

MultiNav Pro+ BLE Module



Overview

MultiNav Pro+ BLE Module is a high-performance long-range wireless communication module designed for advanced robotics, drones, and autonomous systems.

It combines powerful processing, high-speed BLE communication, and seamless ecosystem integration into a compact and programmable platform.

Key Features

- Long-Range Connectivity: Up to 50KM (Drone-to-Drone), 15KM (Man-to-Drone), 5KM (Man-to-Man)
- High-Speed Data Transmission: Up to 2 Mbps
- Powerful Processing Core: STM32WB07CCV6 (ARM Cortex-M0, 64MHz)
- Compact Design: 57mm x 47mm module size, 140mm antenna
- Seamless Integration with GNSS, Sensors, and Motor/Battery modules
- RFOXiA Connect App support (iOS & Android)
- BLE Chat (text, voice, calls without internet)
- Open Source & Programmable via SWD
- Integrated high-accuracy RTC

Long-Range Connectivity

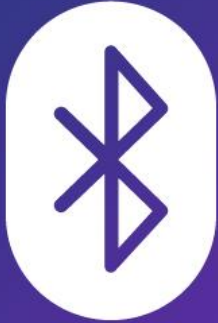
Up to 50KM communication range.

5KM Man-to-Man

15KM Man-to-Drone

50KM Drone-to-Drone

Ideal for drones, robotics, and remote systems.



LONG-RANGE CONNECTIVITY

SCENARIO	EXPECTED RANGE (APPROX.)	DESCRIPTION
DRONE TO DRONE	Up to 50 km	Communication between two flying drones
URBAN OUTDOOR	1- 5 km	City environment with buildings, vehicles, and some obstacles
INDOOR	1000 - 30 meters	Typical office or home environment with walls, furniture, and other obstructions
INDUSTRIAL	100 - 3000 meters	Factory or warehouse environment with machinery and metallic structures



High-Speed Data Transmission

Supports up to 2 Mbps data rate ensuring low latency and reliable communication.



The graphic features a purple-to-pink gradient background with abstract white wave patterns. Two RFOXiA modules, each with a black antenna and a blue PCB, are shown. A dashed line with arrows at both ends connects the antennas, passing through a central purple dot with concentric white circles representing a signal. The RFOXiA logo is in the top left. The text 'HIGH SPEED DATA TRANSMISSION' is on the right, and 'Blazing Fast Speed 2Mbps' is in the bottom left.

RFOXiA
PREMIUM DESIGN

**HIGH
SPEED
DATA**
TRANSMISSION

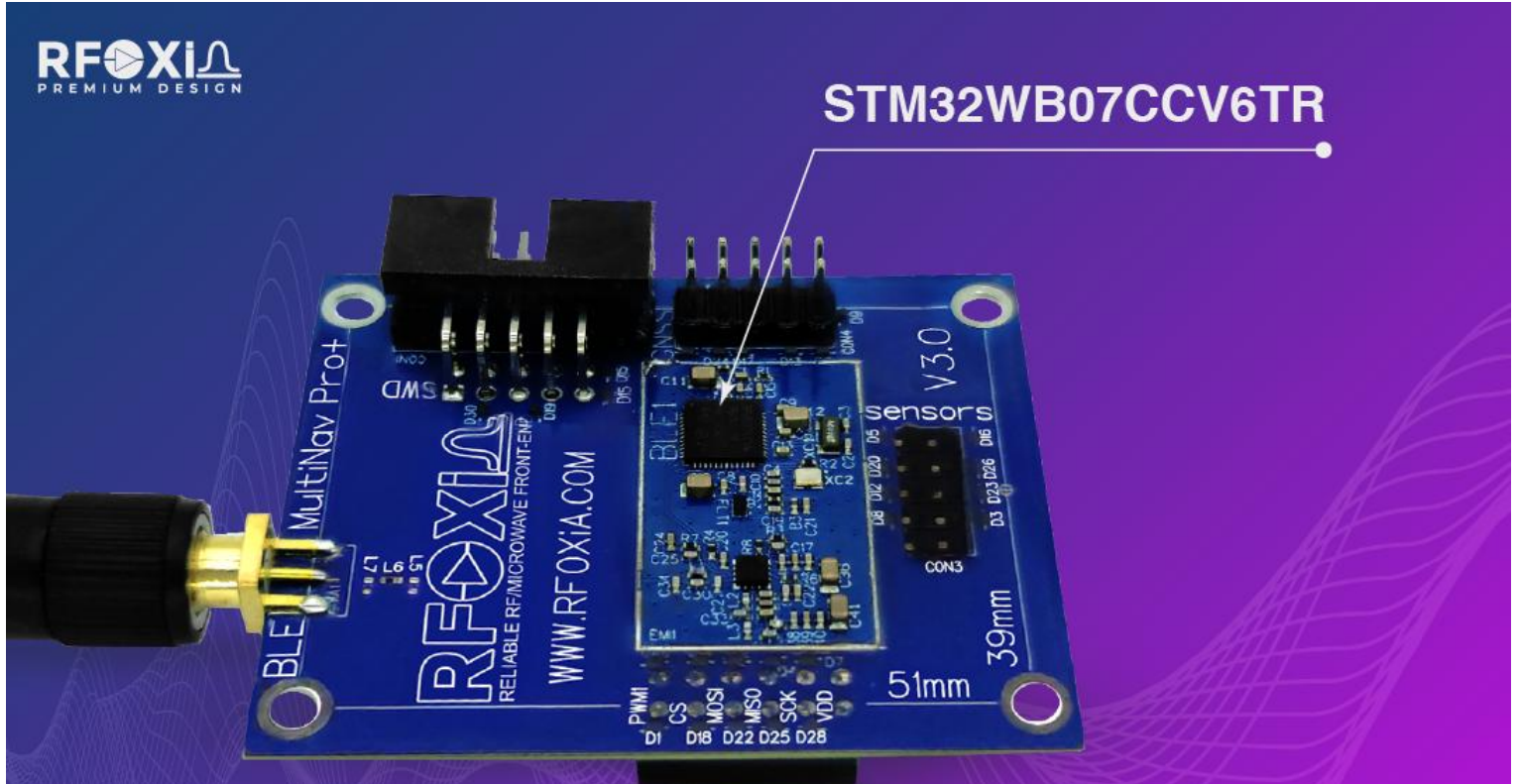
Blazing Fast Speed
2Mbps

Powerful Processing Core

STM32WB07CCV6 (ARM Cortex-M0 @64MHz)

256KB Flash, 64KB SRAM

Rich peripherals: GPIO, ADC, SPI, I2C, UART, PWM.



