

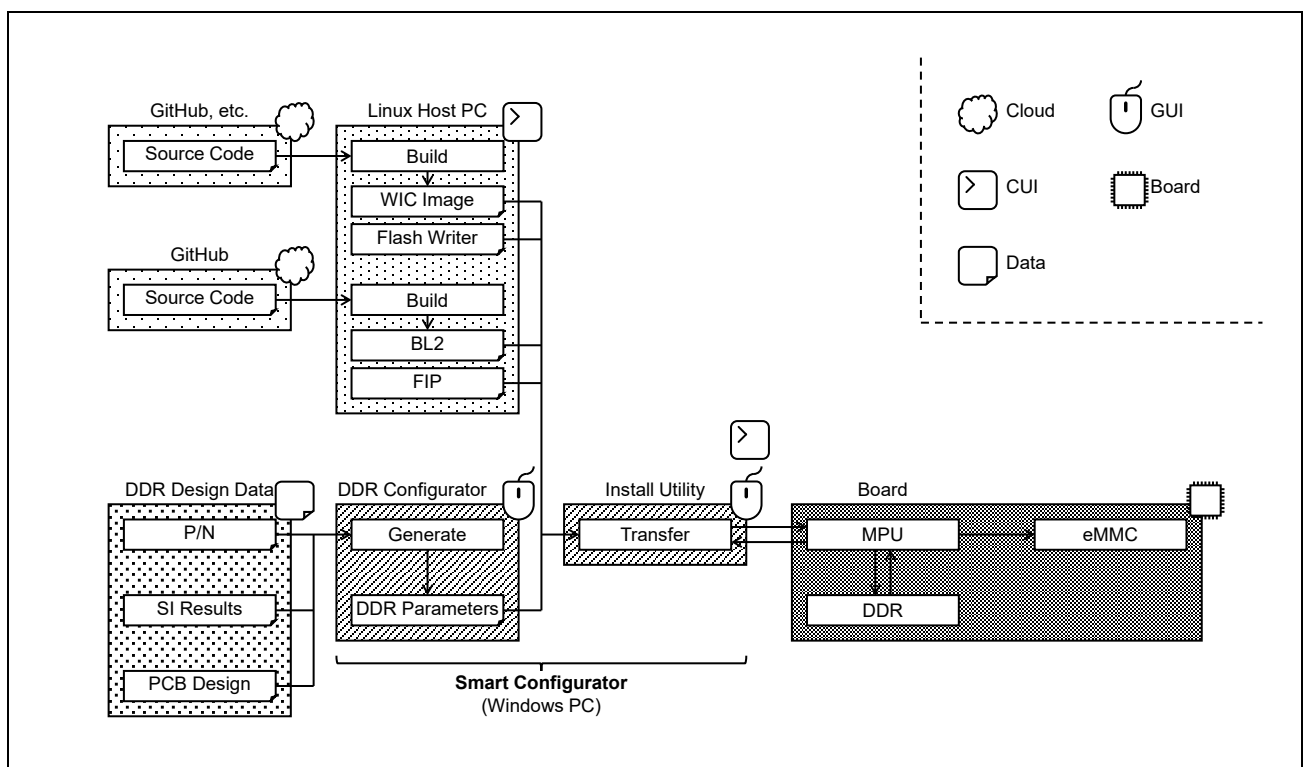
Smart Configurator

RZ Family Smart Configurator Start-up Guide

Introduction

This document shows how to use "DDR Tools", "Install Utility" in "RZ Smart Configurator".

- "DDR Tools" is a GUI tool to check DDR with DDR parameters.
- "Install Utility" is a GUI / CUI tool to install Linux on eMMC.



Target Device

- RZ/G2L
- RZ/G3S
- RZ/G3E
- RZ/G3L, RZ/G3SE

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1. Requirements

These tools can be used for EVKs below without modification.

- EVKIT
 - RZ/G2L-EVKIT (RTK9744L23S01000BE)
 - RZ/G3S-EVKIT (RTK9845S33S01000BE)
 - RZ/G3E-EVKIT (RTK9947E57S01000BE)
 - RZ/G3L-EVKIT (RTK9846L46S01000BE)
- Linux Host PC and Windows PC
 - See also each start-up guide of MPU.

2. Supported Linux Versions

Supported Linux versions are shown below.

Table 2.1 **Supported Linux Versions**

MPU	Linux Version
RZ/G2L	VLP 4.0.0, 4.0.1
RZ/G3S	VLP 3.0.7, 4.0.1
RZ/G3E	BSP 1.0.0
RZ/G3L	BSP 1.0.0

3. Preparation

3.1 Host PC

3.1.1 Download Android SDK Platform Tools

It is necessary to install "Android SDK Platform Tools" and "Google USB Driver" on Windows PC.

- [SDK Platform Tools](#)
- [Google USB Driver](#)

3.1.2 Install Android SDK Platform Tools

In this document, "Android SDK Platform Tools" is extracted in C:\tmp folder. So, executable files are included in C:\tmp\platform-tools.

In this document, "Google USB Driver" is extracted in C:\tmp folder. To install "Google USB Driver", you should right click `android_winusb.inf` and select "Install".

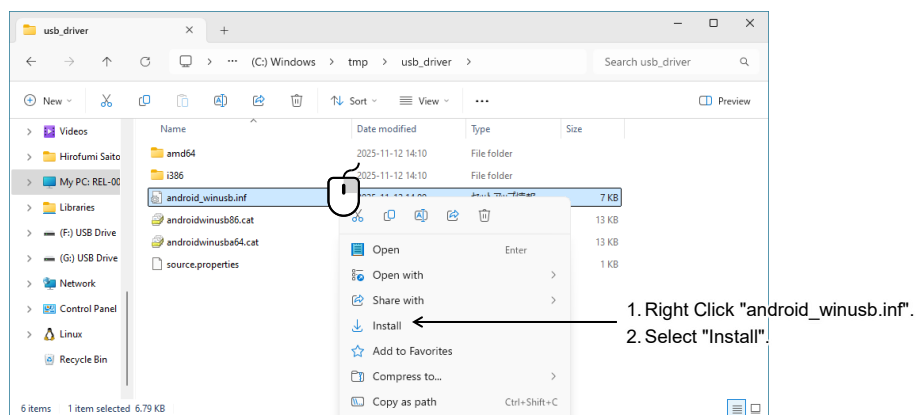


Figure 3.1 Install Driver

3.2 Embedded Programs

"Smart Configurator" includes built embedded programs for each target EVK. If another board is used, please build embedded programs for the target device on Linux Host PC.

This section shows how to build three embedded programs.

- "Flash Writer"
- "BL2" (Boot Loader Stage 2)
- "FIP" (Firmware Image Package)

Please see also the "Linux Start-up Guide" for the target device to build Linux image.

If the DDR parameters file is generated by the "DDR Configurator" in "Smart Configurator", please generate DDR parameters file by checking "Debug Mode 1" and "Debug Mode 2" for "DDR Tools".

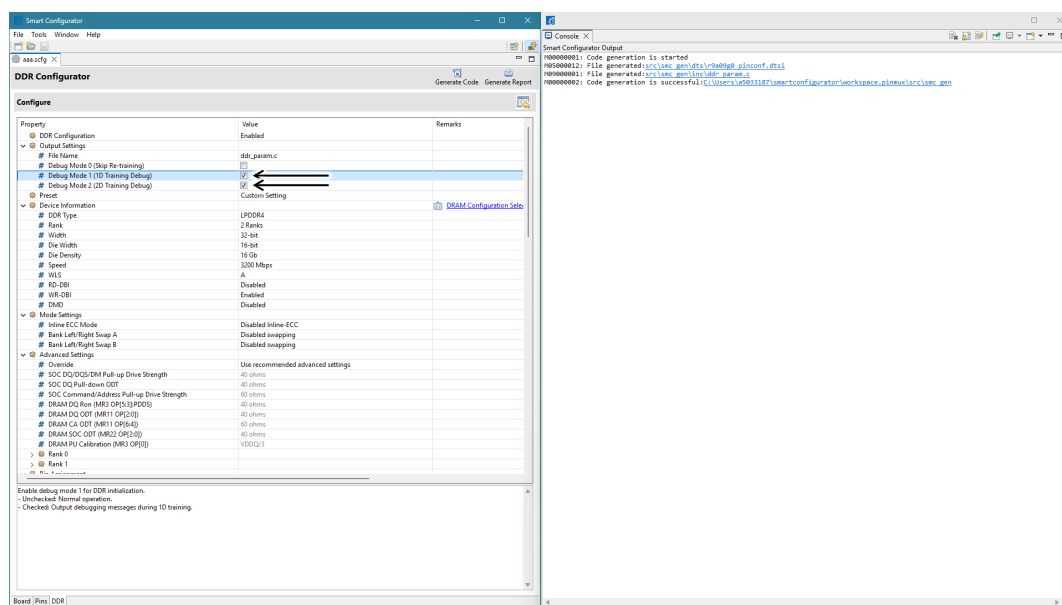


Figure 3.1 Debug Mode 1 and 2

3.2.1 Environment Variables

Please set the variables following the table below.

Table 3.1 Environment Variables

Variables	RZ/G2L	RZ/G3S	RZ/G3E	RZ/G3L or RZ/G3SE
MPU_NAME	g2l	g3s	g3e	g3l
FW_VER	v1.2.0_RZ/G2L	v1.2.0_RZ/G3S	v1.2.0_RZ/G3E	v1.2.0_RZ/G3L
UBOOT_VER	v1.2.0_RZ/G2L	v1.2.0_RZ/G3S	v1.2.0_RZ/G3E	v1.2.0_RZ/G3L
TFA_VER	2.10.5/rz_1.1.0	2.10.5/rz_1.1.0	2.10.5/rzg3e_1.2.0	2.10.5/rzg3l_1.0.1
BOARD	RZG2L_SMARC_PMIC	RZG3S_SMARC	RZG3E_SMARC	RZG3L_SMARC

In the Linux environment, please set these environment variables.

Code 3.1 Set Environment Variables for RZ/G2L

```
$ export MPU_NAME=g2l
$ export FW_VER=v1.2.0_RZ/G2L
$ export UBOOT_VER=v1.2.0_RZ/G2L
$ export TFA_VER=2.10.5/rz_1.1.0
$ export BOARD=RZG2L_SMARC_PMIC
```

Code 3.1 Set Environment Variables for RZ/G3S

```
$ export MPU_NAME=g3s
$ export FW_VER=v1.2.0_RZ/G3S
$ export UBOOT_VER=v1.2.0_RZ/G3S
$ export TFA_VER=2.10.5/rz_1.1.0
$ export BOARD=RZG3S_SMARC
```

Code 3.1 Set Environment Variables for RZ/G3E

```
$ export MPU_NAME=g3e
$ export FW_VER=v1.2.0_RZ/G3E
$ export UBOOT_VER=v1.2.0_RZ/G3E
$ export TFA_VER=2.10.5/rzg3e_1.2.0
$ export BOARD=RZG3E_SMARC
```

Code 3.1 Set Environment Variables for RZ/G3L or RZ/G3SE

```
$ export MPU_NAME=g3l
$ export FW_VER=v1.2.0_RZ/G3L
$ export UBOOT_VER=v1.2.0_RZ/G3L
$ export TFA_VER=2.10.5/rzg3l_1.0.1
$ export BOARD=RZG3L_SMARC
```

3.2.2 Other Settings

Code 3.1 Create Working Directory

```
$ export WORKING_DIR=$(pwd)/install_utility_${MPU_NAME}
$ mkdir -pv ${WORKING_DIR}
```

Code 3.1 Download GCC

```
$ cd ${WORKING_DIR}
$ wget 'https://developer.arm.com/-/media/Files/downloads/gnu-a/10.3-2021.07/binrel/gcc-arm-10.3-2021.07-x86_64-aarch64-none-elf.tar.xz'
$ tar -xvf gcc-arm-10.3-2021.07-x86_64-aarch64-none-elf.tar.xz
```

3.2.3 Build Flash Writer

Code 3.1 Build Flash Writer

```
$ cd ${WORKING_DIR}
$ git clone 'https://github.com/renesas-rz/rz_tool_flash_writer.git'

$ cd rz_tool_flash_writer
$ git checkout ${FW_VER}

$ cd ${WORKING_DIR}/rz_tool_flash_writer/scripts
$ bash -x ./build_flash_writer_${MPU_NAME}.sh ${BOARD}
```

Then MOT file is created in `${WORKING_DIR}/rz_tool_flash_writer/AArch64_output` directory.

Please store it in `C:\tmp\sc` folder on Windows PC.

3.2.4 Build BL2 and FIP

Code 3.1 Build BL2 and FIP

```
$ cd ${WORKING_DIR}
$ git clone 'https://github.com/renesas-rz/rz_tool_u-boot.git'

$ cd rz_tool_u-boot
$ git checkout ${UBOOT_VER}

$ cd ${WORKING_DIR}
$ git clone 'https://github.com/renesas-rz/rzg_trusted-firmware-a.git'

$ cd rzg_trusted-firmware-a
$ git checkout ${TFA_VER}

$ cd ${WORKING_DIR}/rz_tool_u-boot/build_scripts
$ bash -x ./create_${MPU_NAME}_tfa_uboot.sh
```

Then SREC and BIN files are created in `${WORKING_DIR}/output` directory.

Please store them in `C:\tmp\sc` folder on Windows host PC.

3.2.5 Copy DDR Parameter File(s)

Please store DDR parameter file(s) in C:\tmp\sc folder on Windows host PC.

Table 3.2 Supported Linux Versions

MPU	Files	Directories
RZ/G2L	param_mc_C-011_D4-01-1.c	\${WORKING_DIR}/rz_tool_flash_writer/ddr/\${MPU_NAME}
	param_swizzle_T1bc.c	\${WORKING_DIR}/rz_tool_flash_writer/ddr/common
RZ/G3S	ddr_param_def_lpddr4.c	\${WORKING_DIR}/rz_tool_flash_writer/soc/\${MPU_NAME}/board/smarc
RZ/G3E	ddr_param_def_lpddr4.c	\${WORKING_DIR}/rz_tool_flash_writer/soc/\${MPU_NAME}/board/smarc
RZ/G3L	ddr_param_def_lpddr4.c	\${WORKING_DIR}/rz_tool_flash_writer/soc/\${MPU_NAME}/board/smarc

3.2.6 Built Files

Finally, these files are prepared on Windows host PC.

Table 3.3 Files for RZ/G2L

Items	Files
Directory	C:\tmp\sc
DDR Parameters	param_mc_C-011_D4-01-1.c param_swizzle_T1bc.c
Flash Writer	Flash_Writer_SCIF_RZG2L_SMARC_PMIC_DDR4_2GB_1PCS.mot
BL2	bl2_bp_mmc-smarc-rzg2l_pmic.srec
FIP	fip-smarc-rzg2l_pmic.srec
WIC Image	core-image-minimal-smarc-rzg2l.rootfs.wic.gz

Table 3.4 Files for RZ/G3S

Items	Files
Directory	C:\tmp\sc
DDR Parameters	ddr_param_def_lpddr4.c
Flash Writer	Flash_Writer_SCIF_RZG3S_SMARC_LPDDR4.mot
BL2	bl2_bp_mmc-smarc-rzg3s.srec
FIP	fip-smarc-rzg3s.srec
WIC Image	core-image-minimal-smarc-rzg3s.rootfs.wic.gz

Table 3.5 Files for RZ/G3E

Items	Files
Directory	C:\tmp\sc
DDR Parameters	ddr_param_def_lpddr4.c
Flash Writer	Flash_Writer_SCIF_RZG3E_SMARC_LPDDR4X.mot
BL2	bl2_bp_mmc-smarc-rzg3e.srec
FIP	fip-smarc-rzg3e.srec
WIC Image	core-image-minimal-smarc-rzg3e.rootfs.wic.gz

Table 3.6 Files for RZ/G3L or RZ/G3SE

Items	Files
Directory	C:\tmp\sc
DDR Parameters	ddr_param_def_lpddr4.c
Flash Writer	Flash_Writer_SCIF_RZG3L_SMARC_LPDDR4X.mot
BL2	bl2_bp_mmc-smarc-rzg3l.srec
FIP	fip-smarc-rzg3l.srec
WIC Image	core-image-minimal-smarc-rzg3l.rootfs.wic.gz

4. Install Linux using "Install Utility"

In the previous section, all required files were stored in `C:\tmp\sc` folder on Windows PC. These files are used for DDR verification and Linux installation.

4.1 Common Settings

1. Execute "Smart Configurator".
2. Select "Window" and select "Preferences".
3. Click "DDR" on the side menu.
4. Click "Browse" button of "SDK platform" and select folder which "Android SDK Platform Tools" is included.
 - In this document, please set `C:\tmp\platform-tools`.
5. Click "Apply" button and "Apply and Close" button.
6. Close "Smart Configurator".

This procedure is only needed when launching "Smart Configurator" for the first time.

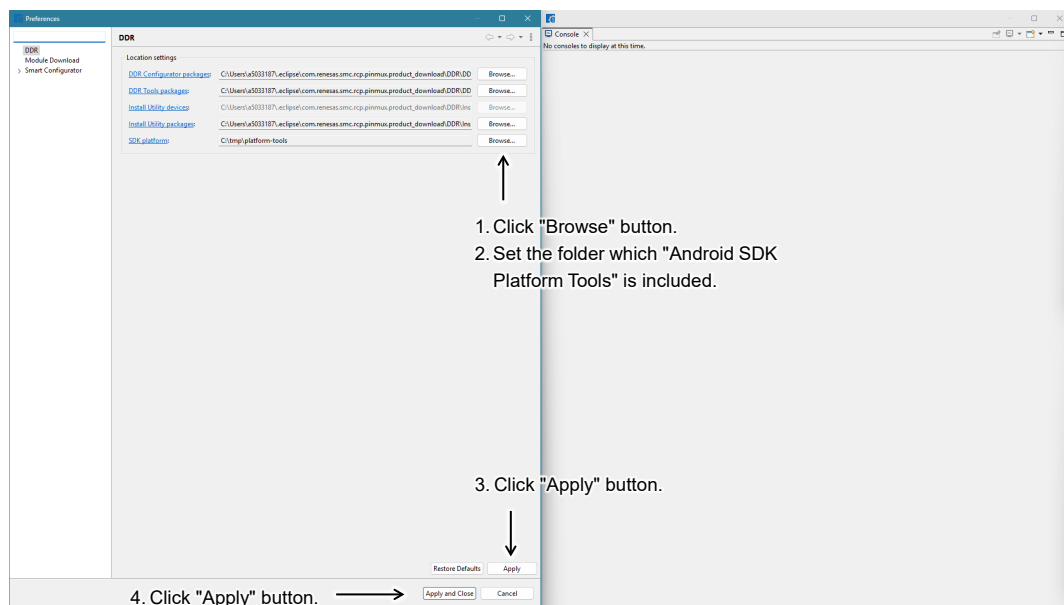


Figure 4.1 Set SDK Platform Directories

4.2 RZ/G2 Series

In this version, "Install Utility" support installing Linux for RZ/G2L.

