

<b>Document Number</b>		RG_TN-0004	
<b>Title</b>		Davis Weather Utility	
<b>Revision</b>	<b>Date</b>	<b>Prepared By</b>	<b>Change History</b>
1.0	03/9/2011	Tim Munn	Initial release

## Introduction to the Davis Weather Utility

The Davis Weather Utility is a MoTeC i2 Pro math plugin that facilitates the importing of weather data from your Davis Weather Station into i2 Pro as physical channels that can be graphed or used in math equations.

### Features

- View you Davis WeatherLink data side by side your MoTeC logged data in i2 Pro.
- Weather Data Channels which are created include:
  - Ambient Temperature
  - Humidity
  - Barometer
  - Average Wind Speed
  - High Wind Speed
  - Wind Direction
- AutoLocate feature collects data from the correct Davis data file automatically.
- Option to make use of a "GPS Time" channel for more accurate syncing of weather data to the logged channel "GPS Time".
- Built in diagnostics for easy troubleshooting.
- Simple and completely automatic once set up.

## Installation

1. Open the installation package and run the installer application "DavisWeatherUtilityInstaller.exe".
2. Click "Install". This will place the several files from the install package into the "c:\motec\plugins\DavisWeatherUtility\" directory. These files are: "DavisWeatherUtility.dll", "TrackTimeZones.txt", and this document "UTN-0004 Davis Weather Utility.doc". The install button should now read "Finish".
3. Open i2 and navigate to "Maths"
4. Click "Add Plugin"
5. Click "Install Plugin"
6. Navigate to "C:\motec\Plugins\DavisWeatherUtility\"
7. Select "DavisWeatherUtility.dll"
8. Open the plugin settings, click "Info"
9. Read the "QuickStart Guide"
10. Close the installer by clicking "Finish" if you haven't already.
11. Start using your new plugin!

## Plugin Setup

### 1. Specify where your weather data files are located

- a. Locate and verify the location of your Davis Weather data log files (\*.wlk). They are usually found in "C:\Weatherlink\station\_name\"
- b. In the plugin settings, change the "AutoLocate Directory" to select this directory location.

### 2. Setup "TrackTimeZones.txt"

If your data files have "GPS Time" logged in them, add your venue names into the time zone database. This will allow you to use "GPS Time" instead of the details "Log Time" parameter. If you are not logging "GPS Time" then you can skip this step.

- a. Navigate to "C:/motec/Plugins/DavisWeatherUtility" and locate the "TrackTimeZones.txt" file.
- b. Edit this file by adding the names of the tracks you visit into this text file along with the time zone of where they are located in. The names must match the venue names listed in edit details of dash manager. This is the name of which i2 uses when generating track maps.

### 3. Start using the DavisWeatherUtility

- a. Start i2 Pro and open a MoTeC log file.
- b. If the above steps have been completed successfully, your weather data should appear automatically.

## AutoLocate Data

The AutoLocate feature enables this plugin to automatically find and collect data from the Davis data file that corresponds to the MoTeC log file you are currently viewing. This is to save you from having to manually select a Davis data file every time you open a MoTeC log file from a different time. When the plugin is run, it looks in the WeatherLink station's directory for the data file that corresponds to the month and year of the currently open MoTeC log file. In order for this process to work, it is required that you specify the directory where your Davis data files are located.

The default directory for this data is "C:\WeatherLink\station\_name\" where station\_name is the name you gave the weather station when you first set it up. Assign this path to the "AutoLocate Directory" setting in the plugin settings to allow the plugin to automatically find and read data from the correct Davis data file.

## Determining Data Timeframe

This plugin grabs data out of a Davis data file corresponding to the time of day that your MoTeC log file was logged. This time can be determined one of two ways:

1. Using the edit details "Log Time" parameter present in every MoTeC log file, found under "Edit Details" in i2. The "Log Time" parameter is filled in with your computer's local time after downloading a log file.
2. Using the logged channel "GPS Time" which is generated and logged in real time on the car. \*Preferred method\*

This plugin will attempt to use a "GPS Time" channel by default. But, if no such channel exists in your log file, this plugin will use the "Log Time" detail. You also have the option to ignore an existing "GPS Time" channel and use the "Log Time" detail by enabling the option "Always use details time" in the plugin settings.

## Using "Log Time"

The edit details "Log Time" parameter present in every MoTeC log file and can be found under "Edit Details" in i2. The "Log Time" parameter is filled in with your computer's local time after downloading a log file. This means it is not the time that your vehicle was actually logging track; rather the time you downloaded the data. To get the most accurate syncing of weather data possible, download as soon as your car comes into the pits. If you download data one hour after being on track, then there will be a one hour time shift in your weather data. If you do manage to download some time after logging stops, simply modify the "Log Time" parameter using "Edit Details" in i2 to more accurately represent the time logging stopped.

