LENTARK

FEATURES

∏ High Sensitivity Electret Microphone: -58dB

∏ Flicker-Free Quick Switching: 2.5 KHz

∏ Programmable Color Properties:
   o GAIN: Maximum Gain Limit.
   o SPD: Color Reaction Speed.
   o BRT: Color Brightness.

∏ Built-in RGB LED to Monitor Color Output.

∏ Outputs Allocated to Monitor Audio Signals:
   o AO1: Raw Audio Signal Output.
   o AO2: Processed Audio Signal Output.

∏ Wide Supply Voltage Input Option:
   o 9-12V Supply Input.
   o 5V Supply Input.
   o Micro USB 5V Supply Input.

∏ Strong Switching Output: 330 mW Total
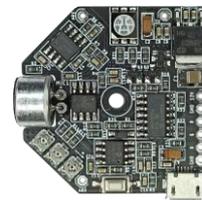
APPLICATIONS

∏ 12V RGB LED Strip Applications.

∏ Audio Monitoring and Analysis Applications.

∏ Hobby Applications.

GENERAL DESCRIPTION

CTS-RGB detects sounds in the environment, converts them into electrical signals and analyzes them to the signals required for colors. These electrical signals are amplified and transmitted to outputs so that they can be used simultaneously on multiple RGB driver cards such as the DVR-RGB driver card. You can find descriptions of inputs and outputs in **Table 1**.

There are three adjustable resistors on the module to change the output characteristics. With these adjustable resistors, the maximum perception distance of the device, the reaction speed of the colors to the sounds and the brightness of the colors can be adjusted. In addition, there are unprocessed and processed audio signal outputs on the device, which are reserved for use in different applications.

CTS-RGB is full of surprises. You will experience the excitement of discovering the product while accompanying your speech or the music in your environment.

INPUT/OUTPUT DESCRIPTION
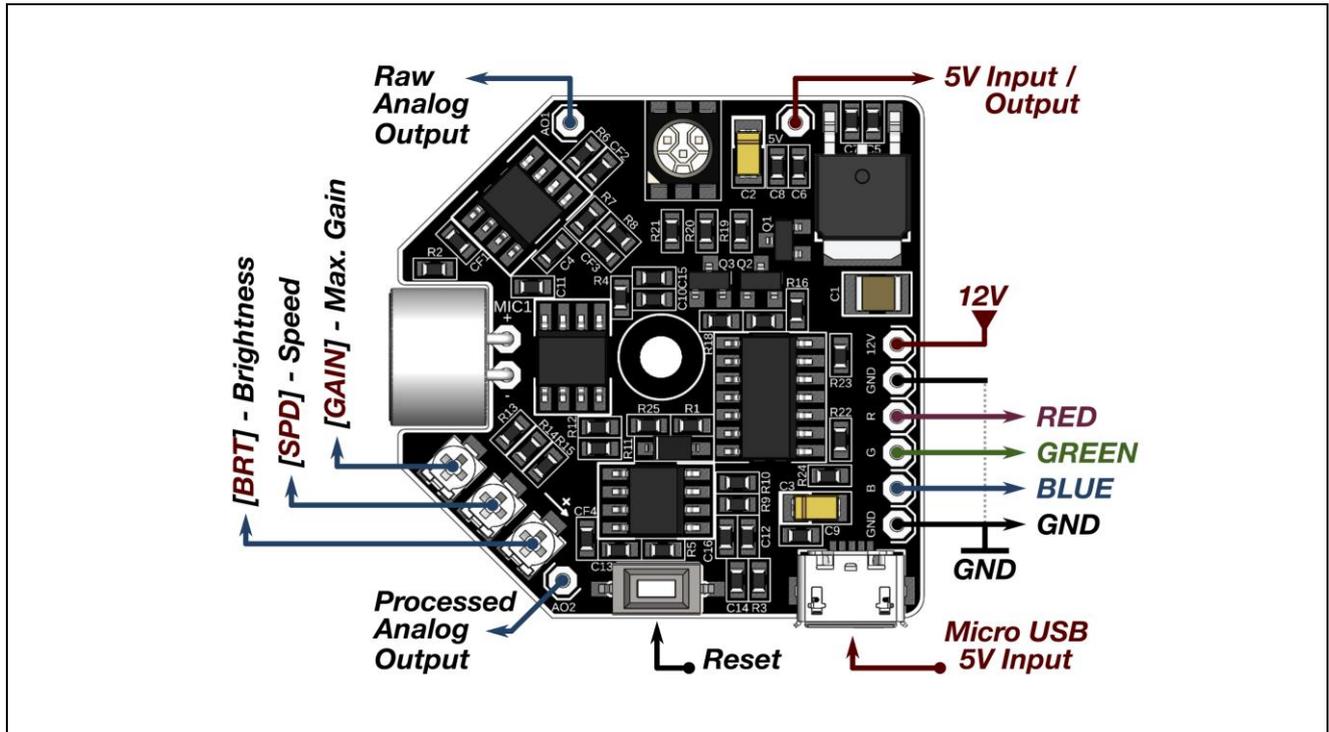
		Description	*Notes*
INPUT	*12V*	9V-12 DC Signal Input. (Rcmd. See **Note 1,2**)	Supply Option 1.
	5V	5V Signal Input. (Optional)	Supply Option 2.
	Mikro USB	5V Signal Input. (Optional)	Supply Option 3.
	GAIN	Maximum Detection Limit.	The device must be restarted or the **Reset** button is pressed to implement the changes.
	SPD	Speed at which Colors React to Sound.	
	BRT	Brightness of Colors.	
OUTPUT	*R*	Red Signal Output.	Signals are sent to these outputs by amplifying. Thus, it can be used as an input signal for multiple driver cards.
	G	Green Signal Output.	
	B	Blue Signal Output.	
	GND	Low Voltage Reference.	It is referenced to the low voltage of driver circuit.
	AO1	Raw Audio Signal Output. (Optional)	Outputs reserved for use in audio-related applications.
	AO2	Processed Audio Signal Output. (Optional)	

