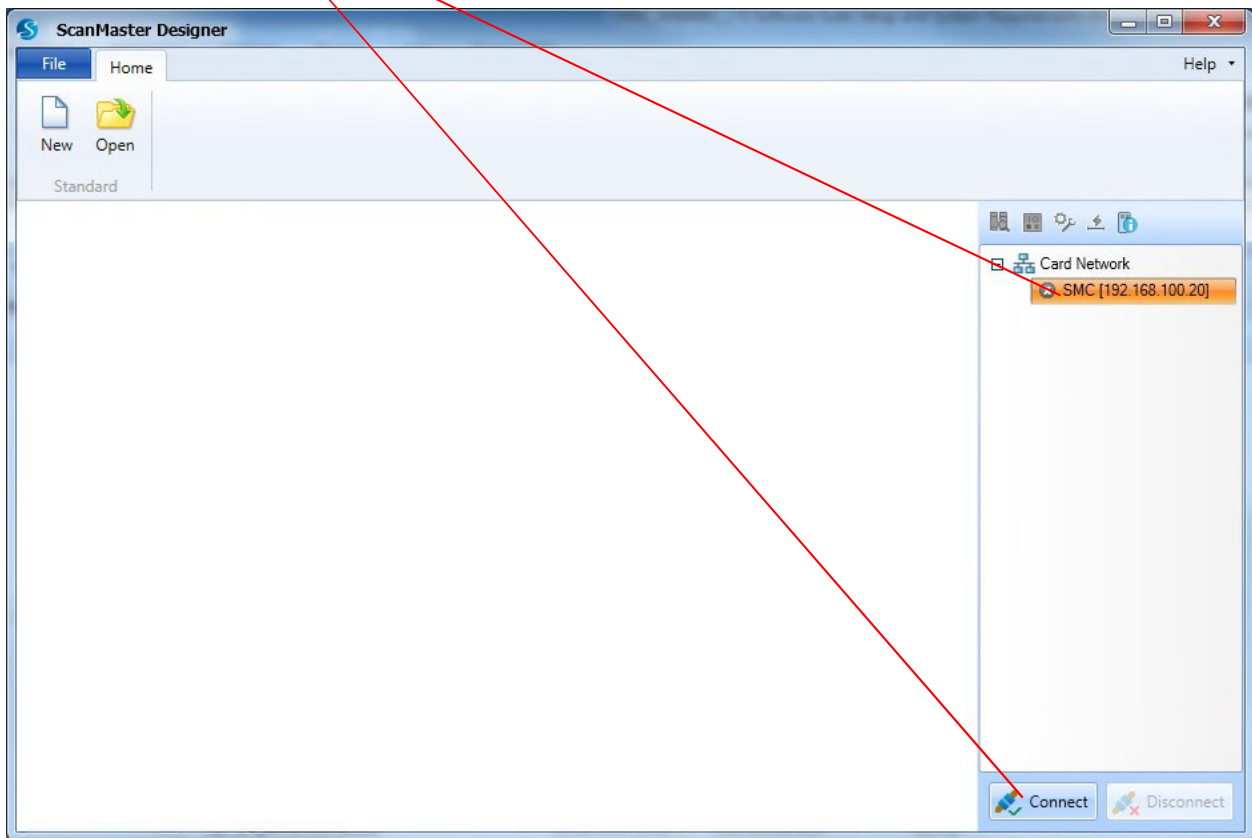
## 5.2 Uploading a License

When you receive your license file, you can install it using the upload license file feature in SMD.

