

Crestron **C2N-TXM**
XM Satellite Radio Tuner

Operations Guide



This document was prepared and written by the Technical Documentation department at:



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Introducing XM Satellite Radio

There's a world of audio listening pleasure beyond AM and FM. **XM Satellite Radio.** Select from over 150 channels of music, news, sports, comedy, talk, and entertainment. Coast-to-coast coverage and digital quality sound, with all music channels 100% commercial free.

Questions? Visit www.xmradio.com.

How to Subscribe

Listeners can subscribe by visiting XM on the Web at www.xmradio.com or by calling XM's Listener Care at (800) 967-2346. Customers should have their Radio ID and credit card ready. The Radio ID can be found by selecting channel 0 on the radio.

A Warning Against Reverse Engineering:

It is prohibited to copy, decompile, disassemble, reverse engineer, or manipulate any technology incorporated in receivers compatible with the XM Satellite Radio system. Furthermore, the AMBE[®] voice compression software included in this product is protected by intellectual property rights including patent rights, copyrights, and trade secrets of Digital Voice Systems, Inc. The user of this or any other software contained in an XM Radio is explicitly prohibited from attempting to copy, decompile, reverse engineer, or disassemble the object code, or in any other way convert the object code into human-readable form. The software is licensed solely for use within this product.

General:

Hardware and required basic monthly subscription sold separately. Premium Channel available at additional monthly cost. Installation costs and other fees and taxes, including a one-time activation fee may apply. Subscription fee is consumer only. All fees and programming subject to change. Subscriptions subject to Customer Agreement available at xmradio.com. Only available in the 48 contiguous United States. ©2005 XM Satellite Radio Inc. All rights reserved.

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XM Satellite Radio Tuner: C2N-TXM

Introduction

Features and Functions

The Crestron® C2N-TXM is a Crestron-controlled XM Satellite Radio tuner (XM Tuner). The XM Tuner adds up to 255 channels of XM satellite radio programming to your whole-house audio distribution system. Up to 31 categories of digital quality audio programs provide music, news, sports, comedy, talk, and entertainment.

The XM Tuner is designed to work in a Crestron control system (herein referred to as the Cresnet® system). You can use any Crestron touchpanel to search through the channels, with on-screen display of song, artist, and XM channel number. Twenty user-programmable presets let you quickly select your favorite channel. The XM Tuner provides analog stereo output plus coax digital and CAT5 balanced analog audio outputs. Output signals can be routed to local amplifiers or to a surround sound decoder such as the C2N-DAP8 or C2N-DAP8RC. Outputs can also be routed to a CNX-BIPAD8 for distribution to other rooms via CAT5 cabling.

Functional Summary

- Up to 255 channels in 31 categories of digital quality audio
- Coast-to-coast coverage in the continental US
- Time and date information (GMT) supplied via XM satellite
- Twenty presets for fast program selection
- Indoor/outdoor high-gain antenna supplied
- Two RCA connectors for analog stereo output
- One RCA connector for coax digital stereo output
- One CAT5 connector for distribution of stereo audio to other rooms

How to Subscribe

Listeners can subscribe by visiting XM on the Web at www.xmradio.com or by calling XM's Listener Care at (800) 967-2346. Customers should have their Radio ID AND credit card ready; the Radio ID (eight-digit identification number assigned by XM Radio) can be found by selecting channel 0 on the radio. It is also printed on

the label on the bottom of the unit, and reports back in the Crestron Viewport when **Diagnostics | Report Network Devices** is selected.

Specifications

The following table provides a summary of specifications for the C2N-TXM tuner.

Specifications of the C2N-TXM

SPECIFICATION	DETAILS
Cresnet Power Usage	8.0 Watts (0.3 Amp @ 24 VDC)
Default Net ID	55
Control System Update Files ^{1, 2, 3}	
2-Series Control System	Version 2.004.CUZ or later
CNMSX-AV/PRO	Version 5.12.63X.UPZ or later
CNRACKX-DP	Version 5.12.63W.UPZ or later
CEN/CN-TVAV	Version 5.12.63V.UPZ or later
C2N-TXM Firmware	C2N-TXM.1.7.upg or later
Audio Output	
AUDIO OUT L, R	Two RCA connectors for analog stereo
AUDIO OUT DIGITAL	One RCA for coax digital
AUDIO OUT (CAT5)	One RJ-45 for analog balanced audio
Analog audio output level	2 V _{rms} maximum, single-ended; 4V _{rms} balanced
NET	One Cresnet [®] 4-wire interface (24, Y, Z, G)
D/A converter total harmonic distortion (THD) + Noise	<0.01% @1 kHz
D/A converter S/N ratio	>97 dB balanced, >95 dB unbalanced, 20 Hz-22 kHz A-weighted
Crosstalk	> -90 dB 20 Hz-22 kHz
Output impedance	<100 ohms single-ended
Recommended load impedance	>1K Ohm
Environmental temperature	32° to 122°F (0° to 50°C)
Humidity	10% to 90% RH (non-condensing)
Dimensions	Height: 1.80 in (4.57 cm) Width: 7.07 in (17.96 cm) Depth: 6.55 in (16.64 cm)
Weight	1.86 lb (0.837 kg)

1. The latest versions can be obtained from the Crestron website. Refer to NOTE after last footnote.
2. Crestron 2-Series control systems include the AV2 and PRO2. Consult the latest Crestron Product Catalog for a complete list of 2-Series control systems.
3. Filenames for CNX and ST-CP update files have a UPZ extension. Files on the website may be .zip or self-extracting .exe files containing the .cuz or .upz file. All can be obtained from the Downloads section of the Crestron website. To avoid program problems, make sure you are using the update file with the correct suffix letter (e.g., S, V, W, X)

NOTE: Crestron software and any files on the website are for Authorized Crestron dealers and Crestron Authorized Independent Programmers (CAIP) only. New users may be required to register to obtain access to certain areas of the site (including the FTP site).

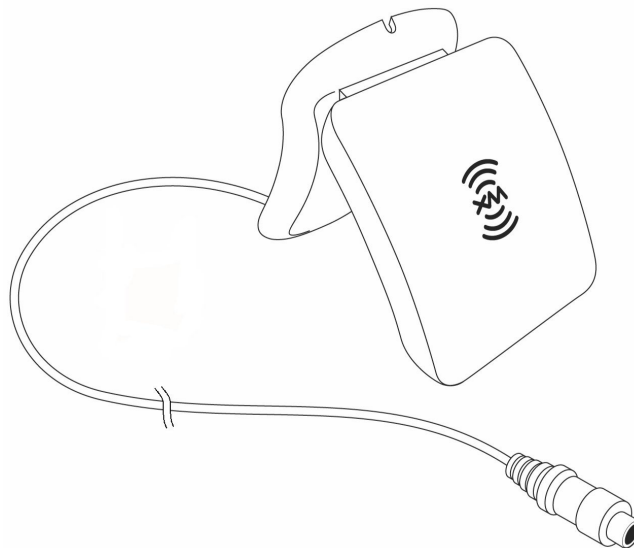
Physical Description

The C2N-TXM is housed in a black enclosure with labeling on the front and rear panels. Five LEDs on the front of the unit indicate the unit's status. All connections, except for headphones, are made on the back of the unit. There are four rubber feet on the bottom of the unit for stability and to prevent slippage. The unit and the supplied indoor/outdoor high-gain antenna are illustrated below and on the following page.

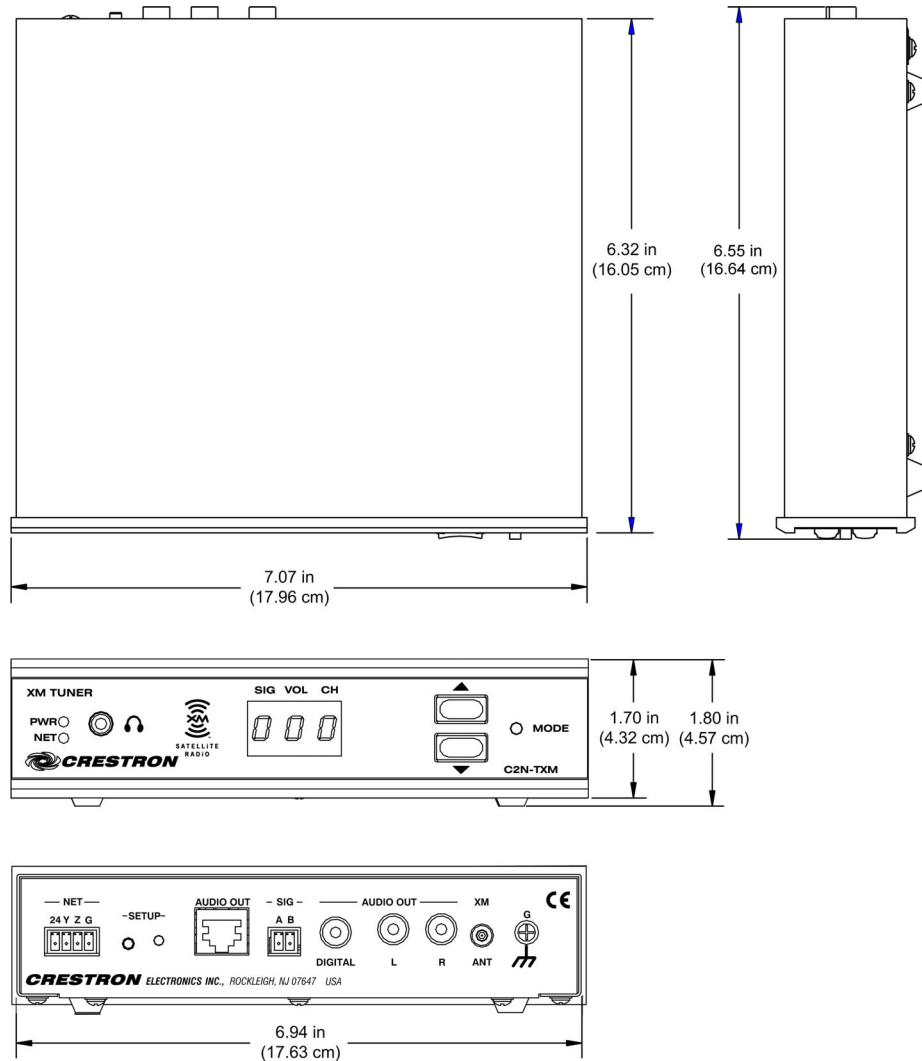
C2N-TXM Physical Views



Supplied Indoor/Outdoor High Gain Antenna



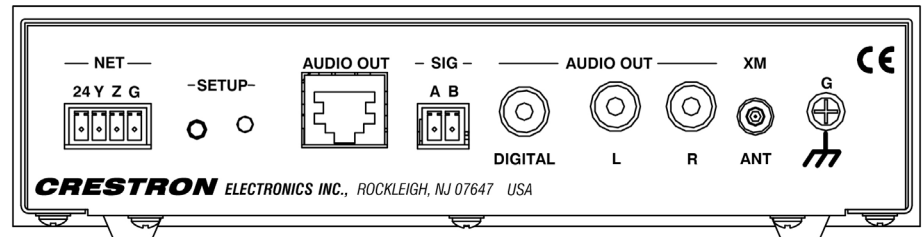
C2N-TXM Overall Dimensions



C2N-TXM Ports

All connections to the C2N-TXM, except headphones, are made through the ports on the rear panel. Refer to the illustrations and descriptions, which follow.

