User's Manual

R-Car V4M System Reference Board Gray Hawk

Setup Manual

RTP8A779H0ASKB0F10S

[Confidential]

This manual should only be disclosed under an NDA.

Renesas Electronics
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Notice

Revision History	R-Car V4M System Reference Board Gray Hawk Setup Manual

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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

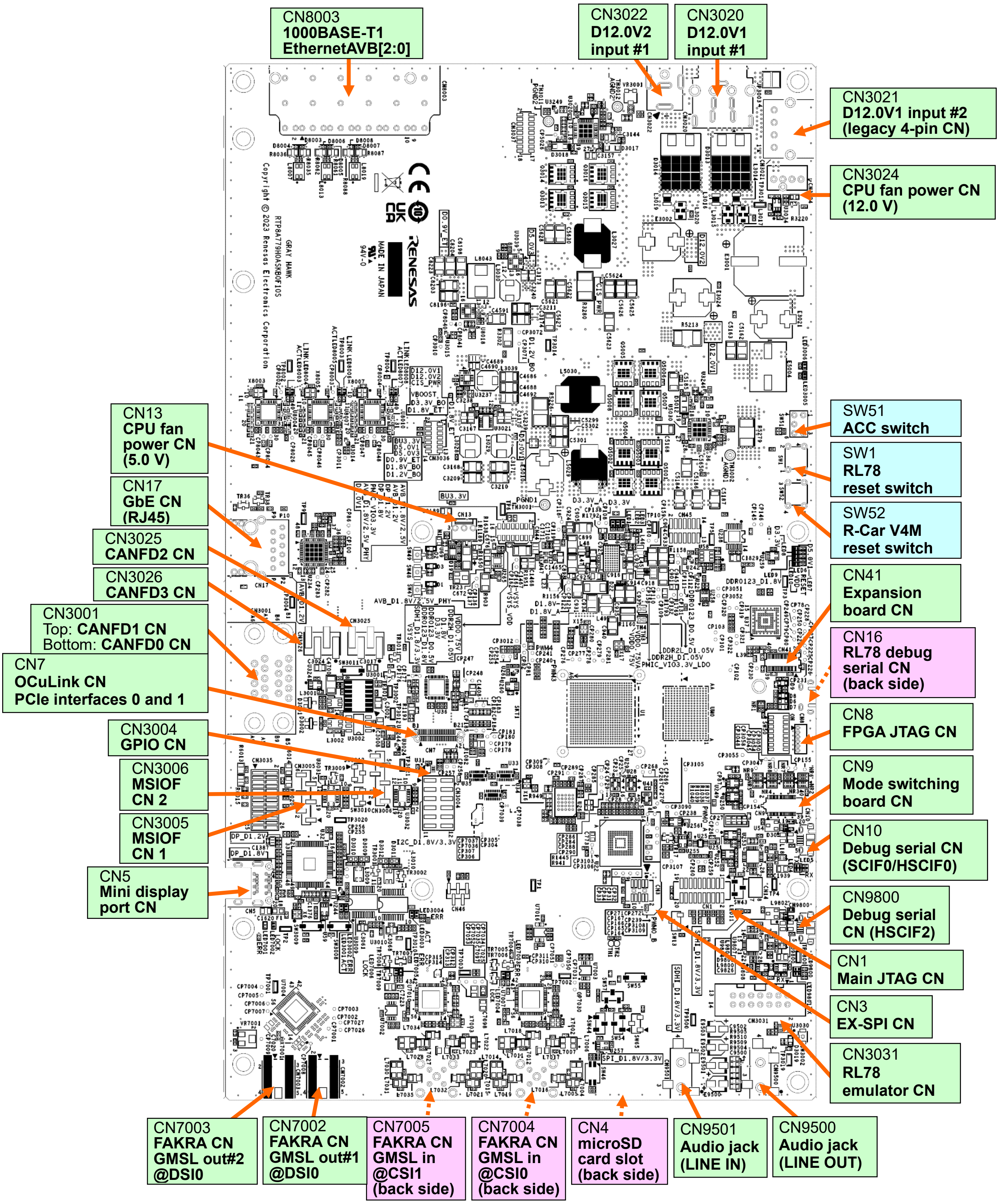


Figure 1.1.1 Location of Connectors on the Gray Hawk Single Board

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

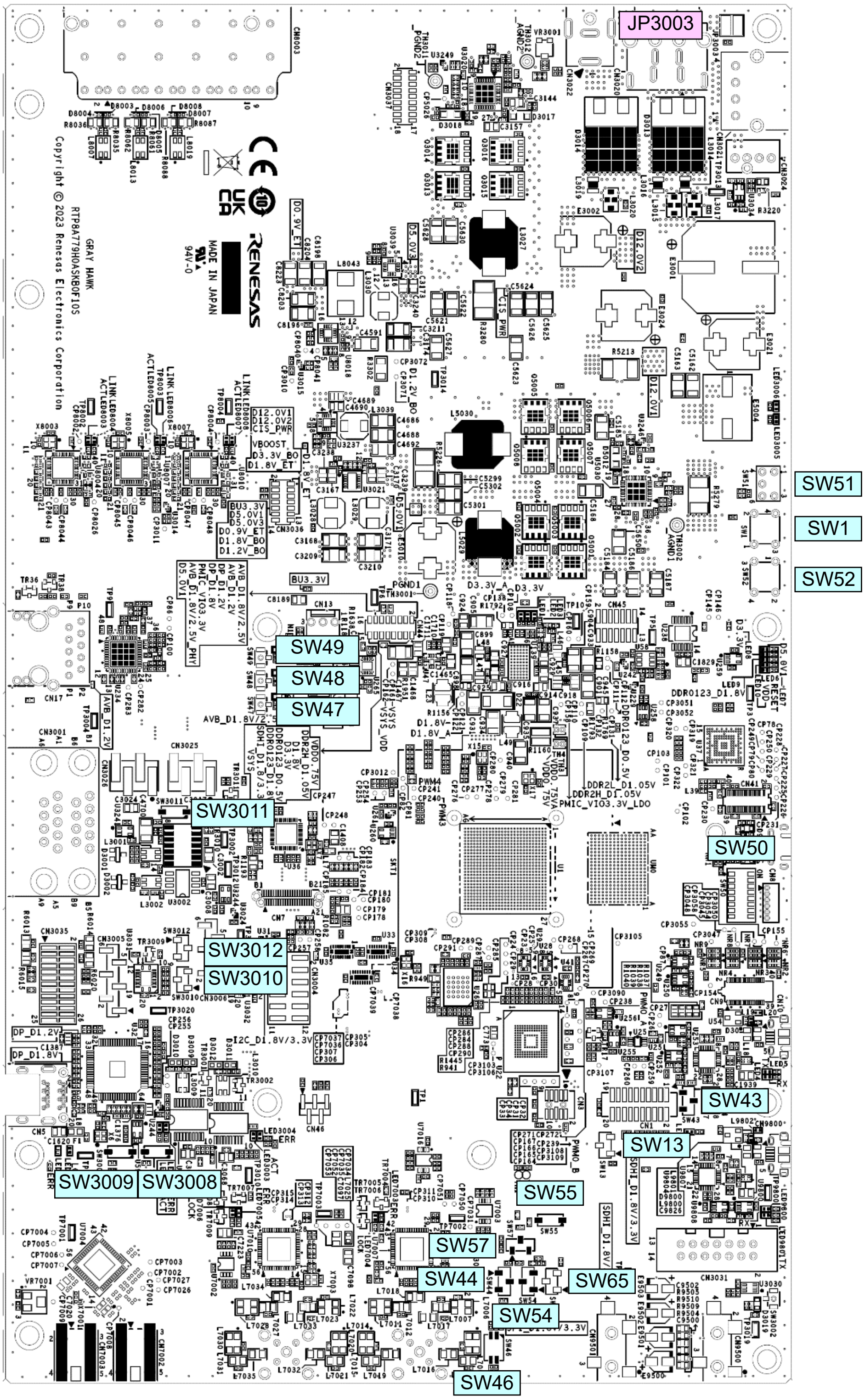


Figure 1.2.1 Location of Switches on the Gray Hawk Single Board (Component Side)

