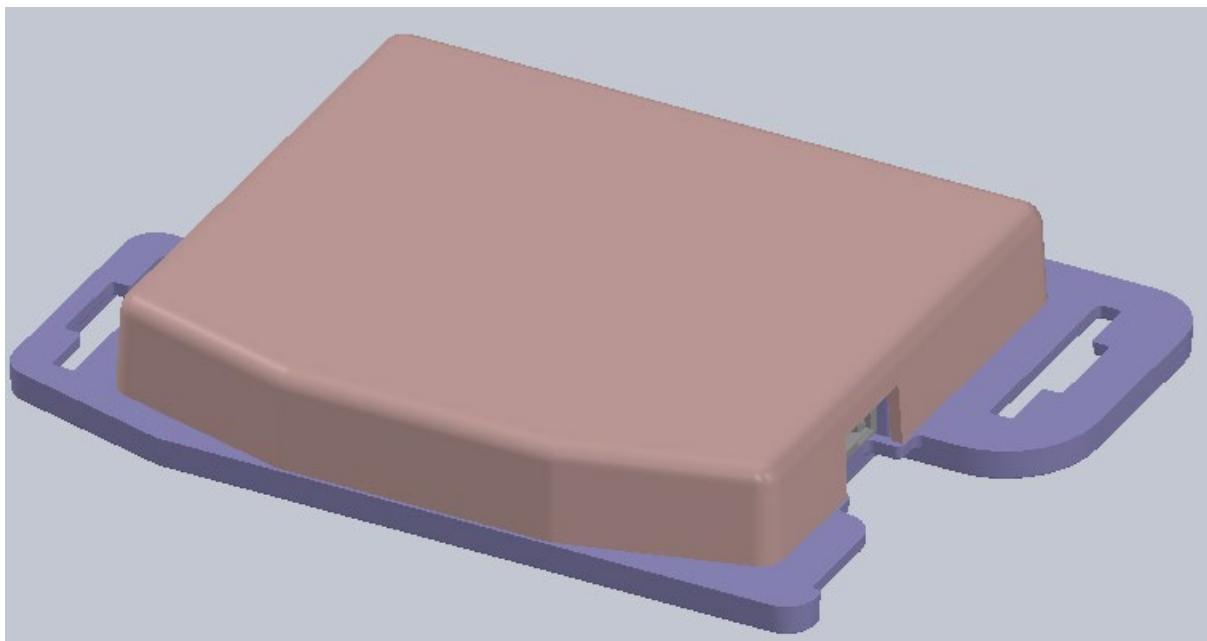




# **VanGoch\_RevA\_CTPC0**



## **User Manual**

**Revision 1.0**



**Vayyar Imaging Ltd.****Web:** <https://vayyar.com>

## Notice

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## Revision History

Revision	Date	Author	Description
1.0	June 2023		

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# Chapter 1 Introduction

This guide provides information on the installation and operation of the **Vayyar VanGoch\_RevA\_CTPCO Module**. VanGoch\_RevA\_CTPCO is a three-dimensional mm-wave sensor used as a short-range device for interactive motion sensing. The operational flow, as described in this document, is one realization for the usage of the VanGoch\_RevA\_CTPCO device, while other possible realizations could be integrated with a hosting-product, operate in conjunction with various hosts other than a PC, communicate through various API-s and SW environments. All control and operation options preserve the same operation of the device in terms of transmitted RF waveform (output power, bandwidth), according to the regulated values.

The device should be installed inside a vehicle cabin, to detect and monitor objects in a defined arena. The module provides a real-time indications of objects positions and existence within the arena.

Typical applications for the device can be in-cabin monitoring for detection of infants left in car, and more.

## 1.0 Release Information

This document provides basic description of the system and its operation flow. The same device can be provided with other operation-environments (host, API, SDK), and a dedicated user-guide will be provided for every option.

As described above – the device will preserve, under all conditions, similar transmitted waveform (output-power, bandwidth).

For more details – contact Vayyar LTD through – [www.vayyar.com](http://www.vayyar.com).

# Chapter 2 Sensor Integration instructions

The VanGoch\_RevA\_CTPCO shall be installed **inside a car's cabin**. There are several potential installation locations inside car's cabin, which must support both functional performance and are applicable by the conditions of the DA 21-407 waiver.

