

Crestron **C2N-MNETRPT**
infiNET™ Repeater

Operations Guide



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InfiNET™ Repeater: C2N-MNETRPT

Introduction

Features and Functions

- Two-way RF repeater
 - ⇒ 2.4 GHz infiNET™ mesh network technology
 - ⇒ Range up to 150 feet indoors, or 250 ft outdoors (subject to site-specific conditions)
 - ⇒ Used to increase operating range of other infiNET devices
- “Wi-Fi” friendly operating frequency selection to avoid interference

The C2N-MNETRPT is a two-way RF repeater designed to extend the coverage of an infiNET wireless network. Requiring only an AC power source, the C2N-MNETRPT can be installed discretely where needed to easily fill a "dead" space between any two or more infiNET devices.

infiNET™

Crestron's groundbreaking infiNET wireless technology provides reliable 2-way communications throughout a home or office structure without the need for physical control wiring. Up to 30 infiNET dimmers, switches, repeaters, and other devices can be linked to a control system via a single RF gateway.

Employing a 2.4 GHz mesh network topology, every infiNET device actually functions as an RF repeater, increasing effective range and

reinforcing the complete network by providing multiple redundant signal paths within the mesh network. Simply adding more devices, or a C2N-MNETRPT repeater, effectively increases the range, strength, and reliability of the network.

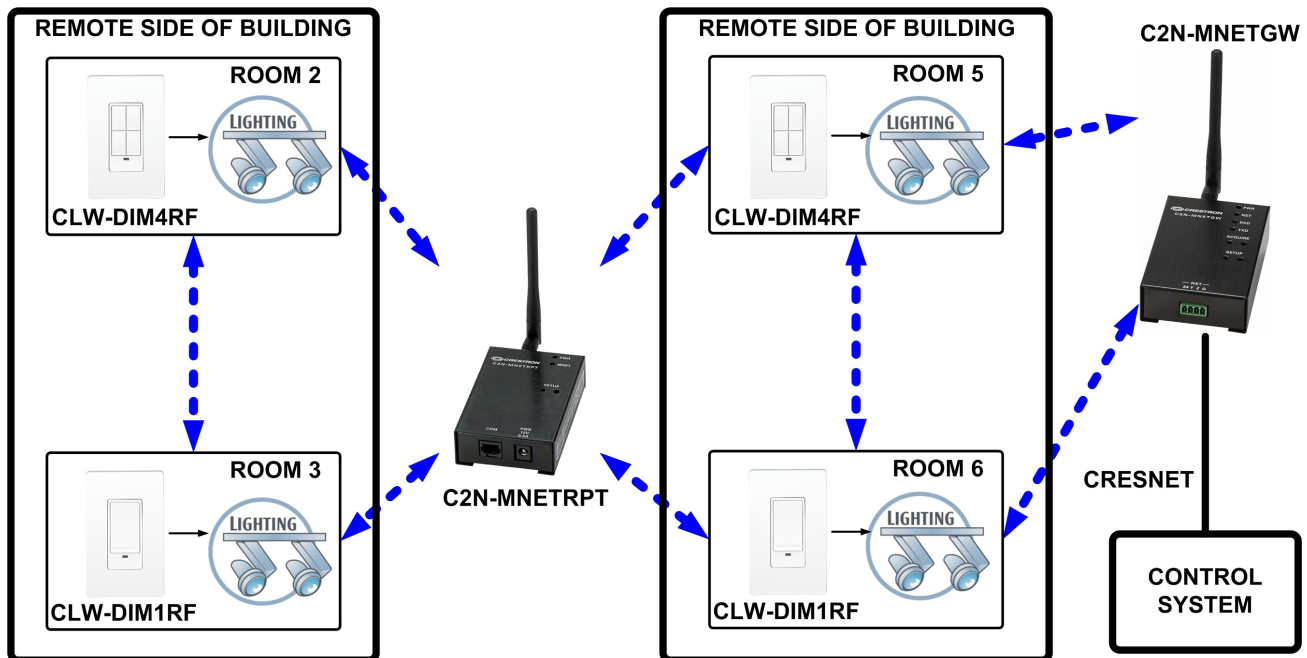
Easy Setup

Setting up a complete infiNET network is simple, utilizing dynamic discovery to locate and acquire each device and repeater automatically.

Applications

The following diagram shows a C2N-MNETRPT “connecting” infiNET devices in a large building.

