



## WC20i-Solar Installation

### User & Reference Manual



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## Safety Information

The products described in this manual can fail in a variety of modes due to misuse, age, or malfunction and is not designed or intended for use in systems requiring fail-safe performance, including life safety systems. Systems with the products must be designed to prevent personal injury and property damage during product operation and in the event of product failure.



**Warning!** Remove power before connecting or disconnecting the interface or RF cables.

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FreeWave Technologies, Inc. warrants the FreeWave® WC20i-Solar (Product) that you have purchased against defects in materials and manufacturing for a period of three years from the date of shipment, depending on model number. In the event of a Product failure due to materials or workmanship, FreeWave will, at its discretion, repair or replace the Product. For evaluation of Warranty coverage, return the Product to FreeWave upon receiving a Return Material Authorization (RMA). The replacement product will remain under warranty for 90 days or the remainder of the original product warranty period, whichever is longer.

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FreeWave's Warranty does **not apply** in the following circumstances:

1. If Product repair, adjustments, or parts replacements are required due to accident, neglect, or undue physical, electrical, or electromagnetic stress.
2. If Product is used outside of FreeWave specifications as stated in the Product's data sheet.
3. If Product has been modified, repaired, or altered by Customer unless FreeWave specifically authorized such alterations in each instance in writing.

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## Preface

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### Contact FreeWave Technical Support

For up-to-date troubleshooting information, check the **Support** page at [www.freewave.com](http://www.freewave.com).

FreeWave provides technical support Monday through Friday, 8:00 AM to 5:00 PM Mountain Time (GMT -7).

- Call toll-free at 1-866-923-6168.
- In Colorado, call 303-381-9200.
- Contact us through e-mail at [moreinfo@freewave.com](mailto:moreinfo@freewave.com).

### Other WAVECONTACT Information



Use the FreeWave <http://support.freewave.com/> website to download the latest version of these documents.

Registration is required to use this website.

| Document          | Description  | FreeWave Part Number |
|-------------------|--|----------------------|
| User Manual       | The User Manual provides setup, configuration, and safety information for the WC20i-Solar. | LUM0097AA            |
| Quick Start Guide | The Quick Start Guide provides the out-of-the-box setup of the WC20i-Solar kits.           | QSG0045AA            |

## Document Styles

This document uses these styles:

- Parameter setting text appears as: **[Page=radioSettings]**
- File names appear as: **configuration.cfg**.
- File paths appear as: **C:\Program Files (x86)\FreeWave Technologies**.
- User-entered text appears as: **xxxxxxxxxx**.



**Caution:** Indicates a situation that **MAY** cause damage to personnel, the radio, data, or network.

**Example:** Provides example information of the related text.

**FREEWAVE Recommends:** Identifies FreeWave recommendation information.

**Important!:** Provides crucial information relevant to the text or procedure.

**Note:** Emphasis of specific information relevant to the text or procedure.



Provides time saving or informative suggestions about using the product.



**Warning!** Indicates a situation that **WILL** cause damage to personnel, the radio, data, or network.

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## 1. Overview - WC20i-Solar Installation

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The WAVECONTACT C1D1 WC20i-Solar system is an intrinsically safe device with these features:

- Complete battery and solar charging system
- Integrated mounting bracket for mounting on a horizontal or vertical pole
- High efficiency solar charging circuit
- Fully encapsulated battery pack and charging circuit

### 1.1. Compatibility

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**Warning!** The available WC20i-Solar system is limited because of IS certification. The WC20i-Solar system **cannot** not be used for all WC20i Endpoint models and configurations.

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These WC20i models and configurations are supported for use with the WC20i-Solar:

- WC20i-485-S (with a sensor power draw of less than 10mA)
  - WC20i-AN-S
  - WC20i-DI-S
  - WC20i-HART-S
  - WC20i-KTh-S
- 



**Warning!** The WC20i-AN-S Modular Endpoint operating in 4-20mA mode **CANNOT** be used with the WC20i-Solar kit.

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## 2. Equipment

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### 2.1. Included Equipment

**Important!:** The WC20i-Solar package does **NOT** include the WC20i Endpoint. It is only the Solar Panel with its accompanying equipment.

| WC20i-Solar Included Equipment |     |   |
|--------------------------------|-----|---|
| FreeWave Part #                | Qty | Description   |
| WC20i-Solar                    | 1   | WC20i Solar Panel kit with bracket, charger, and High Capacity battery pack |
| QSG0045AA                      | 1   | Quick Start Guide   |

### 2.2. User-supplied Equipment

**Important!:** The items listed here are all optional and dependent upon the specific installation of the WC20i-Solar Kit with the selected WC20i and Tank Level equipment.

