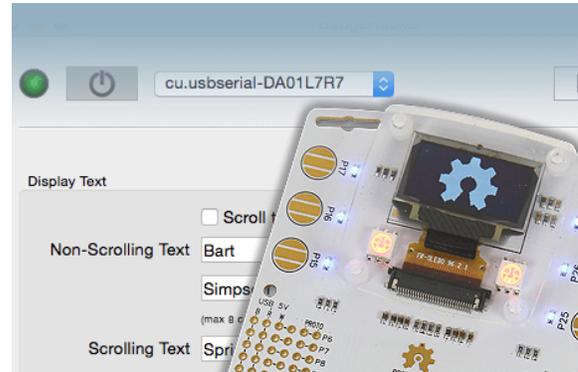


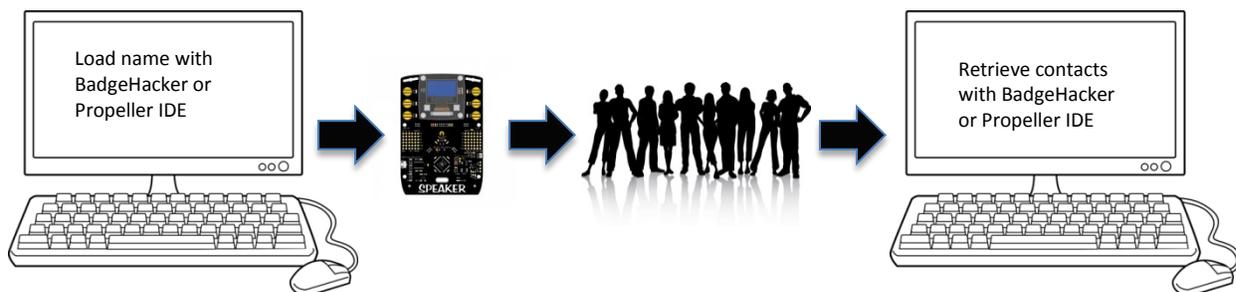
# Customize a Hackable Electronic Badge with BadgeHacker or PropellerIDE



There are two software tools for loading an event application into the Hackable Electronic Badge: [BadgeHacker](#) or [Propeller IDE](#). Both tools serve the same purpose of installing the source code that support personalization and provide a way of retrieved stored contacts. A brief comparison of the two tools is below:

	<b>BadgeHacker</b>	<b>Propeller IDE</b>
Environment	Graphical User Interface	Integrated Design Environment with a terminal provides access to code
Typical User	Event planning and registration staff with minimal technical experience	People familiar with editing source code in microcontroller development environments
Benefit	Simple, understandable tool is quick to learn	Access to source code means greater customization; reliable system
Operating Systems	Mac, Windows, Linux	Mac, Windows, Linux
Download*	<a href="https://github.com/parallaxinc/BadgeHacker/releases">https://github.com/parallaxinc/BadgeHacker/releases</a>	<a href="https://github.com/parallaxinc/PropellerIDE">https://github.com/parallaxinc/PropellerIDE</a>

\* This software is under constant revision so we ask that you download it from our developer web site to ensure you have the latest version.



For people new to microcontrollers, BadgeHacker may be the most convenient way to prepare a large number of Badges for an event. People familiar with (or wanting to learn) microcontroller programming tools may prefer Propeller IDE because it provides direct access to the Propeller chip's Spin-language source code and a built-in terminal for configuration. If you are unsure of how you will load Badges in mass then simply try both tools; the alternative option also provides a backup plan in the event of software/operating system incompatibility issues.

## Event Application Behavior

Parallax provides event-specific applications on the Hackable Electronic Badge's [download page](#). At present, you will find code for two events: (a) the Philadelphia Open Hardware Summit 2015; and (b) London's Simon Denny Studio Serpentine Gallery 2015. A Badge programmed with any of our event firmware will have the same basic features (except with a different logo):

- Event logo displayed for three seconds on Badge power-up;
- Name or message shown as two rows of 1x8 characters in a non-scrolling format, or as two rows of 1x31 characters in a scrolling format;
- Shake-to-activate flashing LEDs and event logo for three seconds, then returns to name display (this is often activated simply by walking around while wearing a Badge);
- Contact manager – store and share up to 250 sets of contact information (four fields of up to 31 characters each) over infrared by pressing the “open source hardware” logo on the front of the Badge;
- Contact information retrieval using BadgeHacker or PropellerIDE.