C2N-TXM Ports



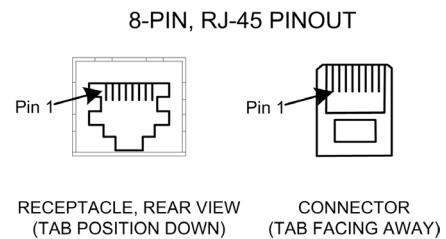
NET

This 4-pin terminal block connector is used to connect the C2N-TXM module to the Cresnet system. Data and power for the C2N-TXM are provided via the connection. Refer to “Network Wiring” on page 7.

AUDIO OUT (RJ-45)

The RJ-45 **AUDIO OUT** port is used to route analog stereo to a CNX-BIPAD8 for distribution throughout the home. Wiring for the connector is shown below.

PIN #	SIGNAL
1	Audio Out L +
2	Audio Out L -
3	Audio Out R +
6	Audio Out R -
4, 5, 7, 8	no connection



NOTE: For additional information on audio connections over CAT5, refer to the latest version of the Crestron CAT5 Wiring Reference Guide (Doc. 6137) which is available from the Crestron website (<http://www.crestron.com/manuals>).

SIG A, B

This two-pin terminal block connector is used for testing signal strength during antenna installation. Refer to “Antenna Installation” on page 12 for details.

AUDIO OUT DIGITAL

This RCA connector provides S/PDIF coaxial digital stereo output for a local surround-sound processor such as the C2N-DAP8 or C2N-DAP8RC.

AUDIO OUT L, R

These two RCA connectors provide analog stereo output for local amplifiers.

XM ANT

This RF SMB connector is for the supplied XM antenna cable.

G (Chassis Ground)

Use this chassis screw to ground the unit to the amplifier and audio source common grounds.

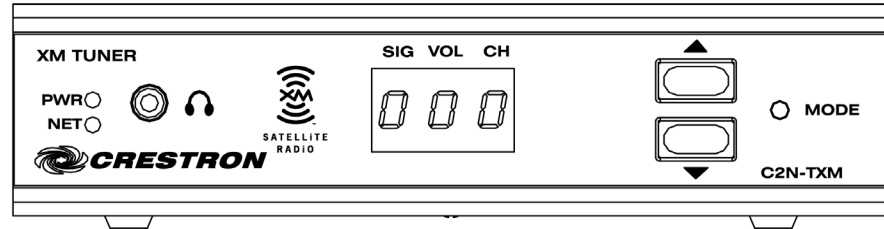
🎧 (Headphone)

The only connection on the front panel of the XM Tuner is the mini-phone jack, which permits the use of headphones to monitor the audio signal. The volume mode, selected by the MODE switch, allows adjustment of the volume to the headphones. Note that plugging in headphones does not interrupt the unit’s other audio output signals.

Front Panel Controls and Indicators

Five LED indicators, a three-digit display, and three pushbutton switches are located on the front panel of the C2N-TXM. Refer to the illustration and descriptions that follow.

C2N-TXM Front Panel Controls and Indicators



PWR (Power)

This green LED illuminates when power is supplied to the C2N-TXM.

NET

This yellow LED illuminates when communication between the control system and the C2N-TXM is established (the unit is polled on the network). Illumination indicates that the program currently loaded has a network device defined at the same ID as the C2N-TXM. The LED flashes or remains on when communication with the processor occurs.

MODE Switch, ▲▼ (Up/Down) Buttons, and Display

Use the **MODE** switch to select between the signal, volume, and channel modes. The corresponding red LEDs (**SIG**, **VOL**, and **CH**) illuminate as each mode is selected. In each mode, the three-digit display shows the appropriate values. In the channel mode, the up/down buttons let you sequence through the available channels; the three-digit display shows the channel numbers. In the volume mode, the up/down buttons select ten volume levels (0 through 9) for the signal supplied to the headphone jack. In the signal mode, the display shows an initial letter (**S**atellite, or **R**epeater) to indicate the signal source, plus two numeric digits (00 – 99) to indicate the signal strength.

SIG, VOL, CH

These red LEDs illuminate in turn when the **MODE** switch selects the respective signal, volume, and channel modes.

SETUP LED and Pushbutton

The C2N-TXM is Touch Settable ID (TSID) ready. The **SETUP** pushbutton and its associated LED are located on the rear panel and are used for setup of the unit’s network ID during the initial configuration of a Cresnet system or when the device is being added/replaced. Refer to “Method B (Touch Settable IDs)” on page 9 for detailed information.

Industry Compliance

As of the date of manufacture, the C2N-TXM has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.



NOTE: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) these devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation.

Setup

Network Wiring

CAUTION: In order to ensure optimum performance over the full range of your installation topology, Crestron Certified Wire, and only Crestron Certified Wire, should be used. Failure to do so may incur additional charges if support is required to identify performance deficiencies as a result of using improper wire.

CAUTION: Use only Crestron power supplies for Crestron equipment. Failure to do so could cause equipment damage or void the Crestron warranty.

CAUTION: Provide sufficient power to the system. Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system (<http://www.crestron.com/calculators>).

NOTE: When installing network wiring, refer to the latest revision of the wiring diagram(s) appropriate for your specific system configuration, available from the Crestron website.

When calculating the wire gauge for a particular Cresnet run, the length of the run and the Cresnet power usage of each network unit to be connected must be taken into consideration. If Cresnet units are to be daisy-chained on the run, the Cresnet power usage of each unit to be daisy-chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is a home-run from a Crestron system power supply network port, the Cresnet power usage of that unit is the Cresnet power usage of the entire run. The length of the run in feet and the Cresnet power usage of the run should be used in the following resistance equation to calculate the value on the right side of the equation.

Resistance Equation

$$R < \frac{40,000}{L \times P}$$

<p>Where: R = Resistance (refer to the following table). L = Length of run (or chain) in feet. P = Cresnet power usage of entire run (or chain).</p>
--

The required wire gauge should be chosen such that the resistance value is less than the value calculated in the resistance equation. Refer to the following table.

Wire Gauge Values

RESISTANCE	WIRE GAUGE
4	16
6	18
10	20
15	22
13	Doubled CAT5
8.7	Tripled CAT5

NOTE: All Cresnet wiring must consist of two twisted pairs. One twisted pair is the +24V conductor and the GND conductor, and the other twisted pair is the Y conductor and the Z conductor.

NOTE: When daisy-chaining Cresnet units, strip the ends of the wires carefully to avoid nicking the conductors. Twist together the ends of the wires that share a pin on the network connector, and tin the twisted connection. Apply solder only to the ends of the twisted wires. Avoid tinning too far up the wires or the end becomes brittle. Insert the tinned connection into the Cresnet connector and tighten the retaining screw. Repeat the procedure for the other three conductors.

Identity Code

Every equipment and user interface within the network requires a unique identity code (Net ID). These codes are two-digit hexadecimal numbers from 03 to FE. The Net ID of each unit must match an ID code specified in the SIMPL Windows program. Refer to “Setting the Net ID in Device Settings” on page 22 for details of the SIMPL Windows procedure.

Refer to the note on page 28 for a definition of Viewport.

The Net ID of the C2N-TXM has been factory set to **55**. The Net IDs of multiple C2N-TXMs in the same system must be unique. Net IDs are changed from a personal computer (PC) via the Crestron Viewport.

NOTE: For detailed information on establishing communication between the PC and control system, refer to “Communication Settings” on page 29. If communication cannot be established, refer to the “Troubleshooting Communications” section in the respective Operations Guide for the control system.

There are two different methods—Method A or Method B—for setting the C2N-TXM Net IDs:

Method A (Cresnet address-settable ID), described on the next page, applies to C2N-TXMs in a Cresnet system with a CNX control system or with a 2-Series control system upgrade file (CUZ) version prior to 3.008, but can be used with later versions of firmware and requires that a single unit be the only network device connected to the control system.

Method B (Touch Settable IDs), which begins on the next page, applies to C2N-TXMs in a Cresnet system with 2-Series control system upgrade file (CUZ) version 3.029 or later. These upgrades enable Touch Settable ID (TSID) functionality, which makes it possible for the control system to recognize a network

device via its serial number, which is stored in the device's memory. This method does not require that any devices be disconnected from the network; Net IDs may be set with the entire Cresnet system intact. This method requires the use of the Crestron Viewport version 3.35 or later.

Use the appropriate method to set the C2N-TXM Net ID.

Method A (Cresnet address-settable ID)

1. Ensure that the C2N-TXM is the only device connected to the control system.
2. Open the Crestron Viewport.
3. From the Viewport menu, select **Functions | Set Network ID**. The software checks the baud rate and then opens the "Set Network ID" window.
4. In the "Set Network ID" window, select the C2N-TXM from the *Current Network Devices* text window.
5. Select the new Net ID for the C2N-TXM from the *Choose the new network ID for the selected device (Hex)*: text box.
6. Click **Set ID** to initiate the change. This will display the "ID command has been sent" window.
7. In the "Command Complete" window, click **OK**.
8. In the *Current Network Devices* text window, verify the new Net ID code.
9. In the "Set Network ID" window, click **Close**.