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

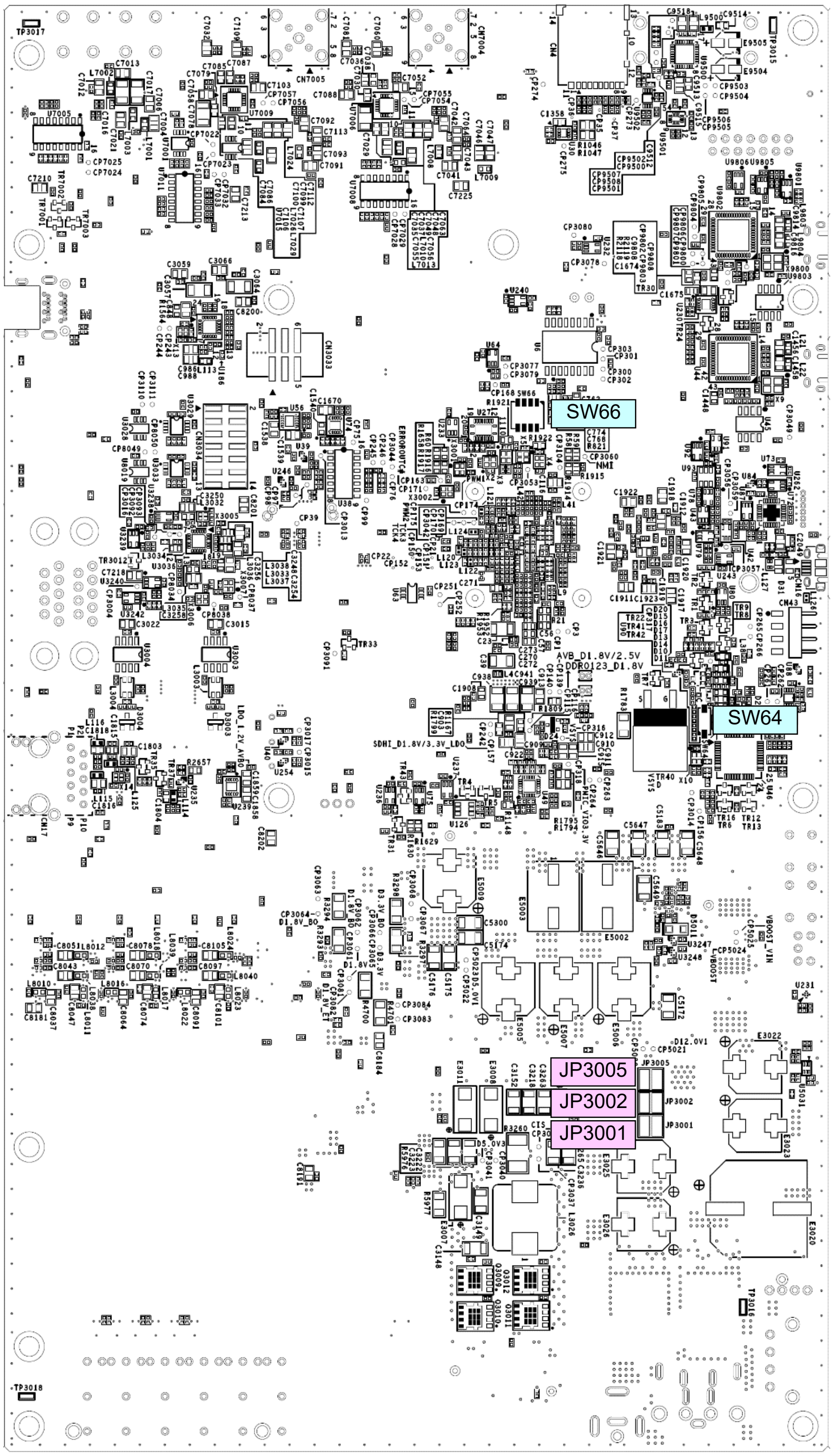


Figure 1.3.1 Location of Switches on the Gray Hawk Single Board (Solder Side)