4.2.1 Check DDR

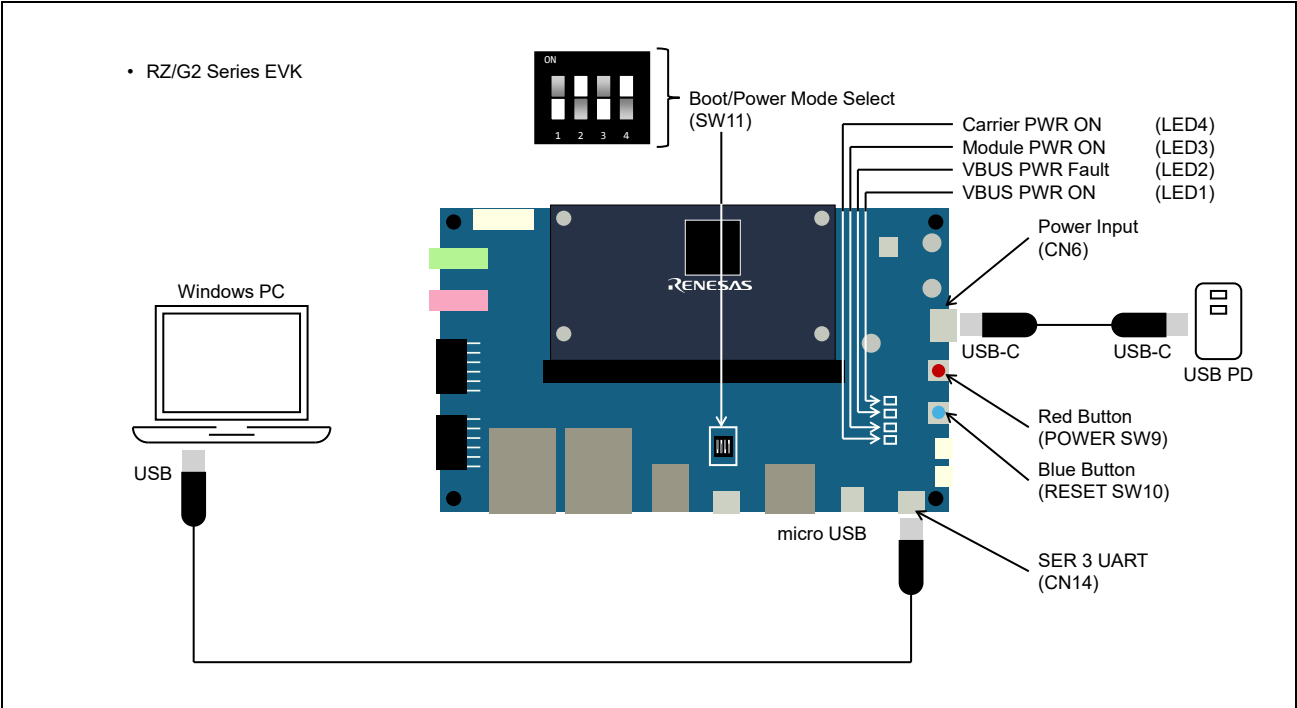


Figure 4.2 Connections for RZ/G2 Series

1. Switch "Boot/Power Mode Select (SW11)" to SCIF download mode.

Table 4.1 SCIF Download Mode

Mode	Switch Image	Descriptions
SCIF Download Mode		1: OFF, 2: ON, 3: OFF, 4: ON

2. Connect "Power Input (CN6)" and USB PD power supply.
 - Please confirm that the "VBUS PWR ON (LED1)" and "Module PWR ON (LED3)" are on.
3. Connect "SER 3 UART (CN14)" and USB on Windows PC.
4. Connect "USB 0 (OTG) (CN11)" and USB on Windows PC.
5. Press and hold "Red Button (POWER SW9)".
 - Confirm that the "VBUS PWR ON (LED1)", "Module PWR ON (LED3)" and "Carrier PWR ON (LED4)" are on.
6. Execute "Smart Configurator".
7. Select "Tools" and select "DDR Tools".

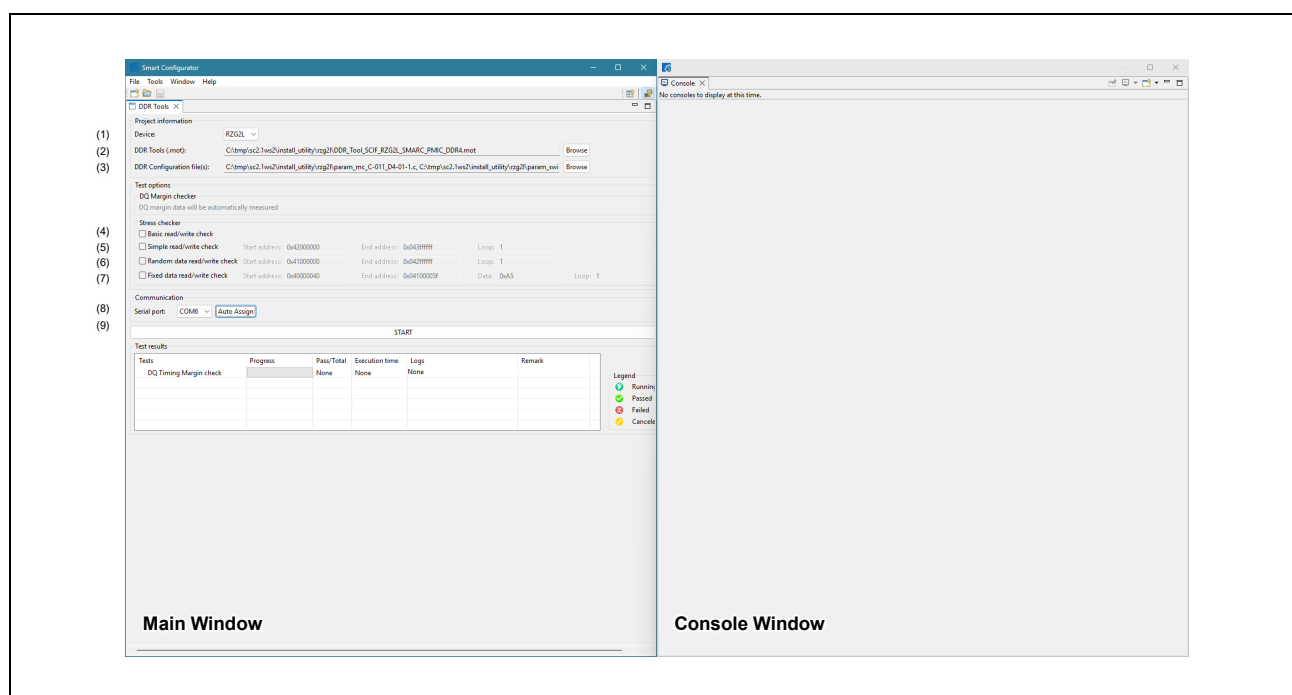


Figure 4.3 DDR Tools for RZ/G2 Series

8. Select "Device" (1).
9. Browse "DDR Tools (.mot)" which is built according to this document (2).
 - In this document, please set .mot file in C:\tmp\sc folder.
10. Browse "DDR Configuration file(s)" and select .c files (3).
 - In this document, please set .c in C:\tmp\sc folder.
11. (Optional) Check if this test is needed. (4)
12. (Optional) Check if this test is needed and fill parameters. (5)
13. (Optional) Check if this test is needed and fill parameters. (6)
14. (Optional) Check if this test is needed and fill parameters. (7)
15. Select "Serial ports", or push "Auto Assign" button. (8)
 - Please check serial port number using "Device Manager".

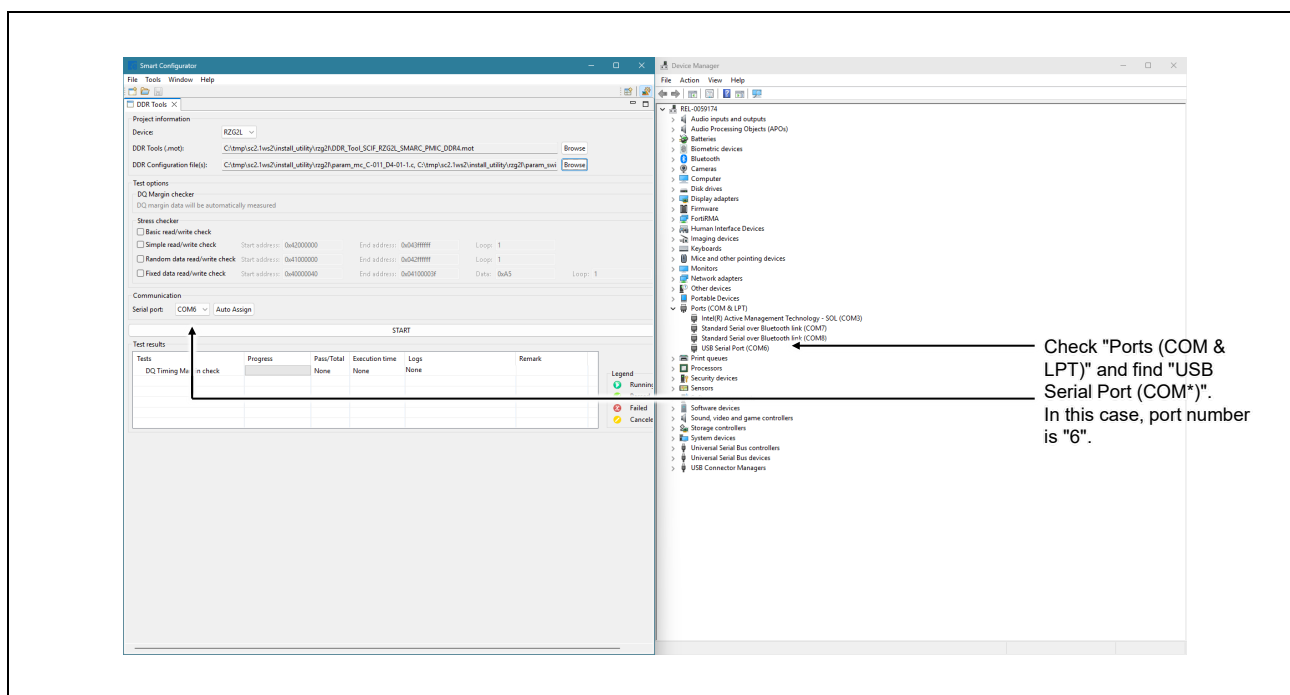


Figure 4.4 Device Manager

16. Click "START" button to start to check DDR (9).
17. Pop-up messages appear. Please confirm "Boot/Power Mode Select (SW11)" is SCIF download mode, and press "Blue Button (RESET SW10)" on EVK.

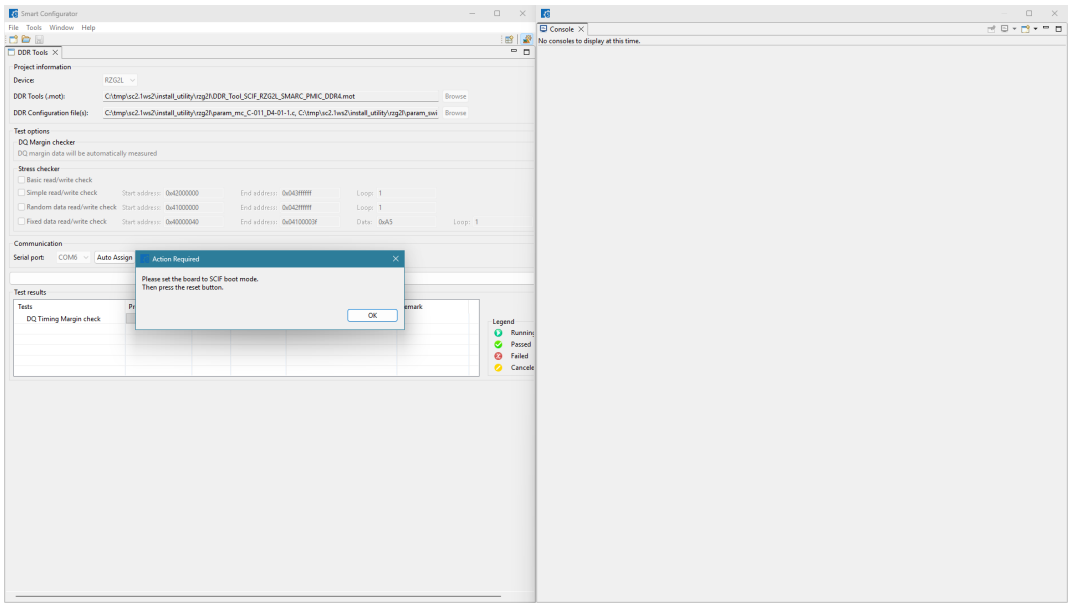


Figure 4.5 Pop-up Message - 1

18. Console log is shown.

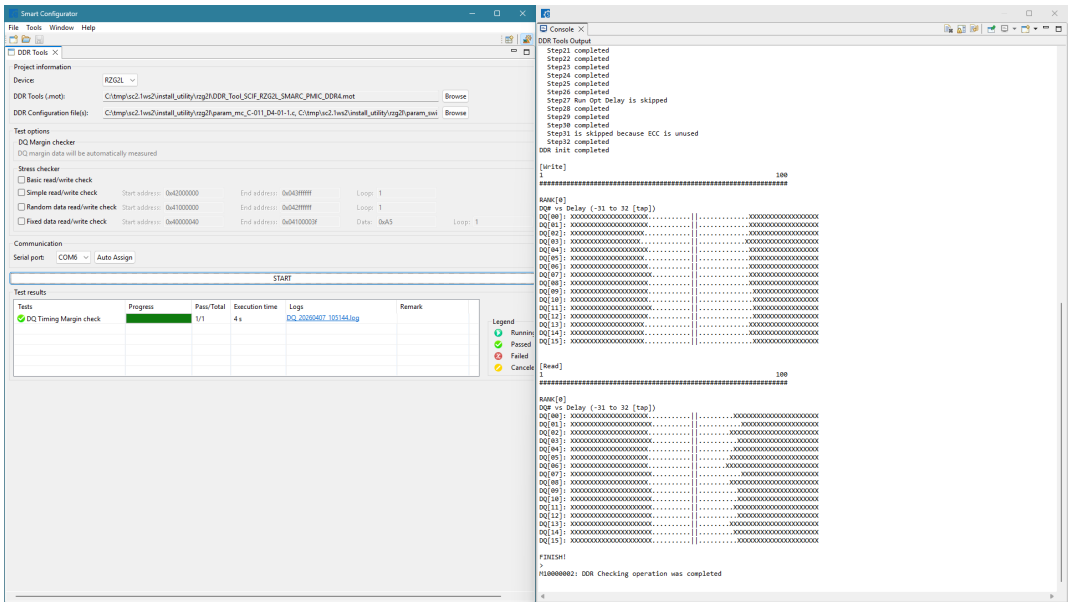


Figure 4.6 Console Log for RZ/G2 Series

4.2.2 Install Linux via USB OTG

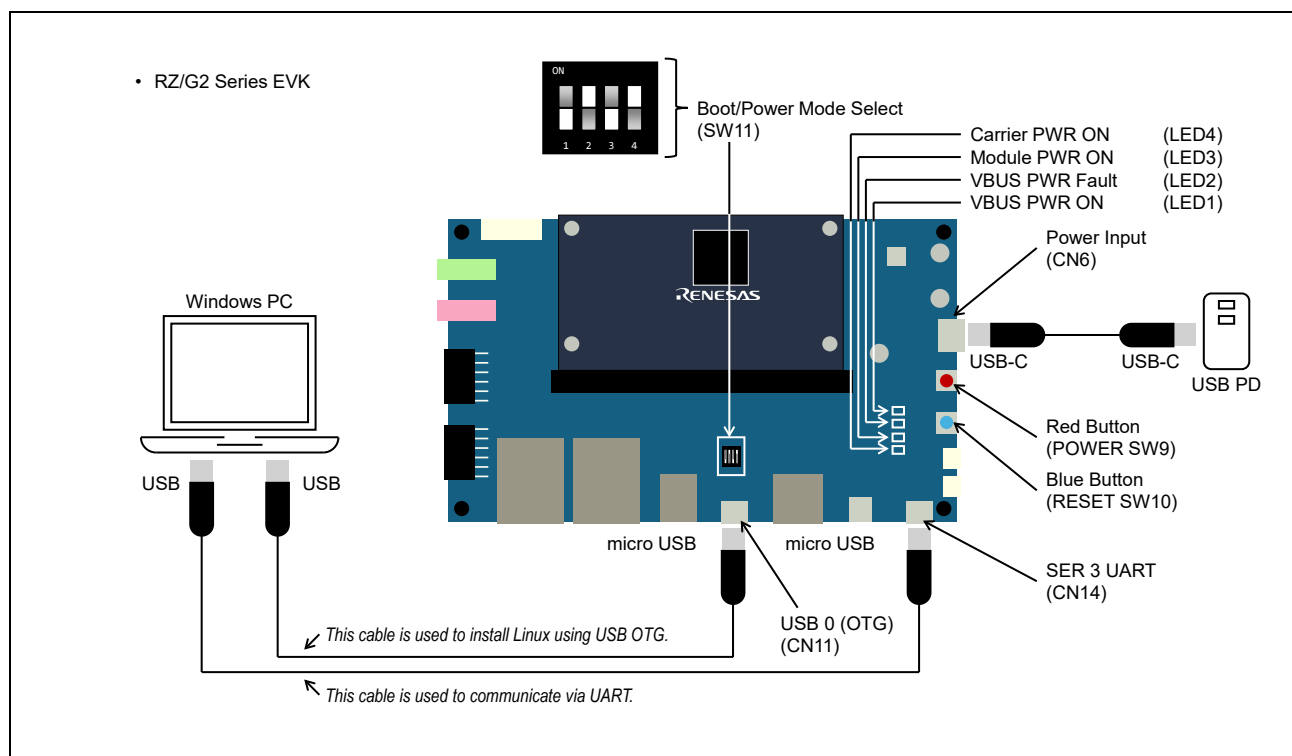


Figure 4.7 **Connections for RZ/G2 Series**

1. Switch "Boot/Power Mode Select (SW11)" to SCIF download mode.

Table 4.2 SCIF Download Mode

Mode	Switch Image	Descriptions
SCIF Download Mode		1: OFF, 2: ON, 3: OFF, 4: ON

2. Connect "Power Input (CN6)" and USB PD power supply.
 - Please confirm that the "VBUS PWR ON (LED1)" and "Module PWR ON (LED3)" are on.
3. Connect "SER 3 UART (CN14)" and USB on Windows PC.
4. Connect "USB 0 (OTG) (CN11)" and USB on Windows PC.
5. Press and hold "Red Button (POWER SW9)".
 - Confirm that the "VBUS PWR ON (LED1)", "Module PWR ON (LED3)" and "Carrier PWR ON (LED4)" are on.
6. Execute "Smart Configurator".
7. Select "Tools" and select "Install Utility".

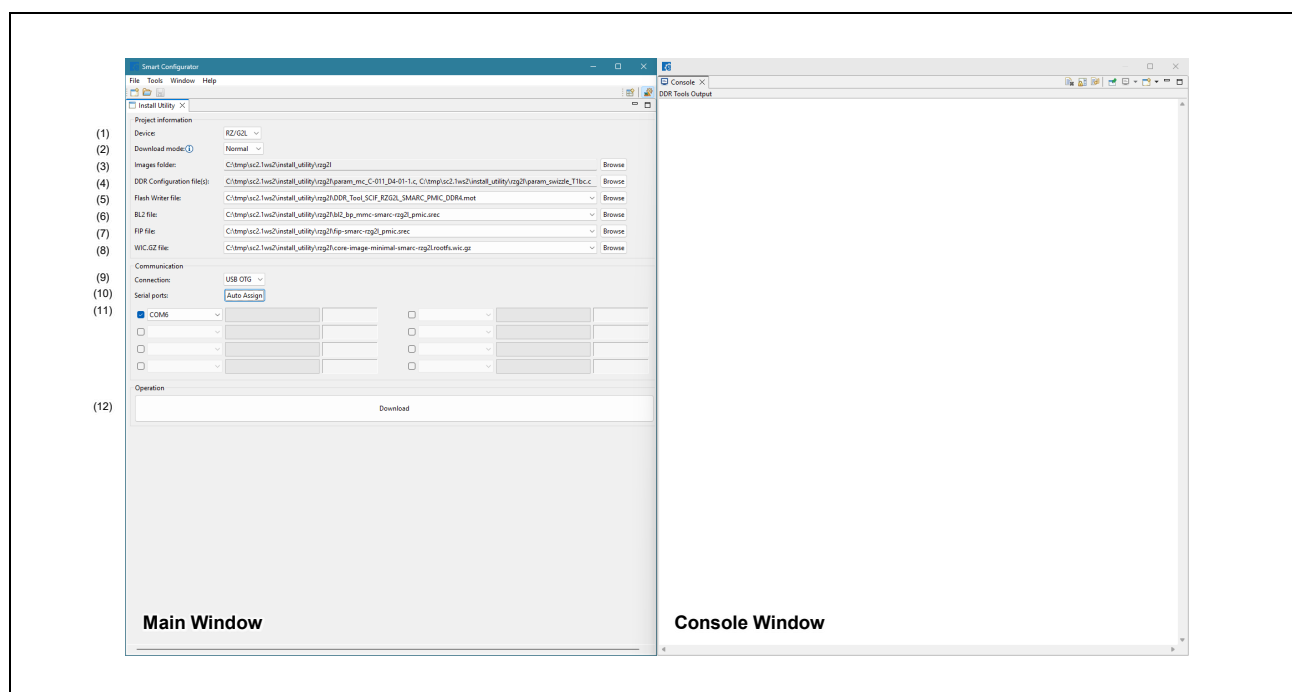


Figure 4.8 Install Utility for RZ/G2 Series

8. Select "Device" (1).
9. Select "Normal" (2).
10. Browse "Images folder" which includes "DDR Configuration file(s)", "Flash Writer", "BL2", "FIP" and "WIC.GZ" files (3).
 - In this document, please set `C:\tmp\sc` folder. Then, all "DDR Configuration file(s)", "Flash Writer", "BL2", "FIP" and "WIC.GZ" are set.
11. Browse "DDR Configuration file(s)" and select `.c` files in `C:\tmp\sc` folder, if the value is not correctly set. (4).
12. Browse "Flash Writer file" and select `.mot` files in `C:\tmp\sc` folder, if the value is not correctly set. (5).
13. Browse "BL2 file" and select `.srec` files in `C:\tmp\sc` folder, if the value is not correctly set. (6).
14. Browse "FIP file" and select `.srec` files in `C:\tmp\sc` folder, if the value is not correctly set. (7).
15. Browse "WIC.GZ file" and select `.wic.gz` files in `C:\tmp\sc` folder, if the value is not correctly set. (8).
16. Select "Connection" to "USB OTG". (9)
17. Select "Serial ports" (11), or push "Auto Assign" button. (10)
 - Please check serial port number using "Device Manager".