- U-bolts
- Hose clamps
- Philips screwdriver
- Flat-head screwdriver
- Pliers
- Appropriate Tank Level Solar Panel Mounting Kit (See the [Tank Level Solar Panel Mounting Kits \(on page 8\)](#) table)

### 2.2.1. Tank Level Solar Panel Mounting Kits

| User-supplied Equipment - Tank Level Solar Panel Mounting Kits   |     |                           |
|--|-----|---------------------------|
| FreeWave Part #  | Qty | Description               |
| <b>Note:</b> These mounting kits fit all FreeWaveWC20i-Solar Panel Kits.<br>Select a mounting kit based on the model of the attached sensor. |     |                           |
| WC20i-B-R5300  | 1   | Rosemount 5300            |
| WC20I-B-YOKO   | 1   | Yokogawa EJA Series       |
| WC20i-BKT-VEGA   | 1   | Vega Single Chamber Radar |



### 3. WC20i-Solar Connections

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- [Solar Power Connection \(on page 10\)](#)
- [Sensor Cable Routing on the WC20i \(on page 11\)](#)

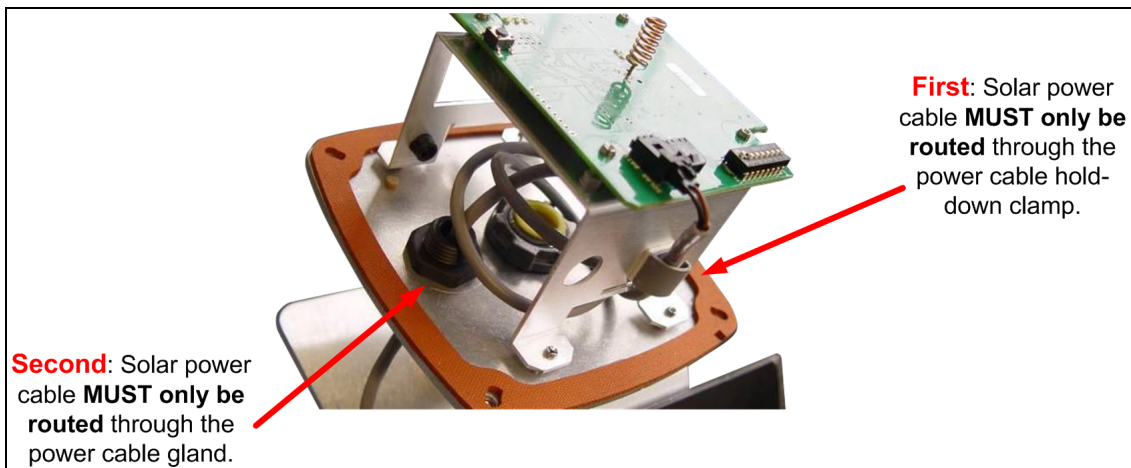
## 3.1. Solar Power Connection

**Important!** To ensure intrinsic safety is maintained, it is required that the installer follow these guidelines when connecting sensors to the WC20i Endpoint.

- The WC20i Endpoint must be purchased for use with the solar system.
- The solar ready WC20i Endpoint has a cable gland for the power cable.
  - The solar power cable must enter through the cable gland.
  - All wiring should be neat and orderly.
- This should be routed away from any sensor wires entering the WC20i Endpoint.
- Verify the solar power cable is routed through the power cable hold-down clamp and the power cable gland.
- See [Figure 1](#) for proper wire routing.



**Warning!** The battery or solar power cable **MUST only be routed** through the power cable hold-down clamp and, as applicable, the solar power cable gland.



