Crestron Adagio® **ATC-AMFMXM**
AM/FM and XM Satellite Radio Tuner Card
Operations & Installation Guide

CRESTRON®

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

CRESTRON

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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 160 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.

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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. 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. ©2007 XM Satellite Radio Inc. All rights reserved.

Contents

AM/FM/XM Tuner Card: Adagio® ATC-AMFMXM

Introduction

Features and Functions

- AM/FM/XM Tuner Card slides easily into place to become an integral part of its control system.
- Independent AM/FM and XM Satellite Radio tuners on a single plug-in card.
- Tuners are ready for routing to additional rooms on attached Adagio® Audio Expanders (AAE).
- Adagio® system front panel and other supported user interfaces control the tuners with out-of-the-box functionality.
- RBDS/RDS compatible.*

* The Radio Broadcast Data System (RBDS), a North American standard, and Radio Data System (RDS), a European standard, permit broadcasters to use a sub-carrier frequency to transmit inaudible digital data along with their regular FM programming to receivers equipped to process the data. Refer to "Appendix: RBDS/RDS Function Support" on page 13 for more information.

Specifications

Specifications for the ATC-AMFMXM are listed in the following table.

ATC-AMFMXM Specifications

SPECIFICATION	DETAILS
Audio	
Maximum Output	1 V_{rms} @ 1 kHz (AM/FM); 2 V_{rms} (XM)
FM Tuner	
Frequency Response	87.50 to 108 MHz (50 or 100 kHz steps)
Intermediate Frequency	10.7 MHz
Usable Sensitivity	11 dBf mono
S/N Ratio	64 dB @ 65 dBf mono; 60 dB @ 65 dBf stereo
IF Rejection	100 dB
AM Rejection	55 dB
Stereo Separation	40 dB
AM Tuner	
Frequency Range	530 to 1710 kHz (9 or 10 kHz steps)
Sensitivity	3.5 µV (RF input level 10 dB S+N/N)
Selectivity	10 kHz
Alternate Channel Selectivity	55 dB
Image Rejection	35 dB
IF Rejection	60 dB
XM Tuner	
Audio Out	Unbalanced stereo output on backplane connector; Maximum voltage output 2 V_{rms}
XM Antenna	Single SMB connector for use with standard home XM antennas
Power Requirements	24 VDC provided from backplane, at 200 mA max. (estimated 5.0 Watts)
Environmental	
Temperature	32º to 140ºF (0º to 60ºC)
Humidity	10% to 90% RH (non-condensing)
Dimensions	
Height	1.38 in (3.51 cm)
Width	4.91 in (12.46 cm)
Depth	6.62 in (16.81 cm)

Physical Description

This section provides information on the connections, controls and indicators available on your ATC-AMFMXM.

