xConnect

xBR V4 Installation and User Guide

Revision History

Dash#/Rev	Date	Author	Description
0.1	04/03/2013	Eric Anderson	Initial draft
0.2	04/08/2013	Eric Anderson	Updated with new mechanical drawings.
0.3	04/10/2013	Eric Anderson	Section 4.4 – Reduce altitude limit to 2000m.
0.4	04/25/2013	Eric Anderson	Section 4.5 – Modify power supply voltage limits. Section 6 – Add power connection details. Document – Correct xConnect logo. Section 4.1 – Update unit weight. Update Power to 13W max.
0.5	05/13/2013	Eric Anderson	Section 1.2 – Add LPS definition. Section 4.5 – Clarify power connections. Section 6 – Clarify power connections
0.6	5/15/2013	Eric Anderson	Section 4.5 – Correct power supply minimum current.
0.7	6/04/13	Jim Hite	Section 3.1 – Add Professional Installation note as per feedback from TCB.

Document Approvers & Sign-Off

Date	Approver	Role	Document Accept/Reject

Table of Contents

1 Introduction 5
1.1 Purpose 5
1.2 Definitions 5
2 Safety Warnings 6
2.1 Important Safety Instructions 6
2.2 Explosive Safety Warning 6
2.3 Lightning Warning 6
3 Regulatory Compliance 7
3.1 Federal Communications Commission (United States) 7
3.2 UL Certification 7
4 Specifications 8
4.1 Physical 8
4.2 Connection Ports 11
4.3 RF Frequencies 11
4.4 Operating Conditions 11
4.5 Power 11
5 Installation 12
5.1 Trained Installation and Service Personnel Warning 12
5.2 Electrostatic Discharge Warning 12
5.3 Telecom Warning 12
5.4 Installation Instructions 13
6 Connection Guide 16

1 Introduction

The xConnect xBR V4 Long Range Reader is part of a proprietary data acquisition and tracking system. It provides a transmitter and multiple receivers to collect data. This data can be then sent over Wi-Fi, a wired Ethernet connection, or a fiber Ethernet connection to a data collection/concentration object.

1.1 Purpose

This document provides basic installation and user instructions for the xBR V4.

1.2 Definitions

Term	Definition
100BASE-FX	A specification for Fast Ethernet over fiber
LPS	Limited Power Supply
PoE	Power over Ethernet
SMA	SubMinature version A connector – a small threaded RF connector
Wi-Fi	Wireless Internet connection

2 Safety Warnings

2.1 Important Safety Instructions

When using this device, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons.

Do not use this product near water. For example, do not use:

- near a bath tub
- near a wash bowl
- near a kitchen sink or laundry tub
- in a wet basement
- near a swimming pool

2.2 Explosive Safety Warning

Warning! Do not operate this device near explosive devices, unshielded blasting caps or in an otherwise explosive environment unless the device has been approved for such use by qualified personnel.

Warning! Do not disconnect the power or any other cabling in an explosive environment until such qualified personnel, trained specifically in explosive environment handling, have determined it is safe to do so.

Warning! Do not touch or move the access point when the antennas are transmitting or receiving.

2.3 Lightning Warning

Warning! Do not connect or disconnect cables or otherwise work with the access point hardware during periods of lightning activity.

Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

3 Regulatory Compliance

3.1 Federal Communications Commission (United States)

Regulatory Compliance Information

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Exposure Statement

The device has been found to be compliant to the requirements set forth in CFR 47 Sections 2.1091 for an uncontrolled environment. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 35 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Professional Installation

Only professional installers trained and authorized by the grantee are permitted to install the unit and its antenna. Refer to section 5 of this document before installing this device in any location.

Caution

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

3.2 UL Certification

This device has been tested to UL Standard 60950-1 and CSA 60950-1-07.

4 Specifications

The xConnect xBR V4 Long Range Reader is manufactured to the following specifications:

4.1 Physical

xBR V4 Assembly, PN: 300-001353 (Figure 1)

- **Housing Material:** Aluminum Alloy 6061
- **Dimensions:**
  Length: 241.6mm (9.51 inches)
  Width: 157.5mm (6.21 inches)
  Height: 25.0mm (0.98 inches)
- **Unit Weight:** 910 grams (2.01 lbs.)

