SismoLink Connector for FS2020 & PMDG

User Manual

FS-MAN-SOF-NA-E-23-2454

Ed. 1.3

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1   PURPOSE

In this document we have tried to explain the key characteristics of SismoLink – how it works, all of its benefits to Sismo customers and also how you can set up your own Sismo flight simulator.

SismoLink has been designed to connect the Sismo Plug&Fly Modules directly to FS2020 via PMDG 737NG.

2   REFERENCE DOCUMENTS

Id	Title	Reference	Ed.	Author/Publisher
[R1]	User Manual - SC-MB Ethernet Configuration	SC-MAN-SCE-E-17-0003	1.6	Sismo
[R2]				

3   INTRODUCTION TO SISMO HARDWARE

Each Plug&Fly module (Such as the AFT; FWD, MIP, etc) which has been developed by Sismo has its own particular hardware components and wiring layout. However, they are all controlled by means of electronic boards which were also designed by Sismo. These boards are called the SimCards Ethernet family, and they have been in use since 2009.

The SimCards, as opposed to many other I/O boards on the market, use ethernet port. This provides a reliable communication, which is highly desirable for a Flight Simulator which requires hundreds of inputs/outputs in real-time.

The most common alternative is USB. However, USB modules usually have communication issues, due to the saturation of information or a simple loss of configuration.

Ethernet communication through a LAN is very stable and can be connected with any router without having to constantly change IP addresses. For further information, please read the manual [R1] or watch the following videos:
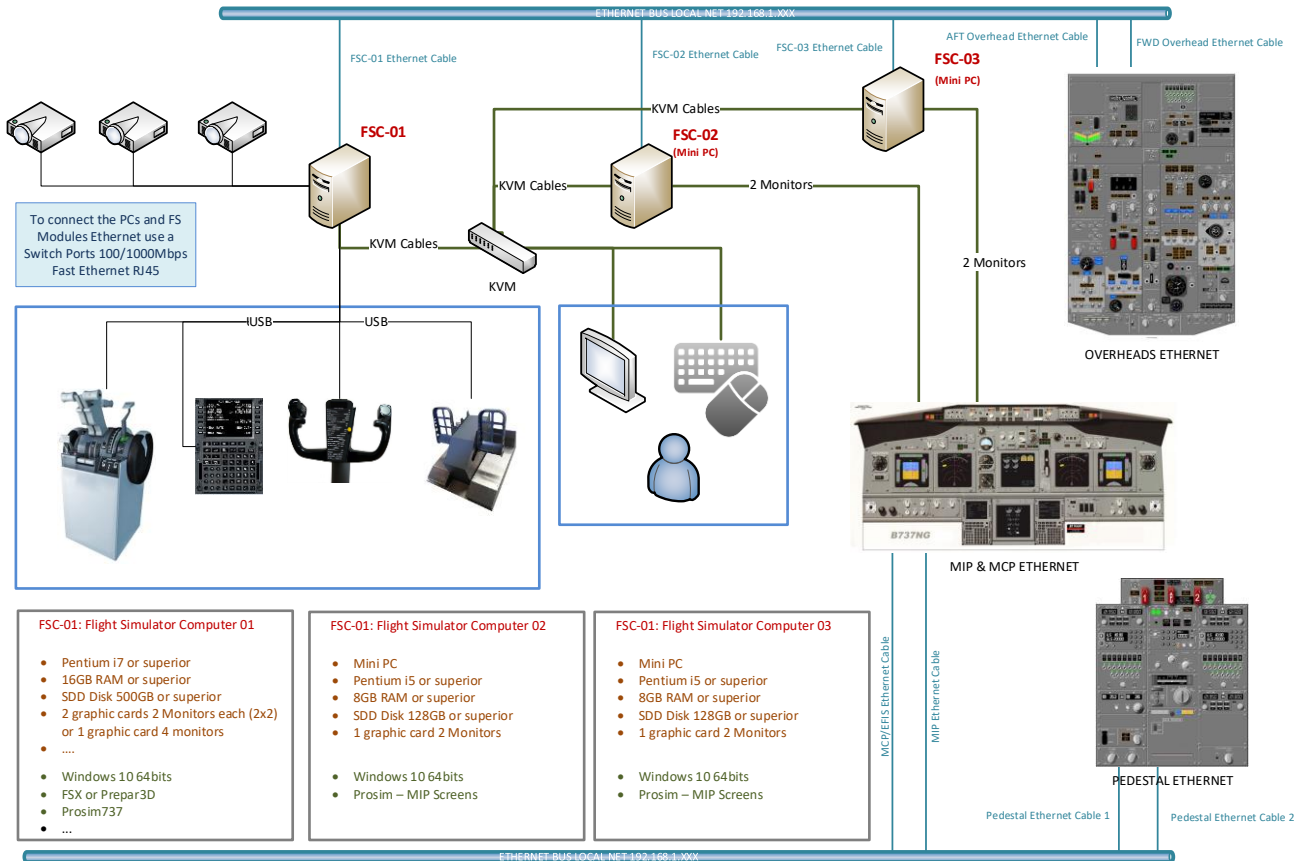
https://www.youtube.com/watch?v=nPaQGjc2VPw&t=14s

https://www.youtube.com/watch?v=0ouRsOyB014

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3.1 EXAMPLE HARDWARE SET-UP

In the figure below you can see a typical layout for a Flight Simulator based on Sismo Hardware.

3.2 REQUIREMENTS

Before run SismoLink in your computer, you need to have installed the following software packages:

- Microsoft Flight Simulator 2020
- PMDG 737 for FS2020
- Modified the file 737_Options.ini, as is described in the chapter 5.1
- Last release of SismoLink

Regarding the hardware, SismoLink is a free application developed by Sismo to connect our modules with PMDG, therefore the mapping for every module is fixed and cannot be modified. One of biggest advantage is that the user has nothing to do in this regard, no programming and no configuration is needed, just push a button, but your need to use Sismo Modules, that include SimCards to control them.

