



SmokeDriver V2.2 Operator Manual

Dear Valued Customer,
thank you for purchasing our SmokeDriver. This small and light-weight component governs three functions when using our electrical smoke device Smoke-EL.

- It regulates the heating element within the smoke device.
- It proportionally regulates the smoke pump.
- It supervises the lipo-voltage.

To connect the receiver you will need only one slot. Please make sure you use a 3-step transmitter (-120% / 0% / +120%), since feeders and dials will compromise the faultless operation of the device.



Mounting the Model:

The SmokeDriver has to be mounted in a way to ensure appropriate cooling, as continuous currents in excess of 40A might exist while the SmokeDriver is running.



If the hull of your model is too small, it might be necessary to add additional air holes so that the airstream can cool down the SmokeDriver.
Overheating may destroy the SmokeDriver.

Please mount the SmokeDriver at an easily accessible area. The battery has to be disconnected after every flight, as this resets the SmokeDriver to its default setting. Furthermore, even though the standby current is low, the battery might be discharged over time and in turn might be destroyed through this.

Connections:

There are six slots for connecting all components. Each slot is clearly marked. However, since the slot for the pump and the slot for the heating element look similar, please pay attention to the appropriate connections.

The Receiver (RC):

The receiver should be connected to a free channel of the receiver with the enclosed patch cable. The negative pole (brown) of the patch cable should be closest to the circuit board.

The SmokePump (Pump):

The SmokePump should be connected to the SmokeDriver through the individual MPX-plugs. The connectors are protected against reverse polarities.

The Smoke Pipe (Heating):

The smoke device should be connected directly to the MPX-plug next to the slot that connects the battery (top right). This connection is also protected against reverse polarities.

The Battery (6S Lipo):

The battery should be connected next to the slot for the heating element. Here too the connection is protected against reverse polarities through the MPX-plug, and the polarity is clearly visible on the plug as well as on the image above.

The Magnetic Valve (optional):

The slot marked as "VALVE" on the connector board is reserved for connecting the magnetic valve. You can attach a maximum of two magnetic valves.

Initial Operation:

For initial tests we recommend that you disconnect the heating element from the SmokeDriver. By doing so you will avoid fusing the heating device.



Heating up the smoke device without the appropriate Smoke-Oil can lead to the destruction of the heating elements. To protect the Smoke device, heating will be deactivated after 10 seconds (Twin:30 seconds), if the device does not detect a change in the switch setting.

The SmokeDriver needs the exact center position of the channel you reserved for the smoke device. Since this position depends on how the manufacturer of a transmitter defines this setting, we have allotted a wide range for the "center position."

The SmokeDriver is programmed to be ready for use. Please delete any programs which could interfere with the SmokeDriver from your transmitter. Adjust the setting to -120% and +100%. The center position should be at 0%.

Operating Test:

Please connect everything except the heating. The pump can be tested "as is," simply plug in the connectors as described above. Please make sure that the battery is connected before you switch the receiver on.

Please perform the following seven tests to check the device's functions:

Switch Setting	Impulse	Function
1 Bottom (-120)	<1300µs	Reset the SmokeDriver
2 Top (+100%)	>1600µs	Pump on (valve switches, optional)
3 Center (0%)	1500µs ±<100µs	Pump off
4 Top (+100%)	>1600µs	Pump on (valve switches, optional)
5 Bottom (-120%)	<1300µs	Pump off, restart SmokeDriver (min. 0.5sec.)
6 Top (+100%)	>1600µs	After 30 sec delay the pump turns on
7 Bottom (-120%)	<1300µs	Pump off

If the pump works as described below, your transmitter is programmed correctly, and the SmokeDriver is ready for use. The protective setting of the SmokeDriver ensures that the pump will not be turned on automatically when the receiver is switched on. Only when the channel is on -120% will the SmokeDriver be activated.

The program recognizes three operating states: Off, Heating up, and Smoke-ON.

