



# vayyar VMAKERPROUWB Module Utilizing USB Interface for Communication with Hosting Device User Manual

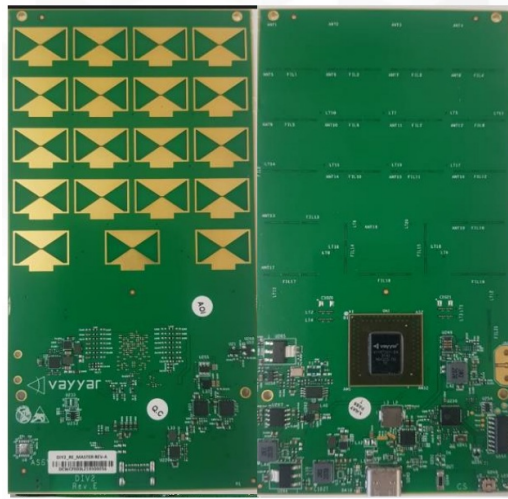
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**vayyar VMAKERPROUWB Module Utilizing USB Interface for Communication with Hosting Device**



## Introduction

The VMAKERPROUWB module builds upon and expands the technology of the maker line of products (FCC ID: 2AHIS-VMaker), to utilize a broader set of antenna models, and support an optional enhanced signaling technique. The VMKAERPROUWB UWB module is used to characterize the environment in the vicinity of the sensor by collecting and analyzing propagation information between the antennas, which is affected by the environment. The information is gathered by sequentially transmitting from the available antennas and collecting the received information at the rest of the antennas. The response information is then processed at the hosting device to obtain spatial information about the environment. The acquisition is controlled by the hosting device. The hosting device may ask VMAKERPROUWB to acquire multiple snapshots, so as to integrate the data into information about a larger spatial extent, or to detect changes in the environment.

## Features

Three-dimensional radio-frequency-based sensor, based on VYYR7201-B4 System-on-Chip for signal generation and recording. A MIMO array of slot-embedded antennas is used to obtain the high-resolution images. The device is operated by a stand-alone host (PC, Smartphone, or another proprietary host), through a USB2 interface or optional WiFi/BLE interface. The power is supplied either by the USB interface, a battery or by an external power supply.

### VMAKERPROUWB model

See the table below for details on the model.

| Capability \ Model       | VMPRO19CB4, VMPRO19EB4 |
|--------------------------|------------------------|
| Number of antennas       | 19                     |
| Board size               | 71mm * 140 mm          |
| External powering option | No                     |
| Antenna Type             | Slot Embedded          |
| Frequency ranges         | 6 -8.5GHz              |
| Power supply             | USB, 4.5-5.5V          |

