



BLACKBERRY RADAR R2

ITE100 – 1

October 2022

Dry Van, Insulated Trailers (Barn Doors)
Cargo Percentage

Installation Guide

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1 Overview

This guide provides detailed instructions for installing and activating new BlackBerry Radar R2 modules. It includes three main tasks:

Task 1: Get ready for installation (see Section 2)

Task 2: Install a BlackBerry Radar R2 module (see Section 3)

- Match the module identifier with the asset identifier on the installation worksheet.
- Install the module onto the asset.

Task 3: Uninstall a module (see Section 4)

- Remove the module from the asset.
- Remove/replace the battery and prepare the device for shipping.
- Post-removal surface repair.

Complete BlackBerry Radar documentation is available online when you log in to BlackBerry Radar Dashboard. For instructions on how to configure the BlackBerry Radar Dashboard or how to activate newly installed devices, see the online documentation.

2 Get ready for installation

To get ready for installation, you need to obtain a worksheet where you can record the pairing of each BlackBerry R2 module to its companion BlackBerry Radar H2 module and its asset (that is, the trailer/container that the modules will be installed on).

For detailed instructions, log in to the BlackBerry Radar Dashboard and access documentation from the main menu.

3 Installing BlackBerry Radar R2 modules


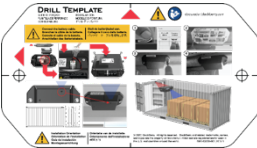


You may have a large number of BlackBerry Radar R2 modules to install. Follow the instructions in this section to:

- Match each module identifier to its asset identifier
- Install the module to the asset you wish to track.

3.1 Prepare to install


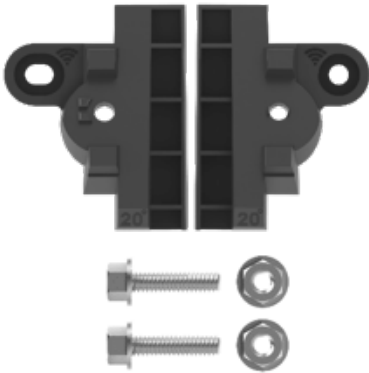

To complete the installation of the module to your assets, you will need the following components. The following components are contained in the module packaging.

Radar R2 Module Package Contents

Radar R2 Module 	Drill Template (Upper-mount installs only) 	Lithium Metal Battery 	Fastener Bag (4 screws / device) 
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Radar R2 20° Side-Mount Tilt Bracket + Visor Accessory Kit Package Contents






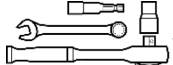




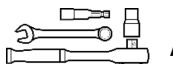
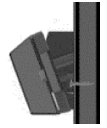


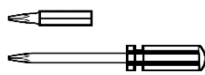



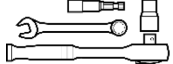

NOTE: The Radar R2 20° Side Mount Tilt Bracket Accessory Kit is **required** for side-mount barn door installations. The Visor Accessory is **required** for side-mount installations at 90° (229 cm). These accessories are available from your BlackBerry Representative.

Side Mount Drill Template 	Radar R2 20° Tilt Brackets and Fasteners (Required for side-mount installations 2 brackets and 4 fasteners per device) 	Radar R2 Visor Accessory and Fastener (Required for side-mount installations at 90° (229 cm). 1 visor and fastener per device) 
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If you are missing any of the above components in your package, contact your BlackBerry Sales Representative.

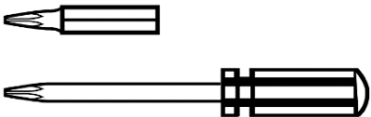
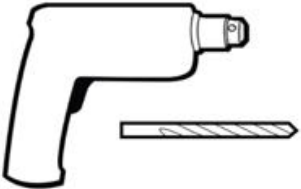


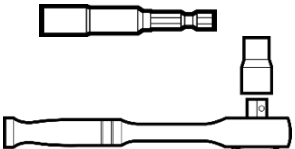


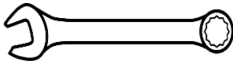
Fastener Considerations—User-Supplied Fasteners

To attach the module to the asset you wish to track, you must supply your own fasteners. Depending on the construction of your mounting location, you may wish to use the following types of fasteners. Please Note: Your choice of fastener will influence the size of the tools required to create the mounting holes (i.e., drill bits) and install or remove the fasteners (i.e., wrenches/sockets/drivers). An example of this is provided below. The actual length of the fasteners will be determined by the thickness of your mounting surface.

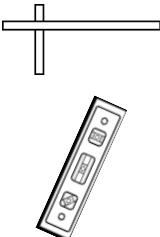
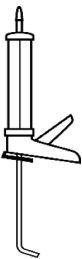

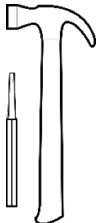

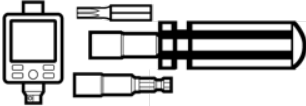
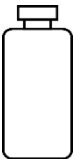


<p>IMPORTANT: The maximum fastener thread diameter supported by this product is 1/4" or M6 (6 mm). For most secure fastening, we do not recommend using fasteners with a diameter less than that of a 1/4" or M6 fastener.</p>		
<p>Box Section (+3mm wall thickness)</p> 	<p>A) 2 thread rolling screws (3/8" head, 1/4"-20 thread, 1" length)</p>  <p>or</p> <p>B) 2 self-tapping screws and washers (3/8" head, 1/4"-14 thread, 1-1/4" length)</p>  <p>*For installation in narrow clearance areas, blunt-ended screws—like thread rolling screws—are recommended.</p>	<p>Drill Bit</p>  <p>Nut Driver/Socket/Wrench</p>  <p>3/8" (10mm)</p>
<p>Panel Section (with rear access)</p> 	<p>A) 2 thread cutting screws or B) 2 hex screws, Nylock Nuts, and sealing washers. (3/8" head, 1/4"-20 thread, 1-1/4" length. 1/4"-20 nut)</p>  <p>or</p> <p>B) 2 hex screws, Nylock Nuts, sealing washers, and washers (7/16" head, 1/4"-20 thread, 1-1/4" length. 1/4"-20 nut)</p>  <p>*For exterior door frame installations, the use of Sealing Washers or Polyurethane Sealant is recommended.</p>	<p>Drill Bit</p>  <p>Nut Driver/Socket/Wrench</p>  <p>A) 7/32" (6mm) B) 3/16" (5mm)</p>
<p>Panel Walls (wood/composite core)</p> 	<p>2 wood screws and washers (#10 wood screw, Phillips PH2 Head, 1" length) (5.0mm wood screw, Phillips PH2 Head, 25 mm length)</p> 	<p>Drill Bit</p>  <p>Screwdriver</p> 
<p>Insulated Trailer Wall</p> 	<p>2 hex bolts, washers, and well nuts Bolt: 7/16" head, 1/4"-20 thread, 1-1/2" length Well Nut Insert: 1/4"-20 thread</p> 	<p>Drill Bit</p>  <p>Nut Driver/Socket/Wrench</p>  <p>7/16" (11mm)</p>
<p>Accessory Adhesive Kits For installations where drilling is not desired. Available from your BlackBerry Representative. NOTE: Not for use on bare wood surfaces. Not for use with the Radar R2 Visor Accessory.</p>		

3.2 Installation tools

Required tools to complete the installation:

Phillips (PH2) Screwdriver or Bit 	Drill and Drill Bits 	Tape  Pencil or Non-Permanent Marker 
Nut Driver or Socket Wrench with Socket*  <p>*Nut Driver + Drill offers fastest installation. If no Nut Driver is available, a socket wrench and socket may be used as a substitute.</p>	Safety Glasses 	Tape Measure  Wrench  <p>*Required only if nuts and bolts are used.</p>

Recommended tools to complete the installation:

T-Square or Pocket Level 	Polyurethane Sealant 	Towel 	Hammer and Punch 	Ladders*  <p>*Tall ladder for installation on taller vehicles and containers. Small ladder for installation inside of containers or the exterior of smaller vehicles.</p>
Torque Screwdriver/Adapter with Socket and Bits* (scale range of 0.4 N-m to 4.5 N-m, 4 in-lb. to 40 in-lb.)  <p>*To check compliance with torque specifications for fasteners.</p>	70% Rubbing Alcohol 	File 	Cutting Lubricant* (Recommended)  <p>*Recommended for faster drilling speed on thicker metals and longer drill bit life.</p>	

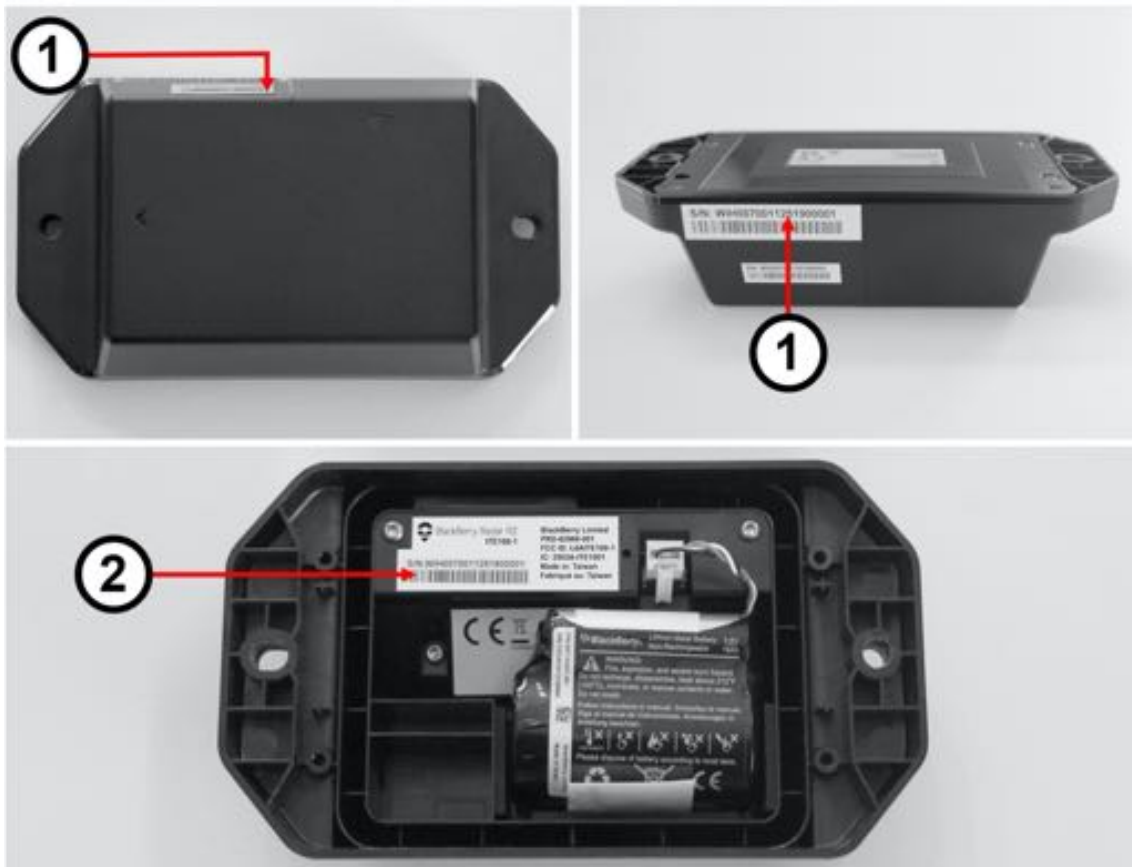
3.3 Matching a module identifier to an asset identifier

In order to track an asset, the BlackBerry Radar R2 module that is installed on the asset must be associated with the asset in the BlackBerry Radar Dashboard. It is, therefore, very important to keep a clear record of which BlackBerry Radar R2 module is installed on which asset.

The Dashboard application tracks modules and assets using 'identifiers'. The asset identifier is the name or number of the asset you wish to track. The asset identifiers are entered into the application when you add the assets and will be listed on your installation worksheet. The identifier for each Radar R2 module is printed on three labels—two labels attached to the front surface of the outer housing and the other label inside the battery compartment. The module identifier also serves as the serial number (S/N) for the module.

To match a module identifier with an asset identifier:

1. Locate the module identifier for your device. The module identifier is shown in two places.
 1. Externally—temporary S/N label and permanent exterior S/N label, attached to the front of the outer housing,
 2. Internally—permanent main product label, in the battery compartment.



2. Once you are ready to install the BlackBerry Radar R2 module to the asset, remove the partially attached label from the front surface of the outer housing and place it on your worksheet, on the row with asset the BlackBerry Radar R2 will track and the BlackBerry Radar H2 module identifier the BlackBerry Radar R2 will be paired with.

BlackBerry Radar Installation Worksheet
 Date: November 22, 2020
 Installer: ccorley@blackberry.com

Asset ID	Module ID Sticker	Accessory ID Sticker	Mileage (Optional)
ZG7419			
New Asset again			
Completely New Asset			
KR8369			

S/N: WIH001010712191006F

Module ID Sticker Accessory ID Sticker

S/N: WZS0000108311800001 S/N: WIH001010712191006F

Date: No
 Installer

Radar H2 Column **Radar R2 Column**

Asset ID	Module ID Sticker	Accessory ID Sticker	Mileage (Optional)
ZG7419	S/N: WZS0000108311800001	S/N: WIH001010712191006F	

3.4 Module installation

To monitor cargo loading status with your BlackBerry Radar R2, there are two installation methods that are supported.

Upper Mount: Install the module on the door frame or the ceiling of the trailer.

Side Mount: Install the module on the left wall of the trailer, just ahead of the door frame.

If you would also like to monitor door open and door closed events, you will need to install the Radar H2 on the exterior of the trailer door.

When selecting a mounting location for either module, carefully consider how the asset will be used during its normal, day-to-day operation.

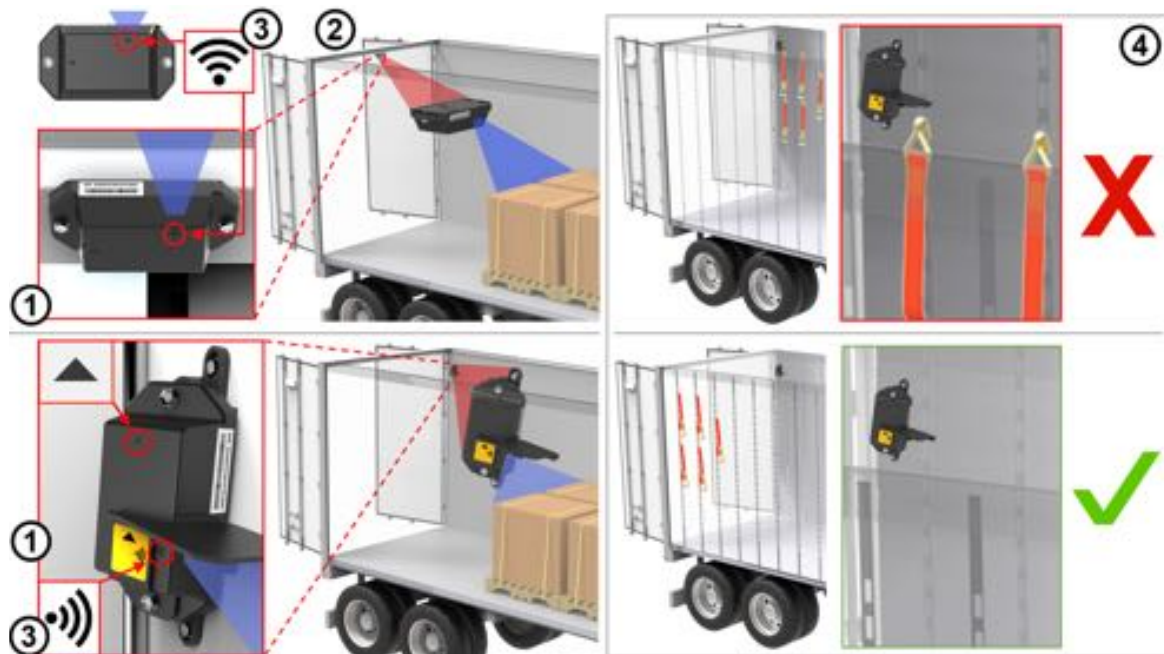
Do not place the modules in a location where they are susceptible to damage from:

- Normal usage activities, such as loading or unloading cargo.
- Moving parts of the asset.
- Road debris.