C2N-MNETRPT in a Large Building Application



Specifications

Specifications for the C2N-MNETRPT are listed in the following table.

C2N-MNETRPT Specifications

SPECIFICATION	DETAILS
RF Transceiver	Two-way RF, 2.4 GHz ISM Channels 11-26 (2400 to 2483.6 MHz), IEEE 802.15.4 compliant
RF Transmitting Power	10 mW
Range (typical) ¹	150 feet indoor, 250 feet outdoor, subject to site-specific conditions; Effective range is increased by adding additional infiNET devices or C2N-MNETRPT repeaters
Power Requirements	6 Watts (0.5 Amp @ 12 Volts DC); AC power supply included
Minimum 2-Series Control System Update File ^{2, 3}	Version 3.154 or later
Default MNET ID	01 ⁴
Enclosure	Black metal, freestanding
Dimensions (without antenna)	
Height	1.24 in (3.15 cm)
Width	2.47 in (6.28 cm)
Depth	3.88 in (9.85 cm)
Weight	8.3 oz (0.24 kg)

1. The location of the transceiver and the orientation of the antenna are important factors in determining the RF performance. With the unit located outside of any metal enclosures, the antenna can be adjusted to achieve the best range. The range is dependent on its placement and the building in which it is used. The construction of the building, obstructions, and RF interference from other devices are factors determining the effective range of the unit. To prevent unit-to-unit RF interference, multiple transceivers operating at the same frequencies should not be installed within three to five feet of each other.

2. The latest software versions can be obtained from the Crestron website. Refer to the NOTE following these footnotes.
3. 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.
4. “01” is not an addressable MNET ID number and is reserved for infiNET repeaters such as the C2N-MNETRPT. The MNET ID cannot be changed.

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).

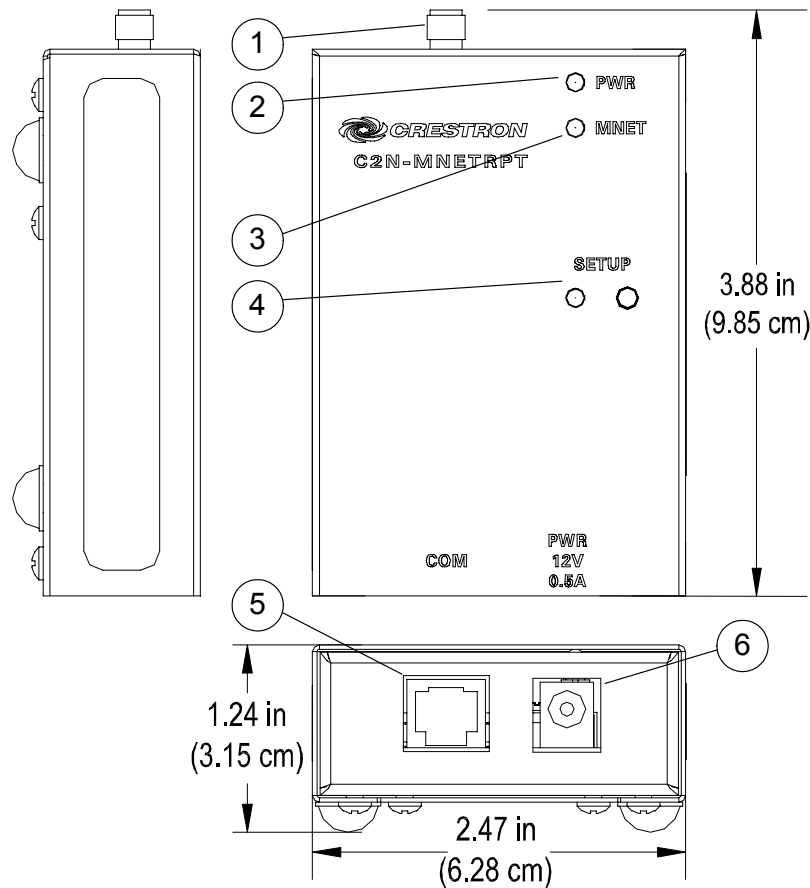
Physical Description

This section provides information on the connections, controls and indicators available on your C2N-MNETRPT.

