GENOVATION

**ControlPad 684 / MacroMaster 684
User Guide**

**Revision 6.00
October 2013**

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This product has been certified to comply with FCC, EC, TUV and other test standards. See label on the product for confirmation.

FCC CERTIFICATION REQUIRED STATEMENT WARNING:

This equipment has been certified to comply with the limits for a Class B Computing Device, pursuant to Subpart J of Part 15 of the FCC rules. Only peripherals (computer, computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this device. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

NOTE: This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for Class B computing devices in accordance with the specifications in Subpart J of part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off or on, the user is encouraged to try to correct the interference by one or more of the following measures:

- o   Reorient the receiving antennas
- o   Relocate the computer with respect to the receiver
- o   Move the computer away from the receiver
- o   Plug the computer and receiver into different circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to identify and Resolve

Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. (Stock #004-000-00345-4).

TECHNICAL SUPPORT

If you require technical support or if you wish to make suggestions about the product, don't hesitate to contact us. We can be reached Monday though Friday from 7:30 AM to 11:00 AM and from 11:30 AM to 3:30 PM Pacific Time. If the customer support lines are busy or if you are calling after hours, leave a message or send a FAX or E-MAIL and a representative will respond, typically within 24 hours.

VOICE NUMBER: (949) 833-3355 ext. 112
FAX NUMBER: (949) 833-0322

EMAIL: support@genovation.com
WEB: http://www.genovation.com
FORUM: http://www.genovation.com/forum/

POST: Genovation, Inc.
                       17741 Mitchell North
                       Irvine, CA
                       92614
                       USA

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1: Installation and Quick Start Guide

Your 684 ControlPad package should include the following items:

- o Quick Start Guide
- o Product CD
- o ControlPad 684 USB or RS232 keypad
- o Double size keycaps (2) and keycap puller

The MacroMaster684 configuration software is designed to work with computers running Microsoft Windows operating systems. The 684 keypad itself will work with <u>any</u> OS.

The ControlPad 684 keypad is designed to connect to any USB (or RS232) port. Once programmed, the keypad will work with any computer or operating system that supports USB CDC virtual COM interface devices (Windows, Mac, Linux, etc) or RS232. Other USB interfaces are also available.

The USB CDC drivers are pre-loaded on all operating systems (Windows, Mac, Linux), **however, for Windows you should install the Genovation software before plugging the keypad in**. The software tells the Windows OS which built-in USB drivers to use.

Install Windows Software

This section shows an abbreviated installation process for experienced users. For a step-by-step guide to installing the software see:

Appendix A: Windows XP Installation Guide, or

Appendix B: Windows 8 Installation Guide.

If you have a Genovation CD, insert the CD into the target computer's CD drive. If the Installation program does not start immediately, navigate to the CD using Explorer and run **Setup.exe**. If you downloaded the software, unzip the file if required and then run **Setup.exe**.

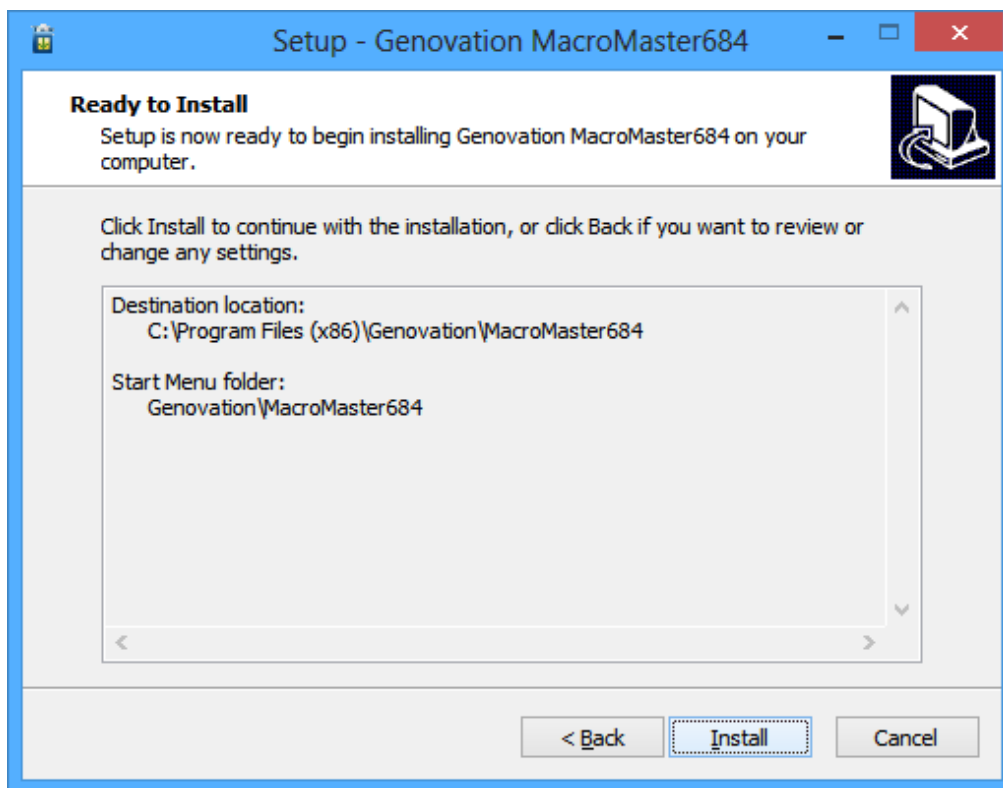If you see a User Account Control dialog or a warning, such as:
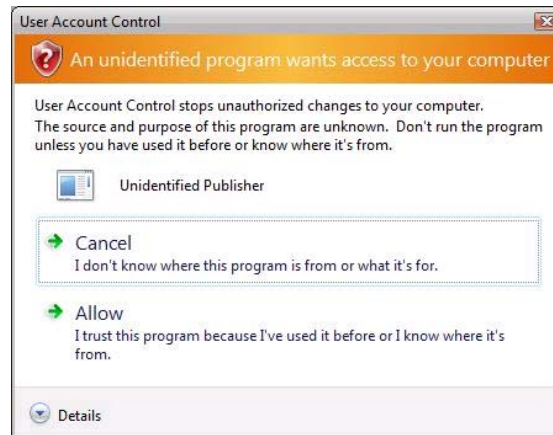
Click on **Allow** or **Yes** as necessary**.** Once Setup begins you should see the following screen:
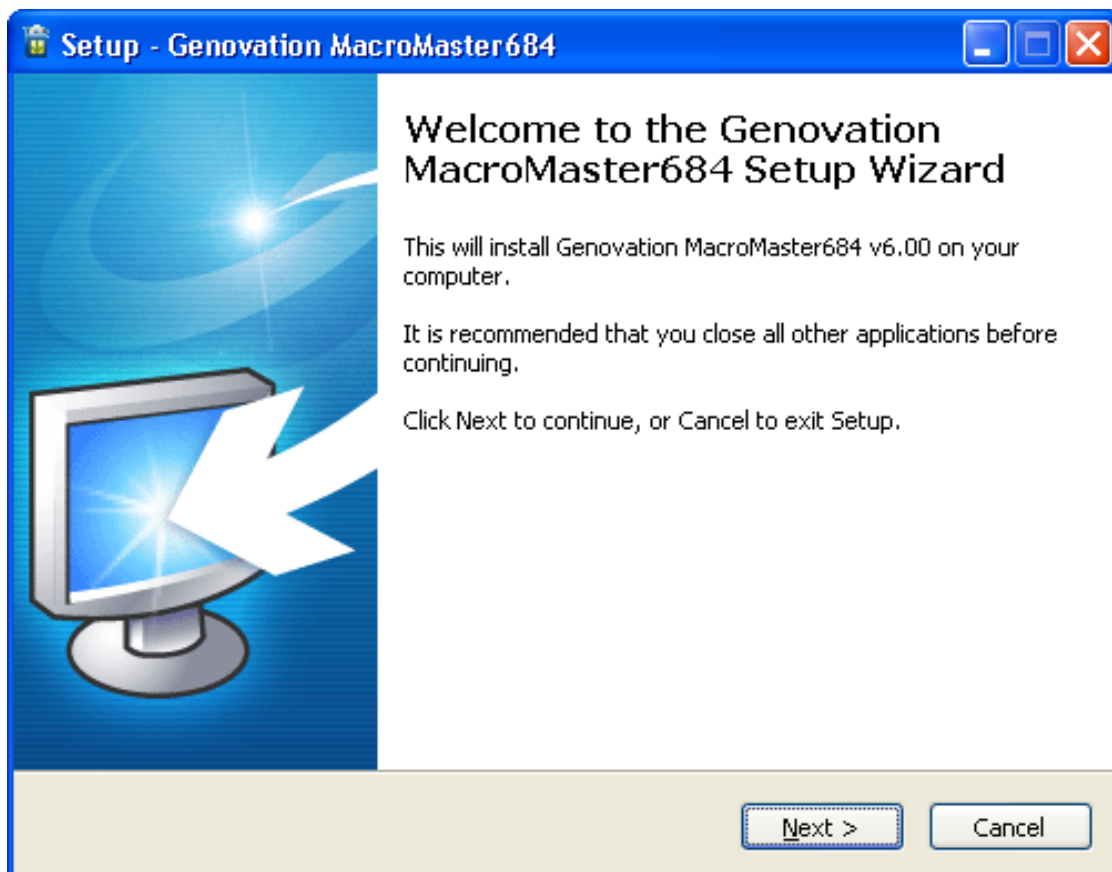
Click on **Next** as required and choose the path you would like to use for storing the PC applications.

Click **Install** to copy the files to your computer from the CD. Click on **Finish** when prompted.

The following files will be installed on your computer:

File	Description
MacroMaster.pdf	This document.
MacroMaster684.exe	Keypad macro creator/editor (redefinition application).
RSLoad.exe	Downloader utility for copying macros to the keypad.
SetPort.exe	Keypad port finder application.
SST.exe	Simple Serial Test keypad testing application.
Getting Started.pdf	Quick start guide.
\Macro Files*.ckd	Sample Custom Keypad Definition (.ckd) files.
\Keycap Labels*.*	Pages for printing custom keycap labels.

The Setup procedure will create the necessary icons on your Start Menu including a shortcut that allows quick access the Device Manager (if you wish to change the COM port #).

Install Hardware

Plug in your new hardware. If you are using RS232, plug in the supplied 5v DC power adapter as well.

For USB keypads on Windows, if you have installed the software then the Found New Hardware wizard should run and complete automatically.
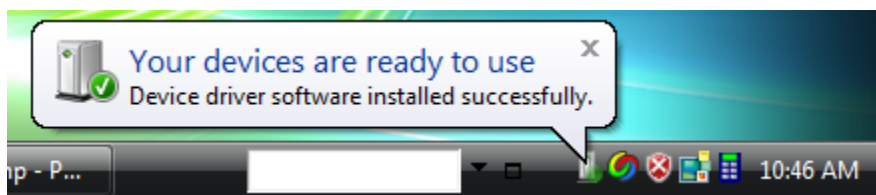
For other operating systems the drivers are assigned automatically in a silent fashion.

Set the COM Port

You will need to set the COM port so that the Windows PC can communicate with the 684. This will allow the PC to communicate with the keypad in order to configure it the way you want.
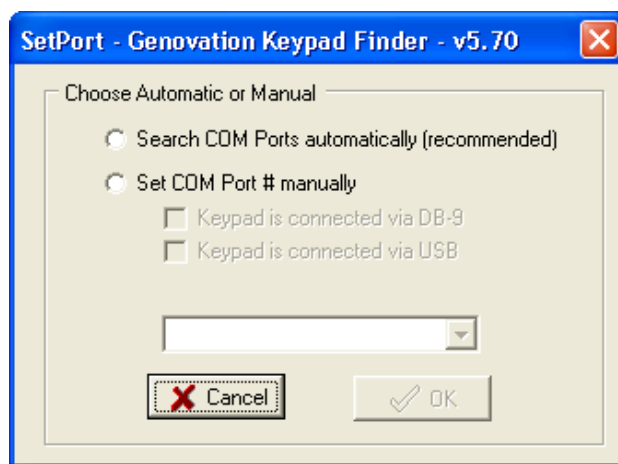
Run the MacroMaster684 application. Normally it is installed in the following path:

Start >> Programs >> Genovation >> MacroMaster684 >> Genovation MacroMaster684
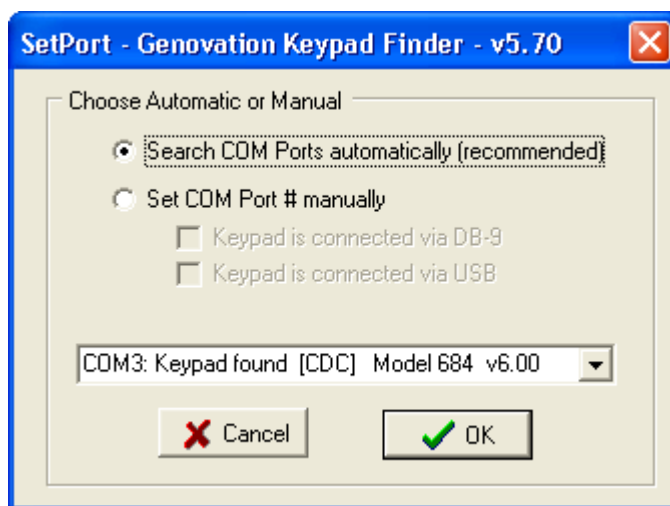
You should see the following:
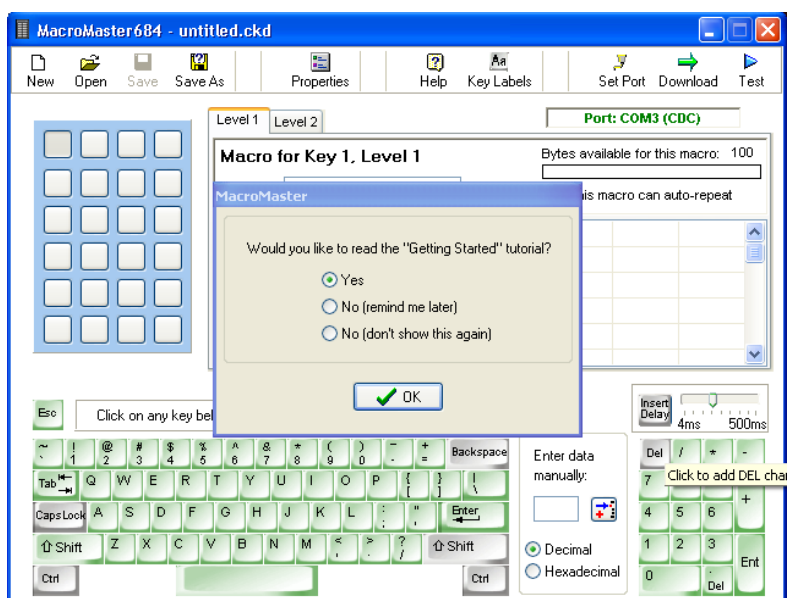
Select one of the **No** options followed by **OK** to dismiss the tutorial and then click on **Set Port**.   Click on the "automatic" option (the top one) in SetPort and then **OK** when the box pops up.

