

## VesseLINK™

### Installation Guide for Certus 350 and Certus 200



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**RECORD OF CHANGES**

| <b>Rev</b> | <b>Date</b> | <b>Description of Change</b>                                                                                                              | <b>Author</b> |
|------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Rev A      | July 2018   | Initial Release                                                                                                                           | SJacques      |
| Rev B      | Sept 2018   | ECN 42140 <ul style="list-style-type: none"> <li>• Update based on Beta user feedback and testing</li> </ul>                              | SJacques      |
| Rev C      | Jan 2020    | ECN 43090 <ul style="list-style-type: none"> <li>• Update includes mounting hardware kit corrections</li> <li>• Added 700 kbps</li> </ul> | SJacques      |
| Rev D      | Oct 2020    | ECN 53618 <ul style="list-style-type: none"> <li>• Update based on new software release 2.2</li> <li>• Updated part numbers</li> </ul>    | SJacques      |
| Rev E      | Feb 2021    | ECN: 53836 <ul style="list-style-type: none"> <li>• Update to include Certus 200</li> </ul>                                               | SJacques      |
| Rev F      | Dec 2021    | ECN: 54407 <ul style="list-style-type: none"> <li>• Expanded Certus 200 sections</li> </ul>                                               | SPeters       |
| Rev G      | May 2022    | ECN 54667 <ul style="list-style-type: none"> <li>• Added Brazil, Mexico and Japan Certs.</li> <li>• Updated pictures</li> </ul>           | SPeters       |
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Prior to installing this product, read and understand this Installation Guide and the User Manual, including the safety warnings and information. Failure to do so could result in serious injury or death.

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**User Documentation:**

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## SAFETY

The Thales VesseLINK™ system should only be installed by a qualified professional installer of Maritime electronic systems. Improper installation could lead to system failure or could result in injury to personnel on board the vessel. The following are general safety precautions and warnings that all personnel must read and understand prior to installation, operation and maintenance of the VesseLINK™ system. Each chapter may have other specific warnings and cautions.



**WARNING**

### **SHOCK HAZARD**

The VesseLINK™ system is a sealed system and is not meant to be opened for repair in the field by operators or technicians. Covers must remain in place at all times on the Below Deck Unit (BDU) and Above Deck Unit (ADU) to maintain the warranty terms. Make sure the system is correctly grounded and power is off when installing, configuring and connecting components.



**WARNING**

### **DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE**

This equipment is not designed to be operated in explosive environments or in the presence of combustible fumes. Operating this or any electrical equipment in such an environment represents an extreme safety hazard.



**CAUTION**

### **LITHIUM ION BATTERIES**

The BDU contains a small Li-ion hold-up battery. Li-ion batteries have a very high energy density. Exercise precaution when handling and testing. Do not short circuit, overcharge, crush, mutilate, nail penetrate, apply reverse polarity, expose to high temperature or disassemble. High case temperature resulting from abuse of the cell could cause physical injury.



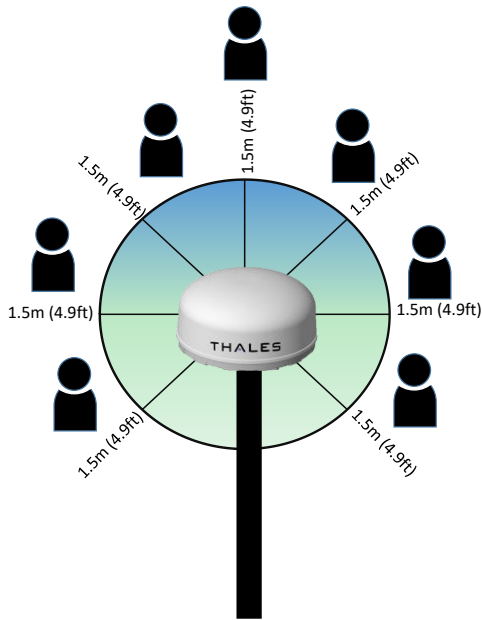
## ANTENNA RADIATION HAZARDS

To comply with FCC Radio Frequency radiation exposure limits, the antenna must be installed at a minimum safe distance as shown below.

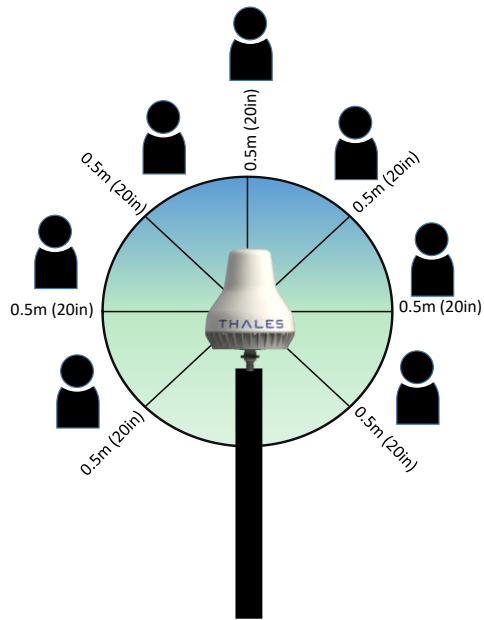
During operation, the antenna radiates high power at microwave frequencies that can be harmful to individuals. While the unit is operating, personnel should maintain a minimum safe distance from the antenna. The antenna should be mounted in an area that prevents the possibility of close exposure to the antenna's radiation.

For the Certus 350 antenna, please remain at least 1.5m (4.9 feet) from the antenna while in operation.

For the Certus 200 antenna, please remain at least 0.5m (20 inches) from the antenna while in operation.



**Certus 350**



**Certus 200**



### **NOTE**

Este Equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em Sistemas devidamente autorizados



## FCC Information



### NOTE

Certus 350  
FCC Identifier: OKCVF350BM  
Contains FCC ID: OKCWROOM32U



### NOTE

Certus 200  
FCC Identifier: OKCVF200BM  
Contains FCC ID: OKCWROOM32U

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

### Note:

This equipment has been tested and found to comply with the limits for a [Class B digital device](#), pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against [harmful interference](#) in a residential installation. This equipment generates, uses and can radiate [radio frequency energy](#) and, if not installed and used in accordance with the instructions, may cause [harmful interference](#) to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause [harmful interference](#) to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Industry Canada Information



**NOTE**

Certus 350  
Industry Canada: 473C-VF350BM  
Contains IC: 473C-WROOM32U



**NOTE**

Certus 200  
Industry Canada: 473C-VF200BM  
Contains IC: 473C-WROOM32U

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

*Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.*

This radio transmitter (473C-VF350BM) has been approved by Industry Canada to operate with the antenna listed in Table 4-1 with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

*Le présent émetteur radio (473C-VF350BM) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.*

This device complies with Industry Canada license-exempt RSS standard(s). 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.

*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.*

## Supplier's declaration of conformity



As required by the following Notices:

- Radiocommunications (Compliance Labelling - Devices) Notice 2014 made under section 182 of the Radiocommunications Act 1992;
- Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2017 made under section 182 of the Radiocommunications Act 1992;
- Radiocommunications (Compliance Labelling – Electromagnetic Radiation) Notice 2014 made under section 182 of the Radiocommunications Act 1992; and
- Telecommunications (Labelling Notice for Customer Equipment and Customer Cabling) Instrument 2015 made under section 407 of the Telecommunications Act 1997.

### Instructions for completion

Do not return this form to the ACMA. This completed form must be retained by the supplier as part of the documentation required for the compliance records and must be made available for inspection by the ACMA when requested.

### Supplier's details

Company Name (OR INDIVIDUAL)

Braco Compliance Pty Ltd

ERAC Responsible Supplier number

E304

Street Address (Australian)

Unit 308, 469-481 High St  
Northcote, VIC 3070

OR

ACN/ARBN

84156023504

### Product details

Product description – brand name, type, current model, lot, batch or serial number (if available), software/firmware version (if applicable)

  
 Maritime Satellite Communications,  
 VesseLINK™, Model VF350BM Terminal with Maritime Antenna.

### Compliance – applicable standards and other supporting documents

Evidence of compliance with applicable standards may be demonstrated by test reports, endorsed/accredited test reports, certification/competent body statements. Having had regard to these documents, I am satisfied the above mentioned product complies with the requirements of the relevant ACMA Standards made under the Radiocommunications Act 1992 and the Telecommunications Act 1997.

List the details of the documents the above statement was made, including the standard title, number and, if applicable, number of the test report/endorsed test report or certification/competent body statement.

|                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Radiocommunications (Electromagnetic Compatibility) Standard 2017, refer MET Laboratories Inc. test report Nos. EMC94508B-ETS489 Rev. 1 dated 15 June 2018 and EMC102479-EN dated 22 April 2019. |
| Radiocommunications (Short Range Devices) Standard 2014, refer SGS Fimko CFR 47 FCC Pt 15.247 test report No. 268892-2 dated 28 June 2012.                                                       |
| ETSI EN 301 441 v2.1.1, refer MET Laboratories Inc. test report No. EMC94508B-ETS441 Rev. 1 dated 16 March 2018.                                                                                 |
| Radiocommunications (Electromagnetic Radiation - Human Exposure) Standard 2014, refer MET Laboratories Inc. test report No. EMC94508B-EN62311 dated 25 May 2018.                                 |


### Declaration

I hereby declare that:

1. I am authorised to make this declaration on behalf of the Company mentioned above,
2. the contents of this form are true and correct, and
3. the product mentioned above complies with the applicable above mentioned standards and all products supplied under this declaration will be identical to the product identified above.

Note: Under section 137.1 of the Criminal Code Act 1995, it is an offence to knowingly provide false or misleading information to a Commonwealth entity.

Penalty: 12 months imprisonment



Bruce Maule  
Director  
5 August 2019

The Privacy Act 1988 (Cth) (the Privacy Act) imposes obligations on the ACMA in relation to the collection, security, quality, access, use and disclosure of personal information. These obligations are detailed in the Australian Privacy Principles.  
The ACMA may only collect personal information if it is reasonably necessary for, or directly related to, one or more of the ACMA's functions or activities.  
The purpose of collecting the personal information in this form is to ensure the supplier is identified in the 'Declaration of Conformity'. If this Declaration of Conformity is not completed and the requested information is not provided, a compliance label cannot be applied.  
Further information on the Privacy Act and the ACMA's Privacy Policy is available at [www.acma.gov.au/privacy-policy](http://www.acma.gov.au/privacy-policy). The Privacy Policy contains details about how you may access personal information about you that is held by the ACMA, and seek the correction of such information. It also explains how you may complain about a breach of the Privacy Act and how we will deal with such a complaint.  
Should you have any questions in this regard, please contact the ACMA's privacy contact officer on telephone on 1800 226 987 or by email at [privacy@acma.gov.au](mailto:privacy@acma.gov.au).

## RADIO SPECTRUM MANAGEMENT



MINISTRY OF BUSINESS,  
INNOVATION & EMPLOYMENT  
HIRIKINA WHAKATUTUKI

### Braco Compliance Limited

### Supplier's declaration of conformity

As required by notices under:

- Section 134 (1) (g) of the New Zealand Radiocommunications Act 1989.

#### Supplier's details

|                                                |                                               |
|------------------------------------------------|-----------------------------------------------|
| Name (name of manufacturer, importer or agent) | ERAC Responsible Supplier registration number |
| Braco Compliance Limited                       | E178                                          |
| Address (address of agent)                     | Contact information                           |
| 9 Braco Place, Ilam                            | Telephone: +64 21 208 4303                    |
| Christchurch 8041                              | Email: admin@bracocompliance.com              |

#### Product details

Product description – brand name, type, model, lot, batch or serial number (if available)



Maritime Satellite Communications,  
VesseLINK™, Model VF350BM Terminal with Maritime Antenna.

#### Applicable standards

Standard title, number and, if applicable, number of the test report

|                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------|
| ETSI EN 301 489-1 v2.1.1 with ETSI EN 301 489-17 v3.1.1, refer MET Laboratories Inc. test report No. EMC94508B-ETS489 Rev. 1 dated 15 June 2018. |
| EN 60945:2002, refer MET Laboratories Inc. test report No. EMC102479-EN dated 22 April 2019.                                                     |
| ETSI EN 301 441 v2.1.1, refer MET Laboratories Inc. test report No. EMC94508B-ETS441 Rev. 1 dated 16 March 2018.                                 |
| CFR 47 FCC Pt 15.247, refer SGS Fimko test report No. 266892-2 dated 28 June 2012.                                                               |

#### Declaration

I hereby declare that the product mentioned above complies with the above mentioned standards, and all products supplied under this declaration will be identical to the sample identified above.

*Bruce Maule*

|                                    |
|------------------------------------|
| SIGNATURE OF SUPPLIER OR AGENT:    |
| PRINT NAME: Bruce Maule            |
| POSITION IN ORGANISATION: Director |
| DATE: 5 August 2019                |

## THALES DEFENSE & SECURITY, INC.

### Declaration of Conformity with Radio Equipment Directive

The undersigned of this letter declares that the following equipment complies with the specifications of Radio Equipment Directive (2014/53/EU) concerning Radio & Telecommunications Equipment.

#### Equipment included in this declaration

VF350BM Certus 350 VesseLINK Broadband Maritime Satellite Terminal and Antenna

VF200BM Certus 200 VesseLINK Broadband Maritime Satellite Terminal and Antenna

MF350BV Certus 350 MissionLINK Broadband Maritime Satellite Terminal and Antenna

MF200BV Certus 200 MissionLINK Broadband Maritime Satellite Terminal and Antenna

#### Equipment Applicability

The VesseLINK and MissionLINK provide voice and high speed data communication over 100% of the globe through the Iridium Certus broadband Satellite system.

#### Declaration

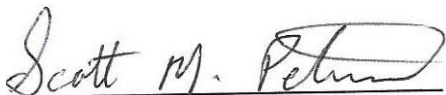
The health requirement is met by conforming to EU standard EN62311. . The safety requirement is met by conforming to EN 60950-1:2006 w/A2:2013 (for Certus 350) and to EN62368-1:2014 (for Certus 200). The electromagnetic compatibility as set out in Directive 2014/30/EU is met by conforming to the EU standards ETSI EN 301-489-1 and ETSI EN 301-489-17. Effective and efficient use of radio spectrum in order to avoid harmful interference is met by conforming to the ETSI EN 301-441 standard.

#### Manufacturer

Thales Defense & Security, Inc.                      22605 Gateway Center Drive  
Clarksburg, Maryland 20871 U.S.A.

#### Place and Date

Clarksburg, MD, 14 January 2021



Scott Peters

Director, Program Management



(Translation)

## Type Approval Certificate

|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Classification                                | Certification Ordinance Article 2-1-28-2<br>Earth Station for Portable Mobile Satellite (non-geostationary/Iridium)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Type of emission, frequency and antenna power | 41K7 Q7W 1618.395833~1625.895833MHz(125kHz 間隔 61 波),<br>1618.3125~1625.9375MHz(125kHz 間隔 62 波),<br>1618.354167~1625.979167MHz(125kHz 間隔 62 波) 3.91W<br>83K4 Q7W 1618.5416665~1625.7916665MHz(250kHz 間隔 30 波),<br>1618.375~1625.875MHz(250kHz 間隔 31 波),<br>1618.4583335~1625.9583335MHz(250kHz 間隔 31 波) 4.7W<br>334K Q7W 1618.5~1625.5MHz(1000kHz 間隔 8 波),<br>1618.8333335~1625.8333335MHz(1000kHz 間隔 8 波),<br>1619.1666665~1625.1666665MHz(1000kHz 間隔 7 波) 15W<br>667K Q7W 1619~1625MHz(2000kHz 間隔 4 波),<br>1619.6666665~1625.6666665MHz(2000kHz 間隔 4 波),<br>1620.3333335~1624.3333335MHz(2000kHz 間隔 3 波) 15W |
| Model Name                                    | VesseLINK VF200BM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| License Holder                                | Thales Defense & Security, Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Manufacturer                                  | Thales Defense & Security, Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Certificate number                            | 005-102887                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Certification date                            | 2021-10-29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Approval as mentioned above is granted under the provisions of Article 38-24-1 of the Radio Law.



(Translation)

## Type Approval Certificate


|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Classification                                | Certification Ordinance Article 2-1-28-2<br>Earth Station for Portable Mobile Satellite (non-geostationary/Iridium)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Type of emission, frequency and antenna power | 41K7 Q7W 1618.395833~1625.895833MHz(125kHz 間隔 61 波),<br>1618.3125~1625.9375MHz(125kHz 間隔 62 波),<br>1618.354167~1625.979167MHz(125kHz 間隔 62 波) 0.55W<br>83K4 Q7W 1618.5416665~1625.7916665MHz(250kHz 間隔 30 波),<br>1618.375~1625.875MHz(250kHz 間隔 31 波),<br>1618.4583335~1625.9583335MHz(250kHz 間隔 31 波) 0.51W<br>334K Q7W 1618.5~1625.5MHz(1000kHz 間隔 8 波),<br>1618.8333335~1625.8333335MHz(1000kHz 間隔 8 波),<br>1619.1666665~1625.1666665MHz(1000kHz 間隔 7 波) 2.26W<br>667K Q7W 1619~1625MHz(2000kHz 間隔 4 波),<br>1619.6666665~1625.6666665MHz(2000kHz 間隔 4 波),<br>1620.3333335~1624.3333335MHz(2000kHz 間隔 3 波) 5W |
| Model Name                                    | VesseLINK VF350BM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| License Holder                                | Thales Defense & Security, Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Manufacturer                                  | Thales Defense & Security, Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Certificate number                            | 005-102914                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Certification date                            | 2021-12-22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

Approval as mentioned above is granted under the provisions of Article 38-24-1 of the Radio Law.

