

CS+ V3.00.00

Integrated Development Environment

User's Manual: RL78 Pin Configurator

Target Device

RL78 Family

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How to Use This Manual

This manual describes the role of the CS+ integrated development environment for developing applications and systems for RL78 family, and provides an outline of its features.

CS+ is an integrated development environment (IDE) for RL78 family, integrating the necessary tools for the development phase of software (e.g. design, implementation, and debugging) into a single platform.

By providing an integrated environment, it is possible to perform all development using just this product, without the need to use many different tools separately.

Readers	This manual is intended for users who wish to understand the functions of the CS+ and design software and hardware application systems.
Purpose	This manual is intended to give users an understanding of the functions of the CS+ to use for reference in developing the hardware or software of systems using these devices.
Organization	This manual can be broadly divided into the following units. 1.GENERAL 2.FUNCTIONS A.WINDOW REFERENCE
How to Read This Manual	It is assumed that the readers of this manual have general knowledge of electricity, logic circuits, and microcontrollers.
Conventions	Data significance: <u>Higher</u> digits on the left and lower digits on the right Active low representation: <u>XXX</u> (overscore over pin or signal name) Note: Footnote for item marked with Note in the text Caution: Information requiring particular attention Remark: Supplementary information Numeric representation: Decimal ... XXXX Hexadecimal ... 0xXXXX

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1. GENERAL

CS+ is an integrated development environment used to carry out tasks such as design, coding, build and debug for developing application systems.

This chapter gives an overview of the Pin Configurator.

1.1 Overview

The Pin Configurator, which is one of the components provided by CS+, enables you to output the pin assignment of the microcontroller (device pin list and device top view) by configuring various information using the GUI.

1.2 Features

The Pin Configurator has the following features.

(1) Reporting function

You can output configured information using the Pin Configurator as files in various formats for use as design documents.

2. FUNCTIONS

This chapter describes the key functions provided by the Pin Configurator along with operation procedures.

Remark In this chapter, an example where an RL78/G13 (ROM: 16KB) R5F1006A(20pin) is the target device is used to explain the key functions.

2.1 Overview

The Pin Configurator is used to output report files such as a device pin list and a device top view by entering pin assignment information of the microcontroller.

The following sections describe the operation procedures for Pin Configurator.

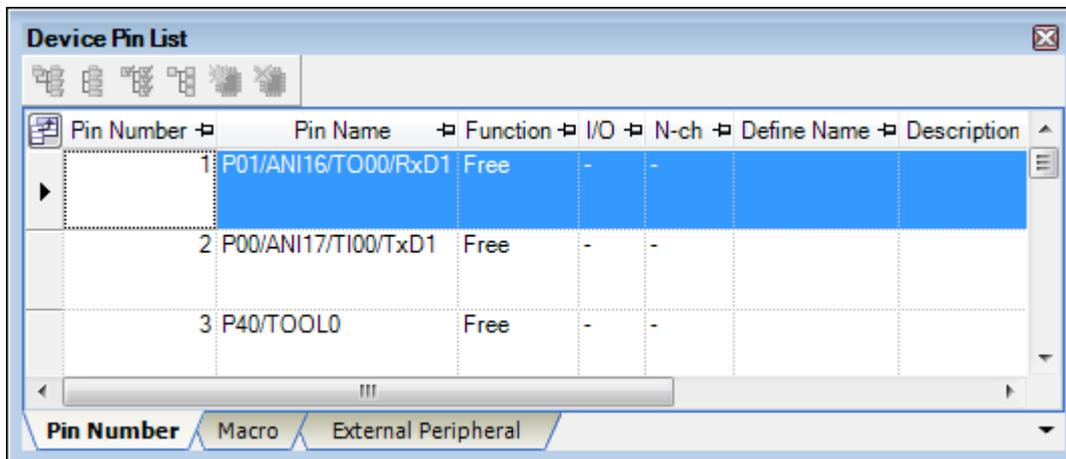
- (1) **Start CS+**
Launch CS+ from the [Start] menu of Windows.
- (2) **Create/Open project**
Create a new project (that defines a kind of project, microcontroller to be used, build tools to be used, etc.) or load an existing project.
- (3) **Open Device Pin List Panel**
Open the [Device Pin List panel](#), where you enter information on the pins of the microcontroller.
 - (a) **Select item**
Allows you to select items displayed in the device pin list.
 - (b) **Change display order**
Allows you to change the order in which items are displayed in the device pin list.
 - (c) **Add column**
Allows you to add columns to the device pin list.
 - (d) **Delete column**
Allows you to delete columns from the device pin list.
- (4) **Open Device Top View Panel**
Open the [Device Top View panel](#), where you can confirm the information entered for the pins.
 - (a) **Select shape of microcontroller**
Allows you to select the shape of the microcontroller displayed in the [Device Top View panel](#).
 - (b) **Select color**
Allows you to select colors used to distinguish the type of pins (power pins, special pins, used pins, etc.) whose information is displayed in the [Device Top View panel](#).
 - (c) **Select popup information**
Allows you to select the type of information that pops up when you move the mouse cursor over each pin in the [Device Top View panel](#).
 - (d) **Select additional information**
Select the type of information to display in Pin area of the [Device Top View panel](#).
- (5) **Enter Information**
Enter information on the pins of the microcontroller in the [Device Pin List panel](#).
- (6) **Output Report Files**
Output report files (files containing configured information using Pin Configurator: device pin list and device top view) to the specified folder.
 - (a) **Output device pin list**
Output a device pin list.
 - (b) **Output device top view**
Output a device top view.
- (7) **Save project**
Save a project.

2.2 Open Device Pin List Panel

Open the [Device Pin List panel](#), where you enter information on the pins of the microcontroller.

To open the [Device Pin List panel](#), double-click [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List] in the [Project Tree panel](#).

Figure 2.1 Open Device Pin List Panel



Remark 1. If an unsupported microcontroller is defined in the project for Pin Configurator, then "[Pin Configurator (Design Tool)] node" will hide under [*Project name* (Project)] in the [Project Tree panel](#).

Remark 2. The [Device Pin List panel](#) consists of three tabs. Selecting one of the tabs changes the order in which "information on each pin of the microcontroller" is displayed.

- [\[Pin Number\] tab](#)

Information on each pin of the microcontroller is displayed in the order of pin number.

- [\[Macro\] tab](#)

Information on each pin of the microcontroller is displayed in the order it was grouped into peripheral functions.

- [\[External Peripheral\] tab](#)

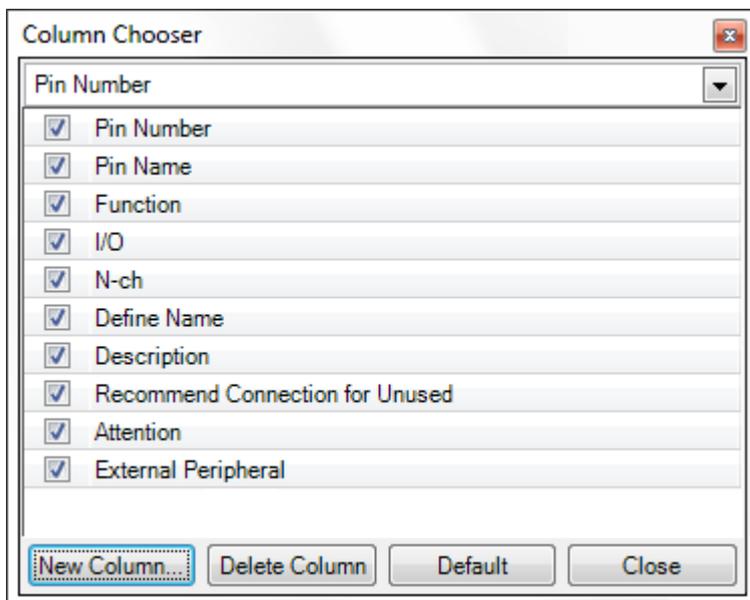
Information about the pins connected to external peripherals is displayed in order grouped at the external-peripheral component level.

2.2.1 Select item

The Pin Configurator is used to select items to be displayed in the device pin list using the  button in the upper left corner of the device pin list.

To select the item to be displayed, use the [Column Chooser dialog box](#) that opens by pressing the  button in the upper left corner of the device pin list.

Figure 2.2 Select Item



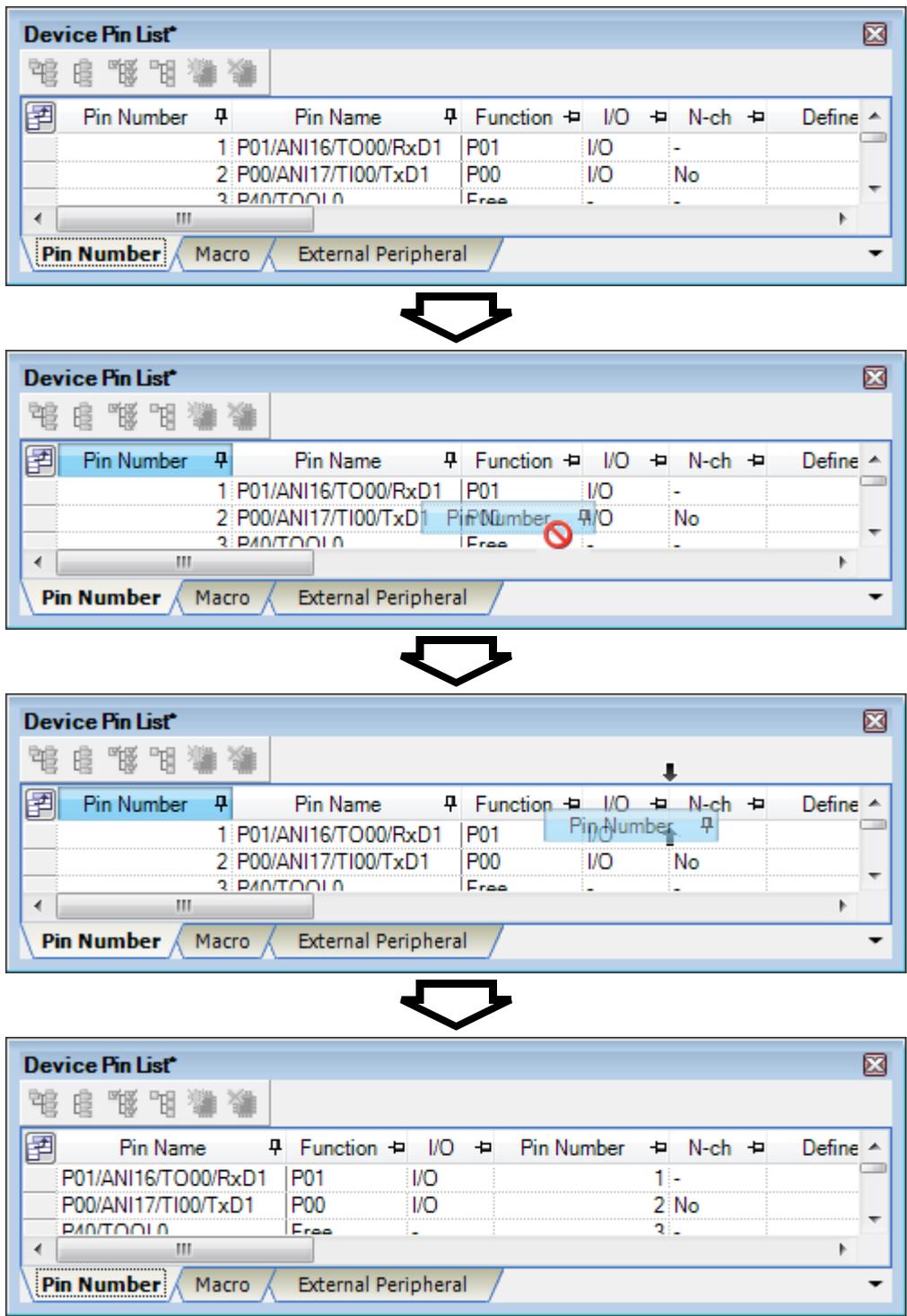
Remark To select the item to be displayed, check the check box that corresponds to the item.

