



# ARMORED 300c



## 1 PRODUCT DESCRIPTION

The patent-pending **TROI Armored 300c** provides identification and tracking capabilities never-before available in rugged or hazardous use-areas.

Not only can the tag be mounted to any metallic surface by either welding or bolting the tag, but it can withstand unprecedented temperature (consistent temperatures of 300 degrees Centigrade), pressure and environmental conditions.

### 1.1 SPECIFICATIONS

<b>Device type</b>	Class 1 Generation 2 passive UHF RFID transponder
<b>Air interface protocol</b>	EPCGlobal Class1Gen2; ISO 18000-6C (-63)
<b>Operational frequency</b>	865-869 MHz (EU) 902-928 MHz (US)
<b>IC options</b>	<b>Standard:</b> Alien Higgs 3 Optional: NXP UCODE G2XM, Impinj Monza4QT
<b>EPC memory</b>	<b>Standard:</b> 128 bit Optional: Up to 240 bit
<b>EPC memory content</b>	Unique 96-bit number encoded
<b>Extended memory</b>	512 bit
<b>TID</b>	Factory-programmed, non-changeable, unique 64-bit ID.
<b>Read range</b>	Real-world: 1 – 2 meters, depending on attachment Lab environment: 6 meters +
<b>Applicable surfaces</b>	Any material. Metal surfaces; ferrous and non-ferrous.
<b>Material</b>	Shell: Nickel-plated steel shell with high-temperature ceramic filler Spacer: High temperature plastic
<b>Weight</b>	Steel shell RFID tag; 1 oz. Steel shell RFID tag with mounting tab; 2 oz.
<b>Standards compliancy</b>	ISO 17665 – Sterilization of Health Care Products – Moist Steam ISO 11135 - Sterilization of Health Care Products – Ethylene Oxide ATEX-compliant
<b>Product RoHS compliant?</b>	Yes

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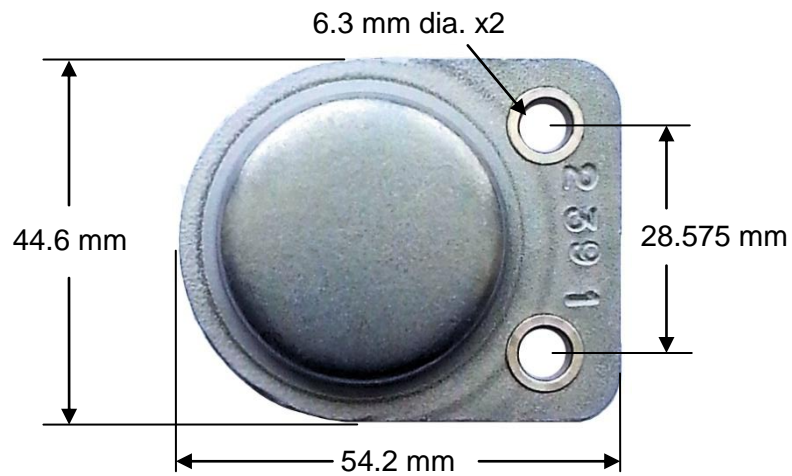


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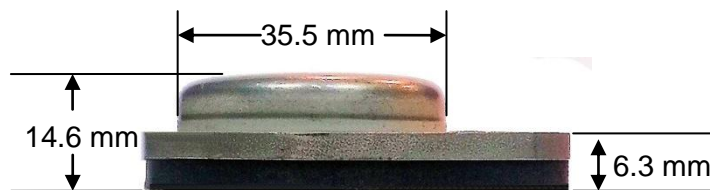


## 1.2 DIMENSIONS

### PLAN VIEW



### PROFILE VIEW



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## 1.3 READ RANGE

	Max read range on metal with 4W ERP
<b>Armored 300c</b> (915 MHz)	660.4 cm / 260 inches (6.63 m / 21.75 feet)

