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Version 1.3.9  
May 2005



## History

### 1.3.9 May 2005

- Rewired the handling of keystrokes for left/right turns during pushback or tow. It was found that in some cases, other gauges can intercept DXInput keys before atn.gau ever sees them – this could prevent the aircraft from turning via keyboard control if a rudder axis is not mapped.

### 1.3.8 December 2004 (unpublished)

- Added support for atn.ini configuration file to allow panels to show in all views or not at all (atn.ini file in gauge folder).

### 1.3.7 November 2004

- Hotfix for temporary files that didn't cleanup.

### 1.3.6 November 2004

- Optimized code and effects for frame rate
- Added cover guards to some switches (electrical panel) – use right click to open/close
- Changed behavior of GPS switch to continuously “force” GPS/NAV on if it is off

### 1.3.5 October 2004

- Made panel persistent across views when visible (panel will not automatically hide when switching between different views)
- Added control circuits for typical functions only available through the keyboard (used for doors, water rudder, etc...) – these are used to trigger some features such as cargo door openings, etc...
- Added test circuit to disconnect joystick input from FS for aileron, elevator, rudder and throttle
- Added repeater for GPS/NAV switch
- Added backlighting / color LEDs / night effects

### 1.3.4 October 2004

- Added relative wind bearing and wind speed indicator (note: need to work on night lighting)
- More bug fixes
- Increased tug speed to 16 kts max based on data from actual tug drivers
- Changed default tug speed to 1kt

### 1.3.1 October 2004

- Added custom background feature
- Tweaked cosmetic effects
- Increase allowed tug speed to 8 kts
- Tweaked taxi auto/throttle behavior after landing

### 1.2.2 September 2004

- Revised documentation

- Improved registration with FSUIPC for performance
- Added additional repeaters to electrical panel for circuits/lights
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## 1.2 September 2004

- Added ability to pull aircraft
- Added popup tooltips to pushback gauge
- Added keyboard controls to pushback gauge for custom cockpit support
- Allow tug speed of 0 for temporary stops without mode disconnect.
- Changed temperature display to 1 digit beyond decimal point
- Minor cosmetic changes
- Improved sound effects

## 1.1 July 7 2004

- Fixed bug in automatic registration with FSUIPC
- Added ambient pressure/temperature gauge
- Added problem solving section at the end of this document

## 1.0 June 2004 – Initial release

# MINIMUM REQUIREMENTS

The gauge requires **Windows XP (any edition)**, with SP1 or SP2, FSUIPC 3.4 or later, Microsoft Flight Simulator 2004 “A Century of Flight” (FS9), including FS9 SP1.

A bitmap editor capable of loading 32 bit images and saving them in the PNG format is also recommended if you intend to create your own custom backgrounds for this gauge.

This gauge utilizes a C runtime library provided with the package that must be placed in the Windows folder, and it uses the Microsoft GDI+ library which is part of Windows XP but not installed by default with some older operating systems (but can be installed as an update available from Microsoft). See the installation section for details.

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**NOTE** Technical support can only be provided the gauge running under Windows XP at this time. Before contacting tech support, please review the Q/A section at the end of the manual as it covers the most common situations reported since release 1.0 of this gauge set.

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## Previous User Quick Start

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This section is for existing users upgrading from a prior release of this gauge set.

1.3.9 Replace the atn.gau file in the gauges folder. No other change is necessary. You can create a regular text file called **atn.ini** in the gauges folder (same folder as the atn.gau file) containing the following text:

[Options]

PanelVisibleInAllViews=0

Change the value of 0 to 1 to see the gauge in every view (including external). Set the value to 0 if you only want the gauge to display in the 2D panel (this was the default setting for release 1.3.2).

1.3.7 Replace the atn.gau file in the gauges folder. You must then modify your panel.cfg to reflect the new height of the electrical and scale panels in 1.3 if you use them. The “standard” panel with all gauges is shown here, which can be pasted as is in your panel.cfg files.

```
[Window 00] // change to reflect window sequence number
// atn.gau ** BEGIN **
BACKGROUND_COLOR=0,0,0
size_mm=300, 410 // overall size of panel window (width x height)
position=8       // bottom right position
visible=0        // make this 1 to make it visible on startup
ident=15123      // this must match the last param in atn!toggle
gauge00=Atn!Pushback,0,0,300,80,15123
gauge01=Atn!Scale,0,80,300,80
gauge02=Atn!Electric,0,160,300,170
gauge03=Atn!Ambient,0,330,300,80
// atn.gau ** END **
```

---

**NOTE:** The shift-ctrl-F12 hot key only works if the toggle gauge is loaded somewhere on the panel (atn!toggle must appear in the main panel).

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Please read the advanced section at the bottom of the document for the use of custom backgrounds for any portion of the gauges. Happy flying!

