BriteBlox

Modular LED Marquee and Development System

User Guide

Version Draft, 9/17/2015

Table of Contents

Hardware Setup

BriteBlox Displayboards and Partnerboards are designed to snap together for easy operation of an LED marquee of virtually any size or shape. Each marquee consists of one or more Displayboards, and additional facilities for power and communication. You can provide these extra facilities yourself, or add our Partnerboards which feature an identical shape and size to the Displayboards.

Single-row Marquee

Start with one Displayboard. Make sure it is facing upward: the LEDs should be facing toward you, and the "BriteBlox.com" text should be at the top, right-side up. The manufacturer's printing on the LED panel should also be on the top, facing you.

Fig. 1: Upright orientation of the BriteBlox Displayboard.

Plug in as many Displayboards as desired into the left or right of the first Displayboard in your marquee. Mate the six male pins on the right of one board with the six female pins on the left of the other board. Make sure all pins are connected properly, or else the marquee will seem to malfunction, and you will risk corrupting the program loaded onto the two microcontrollers on the board.

In order for the panels to display something coherent, they need to learn their position (address) in the marquee. Board addresses visible to users range from 0 to 63, with 0 generally being on the left and 63 generally being on the right (you can customize this). The auto-addressing scheme relies on decreasing voltage through the top pin (pin 6) among the right-angle female pins on the left side of the matrix. If you have the Wall POWAH or Battery POWAH module, it is recommended that you plug it into the left side of the marquee. Then, use a female-female jumper cable to connect the male pin 2 (ground) to male pin 6 on the right side of the marquee.

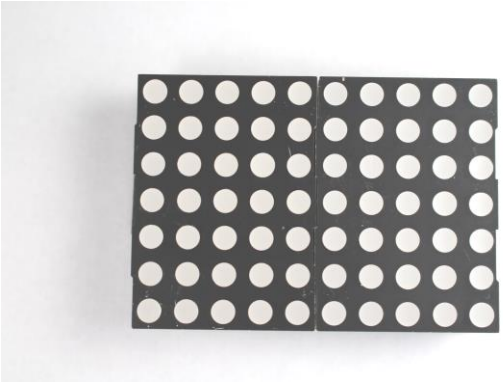

Fig. 2a: Boards are lined up properly.

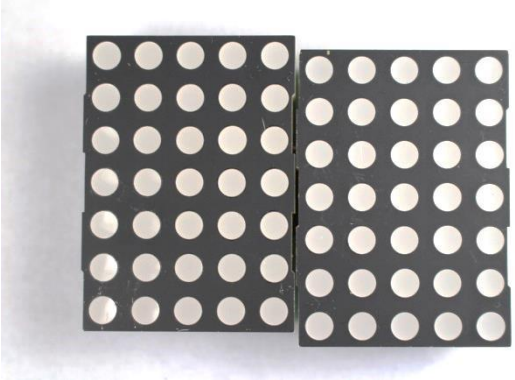

Fig. 2b: Boards are not lined up properly; notice the gap in the middle; also the boards are not flush horizontally.

If you do not have BriteBlox power accessories, one side will still need to be jumped. You can use a jumper between pins on one side of the marquee and then split the line to go into both pins on the other side of the marquee. Or, if you plan to provide power to one side of the marquee and ground to the other side, you can jump whichever pin is not in use on both sides.

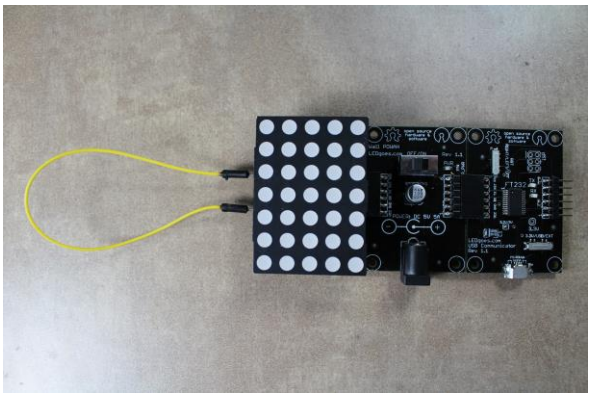

Fig. 3: Jumping pin 1 (bottom) to pin 6 (top). Note that in this case, Wall POWAH is on the right side of the matrix, and thus cannot provide the 5 volts required into pin 6.

Multiple-row Marquee

Start with one Displayboard. Make sure it is facing upward: the LEDs should be facing toward you, and the "BriteBlox Displayboard" text should be at the top, right-side up. The manufacturer's printing on the LED panel should also be on the top, facing you. See Figure 1 from the previous section.

You will now begin to build the matrix by rows. For the first row, plug in as many Displayboards as desired into the left or right of the first Displayboard in your marquee. Mate the six male pins on the right of one board with the six female pins on the left of the other board. Make sure all pins are connected properly, or else the marquee will seem to malfunction, and you will risk corrupting the program loaded onto the two microcontrollers on the board. See Figures 2a and 2b from the previous section.

Three things are important to note at this stage:

1. Auto-addressing a multi-row marquee can be tricky. It might be easier to program addresses for each row of boards first, and then wire them up together. Saving and changing addresses is described in the Software section, "Customizing Board Firmware" on page 14.
2. By default, the software expects the lowest address to be the top left in the marquee. The lowest address in each row should be the leftmost panel. Thus, the bottom right panel should have the highest address in the marquee. If you cannot set the board addresses for your marquee in this manner, you will need to follow the instructions as described in the Software section, "Custom Configuration" on page 16.

0	8	16	24
32	40	48	56

Fig. 4: By setting up a 4x2 matrix with these addresses as shown, simply set "Rows" to 2 and "Panels Per Row" to 4 in the software; no need to use the 'Custom Layout" tool.

3. Unless you have really long wires that can connect Pin 6 between rows in a way that can enforce the addressing order, one alternative may be to "snake" the signal from left to right to left throughout your rows. This will, of course, require a custom configuration you will have to specify to the software, but due to some design limitations in Displayboard hardware revision 3, it is possible two boards may end up with similar or very close addresses. This will become apparent on boards with 3 or more rows.

0	5	10	15
42	37	31	26
42	47	53	58

Fig. 5: The placement of the resistors along the RIN signal (Pin 6) with Displayboard hardware revision 3 will make it difficult to use the auto-addressing feature with this "snake" configuration because some addresses will get skipped and some will likely be duplicated. We are prototyping a solution to resolve this issue; in the meantime, it is still convenient to use the "snake" configuration to provide power and data to each row of your boards when their addresses are preset.

