NuTool – PinConfigure
User Manual

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1 INTRODUCTION

The **NuTool - PinConfigure** is used to configure GPIO multi-functions of Nuvoton NuMicro® Family. Its features are listed below:

- **Configuring by the TreeView**: All the supported modules are collected and listed in the TreeView. The user can manipulate the tree to configure GPIO multi-functions easily.
- **Configuring by individual pins:** Configuring GPIO multi-functions by individual pins is allowed. The user can complete their operation more intuitively and efficiently.
- **Configuring by editing the register value directly:** The user can utilize this feature to inspect the accuracy of the value.
- **Generation of code or report:** After configuring GPIO multi-functions, the user can generate code or print a report. The generated code can be included into the developing projects. The report comprises all the configuration information.

Through the application, the user can configure GPIO multi-functions of the NuMicro® Family correctly and handily.

1.1 SUPPORTED CHIPS

To see the list of supported chips, please refer to C:\Program Files (x86)\Nuvoton Tools\NuTool-PinConfigure\resources\assets**Supported_chips.htm** (default installation path). The alternative way is to click the **Read User Manual** button on the toolbar, or go to Supported Chips of NuTool - PinConfigure.

1.2 Schematic Library and PCD Layout Library

The schematic component library includes the **OrCAD schematic library**, **PADS footprint library**, and **Protel schematic library**. Please visit the official Github website to download: https://github.com/OpenNuvoton/NuTool-PinConfigure/releases.

2 SYSTEM REQUIREMENTS

The following lists system requirements for the user to run **NuTool - PinConfigure**.

- Windows 7 or later operating system.

Or you can run it on the network:

- https://opennuvoton.github.io/NuTool-PinConfigure/

Or you can run it on Visual Studio Code:

- NuTool - PinConfigure - Visual Studio Marketplace

3 RUNNING THE NUTOOL - PINCONFIGURE

To run NuTool - PinConfigure, double-click the NuTool - PinConfigure.exe.

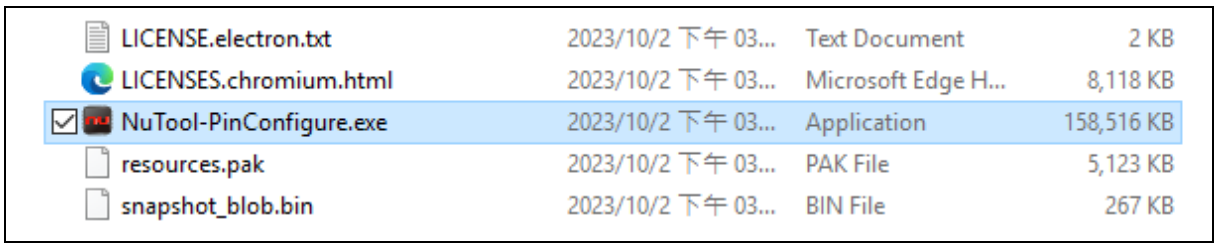


Figure 3-1 NuTool - PinConfigure.exe and Related Folders

4 USER INTERFACE GUIDE

4.1 GUI Overview

The PinConfigure Window includes a variety of components. The name of each component is described in Figure 4-1.

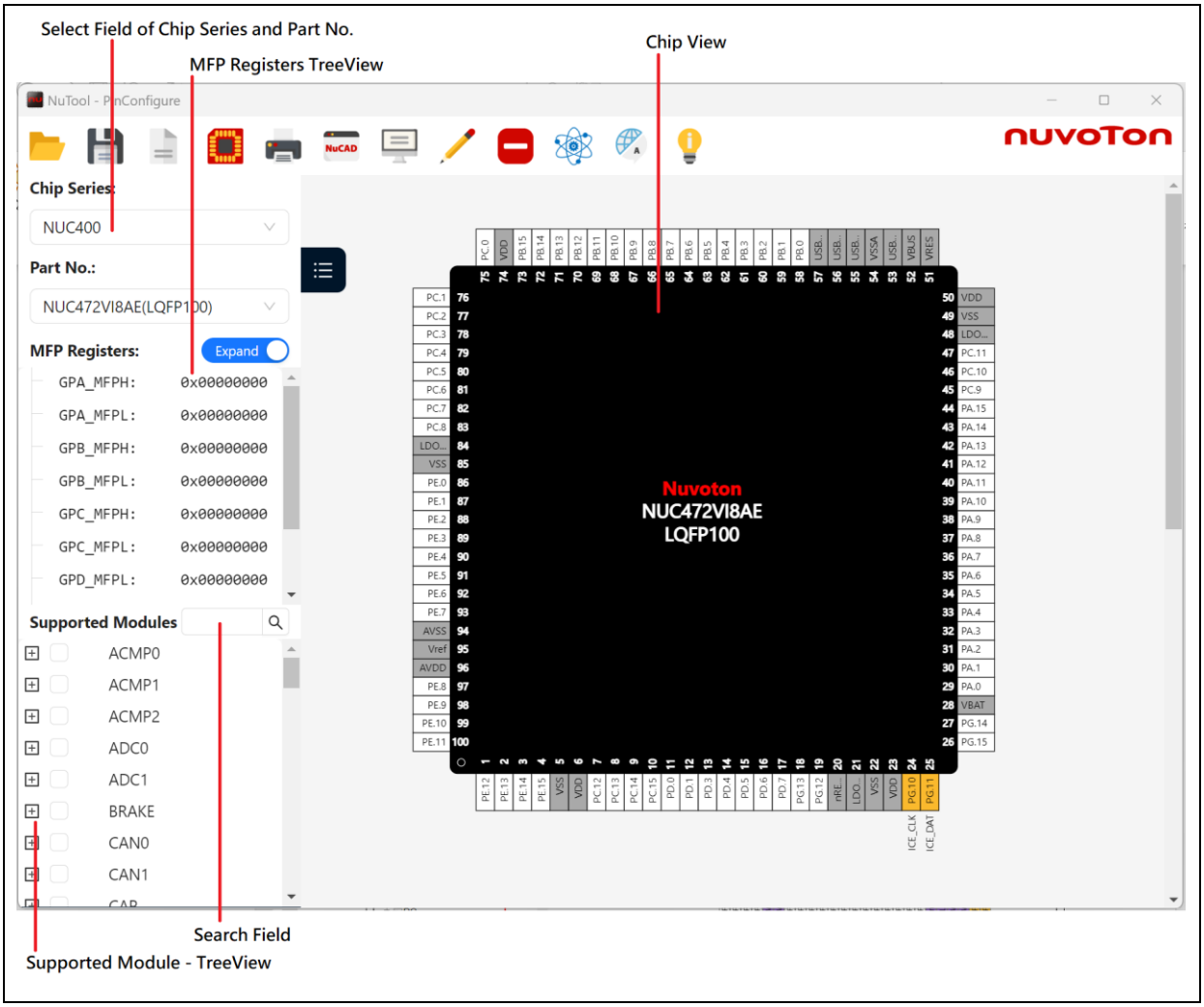


Figure 4-1 PinConfigure Window

4.2 Select Field of Chip Series and Part No.

The user can select the expected chip series and part No. from the upper-left select field (referring to Figure 4-2). If the select field and the MFP Registers TreeView are hidden, please click the **List View Button** to show them.

