



DirecTV XM Music Module Application Guide

Description

This module allows any Crestron 2-series processor to tune XM Music channels on DirecTV receivers using either up to twenty Favorite channels or an updatable channel list grouped by category. Control of the satellite receiver may be accomplished using IR or the two currently supported serial formats if the receiver is equipped with a "Low Speed Data" port.

The XM Categories, channel names and channel numbers are all driven from a text file stored in NVRAM or Compact Flash to facilitate updating the lineup without having to make changes in your program or your touchpanels.






The module includes a Toolbox script file that you can use to update all of your customer's processors if you have remote access. By running one script you can load an updated text file with the new lineup information without the need for a site visit or even rebooting the processor

Supported Receivers

This module supports serial control of the DirecTV D10-100, D10-200, and H10 and most receivers with a "Low Speed Data Port" on the rear panel. Control of other receivers may be possible via infrared (IR) control.

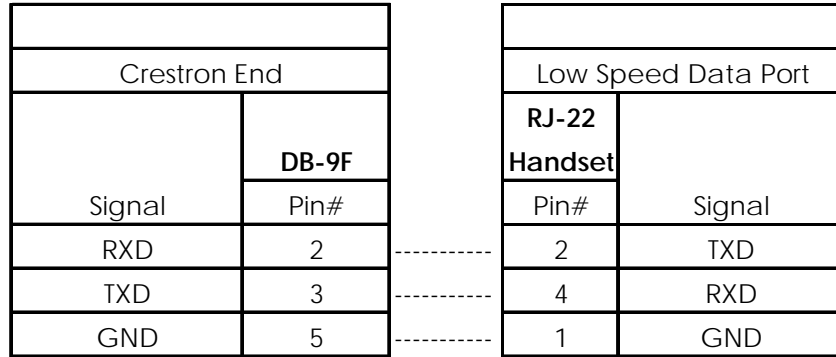
Supported Processors

This module is supported on all 2-series processors.

Compatibility			Processor Requirements	
 2-Series Compatible	 NOT CNMSX Compatible	 NOT System Builder Compatible	 Ethernet NOT NEEDED	 Compact Flash NOT NEEDED

Serial Cable Pinout For Low-Speed Data Port

DB9 CONNECTION



Communications Format:

9,600 BPS

No Parity

8 Data Bits

1 Stop Bit

No handshaking

Module Application

It is strongly suggested that you load the supplied demonstration program and touchpanel to gain an understanding of the application of the module before you attempt to implement the module in your own program.

Using the Receiver Type parameter, configure the module for the control method you will be using for the satellite receiver. Select 0 for Infrared (IR) control, 1 for control using the new serial protocol, or 2 for control using the old serial protocol. See the Parameter descriptions below for more detail on "Old" and "New".

The module has been built to also support channel recall from user interfaces like a keypad where the user can only cycle through their favorite presets. In this case enter each of the "Favorite" channels in the Fav Channel 1 through Fav Channel 20 parameters. Enter the total number of favorite channels in the Number of Favorites parameter. Note that the module needs a minimum of 5 presets and a maximum of 20. When you press favorite+ or favorite- the module will step through each of the defined favorites. When it reaches the last channel it will wrap around to the first.

Enter the name and path of the text file with the XM Category information in the Category Filename parameter, paths would usually be something like [\\NVRAM\\directtv.txt](#) for files stored on the NVRAMDISK or [\\CF0\\directtv.txt](#) for files stored on a Compact Flash card.

The zip file for this module includes a file named "directv_xm_music.txt". This file contains the current DirecTV XM music lineup as of 6-1-06. This file can be tailored to your customer's needs by renaming categories, removing categories or removing channels that may not suit their tastes.

Note: For successful operation you must first load this file to NVRAM or to a Compact Flash card in the Processor!

To store the file in NVRAM

First be sure to enable NVRAM if you have not done so already. At the command prompt type NVRAMDISK then enter. If the processor returns NVRAMDISK: NOT initialized then you must first initialize your disk. Type "NVRAMDISK 64K". You will get a prompt telling you that this operation will erase all your files on the NVRAM. Type Y and enter and the disk will now be initialized. Now in Toolbox launch the File Manager. Double Click on the NVRAM Disk branch of the tree. Now you can drag the "directv_xm_music.txt" into this directory using standard Windows conventions.

To store the file on a Compact Flash Card (only available on a PRO2, AV2 or PAC2)

Launch Toolbox and connect to your processor. Next launch the File Manager. Double Click on the "Compact Flash A" branch of the tree. Now you can drag the "directv_xm_music.txt" into this directory using standard Windows conventions.