The final product, incorporating the VanGoch\_RevA\_CTPCO module, shall be restricted to factory installation in the interior of new passenger motor vehicles for the primary purpose of in-cabin monitoring functions, and shall not be marketed in after-market add-on products.

Adequate installation would be:

1. The sensor connected firmly to the car's roof, either directly to the metal frame \ plastic bracket on the cabin's frame, or on top of the headliner.
2. The sensor connected firmly to the car's A/B/C Pillar, either directly to the metal frame \ plastic bracket on the pillars, or on top of the pillar covers.
3. The sensor connected firmly to the car seat / headrest either directly to the metal frame or on top of the upholstery.
4. Alternative installation locations may also be possible – as long as the sensor is positioned inside the cabin, according to the conditions of the DA 21-407 waiver

Examples of installations options:

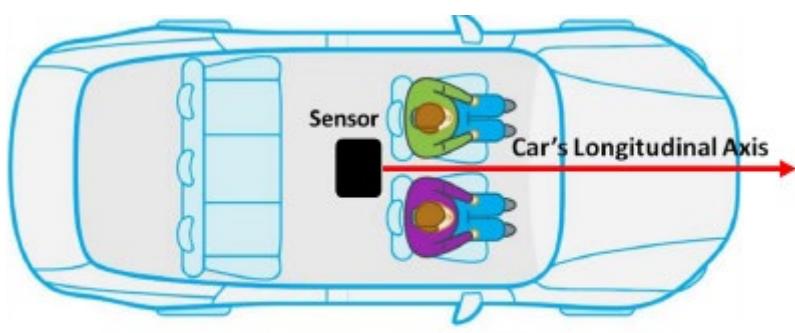


Figure 30: Sensor Centralization

Figure 1: Sensor location – part 1

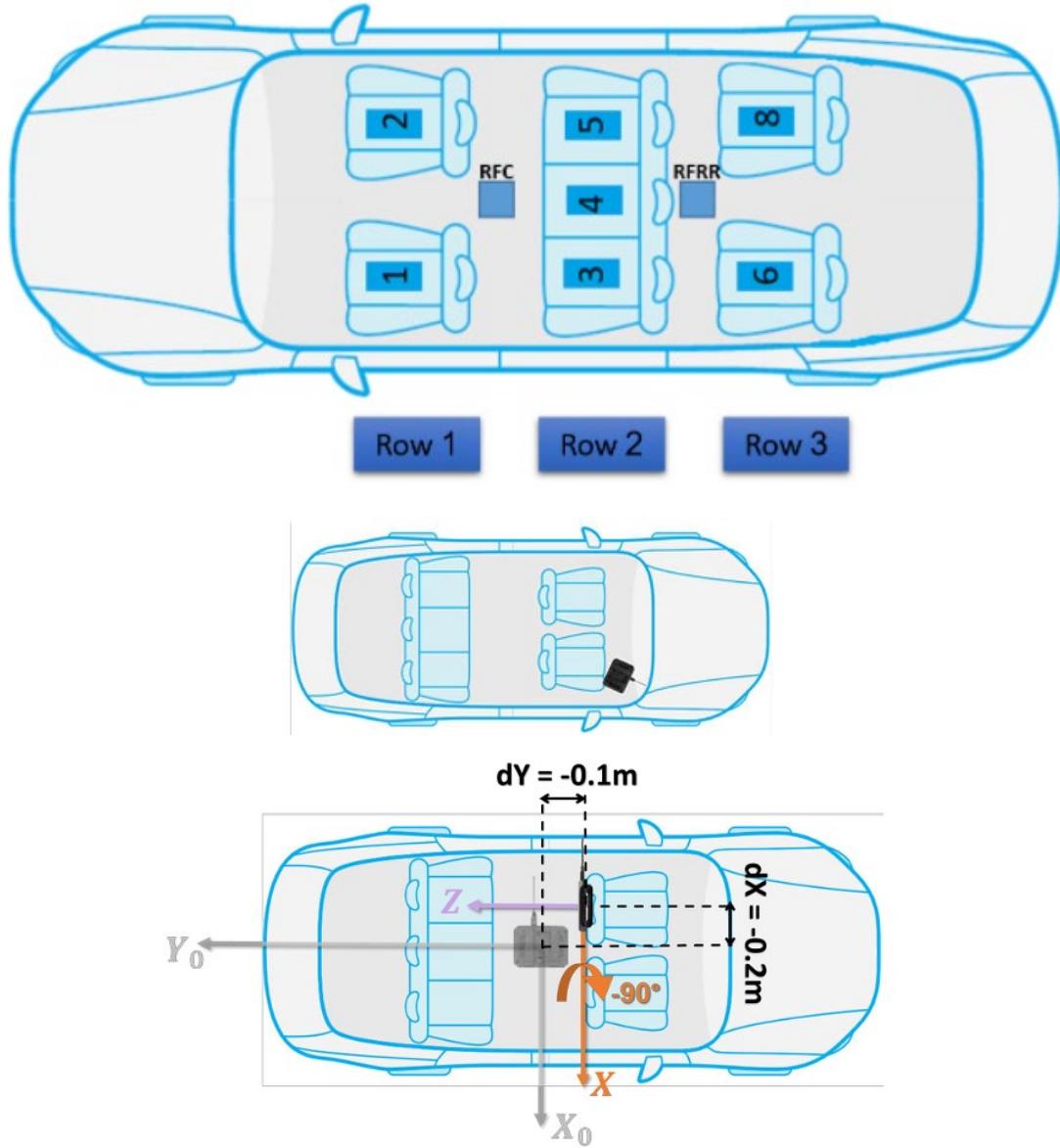


Figure 13: 90 Degree Back-seat Installation – Top view

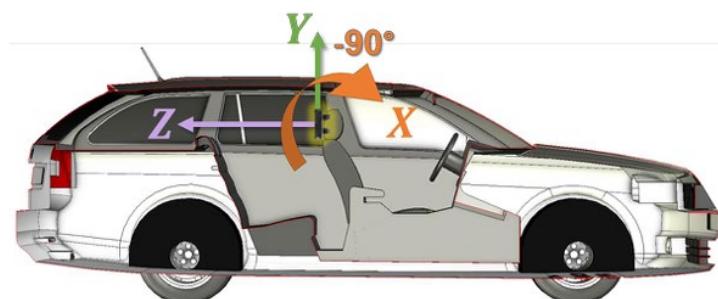


Figure 2: Sensor location – part 2

# Chapter 3 System Overview

The VanGoch\_RevA\_CTPCO is designed to demonstrate Vayyar's 4D interactive motion sensing, which enables identifying multiple objects ("indications") in a defined space ("arena").

## 3.1 CAN Interface

The CAN interface connects the host platform with the module. The interface is implemented on the board using an CAN Transceiver.

The onboard connector (marked with red arrow) is used for data transfer and Battery supply. The data transfer is between the sensor unit and the host controller.

