



Installation Manual  
for the  
Edge E-Series  
Communications Management Unit (CMU)

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## 1. Precautions and Preparation

These instructions are not designed to imply or replace any operating or safety rules. It is the responsibility of the installer to understand and follow all company safety practices.

**! WARNING** In order to comply with hazardous classification, only those items specifically listed can be used and must be used only as shown. Substitution of components may affect intrinsic safety.

**! WARNING** Installation shall be carried out in accordance with the applicable code of practice by suitably-trained personnel.

**! WARNING** Repair of this equipment shall be carried out in accordance with the applicable code of practice.

**! WARNING** Any machining, drilling, and/or sanding related to the installation of this system should be pre-approved by the authorized department before work is started.

**! WARNING** If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

**! WARNING** RF Device: Unit cannot be painted or coated with any material. Coating can adversely affect the performance of the device. Unit shall be masked appropriately if post installation coating is required.

**! WARNING** EXPLOSION HAZARD: The equipment temperature Class is T4 and only certified for use in ambient temperatures. Product is rated from -40°C to +55°C and should not be used outside this range in an explosive environment.

**! WARNING** POTENTIAL ELECTROSTATIC CHARGING HAZARD: Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. This is particularly important if the equipment is installed in a zone 0 location.

**! WARNING** POTENTIAL ELECTROSTATIC CHARGING HAZARD: Suitable for hose down cleaning only. Do not clean unit with a dry cloth. Static can be generated when two dry parts are rubbed together.

**! WARNING** DO NOT OPEN WHEN EXPLOSIVE ATMOSPHERE IS PRESENT. Battery replacement shall be done in an area known to be non-hazardous. Use only replaceable battery pack IONX model 303382 (19 mAH) or 303406 (76 mAH). See battery replacement procedure in Appendix F.

**! WARNING** Products contain Primary Lithium batteries. Proper disposal procedures are required at end of life conditions. Use local regulatory disposal method for lithium Thionyl chloride batteries. For example, disposal procedure 49 CFR 173.185 or Directive 2006/66/CE.



# 1) Avertissements

Ces instructions ne sont pas conçues pour impliquer ou remplacer des règles d'utilisation ou de sécurité. Il est de la responsabilité de l'installateur de comprendre et de suivre toutes les pratiques de sécurité de l'entreprise. Instructions complètes pour utiliser CMU en français en attente.

<p><b>⚠ AVERTISSEMENT</b> Afin de se conformer à la classification des matières dangereuses, seuls les éléments spécifiquement énumérés peuvent être utilisés et doivent être utilisés uniquement comme indiqué. La substitution de composants peut affecter la sécurité intrinsèque.</p>
<p><b>⚠ AVERTISSEMENT</b> L'installation doit être effectuée conformément au code de pratique applicable par du personnel dûment formé.</p>
<p><b>⚠ AVERTISSEMENT</b> La réparation de cet équipement doit être effectuée conformément au code de pratique applicable.</p>
<p><b>⚠ AVERTISSEMENT</b> Tout usinage, perçage et / ou ponçage lié à l'installation de ce système doit être préalablement approuvé par le service autorisé avant le début des travaux.</p>
<p><b>⚠ AVERTISSEMENT</b> Si l'équipement est susceptible d'entrer en contact avec des substances agressives, il est de la responsabilité de l'utilisateur de prendre les précautions appropriées qui empêchent qu'il soit affecté de manière négative, garantissant ainsi que le type de protection n'est pas compromis.</p>
<p><b>⚠ ATTENTION</b> Dispositif RF: L'unité ne peut être peinte ou revêtue d'aucun matériau. Le revêtement peut nuire aux performances de l'appareil. L'unité doit être masquée de manière appropriée si un revêtement post-installation est requis.</p>
<p><b>⚠ ATTENTION</b> DANGER D'EXPLOSION: La classe de température de l'équipement est T4 et seulement certifiée pour une utilisation à des températures ambiantes. Le produit est évalué de -40°C à +55°C et ne doit pas être utilisé en dehors de cette plage dans un environnement explosif.</p>
<p><b>⚠ ATTENTION</b> DANGER D'EXPLOSION: L'installation doit être effectuée conformément au code de pratique en vigueur par du personnel qualifié.</p>
<p><b>⚠ ATTENTION</b> DANGER DE CHARGE ÉLECTROSTATIQUE POTENTIEL: Dans certaines circonstances extrêmes, les pièces non métalliques incorporées dans l'enveloppe de cet équipement peuvent générer un niveau de charge électrostatique capable d'amorçage. Par conséquent, l'équipement ne doit pas être installé dans un endroit où les conditions externes favorisent l'accumulation de charges électrostatiques sur ces surfaces. Ceci est particulièrement important si l'équipement est installé dans un emplacement de la zone 0.</p>
<p><b>⚠ ATTENTION</b> DANGER DE CHARGE ÉLECTROSTATIQUE POTENTIEL: Convient uniquement au nettoyage par tuyau. Ne nettoyez pas l'appareil avec un chiffon sec. Statique peut être généré lorsque deux parties sèches sont frottées ensemble.</p>
<p><b>⚠ ATTENTION</b> NE PAS OUVRIR LORSQU'UNE ATMOSPHÈRE EXPLOSIVE EST PRÉSENTE. Le remplacement de la batterie doit être effectué dans une zone connue comme non dangereuse. Utilisez uniquement une batterie remplaçable IONX modèle 303382 (19 mAh) ou 303406 (76 mAh). Voir la procédure de remplacement de la batterie à l'annexe F.</p>
<p><b>⚠ ATTENTION</b> Les produits contiennent des batteries au lithium primaire. Des procédures d'élimination appropriées sont requises en fin de vie. Utiliser une méthode d'élimination réglementaire locale pour les piles au lithium-chlorure de thionyle. Par exemple, procédure d'élimination 49 CFR 173.185 ou Directive 2006/66/CE.</p>

## 2. Unpacking the CMU

### Required Tools/Materials

Tool Name (Part No)	Description
3/8" Magnetic Drive Socket	 Securing self-drilling screws
T-27 Tamper-Resistant Torx driver	 Securing CMU to bracket

**If using a knife to cut the tape, do not let the blade extend more than ½ inch inside of the cardboard box.**

- 2.1 Inspect shipping box/s to make sure there is no damage.
- 2.2 Carefully unpack the shipping box making sure to open the top of the box. There will be instruction guide/s for modules associated with the system order.
- 2.3 Open shipping box/s and verify that the internal contents match the shipping receipt. Contact IONX Support Center (Appendix D) in the event of any above problems.

## 3. Activating the CMU

- 3.1 Before starting
  - 3.1.1 Confirm your email address is set-up in the IONX TARA system by emailing [tara@ionxlive.com](mailto:tara@ionxlive.com) with "help" in the subject line.
  - 3.1.2 If there is no reply, contact the IONX Support Center (Appendix D) to get your email address set-up to use TARA and IONXlive.net.
- 3.2 If the device has a red label on the top of the case, CMU devices may be activated by removing a magnet, under the red label on the top surface of the CMU.
- 3.3 Alternately, configure CMU with IONX E-series application for Near Field Communication (NFC) reader (supplied by IONX).

**WARNING: NFC tag reader is not for use in potentially explosive atmospheres. Activate the CMU on a benchtop in a non-hazardous area.**

**ATTENTION: Le lecteur d'étiquette NFC ne doit pas être utilisé dans des atmosphères potentiellement explosives. Activer la CMU sur une pailleuse dans une zone non dangereuse.**

- 3.3.1 Start IONX application.
- 3.3.2 Place NFC reader device near yellow label of CMU. This wakes the CMU from deep sleep.
- 3.3.3 Confirm device wake up message was received using IONX E-series application.

- 3.4 Attach the CMU to the mounting plate or car using the supplied hardware.
- 3.5 See mechanical installation drawings in Appendix A for specific mounting details
- 3.6 If the CMU is being mounted to a hatch, be sure the hatch is closed after the CMU has been mounted (Figure 1).



Figure 1: Final CMU connection to mounting plate

- 3.7 Associate the CMU with the car according to Section 4.

## 4. Associating the CMU

The IONX Totally Autonomous Reporting Agent (TARA) is used to associate the car number with the CMU. This is completed by email using an email-enabled smart phone or any computer with email access.

### A. Before starting

1. Confirm your email address is set-up in the IONX TARA system by emailing [tara@ionxlive.com](mailto:tara@ionxlive.com) with “help” in the subject line.
2. If there is no reply within 60 minutes, contact the IONX Support Center (Appendix D) to get your email address set-up to use TARA and IONXlive.net.

### B. Associating the Car Number to the CMU

#### 1. Start a new email message

- **To:** type **TARA@IONXLive.com**
- **Subject:** type
  - ‘I’ or ‘i’
  - Period ‘.’
  - The **serial number** of the CMU
  - Period ‘.’
  - The **Car initials**
  - Period ‘.’

- The **Car number** which the CMU is installed on
- Period '.'
- **Company Name**

Example:

**I.SerialNumber.CarInitial.CarNumber.CompanyName**

Example: **I.E6AA015000.ABCX.1234.ABCRailroad**

**2. Send the message**

**3. A response message confirming the installation will be sent from TARA (Figure 2)**

```
Success!

Unit E6AA015000 now installed on ABCX 1234
associated to ABC. If this is not correct - Contact
IONX Support at- 484-653-2600.

**This is an automated report email, please do not
reply directly to this message as it will be
discarded.
```

Figure 2: Sample Installation Response

**4. The CMU is associated with the car number. The installation is complete. The car now can be released into service.**

**C. Replacing a device on a car**

**1. Start a new email message**

- **To:** type [TARA@IONXLive.net](mailto:TARA@IONXLive.net)
- **Subject:** type
  - 'R' or 'r'
  - Period '.'
  - The **serial number** of the old replaced CMU
  - Period '.'
  - The **serial number** of the new CMU being installed
  - Period '.'
  - The **Car initials**
  - Period '.'
  - The **Car number** which the CMU is installed on

Example:

**R.OldSerialNumber.NewSerialNumber.CarInitial.CarNumber**

Example: **R.E5AC011001.E4AB011000.ABCX.1234**



2. An email response message confirming the replacement will be sent from TARA.

To see details of all TARA email service commands, go to Appendix C.

## D. Using the TARA web site

Click on the link below and log in using the same credentials you use to access the IONX web site:-

<https://www.ionxlive.net/IonxLiveMassTARA/>

**Note:** If you receive the error message 'User is not a valid TARA user', please contact IONX support to be added to the list of valid TARA users.