Note: If you don't have a Plug&Fly Module, just some Sismo modules connected to a SimCard, please be in contact with Sismo through info@sismo-soluciones.com to request how the modules have to be connected in order to follow the mapping assigned to every single module. It is non valid for 3rd parties' modules connected through a SimCard.

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The compatibility is described in the chapter 4.1.

3.3 SISMOLINK FEATURES

SismoLink is a native application in 64 bits developed by Sismo. This product was designed with the following objectives in mind:

- To provide the customer with an application that will be able to connect our Plug&Fly modules directly and automatically to FS2020. The mapping between the modules and PMDG should be done inside the application, which will allow the user to simply connect and run the software.
- The application has to be native 64 bit.
- No 3rd party add-ons are required, due to SismoLink is connected with FS2020 using SimConnect.dll
- SismoLink should be able to scan the LAN to identify connected SimCards that are associated with Sismo modules, and assign them automatically depending on the IP address. See previous videos for further info.
- SismoLink will create a link with FS2020, once it is running and the selected aircraft is PMDG 737NG.
- The customer configuration is minimal and can be managed directly in the SismoLink interface or alternatively in the 'config.ini' file.
- SismoLink is a complex application, but it is free for Customers. We consider this to be an important advancement for Sismo.
- It has been developed using the latest software.
- Please take into account that the mapping is for hundreds of inputs/outputs.

The available functionality depends on the PMDG variables, there are some buttons and modules which are dummy or have limited functionality. This is not due to any hardware limitations. When PMDG releases new panels, SismoLink can be modified to control the new panels.

3.4 FORECASTED ROADMAP

Due to the internal architecture of the application, we are able to go 2 months ahead the forecasted schedule.

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3.5   SISMOLINK FUNCTIONAL LAYOUT
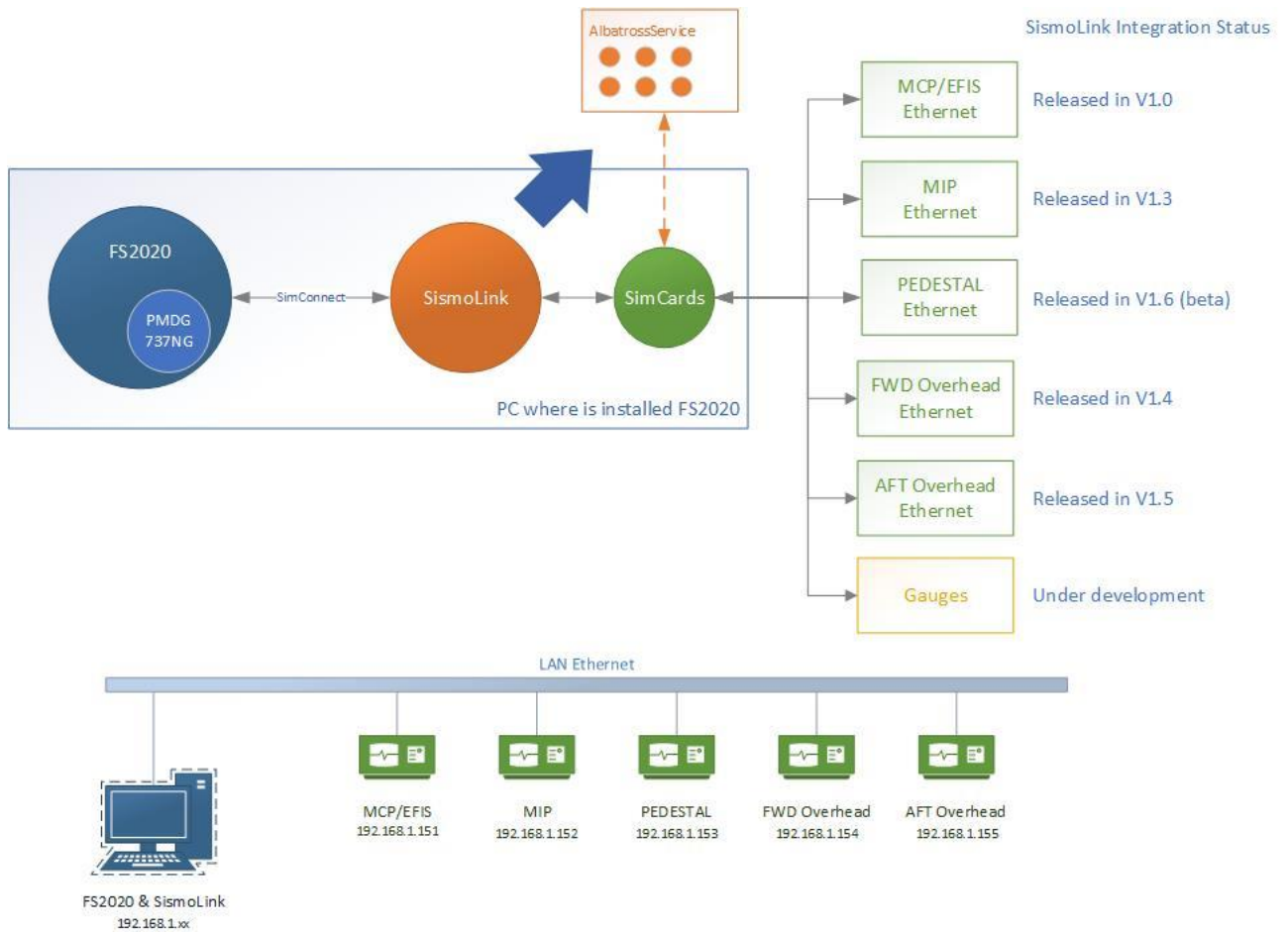
SismoLink is an application with the following capabilities:

- Scans and connects the SimCards connected in the LAN and automatically assigns a Plug&Fly module depending on the IP address.
- Automatically detects when FS2020 is running and establishes a connection.
- You can use SismoLink to access and configure the CONFIG page of the SimCard. By default, the Plug&Fly module will be configured with the correct IP Address, but you can also choose to change the IP to customize your network. There is a limitation to this, which is that the IP must belong to the correct range. This configuration is similar to the way ProSim works.
- SismoLink shows the inputs in real-time and can force outputs, displays, servos and analog inputs. This can be used for testing purposes. This service is very useful when the user wants to check if a particular error is due to the software or the hardware. This service is called "AlbatrossService"

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4   HARDWARE COMPATIBILITY

As is stated in the roadmap, SismoLink supports the following Sismo Modules:

- MCP/EFIS
- MIP
- FWD Overhead
- AFT Overhead
- Pedestal (beta)

You do not need to have the full Plug&Fly module in order to use SismoLink.

It is necessary to follow our wiring schedule with our Baseplate and SimCard. As an example, you could start with just the baseplate with the SimCard Ethernet, and add IDC Modules one by one using flat ribbon cables.
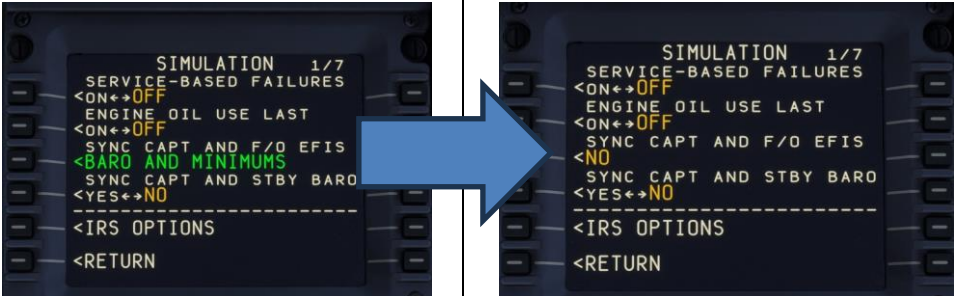
The baseplates are designed with the wiring schedule already integrated for compatibility with SismoLink and any of the IDC Modules (DS, EDC, AFDS, NAV, VHF…). Bear in mind that the baseplate is also useful as it provides specific wiring schedule, it is designed to facilitate the connection of the different IDC modules with the SimCard.

If the customer has a complete Plug&Fly Sismo module, then the module is fully assembled with all the connections. You only need to connect the module to a modem and to a power supply.

5   PMDG CONFIGURATION

To operate real flight sim modules, it is required to configure some specific functions, as shown in the following table:

5.1   F/O EFIS

MINS and BARON Rotaries	

To change the config data within PMDG, go to the FMC and push the button "PMDG SETUP", "OPTIONS", and "SIMULATION".

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6   PMDG USE CONDITIONS

6.1   MIP USE CONDITIONS

ID	Description	Reason
MUC1	Before connect SismoLink, the Landing Gear Lever has to be in the position Down	To be able to synchro hardware and PMDG, due to the PMDG interface. It is not an issue, due to the LG has to be in down position at the beginning (plane landed).

7   SISMO MODULES COMPATIBILITY WITH PMDG

7.1   MIP

7.1.1   MIP missing functions

ID	Description	Reason
M1	Gauges are not still operative	As is stated in the roadmap, this functionality will be delivered before Feb'24

7.2   FWD OVERHEAD

7.2.1   FWD Overhead missing functions

ID	Description	Reason
F1	The toggle switches GEN1, GEN2, APU GEN1 and APU GEN2, in the position down do not work	Is a PMDG bug. It has already been reported, waiting for the answer.
F2	Voice Recorder toggle switch	Non available in the interface of PMDG.
F3	Gauges are not still operative	As is stated in the roadmap, this functionality will be delivered before Feb'24

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7.3 AFT OVERHEAD

7.3.1 AFT PMDG Module

7.3.2 AFT Overhead missing functions

| ID	Description	Reason
A1	ELT Module	As shown in the previous figure, PMDG AFT Module does not include ELT Module
A2	ADC Module	This module is partially implemented in the PMDG interface, being some of the events non-operative, therefore the module cannot be controlled, due to PMDG restrictions in the interface
A3	LE DEVICES Module	The indications of the FLAPS and SLATS are not available in the current PMDG interface.
A4	Encoder BRT	The bright of the displays does not work in this release
A5	Gauges are not still operative	As is stated in the roadmap, this functionality will be delivered before Feb'24