Now, build the additional rows in the same manner. Since Displayboards do not have the capability to mate vertically, you will need to add some additional hardware to facilitate this. Hook up the male pins on one row with the female pins on the row above or below using jumper wires. You can use our male-male and/or female-female cable assemblies to facilitate this; otherwise, you will need to bridge at least pins 1, 2, 4, and 6 between rows. If you wish to pre-program the addresses of your boards (covered later in this Quick Start Guide), you don't need to bridge pin 6 between rows.

Once your rows are built and wired up as desired, add the power and communication modules as desired.

Hints:

- It is often helpful to have two power sources wired up to a double-row matrix so that issues with noise along the ground signal path can be mitigated. Ground noise can cause distortion and improper operation of panels over time.
- Another trick to prevent issues with ground noise and corrupt signals is to connect all side pins to each other in a "double snake" configuration.

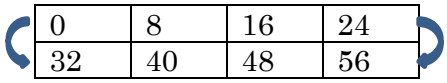

Fig. 6: The double snake (i.e. no exposed side pins)

Minimalist Configuration

For those of you who have BriteBlox Displayboards without Partnerboards and who intend to drive a marquee from hardware you already have, here is an example for how to get your started using a Sparkfun FTDI Breakout board.

As shown in Figure 7, connect 3V3/5V to pin 1 of the BriteBlox (here I've chosen the right-side pins), GND to pin 2, and RX to pin 4. On the left side, I jumped pin 1 to pin 6, and then jumped pin 2 on the left to pin 6 on the right so that pin 6 will decrease from 5V to 0V across the marquee. The microcontrollers read from pin 6 and determine their value based on the voltage drop across that line.

Adding Power and Communication

The Partnerboards can be arranged in virtually any order to maximize ease of use of your BriteBlox marquee. All modules allow pass-through of the power lines and serial signals so that Displayboards can exist on the left side or right side (or even both sides) of Partnerboards. Most of the Partnerboards have jumpers allowing you to set up auto-addressing properly no matter what side they are on.

IMPORTANT: The Wall POWAH board revision 1.1 does not have the capability to output anything besides 5V on its right-side Pin 6. **Make sure** you do not cause a short to GND when hooking devices up to the right side of Wall POWAH. Be sure to check out "Appendix A: Jumper Settings" for more information.

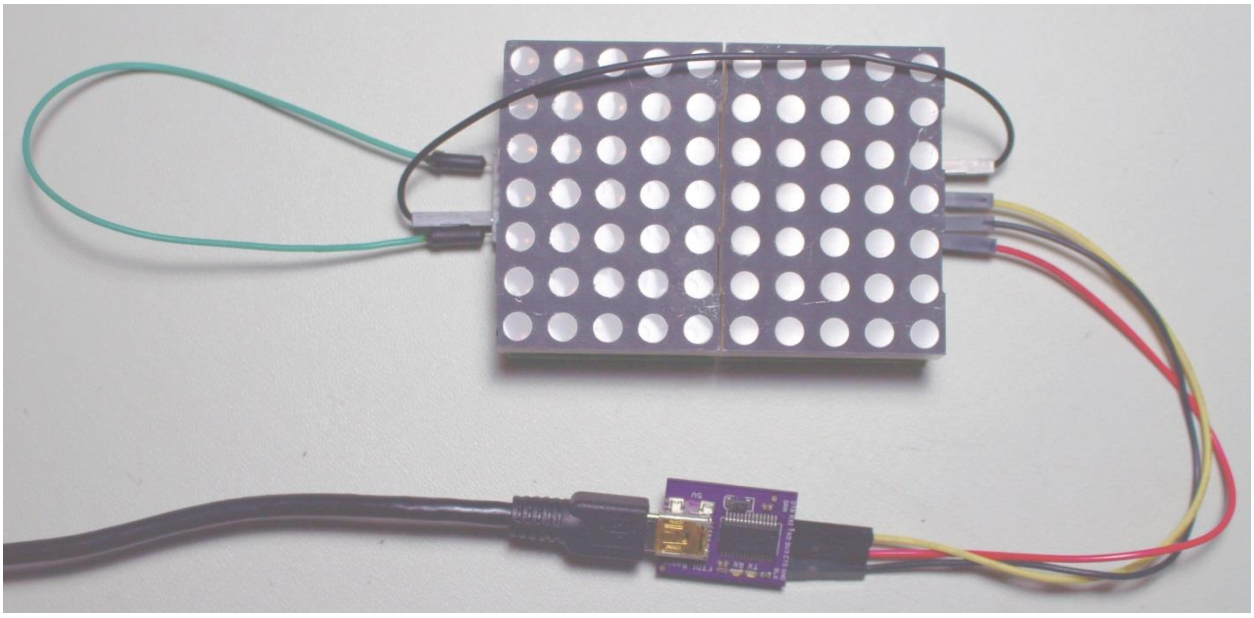

Fig. 7: Running BriteBlox from the Sparkfun FTDI Breakout. Make sure it outputs 5V, not 3.3V!

Since the USB Communicator is also capable of providing power, it is recommended to turn off power from the USB port before connecting the POWAH modules (Wall or Battery). There is a switch on the USB Communicator allowing the output to switch between 5 volts, Off, and 3.3 volts. Slide the switch to the Off position before running a marquee on wall or battery power.

Examples of supported configurations:

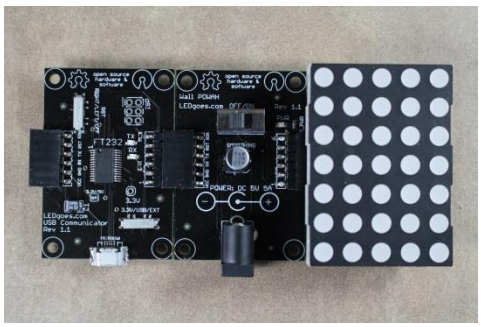

Fig. 8a: The optimum arrangement, consisting of Communication -> Power -> Boards

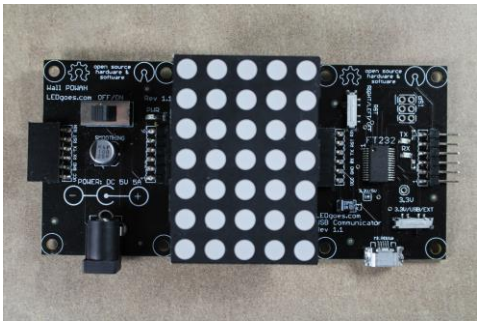

Fig. 8b: Power -> Boards -> Communication, or the mirror image Communication -> Boards -> Power

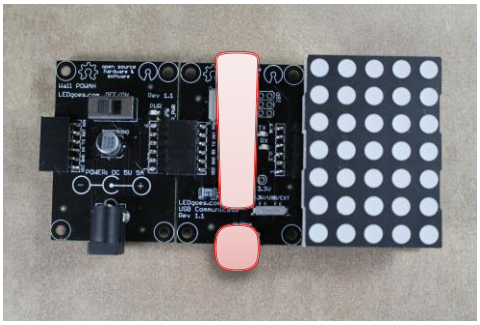

Fig. 8c: Power -> USB -> Boards. When configuring Partnerboards in this manner, **you must** change the jumpers on the left side of the USB Communicator from their factory default configuration, or else you will cause a short, possibly damaging property. See "Appendix A: Jumper Settings" for information.

