



ORBCOMM®

CONNECTING THE
WORLD'S ASSETS



CT 360x

User Guide

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PREFACE

Purpose

This guide contains product information about the CT 3600 and CT 3601 (model numbers CT3600 and CT3601) (hereafter referred to as "CT 360x". The intended audiences for this guide include field support personnel, product evaluators, and certified third-party personnel. It is particularly intended for personnel who are responsible for system installation and activation.

Unless noted otherwise, all the hardware features and functionality in this guide apply to both products and installation instructions are the same for both products.

Notation

Hardware components and hardware labels in this document might not be exactly as shown and are subject to change without notice.

CAUTION: This safety symbol warns of possible hazards to personnel, equipment, or both. It includes hazards that will or can cause personal injury, property damage, or death if the hazard is not avoided.

Note: A note indicates information with no potential hazard. A note indicates points of interest or provides supplementary information about a feature or task.

Bulleted lists highlight information where order or sequence is not crucial.

Battery Safety Warnings

CAUTION: DO NOT short circuit or expose the battery to temperatures above the maximum rated temperature.

CAUTION: Always follow local disposal guidelines to properly dispose of the Lithium-ion battery and the device.

CAUTION: Store in a cool, well-ventilated area. Elevated temperatures will result in shortened battery life.

CAUTION: DO NOT throw the internal battery or the device into fire.

CAUTION: DO NOT replace the battery. Changing the battery without ORBCOMM's permission could violate regulatory conformity.

CAUTION: If Shipping the device, contact your local shipping carrier for safe shipping guidelines.



Cautions and Warnings

IMPORTANT

READ ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING. FAILURE TO DO SO MAY CAUSE PERSONAL INJURY OR DAMAGE TO PRODUCT AND/OR PROPERTY.

- Review the product package and contents prior to beginning the installation. Take care when opening the packaging and removing items. If a return is needed, you will want to return the product in its original packaging if possible.
- This instruction guide is provided as a GENERAL installation guide; some assets vary dimensionally and may require additional steps.
- ORBCOMM has a policy of continuous development and improvements. Therefore, products, guides, and technical information are subject to change without prior notice.
- The manufacturer and / or distributors do not accept responsibility for third-party charges, labor, and / or third-party replacement modifications that are not ORBCOMM approved. Some modifications may void the factory warranty.
- ORBCOMM does not accept any responsibility for installations performed by installers / third parties not approved and / or authorized by ORBCOMM. Some installations may void the factory warranty.
- Exercise due diligence when installing this product. ORBCOMM does not accept any responsibility for asset damage or personal injury resulting from the installation of this product. Careless installation and operation can result in serious injury or equipment damage.
- All liability for installation and use rests with the owner / operator.
- Always make sure you have a clean, dry, and well-lit work area.
- Always ensure products are secure during disassembly and installation.
- Always take steps to protect yourself when drilling, cutting, and grinding because this may create flying particles that can cause injury.
- Thoroughly inspect the area to be drilled, on both sides of material, prior to modification, and relocate any objects that may become damaged.
- Always route electrical cables carefully. Avoid moving parts, parts that may become hot and rough, or sharp edges.
- Make sure to fully understand the product, its intended use, and operation prior to use.

CAUTION: While ORBCOMM provides mounting hardware to assist with installations, it is the responsibility of the installer to select the proper mounting hardware for the asset's surface material where an ORBCOMM device or accessory will be mounted.

Environmental Protection

Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with our local authority or retailer for recycling advice.



1 PRODUCT OVERVIEW

The CT 360x (model numbers CT3600 and CT3601) is a low-cost device capable of tracking, monitoring, and controlling refrigerated containers (reefers) both on land and at sea for total intermodal asset visibility. It pairs information read from the reefer controller with data from onboard sensors such as location and temperature and sends messages over cellular networks.

The CT 360x utilizes a rugged enclosure that houses all electronics and power control. External interfaces for power, communication, and antenna are available through rugged external connectors. It is designed to be mounted inside the reefer controller cabinet with cabled antenna mounted to the inside of the reefer door.

The device can be powered externally through the main connector or through the internal rechargeable battery. The batteries are charged when power is available from the external connector.

Figure 1: CT 360x



The CT 360x includes the following features and functionality:

- RS-232 Reefer Communications Port
- Motion detection accelerometer
- Advanced accelerometer for shock, rollover detection, etc.
- Tri-color LED to indicate overall health
- Internal rechargeable battery
- Global cellular module with factory installed SIM card
- GNSS with support for GPS, GLONASS, BeiDou, Galileo, and QZSS
- Connectors for direct integration with reefer controllers
- Magnet switch
- Bluetooth Low Energy (BLE)
- Temperature sensor to measure internal temperature

The CT 3601 also includes the following:

- A secondary BLE for communication to BLE vessel systems
- Different LTE bands than the CT 3600 (refer to appropriate section for details)
- CT 3601 has two optional variants
 - two I/O connectors base variant, CT3601-2100-H
 - three I/O connectors variant, CT3601-3100-H

2 COMPLIANCE

ISED (Canada)

IC: 11881 A-CT3600 (for CT 3600)

IC: 11881 A-CT3601 (for CT 3601)

CONTAINS IC: 10224A-202212EG21 GL

ICES-003

RSS-102, radiation safety per Safety Code 6 (compliance shown by computation)

IC compliance statement

This device contains licensed transmitter(s)/receiver(s) that comply with Innovation, Science Economy Development Canada's Licensed RSS(s). Operation is subject to the following two conditions:

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

This device complies with the Canadian ICES-003 Class **B** specifications. **CAN ICES-003(B) / NMB-003 (B)**.

L'émetteur/récepteur autorisée contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio autorisée.

L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil numérique de la classe **B** est conforme à la norme **NMB-003** du Canada.