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7.4 PEDESTAL

7.4.1 Pedestal missing functions

- Module integrated Sismo-PMDG
- Module not required to be integrated with PMDG. It is functional by hardware
- Module not available in Sismo Pedestal
- Module partially integrated Sismo-PMDG, due to PMDG limitations in the interface
- This Module is dummy in PMDG, cannot be integrated with Sismo Pedestal
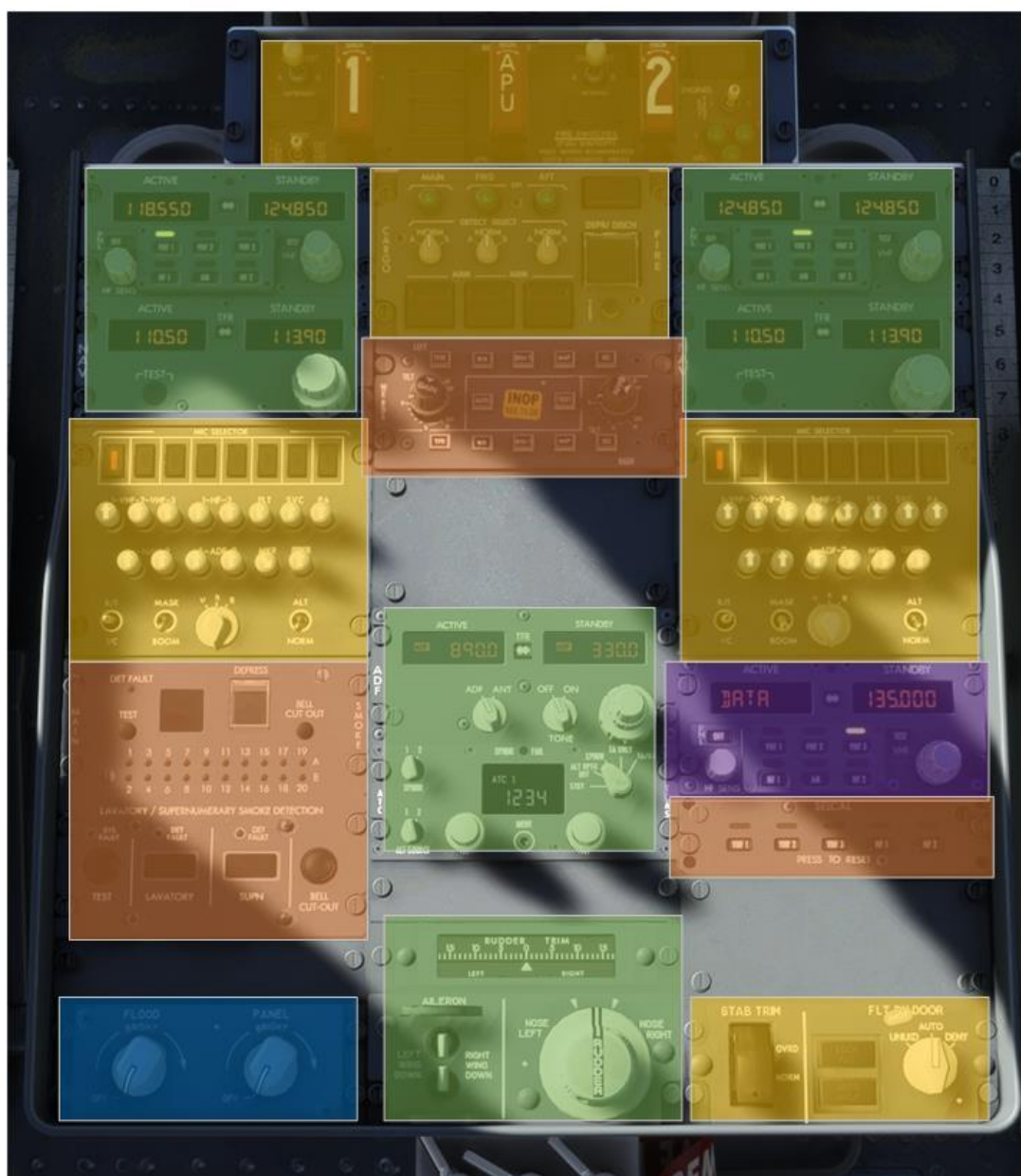
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7.5 SOFTWARE COMPATIBILITY

7.5.1 Operating system

It requires Windows 10/11 x64 Home or Professional version with the latest updates and .NET Framework 4.8.1 Runtime. This framework is installed automatically by SismoLink, but if you need to install it manually, follow this link:

https://dotnet.microsoft.com/download/dotnet-framework/net48

8 INSTALLATION

The latest release of SismoLink is available in the downloads section of our website: www.sismo-soluciones.com, please check the web or follow us on Facebook to hear about new releases.

Before installing the application, you must take into account that SismoLink has to be installed on the same computer where FS2020 is installed.

Download and install the files from our website. You MUST give the application permission to pass through the **Firewall**. If you do not do this the application will not work as expected.

Once the application is installed in the folder "Program Files" of your computer, please do the following steps:

- Open the folder where SismoLink is installed, as shown in figure 01.

Nombre	Fecha de modificación	Tipo	Tamaño
AlbatrossService64.dll	02/09/2023 19:29	Extensión de la ap...	1.586 KB
config.ini	27/08/2023 19:51	Opciones de confi...	4 KB
Microsoft.FlightSimulator.SimConnect.dll	24/04/2023 14:16	Extensión de la ap...	141 KB
Readme.txt	27/08/2023 19:48	Documento de te...	3 KB
SCSismoConnector64.dll	02/09/2023 19:28	Extensión de la ap...	21 KB
SimCards64.dll	02/09/2023 19:21	Extensión de la ap...	62 KB
SimConnect.dll	23/08/2023 11:35	Extensión de la ap...	62 KB
SimDefinitions64.dll	02/09/2023 14:25	Extensión de la ap...	109 KB
SismoComponents64.dll	02/09/2023 14:25	Extensión de la ap...	26 KB
SismoFlightSimModules64.dll	02/09/2023 19:28	Extensión de la ap...	327 KB
SismoLink.exe	28/08/2023 19:41	Aplicación	949 KB
SismoLink.exe.config	23/08/2023 9:55	XML Configuratio...	1 KB
sismolink_para_icon256c.ico	23/08/2023 10:54	Archivo ICO	25 KB
System.Net.Http.dll	24/06/2022 19:18	Extensión de la ap...	79 KB
XPSismoConnector64.dll	27/08/2023 18:52	Extensión de la ap...	2.331 KB

Figure-01

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- Read the readme.txt file if you want to know the functions and services of the release.

8.1   PMDG

To enable the data communication output, you will need to open the file **737_Options.ini** that is located in the 737 persistent storage folder. For Microsoft Store distribution, this folder is located at:

%LOCALAPPDATA%\Packages\Microsoft.FlightSimulator_8wekyb3d8bbwe\LocalState\packages\pmdg-aircraft-737\work\.

For Steam distribution, this folder is located at:

%APPDATA%\Microsoft Flight Simulator\Packages\pmdg-aircraft737\work\.

