Hardware Interface

User Manual

BajuSoftware, LLC
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Introduction

This Interface Software provides the connection of Elite Flight Controls and Avionics to the X-Plane 10/11 Simulator.

The following Elite Hardware is supported by this Interface:

- Elite Pro Panel II
- Elite Pro Panel III
- Elite Pro Panel SE
- Elite Yoke
- Elite Standalone Throttle Quadrant (Multi or Single Engine and King Air)
- Elite Rudder Panels
- Elite AP5000 Avionics stack (AP4000 with EMUTEQ G530)
- Elite AP4000 Avionics Stack
- Elite AP3000 Avionics Stack (*Apollo or Trimble GPS not supported*)
- ELITE iGate TH-100 Avionics with Throttle Module
- Elite COM/NAV Radio (2 modules supported, also Version with 8.33KHz spacing)
- Elite ADF Radio Module
- Elite DME Radio Module
- Elite Auto Pilot Module
- Elite Altitude Pre-Select and Audio Panel Module
- Elite Transponder Module
- Elite NAV/CRS/HDG Module
- Elite Compass
- Elite E500 Module (2 modules supported for Pilot and Copilot)
- Elite GTN Module (2 GTN modules supported, requires Reality XP GTN750/650)
- Elite EFS40 Module (2 supported, preconfigured for Carenado aircraft)
- Elite GNS430 Module (2 GPS modules supported, X-Plane and Reality XP 530/430 V2)
- Elite GNS530 Module (2 GPS modules supported, X-Plane and Reality XP 530/430 V2)

All hardware elements can be used together, or either one of them standalone or any other combination. Other hardware can also be used in combination with Elite Hardware.

The Interface is compatible both the 32bit and 64bit mode of X-Plane 10 and 64Bit X-Plane 11

The Interface software contains two parts, the X-Plane Plugin and the Hardware Driver Interface.

In the next sections we explain how to install, configure and use this interface software in combination with Elite Hardware and X-Plane 10/11.
## Technical Requirements

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Processor</th>
<th>Any Dual Core Processor or greater</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Memory</td>
<td>4GB (32 Bit), 8GB (64 Bit)</td>
</tr>
<tr>
<td></td>
<td>Disk Space</td>
<td>1 GB (approx.)</td>
</tr>
<tr>
<td></td>
<td>Flight Controls/Avionics</td>
<td>See list on previous page</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Software</th>
<th>Windows 7</th>
<th>32 or 64 Bit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Windows 8</td>
<td>32 or 64 Bit</td>
</tr>
<tr>
<td></td>
<td>Windows 8.1</td>
<td>32 or 64 Bit</td>
</tr>
<tr>
<td></td>
<td>Windows 10</td>
<td>32 or 64 Bit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flight Simulator(s)</th>
<th>X-Plane 10</th>
<th>10.20 or greater</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10.30 if using the GNS430 Module</td>
</tr>
<tr>
<td></td>
<td>X-Plane 11</td>
<td>11.0 or greater</td>
</tr>
</tbody>
</table>

**IMPORTANT!** This software only supports Elite Devices with a USB Interface. Serial Devices (RS232) are NOT supported, even when used with a serial to USB converter!

The Interface also requires at a minimum the .Net Framework 4.50 Extended. The .Net Framework 4.5 Client Profile is not sufficient!

During the install process, there is an option to install this required component.
Installation Procedure

**Attention!** If this is the first time you install the Interface, disconnect all Elite Devices from your computer.

**Step 1**

Locate the Installation Package on your computer. If you have downloaded the package, check in your Downloads Folder.

Double click on the installation package, `XPlaneInterfaceElite64.exe`.

**Step 2**

**IMPORTANT!**

Follow the installation instructions on the screen.

Click [Next >] to continue.
Select the folder where the Elite Interface should be installed into, or accept the default:

![Select Destination Location](image)

Click [Next >] to continue.

Select which modules should be installed.

![Select Components](image)

Place a checkmark into each box. If you have both X-Plane 10 and X-Plane 11, check both Interface boxes. Then click [Next >] to continue.
The next screen(s) will prompt you for the location of your X-Plane 10 and/or X-Plane 11 folder. You need to use the [Browse...] button to locate the main folder of your X-Plane installation(s). The install program will verify the selection you made and prompt you if you made an invalid selection.

Click [Next >] to continue. If you have selected both X-Plane Interfaces, you will get another screen for the other X-Plane folder, otherwise ...

