



## 1. Crestron® Module Information

Partner: Yamaha Corporation

Model: DSP-RX, DSP-RX-EX, DSP-R10 &amp; CSD-R7

Device Type: DSP

## 2. General Information

SIMPL Windows Name: Yamaha Rivage V.2.0.0

Category: Mixer

Summary: This module controls one or more Yamaha DSP for the RIVAGE PM series via Ethernet connection.

### 3. General Notes:

This module is designed to control the DSP via a Crestron® Control System.

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**These modules are optimized for 4-Series Control Platform® hardware and therefore runs only on 4-Series Control System® devices!**

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The archive contains the following files:

|                               |   |
|-------------------------------|---|
| Yamaha Rivage Main v2.0.0.usp | The SIMPL+ module as a wrapper for the SIMPL# module  |
| Yamaha Rivage XXX v.2.0.0.usp | The SIMPL+ modules for the specific functionality where XXX is: Input, MixSend, MtxSend, MixBus, MtxBus, Master, Mutegroup, Scene |
| YamahaRivageV2.0.0.clz        | The SIMPL# module as an interface for the DSP   |
| YamahaRivageDemo.smw          | Sample Application  |
| RivageSampleUI.vtp            | XPanel UI for Sample Application  |
| ToggleWithFeedback.umc        | Usermacro for Toggle Function with real feedback  |

#### 4. Tested software versions

- Crestron Simple Windows 4.20
- Crestron Simple+ 4.06
- Crestron Cross Compiler 1.3
- Crestron Database 212
- Crestron Device Database 200.180
- Crestron VT-Pro-e 6.2.02
- Crestron Smart Graphics Controls 2.17.01.01

## 5. Wiring:

For every DSP you want to control you need a main module (Yamaha Rivage Main vX.X.X) and some function modules depending on your needs (e.g. Yamaha Rivage Mutegroup v.X.X.X).

You can use more than one DSP in your Crestron® program, with different functionality distinguished by the DSP-ID)

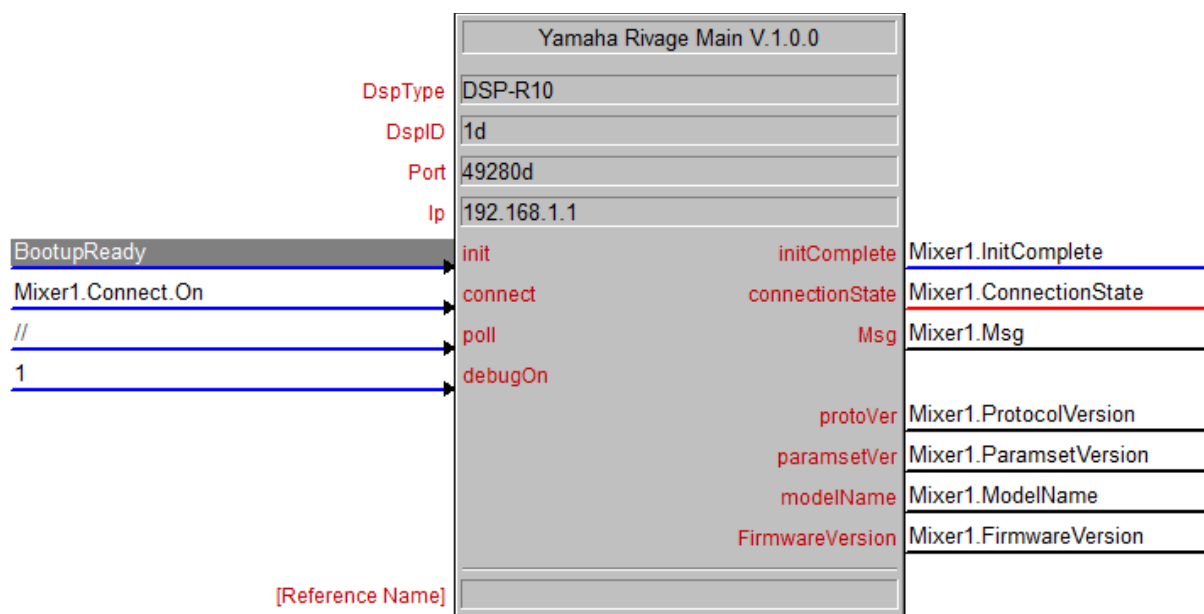
There are function modules for several Mixer/DSP capabilities:

- Input Level/On
- Mix Send Level/On
- Matrix Send Level/On
- Mix Bus Level/On
- Matrix Bus Level/On
- Master Bus Level/On
- DCA Level/On
- Mutegroups
- Scene

### a. Main Module

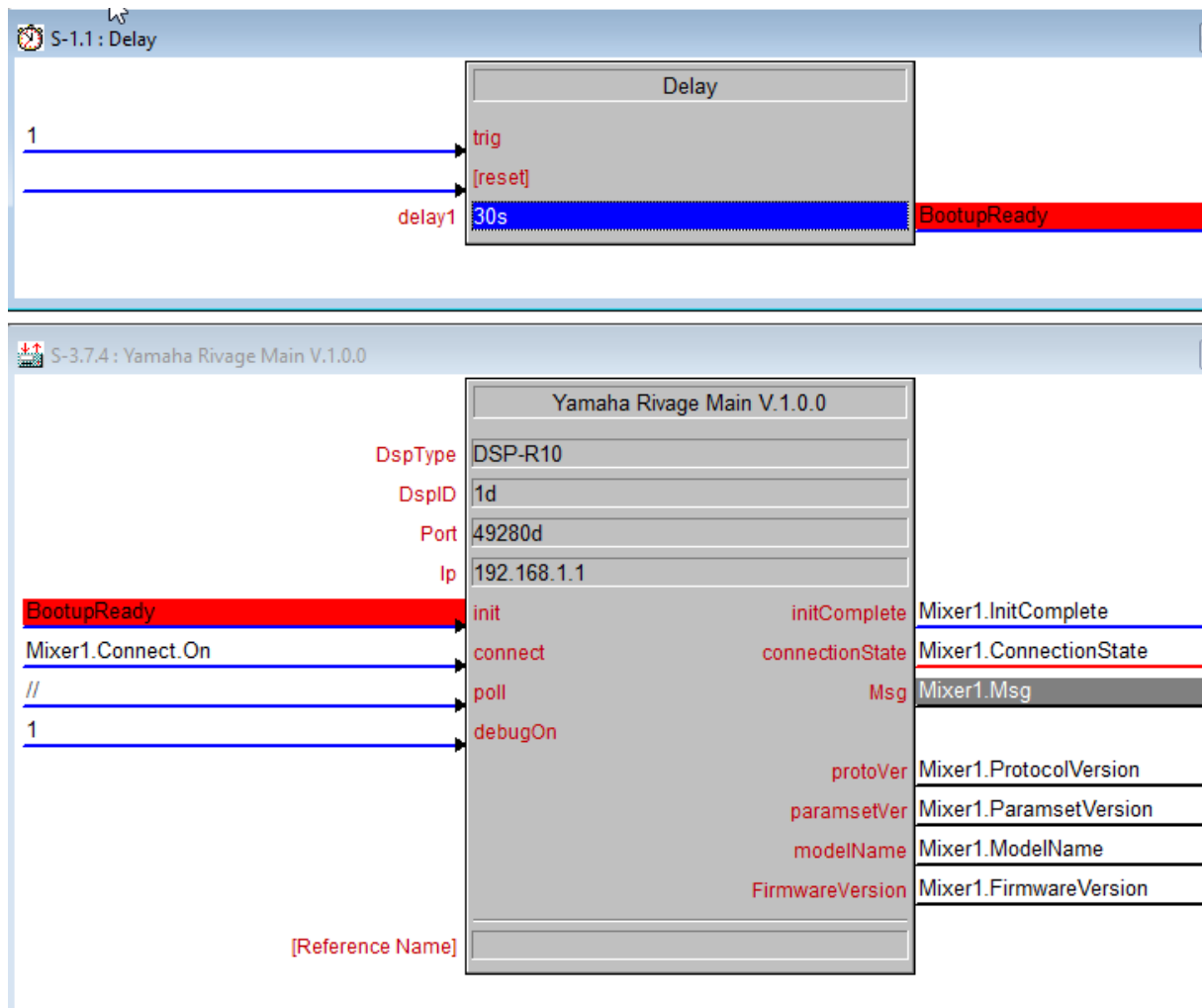
The Main module is the same for every DSP type regardless of it's functionality.