IMPORTANT: For accurate cargo detection, orientation matters.

1. For upper-mount installations, you must install the Radar R2 module horizontally. For side-mount installations, you must install the Radar R2 module vertically.
2. For accurate cargo loading status detection, you must install the Radar R2 modules at the end of the trailer where the cargo is loaded and unloaded.
3. When installing the Radar R2, always ensure the module is installed with the signal icon pointing towards the cargo area that will be monitored.
4. Side-mount installations: Ensure no items are stored on the left wall ahead of the Radar R2 module. Items in front of the module's sensing area will affect cargo sensing.

This diagram illustrates the supported installation orientations for the Radar R2 module.



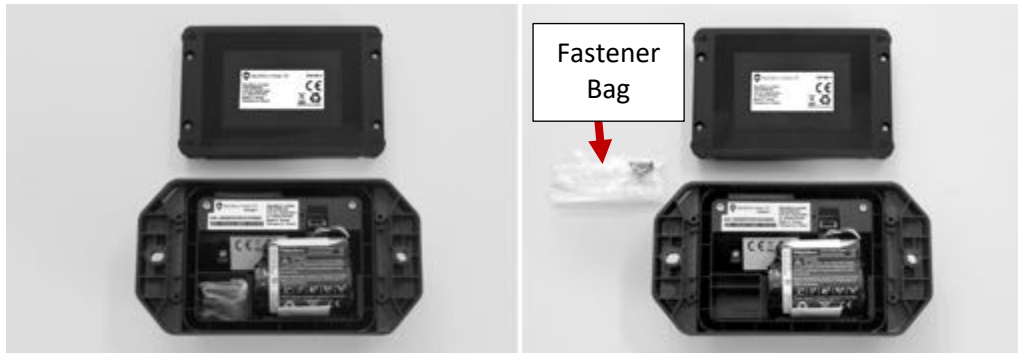
3.4.1 Prepare module for installation—Battery connection

IMPORTANT: Please do not perform the battery connection process until you are ready to install and associate the BlackBerry Radar modules on your asset. Once the battery is connected, please complete the module installation and association, as soon as you can, to conserve battery life.

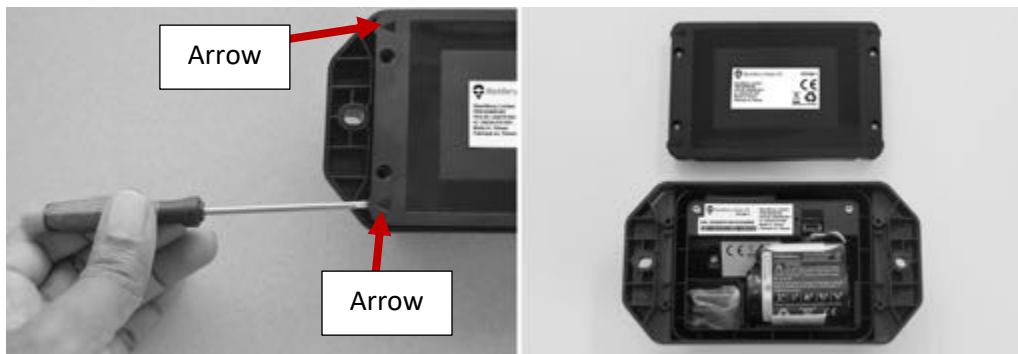
1. Remove the module from the package and from the plastic bag.



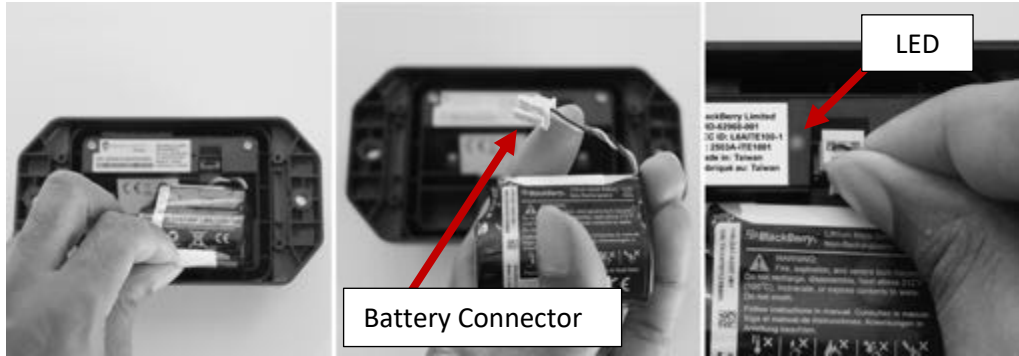
2. Remove the battery door from the rear of the device. Remove the fastener bag from the device and keep nearby. You will require these screws to secure the battery door to the outer housing and complete the module assembly process.



Tip: If you find it difficult to remove the battery door from the outer housing, you may insert a tool--such as a screwdriver--near the arrows embossed into the door and lift to separate the door from the housing.



- Remove the battery from the housing to reveal the battery cable connector. Return the battery to the housing and connect the battery cable to the battery connector. The LED will blink to indicate the module is active. NOTE: It can take up to 5 seconds for the blink sequence to begin. Please be patient. Once you see the LED blink, you may continue to the next step.



- Fully install the battery door. Locate the Fastener Bag and remove the four screws. Using a Phillips (PH2) screwdriver, install the screws to secure the battery door. **IMPORTANT:** Screw torque must be 7-8 in-lb. (0.8-0.9 N-m).



Side-mount installations, only:

(NOTE: 20° tilt brackets are only required for side-mount installations. Visor is required for side-mount installations at 90" (229 cm) installation height.)

5. Locate the Radar R2 20° tilt brackets, bracket fasteners, visor and visor fastener.

**20° Bracket
Fasteners**



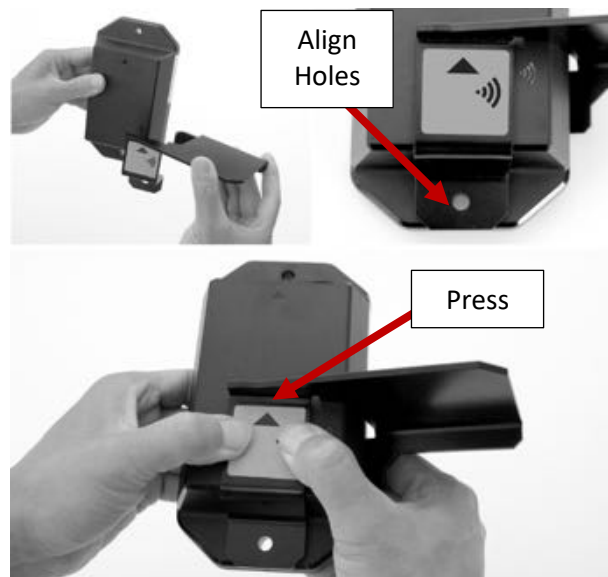
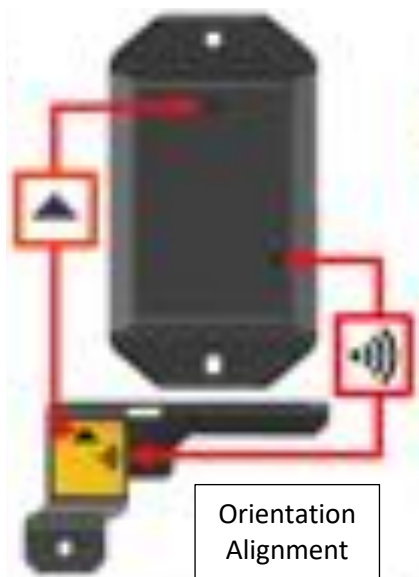
**Visor Screw
FAS-63756-001**



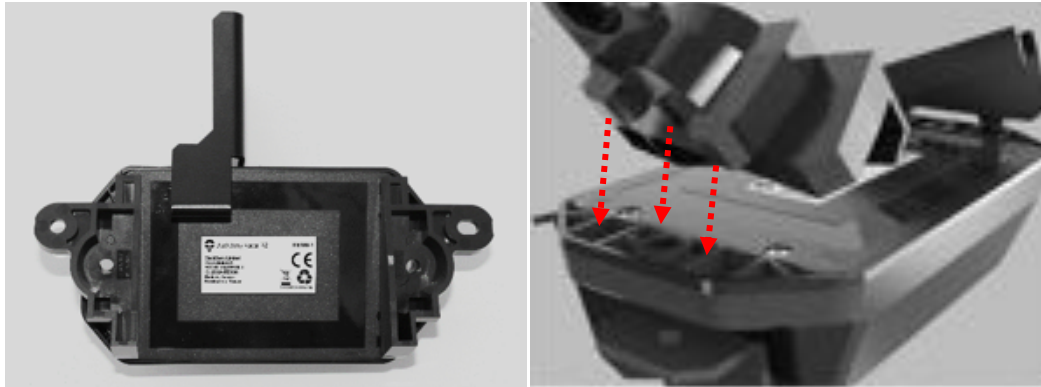
6. Remove the liner from the rear of the visor to expose the adhesive.



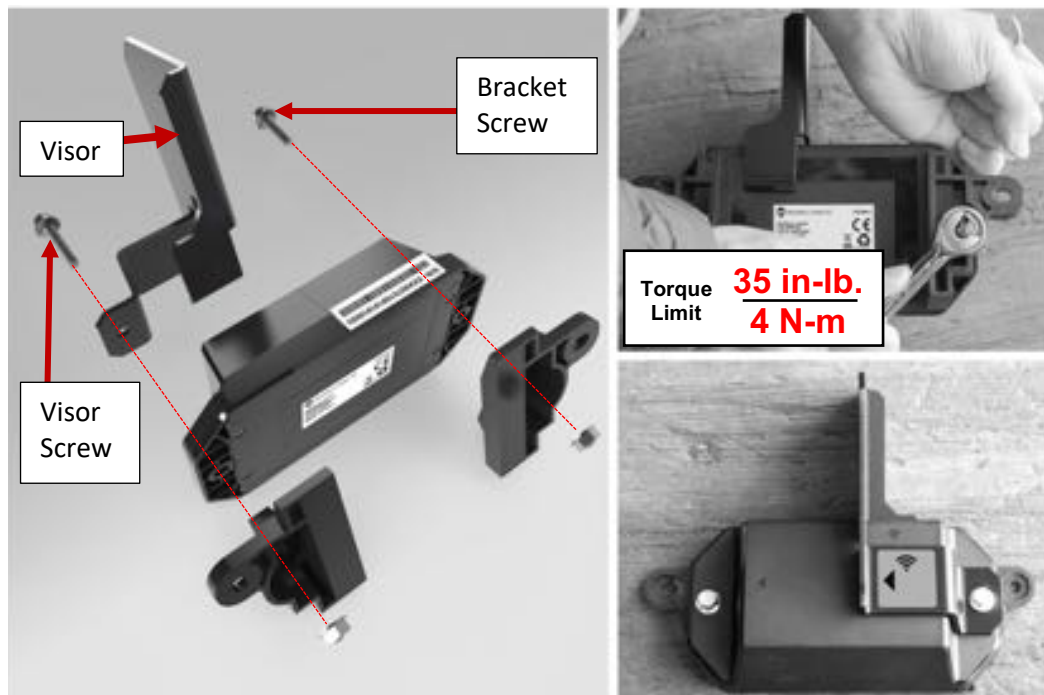
7. Align the orientation of the arrow and signal icon on the visor with the arrow and signal icon on the Radar R2 module. Place the visor onto the device, ensuring the hole on the visor, is aligned with the hole on the device. Press the center of the label to activate the adhesive.



8. Place the brackets on the rear of the Radar R2 module, ensuring the holes on the R2 20° Tilt Bracket Accessory are aligned with the holes on the Radar R2 module and visor and the bracket's guide tabs are seated within the rear openings of the module.



9. Secure the brackets and visor to the module with the supplied fasteners.
IMPORTANT: The longer “visor” screw (FAS-63756-001) must be used on the end of the module where the visor is installed. The shorter “bracket” screw will be used on the opposite end. One extra screw (from the 20° Bracket) will remain, post-installation.



IMPORTANT: Ensure the signal icon on each Radar R2 20° Tilt Bracket and Visor is placed in the same orientation as the signal icon on the Radar R2 module. Ensure the arrow icon on the visor is placed in the same orientation as on the Radar R2 module.



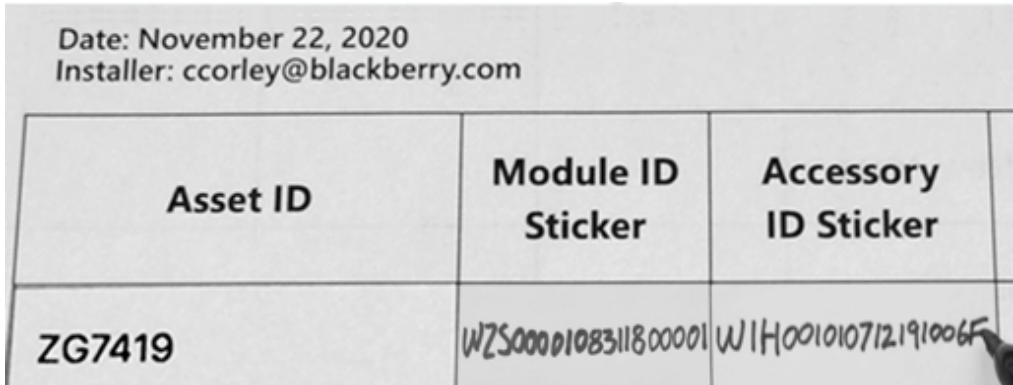
The module is prepared for installation on the asset.

3.4.2 Installing the module on an asset

1. As indicated in Section 3.3 of this guide, record the module identifier and the asset identifier the module will be paired with. For your convenience, you may quickly create a record of the module and asset pairings by removing the partially attached label from the front of the module and placing it on the installation worksheet, next to the asset that will be tracked by the module.



Tip: For modules that have previously been transferred to new assets, the temporary S/N label may no longer be in place. If this is the case, you will need to write the module identifier (S/N) for each module on the installation worksheet.



The following sections of this guide will illustrate recommended installation methods for various asset scenarios.

