

**RAA2L6060KIT LiDAR Receiver and Control Solution Starter Kit**

The RAA2L6060KIT LiDAR receiver and control solution starter kit provides a comprehensive system for initial laboratory evaluation and application tests of three-dimensional object detection using the "Time-of-Flight" (ToF) principle.

**Contents**

**Contents** ..... 1

**Figures** ..... 1

**Tables**..... 1

**1. Terms and Definitions** ..... 2

**2. Introduction** ..... 2

**3. Starter Kit Content**..... 3

**4. Minimum System Requirements** ..... 3

**5. Hardware Description** ..... 4

**6. Graphical User Interface (GUI) Description** ..... 6

**7. System Performance** ..... 7

    7.1 Solid State Line Scan ..... 7

    7.2 Solid State 3D Scan ..... 7

**8. Collaterals** ..... 8

**9. Ordering Information**..... 8

**10. Revision History** ..... 9

**Figures**

Figure 1. RAA2L6060 LiDAR Starter Kit.....2

Figure 2. RAA2L6060KIT Front View .....4

Figure 3. RAA2L6060KIT Back View .....5

Figure 4. GUI Operation Window .....6

**Tables**

Table 1. Solid State Line Scan Performance Examples.....7

Table 2. Solid State 3D Scan Performance Examples .....7

## 1. Terms and Definitions

MCU	Microcontroller unit
GUI	Graphical user interface
SoC	System-on-chip
ToF	Time-of-flight

## 2. Introduction

The RAA2L6060KIT LiDAR receiver and control solution starter kit provides a comprehensive system for initial laboratory evaluation and application tests of three-dimensional object detection using the "Time-of-Flight" (ToF) principle. This principle uses light pulses that are emitted and reflected by objects for detection.

At the core of the LiDAR starter kit is the Renesas RAA2L6060 multi-channel LiDAR frontend IC. This IC triggers the light emitters, which are typically implemented with laser diodes. The reflected light pulses are captured by a photo array, and the resulting data are pre-processed and transmitted through Quad-SPI to the post-processing SoC or microcontroller.

For post-processing, the kit utilizes the Renesas R-Car V3M SoC. This system-on-chip provides adequate performance for post-processing, object detection, and classification requirements. The kit includes an ethernet port for data output. As an option, a cost-optimized post-processing MCU from the Renesas RZ/G series is under development.

The RAA2L6060KIT includes a Graphical User Interface (GUI) enabling users to execute laboratory/system tests and develop their application specific firmware/software.

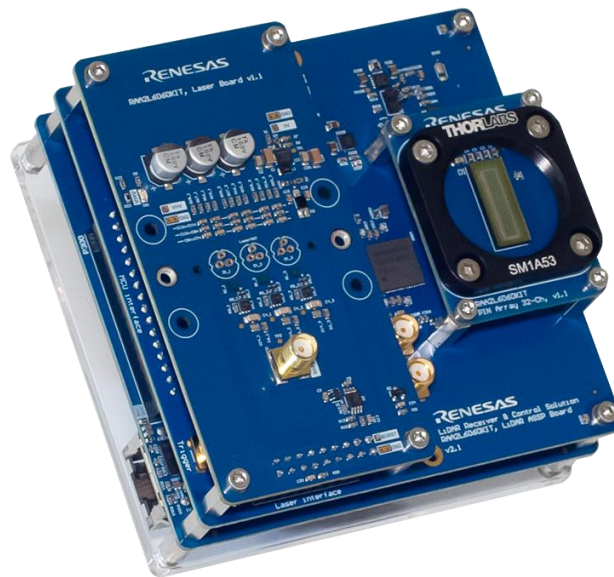


Figure 1. RAA2L6060 LiDAR Starter Kit

### 3. Starter Kit Content

The RAA2L6060KIT starter kit contains all the essential hardware, firmware, and software needed for initial laboratory evaluation and application tests. Starter kit includes the following:

- Evaluation board stack based on four PCBs:
  - RAA2L6060 LiDAR waveform recorder IC board with supporting components
  - R-Car V3M SoC board with supporting components and interfaces
  - 32-channel PIN photo-array board
  - 3-channel light emitter board.
- Ethernet cable and USB-to-Ethernet adapter for data transmission to a PC
- USB-C cable for power supply
- 5 V USB-C power supply, current rating  $\geq 2.0$  A
- Transportation box
- Disclaimer
- Graphical user interface to be executed on a Windows or Linux PC.

