九齊科技股份有限公司

Nyquest Technology Co., Ltd.

User Manual

NYIDE

Integrated Development Environment

Version 5.8

Aug. 27, 2025

NYQUEST TECHNOLOGY CO., Ltd. reserves the right to change this document without prior notice. Information provided by NYQUEST is believed to be accurate and reliable. However, NYQUEST makes no warranty for any errors which may appear in this document. Contact NYQUEST to obtain the latest version of device specifications before placing your orders. No responsibility is assumed by NYQUEST for any infringement of patent or other rights of third parties which may result from its use. In addition, NYQUEST products are not authorized for use as critical components in life support devices/systems or aviation devices/systems, where a malfunction or failure of the product may reasonably be expected to result in significant injury to the user, without the express written approval of NYQUEST.

Table of Contents

1 Introduction 4

1.1 Outline 4

1.2 What is *NYIDE* 4

1.3 Installation 4

1.3.1 Install NYASM 4

1.3.2 Install NYIDE 4

1.3.3 Install Hardware 4

1.3.4 Install Diver of Hardware 14

2 Function Guide 17

2.1 Main Interface 17

2.2 Main Menu 18

2.2.1 File 18

2.2.2 Edit 19

2.2.3 View 20

2.2.4 Project 29

2.2.5 Build 44

2.2.6 Debug 45

2.2.7 Tool 46

2.2.8 Document 46

2.2.9 Window 46

2.2.10 Help 47

2.3 Tool Bar 51

2.3.1 Managing Layout 51

2.3.2 Adjusting Screen Layout 51

2.4 Hot Key 51

2.5 Project Manager 53

2.6 Text Window 54

3 Start Using *NYIDE* 55

3.1 Build Project/Solution 55

3.2 Change Settings of Project 56

3.2.1 NY4 Series Config Block Setting 57

3.2.2 NY5 Series Config Block Setting 58

3.2.3 NY5+ Series Config Block Setting 59

3.2.4 NY6 Series Config Block Setting 60

3.2.5 NY7 Series Config Block Setting 62

3.2.6 NY8A/8B Series Config Block Setting 64

3.2.7 NY8T Series Config Block Setting 206
3.2.8 NY8L Series Config Block Setting 226
3.2.9 NY9T Series Config Block Setting 227
3.2.10 NY9UB / NY9UP Series Config Block Setting 230
3.2.11 NX1 OTP Config Block Setting 234
3.2.12 NX1 EF Config Block Setting 235
3.3 Editing Resource 236
3.3.1 SPI Resource Files 238
3.3.2 EEPROM Overwrite 239
3.3.3 Updateable Resources 240
3.3.4 LED Strip Settings 242
3.3.5 Action Settings 244
3.3.6 PWM-IO Settings 246
3.3.7 QIO Signal Settings 247
3.4 Build Project 248
3.5 Debug 249
3.6 Create Library Project 250
4 Revision History 253

1 Introduction

Welcome to use *NYIDE* (Nyquest Integrated Development Environment). *NYIDE* is a tool for developing application using assembly language of Nyquest NY4 / 5 / 5+ / 6 / 7 / 8 / 8L / 9T & NX1 series.

1.1 Outline

1 Introduction

Brief description of *NYIDE* and requirements for execute *NYIDE.*

2 Function Guide

The detail description of features provide by *NYIDE*.

3 Start Using *NYIDE*

Illustration and guide to the working flow of *NYIDE*.

1.2 What is *NYIDE*

NYIDE is a user-friendly tool for developing and debugging the assembly programs of Nyquest's MCU. The major advantages of using *NYIDE* are the versatilities of program editor and intuitive functions of debugger.

1.3 Installation

A PC with Microsoft Windows OS and some software / utilities are required before the *NYIDE* installation.

- A PC with Pentium 1.3GHz or higher CPU, Windows 7/ 8/ 10/ 11.
- At least 1G RAM.
- At least 2G hard disk free space.
- A display card and monitor that support 1366x768 resolution or higher.
- Install .Net Framework 4.0.

1.3.1 Install *NYASM*

Please refer to *NYASM* user manual.

1.3.2 Install *NYIDE*

Please follow the instructions to install *NYIDE*.

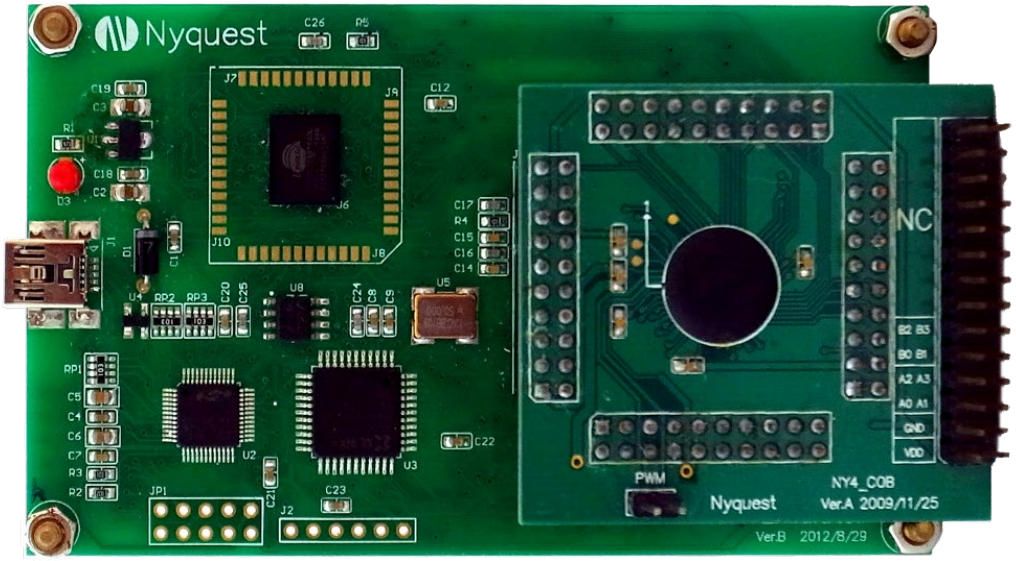
1.3.3 Install Hardware

For users first use *NYIDE*, please make sure the Nyquest emulator is well installed and ready for downloading program to ICE tool for product emulation.

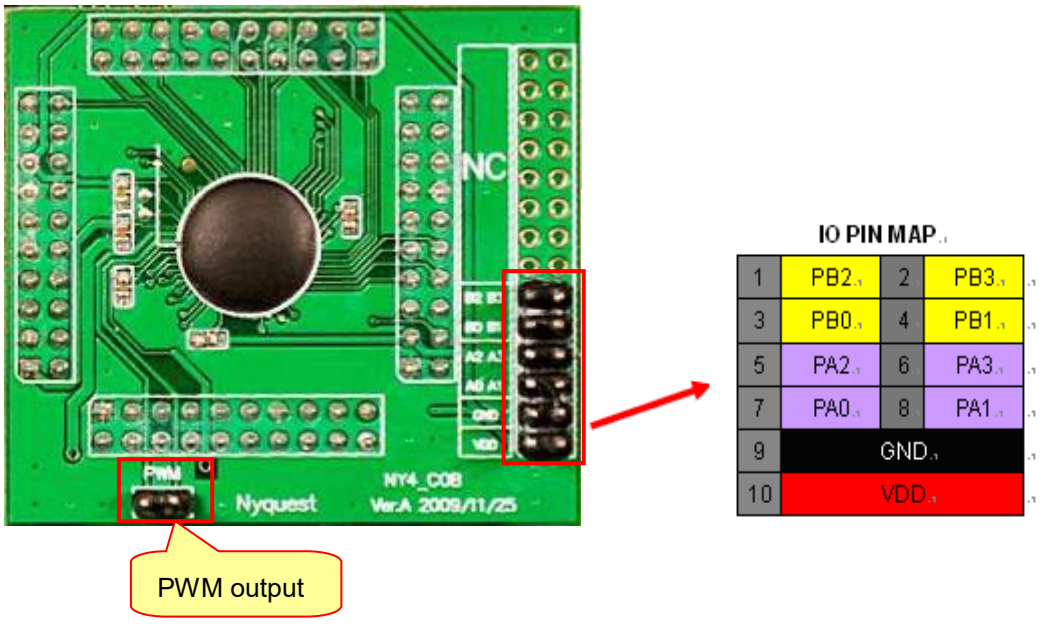
- One In-Circuit Emulator (ICE).
- One USB cable (connect PC and ICE).

The different IC series of ICE is shown below.

