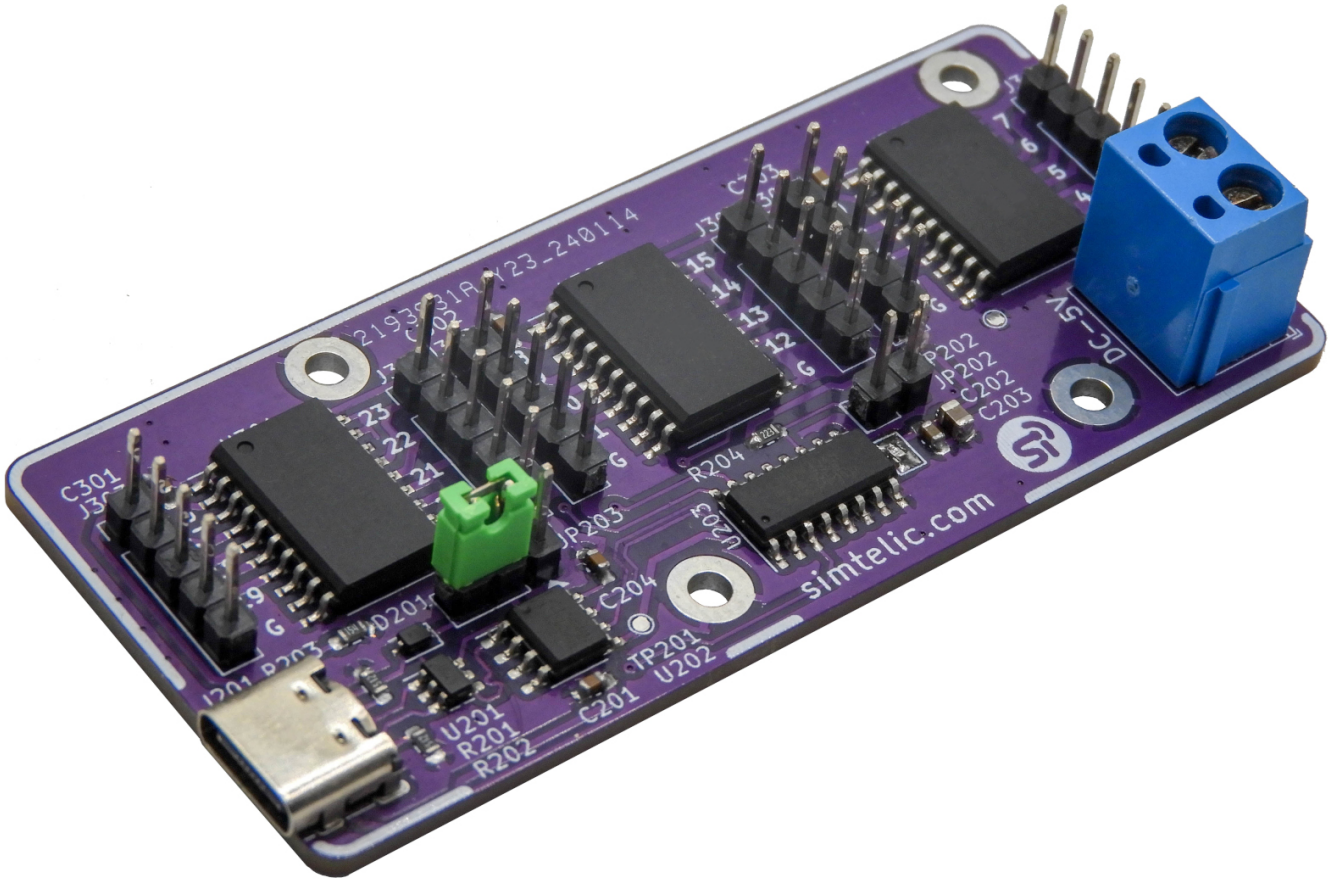
Simtelic



24 Channel USB Output Interface

Thank you for purchasing this Simtelic module.

