5x7 Matrix Blinkie – User Guide

The 5x7 Matrix blinkie does more than just blink – it has three modes:
* Normal
* Demo
* Programming

The normal mode displays the current pattern, while broadcasting the current pattern number via IR. It can infect other blinkies with the currently displayed pattern, as well be infected itself.

The demo mode displays each pattern for two minutes, before moving onto the next. It cannot infect, nor be infected by other blinkies.

The programming mode allows the first message to be changed.

Normal Mode

This is the default mode. The current message or pattern will display.

When the 5x7 Matrix Blinkie is first turned on, it will light all the LEDs, then start displaying a pattern or message. There are three way to change what is displayed.

Via the button on the 5x7

To change the currently displayed pattern, press and hold the button. This will cause the pattern number to be displayed in binary as in *Figure 1*. If you continue to hold the button, the pattern number will begin to count up (in binary). Releasing the button at the point will select that pattern. If you continue to hold the button, the pattern number will continue to increment to the last pattern, and then start counting from the first pattern.
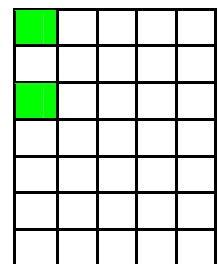
Figure 1

Via other blinkies

Every blinkie in normal mode that has an IR LED will transmit its pattern code every 60 seconds. Every blinkie in normal mode that has an IR receiver can receive that pattern code - if it successfully receives the code, then it will switch to that pattern.

In other words, each blinkie tries to infect every other blinkie with its currently display pattern!

Yes, it's fairly chaotic at first, but ultimately all blinkies in a room will converge to one pattern.

A few caveats:
- This does not change a *stored* pattern, it only changes the *displayed* pattern.
- A message is just another pattern. If Dale's 5x7 has "Foo!" as pattern one, and Dwayne's has "Bar!" as pattern number one, then no matter which 5x7 wins, Dale's is still "Foo!" and Dwayne's is still "Bar!".
- Other blinkies also transmit their pattern number. For example, a 6 LED Circle can infect a 5x7 Matrix and vice versa. Once again, the pattern number is transmitted, not the pattern.

Via a remote

The "channel up" and "channel down" keys on the remote will change the pattern.

We chose the most popular IR signaling protocol, "Philips RC-5". Since no one normally cares about the signaling protocol, IR remote controllers are never labeled this way. This makes it a little more challenging to find one that uses this particular protocol. Here are a couple of options:
  1.) Try yours and see. Philips, Sony, Dish, and many others use RC-5.
  2.) Get a universal remote, and use various Philips or Sony codes. You may have to try a few to find the right one.

Demo Mode

The 5x7 will display each pattern for two minutes, before moving the next pattern.

It's a simple toggle. If not in demo mode, this procedure will turn it on. If it's already in demo mode, this procedure will turn it off. There are two ways to toggle demo mode:

Via the button on the 5x7

Starting with the board turned off, hold down the button, and turn on the power. You should see all the LEDs turn on, and then the first character of the current message will be displayed. Once you see the first character, you can release the button. Turn the power off. Turn the power on.

While in demo mode, you can still change patterns, but the display will be slightly different. While changing patterns, all LEDs on the right side will be lit, in addition to the current pattern number (in binary) being displayed to the left as in *Figure 2*.

In demo mode, the blinkie will not listen for other blinkies. It cannot be infected while in this mode.
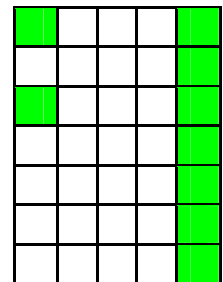

Figure 2

Via a remote

The "TV on/off" key on the remote will toggle the board between normal and demo mode.

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> 2.) Get a universal remote, and use various Philips or Sony codes. You may have to try a few to find the right one.

Programming Mode

Also known as "How to I change the message on my blinkie board?"

We chose the most popular IR signaling protocol, "Philips RC-5". Since no one normally cares about the signaling protocol, IR remote controllers are never labeled this way. This makes it a little more challenging to find one that uses this particular protocol. Here are a couple of options:
> 1.) Try yours and see. Philips, Sony, Dish, and many others use RC-5.
> 2.) Get a universal remote, and use various Philips or Sony codes. You may have to try a few to find the right one.

Starting with the board turned off, hold down the button, and turn on the power. You should see all the LEDs turn on, and then the first character of the current message will be displayed. Once you see the first character, you can release the button. You are now in programming mode.

The "channel up" and "channel down" keys on the remote will change the current character. For each key press on the remote, the display will cycle through:

```
 !"#$%&■()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM
NOPQRSTUVWXYZ[\]^_abcdefghijklmnopqrstuvwxyz■⌂
```

To help speed up editing, the "0" key on the remote will toggle between upper and lower case.

The "volume up" and "volume down" keys on the remote allow you to move through the characters of the message.

When you finish the message, you need to mark the end of the message by pressing the "9" key on the remote. The character in *Figure 3* shows the special "end-of-message" character. You need to do a "volume up" and "volume down" to save the message.

Once you are done with the message you can turn the blinkie off and on to exit the programming mode.
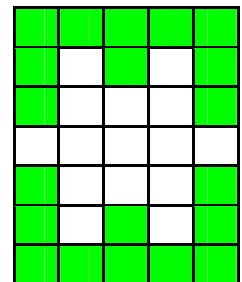

Figure 3

If you have a board with bi-color LEDs, you can use the "1", "2", or "3" keys to change the color of the character. The character in *Figure 4* will be displayed while in programming mode to show where in the message the location of the color changes.
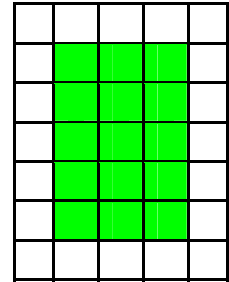

Figure 4

Ok, that seems easy ☺. Here is a programming example to change the first message to "Blink This!"

1.) On the 5x7, hold the button while turning on the power.
2.) Hold until the first character appears.
3.) Press the "channel up" or "channel down" button until a "B" is displayed. For each key press on the remote, the display will cycle through:

    `!"#$%&■()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM`
    `NOPQRSTUVWXYZ[\]^_abcdefghijklmnopqrstuvwxyz■✿`

    To help speed up editing, the "0" key on the remote will toggle between upper and lower case.
4.) If you have bi-color LEDs, press "1", "2", or "3" to change the color of the characters.
5.) Press the "volume up" key to move to the next character.
6.) Repeat steps 3, 4, and 5 for the rest of the message.
7.) Press the "9" key to set the "end of message" character.
8.) Press the "volume up" key and then the "volume down" key.
9.) Turn the blinkie off and on.

Hopefully, you will now have "Blink This!" scrolling across the 5x7.

Interestingly, the end-of-message character merely tells the blinkie when to stop displaying the message. The other characters still exist past it, thus later the message can be made longer by changing the end-of-message character to a regular character. In this way you can have a short message, and then later extend it to up to the maximum length – indicted by the ✿ special character.

Special powers

If you hold down the button while turning on the 5x7 Matrix, it will send a command to toggle the TV's power. If a TV is on, it will turn it off. If the TV is off, it will turn it on. This, of course, assumes the TV conforms to the "Philips RC-5" protocol...