**Common VVC Methods (Command Distribution Methods)** –Quick Reference

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| [**await\_completion**](#await_completion) (vvc\_target, vvc\_instance\_idx, [vvc\_channel,] [wanted\_idx,] [timeout, [msg, [scope]]])  [**await\_completion**](#await_completion) (ANY\_OF, vvc\_info\_list, timeout, [list\_action, [msg, [scope]]]) |
| Example: await\_completion(SBI\_VVCT, 1, 100 ns, “Waiting for all SBI commands to complete”);  Example: await\_completion(UART\_VVCT, 1, RX, v\_idx, 100 ns, “Waiting for UART receive to complete”, C\_SCOPE);  Example: await\_completion(ANY\_OF, my\_vvc\_info\_list, 1 ms, KEEP\_LIST, "Waiting for any VVC in the list to complete", C\_SCOPE); |

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| [**get\_last\_received\_cmd\_idx**](#get_last_received_cmd_idx) (vvc\_target, vvc\_instance\_idx, [vvc\_channel, [scope]]) |
| Example: v\_cmd\_idx := get\_last\_received\_cmd\_idx (SBI\_VVCT, 1);  Example: v\_cmd\_idx := get\_last\_received\_cmd\_idx (UART\_VVCT, 1, RX); |

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| [**terminate\_current\_command**](#terminate_currant_command) (vvc\_target, vvc\_instance\_idx, [vvc\_channel, [msg, [scope]]]) |
| Example: terminate\_current\_command(SBI\_VVCT, 1); |

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| [**terminate\_all\_commands**](#terminate_all_commands) (vvc\_target, vvc\_instance\_idx, [vvc\_channel, [msg, [scope]]]) |
| Example: terminate\_all\_commands(UART\_VVCT, 1, RX); |

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| [**await\_any\_completion**](#await_completion) () |
| *Note: this procedure will be deprecated in future releases, see page 4 for syntax and more info.* |

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| [**enable\_log\_msg**](#enable_log_msg) (vvc\_target, vvc\_instance\_idx, [vvc\_channel,] msg\_id, [msg, [quietness, [scope]]]) |
| Example: enable\_log\_msg(UART\_VVCT, 1, RX, ID\_BFM); |

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| [**disable\_log\_msg**](#disable_log_msg) (vvc\_target, vvc\_instance\_idx, [vvc\_channel,] msg\_id, [msg, [quietness, [scope]]]) |
| Example: disable\_log\_msg(SBI\_VVCT, 1, ID\_BFM); |

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| [**flush\_command\_queue**](#flush_command_queue) (vvc\_target, vvc\_instance\_idx, [vvc\_channel,] [msg, [scope]]) |
| Example: flush\_command\_queue(AXILITE\_VVCT, 1); |

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| [**fetch\_result**](#fetch_result) (vvc\_target, vvc\_instance\_idx, [vvc\_channel,] wanted\_idx, result, [fetch\_is\_accepted,] [msg, [alert\_level, [scope]]]) |
| Example: fetch\_result(SBI\_VVCT, 1, v\_idx, v\_result, v\_fetch\_is\_accepted); |

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| [**insert\_delay**](#insert_delay) (vvc\_target, vvc\_instance\_idx, [vvc\_channel,] delay, [msg, [scope]]) |
| Example: insert\_delay(SBI\_VVCT, 1,100 ns);  Example: insert\_delay(UART\_VVCT, 1, TX, 10); -- 10 Clock cycles delay using the VVC clk |



UVVM methods - target parameters

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| **Name** | **Type** | **Example(s)** | **Description** |
| vvc\_target | t\_vvc\_target\_record | UART\_VVCT | VVC target type compiled into each VVC in order to differentiate between VVCs. |
| vvc\_instance\_idx | Integer | 1 | Instance number of the VVC used in this method |
| vvc\_channel | t\_channel | TX, RX or ALL\_CHANNELS | The VVC channel of the VVC instance used in this method |
| vvc\_info\_list | t\_vvc\_info\_list | v\_vvc\_info\_list | A list of protected type containing one or several VVC IDs (name, instance, channel) & command index.  VVC IDs and corresponding command index can be added to the list by using the procedure  **add(name, instance, [channel,] [cmd\_idx])**. The name is a string that should match the C\_VVC\_NAME in the VVC’s vvc\_methods\_pkg.vhd. |
| void | t\_void | VOID | An empty input parameter for procedure waiting for UVVM to be initialized. |

