

R-Car V4M System Reference Board Gray Hawk

Setup Manual

RTP8A779H0ASKB0F10S

[Confidential]

This manual should only be disclosed under an NDA.

All information contained in these materials, including products and product specifications, represents information on the product at the time of publication and is subject to change by Renesas Electronics Corp. without notice.

Notice

- 1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and 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. Renesas Electronics 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. Renesas Electronics 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 Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples. Further, Renesas Electronics hereby expressly disclaims any warranties against and any and all liability for any loss or damages incurred by or arising from remote access, including but not limited to the security and privacy of data, 24-hour access without interruption, or any accidents, smoke or fire that could have been mitigated with adequate in-person oversight.
- 3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
- 4. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics 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.
- 5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.
 - "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.
 - "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics 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.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user's manual or other Renesas Electronics document.

- 6. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.
- 7. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics 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 Renesas Electronics 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.
- 8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics 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 Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
- 9. Renesas Electronics 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.
- 10. It is the responsibility of the buyer or distributor of Renesas Electronics 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.
- 11. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
- 12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.
- (Note1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries
- (Note2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.



Revisi	ion History	R-Car	V4M System Reference Board Gray Hawk Setup Manual	
Rev.	Date of		Description	
	Issue	Page	Modification	
0.90	Oct. 6, 2023		First edition issued.	

Contents

1.	. Intr	oduction	1
	1.1.	Locations of Connectors on the Gray Hawk Single Board	2
	1.2.	Locations of Switches on the Gray Hawk Single Board (Component Side)	3
	1.3.	Locations of Switches on the Gray Hawk Single Board (Solder Side)	4
	1.4.	Usage Notes	
	1.4.1		
	1.4.2	·	
	1.4.3	Precaution on Power Supply Voltage Settings	5
	1.5.	Quick Setup of the Gray Hawk Board	6
	1.5.1	5 -	
	1.5.2		
	1.5.3 1.5.4	3	
2		tch Settings	
	2.1.	Initial Settings of Slide Switches	
	2.2.	Specifications of Slide Switches on the Gray Hawk Single Board	
	2.2.1	5/ 1	
	2.2.2	7 7 1	
	2.2.3 2.2.4	7 1	
	2.2.5	· ·	
	2.2.6	· · · · · · · · · · · · · · · · · · ·	
	2.2.7	SW54 (SDHI/MMC Interface Voltage Setting) Specifications	. 12
	2.2.8	3 / 1	
	2.2.9	- () 1	
	2.2.1 2.2.1	3 3/ 1	
	2.2.1	· · · · · · · · · · · · · · · · · · ·	
	2.2.1	· · · · · · · · · · · · · · · · · · ·	
	2.2.1		
	2.2.1	, ,	
	2.3.	Specifications of a Toggle Switch on the Gray Hawk Single Board	
	2.3.1	SW51 (Board Power-Supply Circuit Control) Specifications	. 17
	2.4.	Specifications of Push-Button Switches on the Gray Hawk Single Board	
	2.4.1	, ,	
	2.4.2	, ,	
	2.4.3 2.4.4	, ,	
	2.5.	Specifications of Jumper Switches on the Single Board	
	2.5. 2.5.1	·	
	2.5.2	· · · · · · · · · · · · · · · · · · ·	
	26	Specifications of Slide Switches on the Mode Switching Board	20

Tables

Table 2.1 Initial Setting of Slide Switches	7
Table 2.2 Selection of Boot Device (MD1, MD2, MD3, and MD4)	🤇
Table 2.3 Reserved (MD5)	9
Table 2.4 Selection of Master Boot Processor (MD6)	🤇
Table 2.5 Selection of QSPI0 Connection	10
Table 2.6 Device Selection of QSPI0 and QSPI1	
Table 2.7 Selection of MMC Connection	
Table 2.8 Selection of DSI0 Connection	
Table 2.9 Setting of Interface Voltage for SDHI/MMC	
Table 2.10 Selection of the Interface Voltage Control Device for SDHI/MMC	
Table 2.11 Selection of Interface Voltage for SDHI/MMC	13
Table 2.12 Reserved	14
Table 2.13 Voltage Setting of the M01_BKUP Pin	
Table 2.14 Setting of the Enable Pin of the TJA1080ATS (U3009) Device	
Table 2.15 Setting of the Enable Pin of the TJA1080ATS (U3010)	1
Table 2.16 Connection of the GP1_02/MSIOF1_SYNC Pin of the R-Car V4M	
Table 2.17 Connection of the GP1_05/MSIOF1_RXD Pin of the R-Car V4M	
Table 2.18 Connection of the GPIO and MSIOF1 Pins of the R-Car V4M	16
Table 2.19 Setting of the WAKE Pin of the TJR1443AT (U3001)	16
Table 2.20 Accessory Power-Supply Switch	
Table 2.21 System Reset Switch	
Table 2.22 Reset Switch for the RL78/F13	
Table 2.23 Correspondence between General-Purpose Push-Button Switch Number and GPIO Pin	
Table 2.24 Initial Settings of Slide Switches on the Mode Switching Board	20

Figures

Figure 1.1.1 Location of Connectors on the Gray Hawk Single Board	2
Figure 1.2.1 Location of Switches on the Gray Hawk Single Board (Component Side)	
Figure 1.3.1 Location of Switches on the Gray Hawk Single Board (Solder Side)	
Figure 2.2.1 SW50 Settings	
Figure 2.2.2 SW57 Settings	
Figure 2.2.3 SW13 Settings	. 10
Figure 2.2.4 SW43 Settings	. 11
Figure 2.2.5 SW44 Settings	
Figure 2.2.6 SW46 Settings (after Setting POSNEG1 to 1)	. 12
Figure 2.2.7 SW54 Settings	. 12
Figure 2.2.8 SW65 Settings	. 13
Figure 2.2.9 SW64 Settings	
Figure 2.2.10 SW55 Settings	
Figure 2.2.11 SW3008 Settings	. 14
Figure 2.2.12 SW3009 Settings	. 15
Figure 2.2.13 SW3010 Settings	. 15
Figure 2.2.14 SW3012 Settings	
Figure 2.2.15 SW3011 Settings	. 16
Figure 2.3.1 SW51 Accessory Power-Supply Switch	. 17
Figure 2.4.1 SW52 System Reset Switch	. 17
Figure 2.4.2 SW1 Reset Switch for the RL78/F13	
Figure 2.4.3 General-Purpose Push-Button Switches (SW47, SW48, and SW49)	. 18
Figure 2.4.4 General-Purpose Push-Button Switch (SW3002)	. 18
Figure 2.5.1 JP3001, JP3002, and JP3005 Jumper Pin Settings	
Figure 2.5.2 JP3003 Jumper Pin Settings	
Figure 2.6.1 Initial Settings of Slide Switches on the Mode Switching Board	. 2

1. Introduction

This setup manual describes the settings of switches mounted on the "Gray Hawk" R-Car V4M system reference board.

- For the correspondence between the functions and the connectors, see the following sections: section 1.1, Locations of Connectors on the Gray Hawk Single Board
- For the correspondence between the numbers and locations of the switches, see the following sections: section 1.3, Locations of Switches on the Gray Hawk Single Board (Solder Side),
- For the initial settings of slide switches mounted on the Gray Hawk board, see the following section: section 2.1, Initial Settings of Slide Switches.