Table 1: *Input / Output Descriptions.*

Note 1: The reason *12V* input is recommended as the supply input is to ensure that all of the filter blocks designed for operation of the device with the lowest electrical noise are active. Some of these filter blocks are disabled when other feed options are used. If the second and third supply inputs are to be used, make sure that the energy source you connect is a source that can provide a linear signal under the electrical charge of the device. See **Electrical Characteristics**.

Note 2: Using only one of the three different feeding options allocated to operate the device is important for the healthy operation of the device and your energy supply. Trying to provide energy for different energy sources at the same time can put the safety of both the device and the energy sources at risk.

It is preferably to use the inputs and outputs specified in the Description column as "(Optional)". For normal use of the device, these inputs and outputs can be left without connection.

Color Selection Principle in General

CTS-RGB detects, translates and analyzes sounds in the environment. It selects parameters according to the re iterity, frequency, intensity, different intensity of similar sounds, fluctuation, and many other similar characteristics. These parameters ultimately have an impact on the two visuals. One is the color splash and the other is the base color change.

Color splash and changing the base color can occur in many ways according to the selected parameters. For example, repeating the sound in the environment in which the device is located, or the rhythm that is dominant in the sound will cause the base color to change faster. When this repetition or rhythm loses its effect, the base color will begin to lose speed. The threshold level of repetition required to accelerate is not always the same. Each parameter affects another. In this way, the device neither performs an ordinary function by repeating itself, nor displays an incomprehensible attitude by random color selection.

## *Detailed Description of Trimpots and Button*
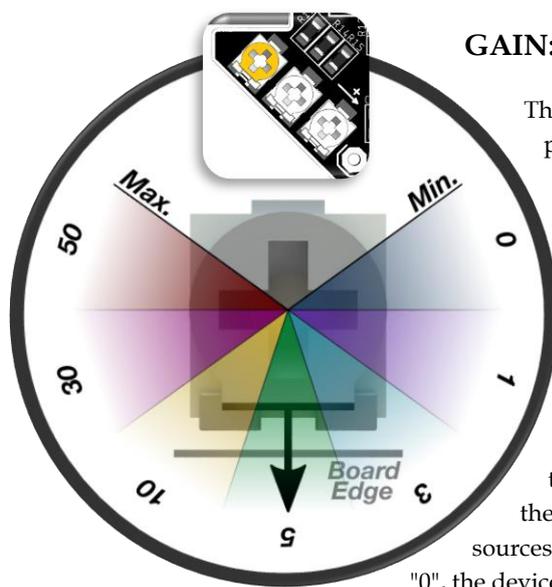
GAIN: Determines the maximum gain coefficient of the device.

The device automatically adjusts the gain coefficient depending on its proximity to sound sources and sound intensity. If the distance between the sound source and the device or the intensity of the sound source is changed, the device changes the gain factor to change its sensitivity to sounds. If the distance is increased or the intensity is decreased, it increases the gain coefficient towards its maximum level. This trimpot is used to determine this maximum coefficient.

