

Crestron **CWD1015**  
Two-Way RF Transceiver Module  

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Operations Guide



**CRESTRON**

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# Two-Way RF Transceiver Module: CWD1015

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## Introduction

### Functions and Features

The CWD1015 (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 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.
  - Operates on one of sixteen available channels to establish optimal signal quality

The transceiver uses a 100 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. 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 CWD1015.

### *Specifications of the CWD1015*

SPECIFICATION	DETAILS
Power Requirements	0.75 Watts (3.3VDC @ 0.250A)
Operating Frequency	2400 MHz to 2483.6 MHz (802.15.4 compliant)
Operating Ranges <sup>1</sup>	
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	100 mW
Serial Communications	SPI, TTL Level
Antenna Connector	U.FL/MMC
Dimensions	Width: 1.50 in (3.81 cm) Height: 2.50 in (6.35 cm) Depth: 0.36 in (0.91 cm)

- 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.

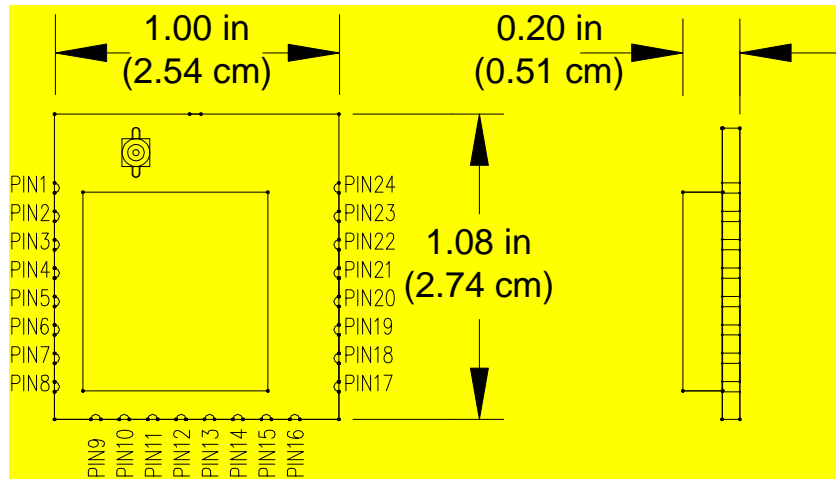
## Physical Description

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 a dipole antenna while 24 solder points line the perimeter of the printed circuit board for the application-specific installation.

### *Physical View of CWD1015*



**CWD1015 Detail Views**

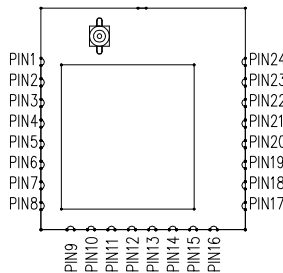


**Ports**

The module contains 24 solder points and one antenna port. Refer to the diagrams and descriptions that follow.

**Power/I-O**

Twenty-four solder points provide 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.



**Power/I-O Pinout Signals**

Pin #	Signal	Pin #	Signal	Pin #	Signal
1	GND	9	Output Amplifier Enable	17	IRQ (active low)
2	Receive Enable (active low)	10	RX/TX Enable	18	Reserved (No Connection)
3	Transmit Enable (active low)	11	Attention (active low)	19	Reserved (No Connection)
4	Reserved	12	Reserved (No Connection)	20	Reserved (No Connection)
5	Reserved	13	SPI CLK	21	GND
6	Reserved	14	SPI MOSI	22	GND
7	Reserved	15	SPI MISO	23	VCC 3.3V
8	Reset (active low)	16	SPI_CE (active low)	24	GND

**Antenna**

This U.FL/MMC antenna port is located at edge of the circuit board for attaching an antenna.

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**APPROVED ANTENNAS:**

The CWD1015 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:** Crestron #4504627

**Description:** ANTENNA, PCB ASSY 2.4 - 2.5 Ghz U.FL connect .

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## Industry Compliance

**Labeling Requirements**

If the FCC ID on the CWD1015 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: EROCWD1015" or "Contains FCC ID: EROCWD1015." 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-CWD1015

**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 received, including interference that may cause undesired operation of the device.



**Section 7.1.4 of RSS-GEN**

This device has been designed to operate with the antenna(s) listed below, and having a maximum gain of 1.9 dBi. Antennas not included in this list or having a gain greater than 1.9 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

<b>Part Number</b>	Crestron #4504627
<b>Frequency</b>	2.4-2.5 GHz
<b>Polarization</b>	Linear
<b>Operating temperature</b>	-40 to + 85 degC
<b>Impedance</b>	50 Ohm

	<b>Min</b>	<b>Typ</b>	<b>Max</b>	
<b>Peak Gain</b>	0.8dBi	1.2dBi	1.9dBi	Frequency 2.4-2.5 GHz
<b>Efficiency</b>	70%	75%	79%	
<b>VSWR</b>	1.0:1	1.5:1	1.9:1	Frequency 2.4-2.5 GHz

**Section 7.1.5 of RSS-GEN**

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

**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 CWD1015 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.).

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**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.

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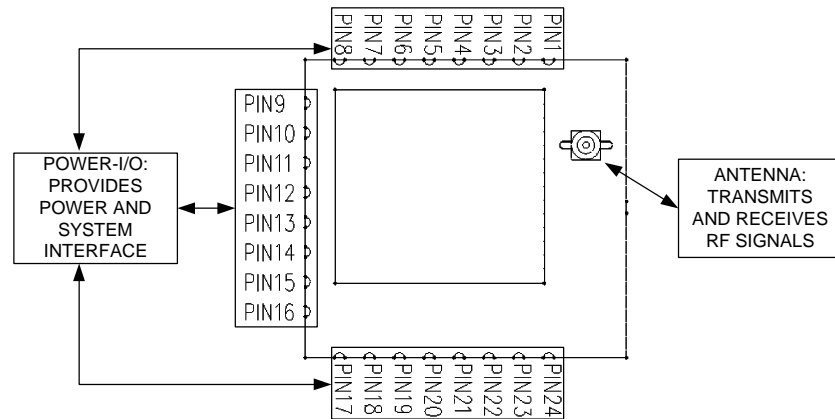
## Setup

### 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 CWD1015*



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

### End Product Labeling

The final end product must be labeled in a visible area with the following: “Contains FCC ID: EROCWD1015 .”

### 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.”

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