Test Patterns and Addresses for Each Board

Upon power-up, each board will display its address. The PC program must have the same understanding of the addresses in the marquee as actually exist in the marquee, otherwise some boards (or possibly none) will appear to show any of the desired information.

The board's addresses are displayed in the following manner: the tens digit of the display is indicated by how many dots are on in the first two rows. No dots means the tens place is a zero (e.g. boards 0-9); six dots means the tens place is a six (e.g. boards 60-63). The ones digit of the board's address is indicated by an Arabic numeral (0-9) lit up as a 5x3 character on the bottom of each panel.

The address must be lit up in yellow for it to be valid for the whole board. Each chip discovers its address separately, and it is possible for the addresses to diverge – e.g. one chip might think it's #31 but the other chip on the same board thinks it's #32. This will be obvious if you can tell which number appears to be only lit up in red or green; portions of numbers that overlap will appear yellow.

Below are real examples of addresses being displayed by the boards:

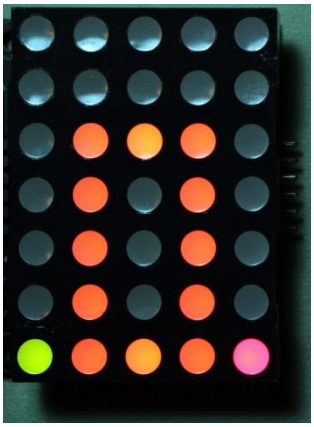

Fig. 9a: Board address 0 (the first board)

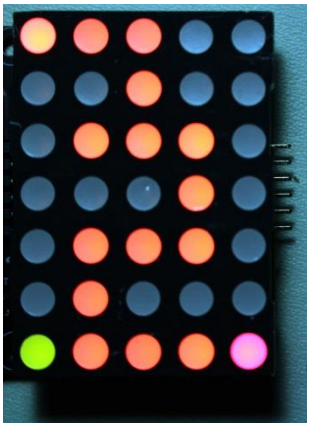

Fig. 9b: Board ID 42

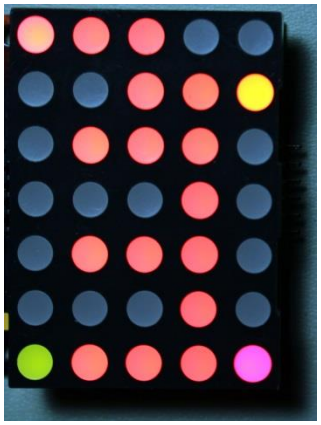

Fig. 9c: Board address 63 (the last board)

Fig. 9d: Green thinks it's 42, red thinks it's 43

From the code:

```
// Output the chip ID onto the test pattern in this manner:
// 1  2  3  X  X    <- tens place
// X  X  4  5  6    <- tens place
// X  o  o  o  X
// X  o  o  o  X    o = ones place, show a digit
// X  o  o  o  X
// X  o  o  o  X    X = unused
// X  o  o  o  X
```

Baud Rate Patterns

This section is important for troubleshooting displays. If you do not need to troubleshoot displays and never run your boards at a different baud rate, you should seldom notice these patterns on your boards.

The baud rate of a board is shown if it has been reprogrammed before any additional data has been sent to it at the new rate. If a long matrix exhibits any of these patterns, it should not be hard to fix. The pattern is shown as a binary number, with the least significant bit (ones place) on the bottom right, the least significant 4 bits on the bottom row, and the most significant 4 bits on the 3rd row. The left column is not used. If the bit in the binary representation of the baud rate is 1, the corresponding LED is illuminated. Otherwise, it is turned off.

From the code:

```
// Output the baud rate in this manner:
// X    X    X    X    X
// X    o    o    o    o
// X 512k 256k 128k  64k
// X  32k  16k   8k   4k
// X   2k   1k  512  256
// X  128   64   32   16
// X    8    4    2    1
```

If a board in an active marquee is showing a baud rate display, it can be corrected most of the time by simply hitting "Disconnect" and "Reconnect" in the latest version of the BriteBlox PC Tools. The PC Tools send instructions to each board at 9600bps to set themselves to the desired baud rate, and since most panels that forget their baud rate usually jump back to 9600bps, the step above is normally sufficient to correct errant panels. If this does not help, power cycle your marquee or else cycle through all baud rates and find out which one your panel responds to.

Here are some boards that are showing their baud rates:

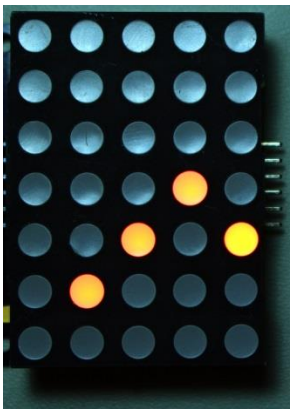

Fig. 10a: 9600 bps

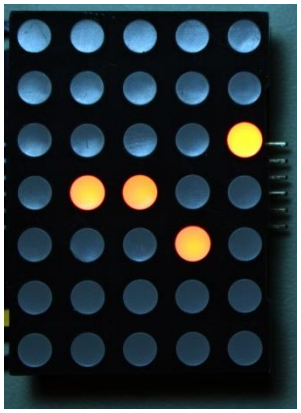

Fig. 10b: 115200 bps

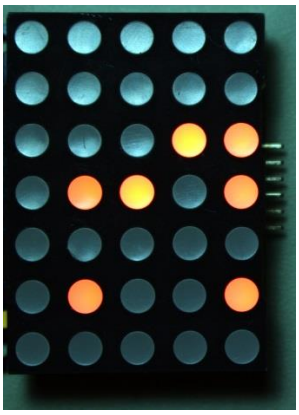

Fig. 10c: 250Kbps

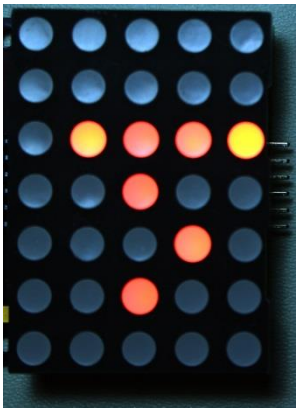

Fig. 10d: 1Mbps*

* **Note:** The 1Mbps rate is no longer recommended when using the latest Python software. 500Kbps is sufficient to run the marquee at a fast refresh rate.

