Ibischk5/6 Specification Document Update

DAC IBIS Summit, San Francisco CA
June 5, 2014

Bob Ross

Teraspeed Consulting Group

bob@teraspeed.com

Mike LaBonte

Signal Integrity Software (SiSoft)

mikelabonte@eda.org

Updated from European IBIS Summit, May 14, 2014

TERASPEED CONSULTING GROUP

Outline

- Ibischk5 specification
  - Document update
  - Work in progress
- Example of Specification page
- Current ibischk Release Activity
- Conclusions

TERASPEED CONSULTING GROUP

Outline of ibischk5 Parser Spec

Contents

● ● ●

● ● ●

© 2014 Teraspeed Consulting Group LLC

TERASPEED CONSULTING GROUP

Command Line for ibischk5

```
Usage: ibischk5          <IBS filename>
     : ibischk5  -ebd <EBD filename>
     : ibischk5  -pkg <PKG filename>
     : ibischk5  -ami <AMI filename>
Usage: ibischk5  -caution -numbered        <IBS filename>
     : ibischk5  -caution -numbered -ebd <EBD filename>
     : ibischk5  -caution -numbered -pkg <PKG filename>
     : ibischk5  -caution -numbered -ami <AMI filename>
The flags prior to the file name can be in any order,
and the -caution and/or -numbered flags are optional.
```

- **–ami** for <file_name>.ami (algorithmic model interface control file)
- **–numbered** for numbered **E**rror, **W**arning, **N**otes, **C**aution, and **B**ug messages

© 2014 Teraspeed Consulting Group LLC

TERASPEED CONSULTING GROUP

ibischk5 {–numbered} –ami file4.ami

```
Checking file4.ami for IBIS 5.0 Compatibility...

ERROR - Illegal Usage value A specified for Param1
ERROR - Illegal Type value B specified for Param1
ERROR - Illegal Format value C specified for Param1
ERROR - No Reserved_Parameters found

Errors  : 4

File Failed
```

```
Checking file4.ami for IBIS 5.0 Compatibility...

E4627 - Illegal Usage value A specified for Param1
E4627 - Illegal Type value B specified for Param1
E4627 - Illegal Format value C specified for Param1
E4622 - No Reserved_Parameters found

Errors  : 4

File Failed
```

© 2014 Teraspeed Consulting Group LLC

**TERASPEED
CONSULTING
GROUP**

Parser Classifications –numbered for message numbers

- E – Error (violation of a specification rule or serious modeling convention violation)

- W – Warning (out of range data or other unexpected model data)

- C – Caution (requires caution flag, legal but probably wrong entry)

- N – Note (so far, used for non-monotonic tables)

- B – Program Bug (an Internal Error that may be related to operating system, memory allocation or ambiguous code branches

- U – Unused (message that is no longer available)
  - moved to Comment column as "No Longer Used"

© 2014 Teraspeed Consulting Group LLC

TERASPEED CONSULTING GROUP

1200+ Unique Message Strings

http://www.eda.org/ibis/ibischk5/ibischk5_messages_draft2.xlsx

Number	Symbol in Code	Message string	Parameters	Comment	Category	Clasification
100	MDL_ERR_0	Unable to Allocate Memory: %s %d	filename, line number	The code failed to allocate memory in <filename> at <linenumber>	Internal Error	E
101	MDL_ERR_1	Unable to get IBIS structure		Program data structures are corrupt	Internal Error	E
102	MDL_ERR_2	Orphan Model keyword.		Model keyword found but not within a Model declaration	Error with IBIS file Line number	E
103	MDL_ERR_3	Illegal Digital Port <%s> (not allowed in SPICE Ports section)	portname	Improper use of Digital port <portname>	Error with IBIS file Line number	E
104	MDL_ERR_4	D_switch not allowed with (D_drive,D_receive,or D_enable) in		Improper use of D_switch	Error with IBIS file Line number	E
105	MDL_ERR_5	%s not allowed with D_switch in Ports/A2D/D2A Section			Error with IBIS file Line number	E
106	MDL_ERR_6	Reserved Digital Port <%s> used as	portname	Improper use of Reserved Digital port <portname>	Error with IBIS file Line number	E
107	MDL_ERR_7	Orphan data line keyword.		A Model related data line was found where none was expected	Error with IBIS file Line number	E
108	MDL_ERR_8	TTgnd Typical value should be >0		Improper TTgnd typical value	Error with IBIS file Line number	E
109	MDL_ERR_9	TTgnd Min value should be >0		Improper TTgnd minimum value	Error with IBIS file Line number	E
110	MDL_ERR_10	TTgnd Max value should be >0		Improper TTgnd maximum value	Error with IBIS file Line number	E
111	MDL_ERR_11	TTgnd typ value is not in between		Improper range for TTgnd	Warning	W
112	MDL_ERR_12	TTpower Typical value should be >0		Improper TTpower typical value	Error with IBIS file Line number	E
113	MDL_ERR_13	TTpower Min value should be >0		Improper TTpower minimum value	Error with IBIS file Line number	E
114	MDL_ERR_14	TTpower Max value should be >0		Improper TTPower maximum value	Error with IBIS file Line number	E
115	MDL_ERR_15	TTpower typ value is not in between		Improper range for TTPower	Warning	W
116	MDL_ERR_16	[Model Spec] should be specified immediately after all the subparameters of a model and		Improper positioning of [Model Spec]	Error with IBIS file Line number	
117	MDL_ERR_17	[Receiver Thresholds] should not be specified for model type %s	modeltype	Receiver thresholds are not allowed for a <modeltype> which is not an Input or I/O model type	Warning with IBIS file Line number	W
118	MDL_ERR_18	[Add Submodel] should be specified before other keywords for a model		Improper positioning of [Ad Submodel]	Error with IBIS file Line number	E
119	MDL_ERR_19	%s Already Defined For Model '%s'	sub parameter/keyword, modelname	A model <sub-parameter or keyword> was already defined for <modelname>	Error with IBIS file Line number	E
120	MDL_ERR_20	[Receiver Thresholds] should be specified immediately after all the subparameters of a model and before the other keywords of a		Improper positioning of [Receiver Thresholds] keyword	Error with IBIS file Line number	E
121	MDL_ERR_21	Expecting Keyword. Invalid Line		An invalid line was found where a keyword was expected	Error with IBIS file Line number	E