In this case, if the maximum gain coefficient is selected as "1", the device will only be sensitive to close-range audio sources. When this coefficient is selected as "50", if there is no sound source nearby, the device will increase its sensitivity over time in order to detect audio sources over long distances. If the maximum gain coefficient is selected as "0", the device will not react to the sound.

The maximum gain coefficient determines the limit for how far the device can search for a sound source in case of a lack of sound source.
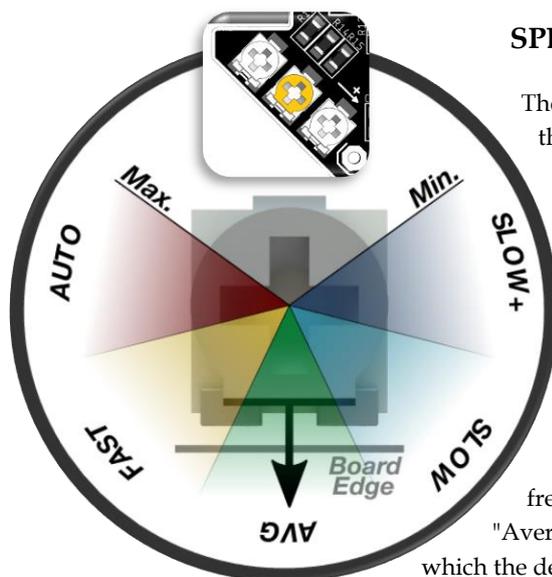

SPD: Determines the speed at which colors react to sounds.

The device chooses colors depending on the intensity and frequency of the sound signals. The color selection is not random, but it is not exactly canonical either. However, in general, the higher the intensity of the sound wave, the faster the response of the colors, and the lower the intensity, the slower the response of the colors.

In this case, the effect of the maximum gain coefficient can be considered. The device will increase its sensitivity when it detects low-intensity sound waves for a long time.

With this adjustable trimpot, you can select the program "Auto" in which the speed is determined automatically according to the frequency and intensity of the sound waves, or you can choose "Fast" - "Average" - "Slow" - "Slow +" according to the sound environment in which the device will operate.
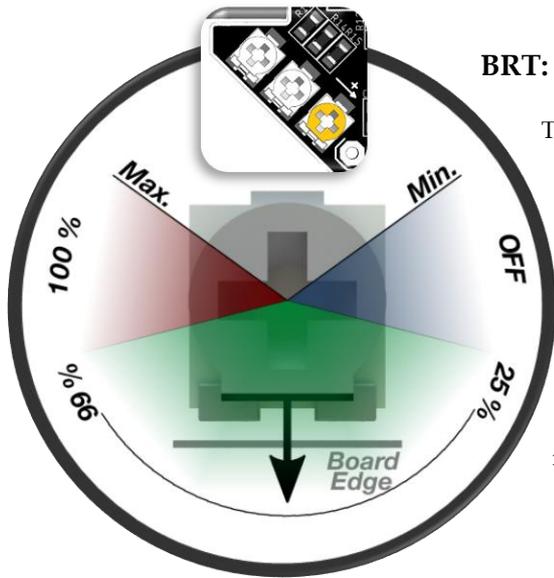
BRT: Determines the brightness of colors.

To change the brightness of colors, the device multiplies the data of the color signals produced by the percentage determined by this trimpot.

"100%" value is left with a wide range of space for easy selection of the value. The "OFF" value allocated for turning off LEDs is also left with a large area for easy selection.

In the remaining and green "dimmer" area, brightness selection of 1% sensitivity can be made, with a minimum of 25% and a maximum of 99%.
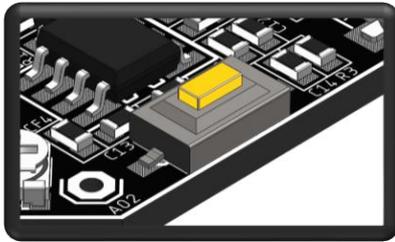
RESET: Used to restart the device.