SetPort will now start scanning your system COM ports for the 684. Once it completes, your 684 COM port should be automatically selected. Click **OK**.
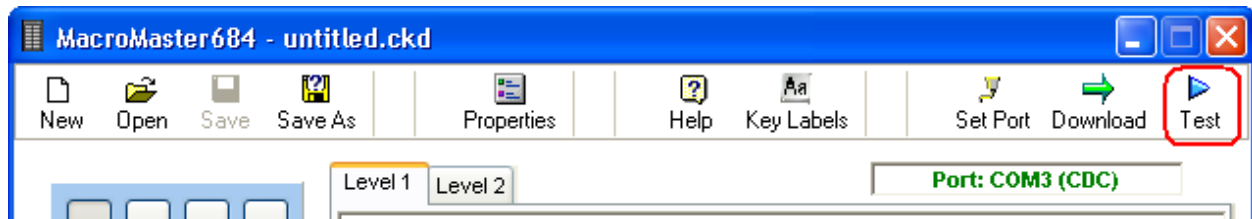
The COM Port number should appear at the top right of MacroMaster.
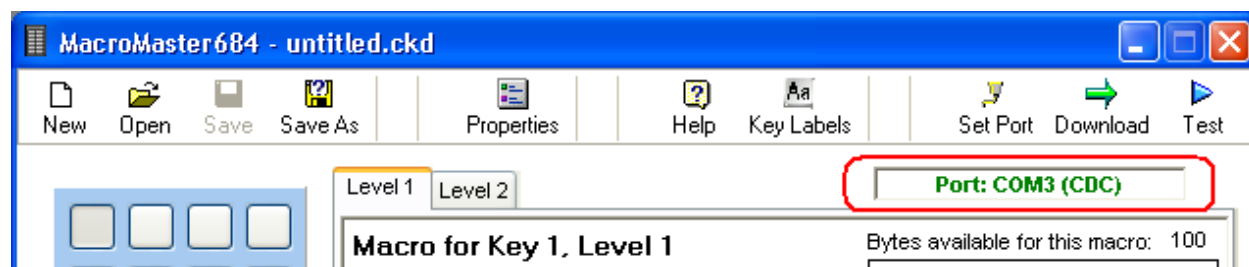
Test Keypad Connection

At the top right of MacroMaster684, click on **Test**.

This will launch the key test program.
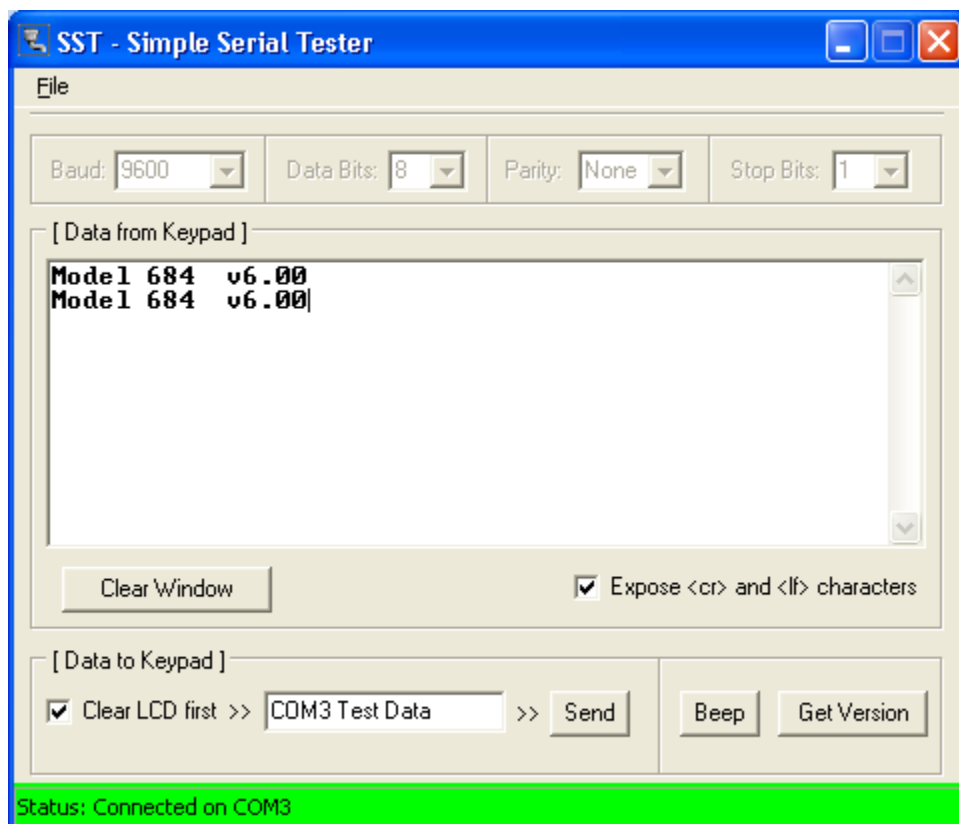
If you click on **Get Version**, the 684 will respond with its version string.

You may also press the keys on the 684. You should see some characters appear in the [Data from Keypad] area. Depending on what key codes have been programmed, this information may appear as nonsense. Also if the baud rate does not match between the keypad and the test program, you might see only gibberish.

Restoring Factory Defaults

At any time your ControlPad can be returned to factory defaults. In order to wipe out the user configuration, **press and hold two keys while plugging the keypad in**.

Continue to hold the two keys down until the keypad is completely plugged in. You should see the LED turn solid red. Release the two keys. The keypad will reboot back to factory settings.

Here is the factory default key layout, shown in ASCII as well as hexadecimal.

<table>
<tr><td colspan="4" align="center">684 key table (ASCII)</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>7</td><td>8</td><td>9</td><td></td></tr>
<tr><td>4</td><td>5</td><td>6</td><td></td></tr>
<tr><td>1</td><td>2</td><td>3</td><td></td></tr>
<tr><td>BS</td><td>0</td><td>CR</td><td></td></tr>
</table>

<table>
<tr><td colspan="4" align="center">684 key table (hex)</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>0x37</td><td>0x38</td><td>0x39</td><td></td></tr>
<tr><td>0x34</td><td>0x35</td><td>0x36</td><td></td></tr>
<tr><td>0x31</td><td>0x32</td><td>0x33</td><td></td></tr>
<tr><td>0x08</td><td>0x30</td><td>0x0D</td><td></td></tr>
</table>

Un-Installing and Re-Installing

It's a quick and simple matter to remove, re-install or upgrade MacroMaster. To un-install MacroMaster, click on:

Start >> Programs >> Genovation >> MacroMaster684 >> Uninstall MacroMaster684

The un-installer will NOT remove any macro files you have created. If you are not installing a newer version, you may delete the macro files and directories manually. If you are installing a newer version (upgrading), your macro files will be saved automatically for you.

Note: As per Microsoft's new requirement, v6 of MacroMaster places the data files under the user's My Documents rather than in the Program Files area.

2: Using MacroMaster68x

Running MacroMaster68x

To program the key codes or change the keypad properties such as baud rate, use the MacroMaster application. To begin, click on the following (assumes default installation directory):

Start >> Programs >> Genovation >> MacroMaster684 >> Genovation MacroMaster684
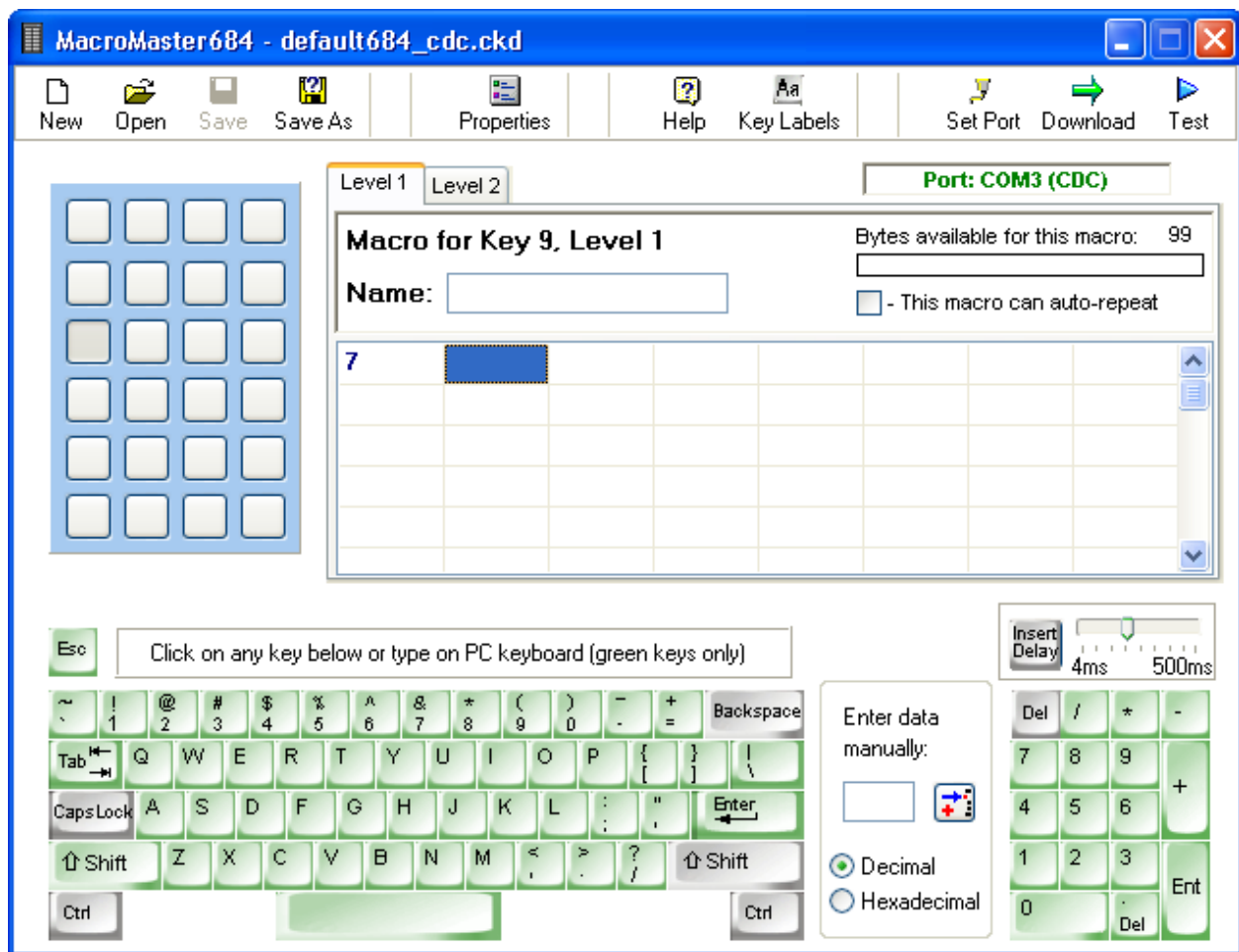

The title bar contains the name of the application and the name of the file that is opened. If the file had been modified but not saved, a * character follows the filename. The * will go away once the file is saved or a new file is loaded.

The top row of buttons accesses the major functions of the program.
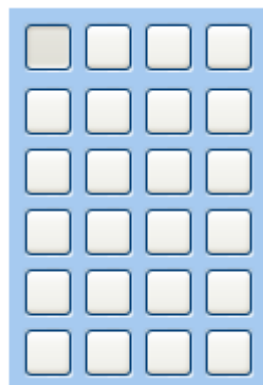
At the center left of the screen is a <u>Virtual Keypad</u>. It is a series of gray squares that represent the keys on the actual keypad hardware.
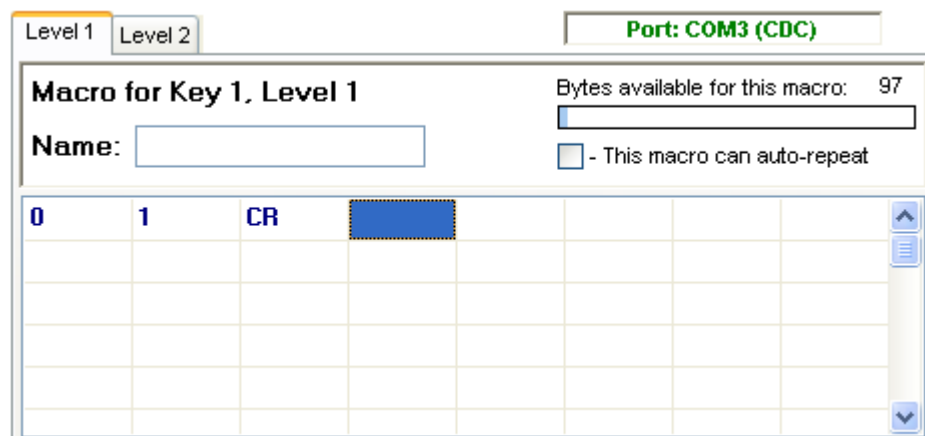
To the right of the Virtual Keypad is a grid of rectangles. This is the <u>Key Data Editor</u>.

It holds the data associated with each key on the keypad.

