following is a list of known issues with the IBIS Specification Version 6.1 document. These are editorial issues deemed to have no functional impact on the specification.

All page numbers refer to the Adobe PDF version.

1. (from Arpad Muranyi, Mentor Graphics)

On page 202 the "GENERAL RESERVED PARAMETERS" section heading is not numbered and is also separated from the section, which begins on the next page. It should be numbered 10.4 and have "Keep with Next" on. Note that this will change the numbering of the existing sections 10.4 through 10.8.

1. (from Curtis Clark, ANSYS)

On page 56, the last sentence on the page (just prior to Figure 7), says:

"The output is connected to the GND (typical) value as shown in Figure 7."

The "GND" should be changed to "VCC" (Figure 7 properly shows the output connected to VCC).

1. (from Arpad Muranyi, Mentor Graphics)

On page 193, the spelling "Model\_Specific" is used.

1. (from Michael Mirmak, Intel Corp.)

On page 28, "Sub-Params:" should use italic font. Likewise, on page 65, "Sub-Params:" should use italic font.

1. (from Radek Biernacki, Keysight Technologies)

In the examples of IBIS-AMI parameters spanning pages 235-236 in the IBIS 6.1 specification, the last two examples are missing the Format, such as Value, shown in the first three examples.

1. (from Curtis Clark, ANSYS)

Page 232: Change:

In summary, UI, bit\_time and symbol\_time are the same and correspond to the time between the waveform sampled at the receiver latch.

To:

In summary, UI, bit\_time and symbol\_time are the same and correspond to the time between the waveform edges sampled at the receiver latch.

Page 234: Change:

The PAM4\_Mapping parameter is ignored when the AMI Reserved Parameter Modulation is not declared or set to "NRZ".

To:

The PAM4\_Mapping parameter is ignored when the AMI Reserved Parameter Modulation is not declared or is declared and set to "NRZ".

Page 235: Change:

The PAM4\_UpperThreshold, PAM4\_CenterThreshold and PAM4\_LowerThreshold parameters are ignored when the AMI Reserved Parameter Modulation is declared or set to "NRZ".

To:

The PAM4\_UpperThreshold, PAM4\_CenterThreshold and PAM4\_LowerThreshold parameters are ignored when the AMI Reserved Parameter Modulation is not declared or is declared and set to "NRZ".

Page 237: Change:

The PAM4\_UpperEyeOffset, PAM4\_CenterEyeOffset and PAM4\_LowerEyeOffset parameters are ignored when the AMI Reserved Parameter Modulation is not declared or set to "NRZ".

To:

The PAM4\_UpperEyeOffset, PAM4\_CenterEyeOffset and PAM4\_LowerEyeOffset parameters are ignored when the AMI Reserved Parameter Modulation is not declared or is declared and set to "NRZ".

1. (from Curtis Clark, ANSYS)

Page 242: Change:

The digital stimulus shall have values of -½ and +½.

To:

If Modulation is NRZ the digital stimulus shall have values of -½ and +½. For other Modulation values see MODULATION RESERVED PARAMETERS.

1. (from Bob Ross, Teraspeed Labs)

Page 4, Change http://www.eda.org/ibis/ to http://www.ibis.org/

1. (from Bob Ross, Teraspeed Labs)

Page 72, Change Last Sentence of

Figure 16 illustrates a general configuration from which a [Rising Waveform] or [Falling Waveform] is extracted. The DUT die shows all of the available power and ground pin reference voltage terminals. For many buffers, only one power pin and one common ground pin terminal are used. The absolute GND is the reference for the V\_fixture voltage and the package model equivalent network. It can also serve as a reference for C\_comp, unless C\_comp is optionally split into component attached to the other reference voltages.

to:

Figure 16 illustrates a general configuration from which a [Rising Waveform] or [Falling Waveform] is extracted. The DUT die shows all of the available power and ground pin reference voltage terminals. For many buffers, only one power pin and one common ground pin terminal are used. The absolute GND is the reference for the V\_fixture voltage and the package model equivalent network. It can also serve as a reference for C\_comp, unless C\_comp is optionally split into the other reference voltages.

