

DatCon Version 4

7-18-2020

1 Quick Start

Don't want to read all this? You have a .DAT file and just want to get the .csv? Do this:

1. Click in the .DAT field at the top to select the .DAT file.
2. Click the GO! Button towards the bottom

The .csv will appear in the same directory as the .DAT file

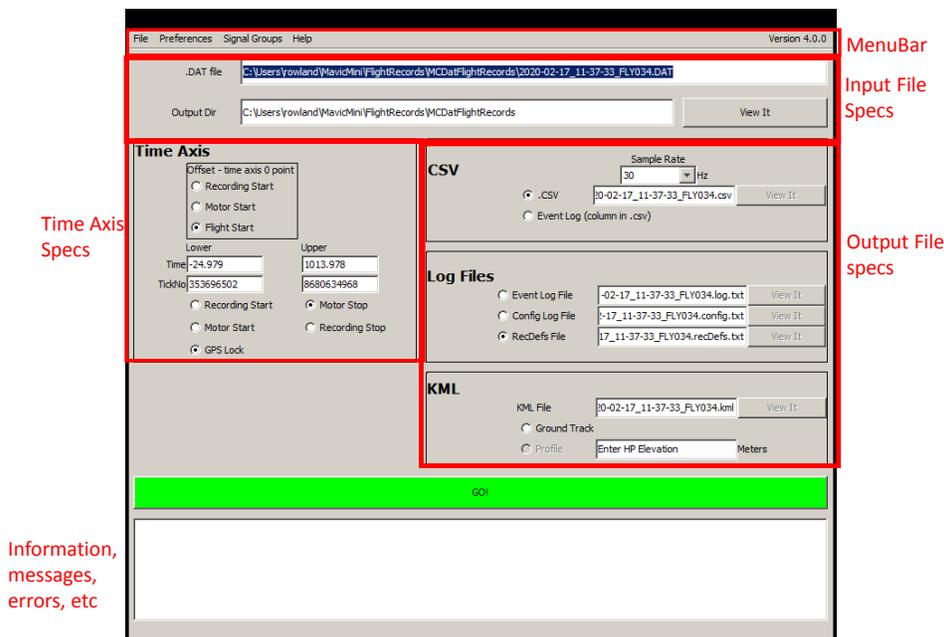
2 Introduction

DatCon converts a .DAT log file to a .csv (Comma Separated Values) file. As of this writing DatCon will accept a .DAT from the Inspire series, Phantom 3 series, Phantom 4 series, some of the Matrice series and Mavic Pro. The Mavic Air, Mavic Air 2, Mavic 2 and Mavic Mini create an encrypted .DAT and can not be processed by DatCon.

DatCon can accept a .DAT created by the Go and Fly apps, regardless of platform.

The .csv can be viewed and/or further processed by several 3rd party apps. Do a Google search to find apps that read and display a .csv file. CsvView has been developed alongside DatCon. It's free – obtain at [CsvView Downloads](#). Although CsvView is adequate for many uses there are situations requiring more powerful data analysis and viewing. The Wavemetrics Igor Pro is a popular choice for this. The Excel plot package can sometimes be difficult to use but is otherwise a good choice. CsvView was developed to mimic using the Excel plot package that eliminates these difficulties.

3 User Interface

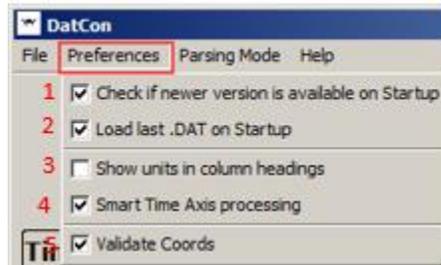


3.1 Menu Bar

3.1.1 File

Check for updates now – Causes DatCon to check for a new version.

3.1.2 Preferences



1. When DatCon starts it can check to see if a newer version is available. If so, you will see a popup explaining how to obtain it.
2. DatCon can automatically load the .DAT that was being used the last time DatCon was run.
3. Show Units in column headings. E.g. vpsHeight[meters]
4. Use Smart Time Axis processing. See the Time Axis Panel discussion below. Most users will select this
5. Occasionally GPS coordinates will be incorrect immediately after power up. Including these incorrect cords in map display apps can be confusing. If Validate Coords is set DatCon attempts to be smart about removing those incorrect coordinates which will then not appear in the map display.