Every time you select a new Virtual Keypad key, a new set of grid cells is available to fill with keystroke data. The bottom of the screen shows a rendition of a PC keyboard. This <u>Virtual PC Keyboard</u> can be used to place the data into the black boxes. In many cases you may also type the data in.
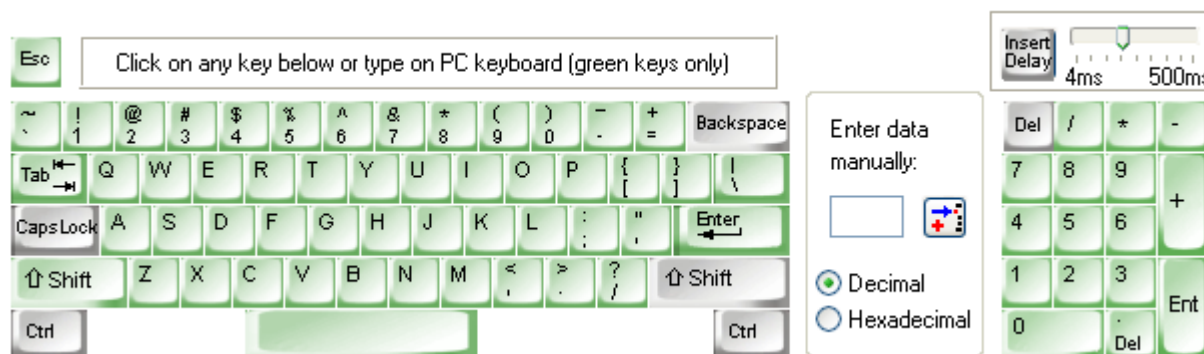
Creating and Saving your first CKD file

The file type used by MacroMaster is a .CKD file. CKD stands for **C**ustom **K**eypad **D**efinition file. The file is simply a collection of key data macros in standard INI file format. To start a new project, click **New** at the top left. This will provide a completely blank template with no keys assigned.

1. Select a key to program. Click on one of the keys on the virtual keypad. Note that whenever you select a new key, the Key Data Editor reflects the key number, for example **Macro for Key 2, Level 1**. Each key on the virtual keypad can contain 100 bytes of macro data (per level). We will discuss levels later, but for now you can assume that you may assign up to approximately 100 characters per key.

2. Enter some key data. Try typing in the phrase "hello world" (without the quotes). You should see something like the following.
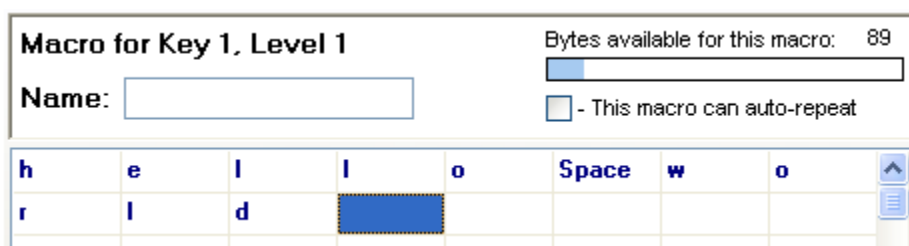
3. Provide a description (name). Although it's optional you should consider typing in a short description for your macro.

4. Select repeat mode. If you want the macro to repeat over and over when you hold the keypad key down, click the auto-repeat checkbox:

5. Save the file. Once you are happy with your macro, save the file by clicking on the **Save As** button at the top left. Name the file something appropriate and click **Save**.
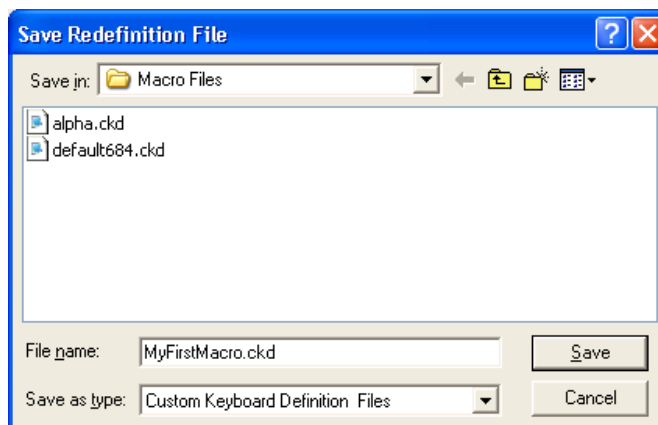
Congratulations, you have completed your first macro! It's only one key, but you now understand the basics of macro programming.

The Green Keys

MacroMaster's **virtual** PC keyboard has keys that are standard gray color and keys that are green. The green virtual key values can entered into the macro by typing on the corresponding key of your real PC keyboard. The gray virtual keys can be entered into the macro only by clicking the mouse.

The gray colored keys on your corresponding PC keyboard retain their original function. For instance, the arrow keys on your PC keyboard allow you to navigate the cells in the grid.

Correcting Mistakes

If you make a mistake while entering your key macro data, there are several ways to correct it.

o If you want to erase only one cell in the grid, double-click the mouse on that cell. Remember to select the cell at the end of the macro before you begin typing again. The dashed blue box indicates where new data will go.


o If you want to erase only one cell in the grid (generally the last cell), use the Backspace key on your PC keyboard. Recall that this is a gray virtual key so it does not generate a macro entry.

o For a given macro, if you want to start over, right-click on the grid and select "Erase all codes for this macro". This operation only affects the current Level.
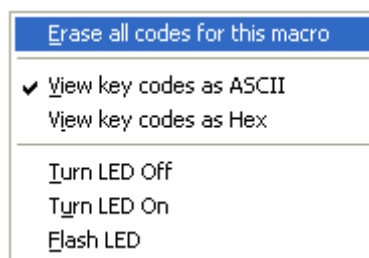
Key Codes

The macro you created earlier in this section is very simple. Each square in the black grid contains exactly one byte (one ASCII character). You can reveal the underlying codes at any time by right clicking on the grid and selecting "View key codes as hex".

l	o	Space	w	o

Erase all codes for this macro

✓ View key codes as ASCII

View key codes as Hex
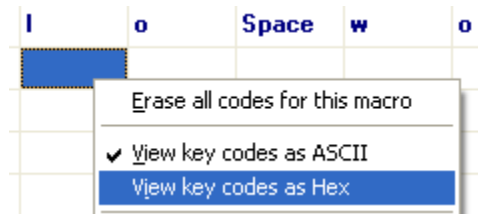
MacroMaster then displays the hexadecimal equivalents for the ASCII codes.

0x68	0x65	0x6C	0x6C	0x6F	0x20	0x77	0x6F
0x72	0x6C	0x64					

ASCII Control Codes

In ASCII (text) mode, unprintable characters (from 0x01 through 0x1F) are shown as control codes. These are standard values and look like ^C for example. In fact, you can create these characters by clicking the **virtual** Ctrl key and then clicking one of the appropriate values:

Hex control codes:

0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07
0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x10	0x11	0x12	0x13	0x14	0x15	0x16	0x17
0x18	0x19	0x1A	0x1B	0x1C	0x1D	0x1E	0x1F

ASCII control codes:

^@ 00h	^A 01h	^B 02h	^C 03h	^D 04h	^E 05h	^F 06h	Bel
BS	Tab	LF	^K 0Bh	^L 0Ch	CR	^N 0Eh	^O 0Fh
^P 10h	^Q 11h	^R 12h	^S 13h	^T 14h	^U 15h	^V 16h	^W 17h
^X 18h	^Y 19h	^Z 1Ah	Esc	^\ 1Ch	^] 1Dh	^^ 1Eh	^_ 1Fh

Inserting Delays

The keypad can rapidly send a long series of keystrokes to the host PC. There may be times when the PC cannot keep up. To give the PC a breather, you can insert delays between your keystrokes.

To the right of MacroMaster's virtual PC keyboard is a small box with an Insert Delay button.   The delay is adjustable over a range of 4ms to 500ms (half a second) using the slider. Hovering your mouse over the slider tells you how long the inserted delay will be. The default is 200ms (one fifth of a second). Click the **Insert Delay** button to pause the keypad for that amount of time. If you need extremely long delays, click it several times in a row.
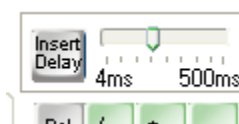

Here is how it appears in the macro:

Two-Level Programming

On your PC, the number keys 1 through 9 are also used for symbols !@#$%^&*(). These symbols are accessed using the PC's Shift key. Similarly, your 684 supports two "levels" per key. In order to use the second level on your 684, you must first assign an access key (a level shift and/or level toggle key) and then you must fill in the data for the second level.

1. Assigning the 2nd level access key. Choose a key on MacroMaster's virtual keypad and then right-click that key. Select whether you want the level access to be Shift (requires that you hold the 2nd level access key down) or Toggle (the level switches back and forth every time you press the 2nd level access key).
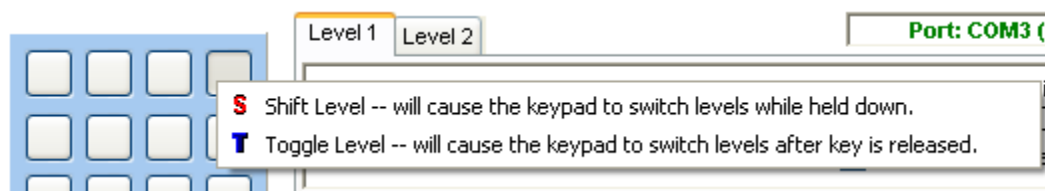
2. Fill in the 2nd level data. Click on the **Level 2** tab that is located right above the words **Macro for Key 1, Level 1.** The words should change to **Macro for Key 1, Level 2** and the virtual keypad background should change to black. You now have access to a new grid of 100 bytes for your 2nd level macro.
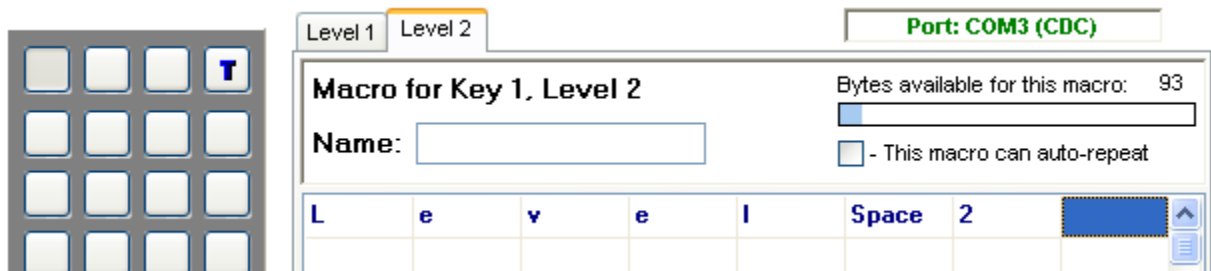
You may have up to two level shifts and two toggles. The keys that perform the level shift/toggle function may also contain macros, but it's not very common.

You may wish to assign the LED indicator so that you can see which level is active. See the next section for details.

NOTE: To use a level shift key, a minimum of 2-key rollover must be programmed via the Keypad Properties panel since the shift level key must be pressed and held along with another key to access that key's second level macro. Key Rollover is discussed later in the manual.

NOTE: When programming **double size** keys it is recommended to program only one of the two keys that are combined into the double size key. In addition, you should select a key rollover of 2 on the Keypad Properties page.

LED Control

The LED state can be controlled from within a macro or from the Host PC. First you need to set the property for the LED.
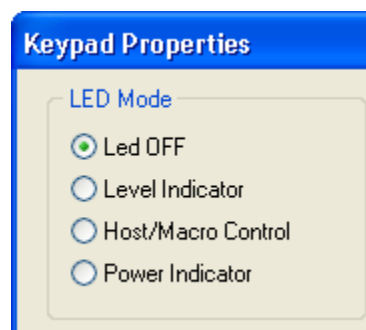
LED Level indicator:

You may assign the LED to illuminate when the keypad's 2nd level is active (Level Indicator). When this property is selected, and keypad level 2 is active via Shift or Toggle, the LED with illuminate.

Macro LED Control:

To insert an LED state code in a macro, first select the Host/Macro Control mode for the LED in the Keypad Properties panel. Then you can insert LED commands inside the macro.

To insert an LED command, right-click on a cell within your target macro and then select one of the LED states.

Host LED Control:

Controlling the LED from the Host PC over USB or RS232 will require software on the PC side to control the LED state (on, off or flashing). There is a complete discussion of all host-side commands in the Host Command Set section of this document.

Keypad Properties

There are several other global keypad settings that can be modified to suit your application. Click on the **Properties** button. This will open up the Properties panel:
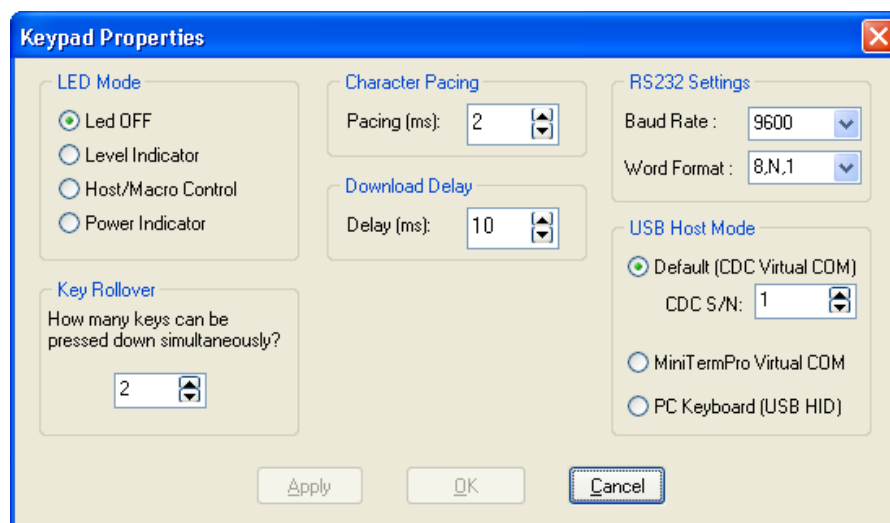
1. <u>Key Rollover</u>. This parameter controls how many keys may be pressed at the same time and be accepted by the keypad. For most control applications, 1-key rollover is recommended. If the ControlPad is used for higher speed data entry or you are using two levels, then 2-key rollover may be preferable.

   o 1-Key: When one key is held down, the keypad will recognize no other key(s).
   o 2-Key (or more): Two (or more) keys pressed and held at the same time will be recognized by the keypad. Keys beyond the rollover number will be ignored. A minimum of two-key rollover is required when using a shift level access key or double size keys.