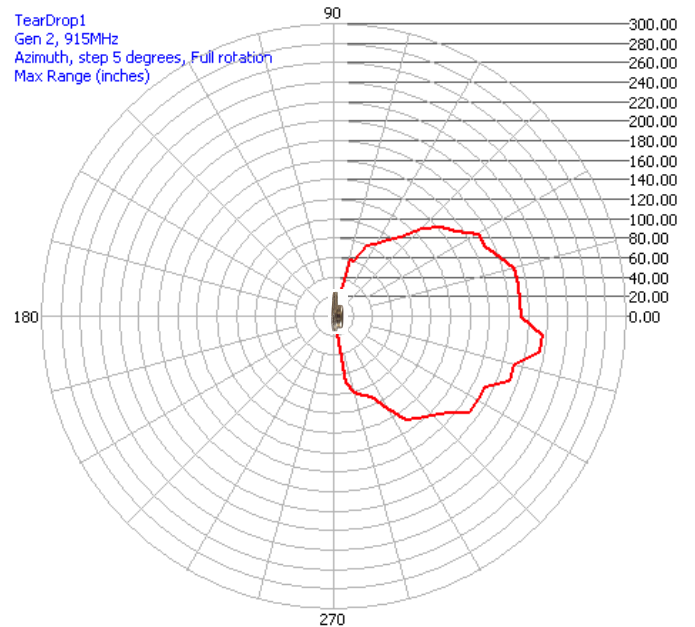
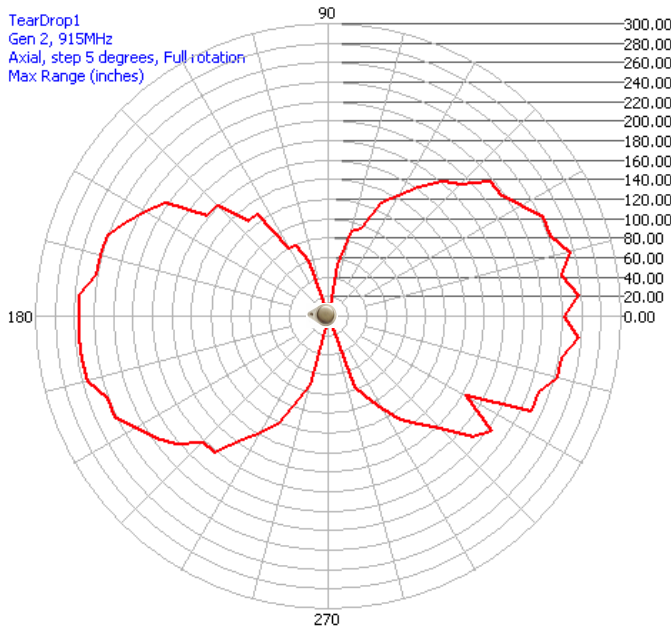
The read range listed above was obtained from a lab test environment. Actual test results may be different. Testing in actual use environments is strongly recommended.

## 1.4 RADIATION PATTERN

Axial radiation pattern; obtained in anechoic test laboratory.

Actual in-use radiation pattern may vary.

Testing in actual use environments is strongly recommended.





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## 1.5 ENVIRONMENTAL SPECIFICATIONS

Operating temperature	-50°C to +300°C / -50°F to +600 °F*
Peak temperature	+350°C / +700°F @ 1 hour duration
Temperature Cycling Test	6 Hours at 300 deg C; 18 hour cool-down; 30-day test cycle.
IP classification	IP68: <ul style="list-style-type: none"> <li>- Complete protection against dust</li> <li>- Protection against continuous immersion in water (Tested for 5 hours in 1 m [3.3 ft] depth)</li> </ul>
Weather ability	Excellent, including UV-resistance and sea water immersion
Pressure resistance	Embedded RFID tag tested to 30,000psi for 30 days
Chemical resistance	No physical or performance changes in: <ul style="list-style-type: none"> <li>- Salt water</li> <li>- NaOH)</li> <li>- Sulfuric acid</li> <li>- Motor oil (tested in 168 hour exposure)</li> </ul> Generally good against: <ul style="list-style-type: none"> <li>- Most solvents</li> <li>- Most acids and bases</li> </ul>

**\* NOTE:**

The RFID tag will not be functional if it is left at the maximum indicated temperatures such that the internal soak temperature exceeds +80 deg C. The RFID tag itself will function between -50 deg C and +80 deg C.

The Armored 300c casing reflects the heat and will protect the RFID tag at the elevated temperatures and the RFID tag will be functional until the tags internal temperature exceeds +80 deg C. The Armored 300c tags cool-down time is significantly accelerated, as well. The end result is that the Armored 300c tag will be functional at extreme temperatures.



