Crestron **MNET-CWD1012**
Two-Way RF Transceiver Module
Hardware Guide

CRESTRON

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Contents

Two-Way RF Transceiver Module: MNET-CWD1012

Introduction

Functions and Features

The MNET-CWD1012 (hereafter referred to as "module") is a two-way radio frequency (RF) module that utilizes the 2.4 GHz frequency band to communicate with other devices.

The module operates according to the IEEE 802.15.4 specification and can be configured to minimize the possibility of interference with other devices.

The module receives RF signals from one or more Crestron MNET devices and can transmit these signals over the air or over a cable run for further processing (depending on the application).

Functional Summary

- Two-way RF transceiver
  - 2.4 GHz frequency band, IEEE 802.15.4 specification
  - Range from 3 feet to 100 ft.
  - Range is effectively increased with the use of additional MNET devices or repeaters
  - Operates on one of sixteen available channels to establish optimal signal quality

The transceiver uses a 10 milliwatt signal that can travel up to approximately 100 feet indoors. The range is dependent on the construction of the building, obstructions, and RF interference from other devices. Adding more modules will increase the range of transmission. The location of the module and the orientation of its antenna are also important factors in determining RF performance.

Specifications

The table below is a summary of specifications for the MNET-CWD1012.

Specifications of the MNET-CWD1012

SPECIFICATION	DETAILS
Power Requirements	0.75 Watts (5VDC @ 0.150A)
Operating Frequency	2400 MHz to 2483.6 MHz (802.15.4 compliant)
Operating Ranges[1]	
Minimum Distance	3 ft
Maximum Distance Indoors (without repeater device)	100 ft
Available Channels	16 (numbered 11 through 26 per 802.15.4)
RF Output Power	10 mW
Serial Communications	TTL Level, 38400 Baud, 8 data bits, 1 stop bit, no parity, software flow control
Antenna (included)	
Type	Dipole Antenna
Antenna Connector	SMA Non-Standard Female Connector with ¼-36 UNS2B Screw
V.S.W.R	1.9 : 1
Gain	2.0 dBi ±0.5
Dimensions	Width: 1.50 in (3.81 cm) Height: 2.50 in (6.35 cm) Depth: 0.36 in (0.91 cm)

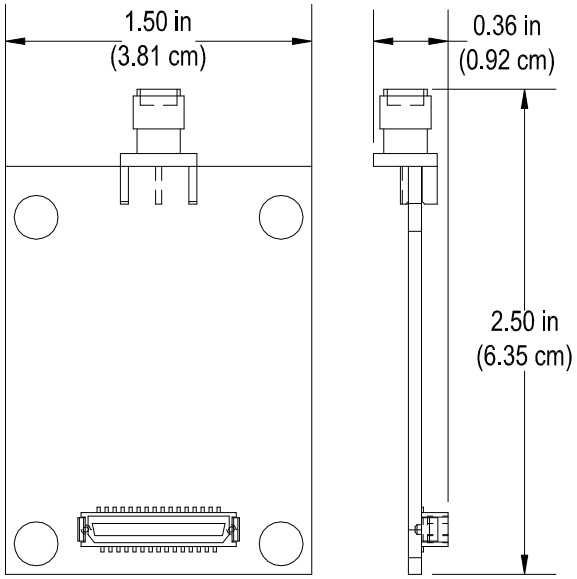
1. The location of the module and the orientation of the antenna are important factors in the RF performance. With the unit located outside of any metal enclosures, the antenna is adjusted to achieve the best range. The range is dependent on its placement and the building in which it is used. The construction 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 modules operating at the same frequencies should not be installed within 3-5 feet of each other.

Physical Description

The module, shown below, consists of various components attached to a printed circuit board. A SMA non-standard female antenna port is located at edge of the circuit board for attaching the included dipole antenna while a 31-pin interface connector is located on the underside of the circuit board.

Physical View of MNET-CWD1012

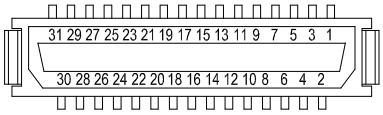
MNET-CWD1012 Detail Views



Ports

The module contains two ports. Refer to the diagrams and descriptions that follow.