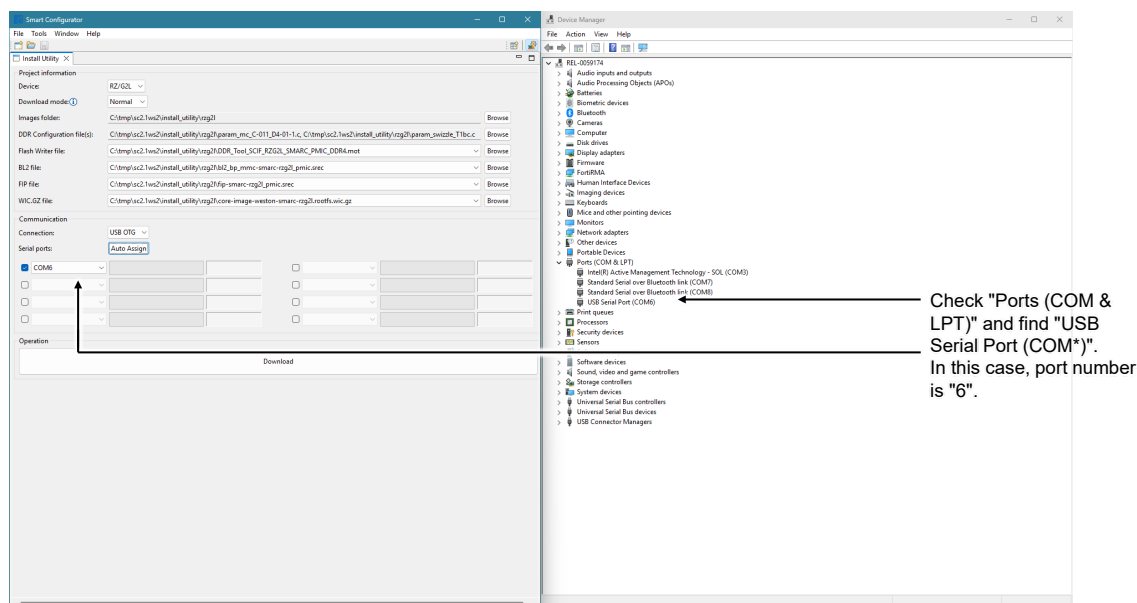


Figure 4.9 Device Manager

18. Click "Download" button to start installing Linux (12).
19. Pop-up messages appear. Please confirm "Boot/Power Mode Select (SW11)" is SCIF download mode, and press "Blue Button (RESET SW10)" on EVK.

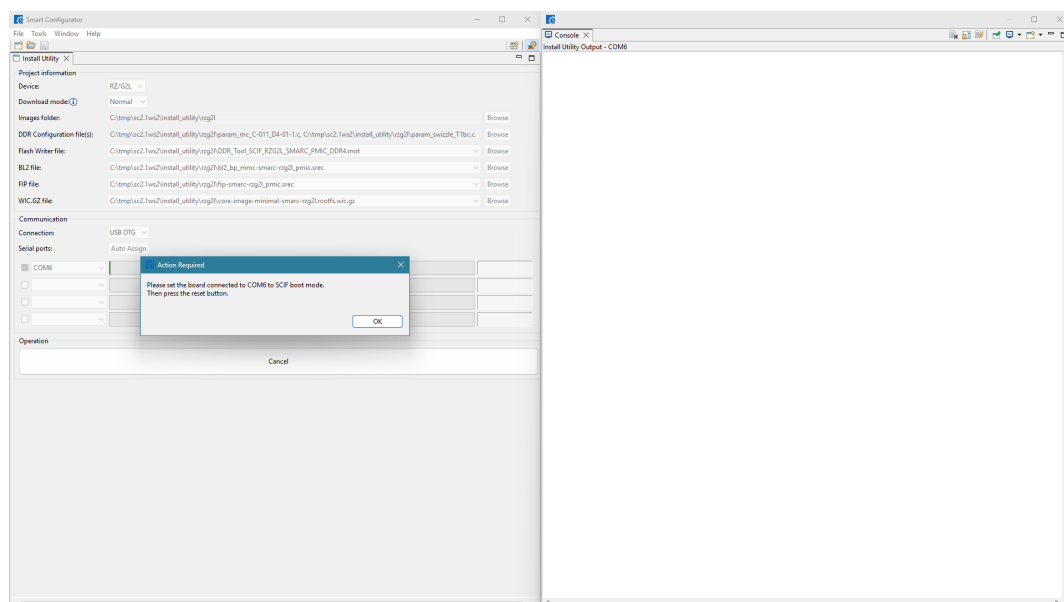
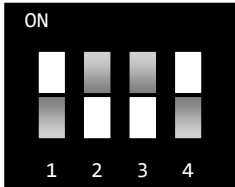


Figure 4.10 Pop-up Message - 1

20. After installing "BL2" and "FIP", another pop-up menu appears. Then, please change "Boot/Power Mode Select (SW11)" to eMMC boot mode and press "Blue Button (RESET SW10)" on EVK.

Table 4.3 eMMC Boot Mode

Mode	Switch Image	Descriptions
eMMC Boot Mode		1: ON, 2: OFF, 3: OFF, 4: ON

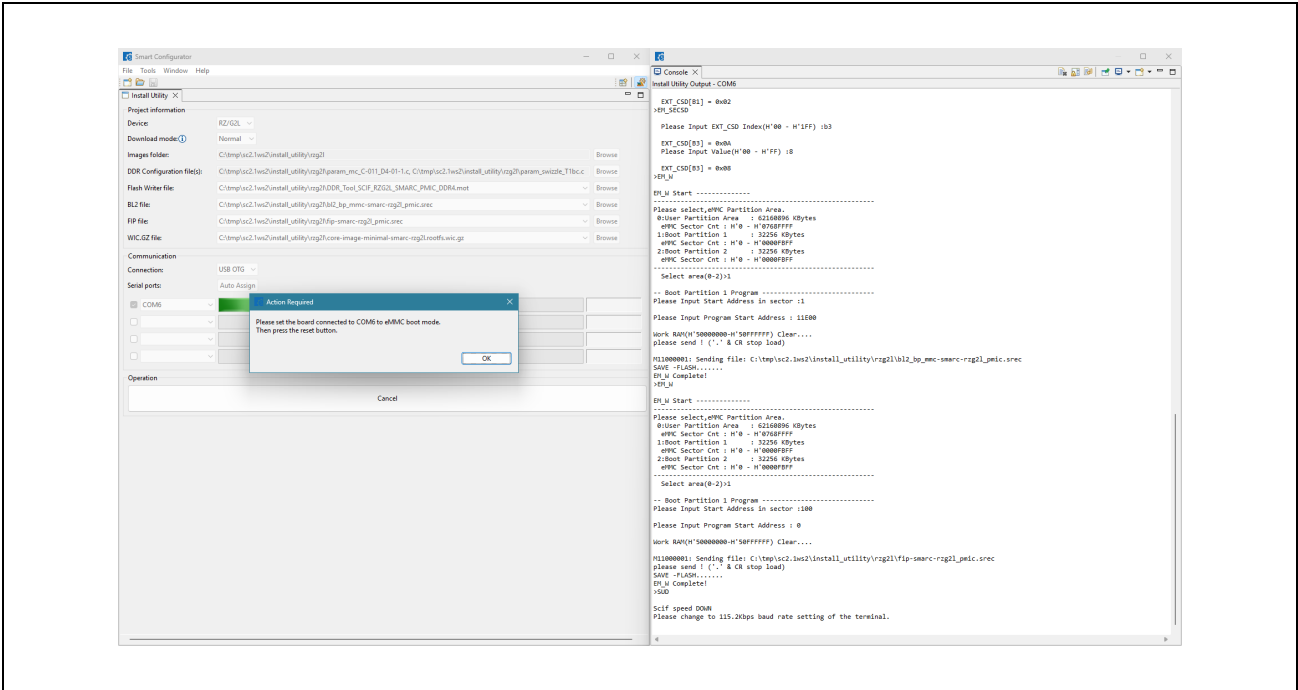


Figure 4.11 Pop-up Message - 2

21. After installing Linux boots from eMMC.

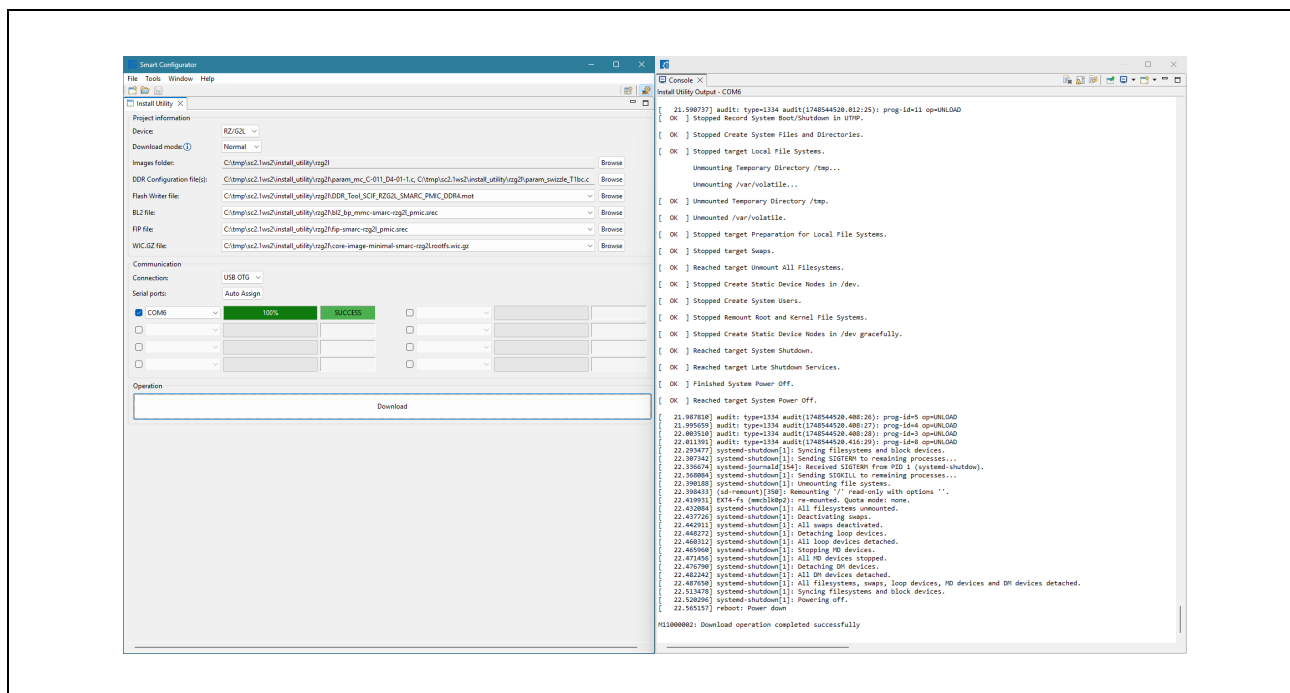


Figure 4.12 Success

22. Please confirm the message "Download operation completed successfully" in the console.

4.2.3 Install Linux via USB OTG - CUI

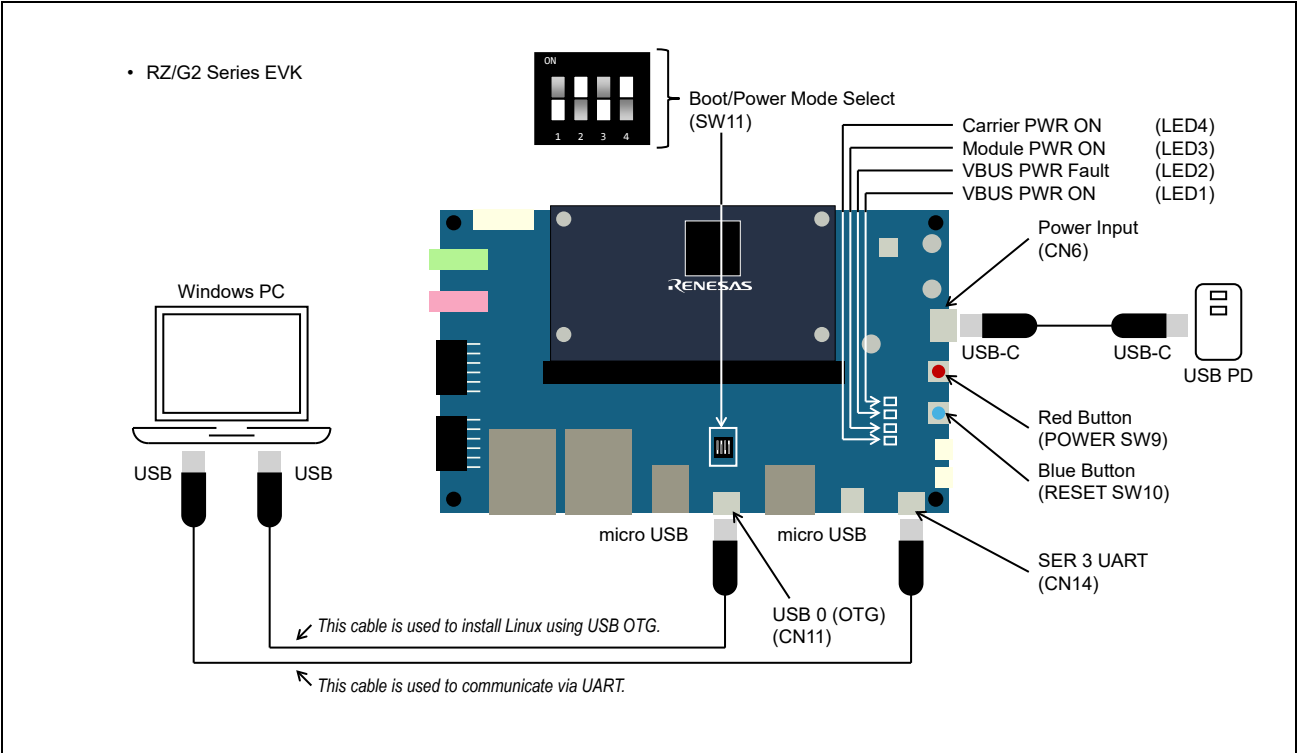


Figure 4.13 Connections for RZ/G2 Series

1. Switch "Boot/Power Mode Select (SW11)" to SCIF download mode.

Table 4.4 SCIF Download Mode

Mode	Switch Image	Descriptions
SCIF Download Mode		1: OFF, 2: ON, 3: OFF, 4: ON

2. Connect "Power Input (CN6)" and USB PD power supply.
 - Please confirm that the "VBUS PWR ON (LED1)" and "Module PWR ON (LED3)" are on.
3. Connect "SER 3 UART (CN14)" and USB on Windows PC.
4. Connect "USB 0 (OTG) (CN11)" and USB on Windows PC.
5. Press and hold "Red Button (POWER SW9)".
 - Confirm that the "VBUS PWR ON (LED1)", "Module PWR ON (LED3)" and "Carrier PWR ON (LED4)" are on.
6. Input command like below.
 - The command is one of the examples. Please follow them to the environment.
 - The folder of InstallUtilityc.exe is C:\Program Files\Renesas\Smart Configurator for RZ\V2.2.0\tools\installutility\eclipse.
 - The number of serial port should be checked by "Device Manager" on Windows host PC.
 - The IP address should be checked by ipconfig command on Windows host PC.

Table 4.5 Command Line Options

Options	Arguments	Descriptions
-p	COMx	The number of serial port. Replace "x" to number.
-d	RZ/G2L	Device name.
-m	Normal	Download mode.
-conn	Usb	Connection method.
-fw	File path of "Flash Writer".	Path of "Flash Writer".
-bl2	File path of "BL2".	File path of "BL2".
-fip	File path of "FIP".	File path of "FIP".
-wic	File path of "WIC.GZ".	File path of "WIC.GZ".
-cfile	File paths of "DDR Configuration files".	File paths of "DDR Configuration files".

Code 4.1 Command to Install Linux (Example)

```
> cd "C:\Program Files\Renesas\Smart Configurator for
RZ\V2.2.0\tools\installutility\eclipse"

> InstallUtilityc.exe ^
  -p COM6 ^
  -d RZ/G2L ^
  -m Normal ^
  -conn Usb ^
  -fw
c:\tmp\sc_rzg2l\Flash_Writer_SCIF_RZG2L_SMARC_PMIC_DDR4_2GB_1PCS.mot ^
-b12 c:\tmp\sc_rzg2l\bl2_bp_mmc-smarc-rzg2l_pmic.srec ^
-fip c:\tmp\sc_rzg2l\fip-smarc-rzg2l_pmic.srec ^
-wic c:\tmp\sc_rzg2l\core-image-minimal-smarc-rzg2l.rootfs.wic.gz ^
-cfile c:\tmp\sc_rzg2l\param_mc_C-011_D4-01-1.c ^
      c:\tmp\sc_rzg2l\param_swizzle_T1bc.c
```

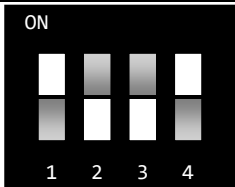
7. Pop-up messages appear. Please confirm "Boot/Power Mode Select (SW11)" is SCIF download mode, and press "Blue Button (RESET SW10)" on EVK.

Code 4.1 Pop-up Message - 1

```
Please set the board connected to COM* to SCIF boot mode. Then press the reset
button...
```

8. After installing "BL2" and "FIP", another pop-up menu appears. Then, please change "Boot/Power Mode Select (SW11)" to eMMC boot mode and press "Blue Button (RESET SW10)" on EVK.