1. After logging in, you should see the following screen. This is the 'Install' tab and should be used if installing a device on a new car. If replacing a device on a car, please see the 'Replace' command instructions in section 4.5.3.



Install Single Device

Enter Serial Number :

Enter Car Name :

Enter Customer:

Install Multiple Devices

Serial Number	Car Name/Number	Customer List
<input type="text"/>	<input type="text"/>	<input type="text" value="Select Customer"/>
<input type="text"/>	<input type="text"/>	<input type="text" value="Select Customer"/>
<input type="text"/>	<input type="text"/>	<input type="text" value="Select Customer"/>
<input type="text"/>	<input type="text"/>	<input type="text" value="Select Customer"/>
<input type="text"/>	<input type="text"/>	<input type="text" value="Select Customer"/>

2. If installing only one device, fill in the serial number of the CMU to be installed, the car name and number (format ABCD 123456) and choose the customer name from the dropdown. Then press the 'Install' button.



Install Single Device

Enter Serial Number :

Enter Car Name :

Enter Customer:

Install Multiple Devices

Serial Number	Car Name/Number	Customer List
<input type="text"/>	<input type="text"/>	Select Customer ▼
<input type="text"/>	<input type="text"/>	Select Customer ▼
<input type="text"/>	<input type="text"/>	Select Customer ▼
<input type="text"/>	<input type="text"/>	Select Customer ▼
<input type="text"/>	<input type="text"/>	Select Customer ▼

The following message should be displayed:-

'Success! Unit <Serial Number> is now installed on <Car Mark> associated to <Customer>. If this is not correct - Contact customer support at IONX - 484-653-2600.'

If the above message is not displayed and an error message displayed which you do not understand, please capture the message and send to IONX Support for further investigation.

Note that IONX installers will have access to all customers from the dropdown list.

3. If installing multiple devices, please use the section at the bottom of the page. Up to five (5) devices can be installed at one time. Success messages will be displayed for all installed devices and they will be removed from the table. Unsuccessful installs will still remain in the table for correction and error messages will be displayed for them.

The screenshot shows the IONXLIVE TARA 1.3 web interface. At the top, there is a navigation bar with the Amsted logo and the title 'IONXLIVE TARA 1.3'. Below the navigation bar are several menu items: Install, Uninstall, Replace, WSM, Detailed Status, Change Battery, Inspection, and About. The main content area is divided into two sections: 'Install Single Device' and 'Install Multiple Devices'. The 'Install Single Device' section contains three input fields: 'Enter Serial Number', 'Enter Car Name', and 'Enter Customer' (a dropdown menu). Below these fields is an 'Install' button. The 'Install Multiple Devices' section contains three columns of input fields: 'Serial Number', 'Car Name/Number', and 'Customer List'. The 'Serial Number' column has two rows with values 'E4AB00001' and 'E5BC00001'. The 'Car Name/Number' column has two rows with values 'ABCD 123456' and 'ABCD 654321'. The 'Customer List' column has four rows, each with a dropdown menu showing 'TTCI' or 'Select Customer'. Below these columns is an 'Install' button.

## E. Other TARA Web Site Commands.

The TARA web site also can be used to send other TARA commands namely uninstall, replace, change, wireless sensor monitor (WSM), detailed status and change battery (certain customers). Below is a short description of each function. Note that descriptions for TARA commands not used during installation can be found in Appendix B.

## 1. Uninstall

Used when uninstalling IONX CMU devices from cars.

Enter the serial number and car name for the device to be uninstalled. Check the RMA check box if the device is to be returned to IONX and press the 'Uninstall' button. If the RMA checkbox is selected, the unit will be moved to the IONX uninstalled fleet, otherwise it will be moved to the customer uninstalled fleet. Note that the car name entered must be in the format 'ABCD 123456' unless the customer is designated as a European customer. European customers may enter the car name in any format.

The screenshot shows the IONXLIVE TARA 1.3 web interface. At the top, there is a navigation bar with buttons for 'Install', 'Uninstall', 'Replace', 'WSM', 'Detailed Status', 'Change Battery', 'Inspection', and 'About'. Below this, the 'Uninstall' section is active. It is divided into two parts: 'Uninstall Single Device' and 'Uninstall Multiple Devices'.  
 In the 'Uninstall Single Device' section, there are two input fields: 'Enter Serial Number' with the value 'E4AB00001' and 'Enter Car Name' with the value 'ABCD 123456'. Below these is a checkbox labeled 'Check this box if device will be returned to IONX under an RMA.' which is checked. A note below the checkbox states: 'This will remove the device from the customer's fleet in the database.' An 'Uninstall' button is located at the bottom of this section.  
 The 'Uninstall Multiple Devices' section features a table with three columns: 'Serial Number', 'Car Name/Number', and 'Return Asset (RMA)'. Each column has five empty rows for data entry. To the right of the table are five checkboxes, one for each row, corresponding to the 'Return Asset (RMA)' column. An 'Uninstall' button is positioned below the table.

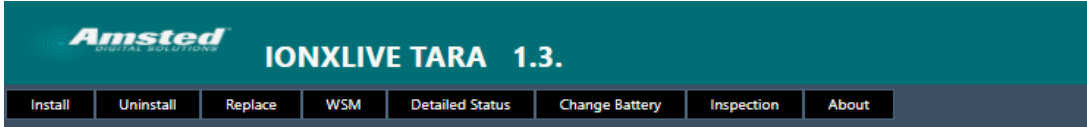
For multiple uninstalls, up to 5 devices can be uninstalled using the 'Uninstall Multiple Devices' table at the bottom of the web page above.

## 2. Change battery. See Appendix F.

## 3. Replace

Used when replacing a CMU device on a car with another CMU.

Enter old CMU serial number (to be replaced), new CMU serial number (replacement) and car name. Press the 'Replace' button.  
Note that the car name must be of the format 'ABCD 123456' unless the customer is designated as a European customer.



Replace Single Device

Enter Old Serial Number :

Enter New Serial Number :

Enter Car Name :

#### 4. Wireless Sensor Monitor (WSM) – For information purposes only.

Car sets are CMU devices plus Wireless Sensor Nodes (WSNs). WSM is used to determine if a CMU is awake and all WSNs have joined the network.

Following the instructions on the web page and then enter the CMU serial number and press the 'Monitor' button.

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IONXLIVE TARA 1.3

Log Out

Install Uninstall Replace WSM Detailed Status Change Battery Inspection About

Monitor

Instructions

1. Please remove the Red Label covering the T-Series device, and look on the bottom for a green blinking light. This will cause the device to wake-up, and send a message.
2. Please wake all WSNs using a magnet
3. Wait at least one hour and press the 'Monitor Device' button
4. If all the WSNs have not woken after one hour and no error message is shown on the page, place a magnet on the reed switch of the CMU, wait 15 minutes and then press the 'Monitor Device' button again

Enter Serial Number :

A table of the WSNs (serial number, node number and status) for the car set should be displayed.

## 5. Miscellaneous

Translations available upon request.

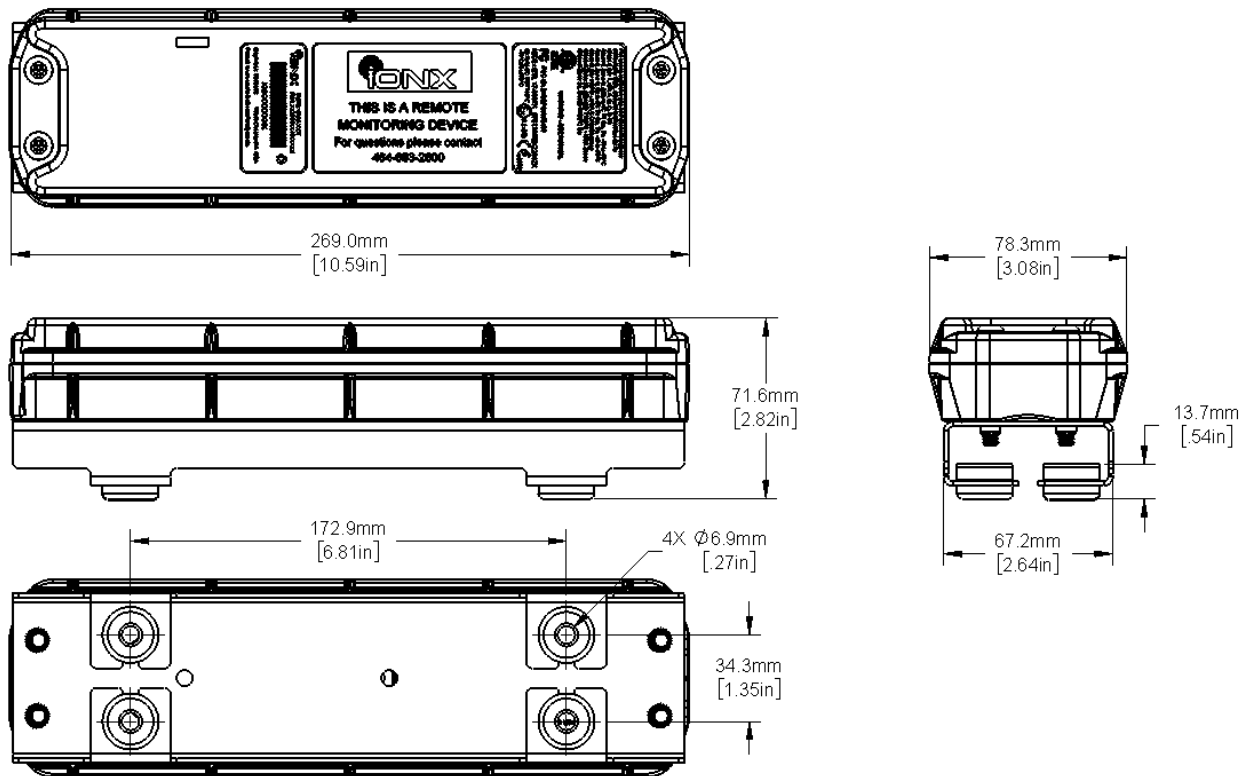
Traductions disponibles sur demande.