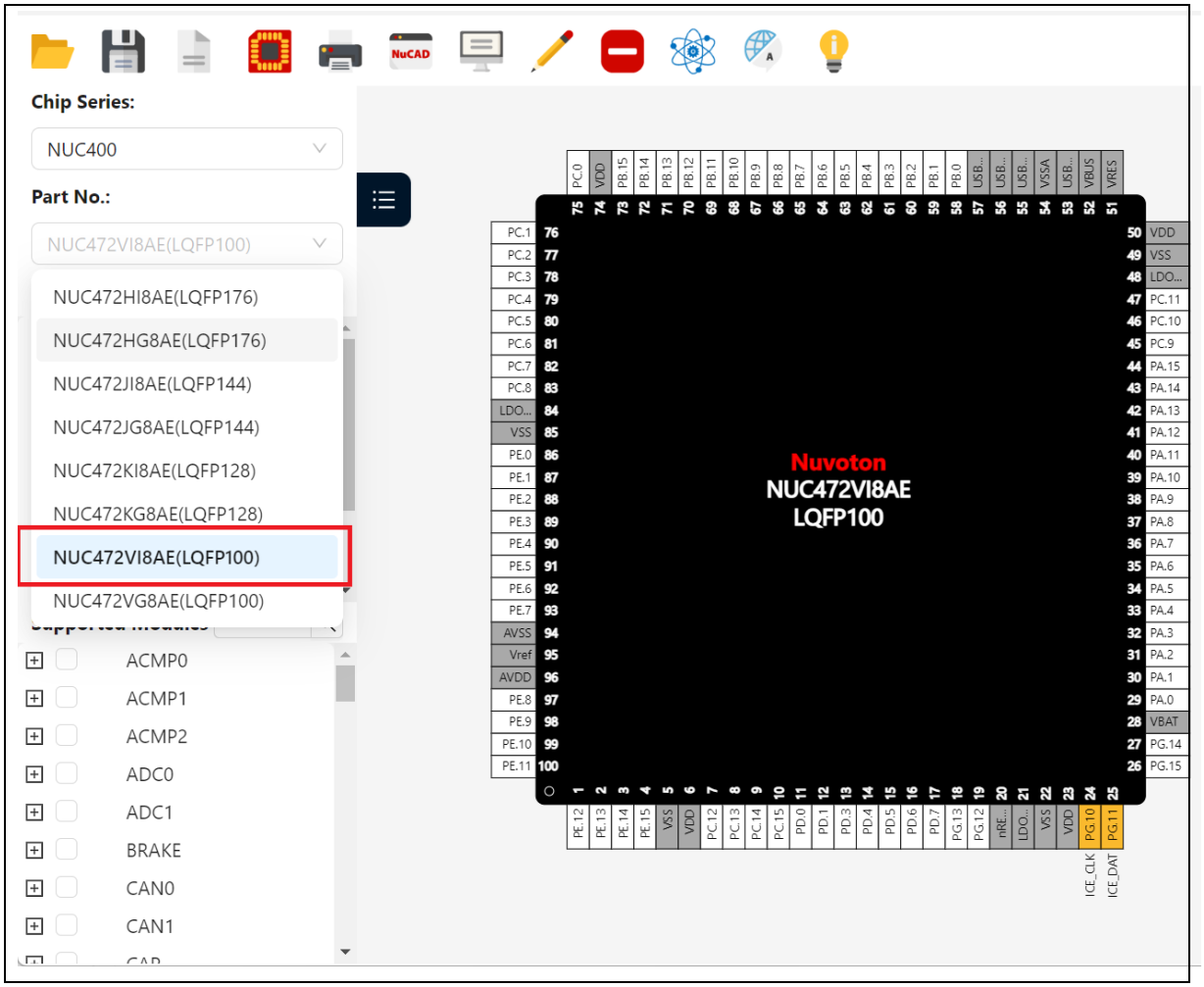


Figure 4-2 Selecting Part Number

4.3 MFP Registers TreeView

The current values of MFP registers are displayed in this TreeView. Moreover, the user can edit them directly by double-clicking on the expected one and enter a new value (referring to Figure 4-3). After editing, the corresponding check boxes of the supported modules - TreeView and the chip view will be updated immediately. Some chips require two different MFP registers to configure GPIO multi-functions, and thus the user cannot edit the values of MFP registers by double-clicking these chips.

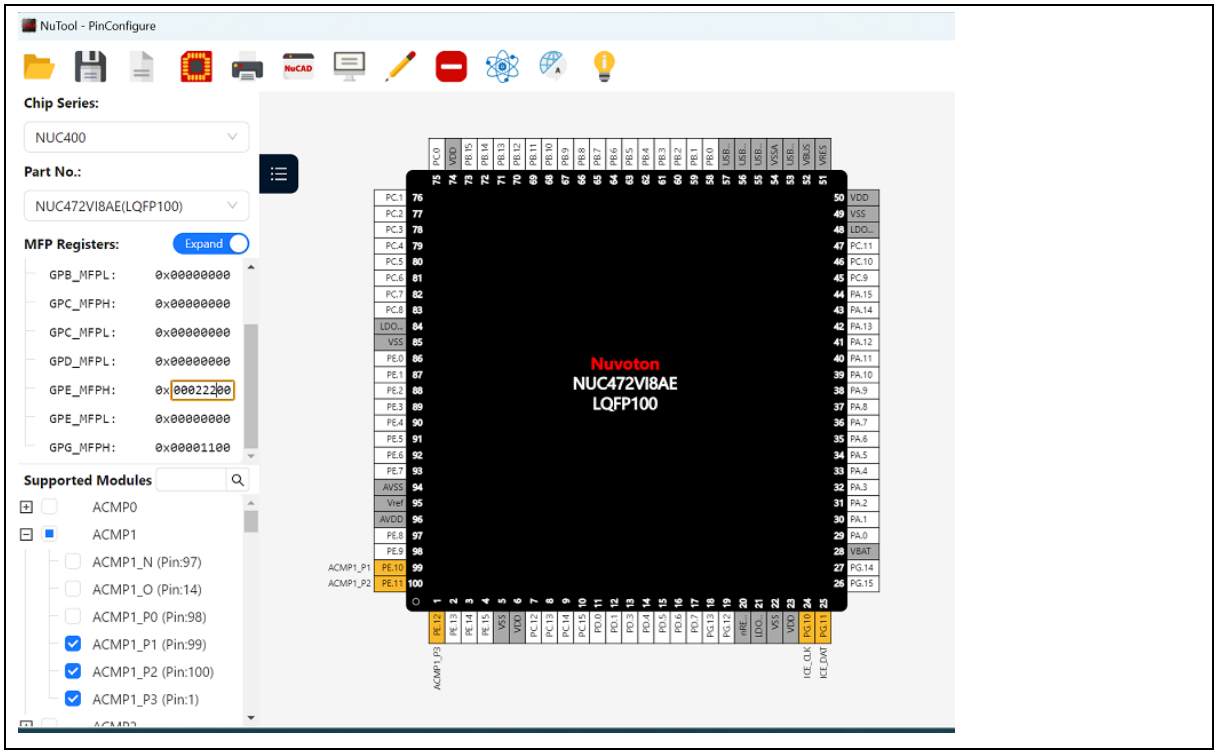


Figure 4-3 Editing a MFP Register

4.4 Supported Module - TreeView

4.4.1 Usage

With the supported module - TreeView, the user can configure the peripheral pin(s). Each time a module or its individual GPIO multi-function is checked in the check boxes, the chip view shown in the right window will display the new state of the pin(s). Besides, the corresponding value of MFP register will be updated at the same time. For example, the user configures ACMP0 and the results are shown as Figure 4-4.