### 4. Minimum System Requirements

The following list outlines the minimum key components and requirements for setting up and using the RAA2L6060KIT starter kit:

- Computer with Windows 10/11 (64 bit) or Linux operating system.
- Memory of 8 GB RAM.
- 500 MB of free HDD space.
- One free USB 2.0 port for the USB-to-Ethernet adapter. Alternatively, a free ethernet port on the computer can be directly used as well.

## 5. Hardware Description

The hardware kit includes essential components such as the RAA2L6060 LiDAR waveform recorder ASSP board for system control and data acquisition, the R-Car V3M SoC board, which provides advanced processing capabilities, and a 32-channel PIN photo-array with a lens mounting socket for precise optical measurements. It also comes with a USB-C cable for power supply and SoC programming, along with an ethernet cable and Ethernet-to-USB adapter for seamless data transmission to a PC. Additional optional accessories can further enhance the functionality of the specific applications.

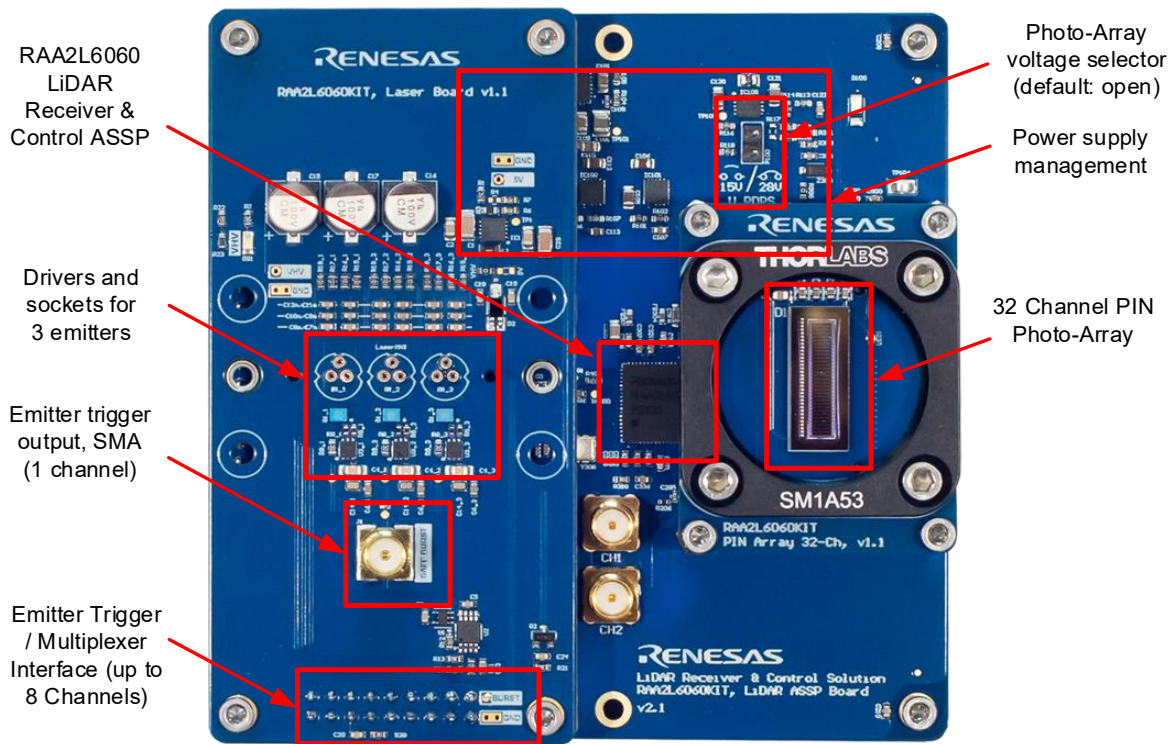


Figure 2. RAA2L6060KIT Front View

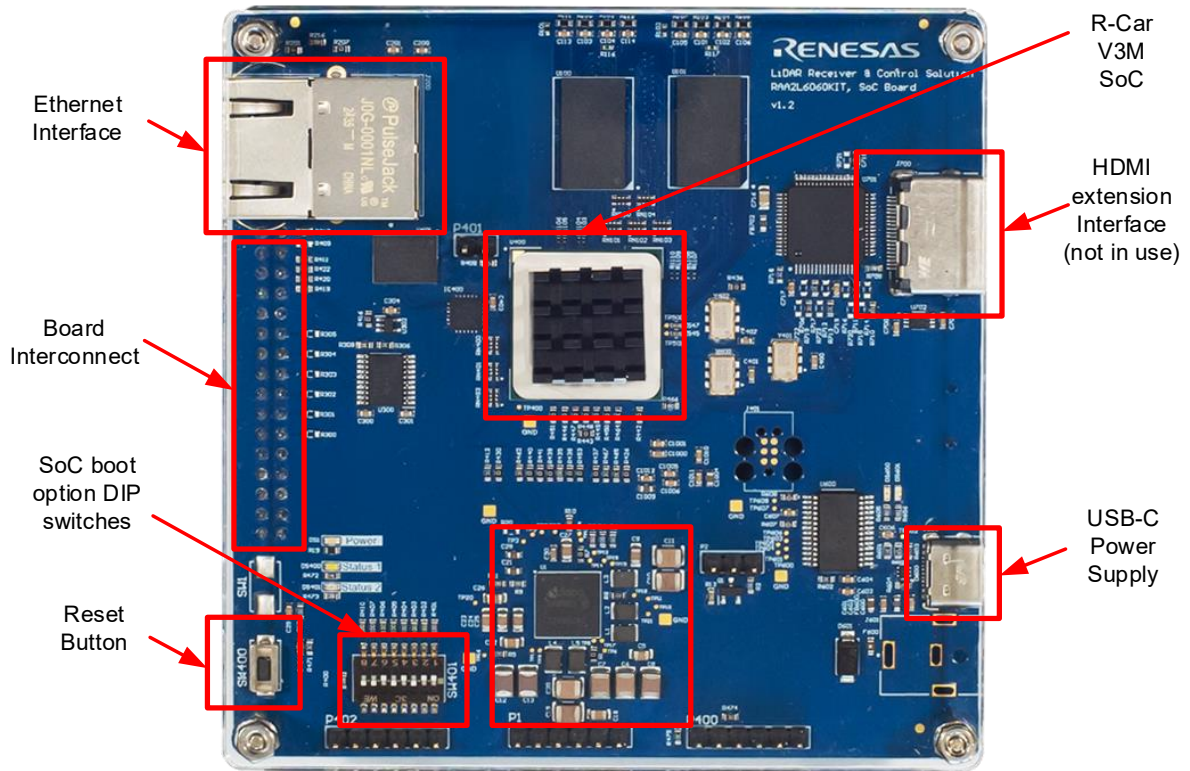


Figure 3. RAA2L6060KIT Back View

## 6. Graphical User Interface Description

The graphical user interface for the RAA2L6060 kit provides an intuitive platform for configuring and monitoring the system. It requires a PC with Microsoft Windows or Linux for the GUI installation. The data connection to the starter kit is made through Ethernet. Herefore, you can use a free ethernet port or use the included USB-to-Ethernet adapter into a free USB port. As an option, the starter kit can also be connected to a router and accessed through the local network.