This will provide you with the option to change the Start Menu folder name. Accept the default or type a new name and click [Next >] to continue.
Review your selected options then click [Install] to continue. Wait for the installation to finish, the following screen will appear:

This screen will allow you to install required additional driver software that the Elite Interface Software needs to operate.

If you are re-installing this software, you will have all this software already installed. In this case, you un-check the tick boxes in front of all 4 software options. (You can then skip the next few sections in the manual, the installation will finish.)
The first option, .Net Framework 4.5, is required for the Interface to work. Leave this option checked. If you have this or a newer version already installed on your computer, you will get the following screen:

![Microsoft .NET Framework 4.5 Warning Screen](image)

In this case you can only click the [Close] button. Otherwise click the [Continue] button to install it.
You possibly also have the Microsoft Visual C++ runtimes already installed. Those might also be required by other programs on your computer. If you are not sure, you can leave the option(s) checked. If the software is already installed, you get the following screen:

![Microsoft Visual C++ 2015 Redistributable (x86) - 14.0.23026](image)

This screen indicates that the software is already installed. Click the [Close] button.

You might also get the following screen (This is for the 64bit version of the C++ software):

![Microsoft Visual C++ 2015 Redistributable (x64) - 14.0.23026](image)

Again, the software is already installed. Click the [Close] button.

The third software option is for the **Elite USB Driver**. This software is required for the Elite hardware to be recognized by Windows. **Make sure you install the USB Driver before attaching any Elite hardware.**

If you have any Elite IFR software installed, you can take the checkbox off as the USB drivers are very likely already installed.

This completes the installation procedure.
Installation Procedures Pro Panel III Yoke

The Pro Panel III yoke is a third-party product by Brunner Elektronik AG. This yoke has “control loading”, meaning that you will be able to experience control forces for different flight situations.

The Yoke is not controlled by the Elite HW Interface. In fact, it will be recognized like any other Flight Control Device and will show up in X-Plane in the joystick & equipment section. This also means that you cannot calibrate the yoke using the Elite HW Interface, but needs to be performed within X-Plane.

Please refer to the installation instructions you have received when you purchased your Pro Panel III.
Post Installation Procedures

After the installation finishes, connect all of your Elite Devices and wait until Windows loads all USB drivers for each Elite Device. This can take a few minutes, be patient.

To check if Windows has the drivers loaded correctly, go to the Windows “Bluetooth and other Devices” option within the Windows Control Panel. All Elite Devices should be. If a device is not showing up, wait a while longer.

In the example above, an Elite AP4000 E500 and Elite Rudder Pedals have been connected.

After verifying that all devices have been recognized, re-boot your computer.
Configuration

During the installation process, a shortcut to the Interface and the User Manual has been created and placed onto your desktop. A shortcut to the Interface has also been placed in the Windows Startup folder. This will automatically start the Interface next time you start your computer.

If your Elite Hardware is not already attached, attach it now to the computer and make sure that power is applied to all devices. If you use the Pro Panel II or Pro Panel III, turn the Panel Master Key to the ‘On’ position.

Double click the Elite HW Interface Icon on your desktop.

The hardware Interface is started and placed into the taskbar into the system icon tray. You will see the following message for a short time appearing on the bottom right of your screen:

![Interface Message]

This indicates that the Interface has been started. The notification will disappear after a short while and the icon will be placed in the tray icon bar. To see the icon again after the message has disappeared, click on the up arrow in the system task bar on the bottom right of your screen:

![System Icon]

Before using the hardware with X-Plane for the first time, you need to configure the interface and calibrate the flight controls (see next chapter).
Licensing and Activation

License Activation is not necessary if you have received an *Elite Interface USB License*. In this case make sure that the USB key is inserted into your computer. It needs to stay connected while the Elite Interface is running.

For download Licenses, the Elite Hardware Interface needs to be activated. If there is no valid Activation present, the Interface will work in a *timed trial mode*. The Interface will operate for *10 Minutes* and then it will shut itself down.

Software Activation

**Step 1 - Request Activation Code**

A License can be purchased online at

https://www.simplugins.com/html/elite_software.html

After the purchase a Serial Number will be e-mailed to you. This Serial Number in combination with the e-mail address will be used to request an activation code.
Click on *Licensing* and enter the information under Step 1.

Then click on [Request Activation Code] and wait for the Activation Code to arrive in your Inbox. This process can take up to 24 hours, please be patient. This option requires an Internet connection on your computer.