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EL0001

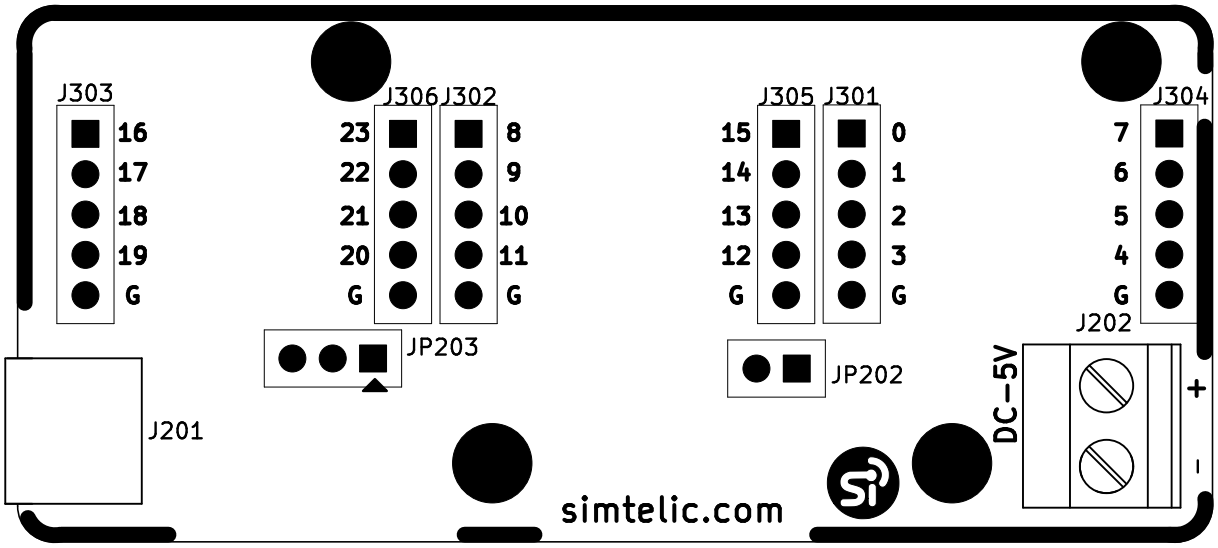
Introduction

Take command of your project with the robust 24-channel USB Output Module! This versatile module empowers you to individually control a wide range of devices directly from your computer through a user-friendly serial interface.

- **24 Independent Outputs:** Manage each channel with pinpoint precision, ideal for complex setups.
- **High-Power Handling:** Drive demanding loads like relays, solenoids, and more with confidence.
- **Dual Power Options:** Choose between USB bus power or an external 5V supply for seamless integration.
- **Simple Serial Interface:** Utilize intuitive AT-style commands to set, get, and clear outputs with ease.
- **Driver-Free Operation:** No need for complicated installations, allowing for immediate use.

Identify connectors and adjustments

Top Side



JP203 - To select the power source for this output interface module, adjust the jumper setting accordingly.

Selection	Mode
1 - 2	Module works with an external 5V power source applied to the J202
2 - 3	USB bus powered

J202 - Apply a 5V 500mA power source. This only applies if jumper JP203 is set to position 1 - 2.

JP202 - To set the outputs of this interface module at startup, use the jumper provided. If the jumper is left open, the outputs of the module will always be in the off position at startup. However, if the jumper is closed, the outputs will activate according to the user's configuration. To set the startup configuration, use the `STR` command.

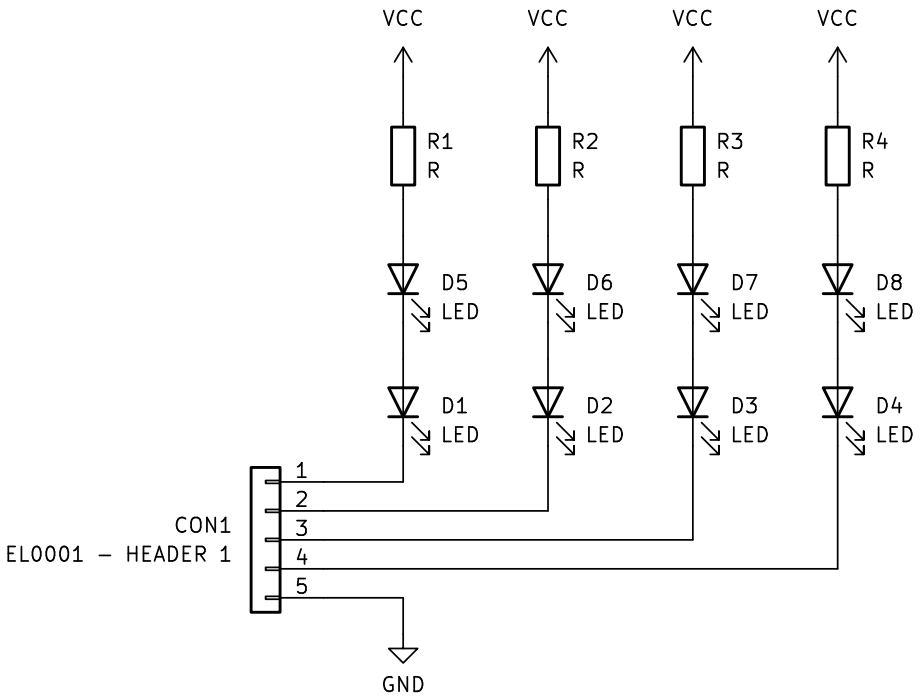
J201 - USB type C connector to establish connectivity with the PC or control device.

