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for Microsoft Flight Simulator X

Product Developed and Published by: VIRTUALI Sagl. http://www.fsdreamteam.com

Credits

Programming - Couatl™ Engine	Alberto Barbati / Gamecentric
Design	Umberto Colapicchioni/Alberto Barbati
Texturing	Francesco Pacchioni
3D Modeling	FsDreamteam
Additional Programming	Massimiliano Rossi
Airport Customization	Umberto Colapicchioni / Fabrizio Pascucci
Manual/Installer	Umberto Colapicchioni / Virtuali Sagl.

Testers:

Brian Kircher, Fabrizio Pascucci, Nuno Oliveira, Robert Fitzgereld, Jon Bradbury, "wb2002",Bruce Hamilton, R. Burrell, Orion Lyau, Angelo Cosma, Sean Campbell, "anappy", Ingo Voigt, Robert Shelley, Ph.D., "9Y-POS", "pride545", "meshman", Stefan Rakel, "NGX_Winglet", "eastern"

System Requirements

In order to run GSX without any problems your system will have to meet the following minimum requirements:

- Pentium 2.5 Ghz or faster - A Dual Core CPU is recommended.
- 200 MB free space on your hard disk
- 2GB RAM
- 3D video card with at least 512 MB
- Microsoft FSX + SP2 or Acceleration Pack or Lockheed Martin Prepar3D 1.4 or 2.0 and above.
- Microsoft Windows XP with SP3 or Windows Vista or Windows 7, both 32 bit and 64 bit versions are supported.

- Adobe Acrobat® Reader 8 or later version, available as a free download at: http://www.adobe.com/products/acrobat/readstep2.html

Technical Support

Support for this product is provided on the forum: http://www.fsdreamteam.com/forum

We have found that the most efficient way to provide customer assistance is through the forum, because a solution to an issue posted in public could benefit many users at time. For this reason, all questions should be posted on the forum. Please DO NOT send messages via email requesting question about use of the product or submit bugs. You should email support only in case you need a reactivation. The forum is also open for general discussions so feel free to post any request, suggestion or comment. You can read all messages on the forum; however you must register as a user to post messages.

We suggest you install our products on fully updated Operating Systems. If you are experiencing problems during the installation or the activation, ensure you have all the Windows hot fixes and updates before contacting Technical Support.

Information related to the product activation are included in the file "**fsdt_Install_Guide.pdf**" found in the destination folder of this product, after installation. Please read it carefully before contacting Technical Support and in case you have to contact VIRTUALI please provide the following information: order number for online versions, serial number and full name/address for CD versions.

Installation

Installation is entirely automatic. The installer will detect your Flight Simulator installation folder automatically, and will copy the files at the correct locations without any user intervention needed. The Addon Manager module, needed in order to be able to use and Buy the product, will be installed as a submenu under the "Addons" menu in FSX. If you already have this module coming with other products, the installer will automatically check its version, and will always install the newer one. In case you find any incompatibility between other product using the Addon Manager, please ensure you are using updated versions of these products.

After Install - the Addon Manager module

When you launch Flight Simulator for the first time in FSX, there will be a request to trust a newly installed module, the Addon Manager, needed by the scenery to work. There will be two dialog boxes, one generated by Windows, the other by FSX itself.

The Windows-generated dialog box looks like this: (or slightly differently, depending on your Windows language)
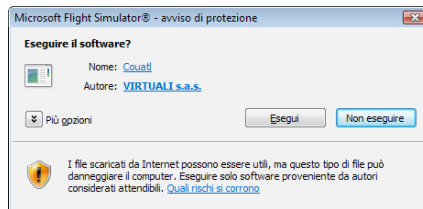
Indicating the module "Addon Manager for FSX" is Digitally signed by VIRTUALI s.a.s., so it's safe to assume is the original one and it hasn't been tampered or corrupted. You should allow Windows to execute the module, otherwise the scenery will not run. If you click the "More Options" arrows, you can allow any software signed by "VIRTUALI s.a.s" to be automatically trusted. This way, subsequent updates coming from VIRTUALI will be automatically executed without requesting confirmation.

After having allowed Windows to trust the module, another similar dialog, this time coming from FSX will appear:
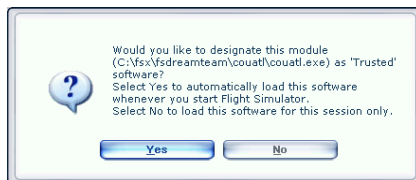
You should select "Yes" to allow FSX to trust this module. If you select "No", the module will run, but this request will be repeated each time you start FSX

After Install - the Couatl™ Engine module

GSX includes a new external executable module, based on the Python programming language, that will allow a great amount of interaction between the user and FSX. This module is called "Couatl Engine". The name comes from the ancient Quetzalcoatl Aztec god, which is a creature half serpent, half bird. Basically, a "Flying Snake", which we find it quite fitting for a Python engine running in a Flight Simulator...Couatl engine will be used in all our present and future products.

To use these new features, you need to allow the Couatl engine to run, in a similar way as the Addon Manager.

First, the Windows trust request:

You should allow Windows to execute the module, otherwise the additional interactive scenery features will not run.

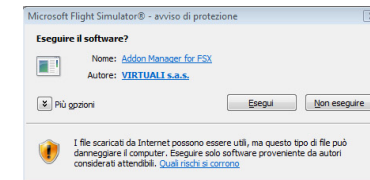Then, the FSX trust confirmation:

You should select "Yes" to allow FSX to trust this module. If you select "No", the module will run, but this request will be repeated each time you start FSX

Trial Option

This product includes a "Trial" option: after the download and the installation, before the purchase, the scenery will work on your PC in several "TRIAL AIRPORTS". The trial version is not time limited and includes all product features so you have the opportunity to completely try it before the purchase. The Trial version also works IN FULL on ALL the existing FsDreamTeam and Flightbeam airports, and GSX replaces and enhances the previous "ParkMe" feature which was offered on those airports.

Purchasing GSX will allow you to use it on every FSX airport both default or 3rd party.

Trial Areas

The Trial areas, were the product will work fully are as follows:

Milano Linate - LIML - Italy
San Francisco - KSFO - USA - from FlightBeam
Munich - EDDM - Germany - default or Aerosoft's

If you are outside of one of the Trial Areas when the product is in Trial mode, this menu will appear, allowing to jump directly to one of the Trial Areas to test the product.

GSX features will not be available on non-FSDT airports outside the Trial areas, until the product is purchased.
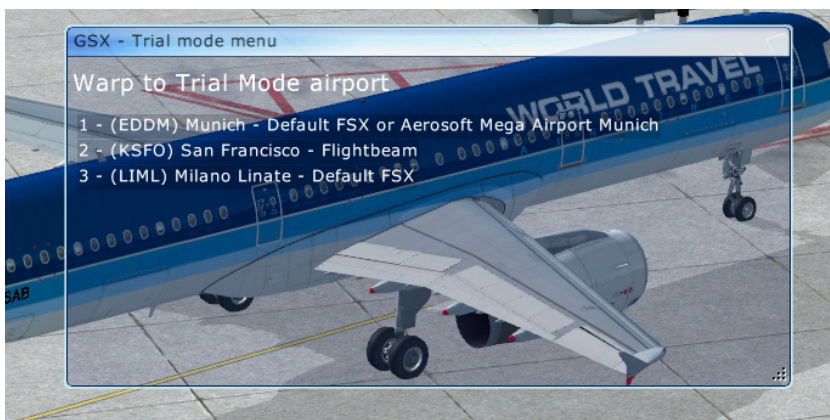
Purchase, Activation and Reinstallation

If you have decided to purchase the product you can do so from Flight Simulator. Follow the instructions in the "**fsdt_Install_Guide.pdf**" document located in the \ FsDreamTeam folder, under your main FSX folder, after installing the Trial. This documents is shared between all our products, and it covers everything related to purchase, activation, reinstallation and troubleshooting.

Very briefly, activation it's done this way:

• Open the "Addon Manager" menu inside FSX, under the "Addons" menu
• Select Fsdreamteam and GSX in the two small text windows
• Click the "Register Serial" button
• Type your Serial Number, as indicated in your purchase receipt
• Let it activate, with a working internet connection

What is GSX ?

GSX stands for Ground Services for FSX. It's a product designed to enhance all your airports to add realistic ground service features, with advanced animations and sounds. It works with all FSDT airports replacing the previous ParkMe feature, but also on all default FSX airports, and on 3rd party airports too. It's enough for an airport to be provided with standard airport data .BGL (also known as an "AFCAD" file) to work with GSX, which means every FSX airport, even those that haven't been designed yet, will work with it with no need of a specific support.

What it does

GSX offers two main classes of services: **Parking Services** and **Assistance Services**. Parking Services are used when your aircraft is on the ground on an airport, but is not located in any parking spot and have the engines running. Assistance Services are used when the aircraft is parked, with engines off and Parking Brake On.

Parking Services

- Follow Me Car - To be used to find your way to the parking spot.
- Marshallers - To help you park the airplane if there's no advanced parking aid available at that parking/gate
- Docking Systems - The advanced parking aids that allows to park the airplane without using a Marshaller, like SafeDock, Agnis, Agnis-Papa, Apis, Rlg, etc.

Assistance Services

- Tow trucks used for Push back
- Passengers Stairs
- Passengers Bus
- Catering Vehicle
- Refueling Vehicle
- Baggage Loaders

How it works

After Landing - Parking spot Selection

You normally call GSX after landing the airplane on any airport, by pressing its Hot key. By default, the Hot key assigned to GSX is **CTRL+F12**, but it can be reassigned using the "Couatl Powered products" menu inside FSX. The following screenshots shows how GSX will look like when just landed on an airport:

Here GSX is asking where you want to park your airplane. This selection is completely independent from the parking spot you might have been assigned to by the default ATC, you can select the same parking, or a different one, it's your choice.

To speed up the selection, all parking places are grouped by terminal or area, so the list won't be several pages long on a large airport with 100+ parking stands. You'll be able to select the desired parking on the next screen:

This screen shows all the available parking spots in the previously selected area/terminal group. If you made a mistake and want to redo your selection, pressing the GSX Hot key (CTRL+F12 by default) again will close the menu, allowing to select a different option.
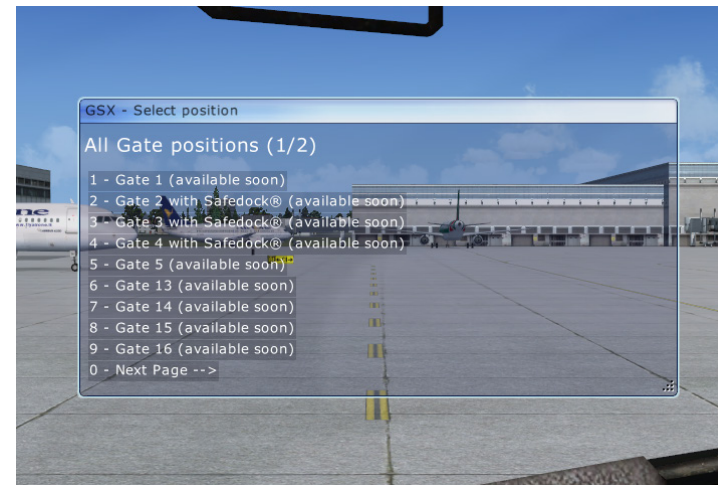
The following screenshot shows an example of how the list looks like when there are many AI airplanes at the airport. It's not possible to select an occupied parking spot, if you do that, you'll see a warning message about this.

The list displays parking spot names with their associated service, as follows:

- If there's an advanced parking assistance, like a Docking system, the list will indicate its type, which could be SafeDock, APIS, AGNIS, RLG, etc.
- With no indications, the parking assistance is assumed to be a Marshaller.

The list will also display if the parking place is free or taken by another AI airplane, with a time indication in minutes:seconds before the parking place will be available (based on the AI Traffic Schedule) or "(available soon)" if that AI is scheduled to depart in the next minute.

If the scheduled departure time for an AI has already passed, but the AI is still there, the list will indicate a "delayed" indication, so you'll know that AI was supposed to depart already, but it's still there, so it's reasonable to assume it should free the parking spot very shortly.

Follow Me selection

The next screen will allow you to decide if you would like a Follow Me Car to guide you to the parking place. If you select Yes, a Follow Me Car will arrive in a short time, and selecting No will allow you to taxi normally on your own.

Changing parking spot or service

It's possible to undo your choice of a parking spot after having selected it, just press the GSX Hot key again, if a parking spot has been already selected, the menu will look like this:


The three menu options are as follows:

- "Change parking facility" - Displays the parking spot you just chose, allowing to select a different one.
- "Request Follow Me" - Allows to select a Follow Me if you decide you need one after having selected the parking spot.
- "Revoke parking Services" - Will cancel both the selected parking spot and the Follow Me car, if you asked for one.

Confirmation of the Parking spot selection

After you select a parking spot, the top text display area will show a confirmation message, indicating your selected parking spot, what parking assistance is available, wether you asked for a Follow Me or not, and the Handler:
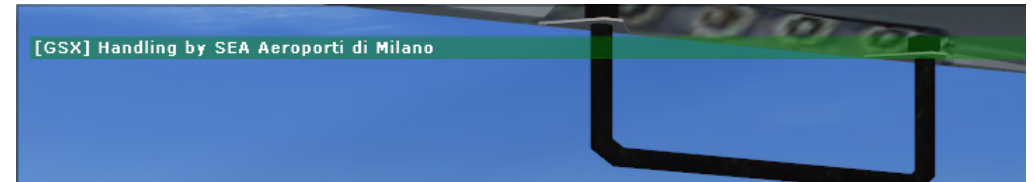
The handler depends on the airport, GSX knows of many different companies around the world, and tries to match it as best as possible. This will affect the liveries of the service vehicle that will appear at the parking place.

Depending if you asked for a Follow Me car or not, you'll then see one of these two messages, indicating the available parking assistance, which could be a type of Docking system or a Marshaller:
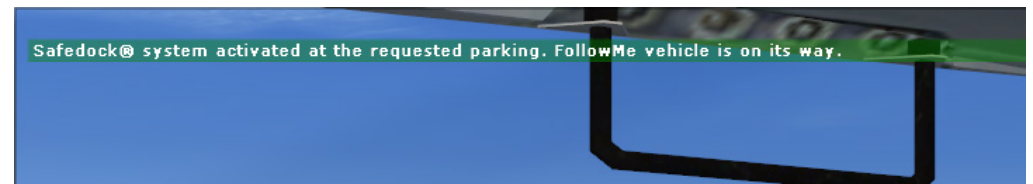
Follow Me

Assuming you selected Yes to the previous request to activate a Follow Me car, after the confirmation message, the Follow Me car will now depart from its assigned parking spot to reach your current destination and then guide you to the selected parking place.

As a general rule in GSX, service vehicle don't just "appear" in front of you. Instead, they are spawned in a suitable parking spot, which usually is the vehicle parking closest to your location, and they **drive** all the way to your aircraft. This is valid both for the Follow Me car, but also for other services like Catering trucks, Fuel trucks and Passenger bus. Other vehicles, like the Stairs, the Tow truck and the Baggage Loders are tied to the destination parking, and are created there the moment you select the parking spot.

This means you'll have to wait for the vehicles, which might take a couple of minutes if the airport is very large or with a complex taxiway layout. But it's just all more realistic this way.

By default, service vehicles that comes from far away, will start from a parking of the "Vehicle" kind, as defined in the scenery. If none is found, a parking of the "Fuel" kind will be used, and if none is found, the vehicles will depart from a random parking.

As soon as the Follow Me car reaches your location, it will reverse its course and will turn on the "Follow Me" lighted indicator, prompting you to start follow it.

Follow Me indications

The lighted indicator of the Follow Me car can display the following messages:

This is the normal status the light will be when you are following the car.

Slow down will be shown if you are taxiing too fast compared to the Follow Me car speed.

This means you were too slow and were left behind, so the Follow Me has stopped to wait for you.

STOP will flash when you are arrived at the destination parking spot, ready to be assisted by a Marshaller or a Docking system.

Left or Right arrows will point the direction in which the next turn on a taxiway will be.

Follow Me to Runway Start

Starting with version 1.9.5, the Follow Me car can be used also to be guided to a Runway when taking-off, in addition of a parking after landing.

To use it, call the GSX menu when you are outside a parking spot, for example after Pushback. The first entries in the menu with the list of available parkings will be the Runway starting positions, which can be chosen as a destination for the Follow Me car, or as a destination to the "Just Warp me there" feature.

Arriving at the Parking spot

When approaching at the desired parking spot, you'll see the Assistance Service vehicles are already waiting from you there. The selected parking assistance system, either a Marshaller or a Docking system is already active and programmed with your airplane type. The vehicles are in the livery of that airport Handler company.

