Technical Note

Document Number		CTN0003	
Title		Basic GPS Beacon Setup with MoTeC's Dash Loggers	
Approved By		*JA*	
Revision	**Date**	**Prepared By**	**Change History**
1.0	23/09/2009	OFK	
1.1	25/09/2009	AW	corrections in GPS coordinates table
1.2	16/04/2013	YK	Automatic GPS Beacon (automatic venue detection)

Introduction

This document describes the procedure to set up or change the GPS Lap Beacons in your MoTeC Dash Logger (e.g. SDL, ADL2).

The MoTeC Dash Manager software can place a lap beacon at a definable location for automatic lap time generation.

In addition to the start/finish beacon, the GPS can produce of up to 4 split beacons, enabling the racer to split up the track for accurate split times.

You only need to set up your beacon points once per venue. The location will be saved within the venue file on your PC. When you go back to a track, all you need to do is load the venue file of the track you are racing at and send it to the Dash Logger. Below are instructions on how to do this.

Scope

GPS Lap Beacons work with all MoTeC Dash Loggers (except for the first generation of ADLs).

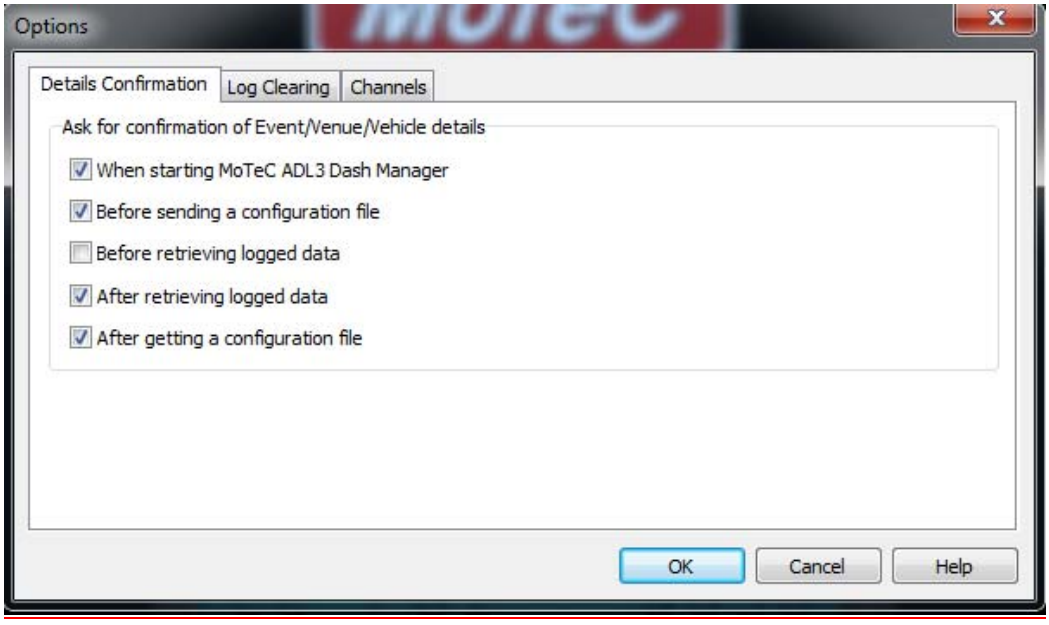
It requires a GPS receiver that transmits data via RS232 (NMEA messages RMC and GGA) at a minimum of 5 Hz.

Vehicle Speed Trigger

Vehicle speed must be above 20kmh to trigger a GPS beacon.

Details Confirmation

During sending or receiving configuration and/or log files; the event, venue and vehicle details can be confirmed. The trigger for enabling this confirmation is set by selecting the appropriate options in the **Details Confirmation** tab in the **Options** menu.



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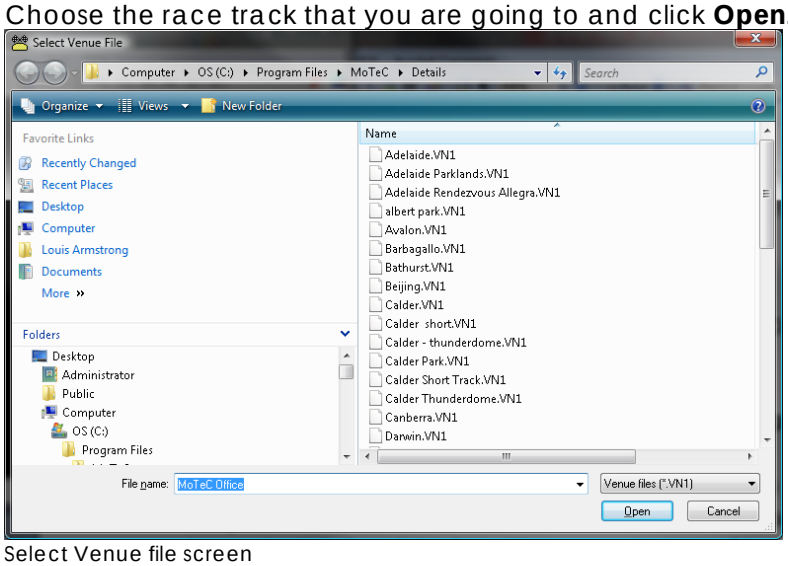
GPS Lap Beacon Setup