JRF-005-102914-001

2021-12-22

TÜV Rheinland Japan Ltd.

 **Federative Republic of Brazil**  
**Telecommunications National Agency**

**Certificate of Equipment Authorization**  
**(Not Transferable)**

Nº: **18495-21-12044**

Expires: **Indeterminada**  
 Date of Certificate: **06/05/2022**

Applicant: **CNPJ: 01.773.463/0001-59**  
**OMNISYS ENGENHARIA LTDA**

Manufacturer: **THALES DEFENSE & SECURITY, INC.**  
**22605 GATEWAY CENTER DRIVE, CLARKSBURG, MD, 20871**  
 Nº: **20871**  
**ESTADOS UNIDOS DA AMÉRICA**

This document approves, in accordance with the Telecommunication Rules and Regulations, the Certificate of Conformity number UL-BR 22.0314, issued by **UL do Brasil Certificações**. This approval is issued on behalf of the applicant here identified and is valid only for the product described below for use under the Anatel's Rules and Regulations.

Type - Category: **Transceptor do SMM por Satélite - III**

Model - Comercial Name (s): **VF350BM (VesselLink) /VF200BM (VesselLink)**

Basic technical characteristics:

| Designação de Emissões | Potência Máxima de Saída (W) | Faixa de Frequências Tx (MHz) |
|------------------------|------------------------------|-------------------------------|
| 590KG1D                | 314,992                      | 1.616,0 a 1.626,5             |

O produto incorpora Transceptor de Radiação Restrita com as características informadas no respectivo Certificado de Conformidade Técnica;  
 Ensaio de SAR não aplicável;  
 Módulos de interfaces disponíveis: FXS.

Comments:  
**Na sua utilização o produto deve estar ajustado na(s) potência(s) e frequência(s) autorizadas pelo órgão técnico competente.**

This certificate replaces the certificate of the same number issued in 31/03/2022.

Constitutes an obligation of the manufacturer or supplier of the product in Brazil to identify all approved products with Anatel's mark before its distribution to the market, as well as observe and maintain the technical characteristics which motivated the original certification.

**The information in this Approval Certificate can be confirmed in the Certification and Approval Management System - SCH, available on Anatel's website. (www.anatel.gov.br).**

Davison Gonzaga da Silva,  
 Gerente de Certificação e Numeração



UNIDAD DE CONCESIONES Y SERVICIOS  
DIRECCIÓN GENERAL DE AUTORIZACIONES  
Y SERVICIOS



INSTITUTO FEDERAL DE  
TELECOMUNICACIONES

"2020, Año de Leona Vicario, Benemérita Madre de la Patria"

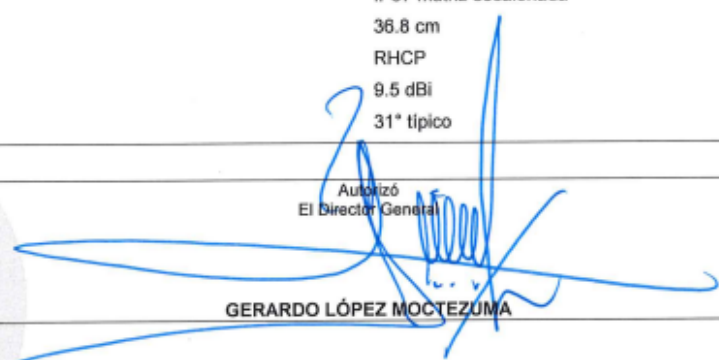
**CERTIFICADO DE HOMOLOGACIÓN**  
**Clase: PROVISIONAL**  
**Número: RCSTHVF20-0843**  
**Vigencia: 4 de mayo de 2021**

Verificable: [www.ift.org.mx/industria/concesiones-y-servicios/homologacion/lista-de-equipos](http://www.ift.org.mx/industria/concesiones-y-servicios/homologacion/lista-de-equipos)

**JORGE LUIS GONZÁLEZ BELTRÁN**  
REPRESENTANTE LEGAL DE  
THALES MÉXICO, S.A. DE C.V.  
Blvd. Miguel de Cervantes Saavedra No. 301, piso 16  
Col. Ampliación Granada  
C.P. 11520, Miguel Hidalgo, Ciudad de México.

|                                                                                        |                                                                          |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Fecha de emisión:<br><b>4 de mayo de 2020</b>                                          | Oficio respuesta a solicitud:<br><b>IFT/223/UCS/DG-AUSE/ 2247 / 2020</b> |
| Equipo:<br><b>Terminal satelital (Thales VesseLINK)</b>                                |                                                                          |
| Marca:<br><b>THALES</b>                                                                | Modelo:<br><b>VF350BM</b>                                                |
| Perito(s) en Telecomunicaciones:<br><b>Ing. José Luis Pérez Baez (IFT-P-0065-2017)</b> |                                                                          |
| <b>CARACTERÍSTICAS TÉCNICAS</b>                                                        |                                                                          |
| Bandas de frecuencias                                                                  | 1616 – 1626.5 MHz (Banda "L")                                            |
| Potencia isotrópica radiada efectiva (PIRE)                                            | 9 dBW (voz), 18.2 dBW (datos)                                            |
| Tipo de modulación                                                                     | DQPSK, QPSK, 16 APSK                                                     |
| <b>Antena:</b>                                                                         |                                                                          |
| Tipo                                                                                   | IP67 matriz escalonada                                                   |
| Diámetro                                                                               | 36.8 cm                                                                  |
| Polarización                                                                           | RHCP                                                                     |
| Ganancia                                                                               | 9.5 dBi                                                                  |
| Ancho del haz                                                                          | 31° típico                                                               |

Autorizó  
El Director General



**GERARDO LÓPEZ MOCTEZUMA**

Insurgentes Sur 1143,  
Col. Nochebuena, C.P. 05720  
Demarcación Territorial Benito Juárez,  
Ciudad de México.  
Tels. (55) 5015 4000

El presente Certificado está sujeto a las condiciones y notas descritas al reverso de la hoja 1.

hoja 1 de 1

## CHAPTER 1 INTRODUCTION

### Introduction

This installation guide provides instructions for proper installation and initial start-up of the VesseLINK™ system and a basic system overview. It contains critical information and safety guidelines for those who install the system and perform initial system activation and test.

After initial start-up, for more detailed operational procedures, refer to the VesseLINK™ User Manual (Document # 84469) located on the Thales website and also accessible through the BDU's Management Portal.

A typical VesseLINK™ user setup that includes standard kit items, accessories and user provided items such as a POTS phone, VoIP phones and a computer is shown in Figure 1-1. A cellular modem or other network modem can be connected to the WAN port for data least-cost routing operations. Voice calls are always routed through the Iridium satellite system and not the WAN port. Refer to Table 1-2, Table 1-3, Table 1-4 and Table 1-5 for a list of kit contents, available accessories and spare parts.

### Equipment Overview



Figure 1-1 Thales VesseLINK™ System with Accessories

## Below Deck Unit (BDU)

The Below Deck Unit (BDU) supports voice and data communications in a marine environment. The BDU is capable of supporting wireless voice and data that links the user with the Iridium satellite network. As a wireless access point, the BDU provides Wi-Fi (802.11) access for data and Voice over IP (VoIP) calls. Three RJ-45 Ethernet connectors and one RJ14 connector enables the user to tether directly to the BDU, if desired. The Management Portal is a graphical user interface that can be used to modify system settings and indicate system status. The BDU is powered by either an AC/DC power supply or a DC power cable with a 10-32V input range and remote start wire accommodating all types of marine vessels, applications and power sources.



*Figure 1-2 Below Deck Unit (BDU)*



**NOTE**

### **Wi-Fi Access Point:**

The internal Wi-Fi access point is not a high capacity Wi-Fi system. If heavy simultaneous data usage is expected through Wi-Fi, it may be best to use an external commercial Wi-Fi router connected to the BDU's LAN port.

The BDU has three status LEDs on the top of the unit that indicate status of system power-up, satellite connection and the Wi-Fi.

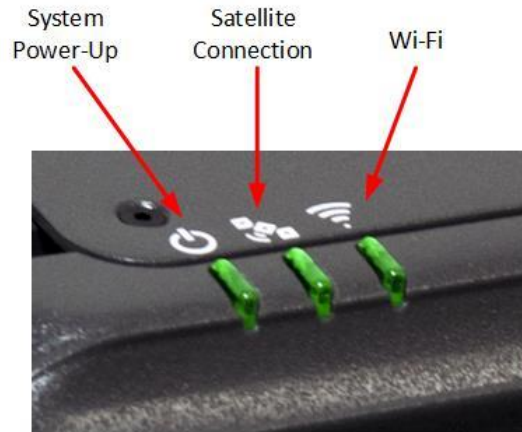


Figure 1-3 Below Deck Unit (BDU) LEDs

Table 1-1 Below Deck Unit (BDU) LED Status

| Indicator        | Description                                 |
|------------------|---------------------------------------------|
| <b>System</b>    |                                             |
| Solid GREEN      | System functioning properly                 |
| Flashing GREEN   | System busy (Booting up)                    |
| Solid RED        | Fault (minor issue)                         |
| Flashing RED     | Critical fault (major issue)                |
| <b>Satellite</b> |                                             |
| Solid BLUE       | Connected and passing data (over satellite) |
| Solid GREEN      | System functioning properly                 |
| Flashing GREEN   | Acquiring satellite                         |
| Solid RED        | Fault (minor issue)                         |
| Flashing RED     | Critical fault (major issue)                |
| <b>Wi-Fi</b>     |                                             |
| OFF              | Wi-Fi OFF                                   |
| Flashing GREEN   | Wi-Fi busy                                  |
| Solid Green      | System functioning properly                 |
| Solid RED        | Fault (minor issue)                         |
| Flashing RED     | Critical fault (major issue)                |



The Indicator Colors are:

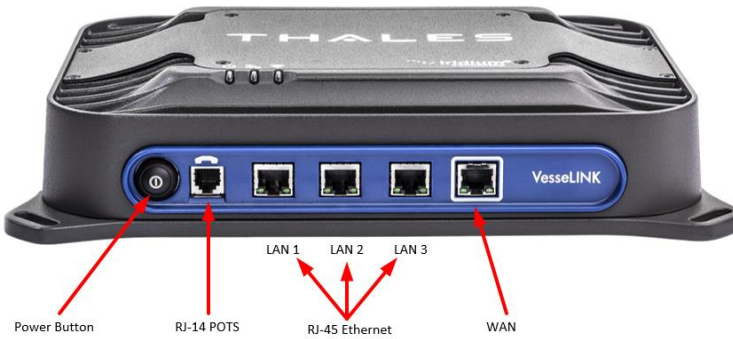
Solid Green: Operational

Flashing Green: start-up or in progress of configuring or acquiring service.

Solid Red: fault requires user attention (Open Management Portal for Alerts)

Flashing Red: critical fault requiring immediate attention. For additional information, refer to Chapter 3 Troubleshooting

The BDU front panel (left to right) has a main power button, one RJ-14 connector for POTS (Plain Old Telephone Service) Phone(s), three PoE (Power over Ethernet) RJ-45 connectors for VoIP phones or Ethernet-based devices, and one WAN (Wide Area Network) connector primarily used to connect an external cellular modem or VSAT.



*Figure 1-4 Below Deck Unit (BDU) Front Panel Detail*

The BDU back panel (left to right) has a Wi-Fi antenna connector, reset button, SIM Card slot, GPIO (I/O) connector, 10-32 Volt DC input connector, 12 Volt DC power input, antenna connector, and chassis grounding lug.



*Figure 1-5 Below Deck Unit (BDU) Back Panel Detail*

## Above Deck Unit (ADU) / Antenna

The Above Deck Unit (ADU) or Antenna is a standalone unit that connects to the BDU through a single coaxial cable. DC power, RF transmit and receive signals, control data and GPS data are communicated between the ADU and BDU using this single coaxial cable.



*Figure 1-6 Above Deck Unit (ADU) / Antenna For Certus 350 and Certus 200 Systems*

## VesseLINK™ Kit Contents and Accessories

The following tables list the kits available for purchase and their contents as well as accessories and spare parts that can be purchased separately.

*Table 1-2 Standard Kit, VesseLINK™ Certus 350, List of Equipment*

| Part Number |             | Description                                   |
|-------------|-------------|-----------------------------------------------|
| VF350BM     |             | Standard Kit, VesseLINK™ Certus 350**         |
| Qty         | Part Number | Description                                   |
| ✓ 1         | 1100789-501 | Kit, Below Deck Unit (BDU), Mounting Hardware |
| ✓ 1         | 1100791-501 | Kit, Antenna Maritime Mounting Hardware       |
| ✓ 1         | 1600901-1   | Above Deck Unit / Antenna, Certus 350         |
| ✓ 1         | 3402131-1   | Quick Start Guide (QSG) VesseLINK™            |
| ✓ 1         | 3900011-1   | Mounting Template, BDU                        |
| ✓ 1         | 3900014-1   | Mounting Template, Antenna                    |
| ✓ 1         | 4102947-511 | BDU, VesseLINK™                               |
| ✓ 1         | 84670-001   | Power Supply, AC/DC 12V – 160W                |
| ✓ 1         | 854024-001  | Cable AC Power with USA Plug 6 ft.            |
| ✓ 1         | 854025-001  | Cable AC Power EURO Plug 6 ft.                |
| ✓ 1         | 855023-082  | Cable, Coaxial 25m LMR300 FR                  |
| ✓ 1         | 855026-010  | Cable, RJ-45 Ethernet, 10 ft.                 |
| ✓ 1         | 85728-001   | Wi-Fi Antenna, 2.4 GHz Dipole 2 dBi           |

\*\* The VF350BM is capable of up to 352 kbps uplink and 704 kbps downlink speeds.

**Note:** The SIM card is provided by the airtime service provider and may be packaged separately from this kit.

*Table 1-3 Base Kit, VesseLINK™ Certus 350, List of Equipment*

| Part Number |             | Description                     |                                       |
|-------------|-------------|---------------------------------|---------------------------------------|
| VF350BM-1   |             | Base Kit, VesseLINK™ Certus 350 |                                       |
| Qty         | Part Number | Description                     |                                       |
| ✓           | 1           | 1600901-1                       | Above Deck Unit / Antenna, Certus 350 |
| ✓           | 1           | 3402131-1                       | Quick Start Guide (QSG) VesseLINK™    |
| ✓           | 1           | 3900011-1                       | Mounting Template, BDU                |
| ✓           | 1           | 3900014-1                       | Mounting Template, Antenna            |
| ✓           | 1           | 4102947-511                     | BDU VesseLINK™                        |
| ✓           | 1           | 85728-001                       | Wi-Fi Antenna, 2.4 GHz Dipole 2 dBi   |

*Table 1-4 Base Kit, VesseLINK™ Certus 200, List of Equipment*

| Part Number |             | Description                      |                                       |
|-------------|-------------|----------------------------------|---------------------------------------|
| VF200BM-1   |             | Base Kit, VesseLINK™ Certus 200* |                                       |
| Qty         | Part Number | Description                      |                                       |
| ✓           | 1           | 1600952-1                        | Above Deck Unit / Antenna, Certus 200 |
| ✓           | 1           | 3402131-1                        | Quick Start Guide (QSG) VesseLINK™    |
| ✓           | 1           | 3900011-1                        | Mounting Template, BDU                |
| ✓           | 1           | 4102947-521                      | BDU VesseLINK™                        |
| ✓           | 1           | 85728-001                        | Wi-Fi Antenna, 2.4 GHz Dipole 2 dBi   |

\* The VF200BM-1 is capable of up to 176 kbps uplink and 176 kbps downlink speeds.



Table 1-5 Available VesseLINK™ Accessories

| Description                                                | Part Number | Qty |
|------------------------------------------------------------|-------------|-----|
| 19" Rack Mount Shelf Kit                                   | 1100796-501 | 1   |
| Thales SureLINK IP Handset Kit                             | 1100818-501 | 1   |
| Kit, Below Deck Unit (BDU), Mounting Hardware              | 1100789-501 | 1   |
| Kit, Antenna Maritime Mounting Hardware (Certus 350 only)  | 1100791-501 | 1   |
| Mounting Template, BDU                                     | 3900011-1   | 1   |
| Mounting Template, Antenna (Certus 350 only)               | 3900014-1   | 1   |
| Power Supply, AC/DC 12V – 160W                             | 84670-001   | 1   |
| Cable AC Power with USA Plug Type B IEC 60320-C13 6 ft.    | 854024-001  | 1   |
| Cable AC Power with Euro Plug Type E IEC 320-C14 6 ft.     | 854025-001  | 1   |
| Cable AC Power with AUS Plug Type 1 IEC 320-C14 6 ft.      | 854026-001  | 1   |
| Cable AC Power with UK Plug Type G IEC 320-C13 6 ft.       | 854027-001  | 1   |
| Cable, Coaxial 25m LMR300 FR                               | 855023-082  | 1   |
| Cable, DC Power Harness                                    | 855024-003  | 1   |
| Cable, RJ-45 Ethernet, 10 ft.                              | 855026-010  | 1   |
| Cable, Coaxial 50m LMR400 FR                               | 855033-164  | 1   |
| Wi-Fi Antenna, 2.4 GHz Dipole 2 dBi                        | 85728-001   | 1   |
| Antenna Basic L-Bracket Pole Mount Kit (Certus 200 only)   | 1100855-501 | 1   |
| Antenna Premium Pole Top Mount Kit (Certus 200 only)       | 1100855-502 | 1   |
| Antenna Premium L-Bracket Pole Mount Kit (Certus 200 only) | 1100855-503 | 1   |
| Antenna Mounting Plate, Small (Certus 350 only)            | 85736-001   | 1   |
| Antenna Mounting Plate, Large (Certus 350 only)            | 85739-001   | 1   |

**Note:** The above accessories are compatible with both Certus 200 and Certus 350 systems unless otherwise noted in the description.