Table 4.6 eMMC Boot Mode

Mode	Switch Image	Descriptions
eMMC Boot Mode		1: ON, 2: OFF, 3: OFF, 4: ON

Code 4.1 Pop-up Message - 2

```
Please set the board connected to COM* to eMMC boot mode. Then press the reset button...
```

9. After installing Linux boots from eMMC.

Code 4.1 Success

```
M11000002: Download operation completed successfully
```

10. Please confirm the message "Download operation completed successfully" in the console.

4.2.4 Install Linux via Ethernet

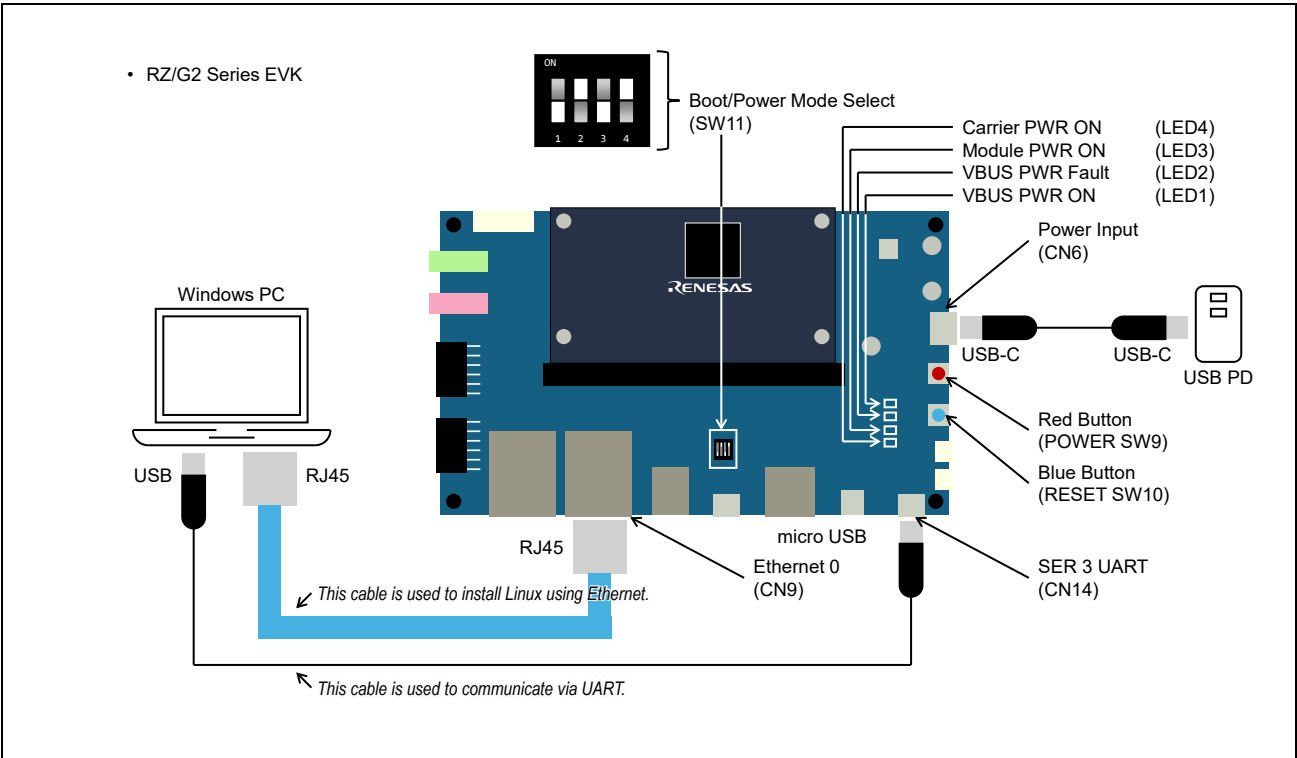


Figure 4.14 Connections for RZ/G2 Series

1. Switch "Boot/Power Mode Select (SW11)" to SCIF download mode.

Table 4.7 SCIF Download Mode

Mode	Switch Image	Descriptions
SCIF Download Mode	ON 1 2 3 4	1: OFF, 2: ON, 3: OFF, 4: ON

2. Connect "Power Input (CN6)" and USB PD power supply.
 - Please confirm that the "VBUS PWR ON (LED1)" and "Module PWR ON (LED3)" are on.
3. Connect "SER 3 UART (CN14)" to the Windows PC using a USB cable.
4. Connect "Ethernet 0 (CN9)" to the Windows PC using an Ethernet cable.
 - The Ethernet router can be used between Windows host PC and EVK.
5. Press and hold "Red Button (POWER SW9)".
 - Confirm that the "VBUS PWR ON (LED1)", "Module PWR ON (LED3)" and "Carrier PWR ON (LED4)" are on.
6. Execute "Smart Configurator".
7. Select "Tools" and select "Install Utility".

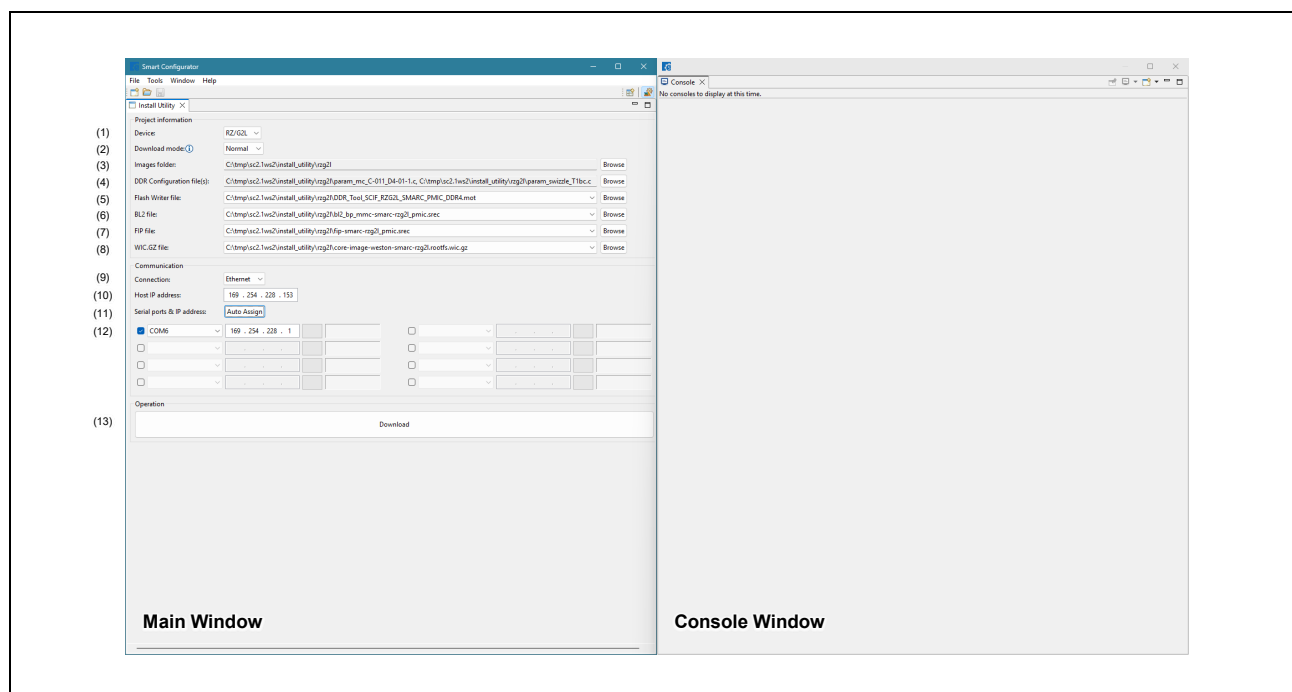


Figure 4.15 Install Utility for RZ/G2 Series

8. Select "Device" (1).
9. Select "Normal" (2).
10. Browse "Images folder" which includes "DDR Configuration file(s)", "Flash Writer", "BL2", "FIP" and "WIC.GZ" files (3).
 - In this document, please set `C:\tmp\sc` folder. Then, all "DDR Configuration file(s)", "Flash Writer", "BL2", "FIP" and "WIC.GZ" are set.
11. Browse "DDR Configuration file(s)" and select `.c` files in `C:\tmp\sc` folder, if the value is not correctly set. (4).
12. Browse "Flash Writer file" and select `.mot` files in `C:\tmp\sc` folder, if the value is not correctly set. (5).
13. Browse "BL2 file" and select `.srec` files in `C:\tmp\sc` folder, if the value is not correctly set. (6).
14. Browse "FIP file" and select `.srec` files in `C:\tmp\sc` folder, if the value is not correctly set. (7).
15. Browse "WIC.GZ file" and select `.wic.gz` files in `C:\tmp\sc` folder, if the value is not correctly set. (8).
16. Select "Connection" to "Ethernet TCP". (9)
17. Input "Host IP address" (10).
 - Please check IP address of Windows host PC using `ipconfig` command.

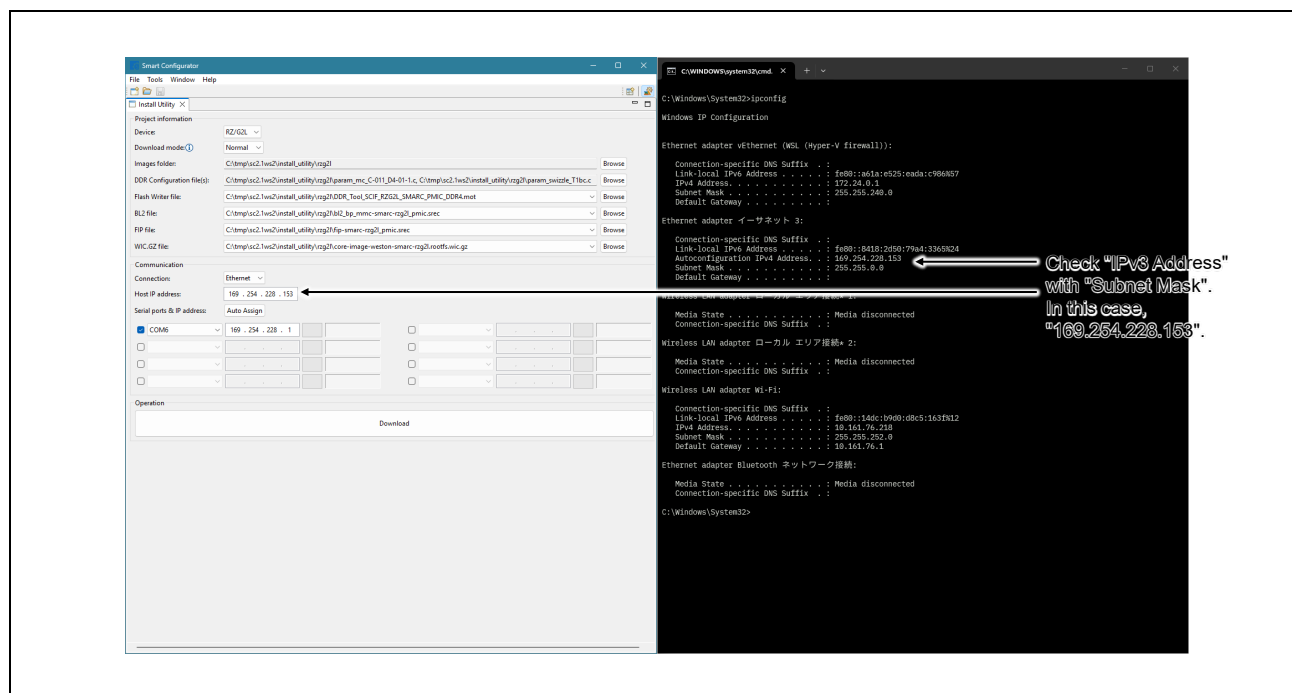


Figure 4.16 Device Manager

18. Select "Serial ports" (12), or push "Auto Assign" button. (10)

- Please check serial port number using "Device Manager".

19. Input IP address of EVK. (12)

- Please assign an appropriate IP address based on the IP address and subnet mask of the Windows host PC.

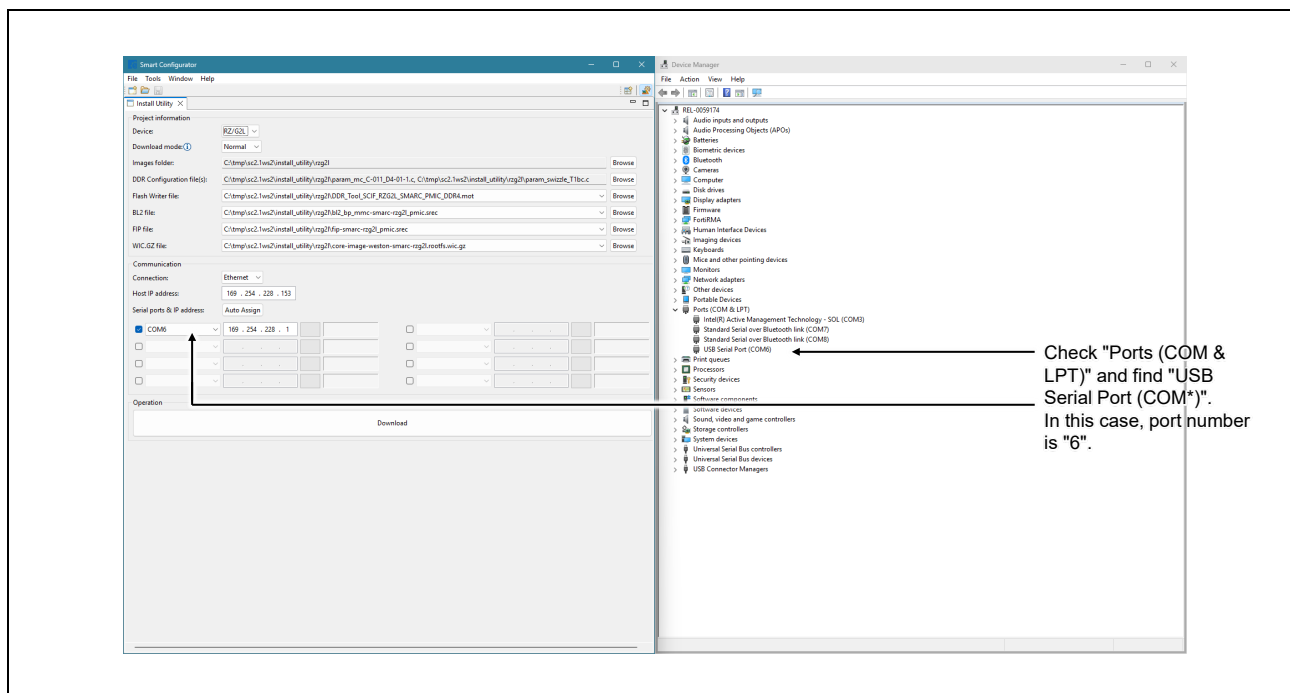


Figure 4.17 Device Manager

20. Click "Download" button to start installing Linux (13).

21. Pop-up messages appear. Please confirm "Boot/Power Mode Select (SW11)" is SCIF download mode, and press "Blue Button (RESET SW10)" on EVK.

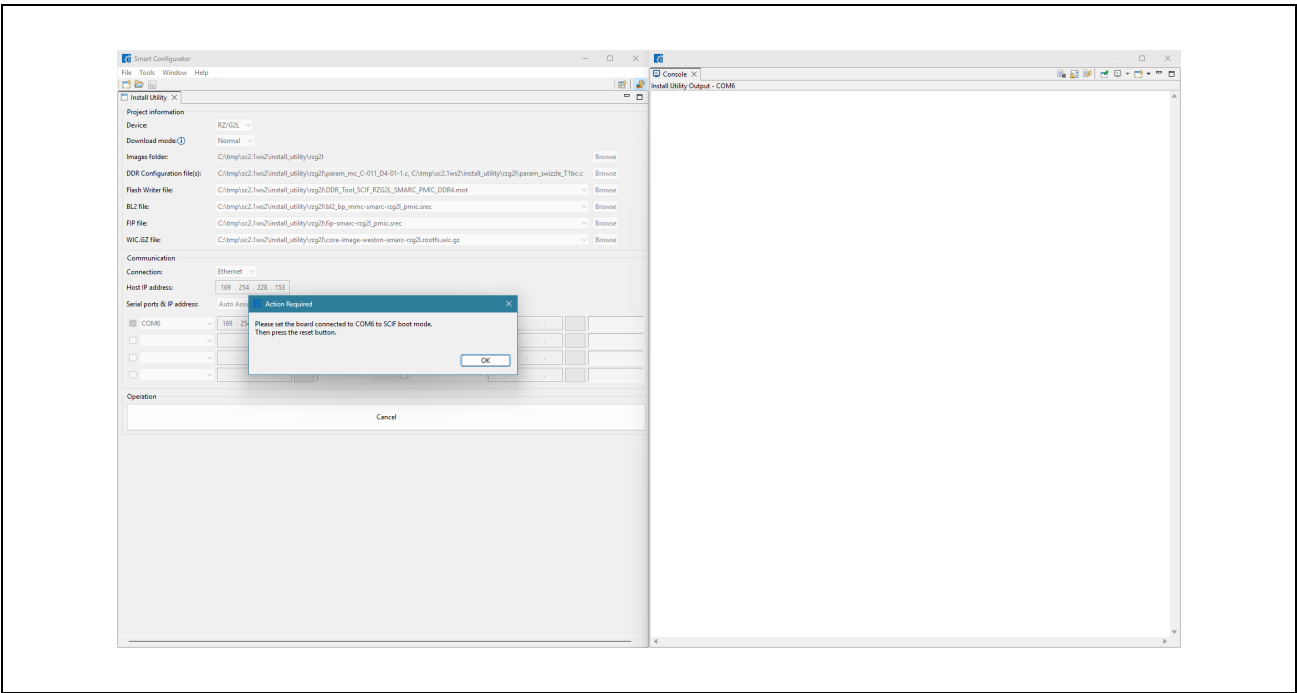


Figure 4.18 Pop-up Message - 1

22. After installing "BL2" and "FIP", another pop-up menu appears. Then, please change "Boot/Power Mode Select (SW11)" to eMMC boot mode and press "Blue Button (RESET SW10)" on EVK.