FCC (USA)

- FCC ID: XGS-CT3600 (for CT 3600)
- FCC ID: XGS-CT3601 (for CT 3601)
- CONTAINS FCC ID: XMR202212EG21 GL
-

CFR 47 Part 15

- **FCC compliance statement**

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. "

CE MARK (Europe)

- RED 2014/53/EU
- **EU Declaration of Conformity**

Hereby, ORBCOMM Inc. declares that the radio equipment types listed in this document comply with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available from <http://www2.orbcomm.com/eudoc>.

¹European Union's (EU) Directive 2002/95/EEC "Restriction of Hazardous Substances" (RoHS) in Electronic and Electrical Equipment.

WARNING:**1) FCC RF Exposure Statement (MPE)**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, this equipment should be installed and operated with minimum distance 20 cm (7.9 inches) between the antenna and your body during normal operation. Users must follow the specific operating instructions for satisfying RF exposure compliance.

2) ISED RF Exposure Statement (MPE)

This equipment complies with ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm (7.9 inches) between the radiator and any part of your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux radiations ISED CNR-102 établies pour un environnement non contrôlé. Une distance de séparation d'au moins 20 cm doivent être maintenue entre l'antenne de cet appareil et toutes les personnes. Lanceurs ou ne peuvent pas coexister cette antenne ou capteurs avec d'autres.

REACH**Ingress Protection**

- Antenna: IP54
- CT 360x: IP54

2.1 Environmental

Parameter	Description
Vibration	The device meets all its specifications during exposure to random vehicular vibration levels per AAR-S-9401, section 3.2.4.2.
Humidity	The device meets all its specifications during exposure to 90% relative humidity at +85°C (185°F), per the test methodology of SAE J1455, section 4.2.3 (8-hour humidity cycle per figure 4a)
Mechanical Shock	The device meets all its specifications after exposure to positive and negative saw tooth shock pulses with peaks of 40 G and durations of 11 ms as specified in MIL-STD-810H, section 516.8, Procedure I, section 2.3.1.
Thermal Shock	The device meets all of its specifications after a thermal shock test as detailed in SAE J1455, section 4.1.3.2
Handling Drop	The device meets all its specifications after a handling drop test as specified in SAE J1455, section 4.11.3.1.
Ingress - Solid Foreign Objects	The enclosure provides protection against ingress of solid foreign objects of IP5X as specified in IEC-60529, section 13.5, Category 2.
Ingress - Water	The enclosure provides protection against ingress of water of IPX4 as specified in IEC-60529, section 14.2.4. The CT 3600 and antenna PCAs are conformally coated to provide additional protection against water.
Salt Spray Atmosphere	The device meets all of its specifications after a salt spray test as detailed in SAE J1455, section 4.3.3.1.



Parameter	Description
Exposure to Chemicals and Oils	The device meets all of its specifications after a light to moderate splash test as detailed in SAE J1455 section 4.4.3.2, for the following chemicals: - Window Washer Solvent - Gasoline - Diesel Fuel - Fuel Additives - Alcohol - Antifreeze Water Mixture - Degreasers - Soap and Detergents - Steam - Waxes - Kerosene - Freon - Spray Paint - Paint Strippers - Ether - Dust Control Agents (magnesium chloride) - Moisture Control Agents (calcium chloride) - Ammonia - Aluminum brightener (acid wash)
ESD	The device meets all its specifications after exposure of the enclosure to 8 kV ESD air discharge per IEC61000-4-2, level 3.



3 SPECIFICATIONS

3.1 Temperature

Parameter	Value
Operating temperature range	-40°C to +85°C (-40°F to +185°F) Temperatures below -20°C (-4°F) or above +60°C (140°F) result in a limited functionality.
Recommended storage temperature range	-40°C to +85°C (-40°F to +185°F) Storage for extended periods of time outside of -20°C to + 60°C (-4°F to +140°F) can result in non-recoverable battery capacity loss.

3.2 Internal Battery Temperature

Parameter	Value
Internal battery operating temperature range	-40°C to +70°C (-40°F to +185°F)
Internal battery charging temperature range	-20°C to +60°C (-4°F to +158°F)

3.3 Temperature Sensor

Measures an internal temperature over the range of -40 to +85°C (-40° to +185°F), with a typical accuracy of $\pm 2^{\circ}\text{C}$ and an accuracy of $\pm 3^{\circ}\text{C}$ over the full range.

3.4 Electrical Specifications

The main power source for the CT 360x is external power provided by the refrigerated container. While operating on external power, the input power also charges the device's internal back up battery. When external power is removed the device operates using its internal battery at a somewhat reduced feature set.

3.4.1 Input Range

The device is designed to operate on 24 VAC power commonly provided by reefer containers.

Parameter	Value
Power supply voltage (DC)	9 V to 32 VDC (specifically designed to operate on 12 V or 24 VDC systems)
Power supply voltage (AC)	15 V to 36 V, 50 Hz to 60 Hz
Over-voltage protection	-40 V to 200 V (but does not operate outside of the 9 to 32 V range)

3.4.2 Power Consumption

Mode	Power
Cellular transmit (pulsed)	7.2 W
Battery charge	800 mW
Cellular transmit plus battery charge	8 W

3.5 RF Specs

3.5.1 External Antenna

The antenna (part number ST101651-001) is in a rugged enclosure with a bottom side RF FAKRA (Bordeaux) cable. It supports LTE and GNSS in a single RF feed.