You need one and only one Main module for every DSP in your program:



| Parameter |  |
|-----------|--|
| DspType   | A dropdown menu with all the available DSP types (DSP-RX, DSP-RX-EX, DSP-R10 & CSD-R7)   |
| DspID     | An ID to allocate the function modules (Input, MixSend, Mutegroups, etc) to the Main module.<br>Important: This ID has nothing in common with the ID set up in your real DSP. It is only used inside your Crestron® program to connect the main module to the respective function modules !! |
| Port      | The TCP-Port for controlling the DSP. Default is 49280.  |

|                 |                           |   |
|-----------------|---------------------------|---|
| Ip              | The IP-Address of the DSP |   |
| Controls        |                           |   |
| init            | digital                   | 1: initialize the module on the underlying SIMPL# Layer.<br>0: without function: There is no “de-init” here! If the module is initialized, it stays initialized as long as your program is running. It is not recommended to use a “1” signal here.<br>Because of the heavy work load for the Crestron®-CPU during the boot-up phase, some signal may not have a consistent state.<br>Use a short Delay (about 20s-30s) for initializing the module right after the boot-up. (see next picture) |
| connect         | digital                   | 1: the module starts connecting the corresponding DSP.<br>If it’s unable to connect, it repeats about every 20s.<br>0: the module disconnects from the mixer or stops trying to connect.<br>If your DSP is always on, you can put a “1” here or use the “initComplete” signal.<br>If your DSP is powered on only sometimes, you should evaluate the power state and use this for connect, otherwise you will get hundreds and hundreds of “unable to connect” messages in your log file.        |
| poll            | digital                   | It triggers a polling of all parameters of all connected function blocks on the rising edge of the input. <b>Usually you will not need this signal because the module triggers a poll automatically if it connects to the DSP or a preset reload is recognized.</b>   |
| debug           | digital                   | This is for testing purposes only. If debug is “0” you will only get error messages. If debug is “1” you will also get some info messages in the Toolbox Debugger   |
| Feedback        |                           |   |
| initComplete    | digital                   | This signal is high if the initialization process in the underlaying SIMPL# Layer is finished.<br>Use this signal to start the initialization of the function modules connected to this DSP (all with the same ID)!   |
| Msg             | serial                    | Messages/Errors from the DSP  |
| protocolVer     | serial                    | The protocol version of the connected device  |
| paramsetVer     | serial                    | The parameter set version of the connected device   |
| modelName       | serial                    | The device name (the DSP type)  |
| firmwareVersion | serial                    | The firmware version of the connected device  |



Use a Boot Delay, because the Crestron is very busy just after booting.  
Give it a little bit extra time...

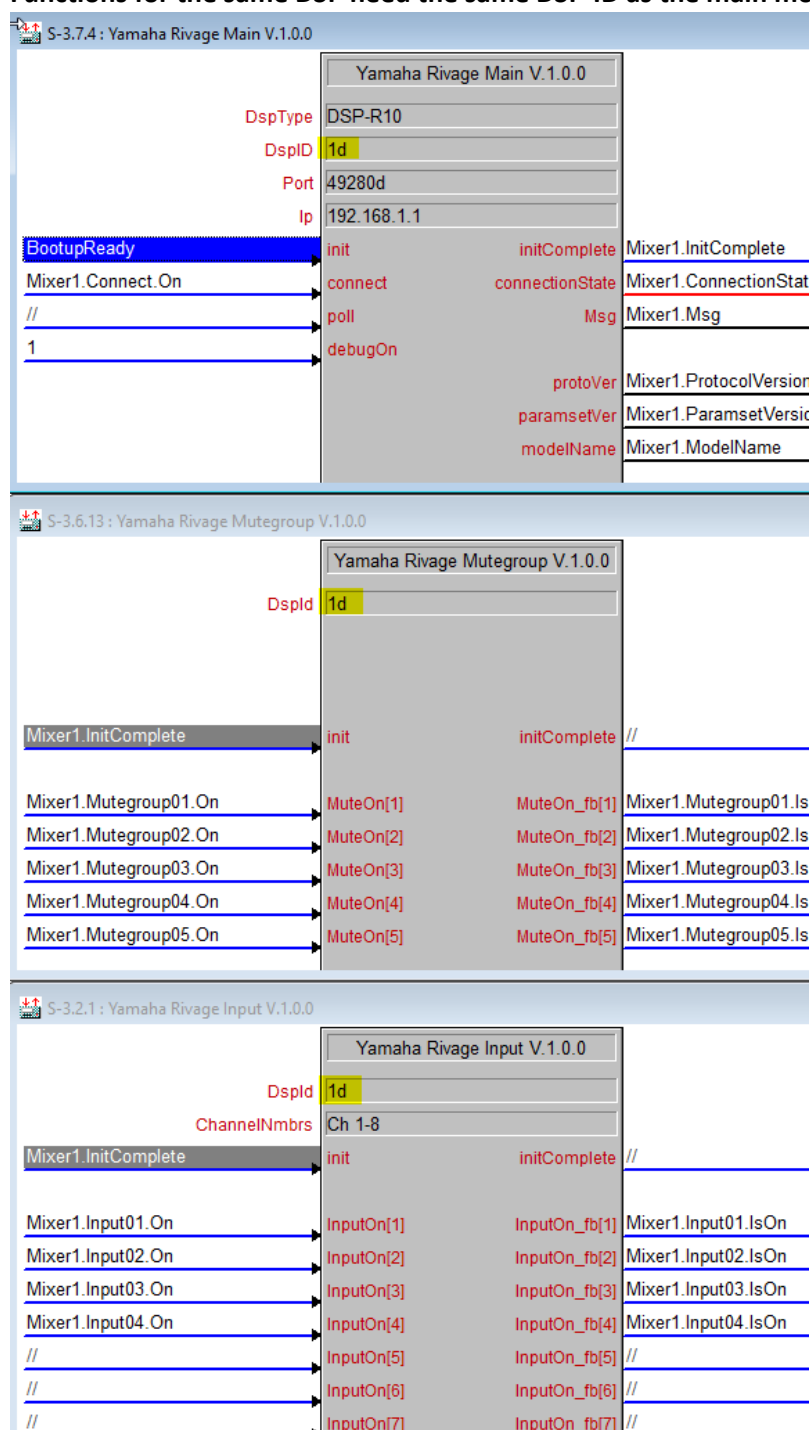
## Function Modules:

The library consists of a bunch of modules for different functions. So you can choose exactly the modules for the scope you need without overwhelming the Crestron® control system with functionality you don't need.

But you have to pay attention to some important things:

### 1. DSP-ID:

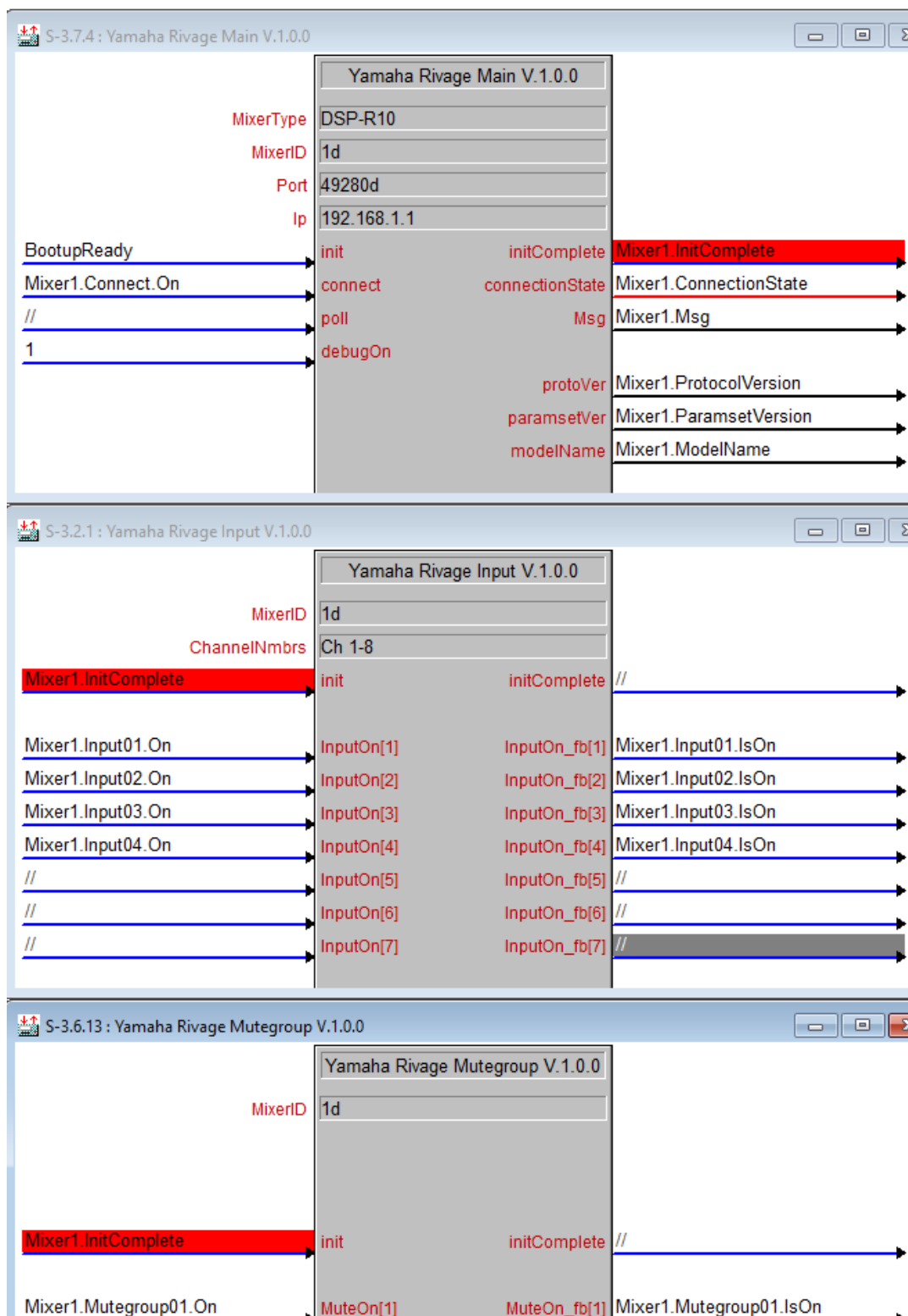
**Functions for the same DSP need the same DSP-ID as the main module they belong to:**