RFOXiA
PREMIUM DESIGN

STM32WB07CCV6TR

APPLICATION CORE:

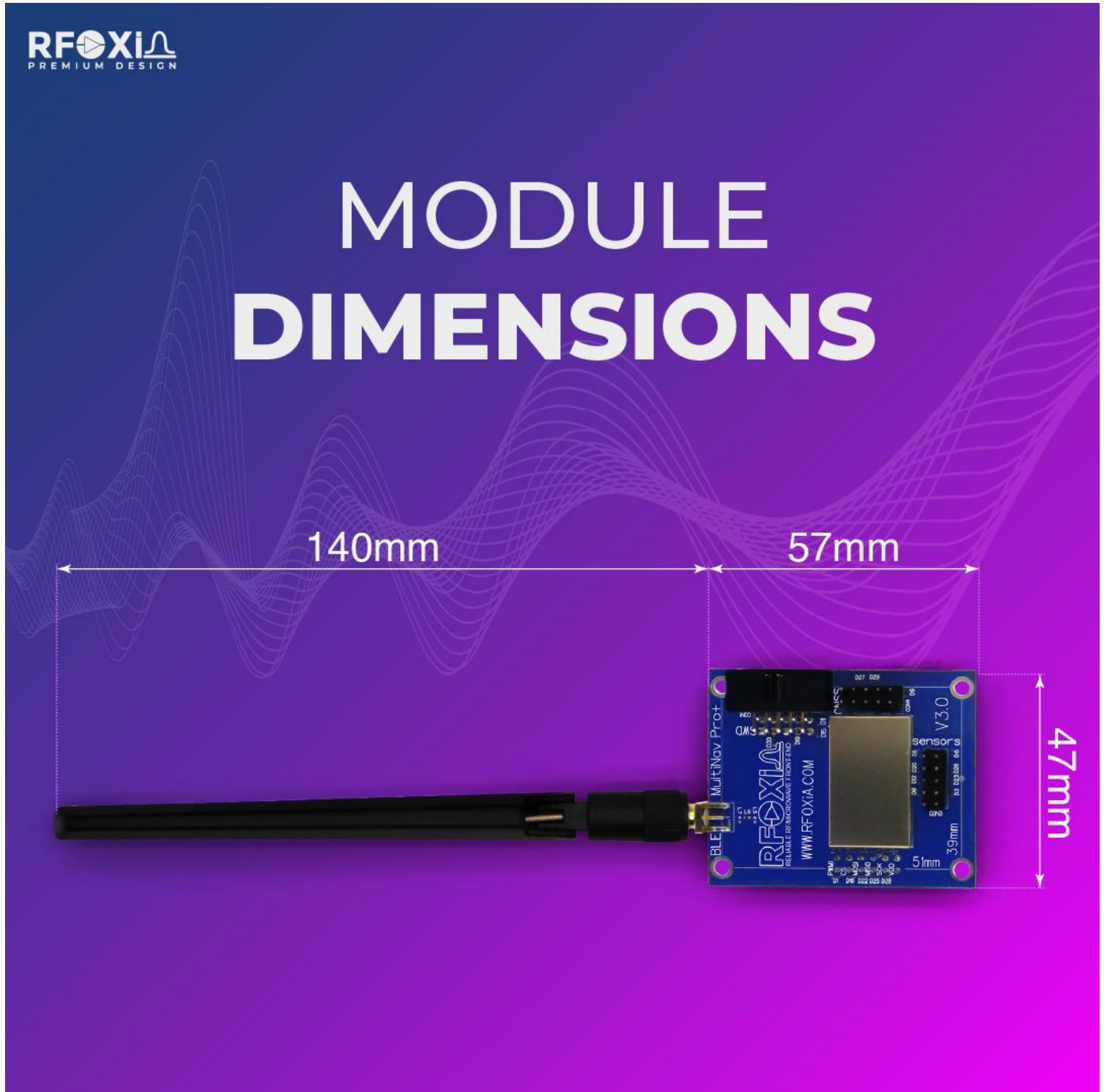
-  ARM Cortex-M0
-  64 MHz Clock
-  256 kB Flash Memory
-  64 kB SRAM
-  DMA, NVIC, (32x)GPIO, (4x)ADC_Single, (2x)ADC_Differential, (2x)I2C, (2x)I2S, (6x)PWM, (3x)SPI, (1x)UART, 11(1x)LPUART, (1x)USART

Compact Design

Module size: 57mm x 47mm

Antenna: 140mm

Mounting: 51mm x 39mm frame.



Ecosystem Integration

Compatible with GNSS, Sensors, Motor/Battery modules forming a unified system.



RFOXiA Connect App

Map view, sensor monitoring, control interface, automation center.
Available on iOS and Android.



RFOXiA

Connect App Integration

Download on the
App Store

GET IT ON
Google Play



Establish Reliable
PRIVATE LONG RANGE
Network System

BLE Chat

Text, voice, and call communication without internet.



Establish Reliable Private Long Range Network System



"BLE Chat" FUNCTIONALITY



Open Source & Programmable

Fully programmable via SWD with open-source firmware support.