2. <u>Inter-character Pacing</u>. This parameter inserts a short pause between **all** bytes sent to the PC. The range for this parameter is 0ms to 200ms. It has the effect of slowing down the typing in case you are working with a slow host PC.

3. <u>Download Delay</u>. Short pauses are inserted the download process to give the host PC and keypad time to synchronize during the download operation. Normally you should not have to adjust this from the recommended 10ms unless you are having trouble performing downloads to your keypad. In that case you can raise the download delay.

4. <u>RS232 Settings</u>. These will need to be set to match your target system. Please note that the downloader uses 9600, 8N1 so you must restore factory defaults before re-programming the unit if you have changed these setting to something else. You may also order the product with specific settings pre-programmed into the device.

5. USB Host Mode: If you are using the RS232 cable then the ControlPad will always operation is RS232 mode. If you use the USB cable, then you have a few choices on how the ControlPad appears to the host.

   • The default mode is USB CDC Virtual COM. This is the mode that uses the OS's built in drivers to create a COM port. To change the COM port number you use the Device Manager (in the case of Windows).
   • You can also choose to use Genovation's MiniTermPro com port configurator software. This software ships with our MiniTerm line. ControlPads and MiniTerms can be manages together using MiniTermPro.
   • Finally you can choose USB HID Keyboard (PC keyboard). In this case the ControlPad essentially becomes an ASCII-to-HID converter keypad. The ASCII character set does not fully represent all the possible key codes a USB keyboard does, so if you need access to special Windows keys (for instance), then the ControlPad 683 is a more appropriate product.

If you change the host mode you will probably need to perform a factory reset before you can download new settings to the keypad. The downloader only "talks" to COM ports.

Keycap Labels

Click on the **Key Labels** button . Some oft the ControlPad keys have clear lenses that allow for labels may be inserted under the lens to indicate the key function. Several templates are provided for Wordpad, Word Paint and Excel in the "Keycap Files" folder. Text, images or icons may be inserted in the template. The resulting file can be printed and saved. The labels can then be cut with scissors and placed under the lens caps.

You may also order custom key caps, custom labels or select from our stock of industry specific key caps.

Extra Key Caps

Genovation sells accessory key cap kits for those who wish to add more double or single re-legendable keys.

When programming double size keys it is recommended to program only one of the two keys that are combined into the double size key. In addition, you should select a key rollover of 2 on the Keypad Properties page.

Reflashing the Firmware (v6+)

The utility downloader program (RSLoad.exe) also allows you to reflash the firmware using an **RS232 cable** (only). To reflash the firmware you need to place the keypad in **Bootloader mode**.

To put the keypad in bootloader mode, disconnect the keypad from the PC, connect the keypad to the PC using the RS232 cable. Press and hold the two top corner keys indicated. Plug the power in to the

keypad while holding the two indicated keys down. Once plugged in you can release the two keys. The LED should be **<u>flashing red</u>**.

If you see the LED flashing red/blue, you are using the wrong cable. The bootloader only supports true RS232.

Launch the RSLoad.exe utlilty program. You will probably need to click on Port Setup and Search to find the keypad.
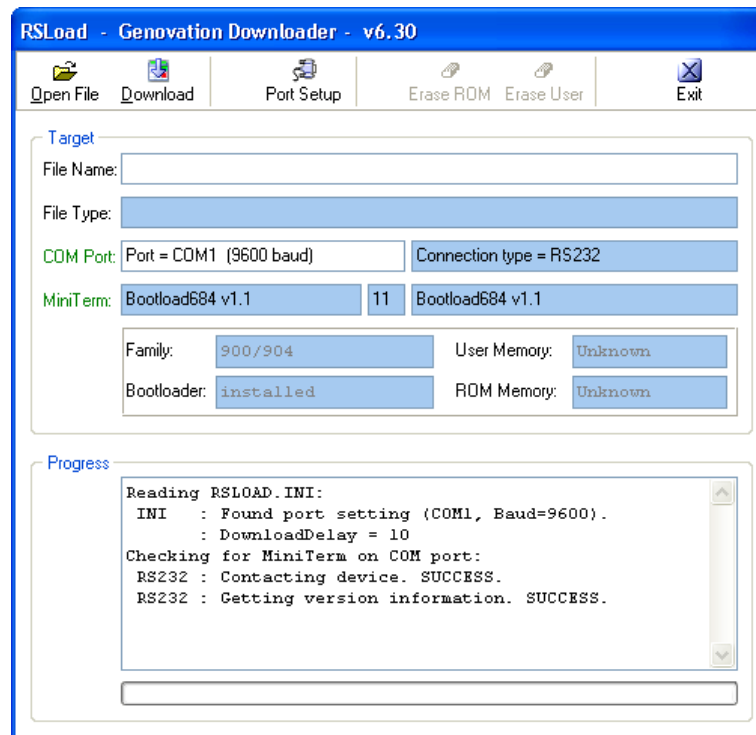
Click on **Open File** and change the File type to .UPG Upgrade Files. Load the .UPG upgrade file that Genovation has supplied for the upgrade. Click on **Download** and follow the on-screen directions. Do not disturb the ControlPad while the upgrade is proceeding. After the upgrade is finished the keypad will reboot.

Customization Is Standard

The 684 product line has been designed with customization in mind. Contact our sales or technical support staff for full-custom or semi-custom variations of our products.

3: Host Command Set

Command Format

All received data that does not correspond to one of the defined commands will be interpreted as raw text and will appear on the LCD.

Commands have the general form: `PREFIX, COMMAND_TYPE, <PARAMS>`

Where:
- o PREFIX – Byte that indicates a command follows. The default value is '@' (0x40).

- o COMMAND_TYPE – A byte that indicates what the command is.

- o <PARAMS> – Zero or more bytes which set the operating conditions of the unit.

Each command has a pre-determined parameter set. See the command information on the pages that follow.

All of the following command examples assume the default command prefix. If the command prefix has been changed, substitute the active prefix.

Command Index Summary

Commands are case sensitive. ASCII values are chosen, when possible, to aid in remembering a given function.

Command Group	Command Byte (ASCII / hex)	Command Description
General	E / 0x45	**E**cho on/off
	T / 0x54	Key **T**ypematic (delay & repeat)
LED	L / 0x4C	**L**ED control (where applicable)
Factory Control[1]	^C / 0x03	Get Build Date string (v6+)
	^D / 0x04	Restart firmware
	^E / 0x05	Get connected port type
	^F / 0x06	Get version string (16 chars)
	^H / 0x08	Get firmware version byte
	^I / 0x09	Get model number

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[1] All other factory control values are reserved. Do not use.

'E' – 45h – Turn Echo on/off

Turning the echo on will cause the incoming RS232 data to be echoed back out the port to the host PC. The default setting is OFF (recommended). The least significant bit of the parameter byte sets the echo state (0 = off, 1 = on), so any odd value turns echo on, while any even value turns echo off.

Example: Turn the echo on.

	Prefix	Command Type	Param
ASCII:	@	E	^A
Dec:	64	69	1
Hex:	40h	45h	01h

Example: Turn the echo off.

	Prefix	Command Type	Param
ASCII:	@	E	^B
Dec:	64	69	2
Hex:	40h	45h	02h

'T' – 54h – Set Keyboard Typematic Delay/Rate

Sets the keyboard repeat values for initial-delay and repeat-rate. The initial-delay is the amount of time from when a key is held before the key begins to auto-repeat. The repeat-rate is the frequency of characters once the auto-repeat takes effect. The format of the supplied parameter is identical to the delay/repeat byte the IBM PC uses internally for its keyboard:

0	Delay b6	Delay b5	Rate b4	Rate b3	Rate b2	Rate b1	Rate b0

The base delay value is 0.25 seconds. If b5 is set, then an additional 0.25 seconds is added to the delay value. If b6 is set, then an additional 0.5 seconds is added to the delay value. Therefore the delay can be from 0.25 seconds to 1.00 seconds.

The repeat-rate (actually a period) is fastest at 00000b and is approximately 30 characters/second. The slowest rate is 11111b and is equivalent to approximately 2 characters per second.

The default power-on value for this parameter is 'l' (lowercase L) which is (6Ch). This provides a delay of 1 second and a repeat rate of 10 characters/second.

Example: 1.00 second delay and approximately 2cps repeat rate.

	Prefix	Command Type	Typematic Delay/Rate
ASCII:	@	T	~
Dec:	64	84	126
Hex:	40h	54h	7Eh

NOTE: The key macro must be set for auto-repeat for this setting to have any effect. Long macros will not repeat until the previous macro is finished. Character pacing can also affect the rate at which characters are emitted by the keypad. This operation is only valid in True Terminal mode.

'L' – 4Ch – LED Control

If one or both of the LEDs are configured for Host Control, then this command controls whether an LED is off (0), on (1) or flashing (2):

0	0	0	0	Grn LED b1	Grn LED b0	Red LED b1	Red LED b0

Example: Flash the green LED (2 decimal = 10 binary) and turn the red LED on (1 decimal = 01 binary). Parameter to transmit then equals 0000 1001.

	Prefix	Command Type	Param
ASCII:	@	L	Tab
Dec:	64	76	9
Hex:	40h	4Ch	09h

^D – 04h – Restart Firmware

This causes the MiniTerm to reboot. The boot screens (version information and host connection type) will appear on the LCD.

Example: Reboot the MiniTerm.

	Prefix	Command Type
ASCII:	@	^D
Dec:	64	4
Hex:	40h	04h

If the device is connected via USB then the host will re-enumerate it and this could take several seconds. Unlike other Virtual COM Port technologies, Genovation's MiniTermPro will restore the COM port connection for you. There is no need to close and reopen the COM port in your software.

^E – 05h – Get Connected Port Type

Issuing this command will prompt the MiniTerm to respond with an ASCII byte representing how the MiniTerm is connected to the PC/host.

Example: Get the connected port type

	Prefix	Command Type
ASCII:	@	^E
Dec:	64	5
Hex:	40h	05h

The MiniTerm responds with a single ASCII byte value. Valid responses are:
- o 'R' for RS-232,
- o 'U' for USB virtual com port, and
- o 'K' for USB PC keyboard
- o 'V' for CDC Virtual com.

	Response
ASCII:	R
Dec:	82
Hex:	52h

^F – 06h – Get Version String

Issuing this command will prompt the MiniTerm to respond with 16 ASCII characters representing the MiniTerm firmware version.

Example: Get the version string.

	Prefix	Command Type
ASCII:	@	^F
Dec:	64	6
Hex:	40h	06h

A sample response might be "`Model 684  v6.00`". There is no terminating null.

^H – 08h – Get Firmware Version Byte

Issuing this command will prompt the MiniTerm to respond with a single byte representing the MiniTerm firmware version. This command is provided as a convenience to programmers so that they do not have to decode the version string.

Example: Get the firmware version byte.

	Prefix	Command Type
ASCII:	@	^H
Dec:	64	8
Hex:	40h	08h

The most significant nibble of the response is the major version number (the value to the left of the decimal point). The least significant nibble is the minor version number (the value to the right of the decimal point). If the firmware version is v6.00, then the response byte would be 0x60.

	Response
ASCII:	`
Dec:	96
Hex:	60h

^I – 09h – Get Model Number

Issuing this command will prompt the MiniTerm to respond with two hex bytes representing the hardware model number.

Example: Get the model number.

	Prefix	Command Type
ASCII:	@	^I
Dec:	64	9
Hex:	40h	09h

The current valid response is 0x0684.

4: LED Diagnostic Information

The keypad is equipped with a dual-color (red/blue) LED. Various operations and modes are indicated by the color and presence or absence of flashing. This information can be useful for tracking down installation or operational issues.

Condition	LED indicators
Keypad is plugged into USB and is waiting for the host PC to configure it.	Blue flashing.
Normal operation	Blue LED operates according to user's pre-programmed settings.
Downloading user's macro data.	Blue and/or red flicker to indicate data transfer.
User holds two keys down to erase keypad settings.[2]	While the two keys are held down the LED is solid RED. Upon release the LED goes dark.
RS232 bootloader is active.[3]	Red flashing.
Wrong cable plugged in while activating bootloader.	Red/blue "police" style flashing.

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[2] To erase the keypad back to factory defaults, hold two keys down (except as detailed in the next part) while plugging power in to the keypad.
[3] To activate the bootloader, hold the top two corner keys down while plugging in the powered RS232 cable.