In the following screenshots, there's a SafeDock3 system activated on the Gate:

Parking Assistance

Marshallers

In case the airport doesn't feature an advanced Docking system, the most common form of parking assistance is the Marshaller, and it's the default choice for almost all airports. He'll will guide you to the parking spot with standard gestures, to help align the airplane with it along both the lateral and longitudinal axes.
By default, the Marshaller will try to guide the airplane in the parking spot center position, with the reference point of the airplane (the red cross you can see in the Top View) placed in the center of the parking spot, as defined in the airport .BGL.

The following it's a list of gestures supported by the Marshaller:

Signal	Description
	Wingwalker/guide Raise right hand above head level with wand pointing up; move left-hand wand pointing down toward body. Note: This signal provides an indication by a person positioned at the aircraft wing tip, to the pilot/ marshaller/push-back operator, that the aircraft movement on/off a parking position would be unobstructed.
	Identify gate Raise fully extended arms straight above head with wands pointing up.
	Straight ahead Bend extended arms at elbows and move wands up and down from chest height to head.
	Turn left (from pilot's point of view) With right arm and wand extended at a 90-degree angle to body, make "come ahead" signal with left hand. The rate of signal motion indicates to pilot the rate of aircraft turn.
	Turn right(from pilot's point of view) With left arm and wand extended at a 90-degree angle to body, make "come ahead" signal with right hand. The rate of signal motion indicates to pilot the rate of aircraft turn.

Signal	Description
	Normal stop Fully extend arms and wands at a 90-degree angle to sides and slowly move to above head until wands cross.
	Emergency stop Abruptly extend arms and wands to top of head, crossing wands.
	Cut engines Extend arm with wand forward of body at shoulder level; move hand and wand to top of left shoulder and draw wand to top of right shoulder in a slicing motion across throat.
	Slow down Move extended arms downwards in a "patting" gesture, moving wands up and down from waist to knees.

The Marshaller will use these standard gestures to guide you to the parking position, you'll have to keep a steady and slow speed during the approach, the Marshaller will issue a "Slow Down" command in case you exceed 5 knots.

During the final phase, in the "Normal Stop" gesture, the Marshallers arms will slowly move above the head, proportionally to the distance left to park. As soon as you see its wands crossing, stop the airplane immediately. If you went too far, you'll see the "Emergency Stop" gesture.

Once you reached the parking position, the Marshaller will signal to "Cut Engines", and you'll have to set your Parking Brake and turn your engines off, which will conclude the Marshalling operation.

Parking Evaluation

After you are parked with engines off and Parking Brakes on, you'll get an evaluation of the parking accuracy, with an information text that will appear in the upper part of the screen.

[GSX] that wasn't a very good parking
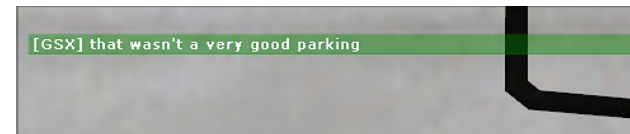
After the evaluation, the Marshaller will salute and will walk away from the parking position. Now you can start calling the various Assistance Services that are available when parked.

Operations at a Parking place.

When parked, with *Engines Off* and *Parking Brakes On*, you can call the following services:

GSX - Activate ground services

Activate ground services

1 - Request deboarding
2 - Request catering service
3 - Request refueling
4 - Request boarding
5 - Prepare for push-back and departure
6 - Operate jetway(s)
7 - Customize this parking position
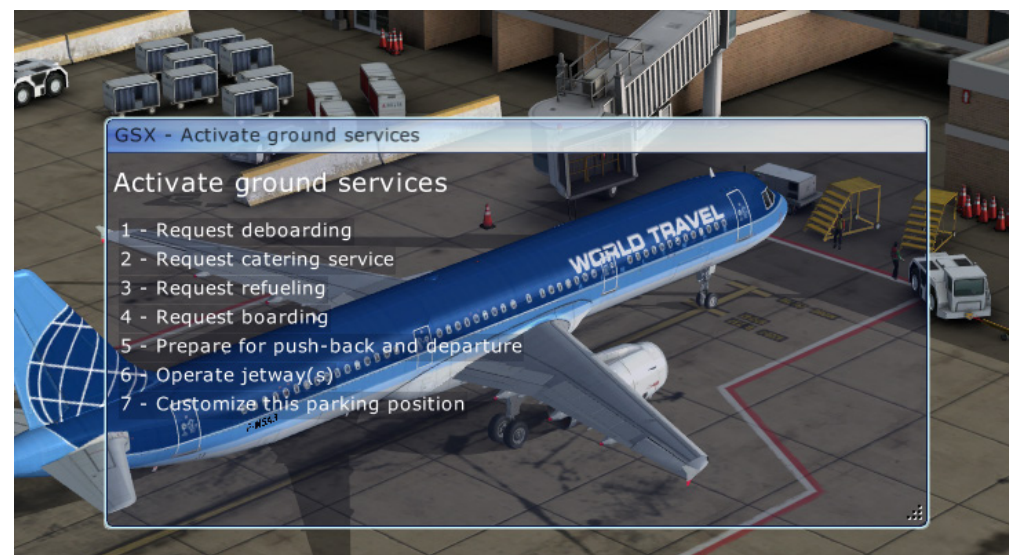
The menu is arranged in the logical chronological order, considering a typical arrival sequence, where passengers/luggage are first deboarded, then the catering and refueling vehicles are being called for the next flight, then new passengers/luggage will be boarded, and finally you'll remove the various ground equipment and ask for Pushback. Starting from version 1.9.5, GSX will integrate with the SODE module, to operate jetways created by it. This is supported both on some FSDT sceneries, and several 3rd party sceneries featuring SODE jetways

Deboarding Time

GSX will calculate Deboarding time by estimating the number of passengers on board, which equals to the sum of all the stations in the **[weight_and_balance]** section of the aircraft.cfg of the airplane in use, divided by 220 lbs. which is an industry standard method of calculating how much a single passenger + baggages weights, in average. For example, the default 737 has 22,000 lbs. of stations load when full, which equals to exactly 100 passengers.

Any operation that involves time, it's scaled down by a factor by GSX, in order to make the process less tedious. By default, boarding passengers takes 0.1 seconds per passengers, with a minimum of 15 seconds. This means the default 737 will deboard passengers in 15 seconds (0.1 x 100 would mean 10 seconds, but the minimum it's 15), and the default 747, which has about 430 passengers when full, will deboard in 43 seconds. You can customize these values to suit your preferences, see the "Customizing GSX" paragraph for more info.

Operating the Airplane Doors

Several operations in GSX are controlled by the status of the airplane doors, and the vehicles will WAIT for you to open or close the door pertaining the operation performed. When boarding or deboarding passengers, the behavior is different depending it the parking spot has a Jetway or not, and if the airplane used has more than one passenger exit that can be controlled independently.

If the parking spot has a Jetway, you will have to open the main passenger door for the Deboarding to initiate (remember to activate the Jetway first!), but the door in the rear left were the additional staircase is placed, can be open at your discretion. A message followed by a short beep sound will warn you which doors are required to be open or closed, before the operation can continue.

On the Apron, you are required to open all doors with a staircase, if your airplane can control them independently. On such parking places, a Passenger Bus will also arrive, and it will wait to board passengers until you open the doors. When all the passenger are deboarded, a screen message will alert you of this.

Deboarding

This operation is performed by two concurrent processes: Passengers and Baggages, each handled by their own set of ground equipment.

Passengers can be deboarded either by Jetways (if the parking spot has them) or by Stairs. On a scenery fully compliant with FSX, with jetways programmed and flagged as such in the airport .BGL, GSX recognizes the Jetway automatically, and this will affect how passengers will deboard. All FSX default airports that have jetways and all the FSDT airports (were you can use GSX for free) are made this way.

Deboarding with Jetway

If the parking spot has a Jetway, GSX will expect passengers to be deboarded through that. However, when using airplanes with a passenger door at the far end of the airplane left-hand side, a single staircase will also arrive to be connected to that door.

NOTE: You are supposed to operate the Jetway. GSX doesn't control, changes or add anything regarding the standard Jetway operations in FSX. A default airport or an airport that has proper FSX jetways will continue to work in the same way even with GSX. If the scenery you use has other means to open Jetways (like using COM frequencies or other additional programs), you will continue to use that method to operate the Jetway, GSX won't interfere or interact with it.

Deboarding without Jetways

If the parking spot is on the apron, or the scenery doesn't feature standard FSX Jetways, GSX will use one or more Stairs to deboard passengers. There are different types available, chosen depending on the airplane doors height, and they are all available in many liveries, representing many ground handlers and airlines around the world.

Animated Passengers

One of the most requested features is being able to see individual animated passengers boarding and deboarding from the airplane. GSX doesn't have this feature right now, but it's surely something we'll consider with future releases, if we could add it without sacrificing too much performances and still looking good.

Animated Jetways using SODE(Simobjects Display Engine)

GSX supports and integrates with the freeware module SODE (Simobjects Engine), made by Jeffrey Stähli. This method allows more flexibility and better animations compared to the default jetway animation system. In order for GSX to be able to control SODE jetways, the scenery must feature SODE jetways. Some of the latest sceneries from FsDreamTeam, like Memphis and Houston, use this system, and there are several 3rd party airports that supports them too. If a scenery use SODE for jetways, GSX will make it easier to use, thank to its integration.

GSX Integration

SODE jetways are integrated with the normal GSX operations, from the "Operate Jetways" menu, and there are several advantadges over using the normal SODE menu:

- There's no need to select the desided parking **twice**, once from GSX and another time in SODE. The parking selected in GSX will automatically be used by SODE.
- SODE jetways will use the extensive airplane database that comes with GSX, so any changes/updates to it will be used by SODE, instead of having to rely on its own separate database. For the same reason, any changes to the airplane configuration in GSX, like editing the airplane doors, will be used by SODE automatically, when called from GSX.
- The performances are optimized, since the scenery will normaly load only a **static** version of the jetway model, with no animations and optimized for fps. After a jetway-equipped parking is selected in GSX, the SODE-animated jetway will replace the static one **in that parking only.** This has a noticeable benefit on performances, and the airport might feature a very large of animated jetways with almost no impact on memory and fps.

SODE Jetways usage

Position the airplane on a jetway-equipped parking. Using the GSX menu, and the "*Warp Me there*" feature, it's easy to know which parkings have a jetway, because they will be labeled with a **/JS** (standard FSX jetways will be labeled with /J) after the name. Then, press the GSX Hotkey (CTRL+Shift+F12, by default) and select the desired operation.
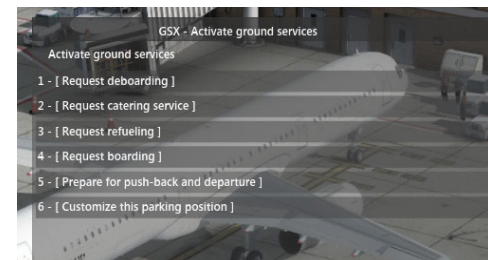
The jetway selection menu will appear, asking to select the door the jetways should connect to:
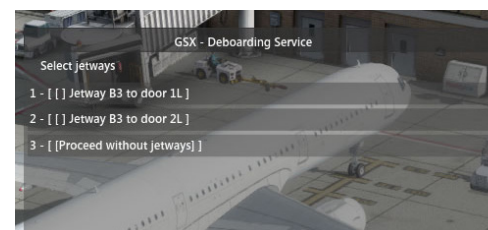
NOTE: SODE supports multiple jetways that can connect to any airplane door, not just the main one, like the default FSX system. However, it's possible that, due to the airplane used, and your position, the jetway might not be able to connect to every door. Since SODE can check this in advance, GSX is able to filter out jetways that cannot connect.

After selecting which doors the jetways should connect to, confirm your choice with the "Confirm selection" menu option.
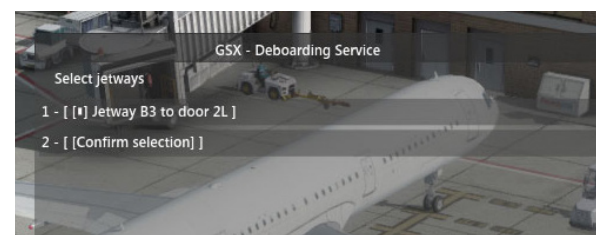
In this example, we asked to connect the Jetway at Gate B3 to the door 2L, which is the 2nd Passenger door of for the default A321, as configured by GSX. As soon the choice is confirmed, the jetway animation will start, and will connect to the selected door.

Deboarding Luggage

At the same you chose the "Deboarding" operation, deboarding of luggage has started, using ground equipment that GSX places on the parking spot, such as baggage loaders with conveyor belts and trains formed by a tractor and a number of wagons (depending on the number of passengers on board).

> The number of wagons in the baggage train depends by the estimated number of passengers on board, which is the total weight of all the loading stations, divided by 220 lbs.

If the airplane has doors too low, like with GA airplanes, no conveyor belt will appear, but just a baggage train.

On a typical liner, the conveyor belt vehicle will move close to the rear cargo door, and will wait for you to open it, only then it will raise to reach the door and baggage deboarding will begin. At the same time, the train will be driven into position, waiting for baggage to be unloaded.

The conveyor belt vehicle driver will then unload baggages, filling each wagon, and then the wagon will go away, reaching the airport terminal to deliver the luggage. The conveyor belt will remain in position, since it's likely you request a boarding in the near future, so it will stay there waiting for next cart, which will arrive full from the terminal.

With smaller GA airplanes, where no conveyor belt is used, the baggage train will just go close to the airplane, wait a bit, and will then go away, to simulate the process. The same will happen if the airplane used has no cargo doors at all.

Request Catering service

The 2nd menu option can be used to call a Catering Service Vehicle. They usually attach to the service doors on the right hand side of the airplane. Depending on the airplane kind, vehicles in different sizes will arrive, and if the doors are low enough, as in smaller and GA airplanes, instead of a truck with platform, a smaller mini van will come close to the airplane.

If the airplane has a service door on the rear right, two Catering vehicles will appear.

Catering vehicles don't appear at the parking spot, but drive from the terminal, following the airport vehicle paths (when possible), so it might take a few moments for them to arrive, after they have been called. Every catering vehicle is available in several liveries of different catering operators around the world, and are selected by airport. Once the Catering vehicles are in position, they will WAIT for you to open the service doors.

The method to open service doors to be used by the Catering vehicles changes depending on the airplane used, default airplanes usually define all the doors on the right side as "Emergency" doors, or Exit 3, but 3rd party airplanes might have independent doors, operated with custom gauges or custom keyboard commands. GSX knows about some of the most popular 3rd party airplanes, and the list of supported products is kept constantly updated.

Once the service doors are open, the procedure will begin, and a human operator will start carrying food carts into the airplane, and will replace the empty carts on the airplane, putting them back into the Catering truck.

After a while, the Catering service will end, prompting you to close the service doors, so the truck can leave and go back to their starting position.

Reset Position

Sometimes, you might want to repeat an operation, either because of a change in your configuration, or just because you would like to see it again, even if GSX wouldn't normally allow it, because of the operation sequence logic explained above. In this case, the "Reset Position" command on the GSX parking menu can be used to restart the servicing process from the beginning, as if you were just parked, so you can restart all services from scratch.

Reset Couatl, your "Panic Button"

Sometimes, it's possible the Couatl engine that drives the GSX logic, might be confused of very unusual airport configurations, or errors in the airport .BGL (AFCAD) file, and report an error, that would stop the script and block all its operations. With the "Restart Couatl" option, under the "Couatl powered products" menu in the main FSX menu bar, you can trigger a manual restart, allowing to resume without having to quit from FSX and restart it.

Refueling

With the 3rd menu option, Refueling, you can ask for a Fuel truck to come and allow you to refuel your airplane.

The Fuel truck will arrive preferably from a parking spot of the "Fuel" type, or from any other parking spot, if the airport hasn't any dedicated Fuel parking spots..

As with other service vehicles, it might take a while for the Fuel truck to come, since it will drive the path from its parking to your current location.

Starting with GSX 1.9.9.10, the Refuel system has been completely revamped, and it *actually refuels the plane*. The system supports both airplanes using the default Fuel and Payload page with no special refueling handling, but also more complex 3rd party airplane addons, using progressive refueling systems. GSX will change its behavior depending on the airplane, and this can be customized by users, with the "*Show the FSX Fuel and Cargo page*" setting in the GSX airplane customization page.

Calling the Fuel Truck

As soon as you request Refueling from the GSX menu, a message will indicate that a Fuel truck is coming:
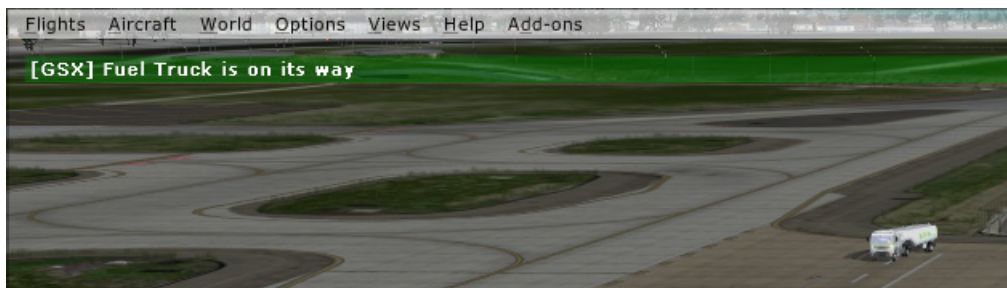
The kind of truck selected depends on the airplane Total Fuel Capacity. For most airliners, a large Truck + Tanker trailer will be used, but smaller planes will call for a smaller truck.

