

Live Flight Data



Real-time data plotter for simulators with FSUIPC or Simconnect communication.

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Connection

There are 3 versions available, one for FSUIPC and Lvars, second for Simconnect and one for MSFS. The connection to the simulator happens automatically when the program starts or the start button is pressed. The variables are entered in the main window. A database can be opened with the small button in each line.

MSFS:

The SDK must be installed. See here:

<https://forums.flightsimulator.com/t/how-to-getting-started-with-the-sdk-dev-mode/123241>

Then the two .dll's have to be copied into the directory where the LiveFlightData_MSFS.exe is located:

...\MSFS SDK\SimConnect SDK\lib\SimConnect.dll

...\MSFS SDK\SimConnect SDK\lib\managed\Microsoft.FlightSimulator.SimConnect.dll

This can easily be done with the MSFS_Simconnect.dll_copier.exe in the LiveFlightData package.

FSUIPC:

FSUIPC from <http://www.fsuipc.com/> must be installed.

The database is based on FSInterrogate2std from the FSUIPC SDK. There is no guarantee of completeness or accuracy.

Many thanks to Pete Dowson and Pelle Liljendal.

Please see the FSUIPC SDK for further infos.

The title can be chosen freely.

Lvars:

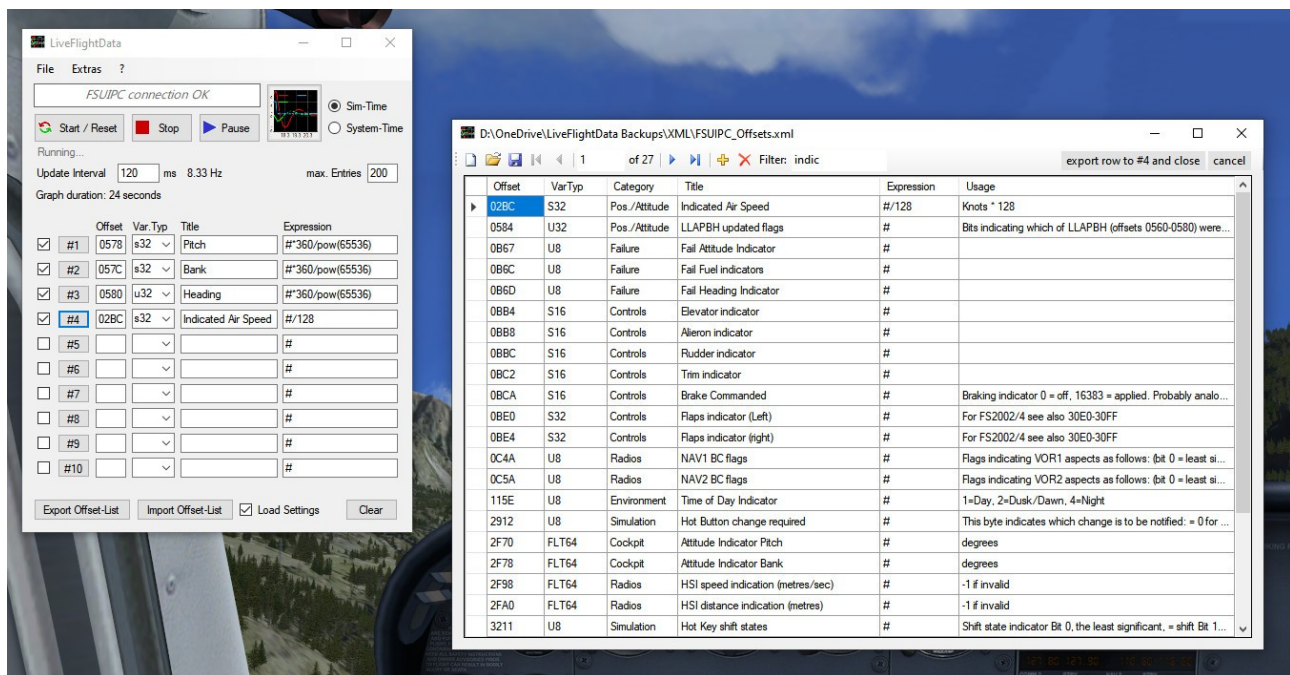
Choose a user offset (66C0 - 66F8) and set the Var.Typ to *Lvar*. In the title insert the variablename without *L:*.