NOTE: The new Net ID code may also be verified by selecting **Diagnostic | Report Network Devices** in the Viewport (alternately, select **F4**).

10. Repeat this procedure for each C2N-TXM to be added to the system.

Method B (Touch Settable IDs)

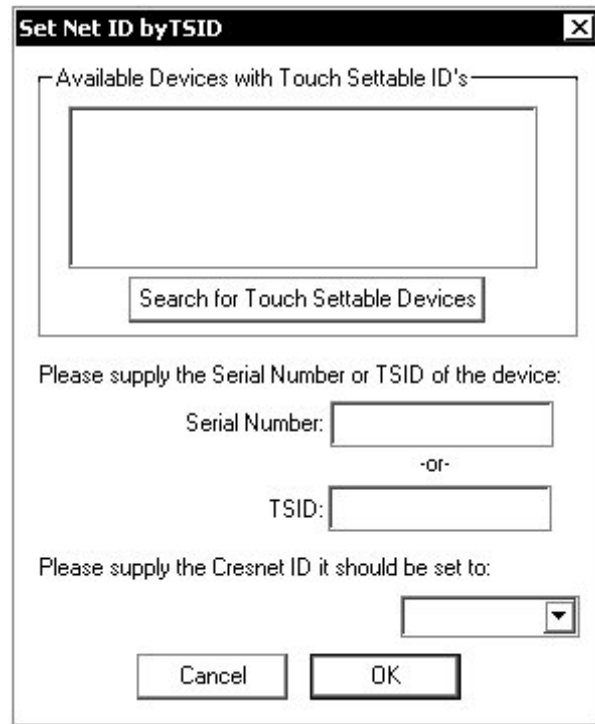
Before using this method, you should have a list of all current network devices and their Net IDs, to avoid assigning duplicate IDs.

Set Net ID by TSID

These procedures are for TSID-enabled network devices during the initial configuration of a Cresnet system or when such devices are being added/replaced.

1. Ensure that all C2N-TXMs are connected to the control system.
2. Open the Crestron Viewport version 3.35 or later.
3. From the Viewport menu, select **Functions | Assign Cresnet ID by Serial Number**. The "Set Net ID by TSID" window appears. The window is first displayed with the data fields empty. (Refer to the figure on the next page.)

“Set Net ID by TSID” Window



4. Click on the **Search for Touch Settable Devices** button. The system searches the network and lists all TSID-enabled devices found. The list is similar to the report produced by pressing **F4** (Report Network Devices); the first eight digits of each line constitute the TSID number (hexadecimal form of the serial number).
5. As you enter either the serial number or TSID number of the device that requires a change, the corresponding TSID or serial number automatically appears in its appropriate field, and the list scrolls to and highlights the device listing. The listing should show the device’s current Cresnet ID.
6. Enter the Cresnet ID that the device should be set to and click **OK**. The number you enter should appear on the list.

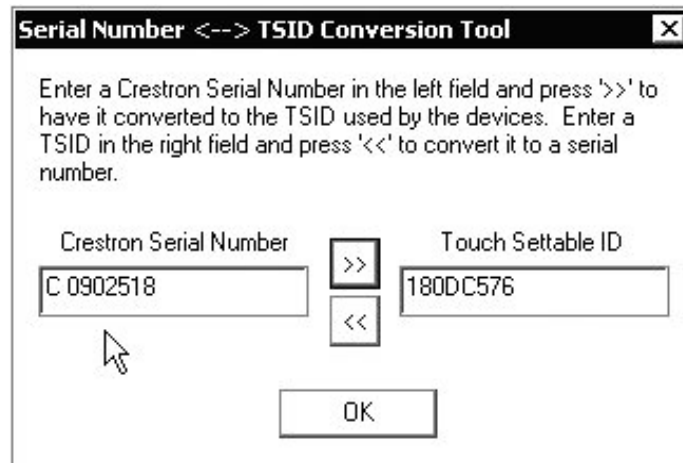
CAUTION: This function does not prevent you from setting duplicate IDs. Be sure to check current assignments before entering the desired Cresnet ID number.

Serial Number to TSID Conversion

This utility is useful in a case where there are multiple devices of the same type on a network, you need to locate a particular one, you know the TSID but not the serial number, and your site installation list is based on device serial numbers. In this (or the reverse) situation, do the following:

1. Open the Crestron Viewport.
2. From the Viewport menu, select **Functions | Serial Number ↔ TSID Conversion Tool**. The “Serial Number ↔TSID Conversion Tool” window is displayed. (Refer to the figure on the next page.)

“Serial Number to TSID Conversion Tool” Window



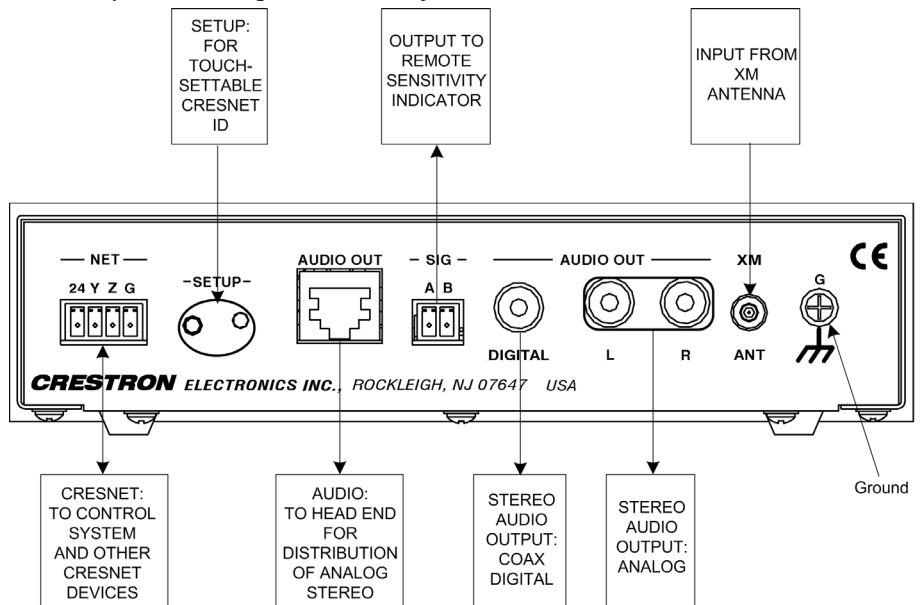
3. Enter the serial number or TSID number as instructed; press the appropriate button to obtain the corresponding number.

NOTE: Enter serial numbers, including spaces, exactly as they appear on the unit label. Alpha characters in serial numbers or TSID numbers may be entered in upper or lower case.

Hardware Hookup

Refer to the hookup diagram below. Complete the connections in any order.

Cresnet System Hookup Connections for C2N-TXM

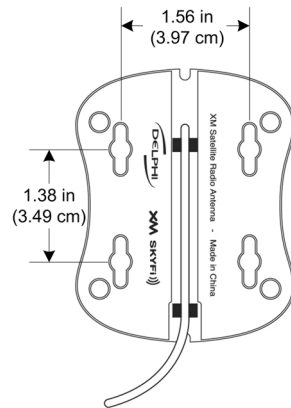


Antenna Installation

It is important to position the supplied high-gain antenna to receive the strongest possible signal either from the satellite (preferred) or from a terrestrial repeater station. This can be done before installing the XM Tuner in your Cresnet system.

Crestron recommends placing the antenna either outside or near a window with a southern exposure. The antenna should face south if you are in the eastern half of the continental US, or south/southeast if you are in the western half of the country.

The antenna can be mounted on a horizontal or vertical surface, using screws or double-faced tape. The following figure shows the antenna mounting plate with dimensions for mounting screw locations.



Connect the cable of the supplied Remote Sensitivity Indicator to the SIG A and B connectors on the back of the XM Tuner. Place the indicator near the antenna and rotate and/or tilt the antenna to obtain the strongest possible signal, as described in the following table, and secure the antenna in position.

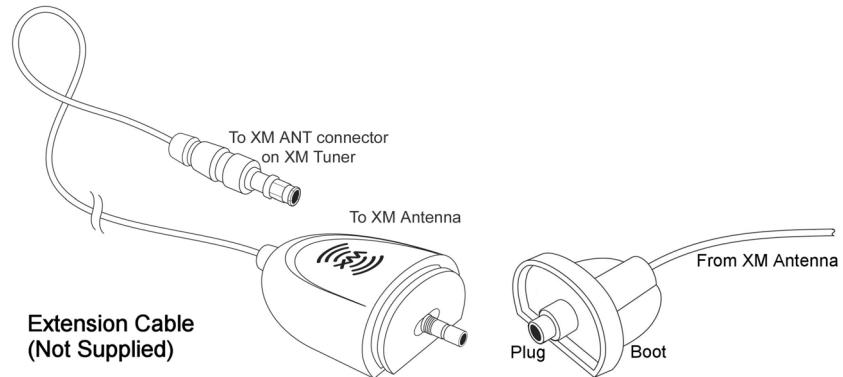
Remote Sensitivity Indicator Operation

SIGNAL STRENGTH	LED		OPERATION
	COLOR	STATE	
No Signal	Red	On	
	Green	Off	
Weak	Red	Flashing	Flashing rate is 250 msec (1/4 th sec) (Slow blink)
	Green	Off	
Marginal	Red	Off	Flashing rate is 50 msec (1/20 th sec) (Fast blink)
	Green	Flashing	
Strong	Red	Off	
	Green	On	

NOTE: The Remote Sensitivity Indicator is supplied with six-inch leads, labeled A and B. A two-pin terminal block connector is required to plug it in to the SIG A and B connectors. It may also be necessary to extend the wires if the antenna position is not within sight of the XM Tuner during adjustment.

NOTE: The supplied antenna has a 20-foot cable. If needed, 50-foot extension cables, C2N-TXM-C50, are available. Crestron recommends a maximum total length of 120 feet. Contact a Crestron customer service representative. Alternate antenna solutions are also available from third-party suppliers. One such source, Antenna Specialists, can be contacted via their website (www.sdarsantennas.com).

When attaching the extension cable, insert the connector from the antenna into the rubber boot supplied with the extension cable, plug it into the extension cable as shown, and cover the connection with the rubber boot. Plug the other end of the extension cable into the XM Tuner XM ANT connector. (Refer to the following illustration.)