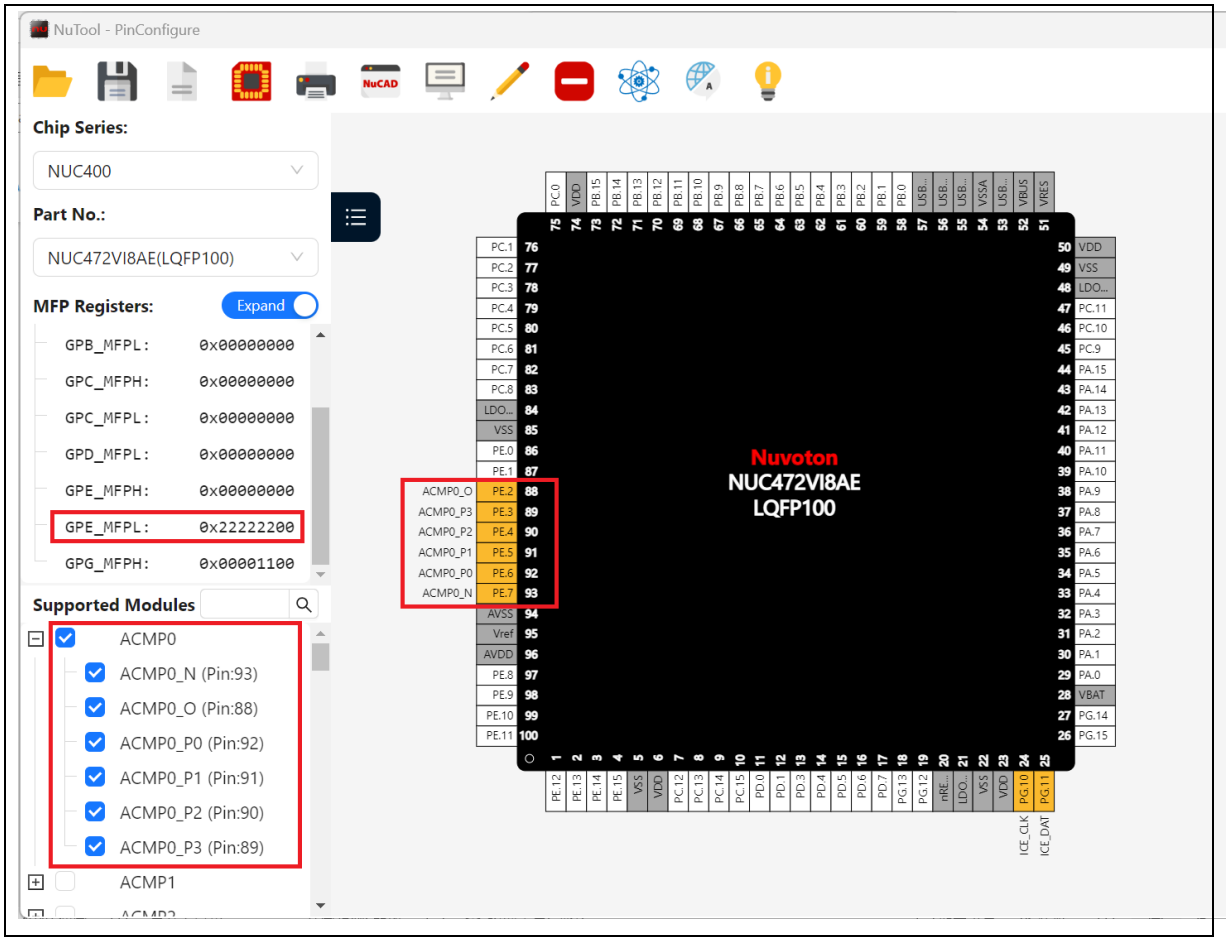


Figure 4-4 Results of Configuring ACMP0 by the TreeView

4.4.2 Conflict

When the pins have been configured to a module, the related texts in the check boxes will be marked in red. If the user obliviously wants to configure the pins again through the TreeView, this case is called as a conflict. A dialog box which lists the relevant pins and their configured modules will be invoked (referring to Figure 4-5). It offers two options to decide the next step. Clicking the Yes button, the tool will make the adjustment of conflicts. Clicking the No button, the tool will only configure the remaining pins.

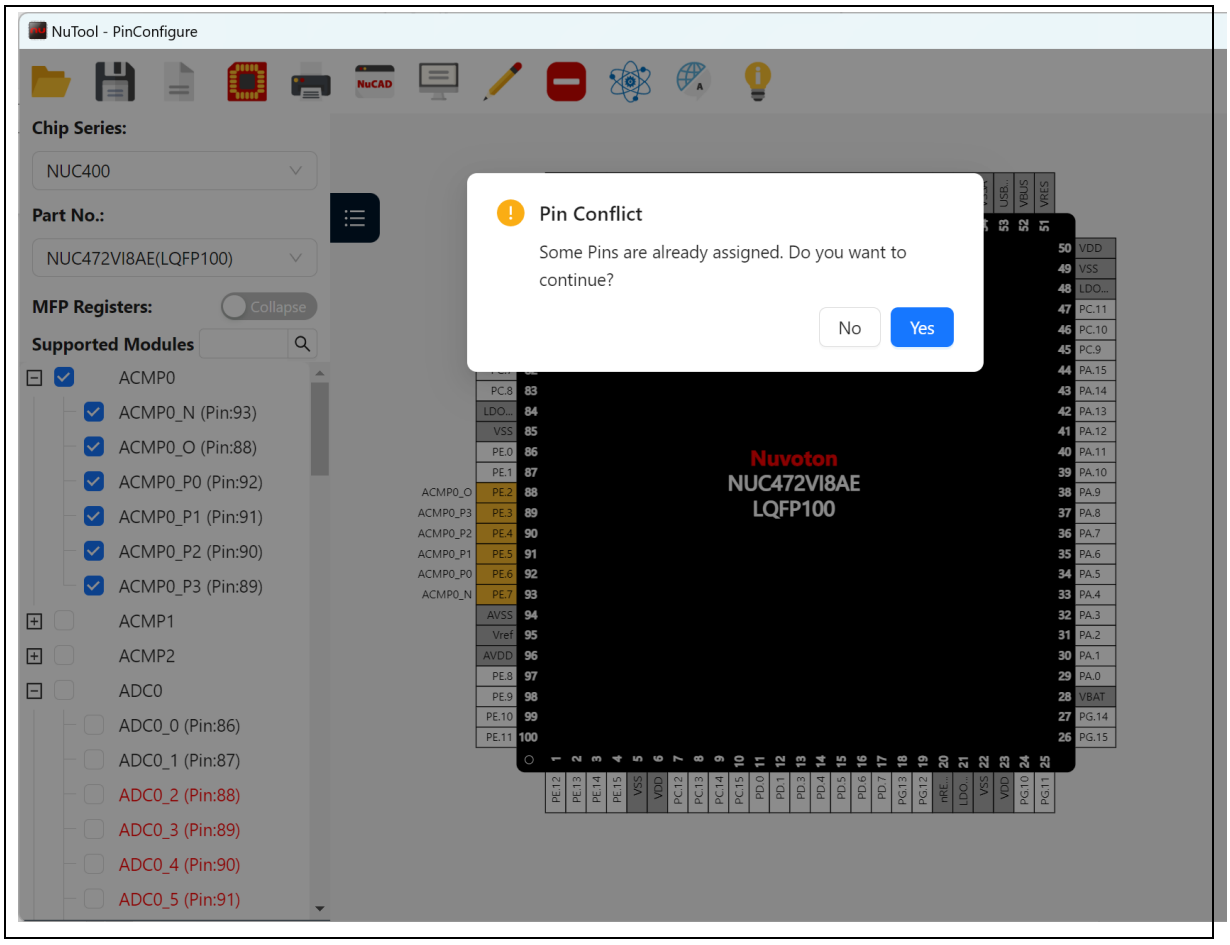


Figure 4-5 “Conflict Occurred” Dialog Box

4.4.3 Multiple Selections

There are some modules whose GPIO functions have multiple selections of pins to the same function. In this case, the related check boxes are displayed as circular indicators. The user is only permitted to select one of pins. For example, in the BRAKE module, its GPIO function of BRAKE00 has two options, pin 65 and 73, but only one of them can be occupied by BRAKE00 (referring to Figure 4-6).