As soon as it reaches the airplane, the Truck will position under the wing, on the Fuel point position, as specified in the GSX Airplane configuration editor.

We have supplied fuel point customization for some default airplanes and some popular 3rd party airplanes with GSX, but any airplane can be added quite easily. The current vehicle type assume the airplane has a refueling point under the wings, but we'll add new vehicle types and animations in the future.

The Refueling procedure

The actual refueling procedure works differently, depending if the airplane used is configured to use the default fuel page or not. This is controlled by the "*Show the FSX Fuel and Cargo page*" option in the GSX airplane customization page.

Airplanes configured to use the default refueling system

In this case, GSX will work in **Active** mode, and will *actually* change the fuel quantity, by progressively refilling tanks using realistic timings, according to real-life capacities of the vehicle fuel pumps in GPM (Gallons Per Minute). A complete refueling for a fully loaded 747, for example, will take multiple trips of the 10K gallons truck and about 45 minutes, but you can accelerate the simulation, using the Fuel Time Acceleration in the GSX Settings->Timings page, which will let you control the speed of the progressive refueling, without requiring to use the default "Time Acceleration" feature, so you can do other tasks at a realistic speed, and accelerate just the refueling process.

After the Fuel Truck goes to its position, the next screen will ask how much quantity to load. There are some presets, and the last option "Custom Refueling", will open the default "Fuel and Load" page. When choosing one of preset levels, the refueling will be made by setting an equal amount of fuel in all tanks, but filling the external tanks first, and starting to fill the central tanks only when the external ones are full.

Next, the fuel crew will attach the fuel hose under the predefined refueling point:

Finally, the refueling process will start, with a visual indication on the fuel truck gallon counter and a progress message to indicate the estimate time to end the process.

Airplanes using custom refueling systems

Some 3rd party airplanes have their own progressive fuel simulations. GSX can be easily configured to integrate with such systems, working in **Passive** mode: the refueling system in the airplane will control the actual refilling of the tanks, but the GSX truck and the crew animations will adapt to it, working as a visual enhancement to the plane-supplied refueling simulation.

Within this category of 3rd party airplanes with a custom fuel system, there might be two different sub-cases:

- Airplanes using custom fuel systems with no "Progressive refuel" simulation, such as the PMDG 737

.
- Airplanes using custom fuel system with a "Progressive refuel" simulation, such as the PMDG 777 or the Aerosoft Airbus series.

GSX can handle both cases, and will offer options to control its behavior as desired. Usually, planes with a progressive refuel simulation, will allow you to set the desired fuel quantity immediately too, for example when using the "Load Instant" function on the Aerosoft Airbus. When using this option, the plane will operate like a plane with no progressive simulation, but still using its own fuel system, which GSX won't interfere with.

Here's two common usage scenarios, covering both modes of operations:

A 3rd party airplane without a Progressive Refueling simulation, the PMDG 737:

- Start by selecting an initial Fuel Quantity, using the "FUEL" option in the "FS AC-TIONS" menu on the FMC. This will immediately set the desired Fuel Quantity to start with.

- Call the GSX Refueling now.

- When the Fuel Truck arrives, it will wait for you to act on the Fuel menu in the FMC, to set a desired quantity. GSX will display the "Please use the refueling system of your airplane to refuel" message", to remind you it's waiting for your action.

- As soon as you change the Fuel quantity from the FMC, the airplane system will load the fuel instantly, and the GSX refuel truck will show it counter simulating the fuel loading visually.

- The (simulated) refueling speed will be controlled by GSX, according to the "*Always Refuel Progressively*" setting in the GSX - Simulation settings page. If the setting is Disabled, the refueling speed will be very fast, just to give some visual feedback of the procedure. If the setting is Enabled, the speed will be the realistic one, calculated from the actual performances of the fuel truck pump, possibly using Multiple trucks (if the "Multiple Trips" option is enabled), and also controlled by the

A 3rd party airplane with a Progressive Refueling simulation, the PMDG 777:

- Start by selecting an initial Fuel Quantity, using the "FUEL" option in the "FS AC-TIONS" menu on the FMC. This will immediately set the desired Fuel Quantity to start with.

- Select the "GROUND OPERATIONS" from the "FS ACTIONS" menu on the FMC, and choose one of the "TURN TIPE" options, SHORT/LONG/MANUAL.

- Insert the planned Fuel quantity in the "PLAN FUEL" field on the same page.

- According to how PMDG simulated the Turn-around, the refueling will start in about 5 minutes, so you should **call the GSX Refueling now.**

- When the Fuel Truck arrives, it will **wait** for the progressive refueling simulation

in the PMDG to start, in order to start its own fuel counters.

- The refueling speed will be controlled by the airplane.

- The Fuel Truck will stay until the PMDG has finished loading fuel, or the Truck itself is full, and another truck will eventually arrive, if the "Multiple Trips" option is enabled in the GSX Settings.

Boarding

The "Request Boarding" option is quite similar to the Deboarding, just in reverse.

Once you selected it, the baggage loader will close to the cargo door and, differently from the "Deboarding", you will wait for a new baggage train that will come from the terminal, full of luggage.

At the same time, if the parking spot is in the open, a Passenger bus will also arrive and, after it goes into position, will ask you to open the doors to let the passengers board the airplane.

As with Deboarding, the Boarding time is related to the actual number of passengers on board, and by default the time it takes to board is twice the time it takes to deboard.

Pushback

Before departure, you can ask for Pushback, and a tow truck will push you out from your parking spot. The Pushback feature in GSX is way more powerful and realistic that the default FSX Pushback, because it recognizes the airport layout, and will push following the taxi lines automatically, you will only have to choose the Pushback direction (usually Left or Right) if the parking spot used has been programmed to allow Both choices, otherwise it will just use the only direction available.

Pushback directions definitions:

The most common choice for Pushback are LEFT or RIGHT.

"LEFT" means the airplane will be pushed in a Lower Left "quadrant", when seeing the airplane from above, so the nose of the airplane will point to the **Right** at the end of the procedure.

"RIGHT" means the airplane will be pushed in a Lower Right "quadrant", when seeing the airplane from above, so the nose of the airplane will point to the **Left** at the end of the procedure.

Common default Pushback directions
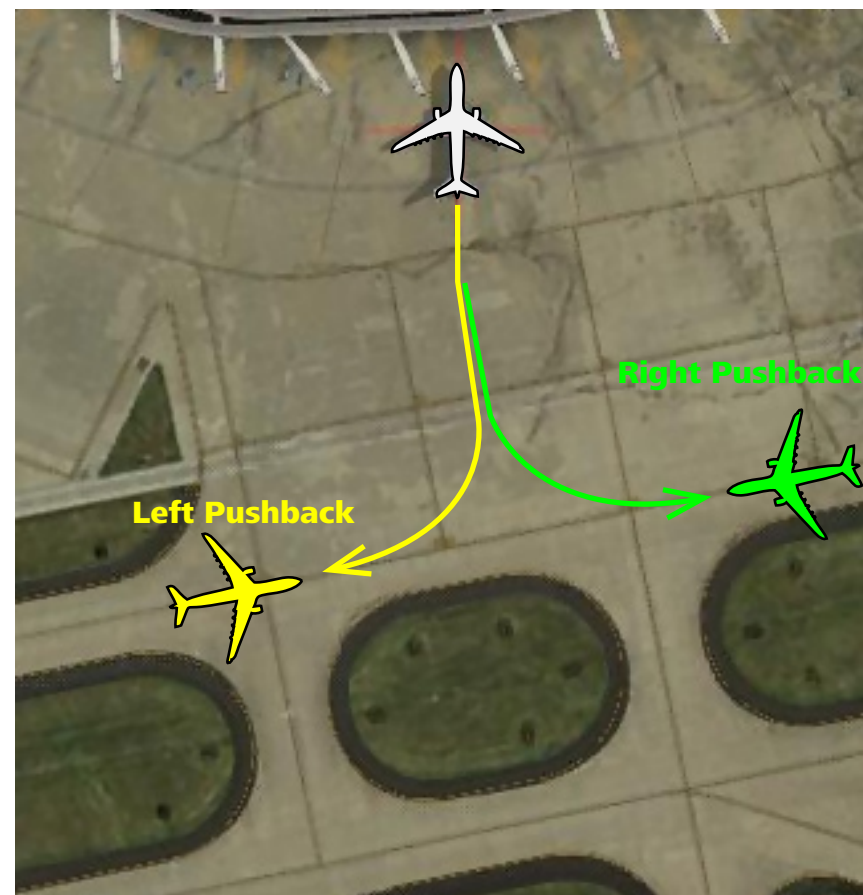
Custom Pushback

When the airport in use has a GSX customization, like in the FSDT airports, the Pushback procedure might be more advanced than just "Left" or "Right", taking into account specific airport limitations, and you might also be presented with easier to understand choices, customized for the airport used.

Pushback Sequence of operations

In order to start Pushback, you need to start at the parking place with engines off and parking brakes on. All ground connections like auxiliary power units, air units, wheel chocks and similar must be removed too. GSX is able to recognise some of these features from the most popular 3rd party airplane products, and will not allow starting push if any of such ground connections are still attached to the airplane. In addition to that, you will be asked to close any passenger or cargo doors that might still be open, and all service vehicles that are still attached to the plane, will end their service and leave.

When you are ready, if the parking place used has more than one Pushback choice available, GSX will ask you which one you want to use. The following screen shows a Pushback choice screen for FSDT KLAX, which has been customized to give an easier to understand choice, rather than the default "Left" or "Right":

The tow truck will then move from its starting position on the parking spot, towards your airplane front gear. There are different tow truck vehicles available in GSX, smaller tractors with a single driver, or larger models, some using a towbar, other with a more modern towbar-less design. Some models have a place for the wingwalker to stand on, but on smaller models, the wingwalker will approach the airplane walking aside the tow truck. They are chosen depending on your airplane weight.

Once the tow truck is in position, you will start hearing the wingwalker talking to you on the headphones, checking if you are ready for Pushback:
If you use any of the 3rd party airplanes that are recognized by GSX, which features custom Ground Connections like GPUs, Air starters, Wheel Chocks, etc. at this point GSX will prompt you to remove any of them, if they are still attached to the plane. You will also prompted to close any doors left open. Once the departure check is complete, you will see/hear the following message:
You can now release your Parking Brakes, and Pushback will start. Usually, this is when

you'll begin starting your engines. On some 3rd party airplanes (most prominent example is the PMDG 737 NGX), GSX will recognize it having a custom-made APU, and will prompt you to start it before Pushing back, so you should be reasonably sure to be able to start your engines while pushing.

Some airplanes didn't had an APU, and their engines had to be started at the Gate, and GSX offers dedicated support to some of them. For example, if you use the Flightsim Labs Concorde, GSX will ask you to start Engines 2 and 3 before starting Pushback, which was the standard procedure on the Concorde.

GSX is kept constantly updated to add support for more 3rd party airplanes which such custom systems, following request by our users, and regular updates of the relevant code can usually be freely downloaded using the installer self-update feature.

Wingwalker

During pushback, the wingwalker will walk alongside the airplane and the tow truck, monitoring the procedure.

At the end of the Pushback path, the airplane will usually be aligned to the closest taxiway line, ready to start taxiing on its own..

Ending Pushback

After the airplane has been pushed in the arrival location, the wingwalker will walk to the front gear, to unlock the towbar from the airplane, or to operate the release controls for a truck without a towbar.

The tow truck will then retreat a few meters back, and the wingwalker will back up too, in order to be seen from the cockpit. Finally, he'll raise his arm, stating that you can now release your Parking Brakes, and will wait with his arm raised until you do so.

As soon as you release your Parking Brakes, the wingwalker will salute you and will return to the parking spot, either by walking or, if the tow truck model allows it, by riding on it. You will be reminded to start your engines, if you haven't already.

This concludes the Pushback procedure.

Straight Pushback

Starting with version 1.9, GSX added a **Straight Pushback** option, which is always available regardless of the parking Pushback preference, and works this way:

In addition to the standard (usually, Left/Right) options, a new entry in the pushback selection menu has been added, indicating "Straight pushback (manual stop, max 100 m)". Using this option, the pushback procedure will start normally, and the airplane will be towed directly backwards, until you press the GSX menu hotkey again, which will give you the ability to Stop the pushback in that place and complete the procedure normally, or Abort abruptly, with all vehicles disappearing immediately.

De-Icing

Starting with version 1.9, De-Icing vehicles has been added to GSX. De-Icing is considered to be part of the Departure procedure, which means there's no separate menu entry for De-Icing in GSX. Instead, De-Icers are offered as an **option**, when the **outside temperature is below 4°C**, so there's a risk of icing.

As soon as you select the "Prepare for Departure and Push-back" menu entry, if the outside temperature is below 4°C, you will be asked if you want to call De-Icers:

After your confirmation, two De-Icing vehicles will depart from a vehicle parking and will come to your airplane, and when they are both in position, the following menu will open:

Asking you to choose the type of fluid to be used for the De-Icing operation. The fluid type choice is included mainly for informative purposes, it doesn't make any difference in the simulation (other than Type IV is green and the other types are yellowish), and the correct concentration is selected by GSX automatically, according to the following table:

Outside Air Temperature OAT	One-Step Procedure Deicing/ Anti-icing
-3° C (27° F) and above	50/50 Heated Type II/III/IV
Below -3° C (27° F) to -14°C (7° F)	75/25 Heated Type II/III/IV
Below -14°C (7°F)	100/0 Heated Type II/III/IV

Type I, which is a mixture of heated water and Glycol, doesn't specify a concentration, the water should be heated at 60°C at the nozzle, and the freezing point should be 10°C below the actual OAT.

After you select a fluid type, the De-icers will confirm your choice, and will start the De-Icing procedure.

At the end of the procedure, the procedure, De-Icers will communicate the "De-Icing code", which will repeat your choice of fluid type and concentration. This concludes the procedure and result in De-Icers going away.

After De-Icing, the normal Push-back procedure will start.

NOTE on the simulation:

FSX has its own internal simulation of ice formation, and GSX interacts with that, by sending the command (which is not assigned to any key, by default, in FSX) to turn On "Structural Deicing". This is done at the end of the De-Icing animation and, the way FSX works, all icing accumulated on the airplane body will be immediately removed when that command is received. This means, on any FSX airplane that use the standard simulation, GSX De-Icers will both be visually appealing, but will also De-Ice the airplane. If you use a 3rd party airplane that comes with its own internal simulation of icing on the airplane body and its own internal simulation of a De-Icing methods, it might not respond to the standard FSX "Structural Deicing" command used by GSX.

Assistance Vehicles

The choice of vehicles that will appear at the parking place depends on many different conditions, either related to the parking place itself, the airport, the country, the airplane type you are using, and whether there's jetway or not.

The airport handler is related to the ICAO code of the airport and the **atc_parking_codes** of the parking spot and it interacts with the ICAO specifications in the sim.cfg file of the vehicle itself.

There's a hierarchical system that will favors the most specific code to be preferred in the choice so, for example, if you are parking at Milano Linate Airport (LIML), vehicles with an L (Southern Europe ICAO) will be chosen but, if there's a vehicle that has a LI code in its ICAO specification (Italy ICAO), it will be preferred over the generic "Southern European" one. If there's a vehicle that has the full LIML code, it will take precedence over the generic "Italian" one.

If the selected parking spot has an **atc_parking_codes** parameter specified in the airport .BGL file (AFCAD), GSX will try to match vehicles according to that code.

The airplane type you are using affects things like the choice of the Tow Truck vehicle to be selected. The different available types are chosen based on your airplane **empty_weight** parameter.

The availability of a jetway at the desired parking spot affects both the appearance of Passengers Stairs and if a Passenger Bus will be called upon Boarding/Deboarding. Both will appear ONLY if there's no Jetway.

User-controlled choice of the Ground Operator

Starting with version 1.9.5, GSX will allow you to manually select between all matching operators available in an airport, instead of always select at random between the highest scoring ones. As soon as you select a service, a menu will show all the operators that are allowed on the airport, with an indication of what GSX would choose by default. You can either select an operator, or wait 5-6 seconds for the menu to close automatically, and have the default operator selected by GSX, which still allows for an "hand-off" approach.

Customizing GSX

It's possible to customize certain aspect of GSX to suit your preferences and flying habits, by editing the following text file:

%APPDATA%\Virtuali\Couatladdons.ini

The %APPDATA% string it's a shortcut for a folder that it's usually located in C:\Users\{username}\AppData\Roaming under Windows Vista or Windows 7, or C:\Documents and Settings\{username}\Application Data under Windows XP. In the "Virtuali"subfolders, there will be several configuration files for our software.