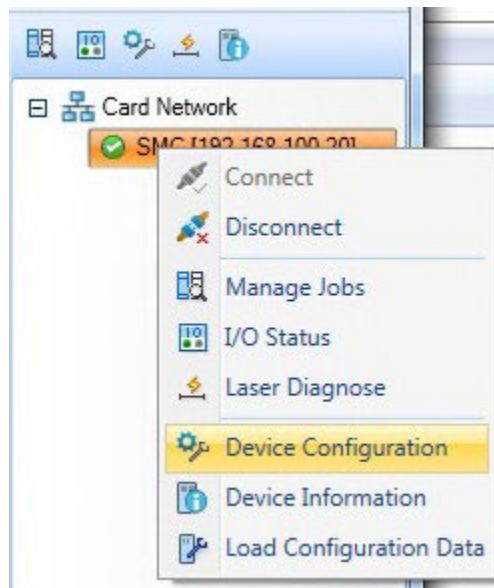
1. Open SMD

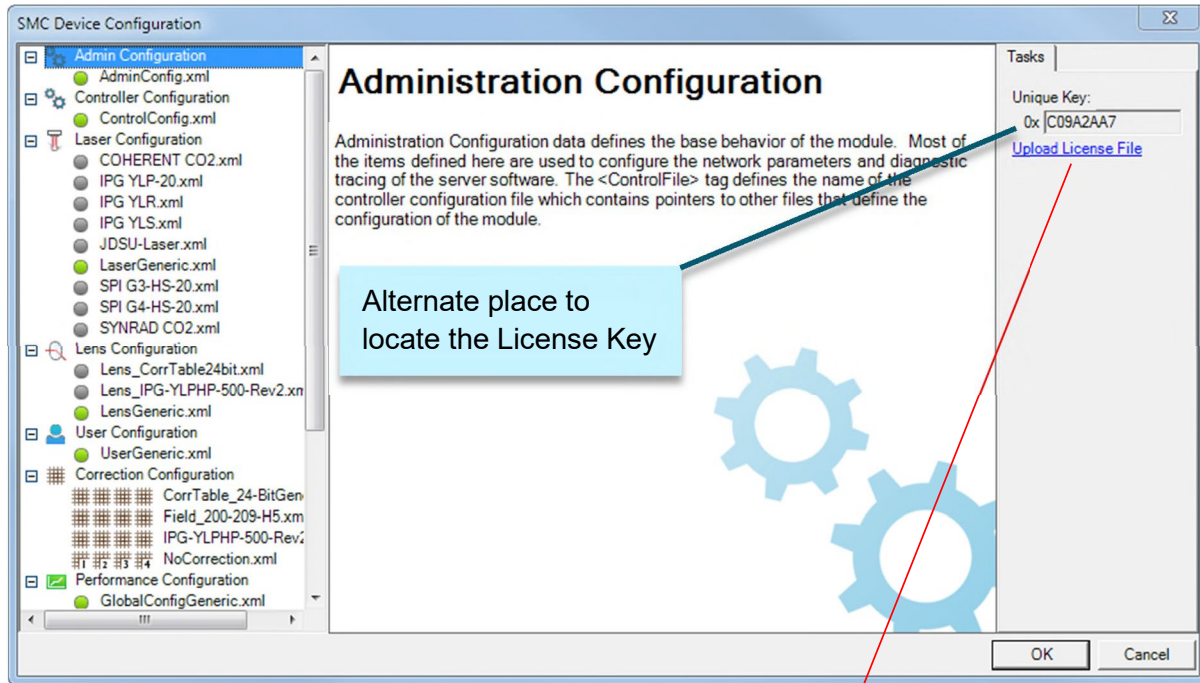


2. Select your controller
3. Connect to controller



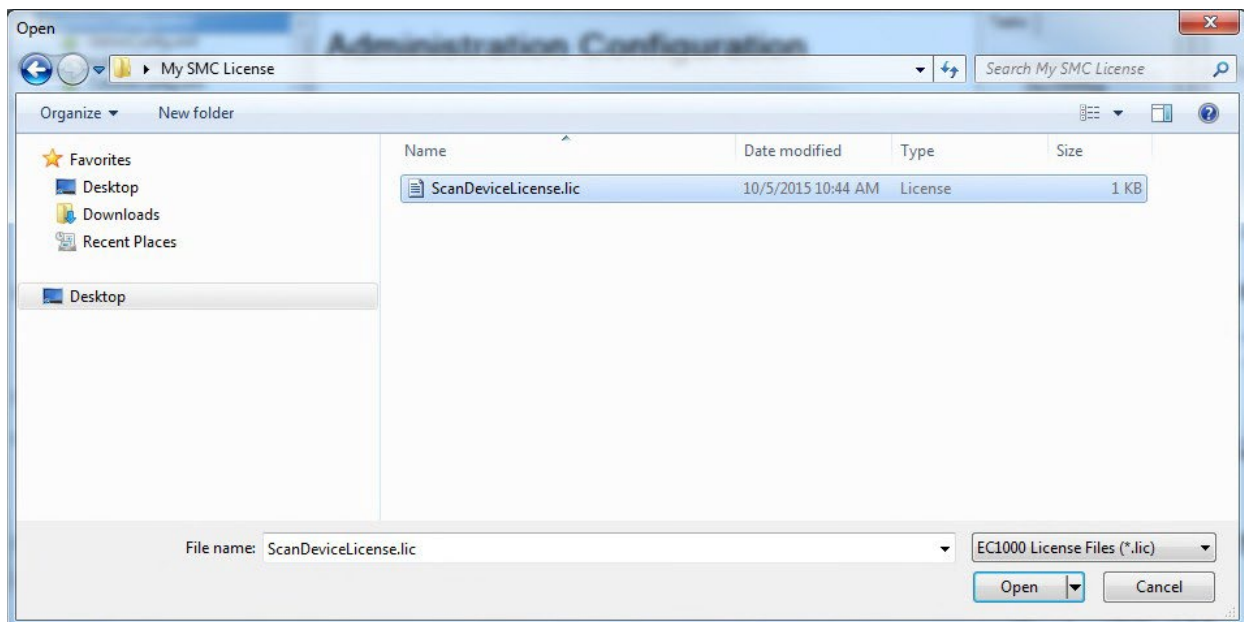
4. Select device configuration by right-clicking on the controller name:





5. Select Upload License File. Browse to the *ScanDeviceLicense.lic* file and select it. The file will automatically be sent to the SMC.

**NOTE:** For the SMC, the License Key can also be identified as shown above. This is useful if you are only requesting a license upgrade from SMAPI to SMD and not performing a firmware upgrade.



6. Power-cycle the SMC to have the license take effect.
7. Restart SMD to rescan the network and identify the updated SMC.

## 6 Troubleshooting

---

Sometimes installations don't go as planned. Below are some common issues that prevent setup applications or applications themselves from running properly. These procedures assume a working knowledge of Windows System Administration tools and policies.

### 6.1 Run as administrator

---

In order to run most Cambridge Technology software setup applications, you need to run the setup as **Administrator**. This can usually be done by right mouse clicking on the file name and selecting "Run as Administrator". The reason for this is some users don't have rights on their computer to add/modify/delete files on their system. These are things setup programs do all the time on your behalf.