1.1. Locations of Connectors on the Gray Hawk Single Board

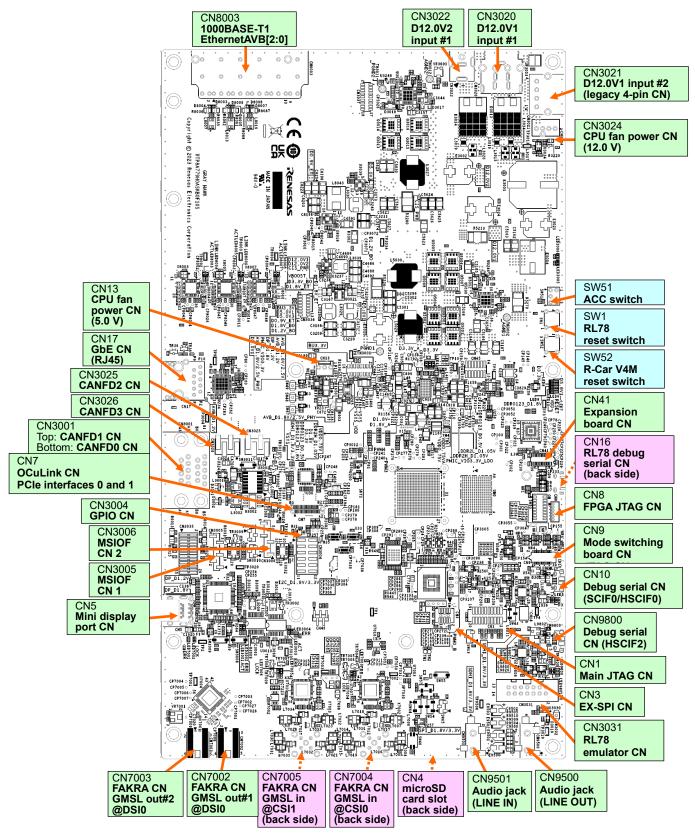


Figure 1.1.1 Location of Connectors on the Gray Hawk Single Board

1.2. Locations of Switches on the Gray Hawk Single Board (Component Side)

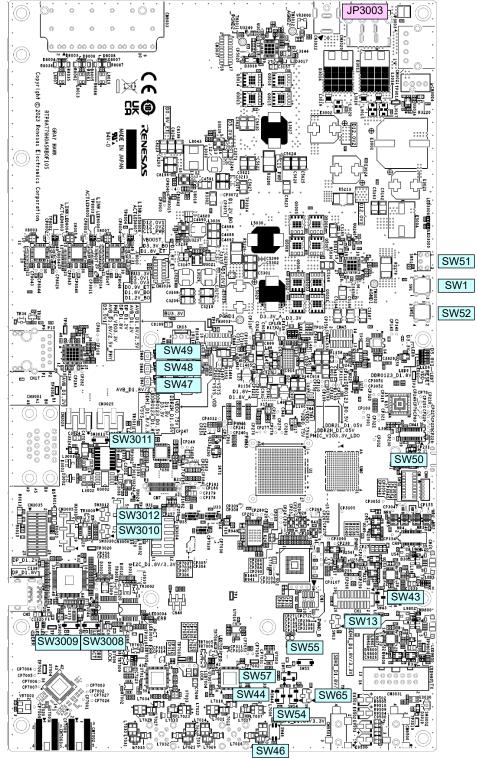


Figure 1.2.1 Location of Switches on the Gray Hawk Single Board (Component Side)

1.3. Locations of Switches on the Gray Hawk Single Board (Solder Side)

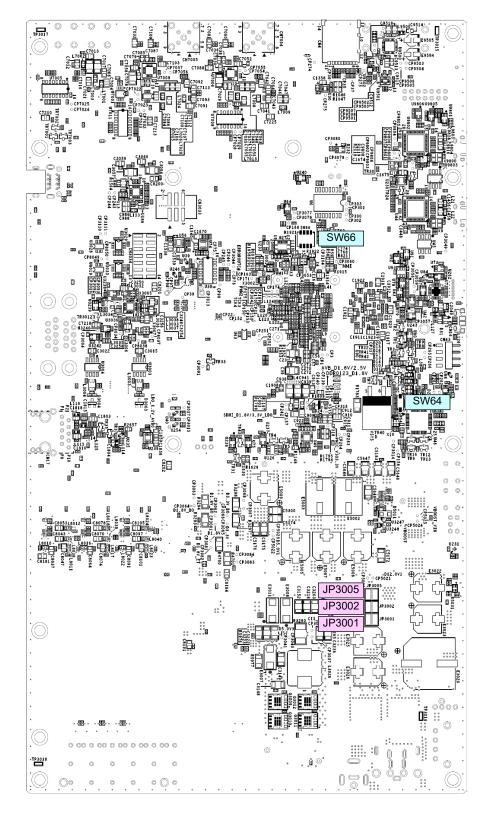


Figure 1.3.1 Location of Switches on the Gray Hawk Single Board (Solder Side)

1.4. Usage Notes

1.4.1. Protection against Static Electricity

Static electricity must not be discharged to the semiconductor devices mounted on the Gray Hawk board. A strong staticelectricity can cause destruction of the semiconductor devices and ultimately degrade the board operation. To protect the semiconductor devices mounted on the Gray Hawk board against static electricity, all test and measurement tools including the workbenches and floors should be grounded. Furthermore, the human body should be grounded by using a wrist strap. The semiconductor devices must not be touched without protection against static electricity.

1.4.2. Specifications of the Gray Hawk Board

When the AC adapter is connected to the power source, 12.0-V DC power is supplied to the Gray Hawk board and some of the circuitry starts operating. Setting the ACC switch (SW51) on the Gray Hawk single board to the ON position after that leads to the generation of various power supply levels (including 5.0-V DC and 3.3-V DC) from the 12.0-V DC power.

- Take particular care to ensure the correct configurations of the jumpers and switches mounted on the Gray Hawk board. Incorrect configurations may damage on-board devices.
- For power supply to the Gray Hawk board, be sure to use the AC adapter that comes with it.
 Applying a voltage exceeding DC 12.0V may damage the device on the board.
- When using two AC adapters on the Gray Hawk board, be sure to disconnect the jumpers from the sockets of JP1, JP2, and JP5. When using one AC adapter, be sure to leave the jumpers in the sockets of JP1, JP2, and JP5.
- Specific sequences apply when turning the power supply to the Gray Hawk board on and off. Be sure that the sequences are in accord with the notes below when using the Gray Hawk board.
 - (1) When turning on the power
 - Be sure to confirm that the ACC switch (SW51) is off before plugging the AC adapter into the power source. Plugging the AC adapter into a power source while the ACC switch (SW51) is on is prohibited.
 - (2) When turning off the power
 - Be sure to turn off the ACC switch (SW51) before unplugging the AC adapter from the power source. Unplugging the AC adapter from the power source while the ACC switch (SW51) is on is prohibited.
- The AC adapter that comes with the Gray Hawk board can supply up to 9.0 A of current at 12.0 V. If you intend to run
 the Gray Hawk board under operating conditions that require the supply of current exceeding 9.0 A, prepare a separate
 stabilized DC power supply to suit the operating conditions.
- The development of software that involves use of the SPI flash memory connected to U6 is not guaranteed on the Gray Hawk board.
- Do not remove the fan and heat sink for cooling the R-Car V4M from the board, as doing so will lead to the R-Car V4M being overheated to destruction.

1.4.3. Precaution on Power Supply Voltage Settings

On the Gray Hawk board, the MMC interface of the R-Car V4M is connected to the eMMC memory (U22) through the TMUX1574RSVR switches (U28, U29, and U41). The interface signals for the eMMC memory are pulled up to D1.8V on the board. Therefore, when the eMMC memory is to be used, ensure the supply of 1.8 V to the VDDQ18_33_SDHI pins of the R-Car V4M. For details, see section 2.8, eMMC Memory Interface (MMC) in the R-Car V4M System Reference Board Gray Hawk Types 1 to 3 Hardware Manual.



1.5. Quick Setup of the Gray Hawk Board

1.5.1. Installing the USB Driver

An FT2232H-56Q high-speed dual USB UART/FIFO IC from FTDI is used on the Gray Hawk single board. The page at the URL below has a tabbed page for downloadable USB drivers for the FT2232H-56Q (virtual COM port driver). [VCP Drivers]

https://ftdichip.com/drivers/vcp-drivers/

1.5.2. Connecting the PC and Gray Hawk Single Board

For connection between the PC and Gray Hawk single board, use a USB cable (type A to micro B). Connect the type A end to the PC and the micro B end to CN10 (Debug serial) on the Gray Hawk single board. For the location of CN10, see Figure 1.1.1 Location of Connectors on the Gray Hawk Single Board.

1.5.3. Settings for Terminal Emulation Software on the PC

Set up the serial communications protocol for the terminal emulation software on the PC as follows.

Communications rate	921.6 kbps (921,600 bps)
Data length	8 bits
Parity bits	None
Stop bits	1 bit
Flow control	None

1.5.4. Confirming Booting-up of the Gray Hawk Board by U-Boot

Connect the 12.0-V DC plug of the AC adapter supplied with the Gray Hawk board to CN22 on the single board and then plug the other end of the adapter into the power source. Subsequently, switch the ACC switch (SW51) on the Gray Hawk single board to the ON position. The Gray Hawk board is activated and the following message is displayed on the screen of the terminal emulation software.

