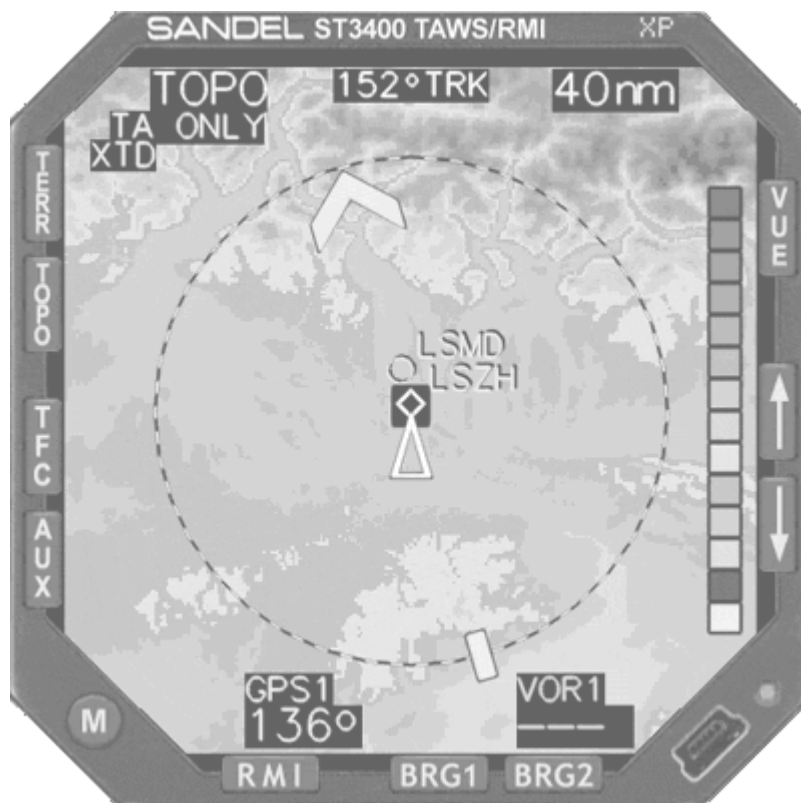


Reality XP

Sandel ST3400

User's Manual



This manual is intended for Flight Simulation use only, and may not be used in any real world aviation applications. The authors are not responsible for any errors or omissions. This manual may be printed out by the user or at the user's request by a commercial print shop. This authorization is provided by the publisher of this product.

About this manual

This manual is intended for flight simulation purposes only, and shall not be used for any real world aviation application or reference.

This manual is intentionally written using “gray scale” colored text in many areas, and much of the print is intentionally this medium gray color. This has been done to conserve ink while printing. In some cases “black” type has been used for emphasis. Photographs used in this manual have also been reduced to black and white, and also in contrast in order to conserve ink. Please be sure to double-check your printer’s settings prior to printing in order to achieve the best results. We have tested, and experienced no issues printing this manual on laser printers. If you are experiencing a problem using a laser printer, you should check the printer’s quality settings.

By reading this manual you should become well acquainted with the product, and should be able to obtain the information necessary to “fly” the product within Flight Simulator.

Please take the time to read this manual completely; so that you can become properly acquainted with the product and its operation.

We thank you for having chosen a Reality XP Product and wish you a pleasant and a safe virtual flight with us.