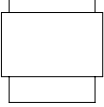
C2N-MNETRPT Physical View



C2N-MNETRPT Overall Dimensions

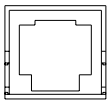
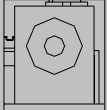


Connectors, Controls & Indicators

#	CONNECTORS, CONTROLS & INDICATORS	DESCRIPTION
1	ANTENNA 	Reverse SMA, female; Dipole antenna included. NOTE: Only the included antenna should be used.
2	PWR LED	Indicates 12 Volts DC power supplied from the included power supply.

(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS, CONTROLS & INDICATORS	DESCRIPTION
3	MNET LED	Indicates that the C2N-MNETRPT is communicating with the C2N-MNETGW to which it was acquired. For more information on acquiring, refer to “Add Repeater To infiNET Network” on page 10.
4	SETUP (LED and button)	Recessed pushbutton with red LED; Used to link the repeater to a gateway.
5	COM (Reserved for future use.) COM 	One 6-pin RJ-11 female RS-232 PC console port. For use with Crestron part number STCP-502 or equivalent. Pin 1: CTS Pin 2: GND Pin 3: RXD Pin 4: TXD Pin 5: RTS Pin 6: N/C (Not connected)
6	PWR PWR 12V 0.5A 	One 2.5 mm barrel DC power jack. This port is used to connect the included power supply. NOTE: Only the included power supply should be used.

Industry Compliance

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



FCC ID: EROCWD1012

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

Installation Tips

NOTE: The following should be used when the network is operating on a fixed channel. If the network is automatically searching for a clear channel, or the infiNET or Wi-Fi channels are not known, maintain at least 12 feet between individual infiNET devices or 12 feet between infiNET devices and Wi-Fi access points. For information on infiNET channels, refer to the latest version of the C2N-MNETGW Operations Guide (Doc. 6317) which is available for download from the Crestron website (www.crestron.com/manuals).

When installing an infiNET device, observe the following for optimum performance:

- InfiNET devices on adjacent channels should be at least 12 feet apart.
- InfiNET devices on non-adjacent channels should be at least three feet apart.

When installing an infiNET device near a Wi-Fi access point, observe the following for optimum performance:

- InfiNET devices on infiNET channels adjacent to operating Wi-Fi channels should be placed at least 12 feet from the nearest Wi-Fi access point.
- InfiNET devices on infiNET channels that are non-adjacent to Wi-Fi bands should be located at least six feet from the nearest Wi-Fi access point.

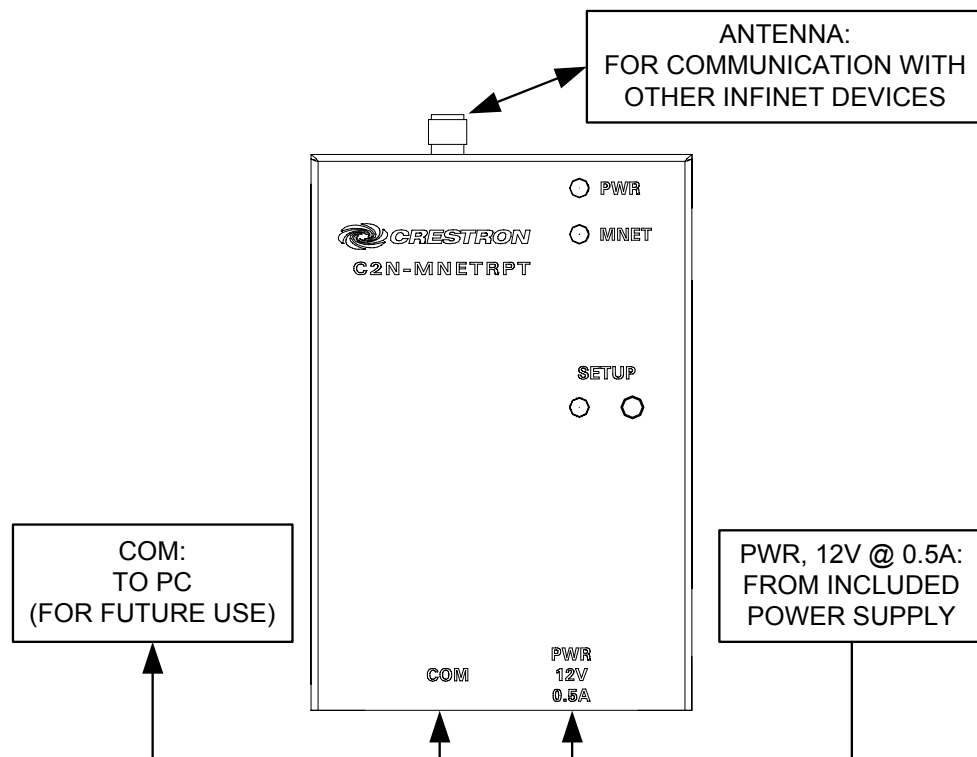
For additional information on optimal repeater placement, refer to “Appendix: Optimum RF Reception Guidelines” on page 15. For more information on infiNET channels and their interaction with the Wi-Fi spectrum, refer to the latest version of the C2N-MNETGW Operations Guide (Doc. 6317).