XMGuide Example Program

The XMGuide user interface example program for the XM Tuner demonstrates the various features of the unit. The program also serves as a model for those individuals who wish to develop a customized program using Crestron's programming software.

The XMGuide program supplied for the XM Tuner is designed to operate on a Crestron TPS-4500 touchpanel (requires firmware version 2.000 or later). If your Cresnet system uses a different model touchpanel, you may wish to recompile the project for that touchpanel.

Preparation

In preparation for running the XMGuide, do the following:

1. Complete the procedures detailed in "Setup," which begins on page 7.
2. Verify that communication setup procedures described in "Communication Settings" on page 29 have been completed.
3. Download the Example Program from the Crestron website, <http://www.crestron.com/exampleprograms>, (search for C2N-TXM.zip).
4. Use the instructions given in "Upload via Crestron Viewport" on page 28, to load the .spz program to the control system and the .vtz program to the touchpanel.

Activating the XM Tuner

When first installed, the XM Tuner is not activated and has limited channel availability. Set the unit to XM Radio channel 1. This channel broadcasts general information about XM Radio. To activate, either contact XM Radio on their website (www.xmradio.com) or call (800) 967-2346.

Channel 0 displays the eight-digit Radio ID number (e.g., RADIO ID A1B12345) assigned to your XM Tuner in the **CHANNEL NAME** field. The number is also printed on the label on the bottom of the unit, and reports back in the Crestron

Viewport when **Diagnostics | Report Network Devices** is selected. Be sure to have it on hand when you call in to activate the XM Tuner.

Running the XMGuide Example

Once the programs are loaded to the touchpanel and the control system, the main screen appears on the touchpanel. The following illustration shows the main screen, with Category Mode selected and a typical display of the Classical category.

XMGuide Example Program Main Screen

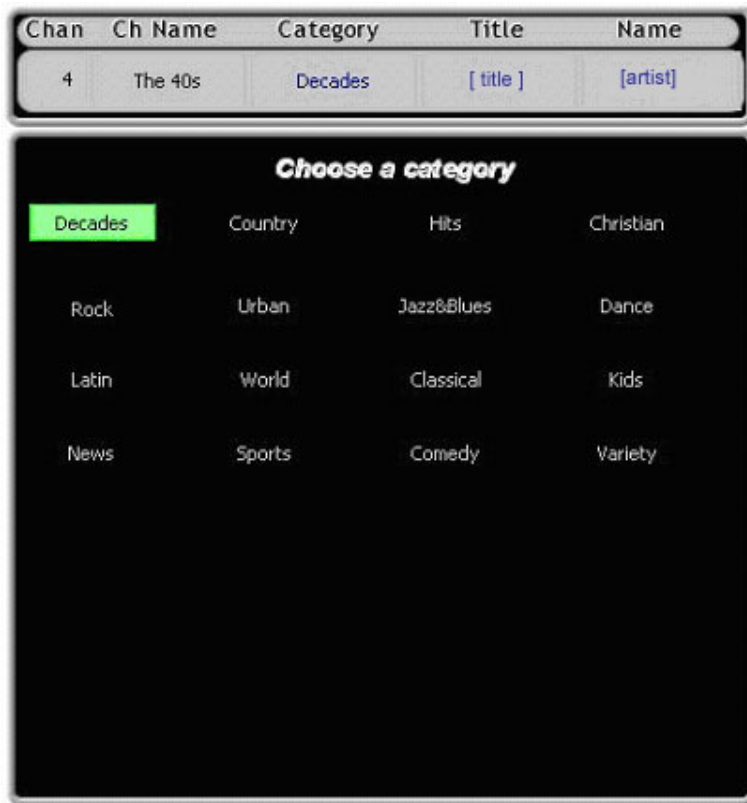


The upper left corner of the screen shows the current time and date. The eight-digit Radio ID number is shown below the time and date display.

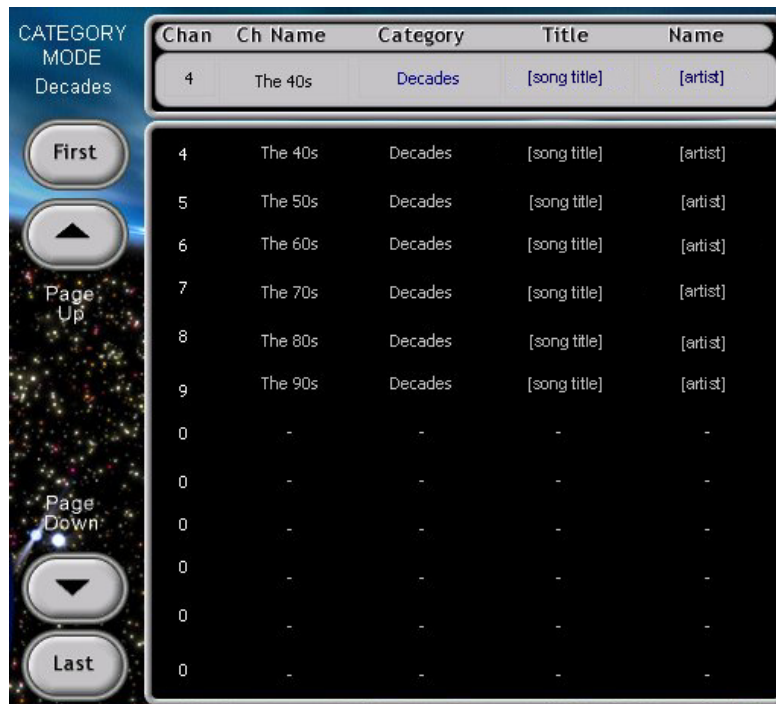
The primary selection controls for the XMGuide are located on the left side of the display. Volume up/down buttons (▲ ▼) and a graphic display plus a **Mute** button are located at the lower left corner of the screen.

Category

Press the **Category** selector to display a list of all the available categories. The current category and program information is displayed above the category listing, as shown in the figure on the next page.



Press a category name to see a list of all programs available within that category. (Refer to the figure below.)



Use the **Page Up** and **Page Down** buttons (▲▼) to select additional pages (if any); use the **First** and **Last** buttons to jump to the first or last page of the list (if necessary).

Channel

Press the **Channel** selector to display a channel selection keypad.



The current channel and program information is displayed above the keypad. The **Signal Strength** graphic indicator to the left of the keypad shows the signal level of the **Repeater** and **Satellite** signals.

On the keypad, key in a number and press the **Enter** button to select a new channel; press **Clear** to clear the entry field if you make a mistake.

Presets

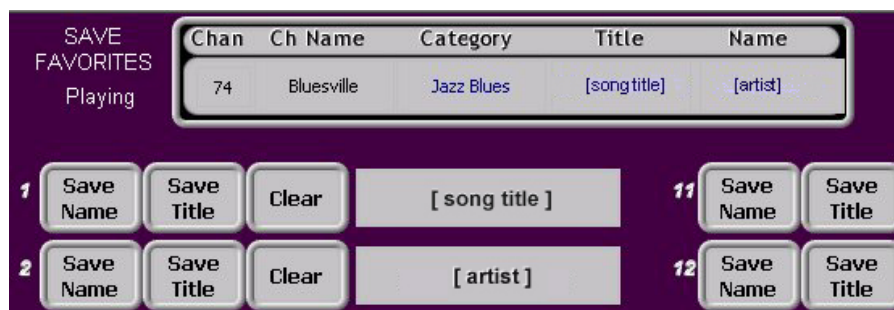
The Presets feature allows you to specify up to twenty channels that you wish to select quickly. You can also specify up to twenty “favorite” artists or programs.

Press the **Presets** selector to display the first six channel presets. Initially, each one is set to XM Preview. To set up the presets, follow the on-screen directions: tune in a station and press and hold an available preset field for five seconds to save it.

To save more than six presets, press the **More...** button. The screen changes to a display of twenty Preset fields. The currently selected channel and program information is displayed above the list of presets.



You can also specify up to twenty “favorite” artists and/or programs. Using any method of tuning in to a channel, select a channel where the title or name is one that you want to include in your list of favorites. Then, on the screen that displays all your Presets, press the **Set Up Favorites** button. The display changes to a screen that allows you to identify favorite artists or titles. Press the **Save Name** or **Save Title** button as appropriate. The saved title or artist name appears in the field to the right. The figure below shows a portion of the screen with two favorites saved. Whenever a “favorite” artist or program title is playing, the XMGuide highlights the Preset channel to alert you so you can select it if you wish.



All Channels

Press the **All Channels** selector to display a list of all the available channels. The display is like the one for a specific category, but lists all channels and categories in channel number order. The current category and program information is displayed above the channel listing. Use the **Page** ▲▼ buttons to select additional pages; use the **First** and **Last** buttons to jump to the first or last page of the list.

Tech Page

The Tech Page is intended for trained individuals to perform system diagnostics.

Quick Page

This screen provides quick selection control of all available channels and categories. Also displayed are the title and artist names of the current selection, and signal strength from satellite and terrestrial sources. The screen and its buttons and displays are described below.



Power

Use this button to turn power to the XM Tuner on and off. (If power is removed and then reapplied, the green **BUSY** indicator briefly turns red as the XM Tuner cycles through its initialization process.) The XM Tuner start-up default is the last channel that was in use prior to power down.

Category ▲▼

With category mode enabled (see below), use these buttons to search up and down through the various program categories. Hold either button down to scroll continuously through all the categories.

NOTE: Each time you press a channel or category button, the green **BUSY** indicator adjacent to the channel selection buttons briefly turns red as the XM Tuner mutes the audio and tunes to the new channel.

Category Mode

Use this button to enable/disable selection of program categories. (In category mode, only those channels that are in the selected category are available for selection via the Channel ▲▼ buttons. When category mode is disabled, these buttons can select all channels.)

Channel ▲▼

Use these buttons to search up and down through the available XM channels. (Channel availability depends on subscription. A non-subscribed radio typically provides only five sample channels in addition to the standard channels 0 and 1.

Either contact XM Radio on their website (www.xmradio.com) or call (800) 967-2346. Hold either button down to scroll continuously through the list.)

(In category mode, only those channels that are in the selected category are available for selection via the Channel ▲▼ buttons. When category mode is disabled, these buttons can select all channels.)

Mute

Use this button to mute/unmute the audio signal.