Parameter	Value
Frequency	698 to 2690 MHz
Impedance	50 Ω
GNSS VSWR (1561MHz – 1602MHz)	Minimum 3:1
Peak gain	698 to 960 MHz: 2.8 dBi 1710 to 2170 MHz: 3.7 dBi 2300 to 2690 MHz: 1.3 dBi
IP rating (enclosure)	IP54

Antenna cable specifications:

Parameter	Value
Cable length	1.2 m / 4 ft
IP rating	IP54

3.5.2 Integrated BLE Antenna

Parameter	Value
Frequency	2400 to 2480 MHz
Impedance	50 Ω
VSWR	≤ 2.2
Gain (realized gain)	3.64 dBi maximum 2400 MHz 3.73 dBi maximum 2440 MHz 3.72 dBi maximum 2480 MHz
Efficiency	88%

3.6 Primary Bluetooth Low Energy (BLE) (CT 3600 and CT 3601)

The primary BLE allows the CT 360x to communicate as a peripheral with a mobile phone or other BLE enabled host for configuration and some debug logging. Additionally, it allows the device to communicate as a host to wireless sensors.

The primary BLE includes an internal BLE antenna.

The characteristics for the primary BLE are:

Parameter	Min.	Typical	Max.	Units
Frequency	2360	-	2500	MHz
Bluetooth version compliance	-	5.4	-	-
Receive sensitivity	-95	-	-	dBm

Parameter	Min.	Typical	Max.	Units
TX power	-	-	+8	dBm
BLE External Memory	The device includes 16 Mbit of nonvolatile onboard flash storage. The flash is capable of 1000,000 write cycles.			

3.6.1 BLE External Memory

The CT 360x includes 16 Mbit of nonvolatile onboard flash storage for data for use with the BLE subsystem. The flash is capable of 100,000 write-erase cycles over its operating life.

3.7 Secondary Bluetooth Low Energy (BLE) (CT 3601 only)

The secondary BLE allows the CT 3601 to communicate with other devices using the external antenna. This allows the broadcasting of reefer information to external mobile devices.

The secondary BLE uses the external Cell/GNSS antenna.

The characteristics for the secondary BLE are:

Parameter	Min.	Typical	Max.	Units
Frequency	2360	-	2500	MHz
Bluetooth version compliance	-	5.4	-	-
Receive sensitivity	-96	-	-	dBm
TX power	-	-	+6	dBm

3.8 Cellular

3.8.1 CT 3600

The CT 3600 includes a cellular module cable of global cellular communication. The table shows the specifications.

Parameter	Value
LTE category	Cat 1
LTE bands	1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 25, 26, 28, 38, 39, 40, 41
UMTS/HSPA+ Bands	1, 2, 4, 5, 6, 8, 19
GSM Bands	2, 3, 5, 8

3.8.2 CT 3601

The CT 3601 includes a cellular module cable of global cellular communication. The table shows the specifications.

Parameter	Value
LTE category	Cat 1
LTE bands	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 39
UMTS/HSPA+ Bands	1, 2, 4, 5, 6, 8, 19
GSM Bands	2, 3, 5, 8

3.8.3 CT 360x

Maximum RF Output Power:

Parameter	Max RF Output Power
LTE	23 dBm $\pm$ 2 dB
GSM	33 dBm $\pm$ 2 dB
WCDMA	23 dBm $\pm$ 2 dB

3.9 Battery

3.9.1 Battery Voltage Measurement

The device can measure the input voltage over the range 2.5 V to 4.2 V.

3.9.2 Internal Battery

The device includes a long life, rechargeable internal battery capable of operating the device when reefer power is disconnected. The battery is charged when external power is available. When external power is removed, the device automatically switches to battery power and goes back to operating on external power when external power is restored.

The electrical specifications for the battery are below.

Parameter	Min.	Typical	Max.	Units
Capacity	2300	-	-	mAh
Voltage (nominal)	-	3.6	-	V
Current output	3	-	-	A
Discharge temperature	-40 / -40	-	70 / 158	°C / °F
Charge temperature	-20 / -4	-	60 / 140	°C / °F
Charge current	-	400	-	mA

		-	-	
			-	
		-	-	
			-	

3.9.3 Battery Life Expectancy

During normal operation, the device is expected to last 6 months while reporting twice per day on a single charge.

3.10 GNSS

The GNSS provides a cold start of 35 s and assisted in 15 s. The horizontal position accuracy is <2.5 m.

3.11 Accelerometer

The device has two accelerometers to allow for dedicated functions that may require different settings. The first provides motion detections, and the second is for advanced functions such as shock and rollover detection.

3.12 Magnet Switch

The device includes a magnetic switch, on the connector face, to allow local interaction. The switch can wake the device from shipping mode and perform other software defined actions.

3.13 Mechanical

3.13.1 CT 360x and Bracket

Parameter	Value
CT 360x Enclosure	Rugged, impact, and chemical resistant plastic material
Weight	
CT 3600	172 g (6 oz)
CT 3601	175 g (6 oz)
Bracket (only) weight	102 g (4 oz)

Units are shown in [millimeters] and inches.