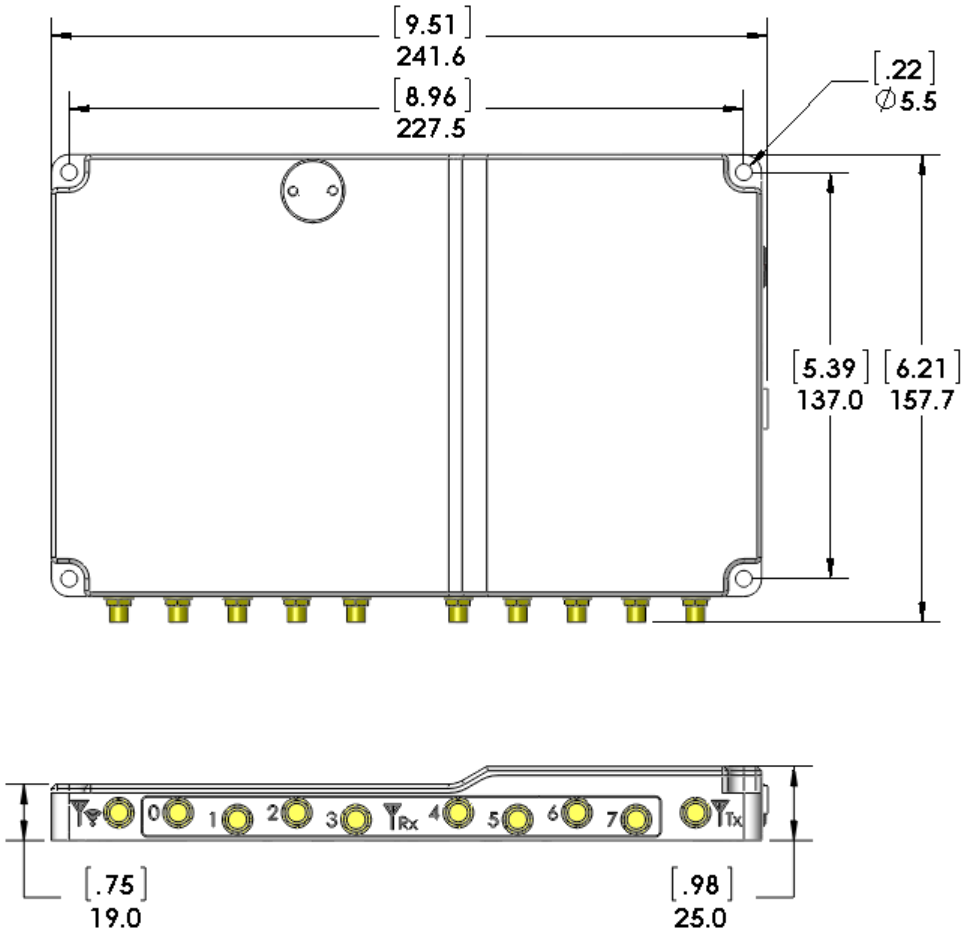

Figure 1 – xBR v4 Module

Quick Release Adapter Mount, PN: 310-006028 (Figure 2)

- **Material:** 304 Stainless Steel, Passivated
- **Unit Weight:** 297 grams (0.65 lbs.)
- **Attaching Screw Size:** M4 x 0.7 x 5mm SHCS