**Figure 1: Solar Power Cable through the Power Cable Hold-down Clamp**

## 3.2. Sensor Cable Routing on the WC20i

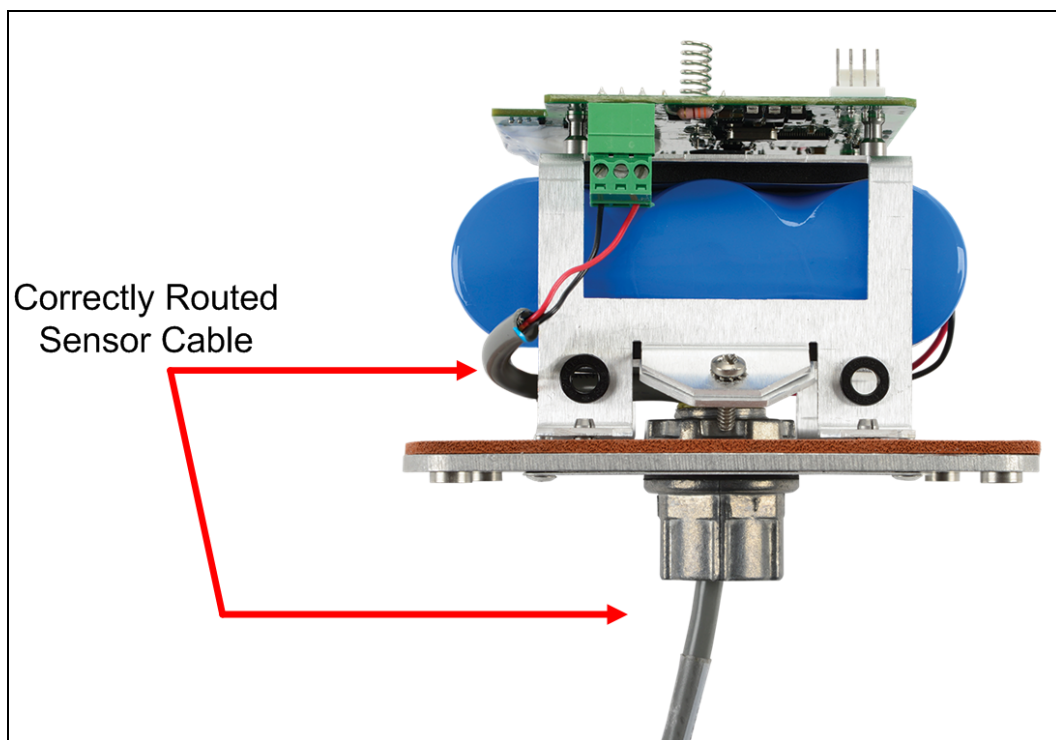
**Note:** Many sensors are compatible with the FreeWave WC20i-Solar. See [www.freewave.com](http://www.freewave.com) for the most up-to-date list of these sensors.

**Important!** To ensure intrinsic safety is maintained, the installer is required to follow these procedures when connecting sensors to a WAVECONTACT Endpoint. See [Figure 2](#) for the proper cable routing.

### Procedure

1. All wiring should be neat and orderly.
2. Strip the cable wires to the sensor so that there is minimal exposed un-insulated wire when inserted into the screw terminal.

**Important!** For both the battery powered and solar powered WC20i, sensor wires entering the enclosure **MUST** be routed and connected as shown in [Figure 2](#).



**Figure 2: Correctly Routed Sensor Cable**

3. Continue with either:
  - [WC20i-Solar U-bolt Mounting Holes and Tabs \(on page 13\)](#)
  - [Rosemount 5300 Mounting \(on page 15\)](#)
  - [Vega Single Chamber Radar Mounting \(on page 18\)](#)
  - [Yokogawa EJA Series Mounting \(on page 21\)](#)