Figure 2: CT 360x Dimensions

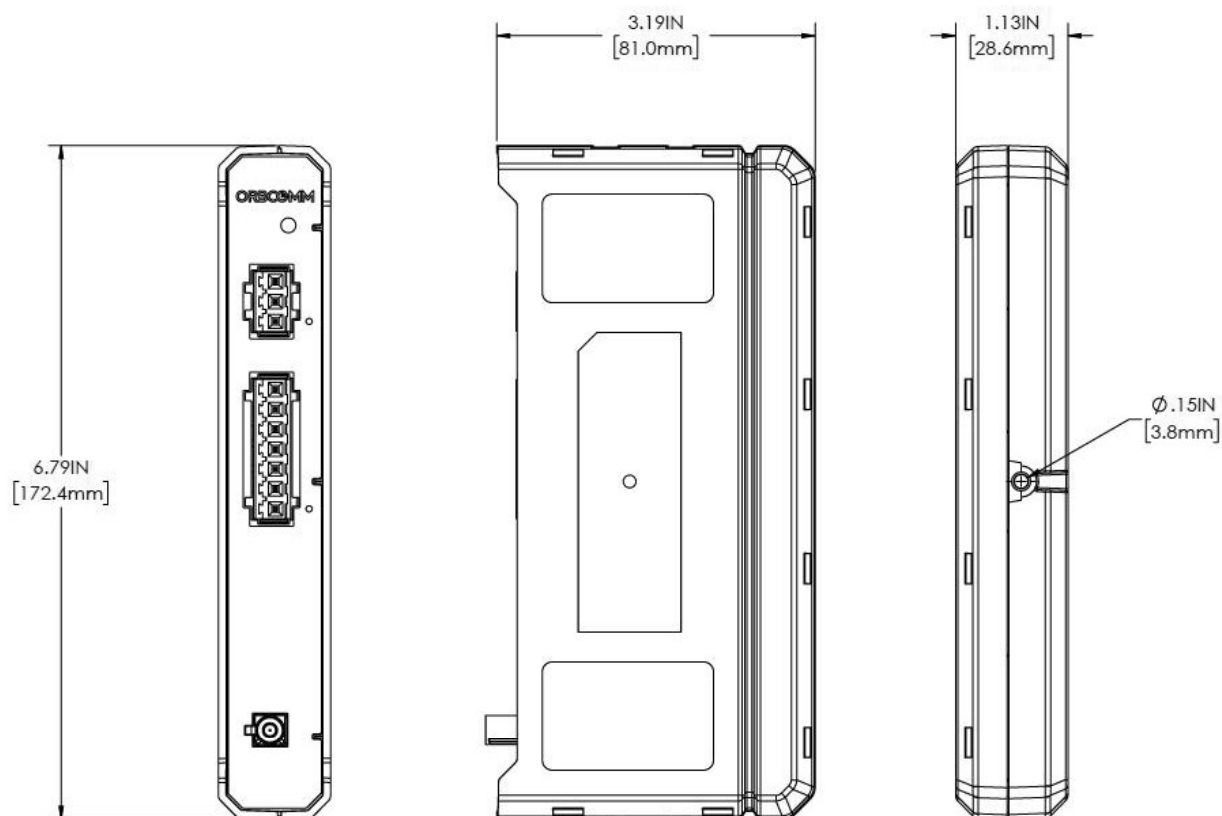
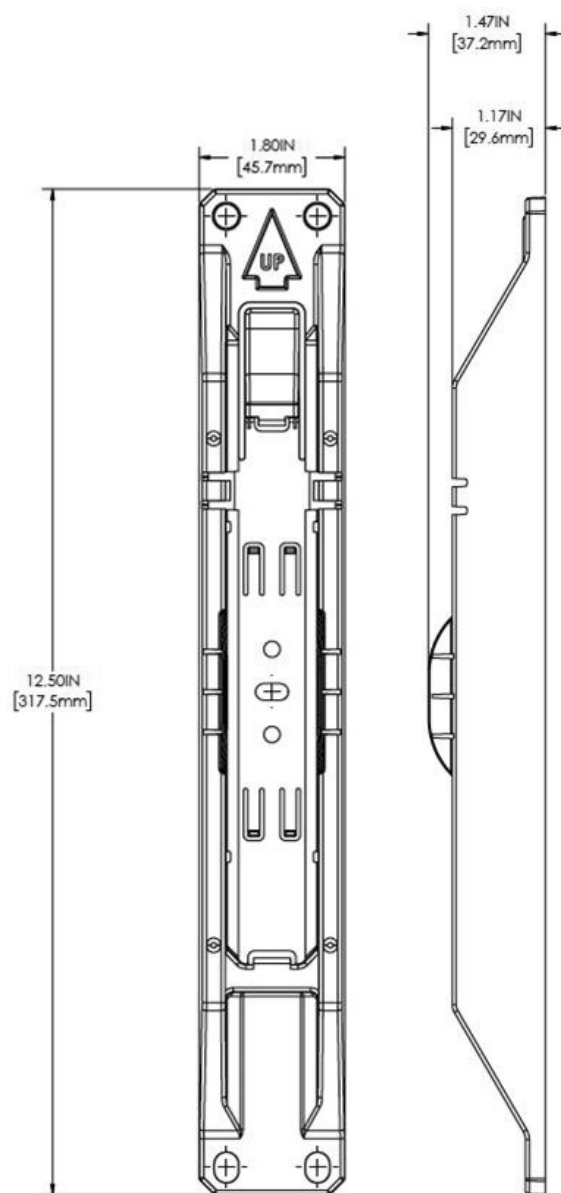
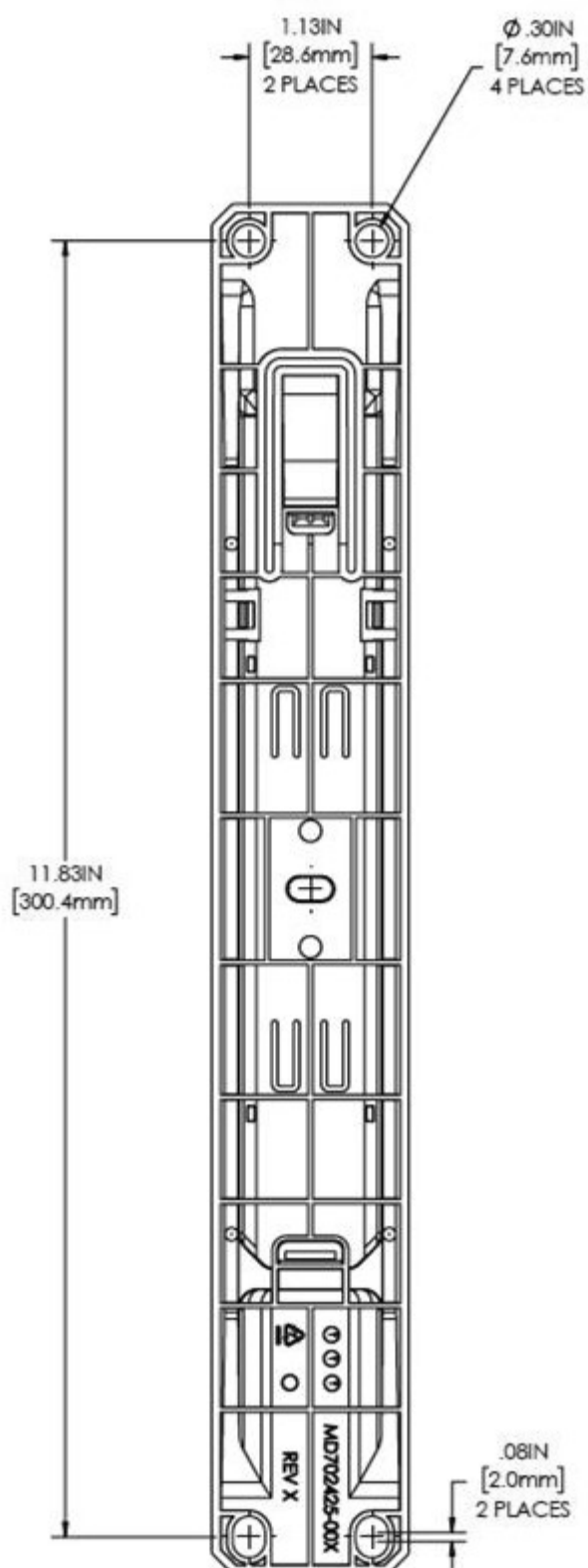