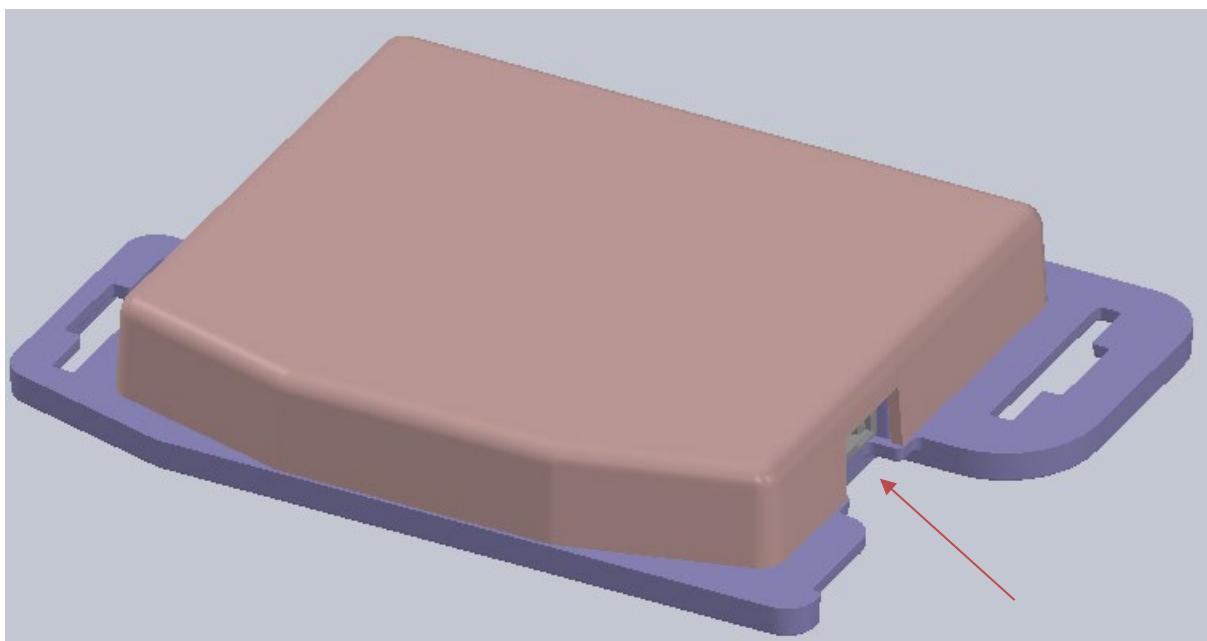


Figure 3: VanGoch\_RevA\_CTPCO Connectivity

## 3.1 Software

The VanGoch\_RevA\_CTPCO system software performs signal processing and generation of the arena detection targets. It communicates with the Host by a serial connection, which sends indications of the detected objects.

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### NOTE

The Graphical User Interface supports use of a single sensor only.

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# Chapter 4

## Regulatory section

### 4.1 Compliance

#### 4.1.1 FCC

The device is certified under FCC DA 21-407 waiver conditions, as - FCC-ID: 2AHIS-V60GINCARVG.

This VanGoch\_RevA\_CTPCO device 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.

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

The device shall not be used on an airplane while airborne.

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.

## 4.1.2 IC

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-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.

## 4.2 Instructions for the Integrator

The VanGoch\_RevA\_CTPCO device should be installed inside a vehicle interior and used primarily for in-cabin monitoring functions.

When used as an end-product and not solely as an evaluation-kit, the device shall be restricted to factory installation in the interior cabin of new passenger motor vehicles, and shall not be marketed in after-market add-on products.

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

### 4.2.1 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 testing 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 authorization is no longer considered valid and the FCC ID 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 authorization.

Users of these devices must be made aware through a disclosure in the vehicle Owner's Manual or an equivalent means that operation is subject to the conditions that no harmful interference is caused and that any interference must be accepted.

### 4.2.2 End Product Labeling

Visible area with the following: "Contains FCC ID: 2AHIS-V60GINCARVG" and IC: 21498-V60GINCARVG (either in user-manual, on the package or the product case).

When the hosting device uses an electric-display in a product, it should be possible to display electronically the FCC-ID.

If the radar is installed such that it is not visible (e.g., behind the headliner), then the required equipment labeling in accordance with the provisions of 47 CFR §§ 2.925 and 15.19 shall be provided in the vehicle's Owner's Manual.

### 4.2.3 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 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/ISED filing and/or in accordance with FCC/ISED multi-transmitter product guidelines.

### 4.2.4 System Approval under DA 21-407 waiver

- (a) the operator's manual shall provide clear and complete installation instructions that explain the applicable restrictions and a copy of these instructions shall be submitted along with the application for equipment authorization;
- (b) the certification grant conditions shall clearly state that the module is limited to factory installation in new passenger motor vehicles;
- (c) the device shall be installed only inside the cabin of a vehicle, according to the conditions of the DA 21-407 waiver.

The module integrator must include the below interference statement in the vehicle owner's manual:

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

The final product, covered by FCC-ID: 2AHIS-V60GINCARVG and incorporating the VanGoch\_RevA\_CTPC0 module, shall be restricted to factory installation in the interior of new passenger motor vehicles for the primary purpose of in-cabin monitoring functions, and shall not be marketed in after-market add-on products.

The waiver conditions granted herein are not transferable to any third party via §2.933 or any other means of technology transfer. The grantee is responsible for continued FCC compliance in any end-product embodiment.

**END OF DOCUMENT**