

## Version 3.2.0 2/8/18

### 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 and then select the .DAT file in the resulting file chooser.
2. Click in the Output Dir field and then select the directory where you want the .csv to be written
3. Click the GO! Button towards the bottom

### Introduction

DatCon reads a .DAT and then creates output files that contain information extracted from the .DAT. The user interface is divided into panels, each with their own function. Normally, the workflow consists of

1. Selecting the .DAT
2. Selecting the output directory if necessary
3. Setting options in the Time Axis Panel
4. Selecting which outputs you want in the CSV Panel, LogFiles Panel, and KML Panel
5. Pushing the GO! Button
6. Viewing the outputs using the View It buttons.

### Menu Bar

#### File

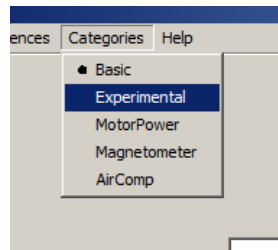
1. Check for updates now
2. Check for updates on startup
3. Show when newer version is available
4. Load last .DAT on startup

#### Preferences

1. Automatically extract .DAT file from DJI Assistant 2 files – DatCon will automatically use ExtractDJI to extract a .DAT from a file created by DJI Assistant 2
2. Show Units in column headings. E.g. vpsHeight[meters]

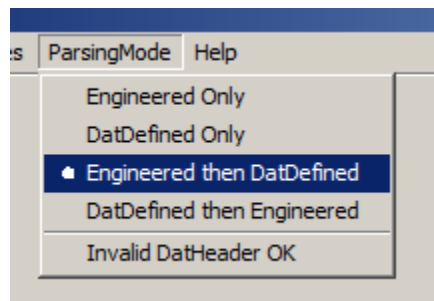
#### Categories

The fields that DatCon extracts from a .DAT are partitioned into categories. There will always be the Basic and Experimental categories. Other categories are subject to change. The fields in a category will be included in the .csv if it is selected. The Basic category is always selected and cannot be un-selected. Pressing the Categories button will cause a selection list to appear where the various categories can be selected.



## Parsing Options

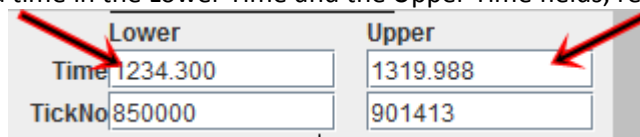
See the Parsing Options discussion below.



## Time Axis Panel

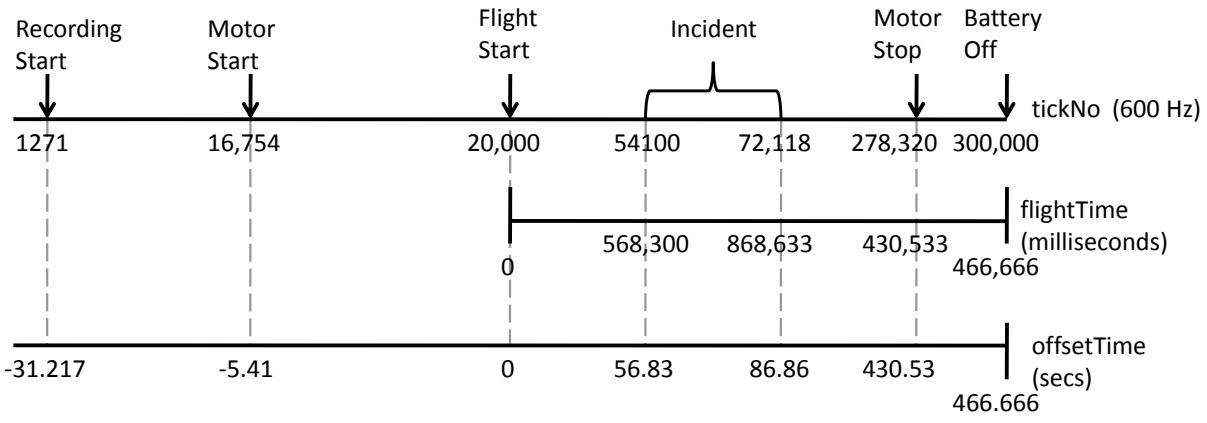
After the user selects .DAT file, a preliminary inspection is done that will be used to choose the settings in this panel. The casual user can safely accept these choices and proceed to the panels where output choices are made.

This panel provides the means to select a time interval 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.