The **Couatladdons.ini** file can control different Couatl plugins, like GSX, and each plugin have its own section. The GSX section, as standard with .INI files, is indicated as [GSX], all settings relevant to GSX will be in this section.

Here's a list of the possible settings and their default values:

Name	Values	Default	Meaning
disable	0 or 1	0	If set to 1, GSX is disabled at all airports.
disable_on_airports	List of ICAO codes separated by spaces.	None	GSX will be disabled only at the airports with ICAO codes matching the provided list,
deboarding_time_min	Floating point number	15.0	Minimum number of seconds for Deboarding.
deboarding_time_factor	Floating point number	0.1	Time in seconds to Deboard a single passenger.
boarding_time_min	Floating point number	15.0	Minimum number of seconds for Boarding.
boarding_time_factor	Floating point number	0.2	Time in seconds to Board a single passenger.
refueling_time_min	Floating point number	15.0	Minimum number of seconds for Refueling.
refueling_time_factor	Floating point number	0.0022	Time in seconds to fill a Gallon of Fuel

For example, if you want to disable GSX at Frankfurt and Denver airports, you will set the following line:

disable_on_airports = EDDF KDEN

Airports Visibility

Auxiliary airports/helipads/seaplane bases

To recognized the airport, GSX by default checks in the airport database for the closest airport in a 3NM radius from your current position. While this covers most of the normal cases, there might be special cases when this automatic detection won't work, such as:

- Small auxiliary airports very close or even inside a larger airport, with their own ICAO code, usually made by 3rd party developers using fictional ICAO codes
- Helipads, Seaplane bases, etc.

By editing the CouatlAddons.INI file, you can specify a custom visibility for such cases, so GSX won't be confused by those small airports and will use the correct (normally the larger airport) instead.

The format for the airport visibility command is as follows:

`airport_visibility_XXXX = Y`

Where **XXXX** is the ICAO of the airport you want to set visibility for, and **Y** is the visibility range in NM, or 0 to exclude it. Note that, "visibility" here only means "visibility by GSX", it doesn't have any effect to the actual visual scenery in the simulator.

A real world example of this might be OrbX's Monterrey Regional Airport - KRMY, which comes with an auxiliary AFCAD with an added code for the (fictional) KMRZ airport. By default, GSX might find the fictional KMRZ is closer to your position, and use that one instead of the main KMRY, which is probably what you wanted to use.

To fix this, the line added to the [GSX] section of the CouatlAddons.INI file would look like this:

`airport_visibility_KMRZ = 0`

This will prevent GSX to use KMRZ, and prefer the larger airport instead, which is the most common case.

An "Airport inside an Airport"

There might be some cases where you might want to use BOTH the "large" and the "small" airport together, and be service by GSX in both, depending on your actual positions.

For example, you have a military area, with a separate AFCAD and its own ICAO code, and a civil area with the normal ICAO code.

First, for an AFCAD to be considered usable by GSX, it must contain at least a parking and at least some taxiway nodes connected to it. If your smaller airbase only has parking spots, but not taxiways, it cannot be used by GSX.

Assuming the airport meets the requirements to be used by GSX, whether this configuration would work, depends on the ***Airport Reference Point***, as indicated in the scenery AFCAD. The auxiliary scenery should be programmed with its Airport Reference Point coordinates ideally centered in the center point of ITS OWN area. If the auxiliary airport shares the same coordinates as the main one, using both at the same time with GSX might not work correctly, and it would be better to just exclude the smaller one, by setting its visibility to zero.

Assuming even this additional requirement is satisfied, you can configure both airports to work together with GSX, by setting a ***smaller*** (less than the default 3NM) visibility for the smaller airport, but different than zero.

For example, assume you have a (fictional) military base called Z401 inside a larger airport, for example KLAS (this is just an example, KLAS doesn't have this issue in either FSX default scenery or FSDT's KLAS), you would set the line in the CouatlAddons.INI file as follows:
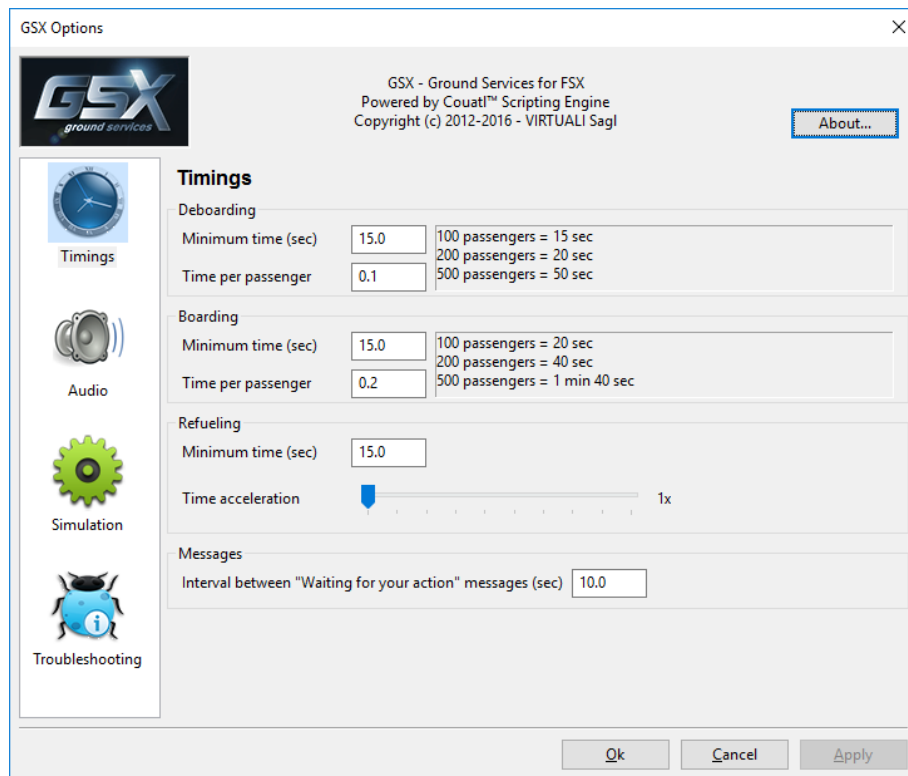
`airport_visibility_Z401 = 0.4`

This will instruct GSX to use Z401 if you are ***inside*** a 0.4 NM (740 mt.) radius from its own Airport Reference Point, otherwise it will use KLAS, which would be the closest airport once you are ***outside*** this 0.4 NM range from Z401. This way, both airfields will be serviceable by GSX, automatically.

GSX Settings Page

Starting with GSX version 1.1, there's an easier way to customize timings without having to edit the .INI file, and there's a panel to set various Audio options.

The Settings page can be accessed from the "GSX Settings..." sub-menu of the "Couatl powered products" menu, under the FSX "Addons" menu bar.
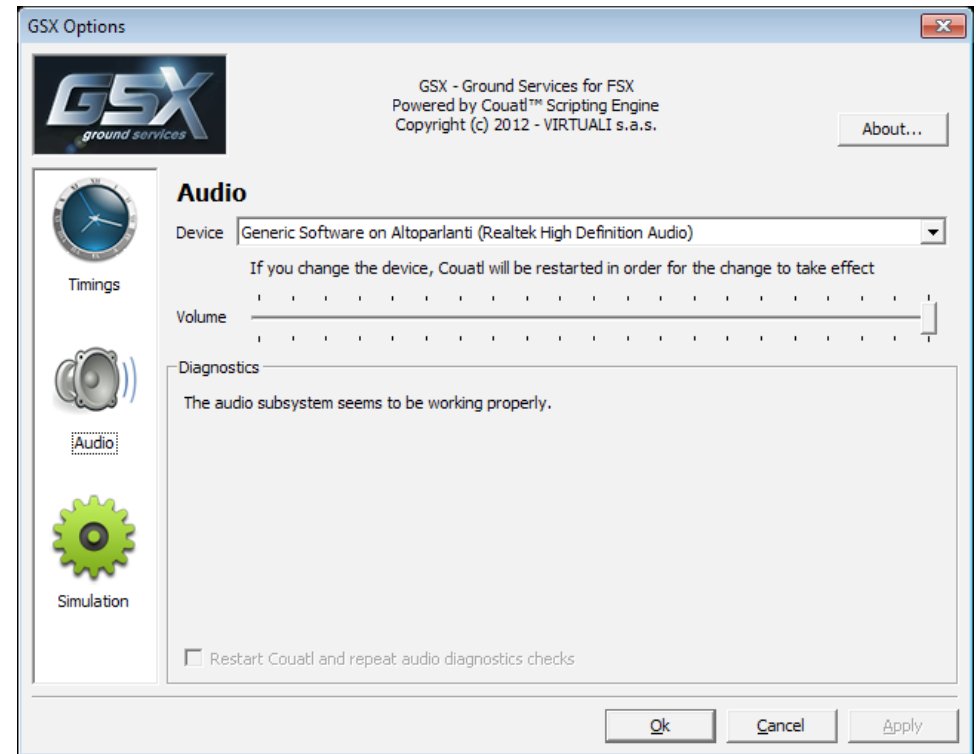
The Timings page:

The Audio page:

The audio page allows to set the preferred audio device used by GSX sounds. This can be useful if you have multiple audio cards, or different output options on the same audio card (for example, digital or analog out).


The Volume slider controls the level of all GSX sounds. At default is set to maximum, and the level at maximum would be equivalent to the default level in previous versions of the products.

With the Timings page, it's possible to easily customize the duration of the Deboardin, Boarding and Refueling operations. The settings are the same as with the .INI file, the interface will help getting a better idea of the timings with common configurations of number of passengers and fuel loadouts.

It's not strictly required to run FSX in Windowed mode when customizing one or more parking spots, the editor interface is tested to work in Full Screen mode too but, we suggest doing it in Windowed mode in any case, because switching between the dialog mode and the normal flight mode will be much faster if FSX runs Windowed.

The Simulation Page:

With the Simulation page, you can control some aspects related to global preferences related to the GSX simulation:
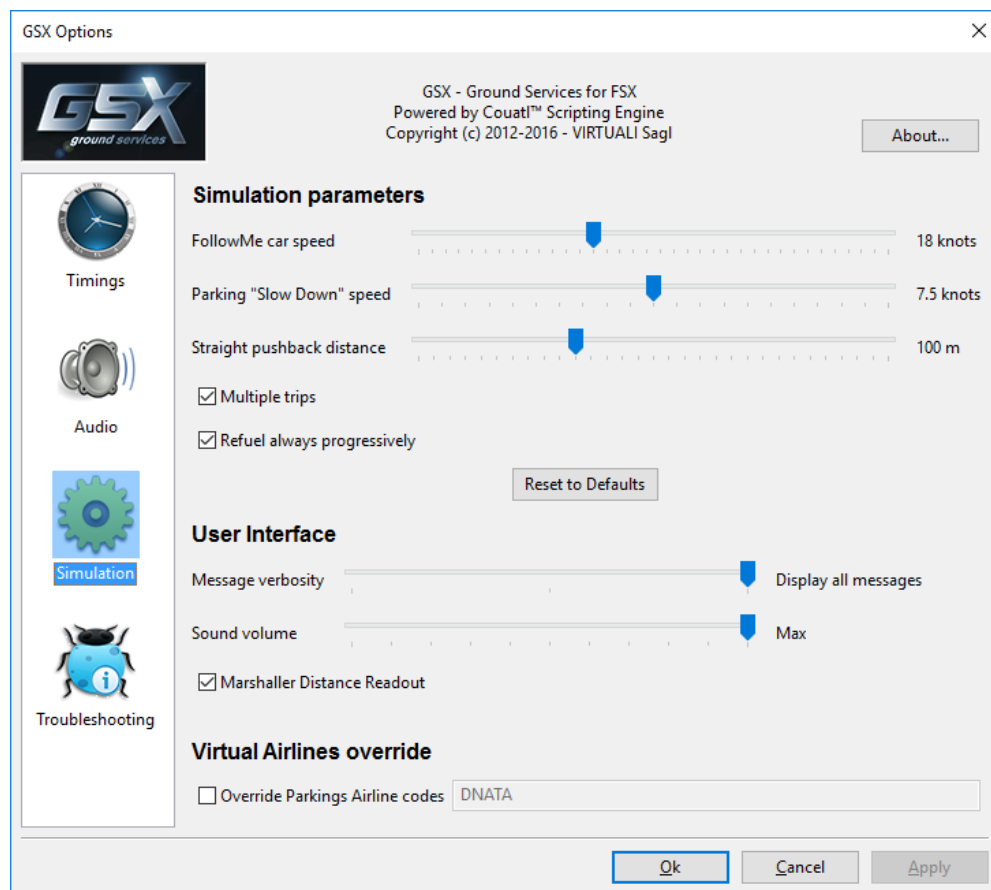
FollowMe Car speed

This slider controls the speed of the FollowMe vehicle, from 5 to 40 knots, default of 18 knots.

Parking "Slow Down" speed:

This slider controls the threshold speed after which a parking system, like a Marshaller or a Docking, will issue a "Slow Down" warning. It goes from 5 to 10 knots in increments of 1/4th of a knot, with a default to 7.5 knots. Controlling this setting might be useful to fine tune GSX in relationship with the ground speed friction of the airplane you use most.

Straight Pushback Distance

Some 3rd party sceneries have all their parking positions pushback preference set to "None". Even in this case, GSX will always offer at least one choice of a "Straight Pushback" distance, which is the distance the Pushback truck will go back to, if you don't stop it earlier manually. This setting is used to set the default distance

Multiple Trips

Some GSX services might need more than a trip to complete their task, for example a Refuel Truck with a 7000 gallons tanker, won't be able to refuel the plane completely, if the amount of fuel requested is larger than what the tank contains, requiring multiple trips. This option can be turned off, if you prefer a faster turnaround. In this case, the tanker will act as if it were of an "Infinite" capacity, and will always refuel with a single trip.

Always Refuel Progressively

This option allows to control the GSX refueling speed when using a 3rd party airplane with a custom refuel system. If it's Enabled, the speed will always be simulated realistically accordingly to the pump performance (but can be accelerated with the Fuel acceleration slider in the Timings). If it's Disabled, if the airplane custom fuel system has loaded the fuel instantly, the GSX refueler will perform a very fast counting of the fuel quantity loaded.

Virtual Airlines override

This option can be used to configure a "Global override" of the airlines codes specified by parking. If you enable the option, and add some airline codes here, they will take precedence *everywhere*. The codes specified here will always be used, at any parking of every airports, regardless of all the other settings and scoring system. It can be used by Virtual Airlines, to quickly specify to always use their own custom liveries for GSX vehicles, regardless of the location.

Reset to Defaults

Pressing this button will reset all values in this page (this page only) to their default values

Airport customization

Starting from version 1.1, GSX adds the ability for users to customize certain parameters of any parking spot, at any airport. It doesn't require using external editors or editing files, and it's integrated in the GSX Parking menu.

When parked with Parking Brakes on and Engines off, open the regular GSX menu with the normal Hotkey, a new option has been added "Customize this parking position"

In order for the option to be available, you have to meet the following requirement:

- No ground services are currently in progress. If you want to customize without waiting for the services to end, use the "Reset Position" option of the menu.

Selecting the "**Customize this parking position**" option, will display the following dialog box. The title will indicate the parking spot position, the next line it's the name of the Airport you are currently editing, and the 3rd line indicates which .BGL (AFCAD) file is active now:
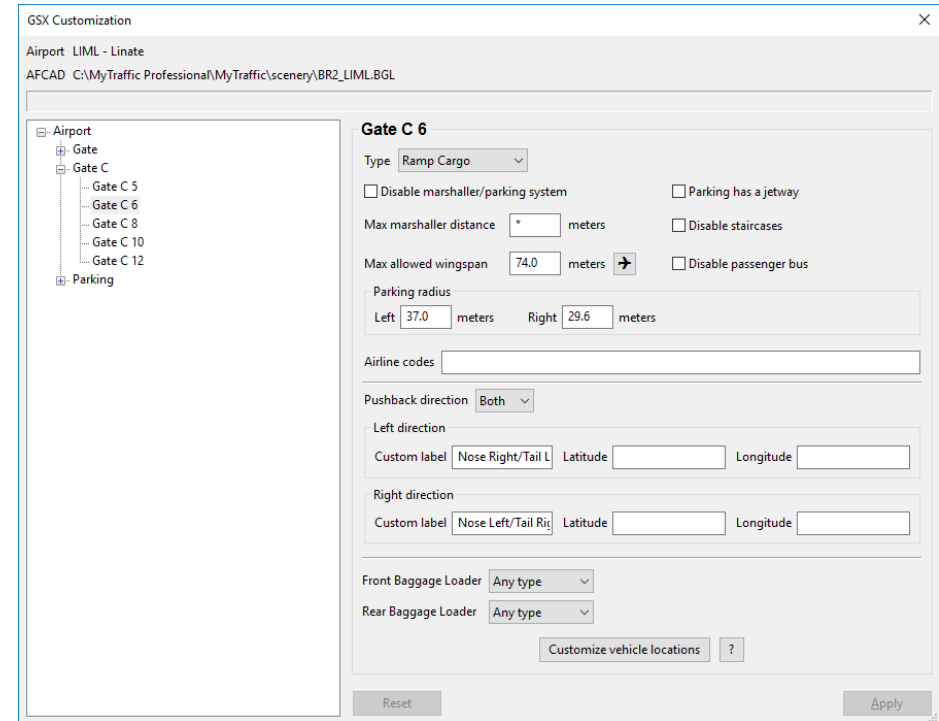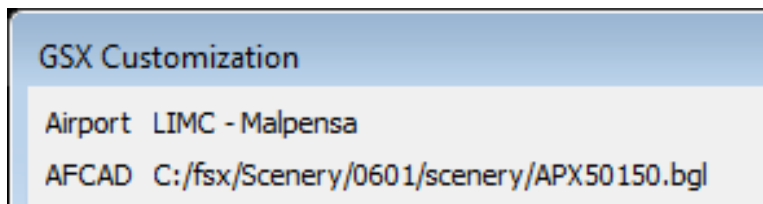
If you never edited this parking, the customization dialog will display values that have been read from the active AFCAD. The options set here will allow GSX to override some of the informations found in the AFCAD file, and add a few GSX-specific preferences.