J30x - Each output terminal comprises of four DMOS transistor outputs and one ground pin. The ground terminal is always the fifth pin of the terminal and is labeled as "G" on the PCB.

Interfacing options

The output terminals of this module can tolerate a maximum of 45V with a continuous current of 150mA per pin. Each output pin has a voltage clamp for protection against inductive transients. Therefore, this module can be used to operate relays, solenoids, or medium current contactors.

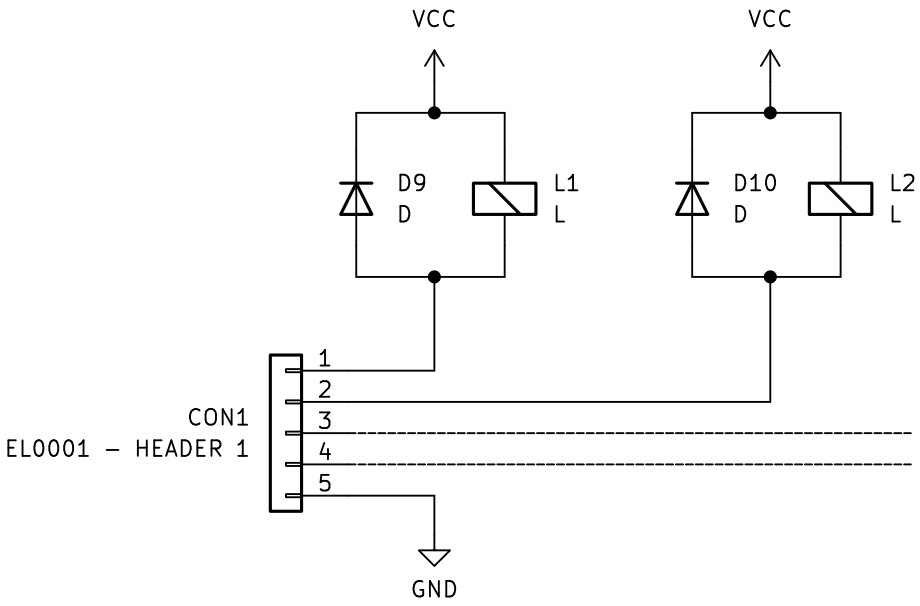
Interface series of low current LEDs



If the voltage of the supply is 12V and two 2.2V LEDs are used, a 470Ω resistor is recommended.

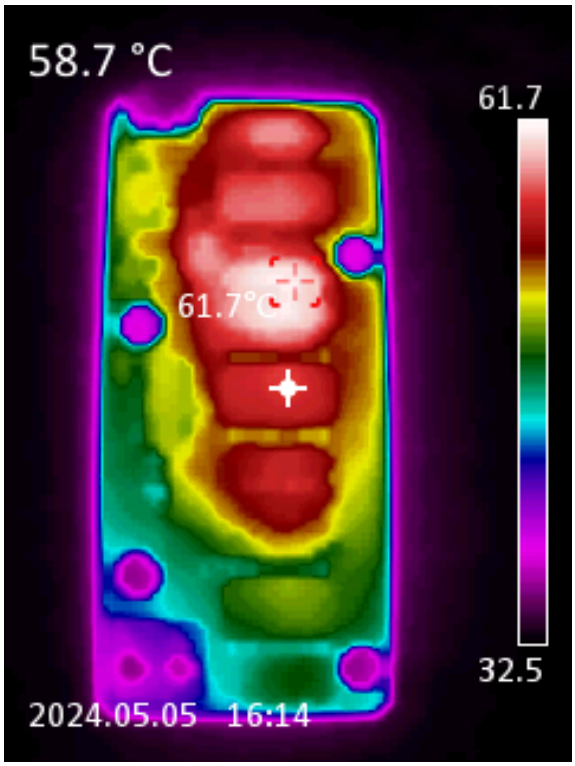
An arrangement similar to the one illustrated above can be used to drive low-power LEDs, seven-segment displays, LED bar graph modules, etc.

Interface inductive loads



It is recommended to use individual heatsinks for the driver ICs when driving high-current inductive loads with this output module. While the printed circuit board has heat transfer traces, the addition of individual heatsinks can increase the durability of the module.

The heat distribution of the PCB and driver ICs are shown in the image below.



The test setup used to obtain these results involved attaching eight 24V automotive-grade relays into terminals J302 and J305 for 8 continuous hours.