U-Boot 2020.10 (Dec 28 2021 - 11:09:18 +0900)

CPU: Renesas Electronics R8A779G0 rev 1.0

Model: Renesas White Hawk CPU and Breakout boards based on r8a779g0

DRAM: 3.9 GiB RAM Configuration:

Bank #0: 0x048000000 - 0x0bffffff, 1.9 GiB Bank #1: 0x600000000 - 0x67ffffff, 2 GiB

Dank #1. 0x000000000 - 0x071111111, 2 Gil

MMC: mmc@ee140000: 0 Loading Environment from MMC... OK

 In:
 serial@e6e60000

 Out:
 serial@e6e60000

 Err:
 serial@e6e60000

 Net:
 eth0: ethernet@e6800000

For the location of ACC switch (SW51), see Figure 1.1.1 Location of Connectors on the Gray Hawk Single Board. After having confirmed booting-up of the board by U-Boot, replace the on-board U-Boot with the latest version.



2. Switch Settings

This section describes the settings of slide switches mounted on the Gray Hawk board.

2.1. Initial Settings of Slide Switches

The following describes the initial setting of each slide switch mounted on the Gray Hawk board.

Table 2.1 Initial Setting of Slide Switches

Switch	Switch	Side	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Number	Name	(C/S)	•							
Gray Haw	Gray Hawk Single Board									
SW50	MODESW	С	ON	OFF	ON	ON	OFF	ON	OFF	OFF
SW57	Hyper/SPI	С		>		-	-	-	-	-
SW13	SPI/EX-SPI	С	~	-		-	-	-	-	-
SW43	MMC/SD	С		>		-	-	-	-	-
SW44	DSI0	С		>		-	-	-	-	-
SW46	SOFTSW	С	OFF	OFF		-	-	-	-	-
SW47	PUSHSW_A	С	Push SW	-	-	-	-	-	-	-
SW48	PUSHSW_B	С	Push SW	-	-	-	-	-	-	-
SW49	PUSHSW_C	С	Push SW	-	-	-	-	-	-	-
SW51	ACCSW	С		-	✓ (OFF)	-	-	-	-	-
SW52	PRESET#	С	Push SW	-	-	-	-	-	-	-
SW64	RL78_RSTC	S		✓ (ON)	-	-	-	-	-	-
SW1	RL78_RESET	С	Push SW	-	-	-	-	-	-	-
SW55	MX_BKUP	С	✓ (OFF)			-	-	-	-	-
SW3002	RL78_PUSHSW	С	Push SW	-	-	-	-	-	-	-
SW3008	EN_FlexRay-A	С	✓ (OFF)		-	-	-	-	-	-
SW3009	EN_FlexRay-B	С		✓ (ON)		-	-	-	-	-
SW3010	GP/MSIOF1_A	С	>	-		-	-	-	-	-
SW3012	GP/MSIOF1_B	С	~	-		-	-	-	-	-
SW3011	CAN_WAKE	С	✓ (OFF)		-	-	-	-	-	-
JP3001	D12.0V2_A	S	Short	-	-	-	-	-	-	-
JP3002	D12.0V2_B	S	Short	-	-	-	-	-	-	-
JP3005	D12.0V2_C	S	Short	-	-	-	-	-	-	-
JP3003	EX_PWRON	С	Open	-	-	-	-	-	-	-

Note: "Side (C/S)" indicates whether the switch is mounted on the component side of the board (C) or solder side of the board (S).

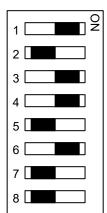
Switch	Switch	Side	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	
Number	Name	(C/S)	•								
Mode Sw	Mode Switching Board										
SW1	MODESW-A	С	OFF	ON	OFF	OFF	ON	OFF	ON	ON	
SW2	MODESW-B	С	OFF	ON	ON	OFF	ON	ON	ON	OFF	
SW3	MODESW-C	С	ON	ON	ON	ON	OFF	ON	OFF	OFF	
SW4	MODESW-D	С	ON	ON	ON	ON	ON	ON	ON	ON	
SW5	MODESW-E	С	ON	OFF	ON	ON	ON	OFF	OFF	OFF	
SW6	Reserved	S				All off					
SW7	Reserved	S				All off					
SW8	Reserved	S	All off								
SW9	Reserved	S	All off								
SW10	Reserved	S			•	All off	•		•	·	

Note: "Side (C/S)" indicates whether the switch is mounted on the component side of the board (C) or solder side of the board (S).

2.2. Specifications of Slide Switches on the Gray Hawk Single Board

2.2.1. SW50 (Mode Setting) Specifications

SW50 sets the levels on the mode pins (MD1, MD2, MD3, MD4, MD5, and MD6) of the R-Car V4M. The following shows the initial setting at shipment. The mode settings made with SW50 are only functional when the MAX10 FPGA (U37) is mounted. [SW50]



Function									
No	Function	OFF	ON						
1	MD1 pin setting	1	0						
2	MD2 pin setting	1	0						
3	MD3 pin setting	1	0						
4	MD4 pin setting	1	0						
5	MD5 pin setting	1	0						
6	MD6 pin setting	1	0						
7		1	0						
8		1	0						

Figure 2.2.1 SW50 Settings

Table 2.2 Selection of Boot Device (MD1, MD2, MD3, and MD4)

Pin 1 MD1	Pin 2 MD2	Pin 3 MD3	Pin 4 MD4	Functions
On (0)	Off (1)	On (0)	On (0)	HyperFlash boot at 160 MHz using DMA • Booting is from the HyperFlash memory (U26) on the Gray Hawk single board. (Initial setting)
Off (1)	Off (1)	On (0)	On (0)	HyperFlash boot at 80 MHz using DMA • Booting is from the HyperFlash memory (U26) on the Gray Hawk single board.
On (0)	On (0)	Off (1)	On (0)	Serial Flash boot at single read 40 MHz using DMA • Booting is from the SPI flash memory (U6) on the Gray Hawk single board, or from the SPI flash memory connected to the EX-SPI connector (CN3).
On (0)	Off (1)	Off (1)	On (0)	Serial Flash boot at single read 80 MHz using DMA • Booting is from the SPI flash memory (U6) on the Gray Hawk single board, or from the SPI flash memory connected to the EX-SPI connector (CN3).
Off (1)	Off (1)	Off (1)	On (0)	Octal SPI flash boot at 160/80 MHz using DMA
On (0)	Off (1)	On (0)	Off (1)	HyperFlash boot at 160 MHz (320 Mbps) using XIP mode • Booting is from the HyperFlash memory (U26) on the Gray Hawk single board.
Off (1)	Off (1)	On (0)	Off (1)	HyperFlash boot at 80 MHz using XIP mode • Booting is from the HyperFlash memory (U26) on the Gray Hawk single board.
Off (1)	On (0)	Off (1)	Off (1)	eMMC boot at 50 MHz x8 bus widths using DMA • Booting is from the eMMC memory (U22) on the Gray Hawk single board.
Off (1)	Off (1)	Off (1)	Off (1)	SCIF/HSCIF downloading mode
	an above			Setting prohibited

Note: The related switches are SW13, SW43, SW54, SW57, and SW65 on the Gray Hawk single board.

Table 2.3 Reserved (MD5)

Pin 5 Setting	Functions
On (0)	Setting prohibited
Off (1)	Normal boot (Initial setting)

The setting of pin 5 (MD5) is reserved for evaluation by Renesas Electronics. Do not change the initial setting (OFF).

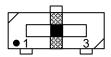
Table 2.4 Selection of Master Boot Processor (MD6)

Pin 6 Setting	Functions
On (0)	MD7 = 1, MD6 = 0: Booted through ICUMXA. (Initial setting)
Off (1)	MD7 = 1, MD6 = 1: Booted through Cortex-R52



2.2.2. SW57 (HyperFlash Memory/SPI Flash Memory) Specifications

The combination of settings of the SW57 and SW13 slide switches and the level of a signal from the MAX10 FPGA (U37) determine the device to be connected to the QSPI0 and QSPI1 pins of the R-Car V4M. For the combinations of the signal level and switch settings, see Table 2.6. SW57 selects the device to be connected to the QSPI0 pins of the R-Car V4M. When SW57 is set to the pin 1 side, the QSPI0 pins are connected to the HyperFlash memory (U26). When SW57 is set to the pin 2 position (neutral), the QSPI0 pins are connected to the SPI flash memory (U6) or EX-SPI connector (CN3). When SW57 is set to the pin 3 side, the level of a signal output by the MAX10 FPGA (U37) determines the device to be connected to the QSPI0 pins. The following shows the initial setting at shipment.