Checked	Displays the selected item in the device pin list.
Not checked	Hides the selected item in the device pin list.

2.2.2 Change display order

In Pin Configurator, you can change the display order of columns in the device pin list (move columns) by dragging and dropping columns.

Figure 2.3 Change Display Order



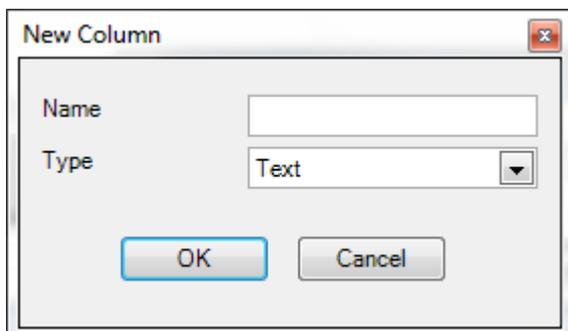
Remark To change the display order, click the  button in the upper left of the device pin list. The [Column Chooser dialog box](#) opens. Drag an item displayed in the dialog's select items to display area, and drop it to the desired destination in the device pin list. This will change the display order.

2.2.3 Add column

The Pin Configurator is used to add the "user's own column" to the device pin list using the [New Column...] button in the [Column Chooser dialog box](#) that opens by pressing the  button in the upper left corner of the device pin list.

To add a column, use the [New Column dialog box](#) that opens by pressing the [New Column...] button in the [Column Chooser dialog box](#).

Figure 2.4 Add Column



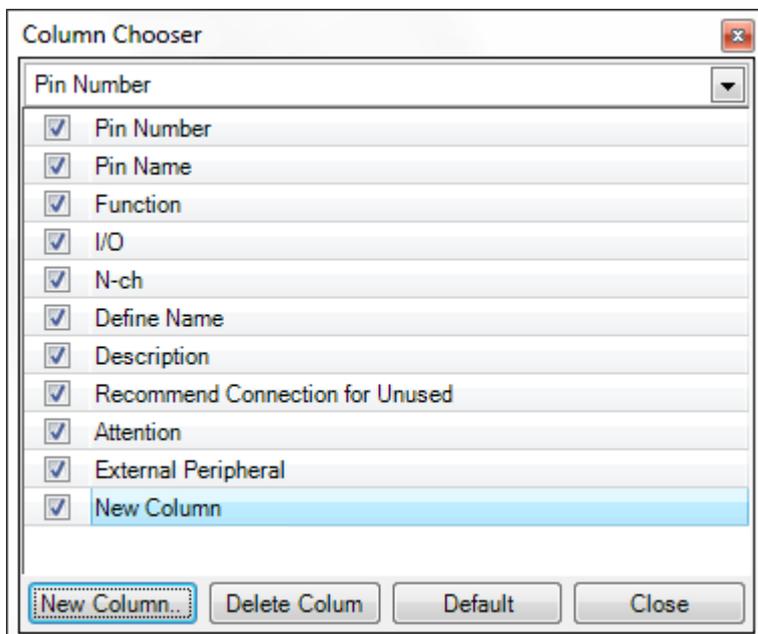
Remark On the device pin list, adding columns to the first level of [\[Macro\] tab](#), [\[External Peripheral\] tab](#) is restricted.

2.2.4 Delete column

The Pin Configurator is used to delete the "user's own column" from the device pin list using the [Delete Column] button in the [Column Chooser dialog box](#) that opens by pressing the  button in the upper left corner of the device pin list.

To delete a column, select the column you want to delete in the displayed item selection area of the [Column Chooser dialog box](#), and press the [Delete Column] button.

Figure 2.5 Delete Column



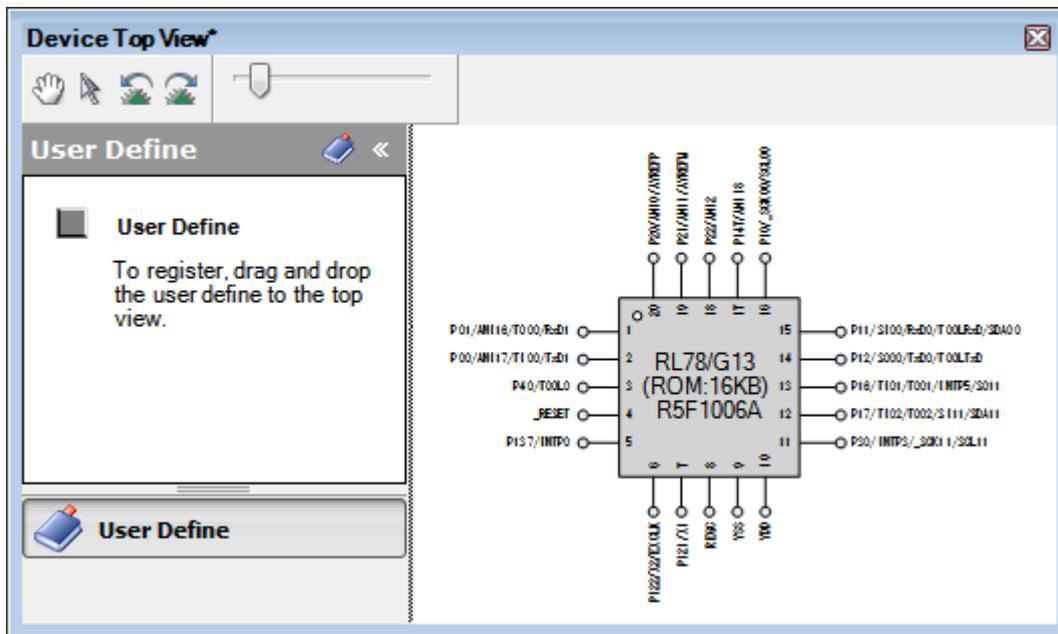
Remark You can only delete the column which you added using the [New Column dialog box](#).

2.3 Open Device Top View Panel

Open the [Device Top View panel](#), where you can confirm the information entered for the pins of the microcontroller.

To open the [Device Top View panel](#), double-click [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Top View] in the [Project Tree panel](#).

Figure 2.6 Open Device Top View Panel



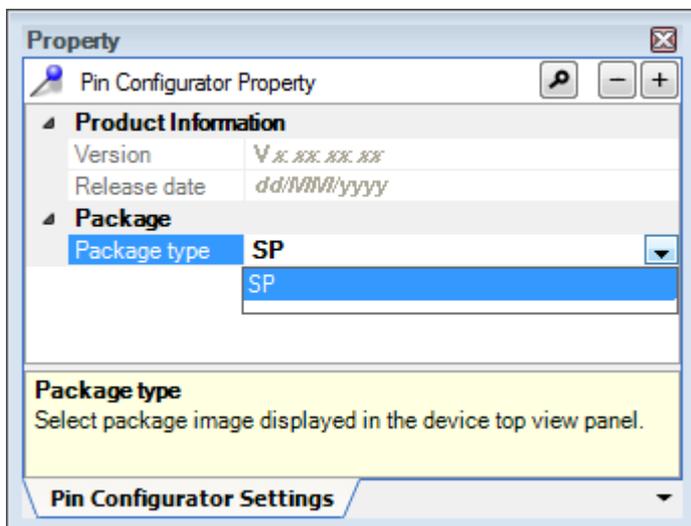
Remark In the [Property panel](#), on the [\[Pin Configurator Settings\] tab](#), if "BGA" is selected for the Package type, then [Device Top View panel](#) cannot be opened.

2.3.1 Select shape of microcontroller

Select the shape of the microcontroller displayed in the [Device Top View panel](#) which is opened as described in "[2.3 Open Device Top View Panel](#)".

To select the shape of the microcontroller, click [\[Pin Configurator Settings\] tab](#) >> [\[Package\]](#) >> [\[Package type\]](#) in the [Property panel](#) and select the desired shape.

Figure 2.7 Select Shape of Microcontroller



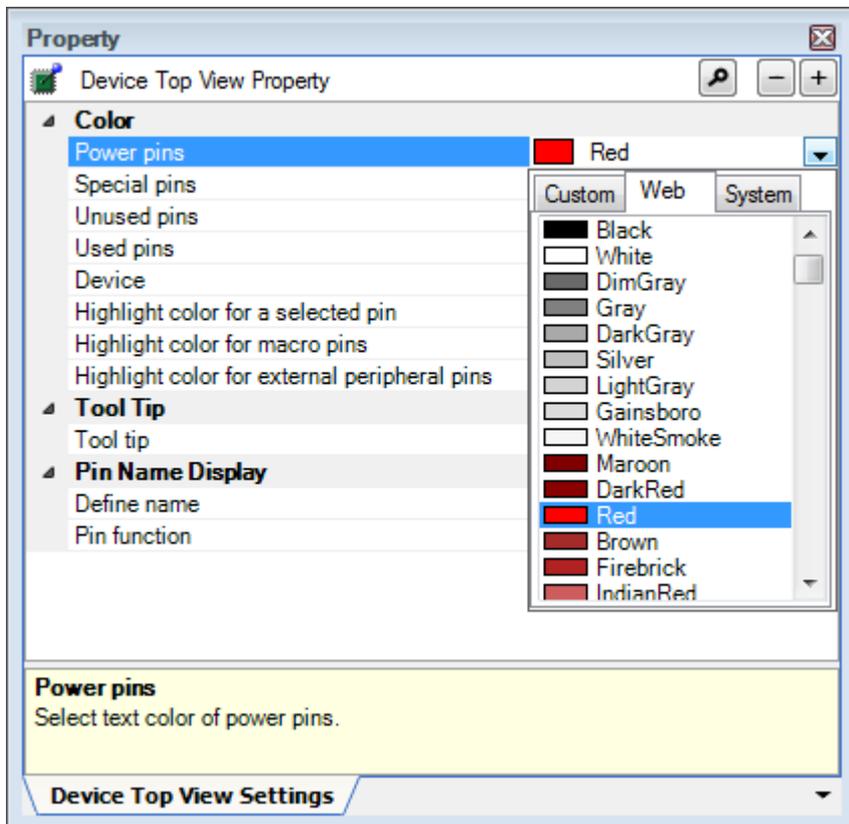
Remark Selection of the shape of the microcontroller is made using the order name (such as GC and GF).