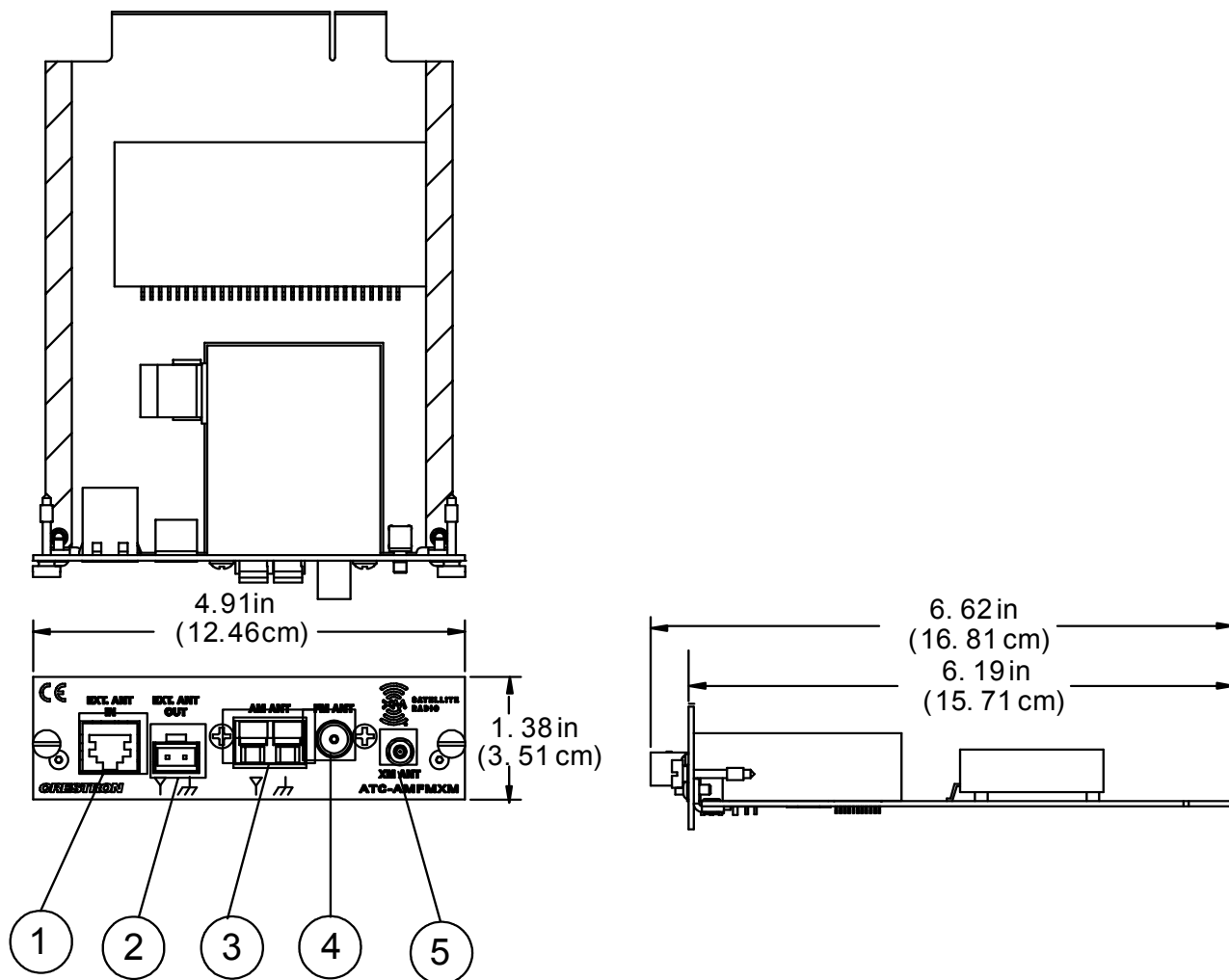*ATC-AMFMXM Physical View (Head On)*
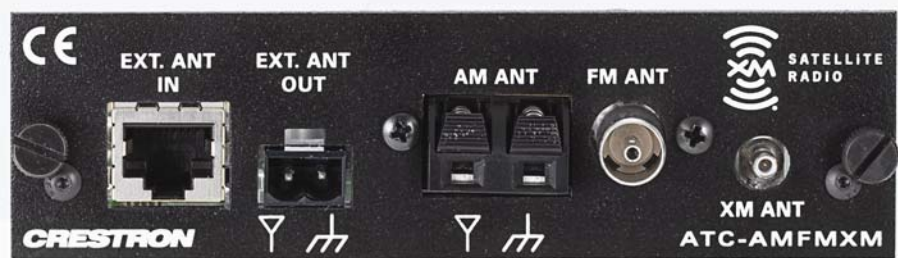

ATC-AMFMXM Physical View (Angled)

Conversion Connector Coax (RG6)/F Type (Antenna) to IEC Type Connector (Tuner)

ATC-AMFMXM Overall Dimensions

4.91in
(12.46cm)

1.38in
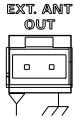(3.51cm)

6.62in
(16.81cm)

6.19in
(15.71cm)

① ② ③ ④ ⑤

Connectors, Controls and Indicators

#	CONNECTORS, CONTROLS, & INDICATORS	DESCRIPTION
1	EXT. ANT IN	(1) 8-wire RJ-45 female; Reserved for future remote AM antenna (not yet available)

(Continued on following page)

Connectors, Controls and Indicators (Continued)

#	CONNECTORS, CONTROLS, & INDICATORS	DESCRIPTION
2	EXT. ANT OUT	(1) 2-pin detachable terminal block; AM antenna signal pass-through from remote antenna
3	AM ANT	(1) 2-pin spring-loaded terminals; AM shielded loop antenna included; Impedance: 50 ohms
4	FM ANT	(1) IEC 169-2 coaxial (IEC-to-F adapter included); T-type FM antennas included; Impedance: 75 ohms
5	XM ANT	(1) SMB, indoor/outdoor high-gain antenna with 20 ft cable included; Impedance: 50 ohms

Industry Compliance

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

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

▪ Reorient or relocate the receiving antenna.