Display Fields

The **CATEGORY** field at the top center of the screen displays the name of the categories as you select them. When you select a category, the Channel ▲▼ buttons (above) select the available channels only within that category.

The **Terrestrial** and **Satellite** graphical and digital displays show the relative strength (0 to 100%) of the signal received from the satellite or the terrestrial repeater station. The XM Tuner automatically chooses the strongest signal for processing.

The **CHANNEL** and **CHANNEL NAME** fields display the XM Radio channel number and the name of the channels as you select them, the **TITLE** field displays the name of the selection currently playing, and the **NAME** field displays the name of the artist performing the selection. (Some selection and title names may be abbreviated.)

Keypad

You can also enter a specific channel number using the keypad at the bottom of the screen. Select the channel number and press **ent** to enter the selection. Your selections appear in the blue field as you enter them. Press **clr** to clear your selection if you make a mistake.

Program

Press the **Program** button at the top right of the screen to enable programming of up to twenty presets of your favorite channel selections. Note that this is not a momentary button: you must press it again to turn off programming.

To program your presets, enable programming with the **Program** button and search through the various categories and channels. When you find a “favorite,” press one of the twenty preset buttons. The button name changes to the “favorite” channel name. When you finish programming presets, be sure to press **Program** again to turn off the feature. Alternatively, press and hold a preset button for about five seconds to automatically program the preset without having to first enable programming.

NOTE: You can program preset channels from among any of the categories. Channel selection using the preset buttons is not affected by the state of category mode.

RETURN

Press this button to return to the main screen of the XMGuide.

Programming Software

Have a question or comment about Crestron software?

Answers to frequently asked questions (FAQs) can be viewed in the Online Help section of the Crestron website. To post a question or view questions you have submitted to Crestron's True Blue Support, log in at <http://support.crestron.com>. First-time users will need to establish a user account.

You can create a program that allows you to include the C2N-TXM in a Crestron control system using the Crestron programming tools Crestron SystemBuilder™ and SIMPL Windows. These tools are intended for users with different levels of programming knowledge. The flexibility of each tool is proportional to the degree of programming expertise (i.e., the more flexible, the more a programmer needs to know and account for). Of course, one can initiate programming using the easiest method (SystemBuilder) and use advanced techniques that are available from SIMPL Windows to customize the job.

Earliest Version Software Requirements for the PC

NOTE: Crestron recommends that you use the latest software to take advantage of the most recently released features. The latest software is available from the Crestron website.

The following are recommended software version requirements for the PC:

- (Optional) SystemBuilder version 2.00 or later. Requires SIMPL Windows (version 2.06.05 or later) and Crestron Engraver. Requires SystemBuilder templates 1.01 or later.
- SIMPL Windows version 2.05.16 or later. Requires SIMPL+ Cross Compiler version 1.1.
- Crestron Database version 16.1.0 or later. Required by SIMPL Windows.

Programming with the Crestron SystemBuilder

The Crestron SystemBuilder offers automatic programming for such residential and commercial applications as audio distribution, home theater, video conferencing, and lighting. The interface of this tool guides you through a few basic steps for designating rooms and specifying the control system, touchpanels, devices, and functionality. SystemBuilder then programs the system, including all touchpanel projects and control system logic.

SystemBuilder is fully integrated with Crestron's suite of software development tools, including SIMPL Windows, VT Pro-e, Crestron Database, User IR Database, and User Modules Directory. SystemBuilder accesses these tools behind the scenes, enabling you to easily create robust systems.

SystemBuilder includes Scheduler programming which allows you to define weekly, periodic, or by-date events that run at scheduled times of day. Scheduler properties can be adjusted via a touchpanel. Refer to the extensive SystemBuilder help file for details.

The easiest method of programming, but does not offer as much flexibility as SIMPL Windows.

Programming with SIMPL Windows

NOTE: The following are acceptable file extensions for programs that include a C2N-TXM, developed for specific control system types:

- .smw *projectname*.smw (source file)
- .spz *projectname*.spz (compiled file for 2-Series)
- .bin *projectname*.bin (compiled file for CNX generation)
- .csz *projectname*.csz (compiled file for CNX generation with SIMPL+)
- .ush *projectname*.ush (compiled file for CNX generation with SIMPL+ header file)
- .usp *projectname*.usp (source code module for SIMPL+)

SIMPL Windows is Crestron's software for programming Crestron control systems. It provides a well-designed graphical environment with a number of workspaces (i.e., windows) in which a programmer can select, configure, program, test, and monitor a Crestron control system. SIMPL Windows offers drag and drop functionality in a familiar Windows® environment.

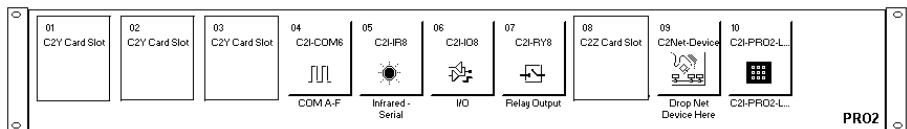
NOTE: The following descriptions assume that the reader has knowledge of SIMPL Windows. If not, refer to the extensive help information provided with the software.

NOTE: In the following description, the PRO2 control system is used.

This section describes a sample SIMPL Windows program that includes a C2N-TXM.

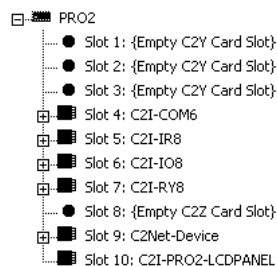
Configuration Manager is where programmers “build” a Crestron control system by selecting hardware from the *Device Library*. In Configuration Manager, drag the PRO2 from the Control Systems folder of the *Device Library* and drop it in the upper pane of the *System Views*. The PRO2 with its associated communication ports is displayed in the *System Views* upper pane.

PRO2 System View



The *System Views* lower pane displays the PRO2 system tree (refer to graphic below). This tree can be expanded to display and configure the communications ports.

Expanded PRO2 System Tree

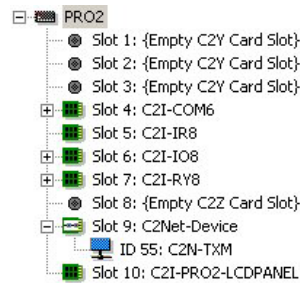


C2Net Device Slot in Configuration Manager

To incorporate a C2N-TXM into the system, drag the C2N-TXM from the Cresnet Control Modules | Cresnet Audio Modules folder of the *Device Library* and drop it in *System Views*. The PRO2 system tree displays the C2N-TXM in Slot 9, with a default Net ID of 55 as shown in the following illustration.

NOTE: The first C2N-TXM in a system is preset with a Net ID of 55 when its symbol is dragged into the upper pane of *System Views*. Additional units are assigned different Net ID numbers as they are added.

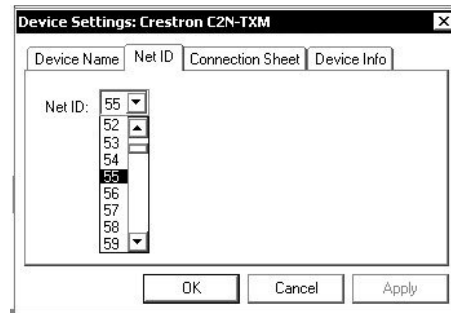
C2Net Device, Slot 9



Setting the Net ID in Device Settings

Double-click the C2N-TXM icon to open the “Device Settings” window. This window displays the C2N-TXM device information. If necessary, select the *Net ID* tab to change the C2N-TXM Net ID, as shown in the figure below.

C2N-TXM “Device Settings” Window

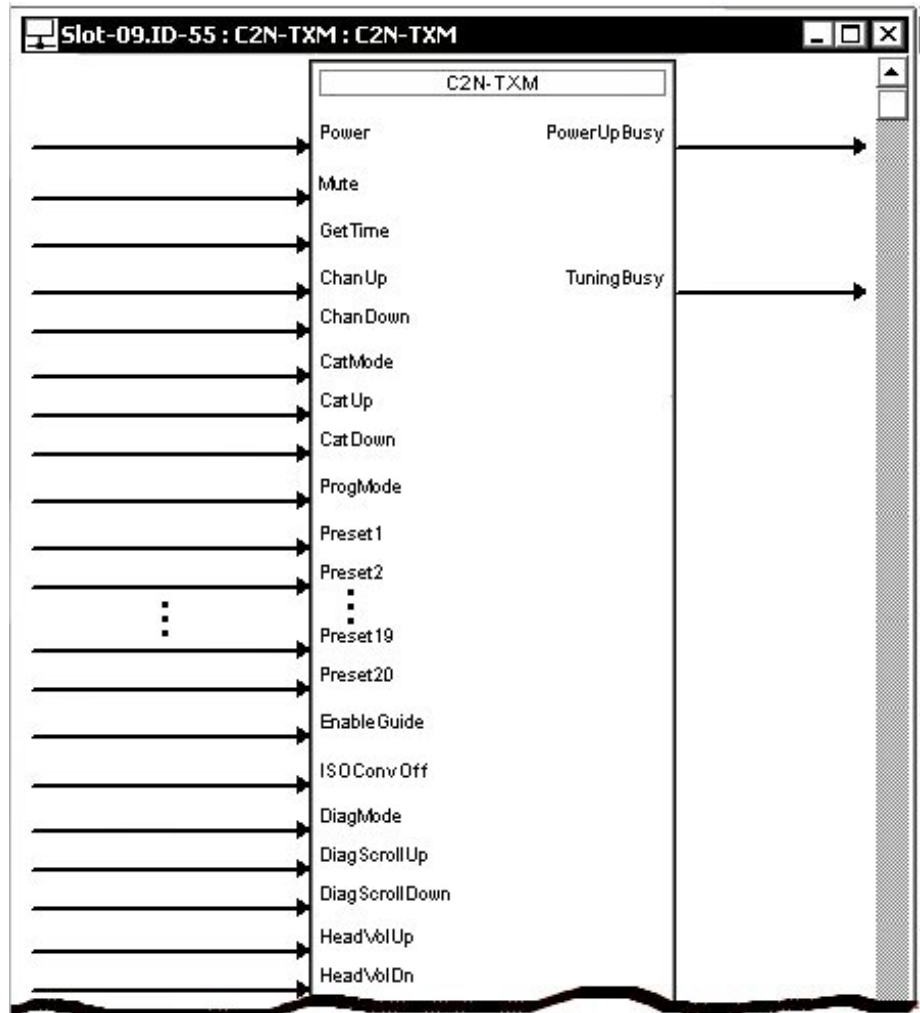


NOTE: SIMPL Windows automatically changes Net ID values of a device added to a program if a duplicate device or a device with the same default Net ID already exists in the program. Always ensure that the hardware and software settings of the Net ID match. For Net ID hardware setting details, refer to “Identity Code” on page 8.