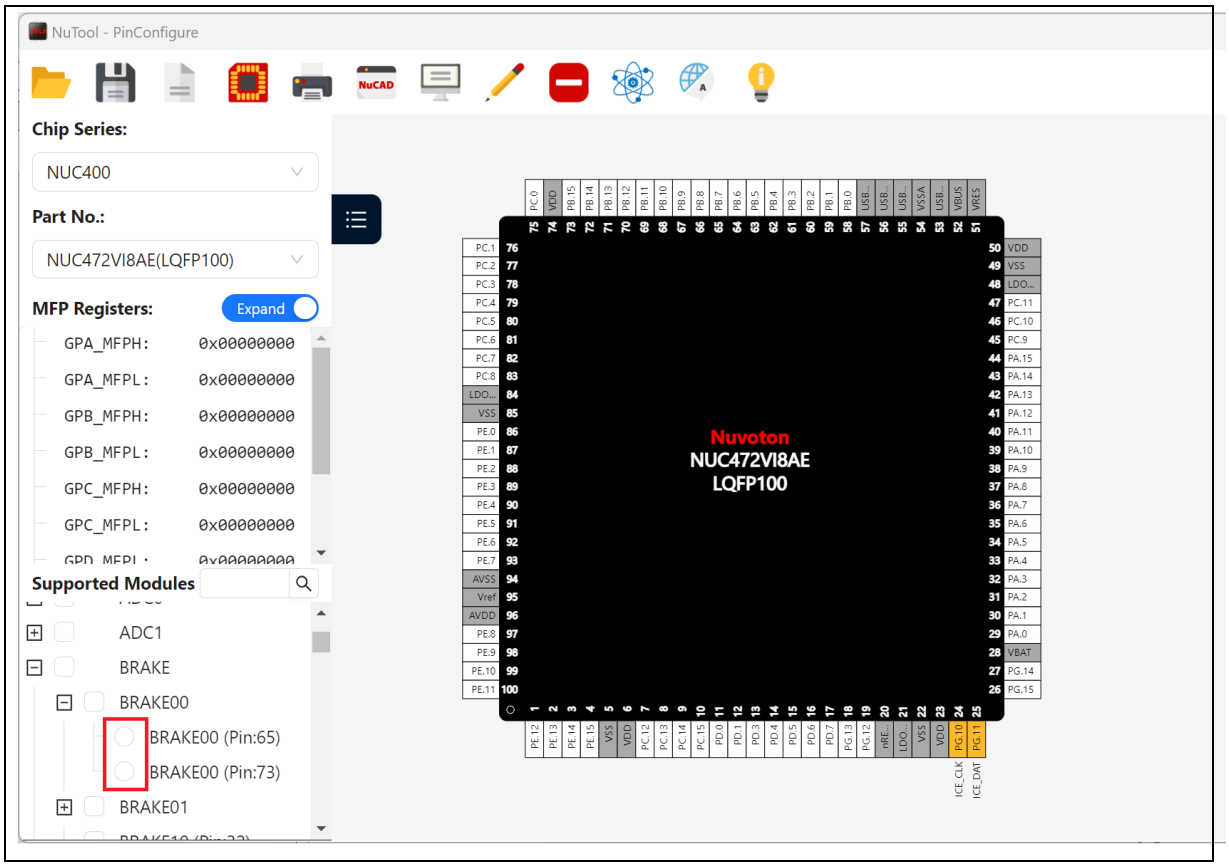


Figure 4-6 Multiple Selections of BRAKE00

4.4.4 Search

To find a specific module in the supported modules - TreeView, the user can input the expected module name in the search field. After input, the matched texts in the check boxes are highlighted with the yellow color. Note that the search adopts the partial match, not exact match (referring to Figure 4-7). The minimum number of input characters is two.

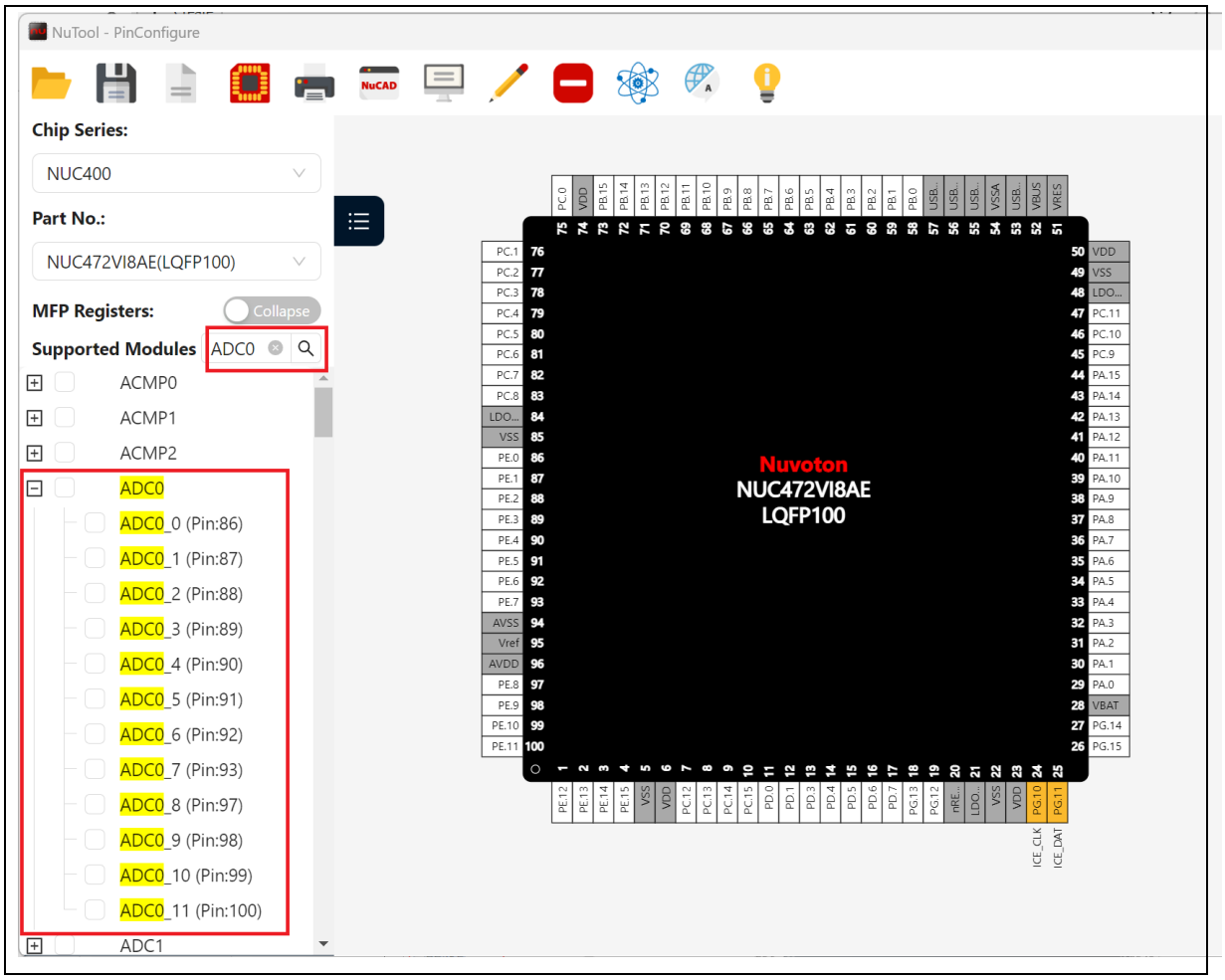


Figure 4-7 Matched Search Results

4.5 Chip View

The chip view, which is in the right pane of the window, depicts a graphical chip involving its pins. Each pin possesses its own information of the current pin assignment. The pins which are highlighted with the grey color denote that they do not belong to the configurable pins. If a pin is being configured to a GPIO multi-function, the corresponding function name will emerge in the vicinity of the pin. Meantime, the pin will be highlighted with the orange color. If there are special hints on the pins, they will be displayed in green, and when you move the mouse over the corresponding pin, it will be presented as a tooltip in a floating window.

To configure by the individual pin, follow the steps below:

1. Move the mouse cursor to the expected pin and click on the left button of the mouse. Then the list of all the related GPIO multi-functions will emerge in the vicinity of the pin (referring to Figure 4-8).
2. Move the mouse cursor into the list and select the expected GPIO function and click on it. Configuring by the individual pin is accomplished. At the same time, the TreeView and the value of the MFP register will be updated correspondingly (referring to Figure 4-9).

The difference between configuring by individual pins and TreeView is that the user can arbitrarily configure any pin by the individual pins without considering the occurrence of a conflict. To disable the configured pins by individual pins, move the mouse cursor to the expected pins and left-click. Select the last row of the list which is named as Reset (referring to Figure 4-10). Then the disable operation is completed.