Note

These setup instructions do not include functionality available in the latest Dash Manger versions, see* New functionality – Automatic GPS Beacon selection *on page 6 for information on this new functionality.

1. Connect the communications cable from your laptop to the Dash Logger (UTC, USB or Ethernet).
2. Turn on power to the Dash Logger.
3. Open your Dash Manager software.
4. On the **Online** menu, click **Get Configuration** and then click **OK** in any of the boxes that may pop up.
5. On the **File** menu, click **Edit Details**
6. Click the **Venue** tab and then click **Select**
7. Choose the race track that you are going to and click **Open**.



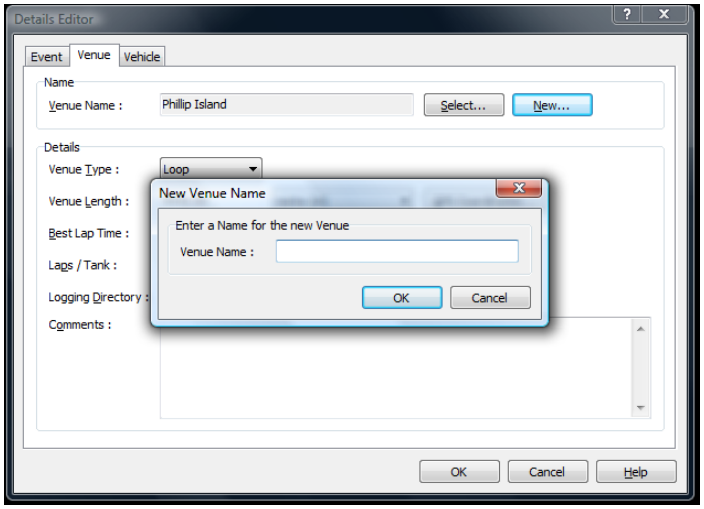
Select Venue file screen

If the track does not exist in the list, click **Cancel**

In the **Details Editor**, click **New**, enter a Venue Name and click **OK**.

It is good practice to fill in the other venue details, but this is not required for GPS Lap Beacons.

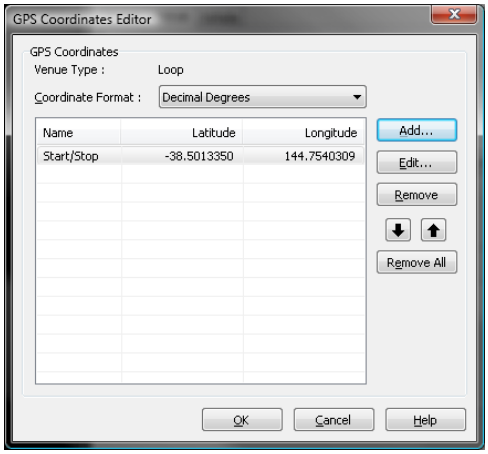
In the **Venue Type** box, ensure you select **Loop** or **Cross Over** if you are on a closed circuit.



New Venue screen

8. You should now check if you already have set your beacon coordinates for this track. To check the GPS Coordinates or add new ones click **GPS Coordinates.**

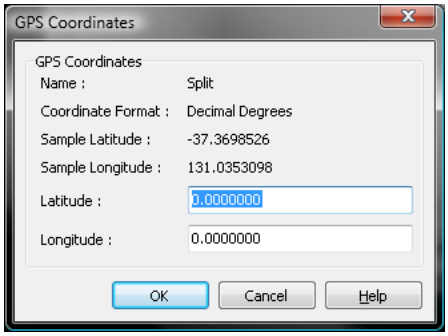
9. If the correct Latitude and Longitude numbers and a Start and Stop name are in the table, you have already setup your beacon positions. (see list of **GPS coordinates of beacon positions** below). Click **OK** and continue at the next step.