5: Technical Specifications

Number of keys	24
Key Type / Life	Full-Travel, Cherry, Gold Contact (50,000,000+ operations)
Interface Port	Standard RS232C Compatible (Full Duplex), USB (HID, CDC, Custom)
Power	5vdc Regulated Wall AC Adaptor (Optional)
Temperature	0-60C (32-140F)
Programmability	24 keys, two levels. 100 bytes per key per level.
Program Method	Easy to use Windows based graphical interface to modify the serial port communication settings, and key codes. Once programmed, the 684 will retain its definitions in its internal memory. It will then function on any standard RS232C compatible serial or USB port.
Memory	No computer memory or tray apps required. The 684 indefinitely retains macro definitions even when power is removed. (> 100 years)
Keycap Labels	Pre-made templates can be edited using any Windows Wordpad application or Microsoft Word 6.0, Excel, Paint, etc

Appendix A: Windows XP Installation Guide

Software

Run the **setup** program from either the CD or the www.genovation.com website to start the installation program.
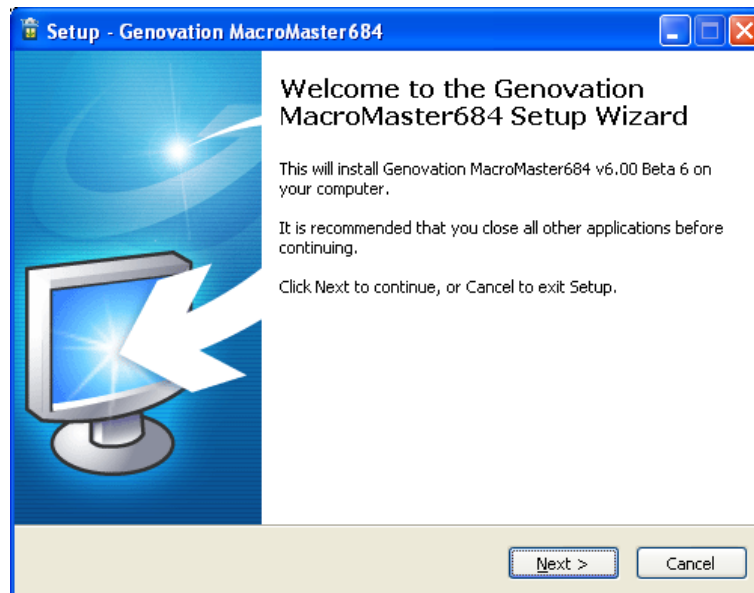
Click on **Next**.
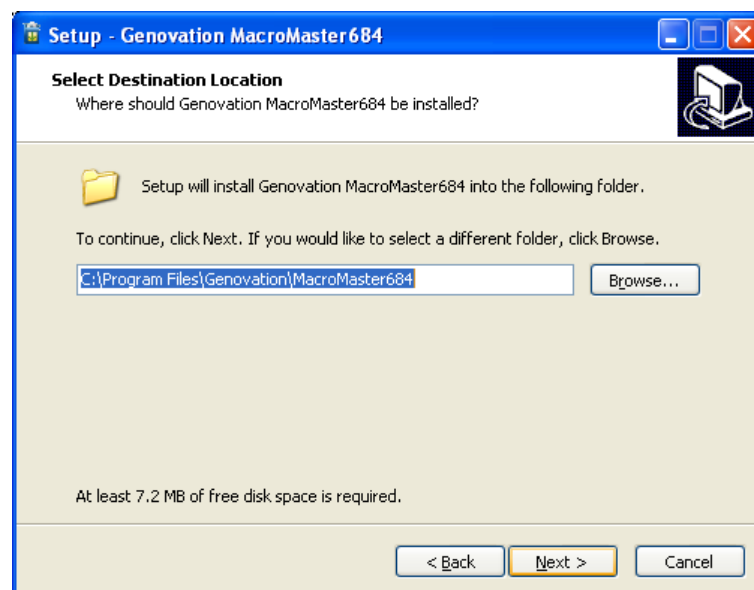
Click on **Next** again.
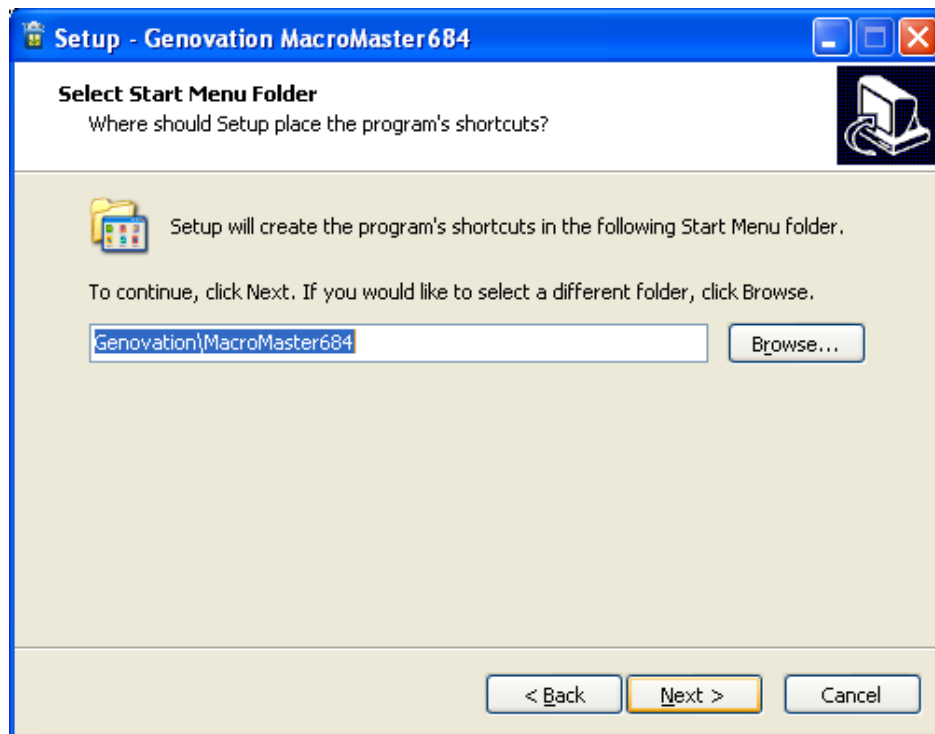
Click on **Next** again.
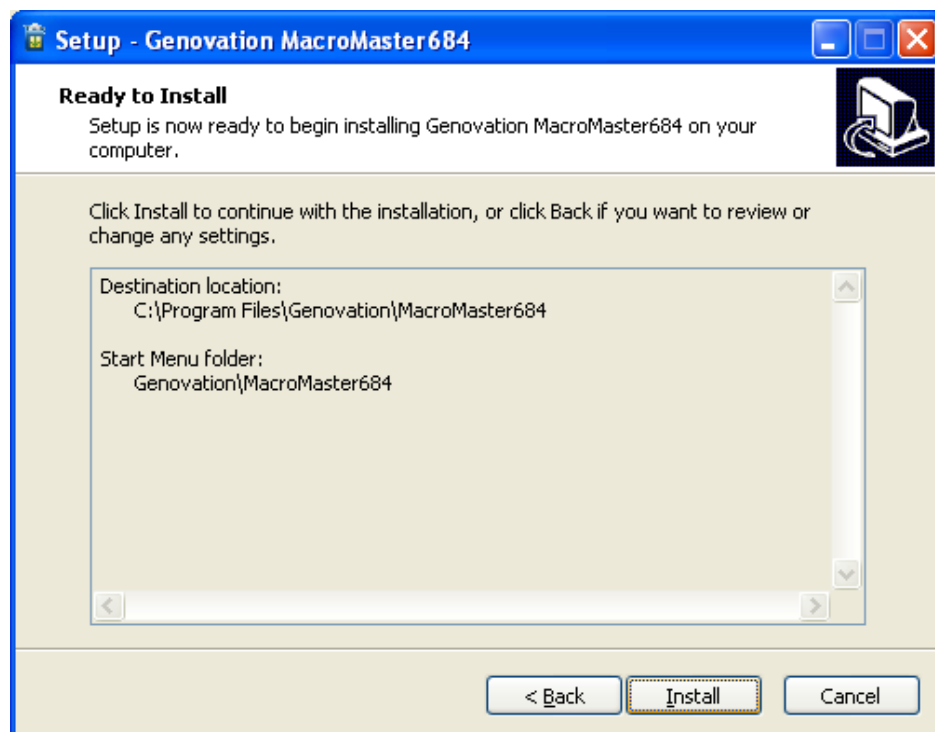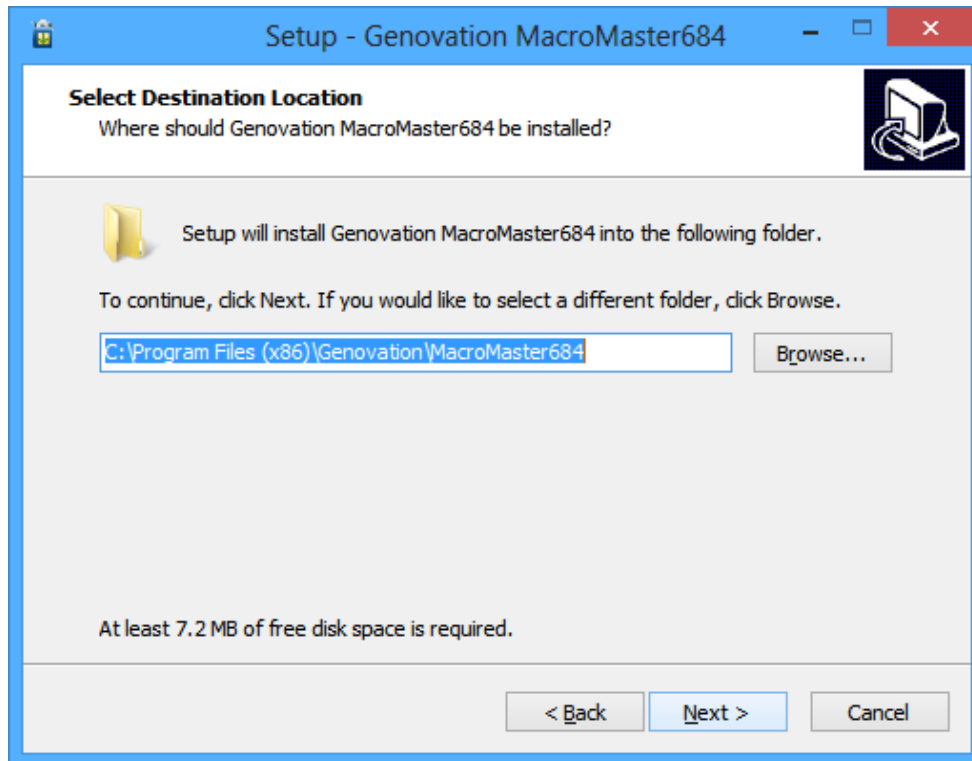

Click on **Install**.

The installation proceeds:
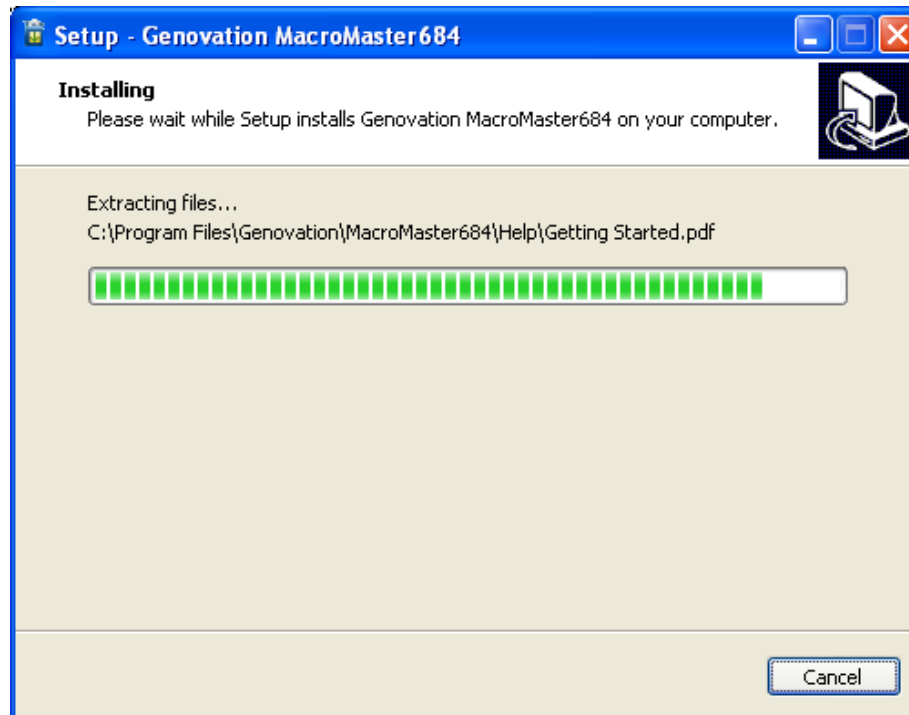
After a short while an additional window opens prompting for the pre-installation of the driver information (INF) file.

Click on **Next**.

The driver configuration proceeds.
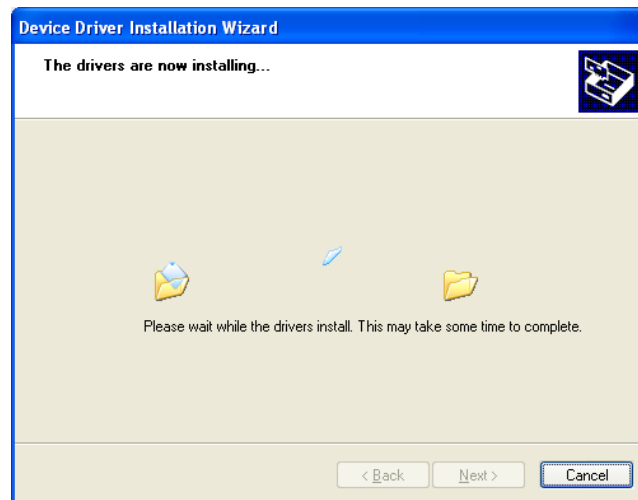
Another popup appears.

Click on **Continue Anyway**.

Click on **Finish**.

The software and driver installation is complete.
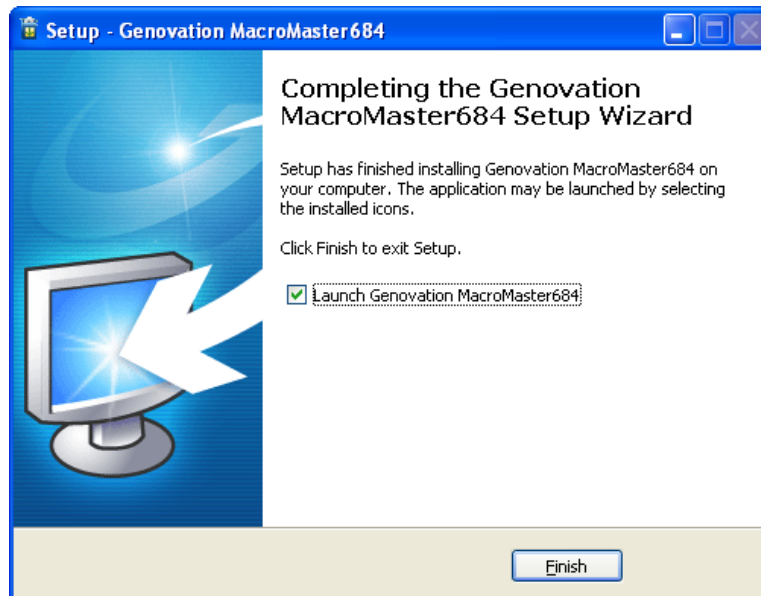
Click on **Finish**.

If you are using RS232 your software installation is complete. You can connect your RS232 keypad to an available DB9 connector on your PC. Use the supplied 5v DC adapter to power the keypad.

If you are using USB, proceed to the next section.

Hardware (USB)

Plug in the 684 keypad. You may see a bubble in the bottom right corner of the display

You may also see the following dialog, if you do, click **No, not this time**

and then click **Next**.

Select **Install the software automatically (Recommended)** and then click **Next**.