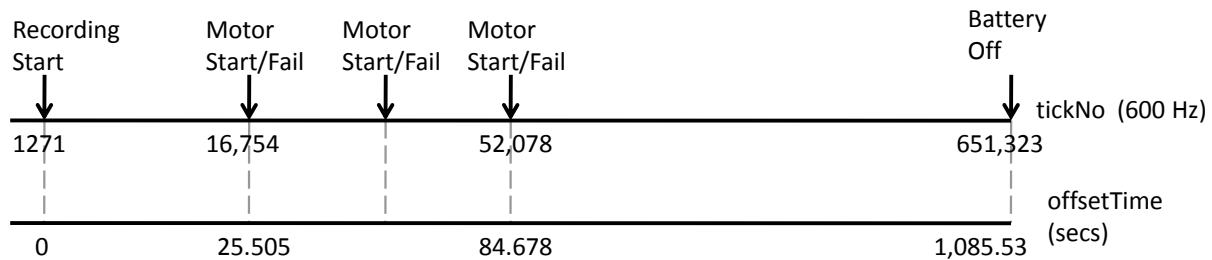
It is often desirable to use DatCon in conjunction with apps that get data from the RC/tablet such DJI Go App, HealthyDrones, or Litchi. This requires that DatCon use the time scale used by these apps. Consider a "normal" flight:



There are three time scales

1. tickNo - 600 Hz. Originates from the P3's internal bus clock. Starts at 0 when the battery is turned on. This time scale exists in every flight.
2. flightTime – milliseconds. Starts at 0 when a flight begins (i.e., the P3 is launched). This time scale will match the time scale of the RC tablet and the .txt produced by the tablet app. This time scale exists only if an actual flight occurs.
3. offsetTime – seconds. Computed from the tickNo scale and the flightTime scale (if it exists). If the flightTime scale does exist then this time scale is offset so that 0 on both the flightTime and offsetTime scales coincide. Note that the offsetTime scale includes the negative times from recordingStart to 0. The alignedTime scale should be used when 1) using Dashware, 2) synchronizing with the other apps, or 3) communicating results with others.

Some .DAT files do not have flightTime values. For example, consider the case where the motors wouldn't start and DatCon is being used to determine the cause. There won't be a flight and consequently the flightTime scale can't be used. Here is an example



In this case the offsetTime scale can be offset so that time = 0 aligns with recordingStart (tickNo = 1271) on the tickNo scale.

The Time Offset subpanel tells you where the origin (time = 0) of the offsetTime scale was set. DatCon makes this choice with these criteria:

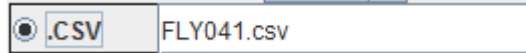
Flight Start	If the .DAT contains a flight
Motor Start	If the .DAT does not have a flight, but has a motor start
Recording Start	If the .DAT contains neither a flight nor a motor start.

This choice can be overridden by selecting a different choice.

## CSV Panel

The size of the .csv can be adjusted by specifying a sample rate which can range from 5 Hz to 200Hz. 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.

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

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.

## Log Files Panel

In addition to the binary data the .DAT contains two text streams. DatCon refers to these, somewhat arbitrarily, as the ConfigLog and the EventLog. This panel allows you to specify which, if any, of these two logs are to be generated as result of pushing the GO! Button. It also shows the file names that will be generated. These file names can be modified by clicking in 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).

The ConfigLog contains information used to initialize the P3, such as acceptable values for the compass mod. The ConfigLog begins at recordingStart and lasts for about 20 seconds. The last lines of the ConfigLog contain the serial number of the MC board which is effectively the serial number of the P3. Also, the build date that was obtained from a different part of the .DAT file is inserted before the first line of the ConfigLog.

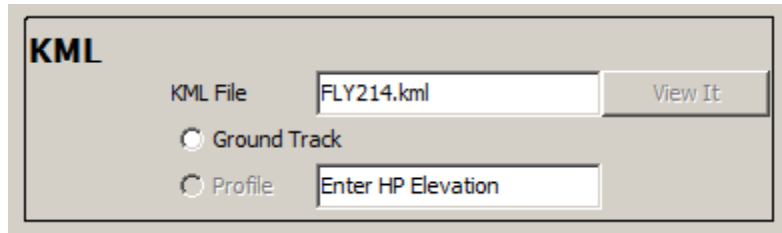
In the EventLog each line represents an event such as switching to ATTI mode, go home initiated, etc. The values from both the offsetTime and tickNo scales are inserted at the beginning of each entry. For example, the EventLog entries

```
1.978 : 110607 : 8988 [Ctrl<2>] REQ_RC_COMMAND ASST_TAKEOFF_HOLD ctrl_asst_takeoff  
3.598 : 111579 : 9069 CTRL reset all by assisted takeoff finish
```