1. (from Michael Mirmak, Intel)

Page 41, change:

The current flow convention for Weak\_I is similar to that of [GND Clamp] and {POWER Clamp] tables.

to:

The current flow convention for Weak\_I is similar to that of [GND Clamp] and [POWER Clamp] tables.

1. (from Michael Mirmak, Intel)

The example on p.180 of the 6.1 PDF is actually illegal, for five reasons:

* 1. Resolve\_Exists is not legal in IBIS 5.0 and, without AMI\_Version, IBIS 5.0 is assumed by the parser.
	2. Model\_Name is not legal in IBIS 5.0 and, without AMI\_Version, IBIS 5.0 is assumed by the parser.
	3. Usage Dep is not legal in IBIS 5.0 and, without AMI\_Version, IBIS 5.0 is assumed by the parser.
	4. Init\_Returns\_Impulse is not included, and it’s required.
	5. GetWave\_Exists is not included, and it’s required.

The text below, with additions shown in red, enables the example to pass IBISCHK6.

(Rx\_model

(Reserved\_Parameters

(AMI\_Version (Usage Info) (Type String) (Value "6.1")

(Description "This is a v6.1 AMI file."))

(Resolve\_Exists (Usage Info) (Type Boolean) (Value True)

(Description "Indicates whether the executable model implements AMI\_Resolve."))

(Model\_Name (Usage In) (Type String) (Value "ignore\_me")

(Description "IBIS model name"))

 (Rx\_Receiver\_Sensitivity (Usage Out) (Type Float) (Range 0.0 0.0 0.01)

(Description "Value depends on OP\_mode and data rate"))

 (Init\_Returns\_Impulse (Usage Info) (Type Boolean) (Default True)

 (Description "Impulse response is returned"))

(GetWave\_Exists (Usage Info) (Type Boolean) (Default True)

(Description "GetWave Exists"))

)

 (Model\_Specific

 (Tstonefile (Usage Dep) (Type String) (Value "ignore\_me.s4p")

 (Description "Rx analog model. Value depends on OP\_mode"))

(my\_corner (Usage In) (Type String) (Corner "Typ" "Min" "Max")

 (Description "Informs the executable model what corner is selected by user"))

(OP\_mode (Usage In) (Type Integer) (List 0 1 2 3)

(Description "Operation mode"))

)

)

1. (from Curtis Clark, ANSYS)

Under Top Level Model on page 78 we have:

The [Add Submodel] keyword lists of name of each submodel and the permitted mode (Driving, Non-Driving or All) under which each added submodel is used.

It needs to say "lists the name" instead of "lists of name".

1. (From Radek Biernacki, Keysight, 6 Jan 2017 Open Forum)

Sentence fragments following a formula should not have leading capitals. For example:

*Other Notes:* The output voltage waveform is calculated as follows:

Output\_wave(t) = wave(t) + Rx\_Noise \* gaussian\_rand()

Where wave(t) is the waveform returned by Rx AMI\_GetWave and gaussian\_rand() is a function that returns floating point numbers between -inf and +inf.

The example is from BIRD188, passed after IBIS 6.1. However, it is believed IBIS 6.1 may contain similar instances.

1. (from Curtis Clark, ANSYS)

The Rx\_Dj description contains the following example (pg 226 of the .pdf):

(Rx\_Dj (Usage Info) (Value 0.1) (Type UI) (Description "Tx Bounded Jitter in UI."))

The Description string should say "Rx" not "Tx". Also, the examples for Rx\_Sj and Rx\_DCD say "RX" instead of "Rx" in their Description strings.

1. (from Arpad Muranyi, Mentor, A Siemens Business)

The example on page 245 lacks “tx\_non\_inv\_pin” on the [Repeater Pin] line.

1. (from Mike LaBonte, SiSoft)

On page 172:

It is assumed that the [Model] Model\_type, use of [Algorithmic Model] Executable\_Rx and/or Executable\_Tx subparameters, and .ami file Reserved\_Parameter directions are consistent (e.g., that a [Model] of Model\_type I/O shall have associated [Algorithmic Model] Executable\_Rx and/or Executable\_Tx subparameters, each with unique .ami file associations where the .ami files use only Tx-capable and only Rx-capable Reserved Parameters, respectively).