2.3.2 Select color

Select the colors used to distinguish the type of pins (power pins, special pins, unused pins, etc.) whose information is displayed in the [Device Top View panel](#) which is opened as described in “[2.3 Open Device Top View Panel](#)”.

To select the color to be displayed, click [[Device Top View Settings](#)] tab >> [Color] in the [Property panel](#) and select the color.

Figure 2.8 Select Color



Remark Select the colors to be displayed for the following eight types of items.

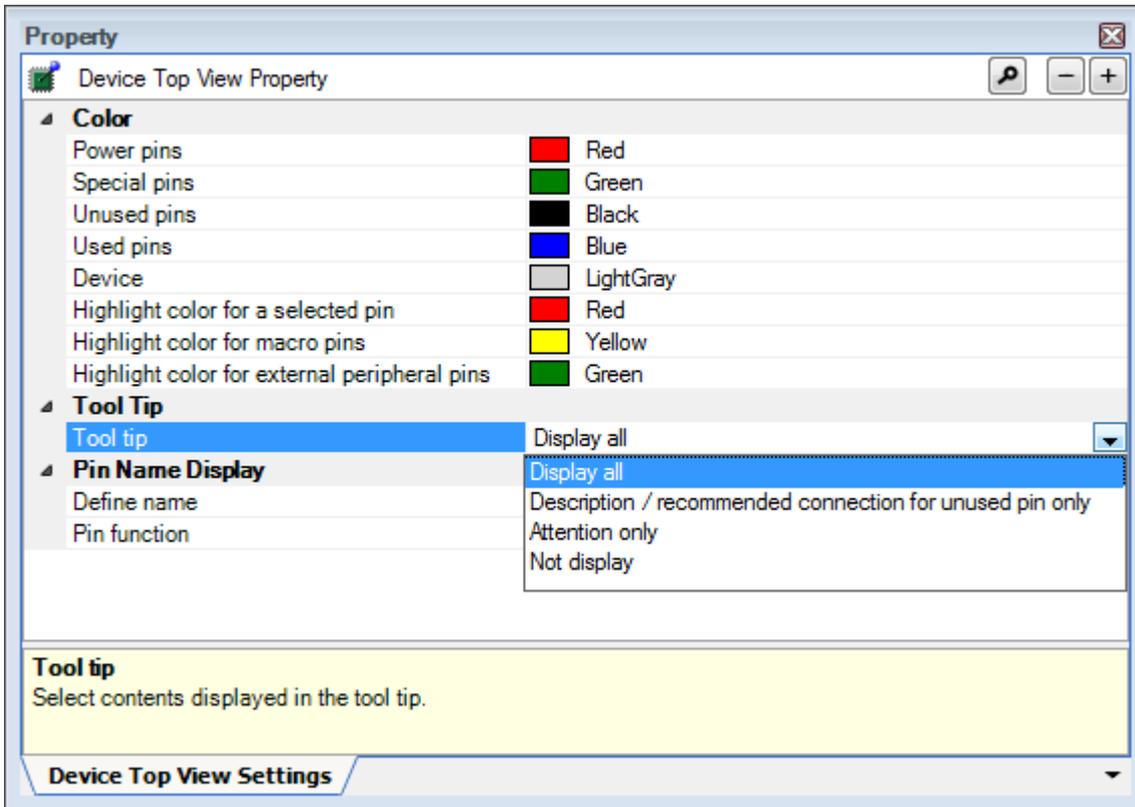
Power pins	Selects the display color for power pins (pins whose use is limited to power).
Special pins	Selects the display color for special pins (pins with specified uses).
Unused pins	Selects the display color for unused pins (dual-use pins with no use set in the Device Pin List panel).
Used pins	Selects the display color for used pins (dual-use pins with a use set in the Device Pin List panel).
Device	Selects the display color of the microcontroller.
Highlight color for a selected pin	Selects the background color of a pin selected in the Device Pin List panel , on the [Pin Number] tab.
Highlight color for macro pins	Selects the background color of pins selected in the Device Pin List panel , on the [Macro] tab.
Highlight color for external peripheral pins	Selects the background color of pins selected in the Device Pin List panel , on the [External Peripheral] tab.

2.3.3 Select popup information

Select the type of information that pops up when you move the mouse cursor over each pin in the [Device Top View panel](#) which is opened as described in [“2.3 Open Device Top View Panel”](#).

To select the popup information, click [\[Device Top View Settings\] tab](#) >> [\[Tool Tip\]](#) >> [\[Tool tip\]](#) in the [Property panel](#) and select the desired type of information.

Figure 2.9 Select Popup Information



Remark Popup information is selected from the following four types.

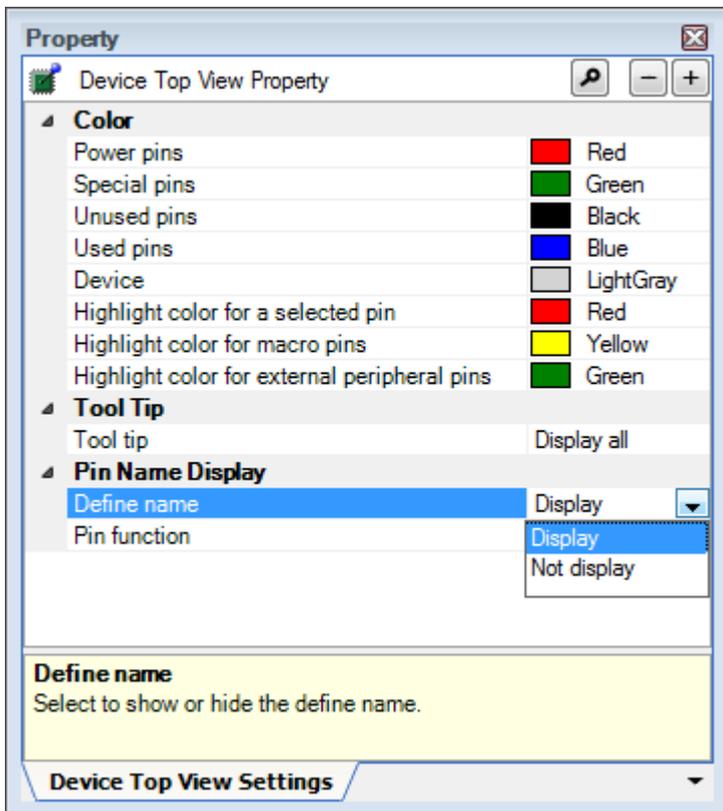
Display all	Displays the “Description”, “Recommend Connection for Unused”, and “Attention” strings for the device pin list.
Description / recommended connection for unused pin only	Displays the “Description”, and “Recommend Connection for Unused” strings for the device pin list.
Attention only	Displays the “Attention” string for the device pin list.
Not display	Hides tooltips when the mouse cursor hovers over a pin.

2.3.4 Select additional information

Select the type of information to display in Pin area, in the [Device Top View panel](#) opened in “[2.3 Open Device Top View Panel](#)”.

Note that additional information is selected from the [Property panel](#), on the [\[Device Top View Settings\] tab](#), by selecting the corresponding information under [\[Pin Name Display\]](#).

Figure 2.10 Select Additional Information



Remark 1. Select one of the following two types for Define name (whether to display the “Define Name” string of the Device Pin List in appended format).

Display	Displays the "Define Name" string of the device pin list in appended format.
Not display	Hides the “Define Name” string of the device pin list.

Remark 2. Select one of the following two types for Pin function (whether to display it whether or not a function is selected for “Function” on the Device Pin List).

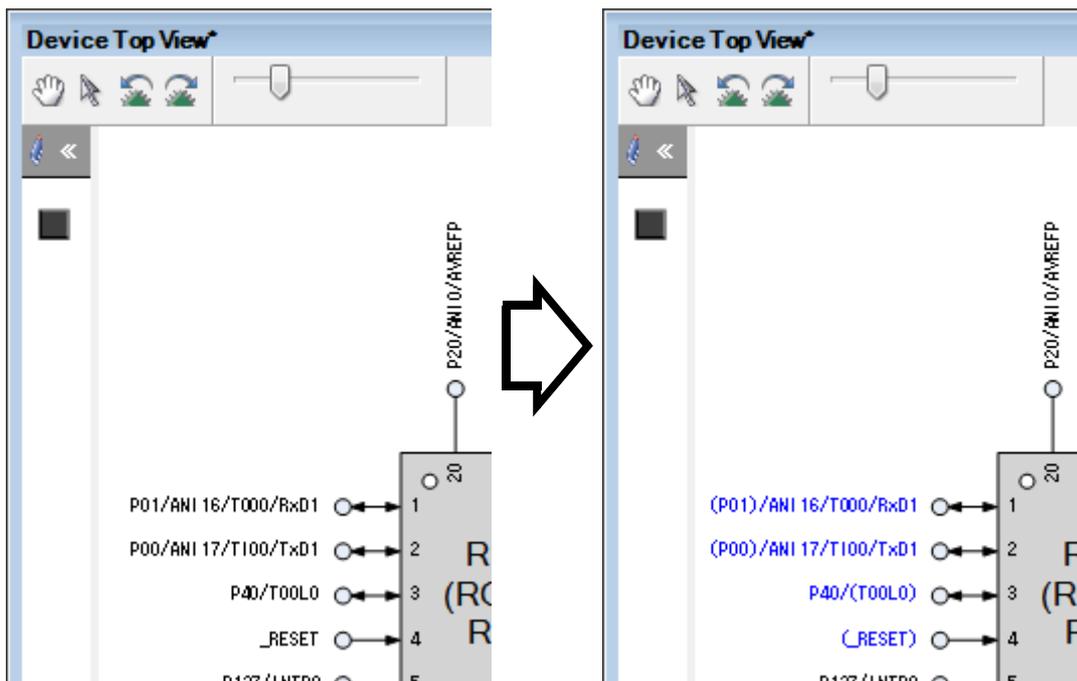
Display all	Displays functions selected via the device pin list's "Function" feature in parentheses.
Selected function only	Only display functions selected via the device pin list's “Function” feature in the device top view.

2.4 Enter Information

Enter information on the pins of the microcontroller in the [Device Pin List panel](#) which is opened as described in “[2.2 Open Device Pin List Panel](#)”.

- Remark 1. You cannot add information in the “Pin Number” column, “Pin Name” column, “Description” column, “Recommend Connection for Unused” column and “Attention” column because they contain fixed information.
- Remark 2. If the “Free” in the “Function” column is changed to a specific pin name, color of the corresponding pin in the [Device Top View panel](#) changes from the “color representing the unused pins” to the “color representing the used pins” selected by clicking [[Device Top View Settings](#)] tab >> [Color] in the [Property panel](#).