## Introduction

This product is a freeware multi-gauge add-on for Microsoft® Flight Simulator® “2004 Century of Flight” (FS9). The gauge implements the following functions:

- A) A tug control mechanism to push or pull the aircraft using pilot controlled speed and direction. This gauge overcomes some of the limitations of the built-in pushback system. Set a speed of 0 to momentarily stop. New in 1.3.6 is the increase of the tug speed to 16 knots (watch the tight turns).
- B) An autothrottle/autobrake system to hold a set ground speed for taxi for any fixed wing aircraft. This facilitates taxi operations. Set a speed of 0 to momentarily stop.
- C) Two information gauges providing common information needed to program flight control computers and to compute landing references and minimums:
  - I. Aircraft weights with gross, payload, fuel and zero-fuel weights in kilograms (Kg) or pounds (lbs).
  - II. Outside air temperature (OAT) and outside air pressure (OAP) with toggles to switch between SI and Imperial units, and (new in 1.3) relative wind bearing and wind speed at the aircraft.
- D) An electric panel with buttons to control key FS9 circuits and functions (useful for panels that do not implement an interface for these functions)

The complete panel with all the included gauges is shown here with the Cessna 172:



I hope you enjoy this set of gauges. Happy flying!



## Acknowledgements

I would like to thank the forum contributors at the Microsoft FS Panel Design forum on [www.AVSIM.com](http://www.AVSIM.com), and in particular Pete Dowson, Paul Croft, and Marcus Thompson and the rest of the test team. Your time and contributions are very appreciated.



## Licensing and disclaimer

This gauge software package is provided free of charge under the terms of the freeware license agreement distributed along with this software.

By installing and using this software, you agree to the terms of the license agreement.

The distribution of this product for commercial (payware or “for profit”) applications is strictly prohibited without express consent of the author.

## General information

The installation instructions in this documentation provide information on how to combined the sub-gauges in a single panel window. Installation does require the modification of the panel configuration file for each aircraft you intend to fly, noting that some aircrafts also share the same configuration files across models.

As background information, it is highly recommended to read the reference information provided by Microsoft® on how to modify and create panels in flight simulator. This information can be found in the documentation accompanying the Microsoft Panel SDK for Flight Simulator available from the Flight Simulator web site.

The installation instructions included below are no substitute for the complete documentation provided by Microsoft.

If in doubt, contact the author at [martiner@rrcol.com](mailto:martiner@rrcol.com). Note that support will only be offered for systems running Windows XP at this time.



## Configuration file (new in 1.3.8)

Starting with version 1.3.8, a configuration file (atn.ini) is created in the gauge folder (the same folder you place the atn.gau file).

All options must appear in the section [Options] as follows:

```
[Options]  
PanelVisibleInAllViews=1
```

Current supported options:

Option name	Value	Meaning
PanelVisibleInAllViews	0 or 1	0 = false, 1 = true, controls the persistence of the panel across views. If 0, the panel will only stay in the view it was called. If 1, the panel will popup in all views when visible.

## Ground-handling gauge

This release includes four gauges for fixed wing aircraft (piston / jet / turboprop) designed to be added to each aircraft's panel.cfg file. Instructions for installation are included below in the document, but let's look at what each gauge does first.

### Ground-handling gauge (size 300 x 80 pixels – atn!pushback)

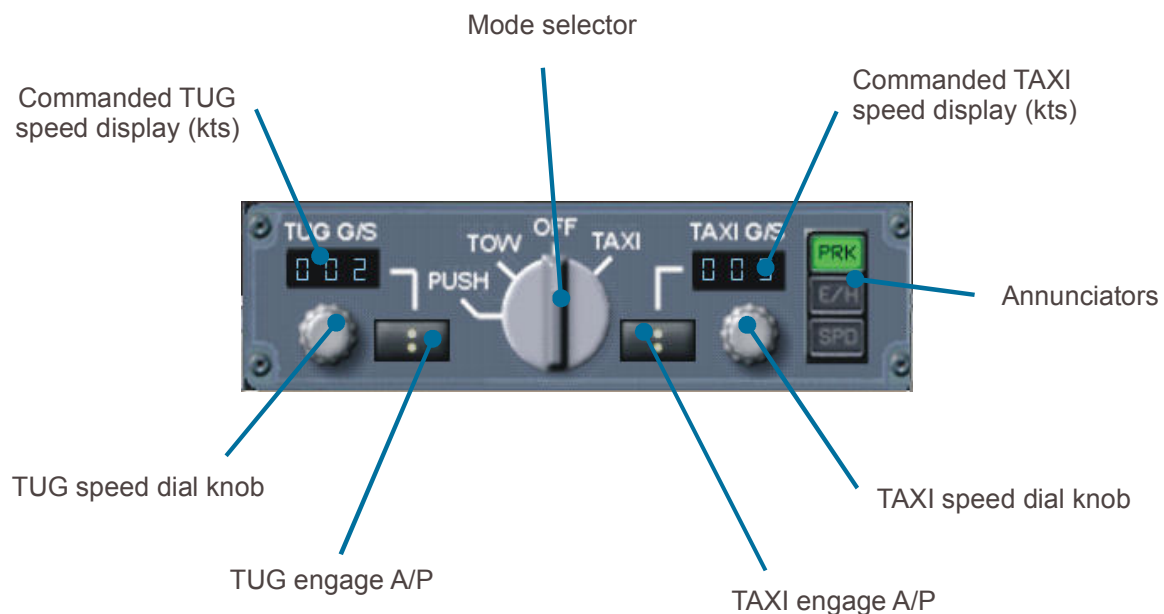
---

The ground-handling features were tested with aircraft having a nose gear. Tail draggers and ski/float plane configuration may have unpredictable results.

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This is a combination gauge used on the ground to control a virtual “tug” to push or tow the aircraft, and also an autothrottle/autobrake system to maintain a set taxi speed.