The Badge can be used for many other purposes, like playing games, controlling a robot, or educational experiments. A number of C and Spin language source code examples are available for download.

## Preparation – Installing USB Drivers

The Badge includes a USB chip from FTDI. Your computer needs FTDI USB drivers installed in order to program or communicate with the Badge. Browse to <http://www.ftdichip.com/Drivers/VCP.htm> and download and install the FTDI driver package for your operating system.

NOTE: If you are using Windows and have a large quantity (hundreds) of Badges to program, see **Port Enumeration Limitation Caution**.

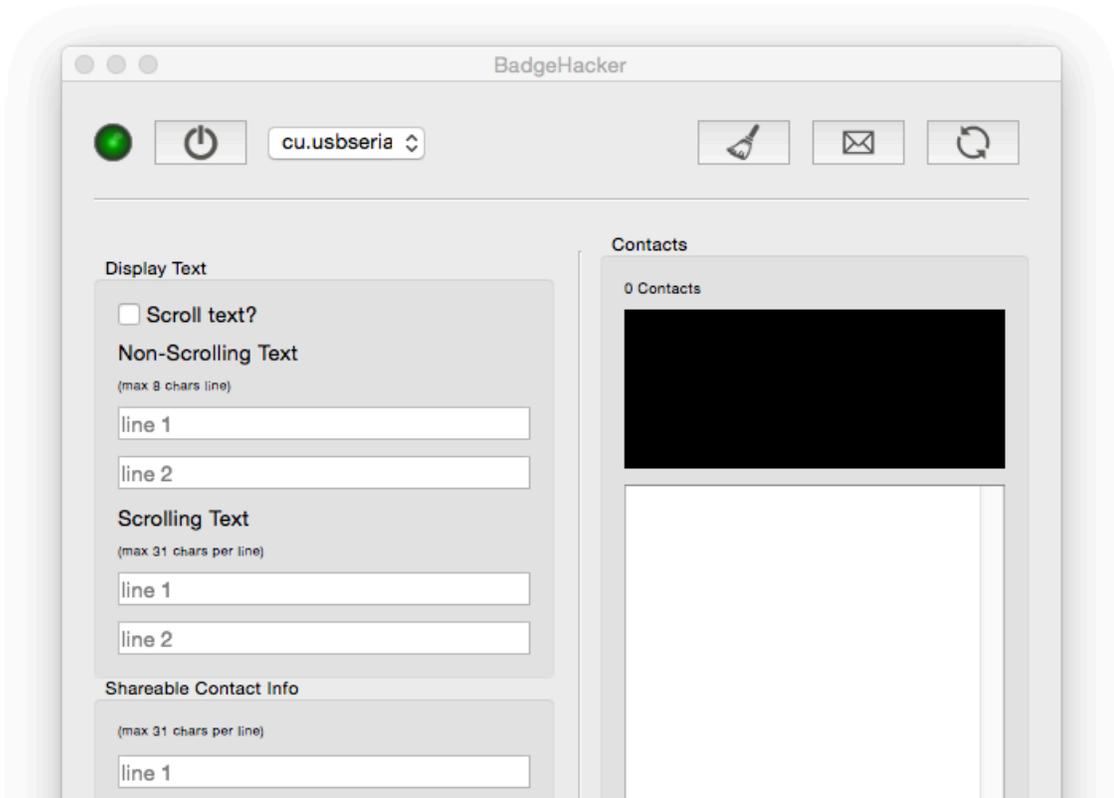
## BadgeHacker Setup

Follow these steps to configure a Badge with BadgeHacker. This will add contact information to this Badge. Then, the contact information can be swapped with other Badges using the same firmware.

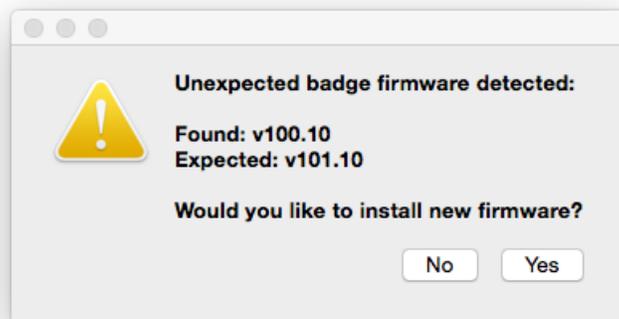
1. Download and install [BadgeHacker](#) for your choice of operating system.
2. Connect a USB to Micro USB cable between your Hackable Electronic Badge and computer.
3. Power ON your Hackable Electronic Badge by pressing the “ON/OFF” button on the right side.