Pressing the **Reset** button will restore the parking with the original values found in the active AFCAD file.

Type:
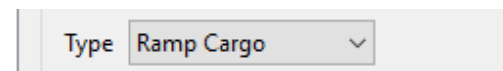
This option allows you to override the Parking Type as defined in the scenery AFCAD. Starting with GSX 1.9.5, the handler operators are divided between Cargo and non-Cargo, in order to allow GSX to properly assign Cargo operators to non-Cargo

parking spots and vice-versa. This usually works well with all default sceneries and with sceneries that correctly assign the "Cargo" specification to cargo parking spots only. Some 3rd party sceneries, might not respect this convention, which will result in GSX not finding the proper operators, which will result in a random one selected. This option allows to change the Parking Type in these situations.

Disable Marshaller

☐ Disable marshaller/parking system

This option is useful if a 3rd party scenery has its own way of implementing advanced Docking Systems that don't use GSX, so the GSX Marshaller won't clash with it.

Maximum Marshaller distance

Max marshaller distance [*] meters

By default, the Marshaller distance it's a function of the Parking radius specified in the AFCAD, and the eyepoint position in the cockpit: the higher the eyepoint, the farther away the Marshaller will be placed. The distance is lowered if there's a jetway, on the assumption that Gate usually a wall behind, so the Marshaller might be easily hidden behind it. Sometimes, it's possible this calculation can't fit any situation. By setting this value to a number of meters (start with about 20 meters) you can fix situations were the Marshaller can't be seen because he's inside a building.

Parking has a Jetway

☑ Parking has a jetway

This option can be used to disable the front/middle Passenger stairs on sceneries that have static Jetways or use any other method than the FSX native one to display or animate them.

> For a Jetway to be recognized, it must be made as a true FSX Jetway, and listed as such in the AF-CAD .BGL of the airport. It's not really important that it moves or not, as long is inserted as a true FSX Jetway, it will be treated as such by GSX. This means, on certain 3rd party airports that have jetways as integral parts of the terminal 3d model, or are separate but programmed in a non-standard way, GSX doesn't have means to automatically recognize it, and will display Passenger Stairs and Bus in any case. This option will help you fixing these sceneries.

Disable staircases

☐ Disable staircases

This option will disable all passenger stairs, even the rear one on a jetway-equipped parking.

Disable Passenger Bus

☐ Disable passenger bus

The option is only available on a Parking position that has no Jetway. Normally, parking positions on the apron always call for a Passenger bus, but on some airports the Terminal might be so close to the Parking position, that it wouldn't make much sense to call for a Passenger bus, this option will allow to indicate such parking spots

Pushback Direction

Pushback direction [Both ▼]

GSX reads the Pushback preference from the AFCAD file, which can be **Left**, **Right**, **Both** or **None**. Normally GSX will not allow pushback from a parking position that has its preference set to **None**, on the assumption the scenery designer had a specific reason to disallow Pushback on that parking spot. But, in case the AFCAD is simply not accurate, this option will allow you to instruct GSX to override the Pushback preference set in the AFCAD with the one specified here.

Starting with GSX 1.9, a new "**Straight Pushback**" option has been added, which is always available, even in parking spots where the Pushback preference is set to **None**.

The following parameters will allow you to customize the positioning on ground of the vehicles/services available on a parking spot, to better fit them with the underlying airport building structure.

Airline Codes:

Airline codes [   ]

This options allows you to choose your preferred operator for the selected parking(s). It takes precedence over any other assignment read from the AFCAD or programmed in GSX and even the Parking Type. It's a list of codes separated by commas so, for example, if you want to specify that only American Airline and United Airlines will be used on a parking, the line will look like this:

UAL, AAL

Some operators are not "airlines", so they don't have either a IATA or ICAO code, so they are defined by their own names in GSX, so you simply insert their names here, that must match the name as defined in the GSX vehicles. Some example of named operators are: **Acciona, Are Group, DNATA, ATA Italy**, etc. To find all the exact codes available in GSX, look at the **SIM.CFG** file for any ground handling vehicles, such as the Staircase, located under the **Simobjects\Misc\FSDT_Staircase** folder and check the **couatl.atc_parking_codes** line, which will show either the IATA/ICAO code or the name of the ground operator, which can be used here..
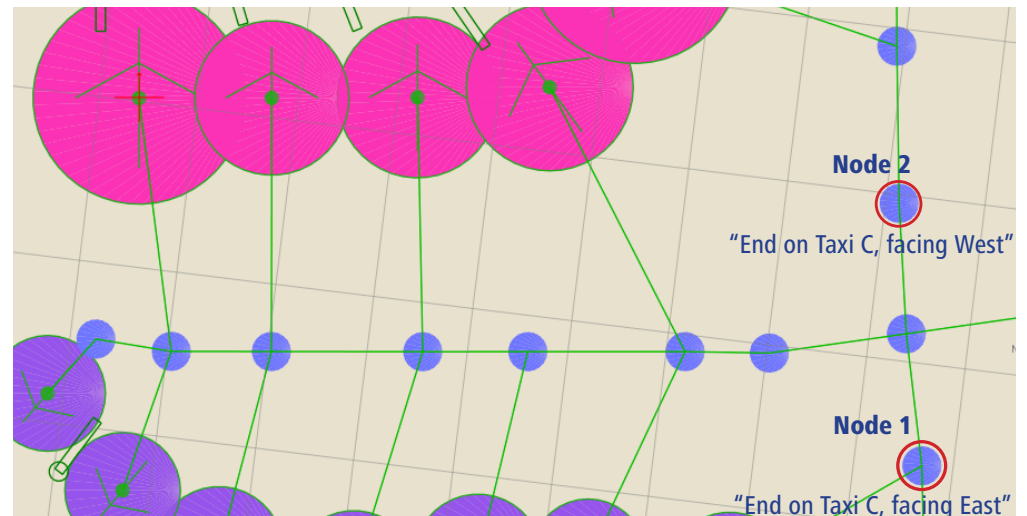
Custom Pushback

Starting with GSX 1.9, we added the ability to specify two custom Pushback nodes for each parking, that can be useful to sort out special situations, usually in parking spots at the end of a Terminal, where a default Pushback in one direction would result in the airplane pointed in the wrong direction, and the other option would place the airplane inside a building.

Let's see an example of a custom Pushback used at FSDT Los Angeles LAX airport. The screenshot in the next page shows parking 21 at the Terminal 2, it's a common problematic parking, where the default Left/Right Pushback wouldn't work.
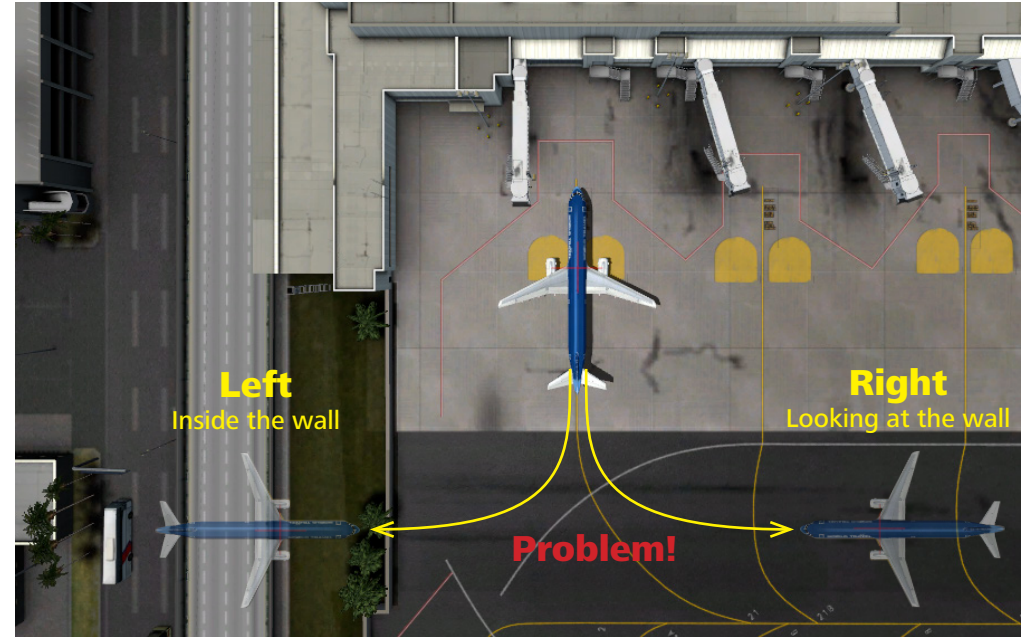
Here, both the Left and Right Pushback options will result in a difficult situation, so Custom Pushback is needed. A solution could be pushing the airplane all the way to the corridor, up to the first taxiway. Let's check the taxiway layout using an AFCAD editor:

We'll use the Lat/Lon coordinates of two existing AFCAD nodes, that will work as "attractors" for the two Pushback options. "Left" and "Right" now has lost any meaning, they are just two options and, to indicate the Custom Pushback, we can specify two labels that will replace the default "Left" or "Right" text.

Labels can be any text string, and will appear as the two choices in the Pushback menu.

The airplane will now be pushed towards one of these two nodes. It will not end up exactly over them, though, but it will be pushed the minimum amount needed to be aligned with the destination taxiway. Think as the two nodes as magnets...

Sometimes, there's only one solution possible, and by inserting only one custom Node with or without a Label (if there's only one choice, GSX won't display a Pushback selection menu), the airplane will automatically be pushed towards that node.

Lat/Lon Coordinates Snap

It's not necessary to be 100% precise with Lat/Lon coordinates. GSX will snap to the closest node in the AFCAD. However, is still suggested to be precise and use Copy & Paste Lat/Lon coordinates of the node from your AFCAD editor of choice (usually, either ADE or AFX), just double click on it in your AFCAD editor, and copy the Latitude from the node properties dialog in the AFCAD editor, to the GSX Latitude field, then repeat for the Longitude.

The reason for Snapping coordinates to the closest node, is to allow you a bit of flexibility when further editing the AFCAD, since a small movement of the node won't prevent GSX to find the right place to end the Pushback procedure, and it might still work on different/updated AFCADs for the same scenery.

Parking Radius Left/Right

Parking radius left	18.0	meters
Parking radius right	14.4	meters

Vehicles at a parking are positioned based on the radius, according the scheme in the following page:
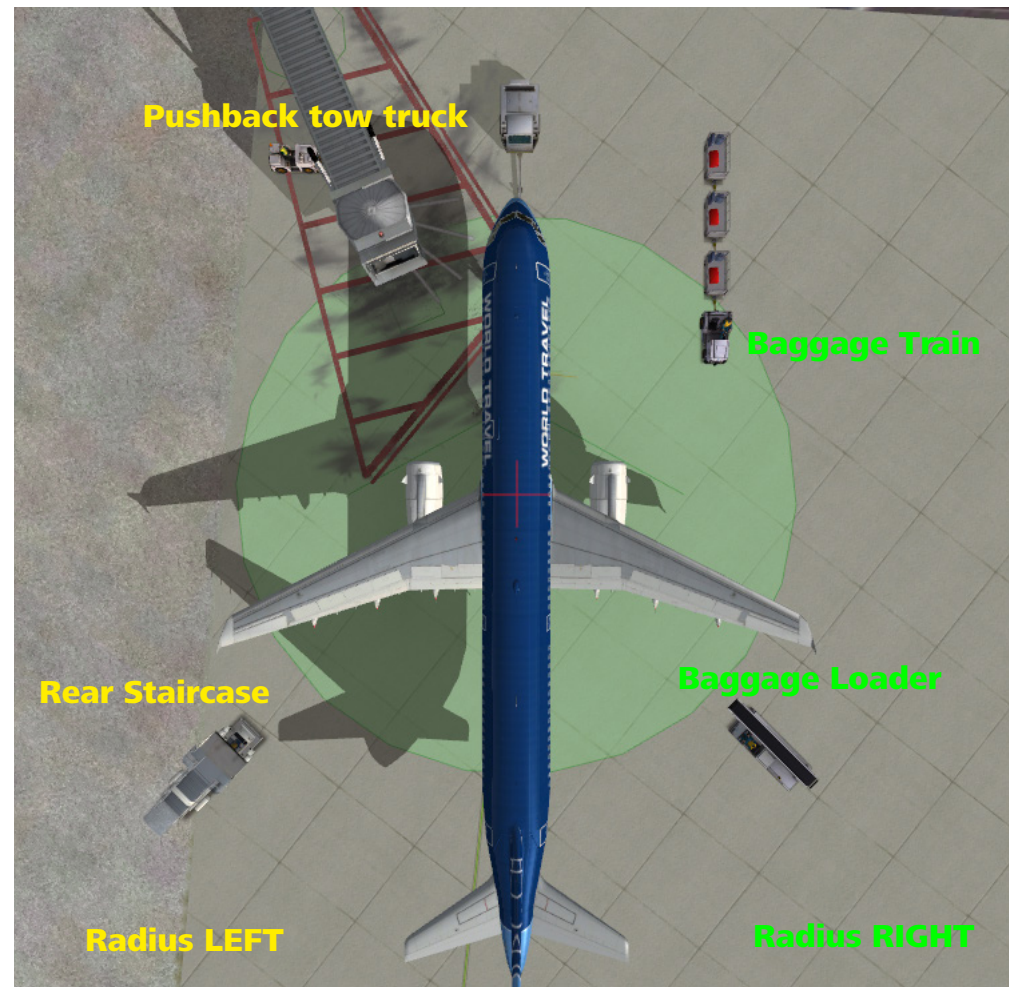
Vehicles on the left-hand side are affected by the LEFT radius, and vehicles on the right-hand side by the RIGHT radius. Changing the Left/Right radius can be useful to fix conflicts between airport buildings or other static vehicles placed by the scenery. NOTE, the Radius parameters are used **only** to give a starting point for service vehicles. It's not used to decide if an airplane fits into a parking spot!

Max Allowed Wingspan

Max allowed wingspan 36.0 meters ✈
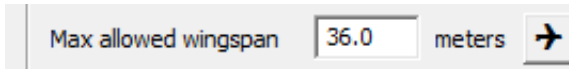
Starting with GSX 1.6, there's a new option that allows to override the parking radius in the scenery AFCAD, used to verify if a parking is too small to fit a certain parking.

Sometimes, it's possible that a scenery has actual space available around a parking spot, but the scenery designer has specified a smaller radius for that parking spot in the AFCAD, maybe for AI flow reasons, or to fix problems with default ground vehicles, or simply because of an oversight.

A too small parking spot radius in the AFCAD, might result in GSX not offering its services at that place, even if the physical layout of it might have allowed that airplane. Since GSX can only rely on the information taken from the AFCAD, up to version 1.6, if the parking radius of the chosen parking spot was smaller than half of the wingspan of the airplane you use, it resulted in a "Parking too small" message.

Now, you can customize this setting too, and override what's in the scenery AFCAD. You can directly put a number in meters of the highest **Wingspan** allowed (so, it's not a Radius, as in the AFCAD, it's double that amount) or you can simply click the **Airplane button** next to the input field, and this will read the Wingspan of the airplane which is currently loaded, and put it into the input filed.

So, without worrying about numbers, you can just load the airplane that used to not fit a parking according to GSX, go to that parking, click the ✈ **Airplane Button** and save, this will open that parking for that airplane type (and all the ones with smaller wingspans, of course). Don't forget you can do this for multiple parking spots at once.

Front and Rear Baggage Loader

Front Baggage Loader [Any type ▼]
Rear Baggage Loader [Any type ▼]
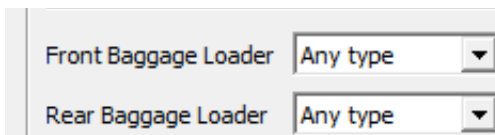
This option will allow you to select the type of baggage loader that can be used at this parking position. You might want to customize this, because the parking position might not offer enough space for both front and rear loaders, and for the larger container loader vehicle, which is much larger than the baggage conveyor belt.