## 4. WC20i-Solar Mounting and Care

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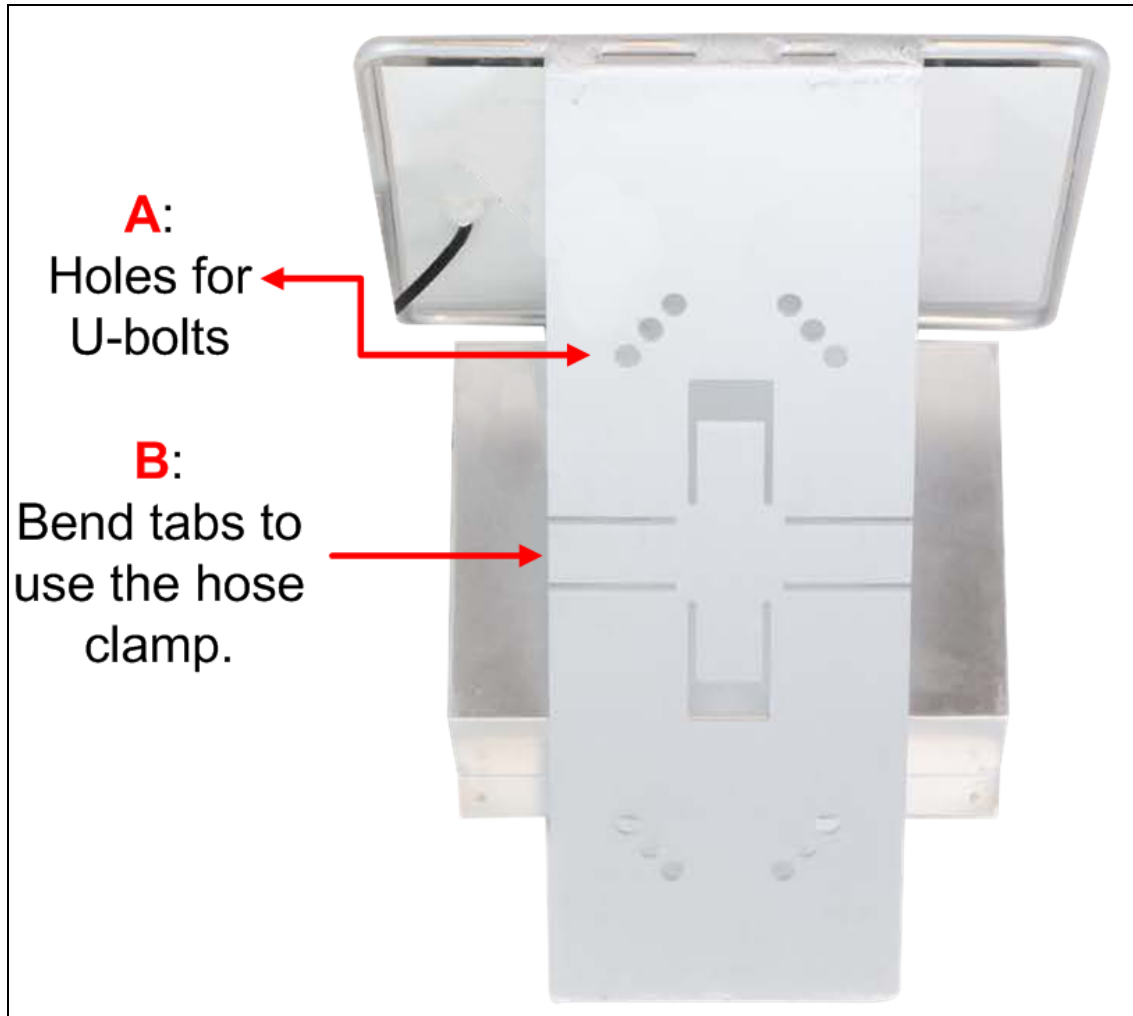
**Note:** The [User-supplied Equipment \(on page 7\)](#) lists the FreeWave kits the WC20i-Solar can be attach to.

- The WC20i-Solar is attached to its own mounting bracket.
  - The bracket may be mounted to either a horizontal or vertical pole.
- Mount the WC20i-Solar so the mounting side of the triangle is vertical and the battery box is at the bottom.
- The [WC20i-Solar U-bolt Mounting Holes and Tabs \(on page 13\)](#) section provides information to mount the WC20i-Solar kit to the Tank Level Solar Panel Mounting Kits.
- These sections show examples about specific Tank Level Solar Panel Mounting Kits:
  - [Rosemount 5300 Mounting \(on page 15\)](#)
  - [Vega Single Chamber Radar Mounting \(on page 18\)](#)
  - [Yokogawa EJA Series Mounting \(on page 21\)](#)
- [Cleaning Instructions \(on page 14\)](#)

**FREEWAVE Recommends:** The WC20i-Solar should be installed with the solar panel facing South with a good view of the sky.