Once this folder is open, add the following lines as required to the bottom of the file:

```
[SDK]
EnableDataBroadcast=1
EnableCDUBroadcast.0=1
EnableCDUBroadcast.1=1
```

For further details, please read the document "PMDG_737_MSFS_SDK.pdf"

9   EXECUTION

- Run FS2020 and load the aircraft PMDG 737NG in any configuration.
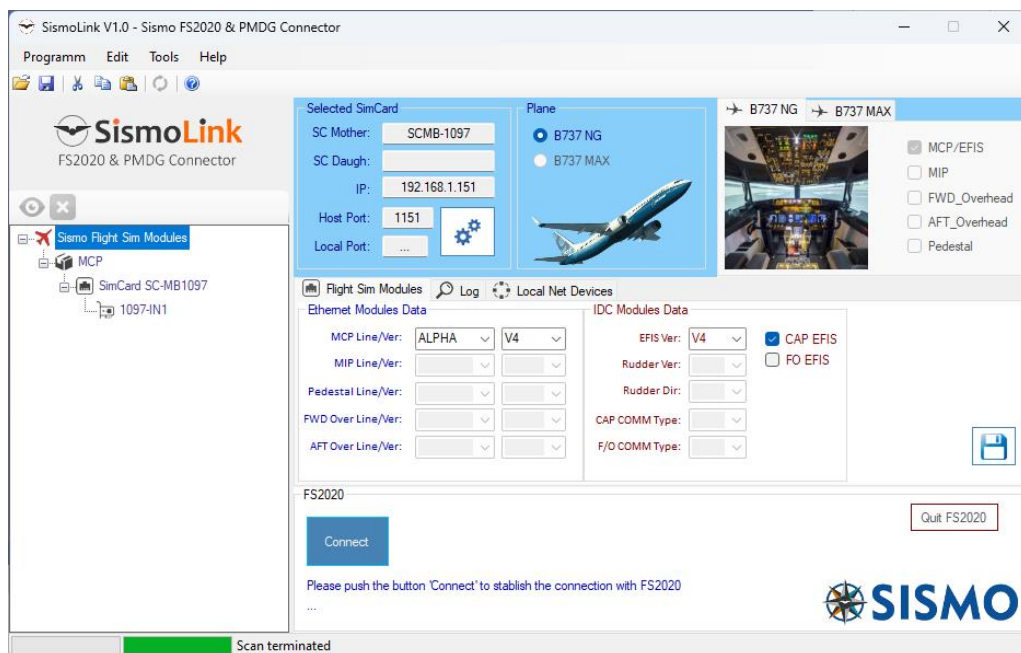- Push the button "Connect" to stablish the connection between SismoLink and FS2020.

Figure-02

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10 SOFTWARE CONFIGURATION

The SimCards have to be connected in the user's LAN as is explained in the document [R1] or in the videos linked above. If for whatever reason the user has to change some parameters on the network, it can be done directly in the browser with the IP address or through SismoLink, by right-clicking on the following icon:

If you bought a specific baseplate with a SimCard (MIP, Pedestal, Overheads) the SimCard connected to the baseplate will be shipped pre-configured. If the client buys a SimCard without the baseplate then the IP address will be 192.168.1.150 by default, but this can be changed following the steps in the manual or videos.

We'd like to highlight that SismoLink has been developed to simplify the work to be done by the user as much as possible.
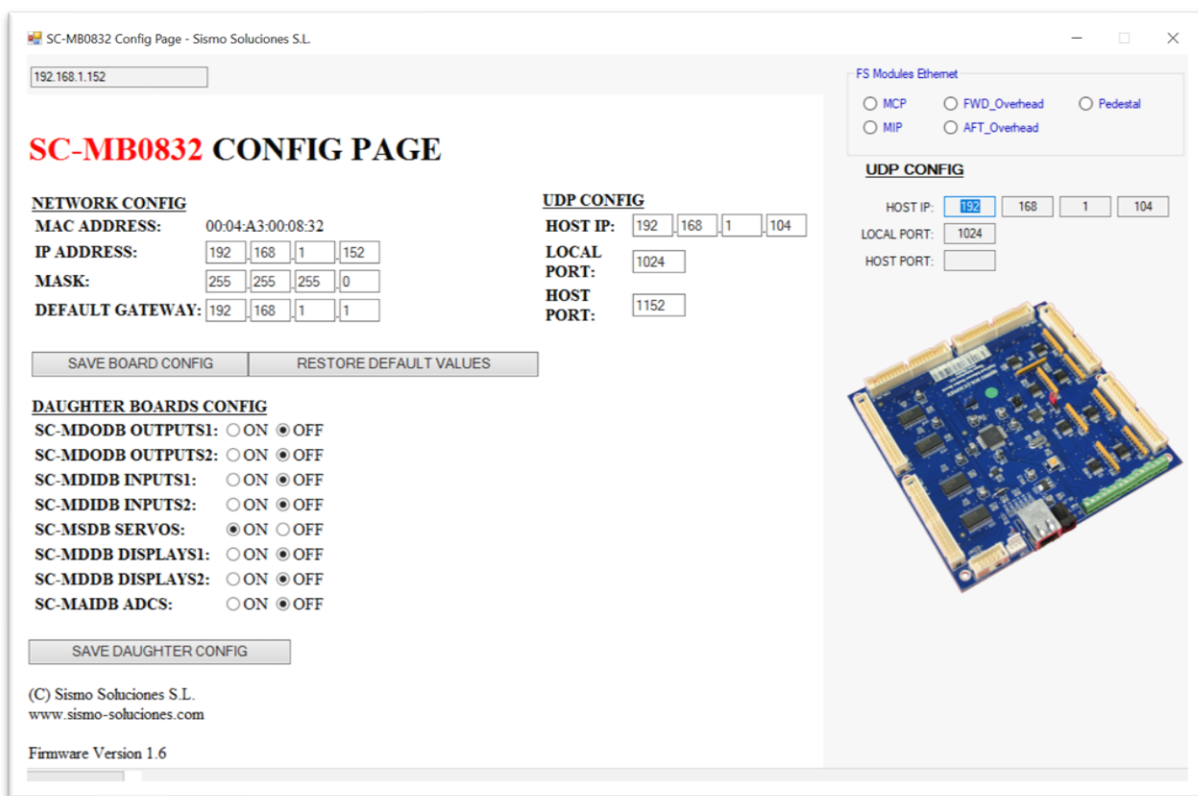
10.1 EDITING THE CONFIG FILE

Although most of the values of the config file installed in the SismoLink program folder are available through the graphical interface of the SismoLink application, the user can also change them directly opening the config file with notepad. If you follow this route, you must respect the syntax of the document.

