FSM Adapter Board
for RZ/V2M Evaluation Board Kit

Hardware Manual

Rev.1.00 Dec, 2022

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. CSM SOLUTION disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.
2. CSM SOLUTION hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of CSM SOLUTION products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.
3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of CSM SOLUTION or others.
4. You shall be responsible for determining what licenses are required from any third parties, and obtaining such licenses for the lawful import, export, manufacture, sales, utilization, distribution or other disposal of any products incorporating CSM SOLUTION products, if required.
5. You shall not alter, modify, copy, or reverse engineer any CSM SOLUTION product, whether in whole or in part. CSM SOLUTION disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.
6. CSM SOLUTION products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). CSM SOLUTION disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any CSM SOLUTION product that is inconsistent with any CSM SOLUTION data sheet, user's manual or other CSM SOLUTION document.
7. Notwithstanding any security measures or features that may be implemented in CSM SOLUTION hardware or software products, CSM SOLUTION shall have absolutely no liability arising out of any vulnerability or security breach, including but not limited to any unauthorized access to or use of a CSM SOLUTION product or a system that uses a CSM SOLUTION product. CSM SOLUTION DOES NOT WARRANT OR GUARANTEE THAT CSM SOLUTION PRODUCTS, OR ANY SYSTEMS CREATED USING CSM SOLUTION PRODUCTS WILL BE INVULNERABLE OR FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION ("Vulnerability Issues"). CSM SOLUTION DISCLAIMS ANY AND ALL RESPONSIBILITY OR LIABILITY ARISING FROM OR RELATED TO ANY VULNERABILITY ISSUES. FURTHERMORE, TO THE EXTENT PERMITTED BY APPLICABLE LAW, CSM SOLUTION DISCLAIMS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS DOCUMENT AND ANY RELATED OR ACCOMPANYING SOFTWARE OR HARDWARE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.
8. When using CSM SOLUTION products, refer to the latest product information and ensure that usage conditions are within the ranges specified by CSM SOLUTION with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. CSM SOLUTION disclaims any and all liability for any malfunctions, failure or accident arising out of the use of CSM SOLUTION products outside of such specified ranges.
9. Although CSM SOLUTION endeavors to improve the quality and reliability of CSM SOLUTION products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions.CSM SOLUTION products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of CSM SOLUTION products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.
10. Please contact a CSM SOLUTION sales office for details as to environmental matters such as the environmental compatibility of each CSM SOLUTION product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using CSM SOLUTION products in compliance with all these applicable laws and regulations. CSM SOLUTION disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. CSM SOLUTION products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.
12. It is the responsibility of the buyer or distributor of CSM SOLUTION products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.
13. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of CSM SOLUTION.
14. Please contact a CSM SOLUTION sales office if you have any questions regarding the information contained in this document or CSM SOLUTION products.

(Note1) "CSM SOLUTION product(s)" means any product developed or manufactured by or for CSM SOLUTION.

Corporate Headquarters

2-4-3 Fukuzumi, Koto-ku, Tokyo 135-0032, Japan
https://www.cosmo.co.jp/

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:
https://www.cosmo.co.jp/support/

Trademarks

CSM SOLUTION and the CSM SOLUTION logo are trademarks of CSM SOLUTION CO.,LTD. All trademarks and registered trademarks are the property of their respective owners.

SAFETY MATTERS

Definitions of Symbols

A variety of symbols are used in this document and on this product, to prevent the damage to harm and the property to you and other people beforehand by correctly using this product.

This section, Safety Matters, presents these symbols and their meanings. It also presents safety notes to assure that this produce is used safely and correctly.

This product should only be used after fully understanding the material presented in this section.

WARNING Warning items indicate things that, if not avoided, could lead to death or serious injury.

CAUTION Caution items indicate things that, if not avoided, could lead injury or damage to the house and household goods, etc.

In addition to the above two symbols, the following are displayed at the same time as required.

[Important] These indicate the points which may cause a breakdown or malfunction of equipment by the incorrect setting when setting up this product.

△ indicates WARNING or CAUTION.

Example:  CAUTION AGAINST ELECTRIC SHOCK

⃠ indicates PROHIBITION.

Example:  DISASSEMBLY PROHIBITED

● inidicates a COMPULSORY ACTION.

Example:  COMPULSORY ACTION

WARNING

Handling Related Warnings:

Always check the jumper and switch settings before connecting a power source. An incorrect jumper or switch setting can lead to internal heat generation, rupture, ignition, or damage to this evaluation board itself or any connected equipment.

If, during either the use or storage of this product, any abnormality in the product itself (including abnormal odors, heating, color changes, or changes to the shape of the product) are observed, disconnect the AC adapter immediately.
The incidence of such an abnormality may result in rupture, ignition, or performance deterioration. Therefore, do not use this product in such a situation.

Installation:

Do not install this product in a location that has a high humidity or where water or other fluids could get on it. This product may be damaged if water or other fluids can get on it.

Ambient Temperature:

The ambient temperature range for using this product is from 5°C to 35°C.

⚠ CAUTION

Handling:

This product must be handled carefully. Do not cause a strong impact by dropping it, letting it fall, etc.

Do not touch this product's component pins with bare hands. Doing so may discharge static electricity that damages the Internal circuits. Eliminate static electricity before touching this product.

When connecting or disconnecting cables to or from this product, hold the parts of the cable intended to be grasped (such as the plugs) and avoid putting stress on the cable. Do not pull this product etc. while it is connected with a communications interface cable. Doing so may cause the cable to be disconnected.

When connecting a cable to a connector, do not insert the plug in the reverse direction or upside down. Incorrect insertion may damage this product or connected equipment.

Always check the jumper and switch settings before connecting a power source. An incorrect jumper or switch setting can lead to damage to this product or connected equipment.

Do not handle this product with wet hands. Doing so can lead to failure of the product.

Transport methods:

When transporting this product, use the product's packing box and cushioning materials and ship it with precision equipment handling. If the products packing is insufficient, it may be damaged during shipping.
If it must be transported by some other method, pack it carefully as precision equipment.
When packing this product, always use the antistatic pouch included with this product.
If some other pouch is used, electrostatic discharge may damage the product.

Abnormal operation:

If operation of this product becomes abnormal due to interference from external noise etc., apply the following procedure.

1. Turn off the power.
2. Wait 10 or over seconds and then turn the power back on.

Disposal:

When disposing of this product, be sure to dispose it as industrial waste according to all applicable laws.

Table of Contents

1. Overview

This board is an extension adapter board (FSM Adapter Board) for connecting FRAMOS sensor Module (FSM-IMX462, FSM-AR1335) to an evaluation kit for RZ/V2M MPU from CSM Solution (RZ/V2M evaluation board kit, hereafter V2MEVK). This manual describes the hardware functions of FSM Adapter Board.

This board is an optional board sold separately from V2MEVK.

FRAMOS sensor Module is sold separately module provided from FRAMOS GmbH.

FRAMOS GmbH Web site:
https://www.framos.com/en/

The configuration required to operate the FRAMOS sensor module is as below.

