Generating LabChart for Windows Binary Files

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You need to know the file and channel header formats described below if you are creating a program to write out a LabChart-readable binary file from another application; and you may need to know the header formats (again, depending on the application) if you are importing a LabChart binary file into another application.

Essentially, the LabChart Binary format consists of a file header, a header for each sampling channel, followed by interleaved sample data.

File Header

The file header has the following format:

type	name	description
char	magic[4]	"CFWB"
long	Version	1
double	secPerTick	sample period in seconds
long	Year	4-digit year
long	Month	month 1-12
long	Day	day of month 1-31
long	Hour	hour 0-23
long	Minute	minute 0-59
double	Seconds	seconds
double	trigger	pre-trigger time in seconds
long	NChannels	number of channels
long	SamplesPer Channel	number of samples per channel
long	TimeChannel	1 => time included
long	DataFormat	1 = double 2 = float 3 = short

The file header has a size of 68 bytes. Note that the sample period (secPerTick) is the reciprocal of the sampling rate, so for example 0.01 represents 100 samples per second.

Channel Headers

The header continues with the channel headers; one header containing the following data for each of the NChannels (number of channels, specified in the file header).

Each channel header has the following format:

type	name	description
char	Title[32]	channel title
char	Units[32]	units name
double	scale	see text
double	offset	see text
double	RangeHigh	see text
double	RangeLow	see text

Each channel header has a size of 96 bytes. The scale and offset parameters are used for converting 16 bit samples into user units with: data = scale * (sample + offset). For the floating point data formats scale = 1.0 and offset = 0.0. The RangeHigh and RangeLow parameters are not used in this version of Translate Binary but may be applied in future versions to specify a suitable range for the display of the data in the channel.

Sample Data

The samples follow immediately after the last of the channel headers, the channels being interleaved. This means that samples are stored for each sampling 'tick' in turn, in the form:

Sample1Ch1, Sample1Ch2, Sample1Ch3, Sample2Ch1, Sample2Ch2, Sample2Ch3,…etc.

Example Source Code

Example source code for generating binary files that can be imported into LabChart can be found in the following source files:

ADIBinaryFormat.h – header file containing the above data structures.

TranslateBinary.c – example program generating a simple data file **test.bin.** This data file can be imported to LabChart using the Translate Binary extension.

This code is implemented in the programming language 'C' and has been tested with the Microsoft Visual C/C++ compiler under Visual Studio 2008. Note that in the compiler you use for your program, you will need to set the packing alignment for structures to the value '1', to ensure that LabChart can read the file. This is already done for Microsoft Visual C/C++ within the header file **ADIBinaryFormat.h**.