## CHAPTER 2 INSTALLATION

### General Guidelines

#### General Guidelines for Installation

- Do not attempt to service items such as Below Deck Unit (BDU) and antenna.
- Do not alter or remove tamper seals/tape from the equipment.
- Always use Ground Lugs as separate connections to chassis and antenna
- Always torque hardware to specified values.
- If mounting antenna near radar array, raise the VesseLINK™ Antenna approximately 15 degrees above radar array centerline and mount as far away as possible to reduce the possibility of interference.

### Tools and Supplies Needed for Installation

#### List of tools you may need to install this system:

- Drill and drill bits
- Pliers or wrench
- 4 mm Hex Drive
- 6 mm Hex Driver
- 10 mm Wrench or Socket
- Torque Wrench
- Marker or pencil
- Tie wraps
- Self-vulcanizing tape to seal connections

### Preparation

#### Prepare the VesseLINK™ Installation Kit as follows:

1. Unpack and lay out all components and parts.
2. Inspect for any damage
3. Conduct an inventory of all components and parts using the equipment packing list provided with the equipment. Any missing items and/or shipping damage should be reported immediately to Thales Customer Service Department (Tel: (800) 324-6089 or email [customer.service@thalesdsi.com](mailto:customer.service@thalesdsi.com)).

## Precautions During Installation

The following steps should be followed to prevent damage to the equipment:

1. Keep dust cover over the SIM Card, once installed.
2. Do not disassemble or modify parts in installation kit unless instructed to do so.
3. Keep mounting hardware covered and protected until needed.

Stay minimum distance indicated in the SAFETY section from the antenna when powered on.

## Installation

The following information covers the installation and set-up of the VesseLINK™ Above Deck Unit (ADU) / Antenna and the Below Deck Unit (BDU).

To complete the installation, you need the appropriate fasteners, tools, and mounts.

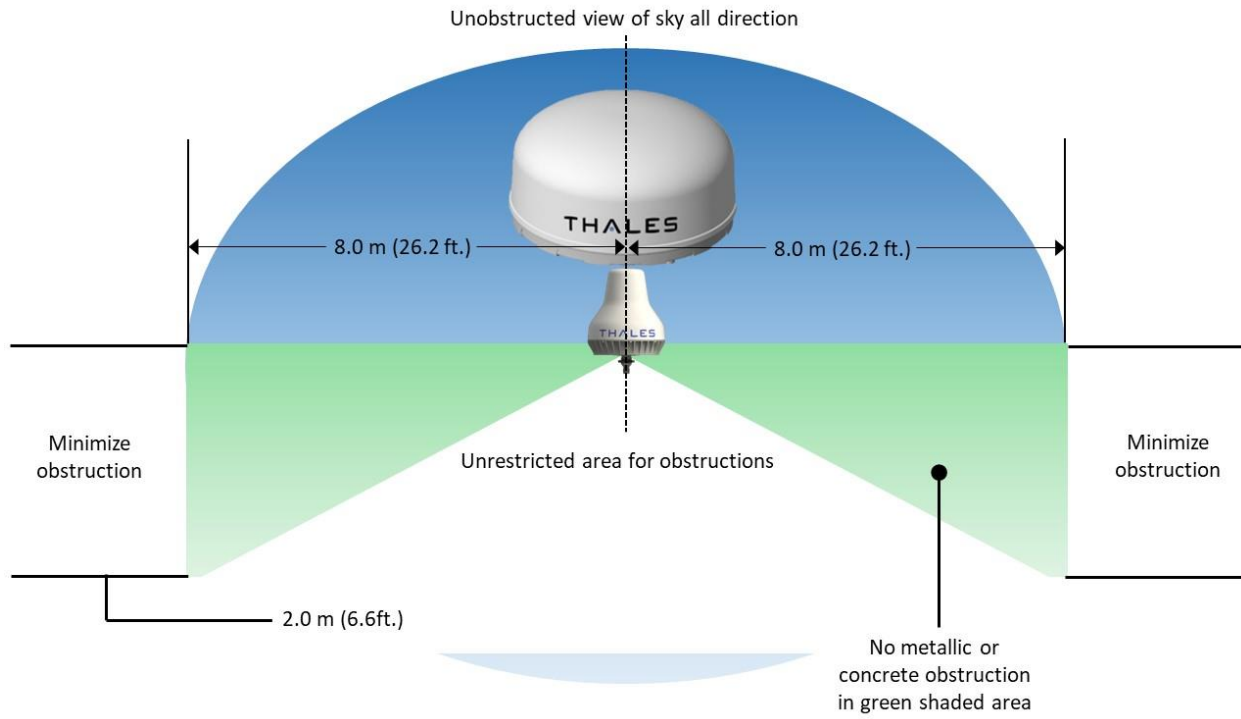


### NOTE

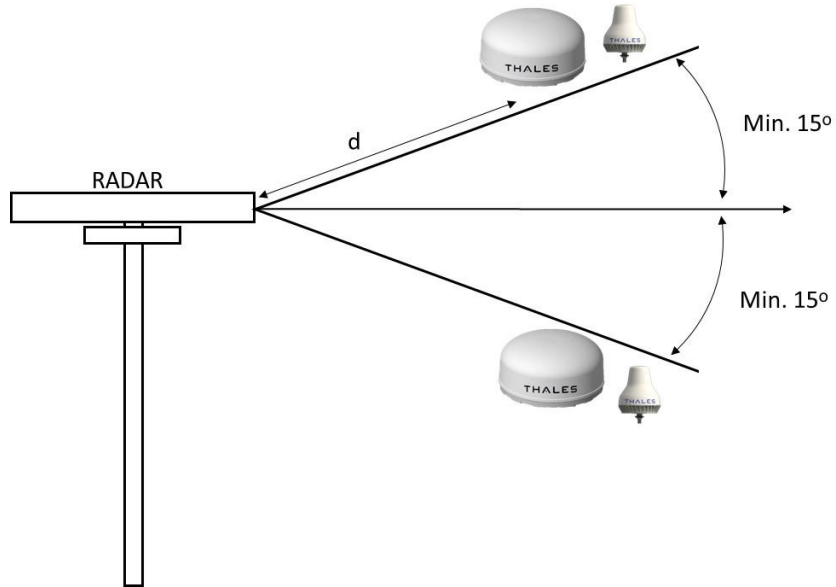
Always wear safety goggles, ear protection, and a dust mask when drilling, cutting, or sanding. When drilling or cutting, always check first to see what is on the other side of surface. If you experience difficulty with the installation, contact your Service Provider or seek the assistance of a professional installer.

Keys to successful installation of the VesseLINK™ Antenna:

- Mount where antenna is at least the minimum safety distance away from vessel personnel (1.5m for Certus 350 and 0.5m for Certus 200).
- Mount antenna with unobstructed full view of the sky (Figure 2-1). Any blockage to part of the sky by metal objects could result in loss of connection and/or poor data speeds.
- Mount antenna level (parallel) to Main Deck.
- Keep antenna away from large metallic surfaces in the field of view when possible to increase performance.
- Mount as far away from other antennas (HF, VHF, UHF, Inmarsat L-Band, radar and magnetic compasses) as possible to avoid interference. See Figure 2-2 for recommendations on distance and horizontal displacement from radar arrays.
- Ground the antenna using a heavy ground cable (not included) from the ground terminal on the bottom of the antenna to the vessel's ground to protect the system from unwanted surges and voltage differentials.
- Use the supplied RF cable designed for VesseLINK™. Do not alter the provided cable prior to installation. It is mandatory to weather seal the connection at the antenna on permanent installations to prevent corrosion and water intrusion.
- Mounting should be in an area that minimizes vessel vibration.



*Figure 2-1 Placing Antenna for optimum performance*



Distance

$d = 2.0\text{m}$  for S-Band up to 50kW

$d = 4.0\text{m}$  for X & C-Bands up to 50kW

*Figure 2-2 Recommended Antenna Placement with Existing Radar*

## Installing the Certus 350 Above Deck Unit (Antenna)

The Standard VesseLINK™ 350 kit includes these hardware kits whereas as the Base VesseLINK™ 350 kit does not include them. The guidelines below are based on the use of these kits during installation.

- ADU / Antenna Mounting Kit PN 1100791-501
- BDU Mounting Hardware Kit PN 1100789-501



In the event of a new installation, pole mount brackets are available as an option. Templates are available for a custom plate that needs to be fabricated.

The Certus 350 VesseLINK™ antenna is designed to fit the two optional Thales stainless steel pole mount brackets (see Table 1-5 and Appendix C for details). These pole mount kits contain instructions and all the hardware necessary for installation of the antenna. If replacing an existing L-band system, it may be possible to use the mounting plate and hardware that is already in place. The VesseLINK™ antenna has two sets of industry standard mounting configurations, each with four mounting points. Included in each Standard kit is a mounting template if custom mounting the antenna is necessary for your application.

It is important to note that the coaxial cable provided in the Standard VesseLINK™ kit, or one of the Thales approved accessory coaxial cables, must be installed for proper operation of the VesseLINK™ system. Otherwise, the system may not calibrate correctly and will result in a failure at start-up. Install the cable using best practices for cable bend radius and avoid pinching the cable. It is also important to ensure the cable does not get cut by or rub on nearby sharp objects. For available accessory cables, refer to Table 1-5.

**Note:** The TNC connectors on the coaxial cable should be hand tightened only. If a tool is used to tighten the connector, it could damage the antenna housing and internal RF connection and void the warranty.

## Antenna Dimensions and Hole Pattern

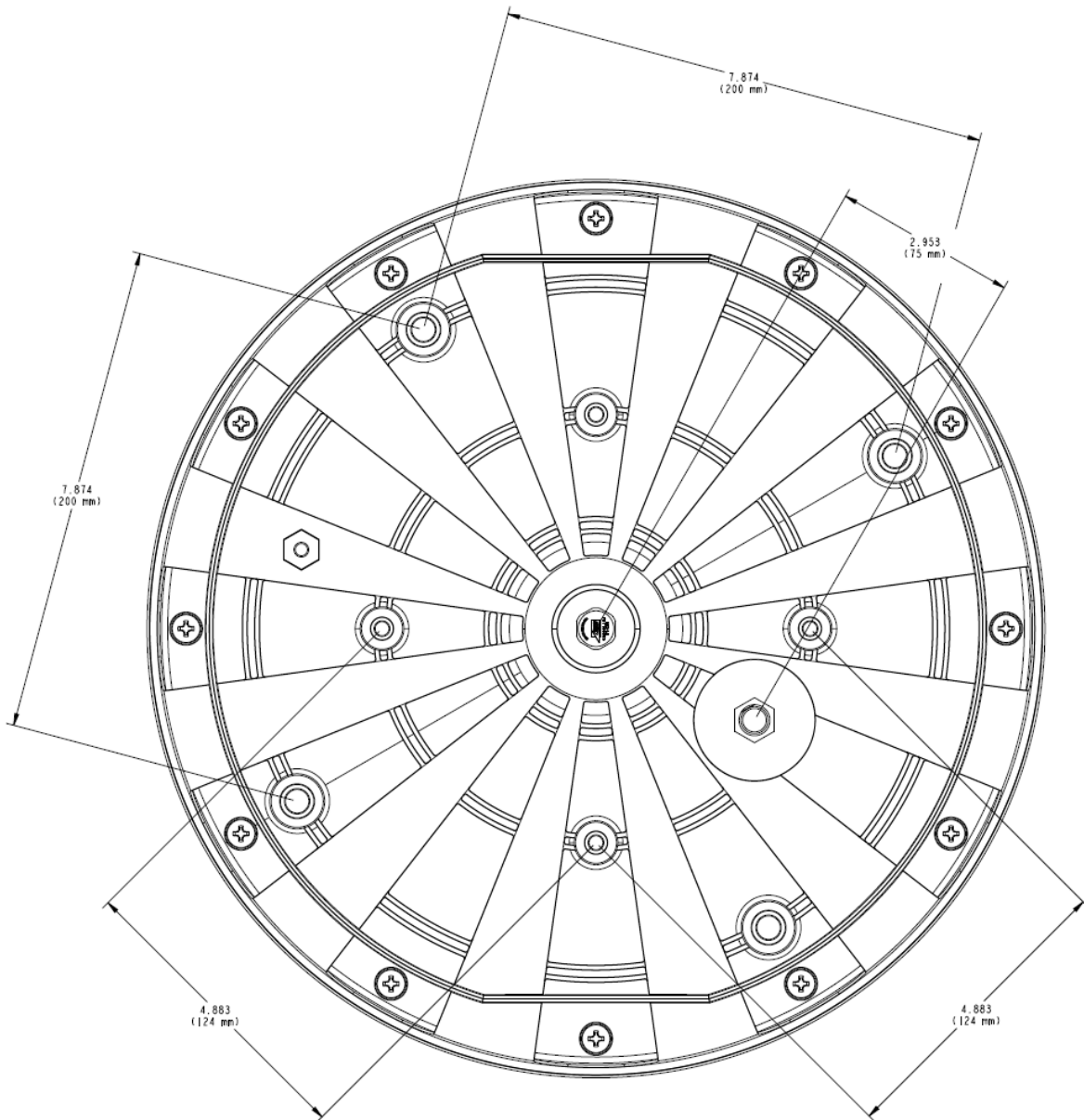


Figure 2-3 Antenna Dimensions and Hole Patterns (1 of 2)

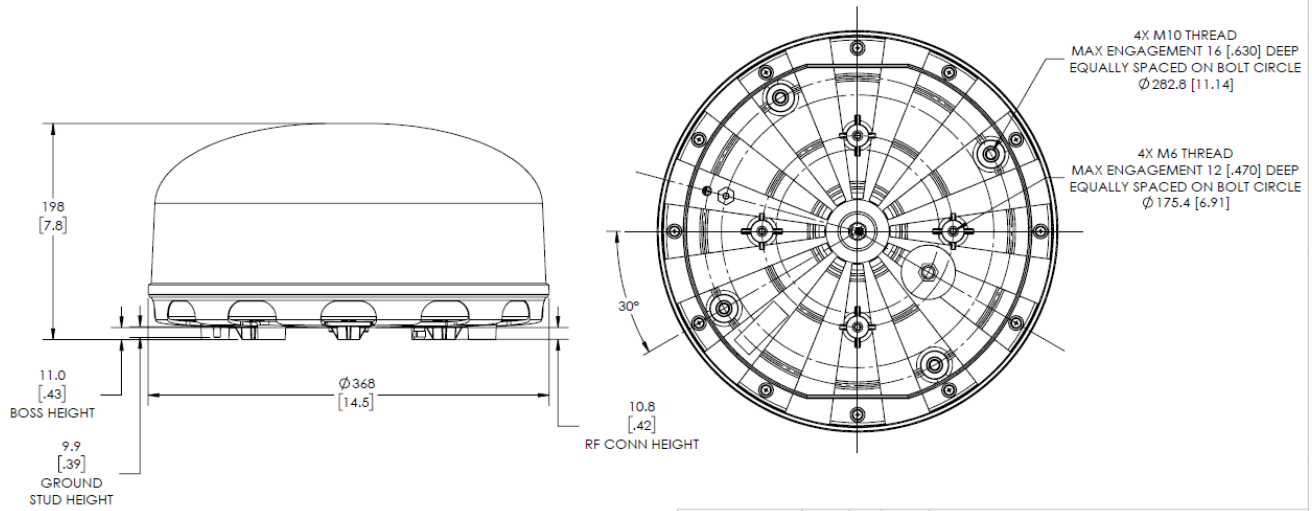


Figure 2-4 Antenna Dimensions and Hole Patterns (2 of 2)

## Mounting the Certus 350 ADU / Antenna



### NOTE

Prior to installing the ADU, it is important to determine which hardware is best suited for installation – M6 or M10 hardware. The Installation Kit (PN 1100791-501) included with the Standard VesseLINK™ system contains the M6 mounting hardware needed for installation. If using the M10 mounting points, the M10 stainless steel hardware is not provided and must be purchased separately. If one of the optional pole mount kits is purchased, all mounting hardware is included.



### NOTE

The Antenna Mounting Template is provided in Appendix A for use in fabricating a custom plate. A mounting plate is not included in the kit, but Thales offers two pole mount brackets as accessory items. (Refer to Appendix C.)

The antenna is mounted with either four M6 (torque to 6 N\*m (4.4 ft.-lbs.)) or four M10 (torque to 28 N\*m (20.6 ft.-lbs.)) stainless steel bolts as appropriate for the chosen mounting pattern on the base of the antenna. Anti-seize compound can be applied to the stainless hardware immediately prior to installation to ease future removal.