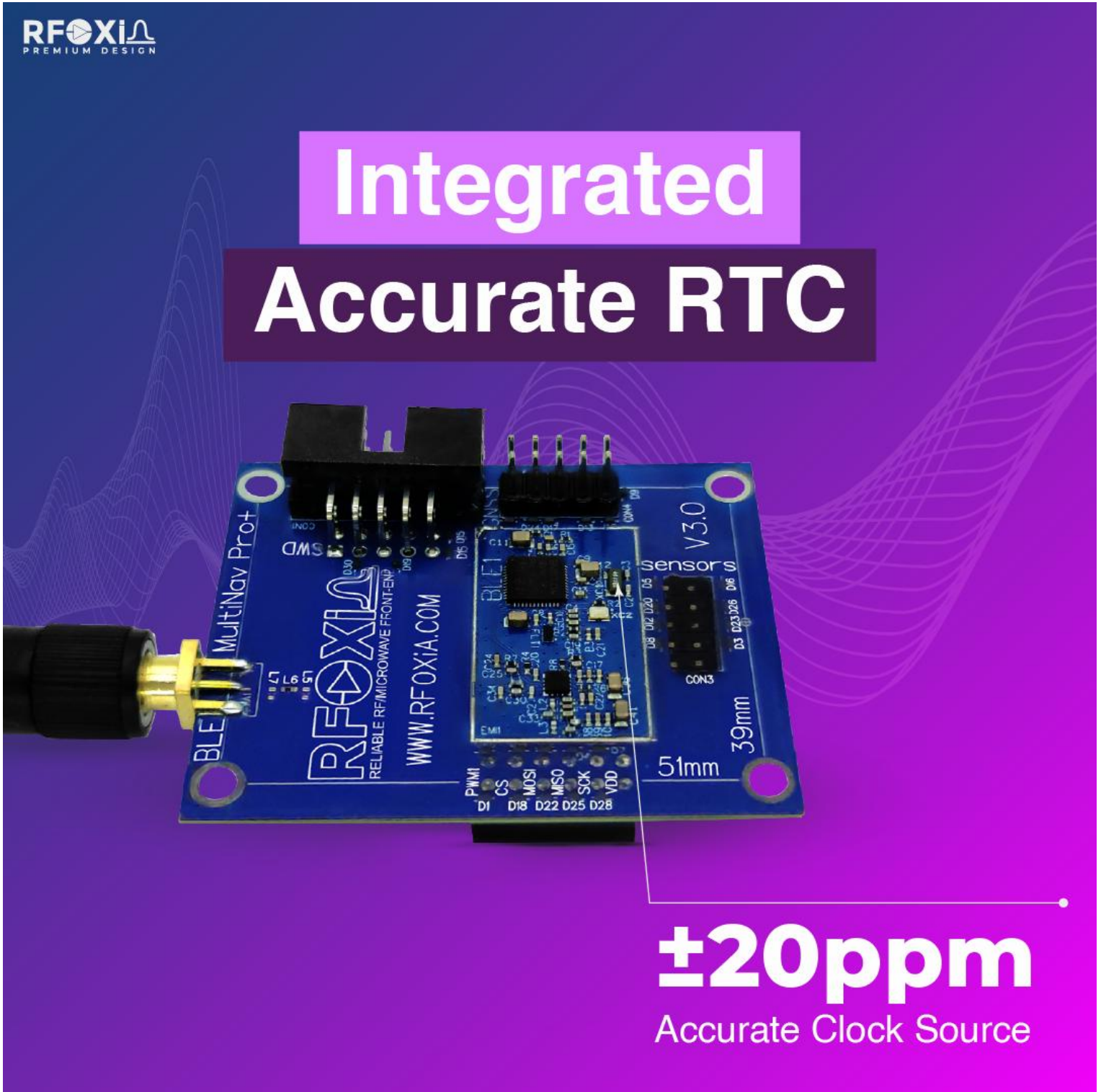
The image features two blue printed circuit boards (PCBs) for the RFOXiA Premium Design. The top board is labeled 'RFOXiA 020' and 'RELIABLE PREMIUM FIRMWARE FRONTEND', with a website 'WWW.RFOXIA.COM' printed on it. It includes a 'Sensor V3.0' and various pins labeled D1 through D29. The bottom board is labeled 'RFOXiA' and 'PREMIUM DESIGN', with 'ORIGINAL' and 'Mot & Bat' also visible. It features pins for SWD, SWCLK, VDD, GND, and various I2C/SPI pins (SCL, SDA, TX, RX, FB7, FB9, EXTH12, EXTH10, EXTH4, EXTH16, EXTH15, EXTH18). To the right of the boards are three STM32 development tools: STM32CubeIDE, STM32CubeMX, and STM32CubeProgrammer, each accompanied by a blue cube icon. Two black cables with gold-plated connectors are shown, one connected to the top board and the other to the bottom board. The background is a gradient of purple and blue with abstract white wave patterns.

Open Source & Programmable

Full firmware Application examples provided with STM32CubeMX & STM32CubeIDE

Accurate RTC

Integrated RTC crystal for precise timing and synchronization.



The image shows a blue PCB labeled 'MultiNav Prot' and 'RFOXiA'. It features a central microcontroller, various passive components, and a large black crystal oscillator. A black cable with a yellow connector is plugged into the left side. The board has dimensions of 51mm by 39mm and is labeled 'V3.0'. A line points from the text '±20ppm Accurate Clock Source' to the crystal oscillator.

Integrated

Accurate RTC

±20ppm
Accurate Clock Source

Technical Specifications

MCU: STM32WB07CCV6

CPU: Cortex-M0 64MHz

Flash: 256KB

SRAM: 64KB

GPIO: 32

ADC: 4 Single, 2 Differential

Interfaces: 3x SPI, 2x I2C, , 2x I2S, UART, USART, LPUART

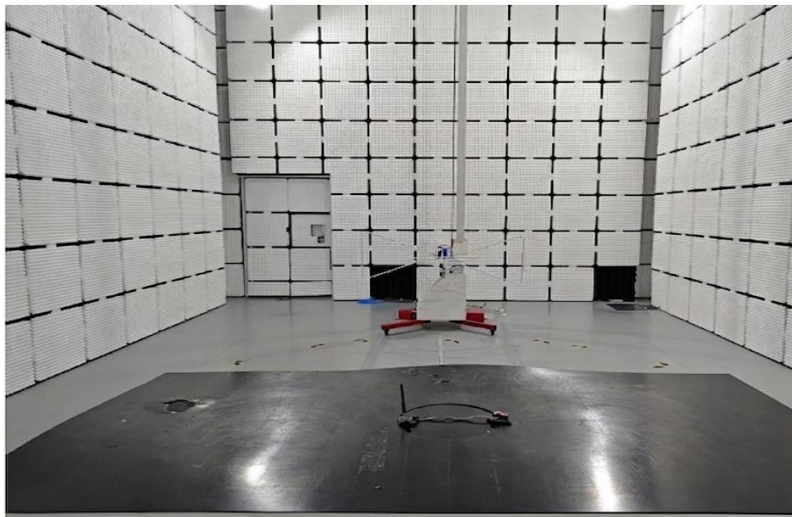
PWM: 6 channels

Sensitivity: -104 dBm

Receiver LNA Gain: 12 dB

ESD Protection: up to 30KV on all exposed pins.