Figure 3: Locking Bracket Dimensions

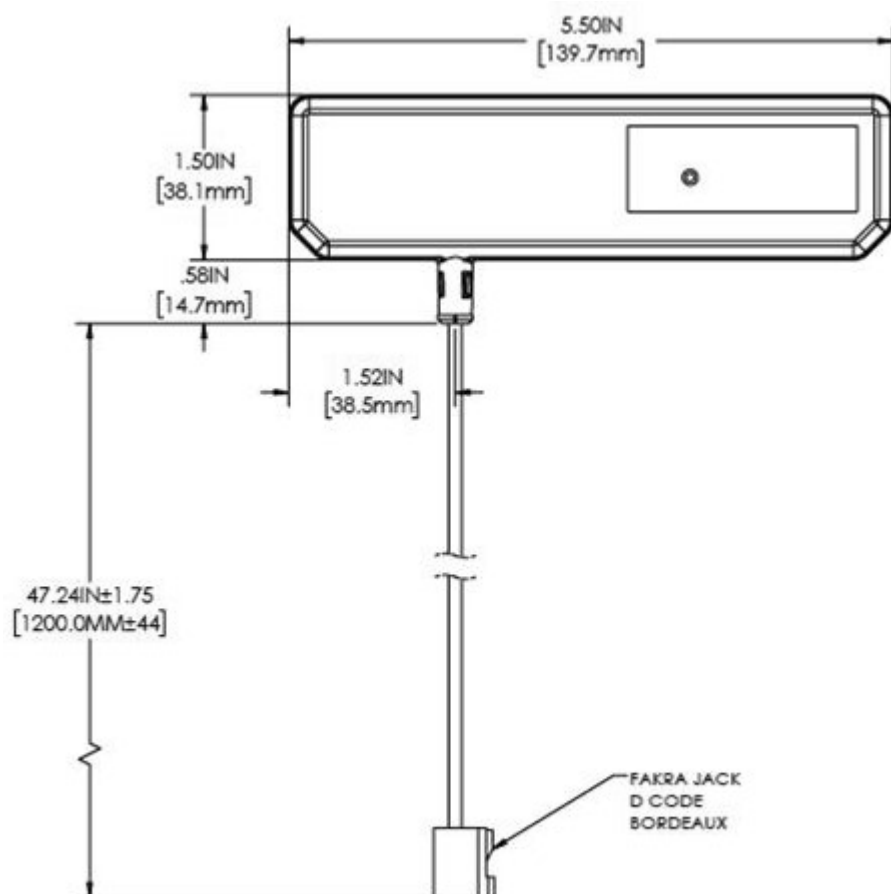


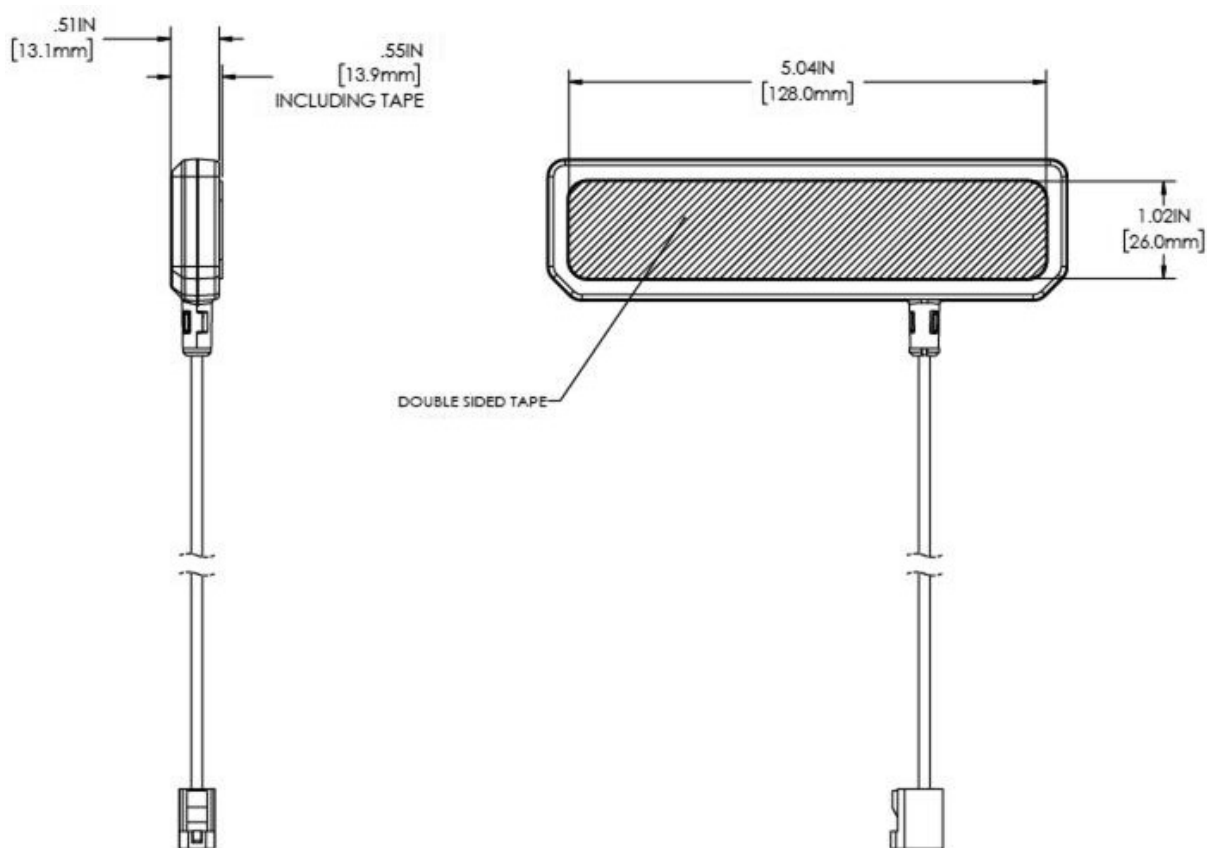


External Antenna

Parameter	Value
Antenna weight	67.5 g (2.4 oz)
Antenna enclosure rating	IP54.

Figure 4: External Antenna Dimensions





4 INSTALLATION

4.1 Gather the Required Tools and Materials

You can order either a CT 3600 kit or a CT 3601 kit. Other than the individual device part numbers, components in the two kits are the same.

The CT 3600 kit part number is SM202983-001 and the CT 3601 kit part number is SM202983-204¹, include the following:

- CT 3600 (part number CT3600-2100-H) **OR** CT 3601 (part number CT3601-2100-H) (depending on the kit ordered)



- Locking Bracket (part number MD702425)



- Antenna (part number ST101651-001)



¹At the time of this printing the CT 3601 is only available for Daikin. Contact your Account Manager for other possible kit numbers as they become available for other OEMs.

- CT 360x Hardware Kit (part number ST101659) that includes:
 - Qty. 4 - M5 x 16 mm stainless steel pan head SEMS screws and hardware
 - Qty. 4 - M6 nylock stainless steel hex nut
 - Qty. 4 - 10-24 x $\frac{3}{4}$ " pan head stainless steel black oxide
 - Qty. 1 - #8 x $\frac{3}{8}$ " pan head Plastite thread forming screw
- Surface preparation kit for double-sided tape
- IoT Presence label (available in some kits)

Additional Tools Required

- #2 Phillips screwdriver or 10 mm socket (extended socket recommended) and socket wrench (depending on fasteners required for the installation).
- Cable ties
- To use ORBCOMM's mobile app, you require:
 - Android or iOS device with Wi-Fi or cellular connectivity
 - User / customer credentials for the platform where the CT 360x is registered / hosted. Contact [ORBCOMM Customer Care](#) if you require credentials.

4.2 Pre-Installation Check

1. Use ORBCOMM's mobile app to scan the device QR code.
2. After you submit the asset / reefer ID for verification, wait until the mobile app displays the "Asset Verified" message before continuing with the CT 360x installation.
3. Disconnect the reefer from power, and then to gain full access to the installation location, open the controller box door and remove any shields / protective brackets.