Figure 2.11 Change in Displayed Color



2.5 Output Report Files

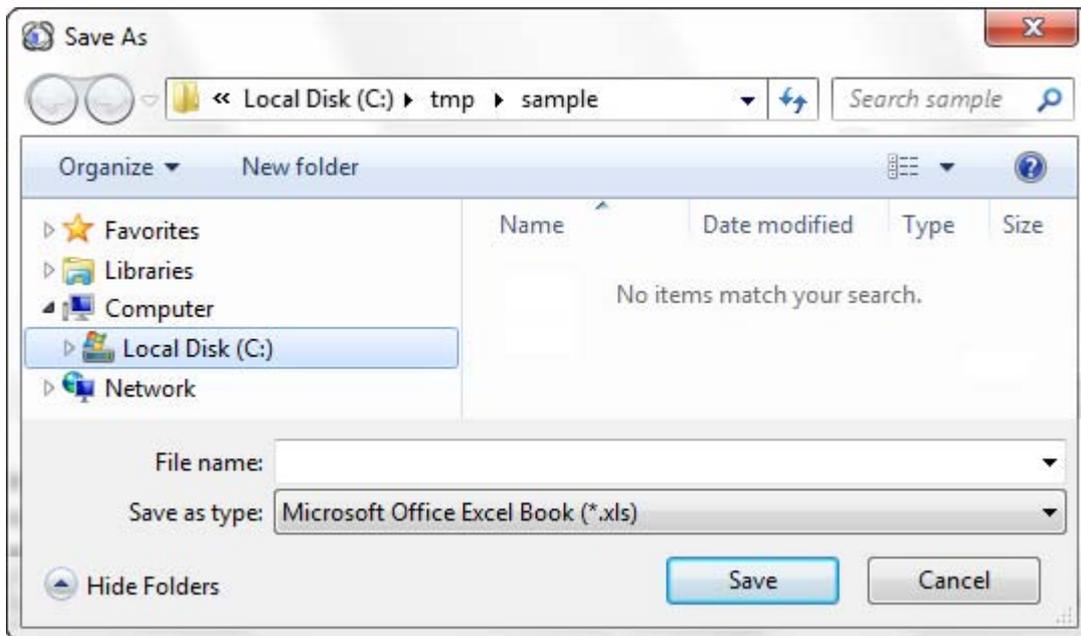
Output report files (files containing information configured using Pin Configurator: device pin list and device top view) to the specified folder.

2.5.1 Output device pin list

Select [File] menu >> [Save Pin List As...] to output a report file (a file containing information configured using Pin Configurator: device pin list).

The destination folder for the device pin list is specified in the [Save As dialog box](#) which opens by selecting [File] menu >> [Save Pin List As ...].

Figure 2.12 Output Device Pin List



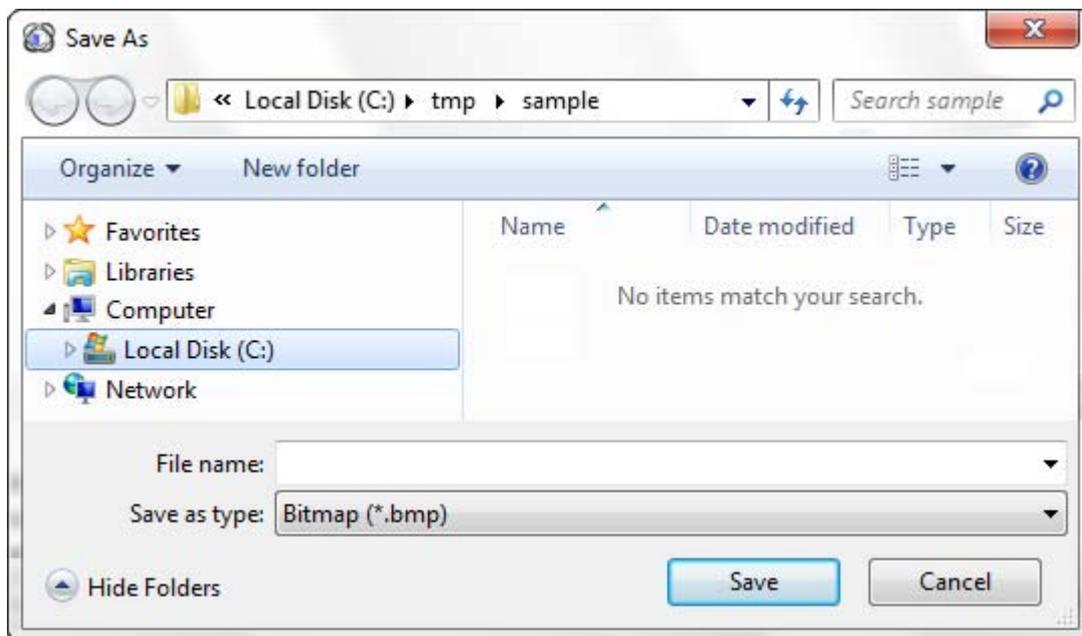
- Remark 1. If a device pin list has been already output, that list will be overwritten by selecting [File] menu >> [Save Pin List].
- Remark 2. The output format for the device pin list is limited to Microsoft Office Excel Book.

2.5.2 Output device top view

Select [File] menu >> [Save Top View As...] to output a report file (a file containing information configured using Pin Configurator: device top view).

The destination folder for the device top view is specified in the [Save As dialog box](#) which opens by selecting [File] menu >> [Save Top View As ...].

Figure 2.13 Output Device Top View



Remark If a device top view has been already output, that view will be overwritten by selecting [File] menu >> [Save Top View].

A. WINDOW REFERENCE

This appendix explains in detail the functions of the windows, panels and dialog boxes of the Pin Configurator.

A.1 Overview

The Pin Configurator has the following windows, panels and dialog boxes.

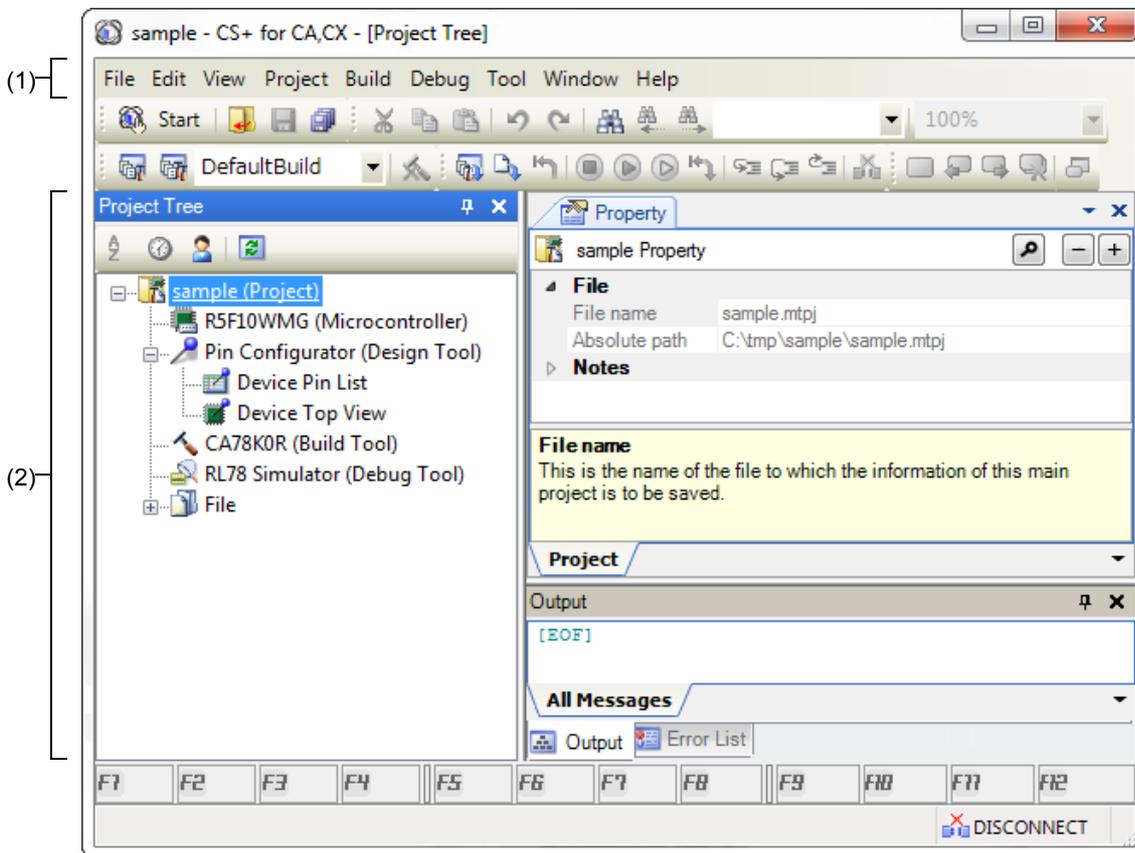
Table A.1 Window/Panel/Dialog Box List

Window/Panel/Dialog Box Name	Function
Main window	This is the first window to open when CS+ is launched. This window is used to operate various components (design tool, build tool, etc.) provided by CS+.
Project Tree panel	This panel displays the components of the project (microcontroller, design tool, build tool, etc.) in a tree structure.
Property panel	This panel allows you to view the information on and change the setting for the node selected in the Project Tree panel .
Device Pin List panel	This panel allows you to enter information on each pin of the microcontroller.
Device Top View panel	This panel displays the information entered in the Device Pin List panel .
Output panel	This panel displays operation logs for various components (design tool, build tool, etc.) provided by CS+.
Column Chooser dialog box	This dialog box allows you to choose whether or not to display the item listed in this dialog box in the device pin list, and add columns to or delete columns from the device pin list.
New Column dialog box	This dialog box allows you to add your own column to the device pin list.
Save As dialog box	This dialog box allows you to name and save a file.

Main window

This is the first window to open when CS+ is launched. This window is used to operate various components (design tool, build tool, etc.) provided by CS+.

Figure A.1 Main Window



The following items are explained here.

- [How to open]
- [Description of each area]

[How to open]

- From the [start] menu, select [All Programs] >> [Renesas Electronics CS+] >>[CS+].

[Description of each area]

- (1) Menu bar
This area consists of the following menu items.

- (a) [File] menu

Save Pin List	Device Pin List panel-dedicated item Saves a report file (a file containing information configured using Pin Configurator: device pin list) overwriting the existing file.
Save Pin List As...	Device Pin List panel-dedicated item Opens the Save As dialog box for naming and saving a report file (a file containing information configured using Pin Configurator: device pin list).

Save Top View	Device Top View panel -dedicated item Saves a report file (a file containing information configured using Pin Configurator: device top view) overwriting the existing file.
Save Top View As...	Device Top View panel -dedicated item Opens the Save As dialog box for naming and saving a report file (a file containing information configured using Pin Configurator: device top view).
Save Output- <i>Tab Name</i>	Output panel -dedicated item Saves the message corresponding to the specified tab overwriting the existing file.
Save Output- <i>Tab Name</i> As...	Output panel -dedicated item Opens the Save As dialog box for naming and saving the message corresponding to the specified tab.