**Note:** When cycling the Badge's power, check for a tactile “click” when pressing the ON/OFF switch. When ON, the Badge's LED display shows characters or graphics (remaining from Parallax's production test). The green LED in BadgeHacker software shows that the Hackable Electronic Badge USB chip is connected but does not mean that the Badge is powered ON. When the Badge is ON you will see the LED display show characters or a graphic.

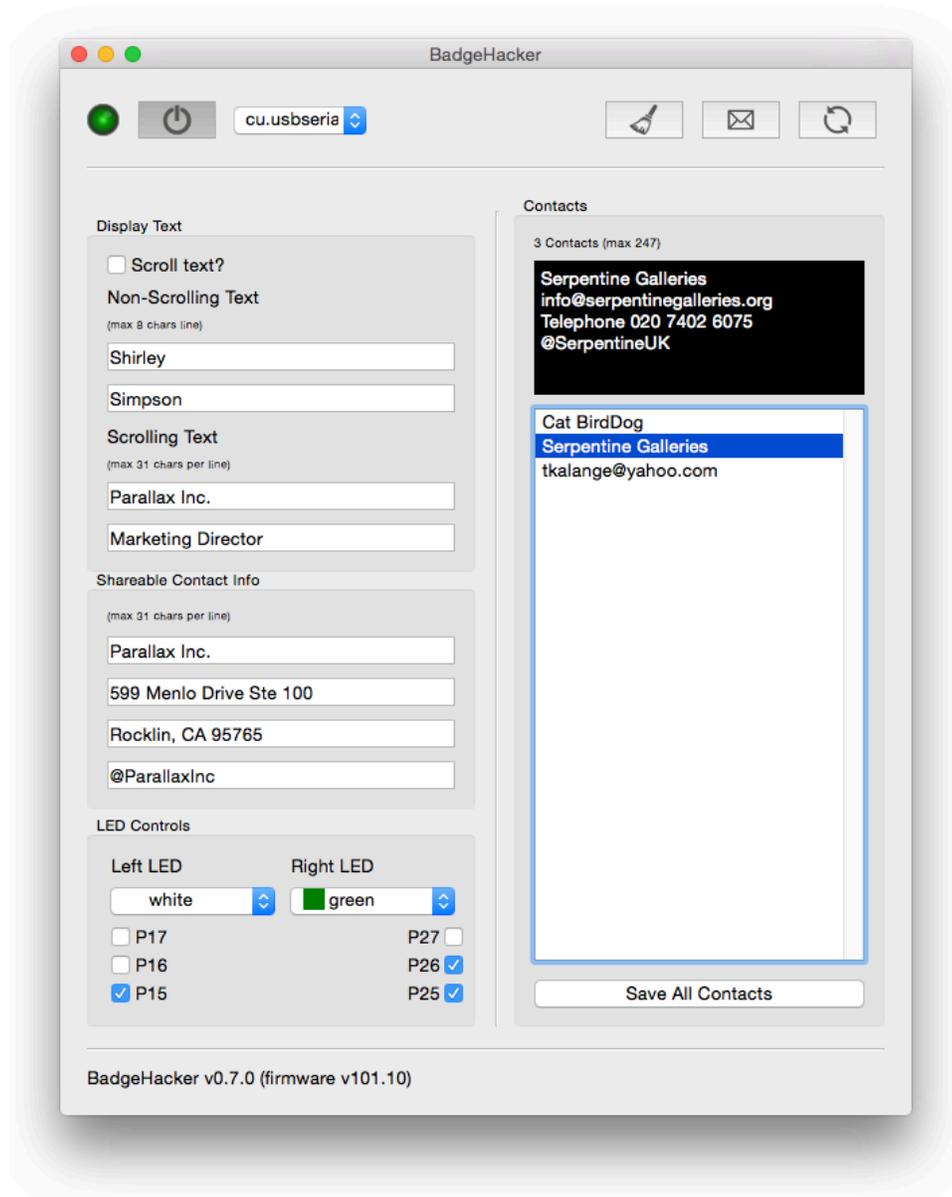
4. Press BadgeHacker's power button to activate the serial port.