### 6.2 Laptops with docking stations

---

If you are using a laptop with a docking station, make sure the Ethernet cable is attached to the docking station and not the laptop. The docking station sometimes causes an override of IP adapter settings which may prevent broadcast packets from the controller from being received and network connections being made.

### 6.3 Windows Firewall

---

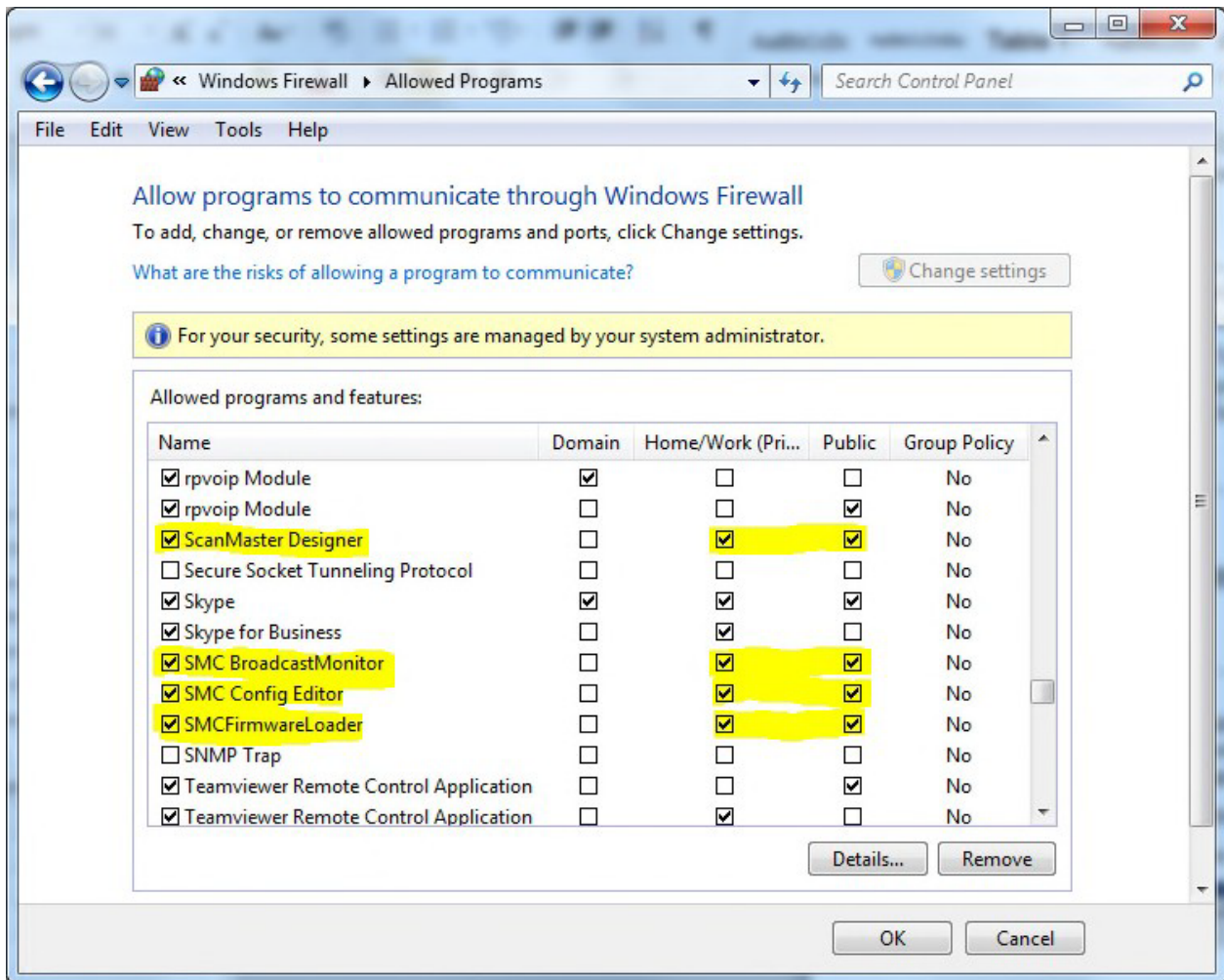
Because the Cambridge Technology controllers are network-based devices, Cambridge Technology applications must have permission to go through the Windows Firewall to work properly.

For example, most Cambridge Technology applications need to sense the presence of controllers that are periodically broadcasting system information on the network. If the broadcast packets are blocked from reaching the applications by the Windows Firewall, they will not be aware of them and hence, not be able to connect to them.

If your firewall is blocking broadcast monitor, it will not show any devices present. Please enable firewall access to the Home/Work, and Public network categories for all Cambridge software products. It may also be necessary to enable the Domain category at some sites.

You can access the firewall settings by:

Start→Control Panel→Windows Firewall→Allow a program or feature through Windows Firewall



## 6.4 Network Settings

Sometimes controllers (EC1000/SM1000, SMC) are not correctly set up on the network. As a result, the controller may appear as an available device, but the application fails to connect to it.

