

ValveBOX

ADPT-VALVE-INTERFACE-2.2

Dual Valve Control Box

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The Valve Control Box will switch an attached pair of 12V DC valves dependent on the set pumping direction. With a Dual Pump System set to Reciprocating Communications mode, the system will synchronize the pumps' start and stop operation, as well as the pumping direction. When one pump is set to infuse or withdraw, the other pump will be set to the opposite pumping direction. With an appropriate control program and valving, this will create a continuous infusion system (see Figure 6).

In Dual Pumps Mode, the system will synchronize the pumps starting and stopping operation, as well as pumping direction. When one pump changes direction, the other pump will change to the same direction.

- **NOTE:** While the pumps can be set for dual pumping, the included power supply may not be sufficient to properly power both valves. Depending on the specific valves used, a larger power supply may be needed.

Contents:

Power Supply: 12V DC @ 1000 mA	1x (Fig.1)
Modular Cable: CBL-NET-7, RJ-11 6P4C, 7'	2x (Fig.2)
TTL Pump Adapter: DB9 to RJ-11 adapter	2x (Fig.3)
Synchronization Cable: CBL-DUAL-3	1x (Fig.4)
Valve Control Interface Box for two valves	1x (Fig.5)

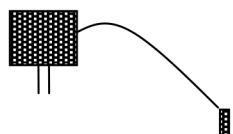


Figure 1: Power Supply



Figure 2: Modular Cable (CBL-NET-7)

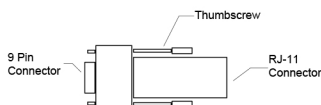
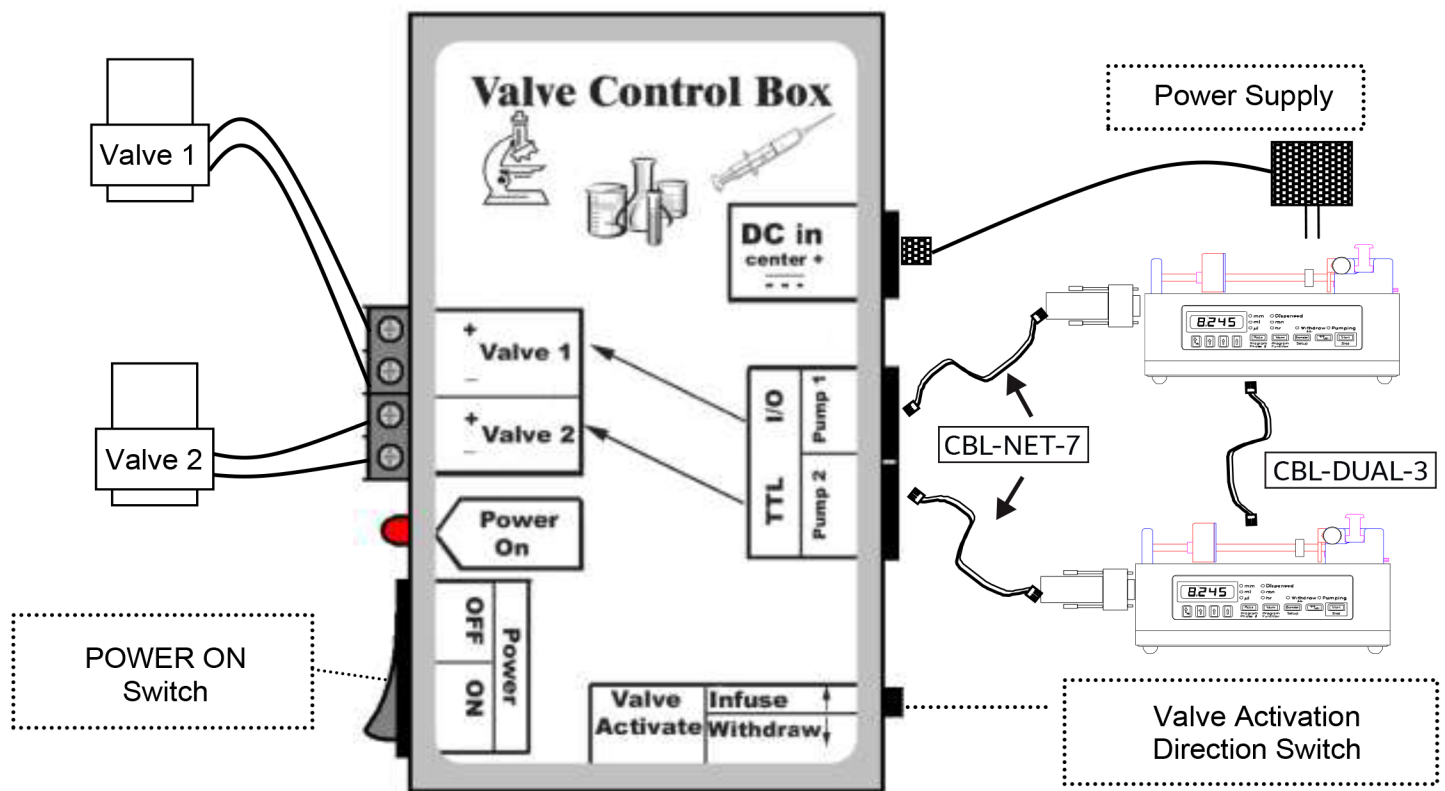