5. Press the circular "refresh" button and the Badge will display the stored text, contacts and LED states. BadgeHacker will detect the firmware on your Badge, and let you know if a newer version is available.
  - a. If this Badge has been out acquiring contacts, select "No" and don't overwrite the firmware! That would also overwrite the contacts that have been collected with this Badge.
  - b. If you are setting up a Badge for the first time, answer "Yes" since new firmware versions are often available.



6. Type over each field, tab to the next and customize the text and LED colors for your Badge. Each time you advance to another setting the Badge will be updated. Pressing the circular “refresh” button also loads the information into your Badge.



Now, this Badge is ready to send and receive contact info with Badges via infrared, by facing the Badges to each other and pressing the Open Source logo.

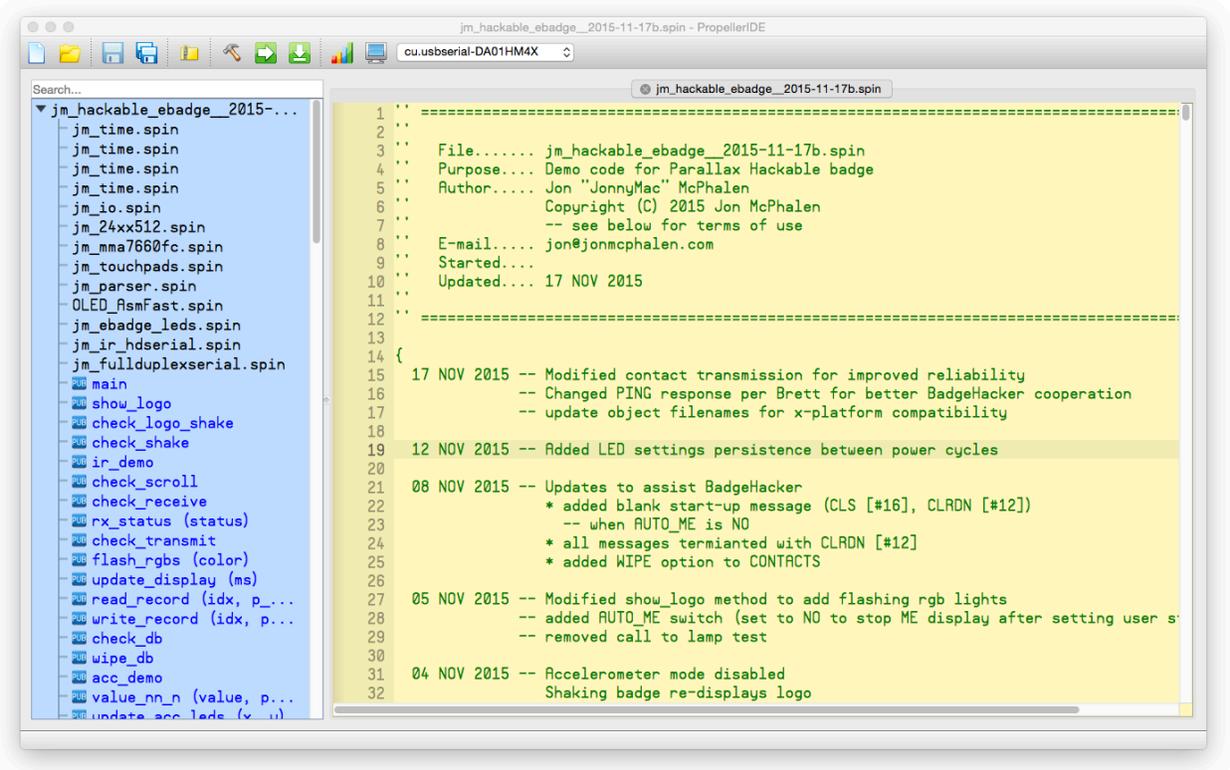
To retrieve contacts stored in your Badge:

1. Connect your Badge to BadgeHacker using the USB to Micro B cable.
2. Power ON your Hackable Electronic Badge by pressing the “ON/OFF” button on the right side. Press the “refresh” button on BadgeHacker. Your stored contacts can now be saved as a text file to your computers (Save All Contacts) or cleared from memory (the broom button).