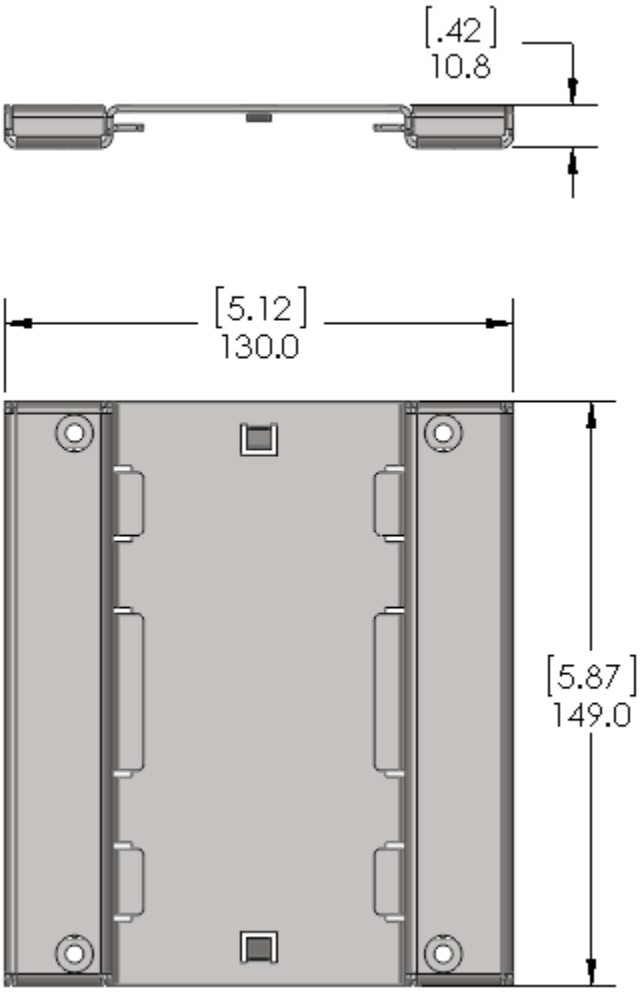

Figure 2 - Quick Release Adapter

Sheet Metal Quick Release Mount, PN: 310-003470 (Figure 3)

- **Material:** 304 Stainless Steel, Passivated
- **Unit Weight:** 106 grams (0.23 lbs.)
- **Attaching Screw Size:** M5 x 0.8 x 30mm SHCS (or #10 x 1.25")
- **Attaching Screw Head Height Limit:** 0.303 inches

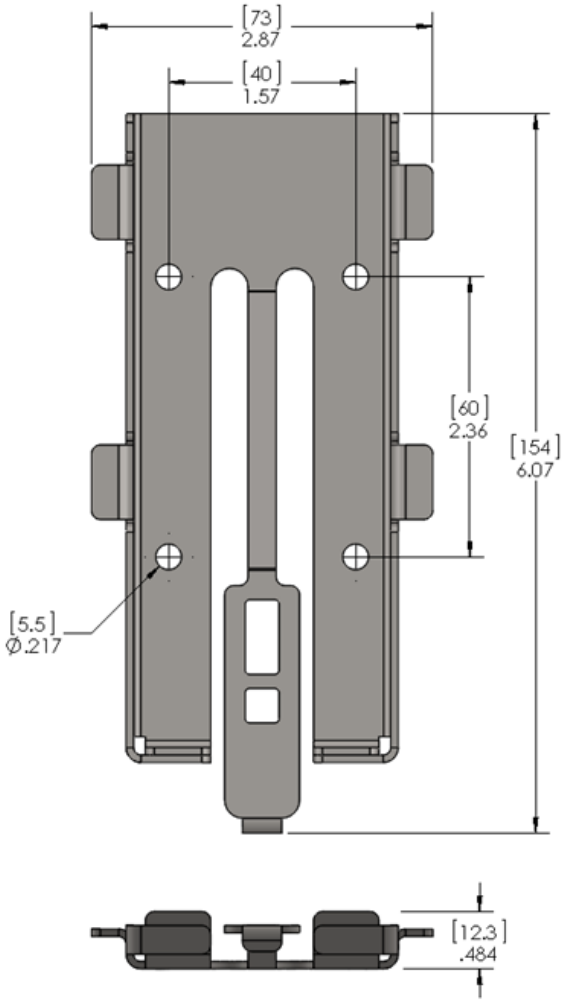

Figure 3 - Sheet Metal Mount

4.2 Connection Ports

- **Ethernet 10/100 RJ-45 (POE):** 100m Max. cable length
- **Ethernet 100BASE-FX (optical) LC Connector:** 300m Max. cable length, multi-mode fiber
- **10 SMA Antennal Ports:** (1 transmit, 8 receive, 1 Wi-Fi)
- **Circular Connector:** 5 pin

4.3 RF Frequencies

- **RX**: 2401, 2424, 2450, 2474 MHz
- **TX**: 2482 MHz
- **Wi-Fi:** 802.11a/n. 5GHz only