For most users these values will not have to be changed, with the default configuration covering most of the work.

One example of when you must edit the config file, is when you are using a previous version of Sismo AFT or FWD Plug&Fly modules which uses a different encoder-manufacturer. More details on this case in 7.1.2.3.

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10.1.1 Typical values

In the Extract of the config file below, you can see the syntax of the document and the different configuration variables available for the network and the different Plug&Fly modules.

```
//------------------------------------------------------------------
// Flight Sim information
//------------------------------------------------------------------
//
// Select from Boeing 737-NG or Boeing 737 MAX
[SISMO_FS]
  SIM_MODEL = "Boeing 737-NG"

//------------------------------------------------------------------
// Network Configuration Data
//------------------------------------------------------------------
// HOST IP: is the IP of the computer where the SC is connected
//
[UDP CONFIG]
  SC_SC_SCAN_FIRST_HOSTPORT = 1151
  SC_SCAN_LAST_HOSTPORT = 1155
// Not used SC_LOCAL_PORT = 1024
 // Not used SC_HOST_IP = "127.0.0.1"

//------------------------------------------------------------------
// SIM Modules for B737-NG & B737 MAX
//------------------------------------------------------------------
//
//######### Flight Simulator Modules Plug&Play <8Ethernet) #########
//
// Simulator Type; Module; Line; Release; IP
  SIMMOD737_MCP = "NG;MCP;ALPHA;V3;192.168.1.151"
  SIMMOD737_MIP = "NG;MIP;ALPHA;V2.6;192.168.1.152"
  SIMMOD737_PED = "NG;Pedestal;ALPHA;V2;192.168.1.153"
  SIMMOD737_FOH = "NG;FWD_Overhead;ALPHA;V3;192.168.1.154"
  SIMMOD737_AOH = "NG;AFT_Overhead;ALPHA;V3;192.168.1.155"
//
//######################## IDC Modules ###########################
//
  /// MCP IDC Mod Data
  MCP_EFIS = "V4"
  // Enabled = true / Disabled = false
  CAP_EFIS = true
  FO_EFIS = false
  //
  /// Pedestal IDC Mod Data
  // VHF or RT
  COMM_TYPE = "VHF"
  // V3 or V4
  RUDDER_TRIM_VER = "V3"
  /// FWD Overhead Mod Data
  // Encoders = CTS or ALPS
  FWD_OVER_ENCs = "CTS"
  // Encoders = CTS or ALPS
  AFT_OVER_ENCs = "CTS"
//
//######################## Servo Gauges #########################
```

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```
//
  //MIP Gauges Positions (between 0 and 255)
  // Positions: UP; 1; 2; 5; 10; 15; 25; 30; 40
  FLAPS_POSITIONS = 35;61;92;117;143;165;184;202;224
  HBP_POSITIONS = 0
  //FWD Over Gauges Positions (between 0 and 255)
  FUEL_TEMP_POSITIONS = 0
  EGT_POSITIONS = 0
  CABIN_CLIMB_POSITIONS = 0
  DIFF_PRESS_POSITIONS = 0
  CABIN_ALT_POSITIONS = 0
  DUCT_PRESS_L_POSITIONS = 0
  DUCT_PRESS_R_POSITIONS = 0
  TEMP_POSITIONS = 0
  //AFT Over Gauges Positions (between 0 and 255)

  OXY_POSITIONS = 0
```

10.1.2 Data description

We will now see the syntax of how to fill-in each field.

10.1.2.1 SIMMOD737_XXX

```
SIMMOD737_MCP = "NG;MCP;ALPHA;V3;192.168.1.151"
SIMMOD737_MIP = "NG;MIP;ALPHA;V2.6;192.168.1.152"
SIMMOD737_PED = "NG;Pedestal;ALPHA;V2;192.168.1.153"
SIMMOD737_FOH = "NG;FWD_Overhead;ALPHA;V3;192.168.1.154"
SIMMOD737_AOH = "NG;AFT_Overhead;ALPHA;V3;192.168.1.155"
```

XXX is the Plug&Fly Module. The different values are separated with a semicolon **;**

Simulator Type: NG or MAX. use always NG

Module Plug&Fly: MCP, MIP, PED, FWD_Overhead and AFT_Overhead

Module Line: ALPHA, BRAVO, CHARLIE, DELTA, ECHO. Usually here use always ALPHA

Module Release: Vx. Depending of the release of your module. This info is in your order. If you don't have the info, keep the default data.

Module IP: It is the IP address of the SimCard Mother Board that controls the module. The default values of IP Address of the Plug&Fly modules are detailed in red in the extract above (e.g. Pedestal is 192.168.1.153).

Notice also the quote signs at the beginning and end **" "**.

10.1.2.2 COMM_TYPE

```
COMM_TYPE = "VHF"
```

You can select this variable in the SismoLink graphical user interface (GUI). The VHF or RT modules of the pedestal variable is stored here.

10.1.2.3 FWD_OVER_ENCs & AFT_OVER_ENCs