Function										
Function	Pin 1 side	Pin 2 position (neutral)	Pin 3 side							
QSPI0 connection	HyperFlash memory	SPI flash memory (U6) or	Depends on the level							
	(U26)	EX-SPI connector (CN3)	of a signal from the							
			MAX10 FPGA (U37)							

Figure 2.2.2 SW57 Settings

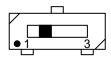
Table 2.5 Selection of QSPI0 Connection

Setting	Functions	
Pin 1 side	 The HyperFlash memory (U26) is connected to the QSPI0 pins of the R-Car V4M. (Initial setting) The OE# signal of the SN74CB3Q3245 bus switch (U27) goes to the high level. 	
Pin 2 position (neutral)	 The SPI flash memory (U6) or EX-SPI connector (CN3) is connected to the QSPI0 pins of the R-Car V4M. The OE# signal of the SN74CB3Q3245 bus switch (U27) goes to the low level. 	
Pin 3 side	The level of the QSPI_SW_SEL signal from the MAX10 FPGA (U37) determines the device to be connected to the QSPI0 pins. [QSPI_SW_SEL == high level] The HyperFlash memory (U26) is connected. [QSPI_SW_SEL == low level] The SPI flash memory (U6) or EX-SPI connector (CN3) is connected.	

2.2.3. SW13 (SPI Flash Memory/EX-SPI Connector) Specifications

The combination of settings of the SW57 and SW13 slide switches and the level of a signal from the MAX10 FPGA (U37) determine the device to be connected to the QSPI0 and QSPI1 pins of the R-Car V4M. For the combinations of the signal level and switch settings, see Table 2.6. When SW57 is selecting connection to the SPI flash memory (U6) or EX-SPI connector (CN3), SW13 selects the device to be connected to the QSPI0_SSL pin of the R-Car V4M. When SW13 is set to the pin 1 side, the QSPI0_SSL pin is connected to the SPI flash memory (U6). When SW13 is set to the pin 3 side, the pin is connected to the EX-SPI connector (CN3). The following shows the initial setting at shipment.





Function				
Function	Pin 1 side	Pin 3 side		
QSPI0_SSL connection	SPI flash memory (U6)	EX-SPI connector (CN3)		

Figure 2.2.3 SW13 Settings

Table 2.6 Device Selection of QSPI0 and QSPI1

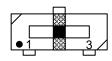
SW57	QSPI_SW_SEL from FPGA	SW13	Device Connected to the QSPI0 and QSPI1
Neutral	-	Pin 3	EX-SPI connector (CN3)
Neutral	-	Pin 1	512-Mbit SPI flash memory (U6)
Pin 1	•	-	512-Mbit HyperFlash memory (U26) (Initial setting)
Pin 3	Driven low	Pin 3	EX-SPI connector (CN3)
Pin 3	Driven low	Pin 1	512-Mbit SPI flash memory (U6)
Pin 3	Driven high	Pin 1	512-Mbit HyperFlash memory (U26)

^{-:} Don't care

2.2.4. SW43 (microSD Card Slot/eMMC Memory) Specifications

The setting of SW43 and the level of a signal from the MAX10 FPGA (U37) determine the device to be connected to the MMC pins of the R-Car V4M. When SW43 is set to the pin 1 side, the MMC pins are connected to the microSD card slot (CN4). When SW43 is set to the pin 2 position (neutral), the MMC pins are connected to the eMMC memory (U22). When SW43 is set to the pin 3 side, the level of a signal output by the MAX10 FPGA (U37) determines the device to be connected to the MMC pins. The following shows the initial setting at shipment.

[SW43]



Function			
Function	Pin 1 side	Pin 2 position	Pin 3 side
		(neutral)	
MMC	microSD card slot	eMMC memory	Depends on the level
connection	(CN4)	(U22)	of a signal from the
		,	MAX10 FPGA (U37)

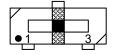
Figure 2.2.4 SW43 Settings

Table 2.7 Selection of MMC Connection

Setting	Functions	
Pin 1 side	 The microSD card slot (CN4) is connected to the MMC pins of the R-Car V4M. The SEL pins of the TMUX1574 switches (U28, U29, and U41) go to the high level. 	
Pin 2 position (neutral)	• The eMMC memory (U22) is connected to the MMC pins of the R-Car V4M. (Initial setting) • The SEL pins of the TMUX1574 switches (U28, U29, and U41) go to the low level.	
Pin 3 side	The level of the MMC_SW_SEL signal from the MAX10 FPGA (U37) determines the device to be connected to the MMC pins. [MMC_SW_SEL == high level] The microSD card slot (CN4) is connected. [MMC_SW_SEL == low level] The eMMC memory (U22) is connected.	

2.2.5. SW44 (EXIO Connector B/SN65DSI86) Specifications

The setting of SW44 and the level of a signal from the MAX10 FPGA (U37) determine the device to be connected to the DSI0 pins of the R-Car V4M. When SW44 is set to the pin 1 side, the DSI0 pins are connected to the EXIO connector B (CN12). When SW44 is set to the pin 2 position (neutral), the DSI0 pins are connected to the SN65DSI86 DSI to eDP bridge (U32) from TI. When SW44 is set to the pin 3 side, the level of a signal output by the MAX10 FPGA (U37) determines the device to be connected to the DSI0 pins. The following shows the initial setting at shipment. [SW44]



Function			
Function	Pin 1 side	Pin 2 position	Pin 3 side
		(neutral)	
DSI0	EXIO connector B	SN65DSI86	Depends on the level
connection	(CN12)	(U32)	of a signal from the
	, ,	,	MAX10 FPGA (U37)

Figure 2.2.5 SW44 Settings

Table 2.8 Selection of DSI0 Connection

Setting	Functions
Pin 1 side * The EXIO connector B (CN12) is connected to the DSI0 pins of the R-Car V4M. * The SEL pins of the PI3PCIE3212ZBE bus switches (U33, U34, and U35) go to the high level. * This setting should be made when the MAX96789 (U4) on the CSI and DSI sub-board is to be connected to the pins of the R-Car V4M.	
Pin 2 position (neutral)	 The SN65DSI86 (U32) is connected to the DSI0 pins of the R-Car V4M. (Initial setting) The SEL pins of the PI3PCIE3212ZBE bus switches (U33, U34, and U35) go to the low level.
Pin 3 side	The level of the SEL_DSI0 signal from the MAX10 FPGA (U37) determines the device to be connected to the DSI0 pins. [SEL_DSI0 == high level] The EXIO connector B (CN12) is connected. This setting should be made when the MAX96789 (U4) on the CSI and DSI sub-board is to be connected. [SEL_DSI0 == low level] The SN65DSI86 (U32) is connected.

2.2.6. SW46 (Software Switch) Specifications

SW46 can be used as a general-purpose input switch. This slide switch is connected to the GPIO of the R-Car V4M. When a bit in positive/negative logic select register 1 is equal to '1' (active low configuration) and moreover a switch of SW46 is off, the corresponding bit in the GPIO general input register becomes '0.' When a switch of SW46 is on, the corresponding bit becomes '1.'

For details, refer to the section on the pin function (PFC/GPIO) in the R-Car V4M Series User's Manual: Hardware. The following shows the initial setting at shipment.

[SW46]



Func	Function				
No	Function	OFF	ON		
1	Software switch bit 0. GP1_24/HRX3	0	1		
2	Software switch bit 1. GP1_28/HTX3	0	1		

Figure 2.2.6 SW46 Settings (after Setting POSNEG1 to 1)

Note: Before using SW46 as a general-purpose input switch, set the GPSR1 register of the R-Car V4M to select the GPIO function. Then, set LSI pin pull-enable register 1 (PUEN1) to enable pulling up or down and set LSI pin pull-up/down control register 1 (PUD1) to enable pulling up. For details, refer to the section on the pin function (PFC/GPIO) in the R-Car V4M Series User's Manual: Hardware.

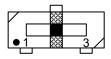
The GPIO functions (GP1_24 and GP1_28) connected to the software switch are multiplexed on the same pins as those of the HSCIF3 module (HRX3 and HTX3) due to the specifications of the R-Car V4M's pin function controller. Therefore, when the HSCIF3 or GPIO functions are to be used through the IO pin header (CN40) on the Gray Hawk single board, be sure to set switches 1 and 2 of SW46 to the OFF position.