(b) [Edit] menu

Undo	Property panel -dedicated item Cancels the effect of an edit operation to restore the previous state.
Cut	Property panel -dedicated item Sends the character string or lines selected with range selection to the clipboard and deletes them.
Copy	Property panel/Output panel -dedicated item Sends the character string or lines selected with range selection to the clipboard.
Paste	Property panel -dedicated item Inserts the contents of the clipboard at the caret position.
Delete	Property panel -dedicated item Deletes the character string or the lines selected with the range selection.
Select All	Property panel/Output panel -dedicated item Selects all the strings displayed in the item being edited or all the strings displayed in the Message area .
Search...	Device Pin List panel/Output panel -dedicated item Opens the Search and Replace dialog box for searching strings with the [Quick Search] tab selected.
Replace...	Output panel -dedicated item Opens the Search and Replace dialog box for replacing strings with the [Whole Replace] tab selected.

(c) [View] menu

Project Tree	Project Tree panel -dedicated item Opens the Project Tree panel .
Property	Property panel -dedicated item Opens the Property panel .
Output	Output panel -dedicated item Opens the Output panel .

Pin Configurator	The cascading menu shown below is displayed.	
	Device Pin List	Device Pin List panel -dedicated item Opens the Device Pin List panel .
	Device Top View	Device Top View panel -dedicated item Opens the Device Top View panel .

(d) [Help] menu

Open Help for Project Tree Panel	Project Tree panel -dedicated item Displays the help of Project Tree panel .
Open Help for Property Panel	Property panel -dedicated item Displays the help of Property panel .
Open Help for Device Pin List Panel	Device Pin List panel -dedicated item Displays the help of Device Pin List panel .
Open Help for Device Top View Panel	Device Top View panel -dedicated item Displays the help of Device Top View panel .
Open Help for Output Panel	Output panel -dedicated item Displays the help of Output panel .

(2) Panel display area

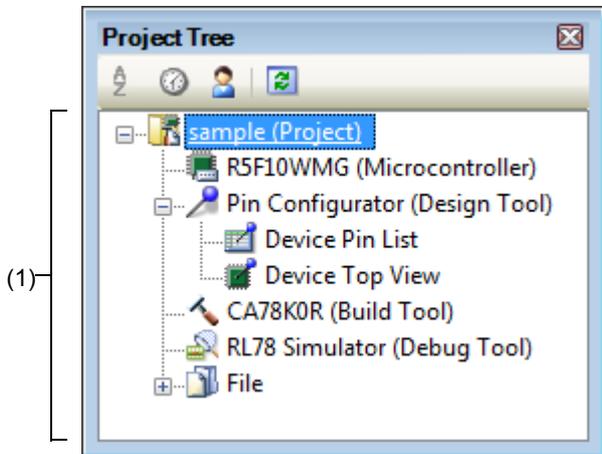
This area consists of multiple panels, each dedicated to a different purpose. See the following sections for details on this area.

- [Project Tree panel](#)
- [Property panel](#)
- [Device Pin List panel](#)
- [Device Top View panel](#)
- [Output panel](#)

Project Tree panel

This panel displays components of the project (microcontroller, design tool, build tool, etc.) in a tree structure.

Figure A.2 Project Tree Panel



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)
- [\[Context menu\]](#)

[How to open]

- From the [View] menu, select [Project Tree].

[Description of each area]

- (1) Project tree area
This area displays components of the project (microcontroller, design tool, build tool, etc.) in a tree structure.
- (a) Pin Configurator (Design Tool)
This node consists of the following pin nodes.

Device Pin List	Opens the Device Pin List panel for entering information on the pins of the microcontroller.
Device Top View	Opens the Device Top View panel that displays the information entered in the Device Pin List panel .

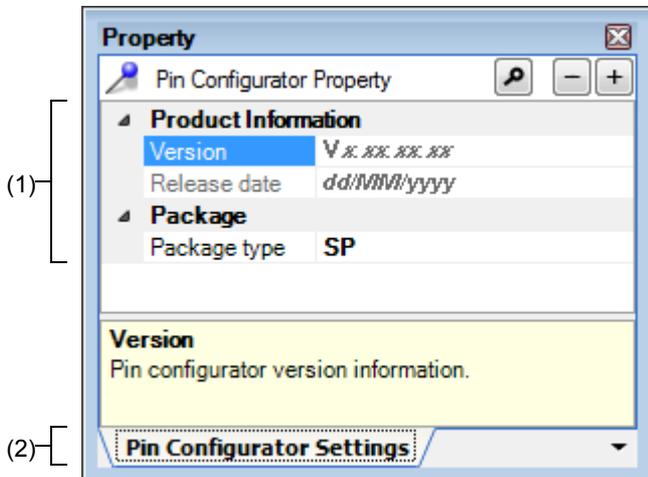
[Context menu]

Return to Reset Value	The default settings of the selected node are restored.
Property	Opens the Property panel corresponding to the selected node.

Property panel

This panel allows you to view the information on and change the setting for the node selected in the [Project Tree panel](#).

Figure A.3 Property Panel



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)
- [\[Context menu\]](#)

[How to open]

- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)], and then select [Property] from the [View] menu.
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)], and then select [Property] from the context menu.
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List], and then select [Property] from the [View] menu.
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List], and then select [Property] from the context menu.
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Top View], and then select [Property] from the [View] menu.
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Top View], and then select [Property] from the context menu.

- Remark 1. If this panel is already open, selecting a different [Pin Configurator (Design Tool)] in the [Project Tree panel](#) changes the content displayed accordingly.
- Remark 2. If this panel is already open, selecting a different [Device Pin List] in the [Project Tree panel](#) changes the content displayed accordingly.
- Remark 3. If this panel is already open, selecting a different [Device Top View] in the [Project Tree panel](#) changes the content displayed accordingly.

[Description of each area]

- (1) Detail information display/change area
 This area allows you to view the information on and change the setting for the node selected in the [Project Tree panel](#).
 The content displayed in this area differs depending on the node selected in the [Project Tree panel](#).

(2) Tab selection area

In this panel, following tabs are contained (see the section explaining each tab for details on the display/setting on the tab).

- [\[Pin Configurator Settings\] tab](#)
- [\[Device Pin List Information\] tab](#)
- [\[Device Top View Settings\] tab](#)

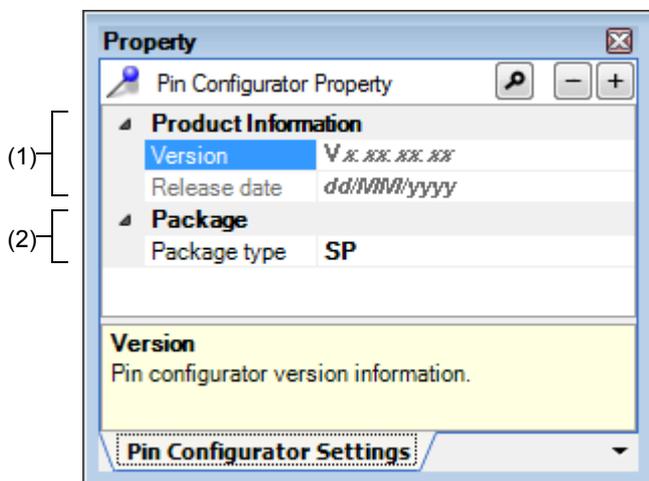
[Context menu]

Undo	Cancels the effect of an edit operation to restore the previous state.
Cut	Sends the character string or lines selected with range selection to the clipboard and deletes them.
Copy	Sends the character string or lines selected with range selection to the clipboard.
Paste	Inserts the contents of the clipboard at the caret position.
Delete	Deletes the character string or the lines selected with the range selection.
Select All	Selects all strings displayed in the item being edited.

[Pin Configurator Settings] tab

This tab displays information (Product Information and Package) on the [Pin Configurator (Design Tool)] selected in the [Project Tree panel](#).

Figure A.4 [Pin Configurator Settings] Tab



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)

[How to open]

- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)], and then select [Property] from the [View] menu.
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)], and then select [Property] from the context menu.

Remark If this panel is already open, selecting a different [Pin Configurator (Design Tool)] in the [Project Tree panel](#) changes the content displayed accordingly.

[Description of each area]

- (1) [Product Information] category
This area displays product information (Version and Release date) on Pin Configurator.

Version	Displays the version of Pin Configurator (Pin Configurator Plug-in).
Release date	Displays the release date of Pin Configurator (Pin Configurator Plug-in).

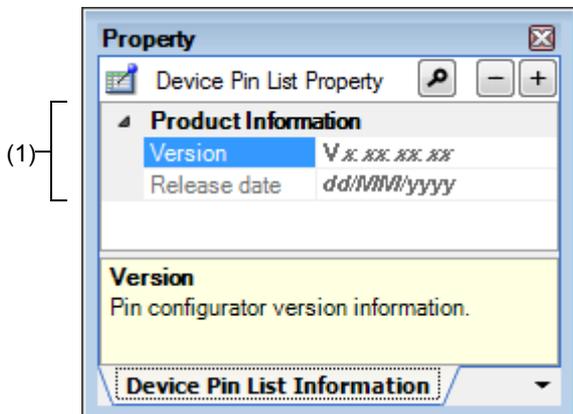
- (2) [Package] category
Change the shape (Package type) and settings of the microcontroller to display as the device top view in the [Device Top View panel](#).

Package type	Selects the shape of the microcontroller displayed in the device top view.
--------------	--

[Device Pin List Information] tab

This tab displays information (Product Information) on the [Device Pin List] selected in the [Project Tree panel](#).

Figure A.5 [Device Pin List Information] Tab



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)

[How to open]

- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List], and then select [Property] from the [View] menu.
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List], and then select [Property] from the context menu.

Remark If this panel is already open, selecting a different [Device Pin List] in the [Project Tree panel](#) changes the content displayed accordingly.

[Description of each area]

- (1) [Product Information] category

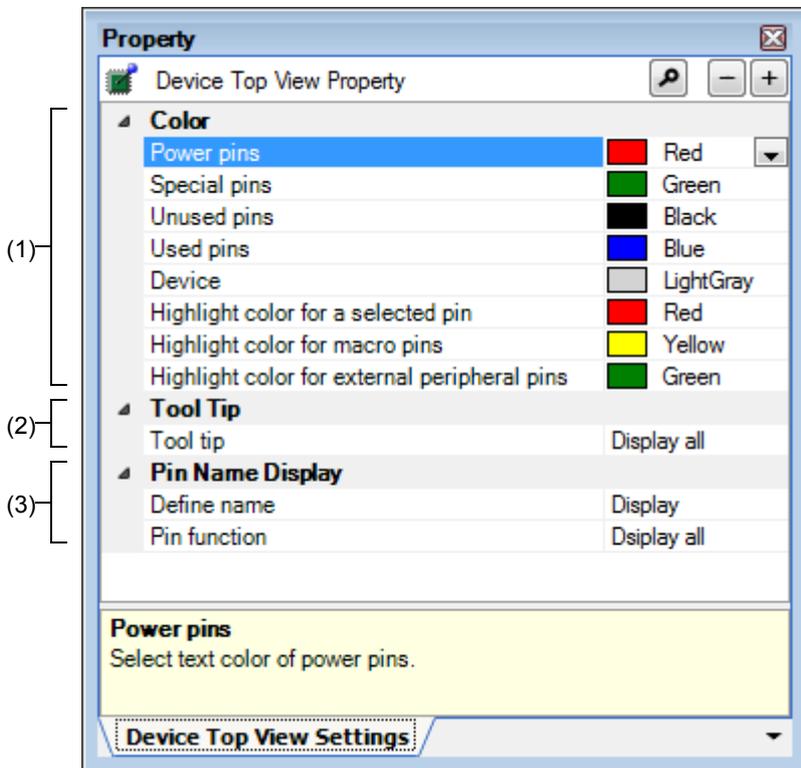
This area displays product information (Version and Release date) on Pin Configurator.