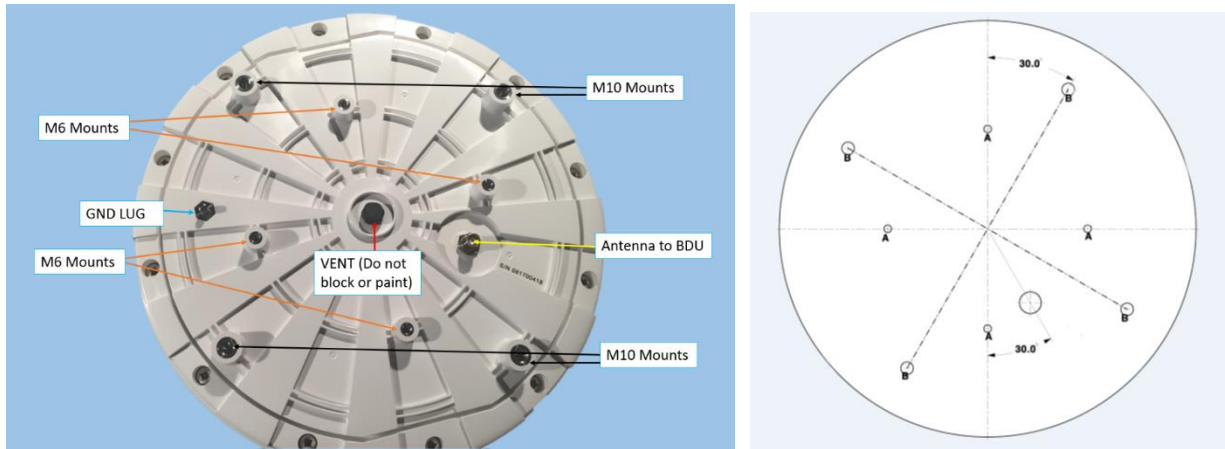


Figure 2-5: Mounting Holes in Bottom of Antenna and Mounting Template

Mounting using M6 Hardware

1. Use the template information provided in Appendix A to create the appropriate hole pattern in the desired mounting surface for the chosen mounting hardware.



Hole sizing and M6 provided hardware are shown for through hole mounting as shown in Appendix A. User may mount antenna with other hardware at their discretion and own risk.

2. Position the pattern to avoid interferences with the antenna or coaxial cable connection to the antenna.
3. Position the antenna in the proper orientation as decided by the pattern placement for the chosen mounting pattern on the base of the antenna (Refer to Appendix A).



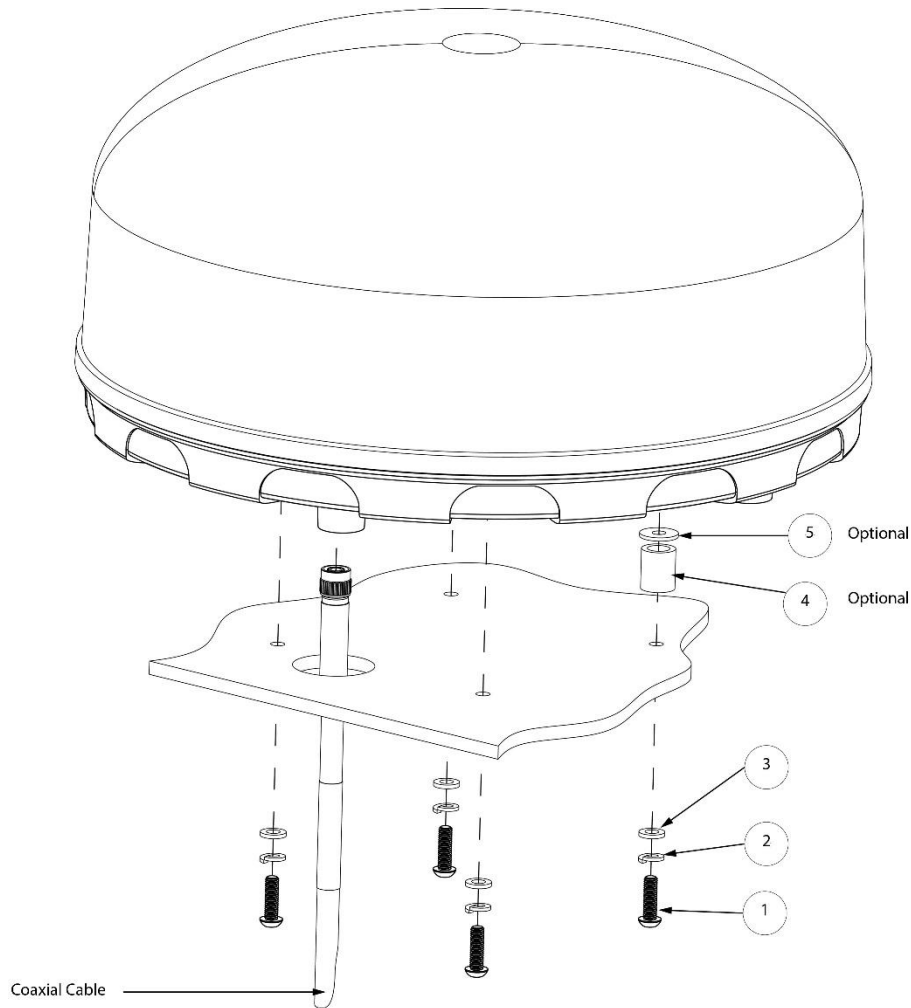
**IMPORTANT:** The antenna is mounted with four M6 (torque to 6 Nm (4.5 ft.-lbs.)) stainless steel bolts (included with Antenna Mounting Hardware Kit PN 1100791-501) as appropriate for mounting plate thickness of .20 to .40 inches (5 to 10 mm.). **Never exceed the recommended torque values on mounting bolts as this will damage the unit.**



Apply the supplied anti-seize to the hardware before assembly IF mounting to metallic plate incompatible with stainless steel hardware.

4. Connect coaxial cable as shown in Figure 2-6 and hand tighten only

5. After connecting the cable to the antenna (Figure 2-6), wrap the connector with the self-vulcanizing tape to ensure a water-tight seal. This is very important to prevent water intrusion and to prevent corrosion.
6. Assemble screws (1) with flat washers (3) and split lock washers (2) as shown in Figure 2-6 and torque to requirements.
7. Run coaxial cable to approximate location of the BDU.



*Figure 2-6 Above Deck Unit / Antenna Installation (M6 Hardware)*

Table 2-1 Installation Kit, Mounting Hardware (M6 Hardware Included)

| Item Number | Description                                    | Part Number | Qty |
|-------------|------------------------------------------------|-------------|-----|
| 1           | Screw, Button HD Socket Cap M6x1x20mm A4-70 SS | 82771-001   | 4   |
| 2           | Washer, Split M6 (DIN 127B) A4 L/W SS          | 71300-001   | 4   |
| 3           | Washer, Flat M6 A4-80 (DIN 125 ISO 7089) SS    | 71299-001   | 4   |
| NI          | Anti-Seize Lubricant, Loctite C5A Paste        | 91383-001   | 1   |
| NI          | Self-Vulcanizing Tape                          | 91384-001   | 1   |



**NOTE**

Mounting Hardware Installation Kit (PN 1100791-501) may contain additional hardware spares. The quantity listed in the above table reflects what is required for installation.

Mounting using M10 Hardware (not included in Hardware Installation Kit (PN 1100791-501))

1. Use the template information provided in Appendix A to create the appropriate hole pattern in the desired mounting surface for the chosen mounting hardware.



**NOTE**

Hole sizing and hardware are shown for through hole mounting as shown in Appendix A.

2. Position the pattern to avoid interferences with the antenna or coaxial cable connection to the antenna.
3. Position the antenna in the proper orientation as decided by the pattern placement for the chosen mounting pattern on the base of the antenna (Refer to Appendix A).



**NOTE**

**IMPORTANT:** The antenna is mounted with four M10 (torque to 28 Nm (21 ft.-lbs.)) stainless steel bolts as appropriate for mounting plate thickness of .20 to .47 inches (5 to 12 mm.). These M10 bolts and washers should be purchased locally by the installer. **Never exceed the recommended torque values on mounting bolts as this will damage the unit.**



**NOTE**

Apply the supplied anti-seize to the hardware before assembly IF mounting to metallic plate incompatible with stainless steel hardware.

4. Connect coaxial cable as shown in Figure 2-7 and hand tighten.

5. After connecting the cable to the antenna (Figure 2-7), wrap the connector with the self-vulcanizing tape to ensure a water-tight seal. This is very important to prevent water intrusion and to prevent corrosion.
6. Assemble screws (1) with flat washers (3) and split lock washers (2) as shown in Figure 2-7 and torque to requirements.
7. Run coaxial cable to approximate location of the BDU installation location.

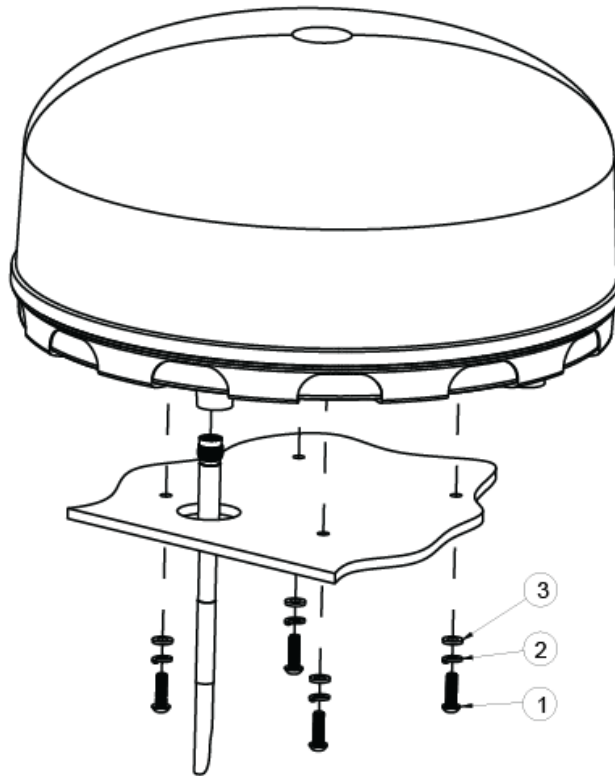


Figure 2-7 Above Deck Unit / Antenna Installation (M10 Hardware)

Table 2-2 Installation Kit, Mounting Hardware (M10 Hardware Not Included)

| Item Number | Description                               | Part Number  | Qty |
|-------------|-------------------------------------------|--------------|-----|
| 1           | Screw, Button HD Socket Cap M10 SS (25mm) | Not Included |     |
| 2           | Washer, Split M10 SS                      | Not Included |     |
| 3           | Washer, Flat M10 SS                       | Not Included |     |
| 4           | Anti-Seize Lubricant, Loctite C5A Paste   | 91383-001    | 1   |
| 5           | Self-Vulcanizing Tape                     | 91384-001    | 1   |

## Installing the Certus 200 Above Deck Unit (Antenna)

The Certus 200 antenna dimensions and included hardware are shown in Figure 2-8. The antenna has a single M18 threaded mounting post on the bottom and includes a gasket, a stainless steel washer and two stainless steel M18 nuts for mounting the antenna to a custom made plate or an available accessory kit from Thales.

Thales offers three accessory pole mount kits for the Certus 200 antenna.

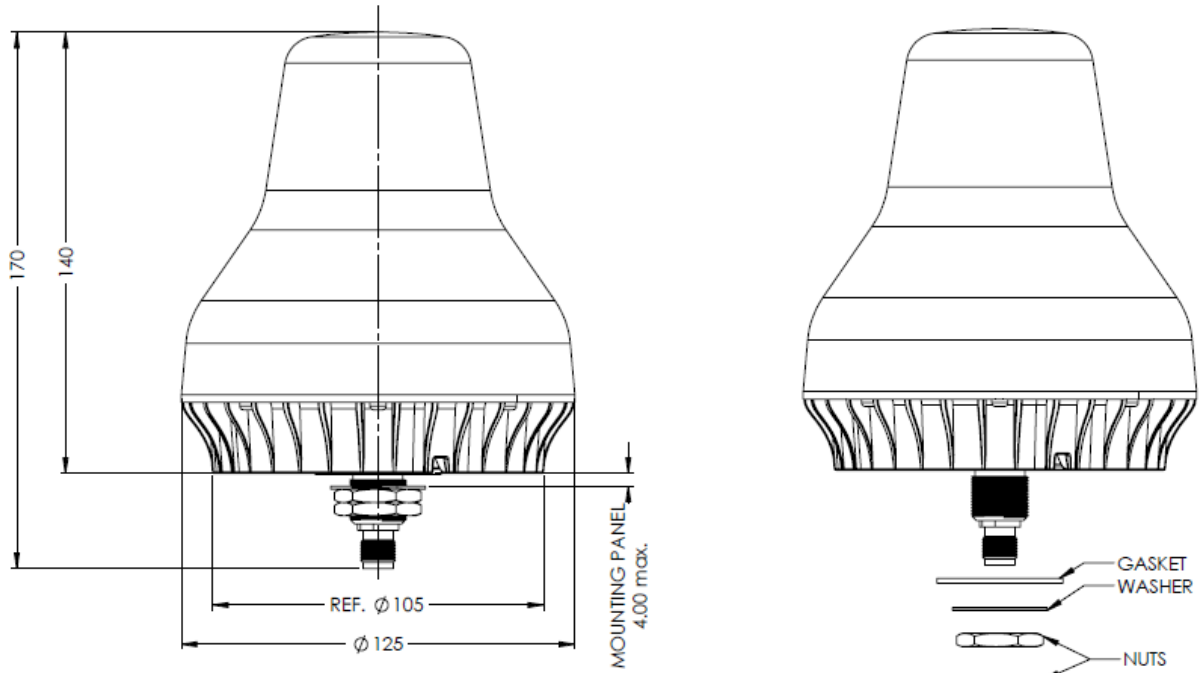
The part numbers for those kits are 1100855-501, 1100855-502 and 1100855-503. These are described in Table 1-5 and detailed in Appendix D. The Certus 200 pole mount kits contain all the hardware needed to mount the antenna.

Purchasing one of the Thales accessory mounting kits is the simplest way to mount the antenna but a custom mount can also be used by following the below instructions.

**Note:** When making a custom mounting plate or drilling a hole in an existing plate, the hole should optimally be 19mm in diameter.

Steps to mount the antenna to a custom plate:

1. Drill a 19mm hole in a plate with thickness of 4mm or less.
2. Remove the nuts and washer from the antenna's threaded post. Leave the gasket in place, pressed against the antenna's base. Add thread locking liquid (user provided) to the M18 threaded post if desired.
3. Attach a ground cable (user provided) to the antenna base using a small M3 screw (see Figure 2-9) and route the cable through the opening in the base to the vessel's chassis for added protection against power surges.
4. Place the antenna's threaded post through the hole making sure the gasket is flat between the antenna's base and the plate (see Figure 2-10).
5. Insert the washer and tighten the first nut (max of 15 in-lb. or 1.7 Nm) until the plate is tight between the gasket and washer and the antenna does not move as shown in Figure 2-10.
6. Tighten the second nut against the first nut to ensure a tight fit that will not loosen under operational conditions (Figure 2-10).
7. Attach the coaxial cable to threaded TNC connector. Hand tighten only.
8. Add self-vulcanizing tape or other waterproofing material (user provided) to keep the RF connection completely dry.
9. Run the coaxial cable to the BDU installation location.