Important information

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www.reality-xp.com

Standard Disclaimer

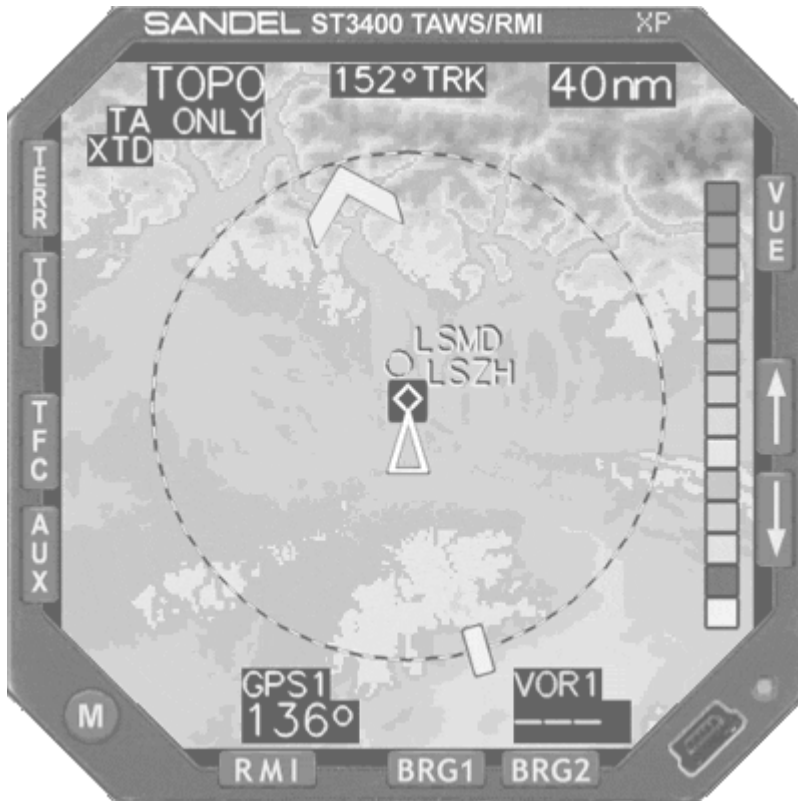
This software is designed **for entertainment only**. Although we have designed the product to resemble and function like the original, it is not designed as a training device. Not all systems have been simulated, and some of those that have been simulated may not be entirely functional.

NOT FOR USE IN REAL FLIGHT OR AIRCRAFT OPERATION.

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Sandel ST3400 overview



The Reality XP ST3400 is a comprehensive full-featured RMI/TAWS. Its modern components perfectly replace the equipment of the default Flight Simulator aircraft, or any additional third party aircraft.

With Flight Line Avionics, you will be flying a simulated avionics package capable of providing the same features and benefits as the real avionics. The Reality XP ST3400 package is a faithful reproduction that pilots and simmers can use it as a training tool to familiarize themselves with the workings of the actual equipment. Each button is fully functional and performs identically to its real-world counterpart.

Gauge Capabilities

The ST3400 offers RMI/TAWS capabilities with:

- Complete feature set of the real ST3400!
- TCAS I and Mark V GPWS (Modes 1-6) included.
- TAWS (EGPWS) FLTA and PDA modes.
- Audible and Visual Alerts/Warnings (30 and 60 seconds prior to impact)
- Visual indicators of collision/impact site.
- Highly optimized terrain and TAWS algorithm for none to little performance hit
- Works directly with the FS2004 Terrain Mesh to offer the best-in-class simulated TAWS. What you see is what you REALLY get!
- No extra CD/DVDs to install or large terrain data sets to download from the internet!
- Works with any add-on mesh at any resolution: the sophisticated algorithm enhance the terrain data for the best TAWS operation.
- Complete Airport database.
- Integration with any Flight Simulator GPS and flight plan display
- RMI needles with User-selectable data source.
- Latest Reality XP True Display XP v5.2 Graphics that are 100 times faster than GDI+ for gauges!

Documentation

After installation, a new program group is accessible from your Windows Start Menu \ Reality XP. This program group contains the necessary utilities and documentation. Make sure you review all available documentation.

The systems features are simulated in form, fit and function. The ST3400 has been developed as accurately as is possible based on its real-world counterpart. We strongly recommend that you download the "The ST3400 Pilots Guide" from the Internet:

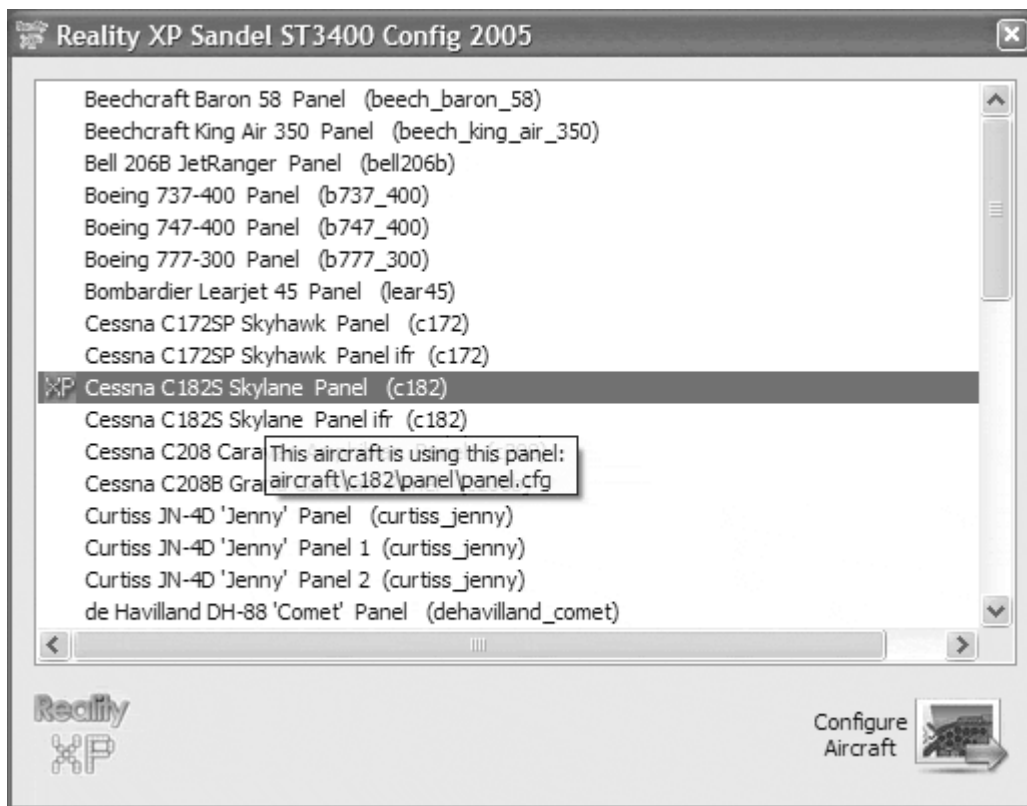
http://www.sandel.com/ST3400_TAWS.php

Please take the time to read all manuals completely; so that you can become properly acquainted with the product and its operation.

Getting Started

The ST3400 is a Flight Simulator compatible gauge and can be configured in any Flight Simulator aircraft panel. The software package includes an easy to use configuration program to assist with integration and configuration: ST3400 Config.

When first started, ST3400 Config detects and prompts you with all available aircraft and panels with the “select an aircraft” panel. Flight Simulator has an open architecture that permits several aircraft to share the same panel, and the selected aircraft can use different panel configurations. Not all available aircraft and panels configurations are listed in the “select an aircraft”: ST3400 Config lists only the unique combinations of both aircraft and panels.



Refer to the additional ST3400 Service Manual (located in your Windows Start Menu \ Reality XP program group), for additional panel configuration options and tutorials.

Configuration File

ST3400 Config provides a graphical user interface to most of the settings provided for the ST3400. The default settings are listed in several files located in:

```
[fs9]\RealityXP\Common\Settings\
```

For each customized aircraft and/or panel, a copy of the configuration files (.INI) will be added to your aircraft or aircraft\Panel folder.

The ST3400 gauges look for an ini file, first in the panel folder, then in the aircraft folder and lastly use the settings from the Reality XP Common Settings folder.

Refer to the additional ST3400 Service Manual (located in your Windows Start Menu \ Reality XP program group), Section RXPST3400.ini for additional details and options.

General features

All of the Reality XP gauges and controls utilize a relatively unique implementation of click spots. They work as follows:

1. As your mouse cursor passes over a click spot on the panel it will cause it to turn from an arrow cursor into a “hand” cursor. There are no + or - click spots: the hand cursor will be empty.
2. Whenever a single click spot is used, and depending upon its function a left click will accomplish the same task as a right click. In other cases, a left click will accomplish one task, while a right click will accomplish another.
3. In some cases the click spot will not function as stated above, but instead will feature separate functions for the left and right clicks. Example: For a toggle switch with 3 positions, a left click will move the switch in one direction, while a right click will move it in the opposite direction.
4. Certain click spots will work with left and right clicks, and the mouse wheel, if your mouse is so equipped. This type of click spot is used on gauges that require adjustment, such as the knobs, etc. In this case the left click turns the item “left” and a right click turns it “right”. Forward / back scrolling on your mouse wheel will also do the same.