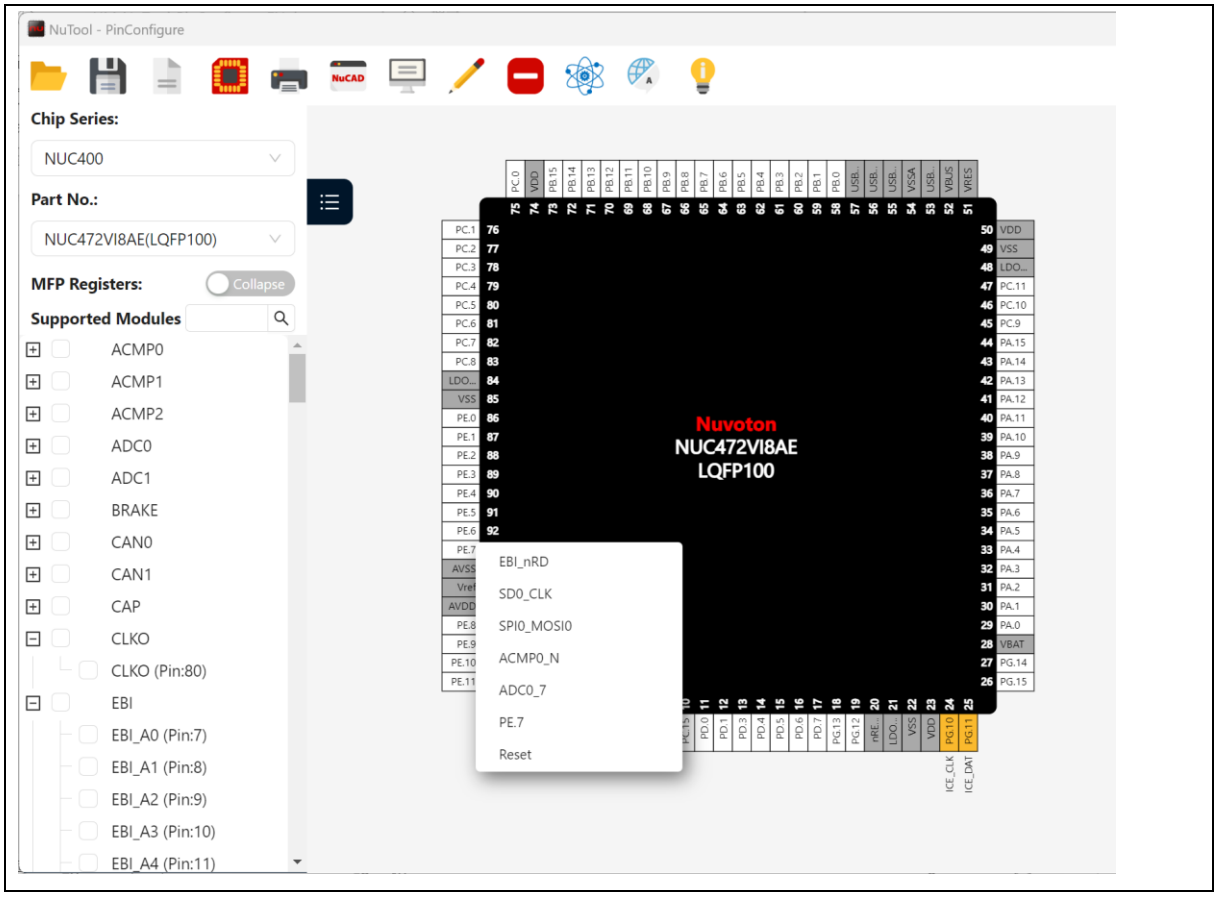


Figure 4-8 List of All the Related GPIO Multi-functions

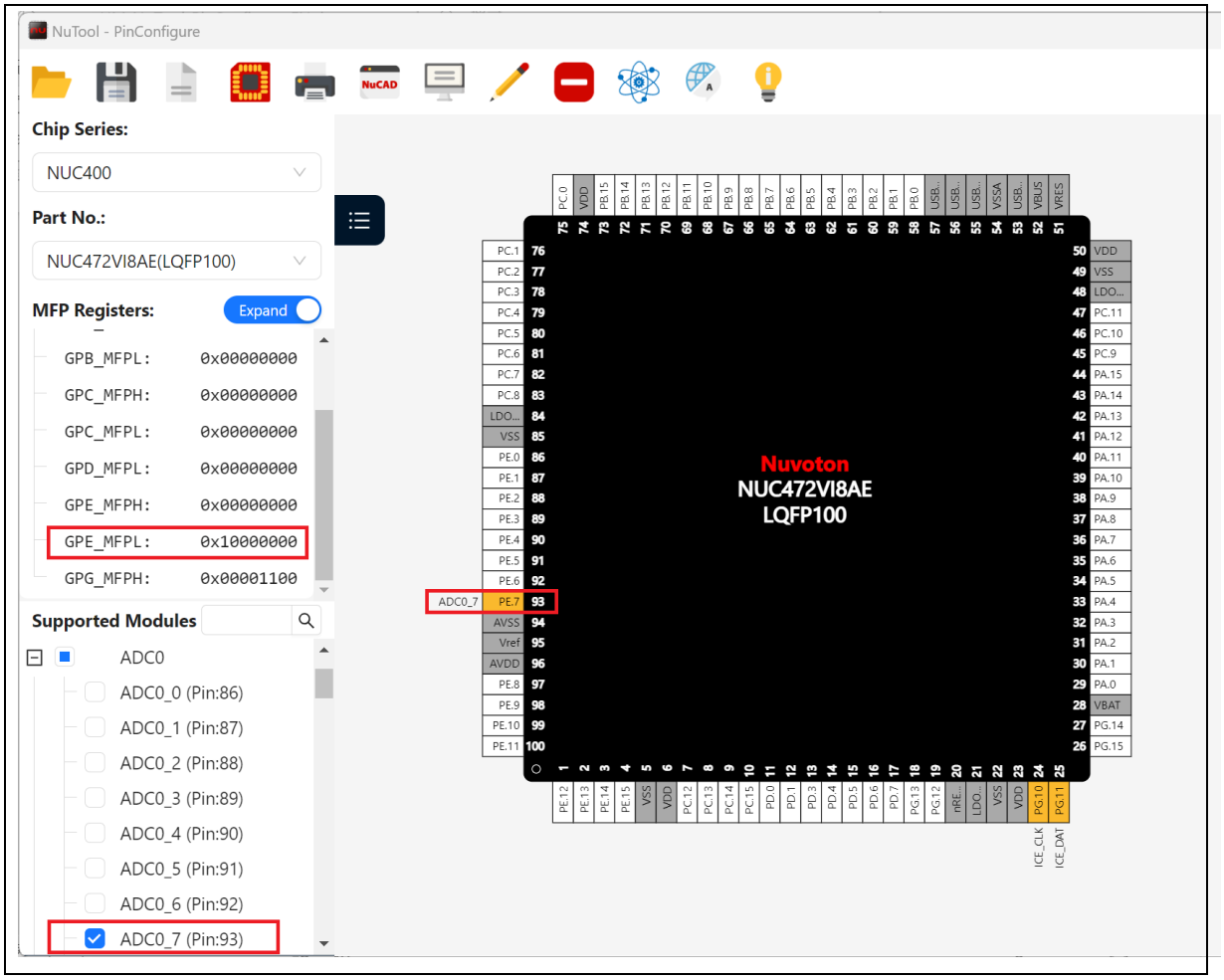


Figure 4-9 Results of Configuring ADC0_7 by the Individual Pin

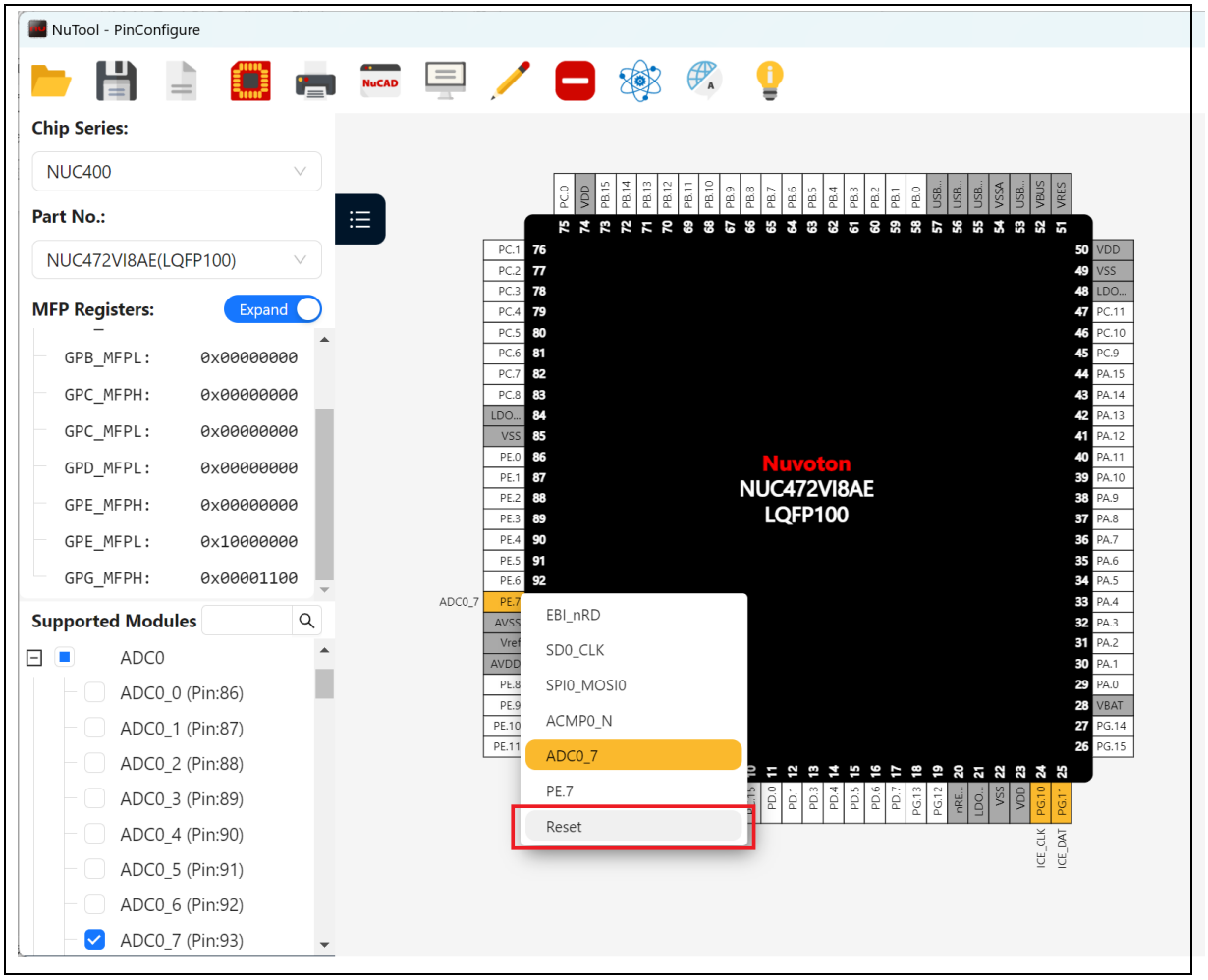


Figure 4-10 Disabling the Configured Pin

5 TOOLBAR

5.1 Load Configuration

The user can browse the previously saved configuration files (*.cfg) and select one of them to restore the configured MCU chip.

To load the configuration, click the **Load Configuration**  button on the toolbar, select the directory preserving the expected configuration file and click the Open button.

5.2 Save Configuration

To save the current configuration, take the following steps:

1. Click the **Save Configuration**  button on the toolbar.
2. Browse a user-defined location and give a proper name to the configuration file (*.cfg).
3. Click the Save button. The current configuration will be saved as a .cfg file with a given name. The configuration file can be used to restore the configured MCU chip in the future.

5.3 Generate Code

To generate code to be included into the developing projects, click the **Generate Code**  button on the toolbar.

5.4 Connect to Chip

To automatically complete setting each step by reading values from the chip, please first select the expected chip series and Part No. you want to connect to and click the **Connect to Chip**  button on the toolbar after connecting to the target chip by usb.