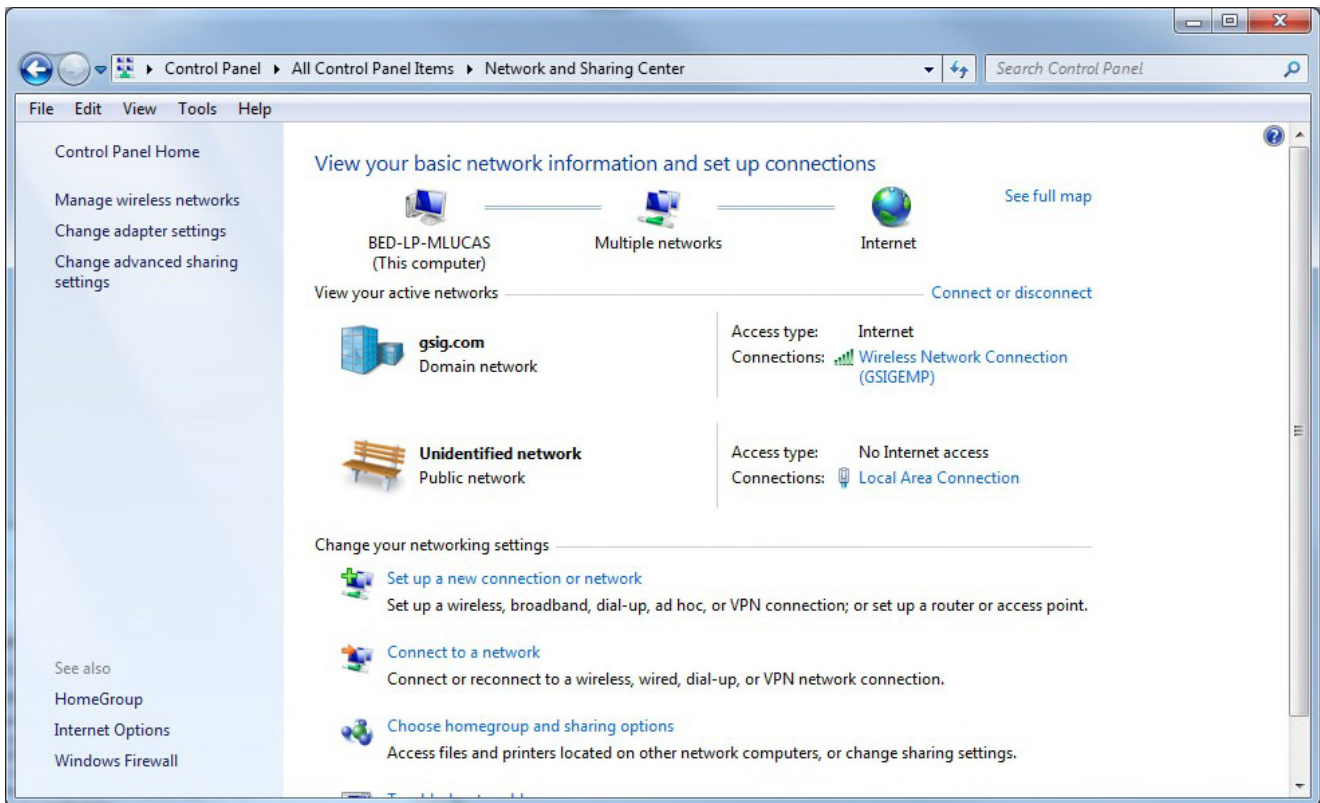
If you can ping the controller’s IP address and it shows up in Broadcast monitor, the controller should be set up correctly.

### 6.4.1 Changing IP Settings

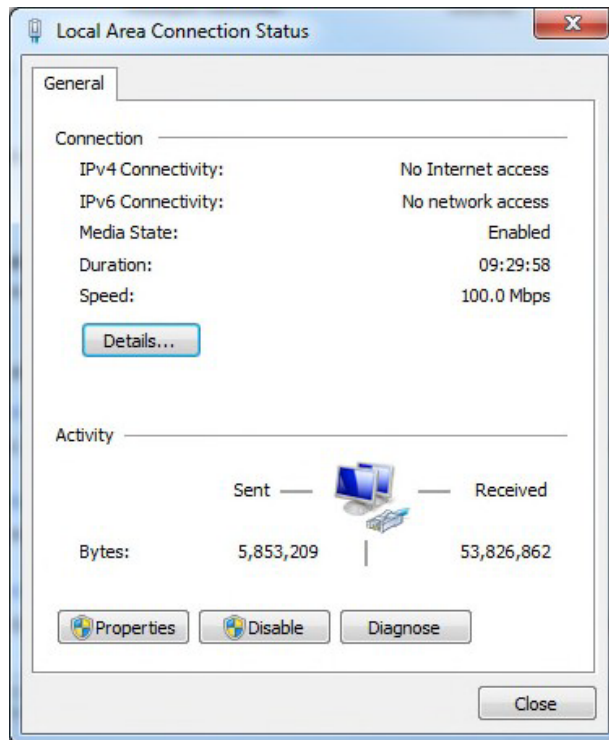
Shown below is a sequence of steps for configuring a simple setup consisting of a computer with a static network address of 192.168.100.1. This situation assumes a controller with a static address of 192.168.100.20.