"Any type" - Both loaders types are allowed, and the airplane type will affect which loader will be used.

"Conveyor Belt" - Only the conveyor belt is allowed on this parking position

"Cargo Loader" - Only the container loader is allowed on this parking position

"None" - Disable all loaders for the selected position.

Saving your work

There's nothing special to do to save your edits: as soon as you press the OK button, the settings are saved as they are in the customization dialog, and they are in effect immediately without having to restart FSX or the Couatl program. To verify your new settings, just ask for service, and all the parameters used for the parking spot will be those you just modified. Airport customization files are saved in the following folder:

`%APPDATA%\Virtuali\GSX`

Each file will be named as its ICAO code, with an .INI extension, they are plain standard .INI files, with a general section and multiple sections for each parking that has been customized.

The .INI file remembers which AFCAD was active when it was created. If you start customizing an airport, and a different AFCAD is now in use, a NEW .INI file will be created from scratch, named as the ICAO code plus a number. This means you might have different customization files for the same airport. The one active is the one matching the AFCAD in use at any time.

You are encouraged to share your customization files with other users. Just be aware that we might use data contained in files you uploaded on the net, to include them in future GSX updates.

Note for scenery developers:

You can use the integrated GSX editor to make your airport more compliant with GSX, and feel free to include the .INI file together with your scenery package. There's no need to install the .INI file into the %APPDATA% folder, you can just distribute the .INI file together with the other .BGL files in the your **scenery** folder, together with the AFCAD it was based on.

Since it's not possible under UAC rules to write in the FSX folder if it's installed in its default location at C:\Program Files, the GSX editor can only **modify** .INI file in the %APPDATA% folder, but it can **read** them if they are placed in the **scenery** folder alongside the other .BGL files.

This means, if your airport is just installed, GSX will read the configuration file from the **scenery** folder, but if the users starts to "customize the customization" a new .INI file will be created into the user %APPDATA% folder, and GSX will then work from there.

If you provide the scenery with different sets of AFCAD files, just provide several .INI files, named YourICAO.INI, YourICAO1.INI, YourICAO2.ini, each one based on a different AFCAD. The AFCAD pathname contained in the .INI file is not mandatory: if no file with that name is found in the full path, any other AFCAD in FSX matching the name only will be used instead, regardless of where it's actually installed.

Graphical Scenery Editor

Starting with version 1.5, the GSX scenery customization feature adds an interactive Graphical Editor, to edit the vehicles starting position precisely, for each parking spot of any airport. This will allow you to better integrate GSX with any scenery, both default and 3rd party, and to overcome potential conflicts between the GSX service vehicles and the scenery objects, either static or dynamic. The Graphical Scenery Editor is very fast and easy to use, and doesn't require any text input: everything is done inside FSX, using the familiar "Slew" keys commands. The results of your customizations are automatically saved in the airport .INI file discussed in the previous section, which you can share with others.

Accessing the Graphical Scenery Editor

After you upgrade to version 1.5 or above, the customization dialog has been modified, with an additional button labeled Customize vehicle positions, this will allow you to enter the Graphical Scenery Editor. As soon as you press that button, GSX will enter in the **Parking Editing Mode**, which locks your airplane in the last parking position, forced in Slew Mode, with default Slew keys now used to control the Editor functions:

When the editor starts, all vehicles are placed in their standard positions, with a pointer on each object. The currently selected object is highlighted in Orange, the others are Light Blue. You will **cycle** through the objects using the **Slew Move Up/Down Quickly** keys (**F1/F4** by default), until you find the one you need to adjust, then use the **Slew Rotate Left/Right** keys (**NumPad 1/3** by default) to rotate the object, **Slew Move Forward/Backward** keys (**NumPad 8/2** by default) to move the object Forward/Backward in the direction of its facing, and **Slew Move Left/Right** keys (**NumPad 4/6** by default) to move the object Left or Right, perpendicular to its facing.

Resetting vehicle positions

If you press the **Slew Freeze All Movement** key (**NumPad 5** by default), the currently selected vehicle will return to its default position.

Note the exclamation mark on top of the object pointer: if there's one, it means the object is not in its default position anymore, which will be also confirmed by the green text line on top, stating that object is in a (customized) position. If there's no exclamation mark, that object is in its default starting position, and the green text line will say (default).

It's possible to reset ALL vehicles in a parking spot to their default positions, by pressing the **Slew Heading North/Attitude Level** key, which is assigned to **CTRL+Spacebar** by default. A confirmation window will appear, asking if you are sure to reset all the vehicles of the current parking to their default starting positions.

NOTE: With "Default starting positions" we indicate whatever source of original information has been used to calculate the default starting position. On a default airport that has no other customization in place, it's controlled by the Left/Right radius parameters, derived from the scenery .BGL (AFCAD). On a fully-customized scenery, like those that are supplied with GSX (all FSDT airports, for example) the "Default position" means the one that was indicated in the scenery customization file supplied with GSX.

Changing parking spot

Using the **Slew Bank Left/Right** keys, assigned by default to **NumPad 7/9**, you can quickly switch to the next/previous parking of the airport. You will "Warp" there immediately, ready to edit the new parking. Reaching the last parking spot of the airport, will start back with the first one.

Automatic Saving

There's no "Save" option, all your modifications are automatically saved as soon as you act on the objects controls, this allows for an easier and faster work.

Exiting from the Editor

Pressing the normal **Slew On/Off** key, by default assigned to **Y** you will exit from the GSX Editor mode, and the Parking Customization Dialog will appear again, allowing to set other options for the parking spot, or to go back to flying, by closing the dialog with the "X" window close gadget on the top-right.

Editor Keys summary:

Editor Function	Key command	Default Key
Cycle next object	Slew Up Quickly	F4
Cycle previous object	Slew Down Quickly	F1
Move object Forward	Slew Move Forward	NumPad 8
Move object Backward	Slew Move Backward	NumPad 2
Move object Left	Slew Move Left	NumPad 4
Move object Right	Slew Move Right	NumPad 6
Rotate object Left	Slew Rotate Left	NumPad 1
Rotate object Right	Slew Rotate Right	NumPad 3
Reset object position	Slew Freeze All	NumPad 5
Reset ALL object positions	Slew Hdg North/Att Lvl.	CTRL+Space
Go to Next Parking	Slew Bank Right	NumPad 9
Go to Prev Parking	Slew Bank Left	NumPad 7
Exit from Editor	Slew Toggle	Y

Airplane customization

Starting with version 1.7, GSX allows users to add support for a new airplane, using an easy to use graphical editor, which allows to place doors interactively inside the FSX graphic window.

### Accessing the Airplane Configuration Editor

The Airplane Configuration Editor can be accessed from the "**GSX Customize Aircraft...**" sub-menu of the "**Couatl powered products**" menu, under the FSX "**Addons**" menu bar.

The Editor works in two different modes: ***Dialog Mode*** and ***3D Editor***. When you first open the Editor, it will start in Dialog Mode. This mode can be used to select doors, turn them on/off and set their parameters.

When you first open the Editor in Dialog Mode, the following Dialog will appear, displaying the currently selected Airplane, with its doors configuration as currently known by GSX. As further explain in the manual, GSX can use different data sources for your airplane, with different reliability, depending if the airplane is internally supported by GSX, has an intelliscene.cfg file in its folder, or just by looking at the aircraft.cfg, which is the worse possible case. Regardless of which data source GSX uses for your airplane, you'll be able to create a GSX.CFG for it, that will override data found in the existing data source, so you can improve and fully customize any airplane, and have it fully supported by GSX.

To change any door's parameters, click on a door on the airplane diagram, and a pop-up will open, to set all parameters for that door:
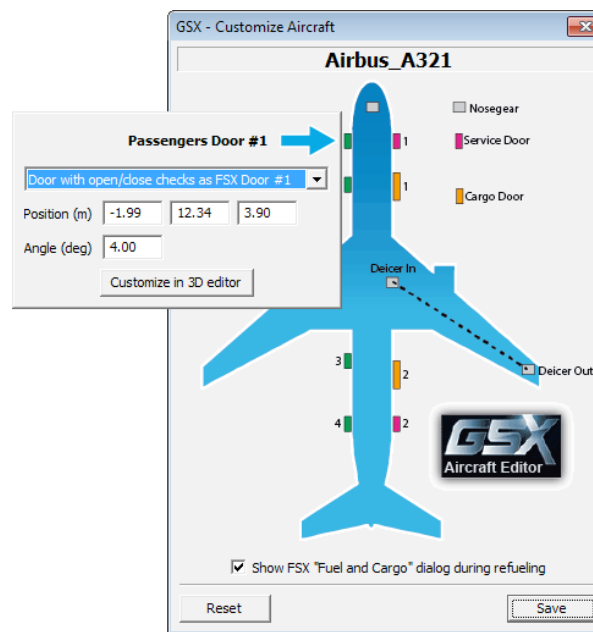
The blue arrow indicates the currently selected door. To select a different door, just click on it, and the pop-up will focus on that door.

To close the pop-up, click on an empty area of the main dialog box.

The **Reset** button will Undo all your modifications and restore the airplane configuration as it was before you entered the Editor. The **Save** button will save the configuration in a **GSX.CFG** file, located in the **%APPDATA%\ Virtuali\Airplanes\Air- planeName** folder.

Inside each door's pop-up, you can set the following parameters:

- How FSX checks for the door's status (opened/closed)
- The door position on the longitudinal, lateral and vertical axes, in meters
- The door's Angle relative to the airplane fuselage.

To remove a door entirely (no GSX services will be associated to it), select the first drop-down list as "**No door at this position**", which will remove the door entirely from GSX usage, the screen for a removed door will look like as in the following screenshot:
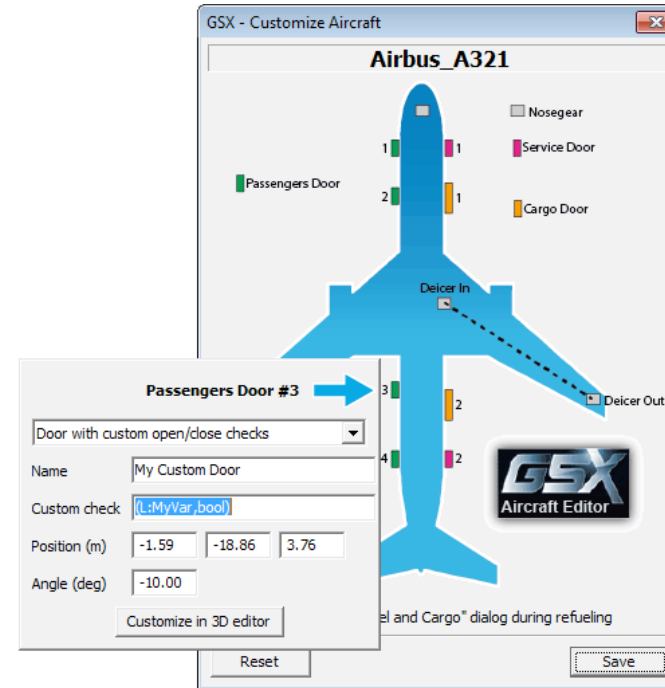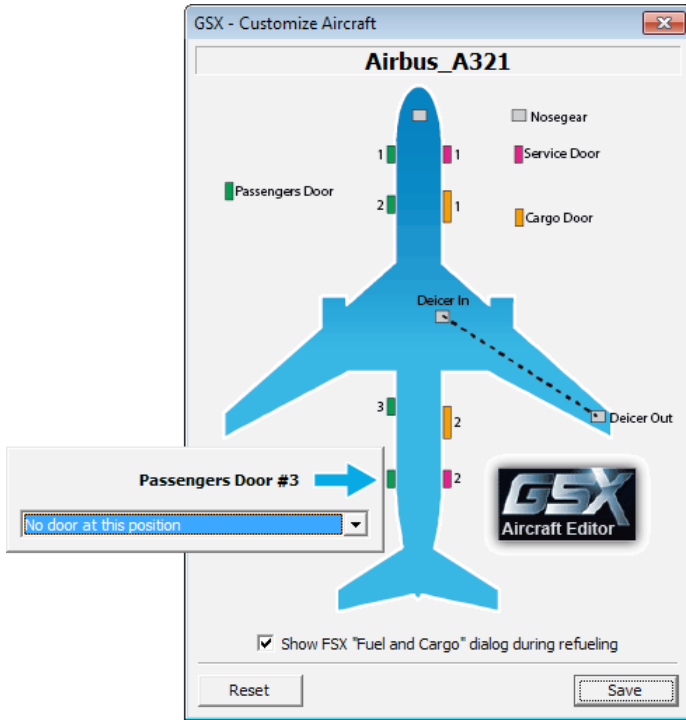
If a door is set as "**Door with Custom open/close checks**" two additional input fields will appear:

- Name - This is how GSX will reference that door, instead of the default Exit 1, 2, 3 and 4 or Service 1, 2 or Cargo 1, 2
- Custom Check - This is the **XML Expression** that can be used to read the door's status, which might involve custom **L:** Variables

Finding custom variables used by a specific airplane, requires a good knowledge of the FSX SDK. Such variables are usually embedded in the airplane .MDL file, and require a bit of trial and error and knowledge of the FSX XML expression language.

The pop-up dialog for a door with a Custom check will look as in the following screen:

Note the "Name" and "Custom Check" fields: the Name is set to "My Custom Door", this means that, when a GSX vehicle will approach the door, before starting its services, it will wait for your intervention to open the door, with the message "**[GSX] Waiting for your action: open My Custom Door**". Doors using standard FSX variables will be referred using standard names, but custom doors can be freely renamed.

The "Custom Check" field is set to **(L:MyVar, bool)**, this is how GSX can check if a custom door is open or closed. In this example, the door is considered to be open if the MyVar custom variable is True (the result of the expression is not 0) and closed if the expression is False (the expression returns 0). You can include any kind of XML code fragment here, allowing GSX to interface with any airplane, even the most advanced ones, which usually have non-standard ways of opening and closing their doors.

If a door is set as **"Door with no open/close checks"**, GSX will use it normally, but it will *not wait for you to open it* to start a service. This can be useful with 3rd party airplanes that have fake/inop doors that cannot be opened.

The 3D Editor Mode

Although you can edit the doors positions by inserting the numerical values directly while in Dialog Mode, is surely much easier to place them interactively in 3D graphics mode.

To access the 3D Editor Mode, simply select a door, and click the "**Customize in 3D Editor**" button. This will leave the Dialog mode and will go back to graphics mode, with the currently selected door ready to be edited interactively, as in the following picture:
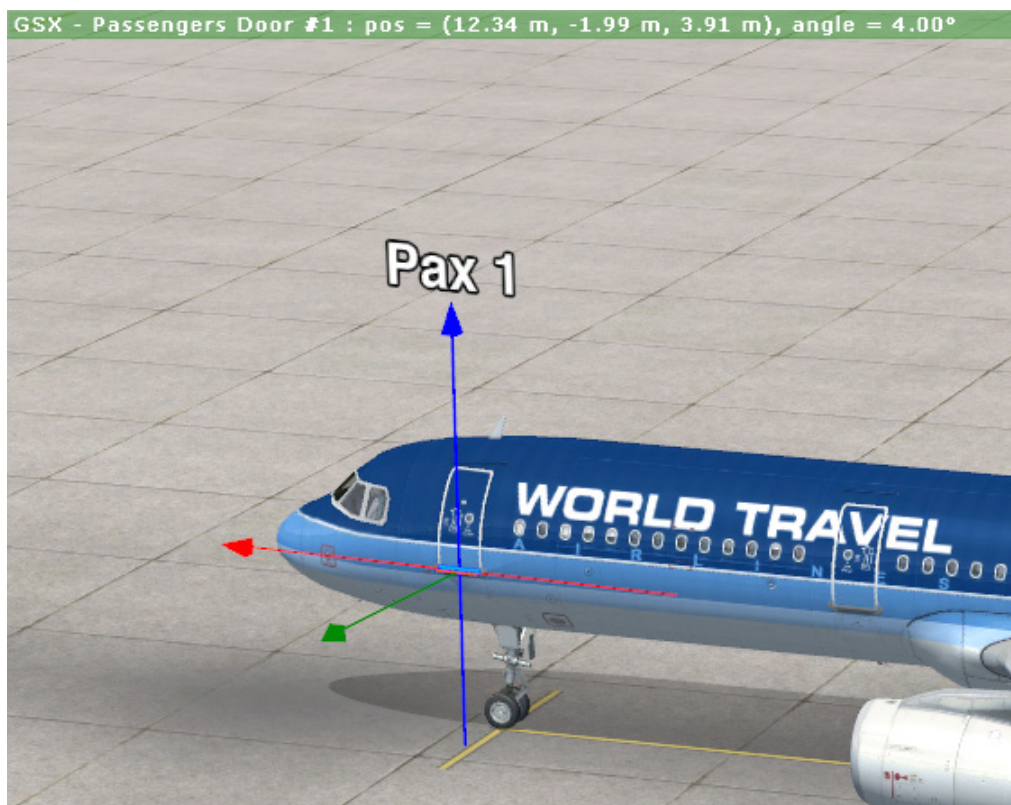
As soon as you enter the 3D Editor Mode, a pointer with the 3 axes will appear at the door position, as currently known by GSX. The 3 axes are color coded as follows:

• **Green** - Longitudinal axis, **relative to the door's heading**, which correspond

to the **Lateral** (Left/Right) distance relative to the Airplane fuselage, since the door is perpendicular to it.

