

Add-on für den Microsoft  
*Flight Simulator X*



aerosoft™

# MANUAL

## DA20-100 'KATANA'



# 4X



**Neither the software nor the documentation may be used for real aviation and training purposes.**

# 1.2

## DEVELOPMENT TEAM

### 1.2.1 DEVELOPERS

Marcel Felde	Models, Graphics, Sounds, Systems, Manuals
Alexander M. Metzger	Aerodynamics
Otmar Nitsche	Load/Save Modul

### 1.2.2 SUPPORT

Diamond Aircraft Industries GmbH, Wiener Neustadt  
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### 1.2.3 TEST TEAM

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A big thank you to all that supported us in our work on this project - the employees of Diamond Aircraft, Diamond Air Service, Hanseatischer Fliegerclub and Aerosoft, the pilots and testers, our families and friends that had to stand back from time to time, while we were working on this project.

# 1.3

## INSTALLATION

# 1.4

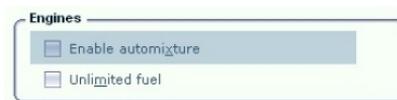
## CONFIGURATION

### 1.4.1 FSX SETTINGS



**Global texture resolution** should be set to **Very high** to get sharp and detailed textures, especially in the virtual cockpit.

**Advanced animations** need to be enabled for skin animations and special effects.



**Enable automixture** has to be untagged as the Katana features a carburetor simulation.

Many systems of the **Diamond DA20-100 'Katana' 4x** were implemented beyond the possibilities of FSX. So there are some keyboard shortcuts that won't work on the Katana. For example CTRL+E for autostarting the engine or SHIFT+M to turn on battery.

Auto-Config.  
FSUIPC.  
Parking Brake etc.

# 1.5

## ADD-ON OPERATION

### 1.5.1 4X MENU (SHIFT+3)



The SHIFT+3 keyboard shortcut opens the **4X Menu** to handle all those actions and options that can not be set from the pilots seat.

The first three entries will open submenu icons to handle further windows.

#### Preflight

This menu offers options for preparing the aircraft before your flight, refueling and cleaning. Only available with parked aircraft.

#### Maintenance

Maintaining the aircraft, servicing and changes of the equipment. Only available with parked aircraft.

#### Instructor

These windows are only available if the add-on is operated in **Instructor Mode** and offer the possibility to influence the aircraft systems with a mouse click.

#### Settings

All settings on how to use the add-on can be selected here, including effects and operation modes.

## 1.5.2 SETTINGS OPERATION MODE

### OPERATION MODE

- REALISTIC (Default)**  
Maloperation has consequences.  
Wear and damage are simulated.  
Aircraft needs maintenance.
- SIMPLE**  
Aircraft is as new every flight.  
No wear and damage but  
systems need correct handling.
- INSTRUCTOR**  
Aircraft is loaded without damage.  
Wear and damage are simulated.  
System failures can be triggered.

The aircraft can be operated in three different modes to fit the different needs of virtual aviators. Some special features will only be available in **Realistic Mode** to reward the user willing to meet the challenge.

**Simple** does not mean that the Katana will behave like the default aircraft. The systems need to be operated correctly but there will be no damages and no wear.

The operation mode can be switched for one flight by a left click or permanently with a right click. There is only one selection possible without reloading or changing the aircraft.

### Realistic

The aircraft has to be operated with care and should be maintained. Damages and wear may occur and will be stored with other data. Special features are enabled.



### NOTE:

All damage and wear simulation within the Katana should be considered as effects aside the FSX crash detection. A FSX crash event will not influence the Katanas systems as this would mean a completely destroyed aircraft.

### Simple

The aircraft is brand new every time being loaded. No damages and wear, no special features. No data stored.

### Instructor

The aircraft is brand new every time being loaded. Damages and wear can occur but will not be stored. Systems can be influenced with a special user interface.