Using the BriteBlox Software (PC/Mac/Linux)

The software is currently available as Python code on our GitHub page, and executables for various platforms including Windows, Mac OSX, and Linux x86 & x86-64 are available from our main site (but not x64 because that's Itanium, or as some call it, the *Itanic* architecture). These instructions are accurate as of this writing, but the application is subject to change and these instructions will likely be obsolete soon. Please refer to the latest software documentation on GitHub bundled with future releases.

Standard Operation and Text

To display scrolling text on the BriteBlox marquee, begin by defining the parameters of your marquee. Enter how many rows are in the matrix, and how many panels per row there are, in the fields at the top left.

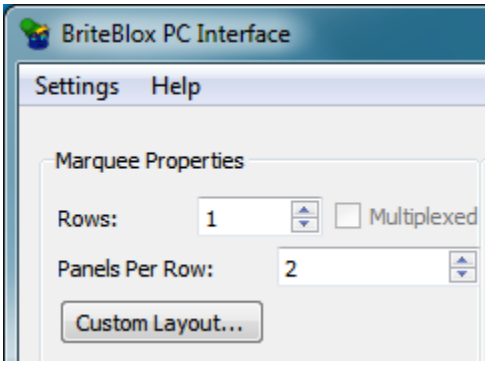

Fig. 11: Set the number of rows & panels per row.

Then, set the communication port(s) on the top right of the window.

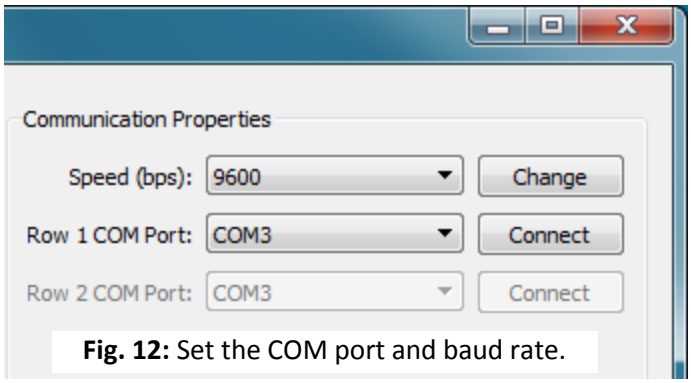

Fig. 12: Set the COM port and baud rate.

When you plug in a BriteBlox USB Communicator or enable Bluetooth communication by pairing your computer with the Bluetooth Communicator, the module will show up in different ways across various computing platforms:

- a "COM_" port on Windows machines (e.g. COM3)
- a "/dev/ttyUSB_" port on Linux machines (e.g. /dev/ttyUSB0)
- a ??? port on Macs

Select the appropriate port from the dropdown. The number of ports will vary depending on how many similar devices you have attached to your computer. Then, select the desired baud rate (keeping in mind the limitations of your device), and hit Connect.

If you don't see the desired communication port in the dropdown, make sure it is plugged in or paired. Then, go to the "Settings" menu and click "Refresh COM Ports".

See Appendix B for more information on USB devices configured as BriteBlox.

Most PCs are able to run the marquee at top supported speed (500 Kbps). However, the Wireless Communicator can only support speeds of up to 115200 bps, and will probably only run at 9600 bps unless you enter the Bluetooth radio's Configuration Mode and change it. The baud rate you choose will influence the scroll rate of the LED matrix.

Note: During setup, as you define the size of the board in the software, it calculates what the board addresses are expected to be. Since not all electronics behave in an ideal manner (i.e. as defined by physics textbooks), the software will take boards with IDs one less than expected and increment them before starting to display any information. The formula for calculating board addresses is [(1024 / total number of boards) * board number, starting from 0 on the left]. For instance, an 8-panel LED matrix should show the addresses {0, 8, 16, 24, 32, 40, 48, and 56} upon startup, but the software will be able to correct "sagging" board addresses in {7, 15, 23, 31, 39, 55} before trying to send data. A software revision in the near future will also correct "bulging" board addresses in {1, 9, 17, 25, 33, 41, 49, 57}. If any board does not have an address one away from or exactly as expected, you will need to reset its address with the instructions laid out in the "Customizing Board Firmware" section.

You may also want to limit the number of messages the board will scroll so new messages can be seen in a timely fashion. Choose or type in a number on the "Message Limit" spin box to do this. Once you send more than that number of messages to the board, the software will start replacing the oldest messages with messages you enter in the future.

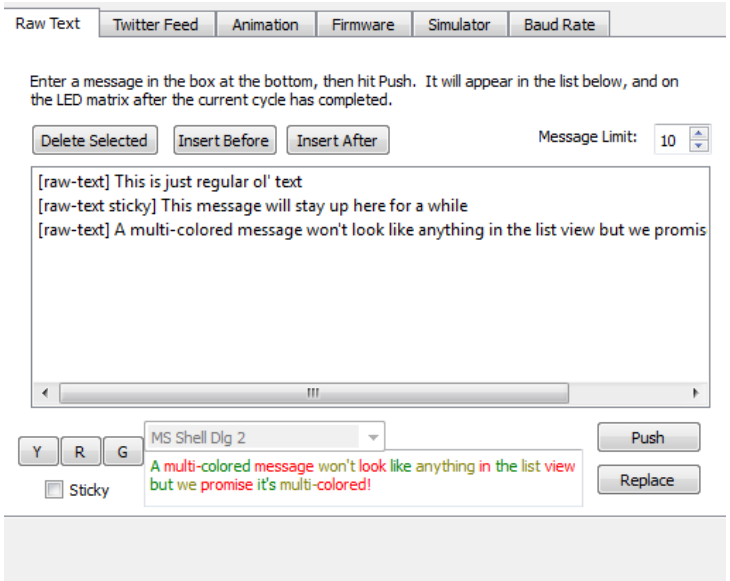

Fig. 13: The "Raw Text" view features several tools for manipulating text on the matrix.