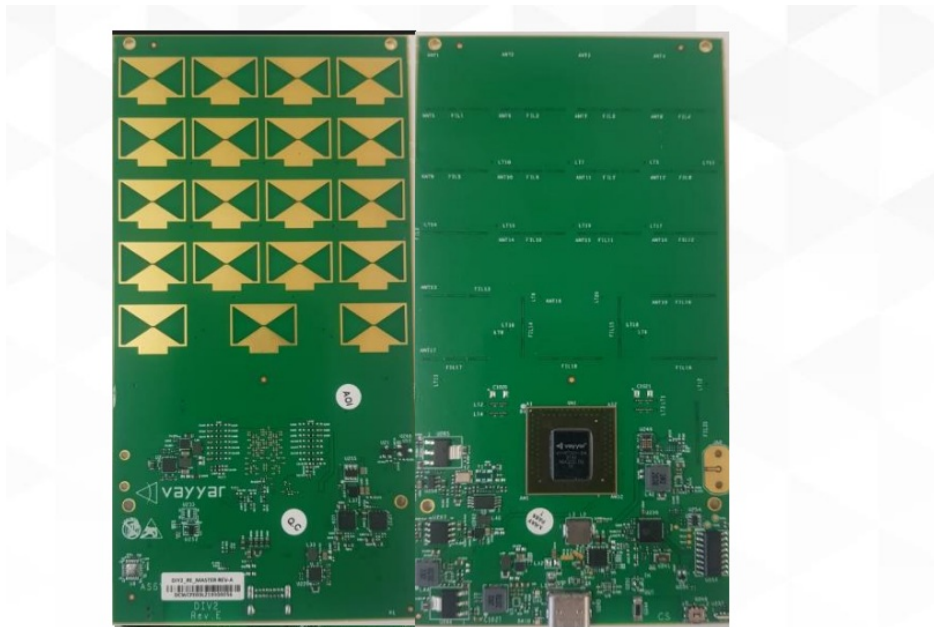


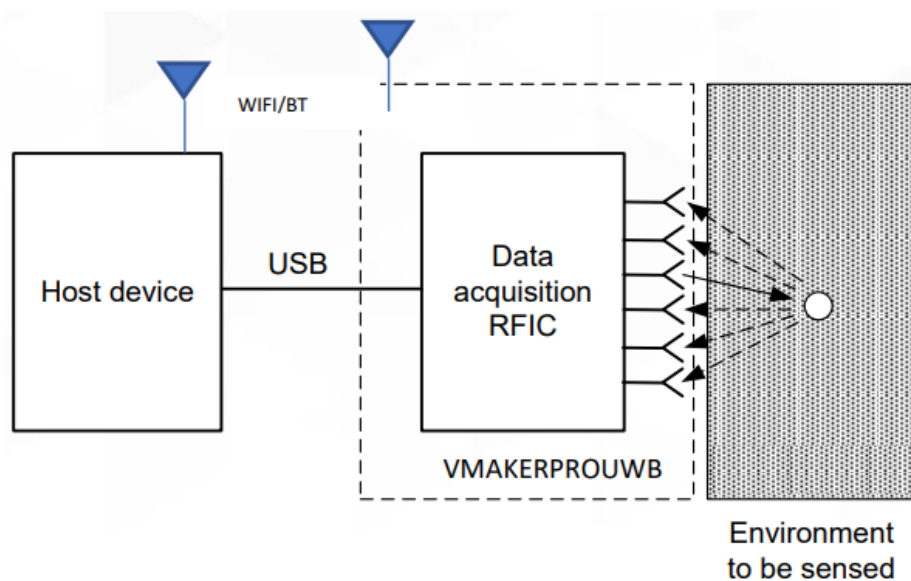
Figure 1: VMAKERPROUWB module utilizing USB interface for communication with hosting device

### Regulatory domains

VMAKERPROUWB models have been manufactured in accordance with the regulatory domains in which they are to be operated. Currently, a single model is designed to support FCC (for operation in the US), ISCED (for operation in Canada), and CE (for operation in the EU and other countries using CE certification). If in doubt, consult your local experts before ordering. The VMPRO19CB4 model is restricted to a 6 -8.5GHz band, supporting FCC, ISCED, and CE permitted frequency bands.

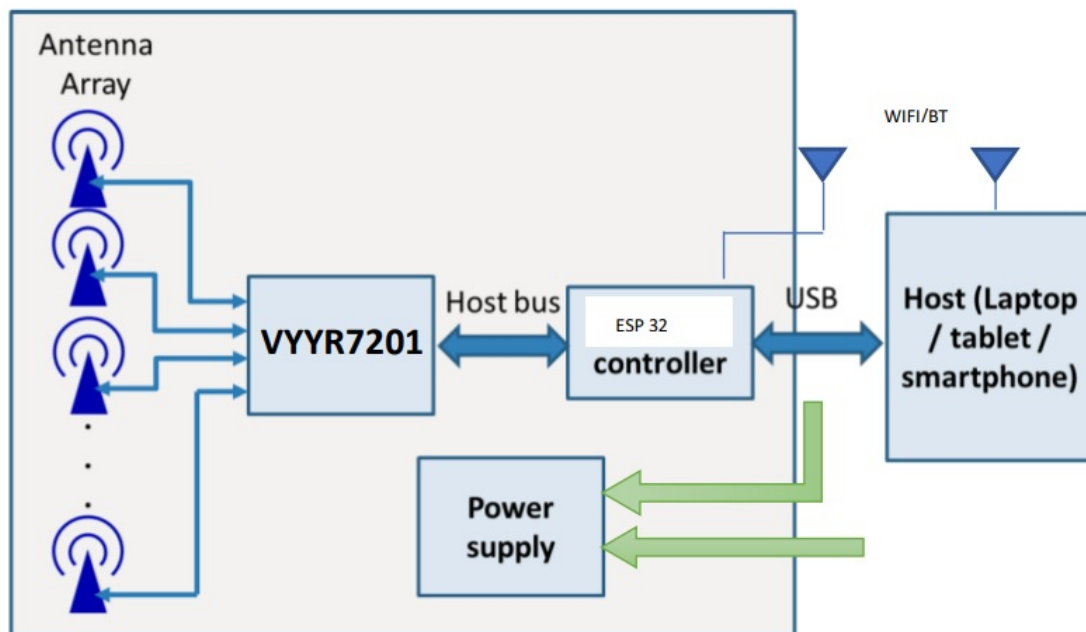
### Technology

The VMAKERPROUWB product is a multi-antenna sensor that characterizes the environment in the vicinity of the sensor. It is done by collecting and analyzing propagation information between the antennas, which is affected by the environment. The propagation response information is collected by VMAKERPROUWB and processed at the hosting device to obtain spatial information about the environment.



### Block Diagram

The following figure presents a high-level block diagram of the VMAKERPROUWB platform.



## Interfaces

The module's main interface is USB for communication configuration

### USB Interface and Powering Options

The board's main interfaces are USB in high-speed mode and a power supply. Both can be provided by an onboard USB type-C connector.