SimConnect: (also for MSFS)

The database is based on the FSX Acceleration SDK. There is no guarantee of completeness or accuracy.

Please see the SDK of your simulator for further infos.

Optionally in the field *Simulation Variable* you can enter your own title: After the variable name, the title can be entered within "".



The offset or SimVar list can be exported. When importing with the checkbox *Load Settings* set, *Update Interval* and *max. Entries* are set too.

Expressions

The expressions enable flexible processing of the read values.

Expression functions	Description	Example	Result
----------------------	-------------	---------	--------

#	Placeholder for read variables from Sim.		
---	--	--	--

Common operators:

+	Addition		
-	Subtraction		
*	Multiplication		
/	Division		
%	Modulo, returns the rest of a division.	5%3	2
		5-3*2	-1
		(5-3)*2	4

Constants:

pi	π	pi	3.1415...
e	Euler's number	e	2.7182...

Special functions:

	input is case-insensitive, can contain spaces.		
deg	Direct conversion from radians to degrees.	deg1 = 180/ π *1	57.2957...
rad	Direct conversion from degrees to radians.	rad1 = π /180*1	0.0174...

Abs()	Absolute value	abs(-5)	5
Acos()	Arc cosine	deg acos(0.5)	60
Asin()	Arc sine	deg asin(0.5)	30
Atan()	Arc tangent	deg atan(2)	63.4349...
Atan2(y,x)	Arc tangent with y and x coordinate of a point.	deg atan2(10,5)	63.4349...
Ceil()	Return integer number, greater or equal to the input value.	Ceil(4.3)	5
Cos(radian)	Cosine	cos(pi)	-1
Floor()	Return integer number, less or equal to the input value.	floor(4.8)	4
Log(, base)	Returns the logarithm with the specified base. If no base is defined, the natural logarithm with the base e is returned.	log(5) log(8,2)	1.6094... 3
Max(,)	Returns the greater of two values.	max(17,24)	24
Min(,)	Returns the smaller of two values.	min(17,24)	17
Pow(, power)	Multiply a value by itself. If no power is defined, the number is squared.	pow(3) = 3 ² pow(4,3) = 4 ³	9 64
Round(, decimal places)	Rounds a number to the specified decimal places. 0.5 is rounded up.	round(1.2345) round(1.2345,3)	1 1.235
Sign()	Returns an integer that indicates the sign of a number.	sign(2.43) sign(0) sign(-7.63)	1 0 -1
Sin(radian)	Sine	sin(rad30)	0.5
Sqrt()	Square root	sqrt(25) = $\sqrt{25}$	5
Tan(radian)	Tangent	tan(rad30)	0.5773...
Trunc()	Truncates the decimal places.	trunc(-2.678)	-2

Cell addresses

Within the expressions it is possible to access other cells. The column number can be specified in the curly brackets.

$\{0\}$ means the most current value from the time column. The column that is accessed must be in front of the one from which it is accessed.

Optionally, the row number can also be specified separated by a ; after the column number. The numbering is based on the latest value as zero and counts back to the previous rows.

The expression $\{0\} - \{0;1\}$ means that the difference between the last two values is calculated from the time column. The result is the time interval.

The screenshot displays the LiveFlightData application interface. On the left, a 'Data Viewer' window shows a table of flight data. On the right, the 'LiveFlightData' configuration window is open, showing settings for data collection and display.