• **Red** - Lateral axis, relative to the door's heading, which correspond to the **Longitudinal** (Forward/Back) distance relative to the Airplane fuselage.

• **Blue** - Vertical axis, which represents the door's height from ground.

The arrows indicates the positive direction of the axes, which means, when values increase, the door will move in the direction pointed by the arrow. Over the vertical arrow, a label indicates the door designation, for an easy recognition.

You can move the pointer using the **Slew Keys**, which by default are assigned as in the following table:

Editor Function	Key command	Default Key
Raise Door (Blue axis)	Slew Up Quickly	F4
Lower Door (Blue axis)	Slew Down Quickly	F1
Move Fwd on Green axis	Slew Move Forward	NumPad 8
Move Bck on Green axis	Slew Move Backward	NumPad 2
Move Back on Red axis	Slew Move Left	NumPad 4
Move Fwd on Red axis	Slew Move Right	NumPad 6
Rotate Door Left	Slew Rotate Left	NumPad 1
Rotate Door Right	Slew Rotate Right	NumPad 3
Coarse/Precision mode	Slew Freeze All	NumPad 5
Edit Next Door	Slew Bank Right	NumPad 9
Edit Previous Door	Slew Bank Left	NumPad 7
Exit from Editor	Slew Toggle	Y

When you press the "**Slew Toogle**" (key **Y** by default), the 3D editor will close and your changes will be **automatically saved** to the GSX.CFG file.
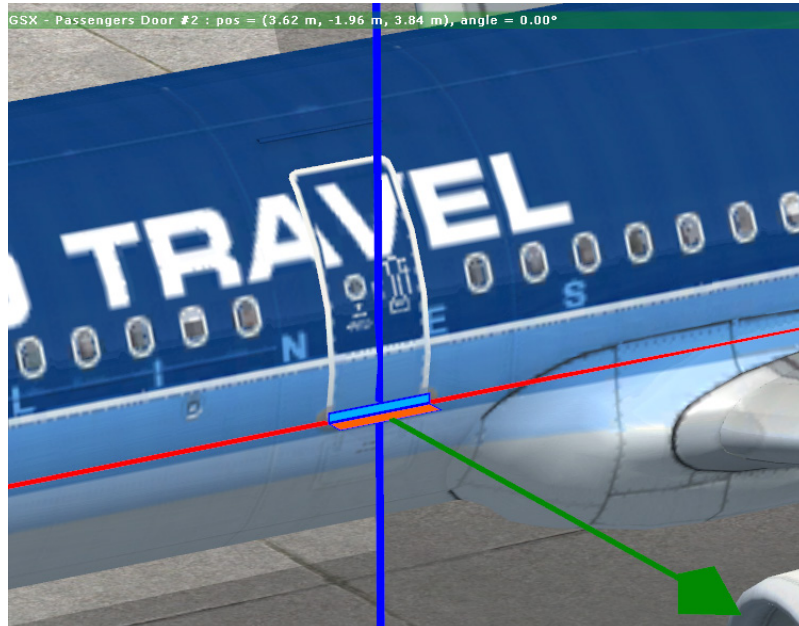
The top green status line will indicate the actual door position as Longitudinal, Lateral and Vertical distances in meters. The Longitudinal and Lateral values are expressed in distances from the airplane Reference Point, with positive values meaning Forward/ Right and negative values meaning Back/Left. The Vertical axis value (the 3rd value displayed, indicates the door's Height over ground.

A small L shaped rectangle colored in Blue/Orange, can help you to better position the door pointer in relationship to the actual doors location. It's usually easier to open all doors **before** entering the 3D Editor, since the door commands will not operate while the 3D Editor is active.

Previewing your changes with GSX vehicles

Sometimes, you might want to check how good your position is, with an actual GSX vehicle in use. To do this, use the following procedure:

- Select a GSX operation, for example "Deboarding", if you need to check positions of Passenger and Cargo doors, or "Catering" to check the positions for Service Doors
- Wait for the relevant vehicles to go into their working positions, and then open the

Airplane Configuration Editor from the "**Couatl powered products**" menu.
- Select a door and click the "**Customize in 3D Editor**" button. The graphical pointer will appear, allowing to move the door, and the vehicles will still be there as a reference.
- Once you exit the Editor and Save your settings, use the "**Reset Position**" command from the GSX standard menu, then try another operation, to check the vehicles position with the updated configuration.

De-icers In/Out points

Starting with GSX 1.9, De-icing vehicles has been introduced, and in order to follow the wing profile precisely, GSX must be aware of the coordinates of 2 control points, named "De-icing In" and "De-Icing Out". The De-icing vehicles will work between these two points. They can be set in the same way of any other door, either by typing coordinates manually, or interactively using the 3D editor. For the best results, place both points roughly in a halfway longitudinal position over the wing, and a bit inside the wingtip, see the two screenshots below for an example:
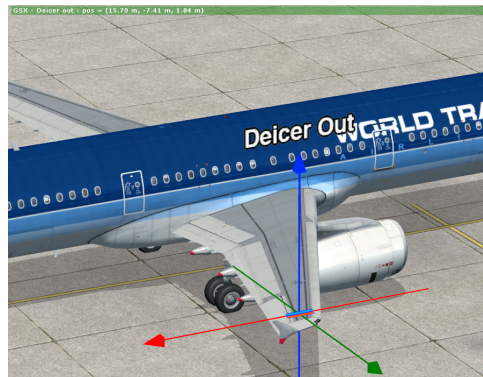
GSX 1.9 comes already internally configured with support for all default and many popular 3rd party airplanes, and the de-icers in/out point has been added starting with this version. You generally need to specify those points only when you need to add support for an unsupported airplane.

The GSX.CFG file

The following is a complete in-depth explanation of the GSX.CFG file, to let you understand exactly what each parameter does, in case you need to modify an existing file. With the introduction of the interactive Airplane Configuration Editor in GSX 1.7, there's no need to know all the following details, but we included them anyway for completeness.

An airplane can be customized by creating a file named **GSX.CFG**, that needs to be placed in the airplane Root folder, the same that contains the **aircraft.cfg** file. For example, if you want to customize the default Boeing 747-400, you will have to create a **GSX.CFG** file in the **FSX\SimObjects\Airplanes\B747_400** folder.

Complete and partial customization.

It's possible to customize both a new airplane that is entirely unknown to GSX, and an airplane that is already supported by it. If the airplane in unknown, you'll likely have to insert data for every door you want to use, but if it's already supported, your information will **override** what data is already available in the GSX internal database, and if you don't supply all information, the data in the GSX internal database will be used instead.

This way, you will be able to do fixes to airplanes already recognized by GSX, without having to supply every data or losing some advanced configuration options that are native to the airplane, like custom doors or custom ground connections.

The **GSX.CFG** file works like a standard .INI file, and it's divided in **sections**, each one containing a **key/value** pair.

GSX.CFG Sections

The **GSX.CFG** file has a main **[aircraft]** section, and several sections, one for each airplane exit.
The **[aircraft]** section contains the following keys:

nosegear = x

Distance in meters from the airplane reference point and the front gear, used by GSX to know where to attach the Pushback truck.

refueling = 0

The Refueling key controls the appearance of the standard Fuel/Load page when the Refueling service is called. By setting it to 0, the standard Fuel/Load page will not display, this could be useful if the airplane you use has a custom Fuel page that you'll rather use instead of the default one.

Following the **[aircraft]** section, there will be one or more **[exitN]** sections, one for each door you want to customize. There's no need to insert all the exits, just the ones you want to customize. If an Exit section is missing, GSX will try to take the information from its other data sources (the internal database, the aircraft.cfg file, etc.). But you CAN disable an existing Exit, if you need.

[exit1]

The **[exit1]** section refers to the first door on the left side of the airplane, which is usually the main passengers door, where the jetway and the front stairs connects to. This section accepts the following parameters:

```
remove = 1
```

This **remove** parameters instructs GSX to ignore this exit, and can be used to disable all services linked to it. Removing a passenger exit will disable passengers stairs and will stop GSX from asking to open that door when boarding/deboarding passengers. NOTE: the **remove** parameter should be used alone, without any other parameters on the same Exit section.

```
pos = X Y Z Angle
```

The **Pos** parameter is probably the most important, because it specifies the Exit position, and it's expressed in meters from the airplane reference point for the first 3 parameters (X, Y and Z) and an angle, expressed in degrees, to specify the door orientation.

X is a Lateral (Left/Right) offset from the airplane center, and negative numbers means Left.
Y is the Longitudinal (Front/Back) offset from the airplane center, with positive numbers going in the Front direction and negative numbers going towards the Back of the airplane.

Z is the Height of the Exit, measured from the ground level. The door height usually affect the choice of stairs and the kind of loaders in case of cargo exits.

```
code = n
```

The **code** parameter it's an integer number, usually 1, 2, 3 or 4, which indicates which command is used to open the Exit in FSX. The numbers correspond to the standard *Shift+E* command, which it's usually followed by a number.

For example:

code = 1 - indicates the door opens with *Shift+E* (the 1 is not necessary)
code = 2 - indicates the door opens with *Shift+E* and then *2* quickly thereafter.
code = 3 - indicates the door opens with *Shift+E* and then *3* quickly thereafter.

```
name = door name
```

If **code** is set to **0**, the door will still work, but will be *ignored* by GSX which will not wait for it to start its animations. This is useful to enable airplanes with static doors or non-standard ways to open them, without having to remove the door and thus losing its associated services.

The **name** parameter it's a string which is presented to the user when GSX asks to open that door, to help identify it better. Not setting this parameter will use a generic "Exit x" name, but it's possible to use any name, to conform to the naming convention of the airplane.

```
[exit2]
```

The **[exit2]** section refers to the 2nd passenger door on the left, and it accepts the same parameters as the **[exit1]** section. It's the exit were the mid stairs connects to.

```
[exit3]
```

The **[exit3]** section refers to the 3rd passenger door on the left, and it accepts the same parameters as the **[exit1]** section. Currently, GSX doesn't use the 3rd exit.

```
[exit4]
```

The **[exit4]** section refers to the 4th and last passenger door on the left, and it accepts the same parameters as the **[exit1]** section. It's the exit were the rear stairs connects to.

```
[service1]
```

The **[service1]** exit is the front door on the right side of the airplane, used by the Catering service. It accepts the same commands of a regular Exit, but adds the following:

```
flip = n
```

The **flip** parameter, followed by an integer number from 1 to 4, indicates the door has a mirrored position, taken from the Exit indicated by that number. This allows you to quickly add a symmetrical service Exit to be used for Catering, if you don't want to insert the position manually. Of course, if the service door in your airplane is not symmetrical to the corresponding door on the left side, you are free to insert its precise location, using the **Pos** parameter, like any other Exit.

Example:

```
[service1]
flip = 1
name = Front Catering door

[service2]
flip = 4
name = Rear Catering door
```

This two sections define the two catering doors, the front one being mirrored from the main passenger exit 1, and the rear one mirrored from the rear passenger exit. We used a custom name for both, so they will display as such by GSX, instead of just "Exit x"

```
[cargo1]
```

The **[cargoN]** sections are used to define the exits used by baggage and container loaders. They use the same parameters as a standard exit, with the following addition:

```
uldcode = code
```

The **uldcode** parameter is a string code, usually 3 characters in length, that identify the standard **IATA** code for the **Unit Load Device** (the container) used by that door. It's important to specify the correct ULD code, so a container having dimensions appropriate for the airplane and the door size will be used. If this code is set to "" (two double quotes), the Cargo loaders will be disabled for that exit, and a Conveyor Belt vehicle will appear instead.

This way, you have the flexibility to specify, for example, to have a conveyor belt even on an airplane with fairly high doors that, with the automatic loader selection strategy, would result in a Cargo loader, which might not be appropriate for the airplane. Some example are the 757 or the Concorde. And, it's possible to specify different configurations for the front and rear Cargo exits.

Example:

```
[cargo1]
pos = 1.0 12.0 2.10 0.0
```

```
name = Front Cargo Door
uldcode = ""

[cargo2]
pos = 0.90 –11.0 2.10 0.0
name = Rear Cargo Door
uldcode = AKE
```

In this example, we specified the Front cargo door to be located at 1 meter on the right side of the airplane, 12 meters in front and with its threshold at 2.10 meters of height. This would normally trigger a container loader vehicle (they usually appear when the door is higher than 2 meters), but since we specified **""** as **uldcode**, a Baggage loader with a Conveyor Belt will be used instead.

The 2nd cargo door it's 90 centimeters on the right, 11 meters in the back and it's 2.1 meters high. We specified the container type should be the AKE type, which is one of the most commonly used types.

```
[cargo2]
```

The **[cargo2]** section, as seen in the previous example, accept the same parameters as the **[cargo1]** section.

A complete GSX.CFG file example for the default A321, commented:

```
[aircraft]
nosegear = 12.25
refueling = 1

; Nosegear at 12.25 mt ahead of the airplane center
; default Fuel/Load page is enabled

[exit1]
pos = –1.95 12.4 3.7 5
code = 1
name = exit 1

; Main passenger doors is at
; 1.95 mt on the left, 12.4 mt ahead and 3.7 mt high
```

```
; angled at 5 degrees clockwise
; can be opened with Shift+E (the 1 is not needed)
; GSX will label the exit as "exit 1"

[exit2]
pos = -2.0 3.6 3.7 0
code = 1
name = exit 1


; Second passenger door, has the same code as the main
; passenger door and open with Shift-E too.


[exit3]
remove = 1


; 3rd passenger door don't exists on this airplane
[exit4]
pos = -1.8 -18.85 3.7 -5
code = 1
name = exit 1


; the last passenger door in the rear opens together with
; the main passenger door, so it has the same code/name


[service1]
pos = 1.95 12.45 3.7 -5
code = 3
name = exit 3


; Front catering door is not perfectly symmetrical with
; the main passenger door (5 cm ahead) and it opens
; using Shift+E then 3, and it's named "exit 3"

[service2]
pos = 1.6 -18.85 3.9 5
code = 3
name = exit 3


; Rear catering door shares the same Shift+E then 3
; command as the Front catering door.
```

```
[cargo1]
pos = 1.2 8.9 2.5 0
code = 2
name = exit 2
uldcode = AKH


; Front cargo door, can be opened with Shift+E then 2
; and accepts the A320 type container, the AKH


[cargo2]
pos = 1.2 -11.4 2.5 0
code = 2
name = exit 2
uldcode = AKH


; Rear cargo door shares the same opening command as the Front ;
cargo door, and accepts the same kind of container.
```

Saving the GSX.CFG file.

The "Save" button, will save the CFG.CFG file in memory in the **%APPDATA%\Virtuali\Airplanes\YourAirplaneRootFolder** folder:

YourAirplaneRootFolder is the same name of the folder that contains the currently loaded airplane, in the regular **Simobjects\Airplanes** folder, under the main FSX folder. For example, editing the Default Airbus A321 and just pressing "Save", will create a **GSX.CFG** file in the **%APPDATA%\Virtuali\Airplanes\Airbus_A321** folder.

The reason for saving into the **%APPDATA%** folder, is to ensure the file can be written without problems even if the UAC is enabled. As soon as you Save your file, the modifications to the airplane configuration in GSX will be applied immediately so, for example, you can try a boarding/deboarding test, to verify your edits, choose "Reset position", going into the editor again, test again and so on, to refine your configuration.

Unit Load Devices - Loading/Unloading your Cargo

Starting with version 1.3, GSX supports two means of loading and unloading cargo:

- The standard Baggage Conveyor Belt, used since the first version

- The larger Cargo loaders, with two platforms that can handle baggage and mail loaded on standard containers.

-

On wide-body airplanes, it's more efficient to load Cargo (Baggage and Mail), using loaders that move standard containers, named Unit Load Device or ULD for short. Their type and measurement is fairly strict, since they must adapt to the fuselage shape and size, and the cargo door size too. There are several containers type used for different airplane types, and GSX supports the most popular ones which are used on the Lower Cargo bay.

A unit load device (ULD), is a pallet or container used to load luggage, freight, and mail on wide-body aircraft and specific narrow-body aircraft. It allows a large quantity of cargo to be bundled into a single unit. Since this leads to fewer units to load, it saves ground crews time and effort and helps prevent delayed flights. Each ULD has its own packing list (or manifest) so that its contents can be tracked.