Version	Displays the version of Pin Configurator (Pin Configurator Plug-in).
Release date	Displays the release date of Pin Configurator (Pin Configurator Plug-in).

[Device Top View Settings] tab

This panel allows you to view the information on and change the setting for the node selected in the [Project Tree panel](#).

Figure A.6 [Device Top View Settings] Tab



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)

[How to open]

- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Top View], and then select [Property] from the [View] menu.
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Top View], and then select [Property] from the context menu.

Remark If this panel is already open, selecting a different [Device Top View] in the [Project Tree panel](#) changes the content displayed accordingly.

[Description of each area]

- (1) [Color] category
Select the display colors to differentiate the pin groups (Power pins, Special pins, etc.) in the device top view.

Power pins	Selects the display color for power pins (pins whose use is limited to power).
Special pins	Selects the display color for special pins (pins with specified uses).
Unused pins	Selects the display color for unused pins (dual-use pins with no use set in the Device Pin List panel).
Used pins	Selects the display color for used pins (dual-use pins with a use set in the Device Pin List panel).

Device	Selects the display color of the microcontroller.
Highlight color for a selected pin	Selects the background color of a pin selected in the Device Pin List panel , on the [Pin Number] tab .
Highlight color for macro pins	Selects the background color of pins selected in the Device Pin List panel , on the [Macro] tab .
Highlight color for external peripheral pins	Selects the background color of pins selected in the Device Pin List panel , on the [External Peripheral] tab .

(2) [Tool Tip] category

Select whether to display a tooltip with information about a pin when the mouse cursor is moved over the pin in the device top view.

Tooltip	Selects whether to display a tooltip with information about a pin when the mouse cursor is moved over the pin.	
	Display all	Displays the "Description", "Recommend Connection for Unused", and "Attention" strings for the device pin list.
	Description / recommended connection for unused pin only	Displays the "Description", and "Recommend Connection for Unused" strings for the device pin list.
	Attention only	Displays the "Attention" string for the device pin list.
	Not display	Hides tooltips when the mouse cursor hovers over a pin.

(3) [Pin Name Display] category

Select whether to display additional information about the pin in the device top view.

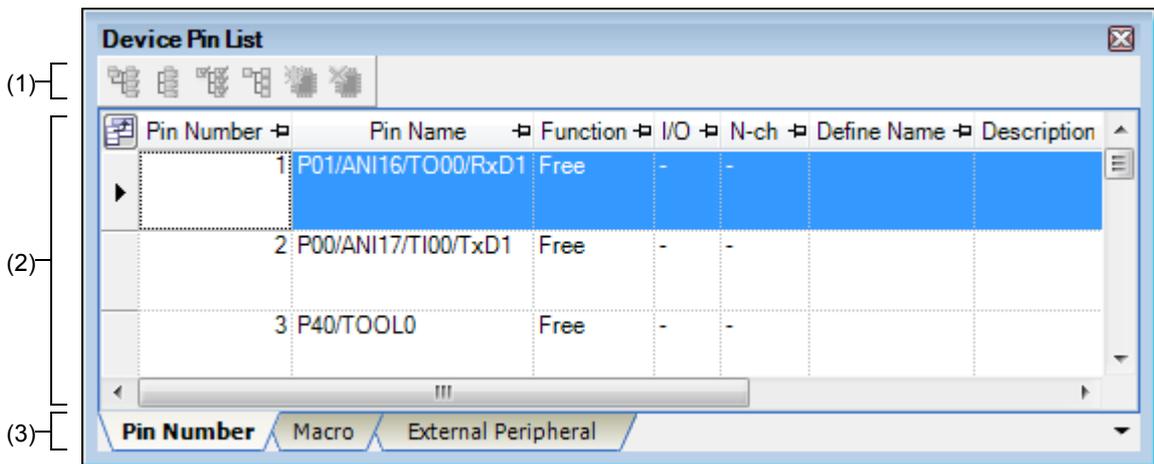
Define name	Selects whether to display the "Define Name" string of the device pin list appended to the pin in the device top view.	
	Display	Displays the "Define Name" string of the device pin list in appended format.
	Not display	Hides the "Define Name" string of the device pin list.
Pin function	Selects whether to also display unselected functions in the device top view when a function has been selected from the device pin list's "Function" feature.	
	Display all	Displays functions selected via the device pin list's "Function" feature in parentheses.
	Selected function only	Only display functions selected via the device pin list's "Function" feature in the device top view.

Device Pin List panel

This panel allows you to enter information on each pin of the microcontroller.

Remark The [Device pin list area](#) can be zoomed in and out by in the tool bar, or by operating the mouse wheel while holding down the [Ctrl] key.

Figure A.7 Device Pin List Panel



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)

[How to open]

- On the [Project Tree panel](#), double-click [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List].
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List], and then press the [Enter] key.
- From the [View] menu, select [Pin Configurator] >> [Device Pin List].

[Description of each area]

(1) Toolbar
This area consists of the following buttons.

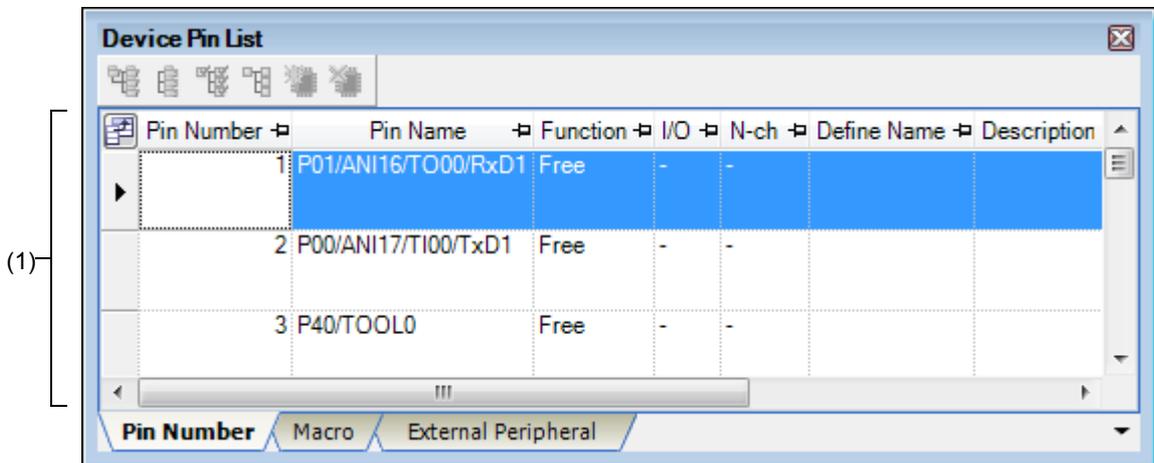
	Displays the information in the Device pin list area in an expanded view.
	Displays the information in the Device pin list area in a folded view only.
	Clicks this button to automatically process the configuration information in the selected function, I/O, N-ch, and other fields after selecting one of the peripheral functions displayed in the first level on the [Macro] tab .
	Clicks this button to initialize the selected function, I/O, N-ch, and other fields after selecting one of the peripheral functions displayed in the first level on the [Macro] tab .
	Clicks this button to create an external peripheral controller from the external peripheral controller information on the [External Peripheral] tab , and display it in the Device Top View panel .
	Clicks this button to delete the information for the external peripheral controller displayed on the [External Peripheral] tab , on the first layer.

- Remark 1. Click the  button to add the information in question as a choice in the "External Parts" column of the [\[Macro\] tab](#) and the [\[Pin Number\] tab](#).
- Remark 2. Click the  button to remove the external peripheral component in question from the [Device top view area](#) if the [Device Top View panel](#).
- (2) Device pin list area
This area displays the "device pin list" for entering information on the pins of the microcontroller.
- (3) Tab selection area
Selecting the tab changes the order in which "information on each pin of the microcontroller" is displayed. This panel has the following tabs:
- [\[Pin Number\] tab](#)
This tab displays information on each pin of the microcontroller in the order of pin number.
 - [\[Macro\] tab](#)
This tab displays information on each pin of the microcontroller in the order it was grouped into peripheral functions.
 - [\[External Peripheral\] tab](#)
This tab displays information about the pins connected to external peripherals in order grouped at the external-peripheral component level.

[Pin Number] tab

This tab displays information on each pin of the microcontroller in the order of pin number.

Figure A.8 [Pin Number] Tab



The following items are explained here.

- [How to open]
- [Description of each area]

[How to open]

- On the Project Tree panel, double-click [Project name (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List].
- On the Project Tree panel, select [Project name (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List], and then press the [Enter] key.
- From the [View] menu, select [Pin Configurator] >> [Device Pin List].

[Description of each area]

- (1) Device pin list area
 This area displays the “device pin list” for entering information on the pins of the microcontroller.
 The device pin list in this area is organized in the order of pin number.
 The following are the columns comprising the device pin list.

Pin Number	Displays the pin number of the pin.
Pin Name	This area allows you to select “which function to use” when the pin has more than one functions.
Function	This area allows you to select “which function to use” when the pin has more than one functions.
I/O	This area allows you to select the I/O mode of the pin.
N-ch	This area allows you to select “which output mode to apply” when using the pin in the output mode.
Define Name	This area allows you to assign a “user-defined pin name” to the pin. WITHIN 256 characters can be entered in the [Define Name].
Description	Displays the summary of function of the pin.

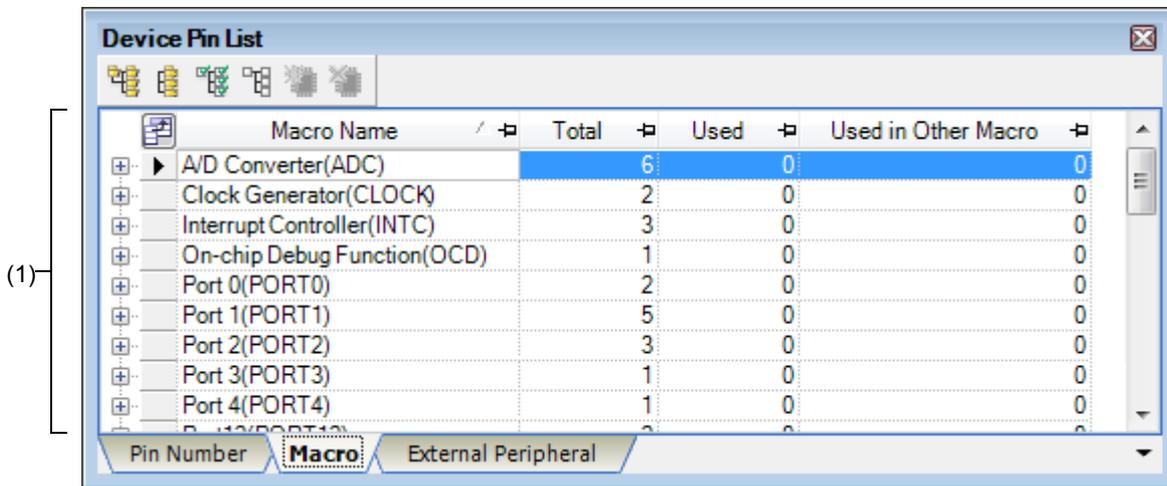
Recommend Connection for Unused	Displays instructions on how to handle the pin when it is not used. This column displays information only when the "Free" is selected in the "Function" column.
Attention	Displays the precaution on using the pin.
External Parts	This area is for selecting which external peripheral controller to connect the pin to.