Table 4.8 eMMC Boot Mode

Mode	Switch Image	Descriptions
eMMC Boot Mode		1: ON, 2: OFF, 3: OFF, 4: ON

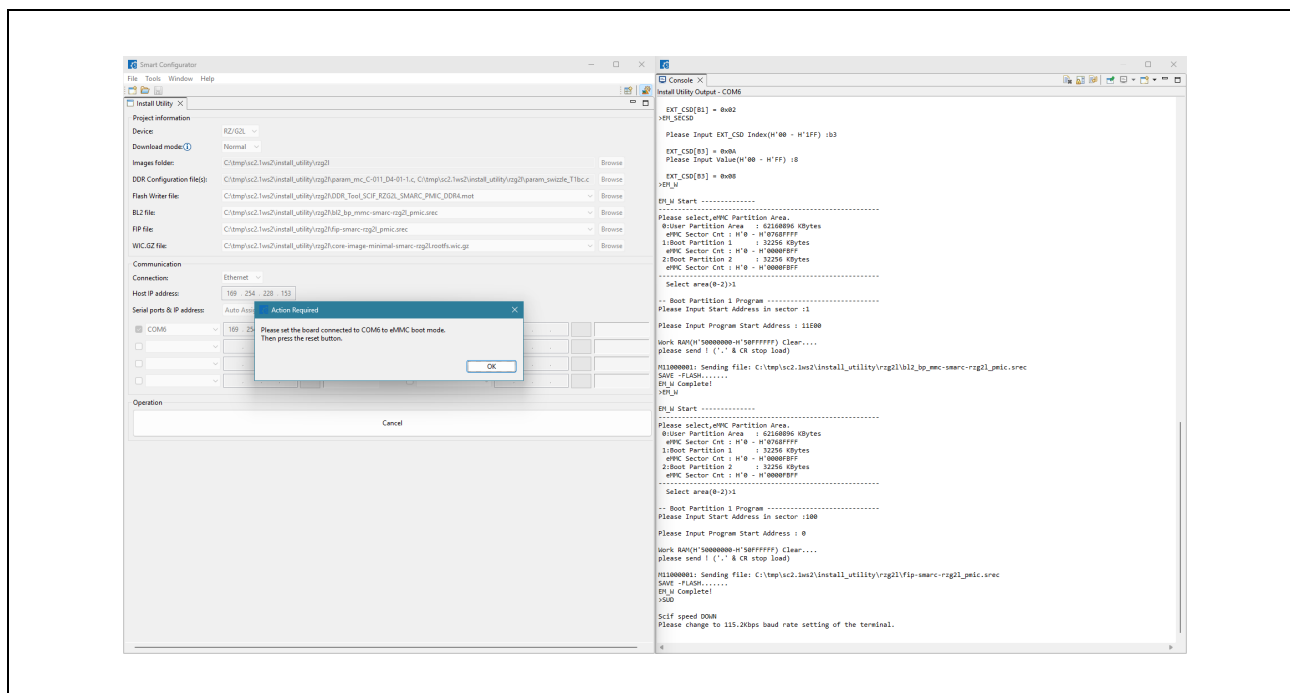


Figure 4.19 Pop-up Message - 2

23. After installing Linux boots from eMMC.

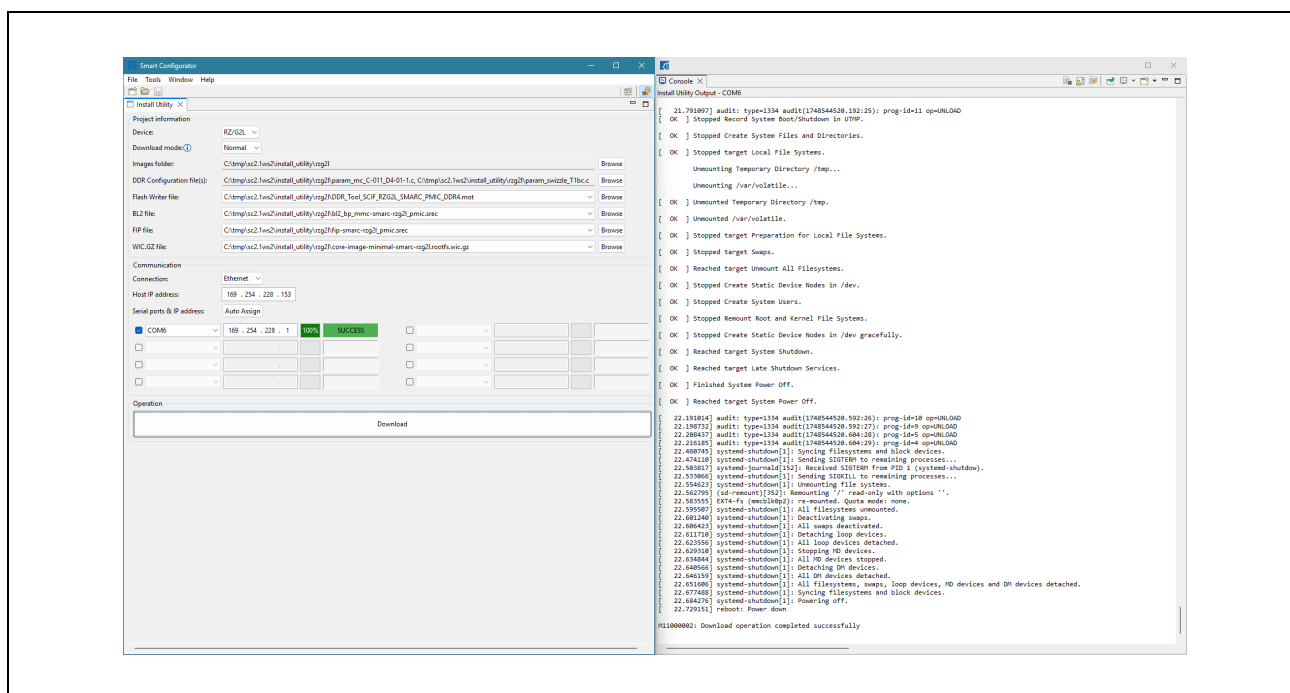


Figure 4.20 Success

24. Please confirm the message "Download operation completed successfully" in the console.

4.2.5 Install Linux via Ethernet - CUI

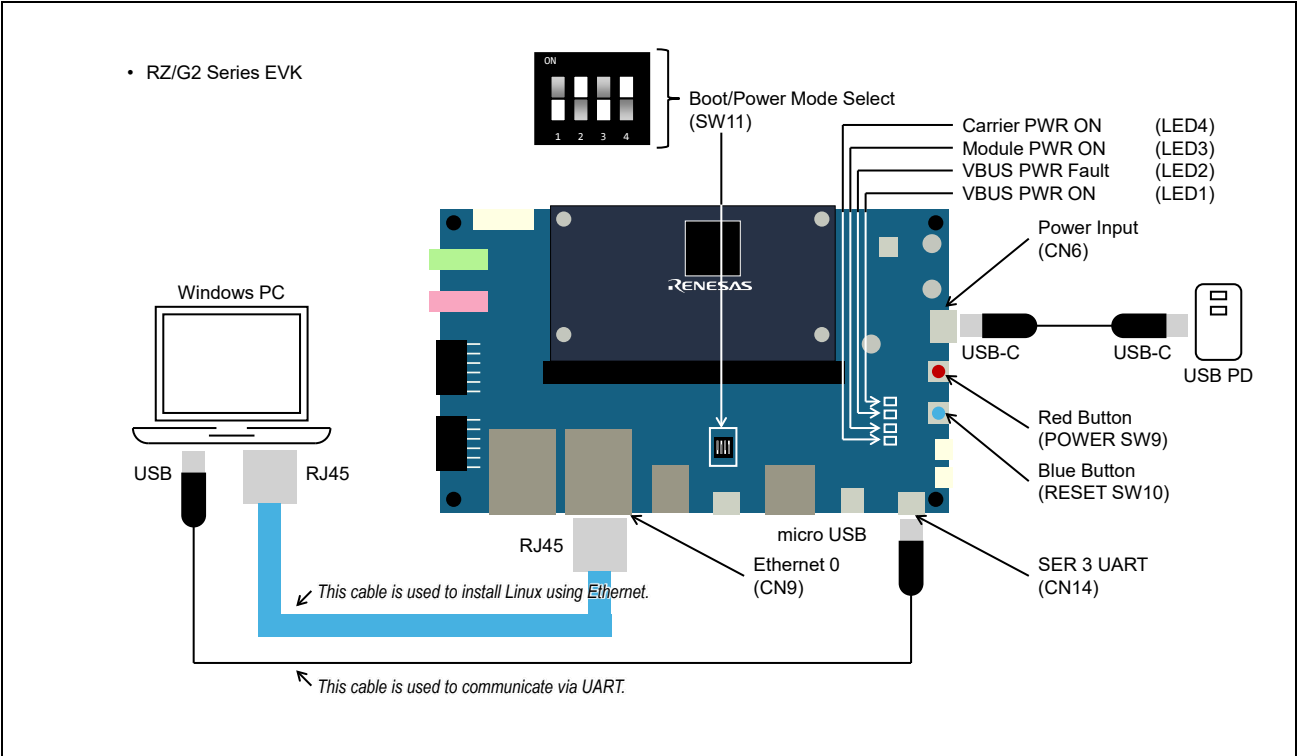


Figure 4.21 Connections for RZ/G2 Series

1. Switch "Boot/Power Mode Select (SW11)" to SCIF download mode.

Table 4.9 SCIF Download Mode

Mode	Switch Image	Descriptions
SCIF Download Mode		1: OFF, 2: ON, 3: OFF, 4: ON

2. Connect "Power Input (CN6)" and USB PD power supply.
 - Please confirm that the "VBUS PWR ON (LED1)" and "Module PWR ON (LED3)" are on.
3. Connect "SER 3 UART (CN14)" to the Windows PC using a USB cable.
4. Connect "Ethernet 0 (CN9)" to the Windows PC using an Ethernet cable.
 - The Ethernet router can be used between Windows host PC and EVK.
5. Press and hold "Red Button (POWER SW9)".
 - Confirm that the "VBUS PWR ON (LED1)", "Module PWR ON (LED3)" and "Carrier PWR ON (LED4)" are on.
6. Input command like below.
 - The command is one of the examples. Please follow them to the environment.
 - The folder of InstallUtilityc.exe is C:\Program Files\Renesas\Smart Configurator for RZ\V2.2.0\tools\installutility\eclipse.
 - The number of serial port should be checked by "Device Manager" on Windows host PC.
 - The IP address should be checked by ipconfig command on Windows host PC.

Table 4.10 Command Line Options

Options	Arguments	Descriptions
-p	COMx	The number of serial port. Replace "x" to number.
-d	RZ/G2L	Device name.
-m	Normal	Download mode.
-conn	Ethernet_TCP	Connection method.
-hostip	IP address of Windows host PC.	IP address of Windows host PC.
-ipaddr	IP address of EVK.	IP address of EVK.
-fw	File path of "Flash Writer".	Path of "Flash Writer".
-bl2	File path of "BL2".	File path of "BL2".
-fip	File path of "FIP".	File path of "FIP".
-wic	File path of "WIC.GZ".	File path of "WIC.GZ".
-cfile	File paths of "DDR Configuration files".	File paths of "DDR Configuration files".

Code 4.1 Command to Install Linux (Example)

```
> cd "C:\Program Files\Renesas\Smart Configurator for
RZ\V2.2.0\tools\installutility\eclipse"

> InstallUtilityc.exe ^
  -p COM6 ^
  -d RZ/G2L ^
  -m Normal ^
  -conn Ethernet_TCP ^
  -hostip xxx.xxx.xxx.xxx ^
  -ipaddr yyy.yyy.yyy.yyy ^
  -fw c:\tmp\sc_rzg2l\Flash_Writer_SCIF_RZG2L_SMARC_PMIC_DDR4_2GB_1PCS.mot ^
  -bl2 c:\tmp\sc_rzg2l\bl2_bp_mmc-smarc-rzg2l_pmic.srec ^
  -fip c:\tmp\sc_rzg2l\fip-smarc-rzg2l_pmic.srec ^
  -wic c:\tmp\sc_rzg2l\core-image-minimal-smarc-rzg2l.rootfs.wic.gz ^
  -cfile c:\tmp\sc_rzg2l\param_mc_C-011_D4-01-1.c ^
        c:\tmp\sc_rzg2l\param_swizzle_T1bc.c
```

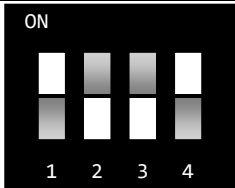
7. Pop-up messages appear. Please confirm "Boot/Power Mode Select (SW11)" is SCIF download mode, and press "Blue Button (RESET SW10)" on EVK.

Code 4.1 Pop-up Message - 1

```
Please set the board connected to COM* to SCIF boot mode. Then press the reset
button...
```

8. After installing "BL2" and "FIP", another pop-up menu appears. Then, please change "Boot/Power Mode Select (SW11)" to eMMC boot mode and press "Blue Button (RESET SW10)" on EVK.

Table 4.11 eMMC Boot Mode

Mode	Switch Image	Descriptions
eMMC Boot Mode		1: ON, 2: OFF, 3: OFF, 4: ON

Code 4.1 Pop-up Message - 2

```
Please set the board connected to COM* to eMMC boot mode. Then press the reset button...
```

9. After installing Linux boots from eMMC.

Code 4.1 Success

```
M11000002: Download operation completed successfully
```

10. Please confirm the message "Download operation completed successfully" in the console.

In this version, "Install Utility" supports installing Linux for RZ/G3S, RZ/G3E, RZ/G3L and RZ/G3SE.

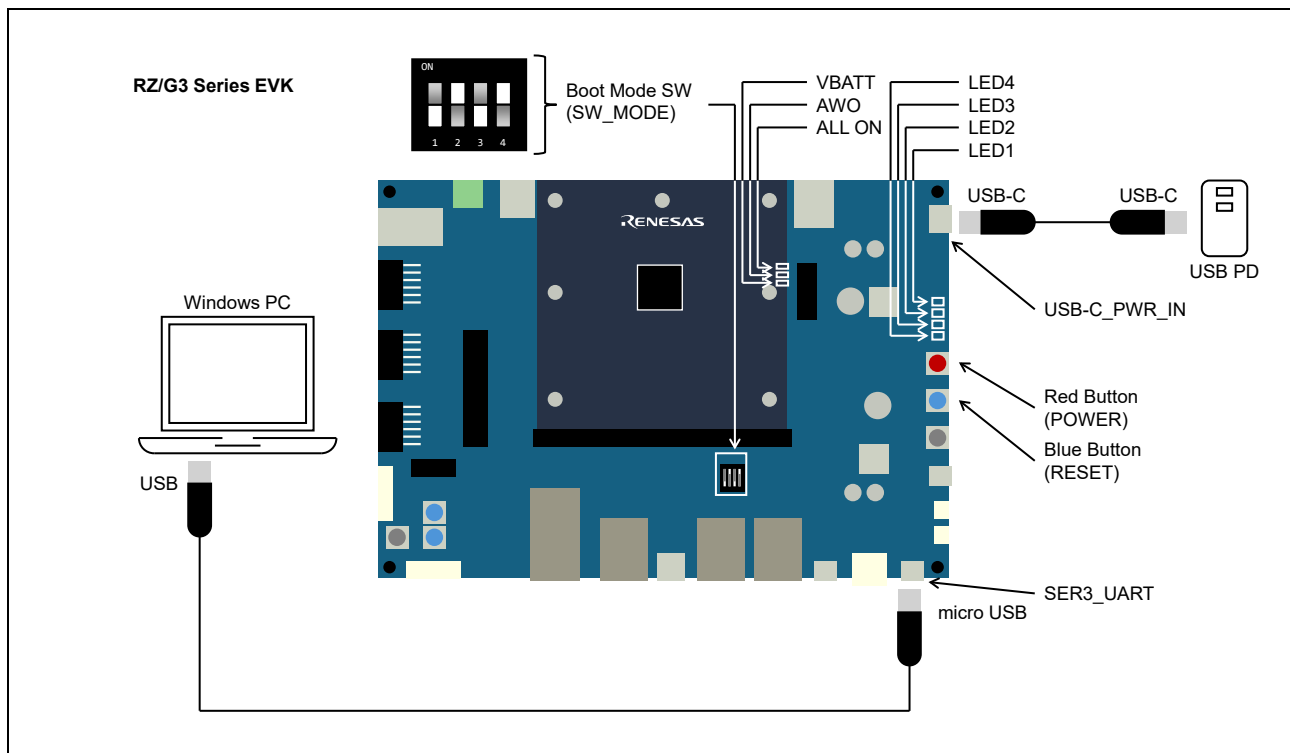


Figure 4.22 **Connections for RZ/G3 Series**

Table 4.12 SCIF Download Mode

Mode	Switch Image	Switch Image
SCIF Download Mode		1: OFF, 2: ON, 3: OFF, 4: ON

2. Connect "USB-C_PWR_IN" and USB PD power supply.
 - Confirm that the "LED2" and "LED3" are on.
3. Connect "SER3_UART" and USB on Windows PC.
4. Press and hold "Red Button (POWER)".
 - Confirm that "ALL ON" and "AWO" are on.
 - Confirm that "LED2", "LED3" and "LED4" are on.
5. Execute "Smart Configurator".
6. Select "Tools" and select "DDR Tools".

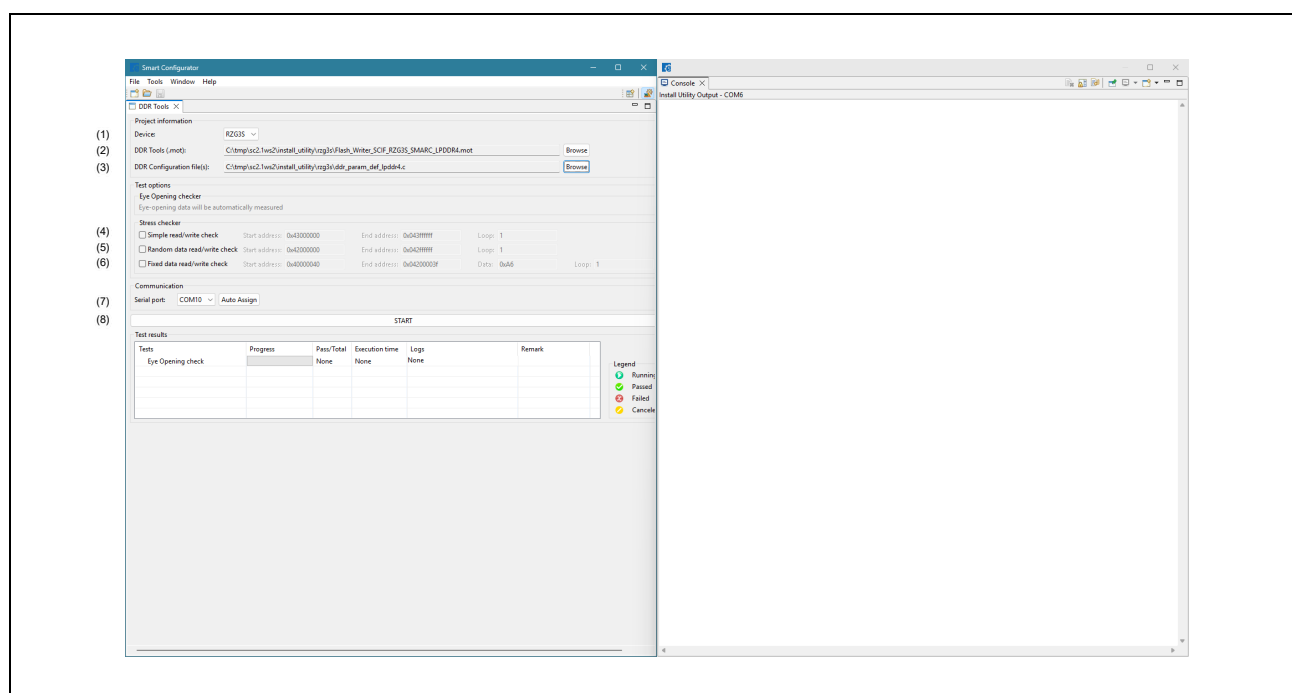


Figure 4.23 DDR Tools for RZ/G3S

7. Select "Device" (1).
8. Push "Browse" button of "Flash Writer file" and select .mot file (2).
9. Push "Browse" button of "DDR Configuration file(s)" and select .c file (3).
10. (Optional) Check if this test is needed and fill parameters (4).
11. (Optional) Check if this test is needed and fill parameters (5).
12. (Optional) Check if this test is needed and fill parameters (6).
13. Select "Serial port" (7) or click "Auto Assign" button.
 - Please check serial port number using "Device Manager".

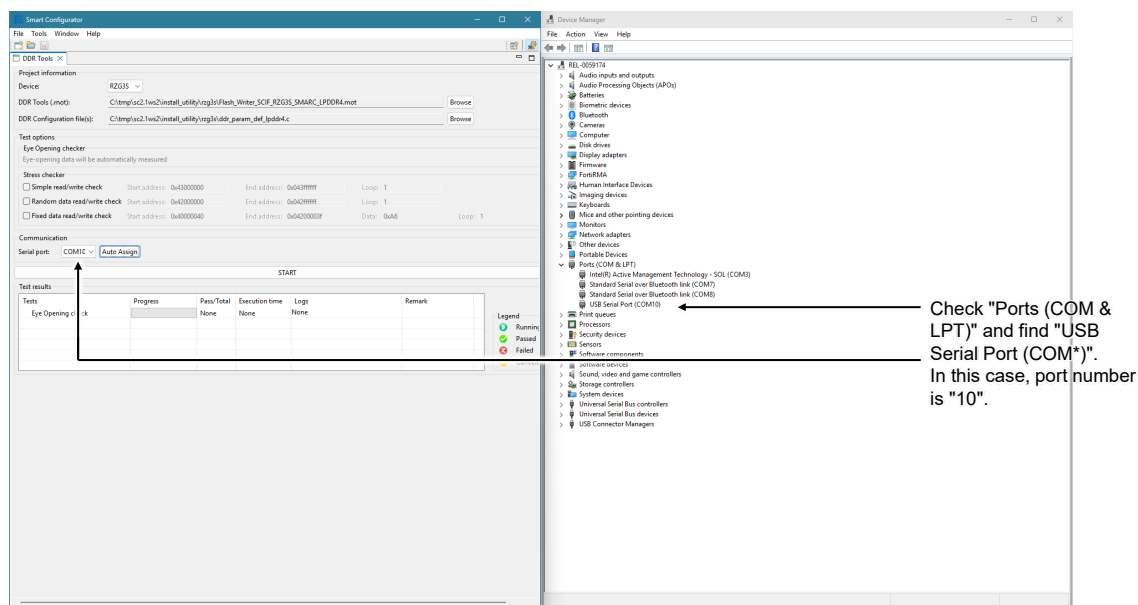


Figure 4.24 Device Manager

14. Push "START" button (8).
15. Pop-up message is shown, "Please set the board to SCIF boot mode. Then press the reset button.". Please set the board to SCIF boot mode. Then press the reset button.