Figure 3: TTL Pump Adapter



Figure 4: Synchronization Cable (CBL-DUAL-3)

Figure 5: Valve Control Box



System Setup:

➤ **NOTE:** Valve 1 will be controlled by Pump 1 and Valve 2 will be controlled by Pump 2.

1) Turn the power off:

- On the Valve Control Box, turn the power switch to the "**OFF**" / "**1**" position.

2) Connect a control valve:

- Using a small screwdriver, attach one wire to the connector labeled **Valve 1(+)** and the second wire to the connector labeled **Valve 1(--)**
- Repeat for **Valve 2(+)** and **Valve 2(--)**

➤ **NOTE:** Most valves do not have polarity, therefore wires can be connected to either connector. If your valve requires polarity, connect according to (+) and (-) polarity.

3) Connect a pump:

- Attach the 9-pin adapter to the 9-pin connector labeled "TTL I/O" on the back of the pump.
- Attach the modular (*telephone style*) cable to the 9-pin adapter.
- Attach the other end of the modular cable to the Valve Control Box "TTL I/O" connector labeled "Pump 1".
- Attach the cables for Pump 2 to the connector labeled "Pump 2".
- Attach the cable **CBL-DUAL-3** to the "To Computer" connector on each pump.

4) Attach the power supply:

- Attach the power supply to the **DC IN** connector then plug the power supply into an outlet.

5) Turn the power on:

- Turn on the power to the pump and the Valve Control Box by turning the Power switch to the "**ON**" / "**1**" position.

- **NOTE:** When the power is turned on to both pumps and the Valve Control Box, the valves will be activated or de-activated depending on the pumping directions of their respective pumps.

Operation:

A Valve Control Box will activate a valve when the pump is either infusing or withdrawing, dependent on the setting of the **Valve Activation Direction Switch (VADS)**. The valve should be set to **"Active"** during the shorter operation cycle, either infusing or withdrawing.

Configure the VADS to determine when the valve activates. Be sure to set up the tubing accordingly.

After powering on the pump, turn the power switch on the Valve Control Box to the **"ON" / "1"** position. If the power is on, the Power On LED will be lit.

Valve Control Box Specifications:

- One pump will be used as the Master pump, which will control its own operations as well as the operations of the secondary pump.
- Attach cable **CBL-DUAL-3** (Instructions are included with the cable).
- Make sure that the RS-232 communications mode is set to either  Reciprocating Mode, or  for Dual Pumps Mode.

Reciprocating Pump Program:

Below is an example of how to set up the pumps for reciprocating, continuous flow operation. Pump 1 is the Master pump which controls when the pumps change direction. In Reciprocating Mode, Pump 2 duplicates the operation of Pump 1, but in the opposite direction.

Pump 1

Phase	Function	Rate	Volume	Direction
1	RATE	750 mL/hr	10.0 mL	Infuse

Phase	Function	Rate	Volume	Direction
2	RATE	750 mL/hr	10.0 mL	Withdraw

Phase	Function
3	JP:01

Jump to Phase 1: Repeats infusion / withdrawal cycle.