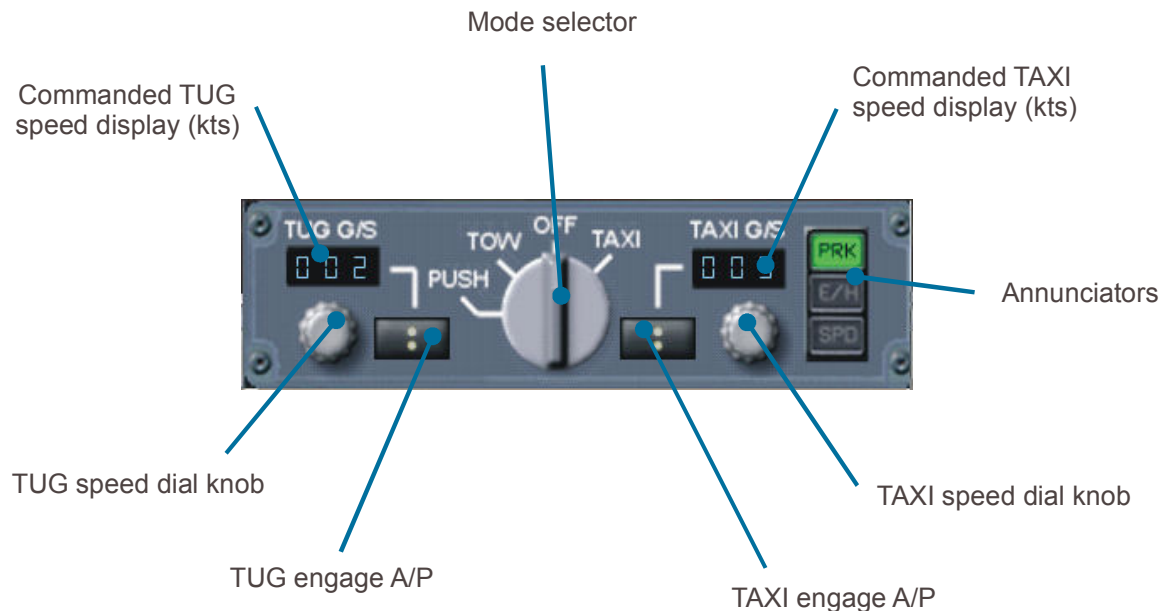
The functions are shown below:



#### Features:

- Smooth directional control via rudder input, or control via keyboard
- Variable speed pushback
- Variable speed tow
- Ground speed control via auto/throttle for taxi

## Summary of control functions



Mode selector	Sets the active function (use mouse wheel to change, left/right click to decrease/increase, or use keyboard hotkeys)
Commanded TUG speed	Displays the speed in knots of the virtual tug (forward or reverse), zero (0) indicating stopped.
Commanded TAXI speed	Displays the speed setpoint in knots of the taxi autothrottle logic controller, zero (0) indicating stopped.
TUG speed rotator knob	Sets the TUG speed (use mouse wheel, left/right click to modify, or use keyboard hot-keys)
TAXI speed rotator knob	Sets the TAXI speed setpoint for the autothrottle (use mouse wheel, left/right click to decrease/increase, or use keyboard hotkeys)
TUG engage A/P	Toggles TUG mode engage (will light up when engaged, requires mode selector set to PUSH or PULL mode)
TAXI engage A/P	Toggles TAXI mode engage (will light up when engaged, requires selector mode on TAXI)
Annunciator panel	<p>PRK (green) – parking brake status indicator (click to toggle parking brakes, green = on)</p> <p>E/H (blue) – engine/hydraulic and or invalid configuration status indicator (on = failed)</p> <p>SPD (yellow) – speed warning indicator (on = warning active)</p>

## Using the virtual tug

In real life, the tug attaches to the nose gear of the aircraft via a boom and is used to move the plane (with or without engines running). Tugs are used to move aircraft between hangars and gates/ramps, moving the airplane in tight spots, and of course, the pushback from the gate before engine start.

In this implementation, the tug is not visible (on the wish list). You as the pilot in command (PIC) control the virtual tug's direction using the rudder input and the speed using the speed dial provided on the gauge. The tug can move forward or back, and at different speeds depending on what's needed. This is very different from the default implementation of pushback in FS9 that is only capable of pushing the aircraft back for the entire length of the plane, and optionally turning 90 degrees left or right.

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**NOTE** This gauge does not use the internal pushback mechanism in FS – this means that controls normally associated with the built-in pushback mechanism will conflict with this product and should not be used at the same time.

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The directional control is achieved by having the rudder axis mapped to a joystick axis or rudder pedals to achieve a proportional rate of turn. Note that slight differential brake input can also be used to assist the tug with turns. However, there are some limitations in this mechanism: some add-on aircraft cut rudder input from the FS9 simulator engine if the proper hydraulic/electrical circuits are not available (example, cold/dark cockpit), while some actually force the rudder to center in those situations. A future version of the gauge will solve this conflict, but in the mean time, if rudder input does not turn your aircraft as expected, use the keyboard input keys (see table of hotkeys) that will override any axis input.



Tow mode engaged at with desired tug speed set at 4 kts.

You can control the speed of the tug (forward or reverse) by setting the dial indicator for the tug speed (top left). A value of zero (0) indicates that you are stopped. This lets you keep the tug mode engaged while stopped.

## Automatic TUG mode disengage

A buzzer sounds if the TUG mode cannot be engaged, or if the mode is tripped by an automatic disconnect in most situations.