GPS coordinates Editor screen

If the numbers in the table are wrong, click on the **Start/Stop** row in the table, then click **Edit** to enter the correct latitude and longitude coordinates for the beacon.

If the numbers in the table are blank, click **Add** to enter the correct latitude and longitude coordinates for the beacon.



GPS Coordinates screen

In this document you will find a list for the beacon positions for some common tracks from around the world. If your track does not exist in this list see the **Determining a beacon position** topic below.

10. Once you have added the Latitude and Longitude Coordinates, click **OK** on the GPS Coordinates window, and then click **OK** on the GPS Coordinates Editor window to accept the changes into the venue file.

11. Click **OK** to get back to the main MoTeC Dash Manager window.

12. On the **Online** menu, click **Send Configuration**

You are now ready for GPS Lap Timing.

GPS coordinates of beacon positions

Track Name	Country	Latitude	Longitude
Algarve	Portugal	37.2297999	8.6299166
Assen	Holland	52.9629295	6.5252761
Barcelone	Spain	41.5699611	2.2609611

Track Name	Country	Latitude	Longitude
Bathurst	Australia	- 33.4393834	149.5592218
Burno	Czech Republic	49.2032263	16.4439615
Calder Park Raceway	Australia	- 37.6713073	144.7540309
Dijon	France	47.3635499	4.8981333
Donington Park	UK	52.8297521	-1.3784046
Imola	Italy	44.3440293	11.7163993
Kyalami	South africa	- 25.9987493	28.0699075
Le Mans	France	47.951527	0.2075357
Losail	Qatar	25.4871760	51.4508574
LurcyLévis	France	46.7171991	2.9525055
MagnyCours Club	France	46.8670652	3.1571734
MagnyCours F1	France	46.8631896	3.1621991
Misano	Italy	43.9618419	12.6840103
Monza	Italy	45.6177419	9.2809437
Nürburgring	Germany	50.3355833	6.9475333
Oran Park	Australia	- 34.0078580	150.7330750
Phillip Island	Australia	- 38.5013350	145.2315488
Salt Lake City	USA	40.5831959	- 112.3763825
Sandown	Australia	- 37.9490784	145.1643209
Sepang	Malaysia	2.7607436	101.7380675
Spa	Belgum	50.4431666	5.9661833
Symmons Plains	Australia	- 41.6576961	147.2500363
Valencia	Spain	39.4840463	- 0.6300597
Winton Raceway	Australia	- 36.5174608	146.0846163

Determining a Beacon Position

If you do not know the beacon position for your track, and it is not in the list above, one way to find the GPS latitude and longitude is to go to Google Earth.

1. Search for your race track and put your cursor on the start finish line.
2. Read the lat and lon values from the bottom line of the display
   (see picture of Sepang race track below).

These lat and lon values can be a little out, compared to measured GPS positions. Ensure that you use a beacon detection radius of 30 meters or more when you first go to the track.
After you have done a few laps of the track, you can use your logged GPS data to improve the accuracy of your position. Ensure you have logged the longitude and latitude channels.

Using MoTeC's ***i2*** data analysis software, you should determine the position of the start finish line, and then send these values to the dash, as described above.

Map Data © 2009 AND
© 2009 Tele Atlas
Image © 2009 DigitalGlobe
© 2009 Europa Technologies
lat 2.760761° lon 101.738394° elev 44 m