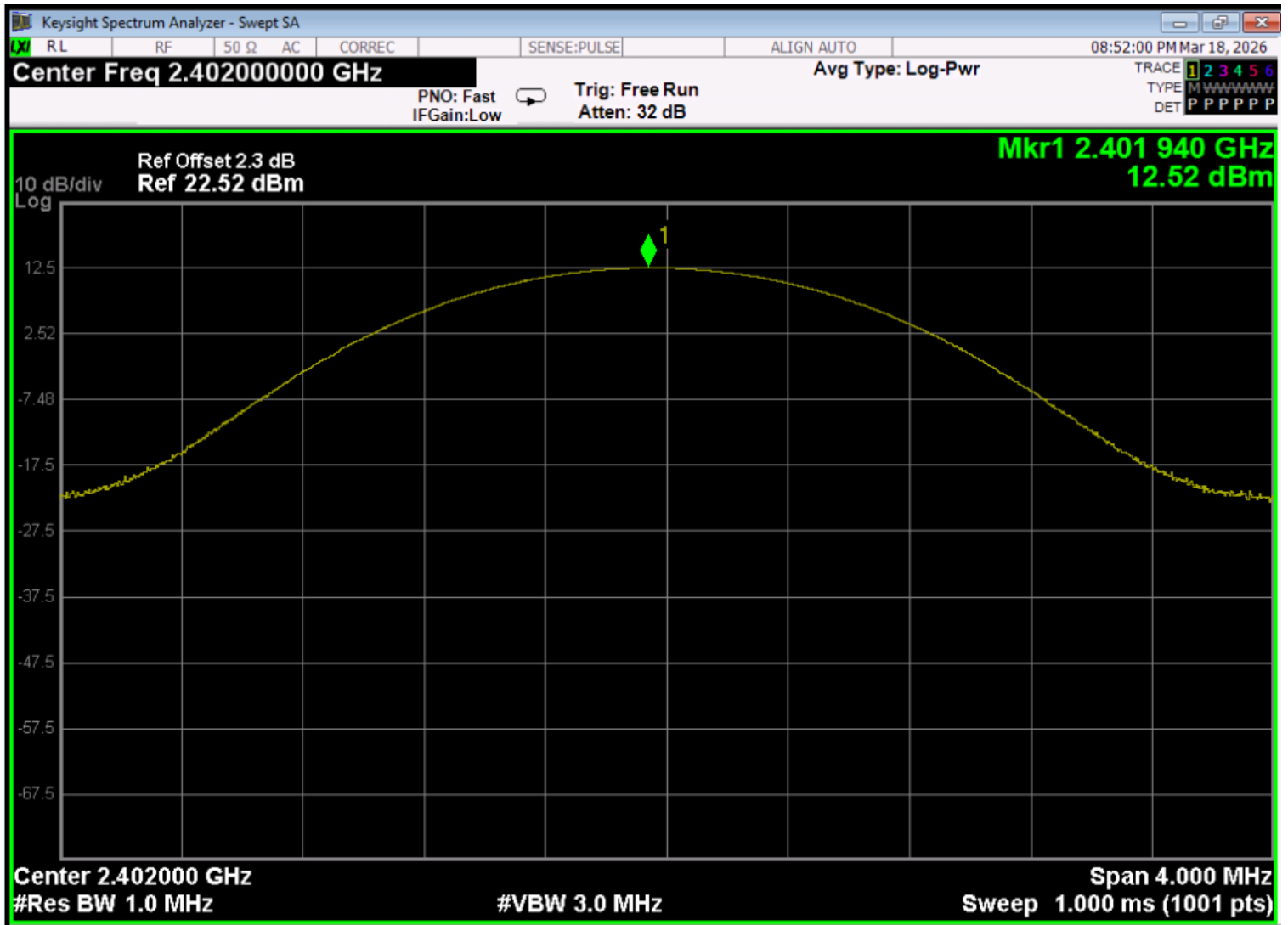
Certifications: FCC, CE