The new hardware installation proceeds.
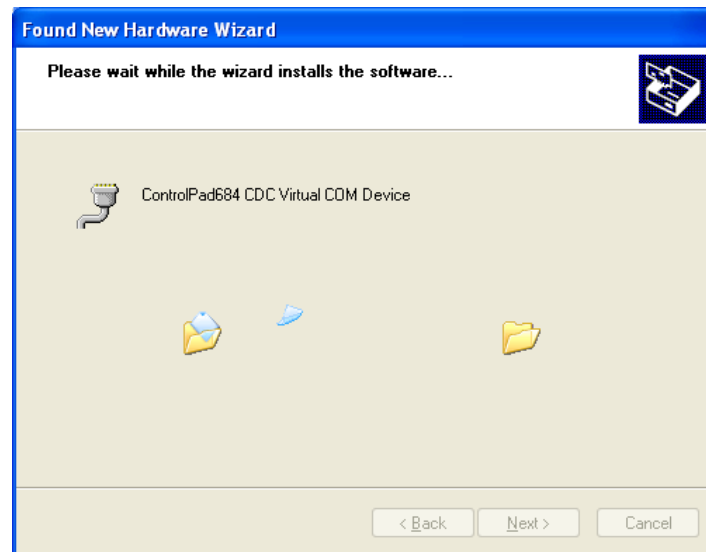
A popup may appear.

Click on **Continue Anyway**. The installation continues.
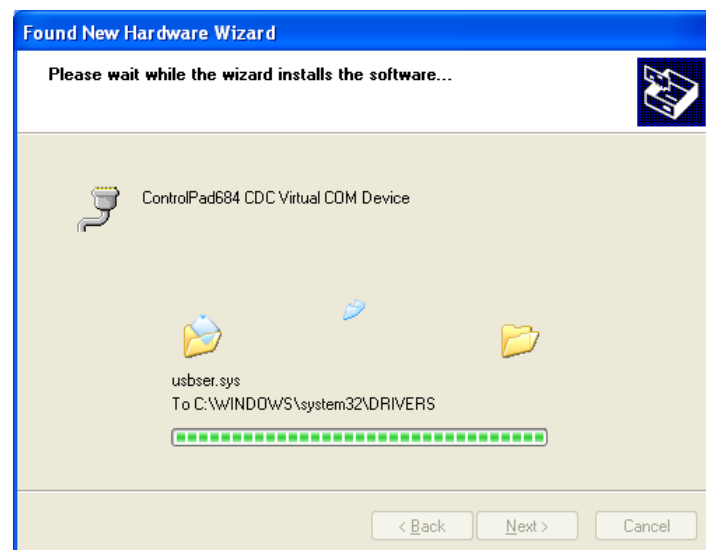
The New Hardware installation completes.

Click on **Finish**. A bubble may pop up to indicate success.

The installation is complete.

Find COM Port (USB)

You may locate the COM port assigned by running MacroMaster684 and then clicking **Set Port** and finally **Search Automatically**. Page 9 in this manual describes the process.

Change COM Port (USB)

You can use the Device Manager to change the COM port by running:

Start >> Programs >> Genovation >> MacroMaster684 >> Tools >> Device Manager
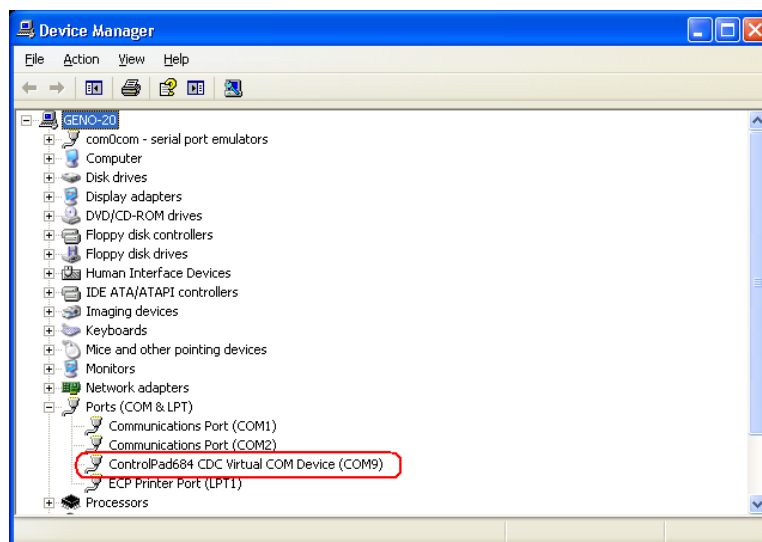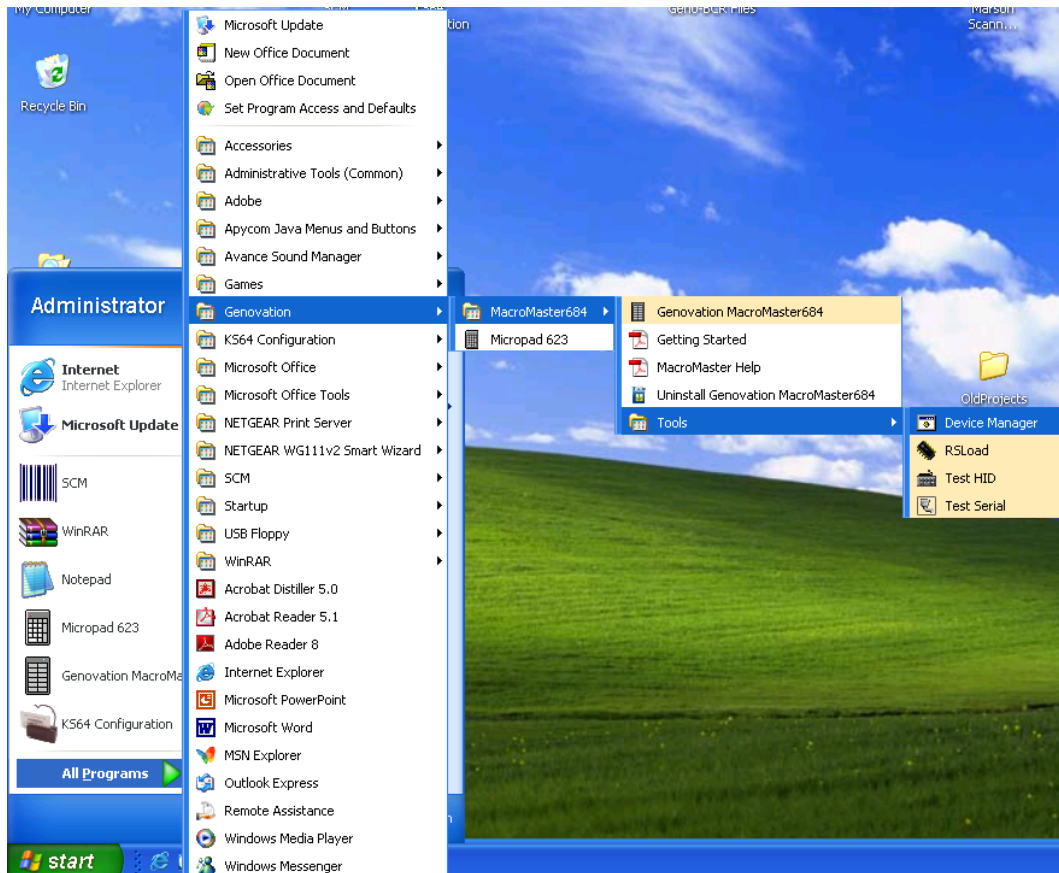
Double-click the **ControlPad684** entry.

Click on the **Port Settings** tab.

Click on **Advanced**.

Choose the COM Port Number using the drop-down box and click **OK** (twice). The new settings take effect. The Device Manager may not show the updated value until it is closed and reopened.

Return to page 9 in this manual to test your keypad.

If you would like to see all the Virtual COM Port assignments, and perhaps locate conflicting devices, click on **View** followed by **Show hidden devices**.
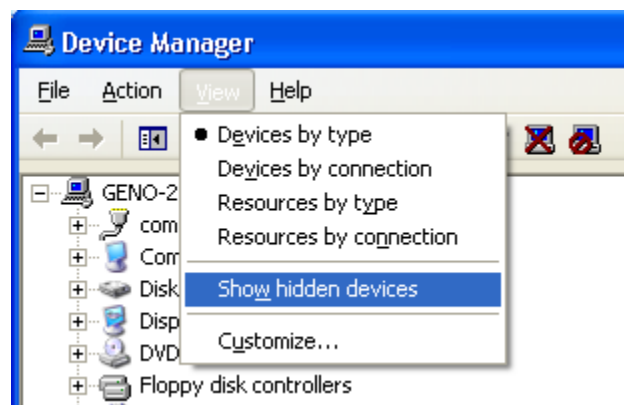
Appendix B: Windows 8 Installation Guide

Software

Run the **setup** program from either the CD or the www.genovation.com website to start the installation program. If you see a User Account Control dialog or a warning, such as:
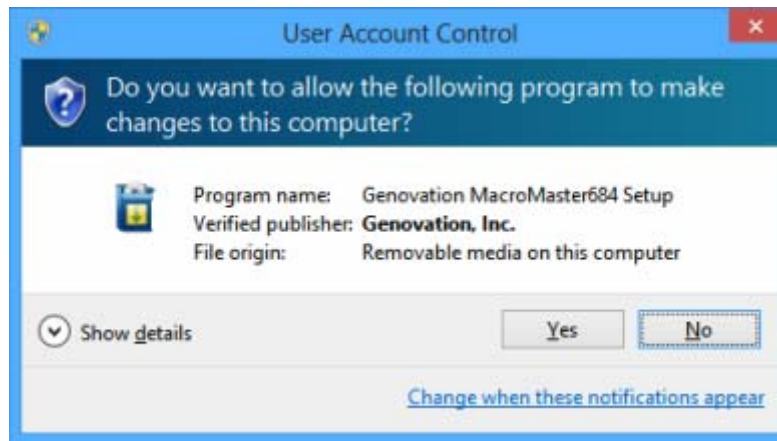
Click on **Yes**.

Click on **Next**.

Click on **Next**.
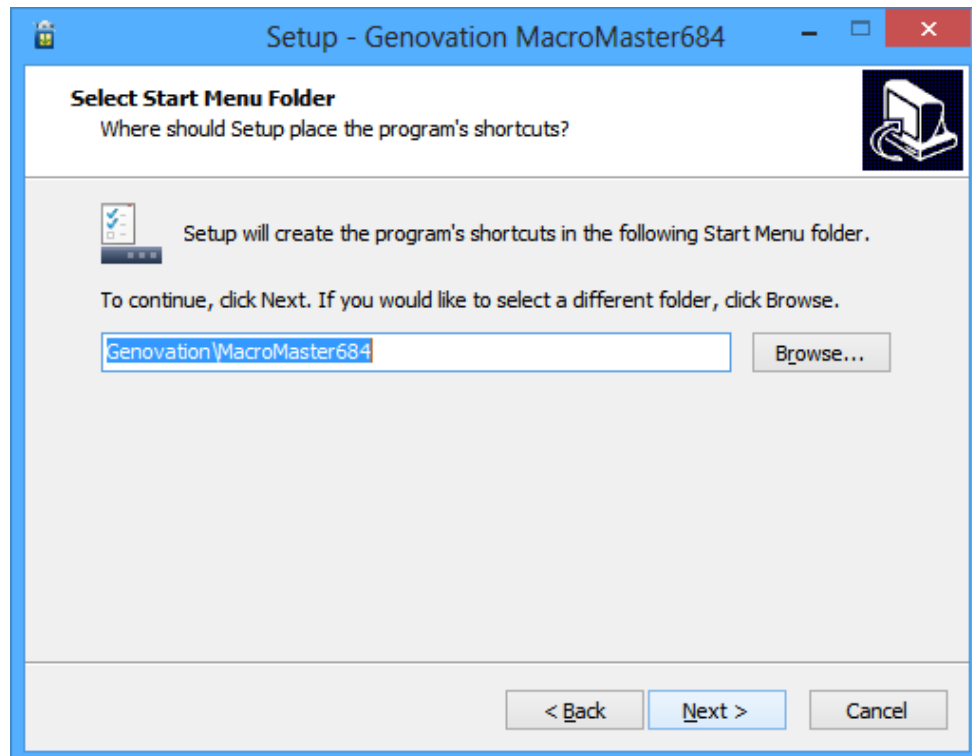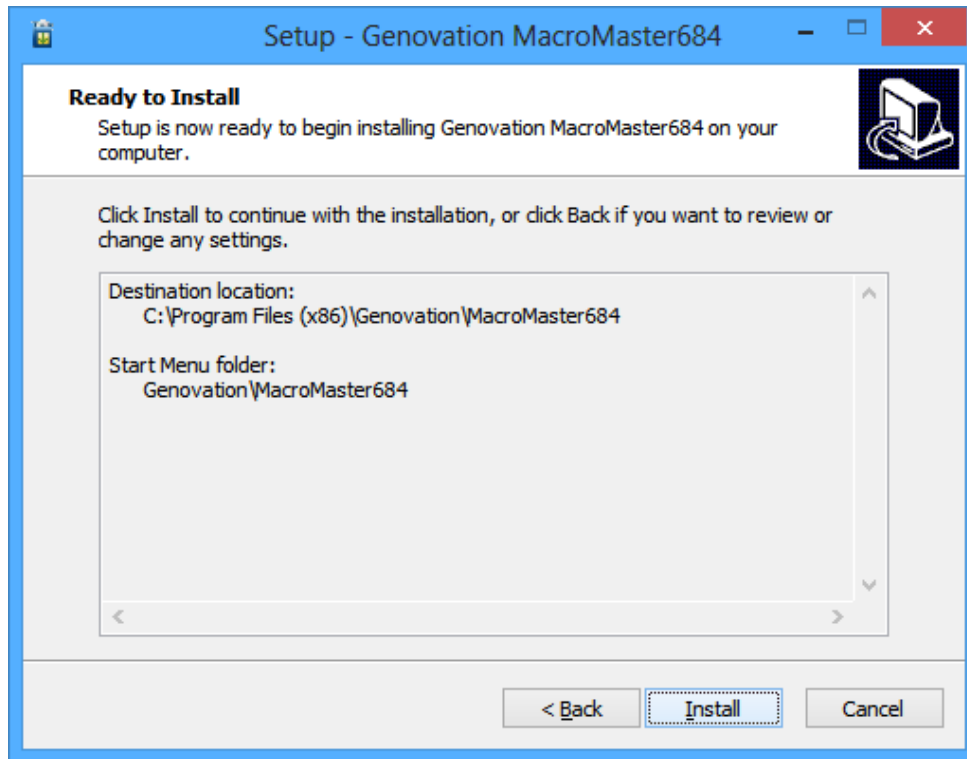
Click on **Next**.