Off, switch setting -120%:

The SmokeDriver is in standby. The heating and the pump are completely turned off, current consumption is minimal.

Heating up, switch setting 0% (center position):

In this position the evaporators will be heated up with reduced power. The pump is still off. The heating process will take 30 seconds, and is governed by the SmokeDriver. After 60 seconds in the center position the SmokeDriver will decrease the current further but will keep the heating on.

Smoke-ON, switch setting +10% to +100%:

As soon as the signal from the transmitter climbs past 10% and the heating up phase has ended (30 seconds), the heating will be increased to 100% and the pump will be added proportionally. The pump output will increase linearly to the transmitter signal from 10% to 100%. You can adjust the output with the transmitter via limiting your chosen channel. Usually, a pump output of 60% will be sufficient. After 10 seconds (Twin 30 seconds) production of the smoke will stop, but you can always reactivate smoke production by using the center position of your transmitter (first put the switch to the "Heating up" position, then to "Smoke-On").

-100%



± 0%



>10%

Pre-Flight Check:

To ensure that the whole device is completely vented before every flight, the SmokeDriver is outfitted with a pre-flight program that has to be run before each flight. When switching the SmokeDriver on for the first time, the heating will always be deactivated.



Without Magnetic Valve: Switch on the pump first (switch setting "Smoke-ON") and wait until the pump has started to deliver SmokeOil to the evaporators. You can now adjust the amount of oil you need with the appropriate valves. The amount is correctly adjusted once a small rivulet of oil comes out of the evaporator, while single drops of oil are not sufficient for the device to work properly. You can disrupt the pump by turning the switch to the center position.

With Magnetic Valve (optional): Switch on the pump first (switch setting "Smoke-ON") and wait until the pump has started to deliver SmokeOil to the evaporators. You can now adjust the amount of oil you need with the appropriate choke valves. The amount is correctly adjusted once a small rivulet of oil comes out of the evaporator, while single drops of oil are not sufficient for the device to work properly.

To adjust the amount of oil for the second evaporator, please switch back to the center position and then turn the pump back on. The magnetic valve will now switch to the second pipe. You can always switch between the pipes until both choke valves are correctly fine-tuned.

After you have correctly adjusted the oil input, please turn off the smoke device (switch setting "Off"). The Smoke-EL is now ready for use.

Lipo-Supervision:

The smoke device Smoke-EL is powered by a 6s Lipo Battery. The recommended capacity for the battery (for approximately 90 seconds "Smoke-ON") depends on the smoke device you are using.

Smoke-EL	Lipo Capacity
S	1100 mAh
S Duo	1600 mAh
S Twin	1600 mAh
SmokeBlock	>=2100mAh

The Lipo-Supervisor will turn off the whole device if the battery voltage falls below 19.8 volt (3.3 volt per cell). The SmokeDriver will be reset when the battery is disconnected and the receiver is turned off. Both the power for the heating elements and the pump originate from the smoke battery, so that neither the receiver battery nor the flight battery will be burdened. Be aware however, that the standby voltage of the SmokeDriver is 0.04A and can discharge the battery. To avoid damage or even destruction of the battery, please disconnect the battery after each use. If your model already uses a 6S Lipo battery you can also connect the smoke device to this battery. However, be sure that your battery can handle the extra load of approximately 500Watt per evaporator.

You can find further tips for adjusting the smoke device here: <http://youtu.be/wSig1LeaJc>

Technical Data:

Operating Voltage	6S-Lipo (max 24Volt)
Current Load (Heating)	40A continually (70A short-term)
Current Load (Pump)	3A (max)
Standby	0,04A (Warning: Disconnect the battery!)
Temperature Range	0°C (32°F) to 45°C (113°F)
Weight	ca.50g (appr. 1lb)
Connectors	JR and MPX

We hope you will have great flights and "many happy landings."
Sieverstedt, 2014

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