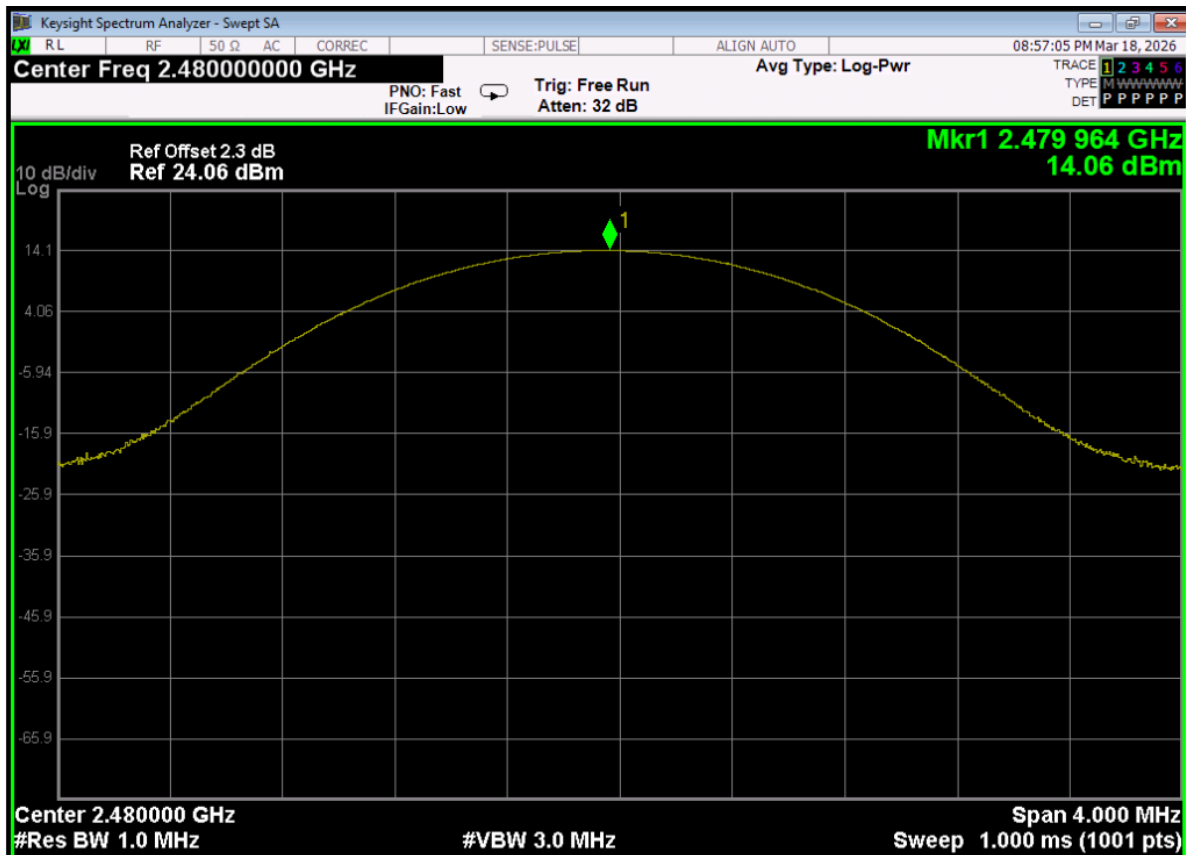
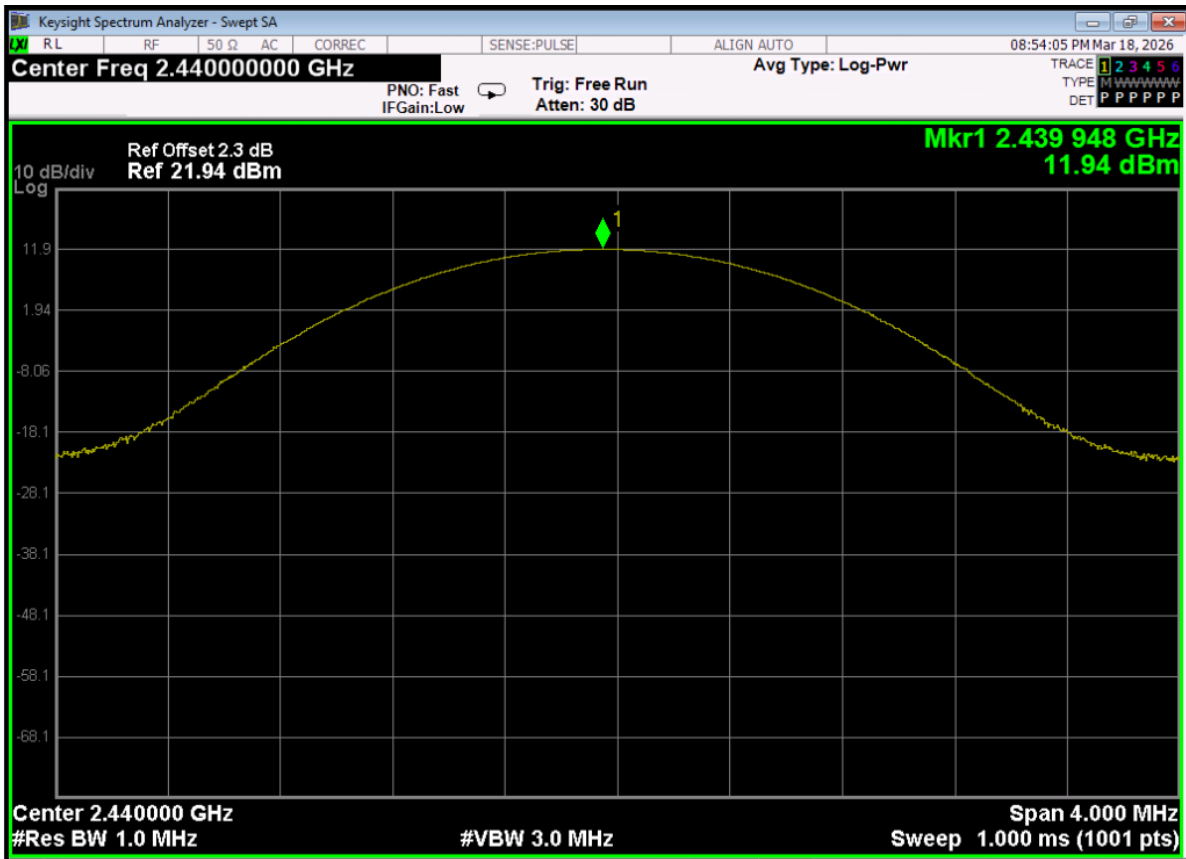