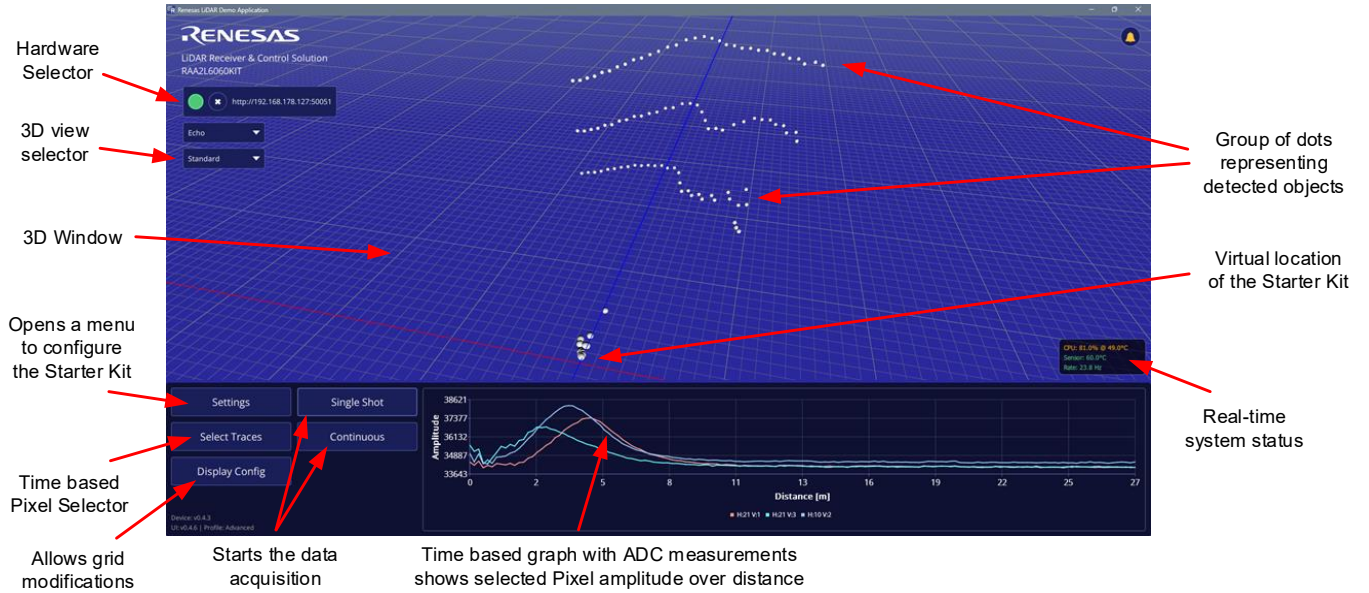


Figure 4. GUI Operation Window

## 7. System Performance

The RAA2L6060 offers a wide range of configuration options to fulfill customer use cases and application requirements. [Table 1](#) and [Table 2](#) show most common use cases and their typical system performance (\*) which may vary depending on customer implementation. Customer specific system performance requirements are evaluated on request.

### 7.1 Solid State Line Scan

Typical examples for solid state line scan applications are machines moving by themselves scanning one line (for example, farming machines, industrial robots, topographic scanning drones) or stationary applications which measure depth of a line while objects move by (traffic control, safety curtains, conveyor belt, sorting plant).