RECOMMEND MOUNTING METHOD:  $\phi$  19 THROUGH HOLE

Figure 2-8 Certus 200 Antenna Dimensions and Mounting Post

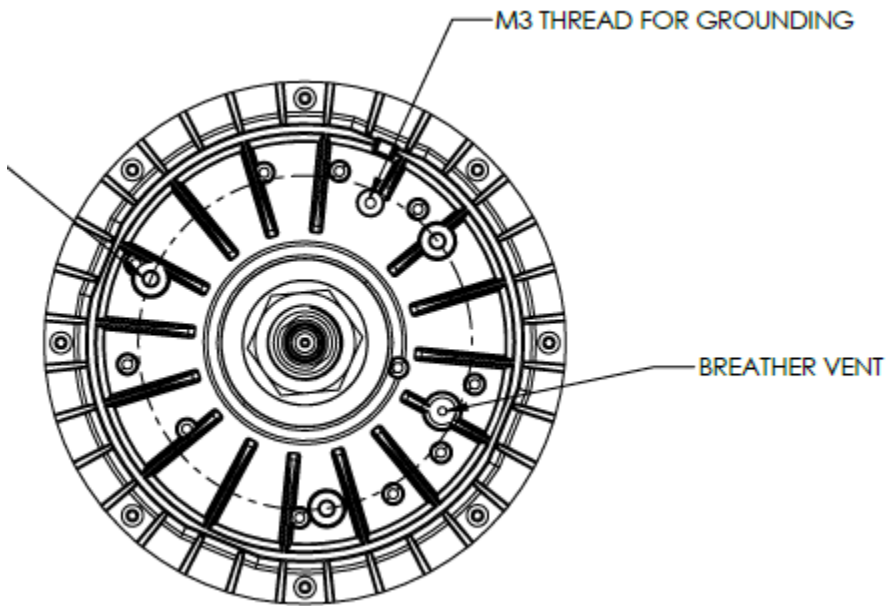


Figure 2-9 Certus 200 Antenna Dimensions and Mounting Post

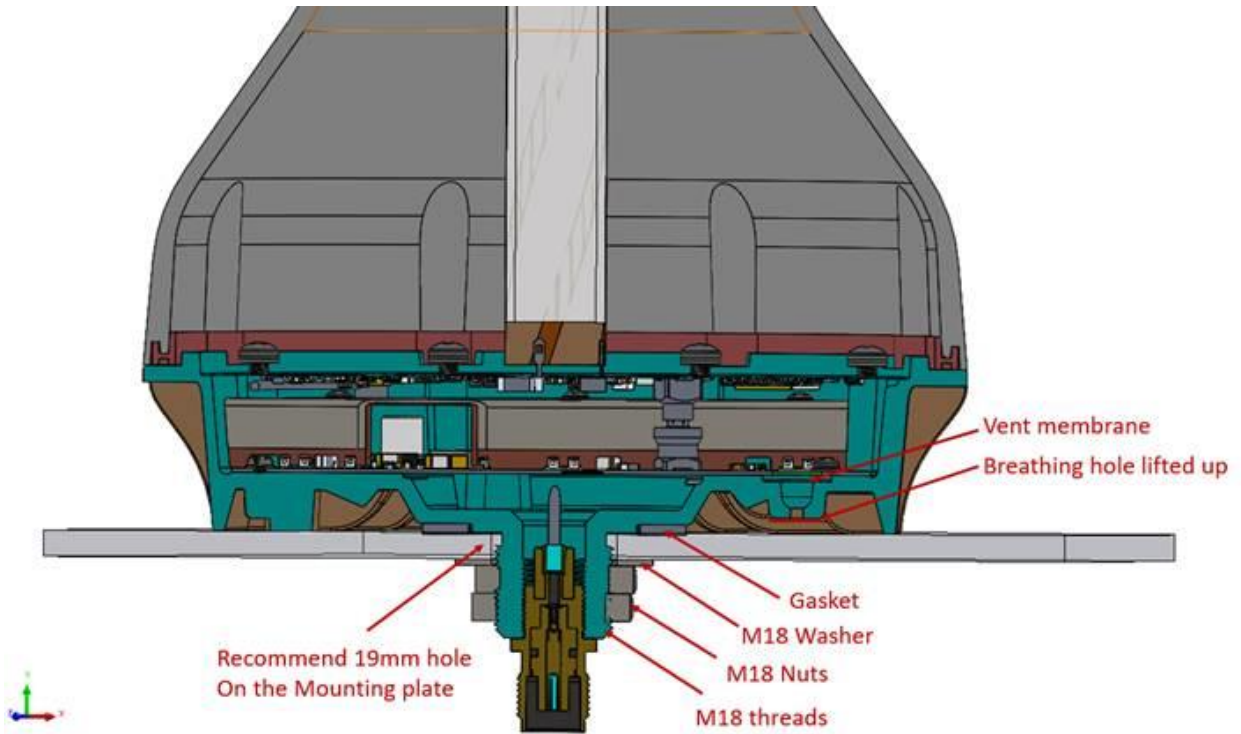


Figure 2-10 Certus 200 Antenna Mounting Details

### Installing the Below Deck Unit

The VesseLINK™ Below Deck Unit is designed for ease of installation with four corner mounting locations for direct mounting. Figure 2-11 and Table 2-3 show the Thales BDU mounting kit with part number 1100789-501.



**NOTE**

It is strongly recommended that the BDU be grounded to vessel ground or earth ground for added protection against surges and static discharge. Use a 14 AWG or larger ground wire (user provided) to connect the BDU's ground lug (see Figure 1-5) to vessel/earth ground.

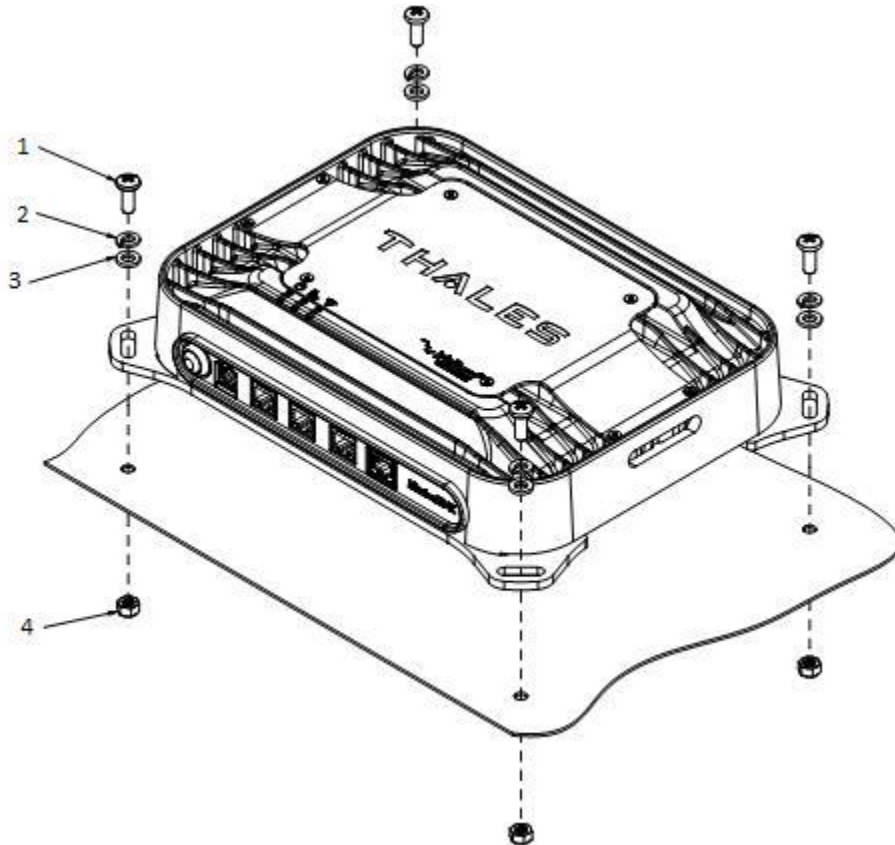


Figure 2-11 Below Deck Unit (BDU) Mounting Detail

Table 2-3 Installation Kit, Below Deck Unit (BDU) (PN 1100789-501)

| Item Number | Description                                                | Part Number | Qty |
|-------------|------------------------------------------------------------|-------------|-----|
| 1           | Screw Phil Pan HD 18-8 M6x1x20mm SS BLK Oxide              | 82768-001   | 4   |
| 2           | Washer Split Lock M6 (DIN 127B) A4 SS BLK Oxide            | 71304-001   | 4   |
| 3           | Washer Flat M6 6.4mm ID x 12mm OD x 1.6mm THK SS BLK Oxide | 71298-001   | 4   |
| 4           | Nut Lock w/Nylon Insert M6x1 18-8 SS                       | 75656-001   | 4   |

1. Use the template information provided in Appendix B to create the appropriate hole pattern in the desired mounting surface for the chosen mounting hardware.



Hole sizing and hardware are shown for through hole mounting as shown in Appendix B. User may mount antenna with other hardware at their discretion and own risk.





**NOTE**

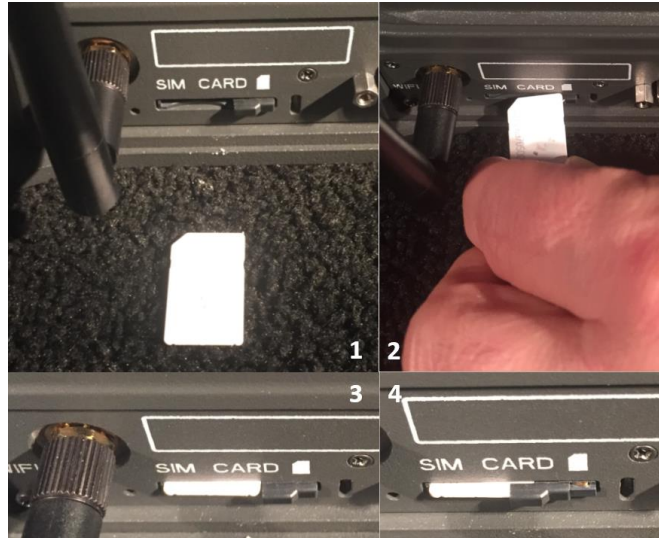
BDU can be mounted in any orientation but for best performance, it is recommended that it is mounted horizontally with the Thales logo facing up. This will give the best protection against any spills or dripping water and allows for the best heat transfer.

2. Position the pattern to avoid interferences with the antenna or coaxial cable connection to the antenna.
3. Assemble screws with split lock and flat washers as shown in Figure 2-11 and torque to 4.5 Ft. Lbs. (6 Nm).
4. Connect the provided Wi-Fi antenna, and install the SIM Card (from service provider) into slot.
  - a. Open the SIM Card protective cover by pulling it away from the TU, exposing the SIM card slot. (Figure 2-12).



*Figure 2-12 SIM Card with Cover Opened*

- b. Install SIM card from Air-time provider (1, Figure 2-13), by inserting the card with contacts down (2) until it clicks into place (3).
    - c. Be sure to engage the lock for the SIM Card (4).



*Figure 2-13 Installing SIM Card and Engaging the Lock*

- d. Secure the SIM Card cover once the SIM Card has been locked into place to prevent moisture or dust intrusion. (Figure 2-14)



*Figure 2-14 Secure the SIM Card Cover*

- 5. Connect the provided RF cable that goes to the antenna.



**NOTE**

The BDU should be grounded. Use a 14 AWG (or larger) ground wire to connect the BDU to earth ground during normal use.

## Connecting Power To The BDU

The BDU has two power connections available:

- AC Operation: The external AC/DC supply (Part #: 84670-001) with power cord. (See Figure 2-15)



*Figure 2-15 AC/DC Power Supply*



To safely disconnect the BDU from the power source, unplug the unit from the power outlet.

### NOTE



When installing the BDU, the power outlet should be near the BDU and be easily accessible.

### NOTE

- DC Operation for vessels operating from battery power: 10-32 Volts DC power cable (Part # 855024-020):
  - RED + ( 10-32VDC)
  - BLACK – ( GND)
  - Yellow (Remote Switch)
    - Turns BDU on/off through a remote switch connection or vessel ignition
    - Leave unconnected for BDU front panel power button operation on/off

## DC Power Connection

Installations using the DC power cable (PN 855024-020) should use the red and black primary power wires as well as the yellow remote wire as the ON/OFF switching source. The BDU will turn OFF with the vessel's ignition switch when the yellow remote line is connected, so it is important to make that connection in the vessel if desired (see Figure 2-16).

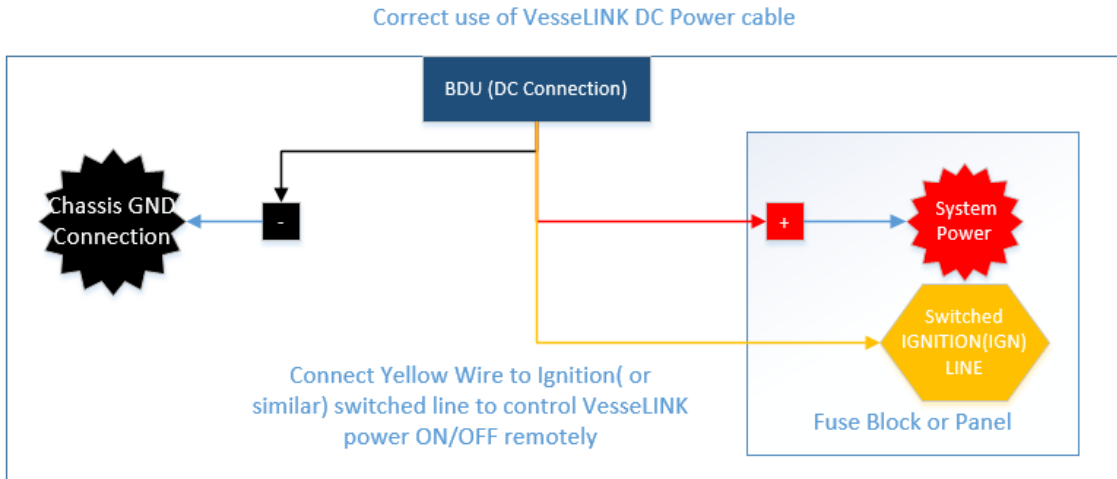


Figure 2-16 10-32V DC Power Connection

1. Connect the RED (+) cable to the positive terminal of DC power source.
2. Connect the BLACK (-) cable to the negative terminal of DC power source.
3. Connect the YELLOW wire to the ignition (or similar) via the fuse box or panel



### NOTE

Extra care and consideration must be taken when powering any device from a dual battery 24V DC system. It is important that 24V systems use the correct GND scheme that ensures unit is connected to the system's lowest potential (usually chassis GND). Otherwise damage to the BDU and antenna are likely and could void the warranty. (Refer to Figure 2-17).

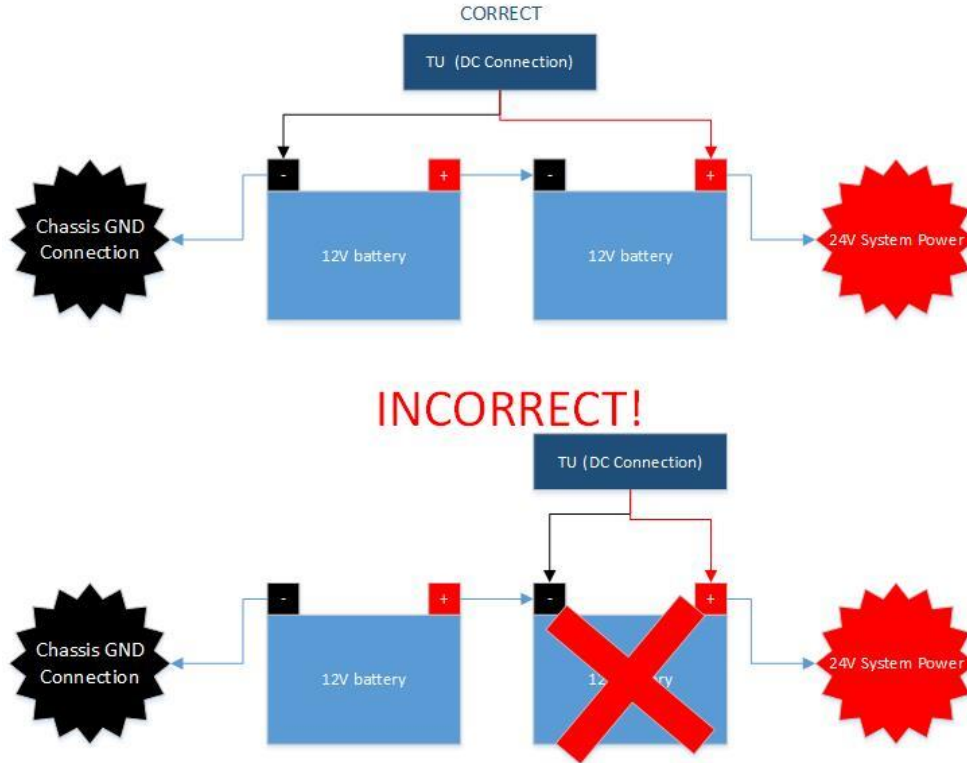


Figure 2-17 24V DC Power Connection

**System Status Indicators**

Now that the system installation is complete, press the power button on the BDU. In Figure 2-18, LEDs from left to right are: System (Overall System Status), Satellite (Satellite Connection Status) and Wi-Fi (Wireless Network Status). Table 2-4 describes the LED states.

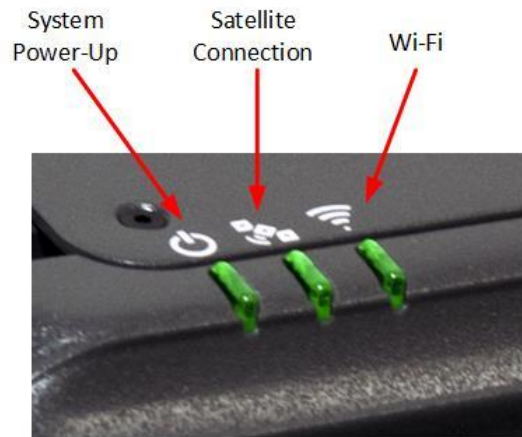





Figure 2-18 Below Deck Unit (BDU) LEDs

Table 2-4 Below Deck Unit (BDU) LED Status

| Indicator                                                                                          | Description                                 |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|
|  <b>System</b>    |                                             |
| Solid GREEN                                                                                        | System functioning properly                 |
| Flashing GREEN                                                                                     | System busy (Booting up)                    |
| Solid RED                                                                                          | Fault (minor issue)                         |
| Flashing RED                                                                                       | Critical fault (major issue)                |
|  <b>Satellite</b> |                                             |
| Solid BLUE                                                                                         | Connected and passing data (over satellite) |
| Solid GREEN                                                                                        | System functioning properly                 |
| Flashing GREEN                                                                                     | Acquiring satellite                         |
| Solid RED                                                                                          | Fault (minor issue)                         |
| Flashing RED                                                                                       | Critical fault (major issue)                |
|  <b>Wi-Fi</b>     |                                             |
| OFF                                                                                                | Wi-Fi OFF                                   |
| Flashing GREEN                                                                                     | Wi-Fi busy                                  |
| Solid Green                                                                                        | System functioning properly                 |
| Solid RED                                                                                          | Fault (minor issue)                         |
| Flashing RED                                                                                       | Critical fault (major issue)                |



**NOTE**

The Indicator Colors are:

Solid Green: Operational

Flashing Green: start-up or in progress of configuring or acquiring service.