**NOTE:** The DSP-ID in this case is for your Crestron program only. It has nothing to do with the “Yamaha Mixer ID” adjusted in your console. The ID connects the main module with the function modules. Same DSP-ID -> means functions on the same DSP...

## 2. InitComplete Signal:

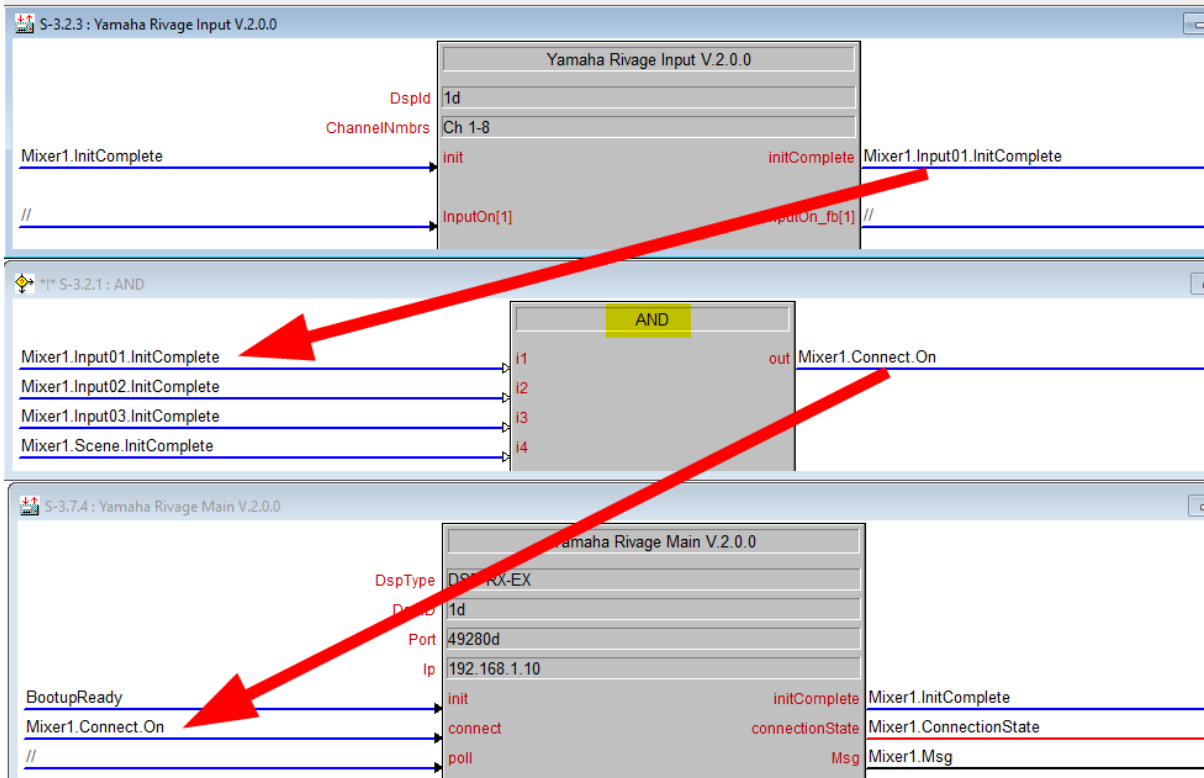
All the init-signals of the function modules for the same DSP should be fed by the initComplete Signal of the main module they are associated with:



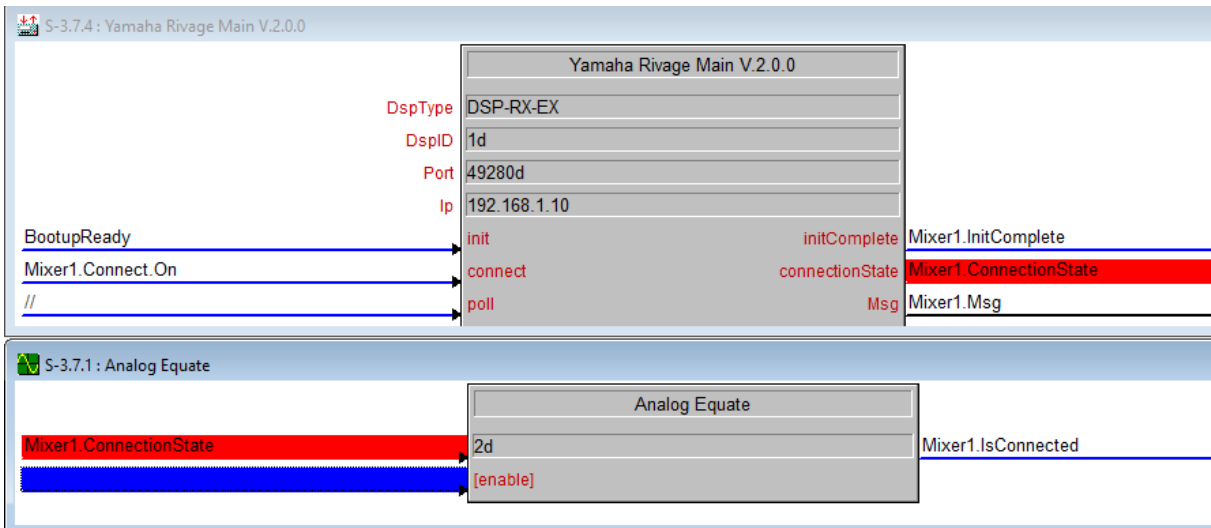
Do not try to initialize a function module before the main module is ready!

### 3. Connection:

Do not try to connect to the DSP before all modules are initialized. (Use an AND module):



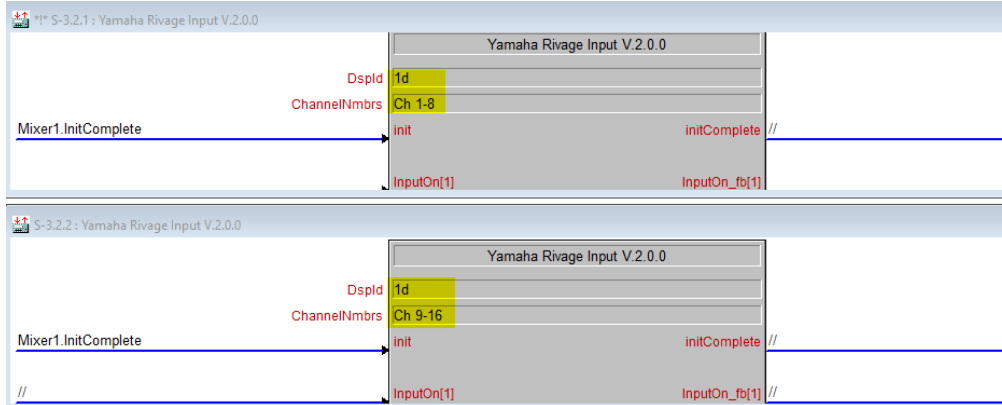
### 4. Do not send value to the DSP before the connection is successfully (use a Analog Equate to check):



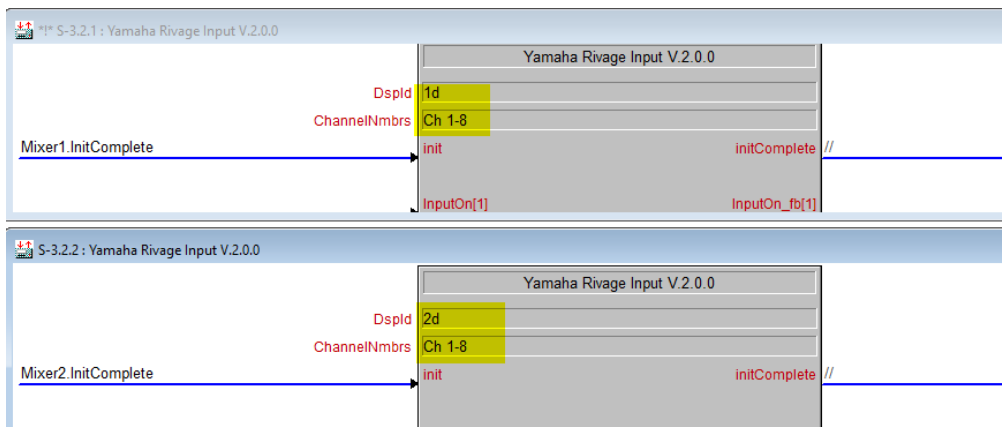
## 5. Function range:

Function modules for the same functionality should not overlap their range on the same DSP:

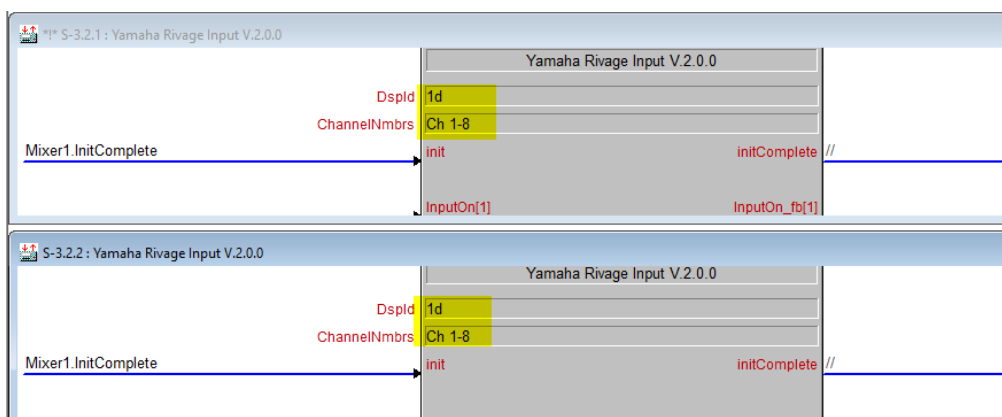
OK:



OK:



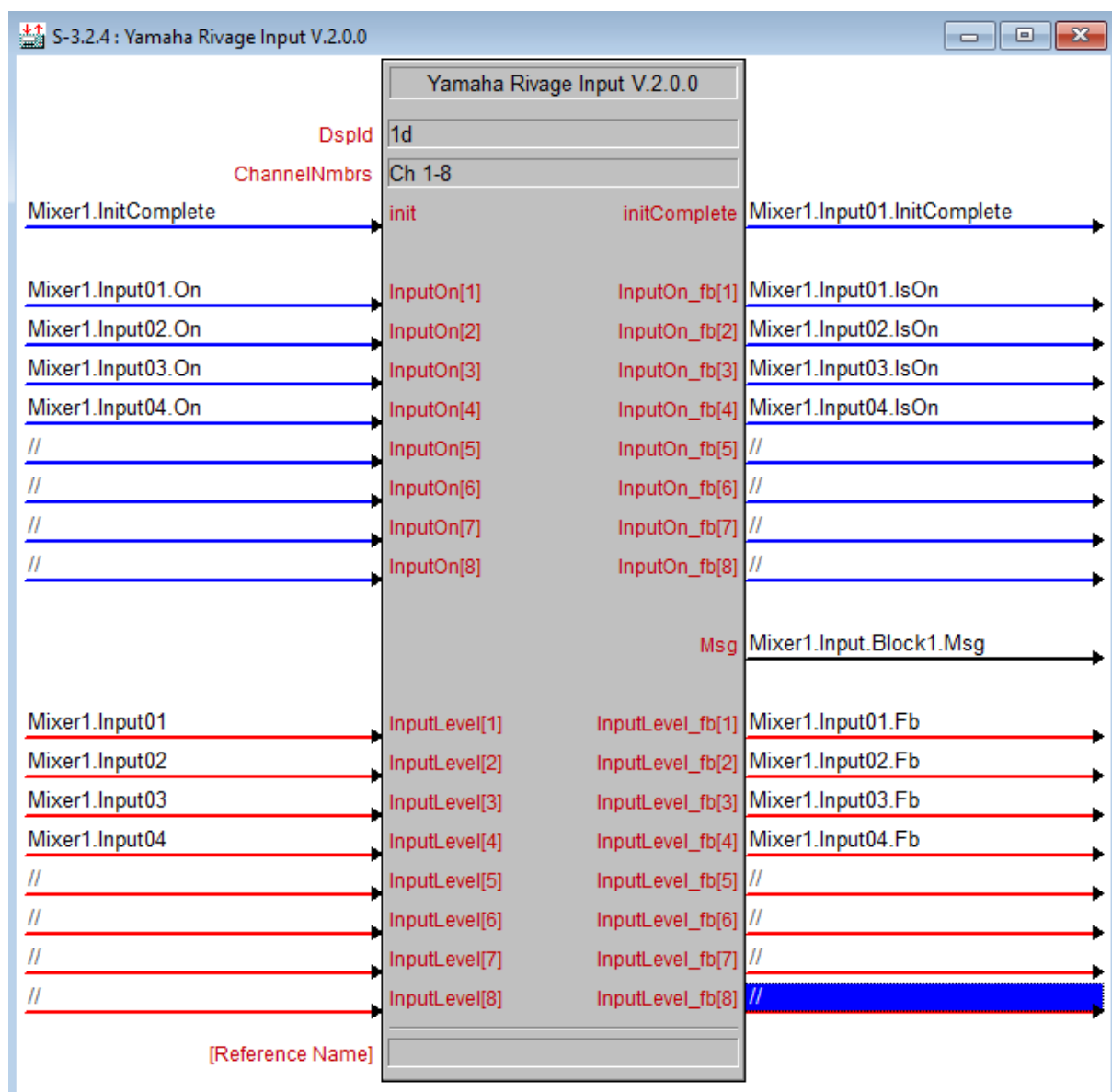
WRONG!!:





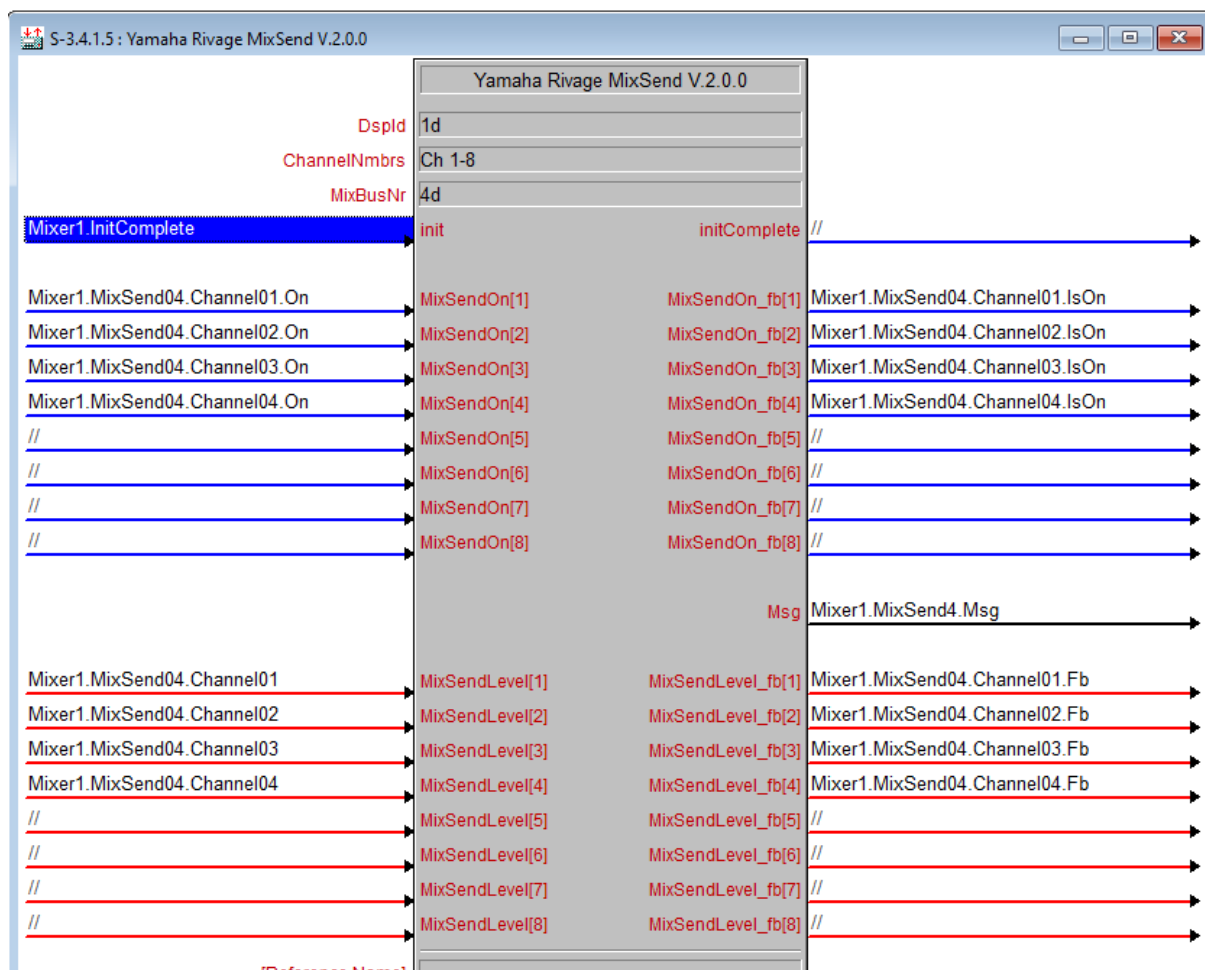
## Modules

### a. Input Module:



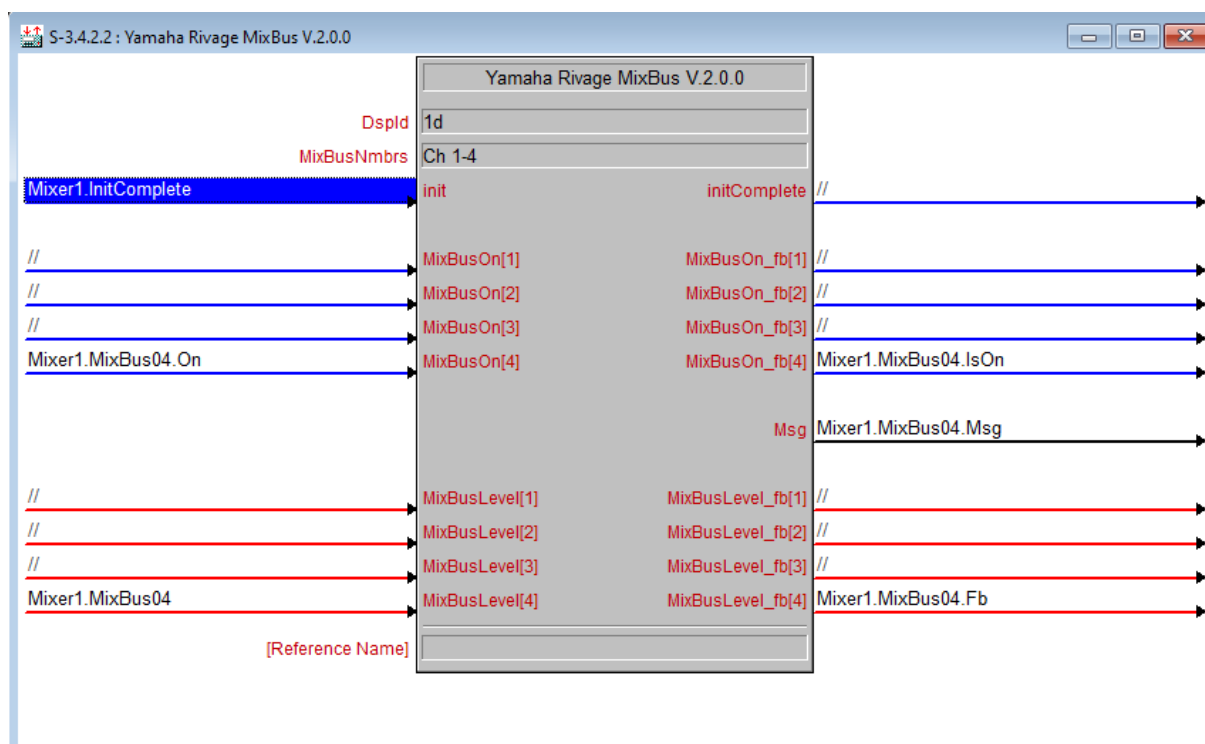
| Parameter        |         |   |
|------------------|---------|---|
| Dspld            |         | The ID of the main module this module belongs to  |
| ChannelNmbrs     |         | The range of the required channels in blocks of 8 channels                                      |
| Controls         |         |   |
| init             | digital | Initialize the module   |
| inputOn[x]       | digital | Sets the corresponding channel On or Off  |
| inputLevel[x]    | analog  | Sets the level of the corresponding channel. Range: -32768 (-327.68dB [OFF]) .. 1000 (10.00 dB) |
| Feedback         |         |   |
| initComplete     | digital | Indicates the completion of the module initialization   |
| inputOn_fb[x]    | digital | Feedback of Channel On/Off from the DSP   |
| inputLevel_fb[x] | analog  | Feedback of Channel-Level   |
| Msg              | serial  | Messages/Errors from the module   |

## b. Mix Send Module:



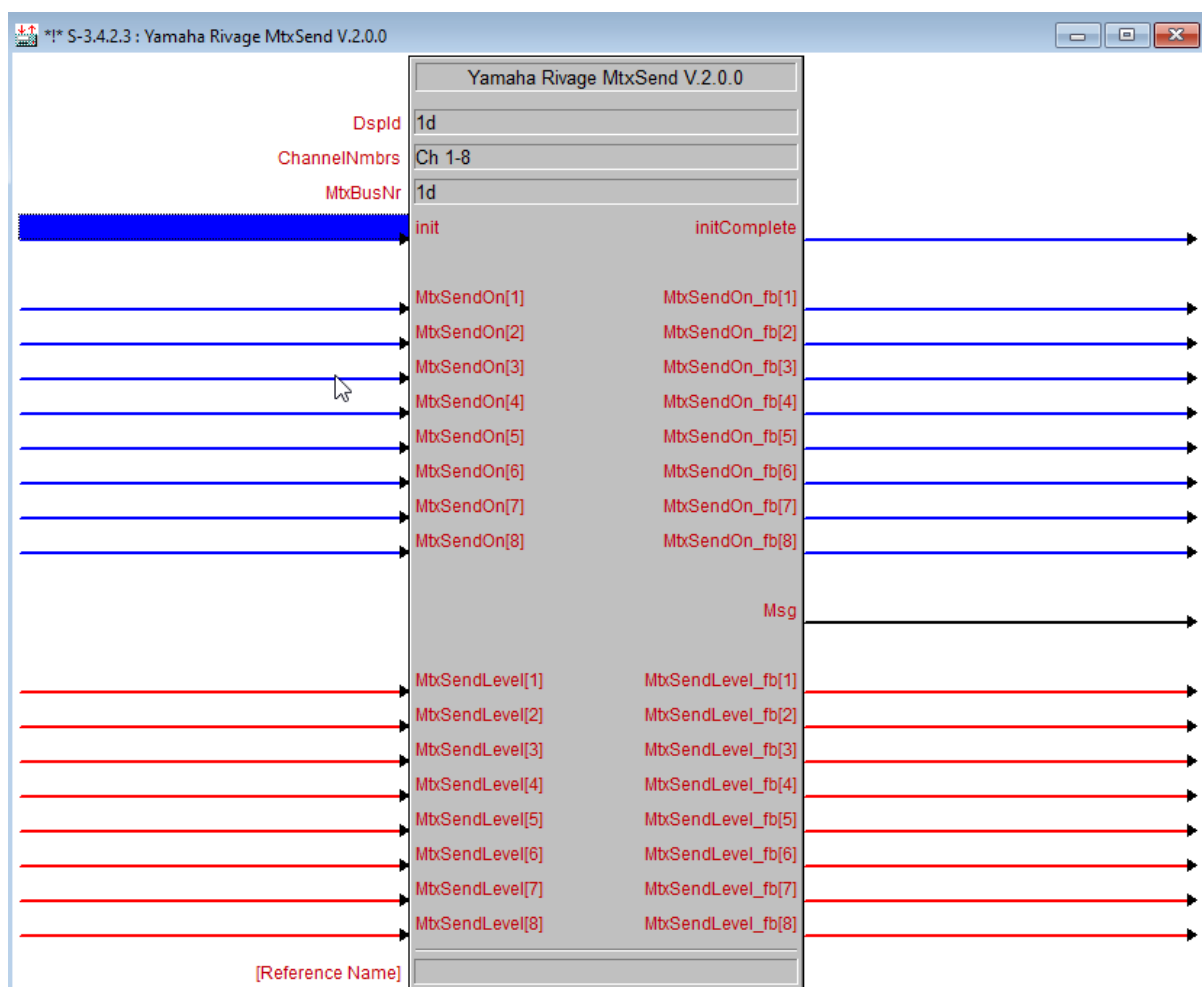
| Parameter          |         |   |
|--------------------|---------|---|
| DSPIId             |         | The ID of the main module this module belongs to  |
| ChannelNmbrs       |         | The range of the required channels in blocks of 8 channels  |
| MixBusNr           |         | The MixBus Number of the MixSends this module is assigned to  |
| Controls           |         |   |
| init               | digital | Initialize the module   |
| MixSendOn[x]       | digital | Sets the corresponding channel for the MixSend On or Off  |
| MixSendLevel[x]    | analog  | Sets the level of the corresponding channel for the MixSend.<br>Range: -32768 (-327.68dB [-∞]) .. 1000 (10.00 dB) |
| Feedback           |         |   |
| initComplete       | digital | Indicates the completion of the module initialization   |
| MixSendOn_fb[x]    | digital | Feedback of Channel On/Off from the MixBus  |
| MixSendLevel_fb[x] | analog  | Feedback of Channel-Level from the MixBus   |
| Msg                | serial  | Messages/Errors from the module   |