## 1.5.2 SETTINGS INITIATION MODE

### INITIATION MODE

- AUTOMATIC**  
Aircraft tries to figure out the situation of flight and configures itself.
- COLD AND DARK**  
Aircraft is forced in 'cold and dark' status after loading.
- PARKED**  
Aircraft is forced in 'parked' status after loading.

As soon as the Katana has been loaded, the add-on tries to figure out the situation of the aircraft to configure itself. This mechanism can be overridden by selecting **Cold and Dark** or **Parked**.

#### Automatic

The aircraft shall be set into the appropriate condition. If it is not able to figure out its situation, it will be forced into a status with engine and all systems running.

#### Cold and Dark

The aircraft is ready to power up the systems and start the engine. It is advised to perform the walkaround check anyway.

#### Parked

The aircraft has been parked for a while so you should check carefully all the systems and prepare the aircraft for the flight.

### 1.5.3 SETTINGS CONTROLS

#### CONTROLS

**FLAP LEVER COMPATIB.**  
Animation not correct but may be necessary for some hardware

**FLAP LEVER REALISTIC**  
Animation realistic but only usable with mouse and FSUIPC

Selection whether the Flap Lever Handle should behave realistic or being compatible with your hardware.

#### Compatible

The flaps system can be triggered by special hardware or with keyboard and joystick commands. But if the flaps are not operative, the lever will be fixed in that position instead of being movable as in reality.

#### Realistic

The lever can be moved also the flaps may not be operative. Hardware control can only be achieved by FSUIPC commands.

### 1.5.4 SETTINGS AVIONICS

#### AVIONICS

**COM/NAV REALISTIC**  
Realistic simulation of the Kx125 not compatibel with hardware

**COM/NAV SIMPLE**  
Simple system controllable with hardware

**TRANSPOND. REALISTIC**  
Realistic simulation of the KT76A not compatibel with hardware

**TRANSPOND. SIMPLE**  
FSX default system compatible with hardware

The avionics can be switched to simple operation for autotune function or compatibility issues with hard- and software. In simple mode all special functions will be disabled and the radio units operate like the default radios in FSX.

## 1.5.5 SETTINGS EFFECTS - LIGHTING



### FX Lights

The Katana features lighted bulbs and subtle glow for all lights. Additionally the FSX default light effects can be enabled by activating FX Lights.

### FX Headlights

By activating this option, the FSX default landing and taxi light cones are enabled.

### Enhanced Headlights

More subtle and realistic headlights can be engaged with this selection.

## 1.5.6 SETTINGS EFFECTS - CUSTOM SOUNDS



This add-on comes with over 120 custom sounds to enhance the simulation experience.

You can enable/disable all or just kinds of the custom sound effects with this menu.

These options will not affect the sound engine of FSX.

### NOTE:

The custom sounds only work in the virtual cockpit.

## 1.5.7 SETTINGS EFFECTS - VIBRATION

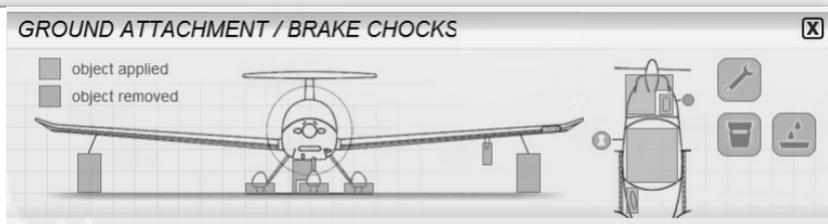


Especially small airplanes get rattled and shaken by the engine and the propeller wind. This add-on features several vibration and motion effects that can be enabled and disabled in this menu section.

# 1.6

## PREFLIGHT

## 1.6.2 PREFLIGHT - GROUND ATTACHMENTS



Brake Chocks, Fixations and Equipment can be applied or removed with this window.

Use this window to clear away everything at and around your aircraft for departure. Or secure it after your flight with brake chocks and/or fixations. Before getting into the cockpit, check for the cowling and the oil access door to be closed. That is indicated in blue color. No tools or equipment shall be lying around the aircraft. The pitot cover has to be drawn off as well. Those icons should be in blue color tagging them as removed.