UVVM methods - functional parameters

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| **Name** | **Type** | **Example(s)** | **Description** |
| wanted\_idx | natural | 50 | The index to be fetched or awaited |
| list\_action | t\_list\_action | KEEP\_LIST, CLEAR\_LIST | An enumerated type to either keep the VVC IDs or remove them from the list after await\_completion() has finished. |
| timeout | time | 100 ns | The maximum time to await completion of a specified command, or all pending commands. An alert of severity ERROR will be triggered if the awaited time is equal to the specified timeout. |
| msg | string | “Awaiting CR from UART” | A message parameter to be appended to the log when the method is executed. |
| msg\_id | t\_msg\_id | ID\_SEQUENCER | The ID to enable/disable with enable/disable\_log\_msg(). For more info, see the UVVM-Util documentation. |
| result | t\_vvc\_result | v\_result | The output where the fetched data is to be placed with fetch\_result() |
| fetch\_is\_accepted | boolean | v\_fetch\_is\_accepted | Output containing a Boolean that states if the fetch command was accepted or not. Will be false if the specified command index has not been stored. |
| alert\_level | t\_alert\_level | TB\_WARNING | The alert level used for the alert which occurs when a fetch\_result() command is not accepted |
| delay | time or natural | 100 ns or 10 | Delay to be inserted in the insert\_delay() procedure, either as time or number of clock cycles |
| quietness | t\_quietness | QUIET | The logging of the command can be turned off by setting quietness=QUIET. |
| scope | string | “Sequencer 1” | A string describing the scope from which the log/alert originates. |

UVVM VVC Framework command broadcasting and multicasting

Commands in UVVM can be distributed to all instances of a VVC or to all VVCs using dedicated parameters.

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| **Command Parameter** | **Description** |
| **VVC\_BROADCAST** | The VVC\_BROADCAST command parameter can be used when a command is to target all VVCs within the test environment, reducing the number of command instructions needed in the testbench.  Example**:**  enable\_log\_msg(VVC\_BROADCAST, ALL\_MESSAGES); -- enable logging for all VVCs  await\_completion(VVC\_BROADCAST, 10 us); -- wait for all VVCs to complete |
| **ALL\_INSTANCES** | The ALL\_INSTANCES command parameter can be used when a command is targeting all instances of a VVC within the test environment, reducing the number of command instructions needed in the testbench.  Example**:**  enable\_log\_msg(SBI\_VVCT, ALL\_INSTANCES, ALL\_MESSAGES); -- enable logging for all instances of SBI\_VVCT  await\_completion(SBI\_VVCT, ALL\_INSTANCES, 100 ns); -- wait for all instances of SBI\_VVCT to complete |
| **ALL\_CHANNELS** | The ALL\_CHANNELS command parameter can be used when a command is targeting all channels of a VVC within the test environment, reducing the number of command instructions needed in the testbench.  Example**:**  enable\_log\_msg(UART\_VVCT, 1, ALL\_CHANNELS, ALL\_MESSAGES); -- enable logging for all channels of SBI\_VVCT instance 1  await\_completion(UART\_VVCT, ALL\_INSTANCES, ALL\_CHANNELS, 100 ns); -- wait for all instances and channels of UART\_VVCT to complete |
| **C\_VVCT\_ALL\_INSTANCES** | See description above. C\_VVCT\_ALL\_INSTANCES = ALL\_INSTANCES.  Warning! This command parameter might be removed in a future release and we encourage the use of ALL\_INSTANCES. |

UVVM VVC Framework Common Methods details

All VVC procedures are defined in the UVVM VVC framework common methods package, td\_vvc\_framework\_common\_methods\_pkg.vhd