3.4.3 Dry van installation procedure

If you wish to monitor cargo load status or with your BlackBerry Radar R2 module, there are two installation positions to choose from, depending on your needs.

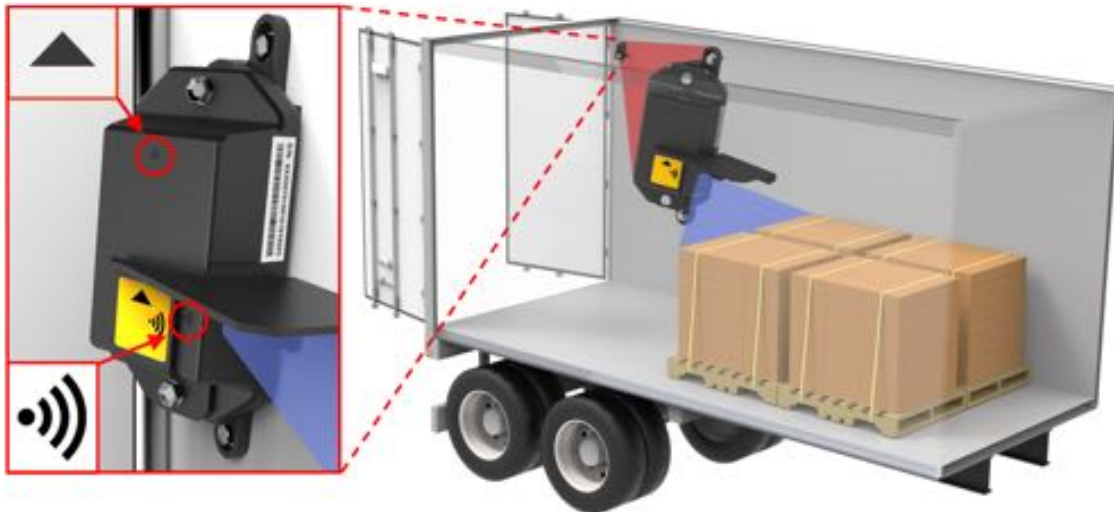
Position 1

Upper-mount installation: Install horizontally on the upper edge of the door frame or the ceiling of the trailer.



Position 2

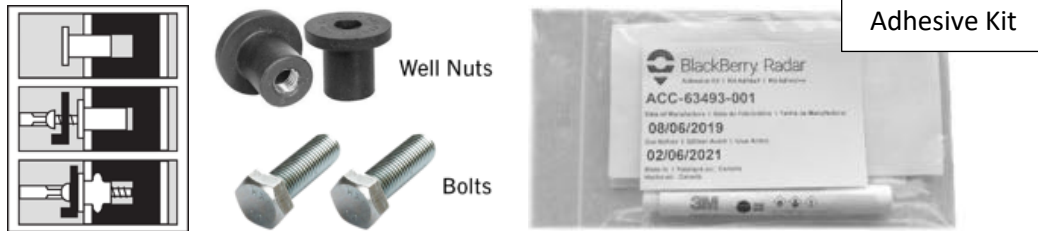
Side-mount installation: Install vertically on **left** side wall of the trailer, just ahead of the door frame. (NOTE: The 20° tilt brackets and visor are **required** for side-mount installation).



Fastener selection considerations

Ceiling or Side Wall Installations

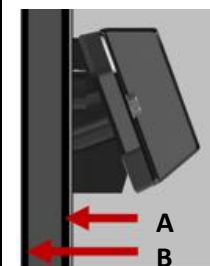
- If your trailer is insulated (i.e., a reefer or heater) and you wish to avoid thermal losses caused from drilling through the ceiling, completely, we recommend the following options:
 - Limiting the depth of drilling and using Well Nuts, along with shorter bolts, to secure the device to the asset.
 - Attach to the asset using the accessory Adhesive Kit. Accessory Adhesive Kits are available from your BlackBerry representative. **NOTE:** Accessory Adhesive Kits are not for use on bare wood surfaces or with the Side Mount Visor.



- If you will install your device on the ceiling of the trailer, and you wish to avoid drilling through the ceiling, completely, we recommend the following options:
 - If the ceiling's surface is metal, plastic fiberglass, etc.--attach to the asset's ceiling using the accessory Adhesive Kit. Accessory Adhesive Kits are available from your BlackBerry representative. **NOTE:** Accessory Adhesive Kits are not for use on bare wood surfaces or with the Side Mount Visor.
 - If the ceiling's surface is wood, attach to the asset's ceiling using wood screws. **NOTE:** Ensure that the screws are short enough not to protrude beyond the external surface of the mounting surface.



IMPORTANT: If you will use the adhesive kit for your installation, and the surface you will mount to uses laminated construction, please ensure the mounting surface (A) is firmly laminated to the substrate (B). If the mounting surface is not firmly laminated to the substrate, you may receive inaccurate cargo status readings.



Door Frame Installations—U Shaped Door Frames, Only

- If you will install on the door frame of your trailer, plan to use fasteners in your installation, and must drill completely through to the exterior of the door frame, you must use a sealant or sealing washers to protect against possible leaks.

- 1) **Polyurethane Sealant Application.** We recommend installing the fasteners from the outside of the trailer. This provides better sealing and protects the fastener's threads from continuous exposure to the weather.

If thread cutting screws are used, the door frame will hold the screws in place and prevent the screws from turning when the locknuts are applied. Preventing the screw from turning will allow lock nuts to be installed/removed from the inside of the trailer—simplifying future maintenance. Apply the Polyurethane Sealant to the rear of the fastener, prior to installation.

Polyurethane Sealant



"U Shaped"
Door Frame
Exterior View



Polyurethane Sealant Application

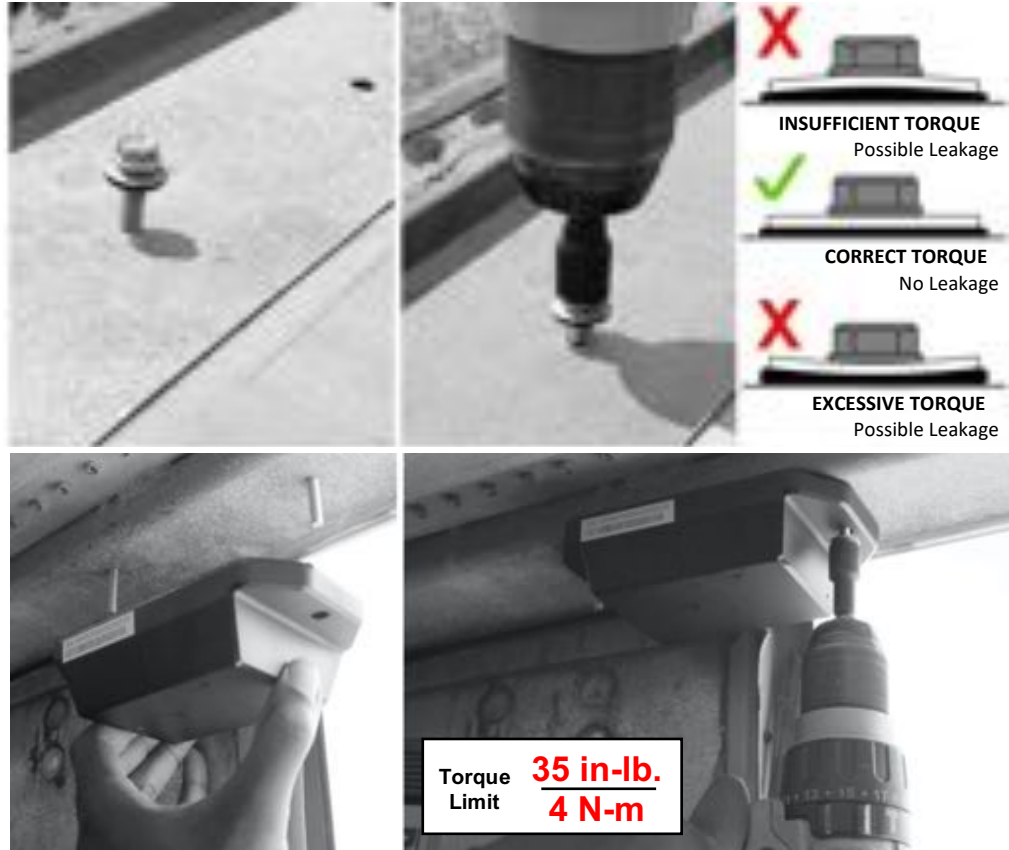


Torque Limit **35 in-lb.**
4 N-m

- 2) **Sealing Washer Application.** We recommend installing the fasteners from the outside of the trailer. This provides better sealing and protects the fastener's threads from continuous exposure to the weather.

If thread cutting screws are used, the door frame will hold the screws in place and prevent the screws from turning when the locknuts are applied. Preventing the screw from turning will allow lock nuts to be installed/removed from the inside of the trailer—simplifying future maintenance. Apply the Sealing Washers to the exterior side of the door frame, prior to installation.

Sealing Washer Installation



3.4.3.1 Upper-Mount Installation Procedure

Barn Doors (upper-mount installation): The module should be installed horizontally on the upper edge of the door frame or ceiling of the trailer. To monitor as much of the cargo area, as possible, you must position the module as close to the rear of the trailer as the trailer's construction will allow. **IMPORTANT:** Ensure the signal icon on the module is pointed towards the cargo that will be monitored.



Whether you install on the interior of the door frame or the ceiling itself will depend on the construction of the trailer, and other associated factors like door thickness, width of the door frame, etc. The illustrations below show an example of when to install on the door frame or the ceiling.

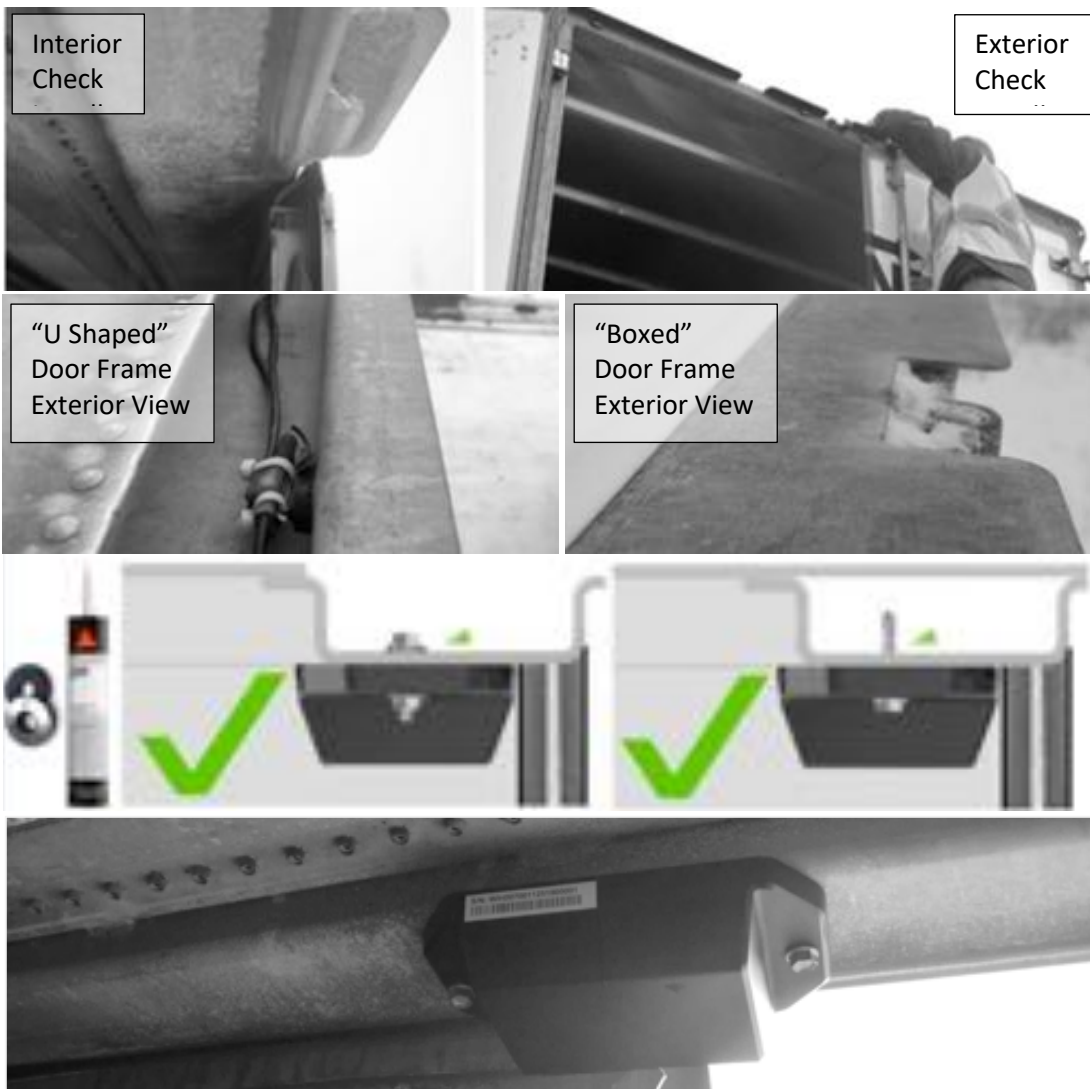


IMPORTANT: When planning your install, be sure to carefully study the trailer’s construction before deciding on installation placement and fastener selection. Below are some examples of how trailer construction will influence installation placement and selections for Radar R2.

Scenario 1: Door Frame Installation

Use this method if you plan to install the Radar R2 on the door frame of your trailer.