Data Viewer Table:

Sim-Time sec.	Pitch	Bank	Heading	Indicated Airspeed
65.111	-4.36850007623434	25.6692356429994	76.9222003687173	72.90625
65.222	-4.35058711096644	25.6335722375661	76.1863755527884	73.0859375
65.333	-4.33827099390328	25.6063908152282	75.4602701403201	73.265625
65.444	-4.32866089046001	25.58120906353	74.713582796976	73.4453125
65.556	-4.3176856264472	25.5525648314506	73.8415853306651	73.6484375
65.667	-4.30418062023818	25.5288318078965	73.1216598115861	73.828125
65.778	-4.28881441242993	25.5039969831705	72.3666660021991	74.0078125
65.944	-4.25724062137306	25.4877650924027	71.6072674188763	74.203125
66.056	-4.20023370534182	25.486333379522	70.8817287068814	74.390625
66.167	-4.14193203672767	25.483021941036	70.0706967618316	74.59375
66.278	-4.11505613476038	25.4728213325143	69.3547622021288	74.7734375
66.389	-4.10671220161021	25.4605358093977	68.6294982489198	74.953125
66.556	-4.1133938357234	25.4451548494399	67.8022639174014	75.1484375
66.611	-4.12854018621147	25.4324902966619	67.1755780186504	75.296875
66.778	-4.16296005249023	25.4146558698267	66.3922998122871	75.484375
66.889	-4.21423475258052	25.390408616513	65.6655054911971	75.6484375
67.000	-4.30237063206732	25.3542172349989	64.8823323938996	75.8359375
67.111	-4.42965846508741	25.3113310597837	64.0375741012394	76.0078125
67.222	-4.53925696201622	25.2767541166395	63.3764859382063	76.140625
67.389	-4.68328856863081	25.2310539688915	62.5222829170525	76.3046875
67.500	-4.80049590580165	25.1918759476393	61.8016414158046	76.4375
67.611	-4.88202064298093	25.1601462531835	61.0799705330282	76.578125
67.722	-4.87722074612975	25.155673250556	60.3437355905771	76.734375
67.778	-4.86409393139184	25.1572568435222	60.1726733520627	76.7734375

LiveFlightData Configuration Window:

- File Extras ?
- FSUIPC connection OK
- Start / Reset Stop Pause
- Running...
- Update Interval: 120 ms 8.33 Hz max. Entries: 200
- Graph duration: 24 seconds
- Offset Var.Type Title Expression
- #1 0578 s32 Pitch #360/pow(65536)
- #2 057C s32 Bank #360/pow(65536)
- #3 0580 u32 Heading #360/pow(65536)
- #4 02BC s32 Indicated Air Speed #/128
- #5 # # #
- #6 # # #
- #7 # # #
- #8 # # #
- #9 # # #
- #10 # # #
- Export Offset-List Import Offset-List Load Settings Clear

Annotations: An orange arrow points from the $\{0\}$ in the text to the 'Sim-Time sec.' column header. Another orange arrow points from the $\{2;3\}$ in the text to the 'Bank' column header. A green box highlights the value '25.1601462531835' in the 'Bank' column of the table.

Example of a complex expression (for advanced Users)

This example shows the calculation of the distance from the read coordinates.

Longitude is in Column #1, latitude in #2

Distance between the last positions:

```
d_lon= {1}-{1;1}
```

```
d_lat= {2}-{2;1}
```

Conversion from degrees to NM. 1 degree Longitude is 60 NM at the equator and decreases to 0 up to the poles. The factor is the cosine from the latitude in radians.

```
d_lonNM= d_lon*60*cos( rad{2} )
```

Latitude is always 60 NM per degree.

```
d_latNM= d_lat*60
```

The total distance of both points is calculated using the Pythagorean theorem.