An alternative method is to click on [Manual Request]. This will show you the information that is required to issue you an Activation Code. You can use this information to use a different computer and request the Activation code by e-mail.
Step 2 - Enter Activation Code

After receiving the Activation Code via E-Mail, it has to be entered together with the same e-mail address that has been used during the request in Step 1.

Click on Licensing and enter the information under Step 2.

![Licensing Interface](image)

Then click on [Activate Product]. You will get a message that the Activation was successful or not. If you get a ‘failed’ message, make sure you entered the correct E-Mail Address and the correct Activation Code you received after performing Step 1.

![Activation Failed Message](image)
Flight Control Calibration

Rudder Pedal Special Configuration for X-Plane 11

If you are using the Elite Rudder Pedal and X-Plane 11, you need to enable the PFC Rudder Pedals in X-Plane 11 in order for them to work correctly.

Start X-Plane 11. The go to menu Settings, select Joystick and click on the [PFC Hardware] button on the bottom page:

Check the ‘Serial port rudder pedals’ option. The click on [Done]. Shutdown X-Plane 11 and continue with the calibration on the next page.

This is not required if you use X-Plane 10.
Motion Range

Before using your Elite Flight Controls for the first time you need to calibrate their motion range and center point.

Right Click on the Elite HW I/F Icon in the system taskbar and select Configure.

The configuration screen is displayed as shown above. There are several pages to this application, accessible via the buttons on the top menu bar.

The first screen displays what Elite devices are connected to your system.

Click on the Calibrate button.

Note: The Calibrate button is only enabled if you have any devices attached that can be calibrated (like the Pro Panel, Yoke, Rudder Pedals or Throttle modules).
The Calibration screen allows you to calibrate each flight control (yoke and rudder pedals), the toe brakes, the throttle quadrant and the rudder trim.

Calibrating the flight controls includes setting the extent of the motion and the center point.

You can test the motion range by moving your controls now. This will move the black pointer. The read pointers indicate the limit of the movement the control can perform. Initially they are set to the theoretical maxim for each control.

Click on Reset Calibration. This will move the red pointers to the current position (black pointer). Now move the flight controls to its full motion extend in all directions. You will see the red pointer moving to their respective maximum position. The values are saved automatically.

Some controls require setting the center point of the flight control. This applies to the rudder pedals the yoke and the rudder trim. After you calibrated the maximum motion range, let the controls return to their center (‘spring loaded center’) or position the control to the center (rudder trim). Don’t touch any control and then press the Set Center button.

If the motion of the control is reversed in X-Plane, you can reverse each axis by clicking the ‘Reverse …’ checkbox.

Repeat the above operation for each Elite Device that has flight controls by selecting the appropriate calibration page, Rudder Pedals, Yoke, Throttle Quadrant and Rudder Trim.
**Control Sensitivity**

By default, each flight control (yoke and rudder pedals), the toe brakes, the throttle quadrant and the rudder trim movements are sent to the flight simulator in a linear motion. This translates each position of a control to its counterpart in the flight simulator.

Because of the sensitivity of the controls, even slight movements of the controls will have an impact on the flight simulator control. This can lead to ‘over-controlling’ the airplane. This is visible for example when taxiing and during the take-off run where it is difficult to keep the airplane in a straight line.

For this reason we have included a sensitivity compensation configuration option. This is available for the flight controls and also the throttle quadrant and the rudder trim. There are 5 settings (levels) to choose from, with each making the control less sensitive at the beginning of the movement range. The chart below shows the curves for each setting.

![Control Axis Sensitivity Curve](image)

The different settings are chosen by moving the *control sensitivity slider* for each control. The further the slider is moved to the right, the less sensitive the control becomes. The furthest position to the left is the default, indicating a linear movement. Choose a setting that ‘feels right’ to you.
**Button Assignments**

This page on the configuration screen allows you to customize some button assignments, mainly for the Elite AP4000 Avionics.

![Configuration Screen](image.png)

**GPS 430/530 Module**

This allows you to choose which GPS device the AP4000 controls. Currently there are 4 options, the built-in X-Plane GNS 430/530, Reality XP GNS 430/530, Reality XP GNS 430/530 V2 or SimAvio GNS430/530. You can also swap GPS1 and 2 modules by checking the box $\text{GPS1} \leftrightarrow \text{GPS2}$. This allows you to swap control of the GPS in X-Plane.

The built-in X-Plane GNS430/530 is fully supported. 2 GPS modules are also supported,

The Reality XP430/530 V2 (version2) is fully supported in 32 and 64bit mode. The power on/off function is not modelled. 2 GPS modules are also supported,

As the Reality XP GPS 430/530 does not support 64bit, this option will only work with X-Plane 10 running in 32bit mode. Only 1 GPS module is supported.