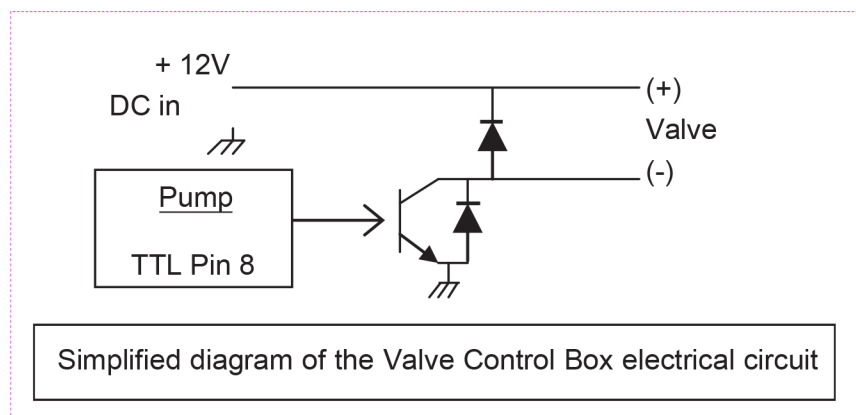
Pump 2

Phase	Function	Rate	Volume	Direction
1	RATE	750 mL/hr	0.0 mL (off)	Withdraw

Phase	Function
2	Stop

Valve Control Box Specifications:

Power Supply Type: Regulated external wall adapter
Connector: 2.1 mm barrel, center positive
Power Supply Output Rating: 12V DC @ 1000 mA



Plumbing for a Continuous Infusion System (P-DKIT):

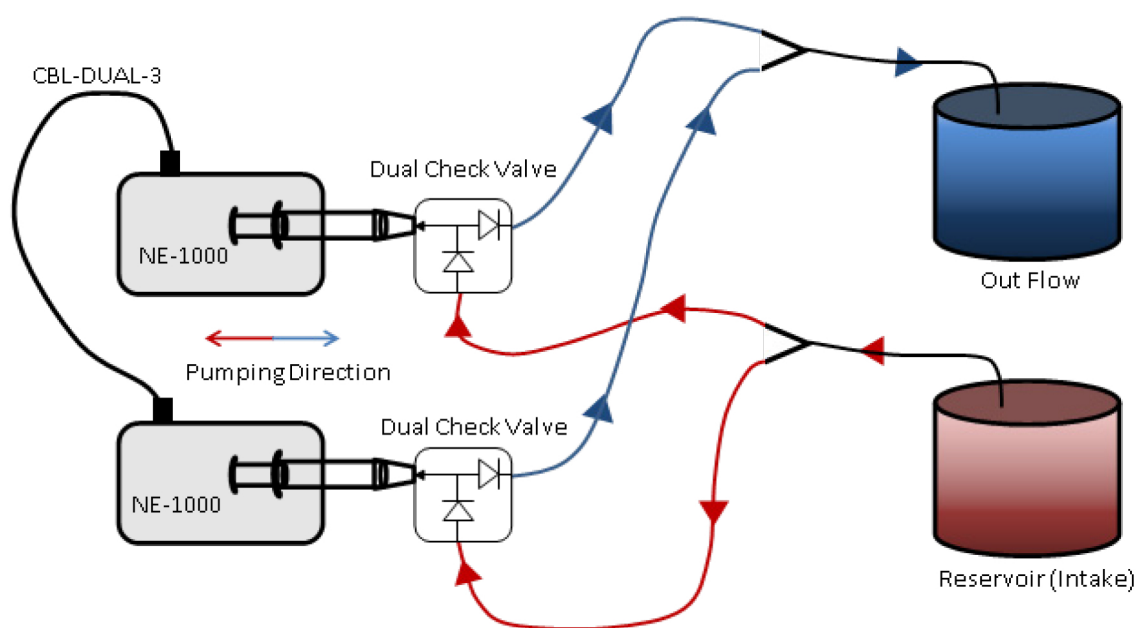


Figure 6