1. Crestron Module Information

Partner: Yamaha Corporation

Model: MRX7-D

Device Type: Digital Signal Processor

2. General Information

SIMPL Windows Name: Yamaha_Mrx7_V.1.2

Category: Mixer

Summary: This module controls a Yamaha MRX7-D DSP Device via RS-232 or Ethernet connection.

3. General Notes:

This module is designed to control a Yamaha MRX7-D via a Crestron Control System. It can use either serial or Ethernet connection although we strongly recommend using Ethernet.

Because the core routines are written in SIMPL# it only runs on Crestron System3 devices!

The archive contains the following files:

Yamaha_Mrx7_V.1.2.usp	The SIMPL+ module as a wrapper for the SIMPL# module
Yamaha_Mrx7_V.1.2.0.clz	The SIMPL# module as an interface for MRX7-D
Sample App Mrx7 Ethernet.smw	Sample Application for controlling MRX7-D via Ethernet
Sample App MRX7 Serial.smw	Sample Application for controlling MRX7-D via serial port
Mrx7SampleUI.vtp	XPanel UI for MRX7-D Sample
AnalogOn.umc	Helper modul to convert a Digital 0/1 to an analog value as it's needed for the module (see chapter 8)
MrxCreston.mtx	Sample File for MRX7-D consistent with the Crestron project

4. Tested software versions

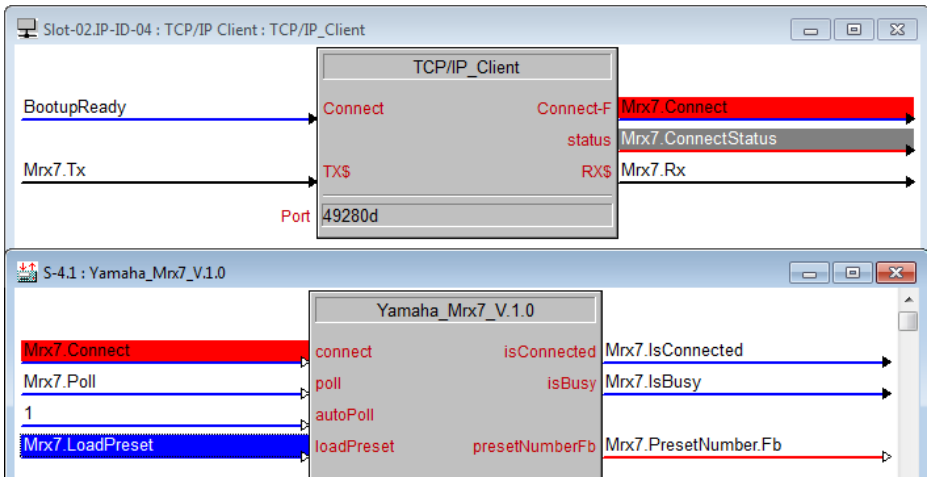
- Crestron SIMPL Windows 4.14.21.00
- Crestron SIMPL+ 4.05.01
- Crestron Cross Compiler 1.3
- Crestron Database 202.00.001.00
- Crestron Device Database 200.25.003.00
- Crestron VT-Pro-e 6.2.01.31
- Crestron Smart Graphics Controls 2.15.08.23
- Yamaha MRX7-D Firmware 3.0.0
- Yamaha MRX7-D Protocol Version 1.0.5
- Yamaha MRX7-D Parameter-Set Version 1.7.0

5. Wiring:

Depending on which connection is used (Ethernet or RS-232), the following remarks should be noted:

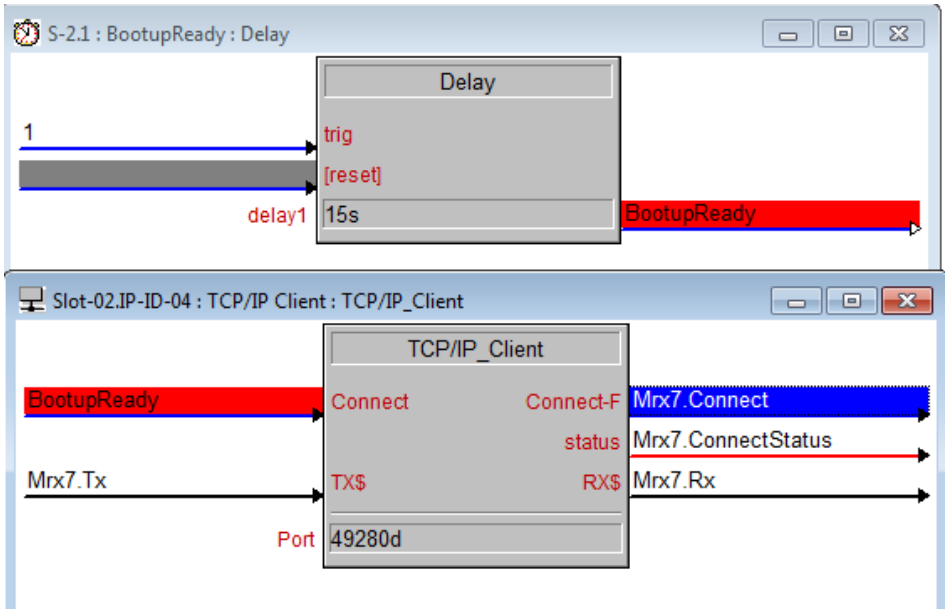
Ethernet:

We recommend to use the “Connect-F” signal (feedback if TCP/IP connection is successful) as an input for the connect signal of the module:
(in the sample app we use a manual connect/disconnect just for demo purposes)



It is not recommended to use a “1” signal at the “Connect”-input of the TCP/IP-Client module. Because of the heavy work load for the Crestron-CPU during the boot-up phase, some signal may not have a consistent state.

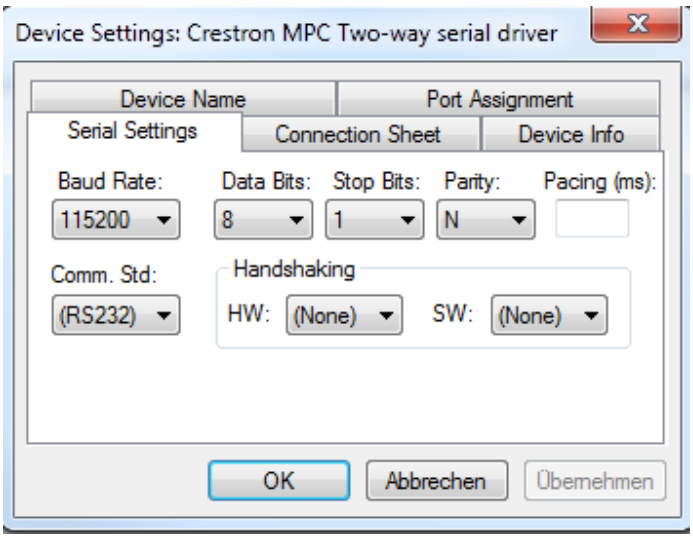
Use a small delay instead (approx. 10-30s):



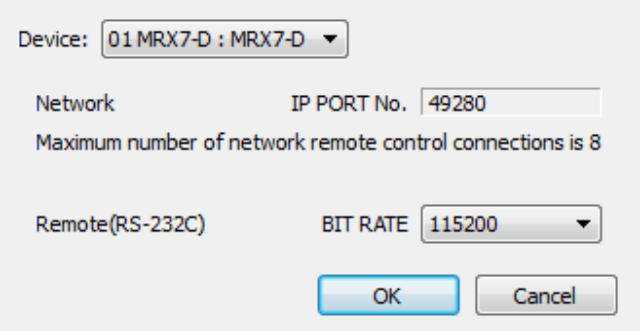
The default TCP/IP Port Number of the MTX is “49280”

Serial:

Despite the fact that it is strongly recommended to use Ethernet, you can use a serial connection. However, you should then choose the highest possible speed, which is 115200 kBaud:



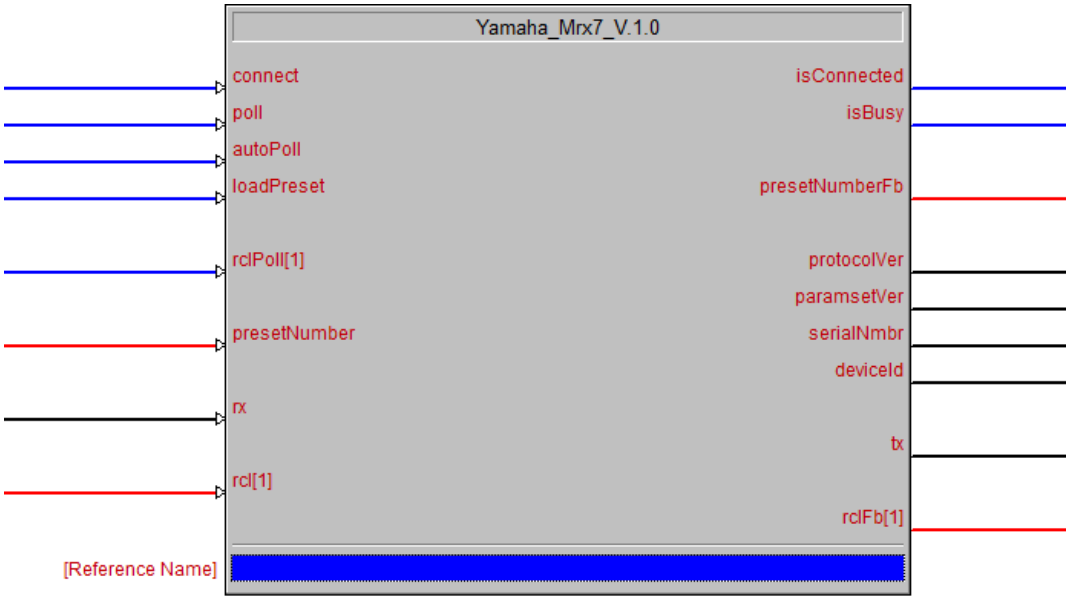
In the YAMAHA MTX-MRX Editor under System -> Remote Control adjust the interface speed:



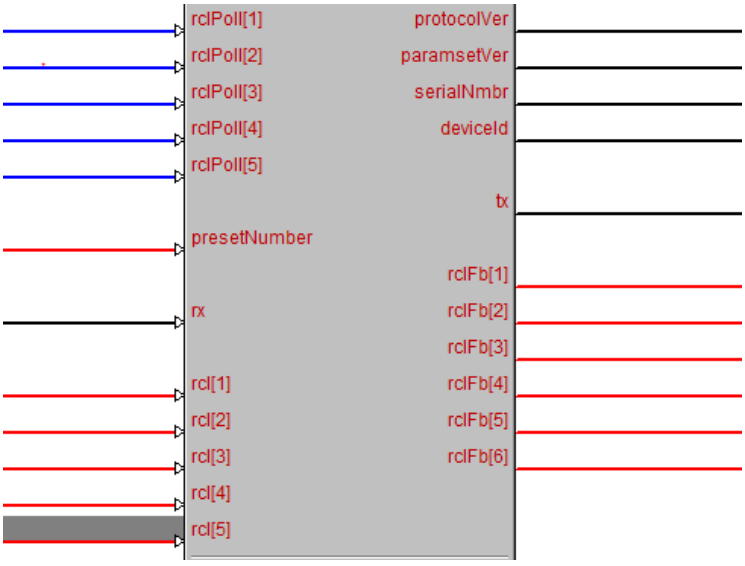
The module uses the keep-alive function of the MRX7-D regardless if you use Ethernet or RS232). The time period is about 10s. If there is no answer after that time, the Crestron CPU assumes a broken connection and tries to re-connect.