2.2.7. SW54 (SDHI/MMC Interface Voltage Setting) Specifications

The power source generated by LDO1 of the RAA271005 PMIC (U139) is supplied to the VDDQ18_33_SDHI pins. SW54 and SW65 can also be used to select an alternative power supply voltage generated by the ISL78310ARAJZ (U230) as the power source for supply to the VDDQ18_33_SDHI pins. Note, however, that <u>U230 and its peripheral circuit are not mounted on the boards as shipped</u>. To enable the setting of these switches, mount U230 and its peripheral circuit, and cut off the path for supply from U139 by removing R2118.

The combination of settings of the SW54 and SW65 slide switches can be used to set the SDHI/MMC interface voltage (VDDQ18_33_SDHI) to 1.8 V or 3.3 V. For the combinations of switch settings, see Table 2.11.

When SW54 is set to the pin 1 side, 3.3 V is supplied on the VDDQ18_33_SDHI pins. When SW54 is set to the pin 2 position (neutral), 1.8 V is supplied on the VDDQ18_33_SDHI pins. When SW54 is set to the pin 3 side, the setting of SW65 determines the voltage to be supplied on the VDDQ18_33_SDHI pins. The following shows the initial setting at shipment. [SW54]



Function			
Function	Pin 1 side	Pin 2 position	Pin 3 side
		(neutral)	•
SDHI/MMC interface voltage	3.3 V	1.8 V	Depends on the
setting (VDDQ18_33_SDHI)			setting of the SW65

Figure 2.2.7 SW54 Settings

Table 2.9 Setting of Interface Voltage for SDHI/MMC

Setting	Functions
Pin 1 side	• 3.3 V is supplied on the VDDQ18_33_SDHI pins of the R-Car V4M.
Pin 2	• 1.8 V is supplied on the VDDQ18_33_SDHI pins of the R-Car V4M. (Initial setting)
position	 Be sure to make this setting when the following function of the Gray Hawk single board is to be used.
(neutral)	• The eMMC memory (U22) is to be used.
Pin 3 side	 The setting of SW65 determines the voltage to be supplied on the VDDQ18_33_SDHI pins.

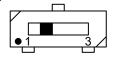


2.2.8. SW65 (Selects the Device to Control the SDHI/MMC Interface Voltage) Specifications

The power source generated by LDO1 of the RAA271005 PMIC (U139) is supplied to the VDDQ18_33_SDHI pins. SW65 and SW54 can also be used to select an alternative power supply voltage generated by the ISL78310ARAJZ (U230) as the power source for supply to the VDDQ18_33_SDHI pins. Note, however, that <u>U230 and its peripheral circuit are not mounted on the boards as shipped</u>. To enable the setting of these switches, mount U230 and its peripheral circuit, and cut off the path for supply from U139 by removing R2118.

The combination of settings of the SW54 and SW65 slide switches can be used to set the SDHI/MMC interface voltage (VDDQ18_33_SDHI) to 1.8 V or 3.3 V. For the combinations of switch settings, see Table 2.11.

When SW54 is set to the pin 3 side, SW65 selects the device to control the voltage to be supplied on the VDDQ18_33_SDHI pins. When SW65 is set to the pin 1 side, the level of a signal from the MAX10 FPGA (U37) determines the voltage on the VDDQ18_33_SDHI pins. When SW65 is set to the pin 3 side, the level on the GP8_12 pin of the R-Car V4M determines the voltage on the VDDQ18_33_SDHI pins. The following shows the initial setting at shipment.



Function			
Function	Pin 1 side	Pin 3 side	
Selection of the interface voltage control device	MAX10 FPGA (U37)	R-Car V4M (U1)	

Figure 2.2.8 SW65 Settings

Table 2.10 Selection of the Interface Voltage Control Device for SDHI/MMC

Setting	Functions
Pin 1 side	 The level of the SEL_SDHI_1.8V/3.3V signal from the MAX10 FPGA (U37) determines the voltage to be supplied on the VDDQ18_33_SDHI pins. (Initial setting) [SEL_SDHI_1.8V/3.3V == high level] 3.3 V is supplied on the VDDQ18_33_SDHI pins of the R-Car V4M. [SEL_SDHI_1.8V/3.3V == low level] 1.8 V is supplied on the VDDQ18_33_SDHI pins of the R-Car V4M.
• The level of the GP8_12 signal from the R-Car V4M (U1) determines the voltage to be supplied on the VDDQ18_33_SDHI pins. Pin 3 side GP8_12 == high level • 3.3 V is supplied on the VDDQ18_33_SDHI pins of the R-Car V4M. GP8_12 == low level • 1.8 V is supplied on the VDDQ18_33_SDHI pins of the R-Car V4M.	

Table 2.11 Selection of Interface Voltage for SDHI/MMC

SW54	SW65	SEL_SDHI_1.8V/3.3V from FPGA	GP8_12 from R-Car V4M	SDHI/MMC Interface Voltage VDDQ18_33_SDHI
Pin 1	-	-	-	Set to 3.3 V
Pin 3	Pin 1	Driven high	-	
Pin 3	Pin 3	-	Driven high	
Neutral	-	-	-	Set to 1.8 V
Pin 3	Pin 1	Driven low	-	(Initial setting)
Pin 3	Pin 3	-	Driven low	

^{-:} Don't care

2.2.9. SW64 (Reserved) Specifications

SW64 is Reserved, so do not change the initial setting (ON). The following shows the initial setting at shipment.

[SW64]



Function				
Function	OFF	ON		
Reserved	Setting prohibited	Use this setting		

Figure 2.2.9 SW64 Settings

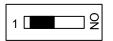
Table 2.12 Reserved

Setting	Functions
On	Use this setting(Initial setting)
Off	Setting prohibited

2.2.10. SW55 (M01_BKUP Pin Voltage Setting) Specifications

SW55 sets control of the voltage on the M01_BKUP pin of the R-Car V4M. To use an output port pin (P73) of the RL78/F13 (U46) to set the voltage on this pin, set SW55 to the OFF position. To forcibly drive the pin to the high level, set SW55 to the ON position. The following shows the initial setting at shipment.

[SW55]



Function				
Function	OFF	ON		
Voltage control setting for the	Controlled by an output	Forcibly set to the high		
M01_BKUP pin	port pin of the RL78/F13	level		

Figure 2.2.10 SW55 Settings

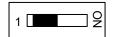
Table 2.13 Voltage Setting of the M01_BKUP Pin

Setting	Functions
On	• The M01_BKUP pin of the R-Car V4M is forcibly driven to the high level.
Off	• The output port pin (P73) of the RL78/F13 (U46) is used to set the level on the M01_BKUP pin of the R-Car V4M. (Initial setting)

2.2.11. SW3008 (Enables FlexRay Transceiver A) Specifications

SW3008 sets the enable pin (pin 3) of the given TJA1080ATS FlexRay transceiver (U3009) to the low level or high level. The following shows the initial setting at shipment.

[SW3008]



Function		
Function	OFF	ON
Enable pin of TJA1080ATS (U3009)	Low level	High level

Figure 2.2.11 SW3008 Settings

Table 2.14 Setting of the Enable Pin of the TJA1080ATS (U3009) Device

Setting	Functions
On	 The enable pin of the TJA1080ATS (U3009) device is set to the high level. The TJA1080ATS (U3009) device is placed in the normal mode.
Off	The enable pin of the TJA1080ATS (U3009) device is set to the low level. (Initial setting)
Oli	The TJA1080ATS (U3009) device is placed in the receive-only mode.

The STBN pin (pin 9) of the TJA1080ATS (U3009) device is always at the high level because it is pulled up by the R3052 resistor on the single board.



2.2.12. SW3009 (Enables FlexRay Transceiver B) Specifications

SW3009 sets the enable pin (pin 3) of the given TJA1080ATS FlexRay transceiver (U3010) to the low level or high level. The following shows the initial setting at shipment.

[SW3009]



Function		
Function	OFF	ON
Enable pin of TJA1080ATS (U3010)	Low level	High level

Figure 2.2.12 SW3009 Settings

Table 2.15 Setting of the Enable Pin of the TJA1080ATS (U3010)

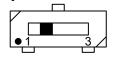
Setting	Functions
On	 The enable pin of the TJA1080ATS (U3010) device is set to the high level. (Initial setting) The TJA1080ATS (U3010) device is placed in the normal mode.
Off	 The enable pin of the TJA1080ATS (U3010) device is set to the low level. The TJA1080ATS (U3010) device is placed in the receive-only mode.