## 1.6.3 PREFLIGHT - TOW BAR

After the area around the airplane has been cleared the Katana can be towed in proper position for further preflight preparations. Clicking on the Tow Bar button will open a circle icon in the middle of the screen. **Note:** Through FSX limitations, moving straight forward after a turn is not possible anymore. It has to be moved in in curves to the desired position.



Left click the inner circle and drag the mouse cursor around the screen to move the aircraft.



While holding down the left mouse button, drag the cursor up or down to push or pull the aircraft and left or right to turn the tow bar. Release the button to stop.

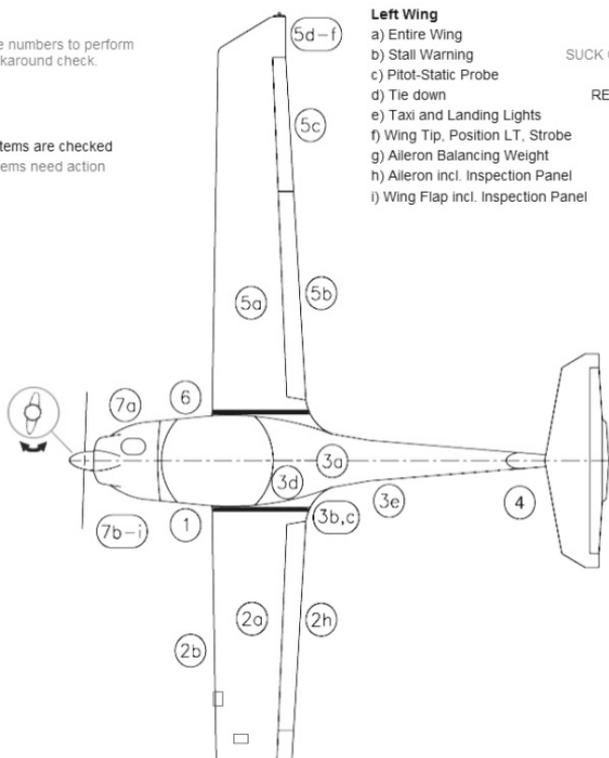


Right click the inner circle to close the icon and remove the tow bar.

## 1.6.4 PREFLIGHT - WALKAROUND CHECK

Use the numbers to perform the walkaround check.

White items are checked  
Cyan items need action



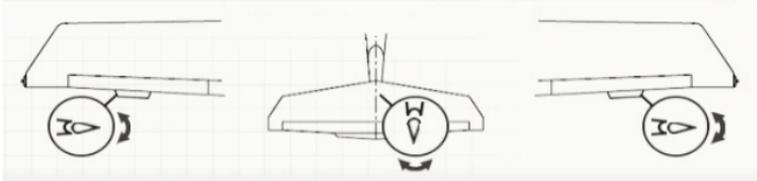
### Left Wing

- |                                     |             |
|-------------------------------------|-------------|
| a) Entire Wing                      | OK          |
| b) Stall Warning                    | SUCK OPENG. |
| c) Pitot-Static Probe               | CLEAN       |
| d) Tie down                         | REMOVED     |
| e) Taxi and Landing Lights          | OK          |
| f) Wing Tip, Position LT, Strobe    | OK          |
| g) Aileron Balancing Weight         | OK          |
| h) Aileron incl. Inspection Panel   | OK          |
| i) Wing Flap incl. Inspection Panel | OK          |

The **Walkaround Check** window is a virtual inspection of the aircraft. Click on the circled numbers to open the respective checklist. Items that need attention are colored blue. Some of them can be done in this window, others are achieved due actions on other windows, for example the oil quantity check.

The propeller pitch can be tested via dragging the drawing of the blade in horizontal direction as indicated by the arrow.

### 1.6.5 PREFLIGHT - TRIM TABS



The **Trim Tabs** can be bent by dragging them with your mouse in the direction indicated by the respective arrows. Keep in mind that adjusting those tabs is only possible on ground at the parked aircraft.