**Table 1. Solid State Line Scan Performance Examples**

Field-of-View, Optical Angle	Resolution per Pixel	Laser Diode	Photo-Array	Acquisition range (*)	Signal Strength/Sensitivity (*)	Frame rate (*)
40° x 10°	1.25° x 10°	1 x 100 Wp	32 Ch. PIN	30 m	At 80% Reflectivity	50 Hz
40° x 2.5°	1.25° x 2.5°	1 x 100 Wp	32 Ch. PIN	30 m	At 80% Reflectivity	50 Hz
40° x 2.5°	1.25° x 2.5°	1 x 100 Wp	32 Ch. SiPM	80 m	At 10% Reflectivity	35 Hz
80° x 2.5°	2.5° x 2.5°	1 x 100 Wp	32 Ch. SiPM	100 m	At 10% Reflectivity	28 Hz

### 7.2 Solid State 3D Scan

Typical examples for solid state:

- 3-dimensional mapping applications are robust portable LiDAR systems without rotating polygon (example drone flight control, autonomous transport vehicles, industrial robots, serving robots, lawn mover).

**Table 2. Solid State 3D Scan Performance Examples**

Field-of-View, Optical Angle	Resolution per Pixel	Laser Diodes	Photo-Array	Acquisition range (*)	Signal Strength/Sensitivity (*)	Frame rate (*)
40° x 20°	1.25° x 10°	3 x 100 Wp	32 Ch. PIN	30 m	At 80% Reflectivity	20 Hz
40° x 20°	1.25° x 5.0°	4 x 100 Wp	32 Ch. PIN	30 m	At 80% Reflectivity	15 Hz
40° x 20°	1.25° x 2.5°	8 x 50 Wp	32 Ch. SiPM	80 m	At 20% Reflectivity	15 Hz
40° x 20°	1.25° x 1.25°	16 x 50 Wp	32 Ch. SiPM	100 m	At 20% Reflectivity	10 Hz

## 8. Collaterals

Application development support documents are available on request.

## 9. Ordering Information

Orderable Part Number	Description
RAA2L6060KIT	RAA2L6060 LiDAR Receiver and Control Solution Starter Kit

## 10. Revision History

Revision	Date	Description
01.01	Mar 31, 2026	Change details: <ul style="list-style-type: none"> <li>▪ Converted to new template and renamed the document to Quick Start Guide</li> <li>▪ Section 2: Updated text in Introduction</li> <li>▪ Section 6: Updated <a href="#">Figure 4</a></li> <li>▪ Section 7: Updated description and <a href="#">Table 1</a>, <a href="#">Table 2</a></li> </ul>
01.00	Dec 11, 2024	First version.

### Status Definitions

Status	Definition
DRAFT	The content of this document is under review and subject to formal approval, which may result in modifications or additions.
APPROVED or unmarked	The content of this document has been approved for publication.

### ROHS COMPLIANCE

Renesas Electronics' suppliers certify that its products are in compliance with the requirements of Directive 2011/65/EU of the European Parliament on the restriction of the use of certain hazardous substances in electrical and electronic equipment. RoHS certificates from our suppliers are available on request.

### IMPORTANT NOTICE AND DISCLAIMER

RENESAS ELECTRONICS CORPORATION AND ITS SUBSIDIARIES (“RENESAS”) PROVIDES TECHNICAL SPECIFICATIONS AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THIRD-PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for developers who are designing with Renesas products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. Renesas grants you permission to use these resources only to develop an application that uses Renesas products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Renesas intellectual property or to any third-party intellectual property. Renesas disclaims responsibility for, and you will fully indemnify Renesas and its representatives against, any claims, damages, costs, losses, or liabilities arising from your use of these resources. Renesas' products are provided only subject to Renesas' Terms and Conditions of Sale or other applicable terms agreed to in writing. No use of any Renesas resources expands or otherwise alters any applicable warranties or warranty disclaimers for these products.

(Disclaimer Rev.1.01)

### Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu  
Koto-ku, Tokyo 135-0061, Japan

[www.renesas.com](http://www.renesas.com)

### Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

### Contact Information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit [www.renesas.com/contact-us/](http://www.renesas.com/contact-us/)

© 2026 Renesas Electronics Corporation. All rights reserved.