C2N-TXM Symbol in Programming Manager

Programming Manager is where programmers “program” a Crestron control system by assigning signals to symbols. The C2N-TXM symbol in the SIMPL Windows’ Programming Manager is extensive and is illustrated in three sections, beginning on the next page. Tables defining the input and output signals follow each section.

C2N-TXM Digital Input and Output Signals



C2N-TXM Digital Input and Output Signal Descriptions

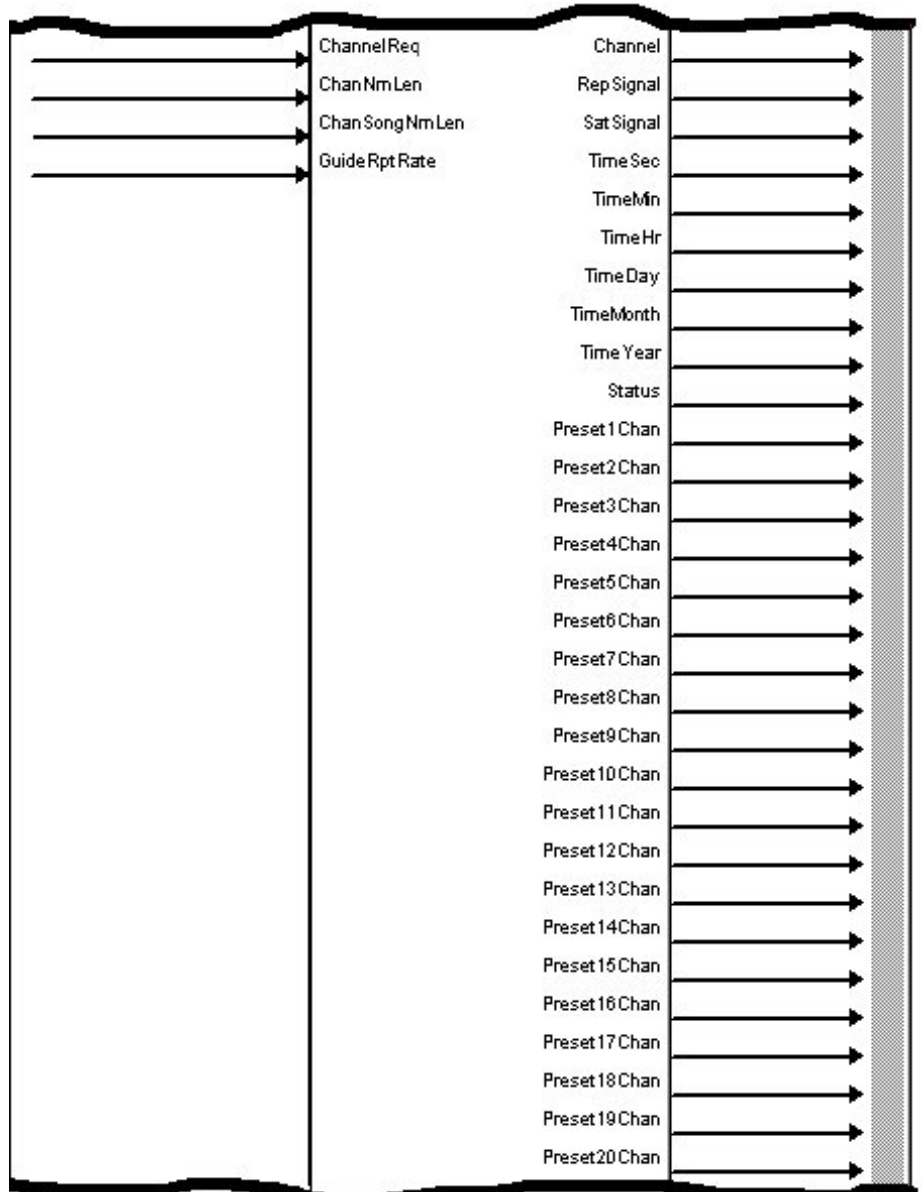
SIGNAL TYPE AND NAME	DESCRIPTION
Digital input: <Power>	Turns power on and off. High/1 = Power on; Low/0 = Power off
Digital output: <PowerUpBusy>	Indicates that the C2N-TXM is busy powering up. High/1 = Powering up (busy); Low/0 = Ready (done)
Digital output: <TuningBusy>	Indicates that the C2N-TXM is busy tuning to a station. High/1 = Tuning (busy); Low/0 = Ready (done)
Digital input: <Mute>	Audio mute on and off. High/1 = Mute on; Low/0 = Mute off (play)
Digital input: <GetTime>	Requests the current time and date from the XM satellite, on the rising edge of the signal. The time and date, in Greenwich Mean Time (GMT), are sent to the <Time> analog outputs described later. High/1 = Get time; Low/0 = not used
Digital inputs: <ChanUp> , <ChanDown>	Channel up and down controls. Channels change up and down with each rising edge of the signal. If the signal is held high (> 0.5 sec.), the channels cycle up or down continuously, for as long as the signal is asserted. High/1 = Start channel up or down; Low/0 = Stop channel up or down
Digital input: <CatMode>	Enables category mode for as long as the input is high, and activates the <CatUp> and <CatDown> category selection inputs described next. High/1 = Enter category mode; Low/0 = Exit category mode
Digital inputs: <CatUp> , <CatDown>	Category up and down controls, enabled if in category mode. Categories change up and down with each rising edge of the signal. If the signal is held high (> 0.5 sec.), the categories cycle up or down continuously, for as long as the input is asserted. High/1 = Start category up or down; Low/0 = Stop category up or down
Digital inputs: <ProgMode>	Enables programming mode, which saves the current channel number to whichever <Preset> input goes high. High/1 = Enter programming mode; Low/0 = Exit programming mode
Digital inputs: <Preset1> through <Preset20>	Saves/plays presets on the rising edge of the signal. Saves the preset if in programming mode; otherwise plays the preset. High/1 = Save or play preset; Low/0 = not used
Digital input: <EnableGuide>	When connected to the "XM Guide" SIMPL+ module, this input enables the XM Program Guide feature. The Program Guide can update indirect text for a scrolling guide to all channels, a list of presets, a guide to all categories and the songs in each category. It also supports direct entry of channel numbers via a keypad. In addition, a list of favorite songs or artists can be maintained. For further information, refer to the F1 help for the "XM Guide" module. High/1 = Enable program guide; Low/0 = Disable program guide
Digital input: <ISOConvOff>	Turns off ISO conversion, which converts ISO characters 128-255 into ASCII characters 0-127. (The Arial font family supports ISO conversion.) High/1 = ISO conversion OFF; Low/0 = ISO conversion ON
Digital input: <DiagMode>	Enables diagnostic mode, which retrieves diagnostic data from the XM Radio controller embedded device, and activates the <DiagScroll> inputs described next. High/1 = Enter diagnostics mode; Low/0 = Exit diagnostics mode

(continued on next page)

C2N-TXM Digital Input and Output Signal Descriptions (continued)

SIGNAL TYPE AND NAME	DESCRIPTION
Digital inputs: <DiagScrollUp>, <DiagScrollDown>	Scrolls through diagnostic data messages 1 through 8, generated by the XM Radio controller embedded device. The data is routed to the <DiagStrings> serial output described later. The data scrolls up or down on the rising edge of the signal. If the signal is held high, the data will cycle up or down continuously for as long as the signal is asserted. High/1 = Start scrolling up or down; Low/0 = Stop scrolling up or down
Digital inputs: <HeadVolUp>, <HeadVolDn>	Headphone volume controls. Headphone volume is adjusted up or down on the rising edge of the signal. High/1 = Volume Up or Down; Low/0 = not used