### 1.6.6 PREFLIGHT - FUEL STATION



The **Fuel Station** is not only the place to refuel the aircraft but also to drain water out of the tank and to test the fuel quantity.

- ① The Gas Pump is equipped with several indicators. Fuel costs can be altered by clicking the numbers on the **cost/liter** indicator. Right click will increase, left click will decrease the digit.
- ② Choose the type of fuel you want to fill in the aircrafts tank.
- ③ Open the fuel tank cap.
- ④ Pull the fuel nozzle to the aircraft and into the tank filler neck.
- ⑤ Press and hold the button to refuel. It will automatically stop when the fuel reaches the maximum capacity. Remove the fuel nozzle when done.
- ⑥ Press the draining vent until there is fuel (yellow) filling the bin and no more water (blue).
- ⑦ Press to dip the pipe into the tank. The pipe will be filled with fuel indicating the approximately fuel quantity. Close the fuel tank cap.

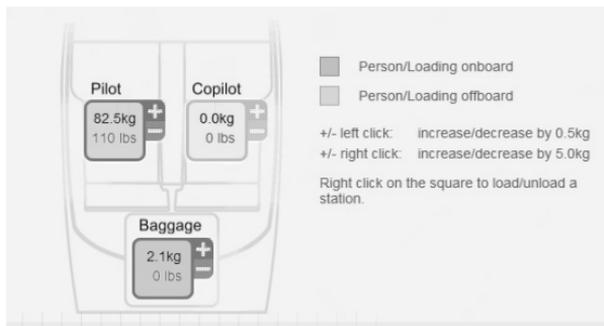
### 1.6.7 PREFLIGHT - OIL & LIQUIDS



The **Oil & Liquids** window is the place to check and refill oil and coolant liquid.

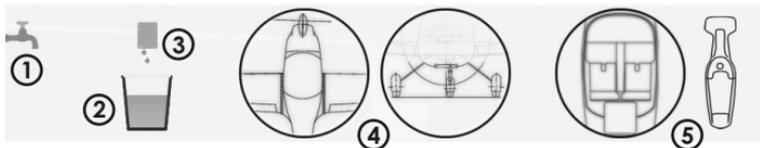
- ① To reach the oil reservoir tank you can open the oil access door or remove the complete upper cowling. Second action is necessary to access the coolant reservoir bottle.
- ② Remove the oil tank cap. Don't forget to close the tank after you are done.
- ③ Turn the propeller by dragging it with the mouse in normal operating rotation to transfer oil from the engine crankcase back into the oil reservoir tank. You can hear a gurgling sound when there is no oil but air drawn and the process is completed. Do not turn the propeller in the opposite direction! When the canopy is open, it is possible to turn the propeller from within the virtual cockpit.
- ④ Draw the dipstick into the tank and pull it out again after a few moments. On the enlarge view the oil should be running from within the flat and light gray area. That area indicates the maximum and minimum oil level.
- ⑤ To refill oil first choose one of the oil cans and it will be highlighted. If there is no yellow stripe indicating the content, a right click on the can will make it a new and full bottle containing 1 litre. The stripe will become smaller indicating the reduced content during refilling.
- ⑥ Press the button to refill oil. Keep your eye on the bottles content indicator. Recheck oil content to not overfill the reservoir tank. If more oil is needed, click right on the can.
- ⑦ Press this button to drain oil out of the reservoir tank.
- ⑧ Open the coolant tank cap and press the button to refill coolant liquid. The minimum and maximum is indicated by two thin lines. Don't forget to close the cap before closing the cowling.

### 1.6.8 PREFLIGHT - PAYLOAD



The **Payload** window is used to adjust the weights of the two pilots and their baggage. Each weight can be easily adjusted with the +/- buttons. The person or the baggage can be loaded or unloaded with a right click. The pilot will automatically be loaded if the aircraft is getting prepared for flight.