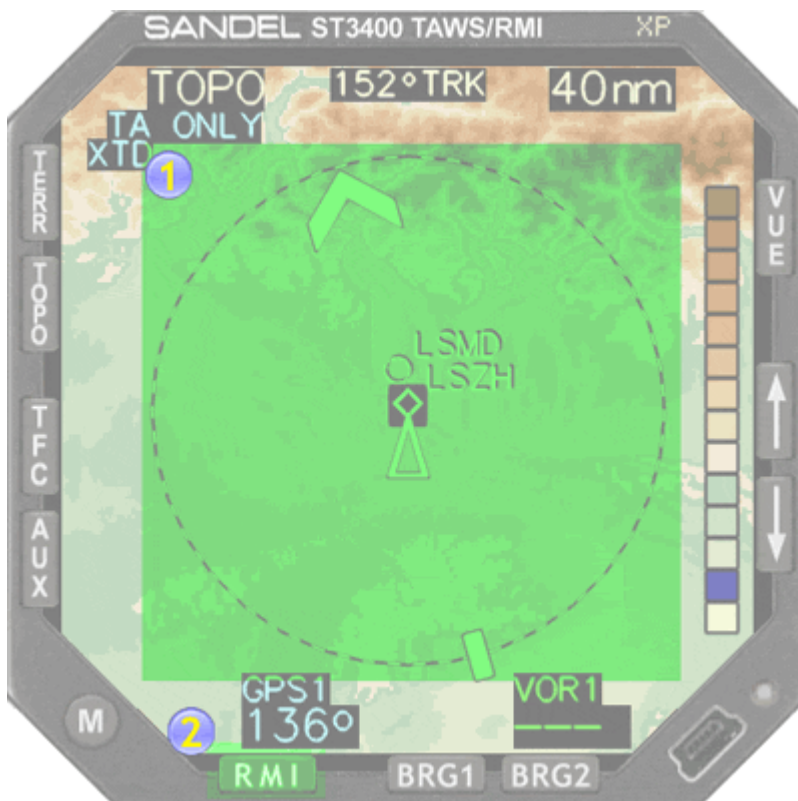
Tool Tips

By turning on FS “Tool Tips” you will see descriptions of these clicks spots when your mouse cursor is placed over them.

Operation with Flight Simulator

This section covers detailed information about how to access the enhanced features the gauge offers when running with Flight Simulator. The regular functions of the Sandel ST3400 unit are described in the “The ST3400 Pilots Guide” downloadable from the Sandel website.

Special Click spots



1 - Popup: The click spot toggles the popup window. The Left and Right mouse buttons operate two different popup ids configured in the RXPST3400.INI file. ST3400 Config automatically configures the click spot for proper operation.

2- Navigation Device selection: The click spot cycles the available navigation devices when clicked with the right mouse button. Its operation is similar to the Device Select Switch Gauge or the Navigation Device selection in the Options menu

NB: The functions referenced above depend on settings in the ini file. These settings are described in the ST3400 Service Manual and the ST3400 Config Application.

Navigation data and Flight Simulator

The ST3400 is designed to connect to a single GPS1 source. When using a panel with multiple GPS sources like a Reality XP GNS or Apollo, a special click spot permits changing the GPS source and connect another one to the ST3400.

Flight Simulator is originally designed to work with a single GPS source. When a Reality XP GPS is loaded, the Flight Simulator Options menu displays an additional “Navigation Device” selection. The entries in the menu are as follows:

1. **FS or Reality XP GPS:** selects the active GPS data source. In addition to selecting the navigation information source for the gauges to display, this selects the device driving the Autopilot (GPS Steering).
2. **Simple VOR Compatibility:** some VOR gauges require this option to be checked to display the information from the Reality XP GPS source, and some advanced EHSI/EFIS gauges require this option to be unchecked to display the correct VOR information.