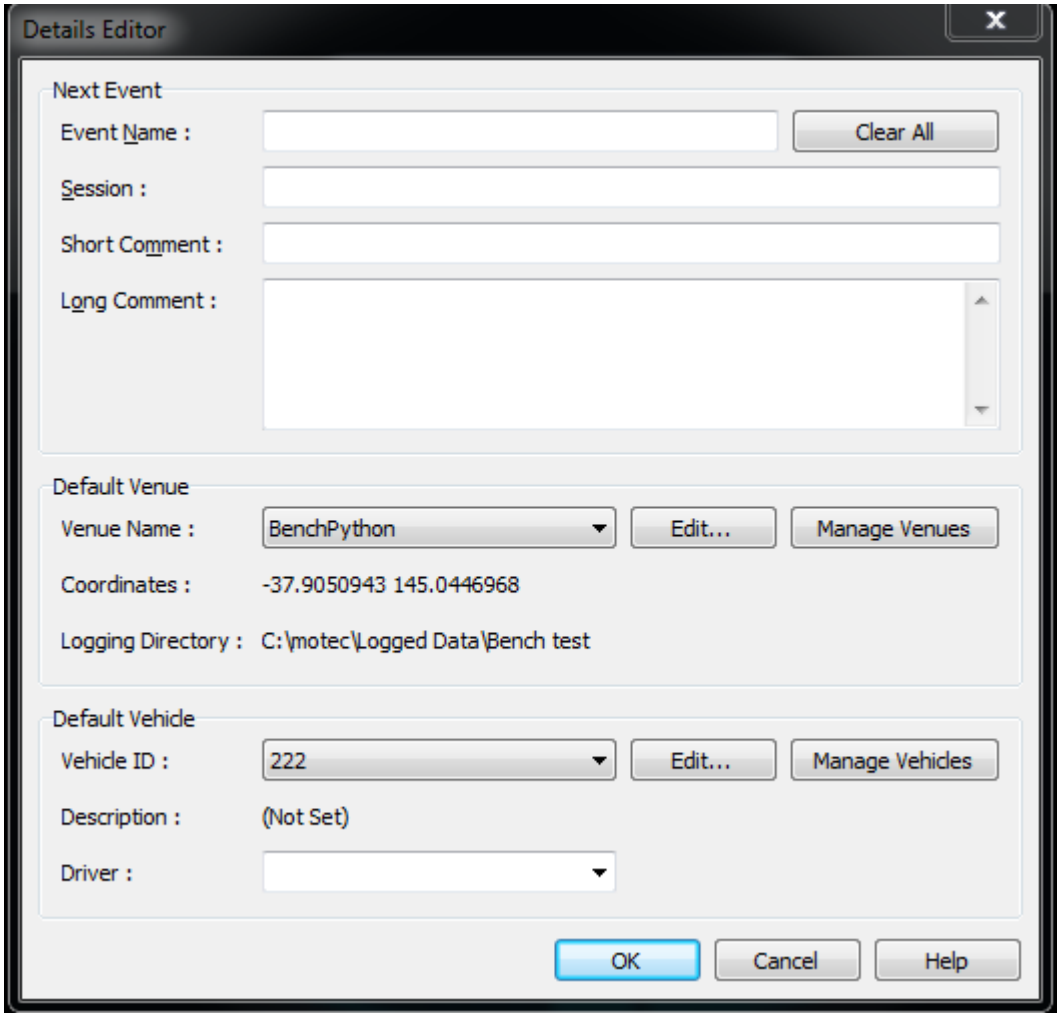
New functionality – Automatic GPS Beacon selection

Starting from Dash Manager version v5.31, v4.31 and v1.31 for ADL3, SDL3 and CDL3 respectively there is new functionality that allows automatic GPS Beacon selection.

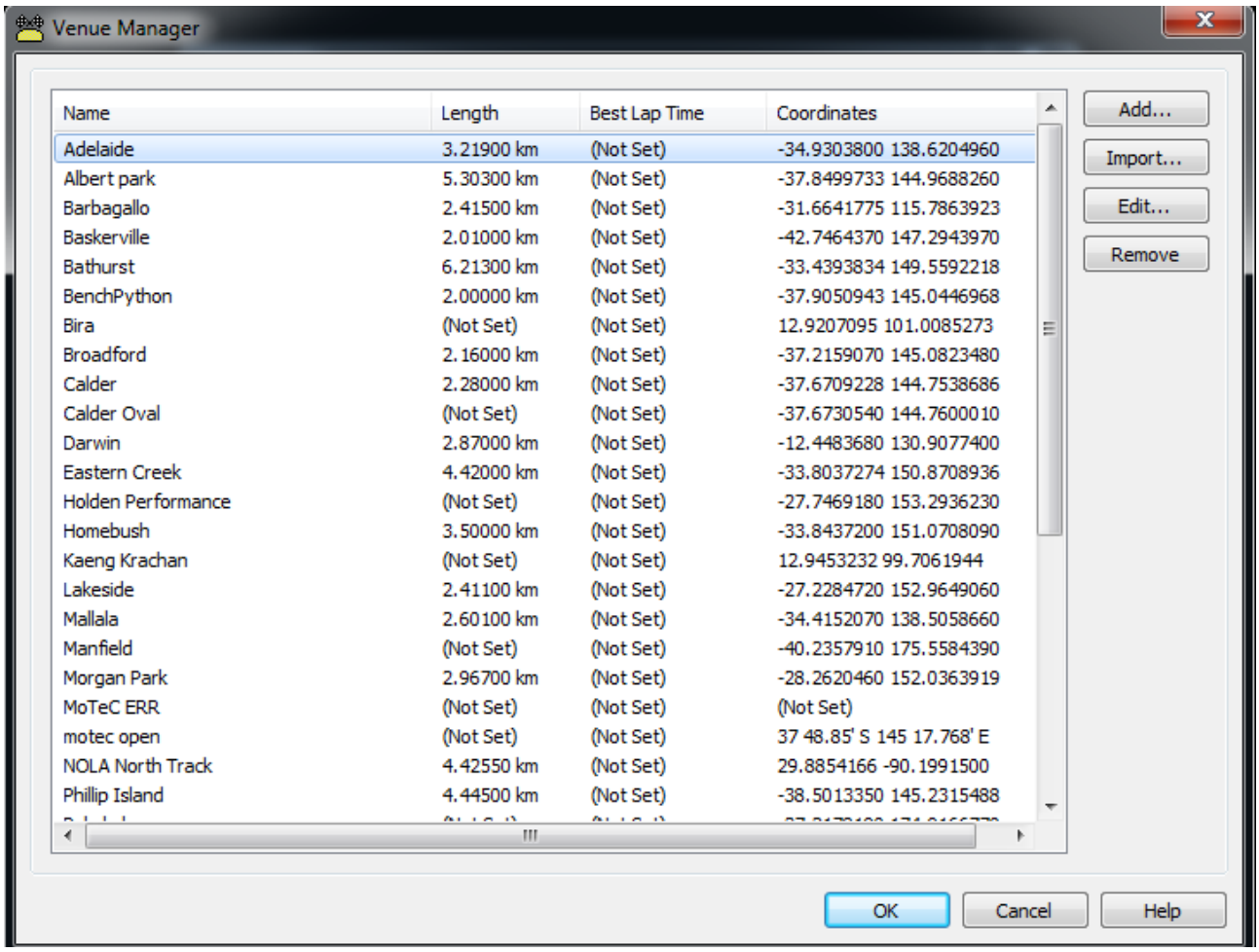
This new functionality is described below.