Table 1.1-1 Required Boards for FRAMOS Sensor Module

Board Name	Overview
RZ/V2M Board (main)	• The RZ/V2M is mounted. • Board on which the main functional components for the RZ/V2M are mounted
RZ/V2M Base Board (base)	• Connected to CN12 and CN13 on the RZ/V2M Board • Board for the generation and supply of power
CIS GND Board (CIS_GND)	• Connected to the CIS connector 2 (CN4) on the RZ/V2M Board • Board for handling unused pins of the CMOS image sensor I/F of the RZ/V2M
FSM Adapter Board (option)	• Connected to the CIS connector 1 (CN2) on the RZ/V2M Board • Board for the generation and supply of power for FRAMOS sensor module (FSM-IMX462, FSM-AR1335)
FRAMOS sensor module (FSM-IMX462, FSM-AR1335)	• Module on which the image sensor is mounted -FSM-IMX462 : SONY IMX462 image sensor mounted -FSM-AR1335 : onsemi AR1335 image sensor mounted

The following documents have been prepared for this V2MEVK. Make sure to refer to the latest versions of these documents. For more information, contact a CSM SOLUTION sales representative..

Table 1.1-2 Documents List

Document Type	Document Title	Document No.	Description
Hardware manual	FSM Adapter Board Hardware Manual	This document	Hardware specifications of FSM Adapter Board (option) for connecting to FRAMOS sensor module (FSM-IMX462, FSM-AR1335) to V2MEVK.
Hardware manual	RZ/V2M Evaluation Board Kit Hardware Manual		Hardware specifications of the V2MEVK

The following documents have been prepared for this V2MEVK. Make sure to refer to the latest versions of these documents. For the development environment including software, contact a Renesas Electronics sales representative.

Table 1.1-3 Documents List

Document Type	Document Title	Renesas Website	Description
Startup guide	RZ/V2M Evaluation Board Kit Start-up Guide	https://www.renesas.com/jp/ja/products/microcontrollers-microprocessors/rz-mpus/rzv2m-evaluation-board-kit-rzv2m-evaluation-board-kit#document	Startup procedure of the V2MEVK

1.1 Features

FSM Adapter Board includes the following features.

- FSM module connector : 1 ch (CN951 [60pin])
- V2MEVK connector : 1 ch (CN952 [60pin])
- Dip switch for FRAMOS sensor module setting
- Power supply for the FRAMOS sensor module
- Power sequence control for the CMOS image sensor

1.2 Block Configuration

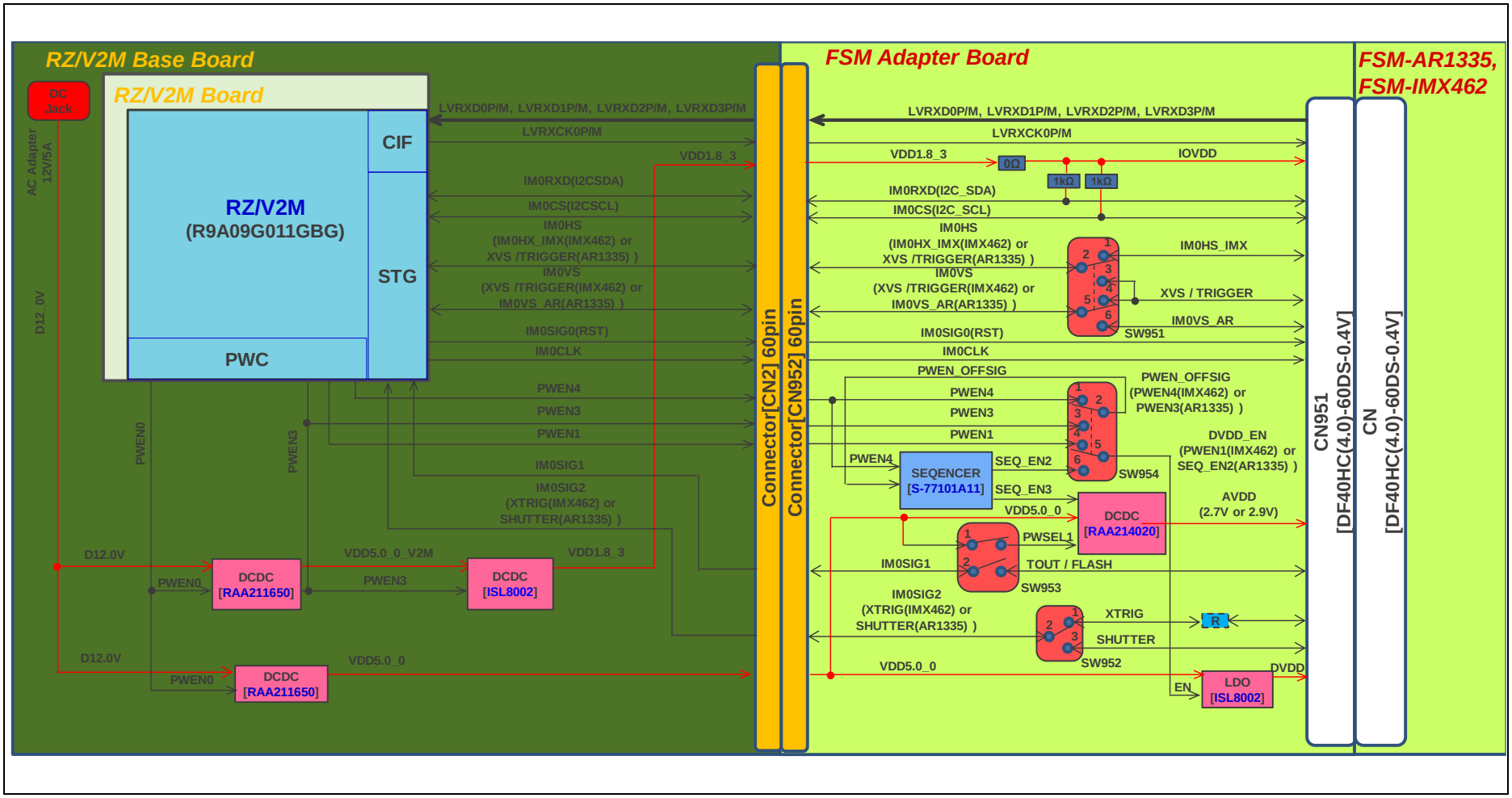


Figure 1.2-1 FSM Adapter Board Block Diagram

2. Specifications

2.1 FSM Adapter Board Specifications

Table 2.1-1 FSM Adapter Board Specifications

Item	Specification
FSM Adapter Board size	70 × 47 × 1.4 mm
V2MEVK Connector	Connector: 60 pins with 0.8-mm pitch For connecting to the V2MEVK.
FSM module Connector	Connector: 60 pins with 0.4-mm pitch For connecting to the FRAMOS sensor module
Dip switches to select a FRAMOS sensor module	Switches to select which FRAMOS sensor module to use (FSM-IMX462, FSM-AR1335) SW951 / SW952 / SW953 / SW954 *For detail, see section **3.3, Operation Switch Setting**

