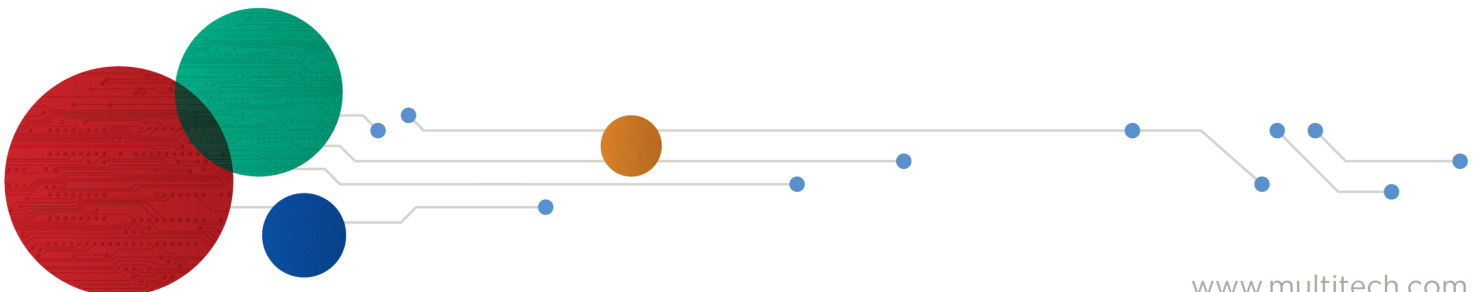# MultiConnect® mDotTM Box Hardware Guide

MultiConnect® mDot™ Box Hardware Guide

Model: MTDOT-BOX

Part Number: S000706 1.0

Copyright

This publication may not be reproduced, in whole or in part, without the specific and express prior written permission signed by an executive officer of Multi-Tech Systems, Inc. All rights reserved. **Copyright © 2018 by Multi-Tech Systems, Inc.**

Multi-Tech Systems, Inc. makes no representations or warranties, whether express, implied or by estoppels, with respect to the content, information, material and recommendations herein and specifically disclaims any implied warranties of merchantability, fitness for any particular purpose and non-infringement.

Multi-Tech Systems, Inc. reserves the right to revise this publication and to make changes from time to time in the content hereof without obligation of Multi-Tech Systems, Inc. to notify any person or organization of such revisions or changes.

Legal Notices

The MultiTech products are not designed, manufactured or intended for use, and should not be used, or sold or re-sold for use, in connection with applications requiring fail-safe performance or in applications where the failure of the products would reasonably be expected to result in personal injury or death, significant property damage, or serious physical or environmental damage. Examples of such use include life support machines or other life preserving medical devices or systems, air traffic control or aircraft navigation or communications systems, control equipment for nuclear facilities, or missile, nuclear, biological or chemical weapons or other military applications ("Restricted Applications"). Use of the products in such Restricted Applications is at the user's sole risk and liability.

MULTITECH DOES NOT WARRANT THAT THE TRANSMISSION OF DATA BY A PRODUCT OVER A CELLULAR COMMUNICATIONS NETWORK WILL BE UNINTERRUPTED, TIMELY, SECURE OR ERROR FREE, NOR DOES MULTITECH WARRANT ANY CONNECTION OR ACCESSIBILITY TO ANY CELLULAR COMMUNICATIONS NETWORK. MULTITECH WILL HAVE NO LIABILITY FOR ANY LOSSES, DAMAGES, OBLIGATIONS, PENALTIES, DEFICIENCIES, LIABILITIES, COSTS OR EXPENSES (INCLUDING WITHOUT LIMITATION REASONABLE ATTORNEYS FEES) RELATED TO TEMPORARY INABILITY TO ACCESS A CELLULAR COMMUNICATIONS NETWORK USING THE PRODUCTS.

The MultiTech products and the final application of the MultiTech products should be thoroughly tested to ensure the functionality of the MultiTech products as used in the final application. The designer, manufacturer and reseller has the sole responsibility of ensuring that any end user product into which the MultiTech product is integrated operates as intended and meets its requirements or the requirements of its direct or indirect customers. MultiTech has no responsibility whatsoever for the integration, configuration, testing, validation, verification, installation, upgrade, support or maintenance of such end user product, or for any liabilities, damages, costs or expenses associated therewith, except to the extent agreed upon in a signed written document. To the extent MultiTech provides any comments or suggested changes related to the application of its products, such comments or suggested changes is performed only as a courtesy and without any representation or warranty whatsoever.

Contacting MultiTech

Knowledge Base

The Knowledge Base provides immediate access to support information and resolutions for all MultiTech products. Visit http://www.multitech.com/kb.go.