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 static-electricity 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 - 0x0bfffffff, 1.9 GiB
Bank #1: 0x600000000 - 0x67fffffff, 2 GiB

MMC:    mmc@ee140000: 0
Loading Environment from MMC... OK
In:     serial@e6e60000
Out:    serial@e6e60000
Err:    serial@e6e60000
Net:    eth0: ethernet@e6800000
```

T.B.D.

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

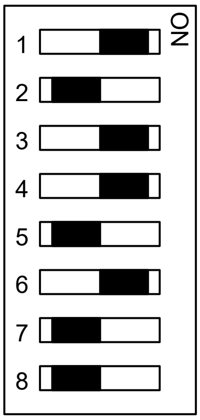
Switch Number	Switch Name	Side (C/S)	Pin 1 ▲	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Mode Switching Board										
SW1	MODESW-A	C	OFF	ON	OFF	OFF	ON	OFF	ON	ON
SW2	MODESW-B	C	OFF	ON	ON	OFF	ON	ON	ON	OFF
SW3	MODESW-C	C	ON	ON	ON	ON	OFF	ON	OFF	OFF
SW4	MODESW-D	C	ON	ON	ON	ON	ON	ON	ON	ON
SW5	MODESW-E	C	ON	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
Other than 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).

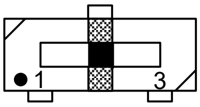
Table 2.4 Selection of Master Boot Processor (MD6)

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.

[SW57]



Function

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

Figure 2.2.2 SW57 Settings

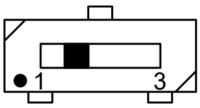
Table 2.5 Selection of QSPI0 Connection

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.

[SW13]



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

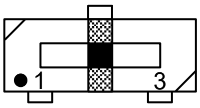
SW57	QSPI_SW_SEL from FPGA	SW13	Device Connected to the QSPI0 and QSPI1
Neutral	-	Pin 3	EX-SPI connector (CN3)
Neutral	**-**	**Pin 1**	**512-Mbit SPI flash memory (U6)**
Pin 1	-	-	512-Mbit HyperFlash memory (U26) (Initial setting)
Pin 3	Driven low	Pin 3	EX-SPI connector (CN3)
Pin 3	Driven low	Pin 1	512-Mbit 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 (neutral)	Pin 3 side
MMC connection	microSD card slot (CN4)	**eMMC memory (U22)**	Depends on the level of a signal from the MAX10 FPGA (U37)

Figure 2.2.4 SW43 Settings

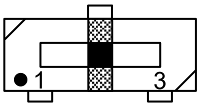
Table 2.7 Selection of MMC Connection

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

Figure 2.2.5 SW44 Settings

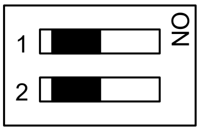
Table 2.8 Selection of DSI0 Connection

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 DSI0 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]



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

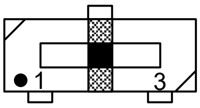
Figure 2.2.6 SW46 Settings (after Setting POSNEG1 to 1)