4. Verify that the necessary AC/COMMS harnesses have been installed. **DO NOT** proceed with the CT 360x installation if these harnesses are not installed.

CAUTION: These harnesses must be installed before you can continue with the CT 360x installation. If the harnesses are not already installed in the controller box wiring, contact the reefer vendor or [ORBCOMM Customer Care](#) to identify and order the appropriate cables. Depending on the OEM, you may require 3-pin and 7-pin connectorized harnesses, or a single 7-pin harness. Ensure that you install these cables per the reefer OEM's assembly instructions. Only once these harnesses are in place should you proceed with the next step of the CT 360x installation.

4.3 Mount the Locking Bracket into the Asset

1. Use the four (4) provided nuts or screws (refer to table below for nut or screw type) to mount and secure the locking bracket into position.

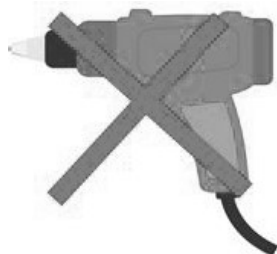
Carrier: 10-24 x $\frac{3}{4}$ " screws
(black oxide finish)

Daikin: M5 screws

Star Cool: M6 hex nuts



CAUTION: For this installation, use hand tools only. DO NOT use power tools.



CAUTION: Ensure that the arrow on the locking bracket is facing towards the sky.

Carrier (screws)



Daikin (screws)



Star Cool (nuts)



2. Position the device into the locking bracket by hooking it to the bottom of the locking bracket, slightly pivot the device, and then snap it into position by gently pushing the top of the device towards the locking bracket.

Locking bracket installed**Carrier****Daikin****Star Cool**

Hook the CT 360x to the bottom of the locking bracket (as shown)



Pivot the CT 360x, snap into position by pushing the top of the device towards the locking bracket



Carrier
(Final Position)



Daikin
(Final Position)



Star Cool
(Final Position)



4.4 Mount the Antenna

CAUTION: The CT 360x is designed to operate with a specific ORBCOMM antenna. Using a different antenna could violate certifications, and ORBCOMM does not recommend the use of any antenna other than what is specified in this guide.