Hardware Hookup

Make the necessary connections as called out in the illustration that follows this paragraph. Apply power after all connections have been made.

NOTE: Only Crestron power supplies should be used for Crestron equipment.

Hardware Connections for the C2N-MNETRPT



NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

For information of obtaining optimum reception, refer to “Appendix: Optimum RF Reception Guidelines” on page 15.

Add Repeater To infiNET Network

To add a repeater to an infiNET network, it must be “acquired” by a gateway that is connected to a Crestron control system. Perform the following to acquire a C2N-MNETRPT to a C2N-MNETGW:

1. Place the C2N-MNETGW that will communicate with the C2N-MNETRPT in the *Acquire* mode by pressing the **ACQUIRE** button or using Crestron Toolbox. For more information on the C2N-MNETGW’s *Acquire* mode, refer to the latest revision of the C2N-MNETGW Operations Guide (Doc. 6317).

NOTE: Only one C2N-MNETGW should be in the *Acquire* mode.

2. Press **SETUP** on the C2N-MNETRPT to enter the *Acquire* mode. The accompanying LED will illuminate indicating that it is searching for a C2N-MNETGW in the *Acquire* mode. Once the C2N-MNETRPT has been acquired, the **MNET** LED will light and the **SETUP** LED will extinguish.

NOTE: To verify that the repeater has been acquired to the correct gateway, use Crestron Toolbox’ network device tree (**Tools | Network Device Tree**). For more information, refer to the Crestron Toolbox help file.

NOTE: If the C2N-MNETRPT does not acquire with a C2N-MNETGW, the **SETUP** LED will extinguish. If the C2N-MNETRPT detects the C2N-MNETGW that it was previously acquired to, the **MNET** LED will light.

3. Exit the *Acquire* mode on the C2N-MNETGW by pressing the **ACQUIRE** button or using Crestron Toolbox as described in the C2N-MNETGW Operations Guide.

Utility 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.

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.

Crestron has developed an assortment of Windows®-based software tools to develop an infiNET system. The following is the minimum recommended software for the PC:

Software

TASK	REQUIRED SOFTWARE VERSION
Upload firmware.	Crestron Toolbox 1.02.16 or later.

Control system programming is not required when adding a C2N-MNETRPT to a system.

Upgrading Firmware

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 upgrade, the C2N-MNETRPT must be acquired by the C2N-MNETGW as described on page 10.

Firmware upgrades are available from the Crestron website as new features are developed after product releases. Upgrade the firmware via the Crestron Toolbox.

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 C2N-MNETRPT firmware via Crestron Toolbox.

- Establish communications with the control system that is connected to the C2N-MNETGW that has acquired the C2N-MNETRPT. For instructions on establishing communications with a control system, refer to the latest version of the 2-Series Control Systems Reference Guide (Doc. 6256).
- Display the network device tree (**Tools | Network Device Tree**) to show all network devices connected to the control system and all infiNET devices that have been acquired by the C2N-MNETGW.
- Right click on the C2N-MNETRPT and select **Functions | Firmware...** to upgrade the C2N-MNETRPT firmware.

For further details on upgrading, refer to the Crestron Toolbox help file.

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-MNETRPT Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
PWR LED does not illuminate.	C2N-MNETRPT is not receiving power.	Verify that the included power supply is properly connected and providing power.
	Incorrect power supply.	Only use the included power supply.
MNET LED does not illuminate.	C2N-MNETRPT is not acquired with a C2N-MNETGW.	Acquire C2N-MNETRPT with a C2N-MNETGW.
SETUP LED does not illuminate when SETUP is pressed.	C2N-MNETRPT has just rebooted.	Wait approximately 15 seconds after the device has rebooted before pressing SETUP .
Intermittent response from C2N-MNETRPT during communication with infiNET devices.	C2N-MNETRPT is located near metal that is causing interference.	Verify that large amounts of metal are not causing interference.