### 4.1. WC20i-Solar U-bolt Mounting Holes and Tabs

1. U-bolts are placed through the holes in the rear of the bracket for pole mounting.  
(**A** in Figure 3)
2. Where applicable, the tabs on the bracket are bent to fit around the pole.  
(**B** in Figure 3)



**Figure 3: WC20i-Solar U-bolt Holes and Tabs**

## 4.2. Cleaning Instructions

The outside of the enclosure may be cleaned with water, mild soap, and a damp cloth as needed.



**Caution:** High pressure washing is NOT recommended.

---

### **Warning! Electrostatic Discharge Hazard!**

Care must be taken to avoid the potential of creating a charge on the enclosure or antenna.

Do NOT wipe with a dry cloth.

Do NOT brush against the enclosure with clothing or gloves.



**AVERTISSEMENT:** Risque de décharge électrostatique! Il faut veiller à éviter tout risque de changement de l'enceinte ou de l'antenne.

Ne pas essuyer avec un chiffon sec.

Ne pas brosser contre l'enceinte avec des vêtements ou des gants.

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## 5. Rosemount 5300 Mounting

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This section provides this information about the FreeWave WC20i-B-R5300 kit:

- [Included Equipment - WC20i-B-R5300 \(on page 16\)](#)
- [Example - Mounted Rosemount 5300 \(on page 17\)](#)

**Note:** See [Cleaning Instructions \(on page 14\)](#) for WC20i-Solar care.

### 5.0.1. Included Equipment - WC20i-B-R5300

This is the equipment included with the FreeWave WC20i-B-R5300 kit:



**Figure 4: Included Equipment - WC20i-B-R5300**



## 5.1. Example - Mounted Rosemount 5300

This example shows how the FreeWave WC20i-B-R5300 kit is mounted to the Rosemount 5300.



**Figure 5: WC20i-B-R5300 - Mounted with WC20i-Solar**

## 6. Vega Single Chamber Radar Mounting

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This section provides this information about the FreeWave WC20i-BKT-VEGA kit:

- [Included Equipment - WC20i-BKT-VEGA \(on page 19\)](#)
- [Example - Mounted WC20i-BKT-VEGA \(on page 20\)](#)

**Note:** See [Cleaning Instructions \(on page 14\)](#) for WC20i-Solar care.

### 6.0.1. Included Equipment - WC20i-BKT-VEGA

This is the equipment included with the FreeWave WC20i-BKT-VEGA kit:



**Figure 6: Included Equipment - WC20i-BKT-VEGA**

## 6.1. Example - Mounted WC20i-BKT-VEGA

This example shows how the FreeWave WC20i-BKT-VEGA kit is mounted to the Vega Single Chamber Radar.



**Figure 7: WC20i-BKT-VEGA - Mounted with WC20i-Solar**

## 7. Yokogawa EJA Series Mounting

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This section provides this information about the FreeWave WC20I-B-YOKO kit:

- [Included Equipment - WC20I-B-YOKO \(on page 22\)](#)
- [Example - Mounted WC20I-B-YOKO \(on page 23\)](#)

**Note:** See [Cleaning Instructions \(on page 14\)](#) for WC20i-Solar care.

### 7.0.1. Included Equipment - WC20I-B-YOKO

This is the equipment included with the FreeWave WC20I-B-YOKO kit:



**Figure 8: Included Equipment - WC20I-B-YOKO**

## 7.1. Example - Mounted WC20I-B-YOKO

This example shows how the FreeWave WC20I-B-YOKO kit is mounted to the Yokogawa EJA Series.



**Figure 9: WC20I-B-YOKO - Mounted with WC20i-Solar**

## Appendix A: Technical Specifications

**Warning!** Use of this equipment in a manner not specified by the manufacturer may impair the protection provided by the equipment.

The use of any parts not supplied by the manufacturer violates the safety rating of the equipment.



**AVERTISSEMENT:** L'utilisation de cet équipement d'une manière non spécifiée par le fabricant peut nuire à la protection fournie par l'équipement.

L'utilisation de pièces non fournies par le fabricant est contraire à la cote de sécurité de l'équipement.

**Important!** The associated apparatus provides intrinsically safe outputs.

L'appareil associé fournit des sorties à sécurité intrinsèque. See the for requirements when used in a Class I Division 1 area.

