



# GRIDLOCK User Guide

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# 1 Introduction

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## 1.1 Purpose

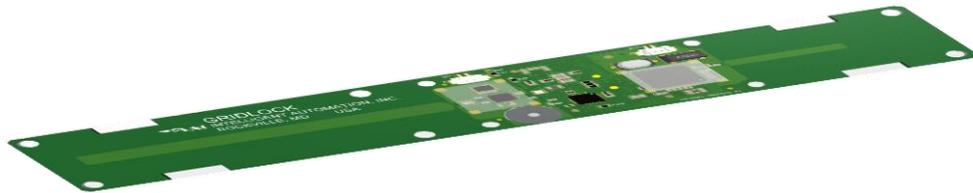
This document is provided to OEMs for the installation of the GRIDLOCK modules into a finished product. Provided the OEM's usage of GRIDLOCK is compliant with the requirements included in Section 6, the OEM is not required to complete radio certification of GRIDLOCK's radio performance in FCC, IC and CE regulated geographies. In addition, this document provides the information necessary to perform certification of the GRIDLOCK module for other geographies.

## 1.2 Scope

This document is intended for those who are responsible for designing with, installing and testing the GRIDLOCK module.

## 1.3 General Description

The GRIDLOCK sensor node is comprised of a single printed circuit board (PCB, see below) and battery.

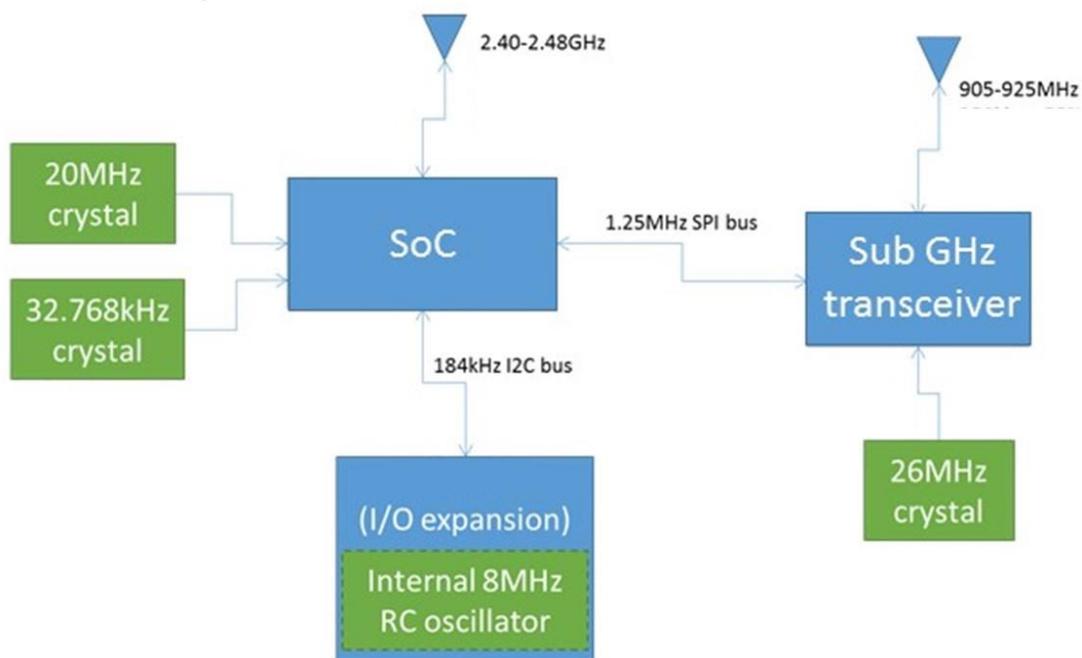


A GRIDLOCK gateway (available from vendor), and two or more GRIDLOCK nodes can be used to implement a trip-wire RF fence like capability. The GRIDLOCK PCB is powered by a single Lithium D-cell primary battery (3.6V, 19Ah capacity) connected via a short wiring harness.

The GRIDLOCK PCB uses a System-on-Chip (SoC) as both the primary processor and the main communications component. The SoC consists of a low-power radio and a processor that runs both a network protocol stack and the GRIDLOCK application firmware.

The GRIDLOCK PCB also contains a secondary RF transceiver for the purpose of intruder detection. The board contains a LED. In general operation, the LED is only blinked three times upon initial power-up.

## 1.4 Block Diagram



## 2 Regulatory and Standards Compliance

### 2.1 RF Exposure

The radiated output power of GRIDLOCK is far below the FCC radio frequency exposure limits. GRIDLOCK complies with FCC radiation exposure limits set forth for an uncontrolled environment. When nearby persons have to be kept to ensure RF exposure compliance, in order to comply with RF exposure limits established in the ANSI C95.1 standards, the distance between the antennas and the user should not be less than 20 cm (8 inches). GRIDLOCK shall not be co-located with any other transmitter within 20 cm; otherwise further transmitter testing may be required.

### 2.2 User's Manual Language

The user's manual for end users must include the following information in a prominent location:

**IMPORTANT NOTE:** To comply with FCC exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.

**IMPORTANT NOTE:** Changes or modifications not expressly approved by the party responsible for compliance 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:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

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4. Consult the dealer or an experienced radio/TV technician for help.

## 2.3 FCC Compliance

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.