### 1.6.9 PREFLIGHT - CLEANING



- ① Use the water faucet to fill the bucket.
- ② Pull the bucket to the aircraft and below the sponge.
- ③ Move the sponge down into the bucket until it is full of water. Pull it up again.
- ④ As long as the sponge is wet, wipe with the mouse over the areas you want to clean. Some sorts of dirt need more work than others. For example oil is far more difficult to remove than insects and mud.
- ⑤ Turn on the vacuum cleaner and move the mouse around in the cockpit to remove dirt in the cabin.

# 1.7

## MAINTENANCE

### 1.7.2 MAINTENANCE - EQUIPMENT: AVIONICS

It is possible to replace the GPS500 unit with the GNS530 from RealityXP. That can be done directly in FSX without the need of editing cfg files or using an external installer. Of course, the GNS530 has to be installed properly before.

#### GPS500 (Installed)



Default FSX GPS  
with some extra  
features



#### GNS530



The GNS530 from  
Reality XP must  
be installed



The installed unit is indicated by a hook and the word **Installed** next to the unit's name. By clicking the empty square of the desired device, the replacing icon will appear and the status bar should indicate the progress. As soon as the process has been finished, the unit is available in the virtual cockpit.

### 1.7.3 MAINTENANCE - EQUIPMENT: WHEEL FAIRINGS

**Wheel Fairings** are reducing drag of the landing gear and make the aircraft faster. But they are not suitable for all terrain. The fairings can be mounted or unmounted just by clicking on the corresponding position. Wait for the progress to be completed before starting another installation procedure.

## 1.7.4 MAINTENANCE - WORKSHOP

The **Workshop** is the place for all repairs and replacements of different systems and devices. It is advisable to visit this place from time to time if you are operating in **Realistic Mode**.



The first button can be used to start an inspection of all systems listed in the workshop window. The icon will start to move and the progress bar will indicate the status of the inspection. As soon as the bar is completed the icon will freeze and different systems may be marked with a yellow or red square.

Yellow markings indicate that the corresponding system is not in the best condition and should be maintained sooner or later.

Red markings indicate that the corresponding system is in bad condition and immediate maintenance is necessary.

Markings will disappear as soon as there is a maintenance action started. So this does not mean, that the system is back in good condition. Another inspection can be done to be sure.



The **Tool Button** is used to start the maintenance of a system. That is indicated by the moving icon and can be observed by the progress on the bar. There can only be one action at a time. The progress bar does not represent the status of the system nor is the system in perfect condition if the progress has been completed. It is just an indicator for working on the system. You can stop the action by clicking on the button again. The system is now at least in some better condition than before.



The **Replacement Button** is used to start the replacement of the corresponding system. The progress is indicated by the movement of the icon and the progress bar. In contrast to the maintenance action, the replacement has to be completed. Otherwise the system has not been exchanged. Replaced systems are always in perfect condition, new batteries are charged etc.

### 1.7.5 MAINTENANCE - SERVICE

**Service** is very similar to the workshop but deals with expandable items such as fluids, brake pads etc. It is advisable to visit this place from time to time if you are operating in **Realistic Mode**.



The only but not being already described in the maintenance section is for **Recharging** the battery. The action can be interrupted at every time but the battery may not be completely charged.

Depending of the type of fuel that is used in the aircraft, the **Oil Filter** should be changed regularly.

The **Inlet Baffle** should be installed at cold air temperatures.

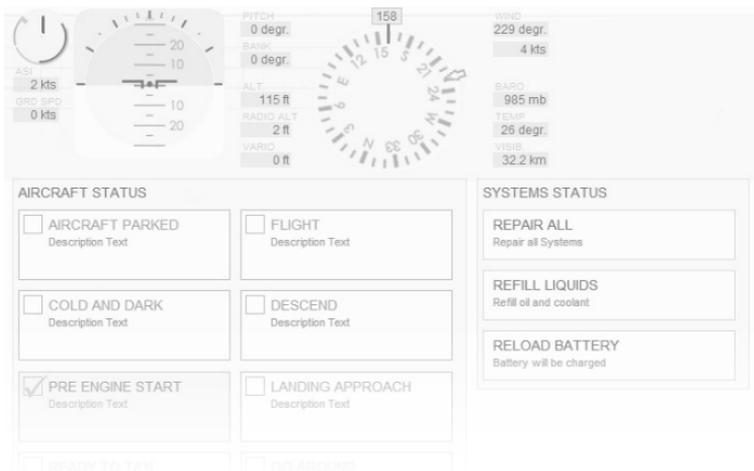
If the fuel tank cap has not been closed it may get lost. Install a new one by replacing the **Tank Cover**.