This button is used to process the new values determined by the "GAIN", "SPD" and "BRT" trimpots on the device and to restart the program.
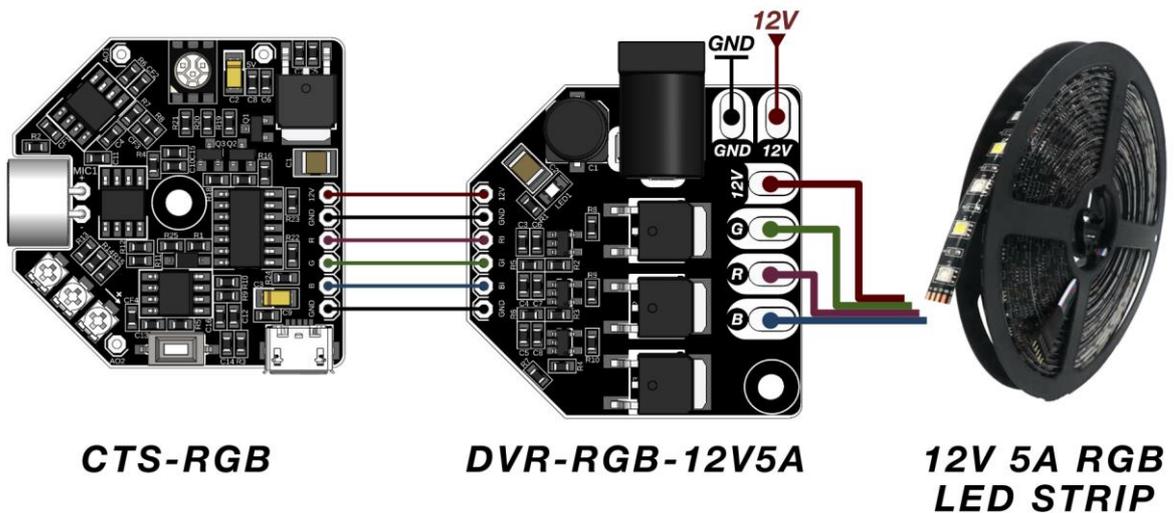
Example Connection Diagram

Figure 1: *Showing Connection of CTS-RGB Module to DVR-RGB-12V5A Module.*

ELECTRICAL SPECIFICATIONS

∏   Pushing the device to operate above the "Max." listed in the table below may cause the device to overheat and to take up permanent damage. It is inconclusive that the device will function beyond the operating limits as set out in this technical document. Prolonged exposure to work under "maximum" rating conditions may affect device reliability.

Table 2: *Electrical Specifications.*

Conditions: Unless Otherwise Noted, $T_O = +25^oC$, $V_{supply} = 12V$ and $BRT = 100\%$.							
Parameters		**Sym**	**Min**	**Typ**	**Max**	**Units**	**Condition**
Input							
Supply Voltage (12V Input)		V_{12V}	9	12	—	V	See **Table 1**
Supply Voltage (5V Input)		V_{5V}	—	5	—	V	
Supply Voltage (Micro USB)		V_{MUSB}	—	5	—	V	
Continuous Input Current		$I_{C,0\%}$	18	—	20	mA	BRT: 0% / 12V DC
		$I_{C,62\%}$	23	—	37	mA	BRT: 62%
		$I_{C,100\%}$	28	—	46	mA	BRT: 100%
		$I_{C,100\%,Load}$	29	—	48	mA	BRT: 100%
Output							
5V Signal Output Current Cap.		$I_{T,5V}$	—	—	50	mA	**Note 1**
R, G and B Signal Outputs	High Voltage	$V_{RGB,H}$	—	—	V_{5V} - 20	mV	
	Low Voltage	$V_{RGB,L}$	15	—	—	mV	
	Continuous Current	$I_{RGB,C}$	—	—	22	mA	For each
	Power Dissipation	P_D	—	—	330	mW	**Note 2**
AO1 Voltage Range		$V_{AO1,range}$	0.05	—	4.95	V	
AO1 Peak Current Capacity		$I_{AO1,peak}$	—	—	10	mA	
AO2 Voltage Range		$V_{AO2,range}$	0	—	4.92	V	
AO2 Peak Current Capacity		$I_{AO2,peak}$	—	—	30	mA	
Switching							
R, G and B Switching Frequency		f_{RGB}	—	2.5	—	KHz	
Frequency Tolerance				0.2		%	
Rise Time		t_R	—	0.8	1.1	μs	C_L = 100 pF
Fall Time		t_F	—	0.8	1.1	μs	C_L = 100 pF

Note 1 : The linear voltage regulator on the device energizes both the device and the 5V output with a series of filtering. In a case of 12V supply input, the current level that can be supplied from this output is determined as 50 mA.

Note 2 : Refers to the total power that can be supplied from R, G and B outputs.

Suggestions and Information

∏   In order for the device to work for a long time, make sure that the microphone on it does not come into contact with liquid or keep it in high humidity environments for a long time.