Solid Red: fault requires user attention (Open Management Portal for Alerts)

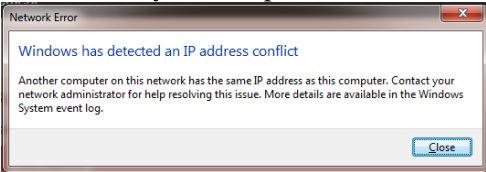
Flashing Red: critical fault requiring immediate attention. For additional information, refer to Chapter 3 Troubleshooting

## CHAPTER 3 TROUBLESHOOTING

### TROUBLESHOOTING

Table 3-1 Troubleshooting

| PROBLEM                                                                                                        | SOLUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  Satellite LED Flashing GREEN | <ul style="list-style-type: none"> <li>Flashing GREEN light indicates that it is acquiring the satellite. If it continues to flash for more than 5 minutes, check that the antenna has a clear view of the sky.</li> <li>Reboot BDU.</li> </ul>                                                                                                                                                                                                                                                                 |
|  Satellite LED Flashing RED   | <ul style="list-style-type: none"> <li>Critical Fault Detected. Open Management Portal <a href="http://portal.thaleslink">http://portal.thaleslink</a> (or <a href="https://portal.thaleslink">https://portal.thaleslink</a>) and check Alerts. Make any adjustments. (For example: check antenna connection, or GPS not acquired.)</li> <li>Turn unit off and on again. If same result, contact your service provider.</li> </ul>                                                                              |
|  System LED Flashing Green    | <ul style="list-style-type: none"> <li>Start-up in progress. Wait until unit has run diagnostics and completed start procedure. This may take more time than usual when acquiring satellites for the first time</li> <li>Switch power off and back on if the light does not turn solid green after 5 minutes.</li> </ul>                                                                                                                                                                                        |
|  System LED Flashing RED    | <p>Fault Detected. Open Management Portal <a href="http://portal.thaleslink">http://portal.thaleslink</a> (or <a href="https://portal.thaleslink">https://portal.thaleslink</a>) and check for alerts. Make any adjustments. (For example: Common alerts include, but not limited to, are the SIM Card not installed, SIM Card not provisioned. Power-Up Test (POST) failure.)</p> <ul style="list-style-type: none"> <li>Turn unit off and on again. If same result, contact your service provider.</li> </ul> |
|  Wi-Fi LED                  | <p>OFF – Turn Wi-Fi ON using the Management Portal through a hardwired, PoE connection.<br/>ThalesLINK &gt; SETTINGS &gt; Wi-Fi</p> <p>Solid RED – Wi-Fi may need to be turned off and back on again from the Management Portal. If the LED does not turn to GREEN within a minute, reboot the BDU.</p> <p>Flashing GREEN – If this continues for more than a minute or two, check for NO OR WEAK Wi-Fi</p>                                                                                                     |
| Call Logs are not appearing                                                                                    | Call logs must be enabled. Verify call logs are enabled (SETTING → PHONE → PHONE CONFIGURATION)                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Calls unexpectedly drop when using Gateway                                                                     | Verify that the Gateway number is not assigned to any other phone. If it is, your Gateway call may drop unexpectedly. To correct this, remove the duplicate number.                                                                                                                                                                                                                                                                                                                                             |
| Cannot connect to the internet                                                                                 | Data sessions default is OFF. Check to make Satellite Data Sessions is ACTIVATED on Dashboard. If not, select ACTIVATE and then APPLY next to SATELLITE DATA SESSION.                                                                                                                                                                                                                                                                                                                                           |

| PROBLEM                                        | SOLUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Cannot connect to the Management Portal</p> | <ul style="list-style-type: none"> <li>• You may need to clear your browser cache.</li> <li>• Ensure Terminal Unit is powered ON</li> <li>• Ensure Wi-Fi is enabled and connected to ThalesLINK (or renamed SSID). If using a Wi-Fi enabled device, the Wi-Fi LED on the BDU should be solid GREEN. If not using Wi-Fi, ensure Cat 5 cable is connected to one of the three Ethernet ports (NOT WAN or POTS Port). If Ethernet connection, replace the cable and re-check connection</li> <li>• Open web browser and type <a href="http://portal.thaleslink">http://portal.thaleslink</a> (or <a href="https://portal.thaleslink">https://portal.thaleslink</a>). Ensure network settings are correct on the connected device.</li> <li>• Device’s browser may be incompatible. Update or try different browser.</li> <li>• You may need to reconnect via Ethernet or Wi-Fi to the BDU.</li> <li>• Check to make sure the correct address is typed in <a href="http://portal.thaleslink">http://portal.thaleslink</a> (or <a href="https://portal.thaleslink">https://portal.thaleslink</a>)</li> <li>• If system LED is flashing GREEN, wait until it turns solid GREEN, then try reconnecting to the portal.</li> </ul> |
| <p>Cannot connect to Wi-Fi service</p>         | <ul style="list-style-type: none"> <li>• Check that the Wi-Fi antenna is attached and tightly screwed in.</li> <li>• Check that the BDU’s Wi-Fi LED is solid GREEN.</li> <li>• Check to see if there’s an available connection by checking the devices that are connected in Status → Current Devices page.</li> <li>• Only 3 simultaneous devices can connect to the Wi-Fi. Any additional connection attempts are blocked.</li> <li>• Remove one or more devices from the Wi-Fi and try again to connect.</li> <li>• Use the Wi-Fi Device Whitelist to limit access to specific wireless devices.</li> <li>• Verify that the SSID has NOT been disabled. If disabled, enable the SSID. If the device does not “automatically” reconnect, then manually reconnect by adding the network on the device. Refer to device user manual for instructions on how to do this.</li> </ul>                                                                                                                                                                                                                                                                                                                                        |
| <p>Network Error</p>                           | <p>If you receive a message similar to this, another user is attempting to use the same IP Address as your computer.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



| PROBLEM                                                              | SOLUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No or Weak Wi-Fi Signal                                              | <ul style="list-style-type: none"> <li>• Connect Wi-Fi antenna and ensure it is secured tightly</li> <li>• If walls or metal obstructions are between the BDU and the Wi-Fi device, move closer to the BDU or move the BDU to a better location with less obstructions</li> <li>• Check to make sure Wi-Fi device is connected to the TBDU's Wi-Fi and verify that you are connected to the ThalesLINK.</li> <li>• Check the Management Portal to make sure the Wi-Fi device is registered as a user.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| VesseLINK is not obtaining a satellite signal (Satellite LED is red) | <ul style="list-style-type: none"> <li>• Check signal bars at the top of the Management Portal. If no bars are highlighted, the satellite is not being detected. Wait a few minutes to see if the signal strength improves as another satellite comes into view.</li> <li>• Check antenna connection at the BDU and antenna. Make sure no corrosion has occurred on the cable connections to the antenna and that the connectors are screwed in tightly.</li> <li>• Check antenna for a clear view of the sky with no obstructions. Relocate antenna if needed.</li> <li>• Check for interferers in the area that could be affecting the signal such as active radars, VSAT systems and other radio antennas. Turn those off and retest.</li> <li>• Move vehicle to a new location and retest if other interfering vehicles are in the area</li> <li>• Reboot BDU and check the Alerts.</li> <li>• Call Service Provider if the satellite connection is still not working.</li> </ul> |
| BDU does not Power-ON                                                | <ul style="list-style-type: none"> <li>• Check BDU for Green lights, If green light is on Unit has Power</li> <li>• Push power button on front of BDU.</li> <li>• Check that the power source is providing 10-32V and is not current limited.</li> <li>• Check connection of the 10-32V DC cable has correct polarity.</li> <li>• Check to ensure Ignition line is connected to switched line or connected to Red (Positive line) for continuous operation.</li> <li>• Check that ignition or remote switch is turned on if ignition line is connected.</li> <li>• If using AC/DC converter, make sure the AC outlet has power and that the plug is securely in the AC outlet and the other end is securely connected to the BDU.</li> </ul>                                                                                                                                                                                                                                          |

| PROBLEM                                          | SOLUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>BDU has power but accessories not working</p> | <ul style="list-style-type: none"> <li>• Remove power from accessories and disconnect from BDU. Restart BDU using the power button or remove power from BDU for 10 seconds. After BDU has rebooted re-attach accessories. (Note: This applies to all accessories, EXCEPT the antenna. Do not disconnect the antenna while booting up the system.)</li> <li>• If PoE accessory not receiving power, make sure PoE is enabled for that port.</li> <li>• PoE is not available on WAN port. Any device on WAN port needs its own power source.</li> <li>• Check VoIP phone manuals for proper configuration. Each phone may have a different configuration method.</li> </ul>                                                            |
| <p>BDU is not responding</p>                     | <ul style="list-style-type: none"> <li>• Check LED status on BDU or on Management Portal. Make sure there are no RED LEDs. Check for Alerts in Management Portal by selecting the Alerts menu item</li> <li>• Reboot the system and recheck for any Alerts that may have been generated.</li> <li>• Call Service Provider if the BDU is still not responding.</li> <li>• As a last resort, use the manual reset button, located below Wi-Fi antenna port, using a straightened paper clip or similar sized article insert into port and push reset button.<br/><u>NOTE:</u> This is not recommended as a routine troubleshooting measure. All user data and debug information will be lost and factory defaults returned.</li> </ul> |

**CHAPTER 4 TECHNICAL SPECIFICATIONS**

**Technical Specifications**

*Table 4-1 Technical Specifications*

| Description                      |                           | Parameters                      |                                     |
|----------------------------------|---------------------------|---------------------------------|-------------------------------------|
| <b>Technical</b>                 |                           |                                 |                                     |
| Frequency of Operation           | Uplink (TX)               | 1616 to 1626.5 MHz              |                                     |
|                                  | Downlink (RX)             | 1616 to 1626.5 MHz              |                                     |
| Channelization                   | FDMA spacing              | 41.667 KHz                      |                                     |
|                                  | TDMA Timing               | 8.3ms Slot in a 90ms window     |                                     |
|                                  | Channels Available        | 240 channels                    |                                     |
|                                  |                           | <b>Certus 200</b>               | <b>Certus 350</b>                   |
| EIRP (Weighted Average)          | Voice                     | 9 dBW                           | 9 dBW                               |
|                                  | Data Certus™ 2xC8 QPSK    | 12 dBW                          | -                                   |
|                                  | Data Certus™ 1xC8 16 APSK | -                               | 15.2 dBW                            |
|                                  | Data Certus™ 2xC8 16 APSK | -                               | 18.2 dBW                            |
|                                  | Certus™ C1, C8 Voice/Data | QPSK                            | QPSK                                |
|                                  | Certus™ C8 APSK Data      | -                               | 16 APSK                             |
| Antenna                          | Type                      | Single passive element          | Electronically steered phased array |
|                                  | Polarization              | RHCP                            | RHCP                                |
|                                  | Gain                      | 1 dBi                           | 9.5 dBi                             |
|                                  | Beam Width                | Omnidirectional                 | 31° typical per beam                |
|                                  | VesseLINK coverage        | -12° to 90° elevation           | -12° to 90° elevation               |
| <b>Power</b>                     |                           |                                 |                                     |
| Main Power (AC/DC Power Adapter) | AC Input Voltage          | 100-240 VAC                     |                                     |
|                                  | Frequency                 | 50/60 Hz                        |                                     |
|                                  | DC Output Voltage         | 12 VDC                          |                                     |
|                                  | Max Power                 | 120 Watts                       |                                     |
| DC Input 10-32VDC                | Voltage                   | 10-32 VDC                       |                                     |
|                                  | Max Current               | 12 Amps (10V) – 3.75 Amps (32V) |                                     |
|                                  | Max Power                 | 120 Watts                       |                                     |
| DC Input 12 VDC                  | Voltage                   | 12 VDC (+10%/-5%)               |                                     |
|                                  | Max Current               | 10 Amps                         |                                     |
|                                  | Max Power                 | 120 Watts                       |                                     |
| Ethernet                         | 3x PoE                    | PSE Class 2 (6.5 Watts each)    |                                     |

| <b>Environmental</b> |                     |                                                   |                                   |
|----------------------|---------------------|---------------------------------------------------|-----------------------------------|
| <b>Description</b>   |                     | <b>Certus 200</b>                                 | <b>Certus 350</b>                 |
| ADU                  | Operating Temp      | -40°C to +55°C                                    |                                   |
|                      | IP Rating           | IP67                                              |                                   |
| BDU                  | Operating Temp      | -30°C to +55°C                                    |                                   |
|                      | IP Rating           | IP31                                              |                                   |
| <b>Mechanical</b>    |                     | <b>Certus 200</b>                                 | <b>Certus 350</b>                 |
| ADU                  | Dimensions          | 5" D x 5.5" H<br>(12.5 cm x 14 cm)                | 14.5" x 7.8"<br>(36.8cm x 19.8cm) |
|                      | Weight              | 1 lb. (0.45 kg)                                   | 6.2 lbs. (2.8 kg)                 |
| BDU                  | Dimensions          | 12" L x 9" W x 3" H<br>(30.5 cm x 23 cm x 7.6 cm) |                                   |
|                      | Weight              | 7.5 lbs (3.4 kg)                                  |                                   |
| AC Power Brick       | Length              | 6.6" (16.7cm)                                     |                                   |
|                      | Width               | 2.6" (6.7cm)                                      |                                   |
|                      | Height              | 1.4"(3.5cm)                                       |                                   |
|                      | Weight              | 1.37lbs (0.62 kg)                                 |                                   |
|                      | AC Cable Length     | ~6ft (1.8m)                                       |                                   |
|                      | DC Cable Length     | ~3.9ft (1.2m)                                     |                                   |
| RF Cables            | 25 meter            | LMR-300FR or Similar w/TNCM-TNCM                  |                                   |
|                      | 50 meter (optional) | LMR-400FR or Similar w/TNCM-TNCM                  |                                   |

## CONNECTOR DETAILS

### General Purpose Inputs / Outputs (GPIO)

The DB-15 connector with Pin out shown in Figure 4-1. See User Manual for more details.

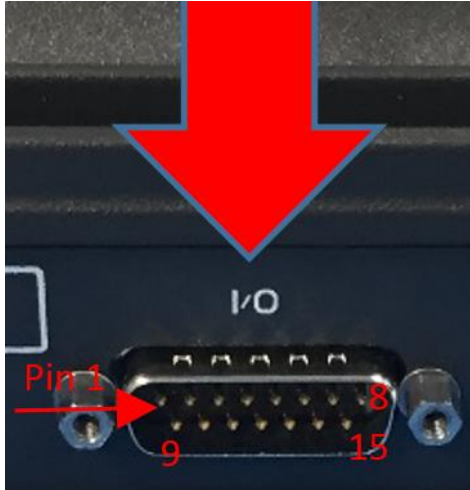


Figure 4-1 GPIO Connector Pin Detail

Table 4-2 GPIO Connector Pin Definition

| Pin No | Name        | Description                                                                                                                                                |
|--------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | GND1        | Ground                                                                                                                                                     |
| 2      | Audio_In +  | Radio Gateway functionality, differential (+) Hi-Z Audio Input from external Radio                                                                         |
| 3      | Audio_Out + | Radio Gateway functionality, Differential (+) Low-Z Audio Output to external radio (mic input)                                                             |
| 4      | RadioCOR    | Radio Gateway functionality, Radio initiated voice into terminal (optional)                                                                                |
| 5      | EMER_IN     | Emergency remote functionality, Ground pin to activate internal Emergency                                                                                  |
| 6      | GPI01       | Software configurable GPIO pin #1 (future)                                                                                                                 |
| 7      | RS232_TD    | RS232 Output (future)                                                                                                                                      |
| 8      | GND2        | Ground                                                                                                                                                     |
| 9      | Audio_In -  | Radio Gateway functionality, differential (-) Hi-Z Audio Input from external Radio                                                                         |
| 10     | Audio_Out - | Radio Gateway functionality, Differential (-) Low-Z Audio Output to external radio (mic input)                                                             |
| 11     | RadioPTT    | Radio Gateway functionality, Output PTT from terminal to external radio, short to ground for PTT enabled, Open drain requires external 10k pullup resistor |
| 12     | GND3        | Ground                                                                                                                                                     |
| 13     | GPI02       | Software configurable GPIO pin #2 (future)                                                                                                                 |
| 14     | RS232_RD    | RS232 Input (future)                                                                                                                                       |
| 15     | 12V         | +12V output, 100mA                                                                                                                                         |

## BDU 12V Connection Detail

Type: KPPX-4x connector (or similar) shown in Figure 4-2.

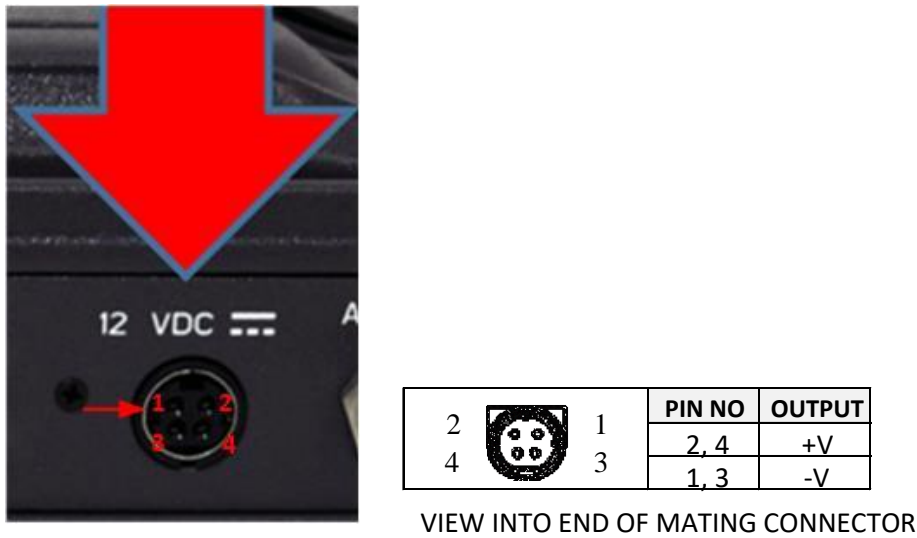


Figure 4-2 12V Input and Mating Connector Detail

## BDU 10-32VDC Connection Detail

Type: 684M7W2103L201 connector (or similar) shown in Figure 4-3.