## Using "GPS Time"

The logged channel "GPS Time" is generated and logged in real time on the car. \*Preferred method\* It is important to note that the values logged in "GPS Time" are recorded in UTC (Universal Coordinated Time) and must be adjusted to local time based on the time zone that your MoTeC log file was logged in. To automate this process, the plugin makes use of a text file called "TrackTimeZones.txt" which contains a database of venue names and their corresponding time zones. When the plugin is run, it automatically looks into this file and searches for the venue of the currently open MoTeC log file. If the venue is found, the time zone will be set automatically. You are responsible for adding your own track and venue names to this file.

### Track Time Zones File

Filename: "TrackTimeZones.txt"

Location: "C:/motec/Plugins/DavisWeatherUtility/"

Open "TrackTimeZones.txt" in a text editor and add a new line following the set format of "venue", "time zone". Where "venue" is the name as it appears exactly in the details of the log file, and "time zone" is the abbreviated time zone in capital letters.

Example:

"Sebring", "EST"

Acceptable time zone acronyms:

USA: PST, MST, CST, EST

EU: GMT, CET, EET, MSK

AUS: AWST, ACST, ACDT, AEST, AEDT

## Note on Wind Direction

Davis Weather Stations log wind direction in cardinal notation (i.e. N, SSE). Since i2 does not have a compass component, wind direction is represented in degrees:

N:	0
NNE:	22.5
NE:	45
ENE:	67.5
E:	90
ESE:	112.5
SE:	135
SSE:	157.5
S:	180
SSW:	202.5
SW:	225
WSW:	247.5
W:	270
WNW:	292.5
NW:	315
NNW:	337.5

## Troubleshooting

If your weather channels are displayed as N/A then there has been an error while trying to collect your weather data. To help resolve the error, please check the "Display Error Msgs" option in the maths setup. This will give you information about why your weather data is not coming through automatically. Detailed instructions on how to resolve each error can be found under "Error Diagnostics" located in the last tab of the setup window, or at the end of this document.

If necessary, you can manually select a Davis data file to read from, as well as manually specifying a time zone when using "GPS Time". However, this approach is not recommended as it is much more time consuming than correctly configuring the plugin to automatically gather data.

## Error Diagnostics

**Error 1:** Attempting to use "Log Time" detail, but the "Log Time" field is blank.

**Fix:** Critical error. Using "Edit Details" in i2, enter a value for "Log Time" in the form "HH:MM:SS XM". Try to enter a time close to the time at which you started your logging session for accurate syncing of weather data.

**Error 2:** "TrackTimeZones.txt" file is missing.

**Fix:** Create a new text document, save it as "TrackTimeZones.txt" and place it in the "C:/motec/Plugins/DavisWeatherUtility" directory. Add to it the venue names of the tracks you visit. For detailed instructions please see "Determining Data Timeframe".

**Error 3:** Venue found in "TrackTimeZones.txt" but the time zone acronym is not recognized.

**Fix:** Locate the entry for the venue of your MoTeC log file in "TrackTimeZones.txt" and enter an acceptable time zone as specified in the "Determining Data Timeframe" detailed instructions.

**Error 4:** Venue not found in "TrackTimeZones.txt."

**Fix:** Edit "TrackTimeZones.txt" to include the current venue. See "Determining Data Timeframe" for detailed instructions.

**Error 5:** Time zone has not been set properly.

**Fix:** Critical error. Check "TrackTimeZones.txt" entry, or choose "Always use details time".

**Error 6:** "GPS Time" data unusable.

**Fix:** This error is triggered when a meaningful timeframe could not be determined from the "GPS Time" channel. Please enable "Always use details time" in the plugin settings.

**Error 7:** "AutoLocate Directory" setting blank.

**Fix:** Under settings, set the "AutoLocate Directory" the location of your Davis data files.

**Error 8:** AutoLocate failed to find the appropriate Davis data file.

**Fix:** Check that the AutoLocate Directory setting is correct, and there exists a Davis data file for the month and year of the MoTeC log file.

**Error 9:** No Weather data corresponds to the time of your MoTeC log file.

**Fix:** Critical error. This error is triggered when the timeframe of your MoTeC log file is outside that of the Davis data file for that date, (e.g. MoTeC log file timeframe: 7:00pm – 7:20pm, Weather data timeframe: 6:00am – 6:00pm). This may be caused by using an incorrect time zone for the venue of your MoTeC log file.