5.5 Print Report

To print a report, click the **Print Report**  button on the toolbar. After inputting the project name and selecting the expected criteria, click on the Confirm button to print the report.

5.6 Run NuCAD (Windows version only)

To run NuCAD, please follow these steps:

1. Click on the **Run NuCAD** 

button on the toolbar.
2. When the first dialog appears, save NuCAD.CSV to your desired location.
3. Use the second dialog to select the OrCAD executable file and the NuCAD.CSV file you just saved.

NuCAD can generate the OrCAD library file (.OLB) to facilitate the schematic design. The OrCAD requirement of the version should be higher than or equal to 16.2. The generated schematic unit will look like Figure 5-1 If the user wants to include the standard library provided by Nuvoton, please refer to the folder of SchematicLibrary in the same directory as the .exe file.

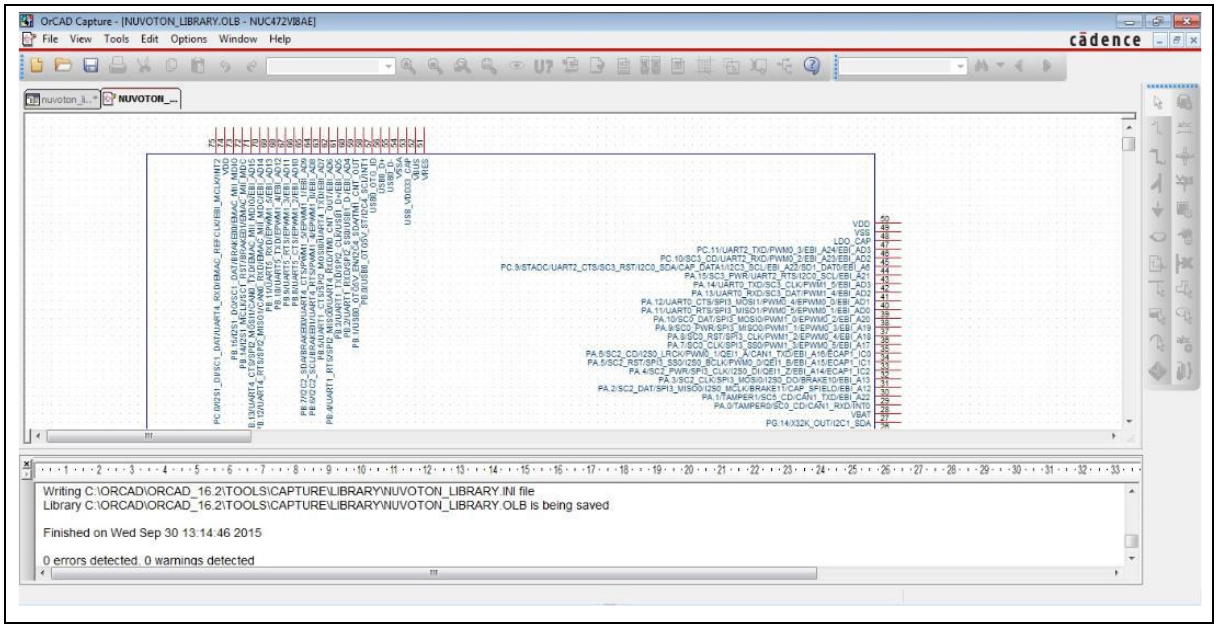


Figure 5-1 Generated Schematic Unit by NuCAD

5.7 Generate Report of Pin Description

To generate report of pin description, click the **Generate Report of Pin Description** button on the toolbar.

5.8 Switch Pin Description

To show pin description, click the **Switch Pin Description** button on the toolbar. The whole description will be expanded around the chip (referring to Figure 5-2).