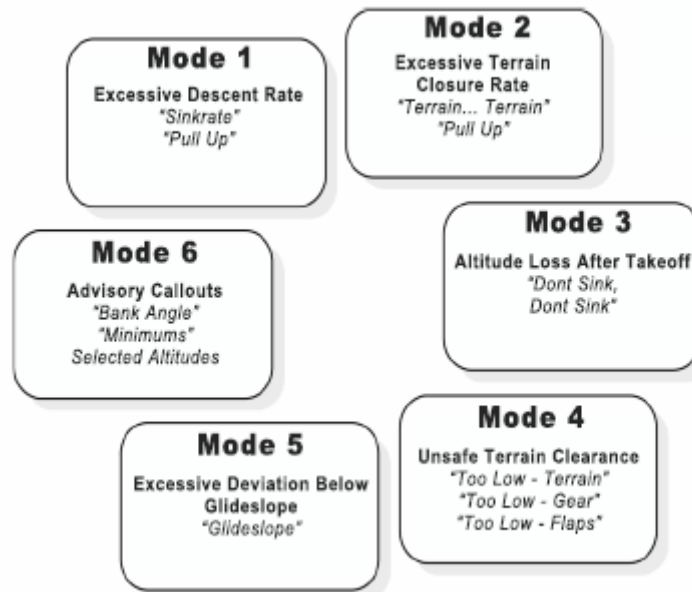
When the ST3400 starts it automatically deselects “Simple VOR Compatibility” for proper operation with the GPS.

Avionics Database

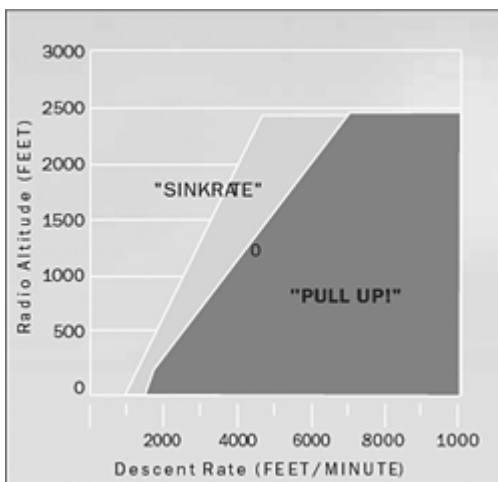
- The ST3400 comes equipped with a complete Airport database.

GPWS (Ground Proximity Warning System)

The Ground Proximity Warning System incorporates six modes. Modeled after an industry standard Mark V system, it provides the pilot with audible and visual cues when flying parameters are out of normal ranges.



Mode 1 – Excessive Descent Rate

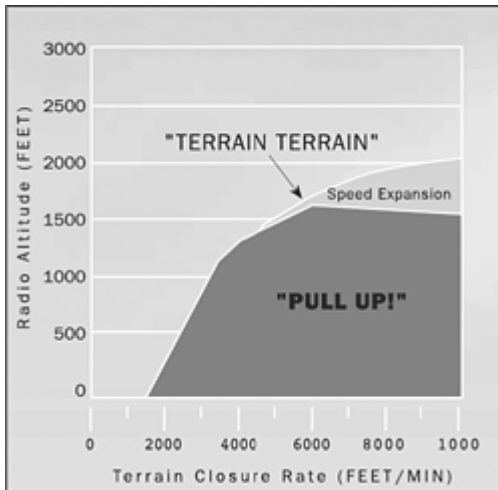


Mode 1 provides alerts for excessive descent rates with respect to altitude AGL and is active for all phases of flight. This mode has inner and outer alert boundaries as illustrated.

If a valid ILS Glideslope front course is received and the aircraft is above the Glideslope centerline, the outer (sink rate) boundary is adjusted to desensitize the sink rate alerting.

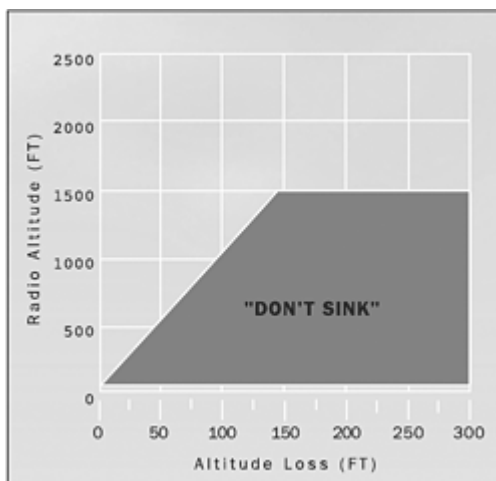
Mode 2 – Excessive Closure to Terrain

Mode 2 protects the aircraft from impacting the ground – Controlled Flight into Terrain (CFIT). It provides alerts when rapidly rising terrain in relation to the aircraft radio altitude and on how rapidly radio altitude is decreasing (closure rate).