The STBN pin (pin 9) of the TJA1080ATS (U3010) device is always at the high level because it is pulled up by the R3068 resistor on the single board.

2.2.13. SW3010 (Selects the Destination for Connection of the GP1_02/MSIOF1_SYNC Pin) Specifications

The combinations of settings of the SW3010 and SW3012 slide switches respectively select the devices to be connected to the GP1_02/MSIOF1_SYNC and GP1_05/MSIOF1_RXD pins of the R-Car V4M. For the combinations of settings of SW3010 and SW3012, see Table 2.18 Connection of the GPIO and MSIOF1 Pins of the R-Car V4M.

When SW3010 is set to the pin 1 side and the R6017 0-Ω resistors are respectively removed and mounted as R4706 on the single board, the GP1_02/MSIOF1_SYNC pin of the R-Car V4M is connected to the STB_N pin (pin 14) of the TJR1443AT (U3001). When SW3010 is set to the pin 3 side, the GP1_02/MSIOF1_SYNC pin of the R-Car V4M is connected to MSIOF connector 1 (CN3005). The following shows the initial setting at shipment.



runction		
Function	Pin 1 side	Pin 3 side
Connection of the GP1_02/MSIOF1_SYNC pin	STB_N pin of TJR1443AT (U3001)	MSIOF connector 1 (CN3005)

Figure 2.2.13 SW3010 Settings

Table 2.16 Connection of the GP1 02/MSIOF1 SYNC Pin of the R-Car V4M

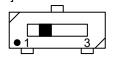
Setting	Functions
Pin 1 side	 The GP1_02/MSIOF1_SYNC pin of the R-Car V4M is connected to the STB_N pin of the TJR1443AT (U3001). (Initial setting) The R6017 0-Ω resistor should be removed and mounted as R4706 on the single board. This setting should be made when the GP1_02 pin of the R-Car V4M is to be used to control the STB_N pin of the TJR1443AT (U1).
Pin 3 side	 The GP1_02/MSIOF1_SYNC pin of the R-Car V4M is connected to MSIOF connector 1 (CN3005). This setting should be made when the MSIOF1_SYNC pin of the R-Car V4M is to be used through MSIOF connector 1 (CN3005).



2.2.14. SW3012 (Selects the Destination for Connection of the GP1_05/MSIOF1_RXD Pin) Specifications

The combinations of settings of the SW3010 and SW3012 slide switches respectively select the devices to be connected to the GP1_02/MSIOF1_SYNC and GP1_05/MSIOF1_RXD pins of the R-Car V4M. For the combinations of settings of SW3010 and SW3012, see Table 2.18 Connection of the GPIO and MSIOF1 Pins of the R-Car V4M.

When SW3012 is set to the pin 1 side, the GP1_05/MSIOF1_RXD pin of the R-Car V4M is connected to the ERR_N pin (pin 8) of the TJR1443AT (U3001). When SW3012 is set to the pin 3 side, the GP1_05/MSIOF1_RXD pin of the R-Car V4M is connected to MSIOF connector 1 (CN3005). The following shows the initial setting at shipment. [SW3012]



Function		
Function	Pin 1 side	Pin 3 side
Connection of the GP1_05/MSIOF1_RXD pin	ERR_N pin of TJR1443AT (U3001)	MSIOF connector 1 (CN3005)

Figure 2.2.14 SW3012 Settings

Table 2.17 Connection of the GP1 05/MSIOF1 RXD Pin of the R-Car V4M

Setting	Functions
Pin 1 side	 The GP1_05/MSIOF1_RXD pin of the R-Car V4M is connected to the ERR_N pin of the TJR1443AT (U3001). (Initial setting) This setting should be made when the GP1_05 pin of the R-Car V4M is to be used to read the state of the ERR_N pin of the TJR1443AT (U3001).
Pin 3 side	 The GP1_05/MSIOF1_RXD pin of the R-Car V4M is connected to MSIOF connector 1 (CN3005). This setting should be made when the MSIOF1_RXD pin of the R-Car V4M is to be used through MSIOF connector 1 (CN3005).

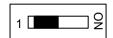
Table 2.18 Connection of the GPIO and MSIOF1 Pins of the R-Car V4M

SW3010	SW3012	GP1_02/MSIOF1_SYNC	GP1_05/MSIOF1_RXD
Pin 1	Pin 1	STB_N pin of TJR1443AT (U3001)	ERR_N pin of TJR1443AT (U3001)
Pin 3	Pin 3	Pin 4 of MSIOF connector 1 (CN3005)	Pin 5 of MSIOF connector 1 (CN3005)
Other that	an above	Setting prohibited	

2.2.15. SW3011 (Selects the Input Level to the WAKE Pin of the TJR1443AT) Specifications

SW3011 sets the WAKE pin (pin 9) of the TJR1443AT CAN transceiver (U3001) to the low or high level. The following shows the initial setting at shipment.

[SW3011]



Function		
Function	OFF	ON
WAKE pin of TJR1443AT (U3001)	High level	Low level

Figure 2.2.15 SW3011 Settings

Table 2.19 Setting of the WAKE Pin of the TJR1443AT (U3001)

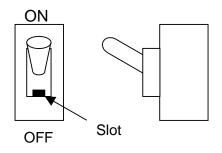
Setting	Functions
On	 The WAKE pin of the TJR1443AT (U3001) is set to the low level. Switching this switch from off to on changes the level on the WAKE pin of the TJR1443AT (U3001) from high to low, thus
-	generating a local wake-up event.
	The WAKE pin of the TJR1443AT (U3001) is set to the high level. (Initial setting)
Off	 Switching this switch from on to off changes the level on the WAKE pin of the TJR1443AT (U3001) from low to
	high, thus generating a local wake-up event.



2.3. Specifications of a Toggle Switch on the Gray Hawk Single Board

2.3.1. SW51 (Board Power-Supply Circuit Control) Specifications

The ACC switch (SW51) can be used to control the power-supply circuit on the Gray Hawk board.



SW51

On: The ACC power supply is turned on.
Off: The ACC power supply is turned off.

Figure 2.3.1 SW51 Accessory Power-Supply Switch

Table 2.20 Accessory Power-Supply Switch

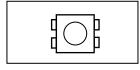
SW51 Setting	Functions
Towards the 'ON'	Turns on the accessory power of the Gray Hawk board. This selects supply of the power-supply voltage to the
marking	system.

When the switch is pushed to the 'ON' position, the switching regulators, e.g. RAA271041, on the single board start generating the power.

2.4. Specifications of Push-Button Switches on the Gray Hawk Single Board

2.4.1. SW52 (System Reset Switch) Specifications

Pushing SW52 resets the R-Car V4M.



SW52 (white)

Push: System reset

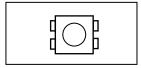
Figure 2.4.1 SW52 System Reset Switch

Table 2.21 System Reset Switch

SW Settin	Functions	
Push	Resets the R-Car V4M. A reset signal is applied to the power-on reset pin (PRESET#) of the R-Car V4M. As a result,	.,
	the R-Car V4M outputs a reset signal (PRESETOUT#) to peripheral devices.	

2.4.2. SW1 (Reset Switch) Specifications

Pushing SW1 resets the RL78/F13 (U46).



SW1 (white)

Push: Reset of RL78/F13

Figure 2.4.2 SW1 Reset Switch for the RL78/F13

Table 2.22 Reset Switch for the RL78/F13

SW Setting	Functions
Push	Resets the RL78/F13. A reset signal is applied to the power-on reset pin (RESET#) of the RL78/F13.



2.4.3. SW47, SW48, and SW49 (General-Purpose Push-Button Switches) Specifications

SW47, SW48, and SW49 are for use as general-purpose input switches. Pressing any of these switches makes the level on the corresponding GPIO pin of the R-Car V4M low (0) by default. To make the level on the GPIO pin high (1) when a switch is pressed, set the corresponding bit of positive/negative logic select register 5 to 1. For details, refer to the section on the pin function (PFC/GPIO) in the R-Car V4M Series User's Manual: Hardware.



SW47, SW48, and SW49 (black) Push: Sets GPx_y to '0'.

