AIRCRAFT SYSTEM VARIABLES

The tables below indicate the properties for the Simulation Variables that can be used to get and set properties related to the various aircraft controls and systems. For information on the units listed for each variable, please see here: Simulation Variable Units

> ***NOTE**: When Microsoft Flight Simulator is running in multiplayer mode, only a small number of variables are communicated between aircraft. Those variables that are available will say so in the description as being either for "All Aircraft" or for "Shared Cockpit".*

You can find a complete index of all available SimVars here: SimVar Index

General

Simulation Variable	Description	Units	Settable
AIRSPEED TRUE CALIBRATE	Angle of True calibration scale on airspeed indicator.	Degrees	
ALTERNATE STATIC SOURCE OPEN:index	Alternate static air source.	Bool	
ANEMOMETER PCT RPM	Anemometer rpm as a percentage.	*Percent Over 100*	
ANGLE OF ATTACK INDICATOR	*AoA* indication.	Radians	
ANNUNCIATOR SWITCH	*Currently not used in the simulation.*	Bool	
APPLY HEAT TO SYSTEMS	Used when too close to a fire.	Bool	
AUDIO PANEL AVAILABLE	True if the audio panel is available.	Bool	
AUDIO PANEL VOLUME	The Volume of the Audio Panel.	Percent	

AUTOTHROTTLE ACTIVE	Auto-throttle active.	Bool	
AUTO COORDINATION	Is auto-coordination active.	Bool	
AVIONICS MASTER SWITCH:index	The avionics master switch position, true if the switch is ON. Use an avionics circuit index when referencing.	Bool	
CABIN NO SMOKING ALERT SWITCH	True if the No Smoking switch is on.	Bool	
CABIN SEATBELTS ALERT SWITCH	True if the Seatbelts switch is on.	Bool	
CANOPY OPEN	Percent primary door/exit open.	*Percent Over 100*	
CARB HEAT AVAILABLE	True if carburetor heat available.	Bool	
DELTA HEADING RATE	Rate of turn of heading indicator.	Radians per second	
DME SOUND	*DME* audio flag.	Bool	
ELT ACTIVATED	Whether or not the Emergency Locator Transmitter is active.	Bool	
EXTERNAL SYSTEM VALUE	Generic SimVar.	Number	
FIRE BOTTLE DISCHARGED	True if the fire bottle is discharged.	Bool	
FIRE BOTTLE SWITCH	True if the fire bottle switch is on.	Bool	
GLASSCOCKPIT AUTOMATIC BRIGHTNESS	This variable will return a value between 0 and 1 for the automatic brightness setting for glass cockpit displays, where 0 is the dimmest and 1 is the brightest. This value will vary depending on the time of day.	Number	
GPWS SYSTEM ACTIVE	True if the Ground Proximity Warning System is active.	Bool	

GPWS WARNING	True if Ground Proximity Warning System installed.	Bool	
GYRO DRIFT ERROR	Angular error of heading indicator.	Radians	
HAS STALL PROTECTION	Will return whether the aircraft has stall protection (true) or not (false).	Bool	
HEADING INDICATOR	Heading indicator (directional gyro) indication.	Radians	
INDICATED ALTITUDE	The indicated altitude.	Feet	
INDICATED ALTITUDE CALIBRATED	Indicated altitude with the altimeter calibrated to current sea level pressure.	Feet	
INDICATED ALTITUDE EX1	Similar to INDICATED_ALTITUDE but doesn't affect actual plane position when setting this variable.	Feet	
INDUCTOR COMPASS HEADING REF	Inductor compass heading.	Radians	
INDUCTOR COMPASS PERCENT DEVIATION	Inductor compass deviation reading.	*Percent Over 100*	
INSTRUMENTS AVAILABLE ***Deprecated***	**Deprecated, do not use!**	Mask	
INTERCOM MODE	Intercom Mode	Enum: 0 = ISO 1 = ALL 2 = CREW	
INTERCOM SYSTEM ACTIVE	Whether or not the intercom system is active.	Bool	
IS ALTITUDE FREEZE ON	True if the altitude of the aircraft is frozen.	Bool	
IS ATTITUDE FREEZE ON	True if the attitude (pitch, bank and heading) of the aircraft is frozen.	Bool	
IS LATITUDE LONGITUDE FREEZE ON	True if the lat/lon of the aircraft (either user or AI controlled) is	Bool	