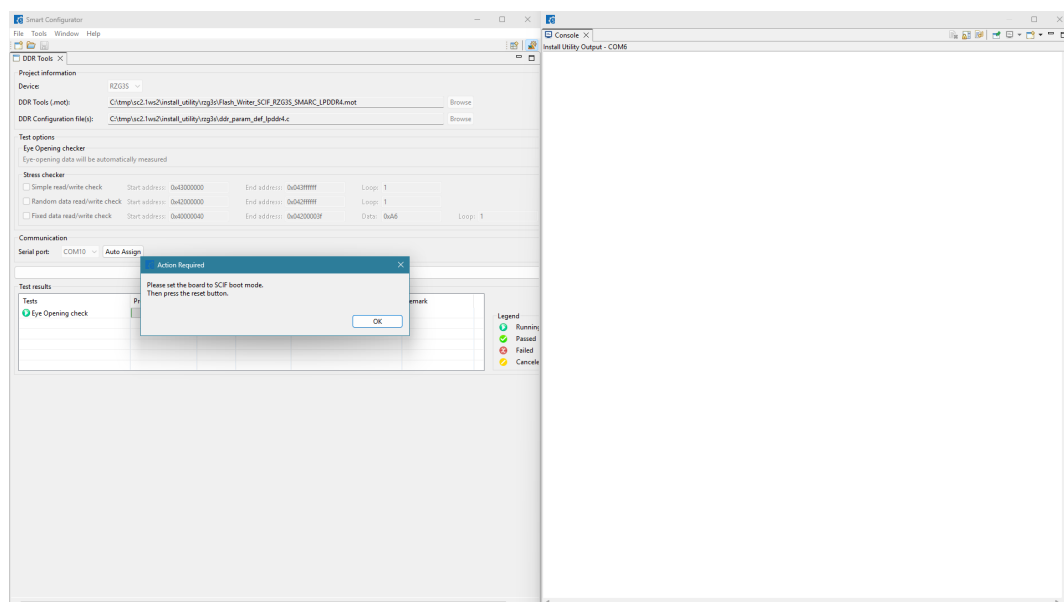


Figure 4.25 Pop-up Message

16. Press "Blue Button (RESET)" on EVK, then start checking DDR.
17. Console logs are shown in "Console" tab or window.

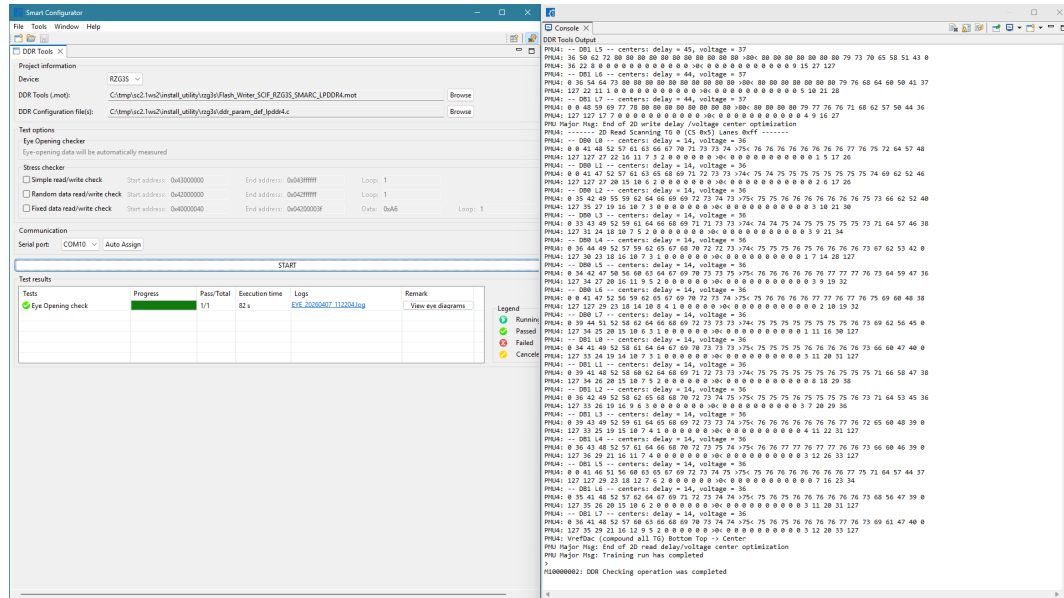


Figure 4.26 Console

18. When you click link of log, you can see the whole log.
19. When you click "View eye diagrams" button, you can see eye diagram.

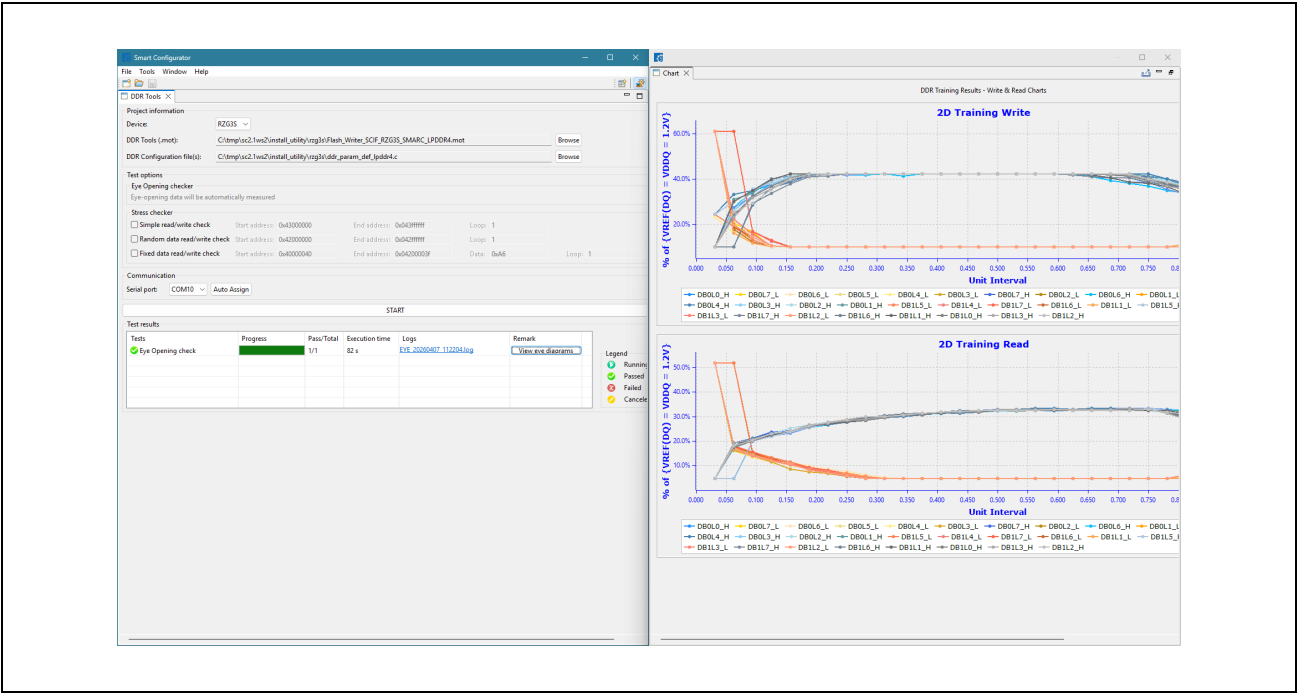


Figure 4.27 Eye Plots for RZ/G3 Series

4.3.2 Install Linux via USB OTG

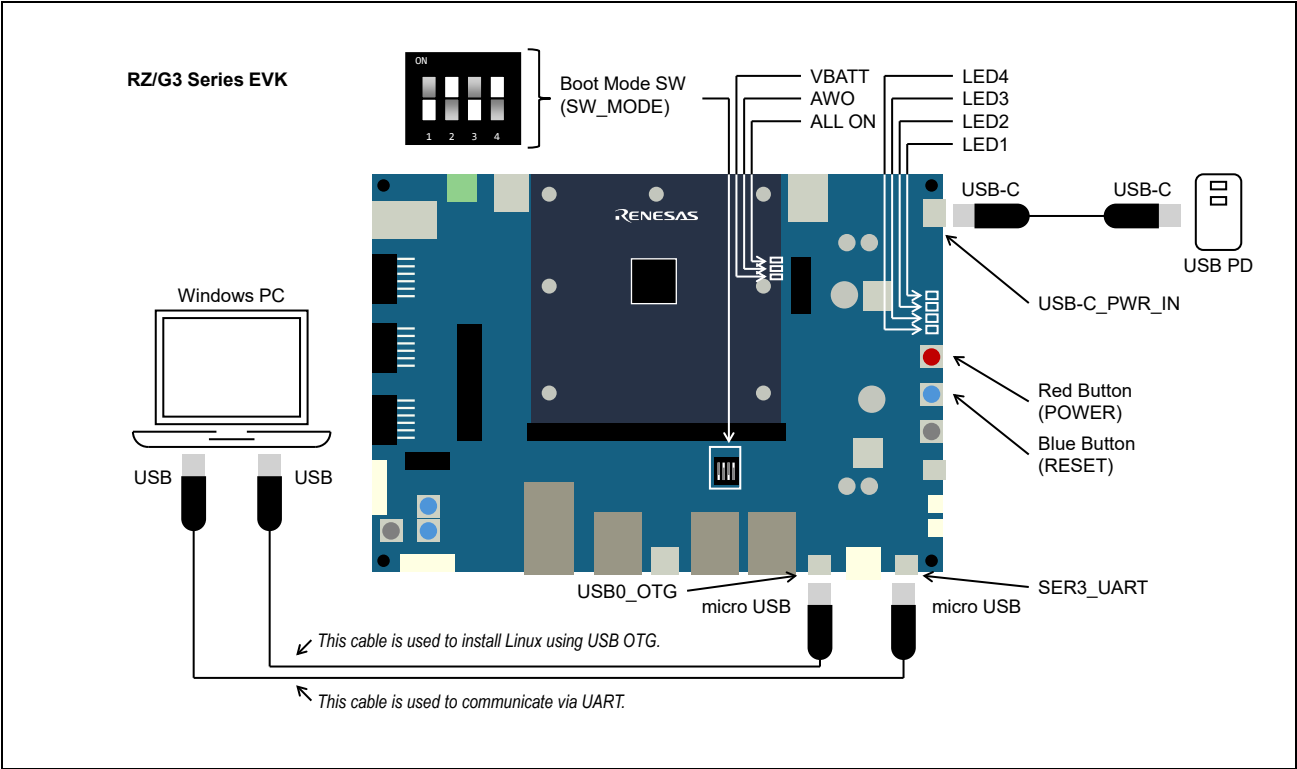


Figure 4.28 Connections for RZ/G3 Series

1. Before installing Linux using "Smart Configurator", please confirm that BL2, FIP, "Flash Writer" and rootfs files are prepared.
2. Switch " Boot Mode SW (SW_MODE)" to SCIF download mode.

Table 4.13 SCIF Download Mode

Mode	Switch Image	Descriptions
SCIF Download Mode	ON 1 2 3 4	1: OFF, 2: ON, 3: OFF, 4: ON

3. Connect "USB-C_PWR_IN" and USB PD power supply.
 - Please confirm that the "LED2" and "LED3" are on.
4. Connect "SER3_UART" and USB on Windows PC.
5. Connect "USB0_OTG" and USB on Windows PC.
6. Press and hold "Red Button (POWER)".
 - Confirm that "LED4", "ALL ON" and "AWO" are on.
7. Execute "Smart Configurator".
8. Select "Tools" and select "Install Utility".

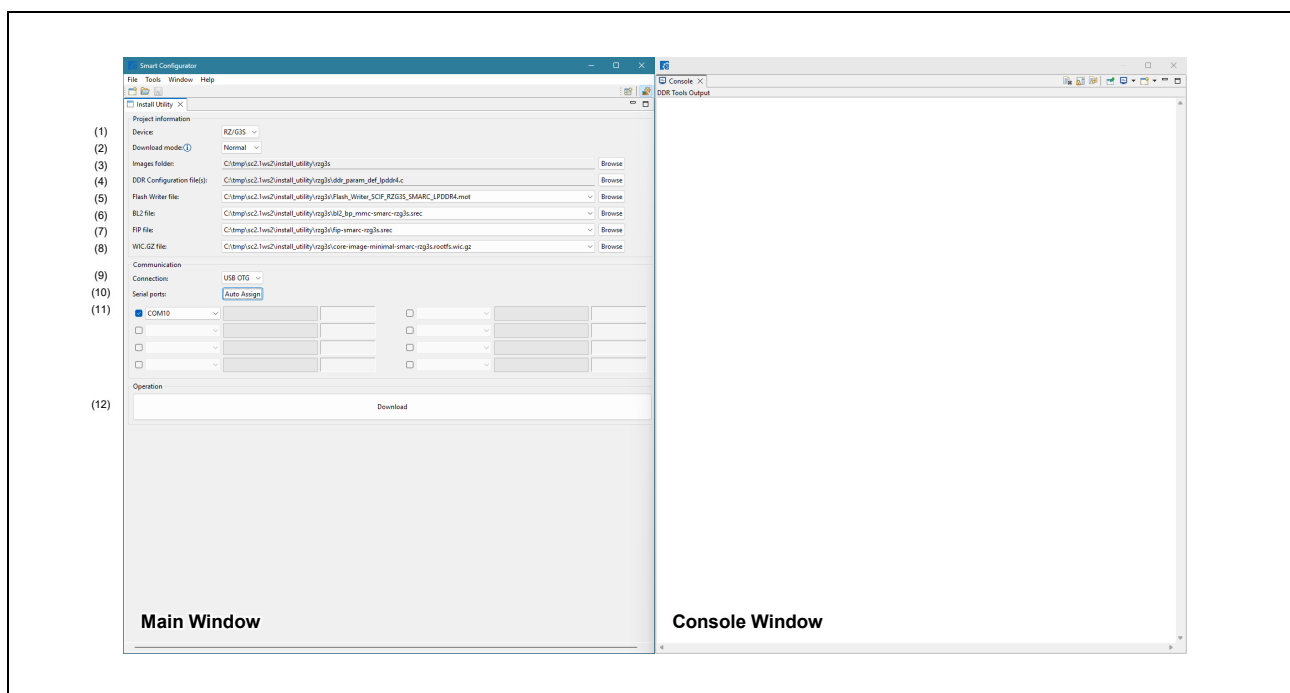


Figure 4.29 Install Utility for RZ/G3 Series

9. Select "Device" (1).
10. Select "Normal" (2).
11. Browse "Images folder" which includes "Flash Writer", "BL2", "FIP" and "WIC.GZ" files (3).
 - In this document, please set `C:\tmp\sc` folder. Then, "Flash Writer", "BL2", "FIP" and "WIC.GZ" files are set.
12. Browse "DRAM Parameters file" and select `.c` file for device (4).
13. Browse "Flash Writer file" and select `.mot` file for device (4).
14. Browse "BL2 file" and select `.srec` file for device (5).
15. Browse "FIP file" and select `.srec` file for device (6).
16. Browse "WIC.GZ file" and select `.wic.gz` file for device (7).
17. Select "Serial ports" (8).
 - Please check serial port number using "Device Manager".

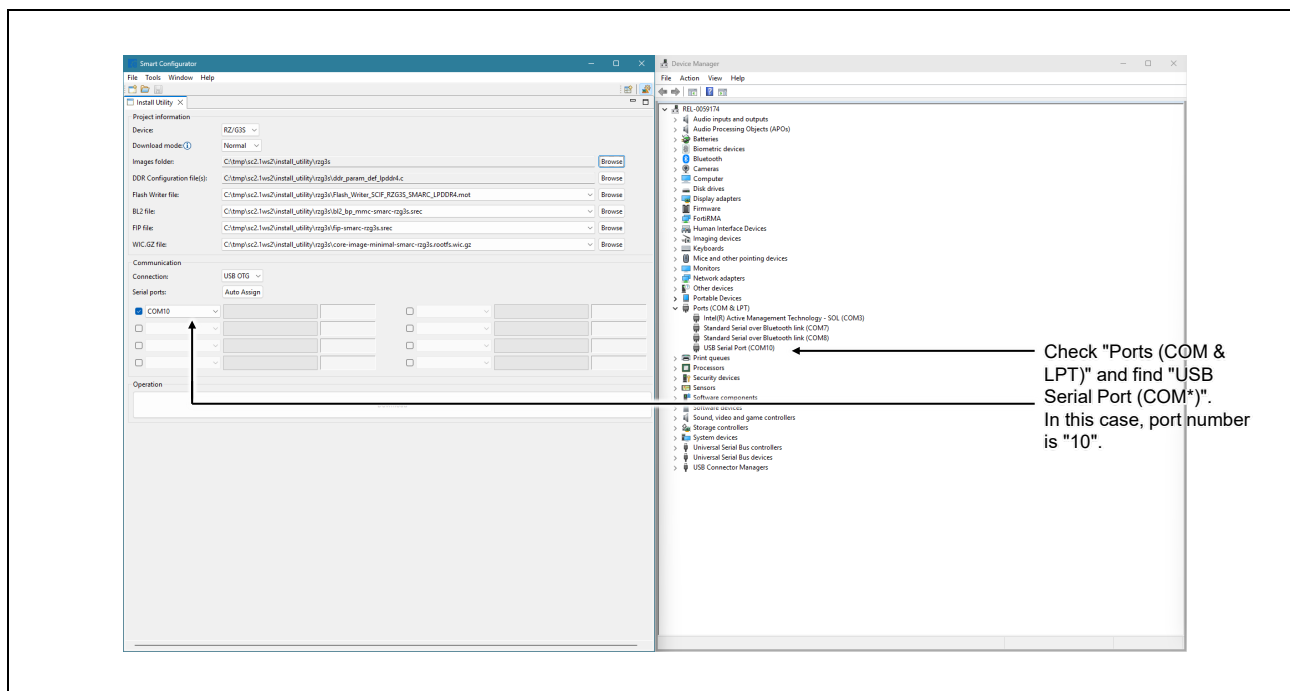


Figure 4.30 Device Manager

- 18. Click "Download" button to start installing Linux (12).
- 19. Pop-up menu appears. Please confirm "Boot/Power Mode Select (SW11)" is SCIF download mode, and press "Blue Button (RESET)" on EVK.

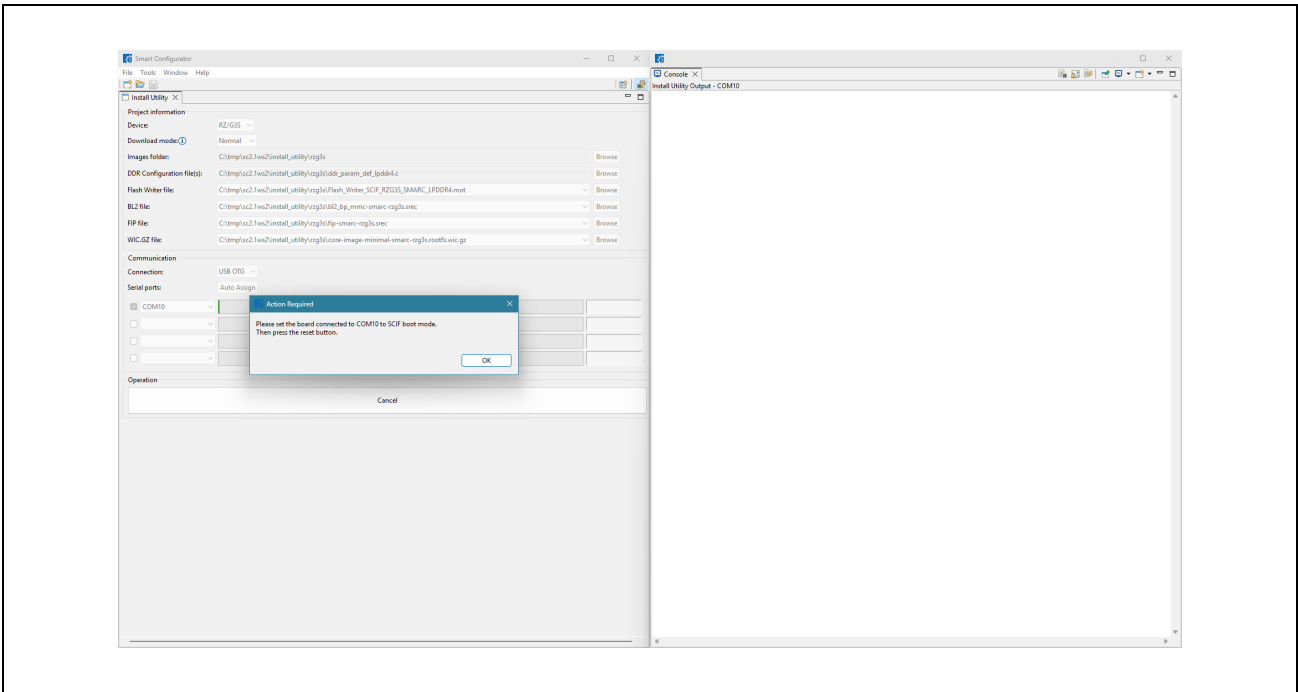


Figure 4.31 Pop-up Message - 1

- 20. Pop-up menu appears again. Then, please change "Boot/Power Mode Select (SW11)" to eMMC boot mode.