1. Open the Windows network configuration panel:  
Start→Control Panel→Network and Sharing Center

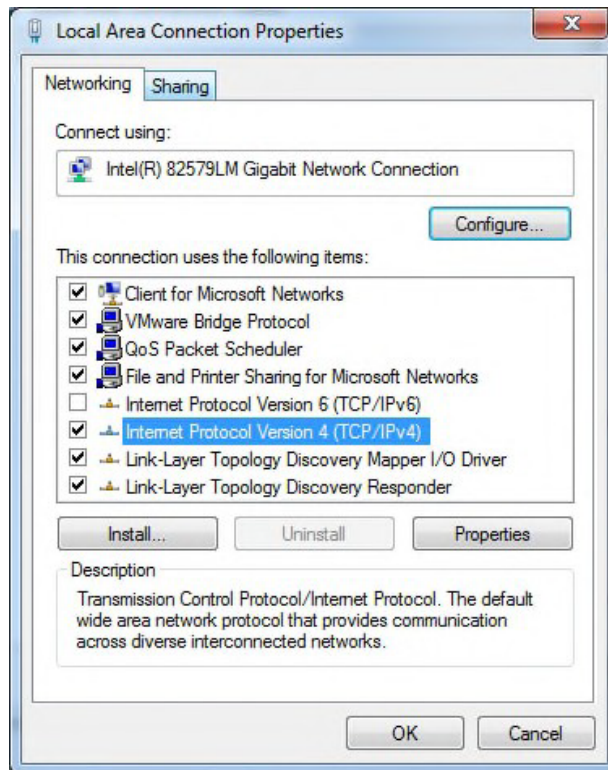




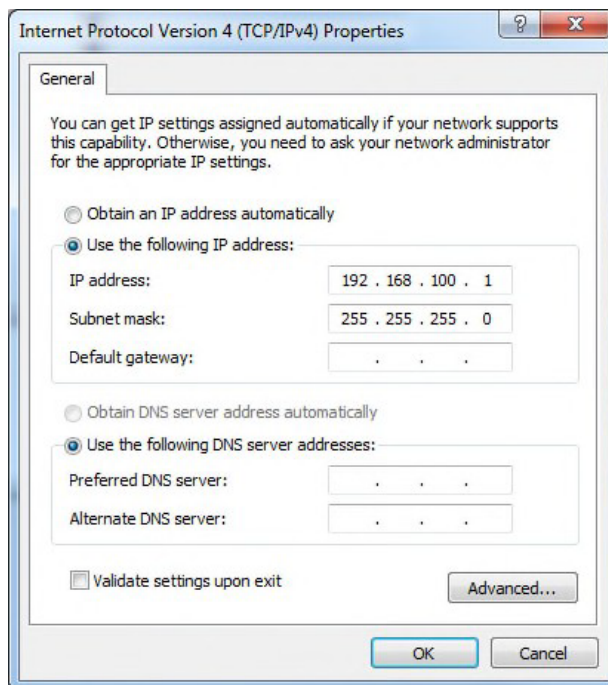
2. Click on "Local Area Connection"



3. Click “Properties”



4. Double-click “Internet Protocol Version 4 (TCP/IPv4)”



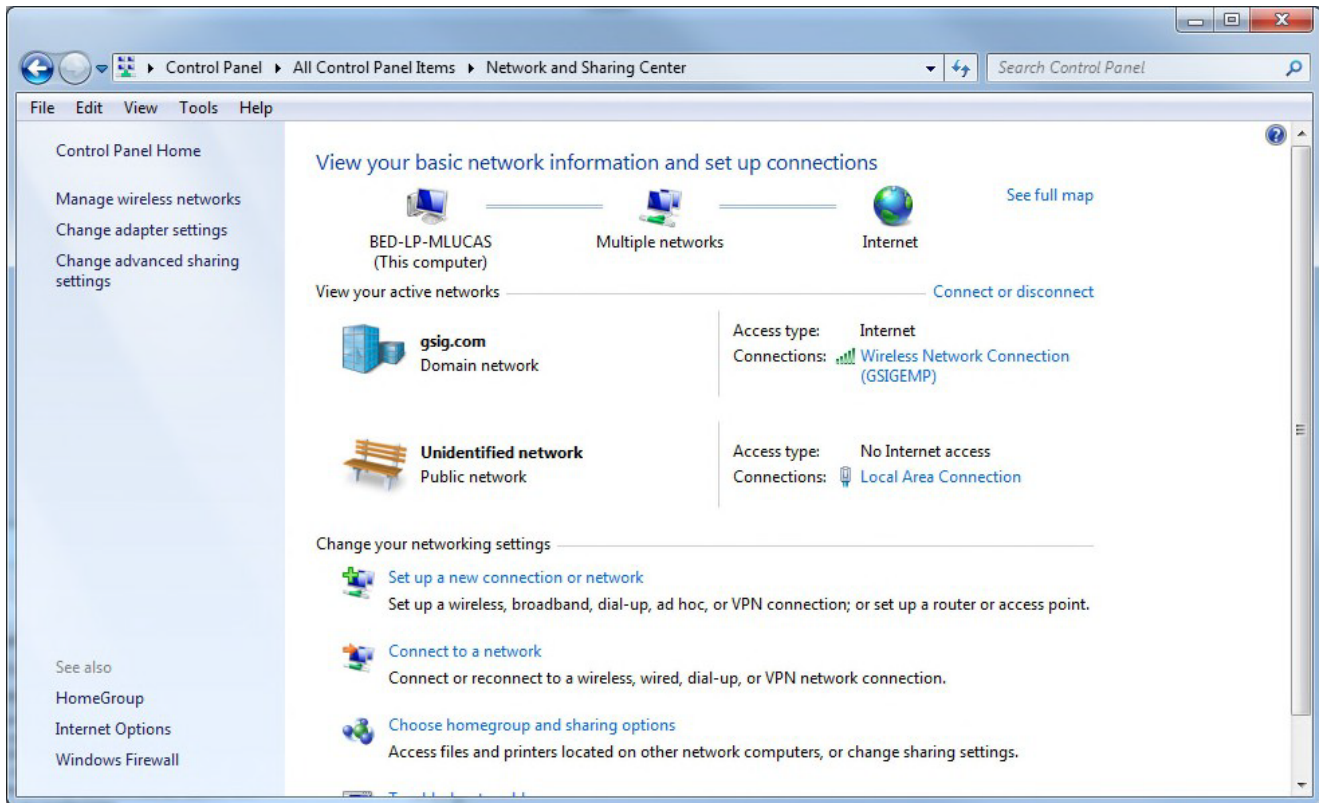
5. Select “Use the following IP address”, and enter the IP address and Subnet mask as shown. Press OK, and Close as you back out of the menu options.