## Appendix A: Mechanicals

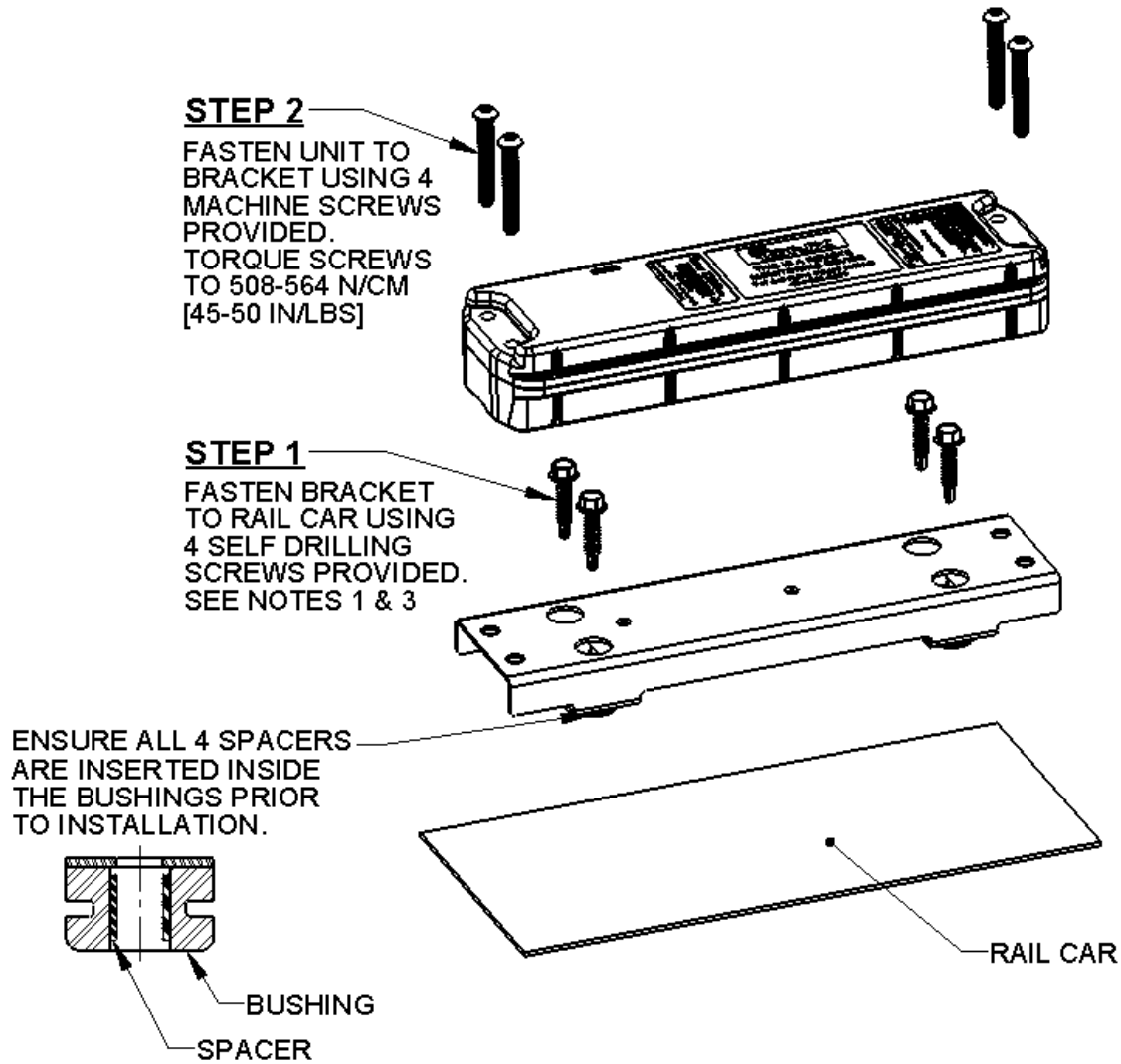
### A.1 E4S and E5S Dimensions

**WARNING: Mounting bracket is required for CMU-E4S and CMU-E5S models when commissioning for use in potentially explosive atmosphere. IONX part numbers 302262 and 301712, Isolation mount brackets for ExS, is approved for use in explosive atmosphere.**

**ATTENTION: Le support de montage est requis pour les modèles CMU-E4S et CMU-E5S lors de la mise en service pour une utilisation dans une atmosphère potentiellement explosive. Le numéros de pièce IONX 302262 et 301712, supports de montage d'isolation pour ExS, est approuvé pour une utilisation en atmosphère explosive.**



## A.2 E4S and E5S Installation with Bracket



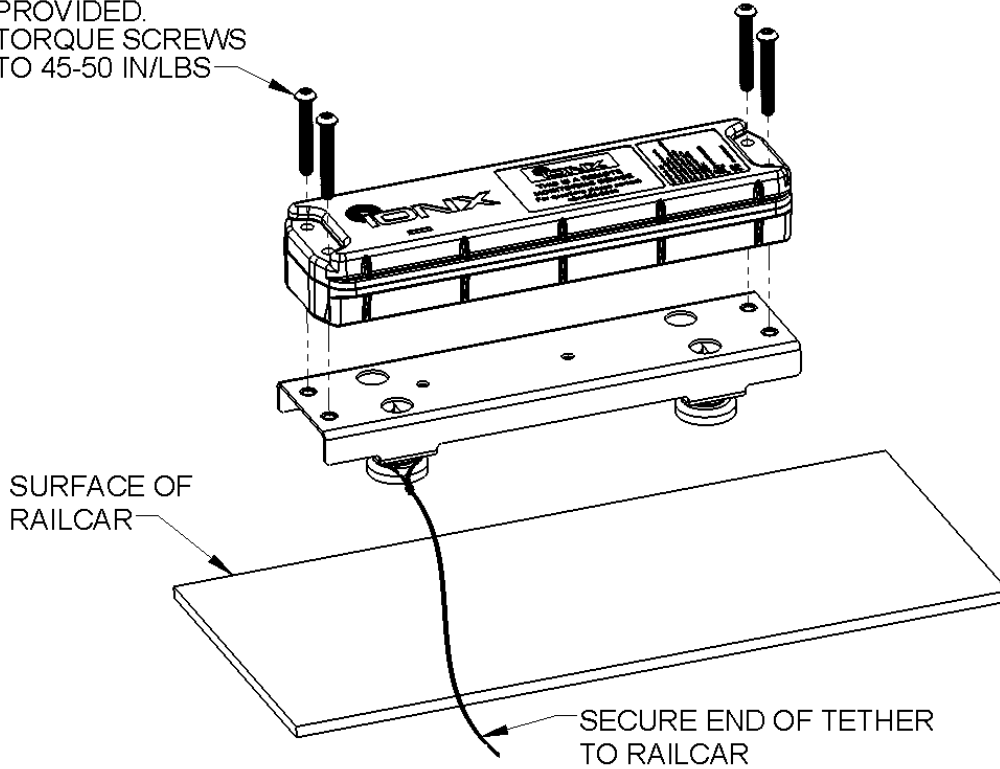
### NOTES:

1. ENSURE MOUNTING SURFACE IS FREE OF ANY IMPERFECTIONS THAT MAY PREVENT THE BRACKET FROM MATING FLUSH TO THE SURFACE.
2. IF REQUIRED, PLACE THE SUPPLIED VINYL CAPS OVER THE TIPS OF THE SCREWS PROTRUDING THROUGH THE INSIDE OF THE LID.





### A.3 E4S and E5S Installation with Magnetic Bracket and Safety Tether

FASTEN UNIT TO  
BRACKET USING 4  
MACHINE SCREWS  
PROVIDED.  
TORQUE SCREWS  
TO 45-50 IN/LBS



#### Required Tools/Materials for Safety Tether

Tool Name (Part No)	Description
Electricians' Crimping Pliers	 Crimps ferrules to wire rope
1/16 inch or 1.58 mm Ferrules - 2 per tether	 Ferrules for wire rope
1/16 inch or 1.58 mm Wire Rope – 6 foot each	<b>UNCOATED CABLE LIGHT-DUTY GALVANIZED 1/16 IN 96 LB SAFE WORKING LOAD</b> Wire rope for safety tether

**STEP 1**

CHOOSE A LOCATION FOR THE CMU BRACKET THAT WILL SEE A CLEAR VIEW OF THE SKY. THIS WILL ENSURE GOOD GPS RECEPTION.

**STEP 2**

ENSURE MOUNTING SURFACE IS FREE OF ANY IMPERFECTIONS THAT MAY PREVENT THE MAGNETS FROM MATING FLUSH AND SECURING TO THE RAILCAR SURFACE.

**STEP 3**

THREAD THE WIRE ROPE THROUGH THE FERRULE AND AROUND ONE OF THE BRACKET FEET AND BACK THROUGH THE FERRULE AS SHOWN BELOW.

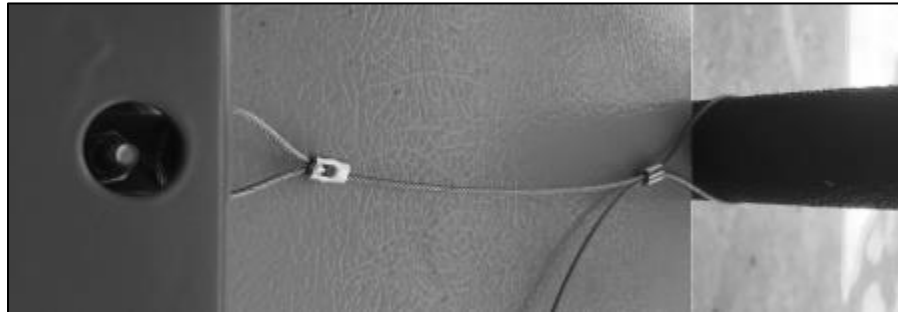
MAKE THE WIRE LOOP TAUT AROUND THE BRACKET FOOT SO THE SAFETY TETHER CAN NOT BE REMOVED OVER THE MAGNET. (SEE SECOND PHOTO BELOW) USE ELECTRICIAN PLIERS TO CRIMP THE FERRULE.

**STEP 4**

TAKE CAUTION THAT THE TETHER DOES NOT CAUSE A TRIPPING HAZARD OR GET TANGLED IN OTHER EQUIPMENT.

**STEP 5**

IF THE ENTIRE LENGTH OF THE WIRE ROPE IS NOT NEEDED, PULL THE EXCESS WIRE THROUGH THE SECOND FERRULE, CRIMP, AND CUT OFF ANY EXCESS WIRE ROPE.