This occurs if

- pushback mode is engaged while the aircraft is moving forward (yellow warning on)
- push or pull is engaged and the aircraft is moving too fast (yellow SPD warning on)
- the aircraft is not on the ground (blue E/H warning on)
- no battery power available (simulates the pilot's ability to communicate to the tug driver).
- left or right differential brake applied over approximately 80%
- parking brake engaged (green PRK warning on)

In 1.2, the differential brake trip was moved to 80% because a slight braking effect could disengage the active mode without the pilot meaning to actually do this. Do check the calibration of your brake controller (toe brakes on rudder pedals for example) as any spikes in the braking system may cause the system to disengage prematurely.

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**TIP** use differential brakes above 80% to trip the tug when the gauge is not visible.

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A disconnect tone sounds when the mode is disengaged normally (differential braking applied to over 80% is considered a normal disconnect).

## Using the TAXI mode

To use the taxi mode, at least one engine must be running because unlike the tug modes, the auto-throttle only works if the airplane provides its own thrust. The gauge includes an auto-throttle/auto-brake logic controller to automatically maintain ground taxi speed. The system sets throttle and brake inputs to maintain the dialed speed.

To allow holding while taxi, a speed of zero (0) can be dialed and the aircraft will come to a complete stop without leaving taxi mode.

The controller for the brakes is biased to favor the aircraft's own drag to slow the plane down, so a very gradual decrease in speed occurs (the nose of the aircraft will not pitch down due to a sudden brake input). If additional braking is needed, two methods can be used:

- Set the taxi speed dial to 0 or 1, which will negate the bias, and slow down very quickly but in a controlled manner.
- Assist the A/T by using differential brakes (note, taxi mode will trip over 80% applied brakes).

### Steering in TAXI mode

Standard rudder inputs can be used to steer the aircraft on the ground. Steering can be assisted using differential brakes.

### TAXI Disengage

The auto-throttle for ground control is automatically disengaged when parking brakes are set or if there is a loss of thrust (engine failure, etc...).

Note that when taxi mode is disengaged, brakes are not applied.

### Closing the panel

The ground-handling gauge has a hot spot in the top right corner that appears when the mouse is over it. Click the "X" to close the panel. If you are using the companion toggle gauge, you can also use the hot-key to toggle the panel, or click the icon on the toggle gauge.



## Keyboard shortcuts – ground-handling gauge

These keyboard shortcuts can be used if you have a custom cockpit or prefer to use the keyboard instead of the mouse to control the pushback gauge. In 1.2, the key assignments cannot be changed. Keys are functional while the gauge is active.

Key assignments cannot be changed in this version, but they are only active if the panel is visible in the active window.

Key	Action
Insert	Increase pushback speed
Delete	Decrease pushback speed
Shift + Delete	Set pushback speed to zero
Page up	Increase taxi speed
Page down	Decrease taxi speed
Shift + Page down	Set taxi speed to zero
Spacebar	Toggle AP button for selected mode
Home	Toggle AP button for selected mode
Up arrow	Next mode
Down arrow	Previous mode
Left arrow	Swing nose left (slow)
Ctrl-left arrow	Swing nose left (fast)
Right arrow	Swing nose right (slow)
Ctrl-Right arrow	Swing nose right (fast)
End	Toggle parking brake
<b>Ctrl+Shift+F12</b>	Toggle pushback panel (if toggle gauge installed) <i>TIP: use in external views or VC to make the gauge visible.</i>

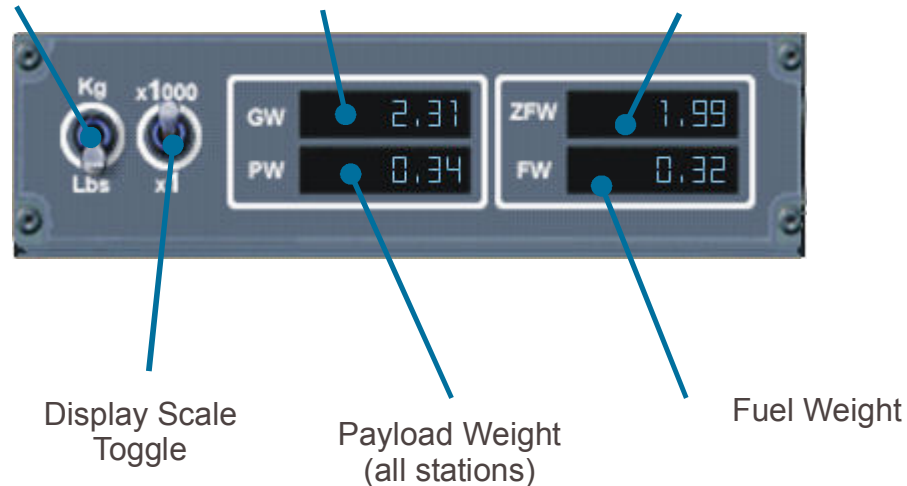
Weight gauge (size 300 x 80 pixels – atn!scale)

Display Units

(pounds / kilograms)

Gross Weight

Zero Fuel Weight



Features:

- Displays weights in metric or imperial units (defaults to current international settings)
- Display toggle between single units and thousands
- Shows weight information for the purpose of flight planning and landing configuration
- Values change as fuel is burned

Note about zero fuel weight (ZFW): The data shown by this panel is what FS reports, not necessarily an accurate figure. This data is derived from the aircraft's configuration files, and in some cases, the zero fuel weigh may differ slightly from the actual aircraft with some tested add-ons. The differences are attributed to "tweaks" or "hacks" made by the aircraft modelers to have the plane behave more realistically in the FS simulation.