6. Signals:

The following picture is showing the MRX7-D module:



Depending on the number of entries in the “Remote Control List” in the Open MRX Designer, you can expand the signals “rcl” and the corresponding signals “rclPoll” and “rclFb” up to 1000…



Controls		
connect	digital	1: causes the module to connect to the MTX 0: causes disconnect
poll	digital	Manually triggers a polling of all parameters where polling is enabled
autoPoll	digital	If “1” after a detected preset recall, all parameters where polling is enabled will be polled
loadPreset	digital	A pulse performs a preset recall of the specified preset number
rclPoll[1] .. [1000]	digital	Enable the poll of the parameter in some cases (see below)
presetNumber	analog	0..50: preselection of preset-number to Recall
rx	serial	Rx-Data (usually connected to the RX Signal of the TCP/IP-Client Module or the Serial-Driver Module)
rcl[1] .. [1000]	analog	Set a new value to a parameter in the remote control list (range 0 … 65535)
Feedback		
isConnected	digital	“1” if the module is successfully connected to the MTX
isBusy	digital	Indicates that the Device is busy (i.e. re-polling all parameters after a preset recall)
presetNumberFb	analog	0..50: shows the current preset number
protocolVer	serial	The protocol version of the connected device
paramSetVer	serial	The parameter set version of the connected device
serialNmbr	serial	The serial number of the connected device
deviceId	serial	The device ID of the connected device
tx	serial	TX-Data (usually connected to the TX signal of the TCP/IP-Client nodule or the serial-driver module)
rclFb[1] .. [1000]	analog	The current value of a parameter in the remote control list (range 0 … 65535)

If rclPoll[x] is high it causes a polling of the related parameter in three cases:

1. A pulse on “poll”
2. The MRX7-D is connected and autoPoll is true (“1”)
3. A preset recall is detected and “autoPoll” is true (“1”)

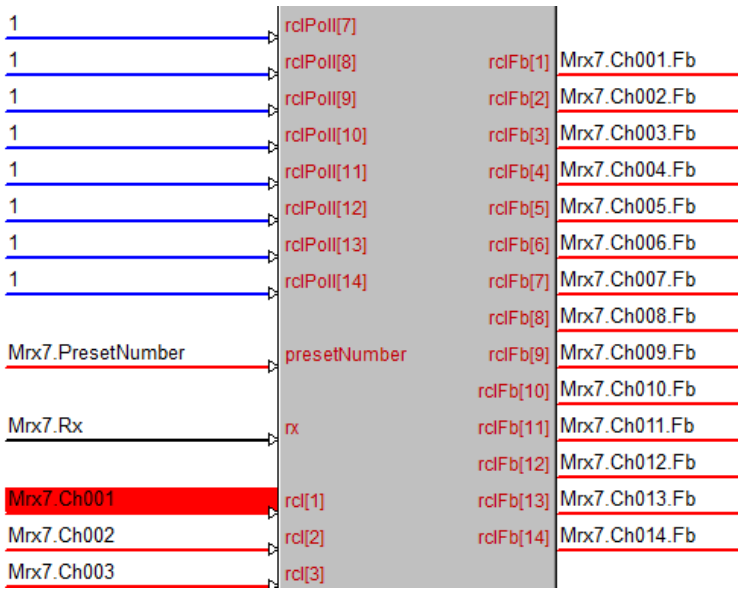
So the usual procedure would be setting autoPoll to “1” and set rclPoll[x] to “1” on all parameters where a feedback is needed.

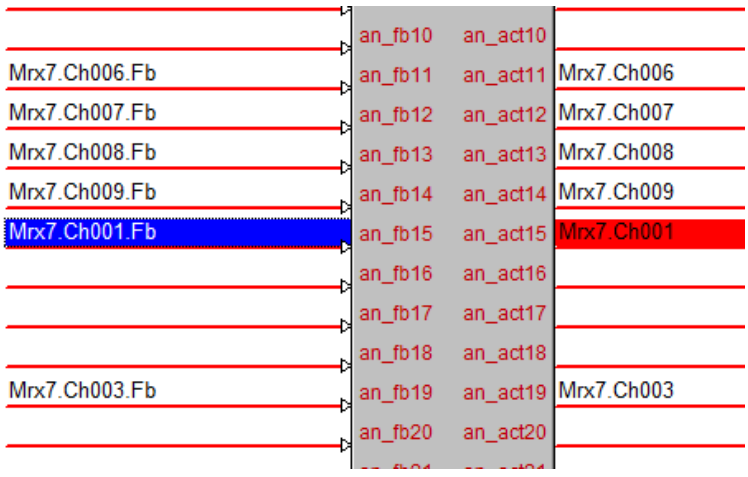
7. Parameter Range:

Because it's unknown which parameter you want to control on the MRX-7 (could be ON's, Mutes, Levels, Times, Frequencies, Routers or others) all Parameters are internally normalized to a range from 0 … 65535.
(Which is also the usual range for an analog parameter in the Crestron system)

The implications are as follow:

Analog parameters, such as a level, DCA, delay or frequency could be directly connected to a Touchpanel-Fader and the feedback to the Touchpanel-Feedback.





