My Project

Generated by Doxygen 1.8.9.1

Wed Jul 15 2015 16:37:32

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Module Index

1.1 Modules

Here is a list of all modules:

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Data Structure Index

2.1 Data Structures

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File Index

3.1 File List

Here is a list of all documented files with brief descriptions:

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: Functions and parameters for dealing with command-line options 13

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: Sets up global flags for debug and quiet options 15

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Chapter 4

Module Documentation

4.1 Option subsystem return codes

Return codes used internally to indicate how to respond to parsing options.

Macros

- #define OPT_RET_OK 0

  Indicates successful option parsing. Continue program operation.
- #define OPT_RET_ERR -1

  Indicates an error occurred while parseing options. Exit with non-zero code.
- #define OPT_RET_EXIT -2

  Indicates program should exit normally without further activity.

4.1.1 Detailed Description

Return codes used internally to indicate how to respond to parsing options.

4.2 Option encoding bitmasks

Bit masks for encoding the flags for the various options that can be set on the command line.

Macros

- #define OPT_TEMPLATE_MASK (1u << 0)

  Flag for requested template file output. 0 is unset, 1 is set.
- #define OPT_RANDAMP_MASK (1u << 1)

  Flag for using random amplitudes for output. 0 is unset, 1 is set.
- #define OPT_HELPREQ_MASK (1u << 2)

  Flag for user-requested help. 0 is unset, 1 is set.
- #define OPT_FROMCMD_MASK (1u << 15)

  Flag indicating user input frequency specification via command-line options. 0 is unset, 1 is set.
- #define OPT_STARTSET_MASK (1u << 8)

  Flag indicating user specified a start frequency, found in progOptions::start_f. 0 is unset, 1 is set.
- #define OPT_STOPSET_MASK (1u << 9)

  Flag indicating user specified a stop frequency, found in progOptions::stop_f. 0 is unset, 1 is set.
- #define OPT_AMPSET_MASK (1u << 10)

  Flag indicating user specified an amplitude. If OPT_RANDAMP_MASK is not also set, found in progOptions::amplitude. 0 is unset, 1 is set.
- #define OPT_PERIODSET_MASK (1u << 11)

  Flag indicating pulse duration is set, found in progOptions::tooth_period. 0 is unset, 1 is set.
- #define OPT_NUMSET_MASK (1u << 12)

  Flag indicating the number of teeth is set, found in progOptions::num_f. 0 is unset, 1 is set.
- #define OPT_ALLSET_MASK (OPT_STARTSET_MASK | OPT_STOPSET_MASK | OPT_AMPSET_MASK | OPT_PERIODSET_MASK | OPT_NUMSET_MASK)

  Pre-combined set of flags for checking if all needed command line options are set.

4.2.1 Detailed Description

Bit masks for encoding the flags for the various options that can be set on the command line.

Options these flags refer to are stored in progOptions::flags

4.3 Expected filenames for I/O

File names are hard-coded here for use throughout the program.

Macros

- #define TEMPLATE_FILENAME "template.txt"

  File to output the frequency specification template to.
- #define INPUT_FILENAME "freqSpec.txt"

  File to read for frequency specification input.
- #define OUTPUT_ROOT "awgOutput"

  File name stem used.

4.3.1 Detailed Description

File names are hard-coded here for use throughout the program.

Chapter 5

Data Structure Documentation

5.1 freqList Struct Reference

Data Fields

- unsigned int **freqCount**
- unsigned int **actualSize**
- double * **freqList**
- double * **ampList**
- double * **durList**

The documentation for this struct was generated from the following file:

- C:/Users/Xenon-2/Documents/thething/src/genBinary/genBinary.h

5.2 progOptions Struct Reference

Structure to hold values for command-line options.

`#include <defOptions.h>`

Data Fields

- uint32_t flags

  Bit flags used to indicate on-off states for various options. See Option encoding bitmasks.
- double amplitude

  Amplitude chosen for combs with constant output-amplitude. In range [0, 1] (fraction of max).
- double start_f

  Start frequency, sets the lowest frequency to be output in the series of pulses. In MHz.
- double stop_f

  Stop frequency, sets the highest frequency to be output in the series of pulses. In MHz.
- unsigned int num_f

  The number of individual pulse to generate.
- double clock_freq

The sample output frequency. In MHz.

- double tooth_period

  The length of each pulse. In ns.

- char * inputPath

  C-string for a command-line specified frequency specification file path.

5.2.1 Detailed Description

Structure to hold values for command-line options.

Expected initialization found in OPT_INIT_VAL

See also

helpText TODO

The documentation for this struct was generated from the following file:

- C:/Users/Xenon-2/Documents/thething/src/defOptions/defOptions.h

Chapter 6

File Documentation

6.1 C:/Users/Xenon-2/Documents/thething/src/defOptions/defOptions.h File Reference

Functions and parameters for dealing with command-line options.

```
#include <inttypes.h>
```

Data Structures

- struct progOptions

  Structure to hold values for command-line options.