3.1.3 Signal Groups

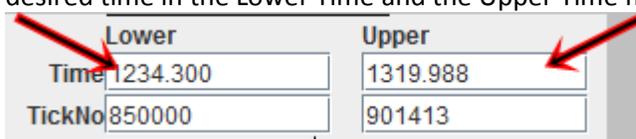
See the Signals section below.

3.2 Time Axis Panel

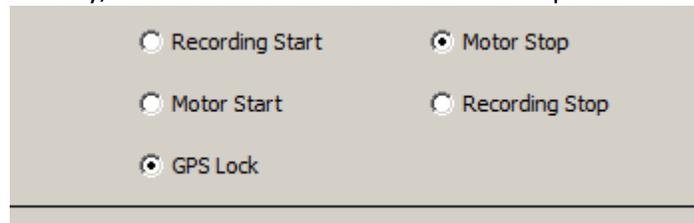
If the Smart Time Axis processing option is selected then DatCon will choose the initial settings in this panel. The casual user can safely accept these choices and proceed to the panels where output choices are made. More advanced users may specify that Smart Time Axis processing not be done. See the Menu Bar->Preferences above.

3.2.1 Time Interval

A time interval may be specified in order to reduce the output size. Selecting an interval can also be done to focus on a particular event. The interval start and end times can be set by entering the desired time in the Lower Time and the Upper Time fields, respectively.



Alternatively, use the buttons below the time fields to set the start time to Recording Start, Motor Start, or GPS Lock. Similarly, the end time can be set to Motor Stop or Recording Stop.

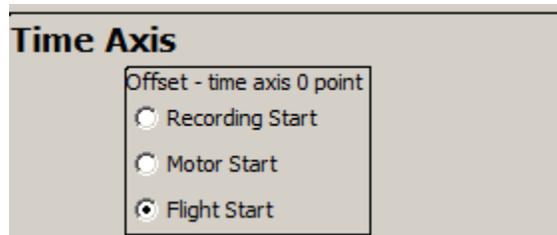


3.2.2 Time Axis shift

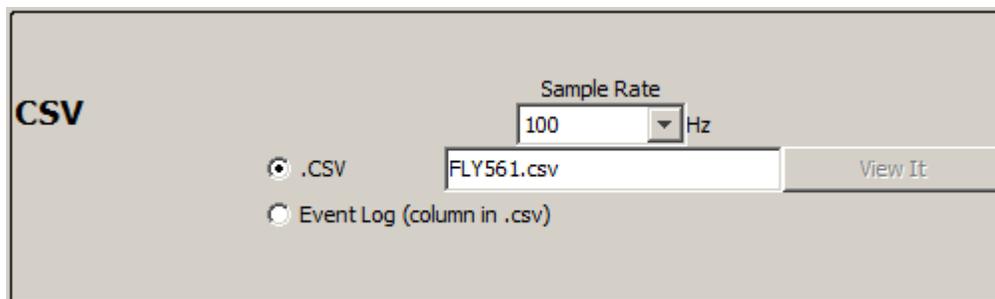
By default, DatCon the origin (time=0.0) of the time axis coincides with the start of the .DAT. If Smart Time Axis is selected then DatCon will shift the time axis so that time=0.0 coincides with the start of the first flight. But if there is no flight then the time axis will be shifted so that time=0.0 coincides with the motors starting. Finally, if the motors are not started time=0.0 will be left at the start of the .DAT.

Time = 0.0	
Flight Start	If the .DAT contains a flight
Motor Start	If the .DAT does not have a flight, but has a motor start
Recording Start	If the .DAT contains neither a flight nor a motor start.

This choice can be overridden by selecting a different choice.