	frozen. If this variable returns true, it means that the latitude and longitude of the aircraft are not being controlled by ESP, so enabling, for example, a SimConnect client to control the position of the aircraft. This can also apply to altitude and attitude. Also refer to the range of KEY_FREEZE..... Event IDs.		
`KOHLSMAN SETTING HG:index`	The value for the given altimeter index in inches of mercury. ***IMPORTANT!*** *In the system.cfg file, altimeters are indexed from 0, but the SimVar indexes from 1. So, altimeter 0 in that file is accessed using* `KOHLSMAN SETTING HG:1`*, 1 by* `KOHLSMAN SETTING HG:2`*, etc...*	Inches of Mercury, *inHg*	
`KOHLSMAN SETTING MB:index`	The value for the given altimeter index in millibars. ***IMPORTANT!*** *In the system.cfg file, altimeters are indexed from 0, but the SimVar indexes from 1. So, altimeter 0 in that file is accessed using* `KOHLSMAN SETTING MB:1`*, 1 by* `KOHLSMAN SETTING MB:2`*, etc...*	Millibars	
`KOHLSMAN SETTING STD:index`	True if the indexed altimeter is in "Standard" mode, or false otherwise. ***IMPORTANT!*** *In the system.cfg file, altimeters are indexed from 0, but the SimVar indexes from 1. So, altimeter 0 in that file is accessed using* `KOHLSMAN`	Bool	

	SETTING STD:1, *1 by* *KOHLSMAN SETTING STD:2*, *etc...*		
MAGNETIC COMPASS	Compass reading.	Degrees	
MANUAL FUEL PUMP HANDLE	Position of manual fuel pump handle. 1 is fully deployed.	*Percent Over 100*	
OVERSPEED WARNING	Overspeed warning state.	Bool	
PANEL ANTI ICE SWITCH	True if panel anti-ice switch is on.	Bool	
PITOT ICE PCT	Amount of pitot ice. 100 is fully iced.	*Percent Over 100*	
PITOT HEAT	Pitot heat active.	Bool	
PITOT HEAT SWITCH:index	Pitot heat switch state.	Enum: 0 = Off 1 = On 2 = Auto	
PLANE HEADING DEGREES GYRO	Heading indicator (directional gyro) indication.	Radians	
PRESSURE ALTITUDE	Standard Altitude, ie: at a 1013.25 hPa (1 atmosphere) setting.	Meters	
PRESSURIZATION CABIN ALTITUDE	The current altitude of the cabin pressurization.	Feet	

`PRESSURIZATION CABIN ALTITUDE GOAL`	The set altitude of the cabin pressurization as initialised from the Design Cabin Pressure value in the `systems.cfg` file. Pressure is converted into an altitude using a standard condition table. You can adjust the goal pressure using the `PRESSURIZATION_PRESSURE_ALT_INC` and `PRESSURIZATION_PRESSURE_ALT_DEC` events.	Feet	
`PRESSURIZATION CABIN ALTITUDE RATE`	The rate at which cabin pressurization changes.	Feet per second	
`PRESSURIZATION DUMP SWITCH`	True if the cabin pressurization dump switch is on.	Bool	
`PRESSURIZATION PRESSURE DIFFERENTIAL`	The difference in pressure between the set altitude pressurization and the current pressurization.	Pounds per square foot, *psf*	
`RAD INS SWITCH`	True if Rad INS switch on.	Bool	
`SELECTED DME`	Selected DME.	Number	
`SMOKESYSTEM AVAILABLE`	Smoke system available. ***NOTE**: There is no default "smoke system" that this SimVar works on and this is a legacy variable that is available for use should you wish to use it but it affects nothing by default.*	Bool	
`SMOKE ENABLE`	Set to True to activate the smoke system, if one is available. Please see the notes for `SMOKESYSTEM AVAILABLE` for more information.	Bool	
`SPEAKER ACTIVE`	Whether or not the speaker is active.	Bool	