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## 1.6 SUPPORTING COMPONENTS

### 1.6.1 Armored 300c Welding or Bolting Spacer Bracket

See Section 2 Installation Instructions for further details and pictures

Purpose	Weldable or boltable spacer bracket used to attach Armored 300c to metal surface
Advantages	Weldable: No need to drill mounting holes Boltable: Rugged attachment when unable to weld
Dimensions (Note: Dimensions include spacer material)	54.2 mm Long X 44.6 mm Wide X 14.6 mm Tall (See pictures in Section 1.2)
Material	Stainless steel
Weight	39g

## 1.7 SUPPORTED SERVICES

Several options are available:

- Tag pre-encoding
- Laser engraving

For further details, please contact TROI LLC.



## 1.8 POSSIBLE APPLICATIONS

Metal surfaces	Metal returnable containers, metal canisters, metal pallets, high value metal items, aerospace applications, military applications, etc.
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## 2 INSTALLATION INSTRUCTIONS

### 2.1 TAG PLACEMENT

The Armored 300c tag must be mounted to the metal surface with the metal “cup” pointed up and with no metal covering the tag.

When selecting the mounting location, ensure the following:

- Select an even metal surface so that the entire flat plate of the Armored 300c is in contact with the mounting surface.
- Place the tag in the middle of the largest metal mounting surface available.
- It is recommended that the tag be taped to the metal surface, before welding or bolting the tag, to check orientation and performance.

The Armored 300c’s performance depends on the shape of the metal object and the tags placement on that surface. The above recommendations are valid for flat surfaces. Testing is recommended to verify performance in each use-case.

### 2.2 TAG ATTACHING METHODS

The tag can be either bolted or welded to the metal surface.

#### 2.2.1 Bolting the tag to the metal surface

Bolting achieves effective mounting and retention in various use conditions.

The Armored 300c can be mechanically attached using;

- Screws (size M4)
- Pop rivets (size 4 mm)

##### 2.2.1.1 Critical Bolting Information

The spacer mounted under the Armored 300 provides the needed functional air-gap between the tag and the mounting surface. The tag must be flush with the metal surface and not “bowed”. **DO NOT REMOVE THE SPACER MATERIAL from the bottom of the tag.** Removing the spacer material will keep the tag from operating.

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## 2.2.2 Welding the tag to the metal surface

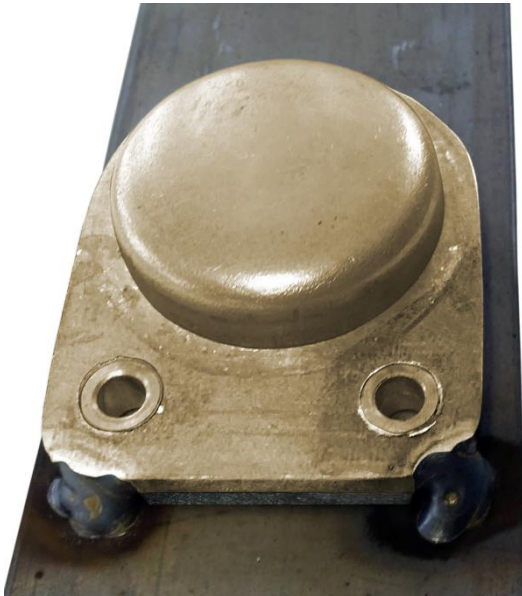
Welding achieves the most effective mounting and retention method. However, the tag must be welded according to the following guidelines, or the RFID tag may not functional correctly (or at all).

### 2.2.2.1 Procedure

The tag should be welded in two “spots” or across the entire end of the tab. See the pictures below.

The tag must NOT be welded all the way around the tag, or in any other area besides the end of the tab - as shown in the pictures below.

Correctly welded “spot” welds



Correctly welded across the end of the tab



### 2.2.2.2 Critical Welding Information

The plastic spacer mounted under the Armored 300c provides the needed functional air-gap between the tag and the mounting surface. The tag must be flush with the metal surface and not “bowed” in any manner. **DO NOT REMOVE THE SPACER MATERIAL from the bottom of the tag.** Removing the spacer material will keep the tag from operating.

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## 3 CONTACTING TROI LLC

For additional information and technical support contact:

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