C2N-TXM Analog Input and Output Signals



C2N-TXM Analog Input and Output Signal Descriptions

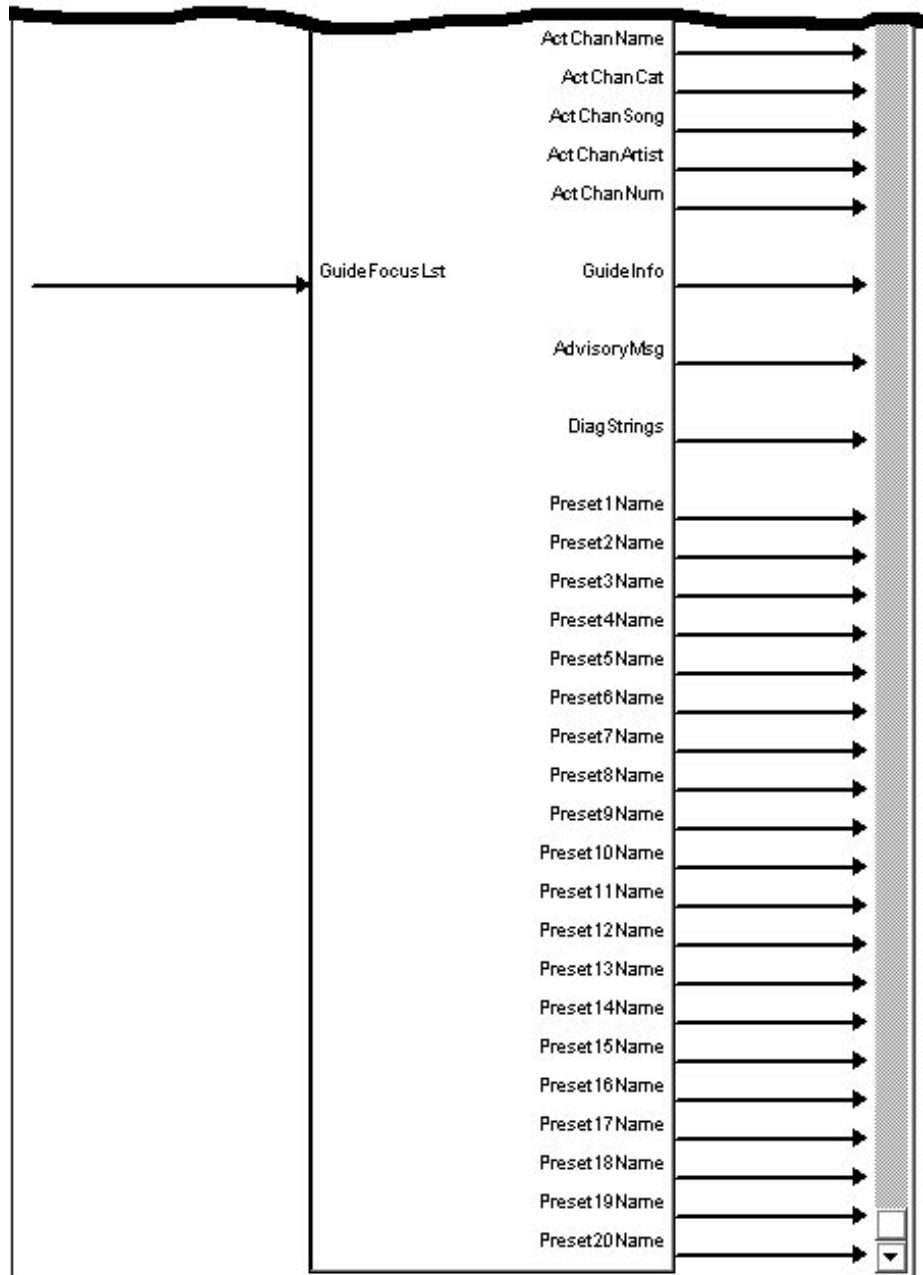
SIGNAL TYPE AND NAME	DESCRIPTION
Analog input: <ChannelReq>	Tunes to the channel defined by the analog value. Valid values range from 0 to 255, although the number of available channels may be less. (Channel 0 is the Radio ID channel, which provides XM Radio licensing information.)
Analog inputs: <ChanNmLen>, <ChanSongNmLen>	<p>The <ChanNmLen> input gives the maximum number of characters allowed in the <ActChanName> and <PresetName> strings described later.</p> <p>The <ChanSongNmLen> input gives the maximum number of characters allowed in the <ActChanCat>, <ActChanSong>, <ActChanArtist> and <ActChanNum> strings described later.</p> <p>Valid values are 8 or 16, indicating a maximum of 8 or 16 characters.</p> <p>No other values are valid for <Len>.</p>
Analog input: <GuideRptRate>	When connected to the "XM Guide" SIMPL+ module, this analog sets the report rate, in milliseconds, for data being sent to the XM radio program guide. Reporting is enabled only when the <EnableGuide> input is set to high. The report rate defaults to 200 milliseconds if <GuideRptRate> is unconnected or set to 0. Otherwise, valid values range from 100 to 10,000.
Analog output: <Channel>	Indicates the current channel number.
Analog outputs: <RepSignal>, <SatSignal>	Indicates the strength of the ground repeater signal and satellite signal. Valid values range from 0 to 65535, which can be mapped to 0% to 100% and routed to a bargraph on the touchpanel.
Analog outputs: <TimeSec>, <TimeMin>, <TimeHr>, <TimeDay>, <TimeMonth>, <TimeYear>	<p>These analogs report the current time and date (in Greenwich Mean Time) on the rising edge of the <GetTime> input. When connected to the "XM GMT Time" SIMPL+ module, the module can use the time data to set the control system's master time clock. For further information, refer to the F1 help for the module.</p> <p><TimeSec> gives the real time clock reading for seconds and ranges from 0 to 59.</p> <p><TimeMin> gives the real time clock reading for minutes and ranges from 0 to 59.</p> <p><TimeHr> gives the real time clock reading for hours and ranges from 0 to 23.</p> <p><TimeDay> gives the real time clock reading for the current day and ranges from 1 to 31.</p> <p><TimeMonth> gives the real time clock reading for the current month and ranges from 1 to 12.</p> <p><TimeYear> gives the real time clock reading for the current year, starting with 2003</p>
Analog output: <Status>	<p>Used for advanced diagnostics and debugging. Status and error messages are taken from the lower 10 bits of the analog value.</p> <p>Bits 0 through 3 indicate signal strength:</p> <ul style="list-style-type: none"> 0 = No signal 1 = Weak signal 2 = Marginal signal 3 = Full signal <p>Bits 4 through 10 indicate error messages:</p> <ul style="list-style-type: none"> Bit 4: 1 = No Antenna Bit 9: 1 = Activation required

(continued on next page)

C2N-TXM Analog Input and Output Signal Descriptions (continued)

SIGNAL TYPE AND NAME	DESCRIPTION
Analog outputs: <Preset1Chan> through <Preset20Chan>	Indicates the channel number of the corresponding preset. These values can range from 0 (for the Radio ID channel) to 255.

C2N-TXM Serial Input and Output Signals



C2N-TXM Serial Input and Output Signal Descriptions

SIGNAL NAME	DESCRIPTION
Serial input: <GuideFocusLst>	When connected to the "XM Guide" SIMPL+ module, this string enables the module to tell the XM radio which stations are currently shown in the display. The information for these stations has priority over all other information, so that the visible display is accurate and up-to-the-second. The first byte in this string is an STX character followed by an A0 character. Each remaining byte is the channel number of a displayed station. A maximum of 30 channels is allowed. The string ends with an ETX character. The program guide is enabled only when the <EnableGuide> input is set to high. The data is reported to the program guide at the rate set by <GuideRptRate>.
Serial outputs: <ActChanName>, <ActChanCat>, <ActChanSong>, <ActChanArtist>, <ActChanNum>	Indicates the current channel name and number, category, song title and artist. Each string can have a maximum of 8 or 16 characters, as set in the <Len> analogs described earlier.
Serial output: <GuideInfo>	When connected to the "XM Guide" SIMPL+ module, this string displays program guide information, including category, artist, song title, category flags, status codes and other data. XM Guide information is enabled only when the <EnableGuide> input is set to high.
Serial output: <DiagStrings>	When in diagnostic mode, this strings displays diagnostic messages 1 through 8 generated by the XM radio controller embedded device. Diagnostic mode is enabled only when <DiagMode> is set to high. The <Scroll> analogs scroll through the data.
Serial outputs: <Preset1Name> through <Preset20Name>	Indicates the channel name of the corresponding preset. Each string can have a maximum of 8 or 16 characters, as set in the <Len> analogs described earlier.

Uploading and Upgrading

NOTE: Crestron recommends that you use the latest software and that each device contains the latest firmware to take advantage of the most recently released features. Please check the Crestron website (<http://www.crestron.com/updates>) for the latest versions of software and firmware. New users are required to register to obtain access to this site.

Assuming a PC is properly connected to the entire system, Crestron programming software allows the programmer to upload programs and projects after their development to the system and network devices. However, there are times when the files for the program and projects are compiled and not uploaded. Instead, compiled files may be distributed from programmers to installers, from Crestron to dealers, etc. Even firmware upgrades are available from the Crestron website as new features are developed after product releases. In those instances, one has the option to upload via the programming software or to upload and upgrade via the Crestron Viewport.

NOTE: The Crestron Viewport is available as a pull-down command from SIMPL Windows and VT Pro-e (**Tools | Viewport**) or as a standalone utility. The Viewport utility accomplishes multiple system tasks, primarily via an RS-232 or TCP/IP connection between the control system and a PC. It is used to observe system

processes, upload new operating systems and firmware, change system and network parameters, and communicate with network device consoles and touchpanels, among many other tasks. Viewport can also function as a terminal emulator for generic file transfer. All of these functions are accessed through the commands and options in the Viewport menus. Therefore, for its effectiveness as a support and diagnostic tool, the Crestron Viewport may be preferred over development tools when uploading programs and projects.

The following sections define how one would upload a SIMPL Windows program or upgrade the firmware of the C2N-TXM. However, before attempting to upload or upgrade, it is necessary to establish communications.

Communication Settings

NOTE: For laptops and other PCs without a built-in RS-232 port, Crestron recommends the use of PCMCIA cards, rather than USB-to-serial adapters. If a USB-to-serial adapter must be used, Crestron has tested the following devices with good results:

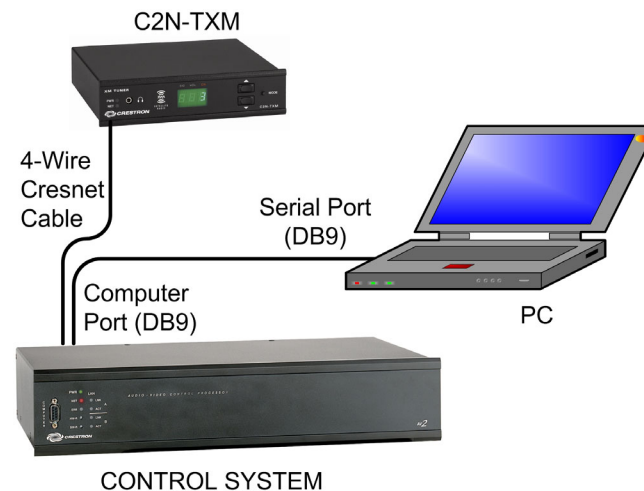
Belkin (large model) F5U103
I/O Gear GUC232A (discontinued)
Keyspan USA-19QW (discontinued)

Other models, even from the same manufacturer, may not yield the same results.

The procedure in this section provides details for RS-232 communication between the PC and the control system. If TCP/IP communication is preferred, consult the latest version of the Crestron e-Control Reference Guide (Doc. 6052) or the respective Operations Guide for the control system. These documents are available from the Crestron website. Refer to the following figure for a typical connection diagram when uploading files.

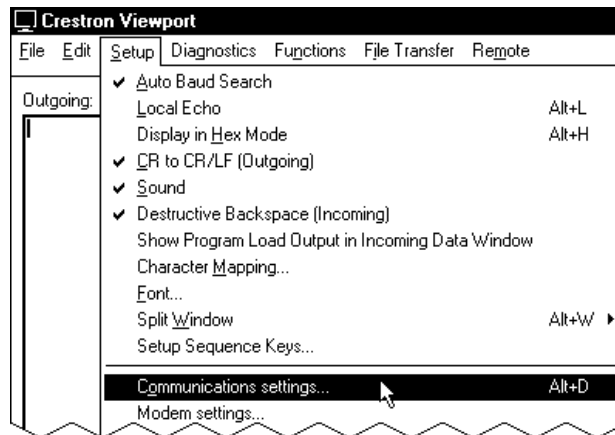
NOTE: Use a standard DB9 male to female “straight-through” cable.