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 U230 and its peripheral circuit are not mounted on the boards as shipped. 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 (neutral)	Pin 3 side
SDHI/MMC interface voltage setting (VDDQ18_33_SDHI)	3.3 V	**1.8 V**	Depends on the setting of the SW65

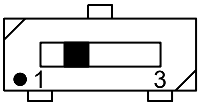
Figure 2.2.7 SW54 Settings

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 position (neutral)	**• 1.8 V is supplied on the VDDQ18_33_SDHI pins of the R-Car V4M. (Initial setting)** **• Be sure to make this setting when the following function of the Gray Hawk single board is to be used.** **• 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.
[SW65]



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.**
Pin 3 side	• 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. [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

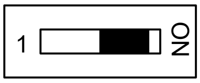
SW54	SW65	SEL_SDHI_1.8V/3.3V from FPGA	GP8_12 from R-Car V4M	SDHI/MMC Interface Voltage VDDQ18_33_SDHI
Pin 1	-	-	-	Set to 3.3 V
Pin 3	Pin 1	Driven high	-	
Pin 3	Pin 3	-	Driven high	
Neutral	**-**	**-**	**-**	**Set to 1.8 V (Initial setting)**
Pin 3	Pin 1	Driven low	-	
Pin 3	Pin 3	-	Driven low	

-: 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

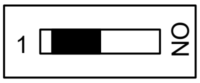
Table 2.12 Reserved

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 M01_BKUP pin	**Controlled by an output port pin of the RL78/F13**	Forcibly set to the high level

Figure 2.2.10 SW55 Settings

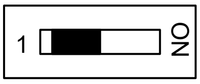
Table 2.13 Voltage Setting of the M01_BKUP Pin

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

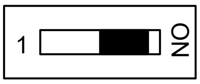
Setting	Functions
On	• The enable pin of the TJA1080ATS (U3009) device is set to the high level. • The TJA1080ATS (U3009) device is placed in the normal mode.
Off	**• The enable pin of the TJA1080ATS (U3009) device is set to the low level. (Initial setting) • The TJA1080ATS (U3009) device is placed in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

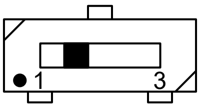
The STBN pin (pin 9) of the TJA1080ATS (U3010) device is always at the high level because it is pulled up by the R3068 resistor on the single board.

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.

[SW3010]



Function

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

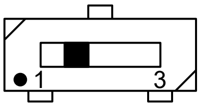
Table 2.16 Connection of the GP1_02/MSIOF1_SYNC Pin of the R-Car V4M