# UVVM VVC Framework Common Methods details and examples

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| **Method** | **Description** |
| **await\_completion()** | **await\_completion(vvc\_target, vvc\_instance\_idx, timeout, msg, scope)**  **await\_completion(vvc\_target, vvc\_instance\_idx, wanted\_idx, timeout, msg, scope)**  **await\_completion(vvc\_target, vvc\_instance\_idx, vvc\_channel, timeout, msg, scope)**  **await\_completion(vvc\_target, vvc\_instance\_idx, vvc\_channel, wanted\_idx, timeout, msg, scope)**  **await\_completion(ANY\_OF, vvc\_info\_list, timeout, list\_action, msg, scope)**  Tells the VVC to await the completion of either all pending commands or a specified command index.  A message will be logged before and at the end of the wait.  The procedure will report an alert if not all commands have completed within the specified time, *timeout*. The severity of this alert will be TB\_ERROR.  It is also possible multicast to ALL\_INSTANCES or ALL\_CHANNELS of a VVC.  To await the completion of one out of several VVCs in a group use the overload with the vvc\_info\_list.  The vvc\_info\_list of type t\_vvc\_info\_list (protected type) is a local variable that needs to be declared in the sequencer. The list\_action default is to clear the list.  This overload will block the sequencer while waiting, but not the VVCs, so they can continue to receive commands from other sequencers.  **Important**: to use the vvc\_info\_list, the package uvvm\_vvc\_framework.ti\_protected\_types\_pkg.all must be included in the testbench. Note that the command with the vvc\_info\_list requires VVCs supporting the VVC activity register introduced in UVVM release v2020.05.19  Examples:  await\_completion(SBI\_VVCT, 1, 16 ns, "Wait for SBI instance 1 to finish", C\_SCOPE);  await\_completion(SBI\_VVCT, 1, v\_cmd\_idx, 100 ns, "Wait for sbi\_read to finish", C\_SCOPE);  Multicast:  await\_completion(SBI\_VVCT, ALL\_INSTANCES, 100 ns, "Wait for all SBI instances to finish", C\_SCOPE);  await\_completion(UART\_VVCT, 1, ALL\_CHANNELS, 100 ns, "Wait for all UART channels from instance 1 to finish", C\_SCOPE);  Using vvc\_info\_list:  variable my\_vvc\_info\_list : t\_vvc\_info\_list;  my\_vvc\_info\_list.add(“SBI\_VVC”, 1);  my\_vvc\_info\_list.add(“AXISTREAM\_VVC”, 3, v\_cmd\_idx);  my\_vvc\_info\_list.add(“UART\_VVC”, ALL\_INSTANCES, ALL\_CHANNELS);  await\_completion(ANY\_OF, my\_vvc\_info\_list, 1 ms, KEEP\_LIST, "Wait for any VVC in the list to finish", C\_SCOPE); |
| **await\_any\_completion()** | **Replaced by await\_completion(ANY\_OF, vvc\_info\_list, timeout, list\_action, msg, scope) above to allow VVCs to accept commands while waiting for completion.**  **This command still works as previously, but with less functionality than the new await\_completion(ANY\_OF, …)**  **Warning! This procedure will soon be deprecated and removed.**  **For details and examples for using this call see UVVM release v2020.05.12 or any earlier releases.**  **await\_any\_completion(vvc\_target, vvc\_instance\_idx, [vvc\_channel,] [wanted\_idx,] lastness, [timeout, [msg, [await\_completion\_idx, [scope]]]])** |
| **disable\_log\_msg()** | **disable\_log\_msg(vvc\_target, vvc\_instance\_idx, msg\_id, msg, quietness, scope)**  **disable\_log\_msg(vvc\_target, vvc\_instance\_idx, vvc\_channel, msg\_id, msg, quietness, scope)**  Instruct the VVC to disable a given log ID. This call will be forwarded to the UVVM Utility Library disable\_log\_msg function. For more information about the disable\_log\_msg() method, please refer to the UVVM-Util QuickRef.  It is also available as a broadcast to all VVCs.  Examples:  disable\_log\_msg(SBI\_VVCT, 1, ID\_LOG\_BFM, “Disabling SBI BFM logging”);  disable\_log\_msg(UART\_VVCT, 1, TX, ID\_LOG\_BFM, “Disabling UART TX BFM logging”, NON\_QUIET, C\_SCOPE);  Broadcast:  disable\_log\_msg(VVC\_BROADCAST, ALL\_MESSAGES, "Disables all messages in all VVCs", NON\_QUIET, C\_SCOPE); |
| **enable\_log\_msg()** | **enable\_log\_msg(vvc\_target, vvc\_instance\_idx, msg\_id, msg, quietness, scope)**  **enable\_log\_msg(vvc\_target, vvc\_instance\_idx, vvc\_channel, msg\_id, msg, quietness, scope)**  Instruct the VVC to enable a given log ID. This call will be forwarded to the UVVM Utility Library enable\_log\_msg function. For more information about the enable\_log\_msg() method, please refer to the UVVM-Util QuickRef.  It is also available as a broadcast to all VVCs.  Examples:  enable\_log\_msg(SBI\_VVCT, 1, ID\_LOG\_BFM, “Enabling SBI BFM logging”);  enable\_log\_msg(UART\_VVCT, 1, TX, ID\_LOG\_BFM, “Enabling UART TX BFM logging”, NON\_QUIET, C\_SCOPE);  Broadcast:  enable\_log\_msg(VVC\_BROADCAST, ID\_LOG\_BFM, "Enabling BFM logging for all VVCs", NON\_QUIET, C\_SCOPE); |