DIFFERENT TYPES OF PLIERS THAT CAN BE USED - SHOWS THE FERRULES IN EACH PLIER TYPE

## A.4 E4S and E5S Dome Mounted

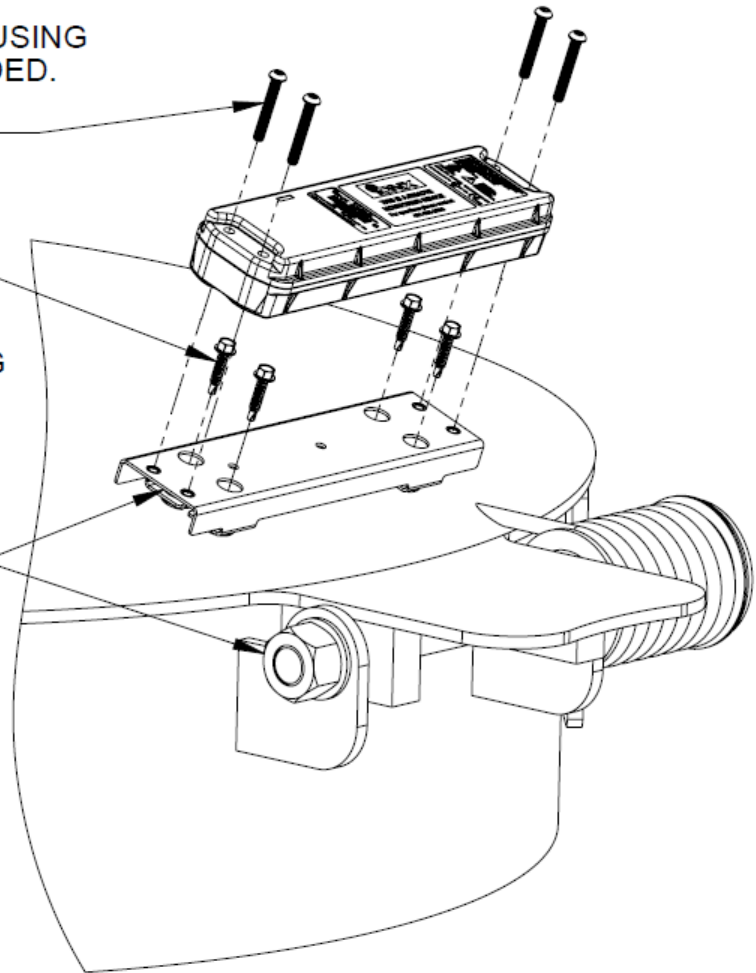
### **STEP 2**

FASTEN UNIT TO BRACKET USING SECURITY FASTENERS PROVIDED. TORQUE SCREWS TO 508-565 N/CM [45-50 IN/LBS]

### **STEP 1**

ATTACH BRACKET USING SELF TAPPING SCREWS PROVIDED. SEE NOTE 1 FOR ADDITIONAL MOUNTING OPTIONS. SEE SHEET 2 OF DRAWING FOR MOUNTING HOLE LOCATIONS. SEE NOTE 4

ATTACH BRACKET TO LID PARALLEL TO THE HINGE AS SHOWN.



### NOTES:

1. ADDITIONAL MOUNTING OPTIONS:
  - HOLES CAN BE DRILLED AND TAPPED IN THE RAIL CAR AND CUSTOMER SUPPLIED 1/4-20 FASTENERS USED TO FASTEN THE BRACKET.
  - THROUGH HOLES CAN BE DRILLED IN RAIL CAR AND CUSTOMER SUPPLIED 1/4-20 BOLTS, NUTS, AND LOCKWASHERS USED TO FASTEN THE BRACKET.
2. ENSURE MOUNTING SURFACE IS FREE OF ANY IMPERFECTIONS THAT MAY PREVENT THE BRACKET FROM MATING FLUSH TO THE SURFACE.
3. WHEN LOCATING THE BRACKET ON THE LID ENSURE THAT IT WILL NOT INTERFERE WITH THE OPERATION OF THE LID OR ASSOCIATED HARDWARE.
4. IF REQUIRED, PLACE THE SUPPLIED VINYL CAPS OVER THE TIPS OF THE SCREWS PROTRUDING THROUGH THE INSIDE OF THE LID.

## A.5 E4S and E5S J-Bolt Mounting

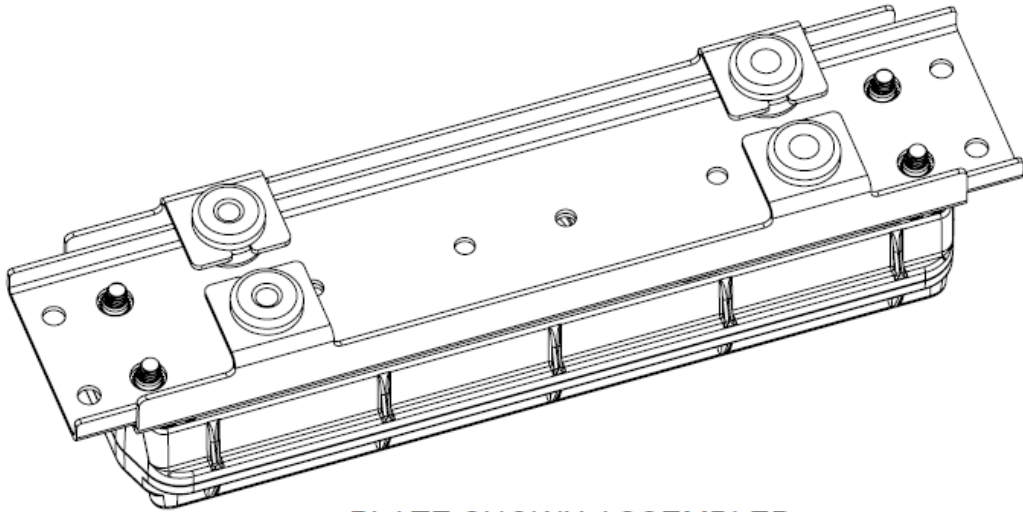
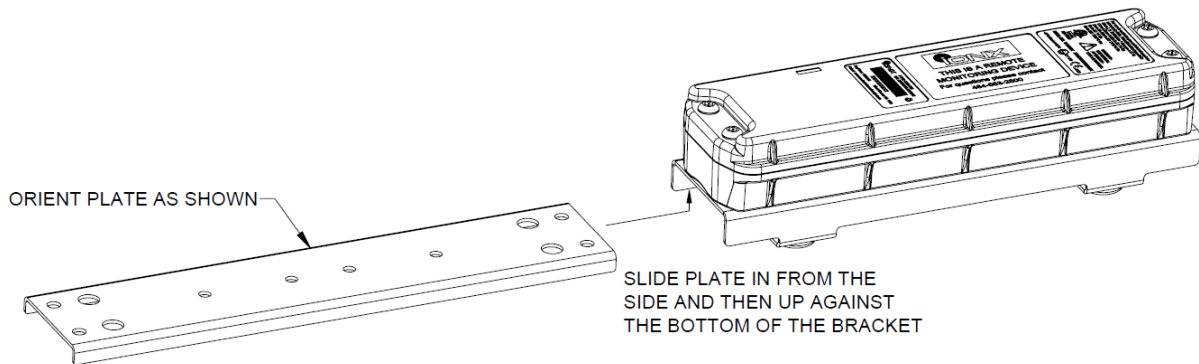
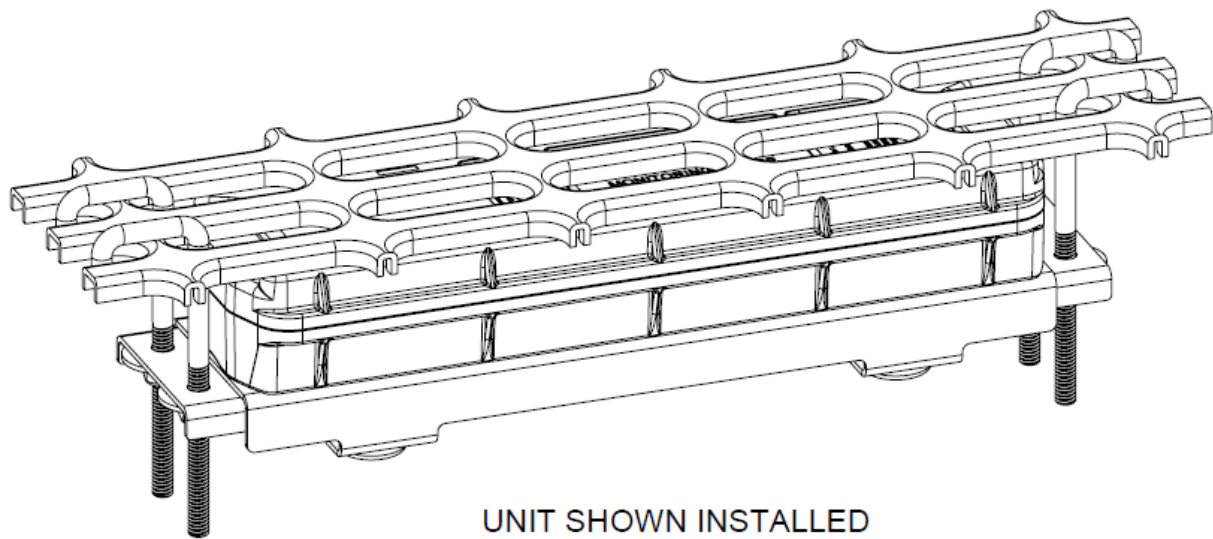
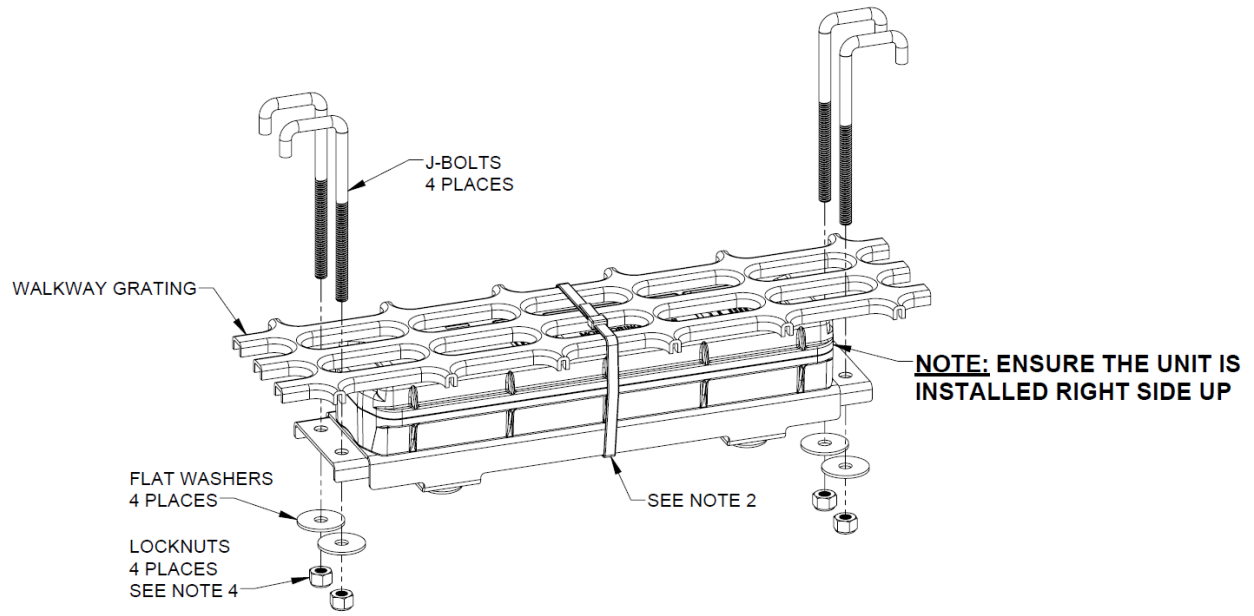