**NOTE:** The IP address must be of the form 192.168.100.xxx where xxx is not 20 which is reserved for the SMC.

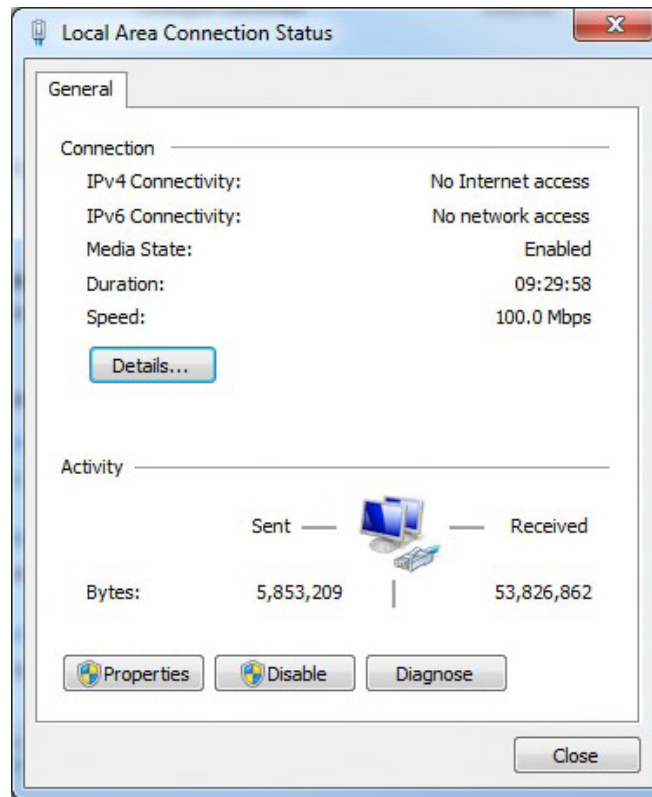
## 6.4.2 Changing the Network Adapter Speed

Shown below is a sequence of steps for setting the Ethernet speed and duplex configuration for SMC use.

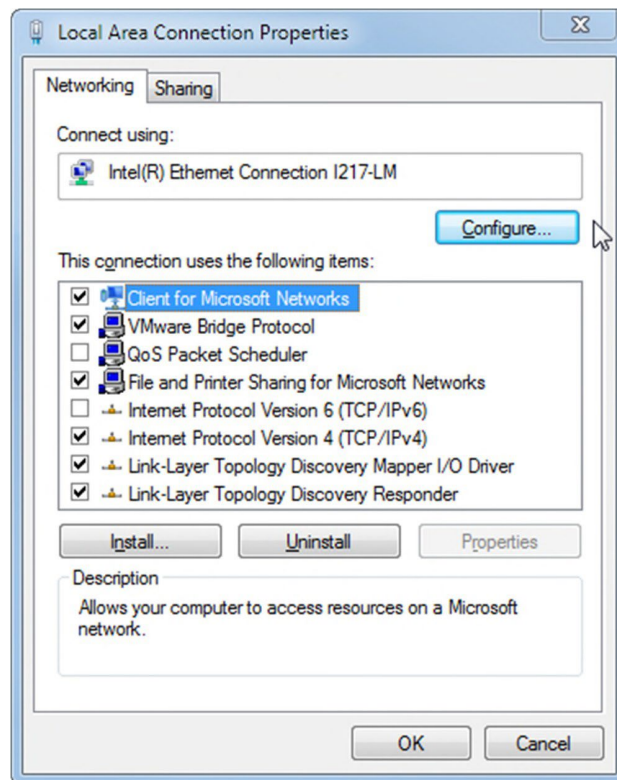
1. Open the Windows network configuration panel:  
Start→Control Panel→Network and Sharing Center