Table 4.14 eMMC Boot Mode

Mode	Switch Image	Switch Image
eMMC Boot Mode	ON 1 2 3 4	1: ON, 2: OFF, 3: OFF, 4: ON

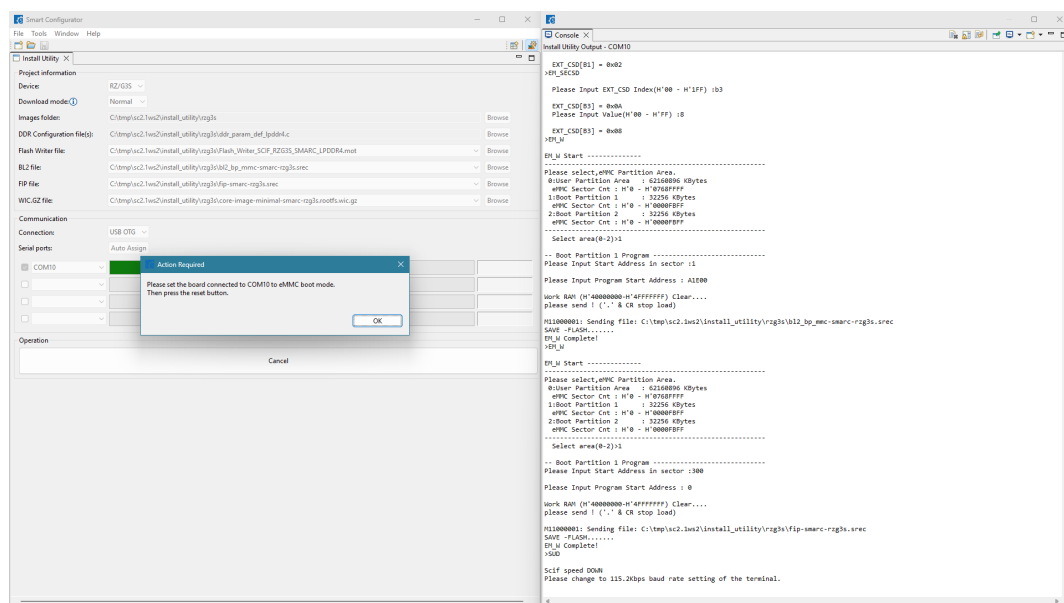


Figure 4.32 Pop-up Message - 2

21. After installing U-Boot, Linux boots from eMMC.

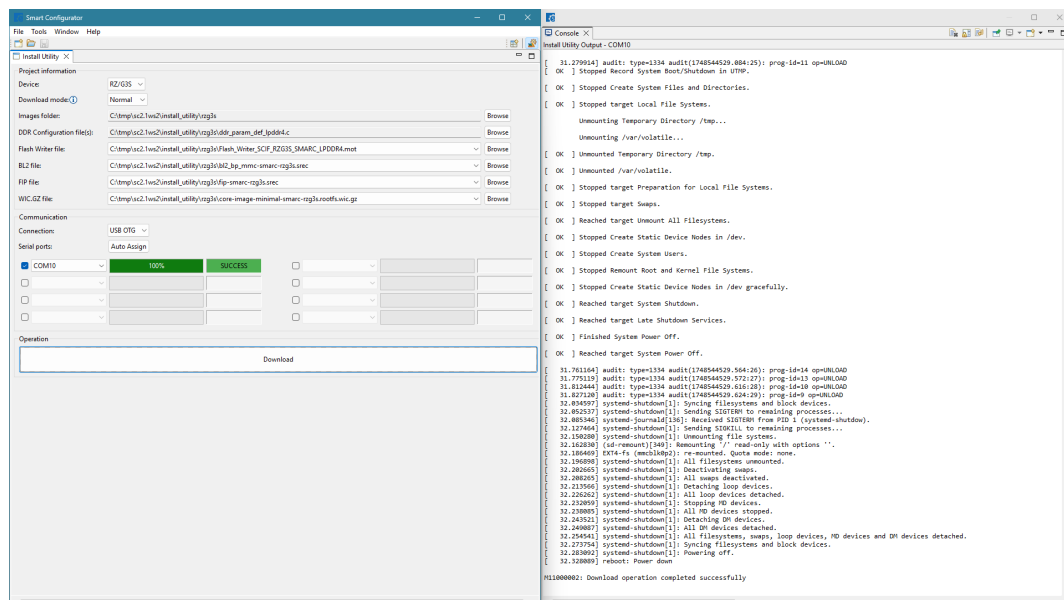


Figure 4.33 Success

22. Please confirm the message, "Download operation completed successfully".

4.3.3 Install Linux via USB OTG - CUI

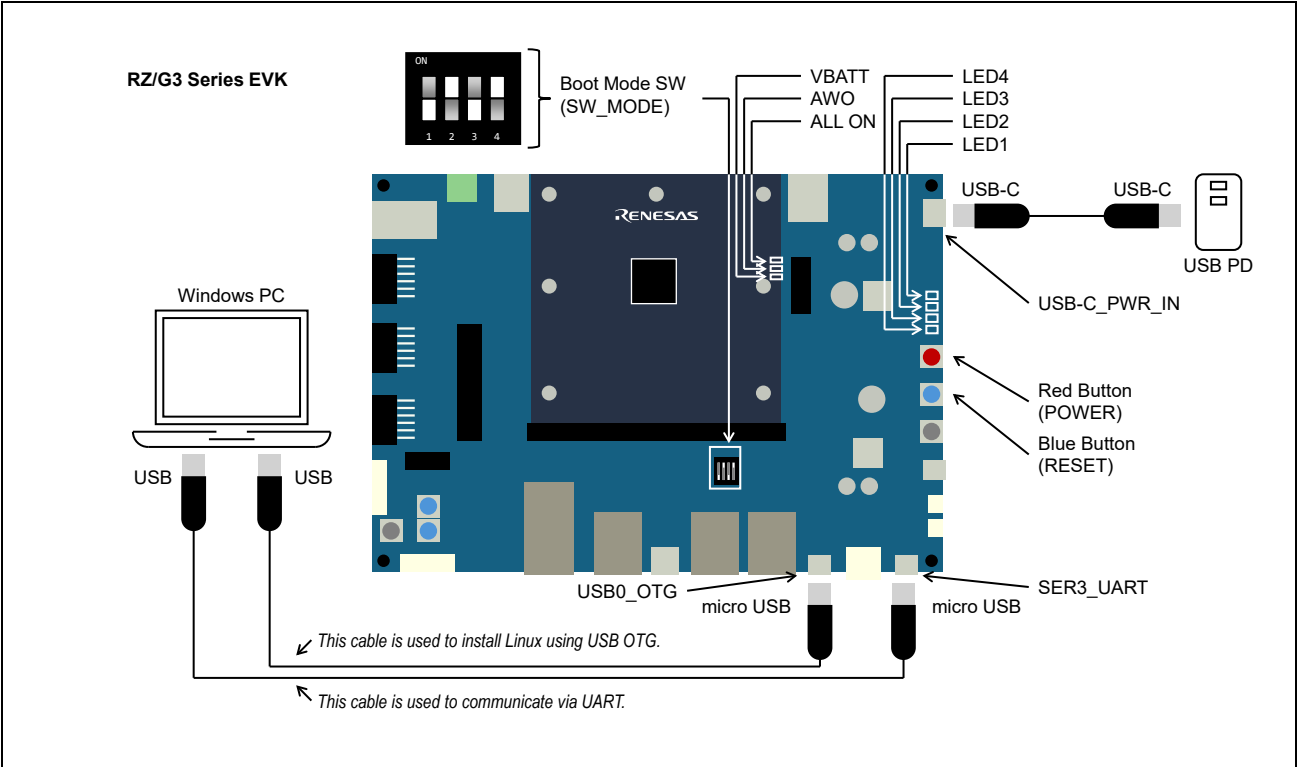


Figure 4.34 Connections for RZ/G3 Series

1. Before installing Linux using "Smart Configurator", please confirm that BL2, FIP, "Flash Writer" and rootfs files are prepared.
2. Switch " Boot Mode SW (SW_MODE)" to SCIF download mode.

Table 4.15 SCIF Download Mode

Mode	Switch Image	Descriptions
SCIF Download Mode		1: OFF, 2: ON, 3: OFF, 4: ON

3. Connect "USB-C_PWR_IN" and USB PD power supply.
 - Please confirm that the "LED2" and "LED3" are on.
4. Connect "SER3_UART" and USB on Windows PC.
5. Connect "USB0_OTG" and USB on Windows PC.
6. Press and hold "Red Button (POWER)".
 - Confirm that "LED4", "ALL ON" and "AWO" are on.
7. Input command like below.
 - The command is one of the examples. Please follow them to the environment.
 - The folder of InstallUtilityc.exe is C:\Program Files\Renesas\Smart Configurator for RZ\V2.2.0\tools\installutility\eclipse.
 - The number of serial port should be checked by "Device Manager" on Windows host PC.
 - The IP address should be checked by ipconfig command on Windows host PC.

Table 4.16 Command Line Options

Options	Arguments	Descriptions
-p	COMx	The number of serial port. Replace "x" to number.
-d	RZ/G3S	Device name.
-m	Normal	Download mode.
-conn	Usb	Connection method.
-fw	File path of "Flash Writer".	Path of "Flash Writer".
-bl2	File path of "BL2".	File path of "BL2".
-fip	File path of "FIP".	File path of "FIP".
-wic	File path of "WIC.GZ".	File path of "WIC.GZ".
-cfile	File paths of "DDR Configuration files".	File paths of "DDR Configuration files".

Code 4.1 Command to Install Linux (Example)

```
> cd "C:\Program Files\Renesas\Smart Configurator for
RZ\V2.2.0\tools\installutility\eclipse"

> InstallUtilityc.exe ^
  -p COM10 ^
  -d RZ/G3S ^
  -m Normal ^
  -conn Usb ^
  -fw      c:\tmp\sc_rzg3s\Flash_Writer_SCIF_RZG3S_SMARC_LPDDR4.mot ^
  -bl2     c:\tmp\sc_rzg3s\bl2_bp_mmc-smarc-rzg3s.srec ^
  -fip     c:\tmp\sc_rzg3s\fip-smarc-rzg3s.srec ^
  -wic     c:\tmp\sc_rzg3s\core-image-minimal-smarc-rzg3s.rootfs.wic.gz ^
  -cfile   c:\tmp\sc_rzg3s\ddr_param_def_lpddr4.c
```

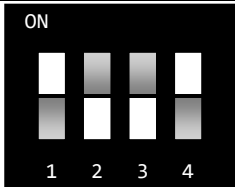
8. Pop-up messages appear. Please confirm "Boot/Power Mode Select (SW11)" is SCIF download mode, and press "Blue Button (RESET SW10)" on EVK.

Code 4.1 Pop-up Message - 1

```
Please set the board connected to COM* to SCIF boot mode. Then press the reset
button...
```

9. After installing "BL2" and "FIP", another pop-up menu appears. Then, please change "Boot/Power Mode Select (SW11)" to eMMC boot mode and press "Blue Button (RESET SW10)" on EVK.

Table 4.17 eMMC Boot Mode

Mode	Switch Image	Descriptions
eMMC Boot Mode		1: ON, 2: OFF, 3: OFF, 4: ON

Code 4.1 Pop-up Message - 2

```
Please set the board connected to COM* to eMMC boot mode. Then press the reset button...
```

10. After installing Linux boots from eMMC.

Code 4.1 Success

```
M11000002: Download operation completed successfully
```

11. Please confirm the message "Download operation completed successfully" in the console.

4.3.4 Install Linux via Ethernet

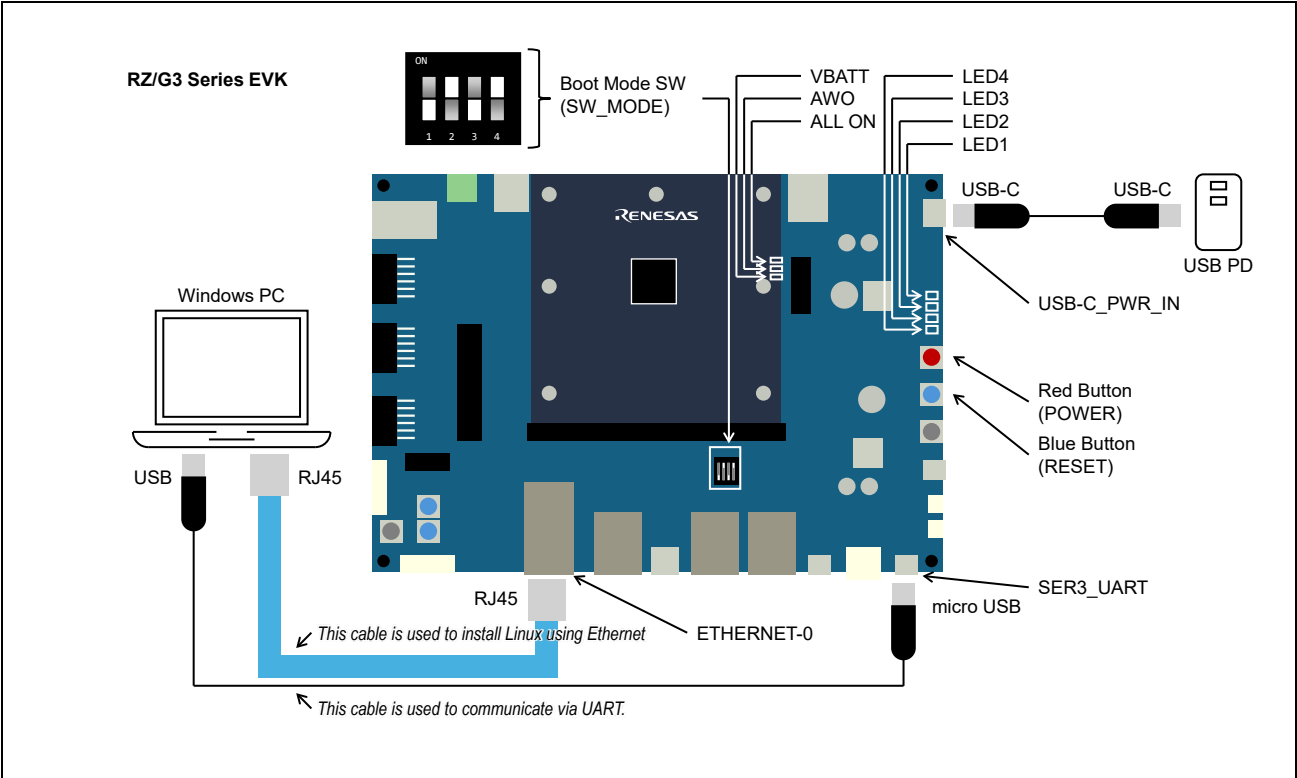


Figure 4.35 Connections for RZ/G3 Series

1. Switch " Boot Mode SW (SW_MODE)" to SCIF download mode.

Table 4.18 SCIF Download Mode

Mode	Switch Image	Switch Image
SCIF Download Mode		1: OFF, 2: ON, 3: OFF, 4: ON

2. Connect "USB-C_PWR_IN" and USB PD power supply.
 - Please confirm that the "LED2" and "LED3" are on.
3. Connect "SER3_UART" to the Windows PC using a USB cable.
4. Connect "ETHERNET-0" to the Windows PC using an Ethernet cable.
5. Press and hold "Red Button (POWER)".
 - Confirm that "LED4", "ALL ON" and "AWO" are on.
6. Execute "Smart Configurator".
7. Select "Tools" and select "Install Utility".

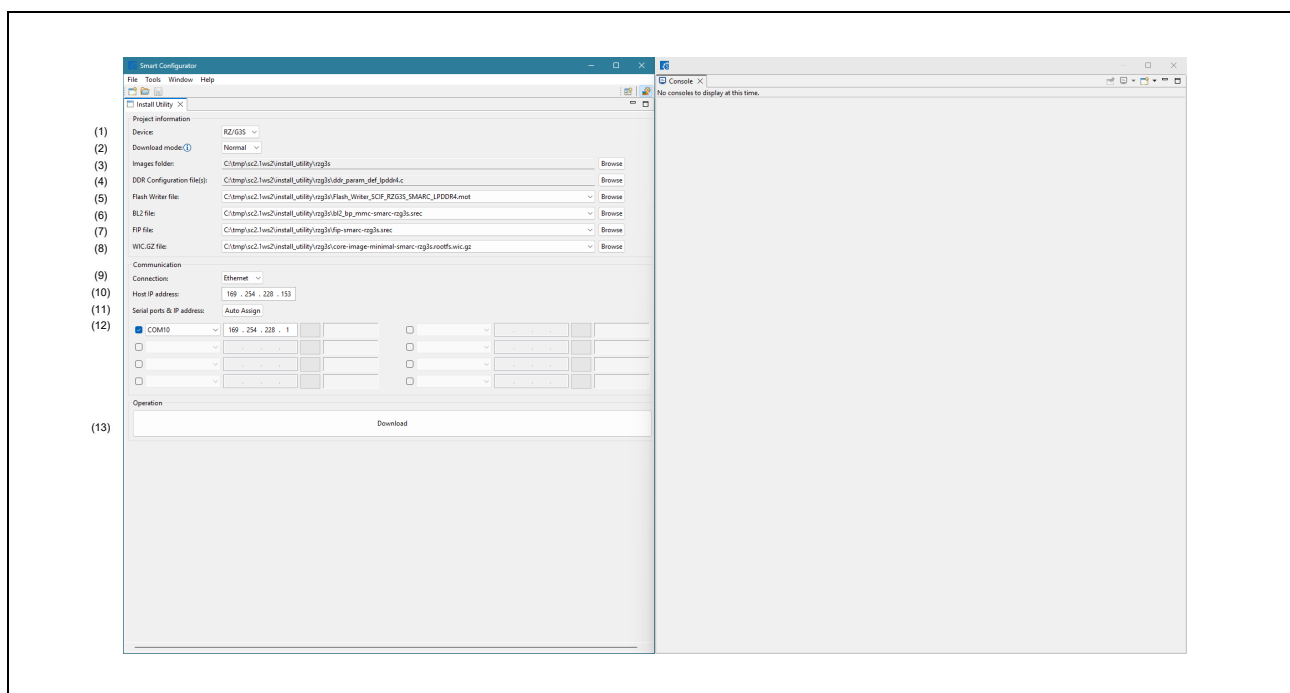


Figure 4.36 Install Utility for RZ/G3 Series

8. Select "Device" (1).
9. Select "Normal" (2).
10. Browse "Images folder" which includes "Flash Writer", "BL2", "FIP" and "WIC.GZ" files (3).
 - In this document, please set C:\tmp\sc folder. Then, "Flash Writer", "BL2", "FIP" and "WIC.GZ" files are set.
11. Browse "DRAM Parameters file" and select .c file for device (4).
12. Browse "Flash Writer file" and select .mot file for device (4).
13. Browse "BL2 file" and select .srec file for device (5).
14. Browse "FIP file" and select .srec file for device (6).
15. Browse "WIC.GZ file" and select .wic.gz file for device (7).
16. Select "Connection" to "Ethernet TCP". (9)
17. Input "Host IP address" (10).
 - Please check IP address using ipconfig command.