PLATE SHOWN ASSEMBLED

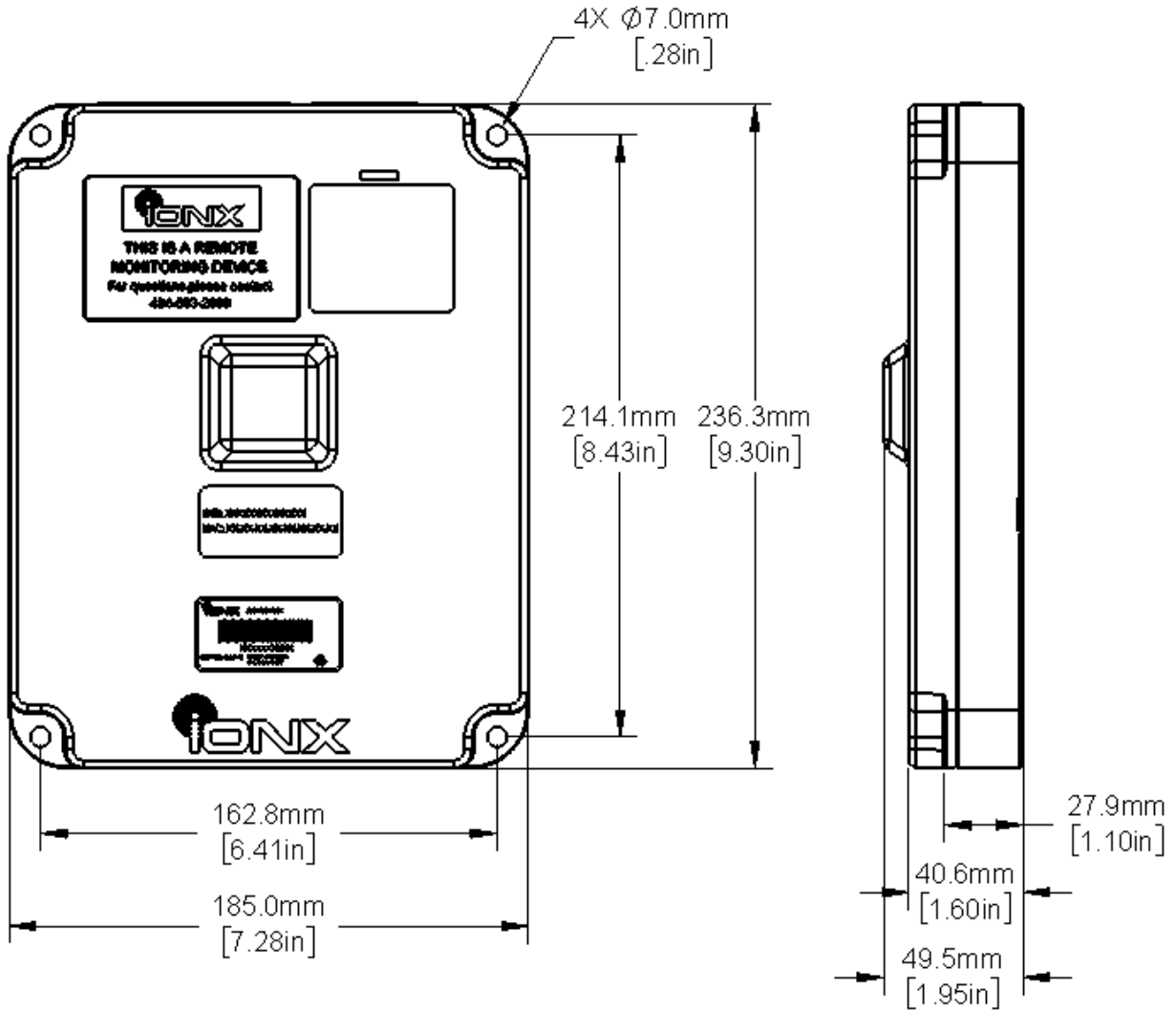
**NOTES:**

1. PRE-ASSEMBLE J-BOLTS TO THE UNIT PRIOR TO MOUNTING.
2. PLASTIC CABLE TIE CAN BE USED TO TEMPORARILY HOLD THE UNIT IN PLACE UNTIL J-BOLTS ARE SECURE.
3. UNIT CAN BE INSTALLED AT AN ANGLE TO THE GRATING AND J-BOLTS ROTATED IF REQUIRED FOR THEM TO PROPERLY CLAMP TO THE GRATING.
4. TIGHTEN NUTS TO 508-565 N/CM [45-50 IN/LBS]

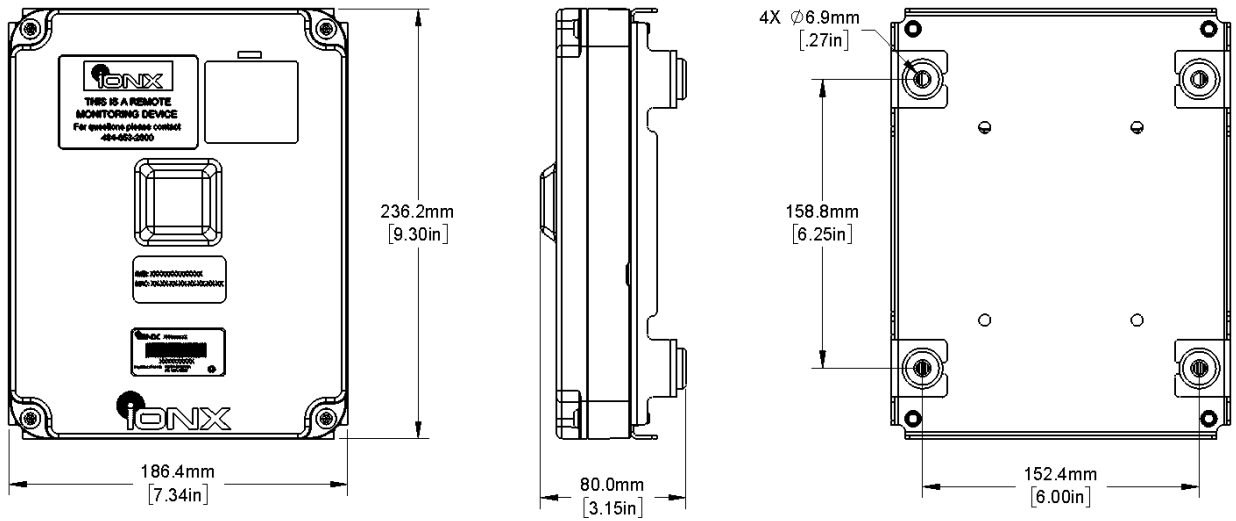


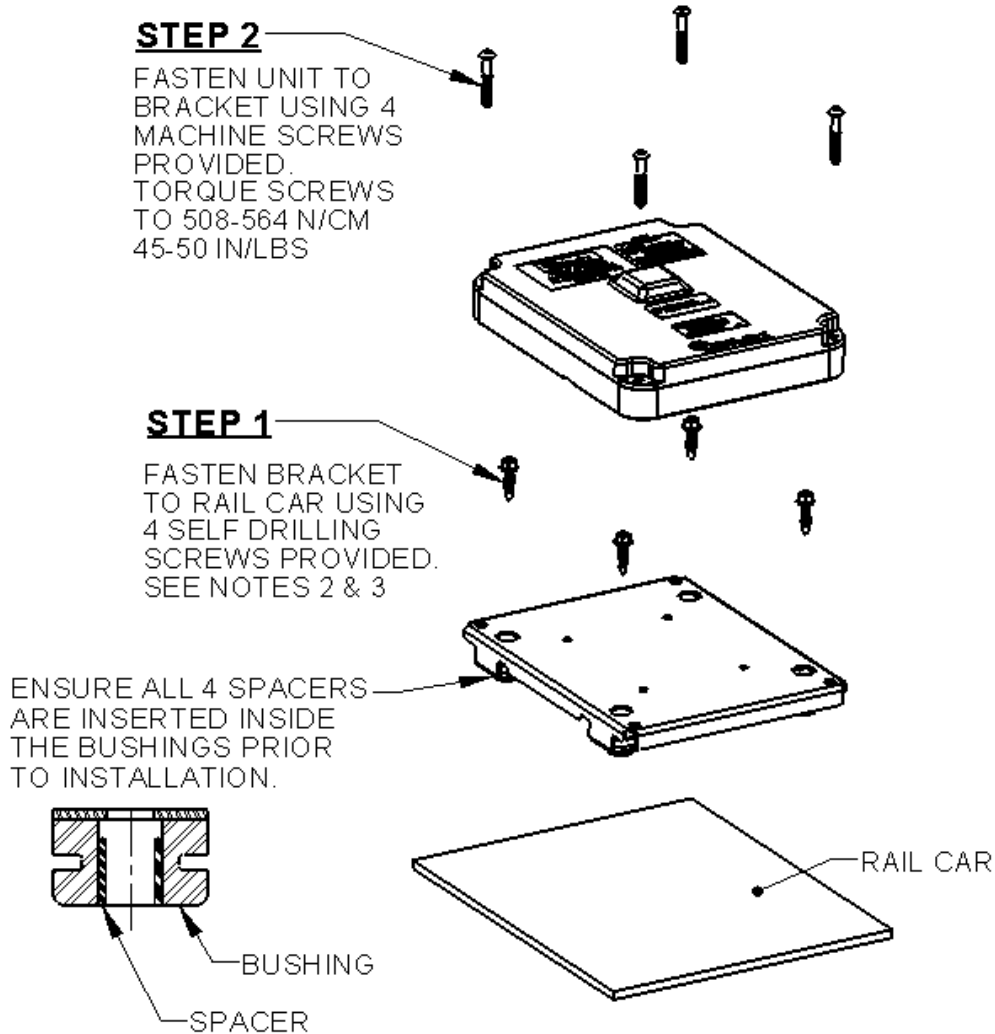


## A.6 E4X, E5X and E6X Dimensions



## A.7 E4X, E5X and E6X Installation with Bracket





NOTES:

1. ENSURE MOUNTING SURFACE IS FREE OF ANY IMPERFECTIONS THAT MAY PREVENT THE BRACKET FROM MATING FLUSH TO THE SURFACE.
2. NOTE: IF MOUNTING ON A TANK CAR DRILL A 3/16" TEST HOLE AT ONE OF THE MOUNTING SCREW LOCATIONS TO TEST FOR THE DISTANCE BETWEEN THE JACKET AND THE INNER TANK. THIS OPERATION SHOULD BE PERFORMED WITH A DRILL STOP COLLAR ON THE DRILL BIT SET TO APPROXIMATELY 1/2". USE A SMALL ROD OR OTHER OBJECT TO DETERMINE THE DISTANCE BETWEEN THE JACKET AND INNER TANK. DO NOT PROCEED IF THERE IS LESS THAN 1 1/8".
3. AFTER INSTALLING SCREWS, REMOVE THE SCREWS, APPLY SILICONE SEALANT IN AND AROUND THE HOLES, AND REINSTALL THE SCREWS MAKING SURE TO USE THE EXISTING THREADS.