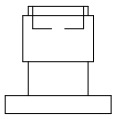
Power/I-O



A Crestron JDSM31M-1 31 pin, male, SMT interface connector provides power to the module as well as serial communications between the module and wired devices. The mating connector is Crestron part number JDSM31F-1, 31 pin, female, SMT connector. Refer to the following table for pin assignments of the module interface connector.

Power/I-O Pinout Signals

Pin #	Signal	Pin #	Signal	Pin #	Signal	Pin #	Signal
1	GND	9	Reserved No Connection	19	Reserved No Connection	27	+5V
2	GND	10	Reserved No Connection	20	SETUP Switch IN (Active Low)	28	GND
3	Reserved No Connection	11	Reserved No Connection	21	Reserved No Connection	29	+5V
4	MODULE SERIAL OUT	12	Reserved No Connection	22	RF Module Status Out (High=Connection Active)	30	GND
5	MODULE SERIAL IN	15	Reserved No Connection	23	RF Module SETUP Status Out (High = Setup Mode)	31	GND
6	No Connection	16	Reserved No Connection	24	No Connection		
7	RF Module /RESET Input (Active Low)	17	Reserved No Connection	25	+5V		
8	Reserved No Connection	18	Reserved No Connection	26	GND		



Antenna

This SMA non-standard male antenna port is located at edge of the circuit board for attaching the included dipole antenna.

APPROVED ANTENNAS:
The MNET-CWD1012 antenna interface has a unique coupling designed to ensure that no antenna other than the one supplied shall be used with the device. Replacement antennas may be purchased from Crestron according to the following description:

Part Number: ANXX2400R00MHZ-2
Description: ANTENNA, 2400.00MHZ, DIPOLE, SMA, REVERSE POLARITY, FEMALE

Industry Compliance

Labeling Requirements
If the FCC ID on the MNET-CWD1012 is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: EROCWD1012” or “Contains FCC ID: EROCWD1012.” Any similar wording that expresses the same meaning may be used.

Compliance Statement (Part 15.19)
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.

Warning (Part 15.21)
Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

RF Exposure (OET Bulletin 65)
To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20cm separation distance between the antenna and all persons.

Industry Canada Statement
The term "IC" before the certification/registration number only signifies that the Industry Canada technical specifications were met.
IC: 5683A-CWD1012

Antenna Requirements:
The module must be installed such that the antenna connector is accessible for direct antenna connection in the final configuration. If any cable or antenna other than that provided with the MNET-CWD1012 is used, then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with

minimum distance 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions:

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna.

As long as the two conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

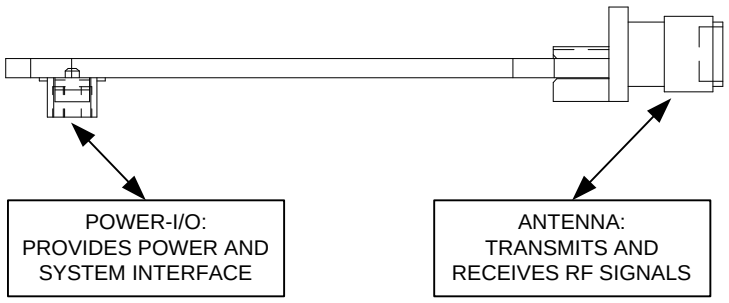
Setup

Hardware Hookup

Refer to the hookup diagram below, which shows the connections made to the module. Complete the connections in any order.

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

Hookup Connections for MNET-CWD1012



For more information on these connectors, refer to “Ports” on page 3.

Antenna Orientation

The module is provided with a dipole antenna that has a 90 degree-adjustable mount. This antenna shall be oriented such that the antenna is in a vertical orientation when the device is mounted for use.

Mounting

The module has four 0.215” diameter holes for screws that can be used to secure the module to an enclosure or other printed circuit board (PCB).

This module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users.

End Product Labeling

The final end product must be labeled in a visible area with the following: “Contains FCC ID: EROCWD1012 .

Documentation

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the users manual of the end product which integrate this module.

The users manual for OEM integrators must include the following information in a prominent location

> “**IMPORTANT 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.”

The users manual for OEM integrators device must include the following information in a prominent location:

> **“IMPORTANT NOTE:** The antenna’s adjustable mount must be manipulated such that the antenna is placed in a vertical orientation when the device is installed.”

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