Click on **Install**. The installation proceeds.
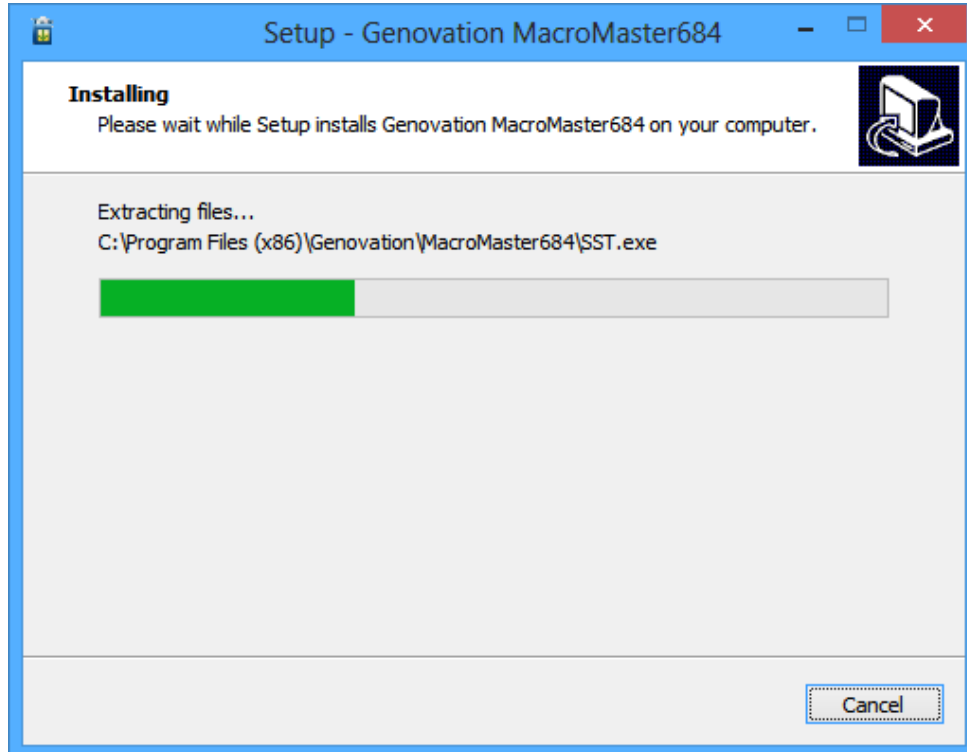
After a short while an additional window opens prompting for the pre-installation of the driver information (INF) file.
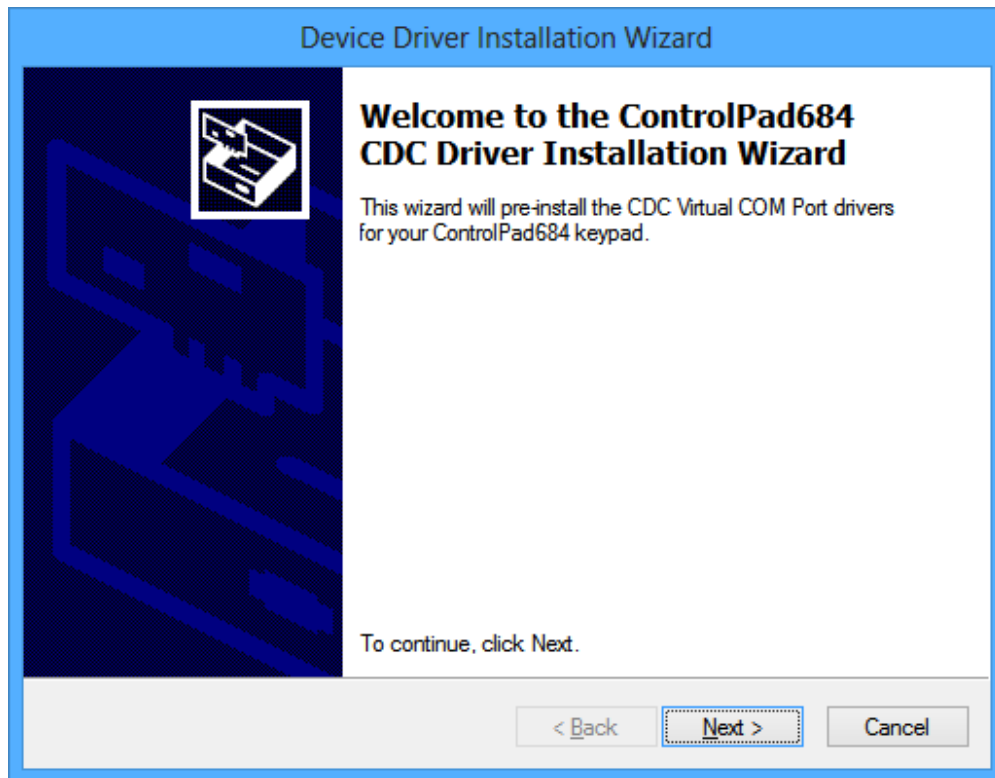
Click on **Next**. A Windows Security popup may appear.
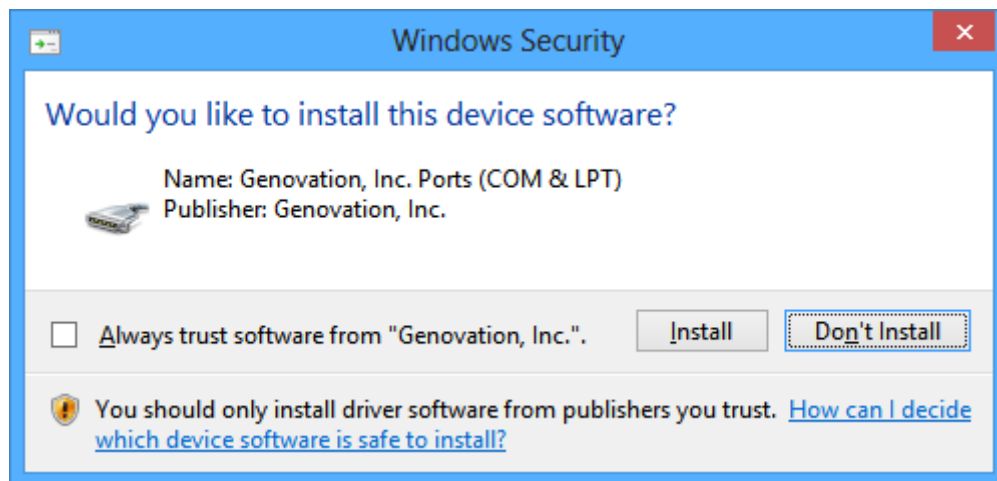
Click on **Install**.

The Device Driver installation completes.
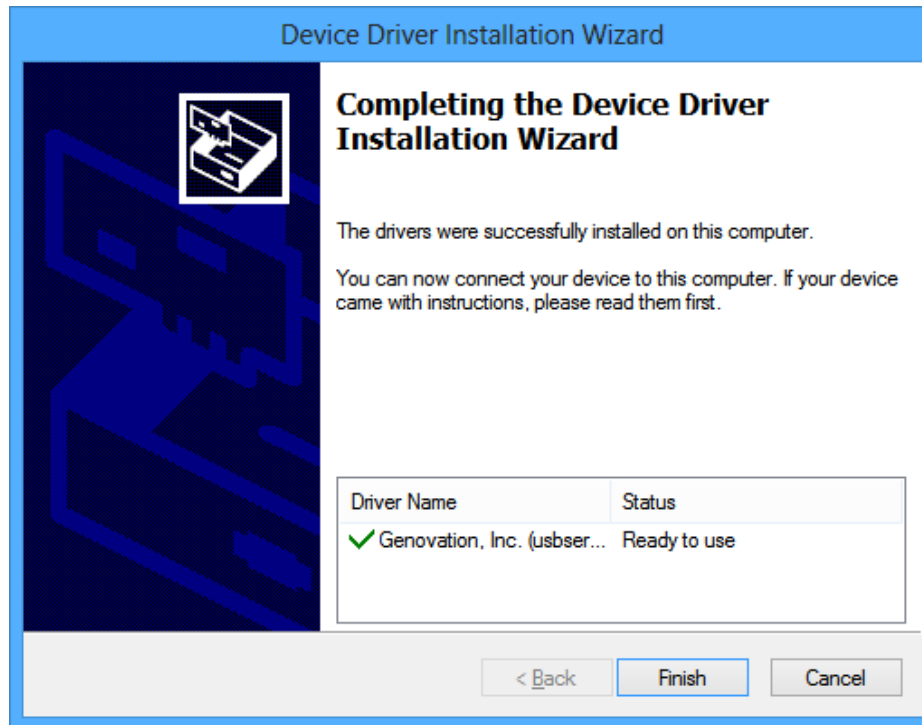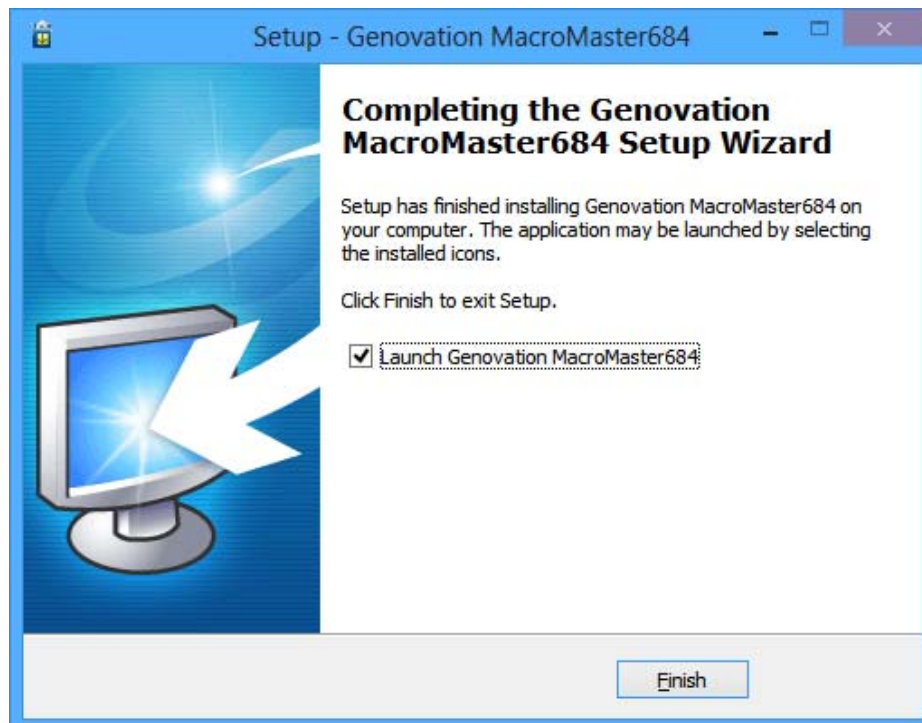
Click on **Finish**.

The software and driver installation is complete. Click on **Finish**.

If you are using RS232 your software installation is complete. You can connect your RS232 keypad to an available DB9 connector on your PC. Use the supplied 5v DC adapter to power the keypad.

If you are using USB, proceed to the next section.

Hardware (USB)

Plug in the 684 keypad. Wait a few moments for the Device Setup installation to complete.
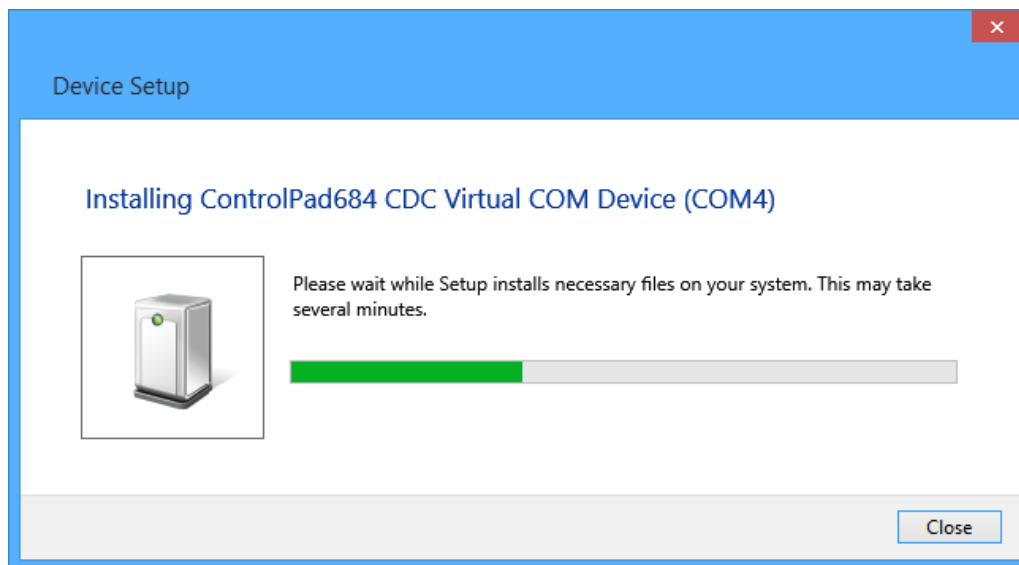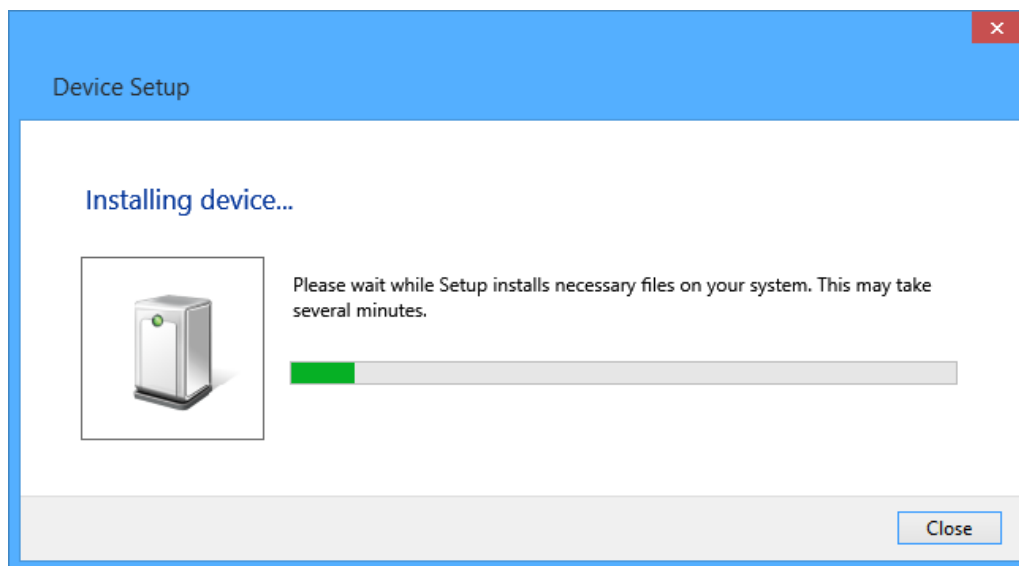
The installation is complete.