Note: In cold weather conditions, you may want to keep the antenna surface warm before installation.

1. **Review** the recommended antenna mounting location based on asset type ¹. The location is different for each asset type. **DO NOT** mount the antenna in this step.

For Carrier

Mount the antenna on the inside of the cabinet door, on the display bezel (as shown).

Flat Condenser Style - Coil Reefer



C-Shaped Condenser - Coil Reefer



For Daikin

LXE Model - Mount on the inside of the cabinet door, on the backside of the keypad panel (as shown).

Zestia Model - Mount to the plastic part (NOT metal) on the back of the display (as shown).

¹Figures show possible locations with antenna already mounted.

LXE Model**Zestia Model****For Star Cool**

Mount on the inside of the cabinet door, on the backside of the plastic display panel (CIM6 model).



2. Prepare the mounting location¹ for the antenna's double-sided tape:
 - a. Use the provided cleaning supplies to prepare the mounting surface (lightly sand and clean).
- Note:** Ensure that an oversized area is prepared.

¹Figures may not reflect actual hardware. Example shown is for Star Cool.



- b. Apply the provided primer to the area and wait at least 30 seconds for the primer to dry.

Note: If the mounting location temperature is below 15°C / 59°F or the mounting surface is wet, refer to Inclement Weather Guidelines for details



CAUTION: ORBCOMM strongly recommends the use of primer.

3. Remove the tape liner from the back of the antenna.

CAUTION: DO NOT touch the sticky surface of the tape.



4. Immediately place the antenna at the recommended location¹, and then **press firmly on the antenna (7 kg (15 lb) for 15 seconds)** to bond the tape to the asset².

**Carrier**

OR

**Star Cool**

¹Figures may not reflect actual hardware.

²Figure example is for a Star Cool location.

Daikin - LXE Model**Daikin - Zestria Model**

CAUTION: Avoid covering the injection gate



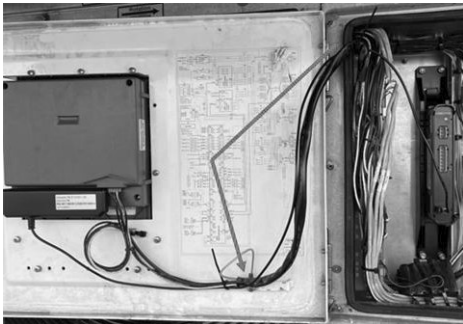
5. Plug the antenna's FAKRA connector into the CT 360x until you hear a click or feel a tactile click. Verify that the connector is securely locked into position.



4.5 Connect and Secure the Cables

1. Secure the antenna cable with cable ties as required. Star Cool example shown.

CAUTION: Ensure that the cables do not get pinched when closing the asset door.



2. Connect the 7-position COMMS cable, and then the reefer's 3-position AC cable, to the mating connectors on the CT 360x, **noting the ground position (pin 1)** on the CT 360x.

Note: Make sure all the connectors are fully pushed in (seated / good contact) before continuing with the installation.

Note: Connectors vary on different asset makes and models, so several possible configurations are shown in the examples that follow.

CAUTION: Take note of the ground position location (pin 1) and match the device accordingly. As a precaution, ORBCOMM strongly recommends you verify the ground pin signal position on the reefer's 3-pin and 7-pin harness connectors prior to connecting them to the device (the ORBCOMM name is horizontal as shown).

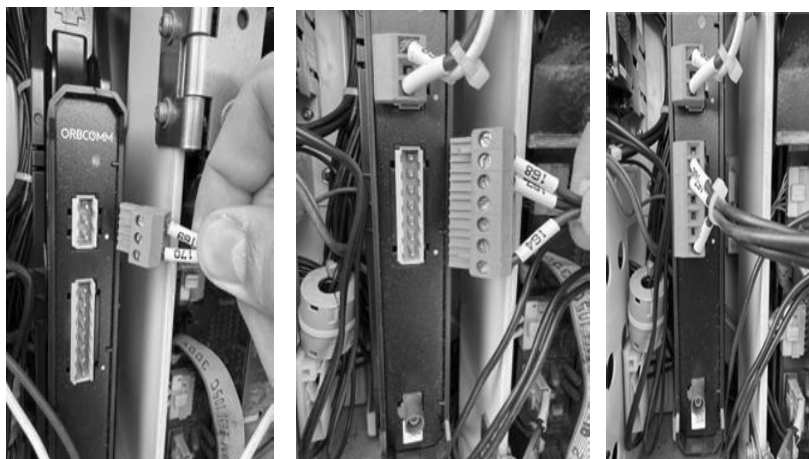


Signal	# of Circuits	Pin Position
VIN (24 VAC)	1	3
		2
Ground	1	1

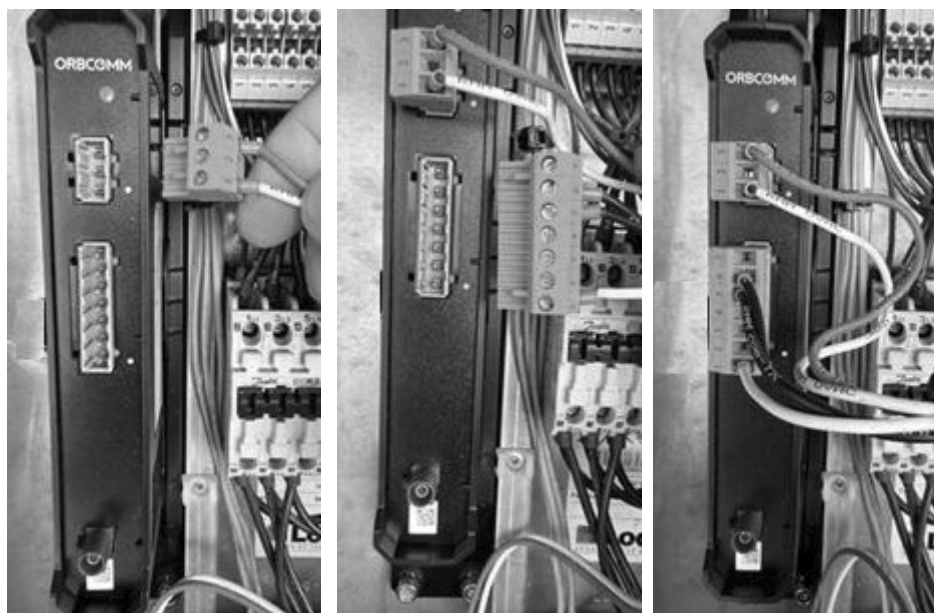
Signal	# of Circuits	Pin Position
		7
Reefer RS-232 Tx	1	6
Reefer RS-232 Rx	1	5
		4
24 VAC	1	3
RMM Ground	1	2
Ground	1	1