## A.8 E4X, E5X, and E6X Dome Mounted

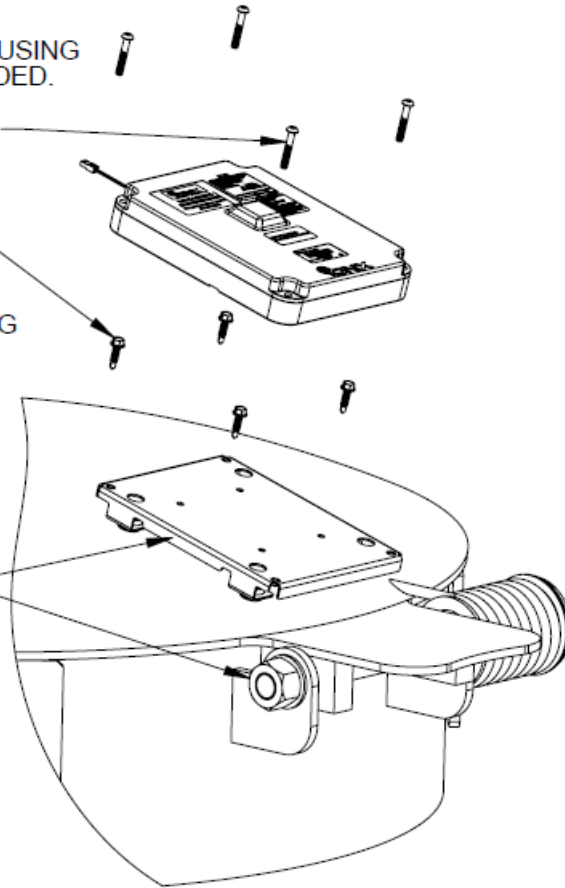
### **STEP 2**

FASTEN UNIT TO BRACKET USING SECURITY FASTENERS PROVIDED. TORQUE SCREWS TO 508-565 N/CM [45-50 IN/LBS]

### **STEP 1**

ATTACH BRACKET USING SELF TAPPING SCREWS PROVIDED. SEE NOTE 1 FOR ADDITIONAL MOUNTING OPTIONS. SEE SHEET 2 OF DRAWING FOR MOUNTING HOLE LOCATIONS. SEE NOTE 4

ATTACH BRACKET TO LID PARALLEL TO THE HINGE AS SHOWN.



### NOTES:

1. ADDITIONAL MOUNTING OPTIONS:
  - HOLES CAN BE DRILLED AND TAPPED IN THE RAIL CAR AND CUSTOMER SUPPLIED 1/4-20 FASTENERS USED TO FASTEN THE BRACKET.
  - THROUGH HOLES CAN BE DRILLED IN RAIL CAR AND CUSTOMER SUPPLIED 1/4-20 BOLTS, NUTS, AND LOCKWASHERS USED TO FASTEN THE BRACKET.
2. ENSURE MOUNTING SURFACE IS FREE OF ANY IMPERFECTIONS THAT MAY PREVENT THE BRACKET FROM MATING FLUSH TO THE SURFACE.
3. WHEN LOCATING THE BRACKET ON THE LID ENSURE THAT IT WILL NOT INTERFERE WITH THE OPERATION OF THE LID OR ASSOCIATED HARDWARE.
4. IF REQUIRED, PLACE THE SUPPLIED VINYL CAPS OVER THE TIPS OF THE SCREWS PROTRUDING THROUGH THE INSIDE OF THE LID.

## Appendix B: Validating the Installation

Validating the installation is an optional step that will allow new installers to confirm the installation was completed correctly. Validation is done with the IONX Totally Autonomous Reporting Agent (TARA) or with IONXlive.net.

### B.1. Before starting:

Contact the IONX Support Center (Appendix D) to make sure your email address is registered to use TARA and IONXlive.net.

### B.2 Install Validation using IONXlive.net

B.2.1 Navigate to [www.IONXlive.net](http://www.IONXlive.net) and login if a username and password has been supplied.

B.2.2 Using the tracking navigator tree view on the left (See Figure B.1):

B.2.2.1 Find the unit being validated and click on the name.

B.2.2.2 If you have not associated the CMU with the car name the unit will appear as the serial number on the website.

B.2.2.3 If you have associated the car with the CMU the unit will appear as the car name on the website.

B.2.2.4 If you cannot find the unit serial number or the car name in the tracking navigator please contact the IONX Support Center (Appendix D).



Figure B.1 Selection of a car with the tracking navigator

- B.2.3 Select serial number or the car name. The message pane in the lower right will update with the latest messages (Figure B.2)

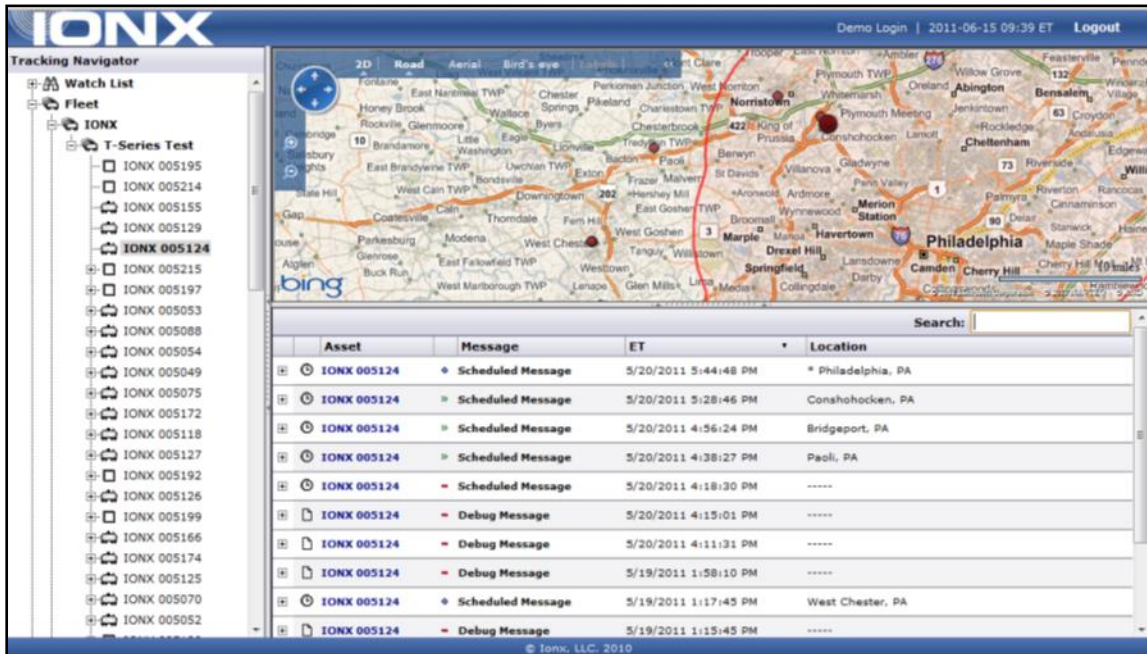


Figure B.2: IONXlive.net displaying the latest asset information

- B.2.4 If the installation was completed successfully, there should be a recent message from the device. If the message does not show up on the website please contact the IONX Support Center (Appendix D).
- B.2.5 If a recent message is shown on IONXlive.net the installation was successful.

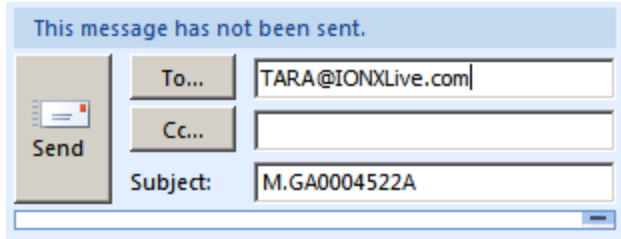
### B.3 Install validation using TARA

**Note:** TARA is case insensitive. Upper case or lower case letters may be used in the subject line or address.

- B.3.1 Find the **device serial** number of the CMU being installed.
- B.3.2 Start a new email message
- **To:** type [TARA@IONXLive.com](mailto:TARA@IONXLive.com)
  - **Subject:** type 'M' or 'm' followed by a period '.' And the CMU serial number (See Figure B.3)

**Example:** M.SerialNumber

**Example:** M.GA0004522A



This message has not been sent.

Send

To... TARA@IONXLive.com

Cc...

Subject: M.GA0004522A

Figure B.3: Sample Email Request to TARA

### B.3.3 Send the email message

B.3.3.1 A response email will be sent from TARA confirming:

B.3.3.2 The subscription to TARA for the CMU

B.3.3.4 Example Below-Figure B.4

**From:** IONXLive Totally Autonomous Reporting Agent [mailto:TARA@ionxlive.net]  
**Sent:** Thursday, February 27, 2014 3:57 PM  
**To:** Christian, Heather  
**Subject:** Automated Report: M.GA0004522A

Monitoring GA0004522A for 8 hours.