Find COM Port (USB)

You may locate the COM port assigned by running MacroMaster684 and then clicking **Set Port** and finally **Search Automatically**. Page 9 in this manual describes the process.
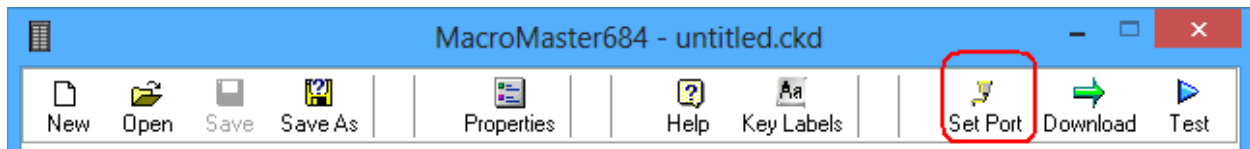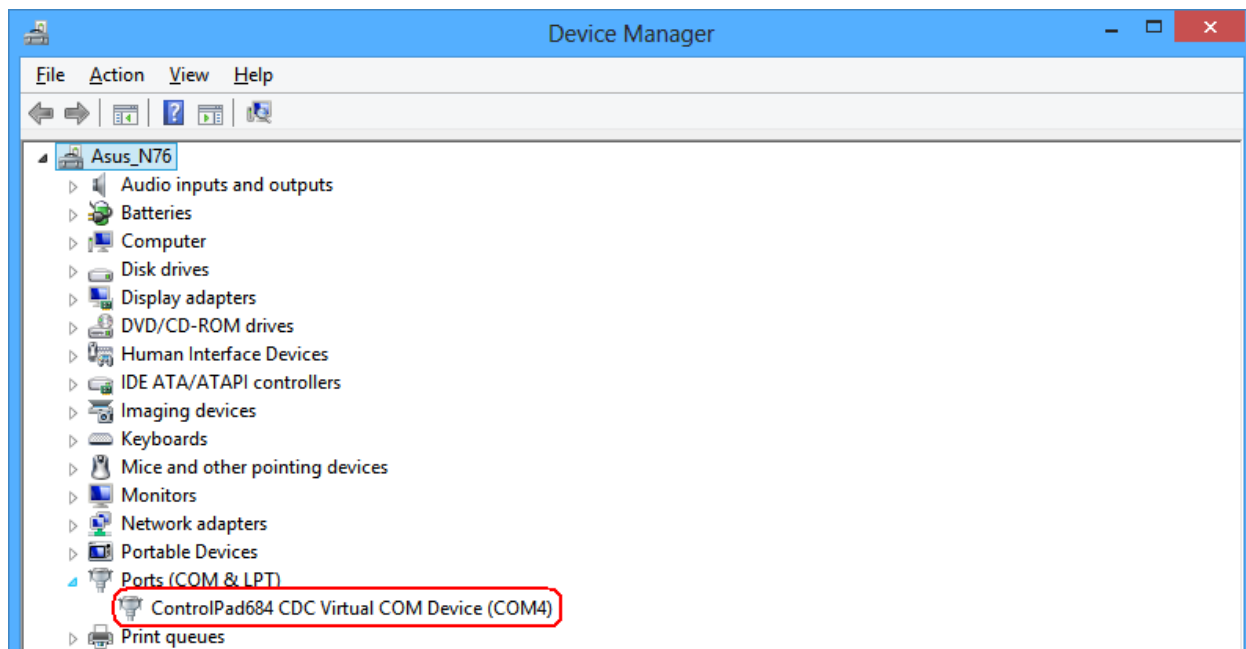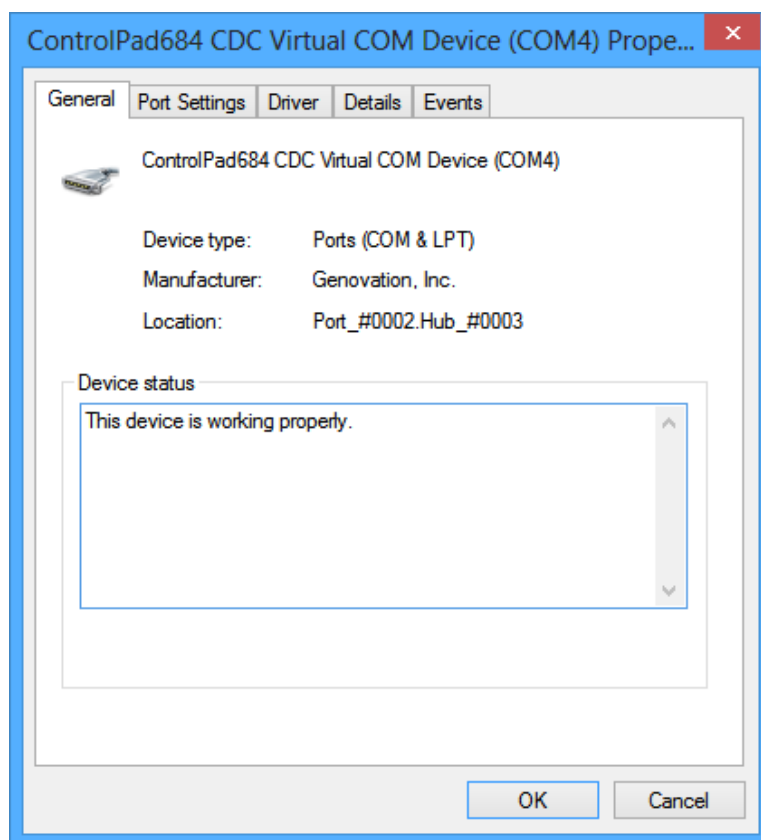

Change COM Port (USB)

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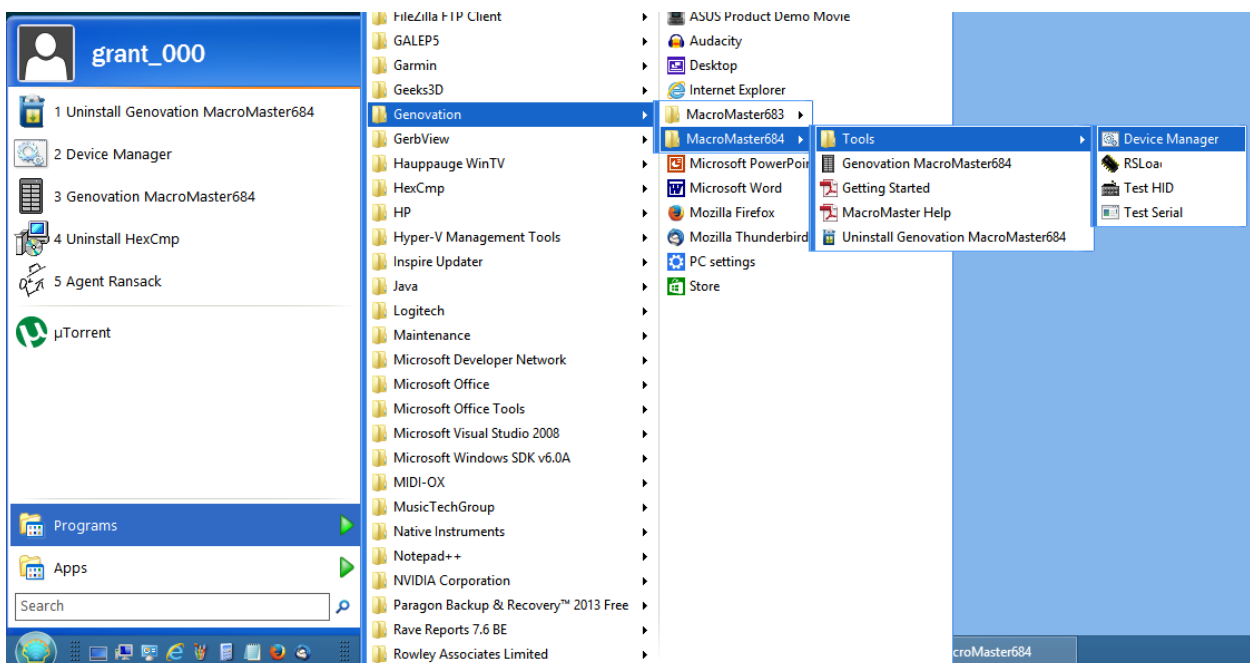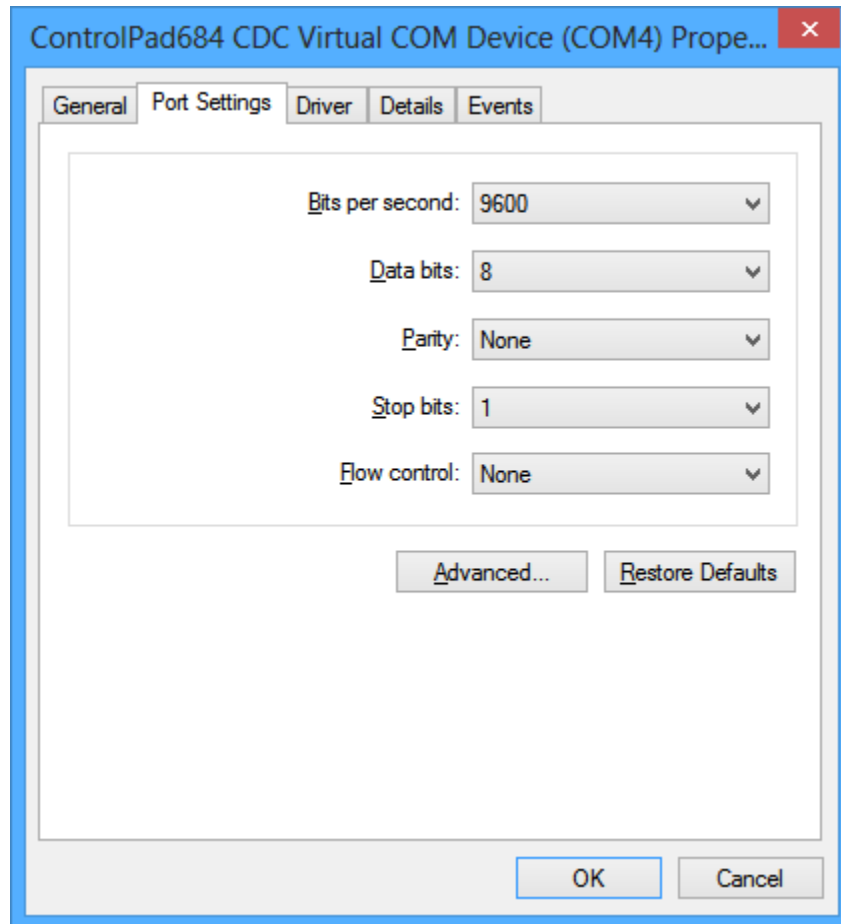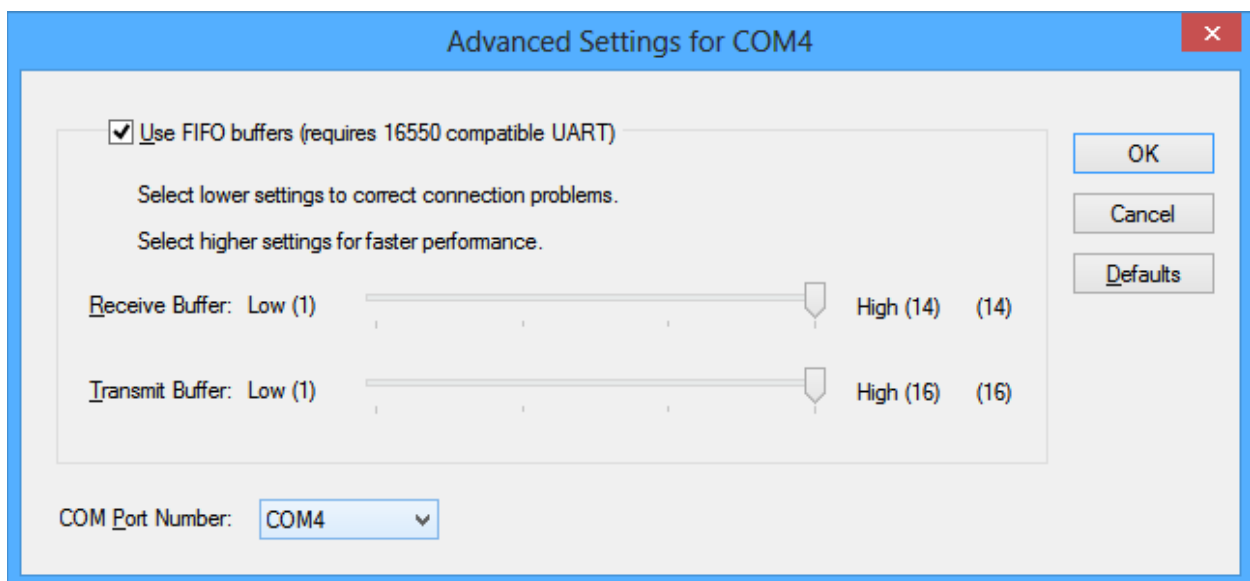
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Click on the **Port Settings** tab.

Click on **Advanced**.

Choose the COM Port Number using the drop-down box and click **OK** (twice). The new settings take effect.

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