Figure 2.4.3 General-Purpose Push-Button Switches (SW47, SW48, and SW49)

Table 2.23 Correspondence between General-Purpose Push-Button Switch Number and GPIO Pin

Push-Button Switch	GPIO Pin of the R-Car V4M
SW47	GP5_00/AVB2_AVTP_PPS
SW48	GP5_01/AVB2_AVTP_CAPTURE
SW49	GP5_02/AVB2_AVTP_MATCH

2.4.4. SW3002 (General-Purpose Push-Button Switch) Specifications

SW3002 is a push-button switch that provides a general-purpose input to the RL78/F13 (U46). While the switch is being pressed, the low level (0) is input on the P137/INTP0 pin of the RL78/F13. While the switch is released, the high level (1) is input on the P137/INTP0 pin of the RL78/F13. For details, refer to chapter 4, Port Functions and chapter 21, Interrupt Functions in the RL78/F13, F14 User's Manual: Hardware.



SW3002 (black) Push: Sets P137/INTP0 to 0.

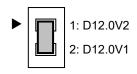
Figure 2.4.4 General-Purpose Push-Button Switch (SW3002)

2.5. Specifications of Jumper Switches on the Single Board

2.5.1. JP3001, JP3002, and JP3005 (Select D12.0V2 Power Supply) Specifications

JP3001, JP3002, and JP3005 select whether to supply the D12.0V2 power supply for the single board from AC adapter #1, in common with the D12.0V1 power supply, or from AC adapter #2, separately from the D12.0V1 power supply. This selection depends on the operating conditions of the Gray Hawk board. When the board will be drawing a relatively weak current, that is, when a single AC adapter can ensure the supply of current for the board, use AC adapter #1 to supply 12.0-V DC power to D12.0V1 and D12.0V2. On the other hand, when the board will be drawing a relatively strong current, that is, when a single AC adapter cannot ensure the supply of current for the board, use the two AC adapters, #1 and #2, to supply 12.0-V DC power to D12.0V1 and D12.0V2, respectively.

When using two AC adapters on the Gray Hawk board, be sure to disconnect the jumpers from the sockets of JP3001, JP3002, and JP3005. When using one AC adapter, be sure to leave the jumpers in the sockets of JP3001, JP3002, and JP3005. The following shows the initial setting at shipment. [JP3001, JP3002, and JP3005]



Function		
	Short	A single AC adapter supplies the power-supply voltages D12.0V1 and
		D12.0V2. (Initial setting)
JP3001,		The AC adapter is connected to either of the two power supply input
JP3002,		connectors (CN3020 and CN3022) on the single board.
and	Open	Two AC adapters #1 and #2 supply the power supply to D12.0V1 and
JP3005		D12.0V2, respectively.
		• AC adapters #1 and #2 are respectively connected to CN3020 for D12.0V1
		and CN3022 for D12.0V2 on the single board.

Figure 2.5.1 JP3001, JP3002, and JP3005 Jumper Pin Settings

2.5.2. JP3003 (EX PWRON) Specifications

The sequence of turning the power on for the Gray Hawk board starts when the result of the logical AND of the following conditions [A] and [B] is "true": [A]: the ACC switch (SW51) is on; [B]: JP3003 is open-circuit. When either of these conditions is not satisfied, the sequence of turning the power on does not start. The sequence of turning power to the Gray Hawk board off starts when the ACC switch is off or the setting of JP3003 is short-circuit.

While JP3003 is short-circuit, power is not supplied to the board even if the ACC switch is switched from off to on. The result of the logical AND is only "true" if JP3003 is switched from short to open-circuit while the ACC switch is on, so in that case power is supplied to the board. After the power is supplied, the power is turned off when the result of the logical AND is no longer "true"; that is, when the ACC switch is switched from on to off or JP3003 is switched from open to short-circuit. The following shows the initial setting at shipment.

[JP3003]

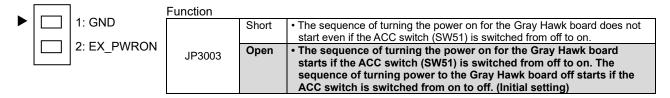


Figure 2.5.2 JP3003 Jumper Pin Settings

Note: The EX_PWRON signal is pulled up by the R1218 resistor on the Gray Hawk single board.



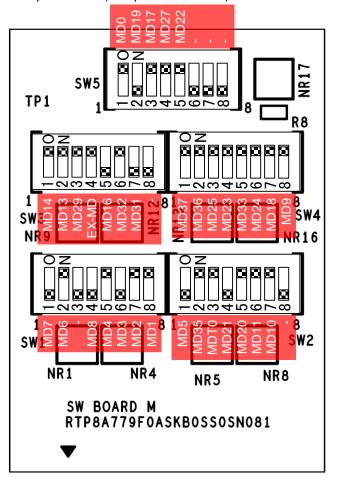
2.6. Specifications of Slide Switches on the Mode Switching Board

