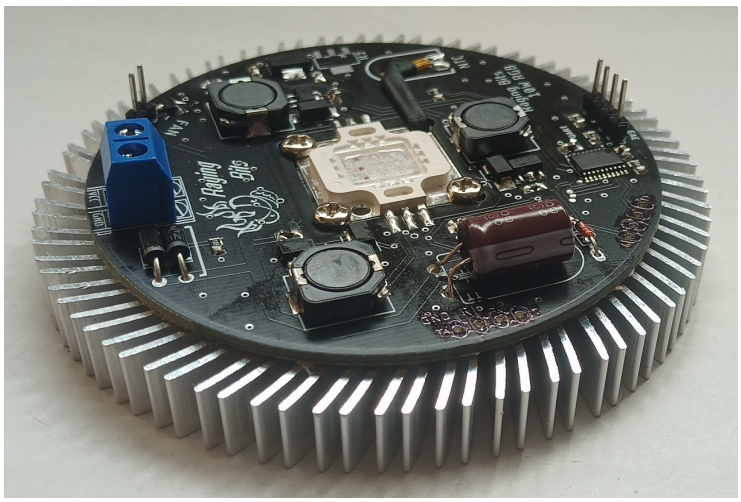
Raging Bits 10W RGB



Top level specs

Colour calibrated 10W RGB LED

24Bit color

Serial TTL port and ByWire Control (needs ByWire power driver)

13.5V MIN to 14.5V MAX

900mA@14V

Automatic Fan Control and Thermal shutdown

Table of Contents

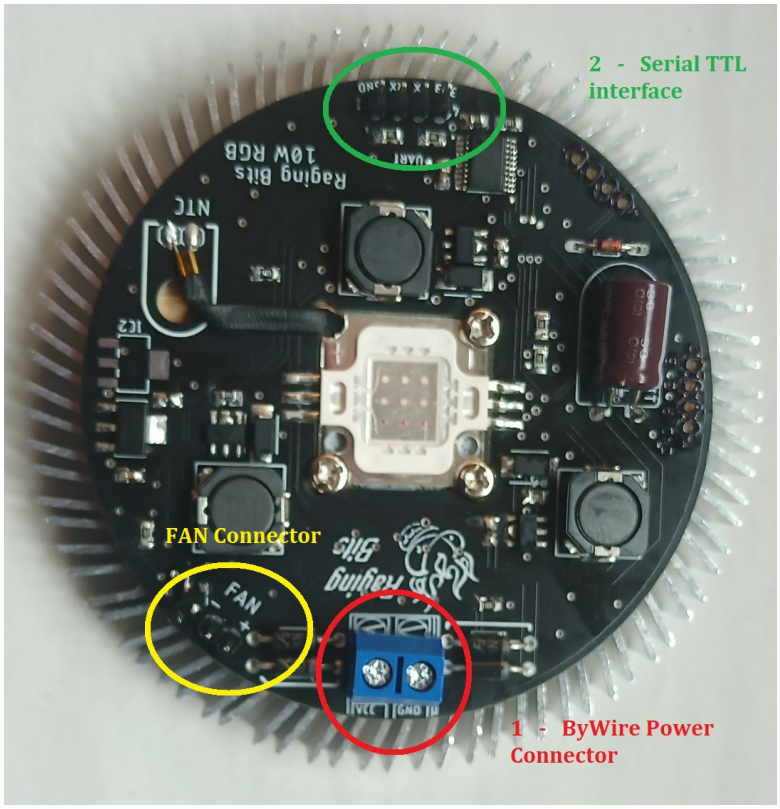
Notes and warnings

!!!ATTENTION!!!

Never power any other device that does NOT support ByWire at the used voltage in the same power line!!!
Never power more than 14.5V as absolute maximum!!!
Never short-circuit the fan connector nor connect the '+' to the ground plane!!!
Never pull the thermistor off the original setup!!!
Never attempt to tamper with other connectors or connection point that are not represented in this document!!!

Any of these actions will most likely partially or totally destroy the unit.

Device interface



PIN MAP

Connector 1

This connector provides the power for the unit.

