

CMOS 32-BIT SINGLE CHIP MICROCONTROLLER

S1C31 Family
PA File Creation Tool
Manual

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Table of Contents

1. Overview	1
1.1 Working Environment	1
2. Installation	2
2.1 Installation instructions	2
2.2 Structure of installation folder and start menu	4
3. Registering Tool	5
3.1 Using IAR EWARM	5
3.2 Using MDK-ARM	6
4. Creating PA File	7
4.1 Using IAR EWARM	7
4.2 Using MDK-ARM	8
Revision History	9

1. Overview

This tool creates a PA file from an ELF file (ROM data). If using the service to load user programs to the internal flash memory in S1C31 Family at Seiko Epson's factory, a PA file must be created and submitted to Seiko Epson.

The S1C31 Family is microcontrollers, which includes the ARM[®] Cortex[®]-M0+ processor, manufactured by Seiko Epson Corporation. Software for S1C31 family can be developed using third party ARM[®] software development environment. We recommend the following ARM[®] software development environments.

- IAR Embedded Workbench for ARM[®] (by IAR Systems)
- MDK-ARM[®] (by ARM)

1.1 Working Environment

To use this package, the following conditions are necessary:

- PC
 - Windows 7, 8.1 or 10
- ARM[®] development environment
 - IAR Embedded Workbench for ARM[®] or MDK-ARM[®]

2. Installation

2. Installation

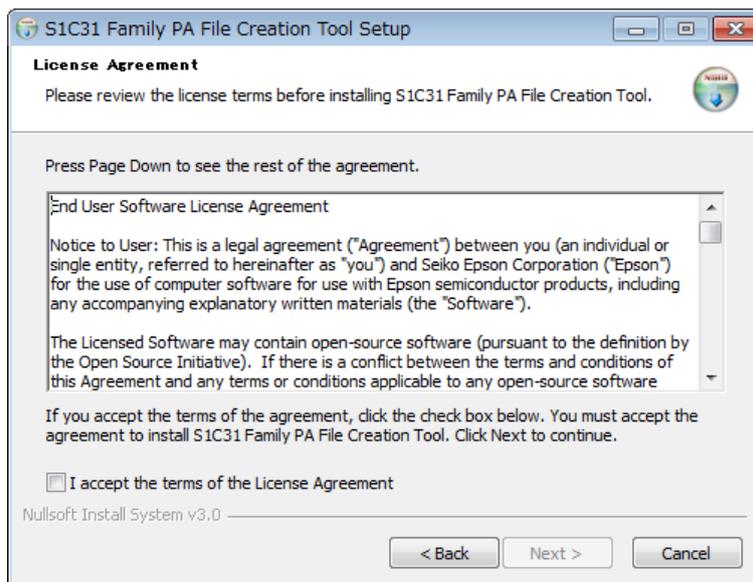
2.1 Installation instructions

To install this package, follow the procedure below.

- (1) Start Windows.
- (2) Download the S1C31 Family PA File Creation Tool (s1c31_pa_file_creation_tool_vx.xx.zip) from the web site of Seiko Epson micro controller, and unzip it in the desired folder.
- (3) Double-click setup.exe in the desired folder to launch the installer. Then the installation start screen will be displayed.



- (4) Click the [Next>] button. Then the software license agreement screen will be displayed.



- (5) Read the software license agreement. If you agree to the terms of the license, select “I accept the terms of the License Agreement” and click the [Next>] button. Hereafter follow the prompts in the installation wizard to proceed with the installation. If you do not agree, click the [Cancel] button to close the installer.
- (6) When the installation is completed, click the [Finish] button to close the installation wizard.