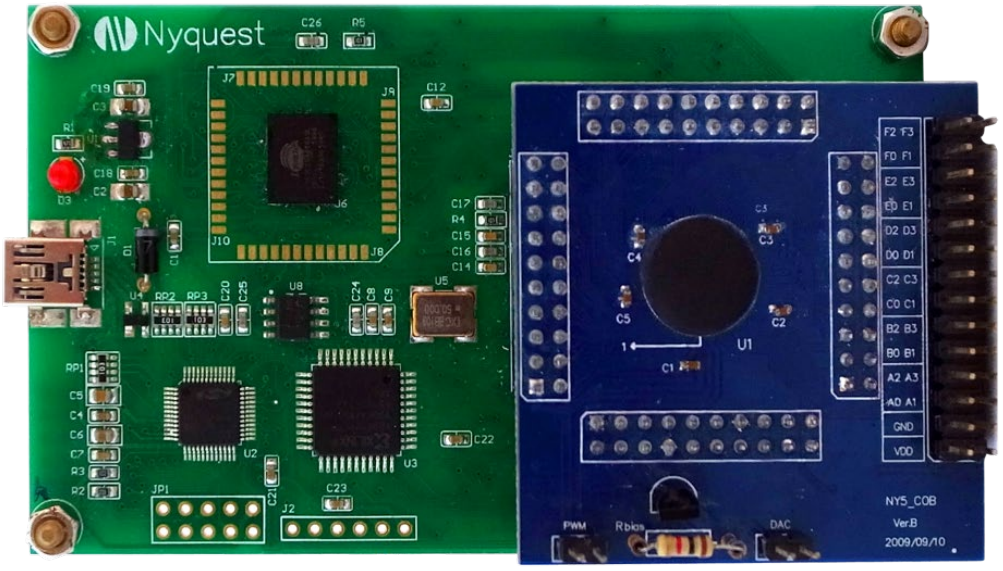
NY4_ICE:



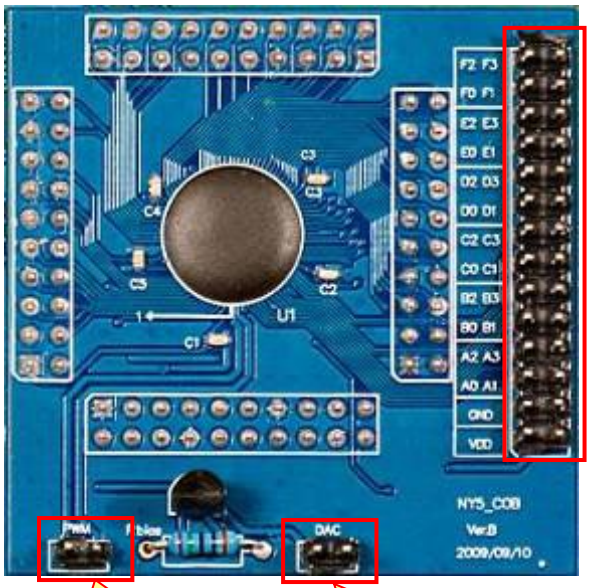
NY4_COB:



NY5_ICE:



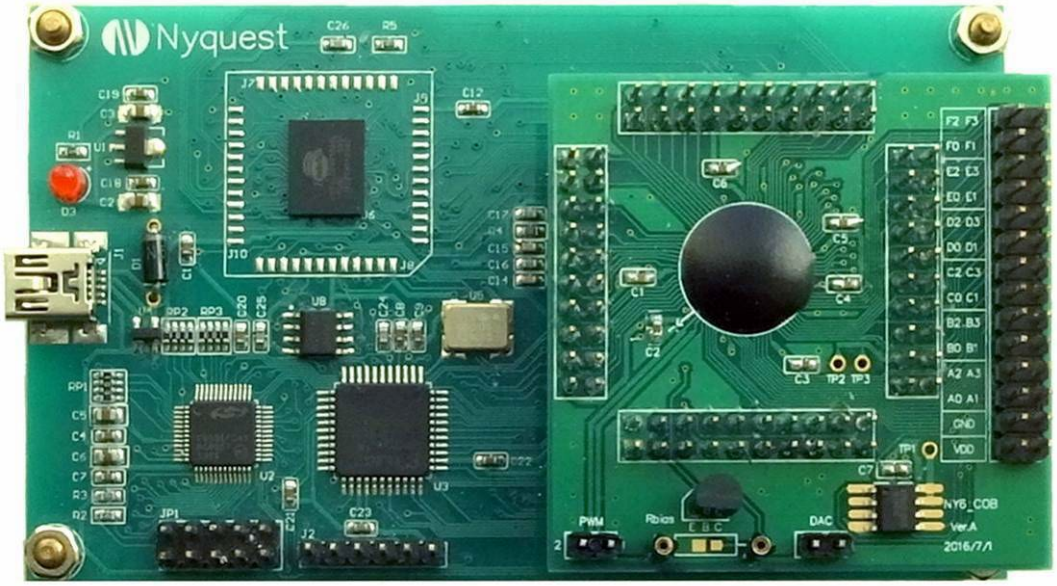
NY5_COB:



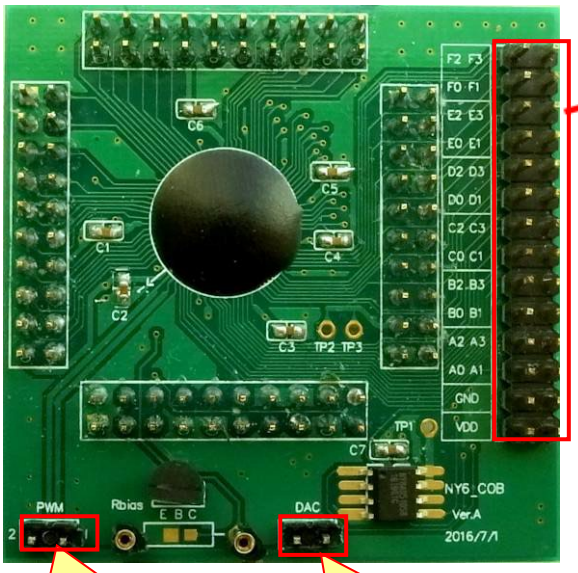
IO PIN MAP

1	PF2	2	PF3
3	PF0	4	PF1
5	PE2	6	PE3
7	PE0	8	PE1
9	PD2	10	PD3
11	PD0	12	PD1
13	PC2	14	PC3
15	PC0	16	PC1
17	PB2	18	PB3
19	PB0	20	PB1
21	PA2	22	PA3
23	PA0	24	PA1
25	GND		
26	VDD		

NY6_ICE:



NY6_COB:

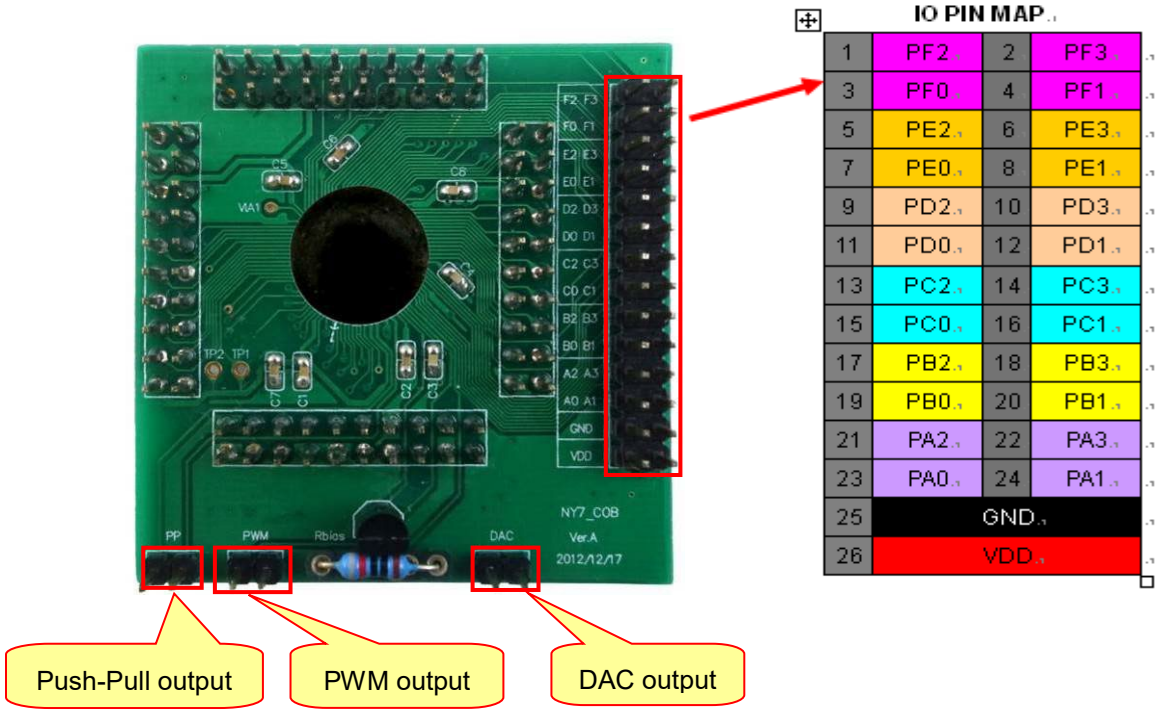


IO PIN MAP

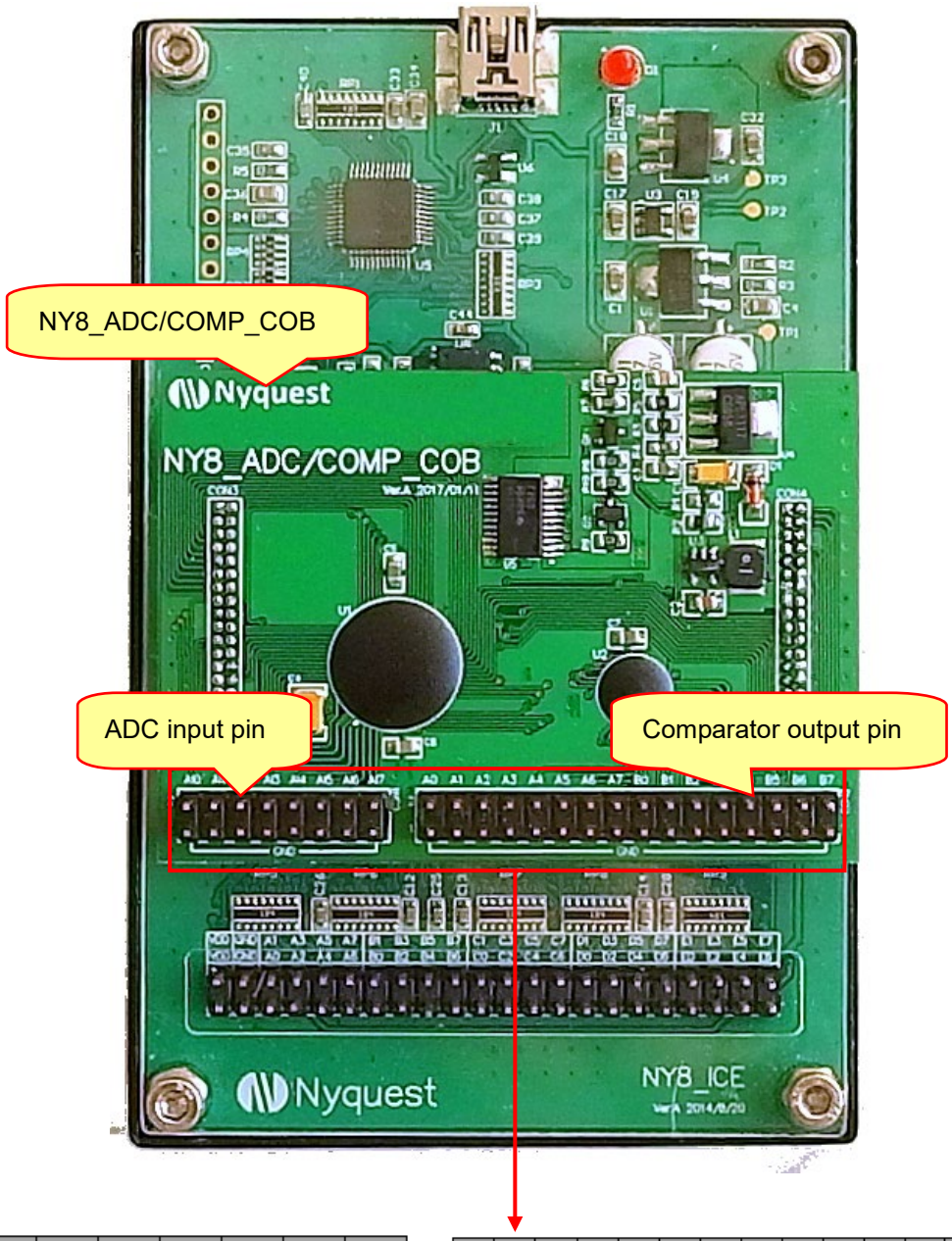
1	PF2	2	PF3
3	PF0	4	PF1
5	PE2	6	PE3
7	PE0	8	PE1
9	PD2	10	PD3
11	PD0	12	PD1
13	PC2	14	PC3
15	PC0	16	PC1
17	PB2	18	PB3
19	PB0	20	PB1
21	PA2	22	PA3
23	PA0	24	PA1
25	GND		
26	VDD		

NY7_ICE:

NY7_COB:



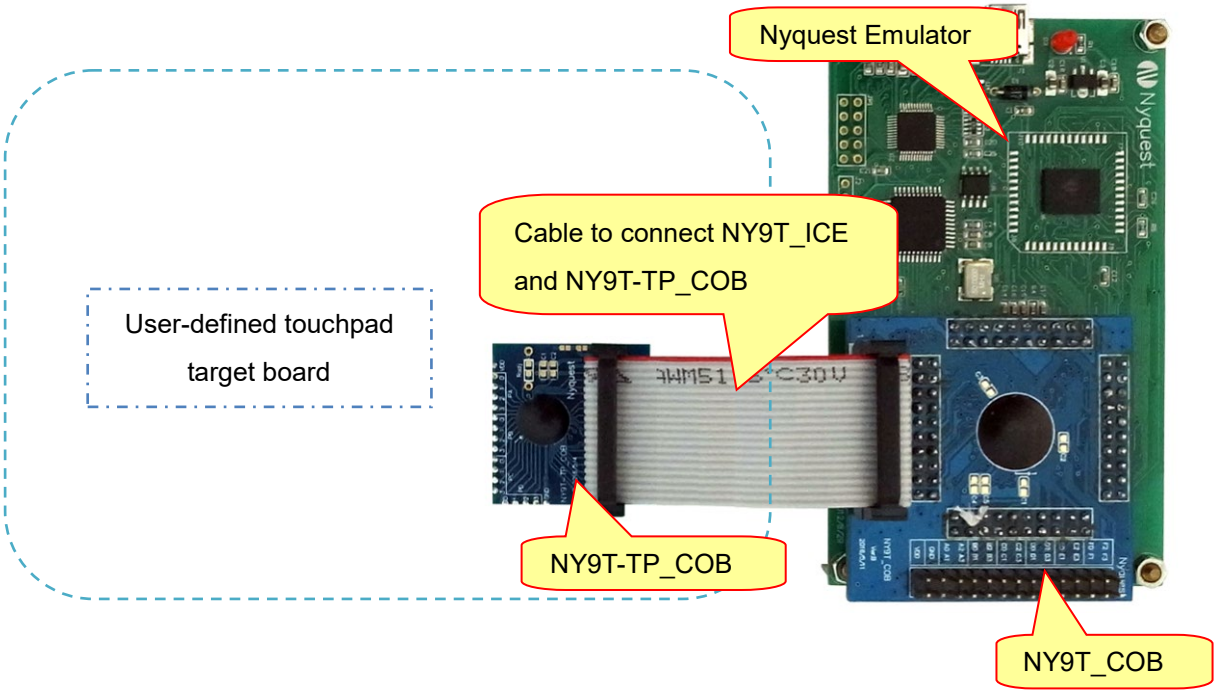
NY8_ICE:



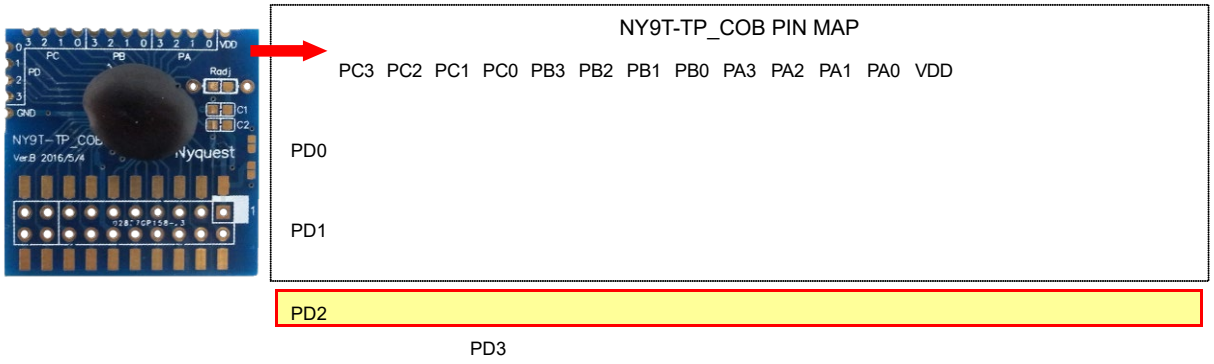
1	2	3	4	5	6	7	8
AIN0	AIN1	AIN2	AIN3	AIN4	AIN5	AIN6	AIN7
GND							

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A0	A1	A2	A3	A4	A5	A6	A7	B0	B1	B2	B3	B4	B5	B6	B7
GND															

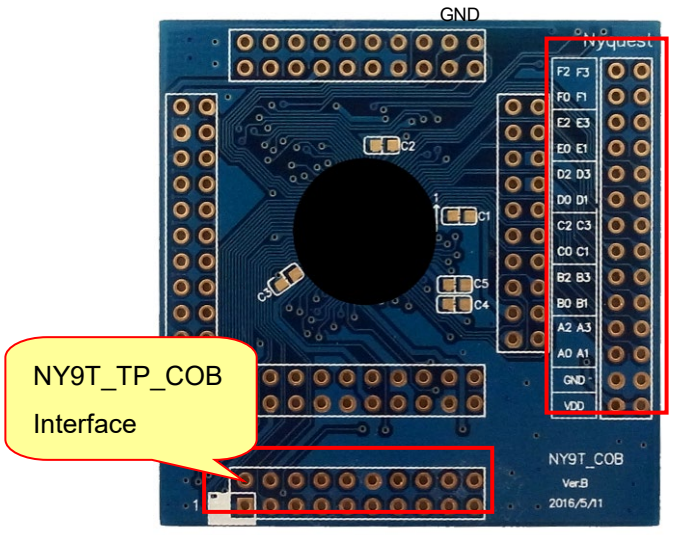
NY9T_ICE:



NY9T-TP_COB:



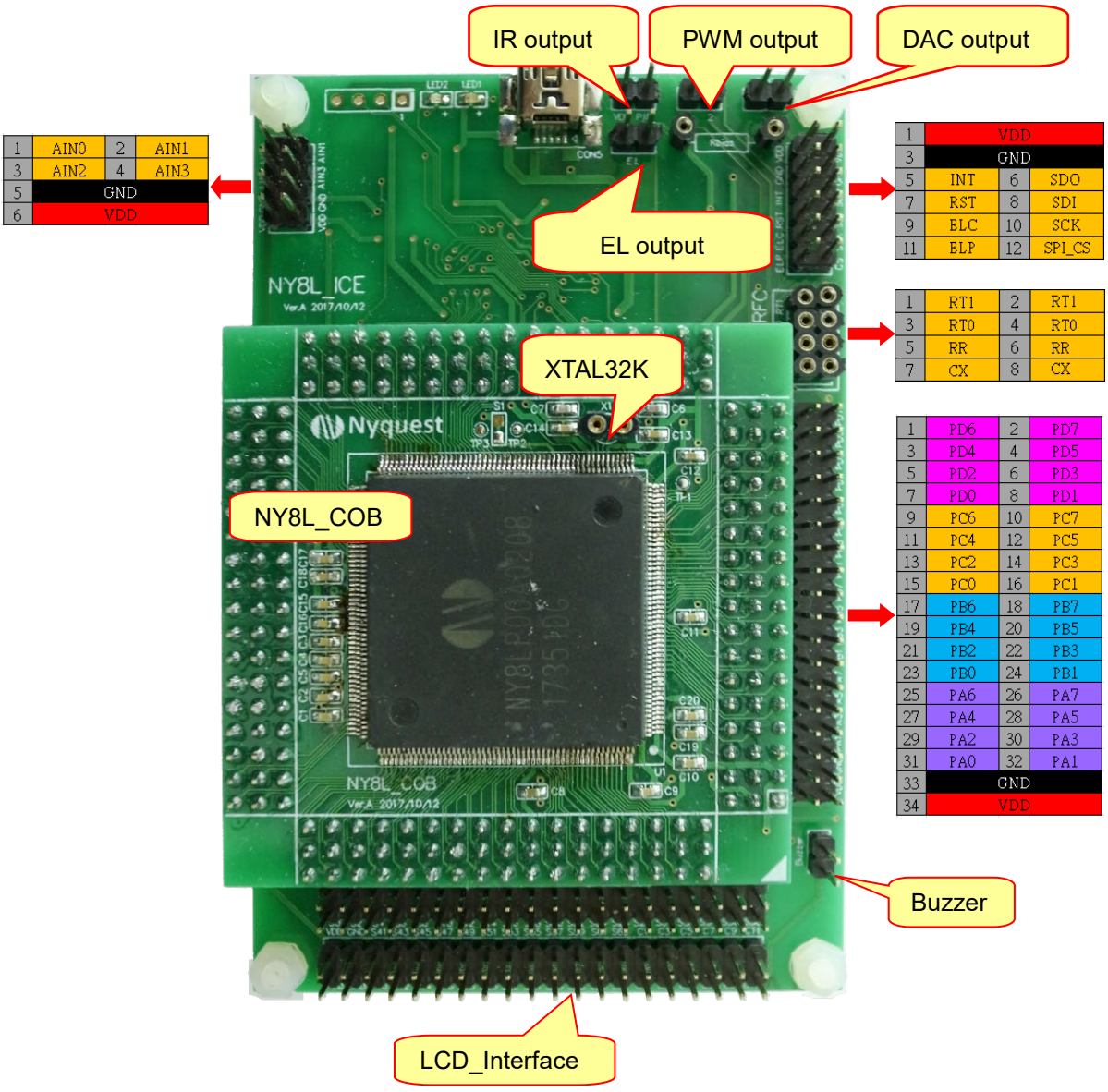
NY9T_ COB:



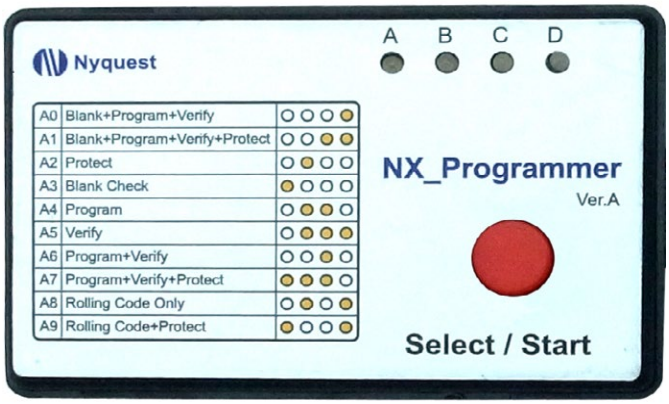
IO PIN MAP

1	PF2	2	PF3
3	PF0	4	PF1
5	PE2	6	PE3
7	PE0	8	PE1
9	PD2	10	PD3
11	PD0	12	PD1
13	PC2	14	PC3
15	PC0	16	PC1
17	PB2	18	PB3
19	PB0	20	PB1
21	PA2	22	PA3
23	PA0	24	PA1
25	GND		
26	VDD		

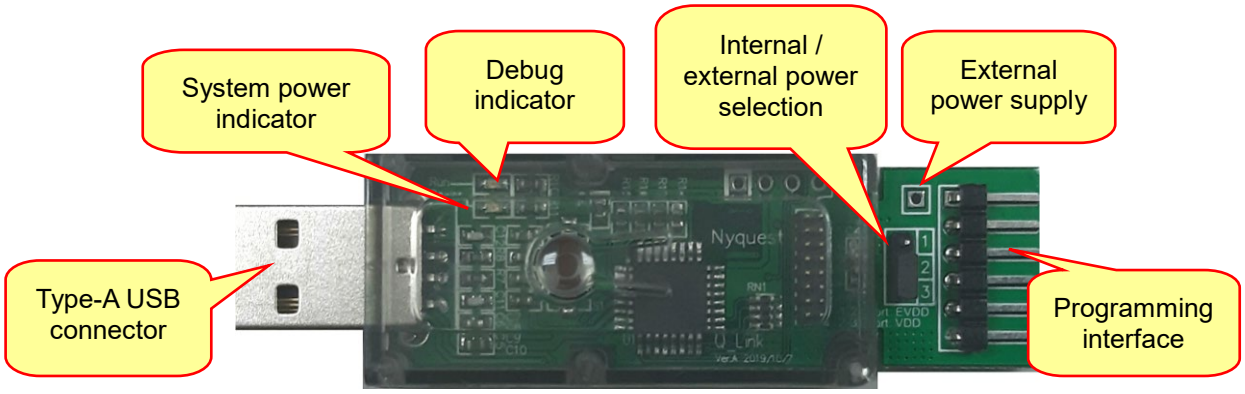
NY8L_ICE:


IR output
PWM output
DAC output
EL output
XTAL32K
NY8L_COB
Buzzer
LCD_Interface
NY8L_ICE
Ver.A 2017/10/12
Nyquest
NY8L_COB
Ver.A 2017/10/12
1 AIN0 2 AIN1
3 AIN2 4 AIN3
5 GND
6 VDD
1 VDD
3 GND
5 INT 6 SDO
7 RST 8 SDI
9 ELC 10 SCK
11 ELP 12 SPI_CS
1 RT1 2 RT1
3 RT0 4 RT0
5 RR 6 RR
7 CX 8 CX
1 PD6 2 PD7
3 PD4 4 PD5
5 PD2 6 PD3
7 PD0 8 PD1
9 PC6 10 PC7
11 PC4 12 PC5
13 PC2 14 PC3
15 PC0 16 PC1
17 PB6 18 PB7
19 PB4 20 PB5
21 PB2 22 PB3
23 PB0 24 PB1
25 PA6 26 PA7
27 PA4 28 PA5
29 PA2 30 PA3
31 PA0 32 PA1
33 GND
34 VDD

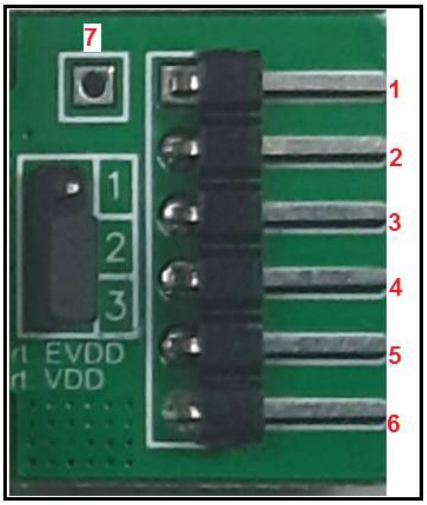
NX_Programmer:



Q-Link:



1. Type-A USB connector: The USB connector can insert into a USB port of PC directly. Please the USB Type-A extension cable if needed.
2. Debug indicator: When user is in the process of developing program and NYIDE executes the RUN function, the Debug indicator will light up and which means the connected NY8BM series IC is in operation.
3. System power indicator: When the system power is normal, this light will be on.
4. Internal / external power selection: Users can select internal or external power by needs. Please refer to *Hardware_Tool* UM v4.0 for the supply voltage specs.
5. External power supply: When user needs external power supply, please input power from this pin, then select external power supply from Jump.
6. Programming interface: The interface provides VDD / VPP / SDO / (SDI/SDA) / (CLK/SCL) / GND, power and IC programming pin. User can connect the corresponding pin of the IC with a transmission line for programming or simulating program development. The pin definitions are described below.

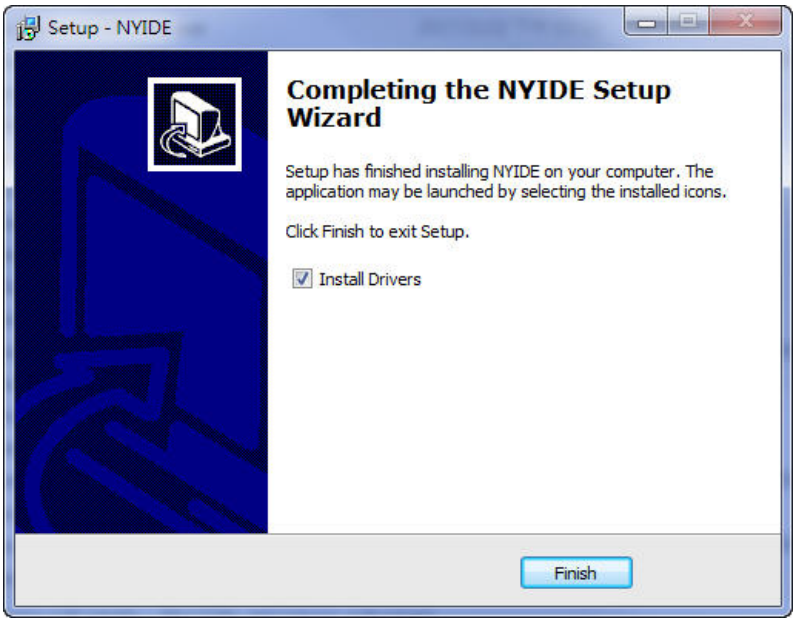


Q-Link Programming Pin Map

PIN no.	Definition	Description
1	VDD	Provide the operating voltage for IC
2	VPP	Provide the programming voltage for IC
3	SDO	The data signals of IC communication (Q-Link input)
4	SDI/SDA	The data signals of IC communication (Q-Link input/output bi-direction)
5	SCK/SCL	The clock source signals of IC communication (Q-Link output)
6	GND	Provide GND for IC
7	EVDD	External power input

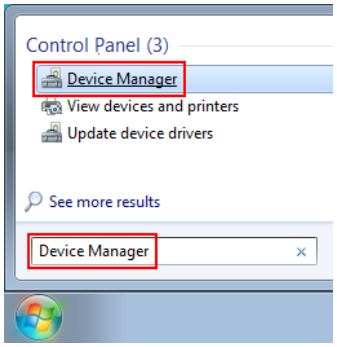
1.3.4 Install Diver of Hardware

NYIDE installation provides automatic installation of driver options. After completing installation, the NYIDE setup wizard will ask whether to install the relevant hardware driver.

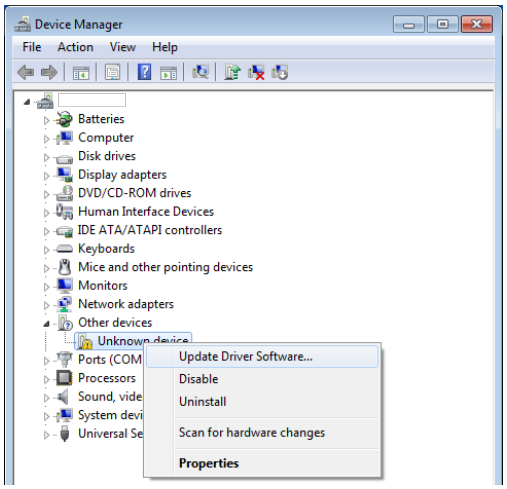


Or, user can follow the steps below to install the driver manually.

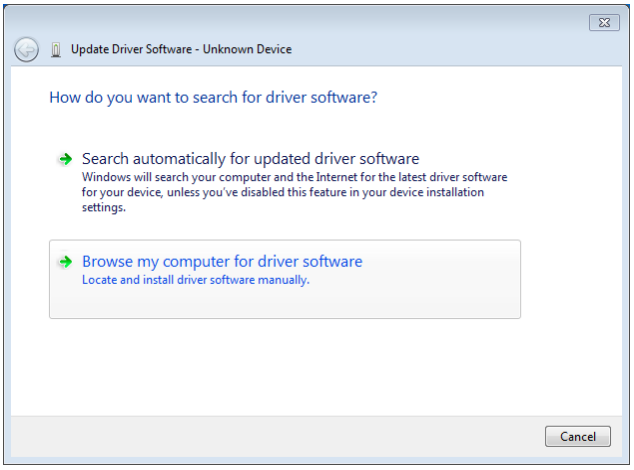
(1) Take Windows 7 as example. Key in “Device Manager” on Start menu, then click the icon of Device Manger.



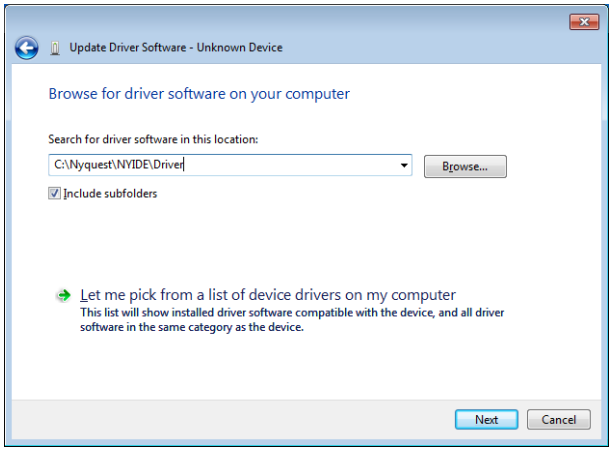
(2) Right-click on “Device Not Recognized” in the “Device Manger” window, then select “Update Driver Software… ”.