The first message to appear is the " :: AWAITING MESSAGES " indication. This means the serial protocol has been initialized successfully. You can begin sending messages by entering them in the text field at the bottom of the screen. The message will appear in the list box. You can color words and letters in your message by using the "R", "Y", and "G" (for Red, Yellow, and Green) buttons next to the rich text window. Click one of the color buttons and begin typing, or select existing text and click one of the color buttons. When you are ready to send your message, click "Push" (if you are in "Raw Text" mode, as indicated by the tabs near the top).

The matrix's scroll rate can be adjusted by indicating an Update Delay (in milliseconds). If the scroll rate is too slow or fast for your liking, adjust this value. It simply adjusts the length of time between updates from the computer over the serial connection to the boards.

If you would like to stop your matrix, click "Disconnect" which will only appear if you are currently connected. After disconnecting, the message on your matrix will freeze in place; you must remove power to clear the board.

"Sticky" messages will not get overwritten when you have exceeded the message limit. This is useful when you want to provide instructions on how to send messages to the marquee, information about yourself, etc.

Troubleshooting Console

"Having problems? Open the Console." Click this button in order to open up a window that will show you diagnostic output from the program that you might be missing, especially if you're running the compiled version of the software. This view probably won't help people running PC Tools from the source code unless they have somehow suppressed standard output in their terminal window.

TrueType Font Support

This feature has not been enabled in the current PC Tools version, but is expected to be ready very soon. When using TrueType fonts, make sure the font size is ideal for the display. It could take some guess and check to find the right font size. Also, it is recommended for use only with marquees with 2 rows or more.

The text of a message written in a TrueType font is treated like an animation. The bottom left pixel of the message will appear on the very bottom pixel of the marquee. If the message is too tall, the top will be clipped off. This is important to consider when using commas or other characters that go below the baseline (for example: g, q, p, or the numeral 5 in Georgia font).

Twitter Feed

You must sign up for a developer account on Twitter in order to display live Twitter feeds on your BriteBlox marquee. Once you sign up for an account and create an application (which only indicates to Twitter that you want unique credentials to their service for the desired application), you will be provided a Consumer Key, Consumer Secret, Access Token Key, and Access Token Secret. Copy the values from the Twitter website and paste them into the appropriate fields. Once you have done this, click Authenticate.

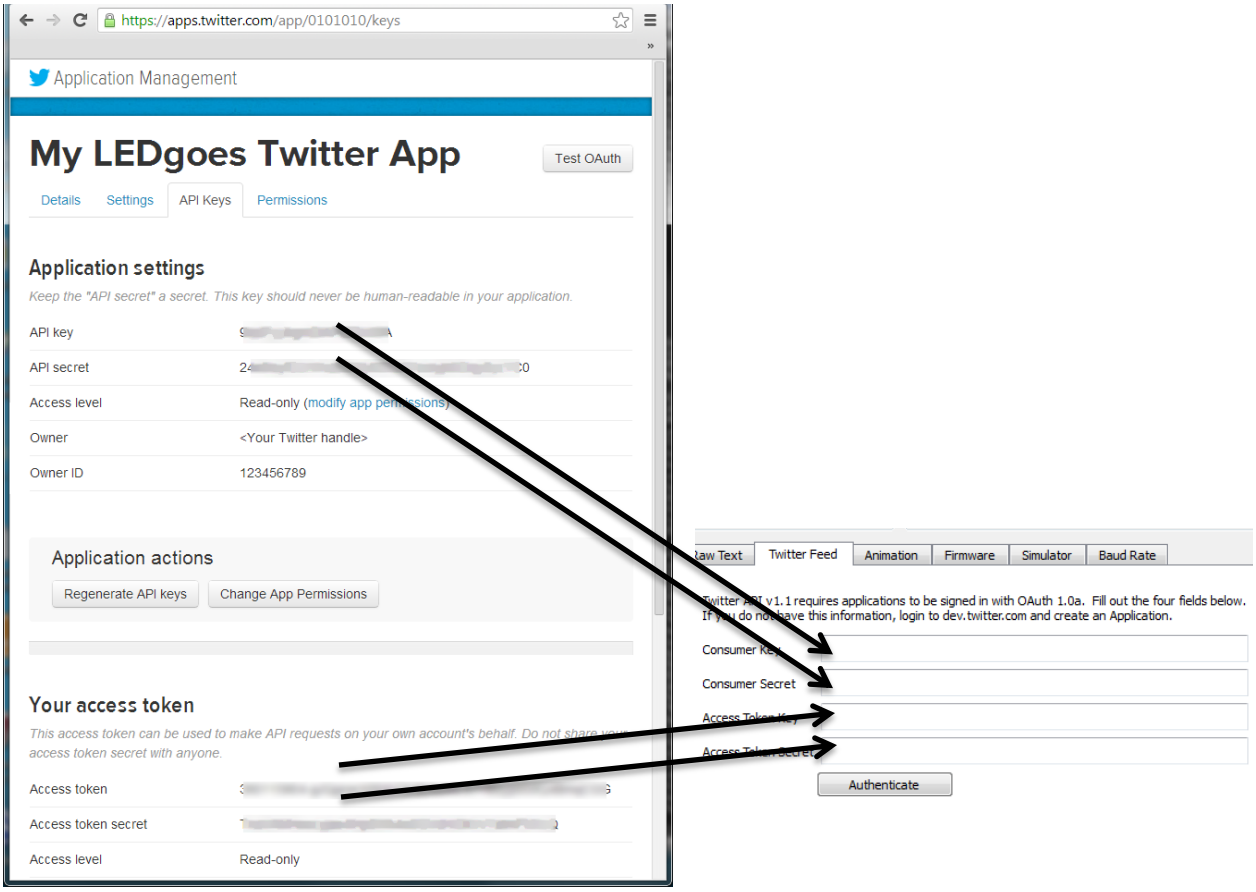

Fig. 14: Mappings of Twitter Dev Center API keys to BriteBlox Twitter Tab input fields.

Finally, enter a Twitter hashtag or handle, or a simple word or phrase, in the appropriate field. Live tweets will be displayed on the marquee once you hit the Start button. Hit the Start button again to stop the flow of live tweets.

Note that you can still set a message limit and "sticky" messages in the "Raw Text" tab. The message limit will help ensure fresh tweets are being shown by replacing older tweets with newer ones once the message limit is exceeded. Sticky messages are not erased nor replaced so that you can tell users how to send tweets to the marquee, convey your code of conduct, etc. If the message limit is exceeded multiple times while one set of messages is scrolling, only the most current tweets before the next refresh will be shown.