RF Performance

TX Power: 12.52 dBm @ 2402MHz

Condition	Mode	Frequency(MHz)	Peak Power(dBm)	Limit (dBm)	Results
NVNT	1M,PHY	2402	12.52	30	Pass
NVNT	1M,PHY	2440	11.94	30	Pass
NVNT	1M,PHY	2480	14.06	30	Pass

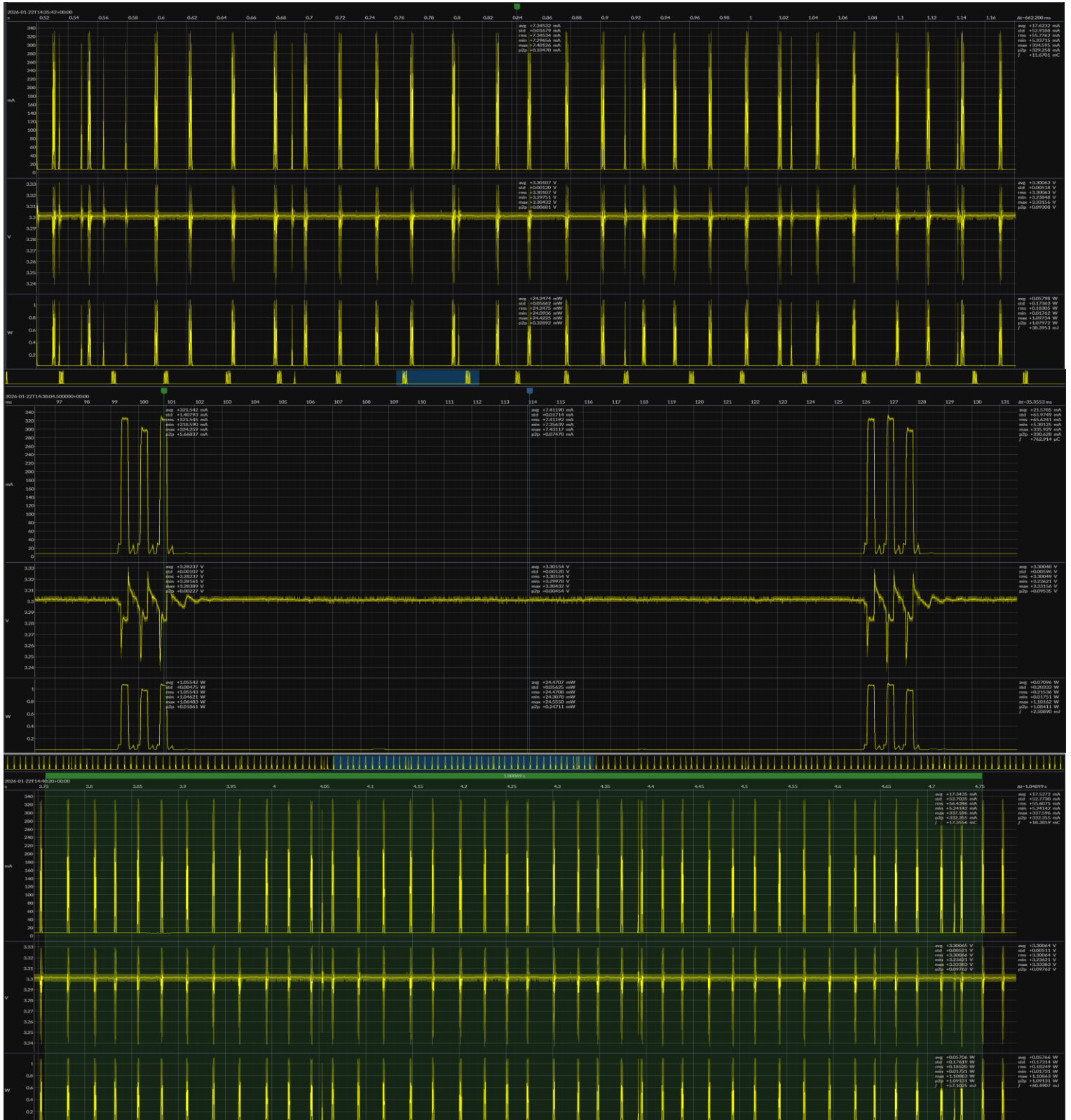




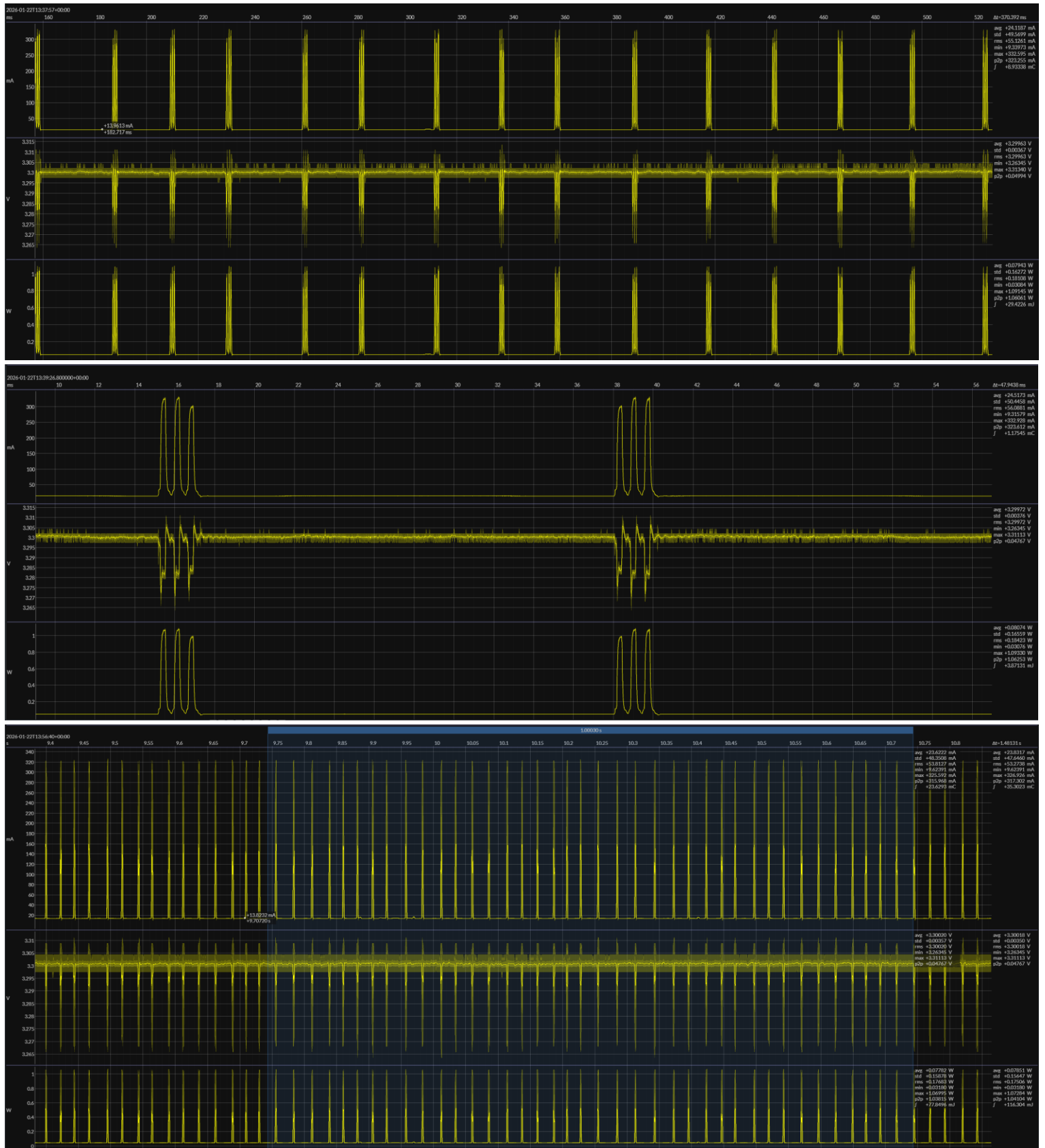
Power Consumption

Insert measurement screenshots for each case below:

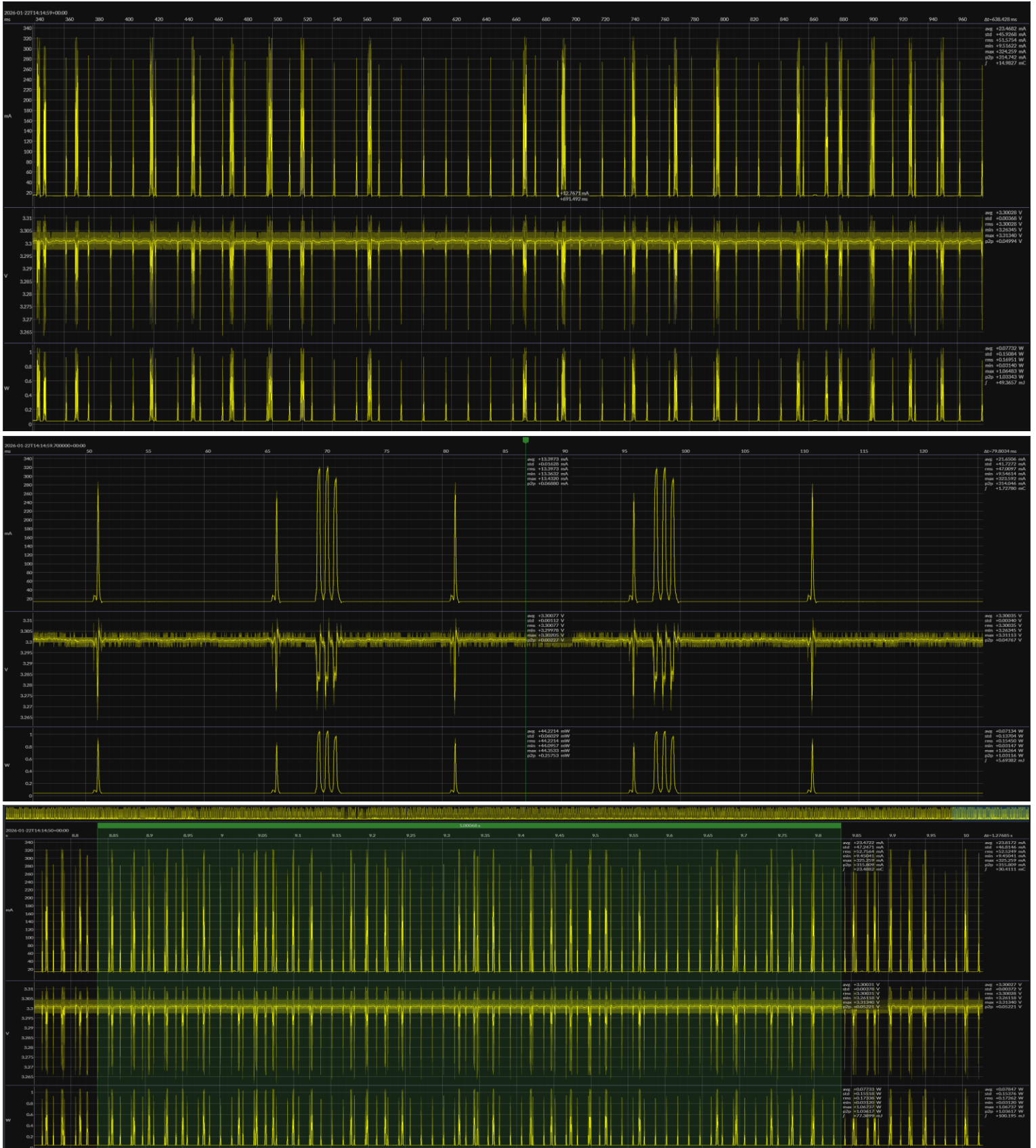
- BLE initialization



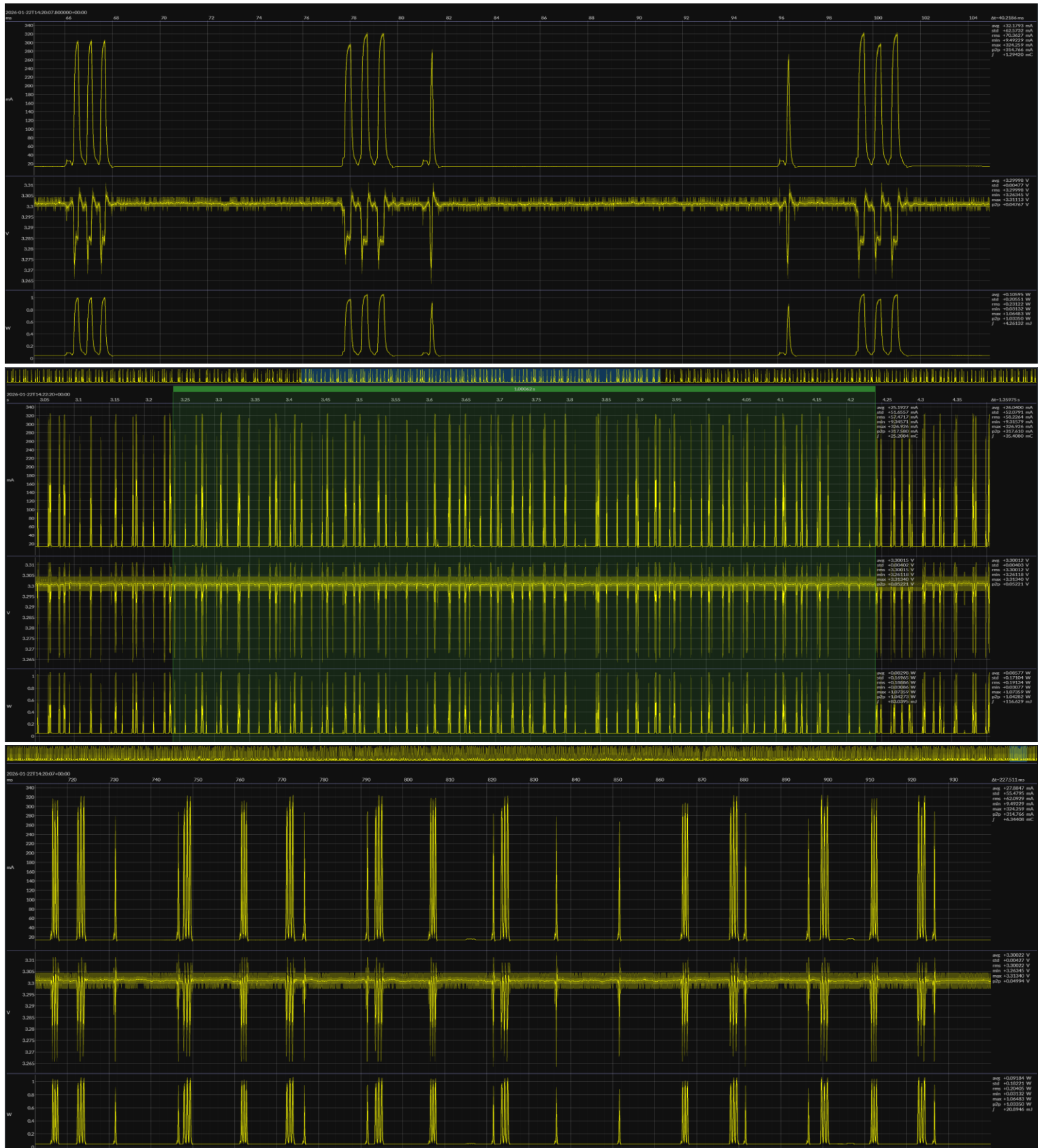
- BLE + GNSS + Sensors initialization



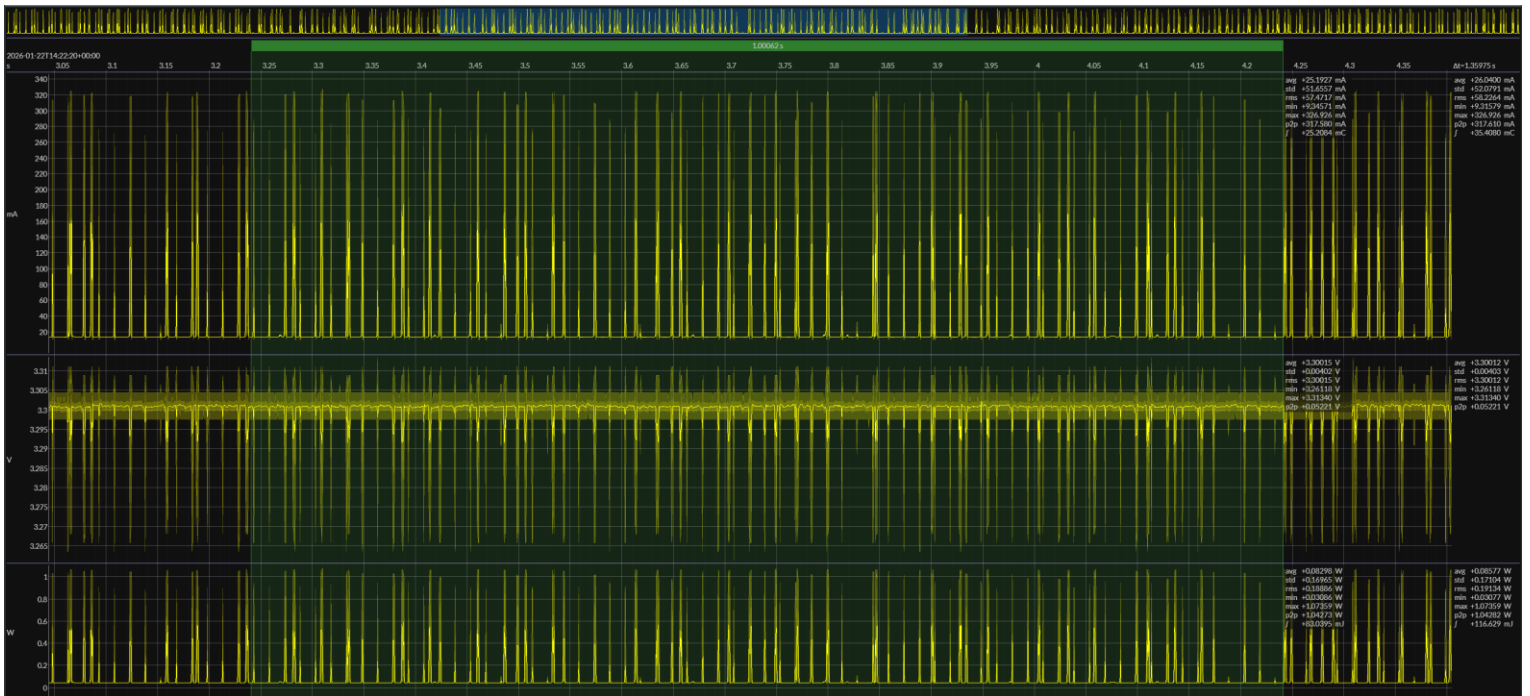
- Map View operation



- 3D View operation



- Dual BLE Mesh communication



FCC ID:

2BUYBMULTINAV

Quick Start Guide

Pre-requirements:

- 1- 2 BLE Modules, GNSS Module, Sensors Module
- 2- Power/Program Kit
- 3- STM32CubeProgrammer software
- 4- BLE Module latest firmware Hex file from RFOXiA Club Resources
- 5- RFOXiA Connect APP, Android or IOS Version

- Update the BLE Module Firmware:

- 1- Open BLE Module package, connect the antenna to the BLE Module
- 2- User the Power/Program Kit to install the latest firmware to the BLE Module, Connect the BLE Module with STLink Programmer using the flat ribbon cable, then plug it to the computer
- 3- Open STM32CubeProgrammer software, drag and drop the hex file to it, press connect and download to install the latest firmware in couple of seconds

- Start pairing with the APP in Control View:

- 4- Mount the GNSS Module and Sensors Module on the BLE Module
- 5- Connect the BLE Module to the Power kit instead of the programmer using the same cable to power it
- 6- Open RFOXiA Connect APP on your phone, Scan and pair with the BLE Module, open Control Screen to see live location from the GNSS Module, real time Temperature, Humidity, Air pressure and Air quality from the Sensors Module
- 7- Press on the 3D view to see the interactive 3D view with real time data from the Accelerometer, Gyroscope, Magnetometer from the Sensors Module
- 8- Press on the Camera view to get Live camera view when you connect the Wifi/Camera Module

- Use the Module in Dual Bluetooth Module to relay sensors data over the long range:

- 9- Install the latest firmware on the 2nd BLE Module as well
- 10- Power the 2nd BLE Module using 2nd Power kit
- 11- Use the APP to scan and connect for the 2nd BLE Module (the module without GNSS nor Sensors Modules)
- 12- Open Chat window, press "Scan for BLE Modules" which let's your BLE Module scan for other BLE Module to find the BLE Module with the GNSS and Sensors Modules, once found press connect
- 13- Go back to the Control Screen, you will find the same GNSS and Sensors Data but this time they are not directly coming from the paired module, instead they are coming from the peer module, the connection between the 2 BLE Modules can work in exceptionally long range