# 1.8

## INSTRUCTOR

The **Instructor Windows** are only available if the add-on is operated in **Instructor Mode**. They can be used to easily influence the aircrafts and systems status and conditions.

## 1.8.1 INSTRUCTOR - GENERAL

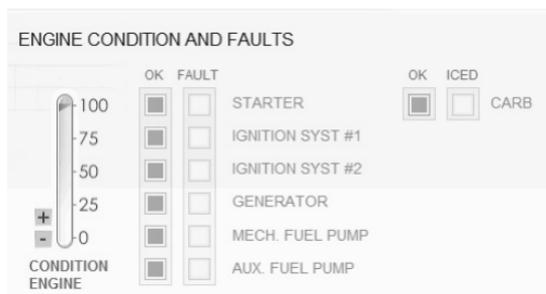


The upper area of the **General Window** displays the aircraft's position and speed and information about the environment and wind.

The **Aircraft Status** can be set with a single click on the different status boxes. The corresponding box will be colored blue for an active setting process and stays green for a few moments if the status has been successfully set. This will only affect aircraft settings, not the position, airspeed etc.

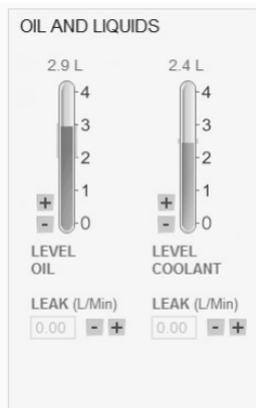
The **Systems Status** can be fixed easily with the three boxes on the right. Within a second all systems can be repaired, liquids are refilled or the battery recharged.

## 1.8.2 INSTRUCTOR - ENGINE AND FUEL



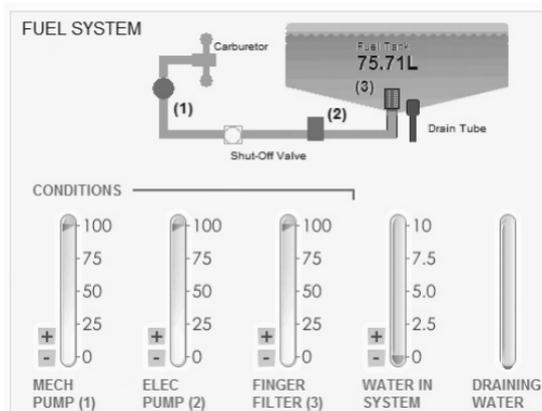
The **Engine Condition** can easily be set by dragging the condition bar or by using the +/- buttons.

Different systems of the engine can be set to **Fault** or back to **Ok** by clicking corresponding box. As well as the carburetor can be **Iced** and Deiced with a single click.



The content of the **Oil and Coolant Liquid** reservoirs can be changed by dragging the content bars or clicking the +/- button.