Animations

The software can load animated GIF images and display their contents on the marquee. Pixels that are to display red must contain a red value of ≥ 128 (0x80) in the GIF image; same goes for green. Pixels to be yellow must contain both red and green values of ≥ 128 (0x80), and pixels to remain off should be colored black or otherwise have red & green values less than 128. Remember that the BriteBlox hardware can only display one shade of green, red, and yellow; if you draw your animation expecting different shades of these colors, you will be disappointed in the output of the matrix.

The animation is aligned so that the bottom left pixel of the animation will appear on the very bottom pixel of the marquee. If the animation is too tall, the top will be clipped off; too wide, the right will be clipped.

At this time, Raw Text or Twitter mode cannot be run along with Animation Mode. The program will behave unpredictably if you try to run both modes at once.

RSS Feeds

RSS feed parsing is tricky business because, despite that it's a standard, content providers utilize the fields differently. Currently, the RSS feed area is set up to provide stock quotes from NASDAQ's RSS feed. The feed is re-read once all messages have scrolled through, and the original message slot for the RSS feed gets updated with the refreshed data.

Customizing Board Firmware

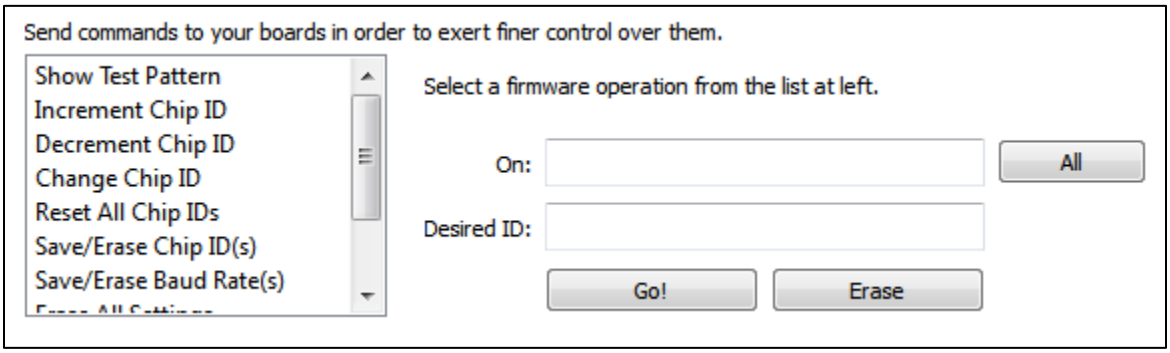

Fig. 15: Screenshot of the Firmware tab; descriptions of each command are below.

The “Firmware” tab contains many operations you can use to help program, troubleshoot, and debug your boards.

Remember that boards have IDs between 0-63, so in each box, you will usually fill in a number in this range.

Note that firmware commands are listed in a selection box. The user interface at right adapts to describe the arguments you need to provide for each command. In some cases, you can click the “All” button (or simply write `All` into the text box) to have the firmware operation take place on all boards at once.

“Show Test Pattern” will show you which board has the address you specify in the “On” field, or will show you the test pattern on all boards if you select All.

“Increment A Chip ID” will take the address of a board (0-63) or chip (128-191 red, 192-255 green) and add 1 to it in case it is one below what it should be.

“Decrement A Chip ID” will take the address of a board or chip and subtract 1 from it in case it is one above what it should be.

“Change Chip ID” changes the board or chip specified in Current ID and changes it to the Desired ID.

“Reset All Chip IDs” will cause the boards to refresh their addresses based on either their internal programming or the auto-address line.

“Save/Erase Chip ID(s)” will alter the board or chip’s address stored in its EEPROM so next time it is powered up, it will either have that same address (when you Save) or read from auto-address (when you Delete). To save or erase all chip IDs to/from all chips at once, click the “All” button.

“Save/Erase Baud Rate(s)” functions identically to “Save/Erase Chip ID(s)” except it alters the baud rate setting in the EEPROM rather than the chip ID setting.

“Erase All Settings” erases all settings from the EEPROM of all boards at once.

“View Firmware Version” will show you the firmware version of the board specified in “On:” (or “All”) in either your terminal window or your Console window (click the “Open the Console” button to view the output).

“Compress Chip IDs” takes boards whose IDs are spread out over large intervals (say 0, 7, 15, 23, …) and compresses the IDs down into 0, 1, 2, 3, … By entering a value in the “Start from:” field, the board addresses will start from the specified offset: e.g. if the number 8 is provided, the IDs would show 8, 9, 10, 11, … after the operations complete. It is recommended to do this to only eight boards at a time in order to prevent time-wasting glitches.

Custom Configurations

Earlier in "Multiple-row Marquee", the setup steps for a multi-row marquee were described. If you are looking to do something with a non-standard addressing format or want to do an odd shape like a heart or a picture frame, then you need to try clicking on the "Custom Layout" button.