2.2 Outer Appearance

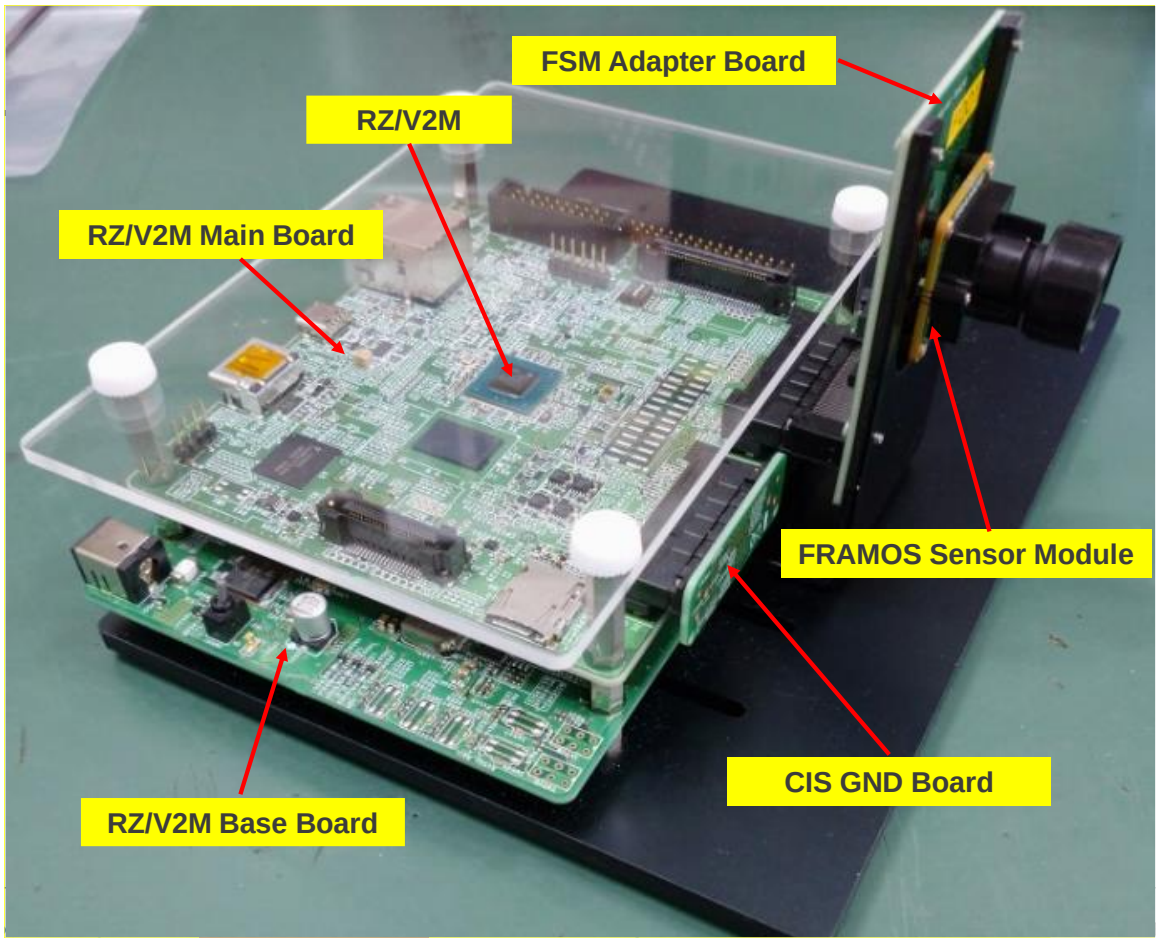


Figure 2.2-1 Outer Appearance of V2MEVK (with FSM Adapter Board)

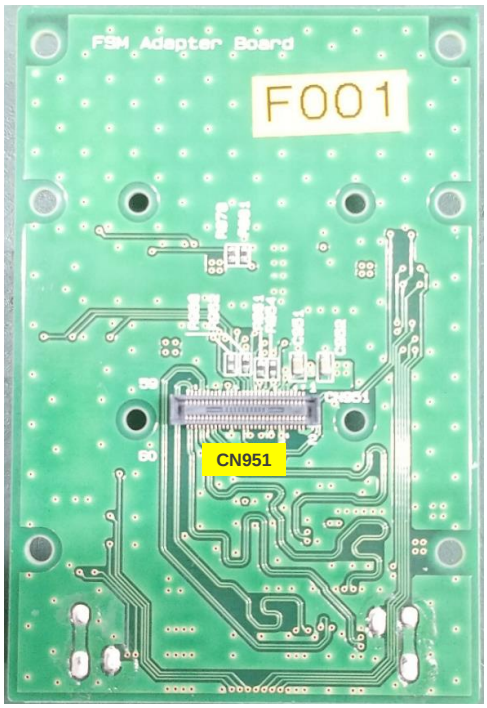


Figure 2.2-2 FSM Adapter Board (FRAMOS sensor module connector side)

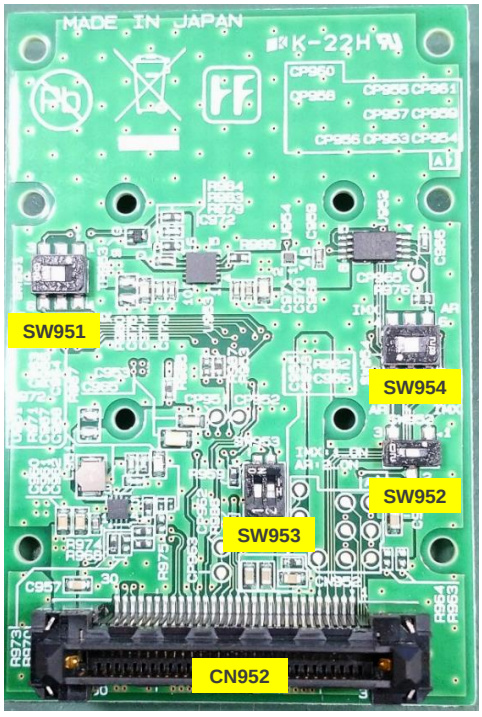
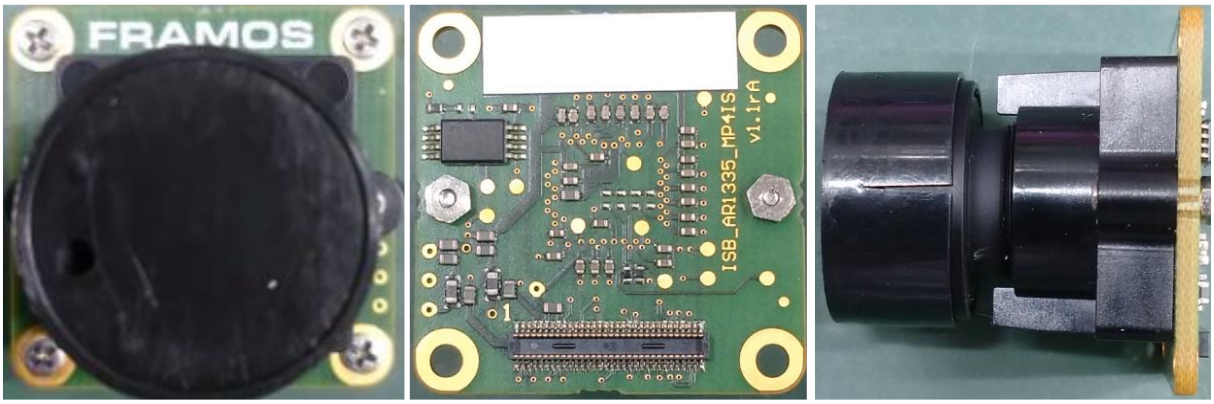
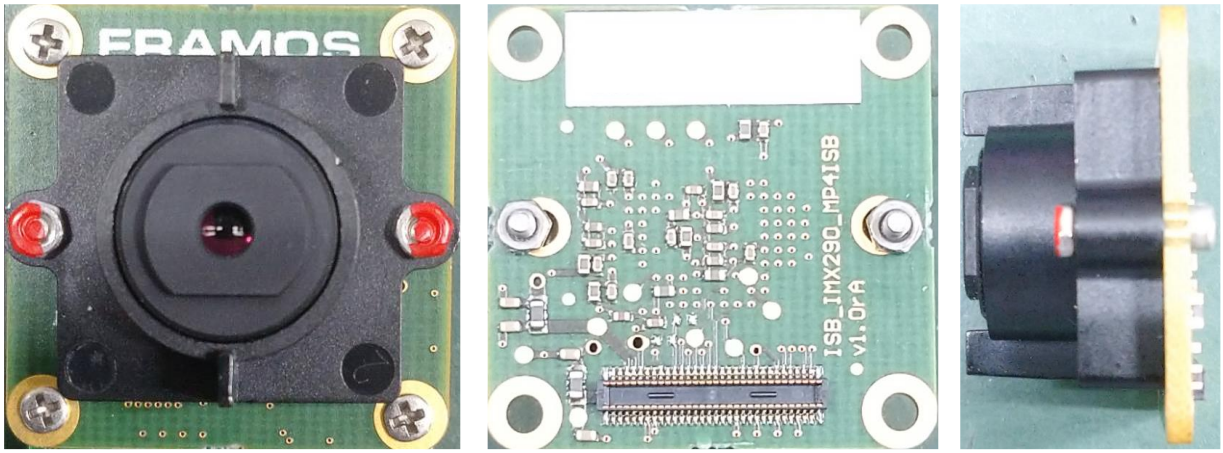