## Mix Bus Module:



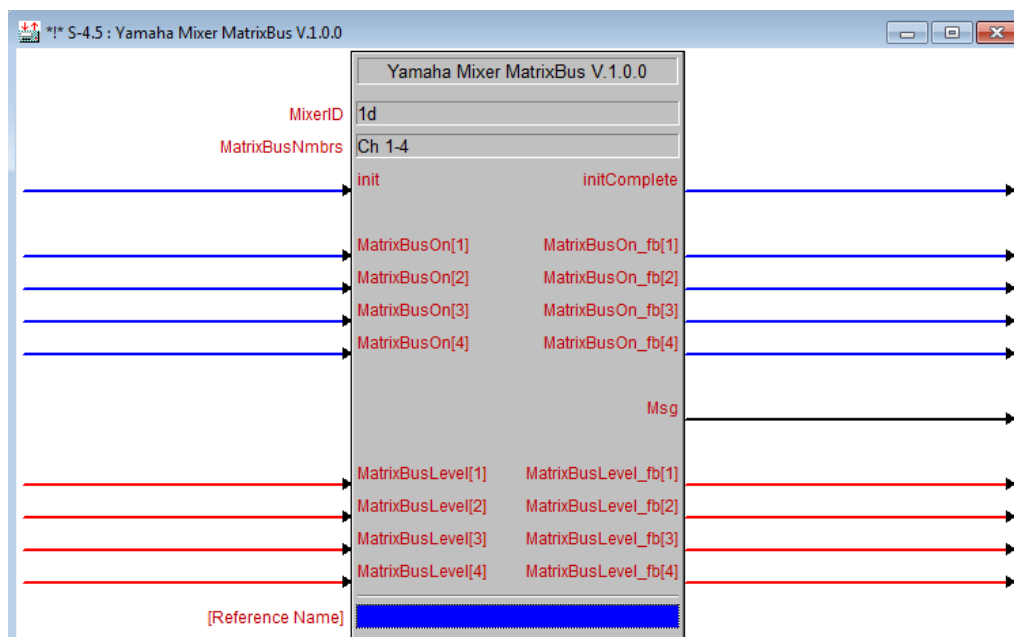
| Parameter         |         |  |
|-------------------|---------|--|
| DSPId             |         | The ID of the main module this module belongs to   |
| MixBusNmbrs       |         | The range of the required mix busses in blocks of 4 channels   |
| Controls          |         |  |
| init              | digital | Initialize the module  |
| MixBusOn[x]       | digital | Sets the corresponding channel for the MixBus On or Off  |
| MixBusLevel[x]    | analog  | Sets the level of the corresponding channel for the MixBus.<br>Range: -32768 (-327.68dB [-∞]) .. 1000 (10.00 dB) |
| Feedback          |         |  |
| initComplete      | digital | Indicates the completion of the module initialization  |
| MixBusOn_fb[x]    | digital | Feedback of Channel On/Off from the MixBus   |
| MixBusLevel_fb[x] | analog  | Feedback of Channel-Level from the MixBus  |
| Msg               | serial  | Messages/Errors from the module  |

### c. Matrix Send Module:



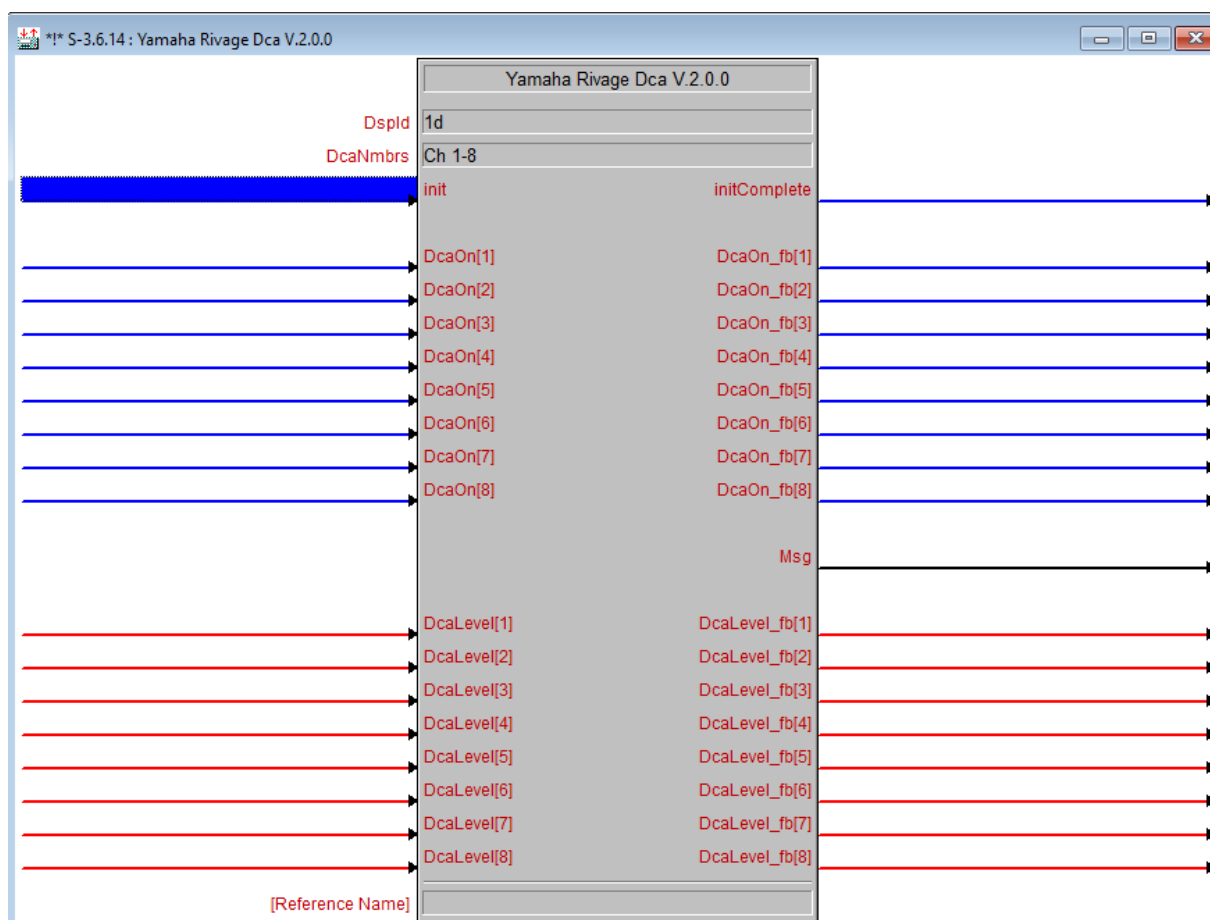
| Parameter          |         |  |
|--------------------|---------|--|
| Dspld              |         | The ID of the main module this module belongs to   |
| ChannelNmbrs       |         | The range of the required channels in blocks of 8 channels   |
| MtxBusNr           |         | The MatrixBus Number of the MatrixSends this module is assigned to   |
| Controls           |         |  |
| init               | digital | Initialize the module  |
| MtxSendOn[x]       | digital | Sets the corresponding channel for the MatrixSend On or Off  |
| MtxSendLevel[x]    | analog  | Sets the level of the corresponding channel for the MatrixSend.<br>Range: -32768 (-327.68dB [-∞]) .. 1000 (10.00 dB) |
| Feedback           |         |  |
| initComplete       | digital | Indicates the completion of the module initialization  |
| MtxSendOn_fb[x]    | digital | Feedback of Channel On/Off from the MatrixBus  |
| MtxSendLevel_fb[x] | analog  | Feedback of Channel-Level from the MatrixBus   |
| Msg                | serial  | Messages/Errors from the module  |