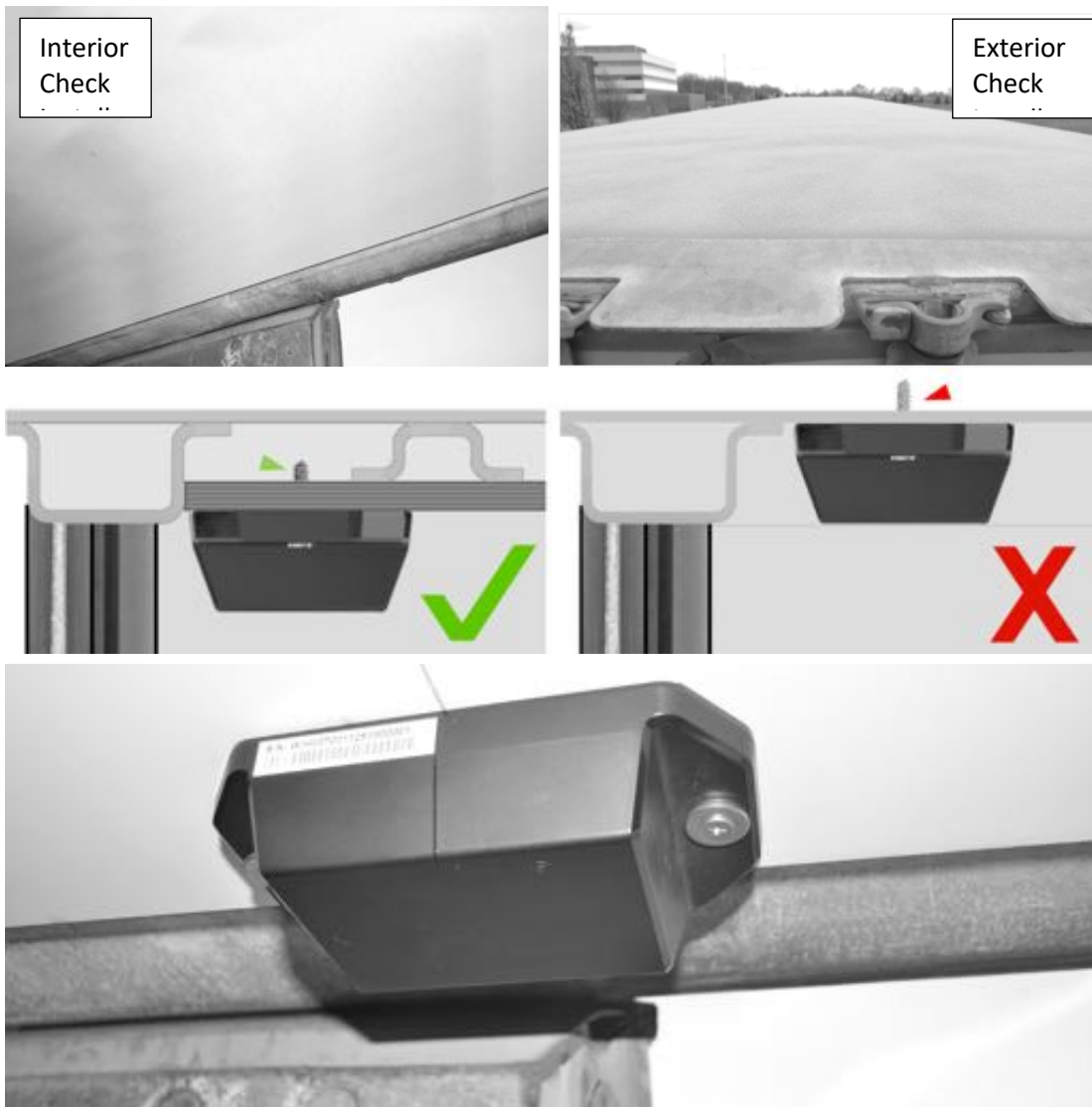
- If you plan to use fasteners in your installation, check the interior and exterior of the door frame to determine if you will drill completely through the door frame, to the exterior of the trailer. **IMPORTANT:** If you must drill completely through the door frame, and choose to use the fastener mounting method, you must use a sealant or sealing washers to address leaks.
- If using fasteners will create a hole on the exterior of the trailer, and you do not wish to install on the door frame, consider the use of an alternate installation location (Side Wall Mounting) or consider the available Adhesive Kit for your installation.
(Full Adhesive Mounting Instructions are on pages 37-46).



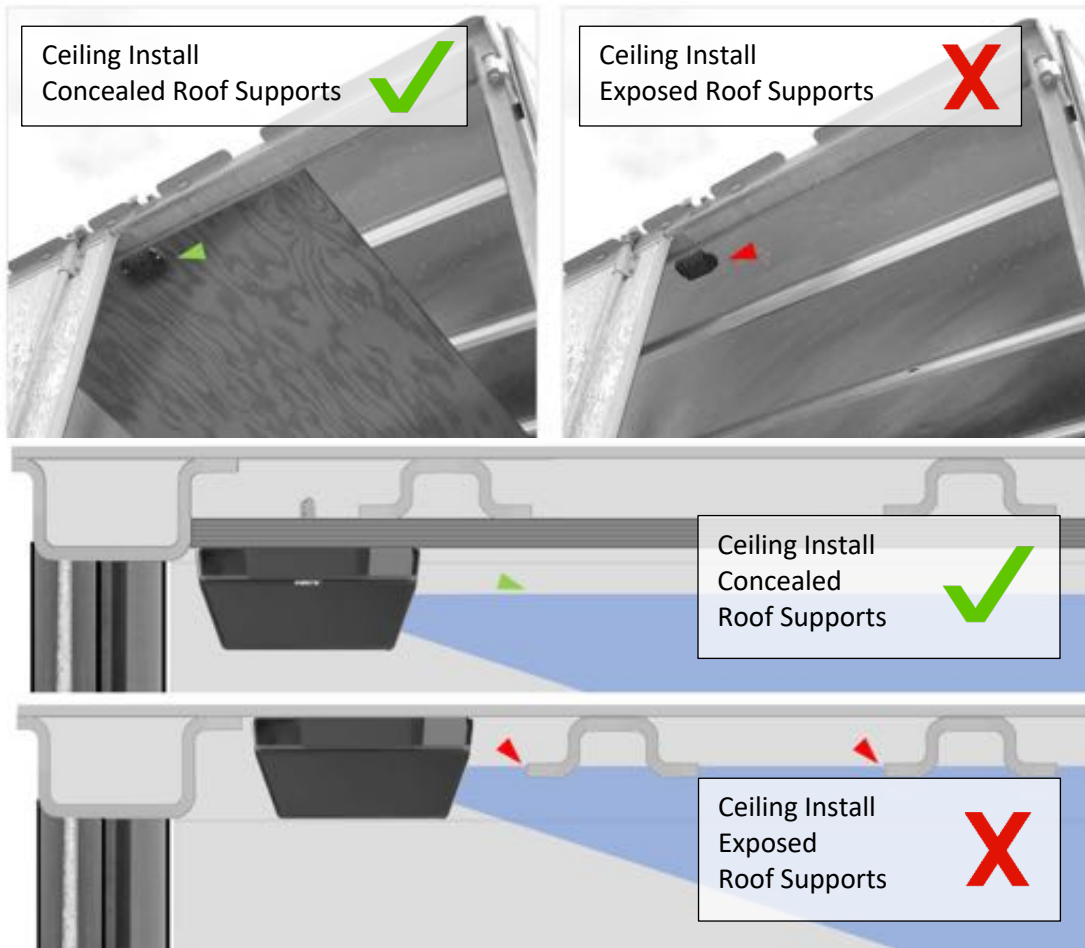
Scenario 2: Ceiling Installation

Use this method if you are considering installation of the Radar R2 on the ceiling of your trailer.

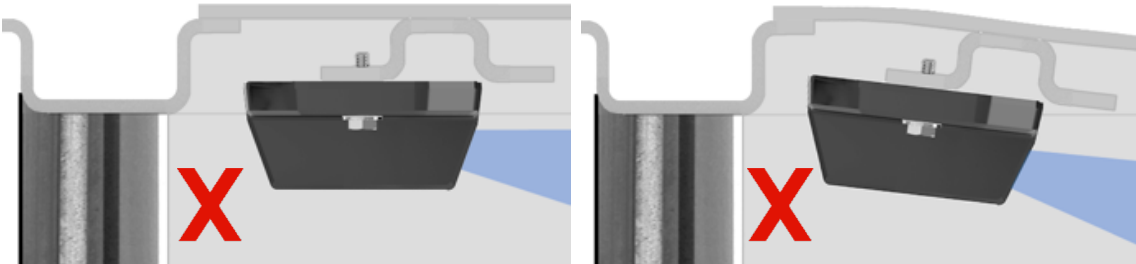
- Check the interior and exterior of the trailer's roof to confirm you will not drill completely through the mounting surface if you use fasteners in your installation.
IMPORTANT: Drilling through the roof is not recommended.
- If the use of fasteners is supported by the trailer construction, you may proceed with the installation of the Radar R2 in this location. (*Full Fastener Mounting Instructions for Ceiling Placement are on pages 32-36*).
- If the use of fasteners will create a hole on the exterior of the trailer, consider an alternate installation location or use the available Adhesive Kit for your installation. (*Full Adhesive Mounting Instructions are on pages 37-46*).



IMPORTANT: If you are considering installation of the Radar R2 on the ceiling of your trailer, and the center of your trailer has exposed roof supports, do not install the Radar R2 between the roof supports. Installing the Radar R2 between roof supports will cause the device's sensing path to be blocked and will affect the cargo reporting. Ceiling mounting is only recommended on trailers where the roof supports in front of the Radar R2 are covered by an interior ceiling panel that conceals the roof supports.



NOTE: Mounting on the roof support is not recommended, as the roof support where the device is mounted may become deformed by impacts to the top of the trailer, affecting the device sensing. Bent roof supports, ahead of the device, may block the sensing path.

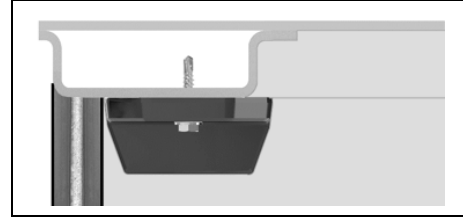


Scenario 1:

Door Frame Placement—Fastener Mounting

Follow these instructions if you plan to install to the door frame.

NOTE: In this example, the door frame is steel and of fully boxed section construction.



1. As indicated in Section 3.3 of this guide, record the module identifier and the asset identifier the module will be paired with. For your convenience, you may quickly create a record of the module and asset pairings by removing the partially attached label from the rear housing of the module and placing it on the installation worksheet, next to the asset that will be tracked by this module.



2. Find and mark the centerline of the trailer door frame.
Tip: When you are marking the centerline on the container, we recommend continuing the mark along the ceiling for approximately 4" (10 cm).



3. Remove the liners from the rear of the template and place the template in the desired installation location. The adhesive at the back of the template ensures that it stays on the door frame surface for accurate drilling of your holes.



It is recommended that you install the module as straight as possible on the asset. To help ensure the module is straight, you may try one of the following techniques.

Technique 1: Align the marks on the template to the marked centerline on the door frame.



Technique 2: Visually, place the template in the desired installation location. Using a square or level, check that the template is straight.



4. Using a drill bit, drill a hole through each of the cross hairs on the template. This will create two holes you will use to mount the module.

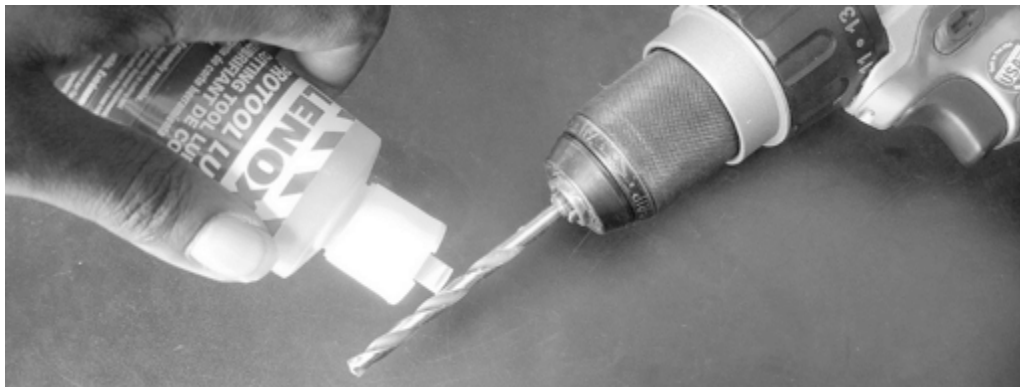


Drilling tips for door frame installations

Due to the thicker, harder steel used on some door frames, you may wish to follow these suggestions.

Tip 1: To shorten drilling time and prolong the life of your drill bit, you may wish to use cutting tool lubricant during the drilling process.

Tip 2: To achieve precise hole drilling, before drilling your hole, you may wish to use a punch and hammer to help place the drill bit. This will prevent the bit from “walking” during the drilling operation.



5. Remove the template. You now have two holes. If there are any burrs around the holes, remove them at this time. Also, remove any dust or debris left over from the drilling or de-burring operations and ensure surface is clean and dry.



6. Insert your fastener of choice into the holes and fasten the module to the ceiling using one of the approaches below.

Interior screw installation (Boxed Door Frame)

- Align the hole in the module with the hole drilled in the container. Insert your fastener into the holes and use the appropriate tools to secure the module to the asset.



IMPORTANT: Do not over-tighten the fastener. Do not tighten fastener beyond 35 in-lb. (4 N-m).

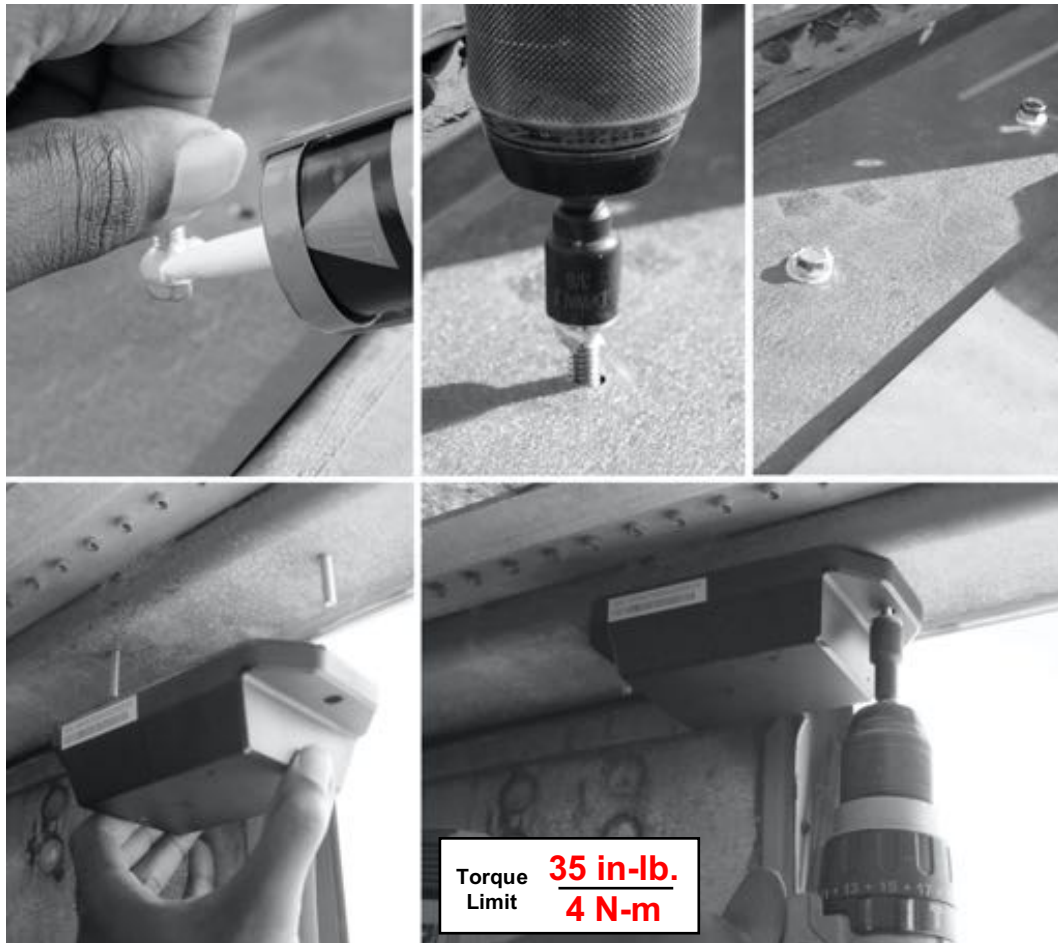
Exterior screw installation (U Shaped Door Frame)

Sealant Install

NOTE: For U-Shaped Door Frames, we recommend installing the fasteners from the outside of the trailers. This provides better sealing and prevents the fastener's threads from continuous exposure to weather.