Mode 2 is active during climbout, cruise and initial approach (flaps not in the landing configuration and the aircraft not on Glideslope centerline). If the aircraft penetrates the mode 2 caution envelope, the aural message "Caution Terrain" is generated. If the aircraft continues to penetrate the envelope, the aural warning message "Whoop Whoop PULL UP" is repeated continuously until the warning envelope is exited.

Mode 3 – Altitude Loss after Takeoff

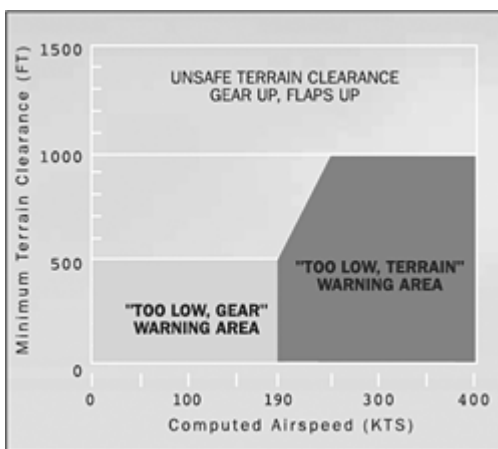


Mode 3 provides alerts for significant altitude loss after takeoff or low altitude go-around. The amount of altitude loss that is permitted before an alert is given is a function of the height of the aircraft above the terrain. This protection is available until the GPWS determines that the aircraft has gained sufficient altitude that is no longer in the takeoff phase of flight.

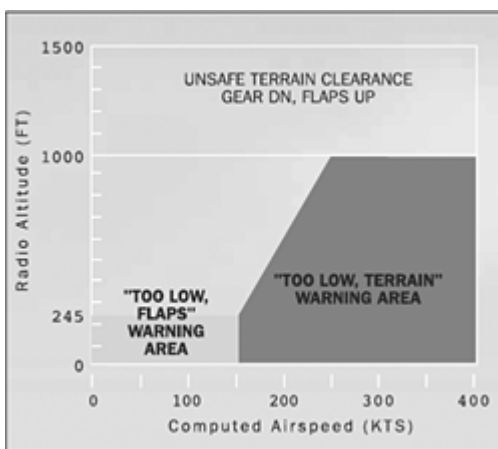
Mode 4 – Unsafe Terrain Clearance

Mode 4 provides alerts for insufficient terrain clearance with respect to phase of flight, configuration and speed. Mode 4 exists in two forms, 4A and 4B.

- Mode 4A is active during cruise and approach with the gear and flaps not in the landing configuration,
- Mode 4B is active during cruise and approach with the gear in the landing configuration and flaps not in the landing configuration.



Mode 4A is active during cruise and approach with gear and flaps up. This provides alerting during cruise for CFIT where terrain is not rising significantly, or the aircraft is not descending excessively. It also provides protection against an unintentional gear-up landing.



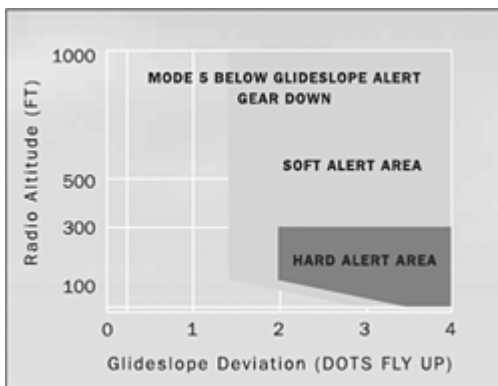
Mode 4B is active during cruise and approach with gear down and flaps not in the landing configuration. Below 1000 feet AGL and above 159 knots, the aural alert is "TOO LOW TERRAIN". This alert is dependant on aircraft speed - the alert threshold is ramped between 245 feet at 159 knots to 1000 feet at 250 knots.