### Electric panel gauge (size 300 x 170 pixels – atn!electric)

The electric gauge provides breakers and switches for internal FS9 circuits. The breakers give you the ability to turn the internal electrical circuits on/off when they are not readily set within the panel logic of the aircraft.

The panel also places repeaters for most light circuits and common controls for exit, tailhook, etc used by some models to trigger things such as cargo doors and engine panels opening.

The joystick disconnect feature provides the player with the ability to completely disable elevator/aileron/throttle inputs from FS (via FSUIPC).



For buttons with cover protectors, right click the button to toggle the cover up/down. The cover must be up to toggle the switch.

---

**NOTE:** the circuits are labeled according to the default function they have in FS. Some aircraft and panel designers may use these circuits for different purposes, for example, the cabin light circuit may be used to turn smoke on/off and the tailhook switch may control a cargo door. The applicability of each circuit is aircraft specific.

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### Ambient gauge (size 300 x 80 pixels – atn!ambient)

This gauge shows the current conditions at the aircraft, including ambient temperature, pressure and wind speed/wind direction. Units for temperature and pressure can be changed for metric/imperial system units.



### Using the relative wind gauge

The ambient wind dial shows the ambient wind direction and speed measured at the aircraft relative to the current heading.

The display consists of a wind indicator needle that displays the relative wind direction from the nose of the aircraft. The bottom display shows the wind speed in knots.

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**NOTE** It is possible that the wind conditions reported at the aircraft is not the same as the wind reported in the METAR or weather radar.

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This instrument functions on the ground or in the air and is useful for selecting runways for departure/arrival at uncontrolled facilities.

The possible states of the dial are shown below:

Off, instrument not powered. Wind speed is not displayed, and the yellow wind indicator arrow defaults to relative bearing 180 (unpowered state).



On, no wind recorded (indicated by a RED indicator) – the wind direction indicator will always move to the 360 relative bearing.



On, wind and direction displayed, indicated by a GREEN indicator, in this case, 16 kts and a relative wind bearing from the current heading at the 10 o'clock position.



Note that the wind at the aircraft is not necessarily the wind reported by the weather station. Also note that the wind bearing is displayed relative to the nose of the aircraft.

### Toggle gauge (standard size 16 x 16 or 12 x 12 pixels)

This is a companion gauge that lets you show or hide the pushback/taxi panel on/off by clicking on the icon. It also adds the hot-key toggle feature in the event the gauge is not displayed.



#### TOGGLE ICON

The gauge can be used for any panel ID, configured in the panel.cfg file. It is very important that the ID of the panel specified in this gauge match that of the window you assign to the pushback panel.

Review the installation notes and the FAQ at the end of this document for positioning instructions in a panel.cfg file.

If the last parameter does not match the ID of the panel window, the window will not pop-up and the CTRL-SHIFT-F12 hotkey will not function either.

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**TIP** If you do not care to have a clickable toggle switch with a mouse and find a suitable position on the panels, you can set the icon size to 1x1 in the top left corner (0,0). This will allow you to only use the hot-key (ctrl-shift-F12) to toggle the panel visibility on/off, but without the ability to click the toggle button.

---



## Requirements

This gauge requires FS9 (Microsoft Flight Simulator 2004, Century of Flight) and Pete Dowson's FSUIPC 3.x (available as of the time of this writing from Pete Dowson's site at [www.schiratti.com/dowson.html](http://www.schiratti.com/dowson.html)). **A registered version of FSUIPC is not required.**

Previous versions of FS were not tested with this gauge, but the gauge is functional with SP1 of Flight Simulator 2004 provided that FSUIPC 3.4 or later is installed. Operating systems other than Windows XP SP1 and SP2 were not tested.

The gauge should work with any plane and panel configuration compatible with FS9. Some complex add-on aircraft can do some interesting things to the internal FS variables to make the aircraft model behave closer to real life. This can adversely impact the operation of the gauge, although when found, workarounds to the observed behavior have been coded in by the author. This is to handle "odd" situations when, for example, the aircraft reports 330,000 tons of fuel in the left auxiliary wing tank.

## Installation

Prior to contacting technical support, please refer to the Q/A section at the end of the manual as it covers the majority of situations reported since version 1.0 of the gauge.

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**NOTE** It is highly recommended that you review the FS Panel SDK documentation available on the Microsoft Flight Simulator web site to get a better understanding of the format and syntax of the panel.cfg file.

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Use the following diagram as the gauge size reference (in pixels) for the width and height of each component. The overall panel size must be 300 x 410 (or any scale thereof).



**STEP 1:** Prior to making any modifications to your FS configuration, you should make a backup copy of any PANEL.CFG file. This is in case something goes wrong and you need to recover the original. Keep the backup file in a safe place.

**STEP 2:** Copy the file [atn.gau](#) into the main FS9 gauge folder (this should be under the main FS( folder, subfolder [gauges](#), example `C:\Program Files\Microsoft Games\Flight Simulator 9\gauges`).