4.4 Operating Conditions

Temperature:

- **Operating:** 0°C to 40°C (32°F to 104°F)
- **Storage:** -10°C to 70°C (14°F to 158°F)
- **Relative Humidity:** 5% to 95% non-condensing
- **Altitude:** 2,000 m (6561 ft.) @28°C (82.4°F)

4.5 Power

Power over Ethernet (IEEE, 802.3af compliant)

PoE 48Vdc, 0.5A max

Power Connector, circular, 5-pin:

The 5 pin power connector has 2 separate sets of input pins. Use pins 1 and 2 when the supplied voltage is between 20 and 48Vdc. Use pins 3 and 4 when the supplied voltage is between 14 and 16Vdc. Apply power to only one set of pins at a time. See the Connection Guide (Section 6) for additional information.

DC Pins 1,2: 20-48Vdc, 1A max (Class 2 or LPS)

NOTE: If a power adapter other than one provided by the manufacturer is used in the US or Canada, it should be cULus (NRTL) Listed, with an output rated 20-48Vdc maximum, minimum 1.0A, Marked “LPS” or “Class 2”, output rated SELV, non-energy hazardous, and suitable for connection to a standard power receptacle in the US and Canada.

DC Pins 3,4: 14-16Vdc, 1A max (Class 2 or LPS)

NOTE: If a power adapter other than one provided by the manufacturer is used in the US or Canada, it should be cULus (NRTL) Listed, with an output rated 14-16Vdc maximum, minimum 1.0A, Marked “LPS” or “Class 2”, output rated SELV, non-energy hazardous, and suitable for connection to a standard power receptacle in the US and Canada.

5 Installation

5.1 Trained Installation and Service Personnel Warning

Warning! Installation and service of this product is to be performed by trained installation and service personnel only. Read and follow all warning notices and instructions marked on the product or included in the documentation. Before installing the product, read the rest of this document and follow specific product instructions.

When installing, the placement of the device must also satisfy the following installation requirements:

- When powered by an AC adapter, connect the unit’s AC adapter to an AC wall outlet (100-240 VAC) using only the standard power cord/adapter provided with the product.
- Placement must allow for easily disconnecting the power cord/adapter of the device from the AC wall-outlet.
- Do not cover the device or block the airflow to the device with any other objects.
- Keep the device away from excessive heat and humidity and keep the device free from vibration and dust.
- Installation must at all times conform to local regulations.
- Connection to a Wireless Access Point can be made with either a Wi-Fi connection, a fiber connection, or Unshielded Twisted Pair (UTP) or Shielded Twisted Pair (STP) cabling. When using the device in combination with Power over Ethernet, use only STP cabling.

5.2 Electrostatic Discharge Warning

Warning! Wear an anti-static wrist strap or take other suitable measures to prevent electrostatic discharge when handling this equipment.

5.3 Telecom Warning

Note: This unit is intended for local (intra-building) connections only and is not designed or evaluated for direct connections to the public telecommunications/cable distributions systems. Cable and Ethernet connections should be made in accordance to the National Electrical Code (NEC). For example, one of the following should be true*:

- Cable runs are located in the same building as this unit.

- Cable runs through air between buildings are less than 42m (140ft).

- Cable runs between buildings are directly buried.

- Cable runs between buildings are in underground conduit, where a continuous metallic cable shield or a continuous metallic conduit containing the cable is bonded to each building grounding electrode system.

*These options are from the US National Electrical Code, Sections 800.10, 800.12, 800.13, 800.31, 800.32, 800.33, and 800.40.

5.4 Installation Instructions

This device should be securely mounted to a fixed surface using either the 4 5.5mm (.22”) diameter mounting holes located at the corners of the unit, OR the Quick Release Adaptor Mount (PN-006028, Figure 5) in conjunction with the Sheet Metal Mount (PN: 310-003470, Figure 6). Mounting with the 4 holes in the corner provides the lowest profile mounting option, while the Quick Release Adaptor Mount in conjunction with the Sheet Metal Mount provides a convenient method of attaching the device while providing the ability to quickly remove or replace the device.

