

# DirectVac II CommandValve Control Software

## USER MANUAL



For all

SMART BUTTERFLY  
**COMMANDVALVE™**

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# 1. INTRODUCTION



**Read the CommandValve User Manual to completely familiarize yourself with CommandValve operation. Follow all safety instructions and warnings.**

**Read this User Manual to familiarize yourself with the software's capabilities.**

Ideal Vacuum's (IVP) DirectVac II control software is a Windows 10 and newer program, exclusively for IVP's series of smart butterfly CommandValves. This software works with all CommandValves and provides an animated representation of the valve's operation in real-time. It allows the user to easily and precisely operate the valve with quick command buttons or to directly input serial commands. For a list of acceptable CommandValve serial commands, see [page 6](#).

The software requires that a CommandValve be attached to a computer via the USB-A to USB-B mini connector cable supplied with the valve, and that the valve be powered.

# 2. DOWNLOADING AND INSTALLATION



**To manually download and install the software:**

1. Go to [idealvac.com](http://idealvac.com)
2. Go to any CommandValve product listing.
3. Download the DirectVac II CommandValve Control Software file.  
The file will typically be saved in the Windows Downloads folder.
4. Double-Click the DirectVac II Setup.exe file.
5. Follow the on-screen prompts to install the software.  
During installation you can choose to add a shortcut and this manual to the Desktop.
6. After the installation is finished, connect the CommandValve to the computer with the USB cable and connect power.
7. If you selected to have a shortcut placed on the desktop during installation, double-click it. Alternatively, go to the Windows Start Menu. Select DirectVac II from the IdealVac folder.

## 4. INTERFACE FEATURES

Upon startup, the software automatically identifies the CommandValve, and displays a representation of the valve and its butterfly position (Figure 1). If more than one valve is connected, the software will open a window for each valve.

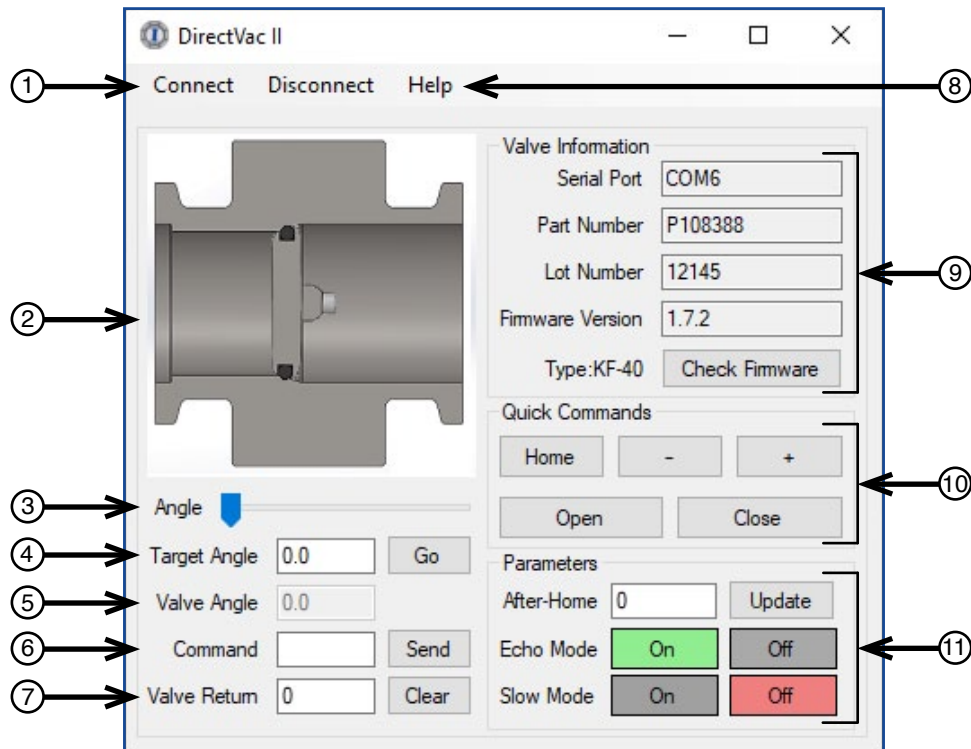


Figure 1 - DirectVac II software interface

### ① Connect and Disconnect Buttons

These buttons are used to start and stop communication between the valve and computer. If the **reset** command is entered in the Command Field (6), the Connect button is used to reconnect the valve.

### ② Animated Valve Image

This dynamic picture shows the valve position relative to the valve body. While the valve is moving, the image is animated.

### ③ Angle Slider

This horizontal slider changes the angle of the butterfly from closed (90°) to fully open (0°). The speed with which the butterfly angle changes depends on the Slow Mode setting in the Parameters Group. See (11) Parameters Group, Slow Mode, next page.