2. Installation

2.2 Structure of installation folder and start menu

The structure of the installation folder is as follows:

C:\EPSON (default)	
\C31_PA	
uninstall.exe	Uninstaller
license.txt	License file for this package
\TOOL	
ptd.exe	Motorola-S2-format file conversion tool
winmdc17.exe	PA file creation tool
\IAR	
c31_setup.bat	Batch file for setting up this tool for IAR EWARM
\ARM	
c31_setup.bat	Batch file for setting up this tool for MDK-ARM
\mcu_model	Folder of the model-specific files for creating PA file

The structure of the start menu folder is as follows:

EPSON MCU	
C31 PA	
Create C31 PA file	Shortcut to PA file creation program
Setup C31 for IAR	Shortcut to batch file for setting up the PA file creation tool (for IAR IDE)
Setup C31 for ARM	Shortcut to batch file for setting up the PA file creation tool (for MDK-ARM)
Uninstall	Shortcut to uninstaller
IAR	Shortcut to “C:\EPSON\C31_PA\IAR” folder
ARM	Shortcut to “C:\EPSON\C31_PA\ARM” folder

3. Registering Tool

By registering this tool to the IDE(IAR EWARM or MDK-ARM) as external tool, you can create a PA file in the IDE. Follow the procedure below to register this tool.

3.1 Using IAR EWARM

(1) Setup the PA file creation tool

Right-click the [EPSON MCU] > [C31_PA] > [Setup C31 for IAR] in the start menu and select [Run as administrator] to setup the PA file creation tool.

(2) Launch the IAR EWARM

Click the [IAR Systems] > [IAR Embedded Workbench for ARM 7.xx] > [IAR Embedded Workbench] in the start menu to launch the IAR EWARM.

(3) Register the PA file creation tool

Follow the steps below to register the PA file creation tool as an external tool in the IDE.

1. Select the [Tools] > [Configure Tools...] in IDE menu to open the [Configure Tools] dialog.
2. Click the [New] button, and then enter the 'Create S1C31xxx PA File'(ex. Create S1C31W74 PA File) in the text box at the [Menu Text:].
3. Click the [Browse...] button at the [Command:], and then select the S1C31xxx_create_pa.bat (ex.S1C31W74_create_pa.bat) in C:\EPSON\C31_PA\IAR(default installation folder).
4. Enter the "\$EXE_DIR\$" "\$PROJ_FNAME\$" "\$TARGET_FNAME\$" "\$EW_DIR\$" in the text box at the [Argument:].
5. Enter the '\$EXE_DIR\$' in the text box at the [Initial Directory:].
6. Enable the [Redirect to Output Window:] checkboxes.
7. Disable the [Prompt for Command Line:] checkboxes.
8. Select the [When not debugging] in the [Tool Available:] drop down list.
9. Click the [OK] button to complete the tool registration.

Menu Text:	Create S1C31XXX PA File
Command:	C:\EPSON\C31_PA\IAR\S1C31xxx_create_pa.bat
Argument:	"\$EXE_DIR\$" "\$PROJ_FNAME\$" "\$TARGET_FNAME\$" "\$EW_DIR\$"
Initial Directory:	\$EXE_DIR\$
Redirect to Output Window:	enable check
Prompt for Command Line:	disable check
Tool Available:	When not debugging

3. Registering Tool

3.2 Using MDK-ARM

- (1) Setup the PA file creation tool

Right-click the [EPSON MCU] > [C31_PA] > [Setup C31 for ARM] in the start menu and select [Run as administrator] to setup the PA file creation tool.

- (2) Launch the uVision (MDK-ARM)

Click the [Keil uVision5] shortcut icon on the desktop to launch uVision which is IDE included with MDK-ARM.

- (3) Register the PA file creation tool

Follow the steps below to register the PA file creation tool as an external tool in the IDE.

1. Select the [Tools] > [Customize Tools Menu...] in IDE menu to open the [Customize Tools Menu] dialog.
2. Double-click the blank line in [Menu Content:], and then enter the 'Create S1C31xxx PA File'(ex. Create S1C31W74 PA File).
3. Click the [...] button at the [Command:], and then select the S1C31xxx_create_pa.bat (ex.S1C31W74_create_pa.bat) in "C:\EPSON\C31_PA\ARM"(default installation folder).
4. Enter the '\$L' in the text box at the [Initial Folder:].
5. Enter the "\$L" "@L" "%L" "\$K" in the text box at the [Arguments:].
6. Disable the checkboxes, [Prompt for Arguments], [Run Minimize] and [Run Independent].
7. Click the [OK] button to complete the tool registration.