### Connector and powering options

| Capability \ Model     | VMPRO19CB4, VMPRO19EB4 |
|------------------------|------------------------|
| Connector types        | USB type-C             |
| Power Supply Connector | USB type-C             |
| Voltage supply         | 5V +/-10%              |
| Power Consumption      | 0.4-0.9A               |

## Software Installation

VMAKERPROUWB is to be operated with dedicated SW per model, project, final product, and the specific platform and OS (Windows, Android, etc). The relevant SW and instructions will be given per device and project, separately from this manual.

### General SW high-levels

- The software contains a driver through which the application software communicates with the VMAKERPROUWB device.
- The driver translates the commands into VMAKERPROUWB's actions.
- Moreover, the driver is in charge of enforcing certain regulatory restrictions.
- The user is required to communicate with the VMAKERPROUWB device only through the driver using the provided API.

## **Mechanical placement**

The VMAKERPROUWB are provided as bare boards or with an optional mechanical housing and case. The mounting instructions shall be provided per specific product or module. In the case that a proprietary case is used, make sure that the front cover is nonmetallic (e.g. plastic) and preferably thin (not exceeding 2 mm).

## **Regulatory Information**

### **Regulatory Conformance**

The VMAKERPROUWB device has been designed to be in compliance with the FCC regulations governing UWB hand-held systems (Part 15.519) also known as “battery-powered devices” or “mobile devices.” This means that the device can be incorporated into a wide variety of products including educational robots, pipe locators, breathing monitors, etc. Note that there are other applications that are specifically forbidden, such as the use of the devices in toys. See FCC Parts 15.519 and 15.521 for more details. Certain models of the VMAKERPROUWB device have been designed and tested to be in compliance with CE requirements, and in particular to conform to ETSI standards EN 302 065-1, EN 301 489-33, and EN 301 489-1. In particular, the CE-compliant devices are restricted to operation in the 6-8.5 GHz band. Make sure that if you use the device outside the US, you order the appropriate model number.

## **FCC regulatory statements**

### **FCC Interference Statement-Part 15.105 (b)**

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 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.

Cessation of operation is required until the interference is resolved.

### **FCC Part 15 Clause 15.21**

“Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment”

### **FCC Part 15.19(a) [interference compliance statement**

“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.”

## **ISED RSS-Gen Notice**

“This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada’s license-exempt RSS(s). Operation is subject to the following two conditions

This device may not cause interference. This device must accept any interference, including interference that may cause undesired operation of the device.” “L’émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d’Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes : L’appareil ne doit pas produire de brouillage; L’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.”

#### **ISED Canada ICES-003 Compliance Label (CAN BE PROVIDED ON LABEL OR in MANUAL**

“CAN ICES-3 (B)/NMB-3(B)”

#### **Labels**

In general, the module will be operated by a hosting device that will show the FCC ID and IC in the app. If for some reason e-label will not be used, the module will have a printed sticker or a silk screen printed FCC ID label on it, and the manual shall advise the users to affix a label saying “Contains FCC ID: 2AHIS-VMAKERPROUWB” if the VMAKERPROUWB is installed so that the on-board label is not visible.

#### **FCC**



FCC ID: 2AHIS-VMAKERPROUWB

#### **IC regulatory Labeling**

IC: 21498-VMAKERPROU

Figure 2: Per device, the FCC ID will either be e-labeled read by the hosting device or as a sticker as shown or specified in the user manual

#### **Instructions for the Integrator**

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install the module.

**OEM Integrators Notices**

This device is intended only for OEM integrators under the following conditions. The transmitter module may not be co-located with any other transmitter or antenna. As long as this condition above is met, further transmitter tests will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

**IMPORTANT NOTE:** In the event that this condition cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC/ISED authorization is no longer considered valid and the FCC ID/IC number cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC/ISED authorization.

**End Product Labeling**

The OEM integrator 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. Visible area with the following: “Contains IC:21498-VMAKERPROU”.

**OEM Manual Information That Must be Included**

The OEM integrator 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 user manual for OEM integrators must include the following information in a prominent location **IMPORTANT NOTE:** To comply with FCC/ISED RF exposure requirements, this device and its antennas must not be co-located or used in conjunction with any other antenna or transmitter except under the conditions shown in the FCC filing and/or in accordance with FCC multi-transmitter product guidelines.

**Documents / Resources**

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|  | <p><a href="#">vayyar VMAKERPROUWB Module Utilizing USB Interface for Communication with Hosting Device [pdf] User Manual</a></p> <p>VMAKERPROUWB, 2AHIS-VMAKERPROUWB, 2AHISVMAKERPROUWB, Module Utilizing USB Interface for Communication with Hosting Device, VMAKERPROUWB Module Utilizing USB Interface for Communication with Hosting Device</p> |
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