STALL HORN AVAILABLE	True if stall alarm available.	Bool	
STALL PROTECTION OFF LIMIT	Alpha below which the Stall Protection can be disabled. See the [STALL PROTECTION] section for more information.	Radians	
STALL PROTECTION ON GOAL	The alpha that the Stall Protection will attempt to reach when triggered. See the [STALL PROTECTION] section for more information.	Radians	
STALL PROTECTION ON LIMIT	Alpha above which the Stall Protection timer starts. See the [STALL PROTECTION] section for more information.	Radians	
STALL WARNING	Stall warning state.	Bool	
STRUCTURAL DEICE SWITCH	True if the aircraft structure deice switch is on.	Bool	
SUCTION PRESSURE	Vacuum system suction pressure.	Inches of Mercury, *inHg*	
SYSTEMS AVAILABLE ***Deprecated***	**Deprecated, do not use!**	Mask	
TAILHOOK HANDLE	True if the tailhook handle is engaged.	Bool	
TAILHOOK POSITION	Percent tail hook extended.	*Percent Over 100*	
TOW RELEASE HANDLE	Position of tow release handle. 100 is fully deployed.	*Percent Over 100*	
TRUE AIRSPEED SELECTED	True if True Airspeed has been selected.	Bool	
TURN COORDINATOR BALL	Turn coordinator ball position.	Position 128 (-127 to 127)	

TURN COORDINATOR BALL INV	Turn coordinator ball position inverted (upside down).	Position 128 (-127 to 127)	
TURN INDICATOR RATE	Turn indicator reading. ***NOTE**: This is available in multiplayer to all **near** aircraft. See here for more information: Note On SimVars In Multiplayer.*	Radians per second	
TURN INDICATOR SWITCH	True if turn indicator switch is on.	Bool	
WINDSHIELD DEICE SWITCH	True if the aircraft windshield deice switch is on.	Bool	
WISKEY COMPASS INDICATION DEGREES ***Deprecated***	**Deprecated, do not use!** Use MAGNETIC_COMPASS instead.	Degrees	

Variometer

Simulation Variable	Description	Units	Settable
VARIOMETER MAC CREADY SETTING	The MacCready setting used to fly an optimal speed between thermals.	Meters per second	
VARIOMETER NETTO	Variometer rate using Netto (Total Energy - polar sinkRate).	Feet per second	
VARIOMETER RATE	The variometer rate.	Feet per second	
VARIOMETER SPEED TO FLY	Optimal speed to fly between thermals using polar curve and MacCready setting.	Kilometers per hour	

VARIOMETER SPEED TO FLY GLIDE RATIO	The glide ratio at optimal speed to fly.	Number	
VARIOMETER SWITCH	True if the variometer switch is on, false if it is not.	Bool	
VARIOMETER TOTAL ENERGY	The variometer rate using total energy. `Total Energy = Potential Energy + Kinetic Energy`	Feet per second	

Water Ballast

Simulation Variable	Description	Units	Settable
WATER BALLAST TANK CAPACITY:index	The capacity of the indexed water ballast tank.	Pounds	
WATER BALLAST TANK NUMBER	The number of water ballast tank available.	Number	
WATER BALLAST TANK QUANTITY:index	The quantity of water ballast in the indexed tank.	Pounds	
WATER BALLAST VALVE	True (1) if a water ballast valve is available, False (0) otherwise.	Bool	
WATER BALLAST VALVE FLOW RATE	The flow rate of the water ballast valve.	*Gallon*s per hour	
WATER BALLAST EVERY VALVE OPEN	This variable will return 1 (TRUE) if all the ballast tank valves are open, or 0 (FALSE) otherwise.	Bool	

Lights

Simulation Variable	Description	Units	Settable
`IS ANY INTERIOR LIGHT ON`	Will return true if any interior light is on or false otherwise.	Bool	
`LANDING LIGHT PBH`	Landing light pitch bank and heading.	`SIMCONNECT_DATA_XYZ` structure	
`LIGHT BEACON`	Light switch state. ***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note On SimVars In Multiplayer.*	Bool	
`LIGHT BEACON ON`	Returns `true` if the target beacon light is functioning *or* if the switch is ON. Use beacon `lightdef` index.	Bool	
`LIGHT BACKLIGHT INTENSITY`	Vehicle backlights current intensity (0 = off, 1 = full intensity).	*Percent Over 100*	
`LIGHT BRAKE ON`	Returns `true` if the target brake light is functioning or if the switch is ON.	Bool	
`LIGHT CABIN`	Light switch state.	Bool	
`LIGHT CABIN ON`	Returns `true` if the target cabin light is functioning *or* if the switch is ON. Use the cabin `lightdef` index.	Bool	