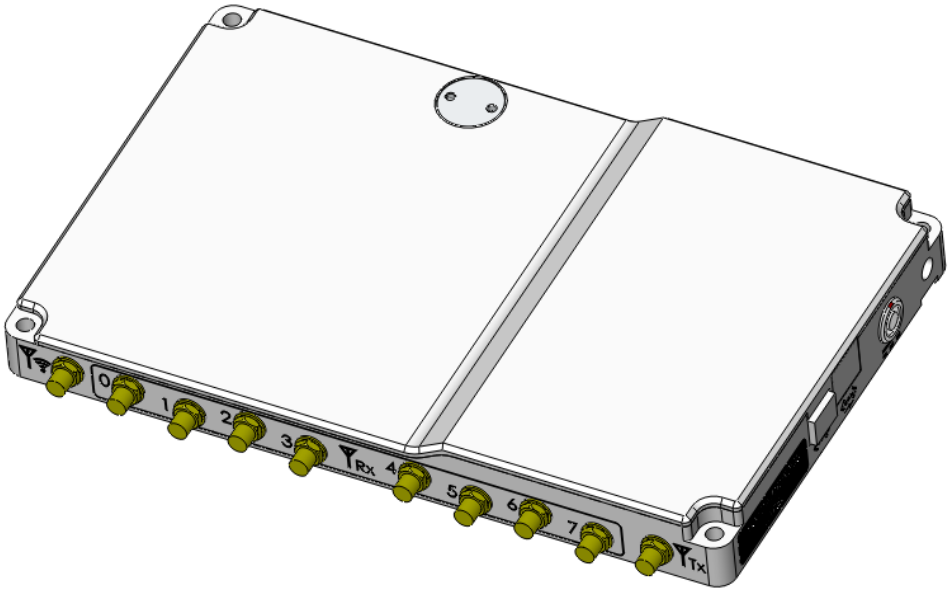

Figure 4 - xBR V4 Module

When mounting the xBR V4 unit directly, the must be securely attached to the mounting surface via the 4 mounting holes. For example, when mounting on drywall, wall anchors, toggle bolts, or expansion anchors should be used to provide more secure attachment points.

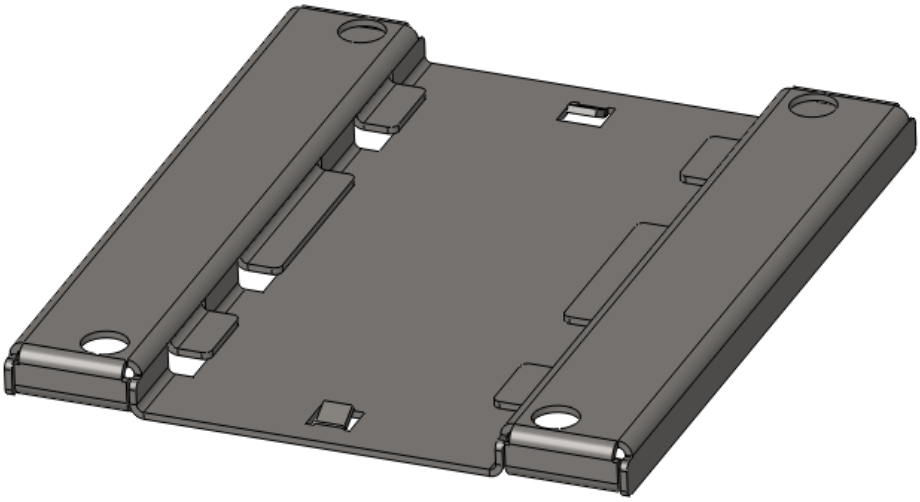

Figure 5 - Quick Release Adapter Mount, PN-006028

The Quick Release Adaptor Mount must be securely attached to the xBR module using 4 M4x.07mm x 5mm SHCS with Loctite 220 Applied to the threads.