Editing the Text File

The text file that drives the module can be edited to suit the needs of the project. However maintaining proper syntax in this file is critical to keeping the module

operational. If you edit the file and encounter issues please load the original text file supplied with the module and verify operation. Then compare your edited version with the supplied version.

Text File Formatting

Each Category is preceded by a zero and a comma. The Category may use any ASCII characters. Then below the Category you must enter the three digit channel number followed by a comma and then the description of the channel name. The description may have any typable ASCII character in the name. Repeat this formatting until the end of the file. Here the module uses the value 65000 as a delimiter to indicate the end of the file. After 65000, you can enter any comments that you wish such as revision dates or customer names.

Loading an Updated File

After using Toolbox or another method to manually load an updated file, type `USERPROGCMD "CW_REFRESH_XM"` (all upper case and including the quotation marks) to force the module to reload the data file. This can also be accomplished by pulsing the "[[force_reload_now](#)]" digital input on the module.

Signal And Parameter Descriptions

Bracketed signals such as "[signal_name]" are optional signals

DIGITAL INPUTS

category+	.....	Pulse to advance to the next category
category-	.....	Pulse to move to the previous category. Note that if the first or last category is reached, the module will "loop around" to the other end of the list
browse+	.....	Pulse to scroll to the next set of channels if there are more than 4 channels in the category
browse-	.....	Pulse to scroll to the previous set of channels if there are more than 4 channels in the category.
pick_selection1...selection4	.....	Pulse to tune to the station that is listed on the associated line
[power_on]	.....	Pulse to turn the receiver power on (not applicable with IR)
[power_off]	.....	Pulse to turn the receiver power off (not applicable with IR)
[tune_fav1]...fav20]	.....	Pulse to tune to the selected favorite channel number (as entered on the in the Fav ChannelX parameter)
[favorite+]	.....	Pulse to advance to the next favorite channel in sequence (if the end of the favorite channels list is reached, it will cycle to the first favorite channel)
[favorite-]	.....	Pulse to change to the previous favorite channel in sequence
[force_reload_now]	.....	Pulse the module to reload the data file. This input should be used infrequently as overuse may reduce system performance

ANALOG INPUTS

This module does not utilize any analog inputs.

SERIAL INPUTS

This module does not utilize any serial inputs.

DIGITAL OUTPUTS

[number_0]...[number_9]	.....	connect to the IR driver for your satellite receiver if you are using IR to tune the receiver.
[enter]	.....	connect to the enter input on the IR driver for your satellite receive if you are using IR to tune the receiver.
[ir_busy]	.....	high when the module is busy issuing IR commands to the receiver. This would normally be tied to a sub page or other logic to provide feedback to the user

ANALOG OUTPUTS

[control_multimode]	.....	This output has a value of 0 if there are fewer than 4 channels in the current category so you can make a multimode button disappear. The value is 1 if there are more than 4 channels in the current category.
[channel_number]	.....	Indicates the current channel number that the receiver has been tuned to.

SERIAL OUTPUTS

category\$	Indicates the name of the currently selected category
current_station\$	Indicates the name and category of the currently tuned station
selection1\$...4\$	Indicates the name of the channel that would be tuned to if the respective pick_selection input was pulsed.
[dss_tx\$]	Tie to the tx\$ input of the serial driver for the serial port that the receiver is connected to, if using RS-232 control.

PARAMETERS

Pulse Time	Enter the amount of time to pulse each digit when tuning, applicable only when using IR control.
Interdigit Delay	Enter the amount of time to wait between digits when tuning, applicable only when using IR control.
Receiver Type	Select the type of receiver control that you will be using. Select IR if you are opting to have the module connect to any IR driver. If you are using IR be sure to adjust the Pulse and Interdigit timing for proper channel tuning via IR. If your receiver is equipped with a Low Speed Data port you will need to select one of the two serial options. "Old" generally refers to Sony SAT-A1 receivers and up. "New" reflects the protocol change for the Advanced Program Guide or AGP for short. This adds two bytes to the command and supports newer RCA receivers. If you are having trouble controlling your receiver via its Low Speed Data then switch from on format to the other and test the module again.
Fav Channel1...20	Enter up to 20 channel numbers for favorite stations.
Number of Favorites	Enter the number of favorite channels (between 5 minimum and 20 maximum) that you are using.
Category Filename	Enter the filename and path of the file containing the DirecTV XM music lineup. Examples include \\NVRAM\directv_xm_music.txt for a file stored in the processor's NV ram or \\CF0\directv_xm_music.txt for a file stored on a Compact Flash card. You may change the name of your text file but be sure that the file name gets entered here correctly. Syntax is important.