Figure 2.2-3 FSM Adapter Board (V2MEVK connector side)



Note: The lens is sold separately. For recommended lens, refer to **Table 3.1-1**.

Figure 2.2-4 FRAMOS sensor module (FSM-AR1335)



Note: The lens is sold separately. For recommended lens, refer to **Table 3.2-1**.

Figure 2.2-5 FRAMOS sensor module (FSM-IMX462)

3. Operating Procedure

3.1 Assembly (FSM-AR1335)

3.1.1 Accessories (FSM-AR1335)

Table 3.1-1 The recommended accessories (FSM-AR1335) (see **Figure 3.1-1**)

No	Item	Part Name	Manufacturer	Spec	Quantity (per unit)	Note
1	Nut	BNT-02	HIROSUGI	M2 (P0.4)	4	—
2	Spacer	C-2004	HIROSUGI	M2, 4 mm	4	—
3	M2 screw	CSPPN1P-ST3W-M2-9	MISUMI	M2 (P0.4) x 9 mm	4	—
4	Stay	CS-STAY	—	—	1	Attached to CIS IMX415 Board in V2MEVK.
5	FRAMOS Sensor Module	FSM-AR1335	FRAMOS	—	1	FSM-AR1335: onsemi_AR1335, M12_Lens_Mount (Recommended lens: DSL385A)
6	M1.4 Screw	PACK-SMIB1.4-8	MISUMI	M1.4 (P0.3) x 8 mm	2	For lens holder*1
7	Nut	HNT1EB-BRN-M1.4	MISUMI	Hexagon head nut M1.4 (0.3)	2	For lens holder*1

Note 1. Screws and nuts for the lens holder should be selected according to the lens holder used.

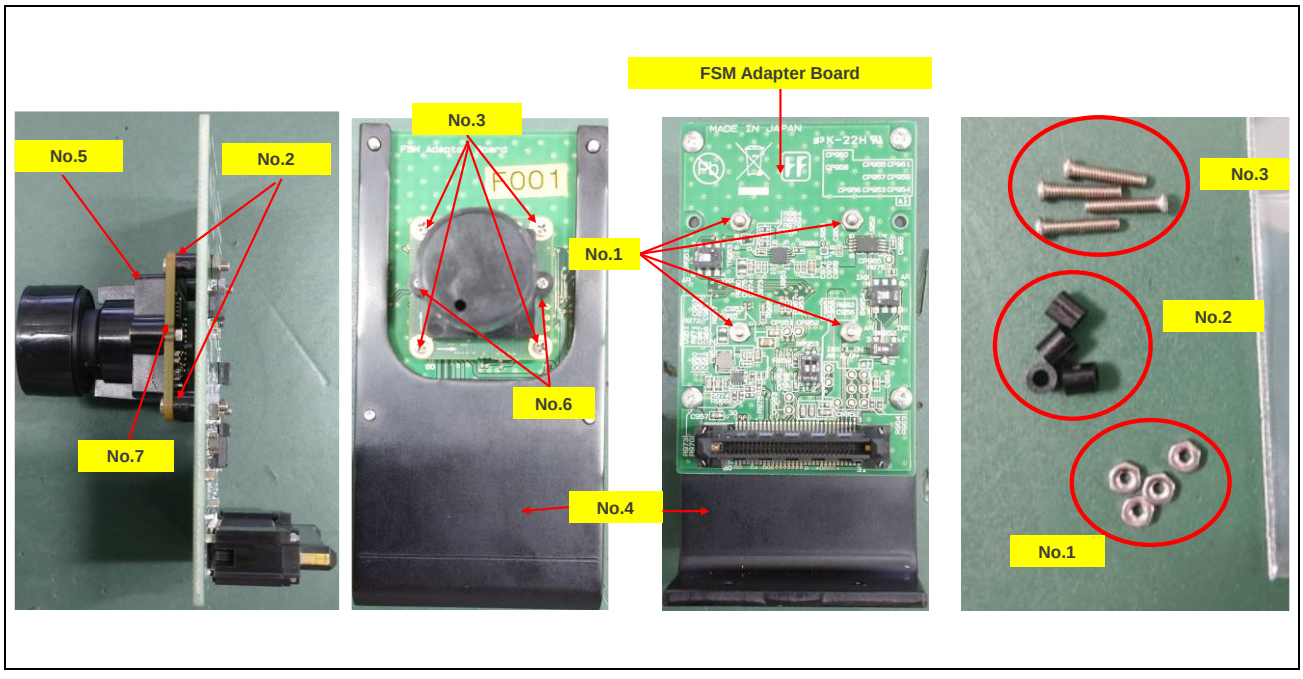


Figure 3.1-1 Accessories (FSM-AR1335)

3.1.2 Assembly procedure (FSM-AR1335)

- Connect CN951 on FSM Adapter Board to the connector on FRAMOS sensor module (See **Figure 3.1-2, Figure 3.1-3**)

- Connect CN952 on FSM Adapter Board to CN2 on RZ/V2M Main Board (See **Figure 3.1-4**)

- Screw (See **Figure 3.1-5**)