**STEP 3:** The gauge requires the Microsoft Visual C++ runtime library version 7.1, MSVCR71.DLL. Because Microsoft no longer distributes runtime library files with service pack updates, you may need to install this file into your windows folder. If you cannot locate this file in the %SYSTEMROOT%\system32 folder (example, `C:\WINNT\System32` or `C:\WINDOWS\System32`, copy the MSVCR71.DLL into that folder. FS9 will be unable to load the gauge if the operating system cannot load this support library.

**STEP 4:** This package requires FSUIPC version 3.4 or above. For the installation of FSUIPC, please check the FSUIPC documentation distributed with the software. While the gauge will not function without FSUIPC, a registered version is not necessary for the gauge to work properly. FSUIPC is available from Pete Dowson's web site at [www.schiratti.com/dowson.html](http://www.schiratti.com/dowson.html).

**STEP 5:** Add the gauges to your aircraft by modifying their PANEL.CFG file. This file contains the configuration information for every panel in Flight Simulator. You must make modifications to every aircraft's PANEL.CFG file you intend to use this gauge with. The PANEL.CFG can be modified with any text editor such as NOTEPAD or WORDPAD.

---

**WARNING – MAKE A BACKUP OF THE PANEL.CFG FILE BEFORE YOU MODIFY IT**

---

The example provided below is for the default 777-300 provided with FS9.

- 1) locate the PANEL.CFG file for the Boeing 777-300 (if you use the default installation, this will be on `C:\Program Files\Microsoft Games\Flight Simulator 9\Aircraft\b777_300\panel`).
- 2) Make a backup copy of this file, for example, copying it as `panel.cfg.old`.
- 3) Open the file in a text editor such as NOTEPAD.
- 4) Make the following modifications:

In the section [Window Titles], add a new window following the sequenced number of existing windows. This adds a new panel for our gauges. Because the last window number is 05, we're using 06.

```
// Panel Configuration File
// Boeing 777-300
// Copyright (c) 1999-2003 Microsoft Corporation. All rights
reserved.
```

```
[Window Titles]
Window00=Main Panel
window01=Radio Stack
Window02=GPS
window03=Throttle Quadrant
window04=Compass
Window05=Mini Panel
window06=Pusback
```

Next, locate the main panel window (usually, 00). Note that on some planes, 00 is used for hidden or "system" gauges, and there may be several views of the front panel (example, IFR and VFR views). For the stock 777-300, this is window00.

```
[Window00]
file=Forward_640.bmp
file_1024=Forward_1024.bmp
size_mm=640
position=7
visible=1
ident=MAIN_PANEL

gauge00=Boeing777-300!Anti_Ice_Switch,406,15
...
```

```

//(skipped for clarity)
...
gauge36=SimIcons!ECU Icon, 221, 457
gauge37=SimIcons!Compass Icon, 234, 457

// x,y,w,h,ident icon_type
gauge38=Atn!Toggle,247,457,12,12,15123

// if you don't want the icon to show and just use
// the ctrl-shift-F12 hotkey, use this following line
// gauge38=Atn!Toggle,0,0,1,1,15123

```

Here, we use the next available gauge number, 38, to add our toggle button. The toggle button will be used to hide or display the panel. The parameters are x,y,w,h,ident as follows:

X = x coordinates in pixel or mm (usually, one and the same) from the top left of the background bitmap (in this case, Forward\_1024.bmp)

Y = y coordinate in pixel or mm

W = width in pixels or mm

H = height in pixels or mm

IDENT = the panel identification number (number)

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**NOTE** the X/Y position of the toggle gauge indicates where on the background panel bitmap the gauge icon will display. If you do not see the toggle gauge, it is an indication that either the icon coordinates are off-window, or that the icon is obscured by another bitmap. It is not uncommon for panel designers to draw additional images onto the background at runtime, thus hiding the toggle gauge.

It is recommended that you locate existing panel toggles (popup kneeboard, radio stack, etc..) and locate the toggle gauge next to the existing set.

You can either use the information in the panel.cfg to “guess” where to position the toggle gauge, or you can load the background image in an image editor that shows you the PIXEL position of the mouse, and pick a “safe” location. This will require some trial an error either way.

---

Next, add a new window entry as follows:

```

[Window08]
BACKGROUND_COLOR=0,0,0
size_mm=300,410 // overall size of panel window
position=8      // bottom right position
visible=0       // make this 1 to make it visible on startup
ident=15123     // this must match the last param in atn!toggle
gauge00=Atn!Pushback,0,0,300,80,15123
gauge01=Atn!Scale,0,80,300,80
gauge02=Atn!Electric,0,160,300,170
gauge03=Atn!Ambient,0,330,300,80

```

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Notice that the section header is window06, which matches the window definition we made above in the [window titles] section, the window sequence is 06 for this aircraft only.

---

---

**IMPORTANT** the number 15123 (the panel ID number) must match where indicated and should be UNIQUE (ie, not used by another panel window).

---

The position value (in this case position=3 determines where the panel appears: (values taken from the Microsoft documentation)

- 0 = upper-left corner
- 1 = upper-middle side
- 2 = upper-right corner
- 3 = middle-left side
- 4 = middle
- 5 = middle-right side
- 6 = lower-left corner
- 7 = lower-middle side
- 8 = lower-right corner

---

**NOTE** the window size of the panel is normally expressed in millimeters and/or pixels (both up there). This is set by the size\_mm parameter and the window\_size parameter. The values are expressed as X, Y where X is the width, and Y is the height. The window will clip (hide) any portion of the gauges that exceed the window width/height. The values 300,272 is large enough for all the gauges in the package. Modify accordingly if you do not use all the gauges.

