

# Plexon Inc

## Matlab Offline Files SDK

**6/20/2013**

Revision History (most recent last):			
DATE	REVISION	DESCRIPTION	ORIGINATOR
5/30/2013	1.0.0	Initial Version	Harvey Wiggins
6/20/2013	1.1.0	Added Read Block functionality	Al Bruns

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## Plexon Data File Import for Matlab

This package allows importing the data from Plexon .plx, pl2 or .ddt files into the Matlab workspace. It also allows writing continuous data from Matlab into a .ddt file.

The package contains:

1. Matlab Executable files (mexPlex.mexw32 and mexPlex.mexw64) that can be used in Windows to read .plx and .ddt files.
2. Compiled Matlab function files (.p files) to read .pl2 files. These files can be used in all operating systems supported by Matlab.
3. Matlab function files (.m files) that call mexPlex executable files (to read .plx and .ddt files) or call .p files (to read .pl2 files).
4. C++ source code that is used to compile mexPlex files in Windows and Linux.

Note: Matlab Executable files, the .m and .p files need to be installed in a path known to Matlab.

## Basic Functions

The following routines provide basic functionality to read plx and ddt files. See the .m files for usage and additional notes.

**plx\_info** – Reads count information about a plx file.

**plx\_information** - Reads extended header information from a .plx file

**plx\_chan\_filters** - Reads channel filter settings for each spike channel

**plx\_chan\_gains** - Reads channel gains for each channel from a .plx file

**plx\_chan\_thresholds** - Reads channel thresholds from a .plx file

**plx\_chan\_names** - Reads spike channel names from a .plx file

**plx\_chanmap** – Returns DSP channel number for each spike channel

**plx\_ts**– Reads spike timestamps for the specified DSP channel and unit

**plx\_waves**- Reads waveform data for the specified DSP channel and unit.

**plx\_waves\_v** - Reads waveform data for the specified DSP channel and unit. Waveform data are represented in millivolts.

**plx\_vt\_interpret** - Takes output of **plx\_event\_ts** and produces an array of coordinates.

**plx\_adchan\_freqs** - Reads the per-channel frequencies for analog channels

**plx\_adchan\_gains** - Reads analog channel gains from a .plx file

**plx\_adchan\_names** - Reads analog channel names from a .plx file

**plx\_adchan\_samplecounts** - Reads analog channel sample counts for .PLX file.

**plx\_ad\_chanmap** – Returns raw channel number for each analog channel

**plx\_ad** – Reads A/D data for the specified A/D channel

**plx\_ad\_span** - Reads a span of the A/D data for the specified A/D channel

**plx\_ad\_v** - Reads A/D data for the specified A/D channel. A/D data are represented in millivolts.

**plx\_ad\_span\_v** - Reads a span of the A/D data for the specified A/D channel. A/D data are represented in millivolts.

**plx\_ad\_gap\_info** – Similar to **plx\_ad/plx\_ad\_v** but returns only general information without A/D data.

**plx\_event\_names** - Reads event type names from a .plx file

**plx\_event\_ts** - Reads event data for the specified external event

**plx\_event\_chanmap** – Returns raw channel number for each event channel

**plx\_close** - Closes any open .plx files

**ddt** - Reads data from a .ddt file..

**ddt\_v** - Reads data from a .ddt file. A/D data are represented in millivolts.

**ddt\_write\_v** - Writes data to .ddt file. A/D data are represented in millivolts.

**plx\_mexplex\_version** - Returns the version of mexPlex library

## How to Read Data from PL2 Files

All existing **plx\_** routines work with pl2 files. For example,

```
[adfreq, n, ts, fn, ad] = plx_ad_v('C:\PlexonData\test1.pl2', 0);
```

will return the data for the first analog channel of pl2 file C:\PlexonData\test1.pl2. This means that you can use your existing Matlab scripts to process both plx and pl2 files.

Please note that you can now also use channel names in all the routines that return channel data:

```
[adfreq, n, ts, fn, ad] = plx_ad_v(filename, 'FP01' );
```

You can also use PL2-specific routines to read data from pl2 files. See the .m files for usage and additional notes.

**PL2GetFileIndex** – Reads file headers and other general info from a .pl2 file.

**PL2Ad** – Reads A/D data for the specified A/D channel.

**PL2AdBySource** – Reads A/D data for the specified A/D channel. The channel is specified using its source id.

**PL2AdSpan** – Reads a span of A/D data for the specified A/D channel.

**PL2AdBySource** – Reads a span of A/D data for the specified A/D channel.

**PL2AdTimeSpan** – Reads a time span of A/D data for the specified A/D channel.

**PL2AdTimeSpanBySource** – Reads a time span of A/D data for the specified A/D channel.

**PL2EventTs** – Reads event data for the specified external event.

**PL2EventTsBySource** – Reads event data for the specified external event.

**PL2StartStopTs** – Reads event data for the start/stop external event.

**PL2Ts** – Reads spike timestamps for the specified spike channel.

**PL2TsBySource** – Reads spike timestamps for the specified spike channel.

**PL2Waves** – Reads spike timestamps and waveforms for the specified spike channel.

**PL2WavesBySource** – Reads spike timestamps and waveforms for the specified spike channel.

**PL2ReadFirstDataBlock** – Reads the first data block in the file.

**PL2ReadNextDataBlock** – Reads the next data block in the file.

#### Notes:

1. The original versions of the MATLAB file import routines were written as pure .m scripts, with no underlying DLL. The DLL-based approach is thus several hundred times faster than the previous .m script-based approach. These old .m scripts are included into this distribution as the old\_scripts.zip file. These old .m files may be useful for instructive purposes or for those running MATLAB on non-Windows platforms. Otherwise, there is no reason to unzip the file. Note that these old .m files are no longer maintained, and new features and bug fixes will be not be added to them. Also note: when reading .plx or .ddt files into MATLAB on non-Windows platforms, be aware that there may be a byte-ordering issue. Plexon files are written with little-endian byte ordering, and MATLAB by default expects binary files with the system native byte-ordering, which may be big-endian on Mac platforms.
2. Conceptually, channels in .plx data files will be ‘collapsed’ into a contiguous block of n channels, regardless of their original numbering, and n is reported back as a return value in some calls. All access to the channel’s data through the API is via its new, ‘collapsed’ index 1..n. If there are gaps in the channel numbers in the original .plx file, the channels names returned from plx\_chan\_names (which have also been collapsed) can be used to identify the channel.