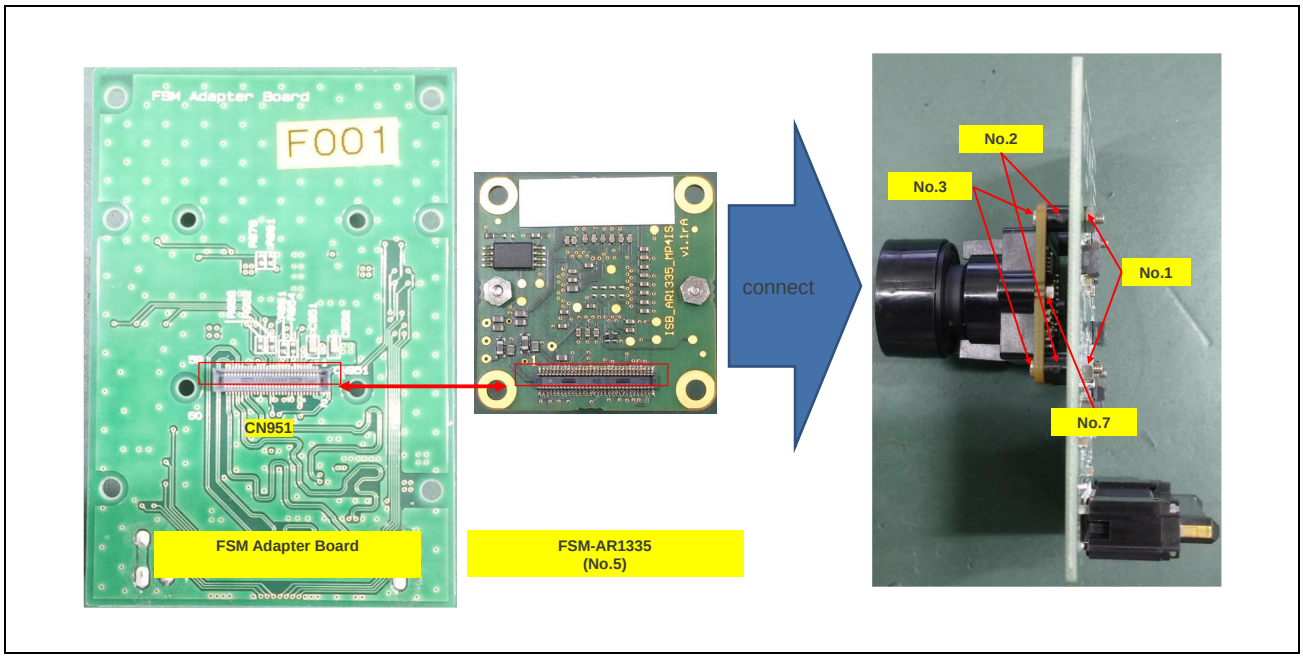


Figure 3.1-2 Connect FSM Adapter Board to FRAMOS sensor module (FSM-AR1335)

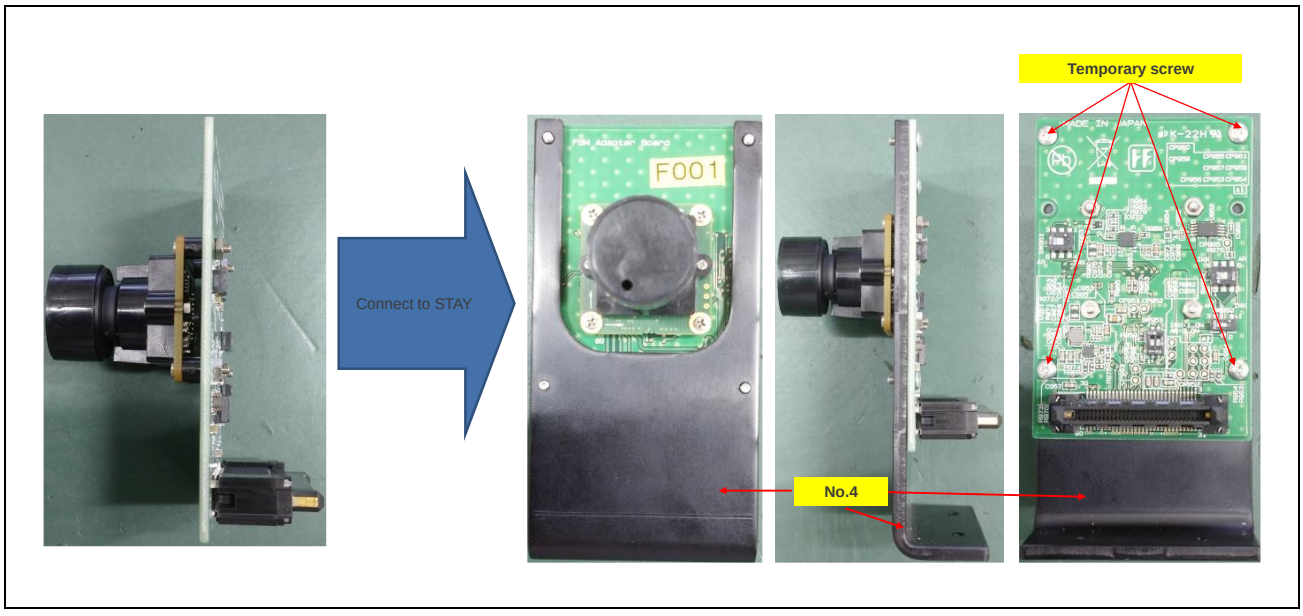


Figure 3.1-3 Connect FSM Adapter Board to Stay (FSM-AR1335)

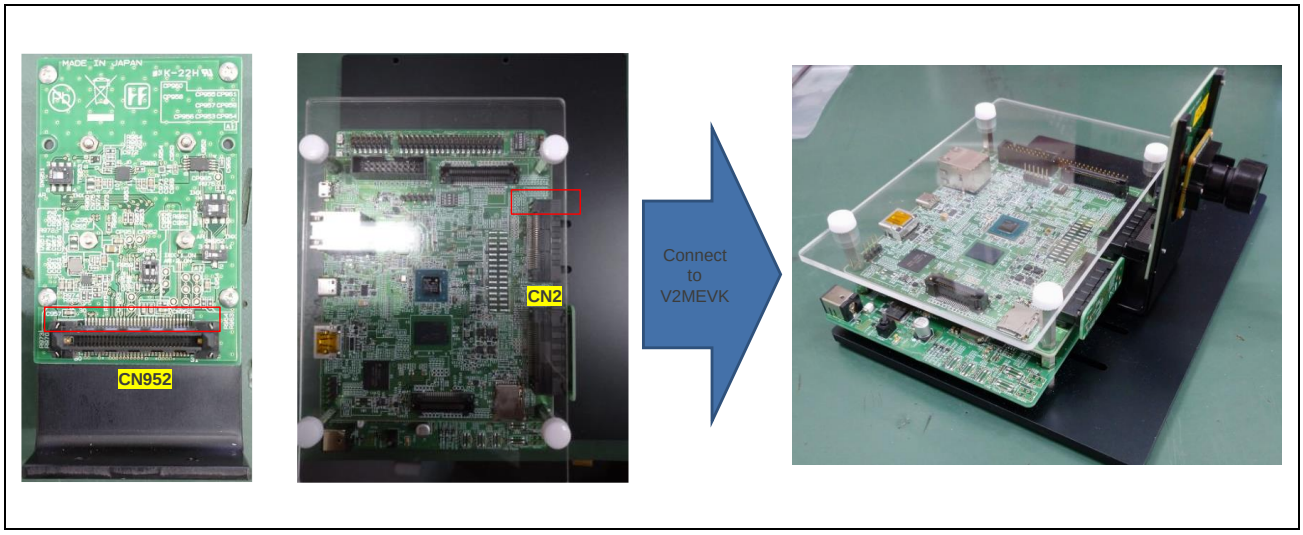


Figure 3.1-4 Connect FSM Adapter Board to V2MEVK (FSM-AR1335)