The SimAvio GPS currently has a bug in the 64bit driver, so you need to start X-Plane 10 in 32bit Mode. Only 1 GPS module is supported.
**ADF Module Timer Display**

Here you can set the display for each ADF Timer, the flight time and the elapsed timer. You can choose from either a HOUR:MINUTE (HH:MM) or a MINUTE:SECOND (MM:SS) display.

You can also choose to play a sound when the count-down ADF Timer has expired (reached zero).

For more information regarding the ADF Operation, see the separate chapter for the ADF.

**NAV/CRS/HDG Module Switches**

There are 2 AUX switches on the NAV/CRS/HDG module on the remote control section of the Avionics stack (the bottom section). You can assign different functions to each of the switches. Currently only the Igniters for engine 1 and 2 are available. More will be added later if required.

**COM/NAV Radio Type**

Check the boxes to indicate if you have COM Radio with 8.33 kHz spacing.

**Electric Trim & Trim Wheel**

This setting allows you to set how many notches for each button press the trim will be moved. The default is 1.

**Yoke Buttons**

Here you can specify which functions to use with both yoke buttons, the left yoke button (red) and the right yoke button (black). Use the dropdown box to select the function you wish to assign. The defaults are

- Left Button: PTT ('Press to talk'). This will contact ATC.
- Right Button: CWS('Control Wheel Steering').

**Note:** If you are using PilotEdge, make sure you have one of the buttons assigned to PTT to contact and talk to the PilotEdge Air Traffic Controllers.

Enable PTT for X-Plane10/PilotEdge

Check this option if you are using the X-Plane 10//1 ATC or the PilotEdge ATC system. If you are using the BajuSoftware CheckRide System, un-check this option.
Value Customization

There are 2 additional configuration options that allow to adjust what values are sent to X-Plane when specific buttons are pressed or how the dials (for heading bug etc.) behave.

Dials

This is used to specify how dials behave when they are turned. The following screen appears:

![Customize Dials](image)

Here you can specify minimum and maximum values and if the values should wrap around, meaning if they should start again at the minimum or maximum if turning beyond the range.

There are 2 settings for configuring the speed settings and how the values are increased or decreased depending on how fat a dial is turned.
Buttons

In the buttons screen you can configure what values are sent to X-Plane for various buttons and their associated datarefs.

Currently those settings can only be made for the AP4000 Autopilot (inside the AP4000 or as a standalone module), the TH-100 Throttle, AP4000 EFS40 Module and the AP4000 E500 Module.
Network & Other Configuration

Network Settings

The Elite Hardware interface communicates to the flight simulator via a network connection.

The flight simulator has a plugin installed that receives and sends information between the Hardware Interface and the Flight Simulator. This allows the Elite Hardware to be installed in a different computer to the Flight Simulator.

Click on the Network Button.

The Network Settings are configured by default to have the Flight Simulator and the Elite Hardware Interface installed in the same computer.
If you have the Flight Simulator installed on a different computer, add the Flight Simulators IP Address in the edit box *IP Address* as shown above. (127.0.0.1 specifies the local computer).

You also need to modify the IP Address of the Flight Simulator plugin to indicate the IP Address of the computer with the Elite Hardware. The configuration file for the plugin can be found in *[X-Plane 10 Main Folder]/resources/plugins/Elite Plugin*. It is called *Sender.cfg*.

Edit the line for the IP Address (under *Client IP Address*) and change it to the IP Address where the Elite Hardware is connected to:

![Sender.cfg - Notepad](image)

The port numbers can be left as they are unless you have a conflict with another program on your computer.

**Misc. Settings**

*Enable periodic updates to AP4000.* This function updates all AP4000 devices every 2 seconds. This ensures that the AP4000 devices always show the correct data. This is optional and is only required if you get ‘garbled’ data displayed now and then. You can take this off and see if this is required by your system.

The *AP4000 Pause between commands (ms)* is used to insert a pause when the system issues consecutive commands to the AP4000. Increase or decrease this setting specific to your system when the display does not seem to update after changes. This is in milliseconds.

**CheckRide Network Settings**

If you are using the BajuSoftware CheckRide System, enter the IP Address and Port Number of the CheckRide Console to send the PTT button to the CheckRide Console as well.
Miscellaneous

AP4000 ADF Radio

The X-Plane ADF radio has only very basic functionality. The only function that is supported is the frequency dial.