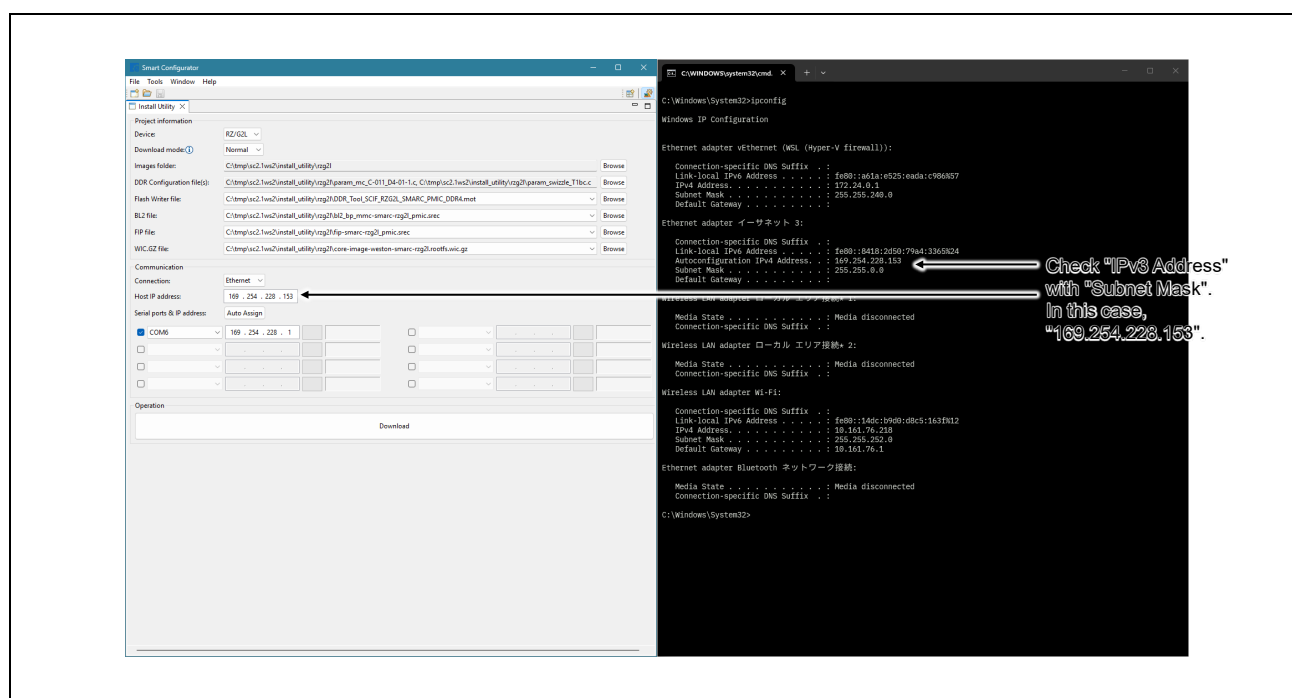


Figure 4.37 Device Manager

18. Select "Serial ports" (8).

- Please check serial port number using "Device Manager".

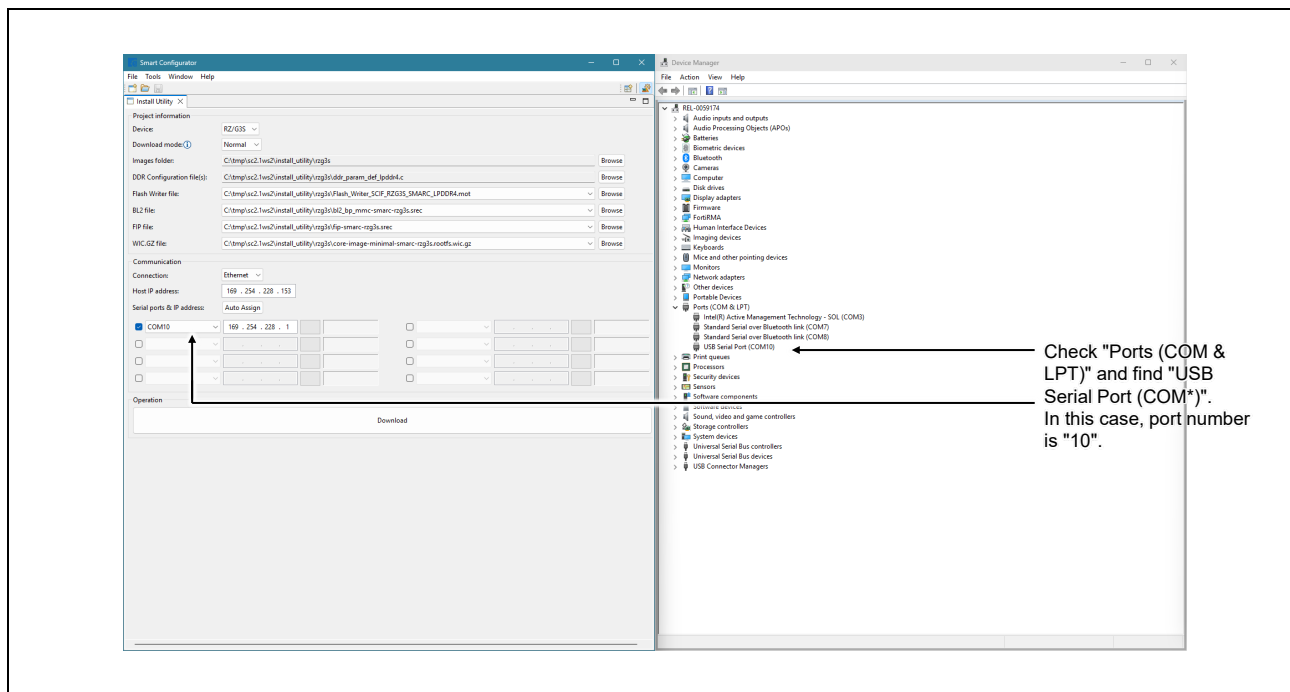


Figure 4.38 Device Manager

- 19. Click "Download" button to start installing Linux (12).
- 20. Pop-up menu appears. Please confirm "Boot/Power Mode Select (SW11)" is SCIF download mode, and press "Blue Button (RESET)" on EVK.

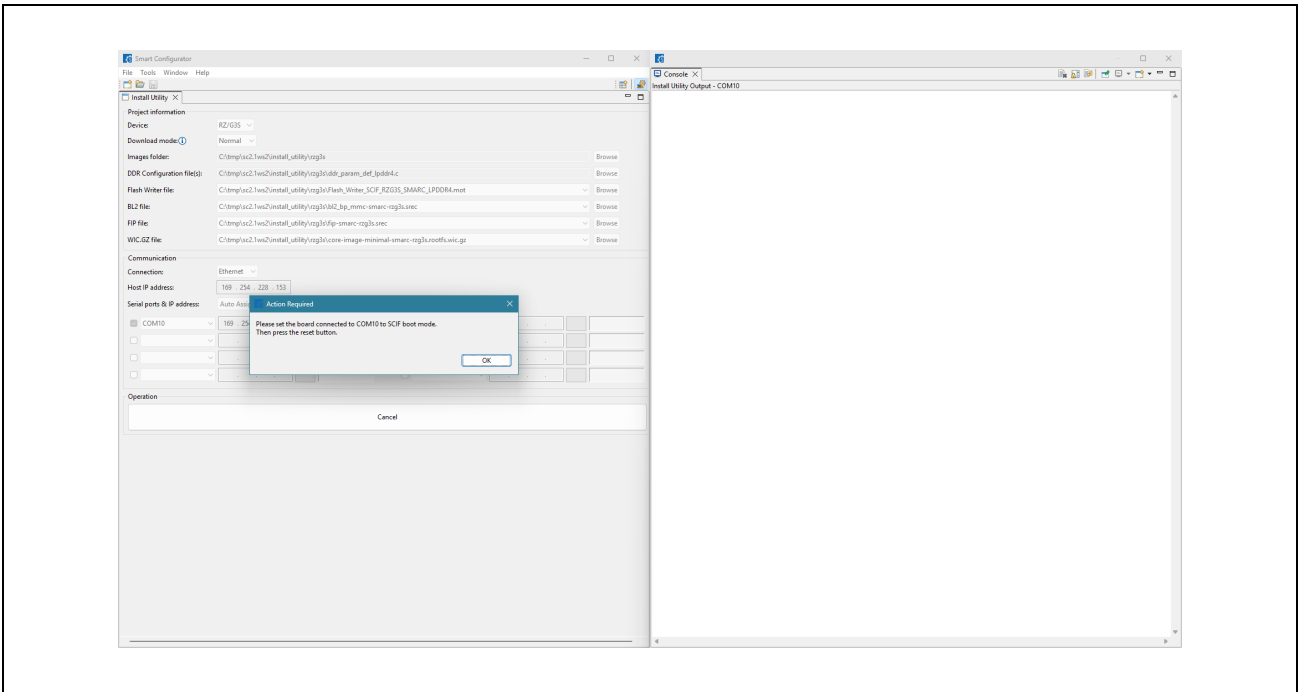


Figure 4.39 Pop-up Message – 1

- 21. Pop-up menu appears again. Then, please change "Boot/Power Mode Select (SW11)" to eMMC boot mode.

Table 4.19 eMMC Boot Mode

Mode	Switch Image	Switch Image
eMMC Boot Mode	ON 1 2 3 4	1: ON, 2: OFF, 3: OFF, 4: ON

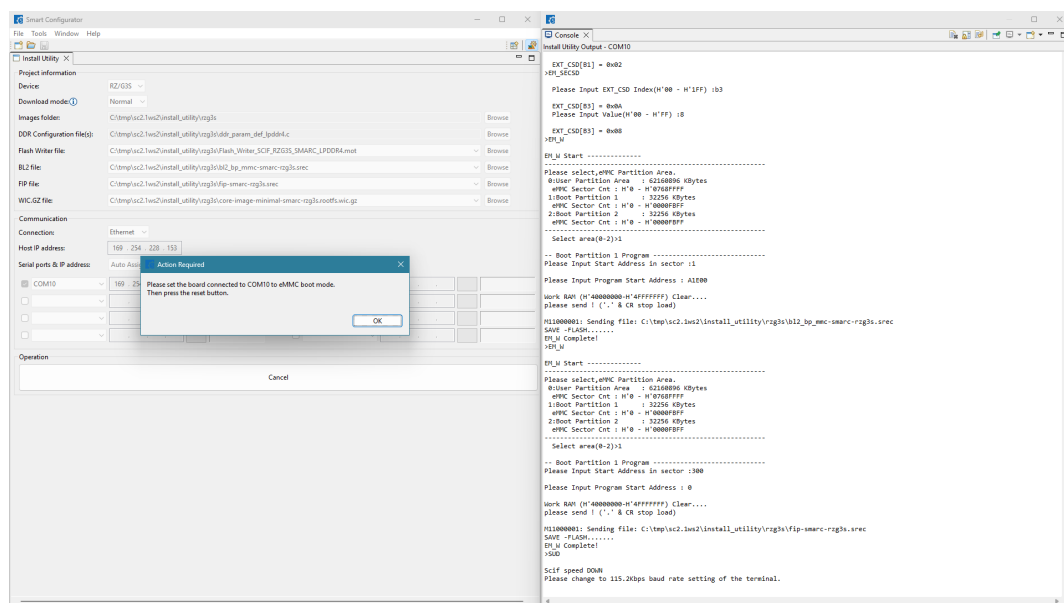


Figure 4.40 Pop-up Message - 2

22. After installing U-Boot, Linux boots from eMMC.

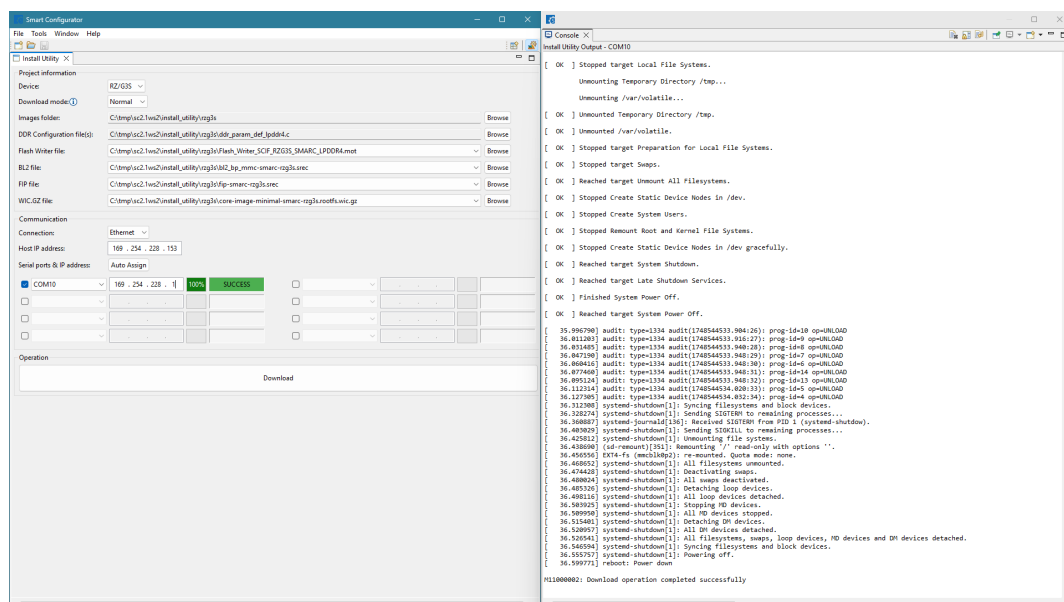


Figure 4.41 Success

23. Please confirm the message, "Download operation completed successfully".

4.3.5 Install Linux via Ethernet - CUI

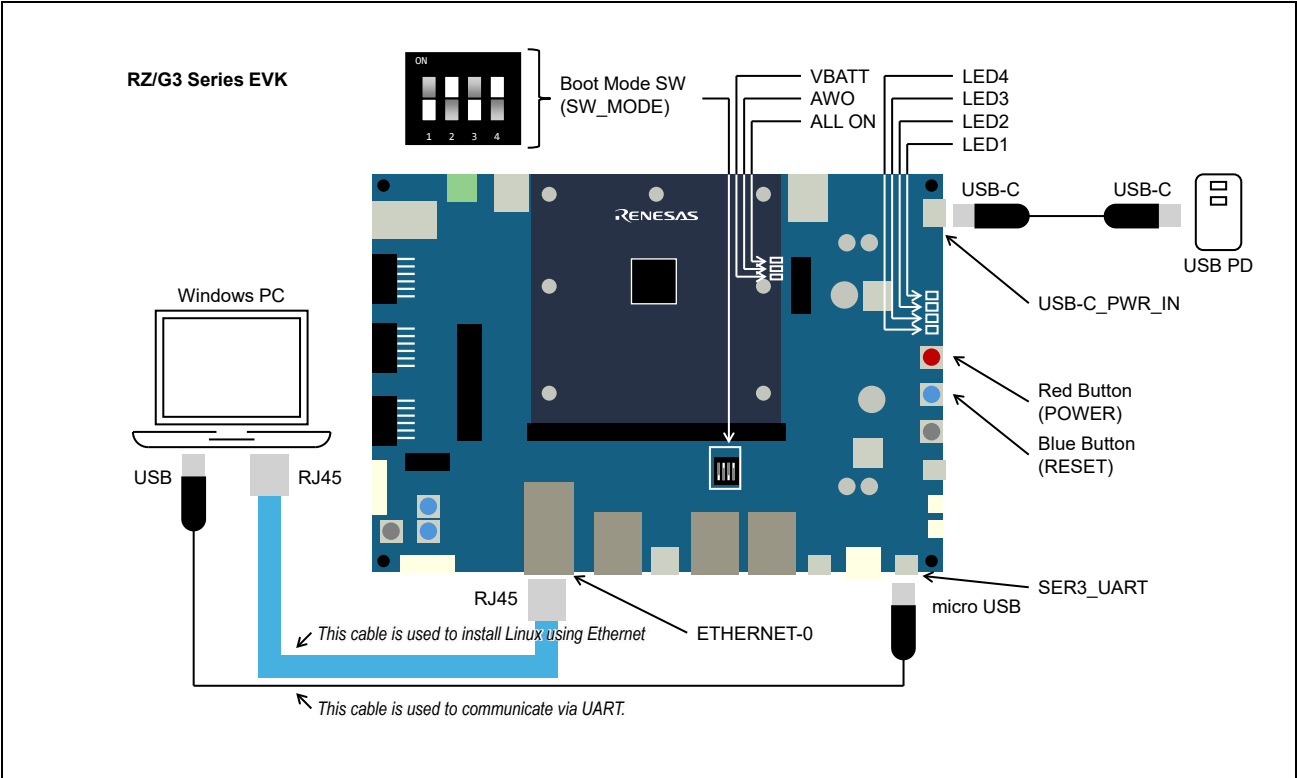
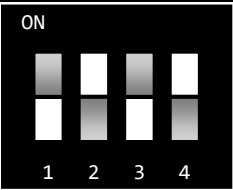


Figure 4.42 Connections for RZ/G3 Series

1. Switch " Boot Mode SW (SW_MODE)" to SCIF download mode.

Table 4.20 SCIF Download Mode

Mode	Switch Image	Descriptions
SCIF Download Mode		1: OFF, 2: ON, 3: OFF, 4: ON

2. Connect "USB-C_PWR_IN" and USB PD power supply.
 - Please confirm that the "LED2" and "LED3" are on.
3. Connect "SER3_UART" to the Windows PC using a USB cable.
4. Connect "ETHERNET-0" to the Windows PC using an Ethernet cable.
5. Press and hold "Red Button (POWER)".
 - Confirm that "LED4", "ALL ON" and "AWO" are on.
6. Input command like below.
 - The command is one of the examples. Please follow them to the environment.
 - The folder of InstallUtilityc.exe is C:\Program Files\Renesas\Smart Configurator for RZ\V2.2.0\tools\installutility\eclipse.
 - The number of serial port should be checked by "Device Manager" on Windows host PC.
 - The IP address should be checked by ipconfig command on Windows host PC.

Table 4.21 Command Line Options

Options	Arguments	Descriptions
-p	COMx	The number of serial port. Replace "x" to number.
-d	RZ/G3S or RZ/G3E	Device name.
-m	Normal	Download mode.
-conn	Ethernet_TCP	Connection method.
-hostip	IP address of Windows host PC.	IP address of Windows host PC.
-ipaddr	IP address of EVK.	IP address of EVK.
-fw	File path of "Flash Writer".	Path of "Flash Writer".
-bl2	File path of "BL2".	File path of "BL2".
-fip	File path of "FIP".	File path of "FIP".
-wic	File path of "WIC.GZ".	File path of "WIC.GZ".
-cfile	File paths of "DDR Configuration files".	File paths of "DDR Configuration files".

Code 4.1 Command to Install Linux (Example)

```
> cd "C:\Program Files\Renesas\Smart Configurator for
RZ\V2.2.0\tools\installutility\eclipse"

> InstallUtilityc.exe ^
  -p COM10 ^
  -d RZ/G3S ^
  -m Normal ^
  -conn Ethernet_TCP ^
  -hostip 169.254.228.153 ^
  -ipaddr 169.254.228.1 ^
  -fw c:\tmp\sc_rzg3s\Flash_Writer_SCIF_RZG3S_SMARC_LPDDR4.mot ^
  -bl2 c:\tmp\sc_rzg3s\bl2_bp_mmc-smarc-rzg3s.srec ^
  -fip c:\tmp\sc_rzg3s\fip-smarc-rzg3s.srec ^
  -wic c:\tmp\sc_rzg3s\core-image-minimal-smarc-rzg3s.rootfs.wic.gz ^
  -cfile c:\tmp\sc_rzg3s\ddr_param_def_lpddr4.c
```

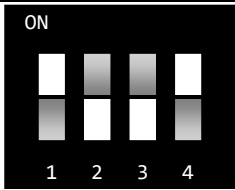
7. Pop-up messages appear. Please confirm "Boot/Power Mode Select (SW11)" is SCIF download mode, and press "Blue Button (RESET)" on EVK.

Code 4.1 Pop-up Message - 1

```
Please set the board connected to COM* to SCIF boot mode. Then press the reset
button...
```

8. After installing "BL2" and "FIP", another pop-up menu appears. Then, please change "Boot/Power Mode Select (SW11)" to eMMC boot mode and press "Blue Button (RESET SW10)" on EVK.

Table 4.22 eMMC Boot Mode

Mode	Switch Image	Descriptions
eMMC Boot Mode		1: ON, 2: OFF, 3: OFF, 4: ON

Code 4.1 Pop-up Message - 2

```
Please set the board connected to COM* to eMMC boot mode. Then press the reset button...
```

9. After installing Linux boots from eMMC.

Code 4.1 Success

```
M11000002: Download operation completed successfully
```

10. Please confirm the message "Download operation completed successfully" in the console.

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Apr. 20, 2026	-	First edition issued
1.01	Sep. 3, 2026	All	Add to support RZ/G3L Add to support Fastboot TCP

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity.

Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.

3. Input of signal during power-off state

Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. Handling of unused pins

Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.

5. Clock signals

After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.

6. Voltage application waveform at input pin

Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).

7. Prohibition of access to reserved addresses

Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

8. Differences between products

Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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