---

### Sizing the window

The size\_mm parameter sets the window size.

```
size_mm=300,410
```

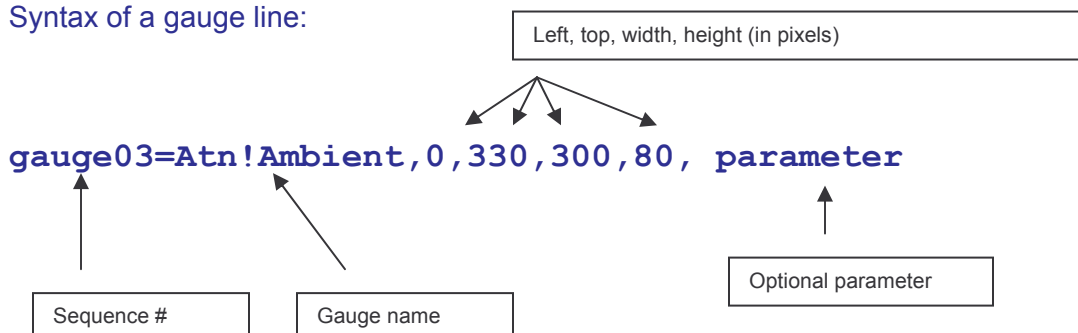
The size of the window is determined by the width and height of all the gauges contained internally. In this case, 300 is the width in pixels of all gauges, and 350 is the overall height.

---

**TIP** If the panel doesn't show at runtime, check for syntax errors, sequence numbers and ID numbers and make sure items match up.

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### Syntax of a gauge line:



## Cockpit integration - custom gauge backgrounds

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**NOTE** This section is for advanced users

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Starting with version 1.3, it is possible to specify a background image for each gauge element. The images are specific to each aircraft and loaded dynamically.

At runtime, the gauge will load the images you specify based on the aircraft you have selected as the aircraft is loaded in memory. If images are not specified, the default background for that gauge will be utilized.

### Supported image formats

The gauge supports any image in the PNG file formats with full alpha channel (transparency) support, also known as 32 bit ARGB.

### Requirements

The image files must be placed in the individual aircraft folder where the aircraft.cfg and the aircraft.air files are located. The file names must correspond to the table below. The size of the image is provided in pixels. If the image is smaller or larger, the gauge will resize the image to fit the specified pixel size in the table to maintain the aspect ratio of the other elements of the gauge.

Gauge	Pixel size (width x height)	Required file name / type
Atn!Pushback	300 x 80	atngau_pushback_background_300x80.png
Atn!Scale	300 x 80	atngau_scale_background_300x80.png
Atn!Electrical	300 x 170	atngau_electrical_background_300x170.png
Atn!Ambient	300 x 80	atngau_ambient_background_300x80.png

If no image is provided, the gauge will use the default internal background.

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**A note about scaling:** when the gauge loads the image, it will scale it to fit 300 x 80 or 300 x 110 to render the gauge at runtime. This is independent of the scaling performed by the FS9 panel rendering engine. If your image looks distorted in relation to the gauge, the problem likely lies in the size of the image you have provided. If the entire gauge is distorted, the problem likely is with the sizing information provided in the panel.cfg file for either the gauges, or the panel's main aspect ratio.

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## QA section: Solutions to common problems

### Problem: Gauge won't load (error when FS9 loads, or when FS9 loads the aircraft)

Solution 1: The gauge requires the Microsoft C++ runtime library called MSVCR71.DLL (provided as part of the release package). This library file MUST be placed in the windows system32 folder (or a folder in the windows default search path) or the operating system will be unable to load the gauge.

Solution 2 (non Windows XP users): The gauge requires the Microsoft GDI+ libraries that are incorporated with Windows XP (any edition), but available as a separate download from the Microsoft web site for previous operating systems. This set of gauges was not tested with an operating system other than Windows XP.

### Problem: Gauge stays dark.

*Solution: The gauge only works when battery power is available. You can turn on battery power directly from the electrical panel. If battery power runs out (a known bug with FS9), the gauge will not function. You can use FSUIPC's extend battery feature (requires the registered version of FSUIPC).*

### Problem: all weights show as zero (0), and pushback/taxi mode while engaged do not function.

*Solution: The automatic registration of the gauge with FSUIPC isn't functional. You can perform a manual registration as follows:*

- 1) Load an aircraft in FS9
- 2) From the FS9 menu, open the FSUIPC dialog box from the Modules drop-down.
- 3) Click on the "register application program" button.
- 4) In the application name box, enter the name "atn.gau" without the quotation marks but do include the gau extension.
- 5) In the serial number box, enter or paste

PG4J GV6G UNBI

- 6) Accept all changes.
- 7) You may have to restart FS9 on some systems.

*note: starting with version 1.1, the registration problem on systems that do not use the registered copy of FSUIPC was fixed.*

### Problem: When pushing back, the plane turns to the right or left by itself and I'm not touching any controls.

*Solution: The input mapped to the rudder in FS9 isn't centered. This can also be caused by mapping multiple joystick axes to the rudder. Check the joystick axis mapping values from the FS9 joystick axis assignment page, and verify the mapping is correct. If you have the registered version of FSUIPC, you can check the calibrated values of the rudder (and any other mapped joystick axis) in the Joysticks tab. You can also use FSUIPC to fix any calibration issues. The normal range for the rudder is -16384 to +16384, with 0 being centered, negative numbers indicating left rudder, and positive right rudder.*

**Problem:** When pushing back, the plane responds to my rudder input but then stops turning until I change my rudder position again.