A1 = V+ /10-32VDC

A2 =V- /GND

Pin 5 = Ignition

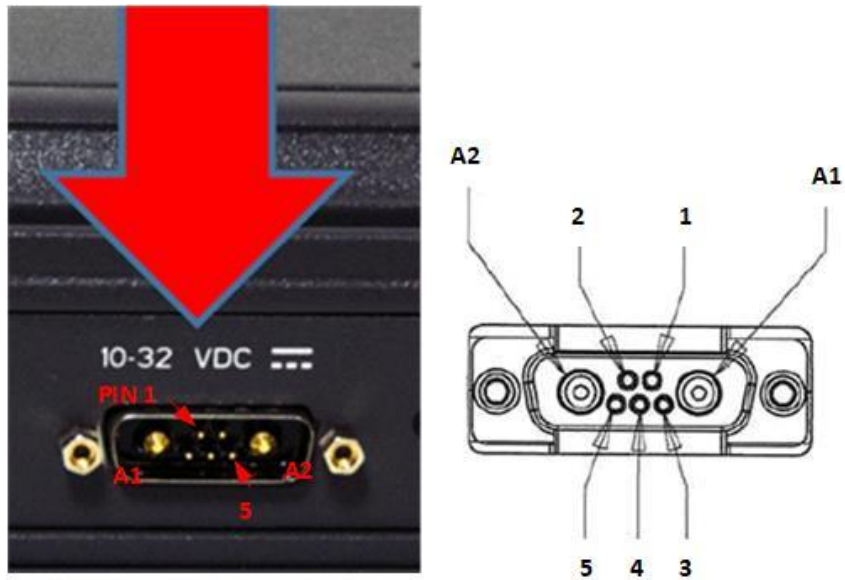


Figure 4-3 10-32 VDC and Mating Connector Detail

**CHAPTER 5 ACRONYMS / GLOSSARY**

**Acronyms / Glossary**

*Table 5-1 List of Acronyms*

| <b>Acronym</b> | <b>Description</b>                                                                          |
|----------------|---------------------------------------------------------------------------------------------|
| ADU            | Above Deck Unit Antenna                                                                     |
| API            | Application Programming Interface                                                           |
| BAA            | Broadband Active Antenna                                                                    |
| BAE            | Broadband Application Electronics                                                           |
| BCX            | Broadband Core Transceiver                                                                  |
| BDU            | Below Deck Unit Terminal Unit                                                               |
| BIT            | Built In Test                                                                               |
| DTMF           | Dual Tone Multi-Frequency                                                                   |
| EBB            | Enhanced Broadband                                                                          |
| ETSI           | European Telecommunications Standards Institute                                             |
| GPIO           | General Purpose Inputs/Outputs                                                              |
| HGA            | High Gain Antenna                                                                           |
| HRLP           | High Speed Radio Link Protocol                                                              |
| HTTP           | Hypertext Transfer Protocol                                                                 |
| IP             | Internet Protocol                                                                           |
| ICMP           | Internet Control Message Protocol                                                           |
| ITU            | International Telecommunications Union                                                      |
| LAN            | Local Area Network                                                                          |
| LED            | Light Emitting Diode                                                                        |
| LGA            | Low Gain Antenna                                                                            |
| MO             | Mobile Originated                                                                           |
| msec           | Milliseconds                                                                                |
| MT             | Mobile Terminated                                                                           |
| NAS            | Network Attached Storage                                                                    |
| PBX            | Private Branch Exchange                                                                     |
| PCM            | Pulse Code Modulation                                                                       |
| PoE            | Power Over Ethernet                                                                         |
| POST           | Power On Self-Test                                                                          |
| POTS           | Plain Old Telephone Service                                                                 |
| PSTN           | Public Switched Telephone Network                                                           |
| PTT            | Two way radio term indicating the pressing of a button to initiate transmit before speaking |
| R/W            | Read/Write                                                                                  |
| SBC            | Smart Battery Charger                                                                       |
| SIM            | Subscriber Identity Module                                                                  |
| SIP            | Session Initiation Protocol                                                                 |

| Acronym  | Description                               |
|----------|-------------------------------------------|
| SMBus    | System Management Bus                     |
| SV       | Satellite Vehicle                         |
| TCP      | Transmission Control Protocol             |
| TU       | Terminal Unit                             |
| UDP      | User Datagram Protocol                    |
| UL/DL    | Uplink/Downlink                           |
| VLAN     | Virtual Local Area Network                |
| VOIP     | Voice of Internet Protocol                |
| WAN      | Wide Area Network                         |
| WI-FI    | Wireless Network                          |
| WPA2-PSK | Wi-Fi Protected Access 2 – Pre-Shared Key |

*Table 5-2 List of Definitions*

| Acronym | Description                                     |                                                                                                                                                        |
|---------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| API     | Application Programming Interface               | The Management Portal provides API to allow for the connection to the terminal remotely.                                                               |
| BAA     | Broadband Active Antenna                        | The antenna and supporting electronics that interface an Iridium satellite terminal with the Iridium constellation                                     |
| BAE     | Broadband Application Electronics               | Hardware and software platform resident in the BDU that interfaces with the BCX, BAA and user devices                                                  |
| BCX     | Broadband Core Transceiver                      | Hardware designed for an Iridium satellite terminal to interface end-user equipment with an Iridium BAA                                                |
| BIT     | Built In Test                                   | Diagnostic testing for system integrity check and error reporting                                                                                      |
| DTMF    | Dual Tone Multi-Frequency                       | Signals generated from phone keypad                                                                                                                    |
| EBB     | Enhanced Broadband                              | EBB Mode is Iridium NEXT phase 1 EBBS (Enhanced Broadband Service)                                                                                     |
| ETSI    | European Telecommunications Standards Institute | Organization that maintains standards for Information and Communications applicable to fixed and mobile radio platforms                                |
| GPIO    | General Purpose Inputs/Outputs                  | General use pins                                                                                                                                       |
| HGA     | High Gain Antenna                               | External antenna that connects to the BDU via a coaxial cable. The HGA2 (also called BAA-H2) provides 352 kbps uplink and 704 kbps downlink capability |
| HRLP    | High Speed Radio Link Protocol                  | Management of In-band signaling on broadband channels                                                                                                  |
| HTTP    | Hypertext Transfer Protocol                     | Protocol to exchange or transfer hypertext                                                                                                             |
| ICMP    | Internet Control Message Protocol               | Protocol by network devices that typically send error messages and is used for diagnostics                                                             |



| Acronym           | Description                            |                                                                                                                                                                         |
|-------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ITU               | International Telecommunications Union | Agency of the United Nations responsible for issues concerning information and communications technologies                                                              |
| LED               | Light Emitting Diode                   | Semiconductor that emits colored light                                                                                                                                  |
| LGA               | Low Gain Antenna                       | External antenna that connects to the BDU via a coaxial cable. The LGA supports Certus <sup>SM</sup> 100 and Certus <sup>SM</sup> 200 capabilities                      |
| Management Portal |                                        | Management Portal: A web page served from the Terminal Unit that brings together the diverse status and configuration information of the LMC 350 in one place.          |
| MO                | Mobile Originated                      | Calls originating from the terminal)                                                                                                                                    |
| MT                | Mobile Terminated                      | Calls terminating at the terminal                                                                                                                                       |
| NAS               | Network Attached Storage               | Ability to store and retrieve files to/from a physical memory storage device attached to the network                                                                    |
| PBX               | Private Branch Exchange                | Telephone connection between local users not requiring external phone connection                                                                                        |
| POST              | Power On Self-Test                     | BIT Test performed at the turn-on of the BDU                                                                                                                            |
| POTS              | Plain Old Telephone Service            | A voice-grade telephone service that utilizes analog signal transmission over copper loops                                                                              |
| PSTN              | Public Switched Telephone Network      | The world's collection of interconnected voice-orientable public telephone networks, both commercial and government owned.                                              |
| PTT               | Push-To-Talk                           | Two way radio term indicating the pressing of a button to initiate transmit before speaking                                                                             |
| R/W               | Read/Write                             | Capability                                                                                                                                                              |
| RGW               | Radio Gateway                          | Radio Gateway feature enables communication between telephone users and users of ground radios.                                                                         |
| SIM               | Subscriber Identification Module       | Iridium provided method to authenticate and identify subscriber                                                                                                         |
| SIP               | Session Initiation Protocol            | An Internet Engineering Task Force (IETF) standard protocol for initiating an interactive user session that involves multimedia elements such as video, voice, and chat |
| SV                | Satellite Vehicle                      | Iridium Satellite                                                                                                                                                       |
| SMBus             | System Management Bus                  | Two-wire bus for communications between devices such as a Terminal and a Smart Battery                                                                                  |
| TCP               | Transmission Control Protocol          | Core internet protocol that provides reliable delivery and error-checking                                                                                               |
| TU                | Terminal Unit                          | Electronic equipment that contains the BCX and the BAE                                                                                                                  |
| UL/DL             | Uplink/Downlink                        | To and from satellite communications                                                                                                                                    |
| UDP               | User Datagram Protocol                 | Connectionless transmission model with minimum , no-handshaking protocol                                                                                                |
| VLAN              | Virtual Local Area Network             | For context within this document, VLAN more specifically designates an Ethernet VLAN. A VLAN is establishes a broadcast domain that is partitioned                      |

| Acronym  | Description                                  |                                    |
|----------|----------------------------------------------|------------------------------------|
| WPA2-PSK | Wi-Fi Protected Access 2<br>– Pre-Shared Key | Method of securing a Wi-Fi network |

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## S

### System Overview

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## T

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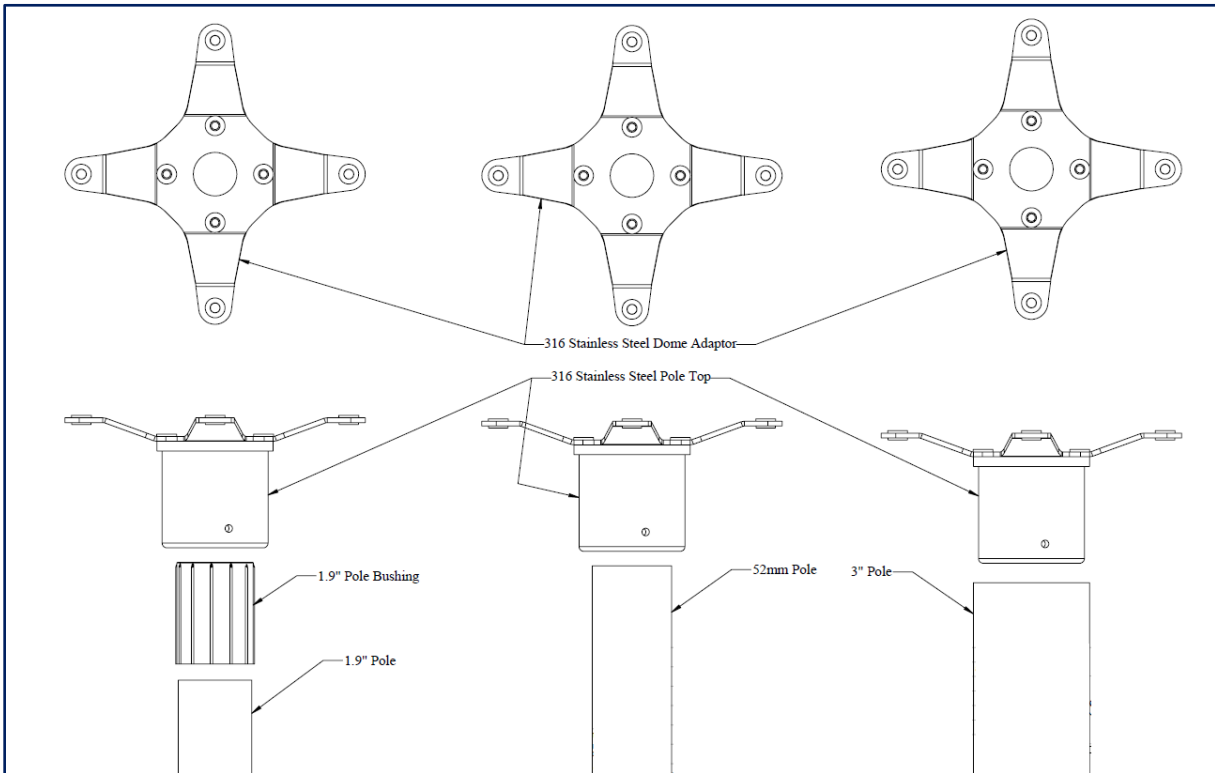


## Appendix C Certus 350 Antenna Pole Mounting (Optional)

Two optional 316 stainless steel antenna mounting brackets are available.

- Antenna Pole Mount M6 (PN 85736-001)
- Antenna Pole Mount M10 (PN 85739-001)

The brackets are both designed to work on standard 1.9-inch (with included bushing), 52mm and 3-inch poles (poles not included). The brackets have mounting holes that match the mounting points on the bottom of the antenna (M6 or M10). The smaller bracket (PN 85736-001) uses the M6 mounting points and the larger bracket (PN 85739-001) uses the M10 mounting points.



*Figure C-1 Thales Antenna Mounting Bracket (Shown With Poles, Not Included)*

## Antenna Pole Mount using M6 Hardware

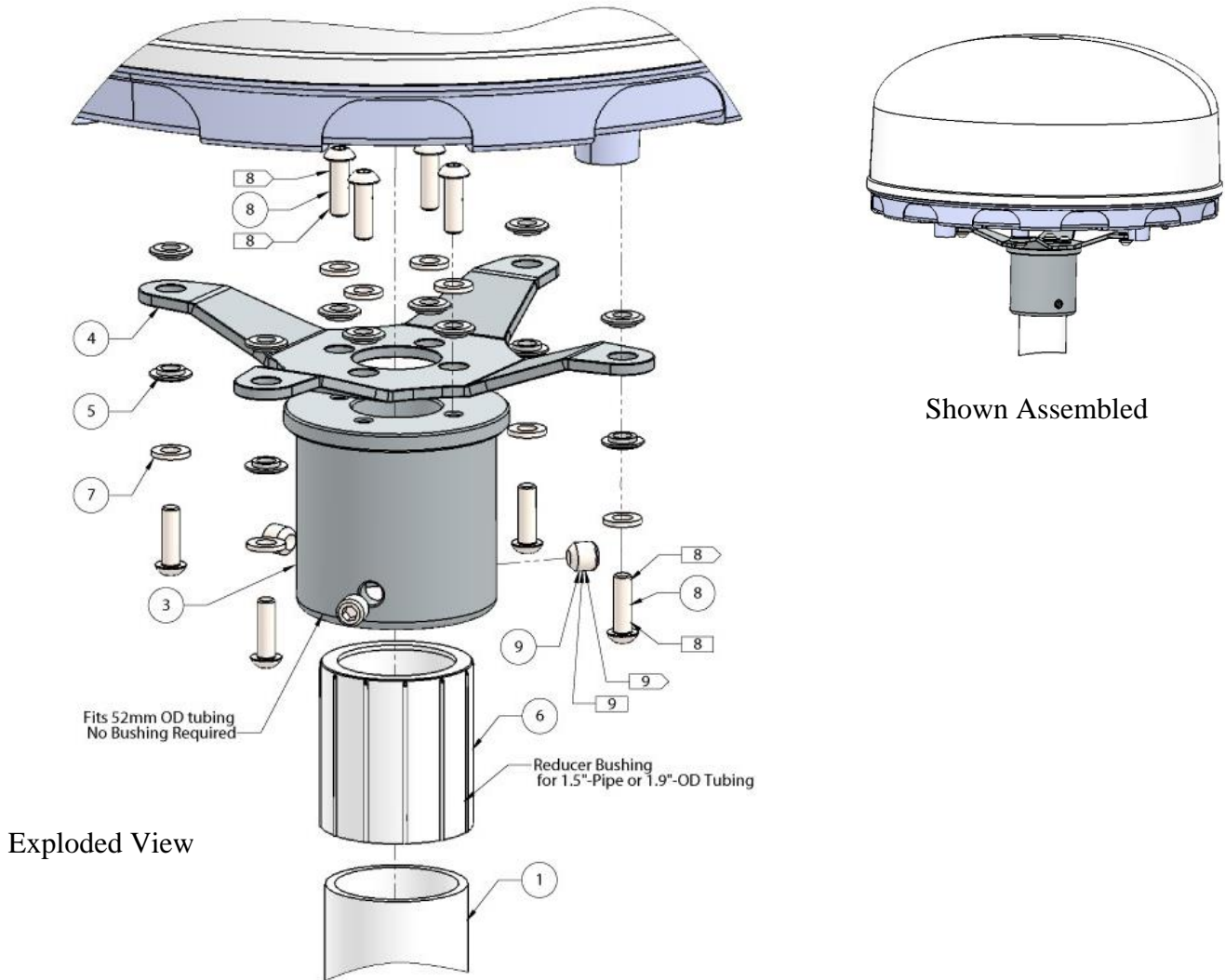


Figure C-2 Thales Antenna Pole Mount Kit – M6 (PN 85736-001)