Should be:

It is assumed that the [Model] Model\_type, use of [Algorithmic Model] Executable\_Rx and/or Executable\_Tx subparameters, and .ami file Reserved Parameters’ directions are consistent (e.g., that a [Model] of Model\_type I/O shall have associated [Algorithmic Model] Executable\_Rx and/or Executable\_Tx subparameters, each with unique .ami file associations where the .ami files use only Tx-capable and only Rx-capable Reserved Parameters, respectively).

On page 193:

* The “Reserved\_Parameter” section is required while the “Model\_Specific” section is optional.
* For AMI\_Version 5.1 and above, the Reserved\_Parameter branch shall appear before the Model\_Specific branch.  Branches may be in any order in the AMI parameter definition file. The “|” character is the comment character.  Any text after the “|” character until the end of the line will be ignored by the parser.

Should be:

* The “Reserved\_Parameters” section is required while the “Model\_Specific” section is optional.
* For AMI\_Version 5.1 and above, the Reserved\_Parameters branch shall appear before the Model\_Specific branch.  Branches may be in any order in the AMI parameter definition file. The “|” character is the comment character.  Any text after the “|” character until the end of the line will be ignored by the parser.
1. From Arpad Muranyi, Mentor, a Siemens Business

This is about a minor typo that we should fix in the next version. Note that in the second line of this

excerpt, “MyVHigh” is spelled with a capitol “H”, while the same parameter in the first D\_to\_A line

is spelled with a lower case “h”. Considering that “MyVlow” uses a lower case “l”, we should use a

lower case “h” for “MyVhigh” also. Please add this to your editorial fixes list, as I am not going to

keep track of it… (While we are at it, we could also align the “=” signs neatly…).



1. From Arpad Muranyi, Mentor, a Siemens Business

On the top of pg. 142, “Subparameters” on the 6th line should start on a new line.

1. From Arpad Muranyi, Mentor, a Siemens Business

I found a sentence that needs a little wordsmithing on pg. 104:



The corresponding text on pg. 125 is different, and doesn’t need any correction.

*Mike LaBonte: Change “measure” to “measuring”.*

1. From Michael Mirmak, Intel

I believe there’s a minor editorial issue with the usage of “platform” vs. “operating system” and “architecture” in IBIS 6.1. While there are a few fixes that could be made in this area, the most striking one is on page. 172:

The EDA tool will check for the compiler information and verify if the executable model file is compatible with the operating system and platform.

Multiple occurrences, without duplication, of Executable are permitted to allow for providing executable model files for as many combinations of operating system platforms and compilers for the same algorithmic model.

I believe this should be:

The EDA tool will check for the compiler information and verify if the executable model file is compatible with the platform (operating system and architecture).

Multiple occurrences, without duplication, of Executable are permitted, to support executable model files for many combinations of operating system, architecture, and compiler for the same algorithmic model.

1. From Bob Ross, Teraspeed Labs

We for PAM4\_\*Threshold parameters, the second set of (Value \*) words are missing (pages 235-236)

The bigger question is why are we repeating the Reserved parameters in the last three parameter lines below (red)?

Examples:

(PAM4\_LowerThreshold (Usage Info) (Value -0.333) (Type Float)

(Description "Lower eye voltage threshold for waveform and eye processing.")

)

(PAM4\_CenterThreshold (Usage Info) (Value 0.0) (Type Float)

 (Description "Center eye voltage threshold for waveform and eye

 processing.")

)

(PAM4\_UpperThreshold (Usage Info) (Value 0.333) (Type Float)

 (Description "Upper eye voltage threshold for waveform and eye

 processing.")

)

(PAM4\_LowerThreshold (Usage Out) (Type Float)

 (Description "Lower eye voltage threshold returned by AMI\_Init.")

)

(PAM4\_CenterThreshold (Usage Out) (Type Float)

 (Description "Center eye voltage threshold returned by AMI\_Init.")