**Solution:** *The aircraft's control systems as simulated cause the internal rudder input to reset. With such aircraft, the left and right arrow keys must be used to control the direction of the pushback. Two rates of turn are provided (holding a shift key down doubles the rate of turn).*

**Problem:** The toggle icon doesn't show or hide the gauge panel when I click on it.

**Solution:** *Check the window ID in the panel.cfg file. This can be caused by duplicate window IDs or when the ID of the window specified in the toggle gauge.*

**Problem:** I cannot close the panel by clicking the top right screw.

**Solution:** *Check the window ID in the panel.cfg file. The ID parameter of the pushback gauge does not match the window ID.*

**Problem:** When dialing in a lower taxi speed, the aircraft takes some time to slow down.

**Solution:** *This is a design decision. The taxi speed hold is designed to be flexible, and momentum plays a large role in the deceleration rate to give it a more realistic feel. When dialing a speed of 0, braking will increase significantly to bring the a/c to a complete stop. A speed of 1 or above relies more on normal drag, with additional braking added only if deceleration doesn't come over several seconds. You can use brakes (not the parking brake) to slow down and assist with turns (differential brakes) while the taxi auto-throttle is engaged. CAVEAT: if you apply brakes and your speed drops below the target speed, the auto-throttle will command additional thrust, which can lead to having full brakes and full throttle, and the a/c to bolt forward the moment the brakes are released.*

**Problem:** How do I go about placing the toggle icon on my panel?

**Solution:** *The position of the toggle icon depends on user preferences and the type of gauges mounted on the panel, and how the panel designers built the panel.*

*The positioning of the toggle icon will likely be a trial and error process to get it just right, and there is no single recipe because every panel is different.*

*Some aircraft have several "primary" panels, in which case the position of the icon will vary depending on the view the panel represents. It is not a good idea to overlay the icon on top of another gauge (the topmost gauge is the last one listed in any [WindowNN] section in the panel.cfg).*

*The easiest approach to placing the icon on a panel is to open the background bitmap referenced in panel.cfg in a graphical editor capable of displaying x and y coordinates using pixel units. This allows you to position the mouse roughly where you want the icon to be and record the x and y coordinates. Another method is to look at current coordinates of other icons in the panel.cfg file, and to extrapolate the values.*

*Normal icon sizes are 12 x 12 or 16 x 16.*

*Note that you can have multiple toggle gauges in the panel file.*

**Problem:** CTRL-SHIFT-F12 doesn't work to hide/show the gauge

*Solution: The toggle gauge (atn!toggle) must be loaded on an existing panel for this feature to be enabled, and the ID number specified in the toggle gauge must match that of the window.*

**Problem:** no window shows up – I can't see the window at all

*Solution: This can be due to a syntax error in the panel.cfg file, a missing entry in the [Windows] section, a duplicate window sequence number (another window uses the same ID or the same window number), or the window's coordinates are off-screen. You should be able to activate the window in the "view" menu under "instruments".*

**Problem:** When I engage taxi mode after landing, the plane accelerates to the max taxi speed.

*Solution: This is a bug that should have been fixed in 1.3 by resetting the auto/throttle controller on landing. This happens infrequently and is also linked to the TO/GA setting in some aircraft on take-off or landing. You can reset the auto/throttle by coming to a complete stop and then engaging the ground auto/throttle.*

**Problem:** Lighting at night is different from the rest of the panel, what's going on?

*Solution: Some panel designers do not use the default panel lighting provided by FS9 to provide better lighting effects. This effect is unrelated to the method used by this set of gauges. Consequently, the colors and the look of the gauge may not coincide with the look of some lighting effects. This can be alleviated somewhat by selecting a background image that blends better with these effects.*

**Problem:** I can't close the panel by unchecking it from the view menu

*Solution: To support persistence across all views, it is not possible in this release to close the panel from the view menu. However, it is possible to open it from the menu.*

**Problem:** I'm not sure what the joystick disconnect function does

*Solution: FSUIPC supports the ability to disconnect the joystick inputs from the main FS aileron, elevator and throttle controls. The switch on the electrical panel provides you with access to this circuit. This feature is useful if you have an add-on that provides its own joystick interface, but you would like FS to continue responding to DirectX buttons and toe brake axis mappings.*

**Problem:** The values reported on the scale gauge are odd or inaccurate.

*Solution: The gauge uses internal values reported by each station inside the FS simulation engine. It has been observed for some aircraft that some of the values do not represent the actual station values but rather values used to optimize the quality of the model in flight due to FS limitations. Also, there may be slight discrepancies due to rounding errors and internal conversions between units that take place. However, the values should be suitable for programming FMCs and setting V speeds.*

**Problem:** Is slew mode used to move the aircraft on the ground?

*Solution: No, slew mode is not used to move the aircraft. The aircraft model is pulled or pushed using forces input into the simulator based on pilot controls. The autothrottle taxi system uses the aircraft's own thrust model. This method allows the aircraft to respond normally to these forces, and it is possible to skid or even flip the aircraft in extreme situations.*