- Remark 1. You cannot add information in the "Pin Number" column, "Pin Name" column, "Description" column, "Recommend Connection for Unused" column and "Attention" column because they contain fixed information.
- Remark 2. If the "Free" in the "Function" column is changed to a specific pin name, color of the corresponding pin in the [Device Top View panel](#) changes from the "color representing the unused pins" to the "color representing the used pins" selected by clicking [\[Device Top View Settings\] tab](#) >> [\[Color\]](#) in the [Property panel](#).
- Remark 3. To move columns (change the display order) in the device pin list, drag and drop the desired column to the desired location.
- Remark 4. To add the "user's own column", use the [New Column dialog box](#) which opens by pressing the [\[New Column...\]](#) button in the [Column Chooser dialog box](#) which opens by pressing the  button in the upper left corner of the device pin list.

[Macro] tab

This tab displays information on each pin of the microcontroller in the order it was grouped into peripheral functions.

Figure A.9 [Macro] Tab



The following items are explained here.

- [How to open]
- [Description of each area]

[How to open]

- On the Project Tree panel, double-click [Project name (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List].
- On the Project Tree panel, select [Project name (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List], and then press the [Enter] key.
- From the [View] menu, select [Pin Configurator] >> [Device Pin List].

[Description of each area]

(1) Device pin list area
 This area displays the “device pin list” for entering information on the pins of the microcontroller.
 The device pin list in this area is organized in the order the pins were grouped into peripheral functions.

(a) First layer
 The following are the columns comprising the device pin list.

Macro Name	Displays the name of the peripheral function.
Total	Displays the total number of pins assigned to the peripheral function.
Used	Displays the total number of pins for which the purpose has been set.
Used in Other Macro	Displays the total number of pins for which the purpose has been set by other peripheral functions.

(a) Second layer
 The following are the columns comprising the device pin list.

Pin Number	Displays the pin number of the pin.
Pin Name	Displays the pin name of the pin.

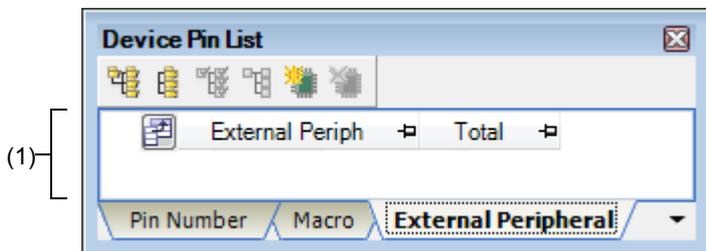
Function	This area allows you to select “which function to use” when the pin has more than one functions.
I/O	This area allows you to select the I/O mode of the pin.
N-ch	This area allows you to select “which output mode to apply” when using the pin in the output mode.
Define Name	This area allows you to assign a “user-defined pin name” to the pin. Within 256 characters can be entered in the [Define Name].
Description	Displays the summary of function of the pin.
Recommend Connection for Unused	Displays instructions on how to handle the pin when it is not used. This column displays information only when the “Free” is selected in the “Function” column.
Attention	Displays the precaution on using the pin.
External Parts	This area is for selecting which external peripheral controller to connect the pin to.

- Remark 1. You cannot add information in the “Macro Name”, “Total”, “Used”, “Used by other function”, “Pin Number”, “Pin Name”, “Description”, “Recommend Connection for Unused” and “Attention” columns because they contain fixed information.
- Remark 2. If the “Free” in the “Function” column is changed to a specific pin name, color of the corresponding pin in the [Device Top View panel](#) changes from the “color representing the unused pins” to the “color representing the used pins” selected by clicking [[Device Top View Settings](#)] tab >> [Color] in the [Property panel](#).
- Remark 3. To move columns (change the display order) in the device pin list, drag and drop the desired column to the desired location.
- Remark 4. To add the “user’s own column”, use the [New Column dialog box](#) which opens by pressing the [New Column...] button in the [Column Chooser dialog box](#) which opens by pressing the  button in the upper left corner of the device pin list.

[External Peripheral] tab

This tab displays information about the pins connected to external peripherals in order grouped at the external-peripheral component level.

Figure A.10 [External Peripheral] Tab



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)

[How to open]

- On the [Project Tree panel](#), double-click [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List].
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Pin List], and then press the [Enter] key.
- From the [View] menu, select [Pin Configurator] >> [Device Pin List].

[Description of each area]

- (1) Device pin list area
 This area displays the “device pin list” for entering information on the pins connected to external peripheral parts. Note that items in this area's device pin list are sorted by groups at the external peripheral controller level.

- (a) First layer
 The following are the columns comprising the device pin list.

External Peripheral	Displays the name of the external peripheral controller. To change the name, select this field and then press the [F2] key.
Total	Displays the total number of pins allocated for connection with the microcontroller.

- (b) Second layer
 The following are the columns comprising the device pin list.

Pin Number	Displays the pin number of the pin.
Pin Name	Displays the pin name of the pin.
Function	This area allows you to select “which function to use” when the pin has more than one functions.
I/O	This area allows you to select the I/O mode of the pin.
N-ch	This area allows you to select “which output mode to apply” when using the pin in the output mode.
Define Name	This area allows you to assign a “user-defined pin name” to the pin. Within 256 characters can be entered in the [Define Name].

Description	Displays the summary of function of the pin.
Recommend Connection for Unused	Displays instructions on how to handle the pin when it is not used. This column displays information only when the "Free" is selected in the "Function" column.
Attention	Displays the precaution on using the pin.

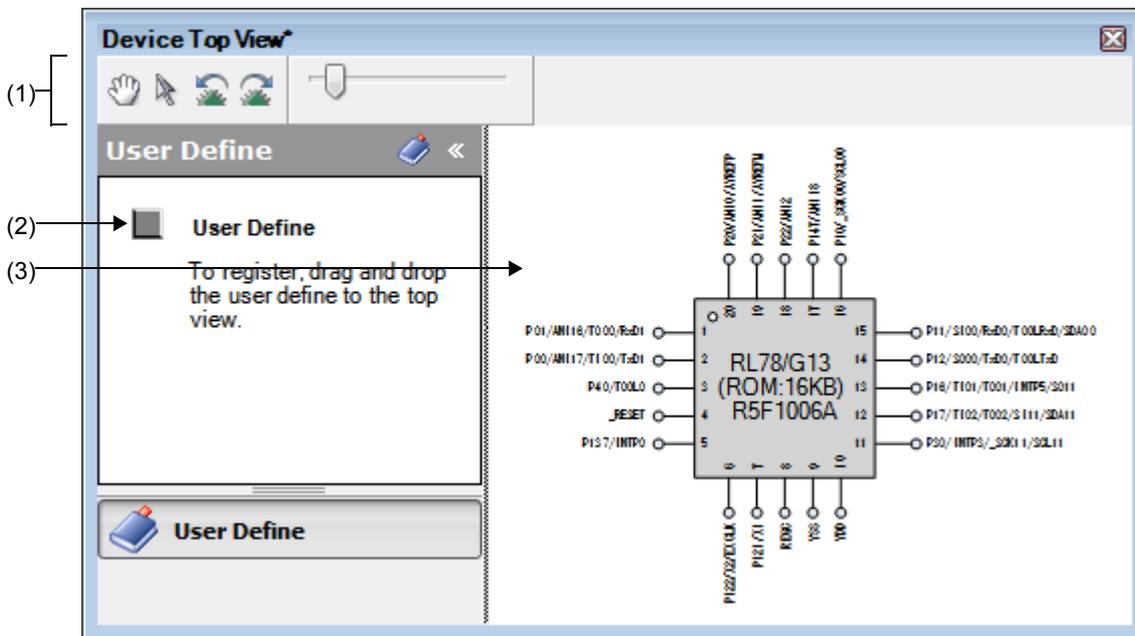
- Remark 1. You cannot add information in the "External Peripheral Name", "Connected Pins", "Pin Number", "Pin Name", "Description", "Recommend Connection for Unused" and "Attention" columns because they contain fixed information.
- Remark 2. If the "Free" in the "Function" column is changed to a specific pin name, color of the corresponding pin in the [Device Top View panel](#) changes from the "color representing the unused pins" to the "color representing the used pins" selected by clicking [\[Device Top View Settings\] tab](#) >> [\[Color\]](#) in the [Property panel](#).
- Remark 3. To move columns (change the display order) in the device pin list, drag and drop the desired column to the desired location.
- Remark 4. To add the "user's own column", use the [New Column dialog box](#) which opens by pressing the [\[New Column...\]](#) button in the [Column Chooser dialog box](#) which opens by pressing the  button in the upper left corner of the device pin list.

Device Top View panel

This panel displays the information entered in the [Device Pin List panel](#).

Remark The [Device top view area](#) can be zoomed in and out by in the tool bar.

Figure A.11 Device Top View Panel



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)
- [\[Context menu\]](#)

[How to open]

- On the [Project Tree panel](#), double-click [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Top View].
- On the [Project Tree panel](#), select [*Project name* (Project)] >> [Pin Configurator (Design Tool)] >> [Device Top View], and then press the [Enter] key.
- From the [View] menu, select [Pin Configurator] >> [Device Top View].

Remark In the [Property panel](#), on the [\[Pin Configurator Settings\] tab](#) >> [Package >> [Package type]], if "BGA" is selected, then this panel cannot be opened.

[Description of each area]

- (1) Toolbar
This area consists of the following buttons.

	Clicks this button to enable changing of the display in the Device top view area by drag and drop. By pressing this button, the shape of the mouse cursor in the Device top view area changes from the arrow to the hand.
--	--

	Clicks this button to enable moving external peripheral components in the Device top view area to arbitrary locations, and select pins. By pressing this button, the shape of the mouse cursor which has changed into the hand by pressing the  button reverts back to the arrow.
	Rotates the content in the Device top view area 90 degrees counter-clockwise.
	Rotates the content in the Device top view area 90 degrees clockwise.
	Expands or reduces the content in the Device top view area .