If thread cutting screws are used, the door frame will hold the screws in place and prevent the screws from turning when the locknuts are applied. Preventing the screw from turning, will allow lock nuts to be installed/removed from the inside of the trailer--simplifying future maintenance.

- Apply a bead of sealant to the underside of the screw's head flange.
- Place the fastener in the hole and fully drive the fastener into the door frame--squeezing the sealant from under the fastener's head to around the fastener. Repeat for second fastener.
- Place the Radar R2 device onto the screws. Place the second set of washers and lock nuts onto the end of the screws and tighten.



IMPORTANT: Do not over-tighten the fastener. Do not tighten fastener beyond 35 in-lb. (4 N-m).

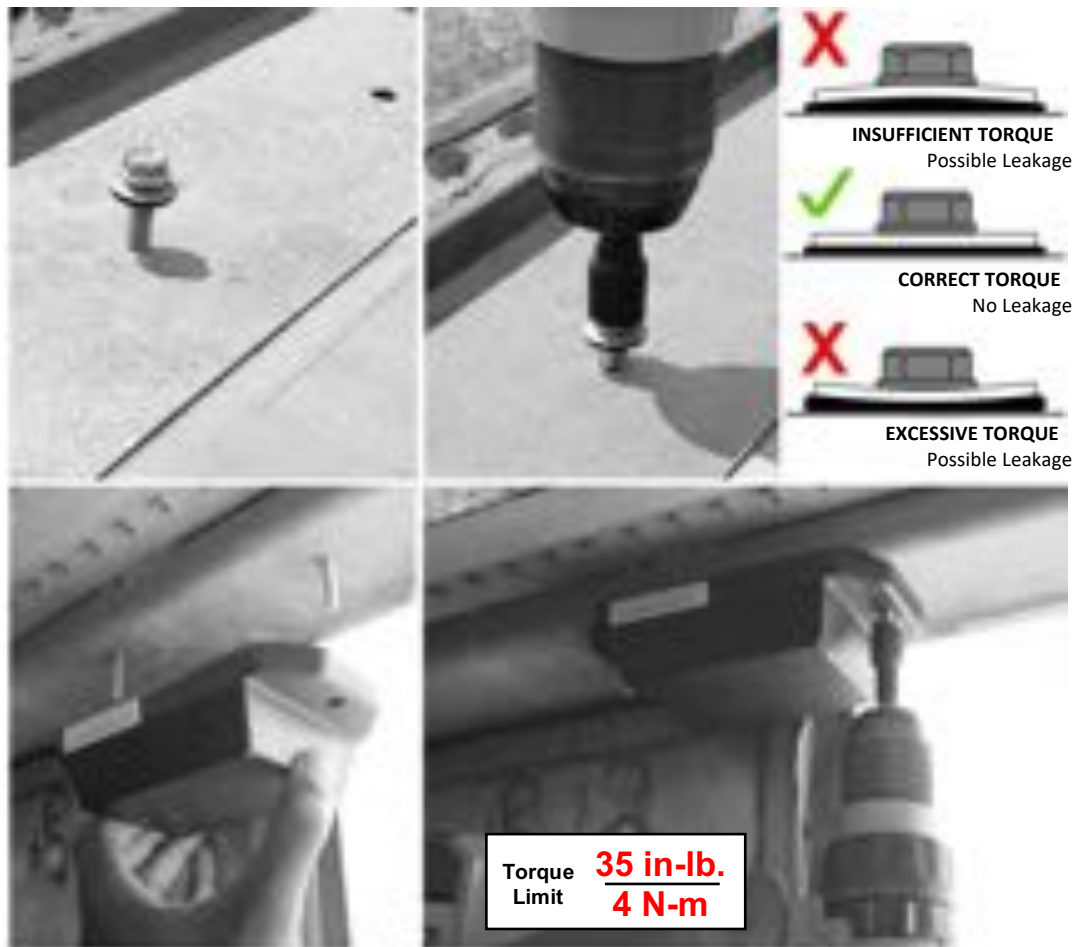
Exterior screw installation (U Shaped Door Frame)

Sealing Washer Install

NOTE: For U-Shaped Door Frames, we recommend installing the fasteners from the outside of the trailers. This provides better sealing and prevents the fastener's threads from continuous exposure to weather.

If thread cutting screws are used, the door frame will hold the screws in place and prevent the screws from turning when the locknuts are applied. Preventing the screw from turning, will allow lock nuts to be installed/removed from the inside of the trailer--simplifying future maintenance.

- Place the fastener in the hole and begin to drive the fastener into the door frame. Tighten the fastener enough to flatten the washer in profile view. This will promote proper sealing and prevent leakage. Repeat for second fastener.
- Place the Radar R2 device onto the screws. Place the second set of washers and lock nuts onto the end of the screws and tighten.



IMPORTANT: Do not over-tighten the fastener. Do not tighten fastener beyond 35 in-lb. (4 N-m).

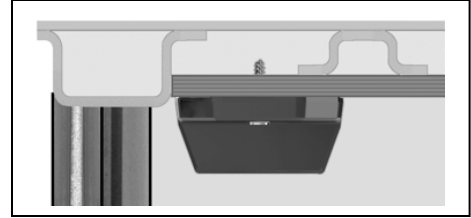
7. Installation is complete.



Scenario 2:
Ceiling Placement—Fastener Mounting

Follow these instructions if you plan to install to the ceiling.

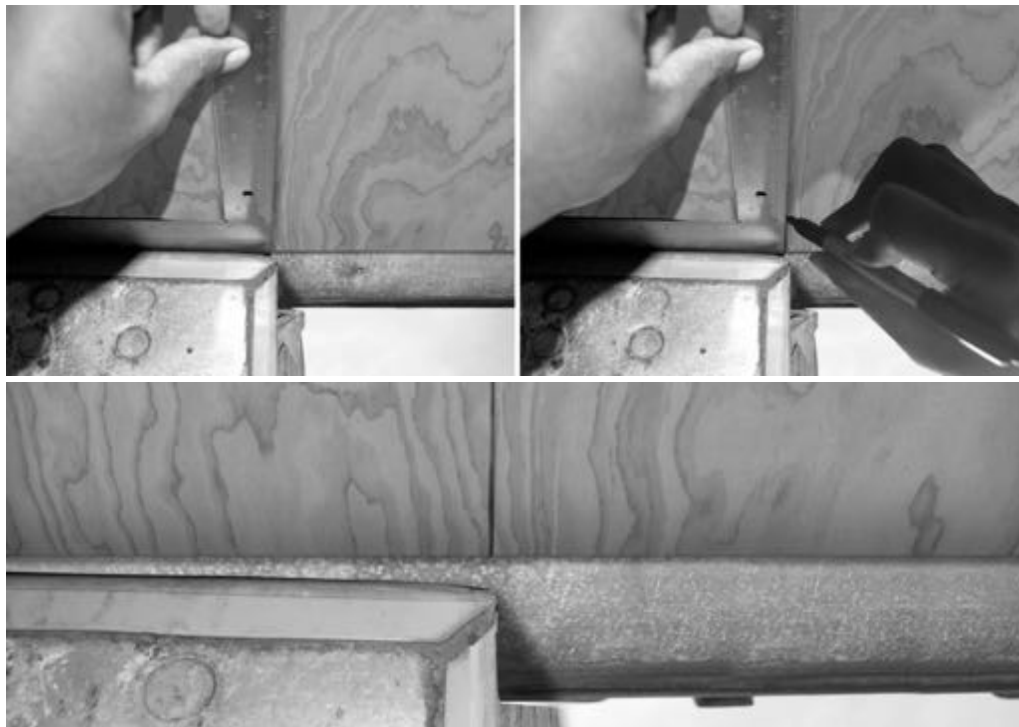
NOTE: In this example, the ceiling is 5/8" (16mm) plywood and the door frame is too narrow to support installation.



1. As indicated in Section 3.3 of this guide, record the module identifier and the asset identifier the module will be paired with. For your convenience, you may quickly create a record of the module and asset pairings by removing the partially attached label from the rear housing of the module and placing it on the installation worksheet, next to the asset that will be tracked by this module.



2. Find and mark the centerline of the ceiling.
Tip: When you are marking the centerline on the container, we recommend continuing the mark along the ceiling for approximately 4" (10 cm).



3. Remove the liners from the rear of the template and place the template in the desired installation location. The adhesive at the back of the template ensures that it stays on the ceiling surface for accurate drilling of your holes.



It is recommended that you install the module as straight as possible on the asset. To help ensure the module is straight, you may try one of the following techniques.

Technique 1: Align the marks on the template to the marked centerline on the ceiling.



Technique 2: Visually, place the template in the desired installation location. Using a square or level, check that the template is straight.



4. Using a drill bit, drill a hole through each of the cross hairs on the template. This will create two holes you will use to mount the module.



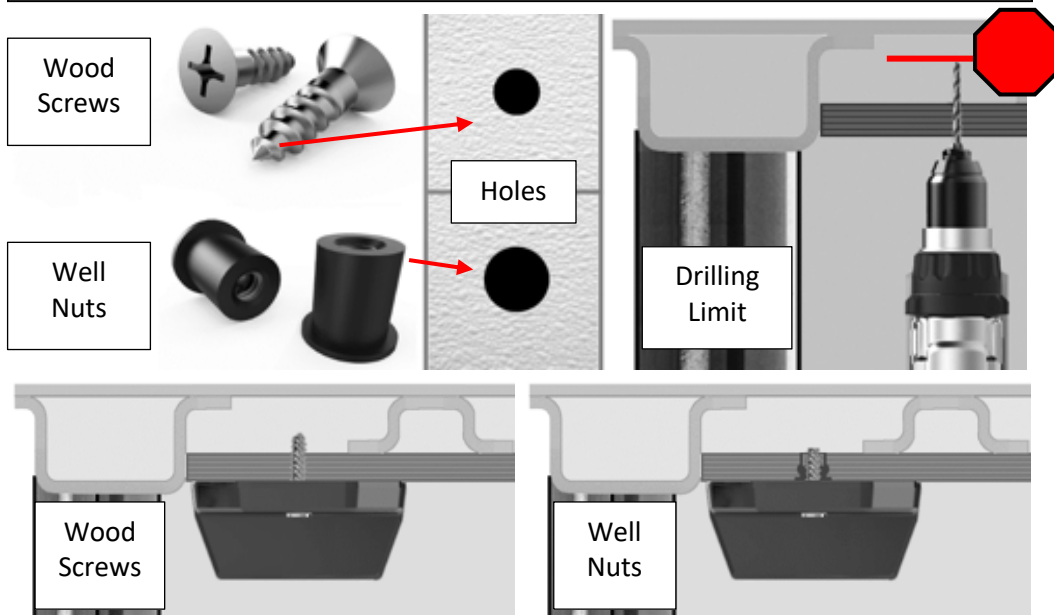
Drilling tips for ceiling installations

Here are some tips to help you determine the best drilling strategy for your container construction and selected fasteners.

IMPORTANT: Due to the construction of most non-insulated trailers, if you use fasteners to install the module, you will drill through the ceiling. Other trailers, such as insulated trailers, may have a thicker ceiling that will offer the opportunity to avoid drilling completely through the ceiling of the asset, if you limit the depth of your drilling.

Tip 1. Wood Screws, Thick Ceiling Section: Drill a pilot hole slightly smaller diameter than your fastener. Limit the depth of the drilling, to avoid breaking through the roof.

Tip 2. Well Nuts, Thick Ceiling Section: Drill a hole large enough in diameter to accommodate your well nut. Limit the depth of the drilling, to avoid breaking through the roof.



5. Remove the template. You now have two holes. If there are any burrs around the holes, remove them at this time. Also, remove any dust or debris left over from the drilling or de-burring operations and ensure surface is clean and dry.



6. Insert your fastener of choice into the holes and fasten the module to the ceiling using one of the approaches below.

Wood Screws

- Having drilled a pilot hole slightly smaller than your fastener, use a screwdriver or drill and driver bit and nut driver to drive the screw to the ceiling.



Well Nuts

- Insert the Well Nuts into the holes. Align the holes on the module to the well nuts, then insert the fasteners. Secure the module to the asset.
- Do not tighten fastener beyond 35 in-lb. (4 N-m) to avoid damaging the well nut.



Tips for well nut installation

Tip 1: For fastest installation, we recommend using a drill and nut driver to install the bolt into the well nut. To avoid over tightening, use the lowest speed to install the bolt.

Tip 2: To avoid spinning the well nut during the install, we recommend pressing the module against the wall while installing each fastener.

Do not over-tighten the fastener. Do not tighten fastener beyond 35 in-lb. (4N-m).

7. Installation is complete.



Door Frame/Ceiling Placement--Adhesive Mounting

Follow these instructions if you plan to install your Radar R2 module in temperatures **above 0°C (32°F)**, using the available accessory adhesive kit.

NOTE: Adhesive is not recommended for use on bare wood, like plywood.

1. Assess the installation surface to determine the surface preparation recommended for your installation surface, to maximize adhesion of your adhesive. Perform the appropriate steps for your installation surface.

The following chart illustrates recommended surface preparation techniques for various installation surface materials.

Installation Surface Material	Recommended Surface Preparation Procedure
Bare metals (Steel, Aluminum)	Lightly sand with 180-240 grit sandpaper to remove any surface oxidation or surface contaminants. Remove dust and debris. Clean with 70% alcohol to remove any remaining surface contaminants.
Painted metals (Steel, Aluminum)	Clean with 70% alcohol to remove any surface contaminants.
Plastics or Composites	Clean with 70% alcohol to remove any surface contaminants.

The following images illustrate the surface preparation procedure for an unpainted aluminum door frame.



The following images illustrate the surface preparation procedure for a plastic panel.



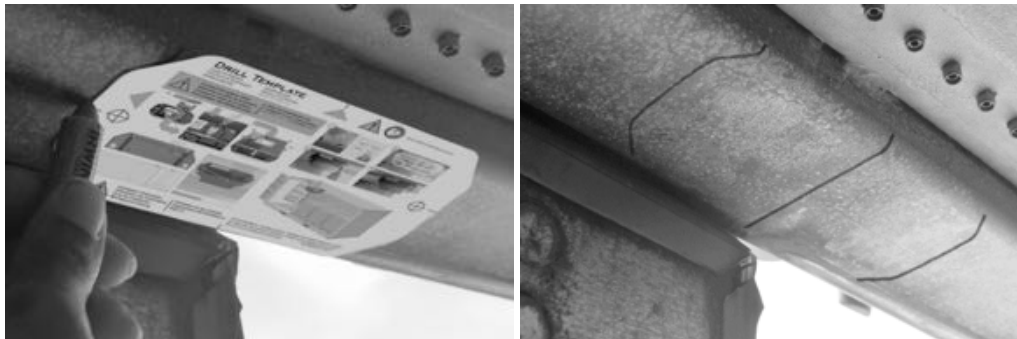
- Record the module identifier and the asset identifier the module will be paired with. For your convenience, you may quickly create a record of the module and asset pairings by removing the partially attached label from the module's front housing and placing it on the installation worksheet, next to the asset this module will track.



- Find and mark the centerline of the trailer's ceiling.
Tip: When you are marking the centerline on the trailer, we recommend continuing the mark along the ceiling for approximately 4" (10 cm).



- Place the installation template on the ceiling. Ensure the centerline on the template is aligned to the centerline on the ceiling. Trace the outline of the template on the ceiling. Once the tracing is complete, remove the template.