Carrier

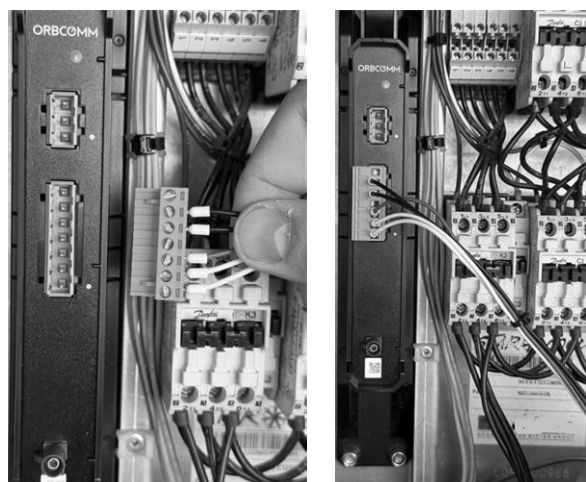


Daikin**OR**

Star Cool



OR



3. If an IoT Presence label is required (ships with some device models), clean the asset surface where you plan to attach the label with alcohol wipes, and then place the label on the face of the reefer above the reefer door or in the designated location.
4. Secure any loose cables with cable ties.

4.6 Commission the CT 360x

The installation is successful if you see a solid green LED on the device and the device is communicating.

1. Plug the reefer into mains power and then verify that the controller display lights up.
2. Verify that the asset / reefer ID is programmed into the controller.

If there is no reefer ID programmed, have a certified / OEM technician enter a valid reefer ID, power cycle the reefer (power OFF at the breaker for >10 seconds and then power ON), and then check for a solid green LED (wait up to 10 minutes for a solid green LED) on the CT 360x.

3. If you have not already power cycled the reefer in one of the previous steps, power cycle the reefer at the breaker (power OFF at the breaker for >10 seconds and then power ON) or the power plug (not the ON/OFF switch), and then check for a solid green LED (wait up to 10 minutes for a solid green LED) on the CT 360x.
4. Use the ORBCOMM Mobile app to verify that the device is communicating by checking the **Device Information** screen for details. Items in the Status section of the screen should show green check marks and details for things like reefer temperature should be present.

Note: Once installed and powered ON, the CT 360x self-commissions, so no additional activation steps are required.

5. If you removed or detached any of the protective shielding, replace these components and then close the controller door to complete the installation.



APPENDIX A INCLEMENT WEATHER GUIDELINES

One method of securing the device to an asset is double-sided tape. Proper tape application requires that the tape is kept warm (room temperature), and the asset surface is both clean and dry.

Mandatory Guidelines for Installation in Wet Weather

The installation surface on the asset must be completely clean and dry for the tape to bond. If it is raining or snowing hard enough that the surface cannot be kept dry, **DO NOT** proceed with the installation.

Mandatory Guidelines for Installation in Cold Weather

Below 15°C (60°F) the double-sided tape starts becoming firm which makes it more difficult to bond to the asset.

If the guidelines below are followed correctly, the device can be installed at temperatures down to -20°C (-5°F).

- At or below freezing temperatures (0°C or 32°F), both the device and the tape primer* must be kept at room temperature, for example, inside an idling vehicle or a warm building.

*If tape primer is not provided with the device, the cold temperature installation kit (ORBCOMM p/n ST101505, suitable for up to 25 installs) **MUST** be used.

Example of Tape Primer



- Keep the primer warm (room temperature) until ready to apply. The primer will not dry quickly at cold temperatures however, in this situation the tape should be applied when the primer is still wet, as it improves initial bond.
- Keep the device warm (room temperature) until it is time to mount it to the asset.
- Press firmly on the entire top surface of the device (7 kg (15 lb) for 15 seconds) to bond the tape to the asset.

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Failing to follow these guidelines will compromise the installation.
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APPENDIX B MAGNET SWITCH

The CT 360x supports a magnet reset and other functions using a magnet.

To enable the magnet switch options:

1. Place the magnet to the **right of the LED**, near the ORBCOMM logo, for the time indicated in the Time Asserted column.



2. Hold the magnet over this location for at least the duration indicated in the **Hold Time** column for the desired action and then remove it.

Action	Hold Time	Description
Generate Message	3 to 7 seconds	The device generates a <i>Wake Up Button</i> message. If the device requires a new GPS fix, then it can take up to 4 minutes for the message to reach the ORBCOMM Maritime platform. This action is disabled while the device is either in shipping or inventory mode and guest mode has not been enabled. This action exists shipping mode and triggers reefer communication if the device has guest mode enabled.
Enter / Exit Shipping Mode	13 to 17 seconds	The device exits shipping and inventory modes if currently in one of those modes. The device enters shipping mode if it is not already in shipping or inventory mode.
Reset Device	23 to 27 seconds	The device performs a software reset.