Menu Content:	Create S1C31XXX PA File
Command:	C:\EPSON\C31_PA\ARM\S1C31xxx_create_pa.bat
Initial Folder:	\$L
Arguments:	"\$L" "@L" "%L" "\$K"
Prompt for Arguments	disable check
Run Minimized	disable check
Run Independent	disable check

4. Creating PA File

If you want to use the service to load the user programs to the internal flash memory of the S1C31 Family at the Seiko Epson's factory, you need to create a PA file and submit it to Seiko Epson.

Follow the procedure below to create a PA file.

4.1 Using IAR EWARM

This section uses the S1C31xxx peripheral circuit sample software provided by Seiko Epson as an example.

(1) Open the Workspace

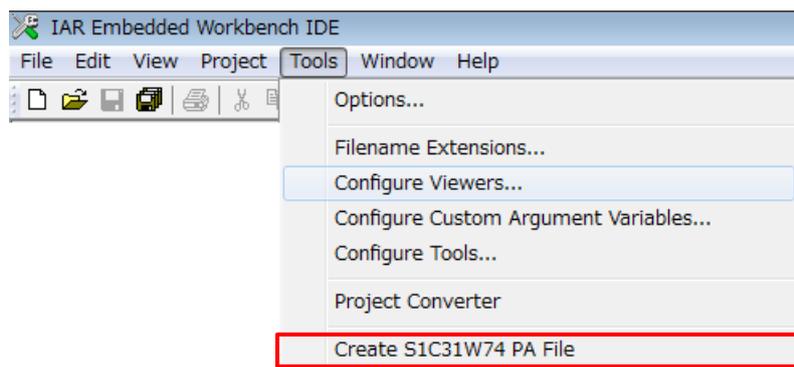
Launch the IAR EWARM, and then select the [File] > [Open] > [Workspace...] in the IDE menu to open the Examples\WORKSPACE\S5U1C31xxxTx\IAR\Examples.eww.

(2) Create the ELF file(*.out)

Set the desired project as active and select the build configuration with "Flash" (ex. DebugFlash or Release Flash). Then select the [Project] > [Make] in IDE menu to build the active project. After the build is completed, an ELF file (*.out) is created in the "\$PROJ_DIR\{build configuration}\Exe" folder.

(3) Create the PA file

Select the [Tools] > [Create S1C31xxx PA File] in IDE menu to create the PA file.



When a PA file generation succeeds, the following message is output to the [Tool output] window displayed at the bottom of IDE.

```
*
* OK    PA file is created.
*
*****
```

The PA file (*.PA) is created in the folder where the ELF file(.out) exists.

4. Creating PA File

4.2 Using MDK-ARM

This section uses the S1C31xxx peripheral circuit sample software provided by Seiko Epson as an example.

- (1) Open the Workspace

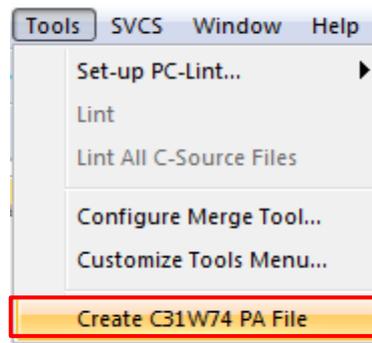
Launch the uVision(MDK-ARM), and then select the [Project] > [Open Project...] in the IDE menu to open the Examples\WORKSPACE\S5U1C31xxxTx\ARM\Examples.uvmpw.

- (2) Create the ELF file(*.axf)

Set the desired project as active and select the build configuration with “Flash” (ex. DebugFlash). Then select the [Project] > [Build ‘xxx (yyy)’] in IDE menu to build the active project. After the build is completed, an ELF file (*.axf) is created in the \$PROJ_DIR\obj\{build configuration} folder.

- (3) Create the PA file

Select [Tool] > [Create C31 PA File] in uVision menu to create the PA file.



When a PA file generation succeeds, the following message is output to the [Build Output] window displayed at the bottom of IDE.

```
*
* OK    PA file is created.
*
*****
```

The PA file (*.PA) is created in the folder where the ELF file(.axf) exists.

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