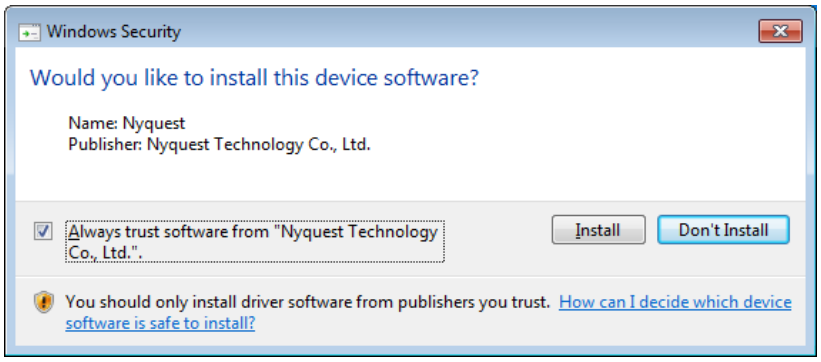
(3) Select “Browse my computer for driver software”



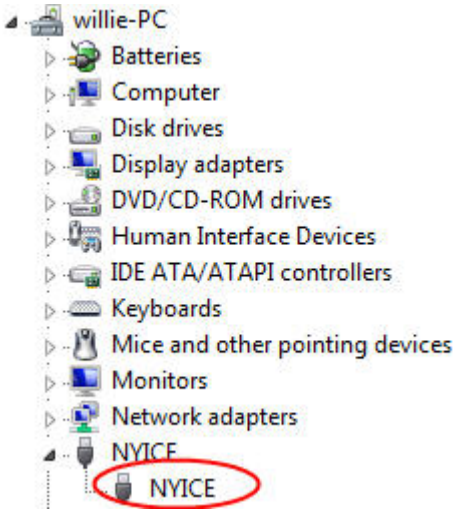
(4) Click the Browse button and select the file location of installation as shown below. Press the Next button.



(5) Windows will show the box as the following illustration. Press the Install button.

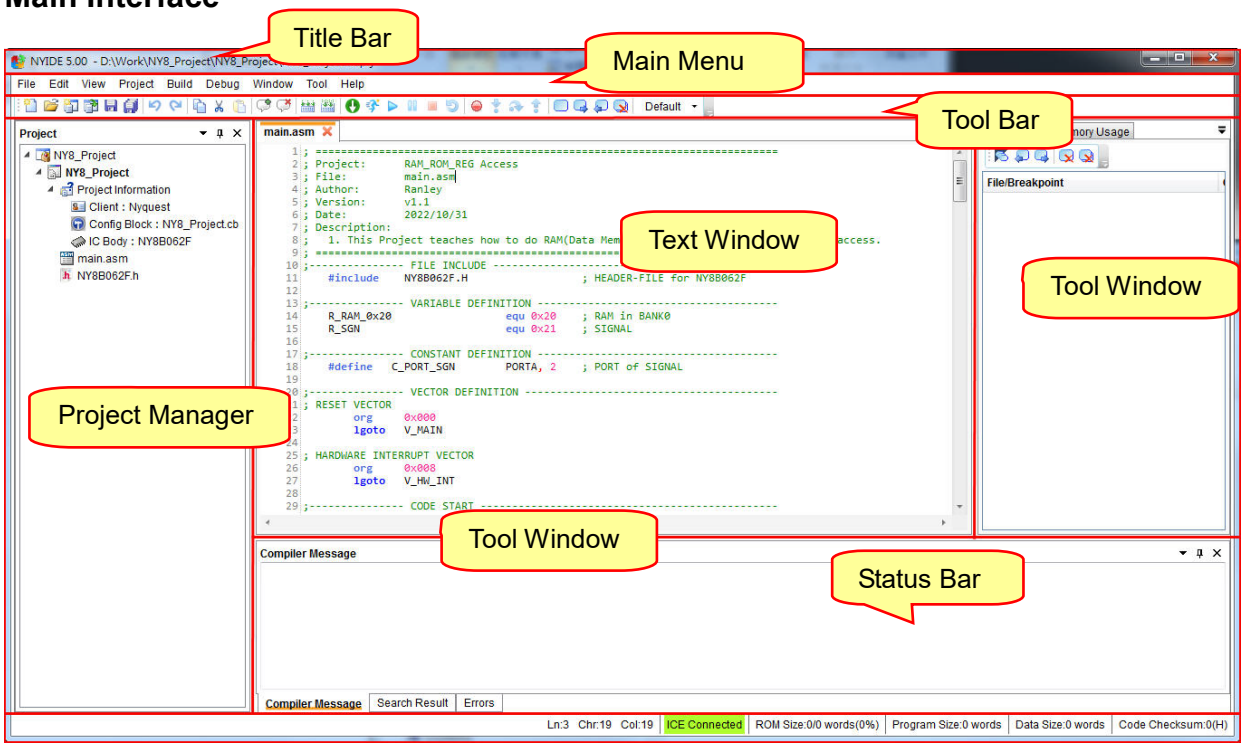


(6) If the driver of emulator is well installed, there will be an entry for “NYICE” in the list of “Device Manager”. *NYIDE* is ready for downloading the programs and doing product emulation on the ICE tool.



2 Function Guide

2.1 Main Interface

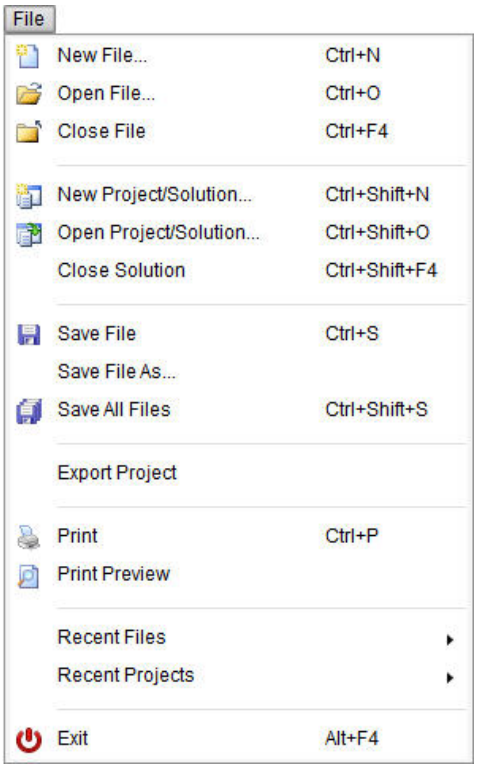


NYIDE can open one solution at a time, each solution contains one or many projects, every project has its own settings separately, for example, using different microcontrollers. For more details and descriptions, please refer to the following introductions.

- Title Bar: The current opened solution name and tool name—*NYIDE*.
- Main Menu: All function menus (not including layout).
- Tool Bar: The commonly used buttons.
- Project Manager: Managements for project/solution. Users can add/remove/rename project/solution in this area.
- Text Window: Review/edit code.
- Tool Window: Includes Error/Output/Bookmarks/Debug windows.
- Status Bar: Show the information, such as ICE connection status, ROM, edition, etc.