### ④ Target Angle Field

A specific butterfly angle is entered in this field in the form <##.#>. When the Go button is pressed, the butterfly rotates to the specified angle at the speed determined by the Slow Mode selection (On or Off). See (11) Parameters Group, Slow Mode, next page.

When a command is entered, whether it be from the Command Line Field (6) or by a Quick Command button (10), the Target Angle Field is updated with the requested angle.

## ⑤ Valve Angle

This value is the current actual butterfly angle. The difference between the Target Angle (4) and the Valve Angle (5) should not be more than 0.5° when the valve is static. When in motion, the difference between the target and actual butterfly angle may be significantly higher.

## ⑥ Command Line Field

CommandValve serial commands can be typed into this field. Commands are case-sensitive. See [page 6](#) for a list of acceptable CommandValve serial commands.

## ⑦ Valve Return Field

Any valve reply information is shown in this field. The reply is dependent on the command sent. When the Echo Mode is On in the Parameters Group (11), the valve may reply with a 0 (command was successful), or a 1, 2, or 3, indicating that the command was not executed because of a syntax or typographical error. See **echo** serial command details, [page 7](#).

## ⑧ Help Button

This button opens up this User Manual.

## ⑨ Valve Information Group

This interface area shows the valve's COM port and other identifying information. This can help identify a single valve in a multi-valve system. This information is needed when contacting Ideal Vacuum about the valve.

This area also shows the firmware revision. The Check Firmware button allows you to determine if the valve's firmware is the latest revision (internet access is required). If a newer firmware version is available, click the link below to download the IVP Firmware Update Tool.



## ⑩ Quick Commands Group

This area contains shortcut buttons for the five most commonly used commands. These buttons behave as if the same command was entered in the Command Line Field (6).

## ⑪ Parameters Group

**After-Home:** The angle that the butterfly returns to each time the valve is reset, homed, or valve power is cycled is entered in the After-Home field. See **after-home** serial command details, [page 8](#).

**Echo Mode:** When Echo Mode is On, the valve returns information (feedback) about the success of an echo-enabled command. Echo Mode On is equivalent to the **echo 1** command. See **echo** serial command details, [page 7](#).

**Slow Mode:** When Slow Mode is On, the butterfly moves at just above the minimum butterfly speed as determined during the homing cycle. Slow Mode On is equivalent to the **slow 1** command. When Slow Mode is Off, the butterfly moves at its maximum speed (equivalent to **slow 0** command). See **slow** serial command details, [page 8](#).

## 5. SERIAL COMMANDS SUMMARY

Table 1, below, summarizes the available CommandValve RS-232 serial commands. The pages following describe the use of and syntax for each command. Commands are case sensitive.

Command	Function
<b>echo<sup>1</sup></b>	Enables or disables command feedback (replies) for select commands.
<b>open</b>	Sends the butterfly to the fully open position (90°).
<b>close</b>	Sends the butterfly to the closed position (0°).
<b>ang</b>	Sends the butterfly to a user specified angle.
<b>+</b>	Opens the butterfly by 1°.
<b>-</b>	Closes the butterfly by 1°.
<b>stop</b>	Immediately stops the butterfly at its current position.
<b>pos</b>	Gets the current angular position of the butterfly in degrees.
<b>err</b>	Gets the butterfly's current deviation from the target position in degrees.
<b>home</b>	Performs the valve's homing cycle and sets the 0° closed position.
<b>after-home<sup>1</sup></b>	Defines the angle the butterfly will return to after each home cycle.
<b>angle-home</b>	Returns the currently set <b>after-home</b> angle.
<b>slow<sup>1</sup></b>	Enables and disables reduced butterfly rotational speed.
<b>version</b>	Gets the firmware version of the valve.
<b>pn</b>	Gets Ideal Vacuum's valve part number.
<b>sn</b>	Gets the serial number (lot number) of the valve.
<b>*IDN?</b>	Gets the unique product identification/model number of the valve (VISA).
<b>*RST</b>	Reboots the valve and performs a homing cycle (VISA).
<b>reset</b>	Same as *RST.

2 - This setting is saved in non-volatile memory and persists when valve power is cycled, unless subsequently changed.

Table 1 - Summary of serial commands

### What is the difference between the *home* and *close* commands?

When first powered on, the CommandValve always performs a “homing” cycle. This calibrates motor power, mechanical backlash, sets the 0° (closed) position of the valve's butterfly, and positions the butterfly to the angle set by *after-home*. The homing cycle is always performed when the *home*, *\*RST*, or *reset* command is sent. Note that while the homing cycle is in progress, serial commands are inactive.

The *close* command simply returns the valve's butterfly to 0° as determined by the homing cycle. It is equivalent to entering a command of *ang 0*.