© 2014 Teraspeed Consulting Group LLC

TERASPEED CONSULTING GROUP

Example – Error 102

```
IBISCHK5 V5.1.4

Checking error_number_example.ibs for IBIS 3.2
Compatibility...

E0102 (line  133) - Orphan Model keyword.

Errors  : 1

File Failed
```

MDL Section Message (from a converted spread sheet)

102	MDL_ERR_2	Orphan Model keyword.		Model keyword found but not within a l declaration

© 2014 Teraspeed Consulting Group LLC

TERASPEED CONSULTING GROUP

Semi-automated Documentation Steps

Initial spread sheet from parser developer

Modify spread sheet by script

Sort by Symbol (source code modules)
and move entries into sections

Final editing of comments and indexing of
message numbers to sections

© 2014 Teraspeed Consulting Group LLC

Sample Section Page
(Based on Converted Spreadsheet)

MDL Checks

ErrNum	Symbol	Message/Comments
B0100	MDL ERR 0	Unable to Allocate Memory <filename> <linenum>
		The code failed to allocate memory in
B0101	MDL ERR 1	Unable to get IBIS structure <filename> <linenum>
		Program data structures are corrupt
E0102	MDL ERR 2	(line <linenum>) - Orphan Model keyword.
		Model keyword found but not within a Model declaration
E0103	MDL ERR 3	(line <linenum>) - Illegal Digital Port <<portname>> (not allowed in SPICE Ports section)
		Improper use of Digital port
E0104	MDL_ERR_4	(line <linenum>) - D_switch not allowed with (D_drive, D_receive, or D_enable) in Ports/A2D/D2A Section
		Improper use of D switch
E0105	MDL ERR 5	(line <linenum>) - <portname> not allowed with D switch in Ports/A2D/D2A Section
		(D receive; D enable; D drive) are not allowed with D switch
E0106	MDL ERR 6	(line <linenum>) - Reserved Digital Port <<portname>> used as analog port
		Improper use of Reserved Digital port
E0107	MDL ERR 7	(line <linenum>) - Orphan data line keyword.
		A Model related data line was found where none was expected
E0108	MDL ERR 8	(line <linenum>) - TTgnd Typical value should be > 0
		Improper TTgnd typical value

© 2014 Teraspeed Consulting Group LLC

TERASPEED CONSULTING GROUP

Ongoing Project by Iteration

- Process used to correct source spread sheet
- Comments expanded (for example, the percent thresholds for Errors and Warnings for V-T matching)
- Some related messages will be described (such as different non-monotonic messages)
- Some comments will remain incomplete or TBD
- Indexing of message numbers to sections or pages planned

TERASPEED CONSULTING GROUP

Current ibischk Release Activity

- Ibischk5 V5.1.4 released September, 2013 (tables based on this release)

- New ibischk6 V6.0.0 expected May - June, 2014
  - New features per IBIS Version 6.0 plus BUG fixes
  - A few more messages expected in the parser document specification
  - Semi-automated process expected to speed up production of new ibischk specification document
  - Ibischk6 parser expected under: http://www.eda.org/ibis/ibischk6/

TERASPEED CONSULTING GROUP

Closure

- Parser specification for ibischk5 being produced

- For best checking results, use the latest version of ibischk5 or ibischk6 when available

- Parser being updated as new BUG reports are submitted and processed

- Work for ibischk6 due soon

© 2014 Teraspeed Consulting Group LLC

TERASPEED CONSULTING GROUP