```
FWD_OVER_ENCs = "CTS"
```

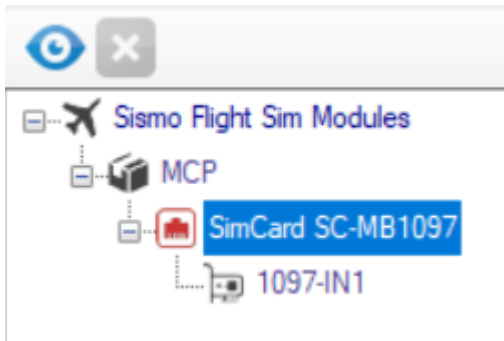|	1.3	SismoLink Connector for FS2020 & PMDG		
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Select between CTS encoders that are 2 bit gradient or ALPS encoders. The second of these two being the ones currently used in Sismo Modules. If the encoders do not work properly, change the value from CTS to ALPS.

10.1.2.4 Gauge Positions

This code records the calibration data of every gauge. So far, only the FLAPS and TEMP gauges can be calibrated through AlbatrossService in the SismoLink GUI. We are planning to have all the gauges calibrated in Albatross. But you can also type in the values in the Servo Gauges as per the example above.
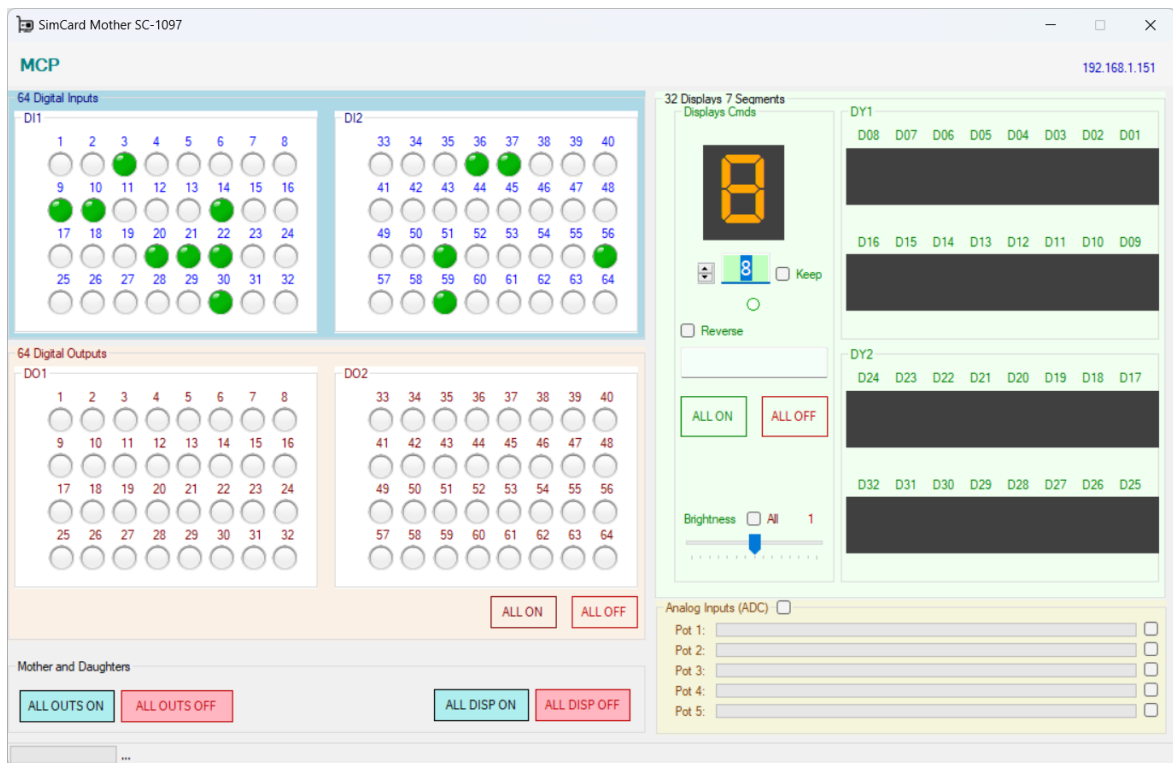
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10.2 SIMCARDS TESTING SERVICE

This service is available in SismoLink V1 and above. If the user has to check if the inputs are being received, just select the SimCard and open the window, clicking on the icon

10.3 SIMCARD MOTHER BOARD

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11   QUESTIONS AND ANSWERS

Q1: A specific function available in a Sismo module does not do anything in PMDG

A2: Please, read the chapter "Software compatibility" in section 4.2.2 in this manual.

Q2: I can't save my changes.

A3: Did you open SismoLink with Administration permissions?

Q3: Modifying the config file doesn't work as expected.

A4: Review the syntax. **;** is not the same as **,**

V4 is not the same as v4. You must select the correct version of your modules.

Q4: SismoLink does not detect any Sismo Module.