**\*\*This is an automated report email, responding to this message will re-issue the same command.**

Figure B.4: Sample Email Response from TARA

- B3.4 A second email will be sent from TARA, which is the most recent location report sent from the CMU.
  - B.3.4.1 The message will likely show a location message from where the IONX production facility is located.
  - B.3.4.2 Disregard this message
  - B.3.4.3 See Figure B.5

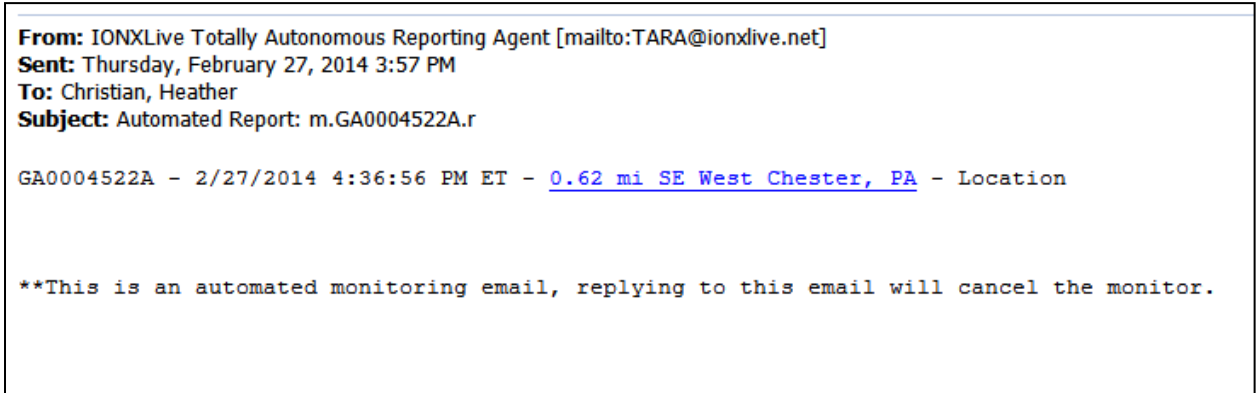


Figure B.5 Sample TARA Message

- B.3.5 TARA now is configured to monitor the CMU. Repeat the process for all the CMUs being installed today
- B.3.6 The installation was successful if you find TARA emails for power up messages time stamped the same time the CMU was activated.

## Appendix C: Replace command

The IONX Totally Autonomous Reporting Agent (TARA) is used to associate the car number with the CMU. If an IONX GPS device has already been installed on the car and associated, the replace command will be used. This is completed by email using an email-enabled smart phone or any computer with email access.

### C.1 Before starting

- C.1.1 Confirm your email address is set-up in the IONX TARA system by emailing [tara@ionxlive.com](mailto:tara@ionxlive.com) with “help” in the subject line.
- C.1.2 If there is no reply, contact the IONX Support Center (Appendix D) to get your email address set-up to use TARA and IONXlive.net.

### C.2 Associating the Car Number to the CMU.

#### C.2.1 Start a new email message

- **To:** type [TARA@IONXLive.net](mailto:TARA@IONXLive.net)
- **Subject:** type
  - 'R' or 'r'
  - Period '.'
  - The **serial number** of the old replaced CMU
  - Period '.'
  - The **serial number** of the new CMU being installed
  - Period '.'
  - The **Car initials**
  - Period '.'
  - The **Car number** which the CMU is installed on

**Example:**

**R.OldSerialNumber.NewSerialNumber.CarInitial.CarNumber**

**Example: R.1234A. E6AA015000.ABCX.1234**

#### C.2.2 Send the message

C.2.3 A response message confirming the installation will be sent from TARA. See example email in below:

```
Success!

Unit 1234A has been replaced by E6AA015000 for
ABCX.1234. If this has been done in error -
Contact Customer Service at IONX - 484-653-2600.

**This is an automated report email, responding to
this message will re-issue the same command.
```

**Sample Installation Response**

C.2.4 The CMU is associated with the car number. The installation is complete. The car now can be released into service.

## Appendix D: General Information

### **D1. IONX Support Center**

An IONX Customer Service Representative can be reached via the following communication methods:

Phone (local): +1-484-653-2600, press 1 for Customer Service

Phone (toll-free): 1-800-621-8442

Email: [supportcenter@ionxlive.com](mailto:supportcenter@ionxlive.com)

Or

[supportcenter@amsteddigital.com](mailto:supportcenter@amsteddigital.com)

### **D2. Forcing the CMU to call**

If there is a problem verifying messages on the website or through TARA, the CMU can be forced to call for 24 hours after removing the installation magnet. Place the installation magnet onto the indentation, where it was located, at the time of shipping for 30-seconds then remove. The CMU should send a report within 15-minutes. If TARA is active for the CMU and no reports are received by email or on the website, contact the IONX Support Center.



**D3. Overview of CMU physical features**



## Appendix E: Trouble Shooting

### **E1. Missed Wake-up Message**

If the wakeup message does not show up through TARA within 30-minutes of the magnet being removed, another message can be forced to be transmitted within 24 hours of the installation magnet being removed. See Appendix D3 –General Information on “Forcing the CMU to Call.”

### **E2. Opening and closing the hatch is not triggering an alarm**

- E.2.1 If CMU was not installed in its final position within the 5-minute mounting period window after removing the installation magnet, an open/close hatch will not trigger an alarm. Contact the IONX Support Center (Appendix D) so a Customer Service Representative can correct the home position of the CMU.
- E.2.2 The CMU configuration is not set correctly. The CMU may not have been configured to report open/close or tilt alarms inside facilities where authorized personal will typically be handling cars. Contact the IONX Support Center (Appendix D) so a Customer Service Representative can check the configuration of the CMU.

### **E3. Unit does not appear on IONXlive.net**



- E.3.1 If the asset does not appear on IONXlive.net it could be a limitation of the user’s login id. Contact the IONX Support Center (Appendix D) so a Customer Service Representative can check the permission level and adjust accordingly.
- E.3.2 Initially the asset will be shown on IONXlive.net as the CMU serial number. When the CMU is associated to an asset, the CMU serial number will be replaced by the car name.

### **E4. Power up message missing on IONXlive.net**

If the CMU misses a power up message but has a recent message showing the current location, then the CMU is OK to install.

## Appendix F: Battery Replacement

### Required Tools/Materials

Tool Name (Part No)	Description
T-20 Torx driver with torque capability of 22-24 in/lbs	
7.2V Power Supply or Wall Wart	

**Warning:** Case can build up electrostatic charge. Clean the case by spraying with water. Do not use cloth to clean the CMU. Remove CMU to area known to be non-hazardous.

**ATTENTION:** Le boîtier peut accumuler une charge électrostatique. Nettoyez le boîtier en pulvérisant de l'eau. N'utilisez pas de chiffon pour nettoyer le CMU. Retirer la CMU dans une zone connue comme non dangereuse.

**WARNING:** Do not open CMU in potentially explosive atmosphere.

**ATTENTION:** N'ouvrez pas la CMU dans une atmosphère potentiellement explosive.

F.1. Turn the CMU unit over and remove the 4 T-20 Torx screws (IONX P/N 300842) that hold the lid in place. See Figure F.1 below.

Figure F.1



F.2. Carefully turn the unit over, being sure to hold the lid in place, as you do so.

F.3. Remove the lid, and set it aside. Inspect the enclosure and seal as directed by Appendix G. Figure F.2 below.



Figure F.2

F.4. Carefully lift the power cable from beside the main board and disconnect the battery. Figure F3.



Figure F.3

F.5. Remove the battery pack, and set aside.

**WARNING: DO NOT PLACE USED HAZARDOUS BATTERY PACKS IN THE TRASH. THESE SHOULD BE TAKEN TO A RECYLCING FACILITY THAT CAN PROPERLY DISPOSE OF THEM.**

**ATTENTION: NE PLACEZ PAS LES PACKS DE BATTERIE DANGEREUX UTILISES DANS LA POUBELLE. CES DERNIERS DOIVENT ETRE UTILISES DANS UNE INSTALLATION DE RECYCLAGE QUI PEUT LES DISPOSER CORRECTEMENT.**

F.6. Connect a 7.2V power supply or wall wart to the power cable of the core module for a **minimum of 5 minutes** (preferably more) to pre-charge the core, and prevent errors once the new battery is connected.

F.7. Disconnect the power supply and select a new battery pack to install.

**WARNING: BATTERY PACK 303382: USE ONLY WITH IONX MODELS E4S and E5S.**

**WARNING: BATTERY PACK 303406: USE ONLY WITH IONX MODELS E4X, E5X, and E6X.**

**ATTENTION: BATTERY PACK 303382: N'UTILISER QUE SUR LES MODÈLES IONX E4S et E5S.**

**ATTENTION: BATTERY PACK 303406: À UTILISER UNIQUEMENT SUR LES MODÈLES IONX E4X, E5X et E6X.**

From your email account (the one you have registered for the IONXLive web site with), start a new email:

- Enter 'TARA@ionxlive.net' in the 'To' recipient text box.
- In the 'Subject' line of the email, enter the command for TARA in the following format:
  - *B.CMUSerialNumber.OldBatterySerialNumber.NewBatterySerialNumber*
- When done, press 'Send'. See Figure F.4 below.

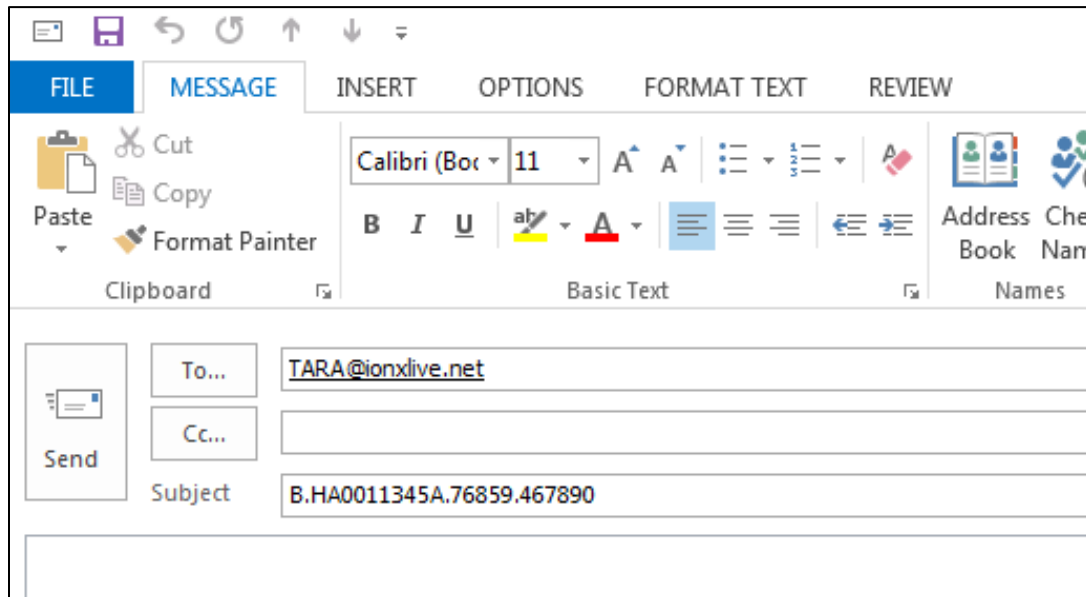


Figure F.4

F.8. Within a few minutes, TARA will email back with either an error message or a message to say that the command was successful. If successful, continue with Step F.9 below. If an error message is received, start over at Step F.7 above. If the error message persists, contact IONX Customer Service at (800) 621-8442.