)

(PAM4\_UpperThreshold (Usage Out) (Type Float)

 (Description "Upper eye voltage threshold returned by AMI\_Init.")

)

The red lines should be deleted.

1. (from Arpad Muranyi, Mentor, a Siemens Business)

I discovered a few problems with the verbiage in the [External Model] and [External Circuit]

sections, which we might want to address as an editorial correction.

Quoting from pg. 110:

“If at-pad measurements for a SPICE, IBIS-ISS, Verilog-A(MS) or VHDL-A(MS) model are desired, the A\_signal\_pos port would be named in the A\_to\_D line under port1 and A\_signal\_neg under port2. The A\_to\_D converter then effectively acts “in parallel” with the load of the buffer circuit. If internal measurements are desired (e.g., if the user wishes to view the signal after processing by the input buffer), the user-defined analog signal port would be named in the A\_to\_D line under port1.”

Note that the paragraph begins with: “IMPORTANT: For true-differential buffers under [External Model]…”,

and the first part of the quoted text above talks about A\_signal\_pos/neg and port1/2.  While I realize that

the receiver model in [External Model] could have a single ended output, it could just as easily have a

differential output.  Consequently, the highlighted text should really address both cases, single ended

output and differential output at the core side.  For this reason it might be useful to change the highlighted

above text to something along these lines:

“If at-pad measurements for a SPICE, IBIS-ISS, Verilog-A(MS) or VHDL-A(MS) model are desired, the A\_signal\_pos port would be named in the A\_to\_D line under port1 and A\_signal\_neg under port2. The A\_to\_D converter then effectively acts “in parallel” with the load of the buffer circuit. If internal measurements are desired (e.g., if the user wishes to view the signal after processing by the input buffer), the ports in the A\_to\_D line would name either two user-defined analog output signal port names if the input buffer’s output is differential, or one user-defined analog output signal port name and a reserved or user-defined reference port name if the input buffer’s output is single ended.”

The corresponding section on pg. 125 has the same problem in the highlighted text at the end of the

following quote, but in addition to that, this section has another problem because it uses “A\_signal”

twice, while the spec states on pg. 123 that under the [External Circuit] keyword only the digital

reserved port names have special meaning.  The illustration in Figure 29 uses “A\_mysig” for the pad

side analog signal port name, so we should probably use something similar in this text also.  I would

suggest to change this text:

“However, for [External Circuit]s, the user may choose whether to measure the analog input response in the usual fashion or internal to the circuit (this does not preclude tools from reporting digital D\_receive and/or analog responses in addition to normal A\_signal response). If native IBIS measurements are desired, the A\_signal port would be named in the A\_to\_D line under port1. The A\_to\_D converter then effectively acts “in parallel” with the load of the circuit. If internal measurements are desired (e.g., if the user wishes to view the signal after processing by the receiver), the user-defined analog signal port would be named in the A\_to\_D line under port1.”

to something along these lines:

“However, for [External Circuit]s, the user may choose whether to measure the analog input response in the usual fashion or internal to the circuit (this does not preclude tools from reporting digital D\_receive and/or analog responses in addition to normal at-pad response). If native IBIS measurements are desired, the ports in the A\_to\_D line would name either two user-defined analog input signal port names if the input buffer is differential, or one user-defined analog input signal port name and a user-defined reference port name if the input buffer is single ended.  The A\_to\_D converter then effectively acts “in parallel” with the load of the circuit. If internal measurements are desired (e.g., if the user wishes to view the signal after processing by the receiver), the ports in the A\_to\_D line would name either two user-defined analog output signal port names if the input buffer’s output is differential, or one user-defined analog output signal port name and a user-defined reference port name if the input buffer’s output is single ended.”

In short, I would like to propose to change the yellow highlighted text to the green

highlighted text.  I hope this is not too much to do without a BIRD…  Questions,

comments welcome, as usual.

1. (from Bob Ross, Teraspeed Labs)

Another note on Version 6.1: (#23?)

Pg. 193, 8th bullet: Model\_Specifiic  Model\_Specific

Last Updated: August 03, 2018