Typical Connection Diagram when Uploading



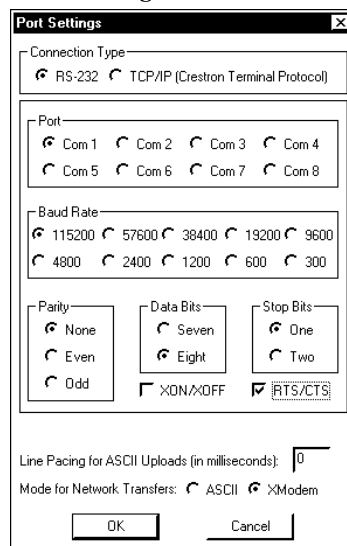
1. Open the Crestron Viewport.
Either launch the stand-alone version of Viewport, or start SIMPL Windows or VT Pro-e, and from the menu bar, select **Tools | Viewport**.
2. Refer to the figure after this step. From the Viewport menu, select **Setup | Communications settings** (alternatively, press **Alt+D**) to open the “Port Settings” window.

Setup | Communications Settings Command



3. Select **RS-232** as the connection type. Verify that an available COM port (COM 1 is shown after this step) is selected, and that all communication parameters and necessary options from the “Port Settings” window are selected as shown below. Click the **OK** button to save the settings and close the window.

“Port Settings” Window



NOTE: The parameters shown in the illustration above are the port settings for a 2-Series control system. Consult the Operations Guide for the control system being used for exact parameter selection.

- To verify communication, select **Diagnostics | Establish Communications (Find Rack)**. This should display a window that gives the COM port and baud rate. If communication cannot be established, refer to the “Troubleshooting Communications” section in the respective Operations Guide for the control system.

Uploading a SIMPL Windows Program

A control system source file has the extension .smw. A compiled SIMPL Windows file has the extension .spz for a 2-Series control system, .bin for CNX generation, and .csz for CNX generation with SIMPL+.

The SIMPL Windows file can be uploaded to the control system using SIMPL Windows or via the Crestron Viewport.

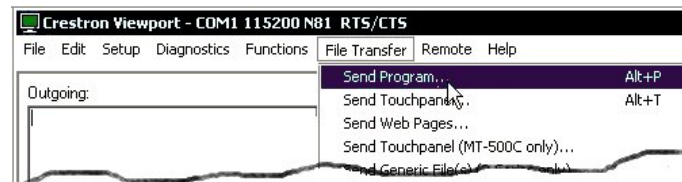
Upload via SIMPL Windows

- Start SIMPL Windows.
- Select **File | Open** to view the “Open” window, navigate to the SIMPL Window file (.smw), and click **Open**.
- Select **Project | Transfer Program**.

Upload via Crestron Viewport

- Verify that the procedure for “Communication Settings” that begins on page 29 has been performed.
- As shown after this step, select **File Transfer | Send Program** (alternatively, press **Alt+P**) from the Viewport menu.

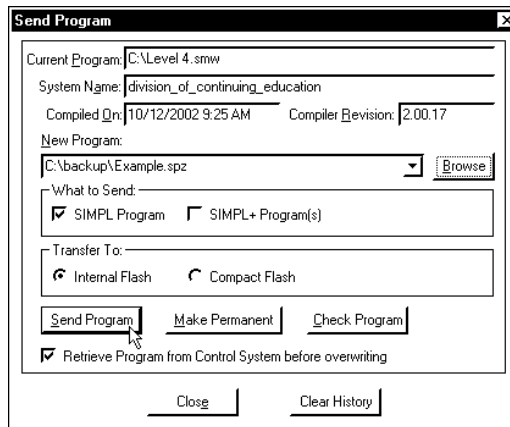
File Transfer | Send Program Command



- The “Send Program” window appears, as shown after this step. Click **Browse**, locate the compiled file (.spz for PRO2), and click **Open**. This will display the program's header information and enable one or both of the *What to Send* check boxes. If the program does not contain any SIMPL+ modules, only the *SIMPL Program* check box will be enabled. If it does contain SIMPL+ modules, then the *SIMPL+ Program(s)* check box will also be enabled. Select one or both check boxes and then click **Send Program** to begin the transfer.

NOTE: Refer to the respective Operations Guide for the control system for details about the other fields shown on the “Send Program” window.

“Send Program” Window



4. To verify that the program has been transferred successfully, select **Diagnostics | Report Program Information**. This should display a window that provides details about the current program loaded into the control system.

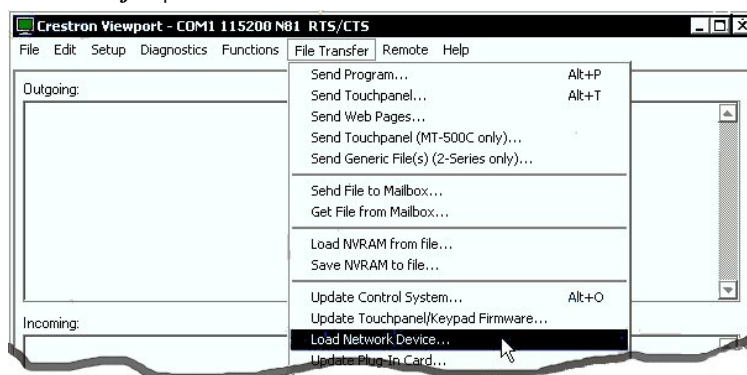
Firmware Upgrade

A firmware upgrade file has the extension .upg.

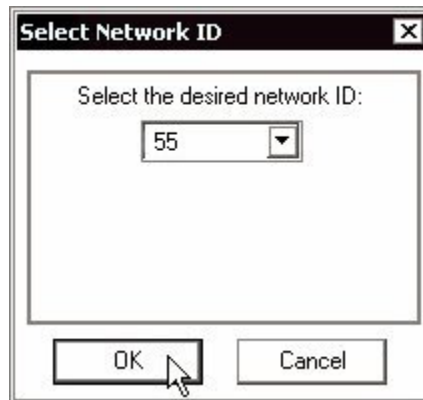
To take advantage of all the available features, it is important that the unit contains the latest firmware. Please check the Crestron website for the latest version of firmware. Not every product has a firmware upgrade, but as Crestron improves functions, adds new features, and extends the capabilities of its products, firmware upgrades are posted. To upgrade the firmware, complete the following steps.

1. Make sure that “Communication Settings” that begins on page 29 has been performed.
2. As shown after this step, select **File Transfer | Load Network Device** from the Viewport menu.

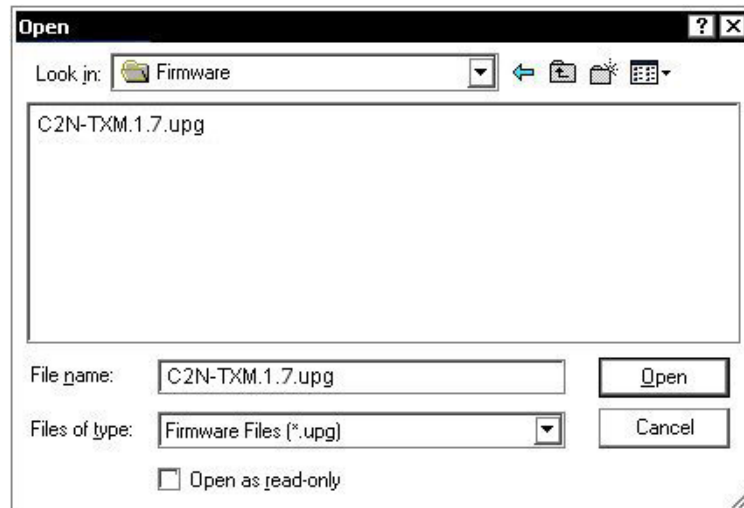
File Transfer | Load Network Device Command



3. As shown after this step, select the Net ID of the C2N-TXM and then click **OK**. The “Open” window appears (refer to the subsequent graphic).

“Select Network ID” Window

NOTE: When transferring any Cresnet file (touchpanel project/firmware), lower the port speed baud rate to 38400 to match the Cresnet bus speed.

“Open” Window

4. Browse to the desired .upg file and click **Open** to begin the transfer.

Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

C2N-TXM Troubleshooting

TROUBLE	PROBABLE CAUSE(S)	CORRECTIVE ACTION
Green PWR LED does not illuminate.	Wrong power supply.	Use a Crestron power supply.
	C2N-TXM is not receiving power.	Verify that cables plugged into NET port are secure.
Yellow NET LED does not illuminate.	Improper Net ID.	Verify that the C2N-TXM Net ID matches Net ID in the software program.
	Loose network connection.	Verify that cable plugged into NET port is secure.
Receiving only XM channels 0 and 1 and, at most, five other channels that change every four hours or so.	The XM Tuner is not activated.	Activate the XM Tuner as described in "Activating the XM Tuner" on page 13.
Cannot tune in to a channel.	Unauthorized to receive that channel, or the channel is blocked.	Contact XM Radio on their website (www.xmradio.com) or call (800) 967-2346.
Display goes off and there is no audio.	(Affects only those radios that are left on all the time.) XM Radio connection needs to be reestablished every 24 hours.	<ol style="list-style-type: none"> 1. Manually recycle power to the XM Radio once every 24 hours. 2. Add SIMPL logic to program to turn power off and then back on once every 24 hours.

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling the Crestron corporate headquarters at 1-888-CRESTRON [1-888-273-7876]. For assistance in your local time zone, refer to the Crestron website (<http://www.crestron.com/>) for a listing of Crestron worldwide offices.

You can also log onto the online help section of the Crestron website to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features, and extends the capabilities of the C2N-TXM, additional information and programming examples may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an "Addendum" in the Download column.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange, or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number, and return address.
2. Products may be returned for credit, exchange, or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J., or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee, plus shipping costs, on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended, or if it has been subjected to misuse, accidental damage, modification, or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced, or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supercedes all previous warranties.

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Operations Guide – DOC. 6234A
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Specifications subject to
change without notice.