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).

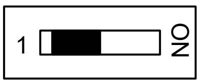
Table 2.18 Connection of the GPIO and MSIOF1 Pins of the R-Car V4M

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 than 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

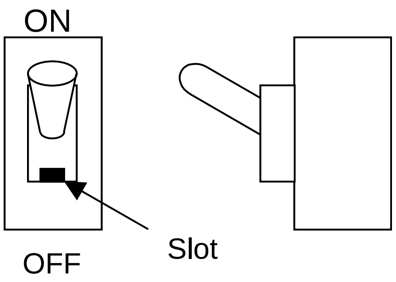
Table 2.19 Setting of the WAKE Pin of the TJR1443AT (U3001)

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.
Off	**• The WAKE pin of the TJR1443AT (U3001) is set to the high level. (Initial setting)** **• 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

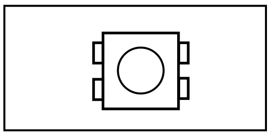
SW51 Setting	Functions
Towards the 'ON' marking	Turns on the accessory power of the Gray Hawk board. This selects supply of the power-supply voltage to the system.

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

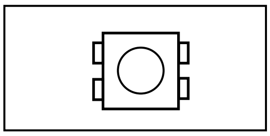
Figure 2.4.1 SW52 System Reset Switch

Table 2.21 System Reset Switch

SW Setting	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

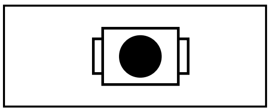
Figure 2.4.2 SW1 Reset Switch for the RL78/F13

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'.

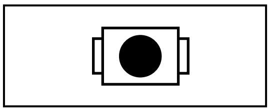
Figure 2.4.3 General-Purpose Push-Button Switches (SW47, SW48, and SW49)

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.



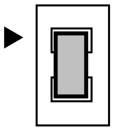
SW3002 (black)
Push: Sets P137/INTP0 to 0.

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]



1: D12.0V2
2: D12.0V1

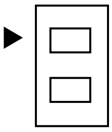
Function

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



1: GND
2: EX_PWRON

Function

JP3003	Short	• The sequence of turning the power on for the Gray Hawk board does not start even if the ACC switch (SW51) is switched from off to on.
	Open	**• The sequence of turning the power on for the Gray Hawk board starts if the ACC switch (SW51) is switched from off to on. The sequence of turning power to the Gray Hawk board off starts if the ACC switch is switched from on to off. (Initial setting)**

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 Number	Switch Name	Side (C/S)	Pin 1 ▲	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Mode Switching Board										
SW1	MODESW-A	C	OFF	ON/OFF	OFF	OFF	ON	OFF	ON	ON
			MD7	MD6	-	MD8	MD4	MD3	MD2	MD1

MD7	MD6	Selection of Master Boot Processor
OFF(1)	**ON(0)**	**Booted through ICUMXA**
OFF(1)	OFF(1)	Booted through Cortex-R52
Other than above		Setting prohibited

