

Crestron **CWD1016**

Two-Way RF Transceiver Module

---

Hardware Guide



**CRESTRON**

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



Crestron Electronics, Inc.

15 Volvo Drive

Rockleigh, NJ 07647

1-888-CRESTRON

# Contents

<b>Two-Way RF Transceiver Module: CWD1016 .....</b>	<b>2</b>
Introduction .....	2
Functions and Features .....	2
Specifications .....	3
Physical Description .....	3
Industry Compliance .....	5
Setup .....	6
Hardware Hookup .....	6
Antenna .....	6
Mounting .....	6
End Product Labeling .....	6
Documentation .....	6

# Two-Way RF Transceiver Module: CWD1016

---

## Introduction

### Functions and Features

The CWD1016 (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 INET 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 150 ft.
  - Range is effectively increased with the use of additional INET devices or repeaters
  - Operates on one of sixteen available channels to establish optimal signal quality

The transceiver produces a 100 milliwatt signal that can travel up to approximately 150 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 CWD1016.

### *Specifications of the CWD1016*

SPECIFICATION	DETAILS
Power Requirements	
Sleep	Typical <5uA   Max 11uA
Receive	Typical 28mA   Max 35mA
Transmit	Typical 150mA   Max 165mA
Operating Frequency	2400 MHz to 2483.5 MHz (802.15.4 compliant)
Operating Ranges <sup>1</sup>	
Minimum Distance	3 ft
Maximum Distance Indoors (without repeater device)	150 ft
Available Channels	16 (numbered 11 through 26 per 802.15.4)
RF Output Power	100 mW
Serial Communications	TTL Level, 38400 Baud, 8 data bits, 1 stop bit, no parity, software flow control
Antenna	Board mounted chip
Dimensions	Width: 1.88 in (0.477 cm) Height: 0.82 in (0.208 cm) Depth: 0.100 in (0.254 cm)

1. The location of the module and the orientation of the antenna are important factors in the RF performance. 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

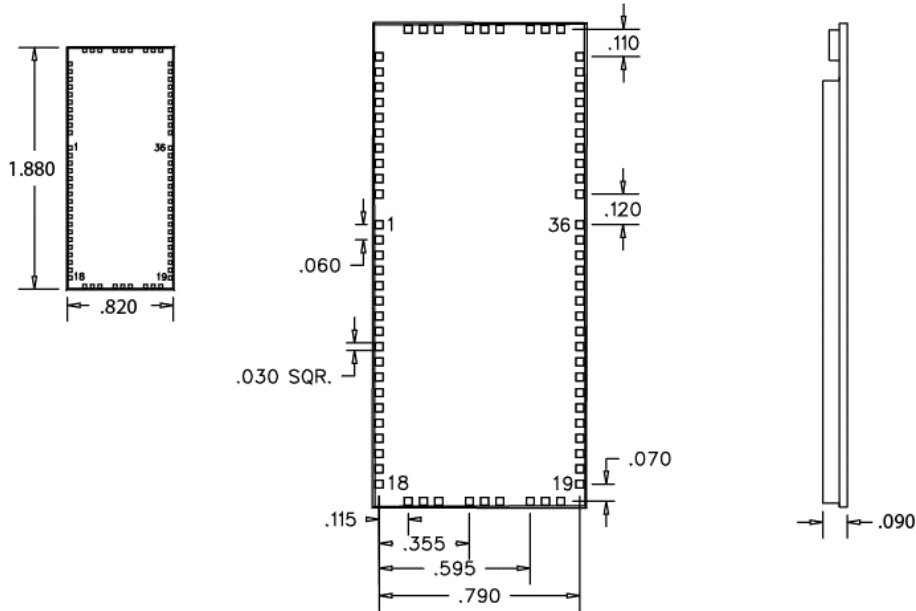
The module, shown below, consists of various components attached to a printed circuit board. A chip antenna port is located at the right edge of the circuit board, while a 38-pin interface is located on the edges of the circuit board.

### *Physical View of CWD1016*



### CWD1016 Detail Views

TOP VIEW, THROUGH BOARD  
(ACTUAL SIZE)



### Power/I-O

An edge connector provides power to the module as well as serial communications between the module and wired devices. Refer to the following table for pin assignments of the module interface connector.

#### I/O Pinout Signals

Pin #	Signal	Pin #	Signal	Pin #	Signal	Pin #	Signal
1	+5v	9	Reserved GPIO	24	RESET	32	MISO
2	GND	10	Reserved GPIO	25	Reserved ADC1	33	GND
3	Reserved PWMA	11	GND	26	Reserved ADC2	34	GND
4	Reserved PWMB	12-16	Reserved	27	Reserved ADC3	35	PA2
5	Reserved GPIO	17-20	GND	28	GND	36	GND
6	Reserved GPIO	21	UART RX	29	Reserved PA1	62	GND
7	Reserved GPIO	22	UART TX	30	SCLK	63	+5v
8	Reserved GPIO	23	Reserved PA0	31	MOSI		

**Antenna**

The board mounted chip antenna port is located at edge of the circuit board.

**Industry Compliance****Labeling Requirements**

If the FCC ID on the CWD1016 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: EROCWD1016” or “Contains FCC ID: EROCWD1016.” 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 20 cm separation distance between the antenna and all persons. This device must not be co-located or operating in conjunction with any other antenna or transmitter within the host device it is installed into.

**Industry Canada Statement****Section 7.1.5 of RSS-GEN**

Operation is subject to the following two conditions:

- 1) this device may not cause interference, and
- 2) this device must accept any interference, including interference that may cause undesired operation of the device.

**OEM Integration :**

OEM Responsibility to the FCC Rules and Regulations

The CWD1016 Module has been certified per FCC Part 15 rules for integration into products without further testing or certification.

To fulfill the FCC certification requirements the OEM of the CWD1016 Module must ensure that the information provided on the CWD1016 label is placed on the outside of the final product.

The CWD1016 Module is labeled with its own FCC ID Number. If the FCC ID 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: EROCWD1016”**

or

**“Contains FCC ID: EROCWD1016”**

The OEM of the CWD1016 Module must only use the approved antenna, which has been certified with this module.

The OEM of the CWD1016 Module must test their final product configuration to comply with Unintentional Radiator Limits before declaring FCC compliance per Part 15 of the FCC rules.

---

**IMPORTANT NOTE:** In the event that these conditions cannot be met (for example 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 /I-O Pinout Signals table which shows the connections made to the module.

---

**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.

---

### Antenna

The module is provided with an internal antenna.

### Mounting

The module has an edge connector for surface mounting to a printed circuit board (PCB).

### End Product Labeling

The final end product must be labeled in a visible area with the following: “Contains FCC ID: EROCWD1016 .

### 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, only the antenna provide with this transmitter may be installed and this device must not be co-located or operating in conjunction with any other antenna or transmitter.”

**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.

**FCC Interference Statement (Part 15.105 (b))**

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 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

This page intentionally left blank