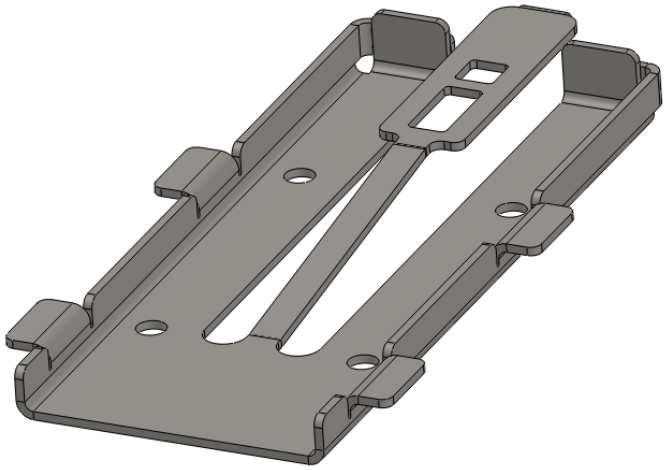

Figure 6 - Sheet Metal Mount, PN-003470

The Sheet Metal Mount must be securely attached to the mounting surface. For example, when mounting on drywall, wall anchors, toggle bolts, or expansion anchors should be used to provide more secure attachment points.

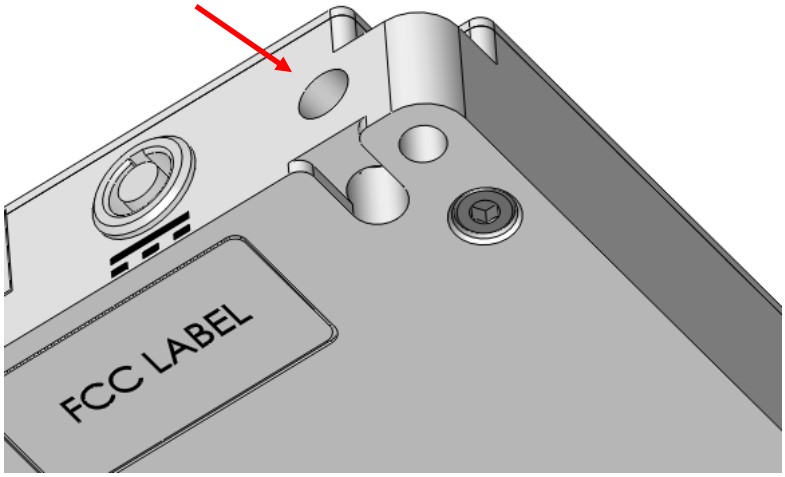

Figure 7 - Safety Cable Attachment Point

Both mounting methods provide secure mounting for the xBR. However, as an added safety feature, the xBR housing has a safety cable attachment point for overhead installations or installations where a falling device may cause a hazard (see Figure 7 - Safety Cable Attachment Point).

Note: *This device is not to be installed in air handling spaces (i.e. not plenum rated).*

6 Connection Guide

The xBR V4 Long Range Reader has several connection points as shown in Figure 8 and Figure 9 - xBR V4 Connections:

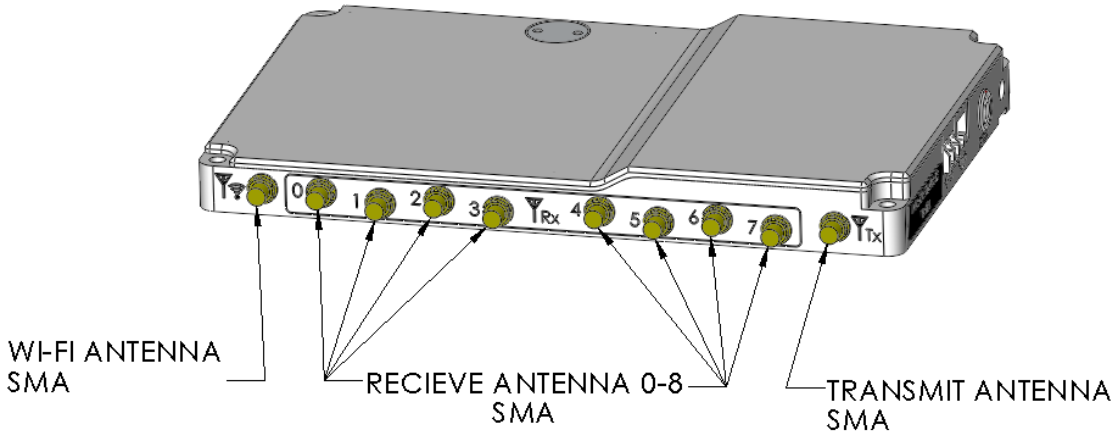

Figure 8 - xBR V4 RF Connections

Transmit Antenna SMA – This is a female SMA connection for the transmit antenna. The transmit antenna must be installed at all times when the unit is powered up and transmitting. Transmitting without the antenna installed may damage the unit.