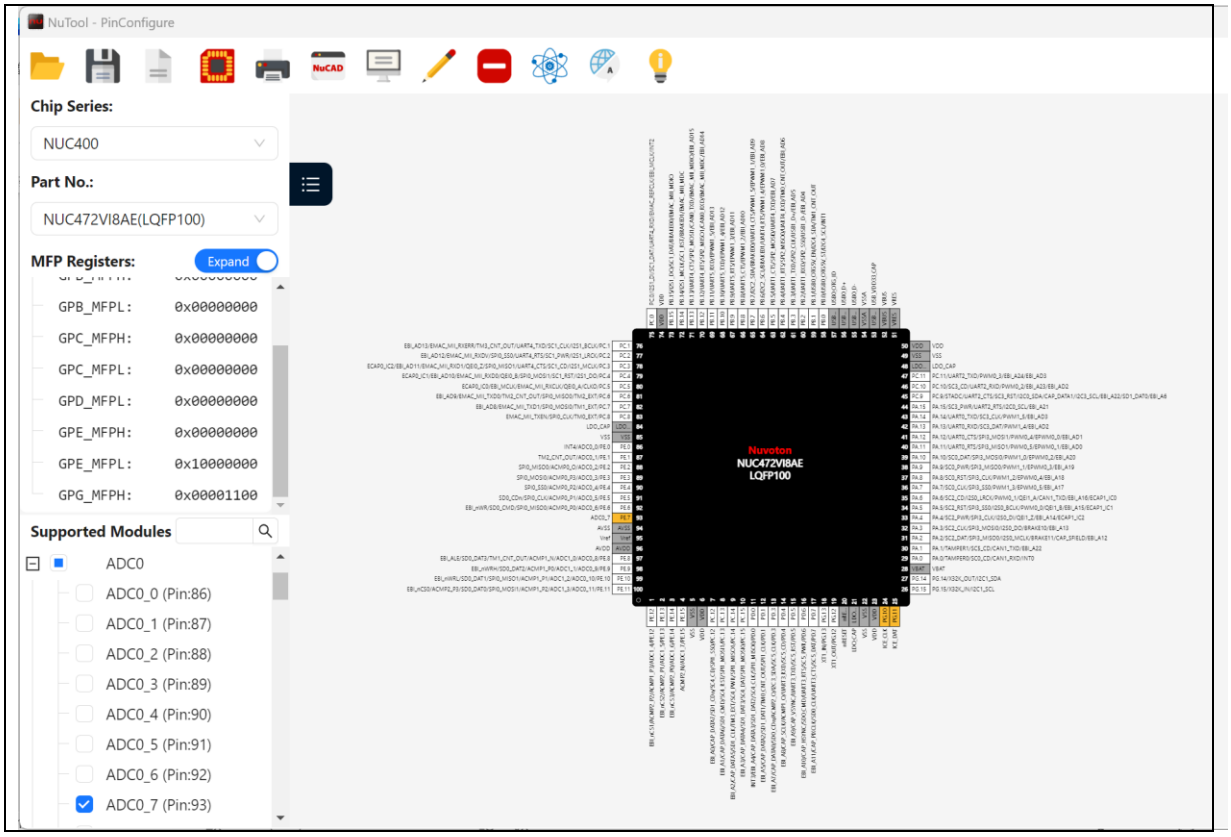


Figure 5-2 Pin Description Expanded around the Chip

5.9 Disable All Checked Modules

To disable all checked modules, click the **Disable All Checked Modules** button on the toolbar.

5.10 Pin Auto Assignment

To automatically assign pins, click the **Pin Auto Assignment** button on the toolbar.

The system intelligently assigns available pins based on the module selected by the user, reducing the need to manually configure pins one by one and improving assignment efficiency.

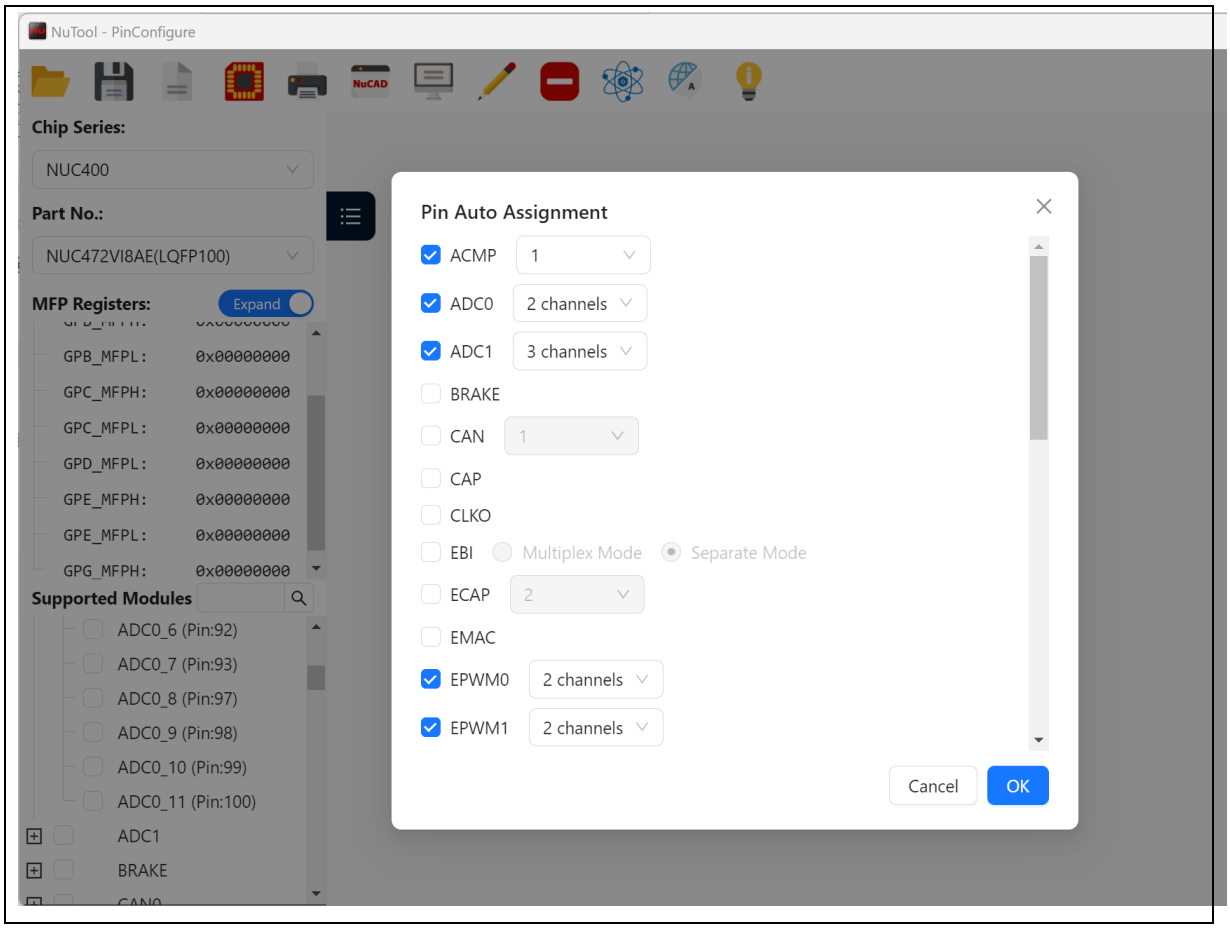


Figure 5-3 Pin Auto Assignment Wizard

When hovering the mouse over a module, a tooltip displays the pins included in that module.