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

## KML Panel

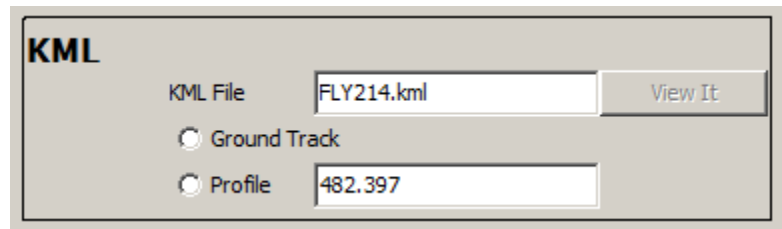
A .kml file can be generated that can then be viewed using Google Earth. Initially, the KML Panel looks like



The screenshot shows a window titled "KML". It contains a text input field labeled "KML File" with the value "FLY214.kml" and a "View It" button to its right. Below this are two radio button options: "Ground Track" (which is selected) and "Profile". To the right of the "Profile" option is another text input field labeled "Enter HP Elevation" which is currently empty.

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



This screenshot shows the same "KML" window as the previous one, but with changes. The "Ground Track" radio button is now unselected, and the "Profile" radio button is selected. The text input field next to "Profile" now contains the value "482.397". The "KML File" field and "View It" button remain the same.

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.

## Parsing Options

### Engineered vs DatDefined

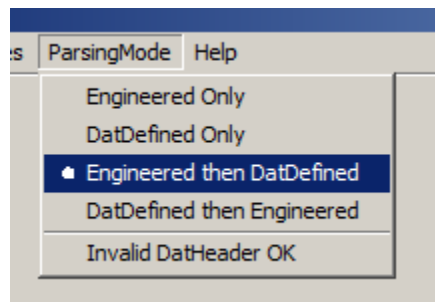
Prior to version 3.0.0 the signals that previous DatCon versions knew about were obtained by reverse engineering the .DAT file. In addition to the Engineered signals version 3.0.0 and later include DatDefined signals whose definitions are found within the .DAT itself. Depending on the platform and the firmware version there can be in excess of 750 DatDefined signals available in addition to the Engineered signals. The user can select which signal types will be used during the parsing process; either Engineered, DatDefined, or a combination of both.

The main advantage of the DatDefined signals is that they provide access to signals other than the Engineered signals. There are disadvantages though.

1. Parsing times are longer and the size of the generated .csv will be larger.

2. The DatDefined signal labels can sometimes be lengthy and/or obscure. The DatDefined signal labels can and do change between platforms and FW versions on the same platform.
3. The DatDefined signals don't have the information that enhances plots presented by CsvView such as scale, common axes and units.
4. Generally, the DatDefined signals contain all of the Engineered signals. However, there are a few Engineered signals not contained in the DatDefined signals
5. There have been a few cases where the DatDefined are incorrect.

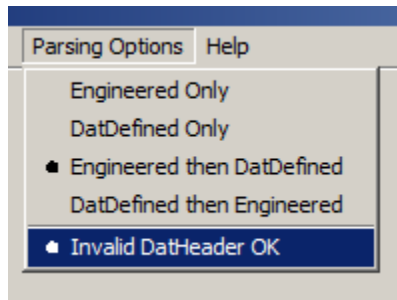
To control the way that DatCon uses the signal types there is a new menu bar item called ParsingMode. (CsvView also has this menu bar item)



1. Engineered Only - Equivalent to previous DatCon versions; i.e. just the signals that were discovered by reverse engineering the .DAT. This is the default that is used until the Parsing Mode has been changed.
2. DatDefined Only - Uses just those signal definitions found in the .DAT.
3. Engineered then DatDefined - First searches the Engineered definitions. Then, for any signals without a definition the DatDefined signals are searched.
4. DatDefined then Engineered - First searches the DatDefined definitions. Then, for any signals without a definition the Engineered signals are searched.

## Invalid DatHeader

The DatHeader is the first 128 or 256 bytes of the .DAT file. By default, DatCon will reject any file that does not have a valid DatHeader. However, with the tablet .DAT the DatHeader will often be missing or corrupted. The requirement for a valid DatHeader can be turned off by selecting Invalid DatHeader option.



## Reporting a bug

Bug reports should be sent to [bug@flylog.info](mailto:bug@flylog.info)

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