▪ Increase the separation between the equipment and receiver.

▪ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

▪ Consult the dealer or an experienced radio/TV technician for help.

Setup

This section contains hardware installation and setup instructions for the ATC-AMFMXM.

Required Tools/Hardware

1. Small flat bladed screwdriver
2. Grounding strap (encouraged)

Installation

CAUTION: The ATC-AMFMXM and Adagio® systems contain electrostatic discharge (ESD) sensitive devices. Crestron encourages you to wear a grounding strap to avoid damaging the card and/or the host system.

When inserting a card into an Adagio system that features tuner card slots you may need to move other source connections if designated connectors are occupied by other sources. For programming purposes, slots and source connections are matched according to the following table:

	Slot 1	Slot 2	Slot 3
Source Connections	1&2	3&4	Refer to note below.

CAUTION: Do not connect external sources to **SOURCES** connectors used by tuner cards.

CAUTION: Be certain to insert tuner card before applying power to the Adagio system.

NOTE: If the user intends to use the out-of-the-box functionality, do not to use **SLOT 3** for tuner cards; otherwise, **SLOT 3** uses source connections 5 and 6.

Begin the card insertion procedure with these steps:

1. Disconnect power from the Adagio system.

2. Remove the slotted screws securing any cover plate that may be fastened to the slot you intend to use then set the screws and the cover plate aside.

3. Unpack the ATC-AMFMXM card.

4. As shown in the photo on the next page, position the ATC-AMFMXM card so the print on the faceplate is right side up and the side rails of the card slide into the plastic slots mounted on left and right inside walls of the Adagio system.

Tuner Card Installation

5. Push the ATC-AMFMXM card into the slot until it stops at the rear connector, and then push again until the ATC-AMFMXM card snaps into place.

6. Secure the card in place by tightening the two slotted screws by hand. The screwdriver slots are provided for removal only.

7. Connect antenna(s).

8. Apply power to the Adagio system.

Regional Configuration

Once the tuner card is installed, users may change tuner configuration for North American and European signal reception. Instructions on changing the regional configurations for Adagio systems that feature tuner card slots can be found in their respective guides which can be obtained from the Crestron website (http://www.crestron.com/manuals).

Hardware Hookup

Make the necessary connections as called out in the following illustration.

Hardware Connections for the ATC-AMFMXM
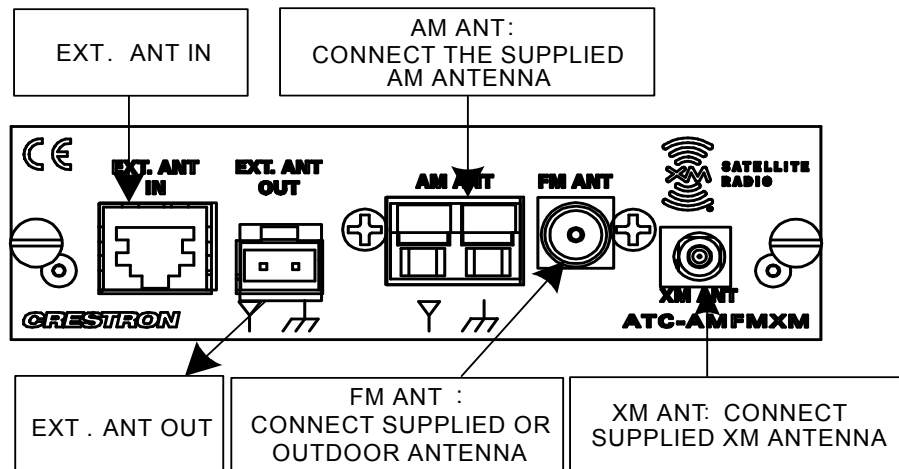
The supplied AM antenna is connected as shown in the following illustration.

