NetLinx Module Interface Specification

for an

Antex XM100 Tuner

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Revision History

Date	Initials	Comments
11/12/2011	DC	Initial Release

Introduction

The Antex XM100 is XM satellite radio tuner. The AMX module communicates to the Antex XM100 using the following RS232 specifications:

Rate = 9600 bps
Data bits = 8
Stop bit = 1
Parity   = none
Handshaking = off

For the NXI integrated controller, the communication cable is a DB-9 Female.

AMX	Antex XM100
1 GND	5 GND
2 RXD	3 TXD
3 TXD	2 RXD

For NI systems, the standard AMX programming cable (crossover) should be used.

The communication module is called by adding the following line of code:
DEFINE_MODULE Antex_XM100_Comm' label(virtual_device_name, real_device_name).

The UI module is called by adding the following line of code:
DEFINE_MODULE ‘Antex_XM100_UI' label (virtual_device_name, touch_panel_array, touch_button_array, display_array)

Overview

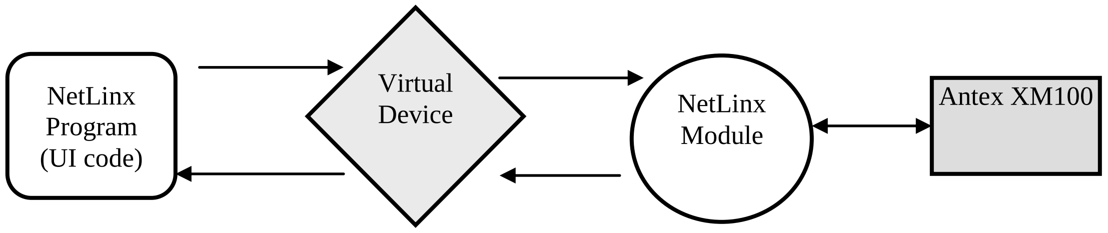
This document will define the common NetLinx module interface for a Antex XM100 TV tuner.

The Antex XM100 may be serially controlled using the Antex_XM100_Comm.tko module included. This module requires a single serial port connection from a NetLinx serial port to the Antex XM100 being controlled. For installations containing more than one Antex XM100, multiple instantiations of the module with multiple physical RS-232 ports may be used. The communication module implements the actual Antex XM100 protocol for communicating to the unit but exposes a more simplified, NetLinx-friendly protocol to the programmer.

The user interface module, called Antex_XM100_UI.axs, contains the simplified protocol. It is through this user interface module the programmer takes control of the device by sending commands to the communication module, which in turn translates the commands into device specific protocol and sends them to the physical device. There is no direct connection between the user interface module and the physical device.

The programmer will interface to the NetLinx module through a virtual device. This virtual device is defined by the programmer and is used to control the communication between the user interface module and the communication module.

The following diagram gives a graphical view of the interface between the interface code and the NetLinx module.



Command Interface

The interface code will control the Antex XM100 TV tuner via command events (NetLinx command *send_command)*. These commands will be sent to the module to affect control. Below are the commands supported.

* Indicates extended commands beyond the generic API.

Command	Description

`DEBUG=<value>`	`Enable/disable the debug mode. Debug is used to view the strings being sent out by the user interface module and the communication module and to view the incoming string from the device to the communication module and from the communication module to the user interface module. To view the messages, open a TELNET session and turn messaging on; then send the debug command as follows:`
	
	`<value> = 1 : (turn debug on)`
	`          0 : (turn debug off)`
	
	`DEBUG=1`

`DEBUG?`	`Query for the state of the telnet debugging messages.`
	
	`DEBUG?`

`PASSTHRU=<string>`	`Allow user the capability of sending commands directly to whatever unit is attached without processing by the NetLinx module. User must be aware of the protocol implemented by the unit to use this command. This gives the user access to features which may not be directly supported by the module. A carriage return should be included for the command to be sent out.`
	
	`<string> : string to send to unit`
	
	`Note:` `The delimiter 'carriage return' is appended by the Comm module. Refer to the "Adding Functions to Modules" section for additional information.`
	
	`PASSTHRU=THIS IS A COMMAND`
	`PASSTHRU=RESET`

`TUNE=<value>`	`Increments, decrements, or sets the tuner channel.`
	
	`<value>: + = increment tuner`
	`         - = decrement tuner`
	`         n = channel, range: 1-255`
	
	`TUNE=+`
	`TUNE=92`

TUNE?	Query the current tuner channel. TUNE?
VERSION?	Query for the current version number of the NetLinx module. VERSION?

Table 1 – Send Command Definitions

String Feedback

The NetLinx module will provide feedback to the interface code for the Antex XM100 TV tuner changes via string events. Below are the strings supported.

String	Description
ARTIST=<value>	**Returns the name of the artist.** **<value> = Artist Name** **ARTIST=Chicago**
CATEGORY=<value>	**Returns the category of the song.** **<value> = Category** **CATEGORY=Soft Rock**
CHANNEL=<value>	**Returns the name of the channel.** **<value> = Channel Name** **CHANNEL=70's on 7**
DEBUG=<value>	Feedback on the current setting of the debug messages. <value> = 0 : Debug messages are off 1 : Debug messages are on DEBUG=1
ERROR=<msg>	Feedback on errors that occur in the Comm module and in the device. <msg> : string ERROR=Invalid command.
SONG=<value>	**Returns the name of the Song.** **<value> = Song Name** **ARTIST=Beginnings**
TUNE=<value>	Feedback on the tuner channel. <value>: n = channel, range: 1-255 TUNE=92

VERSION=<value>	Report the current version number of the NetLinx module. <value> : current version number in xx.yy format VERSION=1.42

Table 2 - String Feedback Definitions

Device Notes

1. The highest channel number that can be tuned is 255.
2. The device baud rate must be set to 9600 in order for the Comm module to work.

Adding Functions to Modules

Commands to the device

This module supplies a mechanism to allow additional device features to be added to software using the module. This is the PASSTHRU command, which allows protocol strings to be passed through the module. The device-specific protocol must be known in order to use this feature.

As an example, suppose that a module for a projector has not implemented the 'white balance adjustment' feature. The command that the projector protocol requires is 03H, 10H, 05H, 14H, followed by a checksum. The documentation for the PASSTHRU command specifies that the module will automatically generate the checksum. In this case, the following string should be sent from the UI code to implement 'white balance adjustment'.

```
send_string vdvDevice,"'PASSTHRU=',$03,$10,$05,$14"
```

The reason to use PASSTHRU instead of sending a protocol string directly to the device port is that the device may require command queuing, calculation of checksums, or other internal processing, which would not be done if the string was sent directly. Because of this, it is best to filter all communication TO the device through the module. (The module documentation will indicate any processing that will be automatically done to the PASSTHRU string like checksum calculation.)

Additional Feedback from the device

The module documentation indicates what feedback is provided. If additional feedback is required, a CREATE_BUFFER for the device must be implemented in the user code to process the strings from the device manually. Note that the module will still be processing the response strings independently and sending the interpreted feedback up to the user code.