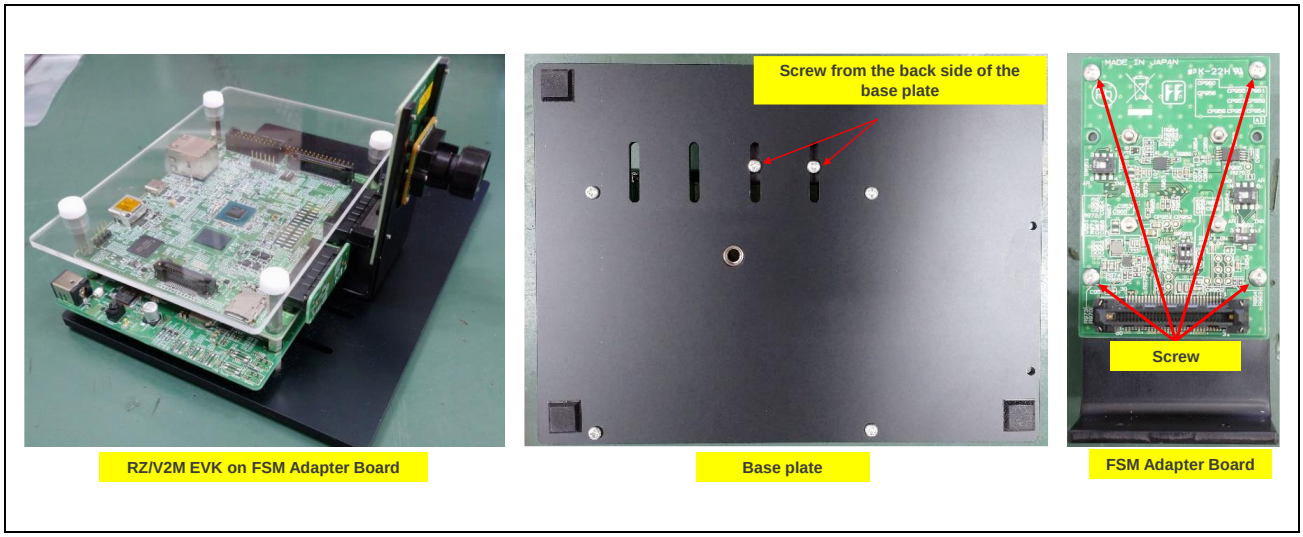


Figure 3.1-5 Screws (FSM-AR1335)

3.2 Assembly (FSM-IMX462)

3.2.1 Accessories (FSM-IMX462)

Table 3.2-1 The Recommended Accessories (FSM-IMX462) (see **Figure 3.2-1**)

No	Item	Part Name	Manufacturer	Spec	Quantity (per unit)	Note
1	Nut	BNT-02	HIROSUGI	M2 (P0.4)	4	—
2	Spacer	C-2004	HIROSUGI	M2, 4 mm	4	—
3	M2 screw	CSPPN1P-ST3W-M2-9	MISUMI	M2 (P0.4) x 9 mm	4	—
4	Stay	CS-STAY	—	—	1	Attached to CIS IMX415 Board in V2MEVK.
5	FRAMOS Sensor Module	FSM-IMX462	FRAMOS	—	1	FSM-IMX462: SONY_IMX462, M12_Lens_Mount (Recommended lens: DSL944C)

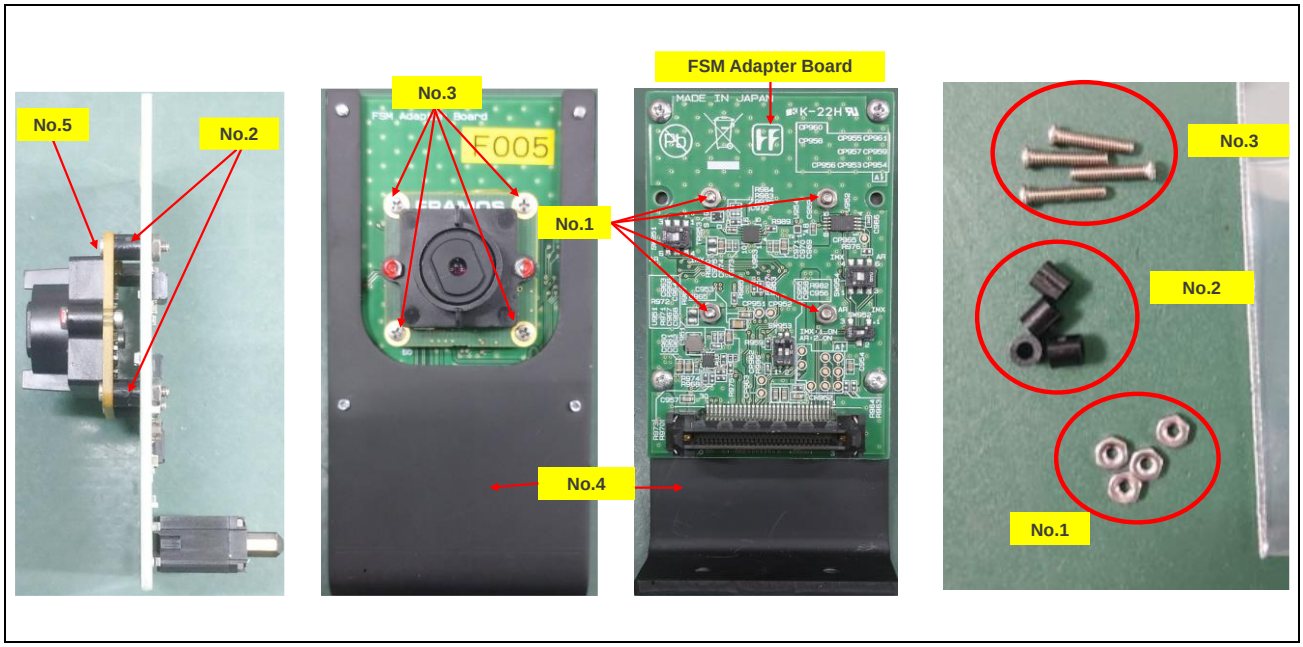


Figure 3.2-1 Accessories (FSM-IMX462)

3.2.2 Assembly procedure(FSM-IMX462)

- Connect CN951 on FSM Adapter Board to connector on FRAMOS sensor module (See **Figure 3.2-2, Figure 3.2-3**)

- Connect CN952 on FSM Adapter Board to CN2 on RZ/V2M Main Board (See **Figure 3.2-4**)

- Screw (See **Figure 3.2-5**)