AM Antenna Connection

SHIELD
(CONNECT TO: ⏚)

CONNECTOR END OF AM ANTENNA

INSULATED CENTRAL
CONDUCTOR
(CONNECT TO: ⏚)

Antenna Orientation

AM

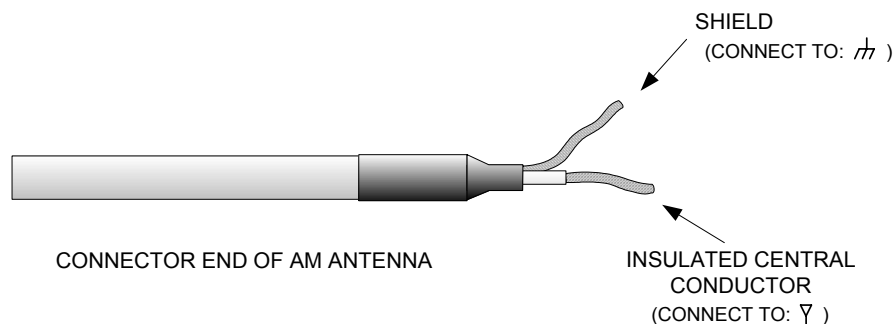Once your antennas have been connected, it may be necessary to orient the AM loop antenna so that the flat surface of the loop antenna faces the metropolitan area originating the broadcast signals. This is particularly necessary when signals are weak. If you are not aware of the source or directions of the signals to which you will listen, simply rotate the loop antenna in clear space for maximum signal strength. The supplied antenna has a folding stand that allows you to place the antenna on a flat surface.

FM

The recommended FM antenna is an outdoor type commonly available in electronics stores. Use of the supplied indoor FM antenna is recommended only if you cannot use an outdoor antenna. Outdoor antennas are particularly important in rural areas, some distance from FM radio signal sources. The FM antenna supplied with your tuner is a T-type and it should be stretched horizontally in space that is as clear as possible. Some reorientation may be necessary if signals in your area are weak. Best results can usually be achieved if the length of the antenna faces the metropolitan area from which the FM signals you wish to receive originate. The supplied antenna has a fitting at its end that will enable you to fasten it in place.

XM

For XM operation, your antenna should be oriented toward the southern sky, where the satellite is located. If the antenna is placed outdoors, it should be in an area where there are no obstacles within 20 to 60 degrees of elevation facing the southern sky. The antenna should be placed on a flat surface that is parallel to the ground. If the antenna is placed where obstacles such as buildings or trees are in the path to the satellite, the antenna may not receive radio waves from the satellite. Certain areas provide satellite radio ground repeaters that retransmit satellite radio signals. Extension cables are available from your dealer or from Crestron.

The following antennas are supplied with your AM/FM/XM Tuner Card:

AM Loop Antenna   FM T-Type Antenna   XM Antenna

Uploading and Upgrading

> **NOTE:** Using this tuner card in a system that goes beyond out-of-the-box functionality requires programming. Since the ATC-AMFMXM is inserted into an Adagio system, refer to the latest version of the operations guide for your particular Adagio system for details.

Crestron recommends using the latest programming software and that each device contains the latest firmware to take advantage of the most recently released features. However, before attempting to upload or upgrade it is necessary to establish communication.

Establishing Communication

Consult the latest version of the operations guide for your particular Adagio system for details.

Firmware

Firmware files may be distributed from programmers to installers or from Crestron to dealers. Firmware upgrades are available from the Crestron website as new features are developed after product releases. For details on upgrading refer to the Crestron Toolbox help file.

Check the Crestron website to find the latest firmware. (New users may be required to register to obtain access to certain areas of the site, including the FTP site.)

Upgrade ATC-AMFMXM firmware via Crestron Toolbox.

- Display the network device tree (**Tools | Network Device Tree**) to show all network devices connected to the control system. Right-click on the ATC-AMFMXM to display actions that can be performed on the ATC-AMFMXM.

- Select **Functions | Firmware** to upgrade the ATC-AMFMXM firmware.

Operation

This section provides a description of the available AM, FM and XM tuner control functions.

In order to access functions of the AM/FM/XM Tuner card, it is necessary to become familiar with the basic Adagio system controls affecting tuner operation.

These are buttons and controls you should know how to use:

- **Selection Knob**
- **Enter Button**
- **Room Buttons**
- **Soft Buttons**

- **Source Button**
- **Menu Button**
- **Volume Knob**
- **Mute Button**

Please refer to the latest version of the operations guide for your Adagio system for detailed information on Source mode control of the AM/FM/XM Tuner.

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.