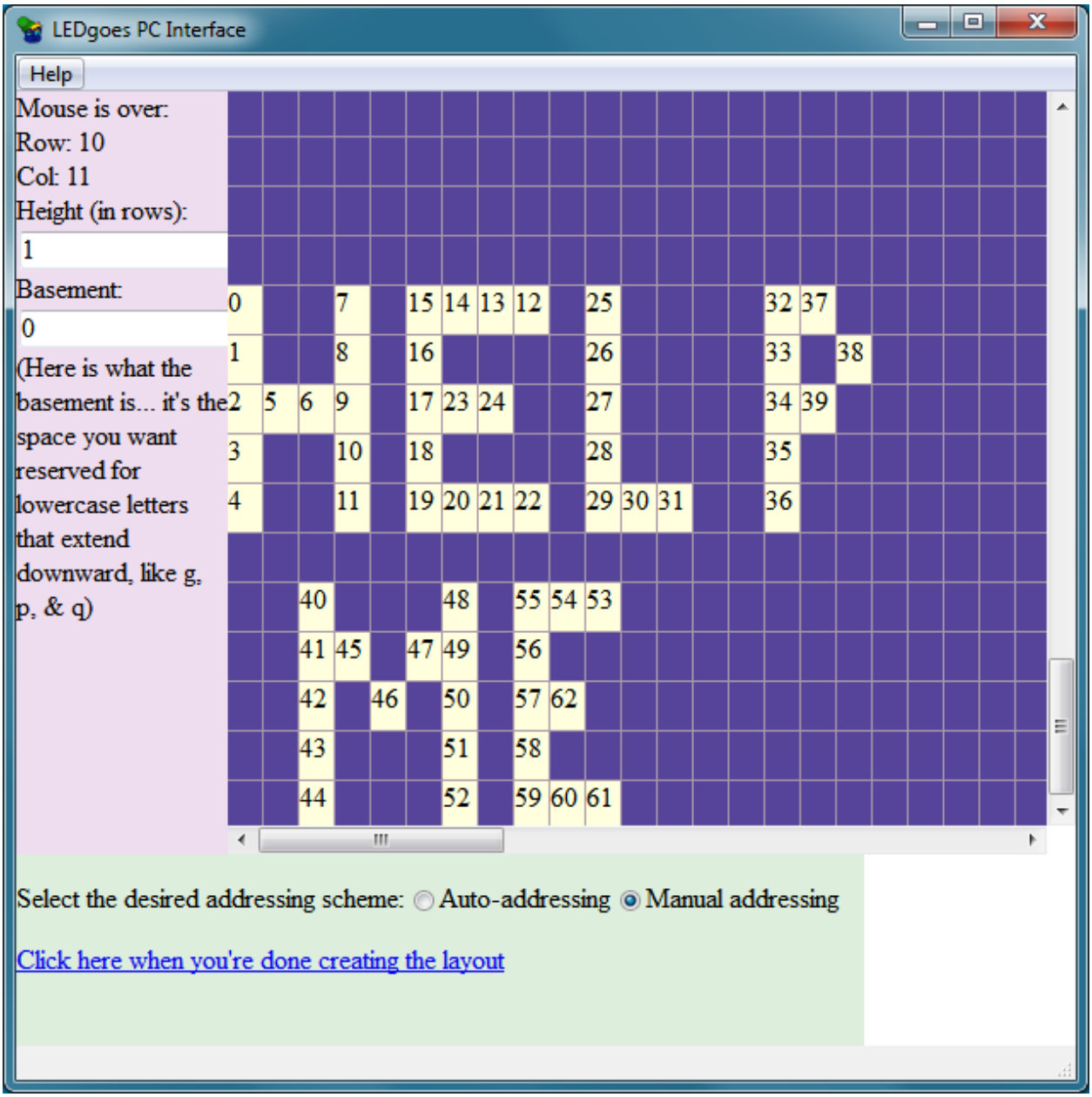

Fig. 16: The Custom Layout Configurator (or a cry for help from our poor manual writer?!).

When you enter this tool, you are greeted with a blank grid of purple boxes. Click and drag in the purple boxes to draw the layout of your matrix from left (lowest address) to right (highest address). As you click on boxes, they turn white and become filled with a number

indicating the expected address of that panel. Once you are done drawing your layout, click on the appropriate link on that page.

This feature "just barely" works – it has no Undo feature, and only Manual addressing mode works. There is no way yet to specify alternate addresses for panels (e.g. 1, 2, 3, 4 in a 4-panel board). In case it's not obvious to you, this widget is written in HTML so any HTML experts are encouraged to help bolster development of this feature.

Fonts

Currently, only one font and one size is supported by the BriteBlox software. BriteBlox-specific fonts are written in JSON format, and multiple sizes and weights can be specified in the same file. I'm about to have a UI emergency and really need to rethink the application layout before I add too many more features in this area.

Baud Rate Calculator

For a panel of a certain length, find out at what baud rate the chips must run at in order to maintain a particular scroll rate. A rate of 12 columns per second tends to be the bare minimum at which the scrolling effect looks good, and this number could increase with a longer matrix. A scroll rate of 25-30 columns per second tends to be very pleasing to the eye.

Troubleshooting

If there is a problem you don't see listed here, please contact us and the solution might get listed in the next version of this instruction set!

General troubleshooting steps – try these after other ideas presented for specific cases below

- Use the "Show Test Pattern" firmware operation with "All" boards to make sure all chip IDs are set as expected. The numbers should conform to the algorithm described in "Using the BriteBlox Software". If not, use the "Reset All Chip IDs" in the Firmware tab to reset all chip IDs. If you are using auto-addressing, make sure 5 volts is being applied to pin 6 of your first board and ground is applied to pin 6 of your last board, and that pin 6 is connected throughout all boards, before resetting.
- Use the Increment, Decrement, or Set a Chip ID tools in the Firmware tab to reset the faulty chip ID, as long as no other boards are indicating the same address.
- If two or more boards constantly have the same address even after resetting all chip IDs, or are resetting themselves to 0 or another number, hard-code the board's address by isolating it from the rest of the panel, then use the tools described above and program the desired address to memory with the "Save Chip ID" button.
- If you are able, try reflashing the firmware onto the microcontroller exhibiting the issue. You can obtain the firmware from out GitHub page.

The boards are not powering on

- Make sure the power switch for either the Wall POWAH, Battery POWAH, or USB Communicator is in the ON position, and that the necessary battery, power jack, or cable is plugged in and/or charged. On the USB Communicator, you must select the 5V output.
- Make sure the board is getting 5 volts in from pin 1 (the bottom pin among the right-angle headers), and that the ground wire is plugged into pin 2.
- Remove some boards from your marquee; perhaps one is bad and needs to be RMA'd.
- If some boards are not powering on in a long matrix, add another power supply to the other side.
- Try different LED panels if you have extras available.
- If you are able, try reflashing the firmware onto both microcontrollers of one board. You can obtain the firmware from out GitHub page.

A board's address looks strange, like two numbers are lit up at once in different colors

- This may not be a big deal. Have you tried sending text to the marquee yet? If that particular panel still causes trouble, try the General Troubleshooting Steps listed above.

Some of the boards are not receiving data over the serial line

- Make sure the number of boards in your matrix is properly reflected in "Rows" and "Panels Per Row" on the top of the BriteBlox application window.
- If a panel is showing a baud-rate pattern (as described in "Baud Rate Patterns"), look up the baud rate pattern, and send a firmware instruction to that board at that baud rate to move to the desired baud rate. Then, you can restart your regular information display.
- Power-cycle the marquee.
- Try the General Troubleshooting Steps listed above.
- Try printing a message on this board in all three colors. If some of the colors do indeed work, try replacing the LED panel.

None of the boards are receiving data over the serial line

- Check that your matrix is powered.
- Make sure the number of boards in your matrix is properly reflected in "Rows" and "Panels Per Row" on the top of the BriteBlox application window.
- Cycle the connection by clicking "Connect" and "Disconnect" on the top right of the BriteBlox program window until the program has appeared to connect to the desired COM port.

- Make sure the COM port is selected in the software is truly the device you want to use. Try all the COM ports, or see which one disappears if you unplug your matrix and/or the communication device from power.
- Make sure nothing is sending out electrical signals or competing serial signals on the serial lines (pins 3 & 4), and that nothing electric in general is touching these lines. Only one serial device at a time can drive the serial transmission line.