MD8	ON(0)= Setting prohibited	**OFF(1)= Use this setting**

MD4	MD3	MD2	MD1	Selection of Boot Device
ON(0)	ON(0)	OFF(1)	ON(0)	HyperFlash boot at 160MHz using DMA
ON(0)	ON(0)	OFF(1)	OFF(1)	HyperFlash boot at 80MHz using DMA
ON(0)	**OFF(1)**	**ON(0)**	**ON(0)**	**Serial Flash boot at single read 40MHz using DMA**
ON(0)	OFF(1)	OFF(1)	ON(0)	Serial Flash boot using DMA
ON(0)	OFF(1)	OFF(1)	OFF(1)	Octal SPI Flash 160/80MHz using DMA
OFF(1)	ON(0)	OFF(1)	ON(0)	HyperFlash at 160MHz(320Mbps) using XIP mode
OFF(1)	ON(0)	OFF(1)	OFF(1)	HyperFlash at 80MHz using XIP mode
OFF(1)	OFF(1)	ON(0)	OFF(1)	eMMC boot at 50MHz x8 bus widths using DMA
OFF(1)	OFF(1)	OFF(1)	OFF(1)	SCIF/HSCIF download mode
Other than above				Setting prohibited

Switch Number	Switch Name	Side (C/S)	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
SW2	MODESW-B	C	OFF	ON	ON	OFF	ON	ON	ON	OFF
			MD5	MD35	MDT0	MD21	MD20	MD11	MD10	-

MD5	ON(0) = Settings prohibited	**OFF(1) = Normal boot.**
MD35	**ON(0)= Use this setting**	OFF(1)= Setting prohibited
MDT0	ON(0) = (See table below)	OFF(1) = (See table below)
MD21	ON(0) = (See table below)	OFF(1) = (See table below)
MD20	ON(0) = (See table below)	OFF(1) = (See table below)
MD11	ON(0) = (See table below)	OFF(1) = (See table below)
MD10	ON(0) = (See table below)	OFF(1) = (See table below)

MDT0	MD21	M20	MD11	MD10	Main_JTAG	Sub_JTAG
ON(0)	**ON(0)**	**ON(0)**	**ON(0)**	**ON(0)**	-	**Normal Function**
ON(0)	ON(0)	ON(0)	OFF(1)	ON(0)	ICUMX JTAG	Normal Function
ON(0)	ON(0)	ON(0)	OFF(1)	OFF(1)	ICUMX LPD	Normal Function
ON(0)	ON(0)	OFF(1)	ON(0)	ON(0)	ICUMX JTAG	CoreSight
ON(0)	ON(0)	OFF(1)	ON(0)	OFF(1)	ICUMX LPD	CoreSight
ON(0)	**OFF(1)**	**ON(0)**	**ON(0)**	**ON(0)**	**CoreSight**	**Normal Function**
OFF(1)	ON(0)	ON(0)	ON(0)	ON(0)	VDSP0	Normal Function
OFF(1)	ON(0)	ON(0)	ON(0)	OFF(1)	VDSP1	Normal Function
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 Function
OFF(1)	OFF(1)	OFF(1)	ON(0)	ON(0)	CoreSight	DUL
Other than above					Setting prohibited	

Switch Number	Switch Name	Side (C/S)	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
SW3	MODESW-C	C	ON	ON	ON	ON	OFF	ON	OFF	OFF
			MD14	MD13	MD29	EX-MD	MD16	MD32	MD31	-

MD14	MD13	Selection of PLL Initial Multiplication Ratio
ON(0)	**ON(0)**	**EXTAL input=16.66 MHz, EXTAL Divider= x1/1**
ON(0)	OFF(1)	EXTAL input= 20.00 MHz, EXTAL Divider= x1/1
OFF(1)	ON(0)	Setting prohibited
OFF(1)	OFF(1)	EXTAL input= 33.33 MHz, EXTAL Divider= x1/2