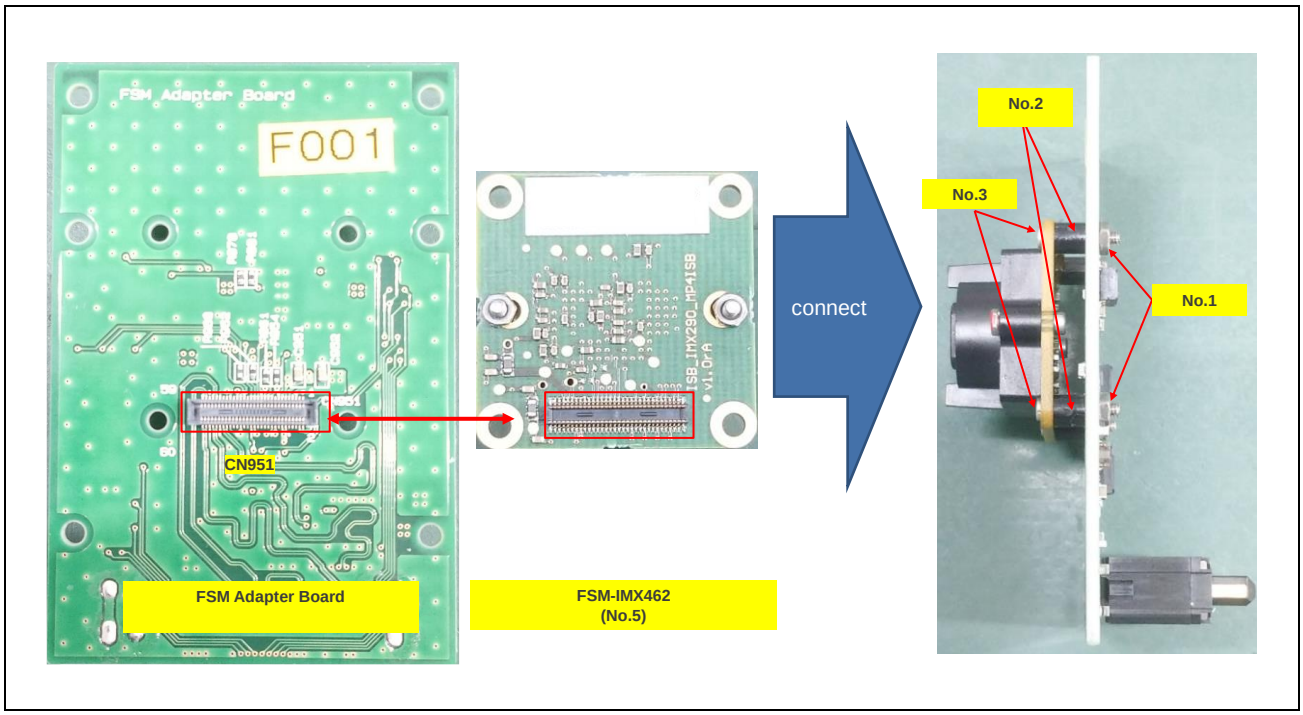


Figure 3.2-2 Connect FSM Adapter Board to FRAMOS Sensor Module (FSM-IMX462)

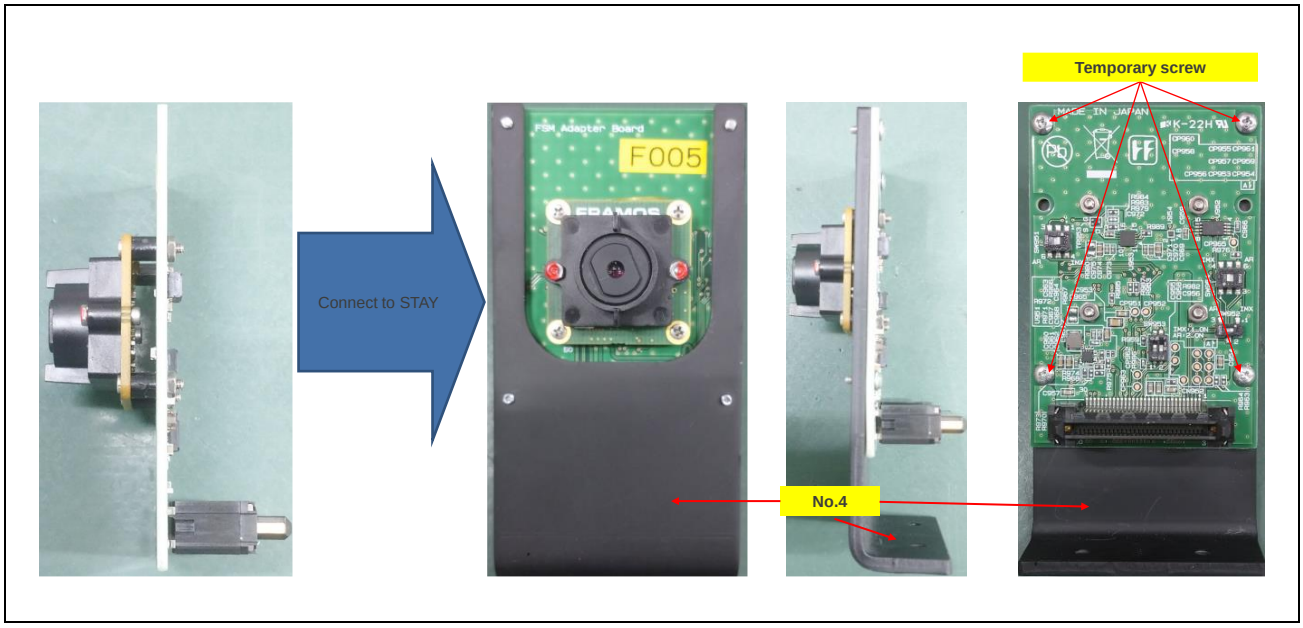


Figure 3.2-3 Connect FSM Adapter Board to Stay (FSM-IMX462)

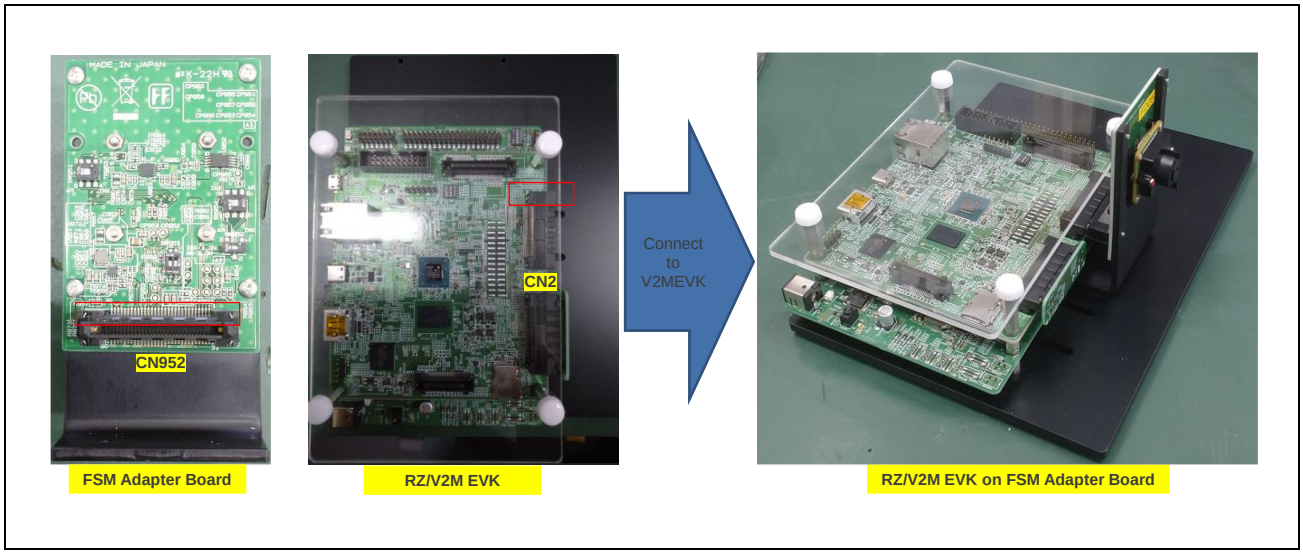


Figure 3.2-4 Connect FSM Adapter Board to V2MEVK (FSM-IMX462)