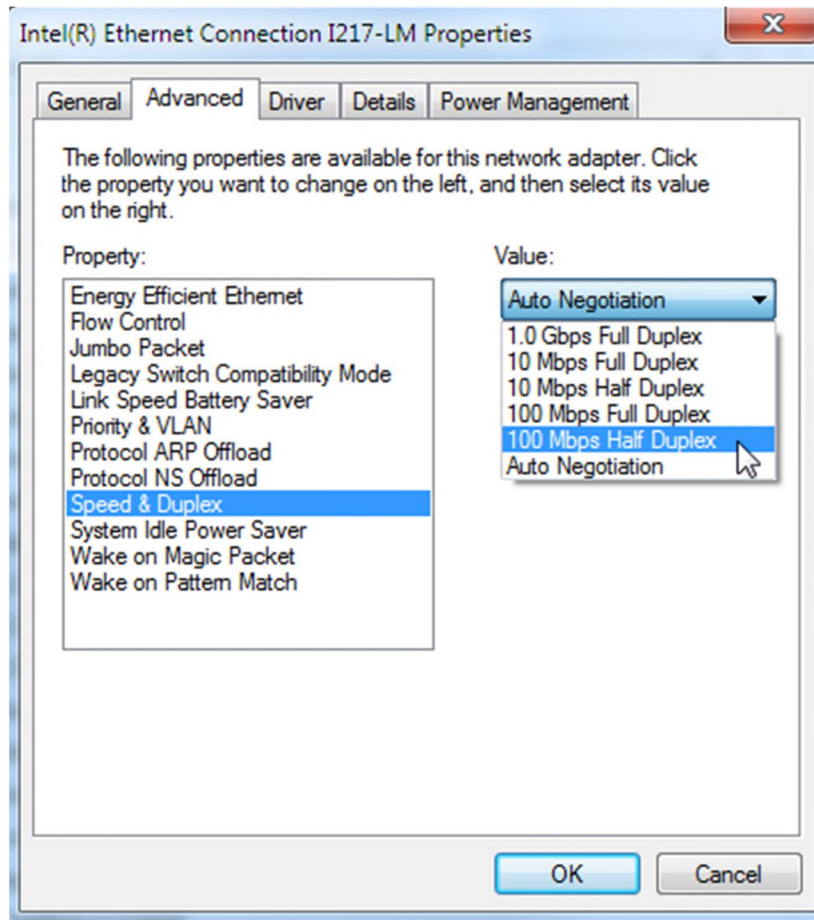
2. Click on "Local Area Connection"



3. Click "Properties"



## 4. Click “Configure”



## 5. Select the “Advanced” tab. Select “Speed &amp; Duplex” and the “100 Mbps Half Duplex” value. Press “OK”.

**NOTE:** Most systems are set to Auto Negotiation mode. The SMC will work with this setting but is NOT RECOMMENDED for use in a manufacturing environment.

### 6.4.3 Using the Remote Administrator to Change the Controller Settings

The Remote Administrator tool that is part of the controller SDK allows the user to configure the controller’s network configuration among other things. It is accessed by running:

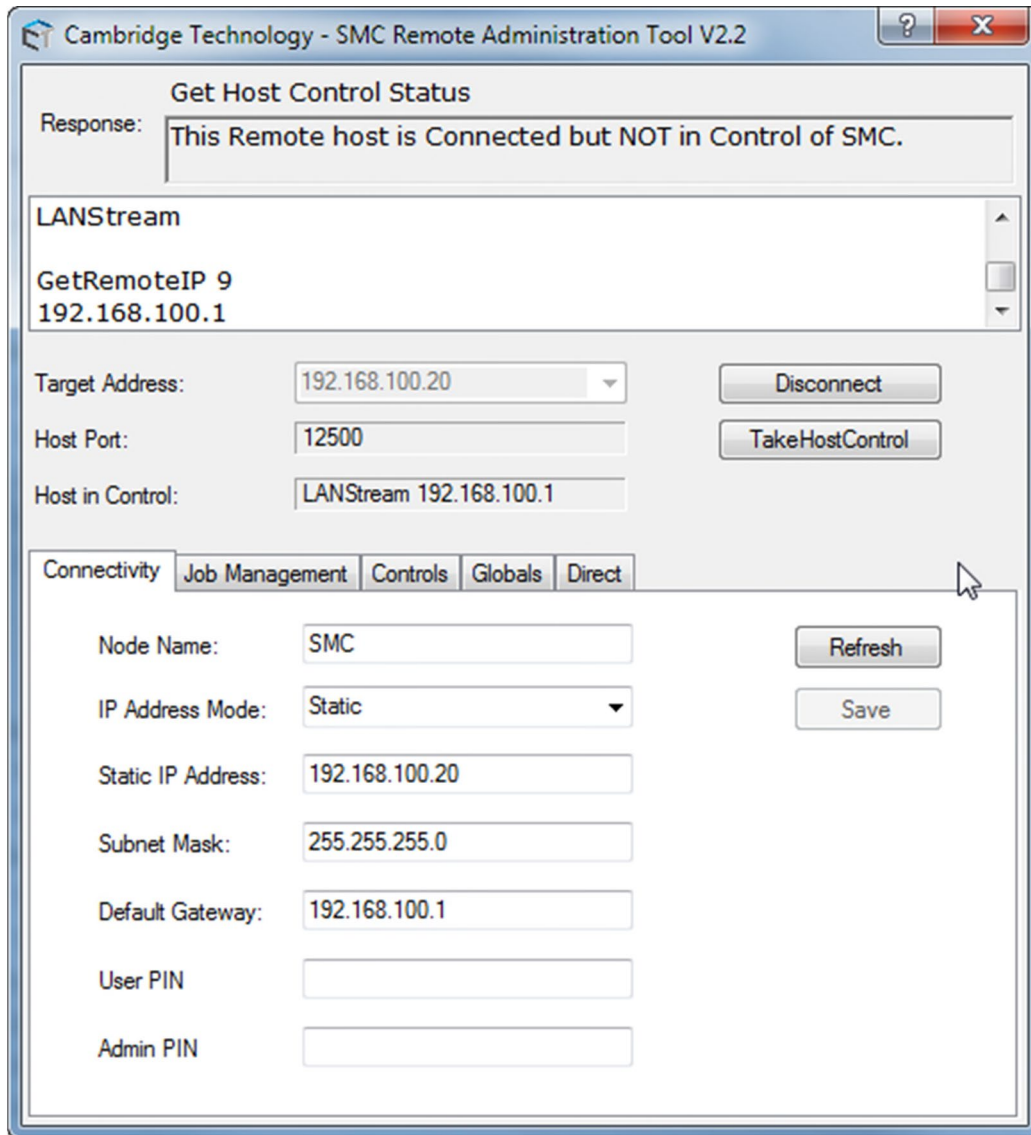
Start→All Programs→ Cambridge Technology →SMC→Remote Administrator

An example figure below shows the controller settings as seen from the Remote Administrator tool. For details on how to use this tool to change a setting, please see the Remote Admin Tool user guide at:

Start→All Programs→ Cambridge Technology →SMC→Documentation→Remote Administrator Manual.