`LIGHT CABIN POWER SETTING`	The current cabin light power setting. Requires the cabin `lightdef` index.	Percent	
`LIGHT GLARESHIELD`	Whether or not the Light switch for the Glareshield is enabled.	Bool	
`LIGHT GLARESHIELD ON`	Returns `true` if the target glareshield light is functioning *or* if the switch is ON. Use the glareshield `lightdef` index.	Bool	
`LIGHT GLARESHIELD POWER SETTING`	The current glareshield light power setting. Requires the glareshield `lightdef` index.	Percent	
`LIGHT GYROLIGHT INTENSITY`	Vehicle gyrolights current intensity (0 = off, 1 = full intensity).	*Percent Over 100*	
`LIGHT HEAD ON`	Returns `true` if the target navigation light is functioning or if the switch is ON.	Bool	
`LIGHT HEADLIGHT INTENSITY`	Vehicle headlights current intensity (0 = off, 1 = full intensity).	*Percent Over 100*	
`LIGHT LANDING ON`	Returns `true` if the target landing light is functioning *or* if the switch is ON. Use landing `lightdef` index.	Bool	
`LIGHT LANDING`	Light switch state for landing light. ***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note*	Bool	

	On SimVars In Multiplayer.		
`LIGHT LOGO`	Light switch state for logo light. ***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note On SimVars In Multiplayer.*	Bool	
`LIGHT LOGO ON`	Returns `true` if the target logo light is functioning *or* if the switch is ON. Use the logo `lightdef` index.	Bool	
`LIGHT NAV ON`	Returns `true` if the target navigation light is functioning or if the switch is ON. Use navigation `lightdef` index.	Bool	
`LIGHT NAV`	Light switch state for the NAV light.	Bool	
`LIGHT ON STATES`	Bit mask:[index] 0x0001:[index] Nav 0x0002:[index] Beacon 0x0004:[index] Landing 0x0008:[index] Taxi 0x0010:[index] Strobe 0x0020:[index] Panel 0x0040:[index] Recognition 0x0080:[index] Wing 0x0100:[index] Logo 0x0200:[index] Cabin	Mask	

`LIGHT PANEL`	Light switch state of the panel light.	Bool	
`LIGHT PANEL ON`	Returns `true` if the target panel light is functioning *or* if the switch is ON. Use the panel `lightdef` index.	Bool	
`LIGHT PANEL POWER SETTING`	The current panel light power setting. Requires the panel `lightdef` index.	Percent	
`LIGHT PEDESTRAL`	Whether or not the Light switch for the Pedestal is enabled. ***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note On SimVars In Multiplayer.*	Bool	
`LIGHT PEDESTRAL ON`	Returns `true` if the target pedestral light is functioning *or* if the switch is ON. Requires the pedestral `lightdef` index.	Bool	
`LIGHT PEDESTRAL POWER SETTING`	The current pedestral light power setting. Requires the pedestral `lightdef` index.	Percent	
`LIGHT POTENTIOMETER:index`	Adjust the potentiometer of the indexed lighting. Index is defined in the appropriate `lightdef` hashmap setting.	*Percent Over 100*	
`LIGHT RECOGNITION`	Light switch state for the recognition light.	Bool	

	***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note On SimVars In Multiplayer.*		
`LIGHT RECOGNITION ON`	Returns `true` if the target recognition light is functioning *or* if the switch is ON. Use the recognition `lightdef` index.	Bool	
`LIGHT STATES`	Same as `LIGHT_ON_STATES`. ***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note On SimVars In Multiplayer.*	Mask	
`LIGHT STROBE`	Light switch state for the strobe lights. ***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note On SimVars In Multiplayer.*	Bool	
`LIGHT STROBE ON`	Returns `true` if the target strobe light is functioning *or* if the switch is ON. Use the strobe `lightdef` index.	Bool	

	***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note On SimVars In Multiplayer.*		
`LIGHT TAXI`	Light switch state for the taxi light. ***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note On SimVars In Multiplayer.*	Bool	
`LIGHT TAXI ON`	Returns `true` if the target taxi light is functioning *or* if the switch is ON. Use taxi `lightdef` index.	Bool	
`LIGHT WING`	Light switch state for the wing lights. ***NOTE**: This is available in multiplayer to all **far** aircraft. See here for more information: Note On SimVars In Multiplayer.*	Bool	
`LIGHT WING ON`	Returns `true` if the target wing light is functioning *or* if the switch is ON. Use the wing `lightdef` index.	Bool	