5. Locate the alcohol pad that was included in your adhesive kit. Open the package and thoroughly clean both substrates where the 3M VHB tape will be applied (back of the module and the installation surface, defined by the outline traced in Step 3). Wipe dry with a clean cloth.



6. Locate the 3M VHB Universal Primer ampule that was included in your adhesive kit. Apply the primer to the back of the module, where the tape will be applied.

IMPORTANT: If the module will be installed on a plastic surface, you must apply the primer to the installation surface. This will improve adhesion on plastic surfaces.



To apply the primer:

- A) Crack the ampule at the “Crush at Dot” icon to release the primer and saturate the felt applicator tip, at the end of the tube.
- B) Once the primer has saturated the applicator, rub the felt tip where the tape will be applied to the module. Apply primer to the installation surface.



7. Remove the white extended liner from the back of the tape. Apply to the battery door. Using firm pressure (minimum of 15 psi) to ensure adhesive bonds to battery door.

IMPORTANT: Minimum application temperature for the tape is **0°C (32°F)**. Initial tape application to surfaces at temperatures below **0°C (32°F)** is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally good. If you must perform your installation in temperatures below **0°C (32°F)**, please refer to the Cold Weather Adhesive Installation Procedure, detailed in the next section.



8. Remove the clear liner. Align the centerline on the front edge of the module to the centerline on the door frame and place the module on the prepared mounting surface. Apply firm pressure (15 psi) to the module for 30-45 seconds to ensure the adhesive bonds to the mounting surface.



9. Installation is complete.




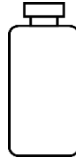



Adhesive Mounting—Cold Weather Adhesive Installation Procedure

Follow these instructions if you must install your Radar R2 module in cold temperatures, using the available accessory adhesive kit, and have trouble getting the adhesive to adhere. Initial tape application to surfaces at temperatures below **0°C (32°F)** is not recommended.

NOTE: Adhesive is not recommended for use on bare wood, like plywood.

Recommended Cold-Weather Installation Tools:

Cordless Heat Gun and Attachments  *Raise installation surface temperature for improved adhesion.	Non-Contact Thermometer  *Check surface temperature for adhesive installation.	Towel 	70% Rubbing Alcohol 	Sandpaper and Sanding Block  *Remove surface oxidation. Bare metal surface prep.
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Pre-Install Device Preparation

Before heading outdoors to your asset, it is recommended that you complete these steps in a warm, indoor environment with a temperature between 59-77°F (15-25°C).

1. Locate the alcohol pad that was included in your adhesive kit. Open the package and thoroughly clean the battery door where the 3M VHB tape will be applied. Wipe dry with a clean cloth.



2. Locate the 3M VHB Universal Primer ampule that was included in your adhesive kit. Apply the primer to the back of the module, where the tape will be applied.

IMPORTANT: When installing in cold weather, it is recommended that you use the primer on the battery door and your asset's installation surfaces. To ensure you have fresh installation surface primer to use on your asset's installation surfaces, conserve your primer by using one primer ampule to prime multiple devices.



To apply the primer:

- A) Crack the ampule at the “Crush at Dot” icon to release the primer and saturate the felt applicator tip, at the end of the tube.
- B) Once the primer has saturated the applicator, rub the felt tip where the tape will be applied to the module.



3. Remove the white extended liner from the back of the tape. Apply to the battery door. Using firm pressure (minimum of 15 psi) to ensure adhesive bonds to battery door.



Asset Installation

4. Assess the installation surface to determine the surface preparation recommended for your installation surface, to maximize adhesion of your adhesive. Perform the appropriate steps for your installation surface.

The following chart illustrates recommended surface preparation techniques for various installation surface materials.

Installation Surface Material	Recommended Surface Preparation Procedure
Bare metals (Steel, Aluminum)	Lightly sand with 180-240 grit sandpaper to remove any surface oxidation or surface contaminants. Remove dust and debris. Clean with 70% alcohol to remove any remaining surface contaminants.
Painted metals (Steel, Aluminum)	Clean with 70% alcohol to remove any surface contaminants.
Plastics or Composites	Clean with 70% alcohol to remove any surface contaminants.

The following images illustrate the surface preparation procedure for an unpainted aluminum door frame.



The following images illustrate the surface preparation procedure for a plastic panel.

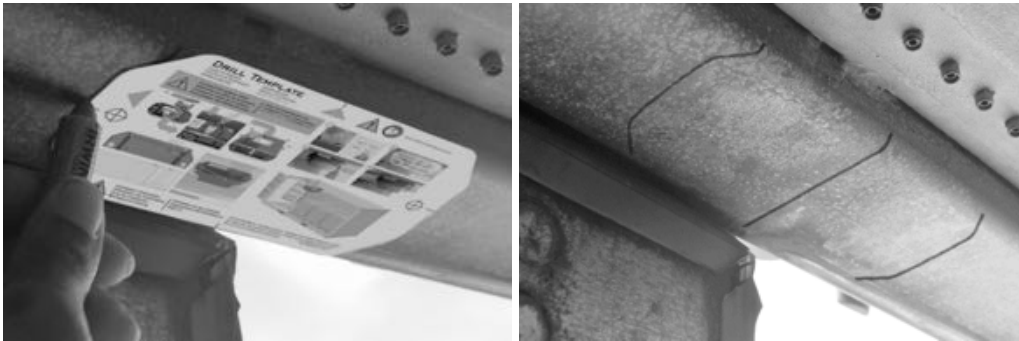


5. Find and mark the centerline of the trailer's ceiling.

Tip: When you are marking the centerline on the trailer, we recommend continuing the mark along the ceiling for approximately 4" (10 cm).



6. Place the installation template on the ceiling. Ensure the centerline on the template is aligned to the centerline on the ceiling. Trace the outline of the template on the ceiling. Once the tracing is complete, remove the template.



7. Using the heat gun, raise the temperature of the of the installation surface. For best adhesion, the recommended installation surface temperature target is 68° F (20° C).

Tip: In most cold weather conditions, this installation surface temperature target is sufficient to allow the time to complete the subsequent steps, while remaining warm enough to improve adhesion for the adhesive.



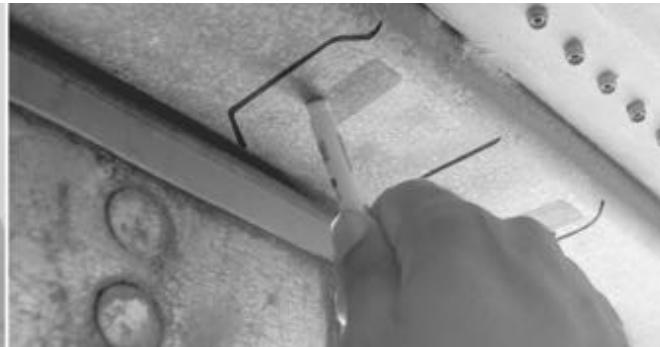
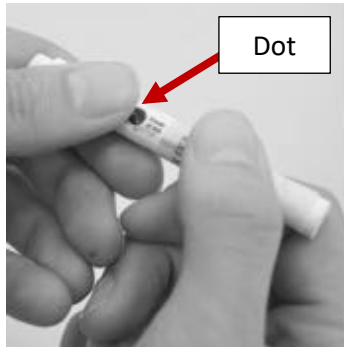
8. Locate the 3M VHB Universal Primer ampule that was included in your adhesive kit. Apply the primer to the installation surface.

IMPORTANT: If the module will be installed on a plastic surface, also apply the primer to the installation surface. This will improve adhesion on plastic surfaces. This step is also recommended to improve cold weather adhesion for bare metal and painted metal surfaces.



To apply the primer:

- A) Crack the ampule at the “Crush at Dot” icon to release the primer and saturate the felt applicator tip, at the end of the tube.
- B) Once the primer has saturated the applicator, rub the felt tip where the tape will be applied to the module. If installing the module on a plastic surface, apply primer to the installation surface.



9. Remove the clear liner. Align the centerline on the front edge of the module to the centerline on the door frame and place the module on the prepared mounting surface. Apply firm pressure (15 psi) to the module for 30-45 seconds to ensure the adhesive bonds to the mounting surface.



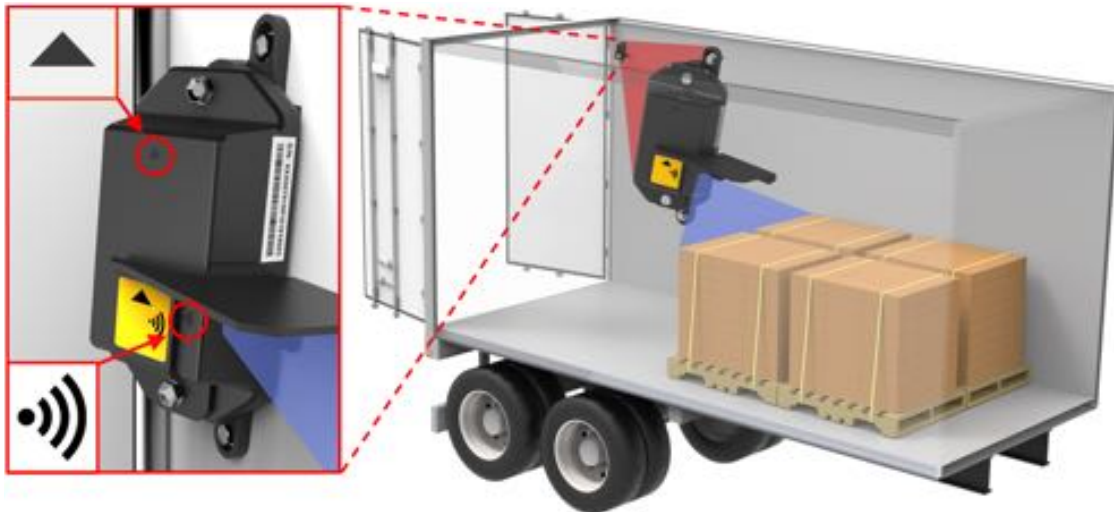
10. Installation is complete.



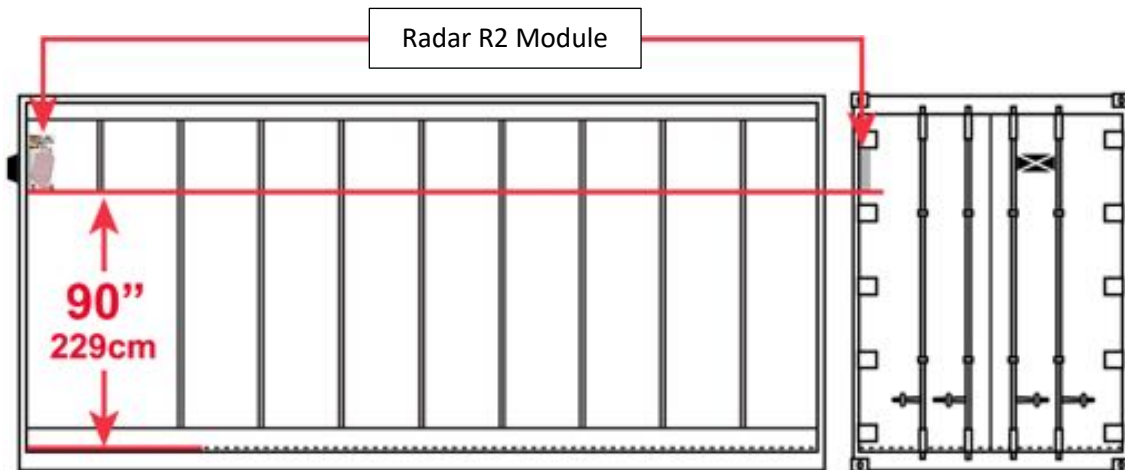
3.4.3.2 Side-Mount Installation Procedure

Barn Doors (side-mount installation): The module must be installed vertically on **left** side wall of the trailer, just ahead of the door frame. Ensure the triangular arrow on the Radar R2 module is pointed towards the ceiling and the signal icon on the Radar R2 module is pointed towards the cargo that will be monitored.

NOTE: The for proper operation, the wall surface where the Radar R2 module will be mounted must be a rigid surface.



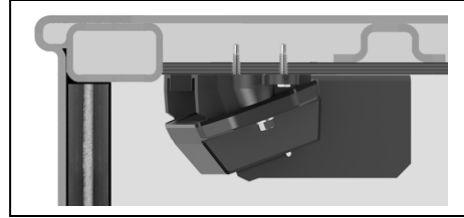
IMPORTANT: When installing the BlackBerry Radar R2 module on the wall of a trailer with Barn Doors, the bottom of the module must be installed 90" (229 cm) above the floor. This is important for cargo detection accuracy.



Wall Placement—Fastener Mounting

Follow these instructions if you are installing the module on a trailer with barn (swing) doors.

NOTE: In this example the wall of the trailer is plywood.



1. As indicated in Section 3.3 of this guide, record the module identifier and the asset identifier the module will be paired with. For your convenience, you may quickly create a record of the module and asset pairings by removing the partially attached label from the rear housing of the module and placing it on the installation worksheet, next to the asset that will be tracked by this module.

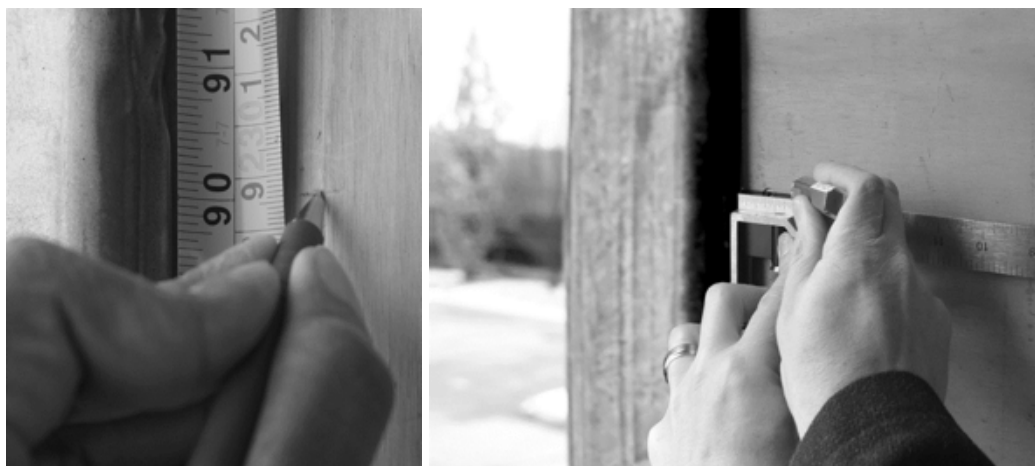


2. Mark the height where the device will be installed on the side wall of the trailer.

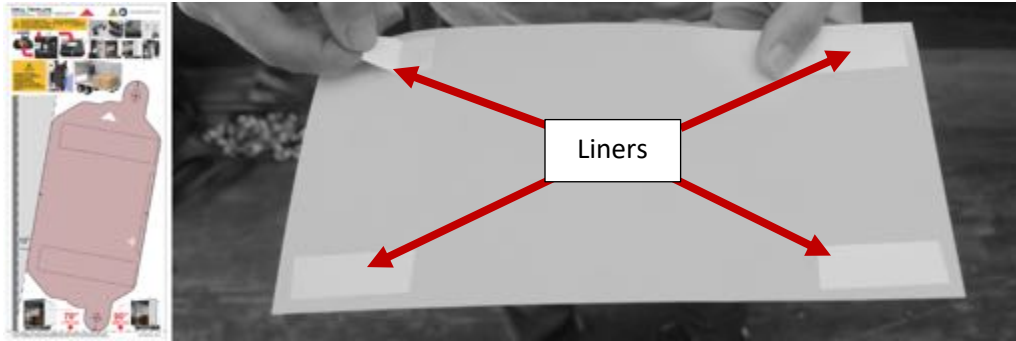
IMPORTANT: The module must be installed on the **left** wall of the container, just ahead of the door frame.