The marquee's display looks jumbled or like a big rotten mess

- If a panel is showing a baud-rate pattern (as described in "Baud Rate Patterns"), look up the baud rate pattern, and send a firmware instruction to that board at that baud rate to move to the desired baud rate. Then, you can restart your regular information display.
- You may be under-powering or over-powering your boards. Make sure a steady, clean 5 volts is being applied to every board. Very long marquees will need power supplies at either end.
- Power-cycle the matrix.
- Try the General Troubleshooting Steps listed above.

Some panels look like they're showing the same things as other panels, or are out of order

- Try the General Troubleshooting Steps listed above.

Some panels do not seem to be displaying information in all colors

- Power-cycle the matrix.
- Try the General Troubleshooting Steps listed above.

Additional Support

Questions? Comments? Email us at sales@BriteBlox.com. Find us on Twitter at @BriteBlox_display, or on Facebook at https://www.facebook.com/BriteBlox.display.

Appendix A: Jumper Settings

Partnerboards that provide power (except for early Wall POWAH) feature the capability to control what goes to Pin 6 through the use of jumpers. Below is an explanation of what each possible jumper setting will cause Pin 6 to become.

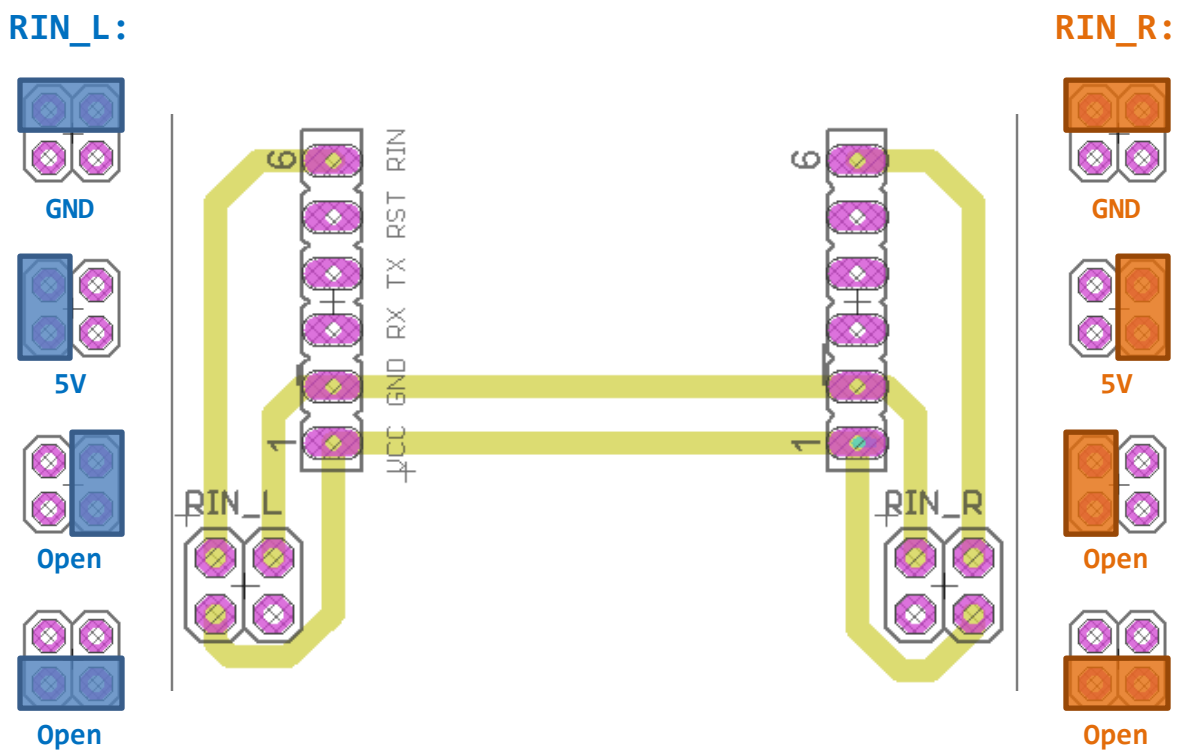

Fig. 17: RIN/Pin 6 jumper settings for Partnerboards. This can be used in your project to provide an extra 5V or GND connection or facilitate auto-addressing. If you are using a Wall POWAH board on the left side of a Partnerboard with jumpers like this, **do not leave the left jumper in the GND configuration**! It will cause an electrical short, putting you at risk of destroying your products or causing physical damage to something else.

Appendix B: USB Communicators Registered Under BriteBlox

In order for a system to identify USB devices, they are programmed with distinct Vendor IDs & Product IDs (VID:PID)s. Several of our early hand-built USB Communicators had the custom VID:PID combination of 0403:7AD0 (hexadecimal) as opposed to the usual 0403:6001 (hexadecimal) that usually comes with FTDI FT232RL chips. There are two advantages of using the 0x7AD0 PID:

- These devices are not susceptible to the "bricking" incurred when certain FTDI chips are configured on a Windows machine with FTDI driver version 2.12 from on or around September 2014.

- It is easy to filter for these devices in BriteBlox PC Tools and reduces the amount of choices for the user (and thus confusion) when trying to pick the right communication port.

However, there were a couple disadvantages which ultimately caused to stop shipping USB Communicators with the 0x7AD0 PID for the time being:

- We could not get a working Linux driver using our special VID:PID combination.
- The software program filtering would not be able to distinguish legitimate BriteBlox Bluetooth serial devices. Thus, only USB Communicators would be shown with filtering enabled, and that would be confusing.

If you are OK with the downsides of using the 0x7AD0 PID, there are ways on various platforms to set the new PID. If you do this, you will have to install the BriteBlox USB drivers for your particular platform, available on our website: http://www.ledgoes.com

The filtering can be toggled by selecting the "Show Only BriteBlox Communicators" option from the "Settings" menu, as such:

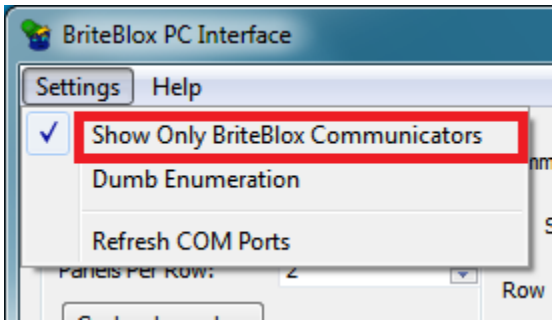

Fig. 18: Where to find the USB VID:PID filter for BriteBlox USB Communicators.