| **flush\_command\_queue()** | **flush\_command\_queue(vvc\_target, vvc\_instance\_idx, msg, scope)**  **flush\_command\_queue(vvc\_target, vvc\_instance\_idx, vvc\_channel, msg, scope)**  Flushes the VVC command queue for the specified VVC target/channel. The procedure will log information with log ID ID\_IMMEDIATE\_CMD.  It is also available as a broadcast to all VVCs.  Example:  flush\_command\_queue(SBI\_VVCT, 1, “Flushing command queue”, C\_SCOPE);  Broadcast:  flush\_command\_queue(VVC\_BROADCAST, "Flushing command queues", C\_SCOPE); |
| **fetch\_result()** | **fetch\_result(vvc\_target, vvc\_instance\_idx, wanted\_id, result, msg, alert\_level, scope)**  **fetch\_result(vvc\_target, vvc\_instance\_idx, vvc\_channel, wanted\_id, result, msg, alert\_level, scope)**  **fetch\_result(vvc\_target, vvc\_instance\_idx, wanted\_id, result, fetch\_is\_accepted, msg, alert\_level, scope)**  **fetch\_result(vvc\_target, vvc\_instance\_idx, vvc\_channel, wanted\_id, result, fetch\_is\_accepted, msg, alert\_level, scope)**  Fetches a stored result using the command index. A result is stored when using e.g. the read or receive commands in a VVC. The fetched result is available on the ‘result’ output. The Boolean output ‘fetch\_is\_accepted’ is used to indicate if the fetch was successful or not. A fetch can fail if e.g. the wanted\_id did not have a result to store, or the wanted\_id read has not yet been executed. Omitting the ‘fetch\_is\_accepted’ parameter causes the parameters to be checked automatically in the procedure. On successful fetch, a message with log ID ID\_UVVM\_CMD\_RESULT is logged.  Example:  fetch\_result(SBI\_VVCT,1, v\_cmd\_idx, v\_data, v\_is\_ok, "Fetching read-result", C\_SCOPE);  Full example:  sbi\_read(SBI\_VVCT, 1, C\_ADDR\_FIFO\_GET, "Read from FIFO");  v\_cmd\_idx := get\_last\_received\_cmd\_idx(SBI\_VVCT,1); -- Retrieve the command index  await\_completion(SBI\_VVCT, 1, v\_cmd\_idx, 100 ns, "Wait for sbi\_read to finish");  fetch\_result(SBI\_VVCT, 1, v\_cmd\_idx, v\_data, v\_is\_ok, "Fetching read-result");  check\_value(v\_is\_ok, ERROR, "Readback OK via fetch\_result()"); |
| **insert\_delay()** | **insert\_delay(vvc\_target, vvc\_instance\_idx, delay, msg, scope)**  **insert\_delay(vvc\_target, vvc\_instance\_idx, vvc\_channel, delay, msg, scope)**  This method inserts a delay of ‘delay’ clock cycles or ‘delay’ seconds in the VVC.  It is also available as a broadcast to all VVCs.  Examples:  insert\_delay(SBI\_VVCT,1, 100, "100T delay", C\_SCOPE);  insert\_delay(SBI\_VVCT,1, 50 ns, "50 ns delay", C\_SCOPE);  Broadcast:  insert\_delay(VVC\_BROADCAST, 50 ns, "Insert 50 ns delay to all VVCs", C\_SCOPE); |
| **terminate\_current\_command()** | **terminate\_current\_command(vvc\_target, vvc\_instance\_idx, msg, scope)**  **terminate\_current\_command(vvc\_target, vvc\_instance\_idx, vvc\_channel, msg, scope)**  This method terminates the current command in the VVC, if the currently running BFM command supports the terminate signal.  It is also available as a broadcast to all VVCs.  Example:  terminate\_current\_command(SBI\_VVCT, 1, “Terminating current command”, C\_SCOPE);  Broadcast:  terminate\_current\_command(VVC\_BROADCAST, “Terminating current command in all VVCs”, C\_SCOPE); |
| **terminate\_all\_commands()** | **terminate\_all\_commands(vvc\_target, vvc\_instance\_idx, msg, scope)**  **terminate\_all\_commands(vvc\_target, vvc\_instance\_idx, vvc\_channel, msg, scope)**  This method terminates the current command in the VVC, if the currently running BFM command supports the terminate signal. The terminate\_all\_commands() procedure also flushes the VVC command queue, removing all pending commands.  It is also available as a broadcast to all VVCs.  Example:  terminate\_all\_commands(SBI\_VVCT, 1, “Terminating all commands”, C\_SCOPE);  Broadcast:  terminate\_all\_commands(VVC\_BROADCAST,”Terminating all commands in all VVCs”, C\_SCOPE); |
| **get\_last\_received\_cmd\_idx()** | **get\_last\_received\_cmd\_idx(vvc\_target, vvc\_instance\_idx, scope)**  **get\_last\_received\_cmd\_idx(vvc\_target, vvc\_instance\_idx, vvc\_channel, scope)**  This method is used to get the command index of the last command received by the VVC interpreter. Necessary for getting the command index of a read for fetch\_result.  Example:  v\_cmd\_idx := get\_last\_received\_cmd\_idx(SBI\_VVCT, 1, C\_SCOPE); |

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