## d. Matrix Bus Module:



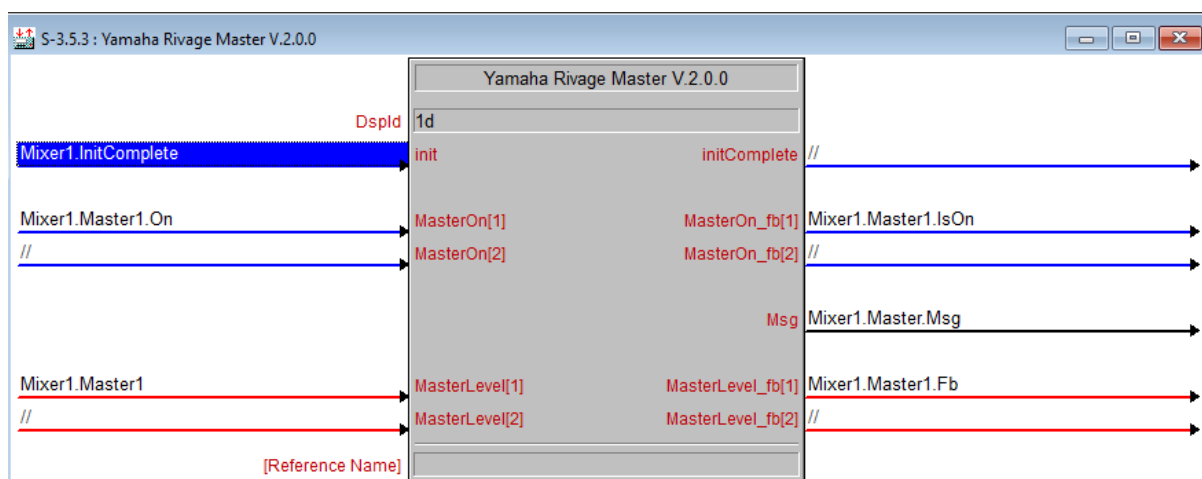
| Parameter            |         |   |
|----------------------|---------|---|
| DspId                |         | The ID of the main module this module belongs to  |
| MatrixBusNmbrs       |         | The range of the required mix busses in blocks of 4 channels  |
| Controls             |         |   |
| init                 | digital | Initialize the module   |
| MatrixBusOn[x]       | digital | Sets the corresponding channel for the MatrixBus On or Off  |
| MatrixBusLevel[x]    | analog  | Sets the level of the corresponding channel for the MatrixBus.<br>Range: -32768 (-327.68dB [-∞]) .. 1000 (10.00 dB) |
| Feedback             |         |   |
| initComplete         | digital | Indicates the completion of the module initialization   |
| MatrixBusOn_fb[x]    | digital | Feedback of Channel On/Off from the MatrixBus   |
| MatrixBusLevel_fb[x] | analog  | Feedback of Channel-Level from the MatrixBus  |
| Msg                  | serial  | Messages/Errors from the module   |

## e. DCA Module:



| Parameter      |         |  |
|----------------|---------|--|
| DspId          |         | The ID of the main module this module belongs to   |
| DcaNmbrs       |         | The range of the required channels in blocks of 8 channels                                     |
| Controls       |         |  |
| init           | digital | Initialize the module  |
| DcaOn[x]       | digital | Sets the corresponding channel On or Off   |
| DcaLevel[x]    | analog  | Sets the level of the corresponding channel. Range: -32768 (-327.68dB [-∞]) .. 1000 (10.00 dB) |
| Feedback       |         |  |
| initComplete   | digital | Indicates the completion of the module initialization  |
| DcaOn_fb[x]    | digital | Feedback of Channel On/Off from the DSP  |
| DcaLevel_fb[x] | analog  | Feedback of Channel-Level  |
| Msg            | serial  | Messages/Errors from the module  |

## f. Master Module:



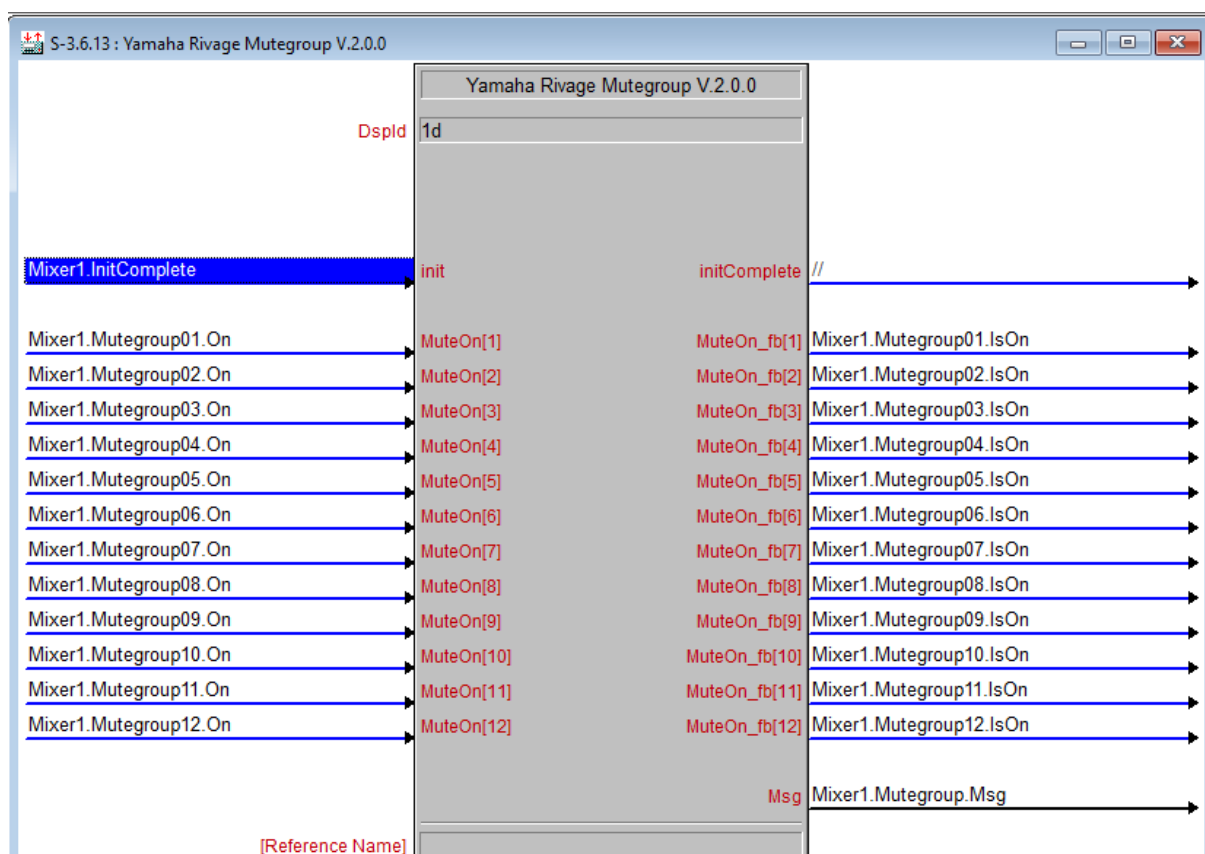
| Parameter         |         |   |
|-------------------|---------|---|
| DspId             |         | The ID of the main module this module belongs to  |
| Controls          |         |   |
| init              | digital | Initialize the module   |
| MasterOn[x]       | digital | Sets the corresponding master On or Off   |
| MasterLevel[x]    | analog  | Sets the level of the corresponding master. Range: -32768 (-327.68dB [-∞]) .. 1000 (10.00 dB) |
| Feedback          |         |   |
| initComplete      | digital | Indicates the completion of the module initialization   |
| MasterOn_fb[x]    | digital | Feedback of Channel On/Off from the DSP   |
| MasterLevel_fb[x] | analog  | Feedback of Channel-Level   |
| Msg               | serial  | Messages/Errors from the module   |

## Note:

Master 1: Stereo Master

Master 2: Mono, Center or Sub Master

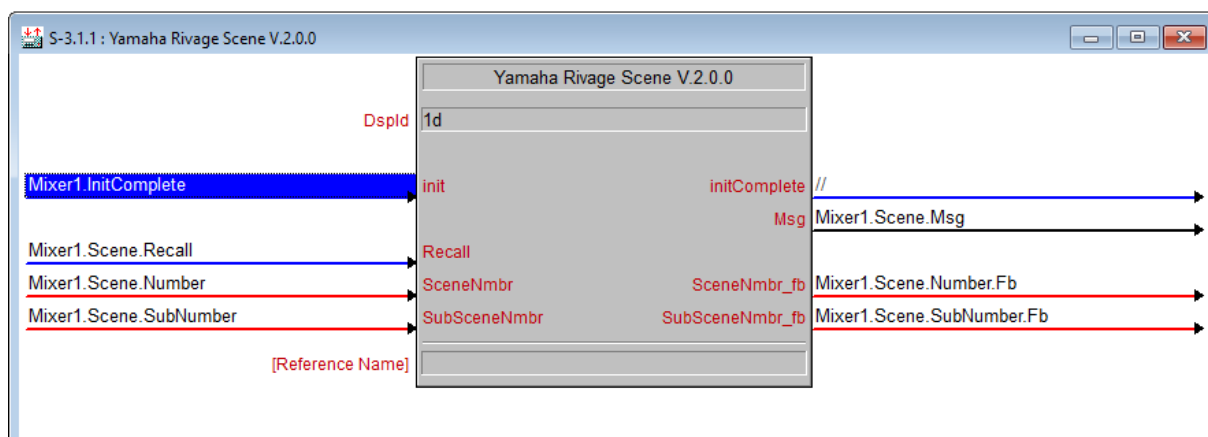
## g. Mutegroup Module:



| Parameter    |         |   |
|--------------|---------|---|
| DspldD       |         | The ID of the main module this module belongs to      |
| MuteNmbrs    |         | The range of the required Mutegroups in blocks of 8   |
| Controls     |         |   |
| init         | digital | Initialize the module                                 |
| MuteOn[x]    | digital | Sets the corresponding Mutegroup On or Off            |
| Feedback     |         |   |
| initComplete | digital | Indicates the completion of the module initialization |
| MuteOn_fb[x] | digital | Feedback of Mutegroup On/Off from the DSP             |
| Msg          | serial  | Messages/Errors from the module                       |