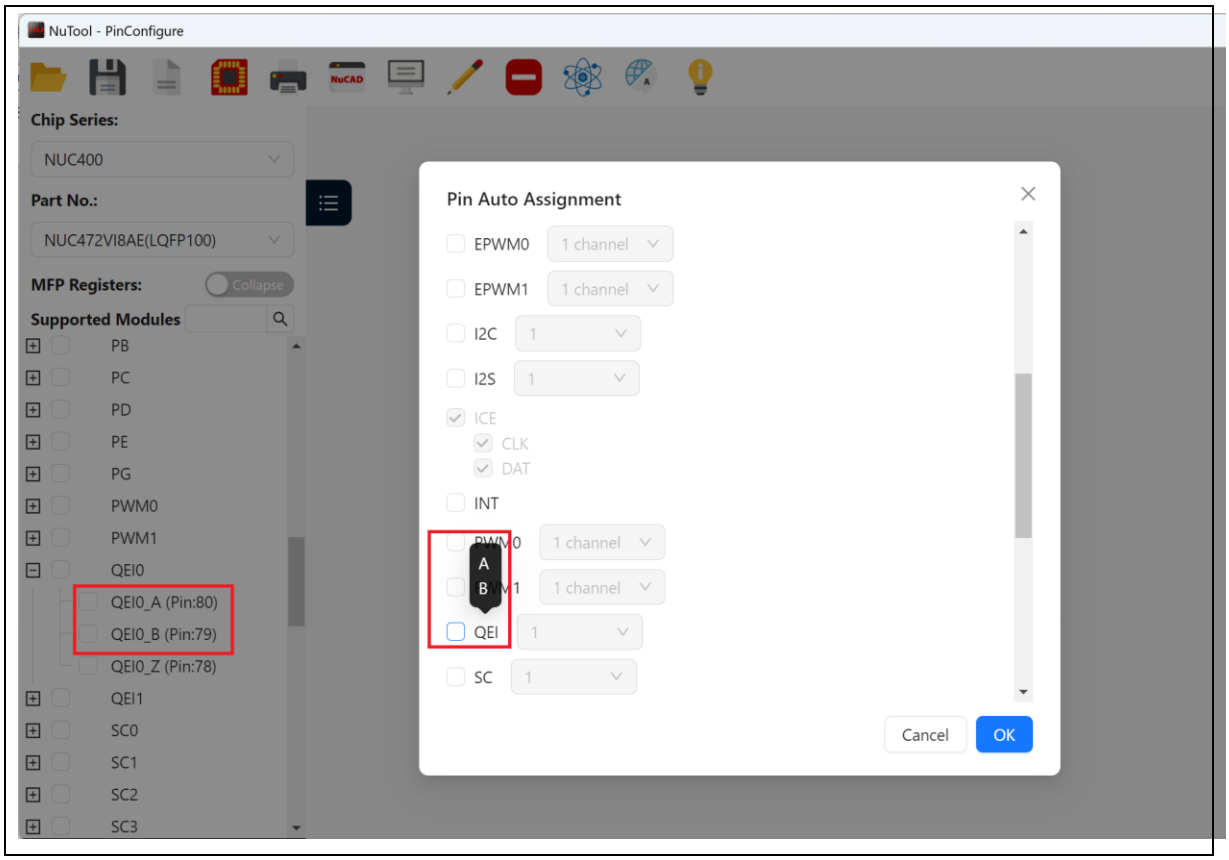


Figure 5-4 Pins Included in the Module

After making the selections, click **"OK"** to automatically assign the pins.

5.11 Language

To select UI language, click the **Language** button on the toolbar. There are three languages supported in the application, including English, Simplified Chinese, and Traditional Chinese.

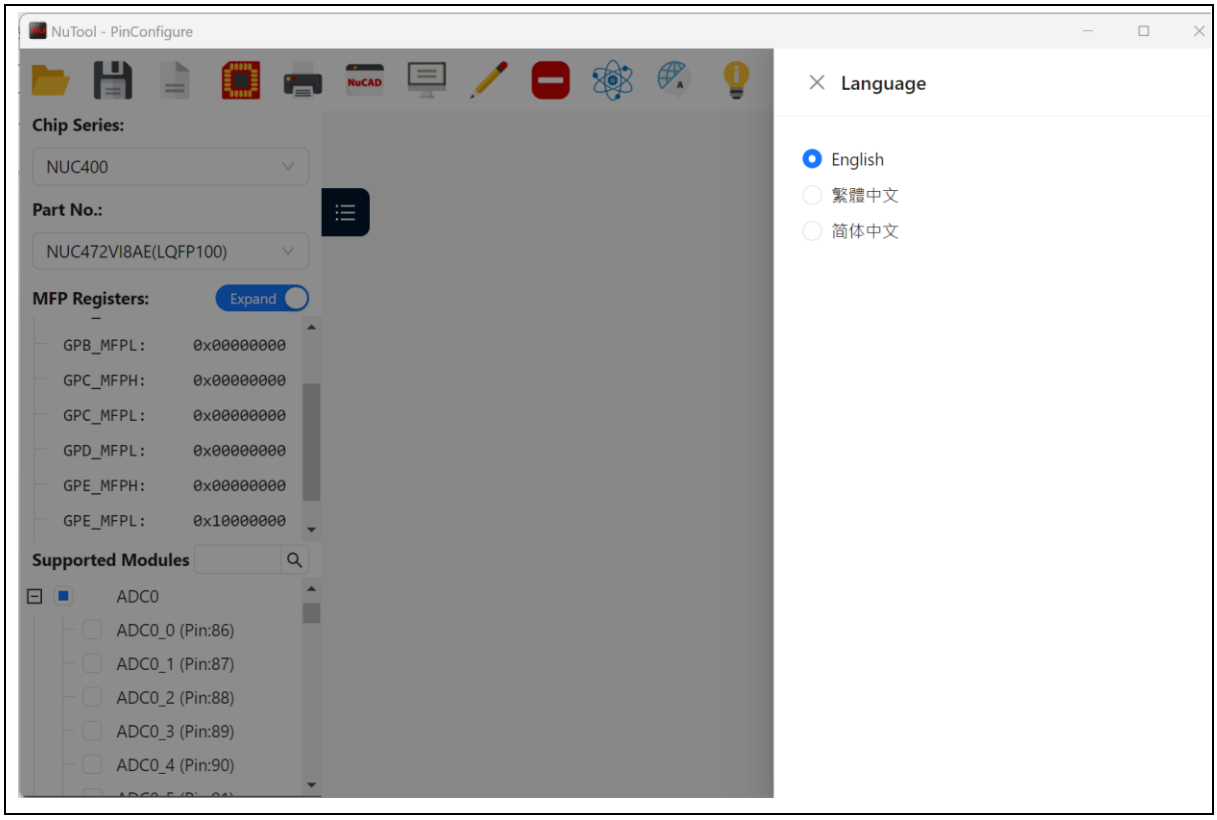


Figure 5-5 Switching language

5.12 Read User Manual

To read this user manual, click the **Read User Manual** button on the toolbar.

6 REVISION HISTORY

日期	版本	描述
2013.10.18	1.00	1. Initially released.
2013.11.08	1.01	1. Supported IE9. 2. Supported Simplified Chinese and Traditional Chinese.
2014.01.03	1.02	1. Supported IE10. 2. Improved performance and GUI. 3. Added the Search feature. 4. Added the Print Report feature.
2014.01.24	1.03	1. Supported M451 series. 2. Enhanced stability.
2014.11.28	1.04	1. Supported IE11. 2. 2. Supported NUC100, NUC200, NUC505, NUC029, M051, M0518, Mini51, Nano100, NM1500, ISD9100 and ISD9300.
2015.07.01	1.05	1. Supported Mini58 and M0519. 2. Added the Tooltip feature.
2015.11.01	1.06	1. Added the NuCAD feature.
2015.12.01	1.07	1. Added back the Generate Report of Pin Description feature.
2016.02.29	1.08	1. Supported NANO103.
2016.07.22	1.09	1. Added new part numbers.
2017.08.01	1.10	1. Supported NUC121, NUC125, NUC126, M0564, and M480.
2017.10.20	1.11	1. Supported the adjustment of conflicts.
2018.06.29	1.12	1. Updated the content of M2351 and M480.
2018.07.29	1.13	1. Supported Mini57, NDA102 and NM1120.
2018.12.28	1.14	1. Supported NUC2201, M251, and ML51. 2. 2. Updated NANO103.
2019.04.29	1.15	1. Supported NUC1261, M05641, M4521, NUC029xDE, NUC029xEE, NUC029xGE, MS51, M031 and M261.
2019.09.06	1.16	1. Supported MS51(8K/32K), M031(G/I/Keyboard/Mouse), M2353SIAAE and NUC1311. 2. Updated M480LD and NANO100BN.
2019.11.01	1.17	1. Supported NUC029ZAN. 2. Updated M031, M480 and MS51.

2020.01.31	1.18	1.	Supported M031BT and M479.
2020.03.06	1.19	1.	Supported ML56, M487KMCAN and NUC029MDE.
2020.04.30	1.20	1. 2.	Supported M0A21 and M030G. Supported a new way of generating code..
2020.11.20	1.21	1.	Supported M071, M253, M258, M471 and M2354.
2021.03.19	1.22	1.	Supported NUC1262 and M030G.
2021.06.30	1.23	1.	Supported M256D, M258G and KM1M7AF.
2022.03.30	1.24	1. 2.	Supported KM1M7BF, M460HD, M460LD and MA35D1. Update the format with template.
2023.03.01	1.25	1.	Supported MUG51, M091, NUC1263 and KM1M7CF.
2023.08.03	1.26	1. 2. 3.	Supported MG51, N76E003, N76S003, M2L31 and KM1M4BF. Updated M231, M460, M480, M2351 and NDA102. Updated Figures.
2023.10.02	1.27	1. 2. 3. 4.	Support Connect to Chip function. Supported M2003C, N9H30, NUC970 and NUC980. Updated NUC1262, M460LD and M258G. Update UI.
2023.11.15	1.28	1.	Supported MA35D0 and MA35H0.
2026.08.20	2.0	1.	Complete UI redesign with improved performance and visual appeal.

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