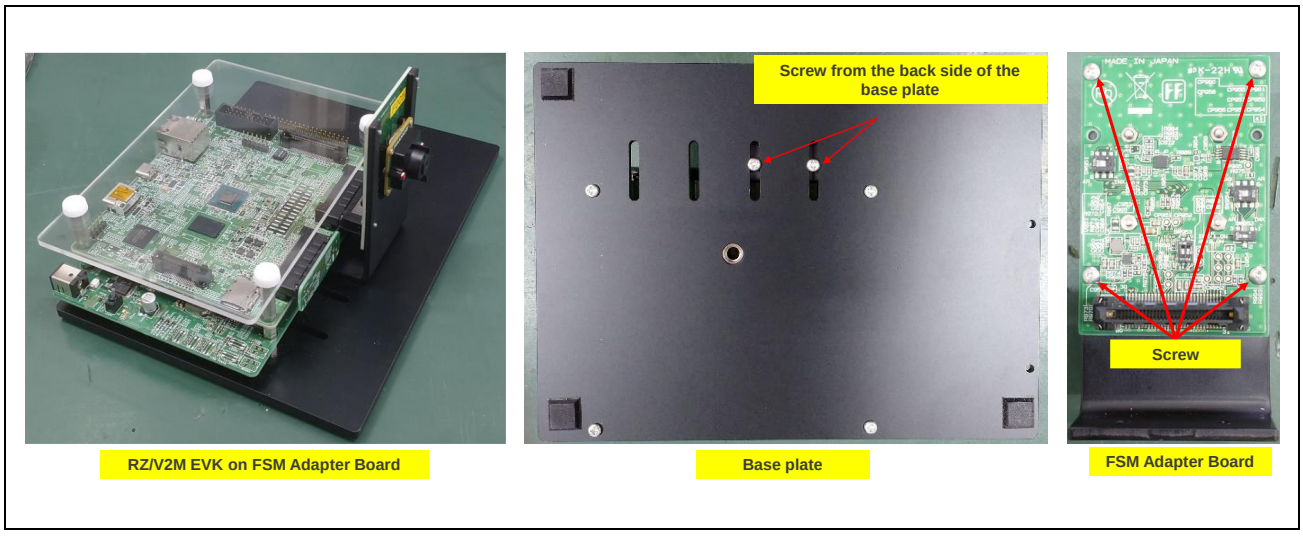


Figure 3.2-5 Screws (FSM-IMX462)

3.3 Operation Switch Setting

The table below lists the settings of the slide switch on the FSM Adapter Board.

3.3.1 Switch Setting (FSM-AR1335)

Table 3.3-1 Switch settings when connecting to FSM-AR1335

No	Part Symbol	Setting
1	SW951	2-3 SHORT 5-6 SHORT
2	SW952	2-3 SHORT
3	SW953	1: OFF 2: ON
4	SW954	2-3 SHORT 5-6 SHORT

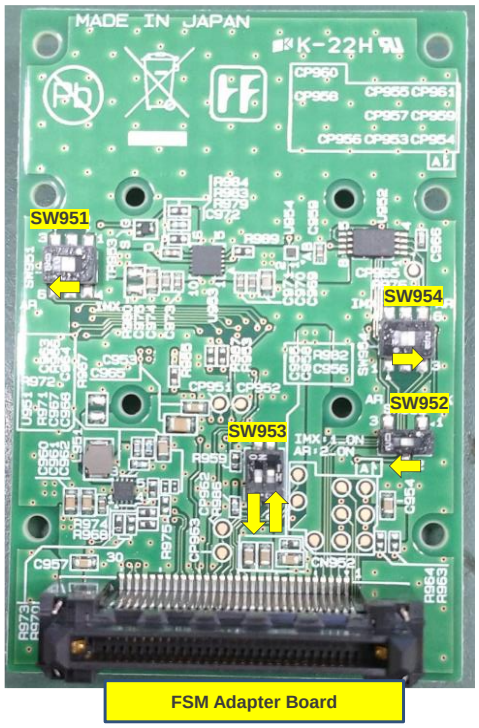


Figure 3.3-1 Switch Setting when Connecting to FSM-AR1335

3.3.2 Switch Setting (FSM-IMX462)

Table 3.3-2 Switch settings when connecting to FSM-IMX462

No	Part Symbol	Setting
1	SW951	1-2 SHORT 4-5 SHORT
2	SW952	1-2 SHORT
3	SW953	1: ON 2: OFF
4	SW954	1-2 SHORT 4-5 SHORT

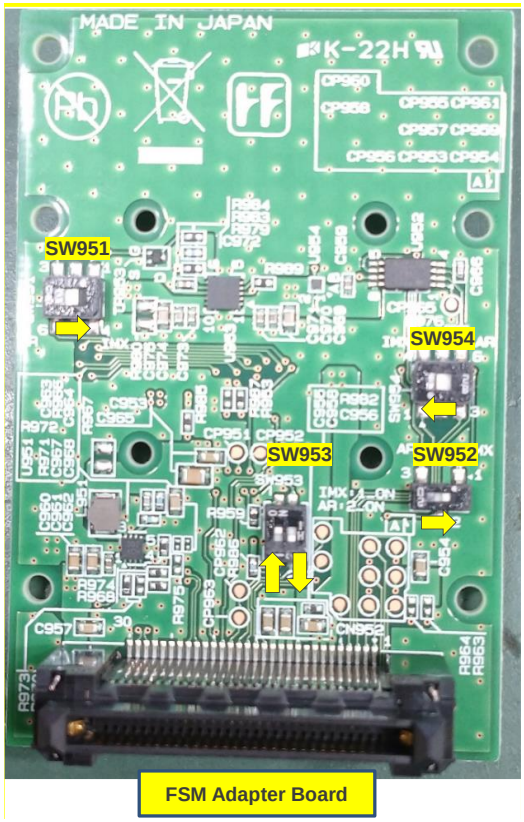


Figure 3.3-2 Switch Setting when Connecting to FSM-IMX462

3.4 Lists of Main Parts

Table 3.4-1 list the main parts of the FSM Adapter Board.

Table 3.4-1 FSM Adapter Board Parts List

No.	Quantity	Part Symbol	Part Name	Manufacturer
1	1	U951	ISL8002IRZ-T7A	Renesas Electronics
2	1	U953	RAA214020GNP	Renesas Electronics

REVISION HISTORY	FSM Adapter Board for RZ/V2M Evaluation Board Kit Hardware Manual

Rev.	Date	Description	
		Page	Summary
1.00	Dec 26, 2022	—	First edition issued

FSM Adapter Board for RZ/V2M Evaluation Board Kit
Hardware Manual

Publication Date: Rev.1.00 Dec. 26, 2022

Published by: CSM SOLUTION CO., LTD.