**BUFFER ISSUE RESOLUTION DOCUMENT (BIRD)**

**BIRD NUMBER:** 190

**ISSUE TITLE:** Clarification for Redriver Flow

**REQUESTOR:**  Ambrish Varma, Cadence Design Systems, Inc.

**DATE SUBMITTED:** June 14, 2017

**DATE REVISED:**

**DATE ACCEPTED:** Rejected April 22, 2022

**DEFINITION OF THE ISSUE:**

As currently written, the reference flow for a Redriver is not clear that the downstream Rx equalization in the AMI\_Init function should not expect the overall equalized impulse response prior to the downstream Rx.

This BIRD proposes to add a similar note that is currently present in the time domain simulation reference flow on page 178 that makes this clear to the model maker.

**SOLUTION REQUIREMENTS:**

The IBIS specification must meet these requirements:

Table : Solution Requirements

|  |  |
| --- | --- |
| Requirement | Notes |
| 1. Add section in Red to page 243 between Step 6 and Step 7.
 | Entire page 243 text is copied in this BIRD with the added section in Red and current text in the spec in black. |

**SUMMARY OF PROPOSED CHANGES:**

For review purposes, the proposed changes are summarized as follows:

Table : IBIS Keywords, Subparameters, AMI Reserved\_Parameters, and AMI functions Affected

|  |  |  |
| --- | --- | --- |
| Specification Item | New/Modified/Other | Notes |
| The time domain simulation flow for a Repeater link on page 243 | Clarification added |  |

**PROPOSED CHANGES:**

*(Include the section in Red to page 243 between Step 6 and Step 7. The text in black is the text in the latest version of IBIS specification.)*

Here Tx1 denotes the Repeater upstream channel (channel 1) Tx AMI model (including analog and

algorithmic models), Rx1 the Repeater Rx AMI model (including analog and algorithmic models),

Tx2 the Repeater Tx AMI model (including analog and algorithmic models) and Rx2 the Repeater

downstream channel (channel 2) Rx AMI model (including analog and algorithmic models).

Step 1. The EDA tool obtains the impulse response of the upstream analog channel, which

represents the combined impulse response of Tx1’s analog model, physical channel 1, and Rx1’s

analog model.

Step 2. The output of step 1 is presented to Tx1’s AMI\_Init function and Tx1’s AMI\_Init function

is executed.

Step 3. The output of step 2 is presented to Rx1’s AMI\_Init function and Rx1’s AMI\_Init function

is executed.

Step 4. The EDA tool obtains the impulse response of the downstream analog channel, which

represents the combined impulse response of Tx2’s analog model, physical channel 2, and Rx2’s

analog model.

Step 5. The output of step 4 is presented to Tx2’s AMI\_Init function and Tx2’s AMI\_Init function

is executed.

Step 6. The output of step 5 is presented to Rx2’s AMI\_Init function and Rx2’s AMI\_Init function

is executed.

Note: The Rx2 executable model file writer for the downstream channels with Redrivers should keep in mind that the impulse response that is presented to the Rx AMI\_Init function does not include the effects of the upstream equalization. Therefore, the Rx AMI\_Init function will not be able to perform accurate optimization in the absence of the upstream channel characteristics and/or equalization effects. For this reason, the parameters of the Rx AMI\_Init function should always default to valid values or have a mechanism to accept user-defined coefficients and allow the user to turn off any automatic optimization routines to ensure successful simulations.

Step 7. The EDA tool performs simulation on the upstream channel, which consists of Tx1,

physical channel 1, and Rx1, according to the AMI flow defined in the specification for channels

without Repeaters.

Step 8a. Redriver: The EDA tool uses the signal waveform at the output end of Rx1’s algorithmic

model in step 7, regardless whether Rx1’s AMI\_GetWave exists or not, as the stimulus of Tx2’s

algorithmic model, regardless whether Tx2’s AMI\_GetWave exists or not, and performs simulation

on the downstream channel, which consists of Tx2, physical channel 2 and Rx2, according to the

AMI flow defined in the spec for channels without Redrivers.

**BACKGROUND INFORMATION/HISTORY:**

There was confusion in the IBI-AMI user base about how to treat AMI models which optimize in the Rx AMI\_Init. The clarification in this BIRD adds text to the specification mentioning to the model writer that they should not expect the entire downstream characterization/equalization when using the AMI\_Init.