In order to expand the functionality, additional ADF functions have been implemented in the Hardware Interface Software.

Timers

The following timers are available:

- Flight Time (from switch on of Avionics Master to switch off).
- Elapsed Time with reset function.
- Countdown Timer.

The timers are accessed via the ADF FLT/ET button. Each subsequent press displays the next timer and then return to the ADF Mode.

ADF mode → Flight Timer → Elapsed Time → Count Down Timer

The countdown timer can be set using the frequency dial. The SET/RST button starts the timer or resets the timer to 0:00. An optional sound is played when the timer reaches 0:00.

All timers continue to run, even when the display is in ADF mode.

BFO

The BFO button is not supported by X-Plane. Pressing the BFO button lights up the BFO LED in the ADF Radio. No other function is initiated.

ANT

The ANT mode is not implemented. Pressing the ADF Button has no effect.
AP4000 NAV/CRS/HDG Module

NAV1/NAV2 Switch - selects the HSI Source

Pro Panel 2

The un-labelled Switch to the right of Pitot Heat is assigned to Carburetor Heat
**AP4000 E500 Module**

This module includes 2 rows of buttons and a dial knob. The bottom row selects which value to change and the dial knob is used change the value, left for down or right for up.

The top row of buttons (“triangle”) buttons are assigned by default to enable switching moving map features on/off. You can assign any dataref to the buttons by editing two of the configuration files. The files to change are called _ReceiverDAT.cfg_ and _Sender.cfg_. Those files are located in the plugins folder of X-Plane under _ElitePlugin_:

**Path Name:** ...

Use your favorite text editor (Notepad) and open the file _ReceiverDat.cfg_:

```
; Configuration File for datarefs for Elite HW Interface
; Version 3.0
; Format: DATATYPE_ID/dataref
;------------------------------------------
; Listen Port Number
; 45020
; E500 1
;E500 1 A sim/cockpit2/EFIS/EFIS_tcas_on
;E500 1 B sim/cockpit2/EFIS/EFIS_airport_on
;E500 1 C sim/cockpit2/EFIS/EFIS_fix_on
;E500 1 D sim/cockpit2/EFIS/EFIS_vor_on
;E500 1 E sim/cockpit2/EFIS/EFIS_ndb_on
; E500 2
;E500 2 A sim/cockpit2/EFIS/EFIS_tcas_on
;E500 2 B sim/cockpit2/EFIS/EFIS_airport_on
;E500 2 C sim/cockpit2/EFIS/EFIS_fix_on
;E500 2 D sim/cockpit2/EFIS/EFIS_vor_on
;E500 2 E sim/cockpit2/EFIS/EFIS_ndb_on
; Pitot Heat
;I0_PITOT|sim/cockpit2/ice/ice_pitot_heat_on_pilot
```

There are 2 E500 units possible by setting the switch on the back of the unit. Replace any of the datarefs in the appropriate section with a valid X-Plane dataref. All datarefs available can be found in an X-Plane file called _Datarefs.txt_ located under:

```
...X-Plane 11/Resources/plugins
```
The top left button for unit 1 is E5001A, the top right button is E5001E. The same applies for unit 2.

**DO NOT CHANGE THE FIRST PART OF THE LINE UP TO AND INCLUDING THE VERTICAL LINE ('|').**

After you made changes to the ReceiverDAT.cfg file, you have to make the same changes to the Sender.cfg file:

![Sender.cfg - Notepad](image)

This is important to synchronize the button state between X-Plane and the Hardware.
AP4000 EFIS Module

The EFIS Module has been preconfigured for Carenado aircraft. It has been tested with the Carenado PC12 and the Carenado B1900, both X-Plane 11. All functions in the module work for both airplanes, most likely also for other Carenado aircraft with similar avionics.

Some buttons also work for standard X-Plane aircraft:

- DH, CRS, HDG and BRT
- Range up/down buttons
- NAV, 1-2 buttons

The HSI, ARC, single Arrow and Double Arrow buttons use custom Carenado datarefs. You can change them in the interface configuration files to match other aircraft.

**Note:** If you are using any Reality XP GPS Add-ons alike the GNS 430/530 or GTN series, the NAV button on the module will not work. You need to make the selection for HSI, GPS or VOR on the GPS instead. The NAV button does work with the standard X-Plane GPS.

Functions not implemented

The following functions are not implemented as they are not support by X-Plane:

**AP4000 Stack and Modules:**

MKR BCN HI/LO

**AP4000 EFIS:**

RALT -TST
SYS REF