Check the config of the SimCard, that controls the module, introducing the IP in the browser. Be sure that the following "HOST PORTS" has been introduced in every SimCard and the computer IP of the customer (HOST IP), where the module is connected is correctly written.

Module	IP ADDRESS	HOST IP	HOST PORT
MCP	192.168.1.151	Client computer IP	1151
MIP	192.168.1.152	Client computer IP	1152
PEDESTAL	192.168.1.153	Client computer IP	1153
FWD OVERHEAD	192.168.1.154	Client computer IP	1154
AFT OVERHEAD	192.168.1.155	Client computer IP	1155

Note: To now the HOST IP, go to the "cmd" windows and write "ipconfig"

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SISMO

An example with the FAT Overhead connected in a computer with the IP 192.168.1.10

← → C ⌂ ⚠ No es seguro | 192.168.1.155

SC-MMB1179 CONFIG PAGE

NETWORK CONFIG

MAC ADDRESS:	00:04:A3:00:11:79
IP ADDRESS:	192 . 168 . 1 . 155
MASK:	255 . 255 . 255 . 0
DEFAULT GATEWAY:	192 . 168 . 1 . 1

UDP CONFIG

HOST IP:	192 . 168 . 1 . 10
LOCAL PORT:	1024
HOST PORT:	1155

[SAVE BOARD CONFIG] [RESTORE DEFAULT VALUES]
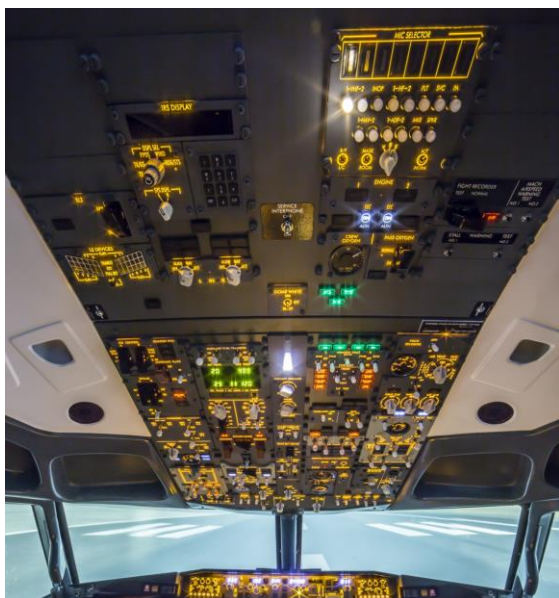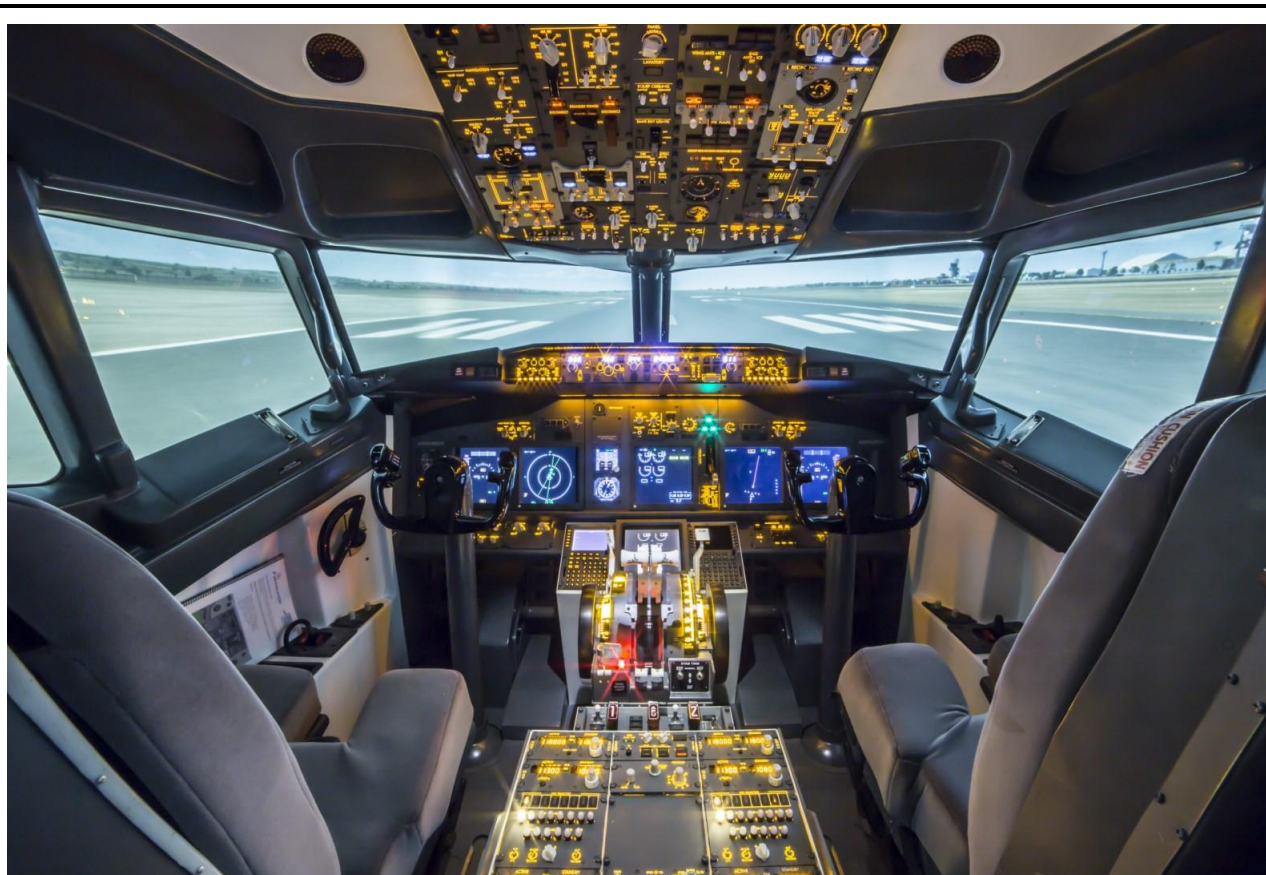
DAUGTHER BOARDS CONFIG

SC-MDODB OUTPUTS1: ◉ ON ○ OFF
SC-MDODB OUTPUTS2: ○ ON ◉ OFF
SC-MDIDB INPUTS1: ◉ ON ○ OFF
SC-MDIDB INPUTS2: ○ ON ◉ OFF
SC-MSDB SERVOS: ◉ ON ○ OFF
SC-MDDB DISPLAYS1: ○ ON ◉ OFF
SC-MDDB DISPLAYS2: ○ ON ◉ OFF
SC-MAIDB ADCS: ○ ON ◉ OFF

[SAVE DAUGTHER CONFIG]

(C) Sismo Soluciones S.L.

Firmware Version 1.5

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12 PICS OF THE SISMO COCKPIT

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