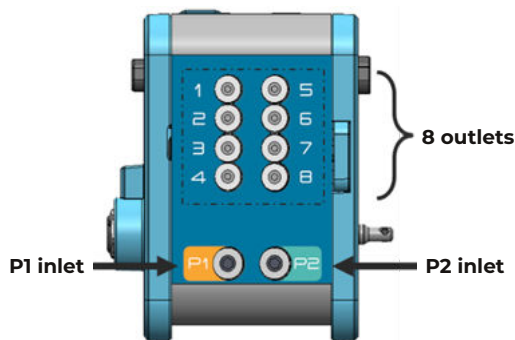USER'S
MANUAL

LINEUP™P-SWITCH

FLUIGENT

USER'S MANUAL

The **P-SWITCH** is a **LineUp™ module** containing eight 3-port / 2-position **solenoid valves**. It can be used to actuate **pneumatic or quake valves** and to deliver **different pressures or vacuum**. It can be used to **pressurize up to 8 reservoirs** per module.

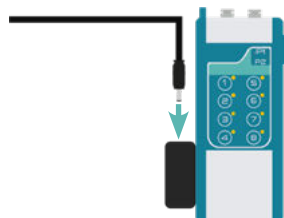

8 outlets

P1 inlet

P2 inlet

The **LineUp P-SWITCH™** allows one to switch **8 pressure outlets** between two different **supplied pressures P1 and P2**. Those pressures are common to all the valves and can be dispense within the range **-800 mbar to 2000 mbar.**

Manual control

Power ON

Power ON the module using the **LineUp Supply Kit** and/or **LINK** module. Once done, the **P-SWITCH leds will turn orange**, the **default dispense pressure** is set on **P1**.

Pressure supply

The **LineUp™ P-SWITCH** requires a **pressure or vacuum** supply to be used. Each inlet can be supplied with a positive pressure **up to 2000 mbar,** a vacuum **down to -800 mbar.**

Note: If an inlet remains unsupplied, the **atmospheric pressure** will be dispensed through this one.
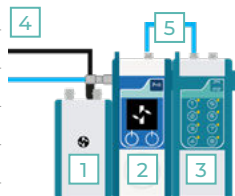
P-CAP and Fluiwell reservoirs can be pressurized with the P-switch via the adapter (3 to 4 mm) (x8) included in the kit.

The **LineUp P-SWITCH™** is designed to work with other **LineUp module** such as **Push-Pull** or **Flow EZ™** to provide **regulated pressure or vacuum**. Provide supply to the pressure controllers and connect their outlets to the **P-SWITCH** inlets.
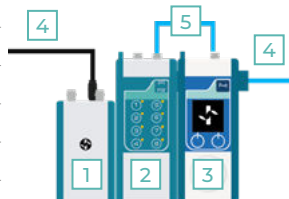
Configurations

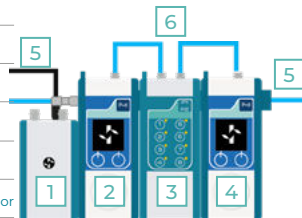| 1	LINK module
2	Flow EZ™ / Push-Pull
3	P-SWITCH
4	LineUp Supply Kit to compressor
5	Supply P1 inlet from Flow EZ / Push-Pull

In the configuration above, the **LineUp P-SWITCH™** allows one to switch between the **P1 regulated pressure** supplied by the **Flow EZ™** or **Push-Pull** and the **P2 atmospheric pressure**.