MANUAL INSTRUMENT LIGHTS	True if instrument lights are set manually.	Bool	
STROBES AVAILABLE	True if strobe lights are available.	Bool	
STROBE FLASH ***Deprecated***	**Deprecated, do not use!**	Bool	

Hydraulics

Simulation Variable	Description	Units	Settable
HYDRAULIC PRESSURE:index	Hydraulic system pressure. Indexes start at 1.	Pound force per square foot	
HYDRAULIC RESERVOIR PERCENT:index	Hydraulic pressure changes will follow changes to this variable. Indexes start at 1.	*Percent Over 100*	
HYDRAULIC SWITCH	True if hydraulic switch is on.	Bool	
HYDRAULIC SYSTEM INTEGRITY	Percent system functional.	*Percent Over 100*	

Partial Panels

Simulation Variable	Description	Units	Settable
PARTIAL PANEL ADF	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	

PARTIAL PANEL AIRSPEED	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL ALTIMETER	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL ATTITUDE	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL AVIONICS	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL COMM	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL COMPASS	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL ELECTRICAL	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL ENGINE	Gauge fail flag.	Enum: 0 = ok 1 = fail	

		2 = blank	
PARTIAL PANEL FUEL INDICATOR	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL HEADING	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL NAV	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL PITOT	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL TRANSPONDER	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL TURN COORDINATOR	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL VACUUM	Gauge fail flag.	Enum: 0 = ok 1 = fail 2 = blank	
PARTIAL PANEL VERTICAL VELOCITY	Gauge fail flag.	Enum: 0 = ok	

		1 = fail 2 = blank	

Payload Stations

Simulation Variable	Description	Units	Settable
DROPPABLE OBJECTS COUNT:index	The number of droppable objects at the station number identified by the index.	Number	
DROPPABLE OBJECTS TYPE:index	The type of droppable object at the station number identified by the index.	String	
DROPPABLE OBJECTS UI NAME:index	Descriptive name, used in User Interface dialogs, of a droppable object, identified by index.	String	
PAYLOAD STATION COUNT	Number of payload stations (1 to 15).	Number	
PAYLOAD STATION NAME:index	Descriptive name for payload station.	String	
PAYLOAD STATION NUM SIMOBJECTS:index	The number of objects at the payload station.	Number	
PAYLOAD STATION OBJECT:index	Places the named object at the payload station identified by the index (starting from 1). The string is the Container name (refer to the title property of Simulation Object Configuration Files).	String	
PAYLOAD STATION WEIGHT:index	Individual payload station weight.	Pounds	

Warning Variables

Simulation Variable	Description	Units	Settable
`WARNING FUEL`	This is the current state of the fuel warning, either on (`true`) or off (`false`).	Bool	
`WARNING FUEL LEFT`	This is the current state of the left fuel tank warning, either on (`true`) or off (`false`).	Bool	
`WARNING FUEL RIGHT`	This is the current state of the right fuel tank warning, either on (`true`) or off (`false`).	Bool	
`WARNING LOW HEIGHT`	This is the current state of the low height warning, either on (`true`) or off (`false`).	Bool	
`WARNING OIL PRESSURE`	This is the current state of the oil pressure warning, either on (`true`) or off (`false`).	Bool	
`WARNING VACUUM`	This is the current state of the vacuum system warning, either on (`true`) or off (`false`).	Bool	
`WARNING VACUUM LEFT`	This is the current state of the left vacuum system warning, either on (`true`) or off (`false`).	Bool	
`WARNING VACUUM RIGHT`	This is the current state of the right vacuum system warning, either on (`true`) or off (`false`).	Bool	
`WARNING VOLTAGE`	This is the current state of the electrical system voltage warning, either on (`true`) or off (`false`).	Bool	

Yoke

Simulation Variable	Description	Units	Settable
YOKE X INIDICATOR	Yoke position in horizontal direction.	Position (-16K to 0)	
YOKE X POSITION	Percent control deflection left/right (for animation).	Position (-16K to 0)	
YOKE X POSITION WITH AP	Percent control deflection left/right (for animation). Also includes AP's inputs.	Position (-16K to 0)	
YOKE Y INIDICATOR	Yoke position in vertical direction.	Position (-16K to 0)	
YOKE Y POSITION	Percent control deflection fore/aft (for animation).	Position (-16K to 0)	
YOKE Y POSITION WITH AP	Percent control deflection fore/aft (for animation). Also includes AP's inputs.	Position (-16K to 0)	