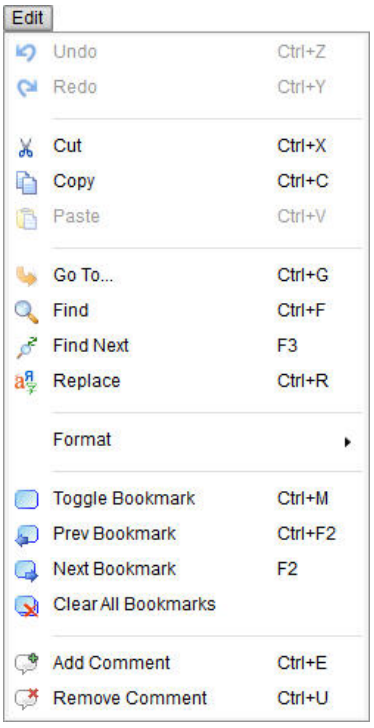
2.2 Main Menu

2.2.1 File



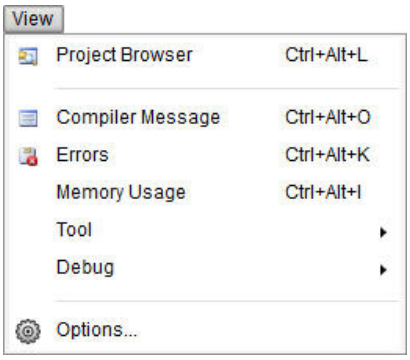
Item	Descriptions
New File	Create a new file.
Open File	Open a file.
Close File	Close the current editing file.
New Project /Solution	Create a project/ solution.
Open Project / Solution	Open a project/ solution.
Close Solution	Close the current solution.
Save	Save the current editing file.
Save As…	Save the current editing file to a new file name.
Save All	Save all opened files.
Export Project…	Export the existing project to the directory
Print	Print the current editing file.
Print Preview	Review the file before printing.
Recent Files	Open recently opened files.
Recent Projects	Open recently opened projects.
Exit	Leave *NYIDE.*

2.2.2 Edit



Item	Descriptions
Undo	Undo last action.
Redo	Redo last action.
Cut	Cut selected area into clipboard.
Copy	Copy selected editing area into clipboard.
Paste	Paste content from clipboard into the editing area.
Go To…	Go to the specific row or bookmark.
Find	Find general text or regular expression.
Find Next	Find next selected text.
Replace	Replace string.
Format	Format
Select All	Select all content of edition area.
Toggle Bookmark	Toggle bookmarks.
Prev Bookmark	Move cursor to previous bookmark.
Next Bookmark	Move cursor to next bookmark.
Clear All Bookmarks	Remove all bookmarks from the marks list.
Add Comment	Add comments, using “;” as a beginning in ASM comment and “//” as a beginning in C comment.
Remove Comment	Clean comments.

2.2.3 View

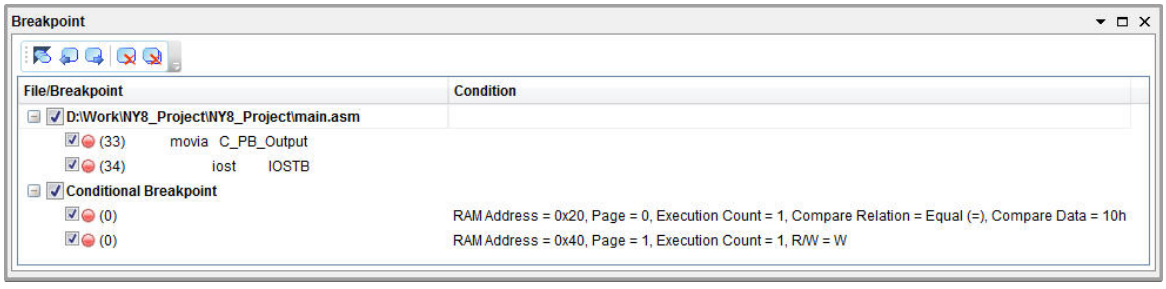


Item		Descriptions
Project Browser		Achieve the interfaces of different functions.
Compiler Message		
Errors		
Memory Usage Information		
Tools	Search Results	
	Bookmarks	
Debug	Breakpoints	
	Watch	
	Register	
	System Register	
	Memory	
	Disassembler	
	Local Variable	
	LCD Memory	
	LCD Simulation	
	Log	
Options…		Set the interface to display related options

2.2.3.1 Breakpoints Window

Display/edit the general breakpoint/conditional breakpoint in the project. Users can also right-click in the window to add a conditional breakpoint (in NY5+/NY6/NY8 series) or watchpoint (only in NX1 series).

Click on normal breakpoint, it will jump to this breakpoint location of current program. *NYIDE* will re-edit the breakpoint by double-clicking on the conditional breakpoint.



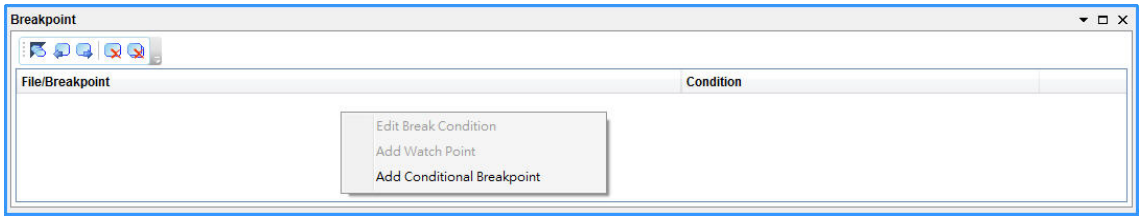
Note:

1. ***If user sets a breakpoint at the status of ICE Free run, the breakpoint will be defaulted as disable. The breakpoint will be enabled to execute at the status of pause.***
2. ***If user sets many conditional breakpoints at the same RAM/ROM address, only one***

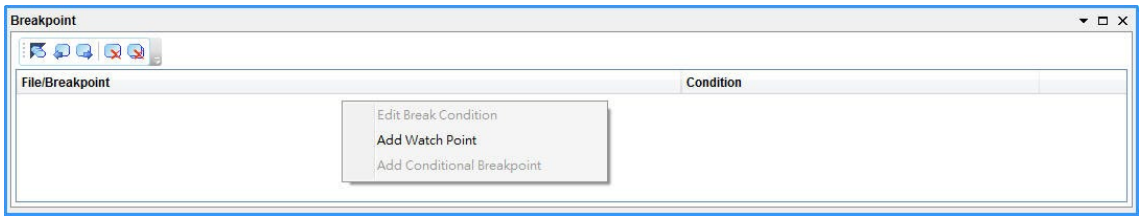
breakpoint is available.

Other features in the Breakpoint Window are described below.

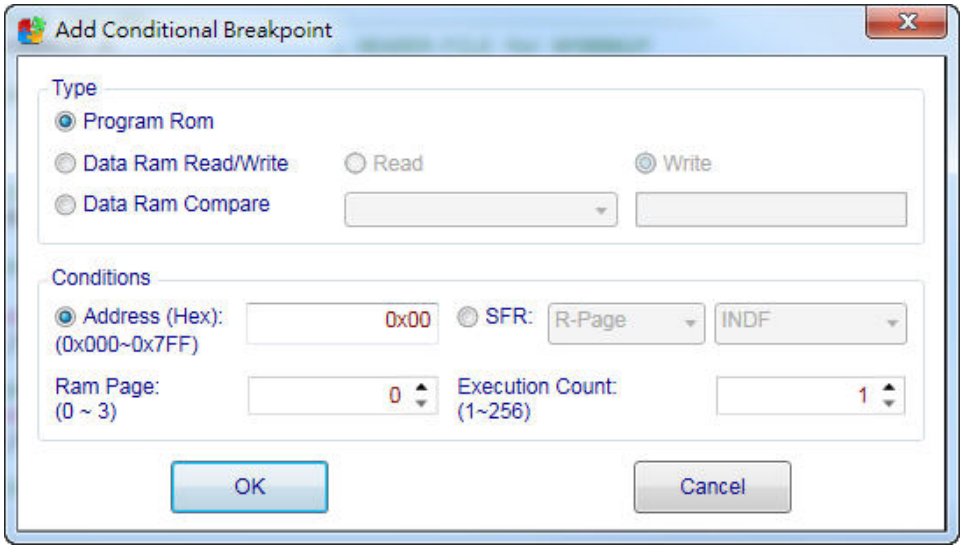
Click the right mouse button to display the menu in NY5+/NY6/NY8.



Click the right mouse button to display the menu in NX1.



◆ Add Conditional Breakpoint: In the right-click menu, the following window will pop up by clicking the “Add Conditional Breakpoint”. (This function only supports NY6/NY8 series)



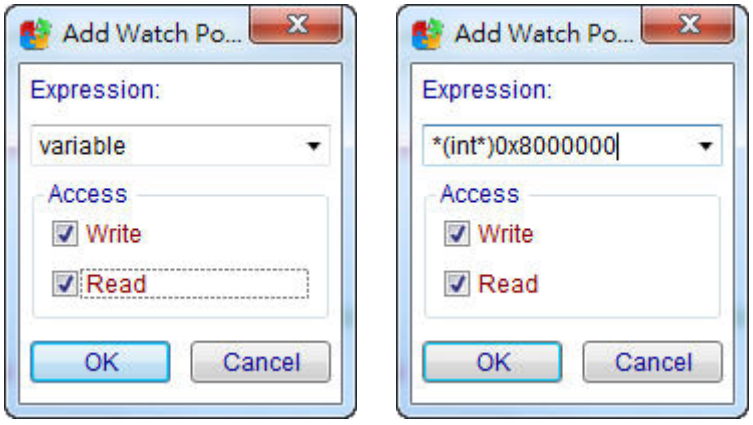
Type: Select the type of conditional breakpoint.