It also supports ByWire control when a ByWire control setup is used.
ATTENTION – Very Important!!!
When using ByWire control ONLY CONNECT ByWire devices to the power lines

Connector 2

This connector allows the unit control via Serial TTL port.
UART speed at 9600 8 bits no parity (1start 1 stop bits).

Pinout:
1 – GND
2 – RX
3 – TX

4 – 3.3V (It can only supply up to 50mA)

Connector 3

Fan Connector able to power a fan up to 200mA at bus voltage.

INTERFACE AND COMMANDS

Commands

Each command is composed by command length, command ID and command data.

When a command is sent via ByWire, the command will have the unit Address as extra first byte.

Command ID	Functionality	Length	Data
0	Intensity set	2 bytes	0 to 100
1	Color	4 bytes	0 to 255 per component
2 (Serial port ONLY)	Unit Address	2 bytes	1 to 254

Intensity set (0x00)

The command composition is:

[0xHH] (*1) [0x02] [0x00] [0xNN]

Where

(*1) 0xHH is the unit Address (only expected in ByWire data);

0x02 is the command length;

0x00 is the command ID;

0xNN is the intensity value from 0 to 100.

Ex.: Setting 37% intensity in unit ID 5

Serial

Serial out > 0x02 0x00 0x25

Serial in < 'B'

(… unit busy)

Serial in < 'R'

(unit ready)

ByWire

ByWire out > 0x05 0x02 0x00 0x25

Colour set (0x01)

The command composition is:

[0xHH] *(1) [0x04] [0x01] [0xRR] [0xGG] [0xBB]

Where

(*1) 0xHH is the unit Address (only expected in ByWire data);

0x04 is the command length;

0x01 is the command ID;

0xRR is the Red Component value;

0xGG is the Green Component value;

0xBB is the Blue Component value;

Ex.: Setting colour white in unit ID 5

Serial

Serial out > 0x04 0x01 0xFF 0xFF 0xFF

Serial in < 'B'

(… unit busy)

Serial in < 'R'

(unit ready)

ByWire

ByWire out > 0x05 0x04 0x01 0xFF 0xFF 0xFF

Unit Address set (0x02) – Serial port ONLY

This command sets the unit ByWire Address. The new address becomes immediately active and it's permanent until a new address is set. The address must be a value between 1 and 254 inclusive.

The command composition is:

[0x02] [0x02] [0xNN]

0x02 is the command length;

0x02 is the command ID;

0xNN is the new Address to be set to the unit;

Ex.: Setting a unit with address 7

Serial

Serial out > 0x02 0x02 0x07

Serial in < 'B'

(… unit busy)

Serial in < 'R'

(unit ready)

ByWire

Cannot be done.

Interface - ByWire

Being ByWire an unidirectional protocol, the units will never answer when receiving a command.

Being ByWire an asynchronous protocol, the unit will always unsure

Each unit will be able to buffer up to 150 bytes of commands data.

The data will only be processed after all of it has been received after the ByWire byte frame timeout. The commands are processed in a FIFO fashion.

The units can be address by either unit Adress or broadcast if the address indicated is of value 255.

Interface - Serial Port

UART speed at 9600 8 bits no parity (1start 1 stop bits).

The serial interface only supports 1 command per message.

When sending commands through serial port, the unit will send a 'B' after 1 command to indicate that it is busy. When it's ready for another command, it will send an 'R'.

Any data sent to the unit while busy, it will be ignored.

Thermal protection and FAN

The unit has an NTC based internal temperature monitoring of the LED. The ranges and action temperature points are fixed and cannot be changed. The temperatures given in this document are measured on the heatsink, with a fixed relation window to the LED die junction itself, and are meant to protect early degradation by excessive degradation.

The fan activation will happen when the unit reaches the 40ºC and will only turn off when the unit temperature falls bellow 30ºC.

If the unit passes the 45ºC, it will turn off and blink red in low intensity to signalise that it's too hot.

The unit will turn on again to the previous setting when the temperature lowers from 43ºC.

The fan connector will supply the bus voltage at a maximum of 200mA.

The fan connector will provide power and an open-drain control to the GND.

Pictures of interest