- F.9. Install the new battery pack from Step F.7 above into battery chamber so that the connector is facing main board, as shown in Figure F.5 below.



Figure F.5

- F.10. Connect the battery to the core module.  
F.11. Confirm device activation message was received using IONX E-series phone application.  
F.12 Tuck the serial and power cables in the case.  
F.13. Place the lid on the base enclosure as shown in Figure F.6 below.

**WARNING: ENSURE NO CABLES ARE PINCHED BETWEEN THE LID AND BASE WHEN COVERING.**

**ATTENTION: ASSUREZ-VOUS QUE LES CÂBLES NE SONT PAS BRISÉS ENTRE LE COUVERCLE ET LA BASE LORS DE LA COUVERTURE.**



Figure F.6

- F.14. Press down on the lid around the edges to insure the O-Ring is fully seated.  
F.15. Turn assembly over, and using the 4 #8-16 Plastite screws you removed in step 0 above, attach lid to base enclosure.

**WARNING: SLOWLY TURN THE SCREWS COUNTER-CLOCKWISE UNTIL YOU FEEL THEM CLICK INTO THE EXISTING THREAD BEFORE TIGHTENING TO**

**ENSURE HOLE IS NOT RE-THREADED. FAILURE TO DO THIS WILL STRIP THE THREADS.**

**MISE EN GARDE: TOURNER LENTEMENT LES VIS DANS LE SENS ANTIHORAIRE JUSQU'À CE QUE VOUS SENTEZ CLIQUER DANS LE FILET EXISTANT AVANT DE LE SERRER POUR VOUS ASSURER QUE LE TROU NE SOIT PAS RETIRÉ. LE FAIT DE NE PAS FAIRE CECI FERMERA LES FILS.**

F.16. Tighten screws to a torque of 22.0-24.0 in/lbs.

## **Appendix G: Inspection of Equipment for Return to Service**

- G.1. Enclosure base and lid shall be free of cracks.
- G.2. O-ring shall be free of cracks. If any part of the o-ring is removed, the o-ring gland must be cleaned to be free of particulates.
- G.3. Clean enclosure base top of o-ring surface with damp cloth.
- G.4. Clean enclosure lid o-ring bump out with damp cloth.
- G.5. Inspect power wires. Insulation shall be free of cracks.
- G.6 Inspect NFC antenna and wire. Both shall be free of cracks.
- G.7 Inspect circular Gore vent under enclosure base. Gore vent shall show no evidence of peeling, puncture or cracking.
- G.8 E6X version only: Inspect coax cable and antenna. Both shall be free of cracks.
- G.9 Replace any parts that fail inspection.
- G.10 Replace lid if enclosure screws have stripped threads.



## Appendix H: Compliance Requirements

### Intrinsic Safety Compliance

Conforms To

UL STDS 913, 60079-0, & 60079-11

Certified To

CSA STD C22.2 # 157, 60079-0, 60079-11, & 25

### Electromagnetic Compliance

**For Part Number ending in “3010”:**

**FCC ID 2ADEPCMUE5-A applies to CMU devices marked CMU-E5X and CMU-E5S.**

**FCC ID 2ADEPCMUE6-A applies to CMU devices marked CMU-E6X.**

**FCC ID R17HE910 applies to CMU devices marked CMU-E4S, CMU-E4X, CMU-E5S, CMU-E5X and CMU-E6X.**

**For Part Number ending in “4011”:**

**FCC ID 2ADEPCMUE5-B applies to CMU devices marked CMU-E5X and CMU-E5S.**

**FCC ID 2ADEPCMUE6-B applies to CMU devices marked CMU-E6X.**

**FCC ID R17ME910C1WW applies to CMU devices marked CMU-E4S, CMU-E4X, CMU-E5S, CMU-E5X and CMU-E6X.**

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.

NOTE: THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

NOTE: This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.

**Pour le Numéro de Pièce se terminant “3010” :**

**Numéro de certification d'Industrie Canada IC: 12436A-CMUE5A s'applique aux appareils CMU marqués CMU-E5X et CMU-E5S.**

**Numéro de certification d'Industrie Canada IC: 12436A-CMUE6A s'applique aux appareils CMU marqués CMU-E6X.**

**Numéro de certification d'Industrie Canada IC: 5131A-HE910 s'applique aux appareils CMU marqués CMU-E4S, CMU-E4X, CMU-E5S, CMU-E5X et CMU-E6X.**

**Pour le Numéro de Pièce se terminant “4011” :**

**Numéro de certification d'Industrie Canada IC: 12436A-CMUE5B s'applique aux appareils CMU marqués CMU-E5X et CMU-E5S.**

**Numéro de certification d'Industrie Canada IC: 12436A-CMUE6B s'applique aux appareils CMU marqués CMU-E6X.**

**Numéro de certification d'Industrie Canada IC: 5131A-ME910C1WW s'applique aux appareils CMU marqués CMU-E4S, CMU-E4X, CMU-E5S, CMU-E5X et CMU-E6X.**

*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

**For Part Number ending in “3010”:**

**Industry Canada Certification Number IC: 12436A-CMUE5A applies to CMU devices marked CMU-E5X and CMU-E5S.**

**Industry Canada Certification Number IC: 12436A-CMUE6A applies to CMU devices marked CMU-E6X.**

**Industry Canada Certification Number IC: 5131A-HE910 applies to CMU devices marked CMU-E4S, CMU-E4X, CMU-E5S, CMU-E5X and CMU-E6X.**

**For Part Number ending in “4011”:**

**Industry Canada Certification Number IC: 12436A-CMUE5B applies to CMU devices marked CMU-E5X and CMU-E5S.**

**Industry Canada Certification Number IC: 12436A-CMUE6B applies to CMU devices marked CMU-E6X.**


**Industry Canada Certification Number IC: 5131A-ME910C1WW applies to CMU devices marked CMU-E4S, CMU-E4X, CMU-E5S, CMU-E5X and CMU-E6X.**

*This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:*


*(1) This device may not cause interference; and*

*(2) This device must accept any interference, including interference that may cause undesired operation of the device.*

## Appendix I: Declaration of Conformity



# Declaration of Conformity




We, IONX LLC, 300 Willowbrook Lane, West Chester, PA 19382 USA declare under the sole responsibility that our Communications Management Units CMU-E4S, CMU-E4X, CMU-E5S, CMU-E5X, AND CMU-E6X, to which this declaration relates, are in conformity with the following standards when installed per the device installation requirements.

**1. ATEX Directive 2014/34/EU**


- Equip. Gr. II Cat. 1G, Ex Ia IIC T4 Ga, -40°C ≤ Ta ≤ 55°C
- Equip. Gr. II Cat. 1D, Ex Ia IIIC T135°C Da

Intertek Cortland NY  
EC Type Examination, Certificate Number: ITS17ATEX22312X  
IECEX Certificate Number: IECEX ETL 17.0037X  
The design was assessed to the below standards:

IECEX	ATEX
IEC 60079-0:2011 Ed 6+CORR1+CORR2	EN 60079-0:2012+A11:2013
IEC 60079-11:2011 Ed 6+CORR1	EN 60079-11:2012



- II 1 GD
- -40°C ≤ Tamb ≤ 55°C




0518

**2. North America**

Intertek Cortland NY

- Class I Division 1 Group A,B,C,D T4
- Class II, III Division 1 Group E,F,G T135°C
- Class I Zone 0, AEx Ia IIC T4 Ga
- Class II Zone 20, AEx Ia IIIC T135°C Da
- -40°C ≤ Tamb ≤ 55°C

Canada Requirements	USA Requirements
CSA-C22.2 No 157-92 +G1;U2	UL 913 (8th Ed.)R:16Oct2015
CSA-C22.2 No 60079-0:15	ANSI/UL 60079-0:13+R:20Oct2017
CSA-C22.2 No 60079-11:14	ANSI/UL 60079-11:13+R:28Mar2014
CSA C22.2 No. 25-1966 +G1	



5011609


**3. EMC Directive 2004/108/EC**

EN 55016-2-3 (EN 55022)	Radiated Emissions, 30 MHz to 6 GHz	Part 2-3
EN 61000-4-2	Electrostatic Discharge	Part 4-2
EN 61000-4-3	Radiated Immunity, 27 MHz to 1 GHz, 1.4 to 2.5 MHz	Part 4-3
EN 61000-4-6	Electromagnetic compatibility testing and measurement techniques	Part 4-6
EN 50121-3-2:2006	Railway applications – Electromagnetic compatibility – Part 3-2: Rolling Stock – Apparatus	Part 3-2, 2006

**4. Other Standards**

ETSI EN 301 489-1 V 1.8.1 (2008-04)	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements	Part 1, 2008
ETSI EN 301 489-3 V1.4.1 (2002-08)	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz	Part 3, 2002
CFR, Title 47	Code of Federal Regulations, Telecommunications Radio Frequency Devices	Part 15
CFR, Title 47	Code of Federal Regulations, Telecommunications, Part 2, Frequency Allocations and Radio Treaty Matters; General Rules and Regulations	Part 2
ANSI C63.4:2003	American National Standard, Methods of Measurement of Radio - Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2003
ICES-003	Industry Canada, Interference - Causing Equipment Standard	Issue 4
ISO 7637-2: 2004	Road vehicles - Electrical disturbances from conduction and coupling -Part 2: Electrical transient conduction along supply lines only	Part 2, 2004
CISPR 16	Specification for Radio Disturbance and Immunity Measuring Apparatus and Methods	
MIL-PRF-15733	Filters and Capacitors, Radio Frequency Interference, General Specifications for	H
AAR S-9401	AAR, Manual of Standards and Recommended Practices, Section K –Part I, Railway Electronics	Section K, Part 1, 2005
Directive 2011/65/EU	ROHS Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment. First year of CE marking 2018.	

The manufacturer bears full responsibility for the production conformity to the requirements stated in the declaration.

Signature: 

Edward J. Mansfield, General Manager

Date: 10 May 2018

720-00016 Declaration of Conformity, E-Series CMU  
Revision date: 10-May-18

Page 1 of 1  
Revision: B



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