Table 2.24 Initial Settings of Slide Switches on the Mode Switching Board

Switch	Switch	Side	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	1
lumber	Name	(C/S)	•								
	itching Board			T							
SW1	MODESW-A	С	OFF	ON/OFF	OFF	OFF	ON	OFF	ON	ON	
		•	MD7	MD6	-	MD8	MD4	MD3	MD2	MD1	<u> </u>
			MD7	MD6		of Master Boot					
			OFF(1)	ON(0) OFF(1)		rough ICUMX ough Cortex-R					
		,		an above	Setting pro		J2				
			MD8		•			055(4) 11			
		,			tting prohibited		l		se this settin	g	
		,	MD4	MD3	MD2	MD1		of Boot Device	II la caisa DM	Δ.	
			ON(0) ON(0)	ON(0) ON(0)	OFF(1)	ON(0) OFF(1)			MHz using DM Hz using DMA		
			ON(0)	OFF(1)	ON(0)	ON(0)				MHz using DM	A
			ON(0)	OFF(1)	OFF(1)	ON(0)		h boot using [
		-	ON(0)	OFF(1)	OFF(1)	OFF(1)			1Hz using DM	A	
		-	OFF(1)	ON(0)	OFF(1)	ON(0)	HyperFlasi	at 160MHz(3	(20Mbps) usin	g XIP mode	
			OFF(1)	ON(0)	OFF(1)	OFF(1)		n at 80MHz us			
			OFF(1)	OFF(1)	ON(0)	OFF(1)			B bus widths u	sing DMA	
			OFF(1)	OFF(1)	OFF(1)	OFF(1)		F download m	iode		
SW2	MODESW-B	С	OFF	Other th	ON	OFF	Setting pro	ON	ON	OFF	ı
5W2	MODE2M-B	٠,	MD5	MD35	MDT0	MD21	MD20	MD11	MD10	UFF .	-
			MD5								1
		,	MD5 MD35		ettings prohibit e this setting	ed			Normal boot. etting prohibit	nd	
			MDT0		e this setting ee table below	()			See table belo		
		,	MD10		ee table below				See table belo		
			MD20		ee table below				See table belo		
		•	MD11		ee table below				See table belo		
		•	MD10	ON(0) = (S	ee table below	1)		OFF(1) = (See table belo	ow)	
		•	MDT0	MD21	M20	MD11	MD10	Main	_JTAG		Sub_JTAG
			ON(0)	ON(0)	ON(0)	ON(0)	ON(0)	-		Normal Fund	
		•	ON(0)	ON(0)	ON(0)	OFF(1)	ON(0)	ICUMX JTAG		Normal Funct	
		•	ON(0)	ON(0)	ON(0)	OFF(1)	OFF(1)	ICUMX LPD		Normal Funct	tion
		•	ON(0)	ON(0)	OFF(1)	ON(0)	ON(0)	ICUMX JTAG		CoreSight	
			ON(0)	ON(0)	OFF(1)	ON(0)	OFF(1)	CoreSight		CoreSight Normal Fund	ction
			ON(0) OFF(1)	OFF(1) ON(0)	ON(0) ON(0)	ON(0) ON(0)	ON(0) ON(0)	CoreSight VDSP0		Normal Funct	
			OFF(1)	ON(0)	ON(0)	ON(0)	OFF(1)	VDSP1		Normal Funct	
			OFF(1)	ON(0)	OFF(1)	ON(0)	ON(0)	CoreSight		VDSP0	
		•	OFF(1)	ON(0)	OFF(1)	ON(0)	OFF(1)	CoreSight		VDSP1	
		-	OFF(1)	OFF(1)	ON(0)	ON(0)	ON(0)	DUL		Normal Funct	tion
		•	OFF(1)	OFF(1)	OFF(1)	ON(0)	ON(0)	CoreSight		DUL	
		,			Other than abo			Setting pro			1
SW3	MODESW-C	C,	ON MD14	ON MD13	ON MD29	ON EX-MD	OFF MD16	ON MD32	OFF MD31	OFF	
									INIDOT	-	ı
		, ,	MD14 ON(0)	MD13 ON(0)		of PLL Initial M out=16.66 MH					
			ON(0)	OFF(1)		ut= 20.00 MHz					
			OFF(1)	ON(0)	Setting pro		, EXIAL DING	61- X1/1			
			OFF(1)	OFF(1)		ut= 33.33 MHz	, EXTAL Divid	er= x1/2			
		,	MD29	ON(0)= Se	•	as RCLK ref			elects on chir	oscillator (OC	O) as RCLK refe
			EX-MD			ettings by the			etting prohibit		.,
		-	MD16		tting prohibited			OFF(1)= U	se this settin	g	
			MD32	MD31	Selects SC	CIF or HSCIF d	ownloading m	ode			
		•	ON(0)	ON(0)		load (IO voltag					
		•	ON(0)	OFF(1)		wnload 921,6					
		•	OFF(1)	ON(0)		mload 1,843,2	00bps (IO volt	age 1.8V)			
0147:	HODESWY	,		an above	Setting pro		0	6	6	6	
SW4	MODESW-D	С	ON	ON	ON	ON	ON	ON	ON	ON	1
		•	MD37	MD36	MD25	MD23	MD33	MD24	MD18	MD9	<u> </u>
		•	MD37	MD36	MD18		L1 Operation				
			ON(0)	ON(0)	ON(0)		ode (SSCG C				
			ON(0) OFF(1)	OFF(1)	ON(0) ON(0)		mode (SSCG mode, SSCG		1 (00/.)		
			OFF(1)	ON(0)	ON(0) OFF(1)		node, SSCG node, SSCG				
				OFF(1)	OFF(1)		node, SSCG				
			MD25		eld BIST is no	•		,	ield BIST is a	ctivated	
			MD25 MD23		e this setting	n avuvated			etting prohibit		
			MD33		e this setting				etting prohibit		
			MD24		e this setting				etting prohibit		
			MD9			is used for ar	oscillator.				used for a resor
	MODESW-E	С	ON	OFF	ON	ON	ON	OFF	OFF	OFF	
SW5		•	MD0	MD19	MD17	MD27	MD22	-	-	-	
SW5			MD0	ON(0)= Fre	e run mode			OFF(1)= S	tep up mode		
SW5			WIDU			of DDR Data R	ate				
SW5			MD19	MD17	Selection of			(-i () DE	DR4X		
SW5			MD19				R5 or 4266 MH				
SW5				MD17 ON(0) OFF(1)	6400 Mbps	/pin for LPDDI			DR4X		
SW5			MD19 ON(0)	ON(0)	6400 Mbps	/pin for LPDDF	R5 or 3733 Mb	ps/pin for LPE			
SW5			MD19 ON(0) ON(0)	ON(0) OFF(1)	6400 Mbps 6000 Mbps 5500 Mbps	/pin for LPDDI /pin for LPDDI	R5 or 3733 Mb OR5 or 3200 M	ps/pin for LPE	PDDR4X		
SW5		,	MD19 ON(0) ON(0) OFF(1)	ON(0) OFF(1) ON(0)	6400 Mbps 6000 Mbps 5500 Mbps 4800 Mbps	i/pin for LPDDf i/pin for LPDDf s/pin for LPDI	R5 or 3733 Mb DR5 or 3200 M R5 or 2133 Mb	ps/pin for LPE	PDDR4X		
SW5		,	MD19 ON(0) ON(0) OFF(1) OFF(1)	ON(0) OFF(1) ON(0) OFF(1)	6400 Mbps 6000 Mbps 5500 Mbps 4800 Mbps	/pin for LPDDI /pin for LPDDI s/pin for LPDI /pin for LPDDI	R5 or 3733 Mb DR5 or 3200 M R5 or 2133 Mb	ps/pin for LPE	PDDR4X		
SW5		,	MD19 ON(0) ON(0) OFF(1) OFF(1) MD27 ON(0) ON(0)	ON(0) OFF(1) ON(0) OFF(1) MD22 ON(0) OFF(1)	6400 Mbps 6000 Mbps 5500 Mbps 4800 Mbps Setting of p LPDDR5	I/pin for LPDDi I/pin for LPDDi I/pin for LPDDi I/pin for LPDDi Din multiplexing	R5 or 3733 Mb DR5 or 3200 M R5 or 2133 Mb	ps/pin for LPE	PDDR4X		
		, ,	MD19 ON(0) ON(0) OFF(1) OFF(1) MD27 ON(0) ON(0)	ON(0) OFF(1) ON(0) OFF(1) MD22 ON(0)	6400 Mbps 6000 Mbps 5500 Mbps 4800 Mbps Setting of p	l/pin for LPDDif l/pin for LPDDi s/pin for LPDDi l/pin for LPDDi pin multiplexing shibited	R5 or 3733 Mb DR5 or 3200 M R5 or 2133 Mb	ps/pin for LPE	PDDR4X		
SW6	Reserved	S	MD19 ON(0) ON(0) OFF(1) OFF(1) MD27 ON(0) ON(0)	ON(0) OFF(1) ON(0) OFF(1) MD22 ON(0) OFF(1)	6400 Mbps 6000 Mbps 5500 Mbps 4800 Mbps Setting of p LPDDR5	l/pin for LPDDif l/pin for LPDDif l/pin for LPDDif l/pin for LPDDif pin multiplexing hibited	R5 or 3733 Mb DR5 or 3200 M R5 or 2133 Mb	ps/pin for LPE	PDDR4X		
SW6 SW7	Reserved Reserved	S	MD19 ON(0) ON(0) OFF(1) OFF(1) MD27 ON(0) ON(0)	ON(0) OFF(1) ON(0) OFF(1) MD22 ON(0) OFF(1)	6400 Mbps 6000 Mbps 5500 Mbps 4800 Mbps Setting of p LPDDR5	u/pin for LPDDi u/pin for LPDD	R5 or 3733 Mb DR5 or 3200 M R5 or 2133 Mb	ps/pin for LPE	PDDR4X		
SW6 SW7 SW8	Reserved Reserved Reserved	S S	MD19 ON(0) ON(0) OFF(1) OFF(1) MD27 ON(0) ON(0)	ON(0) OFF(1) ON(0) OFF(1) MD22 ON(0) OFF(1)	6400 Mbps 6000 Mbps 5500 Mbps 4800 Mbps Setting of p LPDDR5	u/pin for LPDDi u/pin for LPDDi u/pin for LPDDi u/pin for LPDDi u/pin for LPDDi pin multiplexin hibited All off All off	R5 or 3733 Mb DR5 or 3200 M R5 or 2133 Mb	ps/pin for LPE	PDDR4X		
SW6 SW7	Reserved Reserved	S	MD19 ON(0) ON(0) OFF(1) OFF(1) MD27 ON(0) ON(0)	ON(0) OFF(1) ON(0) OFF(1) MD22 ON(0) OFF(1)	6400 Mbps 6000 Mbps 5500 Mbps 4800 Mbps Setting of p LPDDR5	u/pin for LPDDi u/pin for LPDD	R5 or 3733 Mb DR5 or 3200 M R5 or 2133 Mb	ps/pin for LPE	PDDR4X		

Mode switcing board

Component side (Component side view)



Solder side (Solder side view)

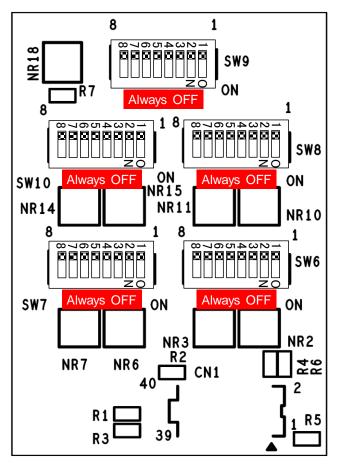


Figure 2.6.1 Initial Settings of Slide Switches on the Mode Switching Board

R-Car V4M System Reference Board Gray Hawk

Setup Manual

Publication Date: Rev. 0.90 October 6, 2023

Published by SoC System Development Department,

HPC Digital SoC Division,

High Performance Computing, Analog and Power Solutions Group,

Renesas Electronics Corporation

R-Car V4M System Reference Board