MD29	**ON(0)= Selects EXTALR as RCLK reference**	OFF(1)= Selects on chip oscillator (OCO) as RCLK reference
EX-MD	**ON(0)= Selects mode settings by the slide switch**	OFF(1)= Setting prohibited
MD16	ON(0)= Setting prohibited	**OFF(1)= Use this setting**

MD32	MD31	Selects SCIF or HSCIF downloading mode
ON(0)	ON(0)	SCIF download (IO voltage 3.3V)
ON(0)	**OFF(1)**	**HSCIF download 921,600bps (IO voltage 3.3V)**
OFF(1)	ON(0)	HSCIF download 1,843,200bps (IO voltage 1.8V)
Other than above		Setting prohibited

Switch Number	Switch Name	Side (C/S)	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
SW4	MODESW-D	C	ON	ON	ON	ON	ON	ON	ON	ON
			MD37	MD36	MD25	MD23	MD33	MD24	MD18	MD9

MD37	MD36	MD18	Selects PLL1 Operation Mode
ON(0)	**ON(0)**	**ON(0)**	**Integer mode (SSCG OFF)**
ON(0)	OFF(1)	ON(0)	Fractional mode (SSCG OFF)
OFF(1)	*	ON(0)	Fractional mode, SSCG (Down spread -1.0%)
*	ON(0)	OFF(1)	Fractional mode, SSCG (Center spread ±0.5%)
*	OFF(1)	OFF(1)	Fractional mode, SSCG (Center spread ±1.0%)

MD25	**ON(0)= Field BIST is not activated**	OFF(1)= Field BIST is activated
MD23	**ON(0)= Use this setting**	OFF(1)= Setting prohibited
MD33	**ON(0)= Use this setting**	OFF(1)= Setting prohibited
MD24	**ON(0)= Use this setting**	OFF(1)= Setting prohibited
MD9	**ON(0)= The EXTAL pin is used for an oscillator.**	OFF(1)= The EXTAL and XTAL pins are used for a resonator.

Switch Number	Switch Name	Side (C/S)	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
SW5	MODESW-E	C	ON	OFF	ON	ON	ON	OFF	OFF	OFF
			MD0	MD19	MD17	MD27	MD22	-	-	-

MD0	**ON(0)= Free run mode**	OFF(1)= Step up mode

MD19	MD17	Selection of DDR Data Rate
ON(0)	ON(0)	6400 Mbps/pin for LPDDR5 or 4266 Mbps/pin for LPDDR4X
ON(0)	OFF(1)	6000 Mbps/pin for LPDDR5 or 3733 Mbps/pin for LPDDR4X
OFF(1)	**ON(0)**	**5500 Mbps/pin for LPDDR5 or 3200 Mbps/pin for LPDDR4X**
OFF(1)	OFF(1)	4800 Mbps/pin for LPDDR5 or 2133 Mbps/pin for LPDDR4X

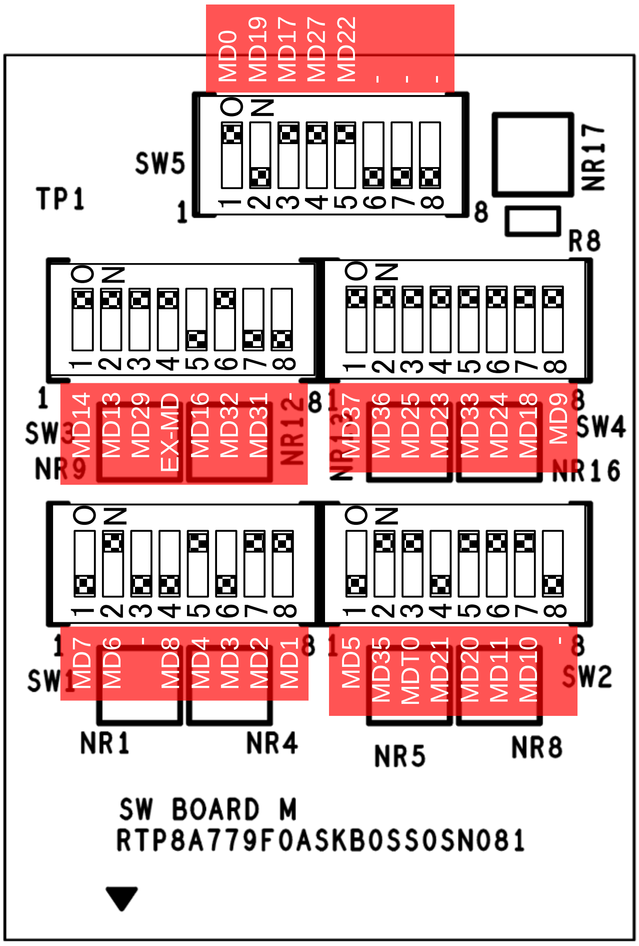
MD27	MD22	Setting of pin multiplexing of DDR phy
ON(0)	**ON(0)**	**LPDDR5**
ON(0)	OFF(1)	LPDDR4X
Other than above		Setting prohibited

Switch Number	Switch Name	Side (C/S)	Pin 1–8
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

Mode switcing board

Component side (Component side view)

Solder side (Solder side view)



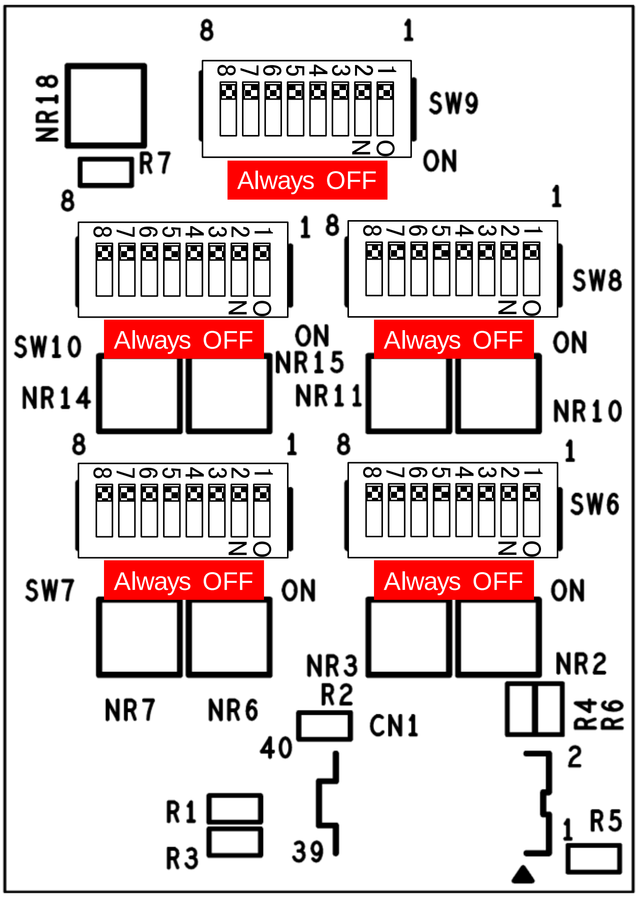


Figure 2.6.1 Initial Settings of Slide Switches on the Mode Switching Board

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Gray Hawk
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