## 2.4 FCC Testing

GRIDLOCK complies with Parts 15.247 and 15.249 modular (Intentional Radiator) of the FCC rules and regulations. In order to fulfill FCC certification requirements, products incorporating GRIDLOCK must comply with the following:

1. An external label must be provided on the outside of the final product enclosure specifying the FCC identifier as described below.
3. The device integrating GRIDLOCK may not cause harmful interference and must accept any interference received, including interference that may cause undesired operation.
4. An unintentional radiator scan must be performed on the device integrating GRIDLOCK, per FCC rules and regulations, CFR Title 47, Part 15, Subpart B. See FCC rules for specifics on requirements for declaration of conformity.

## 2.5 OEM Labeling Requirements

The Original Equipment Manufacturer (OEM) must ensure that FCC labeling requirements are met. The outside of the final product enclosure must have a label with the following (or similar) text specifying the FCC identifier. The FCC ID and certification code must be in Latin letters and Arabic numbers and visible without magnification.

**Contains transmitter module FCC ID: 2AI6Y-GRIDLOCKMOD**

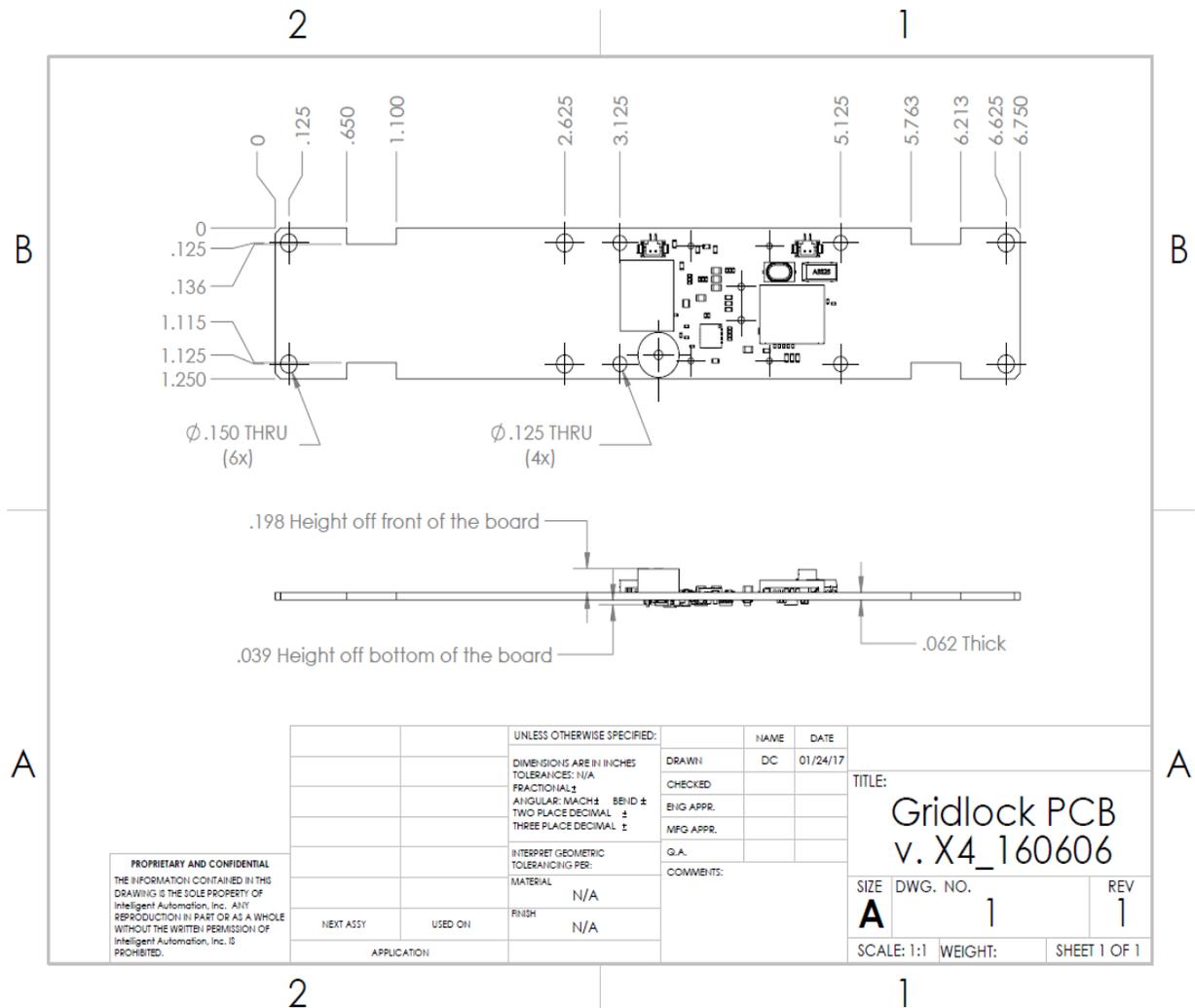
Contains transmitter module FCC ID: 2AI6Y-GRIDLOCKMOD  
Or Contains FCC ID: 2AI6Y-GRIDLOCKMOD

## 2.6 Encryption Cipher

GRIDLOCK uses Dust Network' ETERNA2 chip for communication. ETERNA2's 128-bit Advanced Encryption Standard (AES) cipher has been certified compliant to the United States National Institute of Standards and Technology (NIST) FIPS-197 (NIST certificate number, AES: 1437). To view the FIPS-197 validation list, go to: <http://csrc.nist.gov/groups/STM/cavp/documents/aes/aesval.html>

### 3 Mechanical Specifications

#### 3.1 GRIDLOCK Module



### 4 Command and Response

The GRIDLOCK modules communicate with the GRIDLOCK Gateway. The GRIDLOCK gateway communicates with a PC through a proprietary API. Two versions of the software, a PC application, and a headless gateway can be obtained from the vendor.