New Details Editor window

The new details editor is similar to the following example.



Selecting the **Manage Venues** button opens the *Venue Manager* window where venues can be added (new venue file), imported (existing venue files), edited or removed, an example of the *Venue Manager* window is shown below.



Name	Length	Best Lap Time	Coordinates
Adelaide	3.21900 km	(Not Set)	-34.9303800 138.6204960
Albert park	5.30300 km	(Not Set)	-37.8499733 144.9688260
Barbagallo	2.41500 km	(Not Set)	-31.6641775 115.7863923
Baskerville	2.01000 km	(Not Set)	-42.7464370 147.2943970
Bathurst	6.21300 km	(Not Set)	-33.4393834 149.5592218
BenchPython	2.00000 km	(Not Set)	-37.9050943 145.0446968
Bira	(Not Set)	(Not Set)	12.9207095 101.0085273
Broadford	2.16000 km	(Not Set)	-37.2159070 145.0823480
Calder	2.28000 km	(Not Set)	-37.6709228 144.7538686
Calder Oval	(Not Set)	(Not Set)	-37.6730540 144.7600010
Darwin	2.87000 km	(Not Set)	-12.4483680 130.9077400
Eastern Creek	4.42000 km	(Not Set)	-33.8037274 150.8708936
Holden Performance	(Not Set)	(Not Set)	-27.7469180 153.2936230
Homebush	3.50000 km	(Not Set)	-33.8437200 151.0708090
Kaeng Krachan	(Not Set)	(Not Set)	12.9453232 99.7061944
Lakeside	2.41100 km	(Not Set)	-27.2284720 152.9649060
Mallala	2.60100 km	(Not Set)	-34.4152070 138.5058660
Manfield	(Not Set)	(Not Set)	-40.2357910 175.5584390
Morgan Park	2.96700 km	(Not Set)	-28.2620460 152.0363919
MoTeC ERR	(Not Set)	(Not Set)	(Not Set)
motec open	(Not Set)	(Not Set)	37 48.85' S 145 17.768' E
NOLA North Track	4.42550 km	(Not Set)	29.8854166 -90.1991500
Phillip Island	4.44500 km	(Not Set)	-38.5013350 145.2315488

Notes on the new functionality

- When a configuration file is sent to the Dash, all the venues (in the Venue Manager) are also uploaded to the Dash.
- When a vehicle drives past a start/stop coordinate of a venue contained in the Venue Manager's list, the beacon is automatically triggered (if the GPS beacon type is selected).

  The beacon will be triggered **regardless of what Default Venue is selected in the Details Editor**.

  For example, if venue A with GPS coordinates Xa Ya is selected as the Default Venue and the vehicle actually drives past coordinates Xb Yb, which are associated with venue B, the Lap Beacon will automatically trigger and log the event as at venue B.

  Consequently, when the log file is downloaded, venue B will appear in the log (even if Default Venue was venue A).