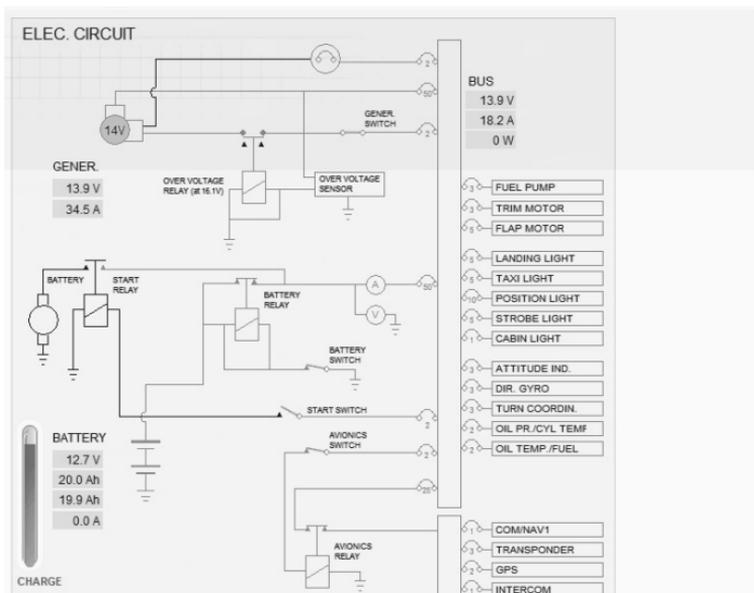
At the bottom there it is possible to engage and set a **Leak** for each system. It can be adjusted by dragging the value display or by clicking the +/- buttons. A right click on the bar will set the optimum filling level.



The drawing of the **Fuel System** is interactive and can be influenced directly. The fuel content can be set by dragging and valves and pumps can be clicked. The fuel pipes will be colored to show if there is fuel running through them.

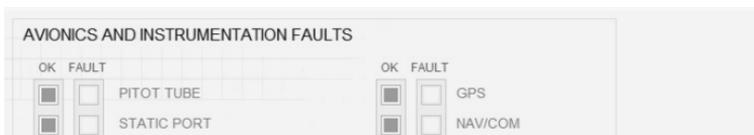
The **Conditions** of Pumps and the Filter can be set by dragging the status bar or by using the +/- buttons. Additionally, the contamination by water can be adjusted in the same way. Clicking the Draining Water bar will drain away accumulated water at the bottom of the tank. Clicking a bar with the right mouse button will repair the corresponding system.

### 1.8.3 INSTRUCTOR - ELECTRIC CIRCUITS



The drawing of the **Electric System** is interactive: switches and circuitbreakers can be set by a right click and the charge of the battery can be changed by dragging the status bar.

### 1.8.4 INSTRUCTOR - AVIONICS AND INSTRUMENTS



The pitot and static system, gyros and avionics can be set to **Fault** or back to **OK** by clicking the corresponding boxes.

# 1.9

## COCKPIT HANDLING

This chapter is about how to control and handle elements of the cockpit with the input devices.

### 1.9.1. CONCEPTS

#### 2-POS SWITCHES

- Left click : toggle switch position
- Wheel down : move switch in the lower position
- Wheel up : move switch in the upper position

Hint: a right click on the battery master switch will also move the generator switch to ON. If the battery switch is disengaged, the generator switch will also be toggled in the OFF position like in the real aircraft.

#### 3-POS SWITCHES (Elevator trim switch)

- Left click : click a side of the switch to hold it down

#### SELECTORS and ROTARIES with steps

- Left click : turning knob left
- Right click : turning knob right
- Wheel down : turning knob left
- Wheel up : turning knob right

#### ROTARIES without steps

- Left Drag : turning knob left and right
- Wheel down : turning knob left
- Wheel up : turning knob right

#### ROTARIES pullout

- Left click faceplate : push rotary in
- Right click faceplate : pull rotary out

## BUTTONS

- Left click : push button  
Right click : push button and hold

## THROTTLE and PROP LEVER

- Left Drag forward/back : Move lever forward/backward  
Wheel down : Fine movement backward  
Wheel up : Fine movement forward

Hint: The friction wheel increases/decreases the dragging sensitivity.

Hint: The propeller lever may also be moved by dragging or rotating the mousewheel over the RPM indicator.

## LEVERS at the console

- Left Drag forward/back : Move lever forward/backward  
Right click : Move the lever to the opposite position  
Wheel down : Fine movement backward  
Wheel up : Fine movement forward

## 2-POS ELEMENTS (for example canopy locks)

- Left click : toggle element position

## ELEMENTS with stepless movement

- Left Dragging : Move the element in the corresponding direction

## PROPELLER

- Left Dragging : Rotating the propeller  
Right Dragging : Moving the propeller pitch