- (2) [User Define] area
Drag and drop the  button from this area to the [Device top view area](#) to create and display an external peripheral controller.
 - (3) Device top view area
This area displays the pin assignment of the microcontroller.
Settings of the pin assignment are displayed using the colors specified by selecting [\[Device Top View Settings\] tab >> \[Color\]](#) in the [Property panel](#).
- Remark If the pin name in the diagram is double-clicked, the [Device Pin List panel](#) opens and the focus moves to the clicked pin in the list.

[Context menu]

- (1) When a pin is right clicked

Use as	If the pin has multiple functions, select which function to use.
Connect to External Peripheral	Selects which external peripheral controller to connect the pin to.

- (2) When an external peripheral controller is right clicked

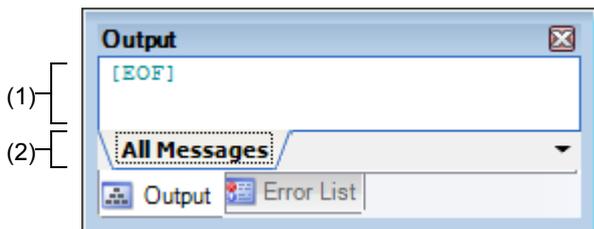
Disconnect Pin	Disconnects from the pin.
Delete External Peripheral	Removes the external peripheral controller.

Output panel

This panel displays operation logs for various components (design tool, build tool, etc.) provided by CS+. The messages are classified by the message origination tool and displayed on the individual tabs.

Remark The [Message area](#) can be zoomed in and out by in the tool bar, or by operating the mouse wheel while holding down the [Ctrl] key.

Figure A.12 Output Panel



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)
- [\[Context menu\]](#)

[How to open]

- From the [View] menu, select [Output].

[Description of each area]

- (1) Message area
The output messages of each tool are displayed.
Note that the character colors/background colors of the message differ with the type of output message (and depend on the settings in the [General - Font and Color] category in the Option dialog box).
- (2) Tab selection area
Select the tab that indicates the origin of message.
The following tabs are available for the Pin Configurator.

All Messages	Displays operation logs for all components (design tool, build tool, etc.) provided by CS+ in order of output.
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Caution Even if a new message is output on a deselected tab, tab selection will not automatically switch. In this case, " * " mark will be added in front of the tab name, indicating that a new message has been output.

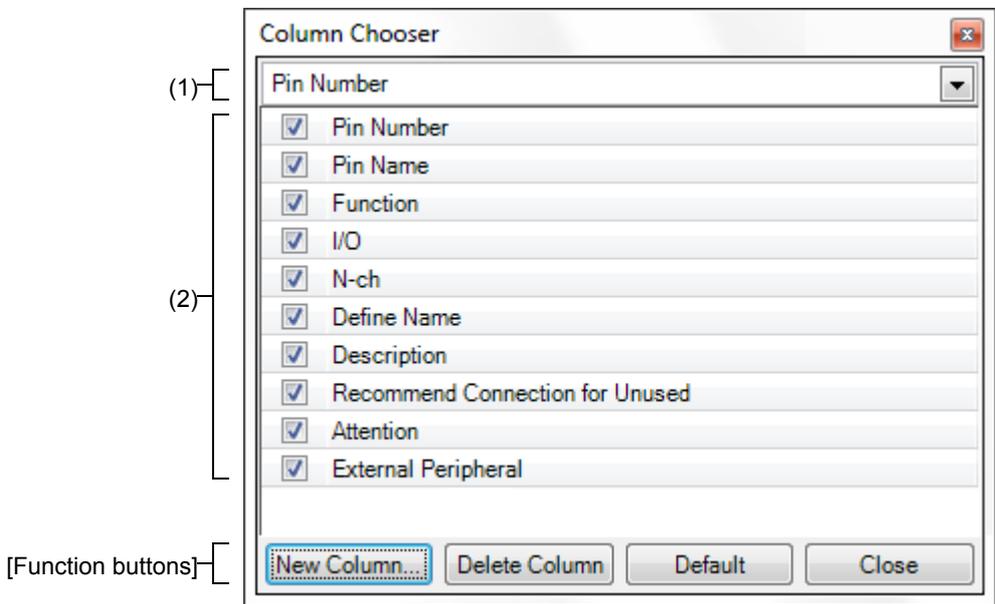
[Context menu]

Copy	Sends the character string or lines selected with range selection to the clipboard.
Select All	Selects all the messages displayed on the Message area .
Clear	Deletes all the messages displayed on the Message area .
Tag Jump	Jumps to the caret line in the editor indicated by the message (file, line, and column).
Open Help for Message	Displays help for the message on the current caret location. This only applies to warning messages and error messages.

Column Chooser dialog box

This dialog box allows you to choose whether or not to display the item listed in this dialog box in the device pin list, and add columns to or delete columns from the device pin list.

Figure A.13 Column Chooser Dialog Box



The following items are explained here.

- [How to open]
- [Description of each area]
- [Function buttons]

[How to open]

- In the [Pin Number] tab of the Device Pin List panel, click the  button.
- In the [Macro] tab of the Device Pin List panel, click the  button.
- In the [External Peripheral] tab of the Device Pin List panel, click the  button.

[Description of each area]

- (1) Operational object selection area
This area allows you to select the device pin list to be configured in this dialog box.

Pin Number	Configures the device pin list corresponding to the [Pin Number] tab.
Macro	Configures the device pin list belonging to the first layer of the [Macro] tab.
Macro - Pin	Configures the device pin list belonging to the second layer of the [Macro] tab.
External Peripheral	Configures the device pin list belonging to the first layer of the [External Peripheral] tab.
External Peripheral - Pin	Configures the device pin list belonging to the second layer of the [External Peripheral] tab.

- (2) Displayed item selection area
Select whether or not to display the item selected in the Operational object selection area in the device pin list.

Checked	Displays the selected item in the device pin list.
Not checked	Hides the selected item in the device pin list.

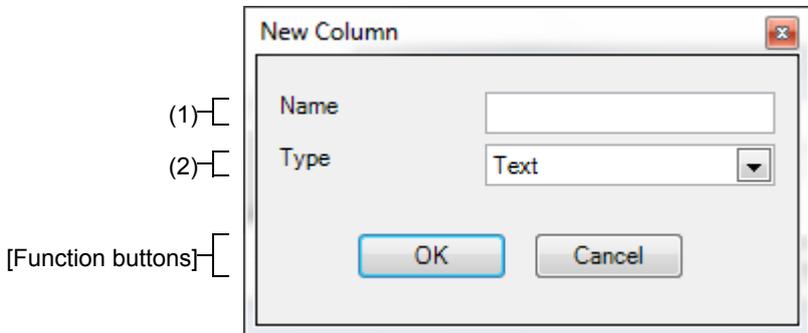
[Function buttons]

New Column...	Opens the New Column dialog box for adding columns to the device pin list.
Delete Column	Deletes the selected columns from the device pin list. You can only delete the column which you added using the New Column dialog box .
Default	Restores the column order to the default settings.
Close	Closes this dialog box.

New Column dialog box

This dialog box allows you to add your own column to the device pin list.

Figure A.14 New Column Dialog Box



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)
- [\[Function buttons\]](#)

[How to open]

- Click the [\[New Column...\]](#) button in the [Column Chooser dialog box](#).

[Description of each area]

- (1) **[Name]**
This area allows you to enter column headings of the columns added to the device pin list. Within 256 characters can be entered in the **[Name]**.
- (2) **[Type]**
Select the input format of the column to add to the device pin list.

Text	Only character strings can be entered in the column.
Check box	Adds a column of check boxes.
Whole number	Only integers can be entered in the column.
Real number	Only real numbers can be entered in the column.
Date	Only dates in YYYYMMDD format can be entered in the column.

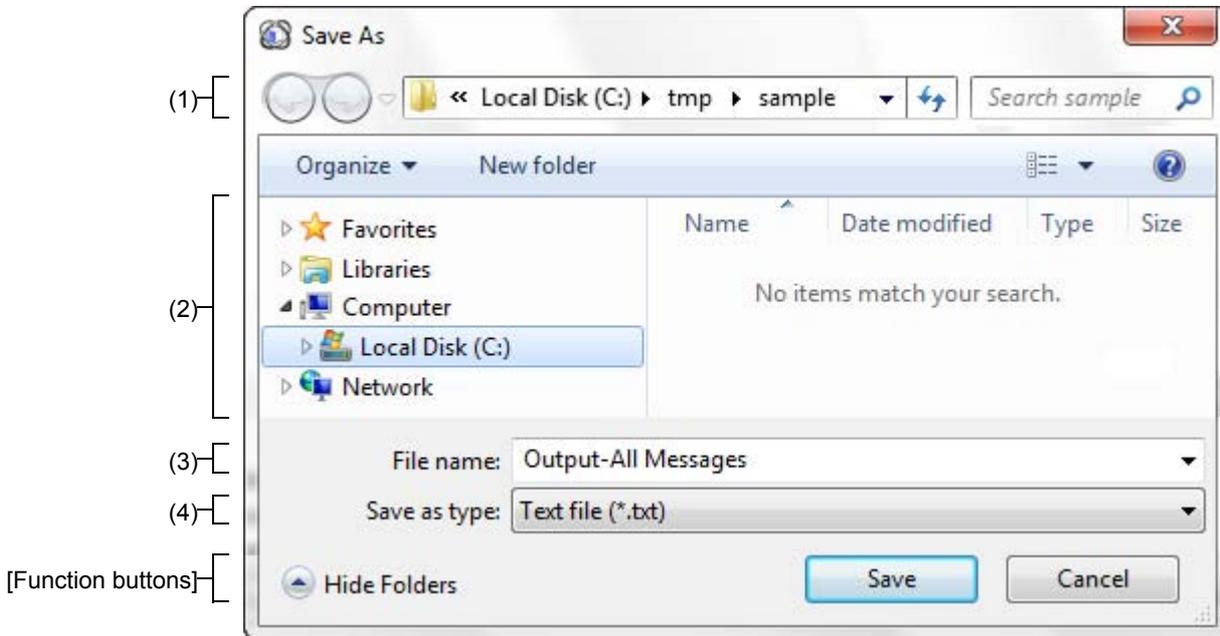
[Function buttons]

OK	Adds a column that has the column heading specified in the [Name] to the right end of the device pin list.
Cancel	Ignores the setting and closes this dialog box.

Save As dialog box

This dialog box allows you to name and save a file.

Figure A.15 Save As Dialog Box



The following items are explained here.

- [\[How to open\]](#)
- [\[Description of each area\]](#)
- [\[Function buttons\]](#)

[How to open]

- From the [File] menu, select [Save Output-Tab Name].
- From the [File] menu, select [Save Output-Tab Name As...].

[Description of each area]

- (1) Folder location
This is for selection of the output destination folder (folder name).
- (2) List of files
This area displays a list of files matching the conditions selected in Folder location and [Save as type].
- (3) [File name]
Specify the name of the file (file name).
- (4) [Save as type]
Select the type of the file (file type).

[Function buttons]

Save	Outputs a file having the name specified in the [File name] and [Save as type] to the folder specified in the Folder location.
Cancel	Ignores the setting and closes this dialog box.

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