ATC-AMFMXM Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Tuner muted.	Mismatched slot.	Place card in proper slot.
	Antenna not connected or not connected properly.	Connect antenna according to instructions.
	Mute turned on.	Press the **Mute** button to disengage muting.
	Station detuned or weak.	Tune station; adjust antenna.
	Adagio system volume is turned down.	Check Adagio system volume setting.
Receiving only XM Channels 0 and 1.	The XM Tuner is not activated.	Follow instructions on inside cover of this manual.
Cannot access tuner card controls from Adagio system front panel.	Dusty contacts.	Clean contacts with cotton swab or clean cloth. Apply Isopropyl alcohol as needed for cleaning.
Noisy AM/FM reception.	Improper antenna connection.	Verify proper antenna connection.
AM/FM scan does not operate.	Station signal strength too weak.	Check antenna placement and orientation for good signal strength.

Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron website (http://www.crestron.com/manuals). This link will provide a list of product manuals arranged in alphabetical order by model number.

List of Related Reference Documents

DOCUMENT TITLE
Adagio AES Entertainment System
Adagio AMS Media System
Adagio AMS-AIP Media System with Advance Image Processing

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/offices) for a listing of Crestron worldwide offices.

You can also log onto the online help section of the Crestron website (http://www.crestron.com/onlinehelp) 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 ATC-AMFMXM, additional information 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.

Appendix: RBDS/RDS Function Support

Many radio stations transmit additional information, such as traffic information, radio text, real time clock etc., with their regular FM programming. The FM tuner contains circuitry that retrieves this information.

The US format for such information is called the Radio Broadcast Data System (RBDS), and in Europe this format is called the Radio Data System (RDS). There are some differences between the US and European standards.

The tables in this appendix describe information included in the standard.

When using out-of-the-box functionality, the Adagio system will display the PTY, PS, and RT features listed in the table below when receiving an FM signal containing the information required to display these features.

RBDS/RDS Supported Feature Overview

FEATURES	DESCRIPTION
Program type name (PTY)	There are 31 program types such as jazz, classic etc. Each station that supports RDS will report its program type. (Refer to program type list following this table.)
Program service name (PS)	The station reports its service name such as WIRL, KTU etc.
Program type additional Info (PTYN)	The station sometimes will report additional information about its program type. For example, a program type "Sport" station may report a PTYN of "Football".
Radio text display support (RT)	The station will report radio text information such as phone numbers, artist, song, stations name, etc., in this field. This field could be either 32 or 64 characters.
Universal real time clock (UTC)	Some stations transmit the universal time clock year, month, day, hour, minute, and GMT offset.
Traffic information report (TA/TP)	The stations that support the traffic information.
Station search by TA, TP or TA &TP traffic information types	The FM Tuner can search for stations, which either broadcast or know about other stations that transmit the traffic information. TA = This station has information about other station which carries the traffic announcements. TP = This station broadcasts traffic announcements, but none is being broadcasted right now. TA&TP = This station is currently broadcasting the traffic announcements.
Station search by PTY	The FM Tuner is able to search for station with specified program type.

RBDS/RDS Program Types

PTY CODE	RBDS PROGRAM TYPE (US)	RDS PROGRAM TYPE (EUROPE)
0	No program type or undefined	No program type or undefined
1	News	News
2	Information	Current Affair
3	Sports	Information
4	Talk	Sports
5	Rock	Education
6	Classic Rock	Drama
7	Adult Hits	Culture
8	Soft Rock	Science
9	Top 40	Varied
10	Country	Pop Music
11	Oldies	Rock Music
12	Soft	M.O.R Music
13	Nostalgia	Light classical
14	Jazz	Serious Classic
15	Classical	Other Music
16	Rhythm and Blues	Weather
17	Soft Rhythm and Blues	Finance
18	Language	Children's Program
19	Religious Music	Social Affairs
20	Religious Talk	Religion
21	Personality	Phone In
22	Public	Travel
23	College	Leisure
24	Unassigned	Jazz Music
25	Unassigned	Country Music
26	Unassigned	National Music
27	Unassigned	Oldies Music
28	Unassigned	Folk Music
29	Weather	Documentary
30	Emergency Text	Alarm Test
31	Emergency	Alarm

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 an authorized CRESTRON dealer. Only authorized CRESTRON dealers may 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 supersedes all previous warranties.

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