

Manual

CPP1 Serial USB pump driver version 2

Prerequisite

If you want to control the pumps using a standalone program, use the program **JT Pump Driver2** that you got from our sales team. Alternatively you can use any other program that can establish a serial USB connection and send serial commands.

In the following it is described how to operate the pumps using the program JT Pump Driver.

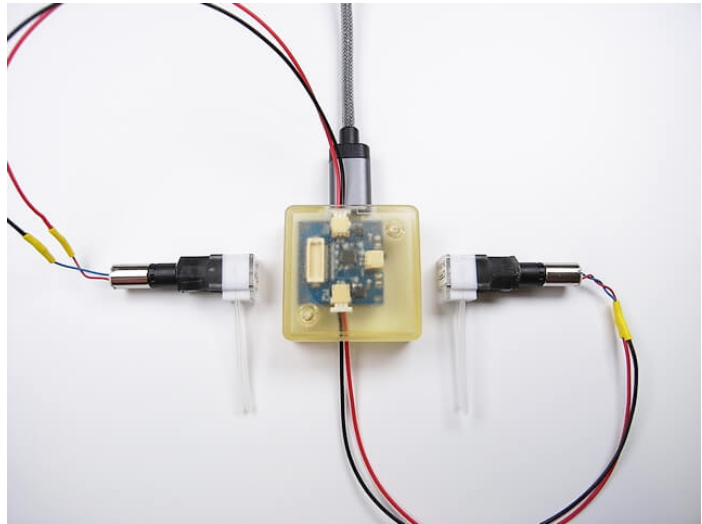


Figure 1: Pump driver Version 2 connected with two CPP1 pumps.

Connection

The pump driver is an electric circuit board that is connected and powered by a USB A to USB Micro B cable. (The cable is included in the delivery package.)

1. Connect the board to an USB port of your computer.
2. Start JT Pump Driver2.
3. Use the menu **Connection** and select the available COM port number. If there are several serial USB devices available you must try out which COM port is the one of the pump driver board. (Note that usually the port COM1 is not a serial USB port, thus only use it if there are no other ports available.) Finally press **OK**.

(If you use another program than JT Pump Driver, connect to the pump driver board with these serial port settings: 9600 baud, no parity, 8 data bits, 1 stop bit, no flow control (9600, n, 8, 1, 0).)

If no connection could be established you will get an error message from JT Pump Driver2. If the pump driver board is connected the LED on the board will blink 5 times.

To refresh the serial USB connection you can keep JT Pump Driver2 open and just use the menu **Connection** again.

When closing JT Pump Driver2, the connection to the board will be closed and the LED on the board will blink 3 times to indicate this.

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Control

To control the pumps, set the parameters you like and press on the button **Run Pumps**. The pumps can be stopped any time by pressing the button **Stop Pumps**.

JT Pump Driver2 offers 2 modes of operation:

Single Run The pumps are run once with the parameters you set at the left half of the JT Pump Driver2 window.

Repeat Run The pumps are run several times with the parameters you set at the right half of the JT Pump Driver2 window. To use this operation mode, check the option **Use** at the top of the tab **Step 1**. You can define up to 6 different steps that should repeatedly be run. The number of repeats is set in the field **Repeat times**. If you use the option **Run until stop pressed**. The steps are repeated infinite times until you click on the button **Stop Pumps**.

With the button **Free Pumps** a special program is run with all connected pumps. This program might be necessary to free the pumps when they were not used for a longer time. The pumping principle is that a rotating excenter presses the silicone hose of the pump together so that the hose is closed on one point. If the excenter is not rotating for a longer time, the silicone hoses will stay closed on the position where the excenter presses it due to Van der Waals forces. To free the pump hose **Free Pumps** runs the pumps for 30 s in different directions for 10 times. If the pumps are not free afterwards you can repeat the procedure. If this does not help, you need a new pump since then the silicone hose is irreversibly mechanically damaged.

Command syntax

If you need to control the pumps using your own software you can send commands to the pump driver board with this syntax:

/n	Device address; default: n = 0		
g	Start repeat sequence		
G	Repeat infinite	/0gGR	Infinite repeats
Gn	Repeat n times	/0gG5R	Repeat 5 times
In	Pumps on/off; up to 4 pumps are possible I0: all off; I1: pump 1 on; I10: pump 2 on; I11: pump 1 and 2 on	/0I11R	Pump 1 and 2 on
I	LED Off (lowercase 'L')	/0IR	
L	LED On	/0LR	

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Mn	Wait n milliseconds	/OLM1000IR	LED off for one second
R	Execute command		
Spnnn	Pump number p and corresponding speed nnn: p [1,2,3,4] = pump number nnn [000-999] = voltage% * 10 -1	/OS14992999D01 R	50 % maximal voltage (1.65 V) for pump 1; 100% for pump 2 Note: The 'S' command has to be sent together with the 'D' command
Dpppp	Pump direction: p [0,1] = clockwise / counterclockwise This means that the pump rotate (counter)clockwise when looking at the front of the pumps (side with serial number)	/OS1500D0R	Pump 1 runs clockwise Note: The 'D' command has to be sent together with the 'S' command
T	Terminate execution of a command	/OT	

After sending the command string (with the trailing R) a CR-LF (character 13 (carriage return) and a character 10 (line feed)) sequence has to be sent.

You can use JT Pump Driver2 also as command generator. By pressing the button **Generate Command** you get the command sequence according to the current settings but the command is not send to the pump driver board. You can copy the generated command from the field **Command**.

Command examples

- To run 2 pumps in contrary directions for 10 s with 1.5 V, then stop, the command is **/OS14552455D01I11M10000I00R**
- To run one pump with 1.5 V for 2 s clockwise then stop it and run pump 2 with 3.3 V counterclockwise for 5 s, repeat this 3 times, then stop both pumps, the command is **/0gS1455D0I10M2000I00M1000S2999D01I01M5000I00M1000G3R**
Note: in this example the pumps are stopped for 1000 ms to protect the motor gear box.

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