TEXAS INSTRUMENTS

TI-RGB Array
Setup Guide

Important Information

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Contents

TI-RGB Array

What is TI-RGB Array?

TI-RGB Array is an accessory to TI-Innovator™ Hub.

TI-RGB Array has 16 programmable RGB LEDs.

Multiple applications

- Smart greenhouse
- Binary counter
- STEAM projects
- Coding lessons
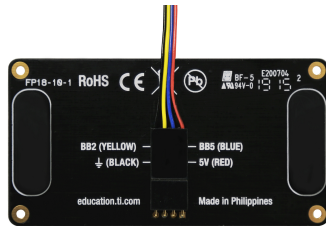
TI-RGB Array – Industrial design and markings

Top view of TI-RGB Array.

Bottom view - identifying label.

Requirements for TI-RGB Array:

Hardware:

Add-on TI-RGB Array to TI-Innovator™ Hub

Use Hub Sketch v1.4 or later

Connecting the TI-RGB Array

Follow these set of steps in this order to connect and use the TI-RGB Array.

Connect the TI-RGB Array to the TI-Innovator™ Hub

TI-RGB Array   **Provided Cable**   **TI-Innovator™ Hub**
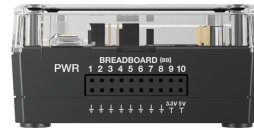
STEPS

1. Connect one end of the provided cable to the TI-RGB Array port labeled:

2. Connect the corresponding wires to the usable pins on the Hub labeled:

   Red: 5V - power

   Blue : BB5 - analog out

   Yellow: BB2 - SPI signal

   Black: ⊪ GND - ground

Connect the TI-Innovator™ Hub to a Graphing Calculator

The TI-Innovator™ Hub connects by a USB cable to a graphing calculator or computer. The connection lets the Hub receive power and exchange data with the host.

See complete details (page 3).

Connecting TI-Innovator™ Hub

The TI-Innovator™ Hub connects by a USB cable to a graphing calculator or computer. The connection lets the Hub receive power and exchange data with the host.
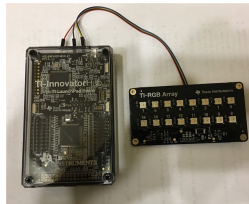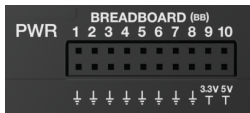
Note: Some peripherals, such as motors, may require auxiliary power. For more information, see Using an Auxiliary Power Source (here).

Connecting to a Graphing Calculator

1. Identify the "**B**" connector on the USB Unit-to-Unit (Mini-A to Mini-B) cable. Each end of this cable is embossed with a letter.

2. Insert the "**B**" connector into the **DATA** port at the bottom of the TI-Innovator™ Hub.

3. Insert the free end of the cable (the "**A**" connector) into the USB port on the calculator.
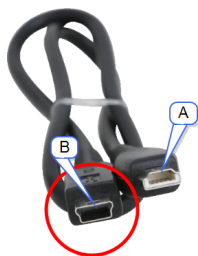
Hub connected to
TI CE Graphing Calculator

Hub connected to
TI-Nspire™ CX Handheld

4. Turn on the calculator if it is not already on.

   The power LED on the Hub glows green to show that it is receiving power.

Connecting to a Computer Running TI-Nspire™ CX Software

1. Identify the "**B**" connector on the USB Standard A to Mini-B cable for Windows®/Mac®. Each end of this cable is embossed with a letter.

2. Insert the "**B**" connector into the **DATA** port at the bottom of the TI-Innovator™ Hub.

3. Insert the free end of the cable (the "**A**" connector) into a USB port on the computer.

   The power LED on the Hub glows green to show that it is receiving power.

TI-RGB Array Commands

Prerequisite: Use the Send "Connect RGB" Command First

The "**CONNECT RGB**" command needs to be used first when using the TI-RGB Array. The "**CONNECT RGB**" command configures the TI-Innovator™ Hub software to work with the TI-RGB Array.

It establishes the connections to the various led binary slots on the TI-RGB Array – 0 through 15 RGB LED. It also clears the various counters and sensor values.