Support Portal

To create an account and submit a support case directly to our technical support team, visit: https://support.multitech.com.

Support

Business Hours: M-F, 8am to 5pm CT

Country	By Email	By Phone
Europe, Middle East, Africa:	support@multitech.co.uk	+(44) 118 959 7774
U.S., Canada, all others:	support@multitech.com	(800) 972-2439 or (763) 717-5863

Warranty

To read the warranty statement for your product, visit www.multitech.com/warranty.go. For other warranty options, visit www.multitech.com/es.go.

World Headquarters

Multi-Tech Systems, Inc.

2205 Woodale Drive, Mounds View, MN 55112

Phone: (800) 328-9717 or (763) 785-3500

Fax (763) 785-9874

Contents

Chapter 1 – Product Overview

Product Overview

About the MultiConnect mDot Box

The MultiConnect mDot Box (MTDOT-BOX) provides an enclosed or boxed version of a portable, handheld LoRa end-point. You can use this device as: 1) a LoRa demonstration that tests an IOT application prototype or proof-of-concept, or 2) a site survey tool. In site survey modes, the device performs link checks gathering data at various power levels and data rates.

Documentation

The following documentation is available at https://www.multitech.com/brands/multiconnect-mdot-box.

Document	Description	Part Number
MultiConnect mDot Box (MTDOT-BOX) Hardware Guide	This document provides overview, safety and regulatory information, design considerations, schematics, and device information.	S000706
Getting Started/Software Overview for mDot Box/EVB	Device Startup, Configuration and other software topics on MultiTech Developer Resources: http://www.multitech.net/developer/software/dot-box-and-evb-software/	N/A
Universal Developer Kit 2.0 Developer Guide	Provides information for using the developer board with the MTDOT-BOX	S000610

Note: Additional documentation is available on the mbed site at https://os.mbed.com/platforms/mdotevb/ and at www.multitech.net.

Package Contents

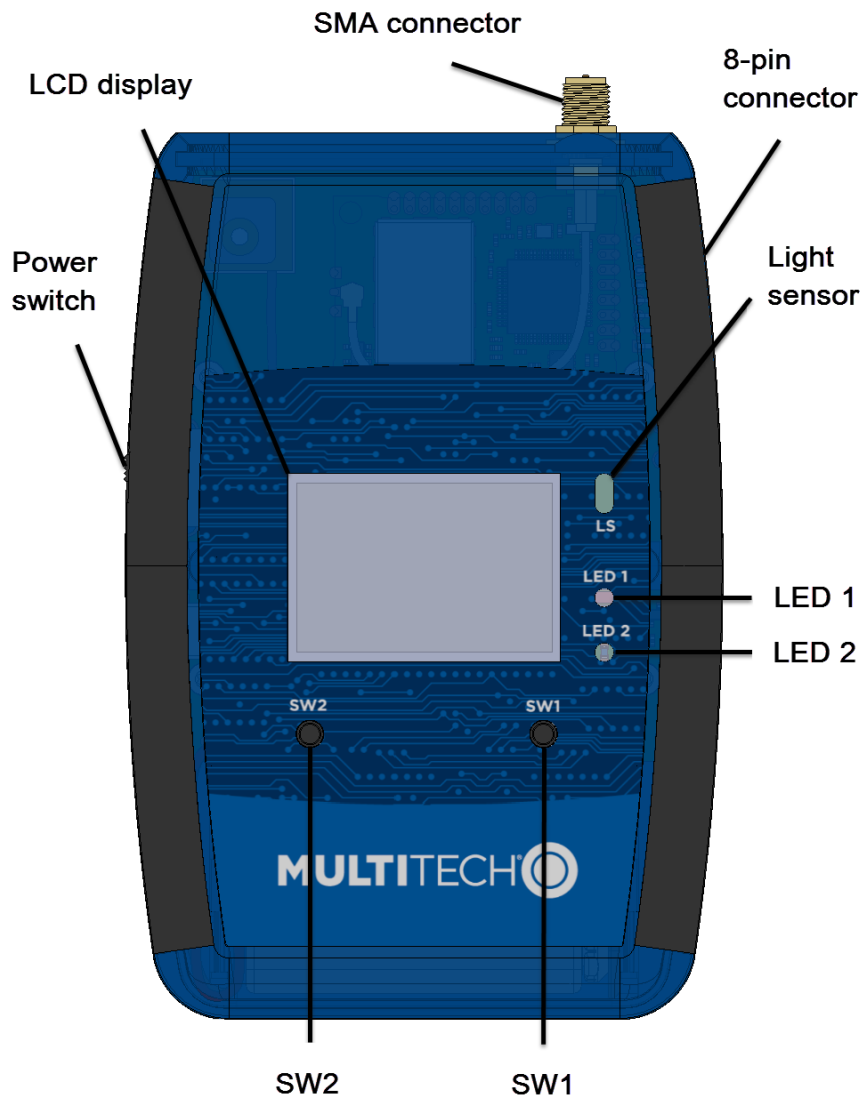Your MultiConnect mDot Box (MTDOT-BOX) package typically includes the following:

Contents	Description
Power Supply	1 - Battery, 9V
Cable	1 - 8 Position Flat Programming Cable
Antenna	1 – Dual frequency 868-915 MHz RP-SMA, 8" antenna (external)
Devices	1 – MutliConnect mDot Box (MTDOT-BOX)
	1 – MutliConnect mDot Micro Developer Kit (MTMDK-ST-MDOT)
Customer Notices	Quick Start

Product Build Options

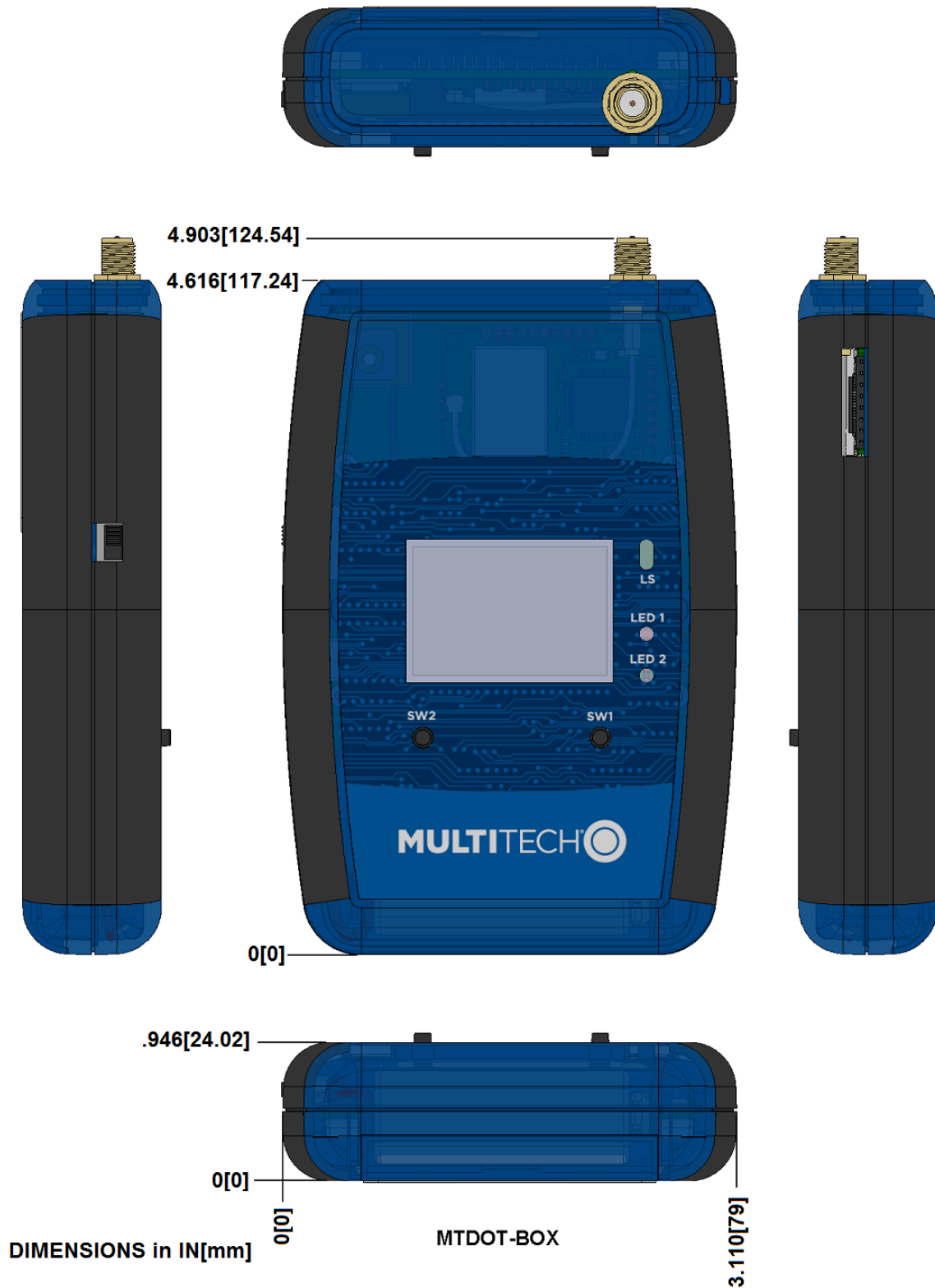| Product	Description	Carrier/Region
MTDOT-BOX-G-915	LoRa Evaluation and Site Survey Box w/GPS – 915 MHz	North America
MTDOT-BOX-G-868	LoRa Evaluation and Site Survey Box w/GPS – 868 MHz	EU/GB
MTDOT-BOX-G-915-AU	LoRa Evaluation and Site Survey Box w/GPS – 915 MHz	Australia
MTDOT-BOX-GLOBAL	LoRa Evaluation and Site Survey Box w/GPS – Global Version	Global (includes Japan/Asia)