The range (Min Value & Max Value) of the corresponding gauge or slider in VT-Pro-e has to be set accordingly:

Properties	
Position and Size	
Orientation	Vertical
Press Digital Join	0
Enable Digital Join	0
Visibility Digital Join	0
Touch Feedback Analog Join	11
Suppress Key Clicks	☐
Read Only	☐
Min Value	0
Max Value	65535
Touch Padding	10

If you want to limit the range of a control (for example a fader should not range from -138db to -10dB, but from -40dB to +6dB), there are two ways:

1.: via Remote Control Setup List of the MTX-MRX Editor. In this case -40dB is then 0 in Crestron and +6db is 65535.

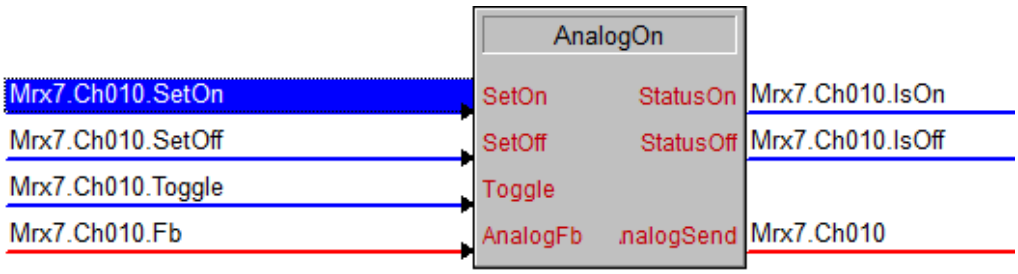
2.: via Crestron programming. In this case your Crestron Min value should be 14286 and your Max Value should be 60411 (see how to evaluate such values with the Crestron Debugger in chapter 9).

You should also note, that returning values may be rounded because of different resolutions in both systems, so please choose your way depending on the situation.

8. ON's and OFF's:

In case of a digital signal (Channel ON, Mute or so) you have to use an analog "0" or an analog "65535" to set these parameters. To make this a little bit easier, a helper macro is provided.
This macro is called "AnalogOn" because it translates your digital signal (on and off) to analog values as the module requires. You can use it for setting parameters on, off or use toggling.

In the sample application you can see and test how it works:

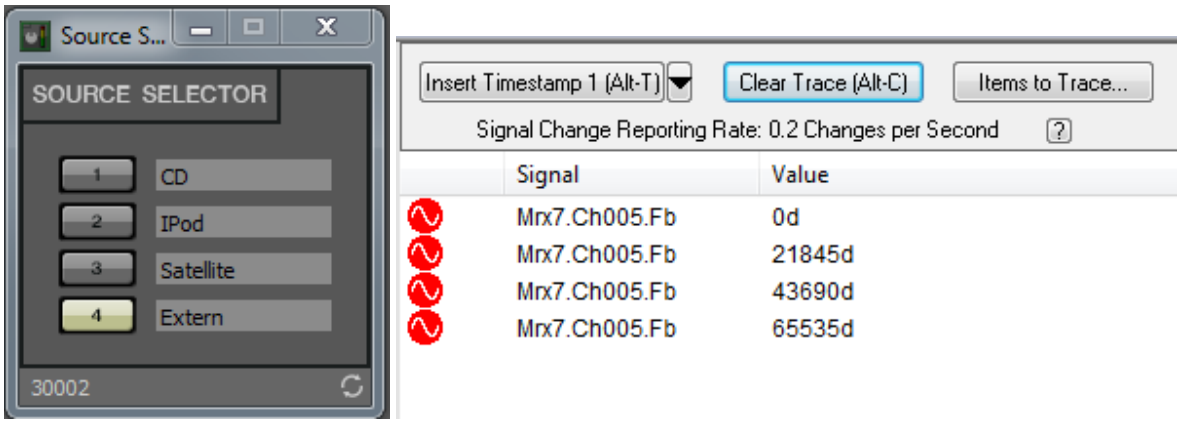


Please note: if you control a MUTE function, ON means muted, OFF means umuted!