Mode 5 – Excessive Deviation Below Glideslope

Mode 5 provides two levels of alerting when the aircraft descends below the glideslope, resulting in activation of the GPWS aural messages.

The first alert level occurs when below 1000 feet radio altitude and the aircraft is 1.3 dots or greater below the glideslope beam. This is called a “soft” alert because the audio message “GLIDESLOPE” is enunciated at half volume. Increases in the glideslope deviation cause additional “GLIDESLOPE” messages enunciated at a progressively faster rate.

The second level alert occurs when below 300 feet Radio Altitude with 2 dots or greater glideslope deviation. This is called a “hard” alert because a louder message is enunciated.



To avoid unwanted Below Glideslope alerts when capturing the localizer between 500 and 1000 feet AGL, alerting is varied in the following ways:

- Below Glideslope alerts are enabled only if the localizer is within 2 dots, landing gear and flaps are selected, and a front course approach is determined.
- The Upper altitude limit is modulated with vertical speed. For descent rates above 500 FPM, the upper limit is set to the normal 1000 feet AGL. For descent rates lower than 500 FPM, the upper limit is desensitized (reduced) to a minimum of 500 feet AGL.

Additionally, both alert levels are desensitized below 150 feet AGL, to allow for normal beam variations nearer the ground and reduce the possibility of nuisance alerts.

Mode 6 – Advisory Callouts

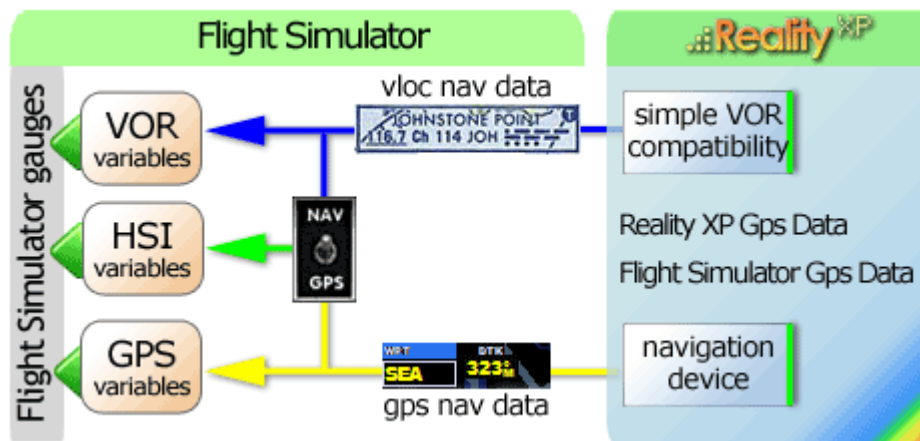
Mode 6 provides GPWS advisory callouts that consist of predefined Radio Altitude based voice callouts, a “500 HUNDREDS” (500ft radio altitude) callout and a “MINIMUMS MINIMUMS” (at Decision Height) as default settings.

Reality XP technology

Gauges made with the Flight Simulator SDK (Software Development Kit) can only access three basic sources of information:

1. VOR: related to VLOC type of information such as signal strength, CDI deviation.
2. HSI: to display both VLOC and GPS information. The type of information is selected with the typical FS Nav/Gps switch.
3. GPS: to display GPS only information, like desired track, cross track etc...

The Reality XP technology enhances the basic capabilities to offer realistic options to the virtual pilot. The following diagram shows the basic Flight Simulator structure, and the enhancements introduced with the Reality XP solution:



Product Support

You should read this manual, and the others included with this product from cover to cover before asking for support or help with this product. We have found that over 95% of all product support questions can be answered by reading the manual.

You can visit the Reality XP General Forum for general customer service issues at:

<http://www.reality-xp.com/community/users.htm>

While anyone may read this support forum, you will need to register in order to post a question or reply with an answer. Support at this forum may be provided by any one of the following individuals:

1. Members of the Development / Publishing Team.
2. Members of the product's beta testing team.
3. Knowledgeable users of the product who know the correct answer.

If you still require help: Product support is available through our online help system. Please visit <http://www.reality-xp.com> for additional support information.

Thank you.