## 6. SERIAL COMMAND DETAILS

### echo <#>

Description: Enables or disables feedback on commands that do not reply with a numerical or string value.

*This setting persists when valve power is cycled, unless it is subsequently changed.*

Argument: 0 or 1 (0 = off, 1 = on). *echo 0 is the default.*

Example: **echo 0** (turns off command feedback from the valve on select commands).

**echo 1** (turns on command feedback from the valve on select commands).

Reply: 0 = Success, 1 = Invalid Argument (when echo is on).

### NOTE

**In all cases, when echo is on (echo =1), if a command is misspelled or nonsensical, the valve replies with <3> (Invalid command).**

### open

Description: Sends the butterfly to 90° (the fully open position).

Reply: 0 = Success (when echo is on).

### close

Description: Sends the butterfly to 0° (the closed position).

Reply: 0 = Success (when echo is on).

### ang <##.#>

Description: Opens the butterfly to a user specified angle.

Argument: Range is 0.0 to 90.0

Example: **ang 25** (opens the butterfly to 25° from closed position).

Reply: 0 = Success, 1 = Invalid Argument, 2 = Missing Argument (when echo is on).

### +

Description: Opens the butterfly 1° from its current position.

Reply: 0 = Success, 1 = Invalid Argument - angle is already at 90° (when echo is on).

### -

Description: Closes the butterfly 1° from its current position.

Reply: 0 = Success, 1 = Invalid Argument - angle is already at 0° (when echo is on).

### stop

Description: Immediately stops the butterfly's motion at its current position.

Reply: 0 = Success (when echo is on).



## pos

Description: Gets the angular position of the butterfly in degrees (from the closed position).

Reply: <##.#>

## err

Description: Gets the valve's current deviation from the target position in degrees.

Reply: <##.#> (range -90.0 to 90.0)

*When the butterfly is static, **err** should not be more than  $\pm 0.5$  degrees.*

*If **err** is requested while the butterfly is in motion, err could be significantly larger.*

## home

Description: Runs the valve's homing cycle.

*The homing cycle calibrates motor power, mechanical backlash, sets the 0° (closed) position of the valve's butterfly, sets the minimum butterfly rotational speed, and positions the butterfly to the **after-home** angle.*

*During the homing cycle, serial commands are inactive.*

Reply: 0 = Success (when echo is on). *Reply is delayed until homing cycle is completed.*

## after-home <##.#>

Description: Defines the opening angle that the butterfly will return to after each home cycle.

*This setting persists when the valve is **reset** or when valve power is cycled, unless it is subsequently changed.*

Argument: Range is 0 to 90 (integer values only). *after-home 0 is the default.*

Example: **after-home 20** (butterfly opens to 20° after power is cycled or valve is reset).

Reply: 0 = Success, 1 = Invalid Argument, 2 = Missing Argument (when echo is on).

## angle-home

Description: Gets the currently set **after-home** angle.

Reply: <##.#>

## slow <#>

Description: Enables or disables slower butterfly rotation.

*The **slow** speed is set just above the minimum butterfly speed, as determined during the **home** cycle.*

*This setting persists when valve power is cycled or **reset** command is entered, unless it is subsequently changed.*

Argument: 0 or 1 (0 = off, 1 = on). *slow 0 is the default.*

Example: **slow 0** (butterfly rotates at maximum speed).

*Equivalent to Slow Mode On in Parameters Group (14).*

**slow 1** (butterfly rotates at reduced rotational speed).

Reply: 0 = Success, 1 = Invalid Argument, 2 = Missing Argument (when echo is on).



## version

Description: Gets the valve's firmware version number.

*This information is also in the Valve Information area, (10), [page 5](#).*

Reply: <#.#.#>

## pn

Description: Gets the valve's Ideal Vacuum product number.

*This information is also in the Valve Information area, (10), [page 5](#), and is needed when contacting Ideal Vacuum's customer support.*

Reply: P<#####>

## sn

Description: Gets the valve's serial/lot number.

*This information is also in the Valve Information area, (10), [page 5](#), and is needed when contacting Ideal Vacuum's customer support.*

Reply: <#####>

## \*IDN?

Description: Gets the valve's unique product identification (VISA)

Reply: "CommandValve"

## \*RST

Description: Reboots the valve and the valve performs a homing cycle.

*The homing cycle calibrates motor power, mechanical backlash, sets the 0° (closed) position of the valve's butterfly, sets the minimum butterfly rotational speed, and positions the butterfly to the **after-home** angle.*

*During the homing cycle, serial commands are inactive.*

*User defined **echo**, **slow**, and **after-home** settings persist after **\*RST** or **reset**.*

Reply: 0 = Success (when echo is on). *Reply is delayed until homing cycle is completed.*

## reset

Description: Behaves the same as \*RST.



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