For additional commands see: education.ti.com/eguide

CONNECT RGB

Command:	CONNECT RGB
Command Syntax:	**CONNECT RGB**
Code Sample:	`Send "CONNECT RGB"`
Range:	N/A

Command:	CONNECT RGB
Describe:	The "**CONNECT RGB**" command configures the TI-Innovator™ Hub software to work with the TI-RGB Array.
Result:	Connects the TI-RGB Array to the TI-Innovator™ Hub. The TI-RGB Array is now ready to be programmed
Type or Addressable Component:	All components of the TI-RGB Array. **See Also:** Commands to use with TI-RGB Array

Command:	CONNECT RGB AS LAMP
Command Syntax:	**CONNECT RGB AS LAMP**
Code Sample:	`Send "CONNECT RGB AS LAMP"`
Range:	N/A
Describe:	This command will enable the "high brightness" mode of the TI-RGB Array as long as an external power source (like the USB battery) is connected to the **PWR** port. **Note:** "AS LAMP" will need to be typed in.
Result:	The TI-RGB Array is now configured to be in high-brightness mode. If the external power is not connected, the "**AS LAMP**" has no effect – i.e. the brightness will be at the default level. Also note, an error will be indicated by a beep tone.
Type or Addressable Component:	All components of the TI-RGB Array. **See Also:** Commands to use with TI-RGB Array

SET RGB

Command:	SET RGB n r g b
Command Syntax:	**SET RGB n r g b** **SET RGB eval(n) r g b**
Code Sample:	`Send "SET RGB 1 255 0 255"`
Range:	0-15 for 'n', 0-255 for r,g,b

Command:	SET RGB n r g b
Describe:	The SET RGB command controls the brightness and color of each RGB LED in the TI-RGB Array
Result:	The specific LED lights up with the specified color
Type or Addressable Component:	All components of the TI-RGB Array **See Also:** Commands to use with TI-RGB Array **See Also:** SET RGB ALL

SET RGB [n1 n2 n3...] r g b

Command:	SET RGB [n1 n2 n3...] r g b
Command Syntax:	**SET RGB [n1 n2 n3...] r g b**
Range:	A max of 16 LEDs can be specified.

Code Sample:	```SET RGB [1 3 5 7] 200 0 200```
	Sets LEDs #1, 3, 5 & 7 to purple (red + blue).
	Note: If using eval() with a variable for the **LED** number, make sure there's a preceding space before the 'eval()'.
	```SET RGB [eval(i) eval(i+1)] 255 0 255```

Describe:	Set the **LED**s specified by their numbers to the specified color.
Result:	
Type or Addressable Component:	All components of the TI-RGB Array.

SET RGB PATTERN nnnn r g b

Command:	SET RGB PATTERN nnnn r g b
Command Syntax:	**SET RGB PATTERN nnnn r g b** nnnn – can be a decimal or a hexadecimal number.
Range:	nnnn – 0 to 65535

Code Sample:	```SET RGB PATTERN 100 255 0 255```
	Display the number 100 in binary form on the RGB array and set the color of the LEDs to purple.
	```SET RGB PATTERN 0X100 255 0 0```

Command:	SET RGB PATTERN nnnn r g b
	Display the hexadecimal number 100 (equal to 256 in decimal) in binary form on the RGB array and set the color of the LEDs to red.
Describe:	Display the pattern indicated by the number using the specified color.
Result:	
Type or Addressable Component:	All components of the TI-RGB Array.

SET RGB ALL

Command:	SET RGB ALL r g b
Command Syntax:	SET RGB ALL r g b
Code Sample:	`SET RGB ALL 255 0 255`
	`SET RGB ALL 255 0 0`
	`SET RGB ALL eval(R) eval(G) eval(B)`
	`SET RGB ALL 0 0 0`
Range:	
Describe:	To control all the LEDs in a single command use: SET RGB ALL r g b
Result:	Control all LEDs in a single command
Type or Addressable Component:	All components of the TI-RGB Array

READ RGB

Command:	READ RGB
Command Syntax:	Send "READ RGB"
Code Sample:	`Send "READ RGB"` `Get c`

Command:	READ RGB
Range:	
Describe:	Returns the value of the current consumed by the TI-RGB Array in mA
Result:	
Type or Addressable Component:	All components of the TI-RGB Array **See Also:** New Commands to use with TI-RGB Array

General Precautions

TI-RGB Array

- Do not expose the TI-RGB Array to temperatures above 140°F (60°C).
- Use only the Ribbon cable provided with the TI-RGB Array.
- When inserting the Ribbon cable into the TI-RGB Array connectors, make sure the red (dark) wire pin is inserted into the 5v hole.
- Use the TI-RGB Array no closer than 8 inches to your eyes.
- Rest your eyes periodically by focusing on an object at least 5 feet away.

General Information

Online Help

education.ti.com/eguide

Select your country for more product information.

Contact TI Support

education.ti.com/ti-cares

Select your country for technical and other support resources.

Service and Warranty

education.ti.com/warranty

Select your country for information about the length and terms of the warranty or about product service.

Limited Warranty. This warranty does not affect your statutory rights.

TEXAS INSTRUMENTS