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
2-Series Control Systems Reference Guide
C2N-MNETGW Guide

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 C2N-MNETRPT, 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: Optimum RF Reception Guidelines

Many factors can affect the reliability of RF communication between infiNET gateways, repeaters, and devices. While an effort has been made to determine operating specifications, some specifications are not constant. RF communication can be limited by several factors including but not limited to electromagnetic interference (EMI), intervening objects, antenna orientation, and device placement. To obtain maximum reliability and performance, some basic rules for installing infiNET repeaters are listed below.

Minimize Interference

RF reception range can be hindered by spurious EMI noise that may interfere with or mask the desired frequency thereby reducing the useable range. EMI can be generated by any electrical device at various RF noise levels depending on the device. Sources of EMI include computers, video equipment, digital processors, lighting dimmers, lighting ballasts, motors or any large AC source. Every effort should be made to separate any RF transceiver such as the C2N-MNETRPT from these sources of RF noise including Audio-Visual equipment in racks. If a repeater must be installed in an equipment rack, make sure there is ample separation between the equipment and the repeater.

NOTE: Check any 802.11 equipment operating near the Cresnet system to ensure that it is using channels that are not being used by the C2N-MNETGW. If necessary, change the gateway's channel setting to avoid interference. For details on changing the operating channel, refer to the latest revision of the C2N-MNETGW Operations Guide (Doc. 6317) which is available for download from the Crestron website.

Repeater Placement

Optimum reception for any infiNET repeater is obtained by installing the repeater in an open area or shelf with a clear line of sight (no obstructions between repeater, gateway, and other infiNET devices). Crestron recommends that the repeater be placed at least five to six feet high for best results. Avoid placing repeaters at a low height or on the ground. Placing RF equipment near metal objects, walls, corners or metal

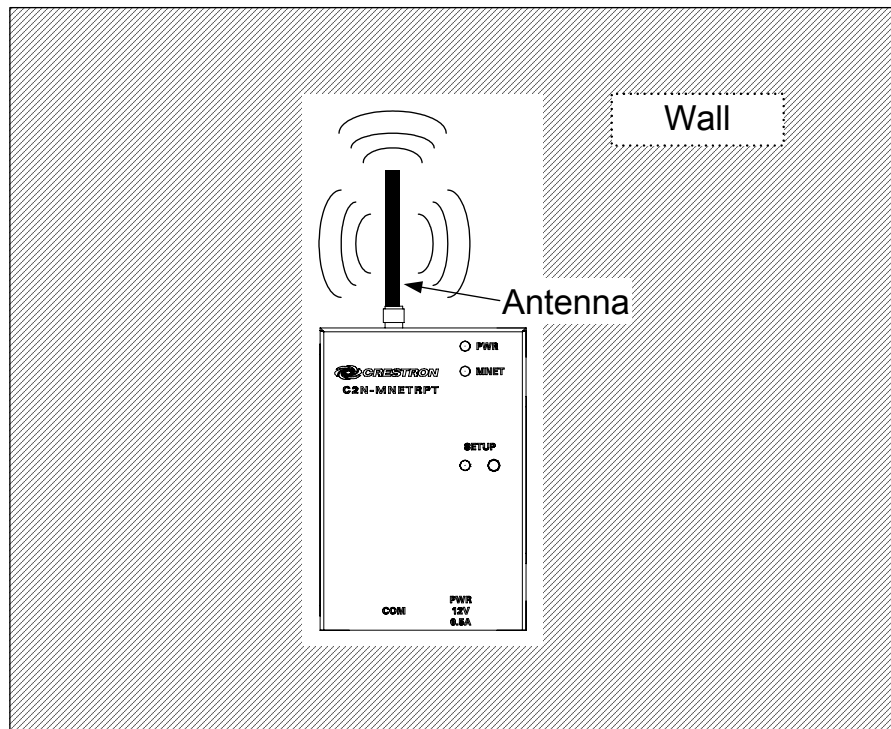
enclosures will compromise RF propagation and reception. Try to avoid installing repeaters in equipment racks, service rooms, or electrical closets.