Chapter 2 – Product Details

Device Details

LED Descriptions

- **LED1** (red = network not joined, green= network joined)
- **LED2** (no light = no GPS, flashing blue = no GPS lock, blue =GPS lock)

Dimensions

4.903[124.54]

4.616[117.24]

LS

LED 1

LED 2

SW2   SW1

MULTITECH

0[0]

.946[24.02]

0[0]

0[0]

3.110[79]

DIMENSIONS in IN[mm]   MTDOT-BOX
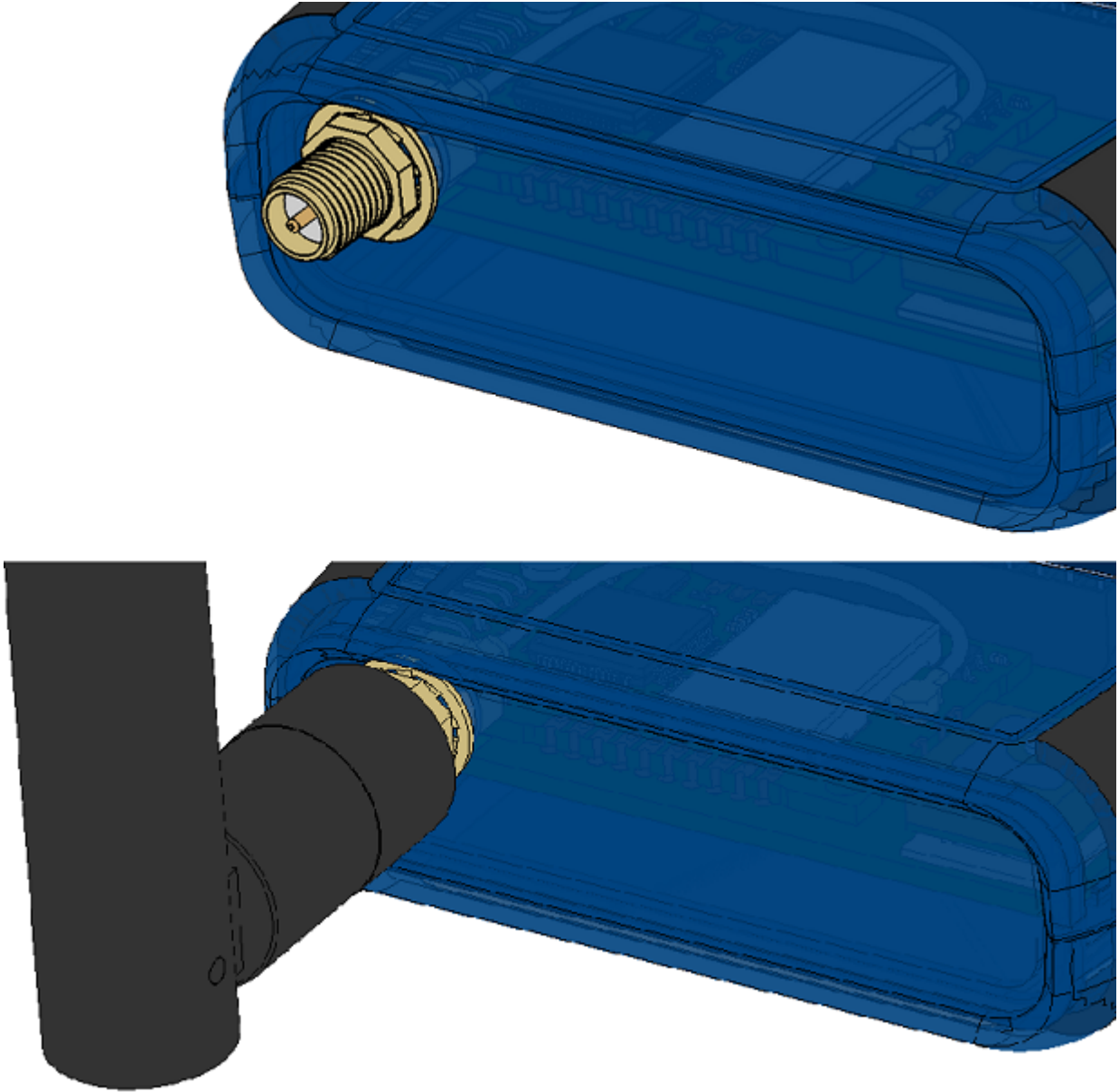
Internal Sensors

Below are the internal sensors within the device.