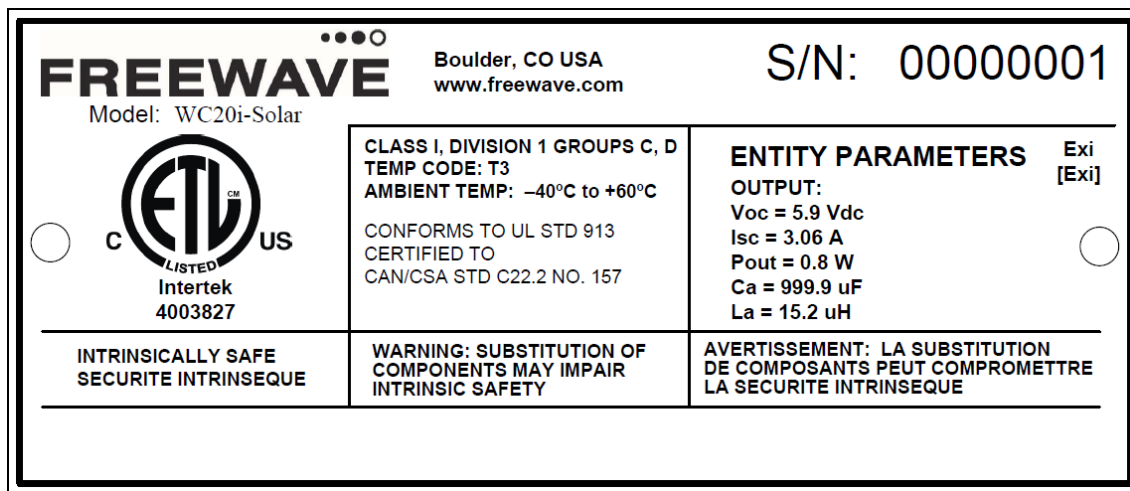
| Technical Specifications: WC20i-Solar |   |
|---------------------------------------|---|
| Specification                         | Description   |
| <b>Power Requirements</b>             |   |
| Battery Capacity                      | <ul style="list-style-type: none"><li>• 4.5 Amp/Hr</li><li>• 9.0 Amp/Hr for High Capacity model</li></ul> |
| Panel Wattage                         | 4.0 Watts   |
| <b>General Information</b>            |   |
| Operating Temperature                 | -40°C to 60°C   |
| Humidity                              | 0% - 100% condensing  |
| Enclosure Size                        | 9.5in. tall × 8.0in. wide   |



| Technical Specifications: WC20i-Solar |   |
|---------------------------------------|---|
| Specification                         | Description   |
| Safety Rating                         | <ul style="list-style-type: none"><li>• Intrinsically Safe</li><li>• Certified for use in Class I, Division 1 Groups C and D.</li><li>• EXi [EXi]</li></ul> |

## Appendix B: FreeWave Legal Information

**Important!** This label MUST BE visible when the WAVECONTACT product is installed.



**WC20i-Solar ETL C1D1 Label**



**Warning!** The available WC20i-Solar system is limited because of IS certification. The WC20i-Solar system **cannot** not be used for all WC20i Endpoint models and configurations.

These WC20i models and configurations are supported for use with the WC20i-Solar:

- WC20i-485-S (with a sensor power draw of less than 10mA)
- WC20i-AN-S
- WC20i-DI-S
- WC20i-HART-S
- WC20i-KTh-S



**Warning!** The WC20i-AN-S Modular Endpoint operating in 4-20mA mode **CANNOT** be used with the WC20i-Solar kit.

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**Warning!** When the WC20i-Solar kit is used, the WC20iInternal Lithium Battery Pack **MUST NOT BE** connected.

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**Warning! Electrostatic Discharge Hazard!**

Care must be taken to avoid the potential of creating a charge on the enclosure or antenna.

Do NOT wipe with a dry cloth.

Do NOT brush against the enclosure with clothing or gloves.



**AVERTISSEMENT:** Risque de décharge électrostatique! Il faut veiller à éviter tout risque de changement de l'enceinte ou de l'antenne.

Ne pas essuyer avec un chiffon sec.

Ne pas brosser contre l'enceinte avec des vêtements ou des gants.

---

**Important!:** The associated apparatus provides intrinsically safe outputs.

L'appareil associé fournit des sorties à sécurité intrinsèque. See the for requirements when used in a Class I Division 1 area.

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**FREEWAVE**