1	LINK module
2	P-SWITCH
3	Negative Flow EZ™ / Push-Pull
4	LineUp Supply Kit to vacuum pump
5	Supply P2 inlet from Flow EZ neg / Push-Pull

In the configuration above, the **LineUp P-SWITCH™** allows one to switch between the **P2 vacuum** supplied by the **negative Flow EZ™** or **Push-Pull** and the **P1 atmospheric pressure**.
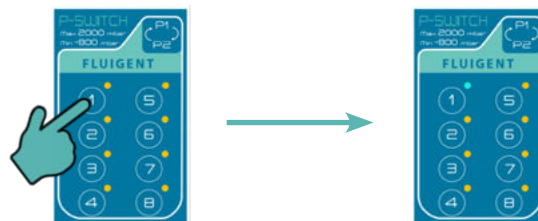
1	LINK module
2	Flow EZ™ / Push-Pull
3	P-SWITCH
4	Negative Flow EZ™ / Push-Pull
5	LineUp Supply Kit to requested compressor
6	Supply P1 and P2 from Flow EZ / Push-Pull

In the configuration above, the **LineUp P-SWITCH™** allows one to switch between the **P1 regulated pressure** or the **P2 vacuum** both supplied by each **Flow EZ™** or **Push-Pull**.
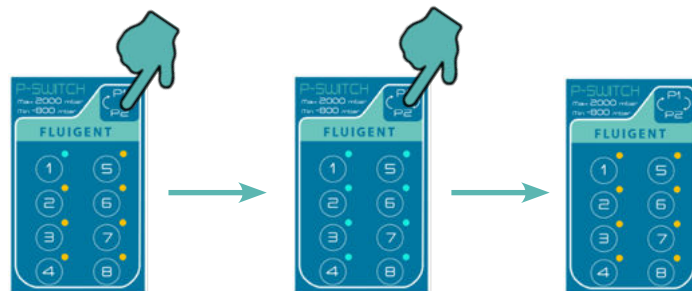
Switching valve position

To **switch any valve position** from **P1 to P2** or **P2 to P1**, press the correspunding button of the valve. Once done, the **led will change color** either in orange or in blue to **indicate new current position**.

Note: Several valves can be actuated at the same time.
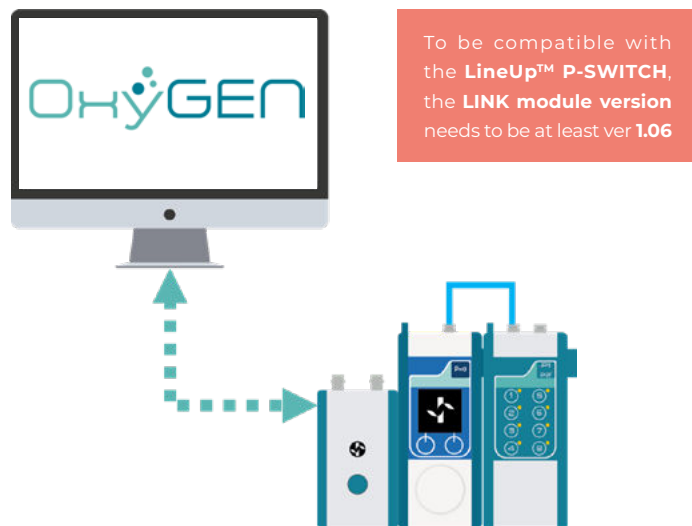
P1 to P2 button

By pressing the **"P1 <-> P2"** button, one can set **every valve at the same time** to the **same position**. By pressing it again, one can set every valve on the second position. (LEDs color indicates the supplied pressure)

Computer first ensure

First of all, ensure the **P-SWITCH** is stacked to a **LINK** connected to the computer.

In addition to the **local control**, Fluigent newest software allows one to **automate any protocol** and **easily program sequences of pressure steps.**
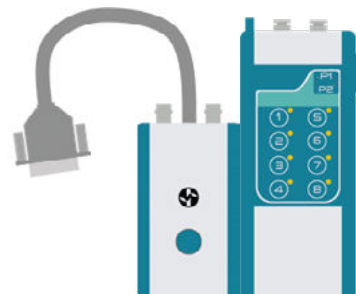
Note: A **cable is provided** with the **LINK** to enable connection to PC.