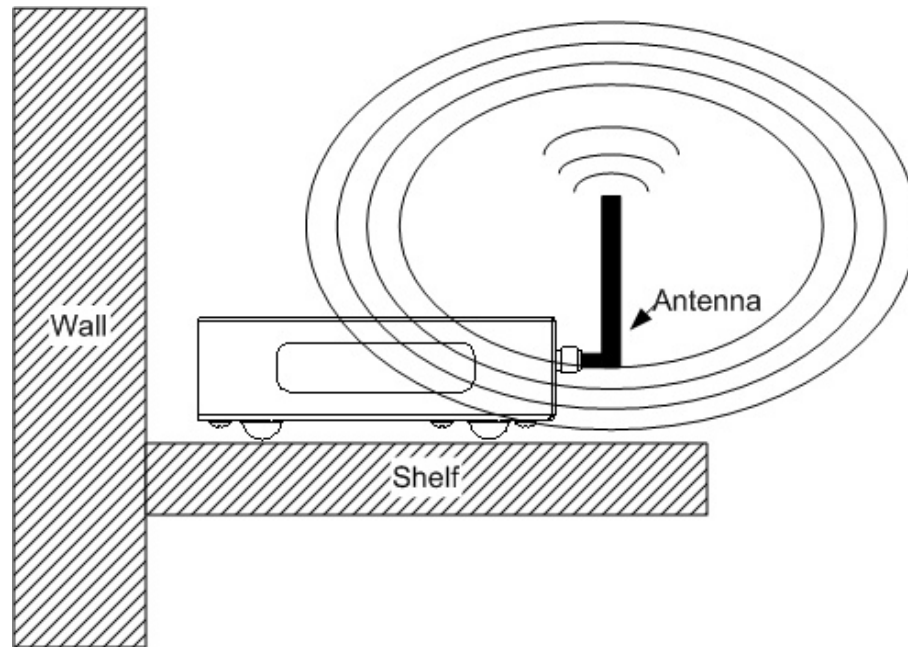
To prevent unit-to-unit RF interference, multiple transceivers operating at the same frequencies should not be installed within three to five feet of each other.

Antenna Orientation

The antenna orientation on the C2N-MNETRPT can have considerable effect on the signal range and reliability. In most applications, the antenna should be set vertically as shown in the following diagrams.

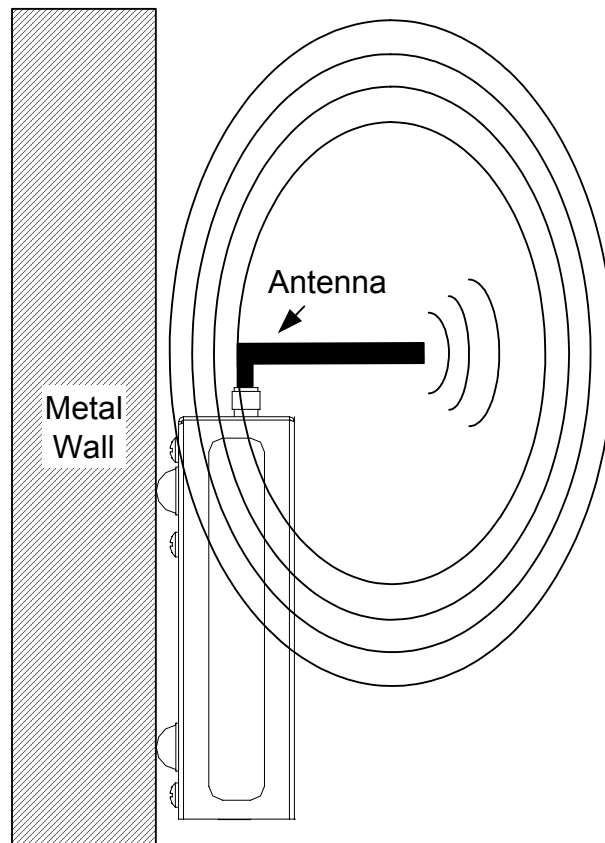
Vertical Orientation





If placing the antenna vertically causes it to lay parallel to a metal surface (i.e. a metal wall), the antenna should be oriented horizontally (perpendicular to the metal surface) as shown in the following diagram.

Horizontal Orientation



NOTE: RF propagation is best from the sides of the antenna.

For specific information on where to place the C2N-MNETRPT, refer to “Repeater Placement” on page 15.

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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