Table C-1 Antenna Pole Mount using M6 Hardware Kit (PN 85736-001)

| Item Number | Description                                   | Qty | Comment                  |
|-------------|-----------------------------------------------|-----|--------------------------|
| 1           | Outside Diameter 1.9" OD                      | 1   |                          |
| 2           | Blue Loctite                                  | 1   | Apply to item 8, 9       |
| 3           | S.S. Hub 52mm-ID for Metric 52mm Tube         | 1   |                          |
| 4           | S. S. Bracket for Thales Antenna              | 1   |                          |
| 5           | Nylon Bushing, ID.25, 24SW0250                | 12  |                          |
| 6           | Plastic Reducer Bushing for 1.5"-Pipe 1.9" OD | 1   |                          |
| 7           | S. S. Washer .275 x .5 x .062                 | 8   |                          |
| 8           | S. S. Button Hd Bolt M6x20                    | 8   | Recommended Torque 8 Nm  |
| 9           | S. S. Cup Pt Set Screw 3/8 – 16 x 3/8         | 3   | Recommended Torque 30 Nm |



## Antenna Pole Mount using M10 Hardware

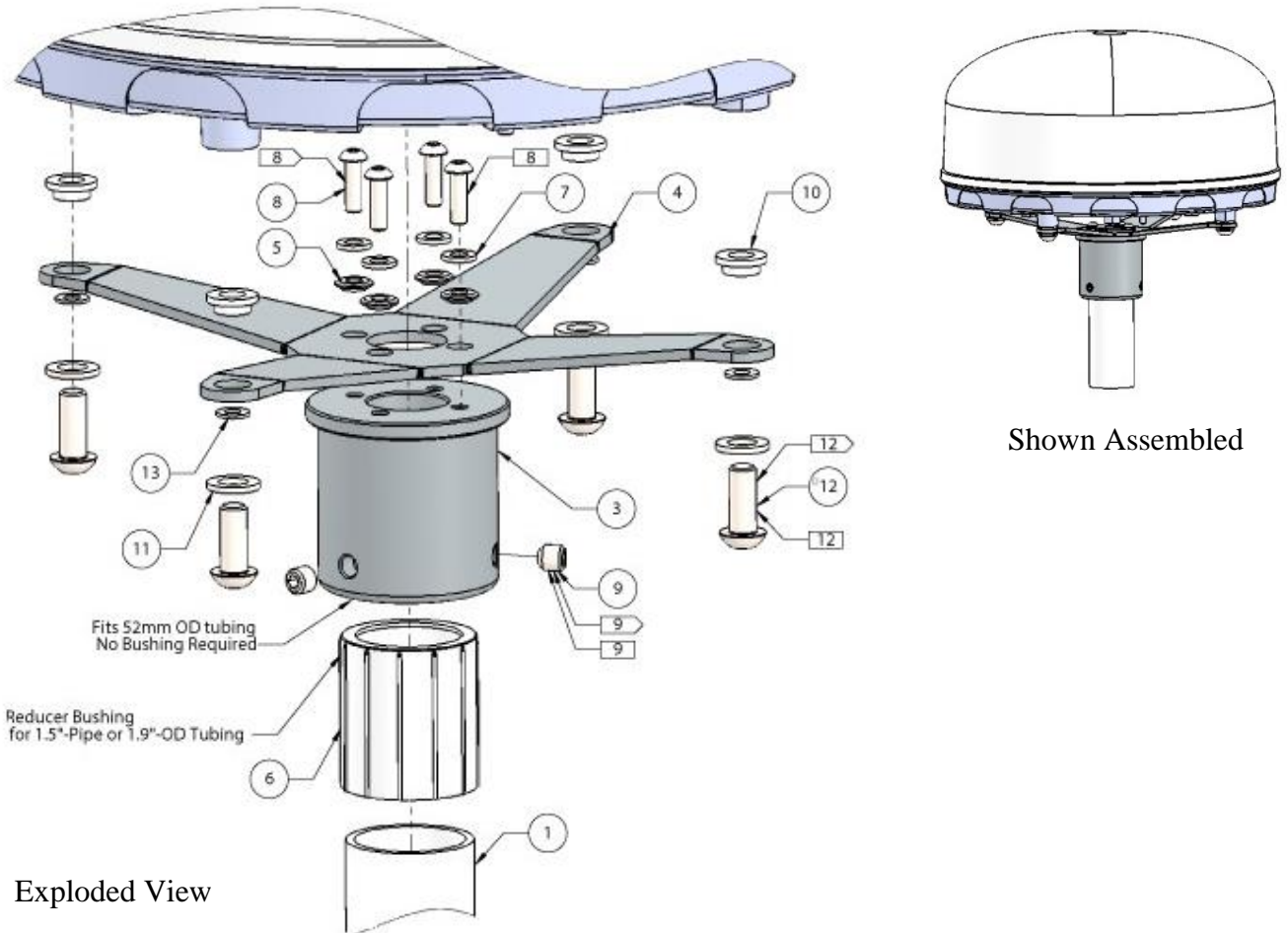


Figure C-3 Thales Antenna Pole Mount Kit – M10 (PN 85739-001)

Table C-2 Antenna Pole Mount using M10 Hardware Kit (PN 85739-001)

| Item Number | Description                                   | Qty | Comment                  |
|-------------|-----------------------------------------------|-----|--------------------------|
| 1           | Outside Diameter 1.9" OD                      | 1   |                          |
| 2           | Blue Loctite                                  | 1   | Apply to item 8, 9 , 12  |
| 3           | S.S. Hub 52mm-ID fo Metric 52mm Tube          | 1   |                          |
| 4           | S. S. Bracket for Thales Antenna              | 1   |                          |
| 5           | Nylon Bushing, ID.25, 24SW0250                | 4   |                          |
| 6           | Plastic Reducer Bushing for 1.5"-Pipe 1.9" OD | 1   |                          |
| 7           | S. S. Washer .25"                             | 4   |                          |
| 8           | S. S. Button Hd Bolt M6x20                    | 4   | Recommended Torque 6 Nm  |
| 9           | S. S. Cup Pt Set Screw 3/8 – 16 x 3/8         | 3   | Recommended Torque 30 Nm |
| 10          | Nylon Bushing 10mm                            | 4   |                          |
| 11          | S. S. Washer                                  | 4   |                          |
| 12          | S. S. Button Hd Bolt M10 x 25                 | 4   | Recommended Torque 28 Nm |
| 13          | Nylon Washer 10mm                             | 4   |                          |

### 1100855-501 CERTUS 200 BASIC VESSELINK ANTENNA MOUNTING KIT



The bracket itself is 316 stainless steel. The other hardware is 304 stainless steel. This has a single U-bolt for securing the antenna to a vertical pole.

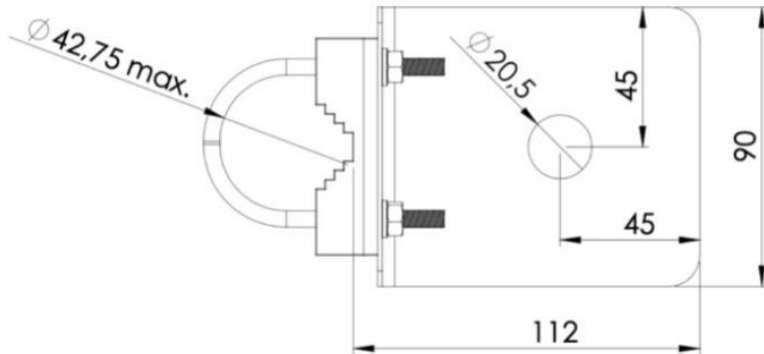


Figure D-1 Certus 200 Basic VesseLINK™ Antenna Mounting Kit

Table D-1 Certus 200 Basic VesseLINK™ Antenna Mounting Kit Specs

GENERAL SPECIFICATION

|                        |                                                                 |
|------------------------|-----------------------------------------------------------------|
| Mounting               | Pole Mount                                                      |
| Dimensions (mm)        | 112 × 90 × 30                                                   |
| Operating temperature  | -40 °C to +85 °C                                                |
| Material               | Stainless Steel                                                 |
| Note                   | Can be used for other screw mount antennas with same screw type |
| Max Pole Diameter (mm) | Ø 43                                                            |

## 1100855-502 CERTUS 200 PREMIUM VESSELINK POLE TOP MOUNT



Polished 316 Stainless Steel Hub, Plate and Hardware

### NOTE

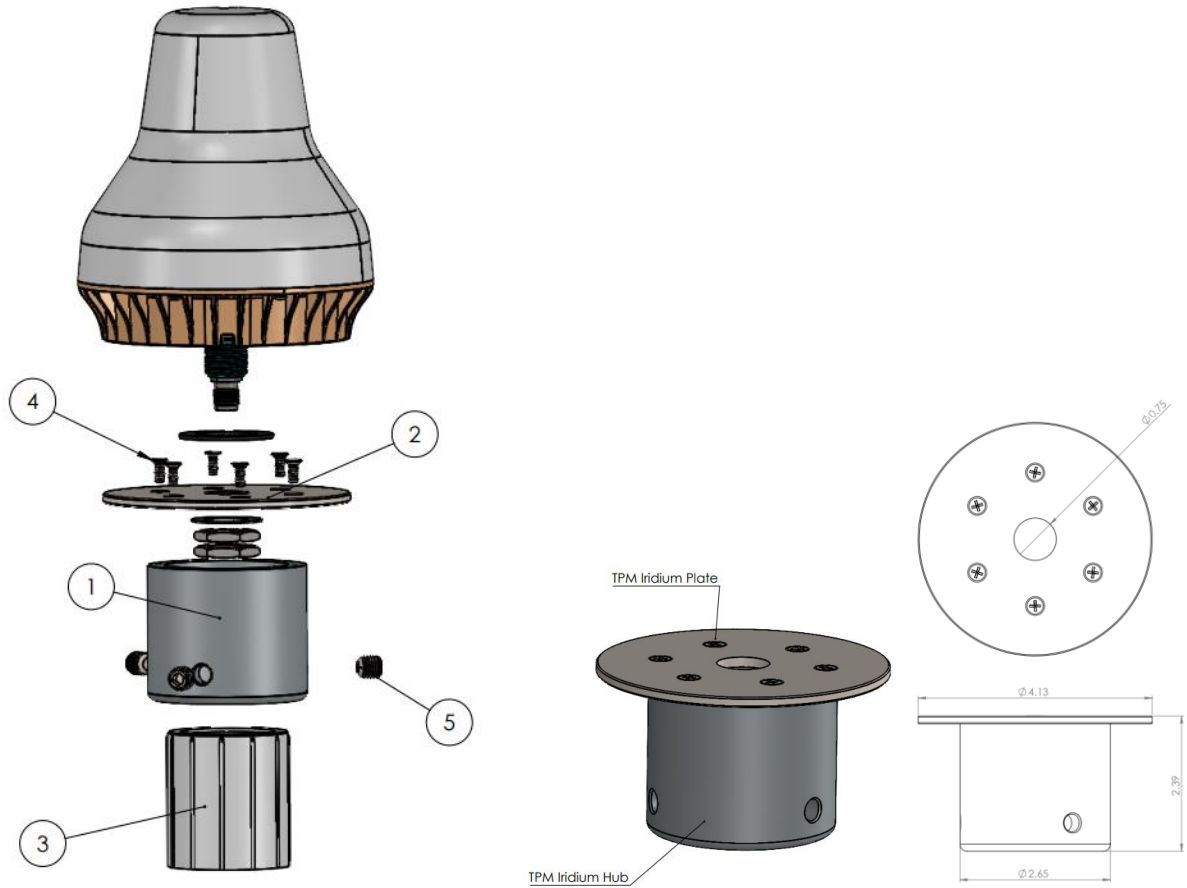


Figure D-2 Certus 200 Premium VesseLINK™ Pole Top Mounting Kit

Table D-2 Certus 200 Premium VesseLINK™ Pole Top Mounting Kit Contents

| Item No. | Qty. | Description                                            |
|----------|------|--------------------------------------------------------|
| 1        | 1    | 316 Stainless Hub 52mm-ID For Metric 52mm (2" OD) Pipe |
| 2        | 1    | 316 S.S. Certus 200 Mount plate                        |
| 3        | 1    | Plastic Reducer Bushing For 1.5" ID Pipe (1.9"OD)      |
| 4        | 6    | Flat head M4 screw, 3/8" long                          |
| 5        | 3    | 3/8-16 x 3/8" long S.S. cupped point set screw         |

## 1100855-503 CERTUS 200 PREMIUM L-BRACKET POLE MOUNT



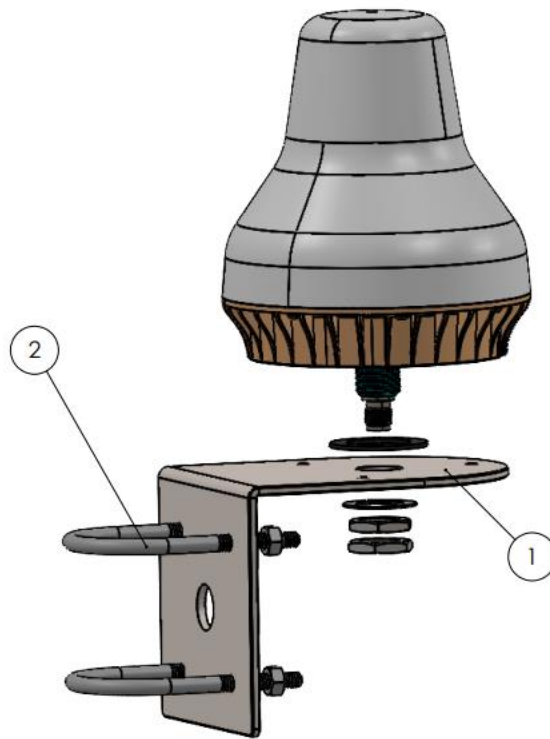
U bolts can be rotated vertically to accommodate horizontal pole or rail mounting

**NOTE**



The 3 other mounting holes on this bracket are primarily used to pole-mount a MissionLINK antenna (with side exiting coax connector). The holes accommodate M4 stainless screws that are 5 – 7mm in length. Max depth with plate and screw insert is 7.5mm.

**NOTE**



*Figure D-3 Certus 200 Premium L-Bracket Mounting Kit*

*Table D-3 Certus 200 Premium L-Bracket Mounting Kit Contents*

| Item No. | Qty. | Description                                                        |
|----------|------|--------------------------------------------------------------------|
| 1        | 1    | Certus 200 Polished Stainless Steel L-Bracket Mounting Plate       |
| 2        | 2    | U-Bolt to fit 48mm (1.9") diameter pole, includes nuts and washers |

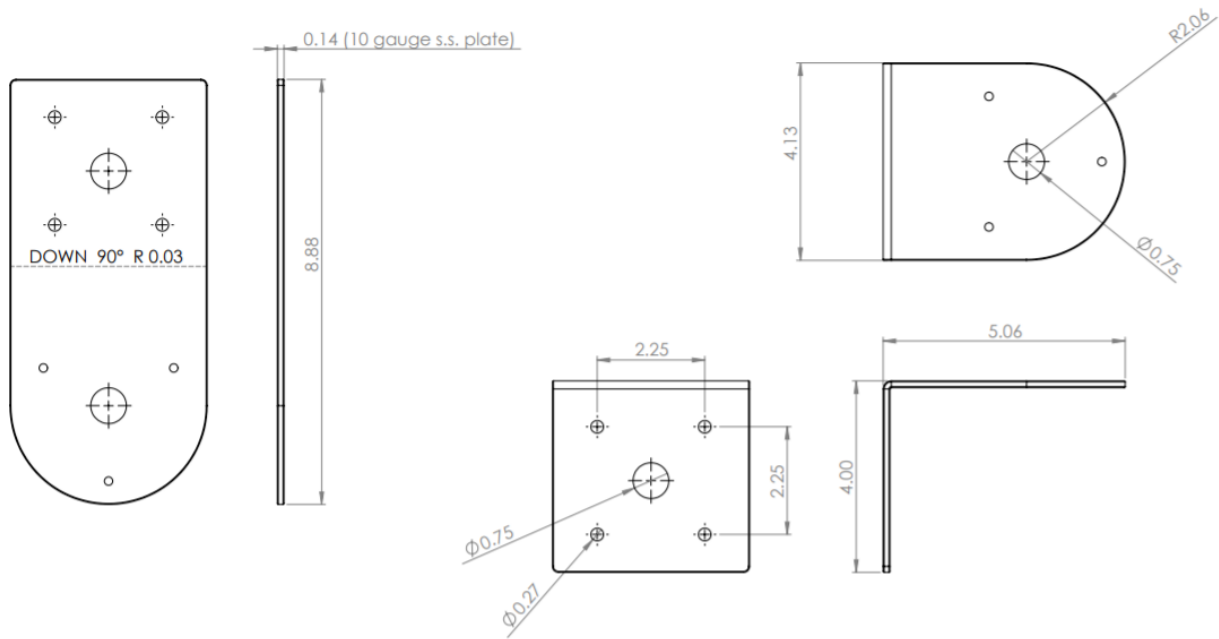


Figure D-4 Certus 200 Premium L-Bracket Mounting Kit Dimensions



Thales Defense & Security, Inc.  
22605 Gateway Center Drive | Clarksburg MD 20871  
Toll-Free 1.800.324.6089 | Phone: 240.864.7000 | Fax: 240.864.7920  
Email: [Customer.Service@thalesdsi.com](mailto:Customer.Service@thalesdsi.com) | Website:  
[www.thalesdsi.com](http://www.thalesdsi.com)