Communication interface and commands

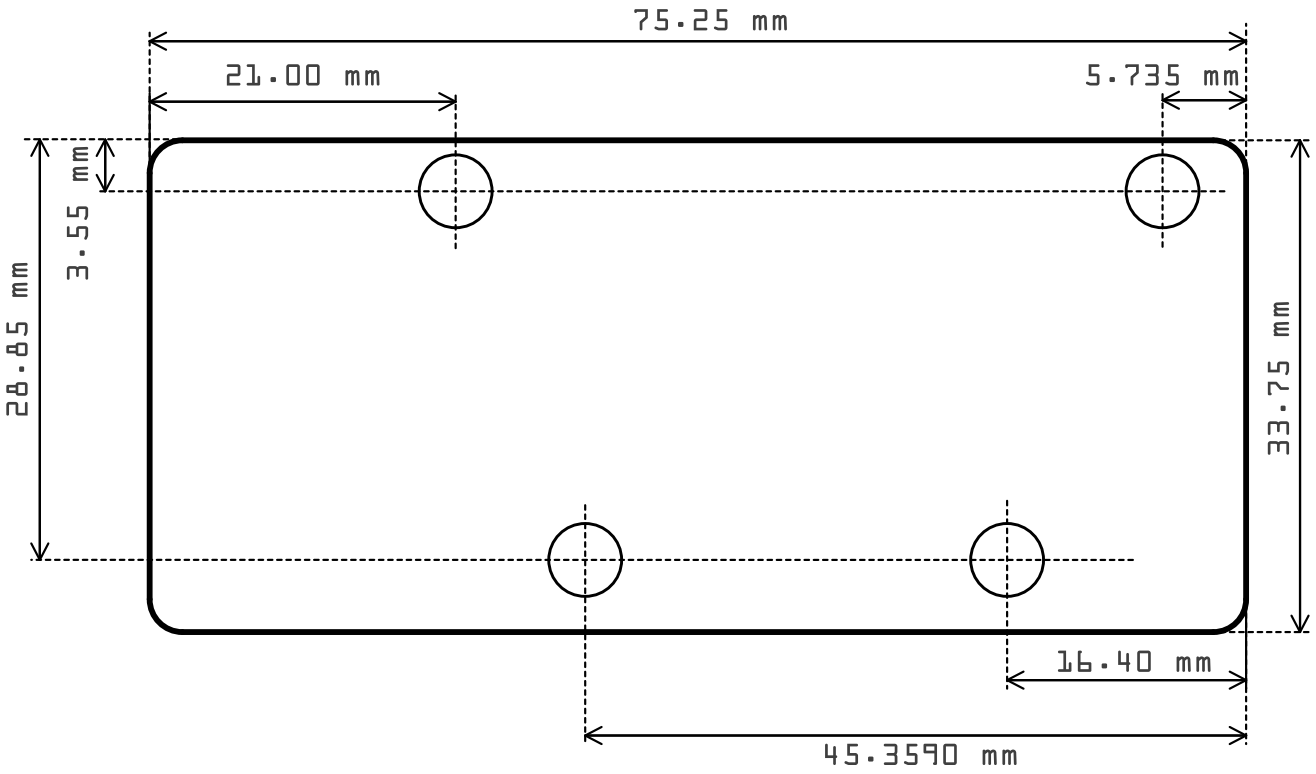
To configure the 24-channel USB module and control its outputs, the user must connect to it using a serial terminal. The connection parameters for the USB module are provided below:

- Baud rate 9600
- Data bits 8
- Parity No Parity
- Stop bits 1

Command	Description
`ON=XXXX`	Turn on pins marked as "1" in the specified parameter. The maximum allowed number for this command is `16777215`. For example, to turn on pins 1, 3, 5, and 7, specify `XXXX` as `55`.
`OFF=XXXX`	Turn off pins marked as "1" in the specified parameter. The maximum allowed number for this command is `16777215`. For example, to turn off pins 2, 4, 6, and 8, specify `XXXX` as `170`.
`GET`	Return a number indicating the on/off status of each pin, with each bit representing a pin's state.
`TOG=XXXX`	Toggle the state of the pins marked as "1" in the specified parameter. The maximum allowed number for this command is `16777215`. For example: Assuming that pins 2 and 3 were in off state previously, issuing the `TOG=6` command turns them on. To turn off pins 2 and 3, repeat the `TOG=6` command.
`CLR`	This command will reset all 24 output pins to a low state.
`STR`	Save the current pin state as the default state. Once set, if the JP202 jumper is close, the system will restore all pins to the specified value in the next power cycle.

Module specification

1. Dimensions of the module (width × height)..... 75.25mm × 33.75mm
2. Weight (with JP202 jumper)..... 15.9g (± 0.2g)
3. Average power consumption (without any load)..... < 1.25Wh
4. Working voltage..... 5.0V DC
5. Maximum rated voltage for output terminals..... 45.0V DC
6. Maximum rated continuous sink current for output terminals..... 150mA
7. Maximum rated current for output terminals..... 500mA



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