To be compatible with the **LineUp™ P-SWITCH**, the **LINK module version** needs to be at least ver **1.06**

Remote operation

The following part details the serial RS-232 communication information for the use of the LineUp™ P-SWITCH with the LINK COM.

The RS-232 interface is a 9-pin D-Sub socket used for remote communication The voltage level is ±10 V (pin 5: GND; pin 2: RX +-10V; pin 3: TX +- 10V).

LINK COM   P-SWITCH

Serial communication parameters should be set as follows:

Baud Rate	115 200 bps
Stop Bits	1
Parity	No parity
Flow control	None

> This remote command set is the default set available on the instrument. All commands must be terminated with a <CR>. All decimal values use the point "." as decimal separator.

A query command ends with a question mark "?" for queries. The data column represents the response of the instrument. All response strings are terminated with a <CR>. Any response that have multiple parameters return the parameters separated by commas ",".
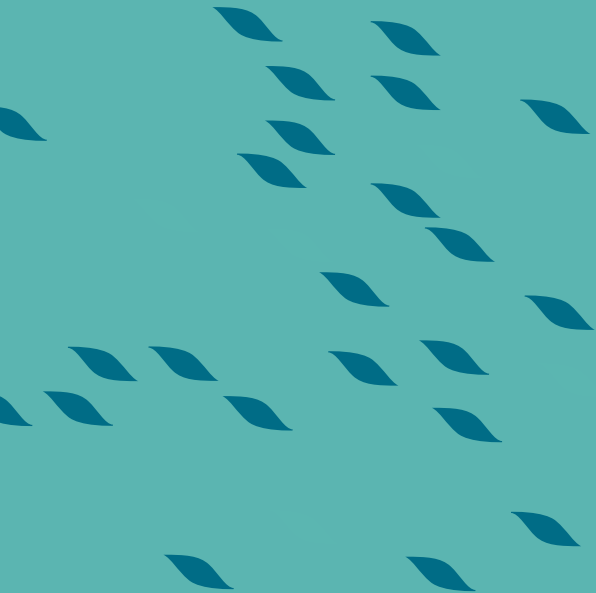
For all commands (no question mark "?"), the data column represents the required parameters to be sent to the instrument following the string in the command column. Any command that requires multiple parameters must have the parameters separated by commas ",". In case of error in the commands spelling, the command is ignored by the instrument without error code returned.

Queries related to an instrument connected at index "X" return "ERROR NO MODULE" in case there is no instrument at the index they refer to or the instrument at the index is not compatible with the query (e.g a query for a Flow EZ™ will not work if there is a P-SWITCH at the index poled).

The following table describes the P-SWITCH remote commande set:

Query	Data	Function / Response
SWEZ		
:X:READ:Y?	<pos>	Gives the state of the 8 valves of the P-Switch at index X on 8 bits, displayed as 2 hexadecimal code. Valve ON : position bit is 1 Valve OFF : position bit is 0. Examples : 00 : all valves are OFF 01 : only valve 1 is ON FF : all valves are ON F0 : only valves 5 to 8 are ON
:X:SET:<mask>:<value>		<mask> : ZZ (hexadecimal code, from 00 to FF). Sets the valve that will be allowed to be controlled 0 leaves the valve as is, 1 makes it switch to the corresponding bit of <value>. <value> : YY (hexadecimal code, from 00 to FF) Sets the valve to the value of the bit. 0 : valve OFF, 1 : valve ON.
:X:INVERT:<mask>		Inverts the state of the valves selected by the mask. <mask> : ZZ (hexadecimal code from 00 to FF). Sets the valves to invert. 1 will invert the valve, 0 will leave it as is.

Example of remote commands : PSWI:1:SET:F0:80 : Forces the valves 5 to 7 to OFF state, valve 8 to ON state, and valves 1 to 4 unchanged on the P-Switch at index 1. (Note : F0 = 1111 0000 and 80 = 1000 0000 in binary). If state was 0101 0101 (55), after this command it is now 1000 0101 (85)

**VERSION
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