 - The bottom of the R2 device and bracket assembly should be 90" (229 cm) above the interior floor.
 - The R2 device and bracket assembly should be tilted forward 10°. This 10° tilt angle is automatically included in the installation template.

Tip: When you are marking the line on the wall, we recommend continuing the mark along the wall for approximately 4" (10 cm) to accommodate the width of the installation template.



3. Locate the “Side Mount” Install template that came with the 20° bracket. Remove the liners from the rear of the template and place the template on the wall. The adhesive ensures the template stays on the wall for accurate drilling of your holes.

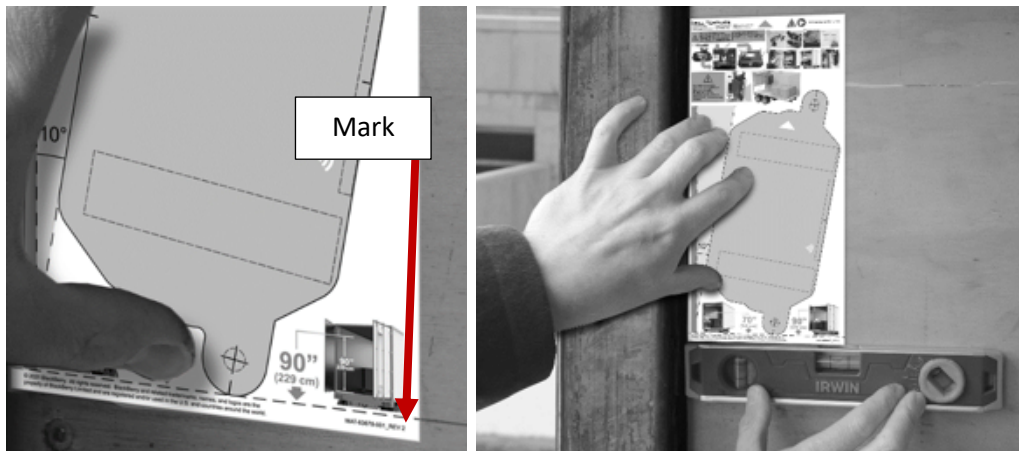


It is recommended that you install the module as level as possible on the asset. To help ensure the module is straight, you may try one of the following techniques.

Technique 1: Using a square or level, confirm the door frame is perfectly vertical (perpendicular to the floor). If the door frame is perfectly vertical, align the rear of the module to the front edge of the door frame



Technique 2: Visually, align the dotted line near the bottom of the template to the mark you created on the wall. Using a square or level, confirm that the template is level, and the bottom edge of the template is parallel to the floor.



- Using a drill bit, drill a shallow hole through each of the marked holes. This will create two holes you will use to mount the Radar R2 bracket and device to the asset.



Drilling tips for side wall installations

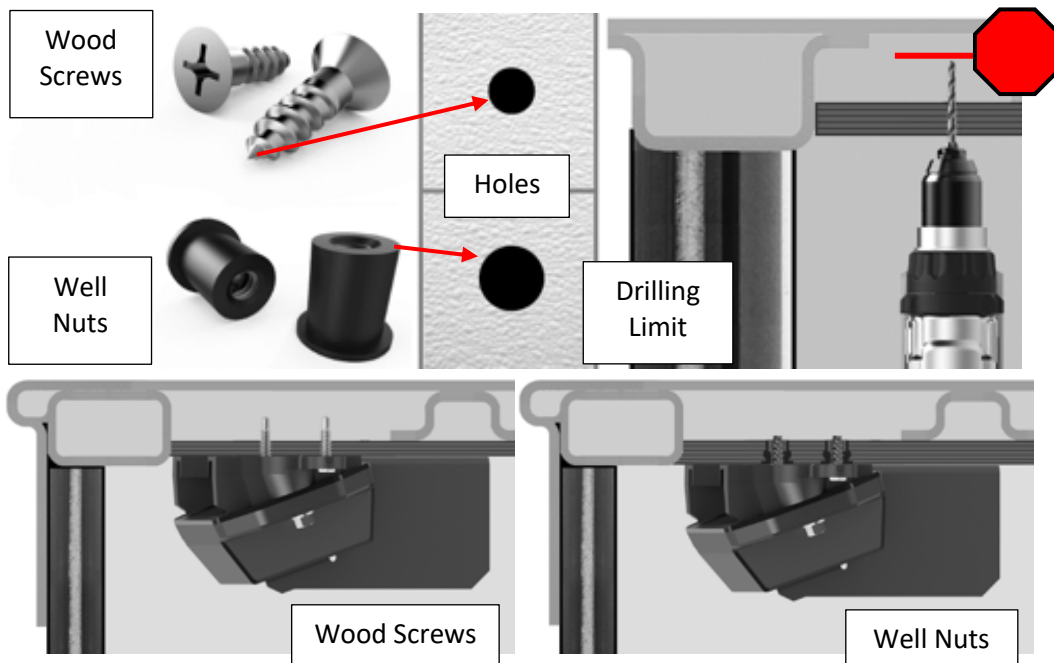
Here are some tips to help you determine the best drilling strategy for your trailer construction and selected fasteners.

IMPORTANT: To avoid drilling completely through the wall of the asset, we recommend limiting the depth of the drilling.

Tip 1. Wood Screws, Thick Wall Section (Plywood or Composite side walls): Drill a pilot hole slightly smaller diameter than your fastener. Limit the depth of the drilling, to avoid breaking through the wall.

Tip 2. Well Nuts, Thick Wall Section (Insulated Trailers):

Drill a hole large enough in diameter to accommodate your well nut. Limit the depth of the drilling, to avoid breaking through the wall.



5. Place the module on the wall, aligning the holes on the 20° bracket with the holes you drilled into the wall.



6. Insert your fastener of choice into the holes and fasten the module to the wall using one of the approaches below.

Wood Screws

- Having drilled a pilot hole slightly smaller than your fastener, use a screwdriver or drill and driver bit and nut driver to drive the screw to the wall.



Well Nuts

- Insert the Well Nuts into the holes. Align the holes on the 20° bracket to the well nuts, then insert the fasteners. Secure the module to the asset.
- Do not tighten fastener beyond 35 in-lb. (4 N-m) to avoid damaging the well nut.



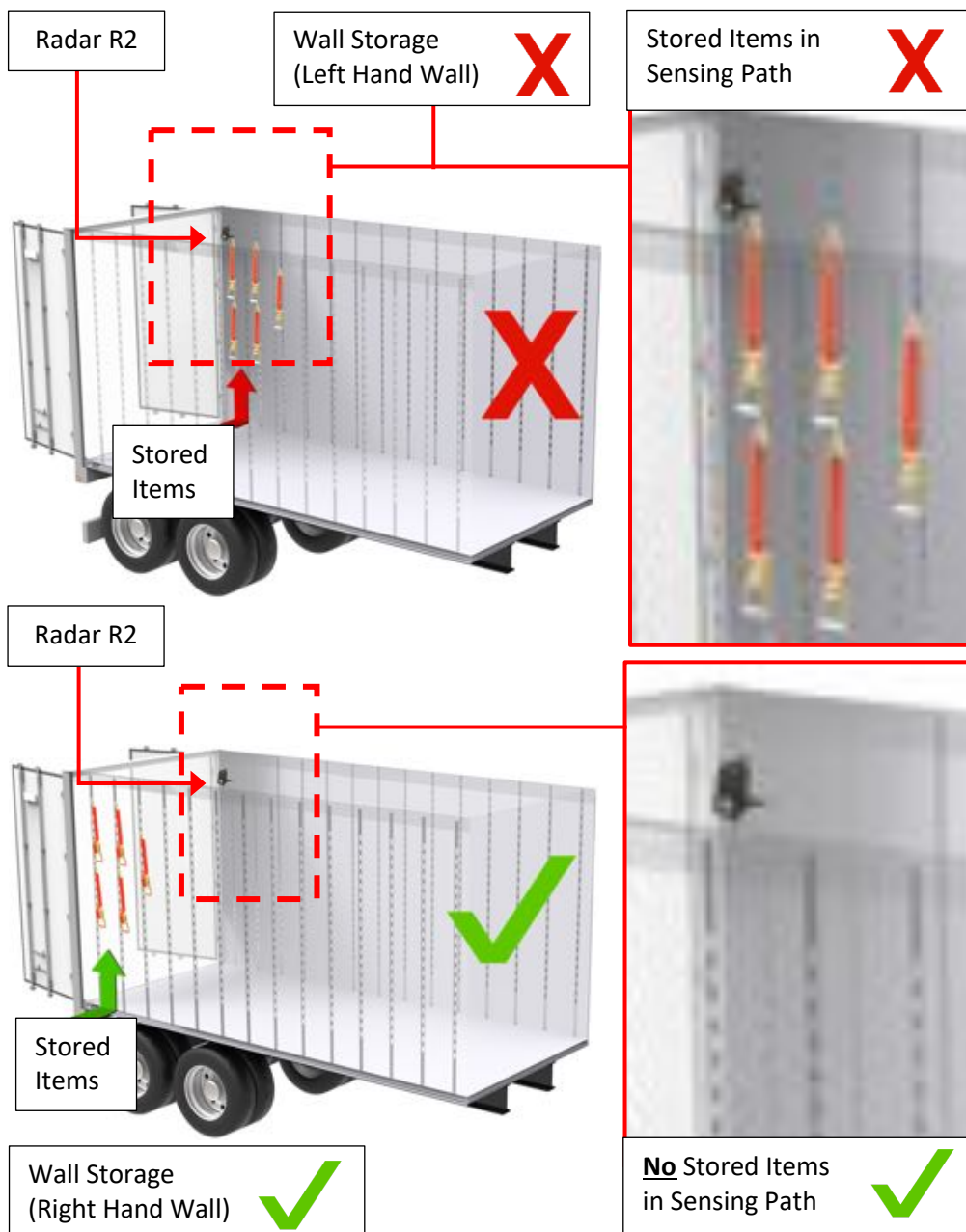
Tips for well nut installation

Tip 1: For fastest installation, we recommend using a drill and nut driver to install the bolt into the well nut. To avoid over tightening, use the lowest speed to install the bolt.

Tip 2: To avoid spinning the well nut during the install, we recommend pressing the module against the wall while installing each fastener.

7. If there are items that are stored on the left wall of the asset, please move them to the right-hand wall of the asset.

IMPORTANT: Ensure no items that will be stored on the left wall of the trailer, in front of the Radar R2 module. Any items in front of the device's sensing path will affect the cargo reporting.



- 8.



4 Removing BlackBerry Radar R2 modules

Use this procedure if you need to remove your BlackBerry Radar R2 module for servicing or recycling.

For more information on obtaining service for your devices, or recycling and safe disposal of your devices and batteries, contact your BlackBerry representative, or visit the following:

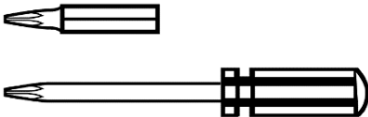

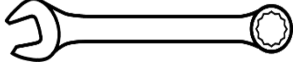
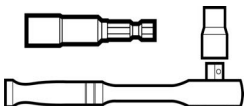


blackberry.com/RadarSupport--for information on service and the recycling and safe disposal of your device and battery.

Note: If you plan to ship your Radar R2 module, or Radar R2 battery, please be aware that the **battery, and the module when shipped along with the battery**, is considered Fully Regulated Class 9 Dangerous Goods in all modes of transportation (Air, Ocean, and Ground) and must only be shipped in special UN certified Dangerous Goods packaging. If you are returning the battery, or battery with module to BlackBerry, you may request this UN-certified packaging from BlackBerry. The Radar R2 module, when shipped **without** the battery, is not considered Dangerous Goods and can be shipped in any package.

Also, any person who handles, offers for transport, or transports Dangerous Goods must be adequately trained and hold a training certificate; or perform those activities in the presence and under the direct supervision of a person who is adequately trained and who holds a training certificate.

Products that are considered Dangerous Goods can only move on carrier accounts that are approved for Dangerous Goods and are subject to Dangerous Goods surcharges. The Radar R2 module, when shipped without the battery, are not subject to these surcharges.

4.1 Removal Tools

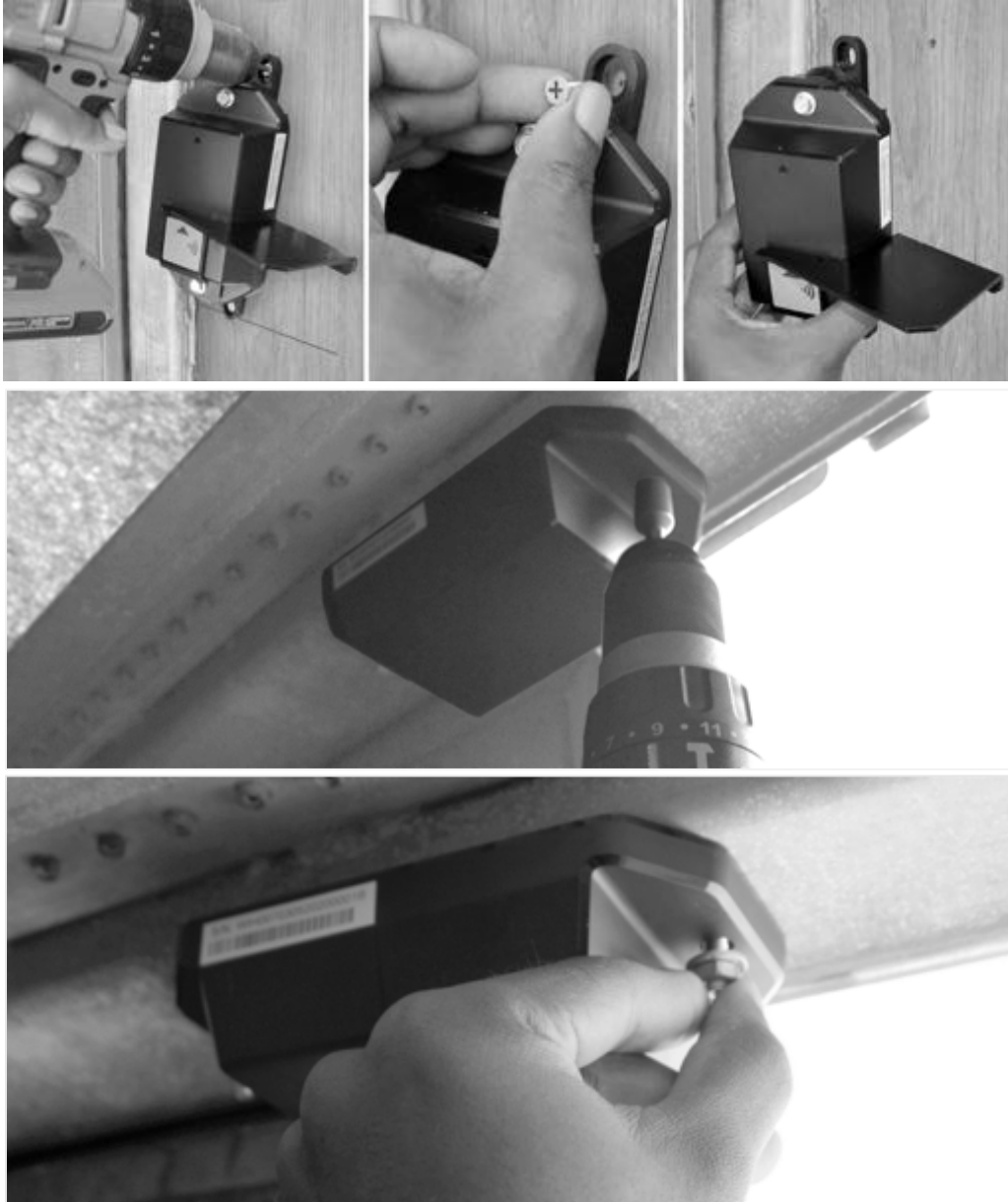
Phillips (PH2) Screwdriver or Bit 	Drill 	Wrench  *Required only if nuts and bolts are used.
Nut Driver or Socket Wrench with Socket*  *Nut Driver + Drill offers fastest removal. If Nut Driver is unavailable, a socket wrench and socket may be used.	Safety Glasses 	Caulking Gun and Polyurethane Sealant  *Recommended for sealing holes.