3.3 CSV Panel



The size of the .csv can be adjusted by specifying a sample rate from the set [1 Hz, 2 Hz, 5 Hz, 10 Hz, 20 Hz, 30 Hz, 50 Hz, 60 Hz, 100 Hz, 200 Hz, 2147483647 Hz]. 2147483647 Hz is effectively the highest rate possible. Lower sample rates produce a smaller but less precise .csv. Conversely, a higher

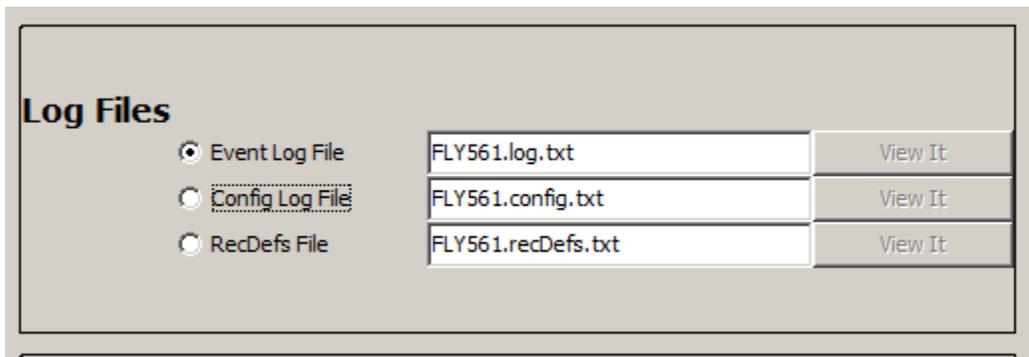
sample rate will produce a larger but more precise .csv. The default, 30 Hz, is usually a good compromise.

Selecting the .CSV option will cause the indicated file to be generated when the GO! Button is pushed. If desired, the file name can be modified.

The Event Log option causes the event log entries to be included in the .csv under the column heading "eventLog". See the discussion of the EventLog in the Log Files panel. Multiple events can occur for a single row in the .csv. In this case the events are concatenated using the "|" character as a separator.

After the GO! Button is pushed the View It button will be enabled. Pushing it causes the generated .csv to be displayed in Excel.

3.4 Log Files Panel



In addition to the binary data the .DAT contains three text streams. DatCon refers to these, somewhat arbitrarily, as the EventLog, ConfigLog and RecDefs. This panel allows you to specify which, if any, of these three logs are to be generated. It also shows the names of the generated log file. These file names can be modified by clicking on the file name and entering a different name. View It buttons are provided that, when clicked, will display the log in a text file viewer (such as NotePad).

3.4.1 Event Log

Each line represents an event such as switching to ATTI mode, go home initiated, etc. The values from both the offsetTime and tickNo scales are inserted at the beginning of each entry. For example, the EventLog entries

```
1.978 : [Ctrl<2>] REQ_RC_COMMAND ASST_TAKEOFF_HOLD ctrl_asst_takeoff  
3.598 : CTRL reset all by assisted takeoff finish
```

describe an assisted takeoff starting at time = 1.978 seconds and finishing at time = 3.598 seconds.

3.4.2 ConfigLog

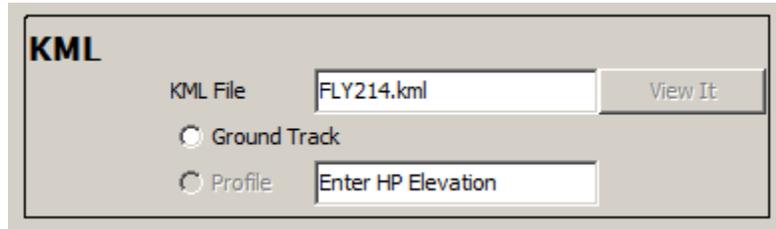
Contains information used to initialize the AC, such as acceptable values for the compass mod. The ConfigLog begins at recordingStart and lasts for about 20 seconds. Also, the build date that was obtained from a different part of the .DAT file is inserted before the first line of the ConfigLog.

3.4.3 RecDefs

Contains record definitions. See Signals->DatDefined below.

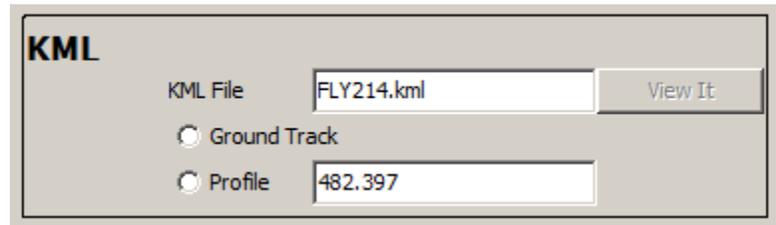
3.5 KML Panel

A .kml file can be generated that can then be viewed using Google Earth. Initially, the KML Panel looks like



GroundTrack – When viewed by Google Earth the ground track is displayed. The track is “clamped” to the ground.