Integration instructions for host product manufacturers according to KDB 996369 D03OEM Manual v01

2.2 List of applicable FCC rules

FCC Part 15.247

KDB558074 D01 15.247 Meas Guidance v05r02

ANSI C63.10:2020

2.3 Specific operational use conditions

The module can be used for mobile applications with a maximum 8.4dBi antenna. The host manufacturer installing this module into their product must ensure that the final composite product complies with the FCC requirements by a

technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer has

to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

2.4 Limited module procedures

The device is a Single module and complies with the requirement of FCC Part 15.247.

2.5 Trace antenna designs

Not applicable, The module has its own antenna, and doesn't need a host sprinted board micro strip trace antenna etc

2.6 RF exposure considerations

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction; and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application

The FCC ID of the module cannot be used on the final product In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization

2.7 Antennas

Antenna Specification are as follows:

Type of antenna: hardware Antenna

Gain of antenna:8.4dBi.

This device is intended only for host manufacturers under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna; The module shall be only used with the internal antenna(s)

that has been originally tested and certified with this module. The antenna must be either permanently attached or

employ a "unique" antenna coupler As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc)

2.8 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating " Contains FCC ID: 2BUYBMULTINAV"

with their finished product

2.9 Information on test modes and additional testing requirements

Host manufacturer must perform test of radiated & conducted emission and spurious emission, e.t.c according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for FCC Part 15.247

KDB558074 D01 15.247 Meas Guidance v05r02, ANSI C63.10:2020 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuit), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed

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.

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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information:

- (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID:2BUYBMULTINAV