9. Routers and Source-Selectors:

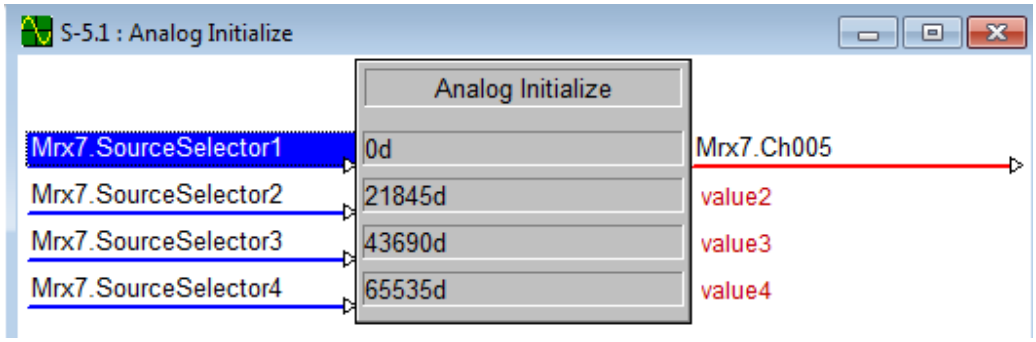
To set a router, a source selector or something similar, you have to figure out which values correspond to the different functions.

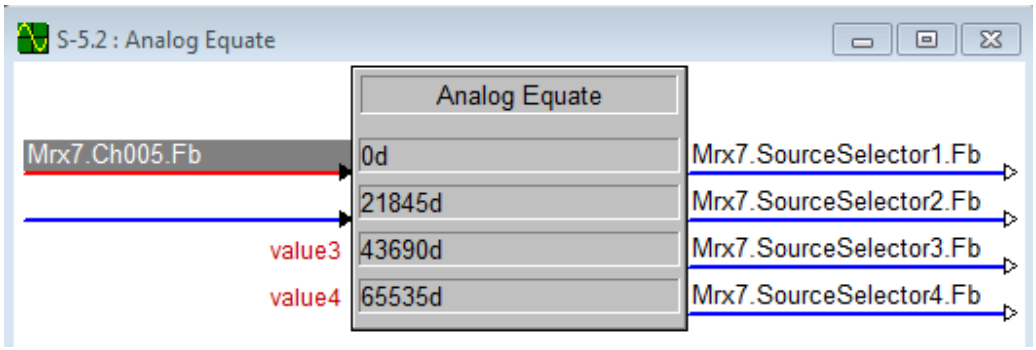
For an example, see the Selector in the sample application. We want to control a source selector with 4 inputs here. The source selector is in the remote control list on No. 5.
Now we go online and step through the selector. At the SIMPL debugger you see which values are corresponding to a certain input:



As you can see, during the clicks on the source selector the feedback on the corresponding parameter shows 0 (CD), 21845 (IPod), 43690 (Satellite) and 65535 (Extern).

Now we can use an “Analog Initialize” to control the source selector and an “Analog Equate” for the feedback on the Touchpanel:





The upper and lower values are always 0 and 65535 but the values in between depend on the number of steps in between. As the steps are all equal, the values could also be calculated. But, in some cases this can cause some rounding errors witch may result in not working feedbacks. So, it is much safer to analyse the exact values using the SIMPL debugger.

10.Other Documents

In case you encounter any errors (you may see them on the Rx signal in the debugger coming from the MRX7-D) please also have a look at the other documents as:

- latest release notes
- FAQ
- Protocol description (MRX7-D Remote Control Protocol Specifications)