This antenna must be of an approved or supplied type. Use of an unauthorized antenna is not allowed.

Receive Antennas 0 - 7 SMA – These are female SMA connections for the receive antenna(s).

Wi-Fi Antenna SMA – This is a female SMA connection for the Wi-Fi antenna. The Wi-Fi antenna must be installed at all times when the unit is powered up and Wi-Fi is enabled. Operating Wi-Fi without the antenna installed may damage the unit.

This antenna must be of an approved or supplied type. Use of an unauthorized antenna is not allowed.

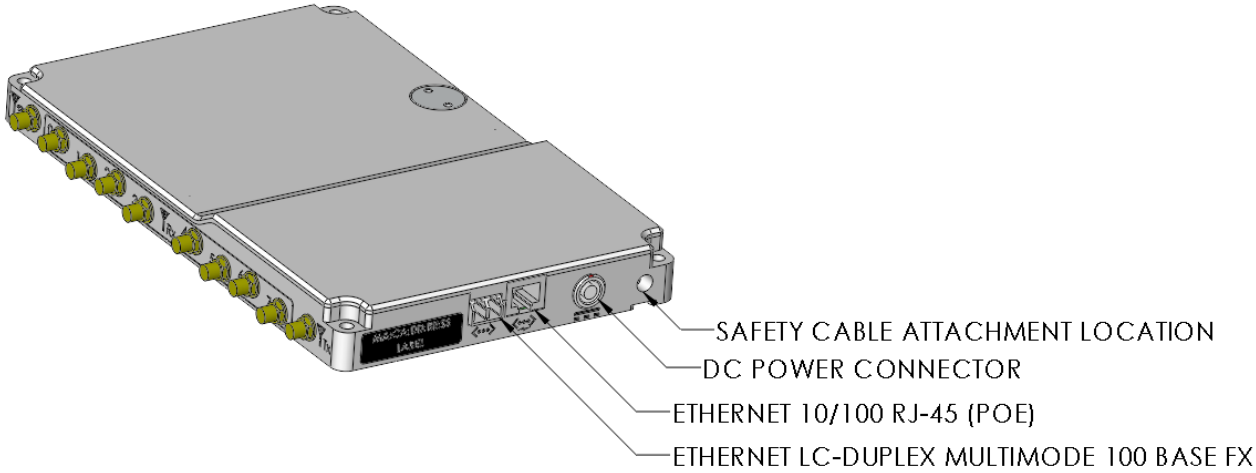

Figure 9 - xBR V4 Connections

Ethernet 10/100 RJ-45 (PoE) – This is an RJ-45 jack for an Ethernet connection with optional Power over Ethernet (PoE)

Ethernet 100BASE-FX – This is an LC connection for an optical Ethernet connection.

DC Power Connector – This connector provides a means of powering the unit if PoE is not available. Connect only a supplied or approved power supply.

The connector on the V4 is a Lemo EGG.1B.305.CYM. The mating connector is a Lemo FGG.1B.305.CLAD52Z (male pins).

When connecting a 20 to 48Vdc power supply, use pins 1 and 2 on the connector (pin 1 positive, pin 2 negative). Leave the other pins unconnected (Figure 10).

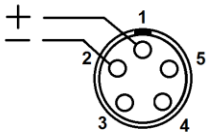

Figure 10 – DC Power Connector – 20 to 48Vdc Connection

When connecting a 14 to 16 Vdc power supply, use pins 4 and 5 on the connector (pin 4 positive, pin 5 negative). Leave the other pins unconnected (Figure 11).

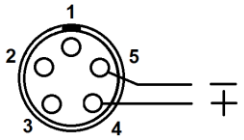

Figure 11 - DC Power Connector – 14 to 16Vdc Connection