## Propeller IDE Setup

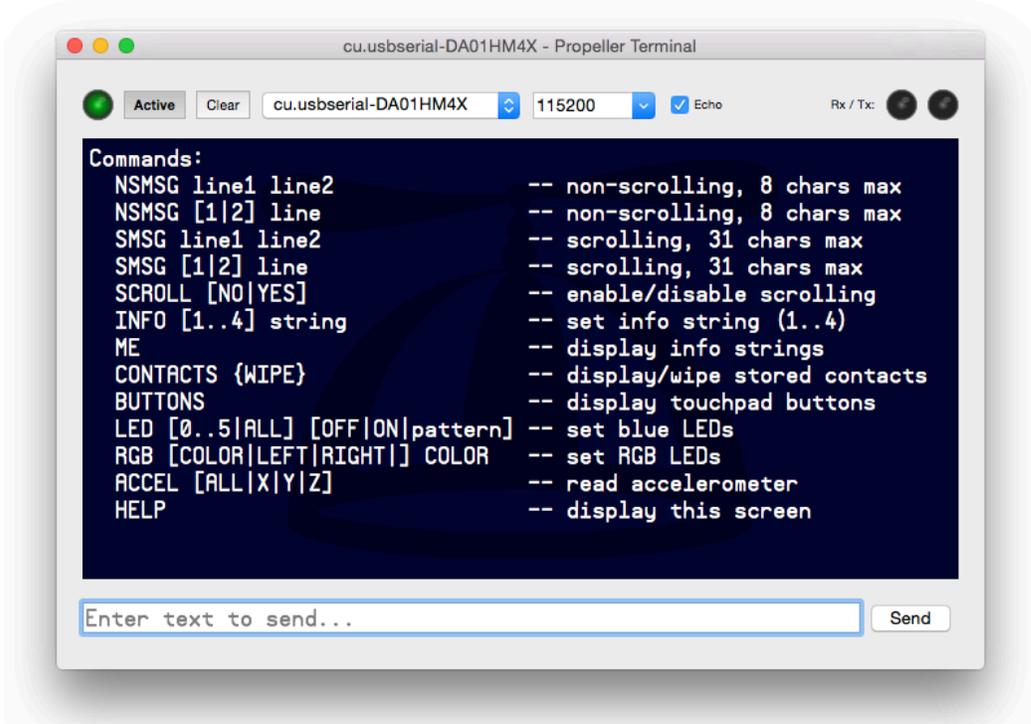
These are the steps for installing the event firmware and adding contact information to a Badge using the Propeller IDE software:

1. Download and install [Propeller IDE](#). The open source Propeller IDE software is available for Mac, Windows or Linux.
2. Download, save and extract the firmware zip archive for your event from the Hackable Electronic Badge's [download page](#).
3. Run Propeller IDE.
4. Navigate within Propeller IDE to File > Open and find the "top" Spin file you extracted above. To determine which .spin file is the top file, open the README.txt in the archive. In this case, it's named "jm\_hackable\_eBadge\_2015-11-17b.spin."
5. Connect the Badge to your computer using the USB to Micro USB cable.
6. Power the Badge ON.
7. Download the code to your Badge's EEPROM (the white arrow with green background pointing down).



Now you can use Propeller IDE's built-in Terminal to customize your Badge:

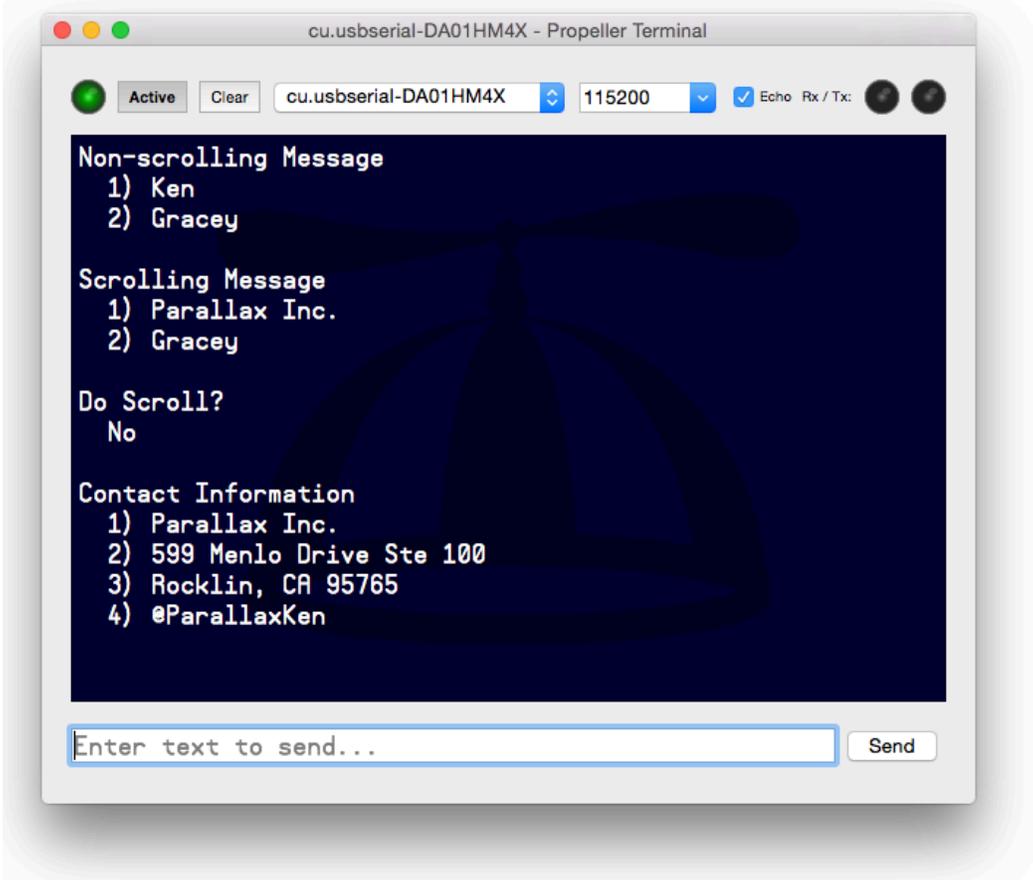
1. Open up the Terminal by pressing the blue monitor icon (rightmost icon). Once it opens, set the baud rate to 115200 and connect to the Badge by pressing the "Active" button.
2. Once connected, the two main menus delivered to you from the Badge are HELP and ME. Type HELP into the Terminal transmit pane, then hit enter, and you will see the Help menu with available commands.



- Configure your Badge by entering text in the transmit pane at the bottom of the Propeller Terminal. Descriptions of the commands and examples are shown in the table below.

Command	Description	Example
NSMSG line 1 line2	Top and bottom lines non-scrolling in one command by using a space between first and last name (8 chars max) entered without quotes	NSMSG Mickey Mouse
NSMSG [1 2] line	Top or bottom line non-scrolling (8 chars max) entered without quotes	NSMSG 1 Ken
MSG line 1 line 2	Top or bottom line scrolling message (31 chars max) entered with quotes	NSMSG 2 "Microcontrollers and Robots"
SCROLL [NO YES]	YES displays the MSG 1 and 2 scrolling message and NO displays the NSMSG 1 and 2.	MSG YES
INFO [1..4] string	Up to four lines of contact data (31 chars max) that is shared over infrared in contact manager. For e-mail, long names, Twitter, phone number.	INFO 4 "@ParallaxKen"
ME	Displays the current settings programmed into Badge.	ME
CONTACTS {WIPE}	Displays all contacts stored in Badge EEPROM. Select all, copy to Notepad to save. Or, clears all contacts from memory.	CONTACTS <u>or</u> CONTACTS WIPE
BUTTONS	Displays state of touchpad buttons.	BUTTONS
LED (0..5 ALL) [OFF ON pattern]	Set blue LEDs next to touchpads.	LED 2 ON
RGB [COLOR LEFT RIGHT] COLOR	Set left and right RGB LEDs (black, blue, green, cyan, red, magenta, yellow white)	RGB WHITE RED
ACCEL [ALL X Y Z]	Displays current accelerometer value.	ACCELL ALL
HELP	Displays the command menu.	HELP

4. To confirm your customizations, just type ME and press enter in the transmit pane.



5. Once you've acquired contacts, type CONTACTS and they will display in the terminal window.

## Port Enumeration Limitation Caution

Each time you connect a different Badge to a Windows computer, the operating system opens a COM port for communication, and assigns a number to it. Some systems have an upper limit of 256 COM ports. If you have a very large number of Badges to program, you may wish to pay attention to the COM port numbers assigned, and switch to a different computer before approaching that number.

If you reach a port enumeration limit and cannot program additional Badges, consult the instructions from FTDI:

[http://www.ftdichip.com/Support/Utilities/CDM\\_Uninst\\_GUI\\_Readme.html](http://www.ftdichip.com/Support/Utilities/CDM_Uninst_GUI_Readme.html)

The cited utility is available here:

<http://www.ftdichip.com/Support/Utilities.htm#CDMUninstaller>

Use Parallax's Vendor ID: 0403, and Product ID 6015.