1. **GPS** (for Box only, using internal antenna)
2. **Accelerometer:** displays the x, y and z positions of the device in g-force (g).
3. **Pressure:** displays barometric pressure in kilopascals (kPa).
4. **Altimeter:** displays elevation in meters (m).
5. **Temperature:** displays temperature in degrees Celsius (C).
6. **Light:** displays illuminance in lux (lx).

Chapter 3 – Antenna Connection and Battery

Antenna Connection

Caution: To avoid damage, only finger-tighten the antenna on the device connector. Do not use any tools.
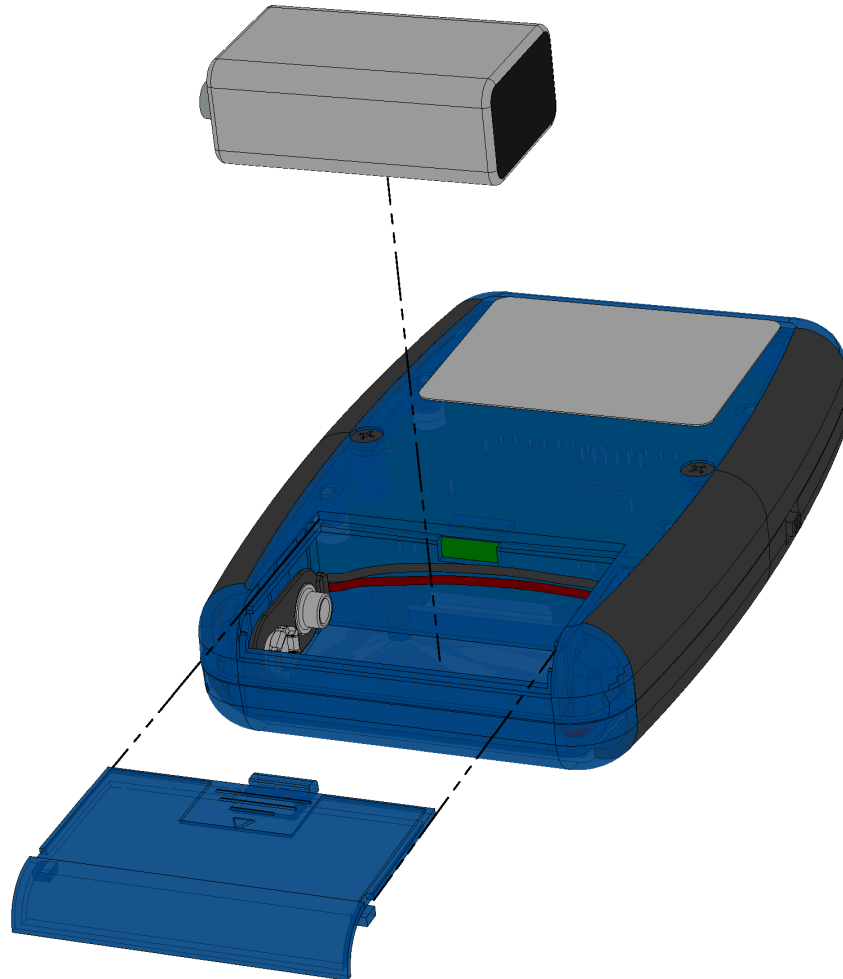
Battery

The device uses a standard 9V battery.

The battery compartment is located on the bottom of the device as shown.

> **Note:** Power off the device after use. Battery life is limited.

Replacing Battery

Chapter 4 – Regulatory Information

Regulatory Info for MTDOT-BOX-GLOBAL

The **MTDOT-BOX-GLOBAL** product contains an MTDOT module for LoRa communication.

When a region is selected in the **MTDOT-BOX-GLOBAL** the internal MTDOT will operate in the identical manner as one of the following regionally-approved MTDOT which are all identical from a hardware perspective:

MTDOT-915 (North America)

MTDOT-868 (Europe)

MTDOT-915-AU (Australia)

MTDOT-923-JP1 (Japan)