All ULDs are identified by their ULD number. A three-letter prefix identifies its type, followed by a 4 or 5 digit serial number to uniquely identify it from others of the same type, and ending with a two character (alpha-numerical) suffix identifying the ULD's owner (if an airline, often the same as IATA designator codes).

For example, AKN 12345 DL means that the ULD is a forkliftable LD3 with the unique number 12345 and its owner is Delta Air Lines.
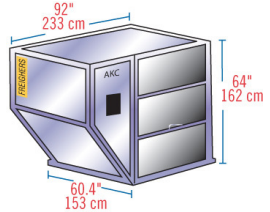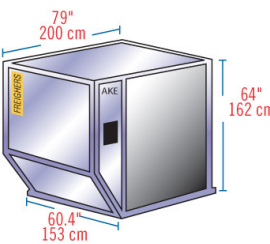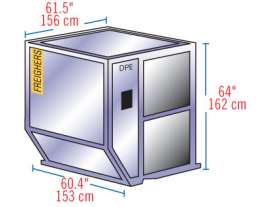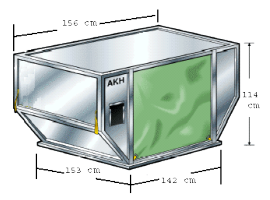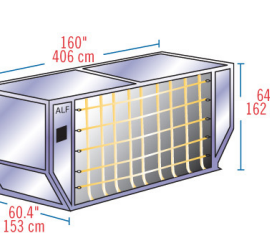
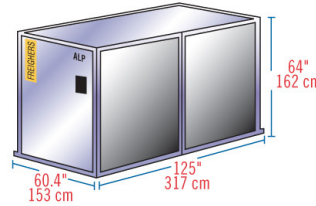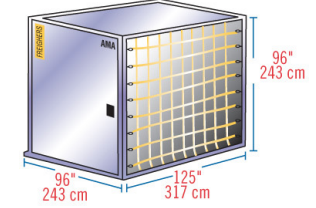GSX supports the most widely used ULDs, listed in the table on the next page:

IATA	ICAO	Dimensions	Description
AKC	LD1	156/234 × 153 × 163 cm	Contoured, half width, used for 747
DPE	LD2	119/156 × 153 × 163 cm	Contoured, half width, used by the 767
AKE	LD3	156/201 × 153 × 163 cm	Contoured, half width, used by B77, A330/340, MD11
AKH	LD3-45	114 × 153 × 163 cm	45" height for loading on Airbus A320 family
ALF	LD6	406 x 153 x 163 cm	Full-width lower hold container with angled ends
ALP	LD11	317 x 223 x 163 cm	Full-width lower hold container. Canvas Door.
AMP	M1	317 x 243 x 243 cm	Main-deck container. Door is canvas with built-in net door straps.
DQF	LD8	243 x 153 x 163 cm	Full-width lower hold container angled at both ends. Canvas door with built-in door straps.

Below, a table of which ULD are used in most common airplane types:

Aircraft	IATA ULD	ICAO ULD
B747	LD1	AKC
B767	LD2	DPE
B777	LD3	AKE
B787	LD3	AKE
A300	LD3	AKE
A310	LD3	AKE
A319	LD3-45	AKH
A320	LD3-45	AKH
A321	LD3-45	AKH
A330	LD3	AKE
A340	LD3	AKE
A380	LD3	AKE
MD-11	LD3	AKE
L-1011	LD3	AKE
IL-86	LD3	AKE
IL-96	LD3	AKE

ULDs specifications:

AKC **LD1**	92" 233 cm / 64" 162 cm / 60.4" 153 cm	IATA ULD Code: AKC Contoured Container Also known as: AVC, AVD, AVK, AVJ Forkable: AVY Classification: LD-1 Rate Class: Type 8 Suitable for: B747, B767, B777, MD-11 Internal volume: 4.8 cu. m (169.5 cu. ft) Maximum gross weight: 1588 kg (3501 lb
AKE **LD3**	79" 200 cm / 64" 162 cm / 60.4" 153 cm	IATA ULD Code: AKE Contoured Container Also known as: AKE, AVA, AVB, AVC, AVK, DVA, DVE, DVP, XKS, XKG Forkable: AKN, AVN, DKN, DVN, XKN Classification: LD-3 Rate Class: Type 8 Suitable for: A300, A310, A330, A340, B747, B767, B777, DC-10, MD-11, L1011 Internal volume: 4.3 cu. m (152 cu. ft) Maximum gross weight: 1588 kg (3500 lb)
DPE **LD2**	61.5" 156 cm / 64" 162 cm / 60.4" 153 cm	Dimensions LxWxH: 156cm x 153cm x 163cm (61.5"/47" x 60.4" x 64") IATA Code: LD2 Type Code: DPE Also known as: DPA, APA, DPN (Forkable) Tare Weight:92 kg* / 203 lb* Weight Limitation: 1'225 kg / 2'700 lb Aircraft: B767
AKH **LD3-45**	156 cm / 134 cm / 153 cm / 142 cm	Dimension LxWxH: 244cm X 153cm X 117cm (96"/61.5" X 60.4" X 46") IATA Code: LD3-45 (LD45) Type Code: AKH Also known as: DKH Tare Weight:82 kg* / 180 lb* Weight Limitation: 1'588 kg / 3'500 lb Aircraft: A319, A320, A321
ALF **LD6**	160" 406 cm / 64" 162 cm / 60.4" 153 cm	IATA ULD code: ALF contoured container Also known as: AWA, AWF, and forkable AWC Rate class: Type 6W Description: Full-width lower hold container with angled ends. Door is canvas with built-in door straps. Suitable for: 747, 777, 787, DC-10, MD-11 lower hold Door opening: 120 x 60-in (305 x 152-cm) Maximum gross weight: 3,175 kg (7,000 lb) Tare weight: 230 kg (507 lb)

ALP **LD11**	64" 162 cm / 60.4" 153 cm / 125" 317 cm	IATA ULD code: ALP rectangular container Also known as: ALD, AW2, AWB, AWD, AWZ, DLP, DWB, and MWB. Refrigerated version: RWB, RWD, and RWZ. Rate class: Type 6 Description: Full-width lower hold container. Door is canvas. Center post swings clear for loading. Refrigerated version has solid door. Suitable for: 747, 777, 787, DC-10, MD-11 lower hold Door opening: 120 x 61-in (305 x 155-cm) Maximum gross weight: 3,176 kg (7,002 lb) Tare weight: 185 kg (408 lb)
AMP **M1**	96" 243 cm / 96" 243 cm / 125" 317 cm	IATA ULD code: AMA rectangular container on P6P base Rate class: Type 2 Also known as: AMF, AMG, AMK, AMP, AQA, AQD, and AQ6 Description: Main-deck container. Door is canvas with built-in net door straps. Suitable for: 747F, 747 Combi 777F center loading only Maximum gross weight: 6,804 cm (15,000 lb) Tare weight: 350 kg (772 lb),

The choice to decide which method of cargo loading will be used (Conveyor Belt or Cargo Loader), varies depending how the airplane is recognized by GSX:

If the airplane is recognized by GSX internal database, we already set up the correct ULD type for each supported airplane.

If the airplane is not included in the GSX internal database, the choice will be made depending on the Cargo door *height*: if it's less than 2 meters, a Conveyor Belt loader will be used, otherwise the loader will a Cargo loader.
In the previous pages, we demonstrated how you can control the assignment creating a `GSX.CFG` file, with an `uldcode` parameter that can control which container type will be used for every Cargo exit.

The ULD used by GSX are *customized with airline logos* and their identification code, according to correct IATA standards, as explained before. The airline selection is made according to the following strategy:
If your airplane.cfg includes the *ICAO code* of your airline in the `atc_parking_codes` parameter, this will take precedence over any other selection method. It's assumed you will preferably load containers with the airline logo of the *airplane*. If your airplane doesn't have an `atc_parking_codes` parameter in its aircraft.cfg file, the selection

will be made per **airport**, using the same selection methods as the handling vehicles. In this case, it might happen you will load containers with a logo on departure, and a different one when unloading on arrival. This is normal, and can't be prevented if your airplane.cfg doesn't have the airline code set.

The standard Cargo Loader used is modeled after the real world FMC Commander 15, a very popular vehicle, with two hydraulic platforms that can reach doors as high at 3.55 meters. GSX version 1.8 added support for the FMC Commander 30i, which can reach the Main Cargo door, up to 5.558 mt. of height.

Live Update

GSX has been designed with the capability of being constantly updated. The kind of product is very suited to evolve: new 3rd party airplanes that require support with doors configuration and special features, and new 3rd party airports that might need a specific customization, are being released every day. And of course, with such complex code that needs interaction with a wide range of addons and user habits, bugs are always possible.

With the Couatl Live Update, your product will be always fresh without much effort to check for new versions. The Couatl Live Update also covers other products, from FSDT and 3rd parties that license the Couatl scripting engine, and can be kept updated very easily with the same method.

How it works

The Couatl Live Update is integrated in the Couatl engine, and notifications for updates are both automatic or triggered by the user.

The automatic notification runs once every day. No background tasks are installed, the notification it's part of the Couatl engine and runs only with FSX. The system will check our servers every 24 hours, and if there's an update, will be shown with a standard FSX menu:


The menu shows 3 options, allowing to Download and install the update, Read the release notes or Ignore the update.

If you choose to Ignore the update, there will be no further automatic notifications, until the NEXT update will be published. But it's always possible to force an Update check manually, using the "Check Live Update" option under the "Couatl powered product" menu under the "Addons" menu of the main FSX menu bar:

vUsing the "Check Live Update" function, you can check if there's an update available without having to wait up 24 hours after it has being published, and get a chance to download or read about an update that you chose to ignore with the automatic notification.

The option to Read the list of changes, will launch a mini-browser window (which works in FSX Full Screen mode too), that contains an updated web page that lists all the news related to the update.

It's possible to read the release notes again, by selecting "Check Live Update" again, even if you already installed the update.
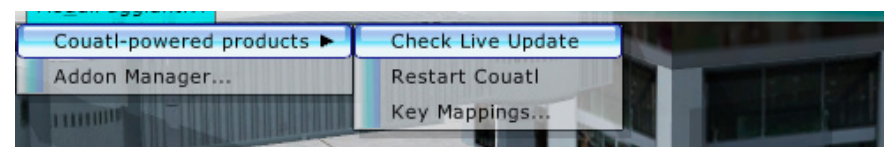
Minor and Major Updates

There are two kind of updates that might be made available: we call them Minor and Major updates, and will be labeled differently in the Live Update notification window.

Minor Updates

A Minor update can be downloaded and installed "On the Fly", without having to leave FSX, and usually covers the following:

- New 3rd party Airplane supported. The GSX internal database of airplanes will be updated to add new products to the list of supported airplanes, with their doors configurations and special features like ground connections.
- New or improved airport customization files, featuring both default and 3rd party airports, to better detection of parkings, pushback paths, jetway locations and other issues that might affect GSX
- Code fixes and new features for the core GSX program code, or general improvements to the scripts shared by all plugins powered by the Couatl engine, including sceneries from FSDT and other Couatl licensee that use the scripting engine to create special features in their sceneries.

All these updates can be downloaded and installed without exiting FSX, if you select the Download and Install option, a separate Updater utility will be launched:
At the end of the download process, a menu will announce that the Update has been successfully installed (or will announce of any problems, like a connection problem), and the Couatl engine will restart automatically, so all the new code changes will be

immediately available without requiring an FSX restart.

After selecting Option 1, the Live Update will be downloaded and installed, and the following screen will appear:
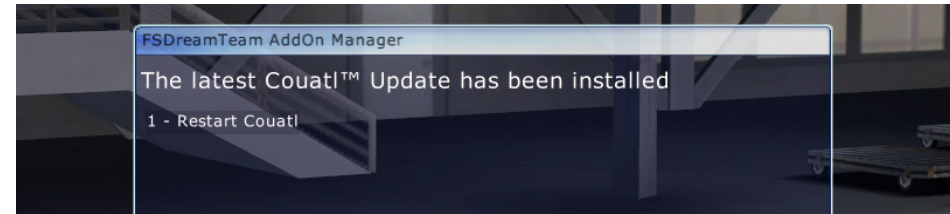

Launching the Updater outside FSX

It's possible to launch the Updater when FSX is not running, this might be useful if you want to be sure you have the latest updates before starting a flight, or if any kind of connection problems or corrupted downloads might prevent the Live Update to work from within FSX.

The Updater is located in the following folder:

YourFSXFolder\Fsdreamteam\Couatl\Couatl_Updater.exe

It's should be launched directly from this folder when FSX is not running, and it's equivalent of doing a manual update inside FSX.
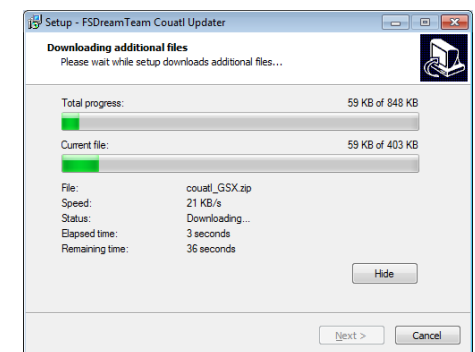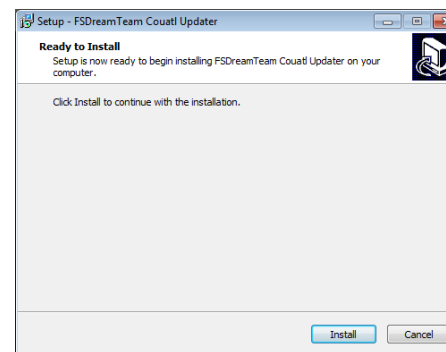
Major Updates

There are times when an Update can't be downloaded and installed on the fly, because it requires an update of the Addon Manager .DLL module, or the Couatl executable, so you will have to Quit from FSX, download and install the **Stand-Alone Addon Manager for FSX**, (which contains all the updates normally found in a Minor update too), but also other files that couldn't be downloaded and installed without restarting FSX. When a Major update is available, the notification menu is slightly different: Note the menu Title: it's says "An Addon Manager upgrade is available", and the text saying you can install update without restarting FSX it's gone. This indicates a Major Update.
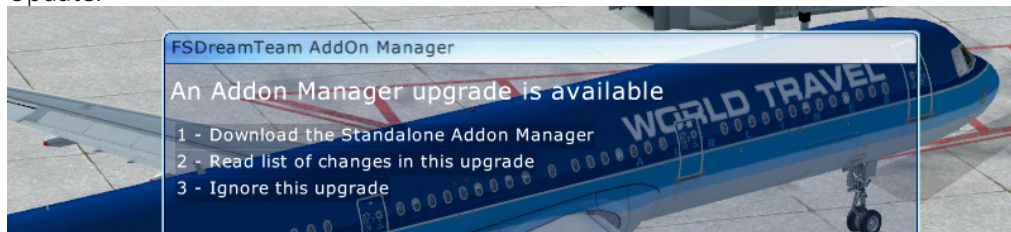
Major updates that requires exiting from FSX and install the Stand-Alone Addon Manager are usually reserved for features that require to update one or both the two executable modules that are required by GSX, or to update files that can't be installed while FSX is running, like airport .BGLs.

Note that, it's usually possible to obtain the same result as installing the latest Stand-Alone Addon Manager, also by reinstalling GSX with its full installer

Updating GSX 3D Models, Textures and Sounds

These are the largest files that takes most of the installer space which means they'll require downloading and installing the most current GSX installer. We might add them to the Live Update service in future upgrades.

However, if such update is required, you'll be notified by the Live Update program, with the release notes, that will explain when a full GSX download and installation is needed.

Interfacing with GSX

Here's some informations useful to developers wanting to interface their airplanes or utilities with GSX. Most of the information can be retrieved using L: variables, which can be read very easily from an XML gauge code, but also in a C/C++ gauge, using the **register_var_by_name(), get_named_variable_value()** API calls from the Panels interface.

Reading the current status of GSX operations:

Each GSX service has an associated L: variable:

```
L:FSDT_GSX_DEBOARDING_STATE
L:FSDT_GSX_CATERING_STATE
L:FSDT_GSX_REFUELING_STATE
L:FSDT_GSX_DEBOARDING_STATE
L:FSDT_GSX_DEPARTURE_STATE
```

With a status being a numeric value, indicates the following:

```
1 = service can be called
2 = service is not available
3 = services has been bypassed
4 = service has been requested
5 = service is being performed
6 = service has been completed
```

Checking the Pushback status

When GSX is Pushing the airplane, it sends several "Freeze" commands using Simconnect, so the plane will not move while being pushed. The plane is set to its normal status when the Pushback Truck is removed. This might cause issues if you use a custom flight model, for example, which should be notified of the freezing, as the standard flight model would. To check the precise moment GSX has frozen the airplane, you can poll the **L:FSDT_VAR_Frozen** variable, which is set to 1 when the Pushback starts pushing, and reset to 0 when it's done.