Macros

- #define OPT_RET_OK 0

  Indicates successful option parsing. Continue program operation.
- #define OPT_RET_ERR -1

  Indicates an error occurred while parseing options. Exit with non-zero code.
- #define OPT_RET_EXIT -2

  Indicates program should exit normally without further activity.
- #define OPT_TEMPLATE_MASK (1u << 0)

  Flag for requested template file output. 0 is unset, 1 is set.
- #define OPT_RANDAMP_MASK (1u << 1)

  Flag for using random amplitudes for output. 0 is unset, 1 is set.
- #define OPT_HELPREQ_MASK (1u << 2)

  Flag for user-requested help. 0 is unset, 1 is set.
- #define OPT_FROMCMD_MASK (1u << 15)

  Flag indicating user input frequency specification via command-line options. 0 is unset, 1 is set.
- #define OPT_STARTSET_MASK (1u << 8)

  Flag indicating user specified a start frequency, found in progOptions::start_f. 0 is unset, 1 is set.
- #define OPT_STOPSET_MASK (1u << 9)

  Flag indicating user specified a stop frequency, found in progOptions::stop_f. 0 is unset, 1 is set.
- #define OPT_AMPSET_MASK (1u << 10)

Flag indicating user specified an amplitude. If OPT_RANDAMP_MASK is not also set, found in progOptions::amplitude. 0 is unset, 1 is set.

- #define OPT_PERIODSET_MASK (1u << 11)

  Flag indicating pulse duration is set, found in progOptions::tooth_period. 0 is unset, 1 is set.

- #define OPT_NUMSET_MASK (1u << 12)

  Flag indicating the number of teeth is set, found in progOptions::num_f. 0 is unset, 1 is set.

- #define OPT_ALLSET_MASK (OPT_STARTSET_MASK | OPT_STOPSET_MASK | OPT_AMPSET_MASK | OPT_PERIODSET_MASK | OPT_NUMSET_MASK)

  Pre-combined set of flags for checking if all needed command line options are set.

- #define TEMPLATE_FILENAME "template.txt"

  File to output the frequency specification template to.

- #define INPUT_FILENAME "freqSpec.txt"

  File to read for frequency specification input.

- #define OUTPUT_ROOT "awgOutput"

  File name stem used.

- #define OPT_INIT_VAL {0, 0.0, 0.0, 0.0, 0, 1024.0, 0.0, NULL}

  Initialization data for a progOptions instantiation.

Typedefs

- typedef struct progOptions progOptions_type

  Structure to hold values for command-line options.

Functions

- int **parseOptions** (int argc, char *argv[ ], progOptions_type *options)
- void **printOptions** (const progOptions_type *toPrint, const char *idStr)
- void **printBitSetting** (uint32_t flags, unsigned int mask, const char *title)

Variables

- int g_opt_debug

  Whether -d/–debug has been set. 0 is unset, 1 is set.

- int g_opt_quiet

  Whether -q/–quiet has been set. 0 is unset, 1 is set.

6.1.1 Detailed Description

Functions and parameters for dealing with command-line options.

Contains the functions used to handle parsing of input flags, printing out debug information about set options, and masks used to decode flags.

6.1.2 Typedef Documentation

6.1.2.1 typedef struct progOptions progOptions_type

Structure to hold values for command-line options.

Expected initialization found in OPT_INIT_VAL

See also

helpText TODO

6.2 C:/Users/Xenon-2/Documents/thething/src/defOptions/defOptions_int.h File Reference

Sets up global flags for debug and quiet options.

Variables

- int g_opt_debug = 0

  Whether -d/–debug has been set. 0 is unset, 1 is set.
- int g_opt_quiet = 0

  Whether -q/–quiet has been set. 0 is unset, 1 is set.

6.2.1 Detailed Description

Sets up global flags for debug and quiet options.

6.3 C:/Users/Xenon-2/Documents/thething/src/defOptions/templateContents.h File Reference

Content of the template file printed with the -t or –template flags.

Variables

- const char templateStr [ ]

  The full template file contents.

6.3.1 Detailed Description

Content of the template file printed with the -t or –template flags.

Contained here in its entirety to allow easy editing in the future.

6.3.2 Variable Documentation

6.3.2.1 const char templateStr[ ]

Initial value:

```
="# Lines starting with '#' are comments\n\
# All other lines should be in the following format\n\
# freq [MHz], duration [ns], amplitude [relative, [0,1] ]\n\
# durations are a goal, not a guarantee, will be rounded to nearest 1/2 cycle of freq (including 0!)\n\
# amplitudes relative scales, where 1 is full-scale.\n\
# Output is only 8-bit, so effective amplitude resolution is 1/127 ~ 0.008\n\
#\n\
# Example line of 111 MHz for 30ns, with 3/4 full scale amplitude\n\
# 100, 30, 0.75\n\
"
```

The full template file contents.

The template file will be written to disk when the full program is called with the -t or –template flags. This gives an example of how to specify the output pulses, as well as a description of how it will actually work internally.

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