Profile – When viewed by Google Earth the 3D track is displayed. This option will be enabled if DatCon knows what the home point elevation is. This can be set manually by entering the home point elevation in the window to the right of the Profile option. It will also be set by DatCon itself when the .DAT is converted the first time. Either way, after the home point elevation has been set this panel will look like



The track generated with either option will be restricted to the interval specified in the Time Axis Panel. After the conversion is run the View It button can be used that will cause Google Earth to display the track.

4 Signals

DatCon output is organized into signal groups with each signal corresponding to a column in the .csv. The column header (1st row) is the signal name and the remaining rows are the data. E.g. the some of the signals in the IMU_ATT1 group are shown here as they appear in the .csv.

IMU_ATT1:Longitude	IMU_ATT1:Latitude	IMU_ATT1:press:D	IMU_ATT1:magYaw:C
:	:	:	:
-120.4878355	35.34834728	461.10004	7.278717254
-120.4878355	35.34834728	461.10004	7.278717254
:	:	:	:

4.1 Signal Categories.

4.1.1 DatDefined Signals – a DatDefined signal has a **:D suffix**

The .DAT for the Mavic Pro and most platforms following it contain RecDefs (record definitions) which are used to create the DatDefined signals. Each RecDef corresponds to a signal group and the fields within the RecDef each correspond to a signal in that group.

4.1.2 Engineered Signals – an Engineered signal has **no suffix**

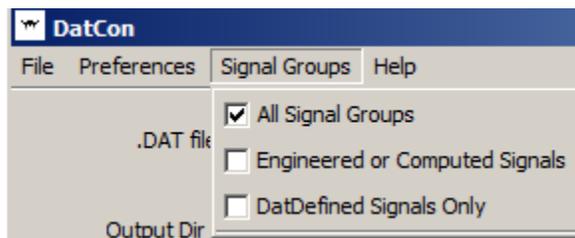
The RecDef specifications is sometimes limited. Field names can sometimes be lengthy and/or obscure. Field names can and do change between platforms and FW versions on the same platform. Fields don't have the information that enhances plots presented by CsvView such as scale, common axes and units. There are a few record types in the .DAT that do not have a RecDef. There have been a few cases where the RecDef is incorrect.

An Engineered signal extends and/or modifies the basic specifications found in the RecDef. E.g., the RecDef specifies a field "tx" that has been determined to contain the temperature of the IMU. Instead of a DatDefined signal IMU_ATT1:tx:D DatCon uses the Engineered signal IMU_ATT1:temperature that 1) has been renamed, 2) scaled by 0.01, and 3) been given the Units Celsius.

4.1.3 Computed Signals – a Computed signal has a **:C suffix**

These signals are the result of DatCon performing a calculation and creating a signal not present in the .DAT. E.g. IMU_ATT1:magYaw:C is a heading value derived from the three magnetometers data and then corrected with roll and pitch data.

By default, DatCon will create a .CSV that contains all signal categories. Processing time and .csv file size can be reduced by selecting a subset of signal categories. To do this use the Signal Groups pulldown in the menu bar



1. All Signal Groups– All of the signal groups are included. Processing time and .csv file size are maximal.
2. Engineered or Computed Signals– Signal groups that have at **least one** Engineered or Computed signal. Processing time and .csv file size are minimal.
3. DatDefined Signals Only – Just those signal groups with **no** Engineered or Computed signals. I.e. all the signal groups that have just DatDefined signals. This option will replace the Engineered signals with the underlying DatDefined signal. E.g., the Engineered signal IMU_ATT1:Latitude

expressed in degrees will be replaced with the DatDefined signal IMU_ATT1:Lat which is expressed in radians.

5 Reporting a bug

Bug reports should be sent to bug@flylog.info

1. Attach the file. datConLog that will be found in your home directory
2. Include as many details and be specific as possible.