Support

This module is supported by ControlWorks Consulting, LLC. Should you need support for this module please email support@controlworks.com or call us at 440-449-1100. ControlWorks normal office hours are 9 AM to 5 PM Eastern, Monday through Friday, excluding holidays.

Before calling for support, please ensure that you have loaded and tested operation using the included demonstration program and touchpanel(s) to ensure that you understand the correct operation of the module. It may be difficult for ControlWorks to provide support until the demonstration program is loaded.

Updates, when available, are automatically distributed via Email notification to the address entered when the module was purchased. In addition, updates may be obtained using your username and password at <http://www.thecontrolworks.com/customerlogin.aspx>.

Distribution Package Contents

The distribution package for this module should include:

DirecTV_XM_Music_v2.umc	Crestron module for tuning DirecTV XM Music Channels
DirecTV_XM_Music_engine_v2.usp	SIMPL+ Module used in the module
DirecTV_XM_Music_engine_v2.ush	SIMPL+ Module used in the module
DirecTV_XM_Music_Demo_v2.smw	SIMPL Windows program to demonstrate module use.
DirecTV_XM_Music_TPS3000_v2.vtp	Demo touchpanel for TPS-3000 touchpanel
DirecTV_XM_Music_Xpanel_v2.vtp	Demo touchpanel for X-Panel touchpanel
DirecTV_XM_Music_Module_Help_v2.pdf	This help file
directv_xm_music.txt	Sample XM Music Lineup file to be loaded to the processor
Load_Channel_Lineup_to_Processors.txt	Toolbox Script file to demonstrate loading the channel lineup text file to remote processors.

Revision History

V2 lincoln@controlworks.com 2007.06.06

Added ability to reload lineup without resetting processor (via script or USERPROGCMD "CW_REFRESH_XM" command)

V1 lincoln@controlworks.com and jim@controlworks.com 2006.06.01

Initial release

Development Environment

Version 2 of this module was developed on the following hardware and software. Different versions of hardware or software may or may not operate properly. If you have questions, please contact us.

Hardware

Crestron PRO2 Processor	v3.155.1243
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Software

Crestron SIMPL Windows	Version 2.08.38
Crestron Vision Tools Pro-e	Version 3.6.1.3
Crestron Database Version	18.7.8
Crestron Symbol Library	Version 472
Crestron Device Library	Version 472

ControlWorks Consulting, LLC Software License Agreement

Definitions:

ControlWorks, *We*, and *Us* refer to ControlWorks Consulting, LLC, with headquarters located at 701 Beta Drive, Suite 22 Mayfield Village, Ohio 44143-2330. *You* and *Dealer* refer to the entity purchasing the module. *Client* and *End User* refer to the person or entity for whom the Crestron hardware is being installed and/or will utilize the installed system. *System* refers to all components described herein as well as other components, services, or utilities required to achieve the functionality described herein. *Module* refers to files required to implement the functionality provided by the module and may include source files with extensions such as UMC, USP, SMW and VTP. *Demo Program* refers to a group of files used to demonstrate the capabilities of the Module, for example a SIMPL Windows program and VisionTools Touchpanel file(s) illustrating the use of the Module but not including the Module. *Software* refers to the Module and the Demo Program.

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Provision of Support

We provide limited levels of technical support only for the most recent version of the Module as determined by Us. We do not provide support for previous version of the module, modifications to the module not made by Us, to persons who have not purchased the module from Us. In addition, we may decline to provide support if the Demo Program has not been utilized. We may withdraw a module from sale and discontinue providing support at any time and for any reason, including, for example, if the equipment for which the Module is written is discontinued or substantially modified. The remainder of your rights and obligations pursuant to this license will not be affected should ControlWorks discontinue support for a module.

Modification of Software

You may not decrypt (if encrypted), reverse engineer, modify, translate, disassemble, or de-compile the Module in whole or part. You may modify the Demo Program. In no event will ControlWorks Consulting, LLC be liable for direct, indirect, incidental or consequential damages resulting from You modifying the Software in any manner.

Indemnification/Hold Harmless

ControlWorks, in its sole and absolute discretion may refuse to provide support for the application of the Module in such a manner that We feel has the potential for property damage, or physical injury to any person. Dealer shall indemnify and hold harmless ControlWorks Consulting LLC, its employees, agents, and owners from any and all liability, including direct, indirect, and consequential damages, including but not limited to personal injury, property damage, or lost profits which may result from the operation of a program containing a ControlWorks Consulting, LLC Module or any component thereof.

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