4.2 Module removal

Module removal approach will be determined by the installation method used.

Fastener Mounting Removal

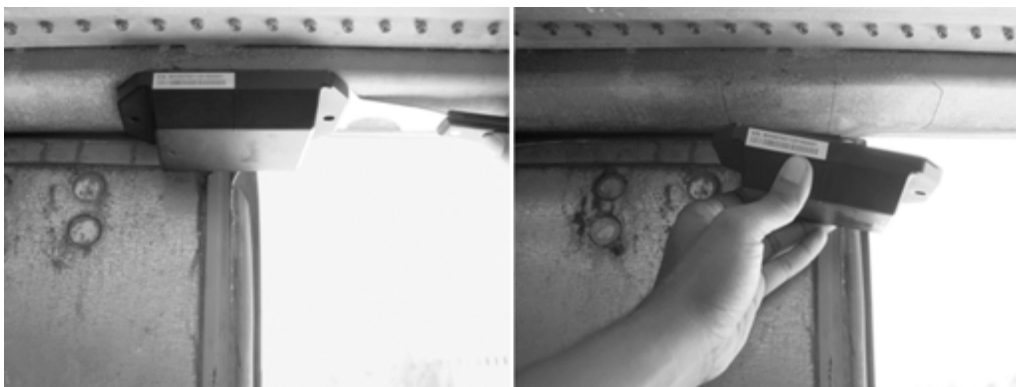
1. If you have used fasteners in your installation, remove the fasteners from the asset and the module from the asset.





Adhesive Mounting Removal

1. Insert a tool between the bottom edge of the module and the mounting surface. Pry gently to separate the module from the installation.



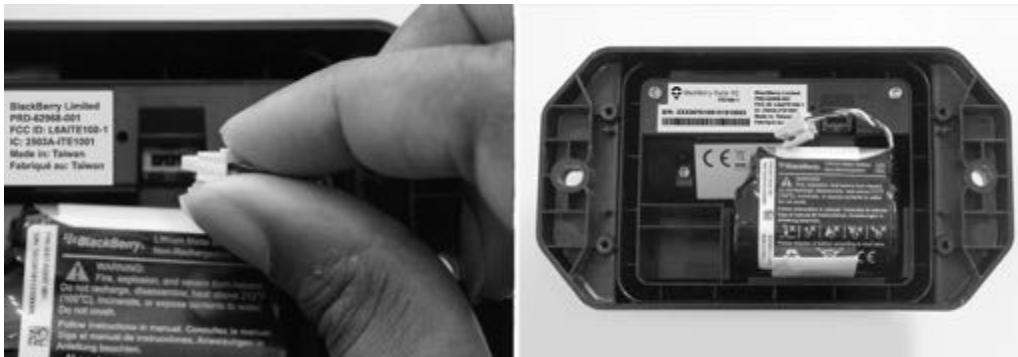
4.3 Battery removal and replacement

Battery removal

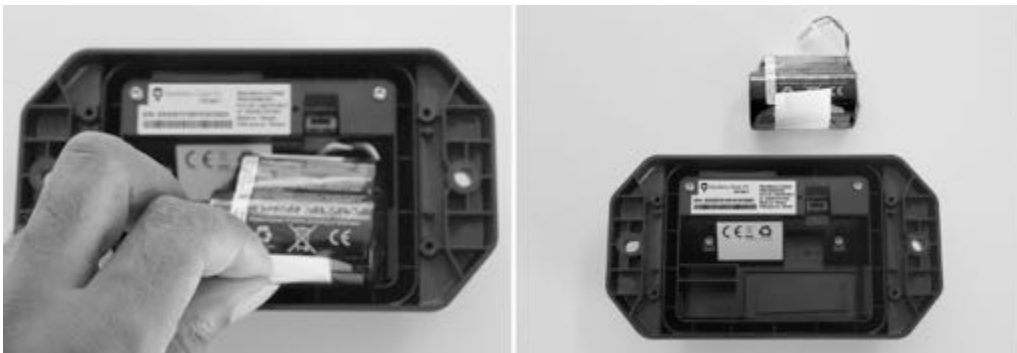
1. Remove the four screws from the back of the product and separate the inner housing from the outer housing to access the battery. Retain the screws as all screws will be required to re-secure the inner housing to the outer housing.



2. Disconnect the battery cable from the battery connector.



3. Remove the battery from the battery compartment by grasping the pull tab and lifting the battery out of the compartment.

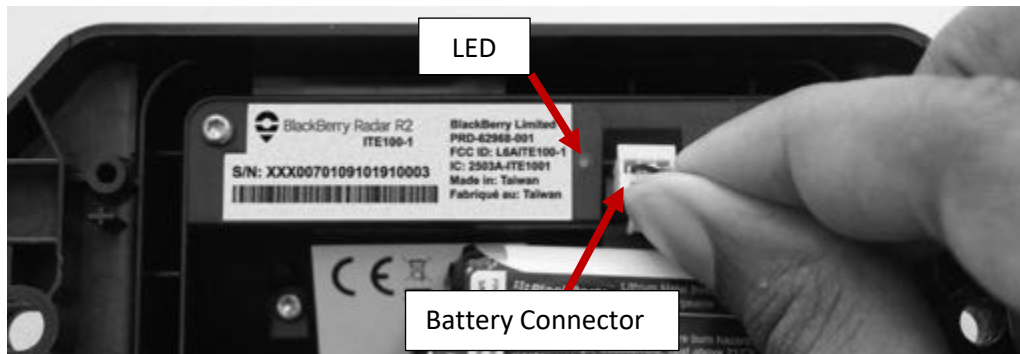


Battery replacement

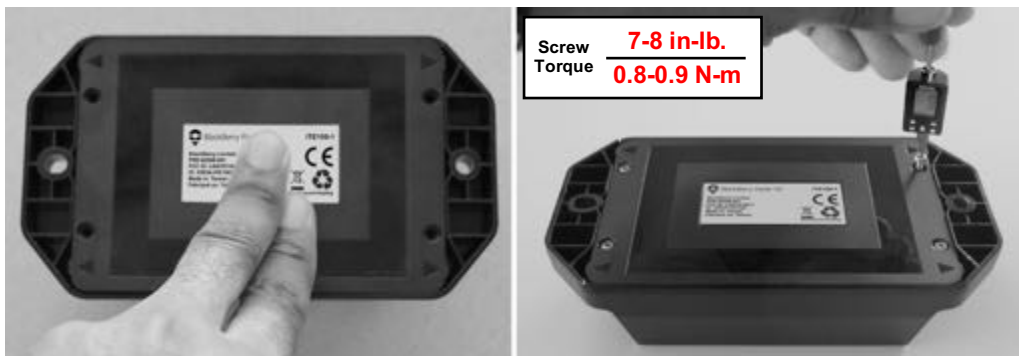
1. Place the battery into the battery compartment.



2. Connect the battery cable to the battery connector. The LED will blink to indicate the module is active. **NOTE:** It can take up to 5 seconds for the blink sequence to begin. Please be patient. Once you see the LED blink, continue to the next step.



3. Fully install the battery door. Locate the four battery door screws. Using a Phillips PH2 screwdriver, install the screws to secure the battery door. **IMPORTANT:** Screw torque must be 7-8 in-lb. (0.8-0.9 N-m).



Preparing battery for shipment

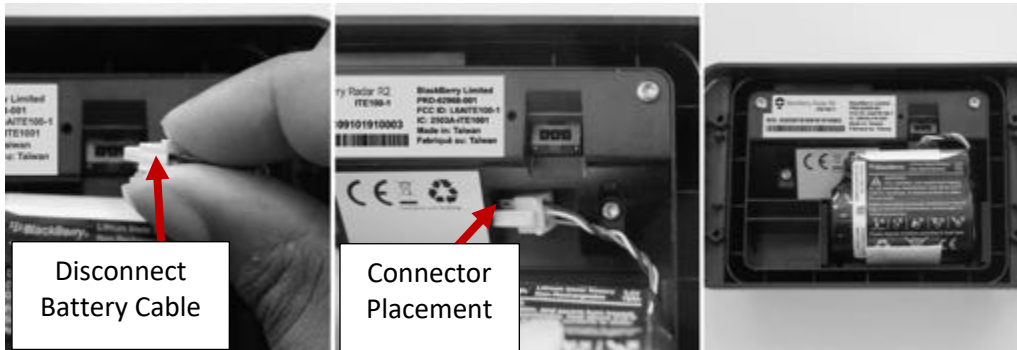
If you do need to ship the battery, along with the module, please follow this procedure.

IMPORTANT: Never ship the module with the battery cable connected. Battery must be shipped inside the module with battery cable disconnected and the battery connector placed under the battery.

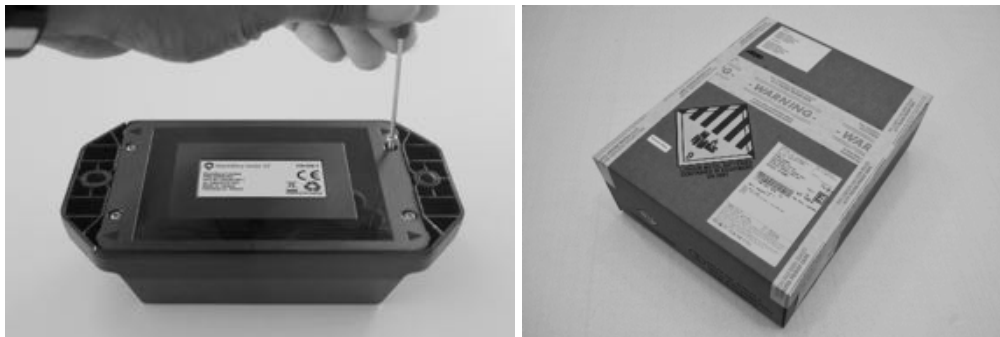
1. Remove the four screws from the battery door. Insert a tool at the arrows and lift upward to remove the battery door. Retain the screws as they will be required to re-secure the battery door to the rear housing.



2. Ensure the battery cable is disconnected from the battery connector. Lift the battery and tuck the connector under the battery. Return the battery to the battery nest.



3. Place the battery cover onto the module and install the screws. Module is now ready to be placed in the UN certified Dangerous Goods packaging.

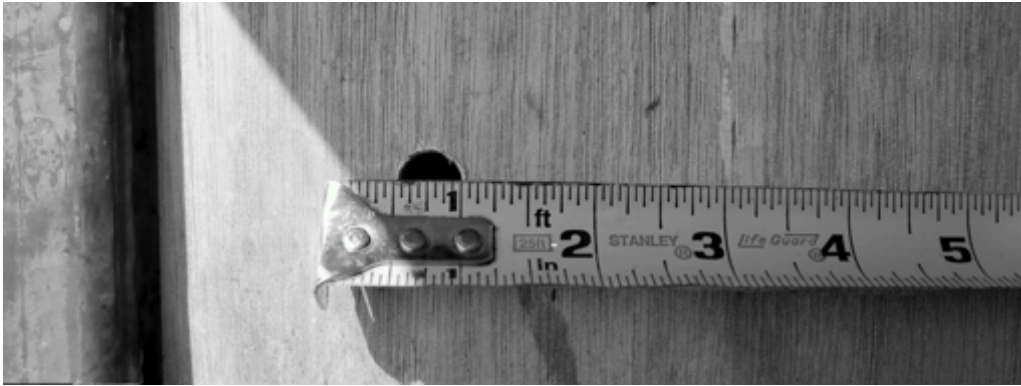


4.4 Surface repair

After the module has been removed from the door, there will be holes in the door. There are various techniques that can be used to repair the holes. This section will discuss some approaches you may wish to use.

Method 1: Hole Plugs

1. With the module removed, measure the size of the holes.

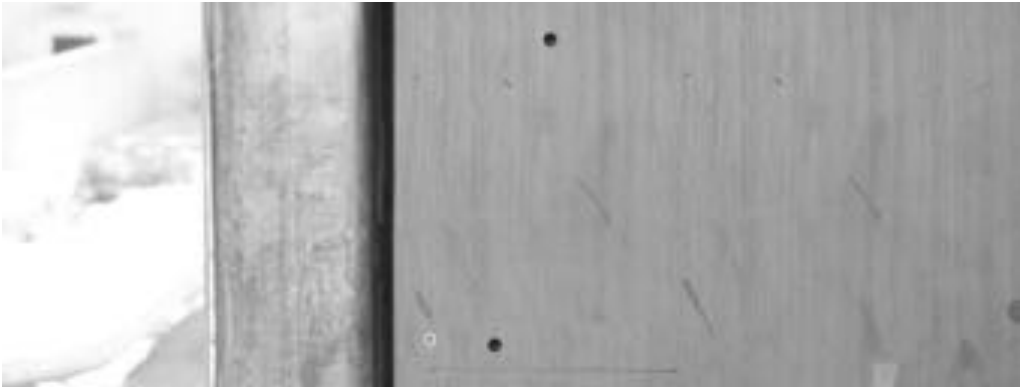


2. Source a set of nylon or rubber plugs, of the appropriate diameter, to fill the holes. These plugs can be sourced from hardware or auto supply stores. Insert the plugs into the holes.



Method 2: Sealant

1. With the module removed, you'll have two holes.



2. Fill the holes with a weatherproof sealant. If desired, you may use 100% Silicone Exterior Grade caulk or Polyurethane Sealant.



Tip: For an improved appearance, you may use a sealant that matches the surface's color.

Method 3: Fasteners

1. With the module removed, you'll have two holes.



2. Drive the screws into the holes.



5 Support

If you run into any problem during the installation process, contact the BlackBerry Radar support team at 1-844-RADAR-BB.

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