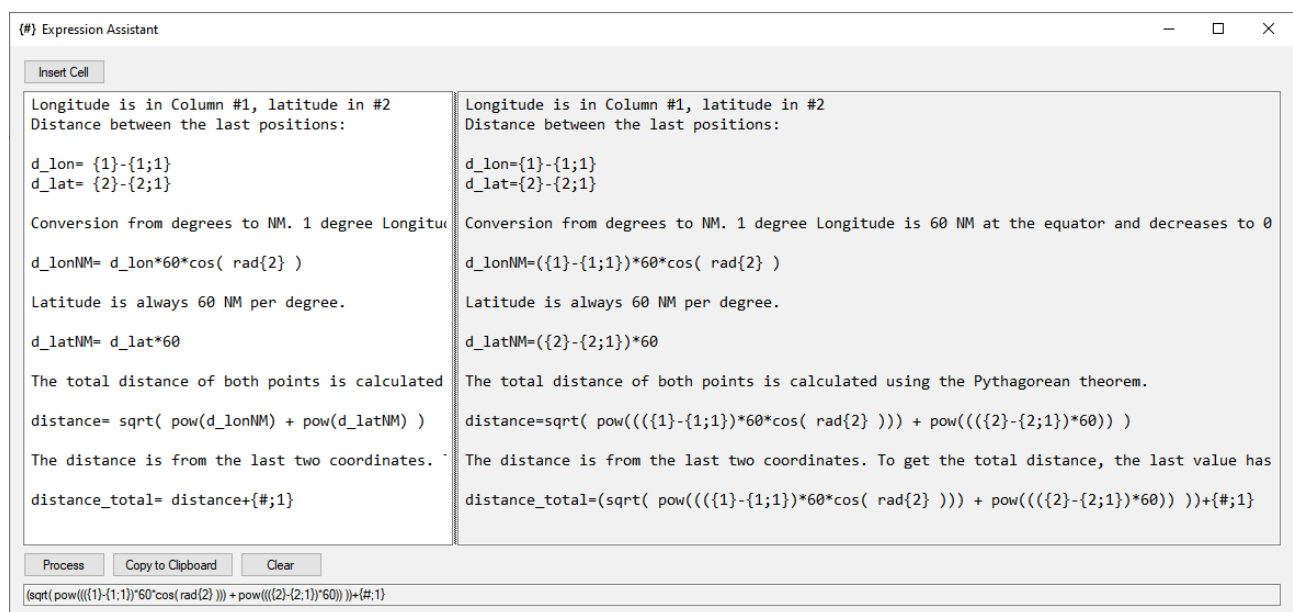
```
distance= sqrt( pow(d_lonNM) + pow(d_latNM) )
```

The distance is from the last two coordinates. To get the total distance, the last value has to be added.

```
distance_total= distance+{#;1}
```

There is an Expression Assistant under the menu item *Extras*.

The formulas can be entered in this. Make sure the variable names are unique.



Copy / paste the final expression into the LiveFlightData list. Don't worry about the complex formulas, this doesn't affect performance.

LiveFlightData

File Extras ?

FSUIPC connection OK

Start / Reset

Stop

Pause

☒ Sim-Time
 ☐ System-Time

Running...

Update Interval ms 10 Hz

max. Entries

Graph duration: 1 minutes 40 seconds

	Offset	Var. Typ	Title	Expression
<input checked="" type="checkbox"/> #1	0568	s64	Longitude of aircraft	#*360/pow(65536,4)
<input checked="" type="checkbox"/> #2	0560	s64	Latitude of aircraft	#*90/(10001750*pow(65536))
<input checked="" type="checkbox"/> #3			Distance	(sqrt(pow((((1}-{1;1})*60*cos(rad{2}))) + pow((((2}-{2;1})*60))))+{#;1}
<input checked="" type="checkbox"/> #4	02BC	s32	Indicated Air Speed	#/128
<input type="checkbox"/> #5				#
<input type="checkbox"/> #6				#
<input type="checkbox"/> #7				#
<input type="checkbox"/> #8				#
<input type="checkbox"/> #9				#
<input type="checkbox"/> #10				#

Export Offset-List

Import Offset-List

☒ Load Settings

Clear

Data recording

Start/Reset starts a new recording in an internal table. If the max. Entries is reached, the oldest entries are deleted.

Stop stops recording and keeps the data in the table.

Pause is synchronized with the simulator.

The internal table can be displayed (not suitable as real time display due bad performance) or saved as a CSV file under the menu item *File*.

Live Graph



A right click within the graph allows some configurations of the display.

Note: The secondary X-axis is always the time axis. The selection makes only sense if another (primary) X-axis has been selected.

A position or selection can be shown with the left mouse button. The marking is removed with a double click.

A selection with the Ctrl key pressed zooms into the graph.