## h. Scene Module:



| Parameter       |         |   |
|-----------------|---------|---|
| DspId           |         | The ID of the main module this module belongs to      |
| Controls        |         |   |
| init            | digital | Initialize the module                                 |
| Recall          | digital | Recalls the scene memory as stated by "SceneNmbr"     |
| Store           | digital | Stores the scene memory as stated by "SceneNmbr"      |
| SceneNmbr       | analog  | The scene number here will be stored or recalled      |
| SubSceneNumber  | analog  | The sub-Scene number here will be stored or recalled  |
| Feedback        |         |   |
| initComplete    | digital | Indicates the completion of the module initialization |
| SceneNmbr_fb    | analog  | Shows the current scene number                        |
| SubSceneNmbr_fb |         | Shows the current sub-scene number                    |
| Msg             | serial  | Messages/Errors from the module                       |

## 6. Parameter Range:

The level range uses Crestron® analog values (signed integer) in hundredths of dB.

So, unless otherwise stated, the level range is always:

-32768 (-327.68 db, which means  $-\infty$  in the mixing console) as the lower end and 1000 (-10dB) as the upper end.

The range (Min Value & Max Value) of the corresponding gauge or slider in VT-Pro-e or your Ramp in SIMPL-Windows can be set to anything in between these values, so you can work with the full range:

|                            |                                     |
|----------------------------|-------------------------------------|
| Touch Feedback Analog Join | 31                                  |
| Suppress Key Clicks        | <input type="checkbox"/>            |
| Read Only                  | <input type="checkbox"/>            |
| Min Value                  | -32768                              |
| Max Value                  | 1000                                |
| Touch Padding              | 10                                  |
| Show Gauge Fill            | <input checked="" type="checkbox"/> |
| Touch Settable             | <input type="checkbox"/>            |

... or with a limited range, -40db to +6db in this example:

|                            |                                     |       |
|----------------------------|-------------------------------------|-------|
| Touch Feedback Analog Join | 31                                  | A ... |
| Suppress Key Clicks        | <input type="checkbox"/>            |       |
| Read Only                  | <input type="checkbox"/>            |       |
| Min Value                  | -4000                               |       |
| Max Value                  | 600                                 |       |
| Touch Padding              | 10                                  |       |
| Show Gauge Fill            | <input checked="" type="checkbox"/> |       |
| Touch Settable             | <input type="checkbox"/>            |       |

Values lower than -32768 are not possible inside the Crestron® system.

Values higher than 1000 will be limited to 1000 (+10dB) by the module.

## 7. ONs and OFFs

You can set every Channel or Mute group by setting the appropriate Crestron® Signal to ON or OFF.

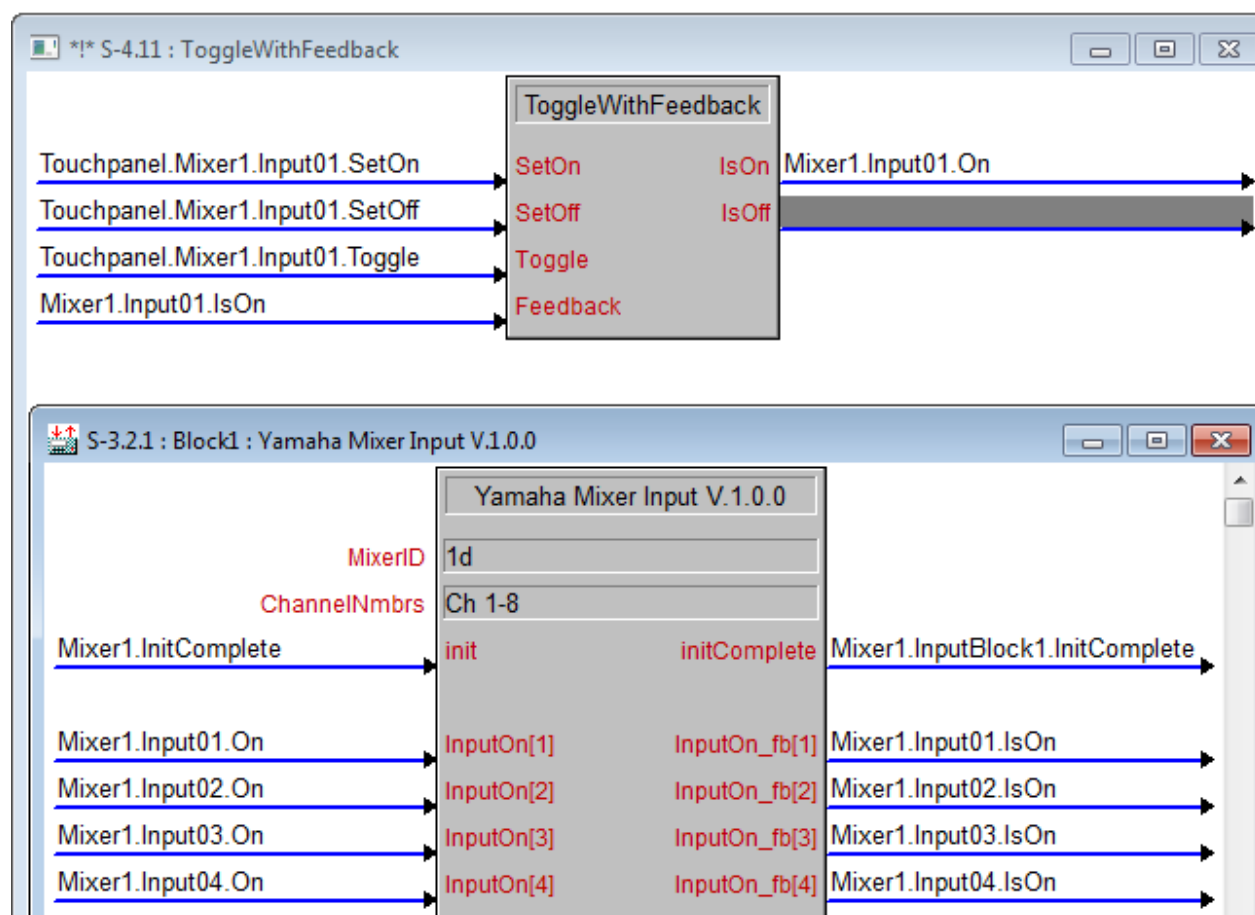
If you want to use a toggle, you have to pay attention to the real status in the DSP (feedback).

To make this easier, a small helper macro is included.

The macro is called “ToggleWithFeedback”.

It could be used for setting parameters on, off or just to toggle.

See this example:



## 8. Mixer/DSP capacity

The different mixers have different capacities in terms of channels, mix busses etc. related to the DSP they are connected to. Therefore in the Main Module not the mixer type or the surface type is set (for example CS-R5 or CS-R10) but the type of DSP they work with (DSP-RX, DSP-RX-EX, DSP-R10 & CSD-R7).

You have to take care not to overload their capacity (e.g: control input channel 140 on a mixer with a DSP-RX which only handle 120 input channels).

Here is a table of the DSP capacities:

|                  | <b>Input Channels</b> | <b>Mix Busses</b> | <b>Matrix Busses</b> | <b>DCA</b> | <b>Mute Groups</b> | <b>Stereo Master</b> |
|------------------|-----------------------|-------------------|----------------------|------------|--------------------|----------------------|
| <b>CSD-R7</b>    | 144                   | 60                | 36                   | 24         | 12                 | 2                    |
| <b>DSP-R10</b>   | 144                   | 72                | 36                   | 24         | 12                 | 2                    |
| <b>DSP-RX</b>    | 120                   | 48                | 24                   | 24         | 12                 | 2                    |
| <b>DSP-RX-EX</b> | 288                   | 72                | 36                   | 24         | 12                 | 2                    |

## 9. Other Documents

In case you encounter any errors (you may see them on the Msg signal or as debug messages) please have a look at these other documents:

- latest release notes
- FAQ (if available)