∏   For the electret microphone used on the device, the distance to the sound source, whether it is looking directly at the sound source or not is important in capturing the sound waves. Use this situation to your advantage to capture some sounds more dominant and others dimmer.

∏   Copper area reserved for thermal dissipation of linear voltage regulator is $10 \, Cm^2$ and copper thickness is 1 oz. Thermal resistances are $R_{thj-case} = 8 \, °C/W$ and $R_{thj-amb} = 100 \, °C/W$. The maximum operating temperature is $T_{op,max} = 150 \, °C$. If it is required to provide higher levels of current than the 5V output, it is important to consider the thermal properties of the linear voltage regulator.
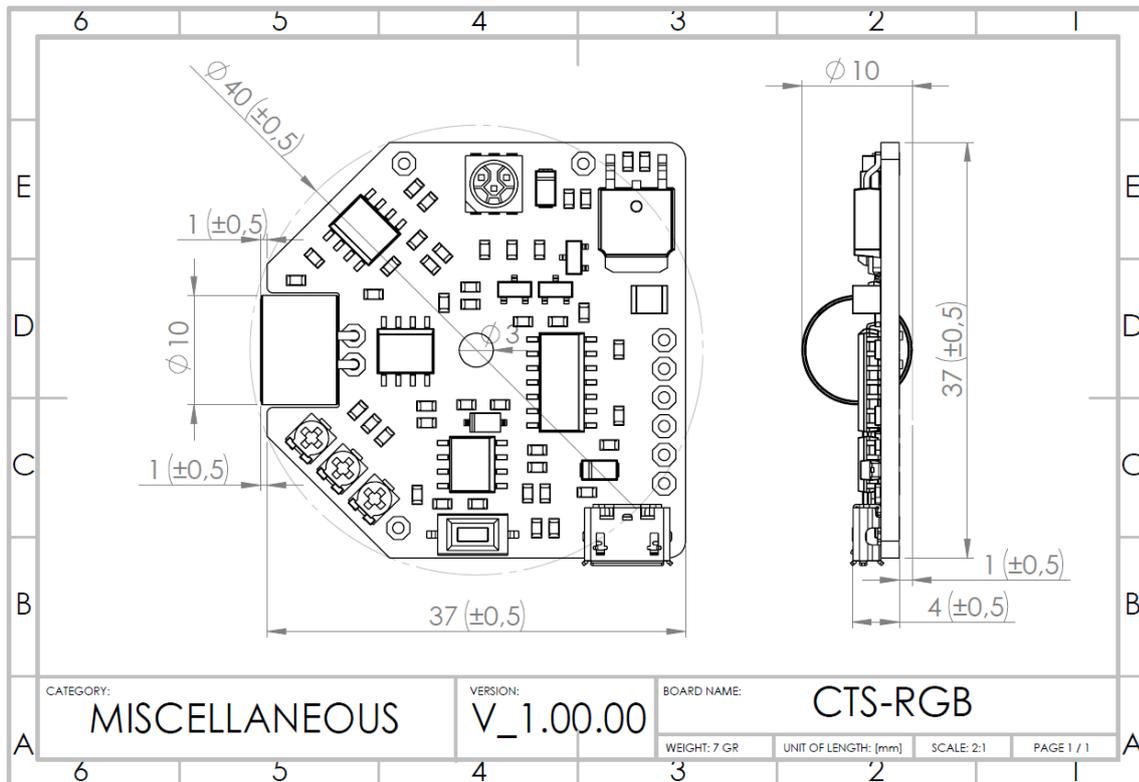
PRODUCT CODE

MIS - CTS - RGB

CATEGORY
GD : Gate Drivers
PC : Pwm-Cores
MM : Mini-Multimeters
DD : DC-DC Converters
MIS : Miscellaneous

GROUP: CTS : Control with Sounds.
DVR : Driver.
MUA : Micro USB Adapter.
RGB : RGB LED.

FUNCTION: RGB: RGB Control Board.

TECHNICAL DRAWING

CATEGORY: MISCELLANEOUS	VERSION: V_1.00.00	BOARD NAME: CTS-RGB			
		WEIGHT: 7 GR	UNIT OF LENGTH: [mm]	SCALE: 2:1	PAGE 1 / 1

Ø 40 (±0,5)
1 (±0,5)
Ø 10
1 (±0,5)
37 (±0,5)
Ø 10
37 (±0,5)
1 (±0,5)
4 (±0,5)
Ø 3

CONTACT INFORMATION

Lentark Electronics

Website   : www.lentark.com
E-mail   : info@lentark.com