**NOTE:** If you do change the IP address, make sure that the Default Gateway address is set to your host adapter IP address or you may lose communication with the controller.



#### 6.4.4 Using the Broadcast Monitor to Check Controller Status

The Broadcast Monitor is another tool in the SDK package that shows controllers that are connected to the network. It is accessed by running:

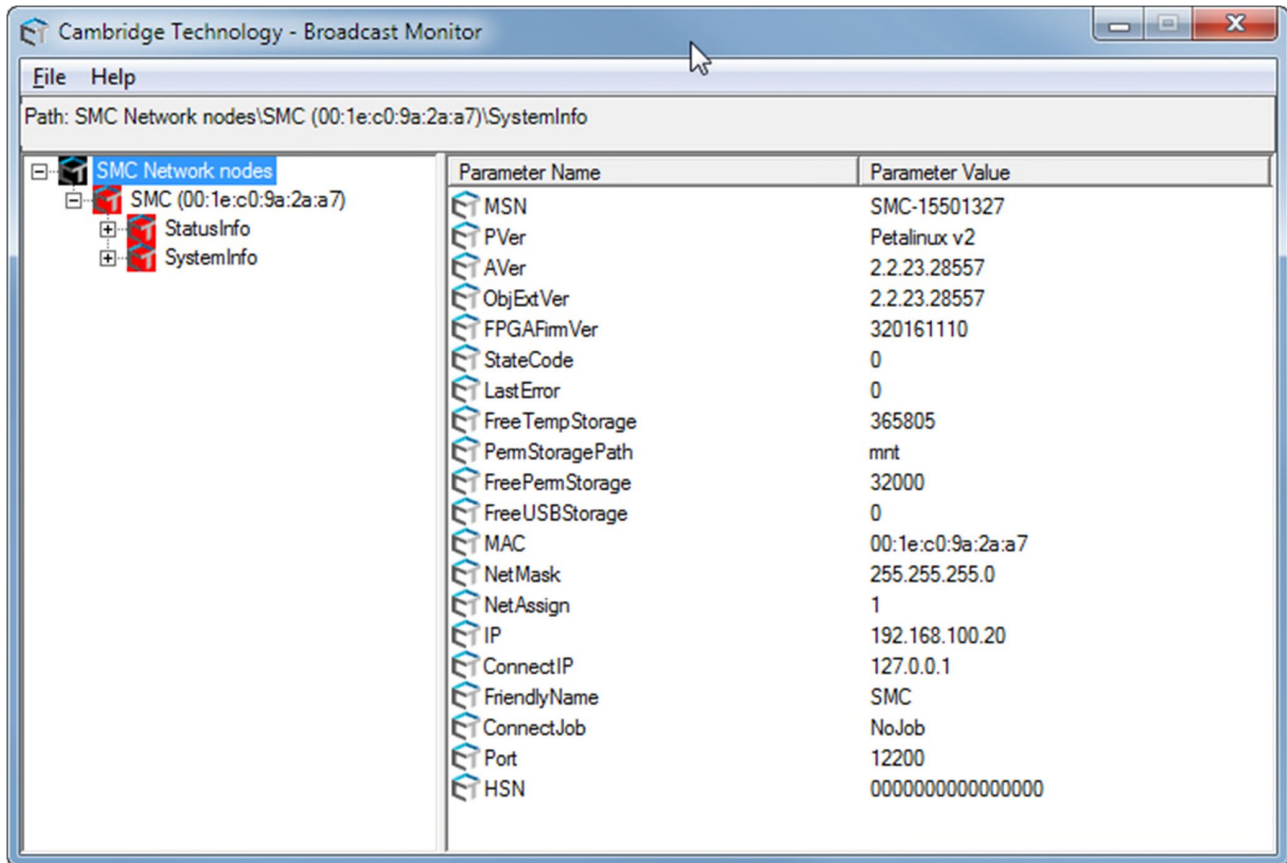
Start→All Programs→ Cambridge Technology →SMC→Broadcast Monitor

Operating controllers continuously broadcast system and status packets at 2 – 5 second intervals. These packets are captured by the Broadcast Monitor and displayed.

For details on how to use this tool to examine broadcasted information, please see the Broadcast Monitor user guide at:

Start→All Programs→Cambridge Technology→SMC→Documentation→Broadcast Monitor Manual.

Below is an example view of the Broadcast Monitor showing a controller's system information:



## 7 Referenced Documents

---

The following table lists the Application Notes that are referenced herein.

**NOTE:** Unless otherwise noted, the current version of the following Application Notes is the applicable one.

**Table 1 - Referenced Application Notes**

Lit. No.	Title
AN00012	How to upgrade SMC firmware to V2.2 with the new SD card