- Program Rom: When the program execute to the set ROM address, the program will be interrupted.
- Data Ram Read/Write: When the set RAM address is read or written, the program will be interrupted.
- Data Ram Compare: When the value in the set RAM address conforms the setting compare relationship (supports =, ≠, <, ≤,>, ≥ six kind of comparison relationship), the program will be interrupted.

Conditions: Set the condition for interruption.

- Address (Hex): Set ROM/RAM address. This option requires using hexadecimal format. The supported setting range will be prompt below.
- SFR: If the RAM is set as a correlation type, SFR can be selected as the interrupt condition address.
- Ram Page: Set the page where the RAM address is located. The supported setting range will be prompt below.
- Execution Count: Set how many times the number of interrupt conditions meet, the program will really interrupt. For example, if set Execution Count to 1, when the interrupt condition met once, the program will interrupt. If set Execution Count to 2, the interrupt condition has to meet twice, the program will interrupt.

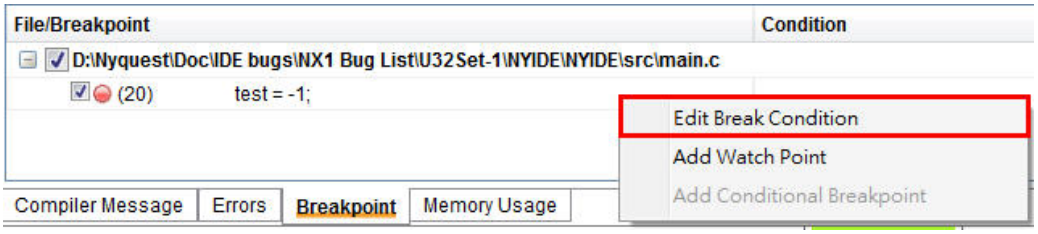
◆ Add Watch Point: In the right-click menu, the following window will pop up by clicking the “Add Watch Point”. (This function only supports NX1 series)

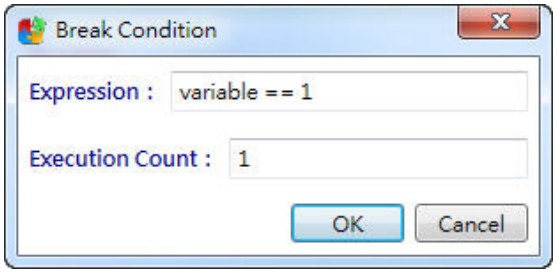


- Expression: Sets variables that user want to observe (the upper left figure) or addresses (the upper right figure).
- Access: Set the observed variable/address to be read/overwritten, the program will interrupt.

Note: The Watch Point only supports Global Variable. If set to observe the Local Variable, the Watch Point is valid only in the scope of regional variable. The Watch Point will automatically be removed from the range while leaving the action range. If the optimization function is enabled, the Local Variable will automatically remove the Watch Point even if it's in the action range, but the variable is optimized.

◆ Edit Break Condition: Select a general breakpoint and right-click to show menu, the following window will pop up by clicking the “Edit Break Condition”. (This function only supports NX1 series)

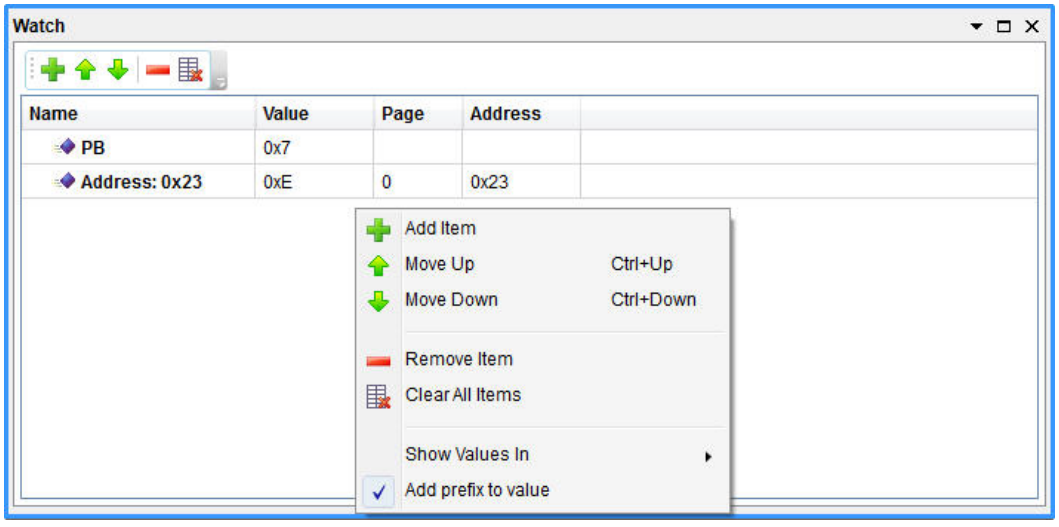




- Expression: Set the interrupt comparison condition. When the program execute to the breakpoint address and meet this condition, the program will interrupt.
- Execution Count: Set how many times the number of interrupt conditions meet, the program will really interrupt.

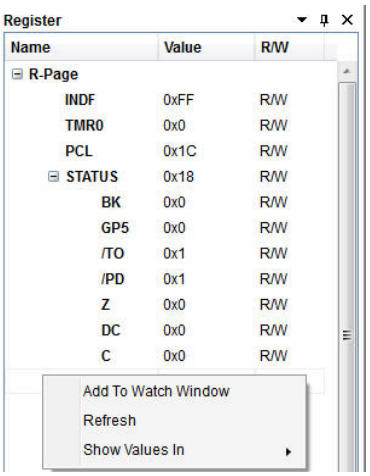
2.2.3.2 Watch Window

User can add registers or values for tracking in Watch Window, or switch to Page/Bank tab to add the memory address. The "Show Values In" function could be applied to binary. User can add registers or values for tracking in Watch Window, or switch to Page/Bank tab to add memory address. The "Show Values In" function could be applied to binary, decimal, and hexadecimal for switching values. The "Add prefix to value" function will add a prefix to the selected value. (The prefix for binary is 0b, for hexadecimal is 0x) These functions can be set separately for each item (use the context menu via the right click on the target item), or set all items at once on the context menu by right-clicking on the blank space.



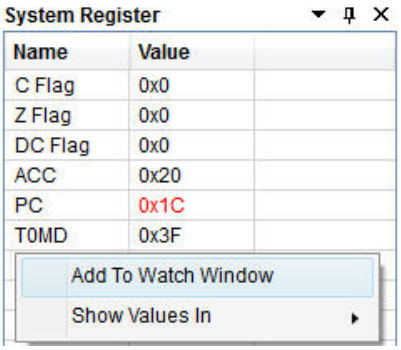
2.2.3.3 Register Window

If the register is meaningless, its value will be blank. The changed registers while debugging are shown in red.



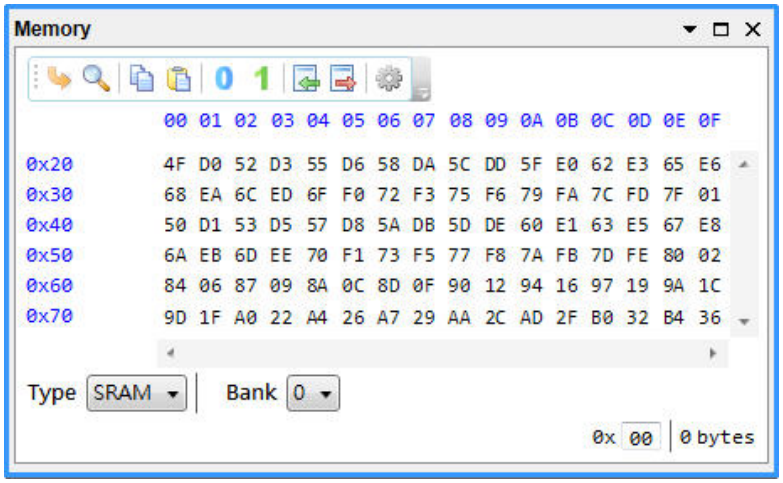
2.2.3.4 System Register Window

Show the system register commonly used. The changed system registers while debugging are shown in red.



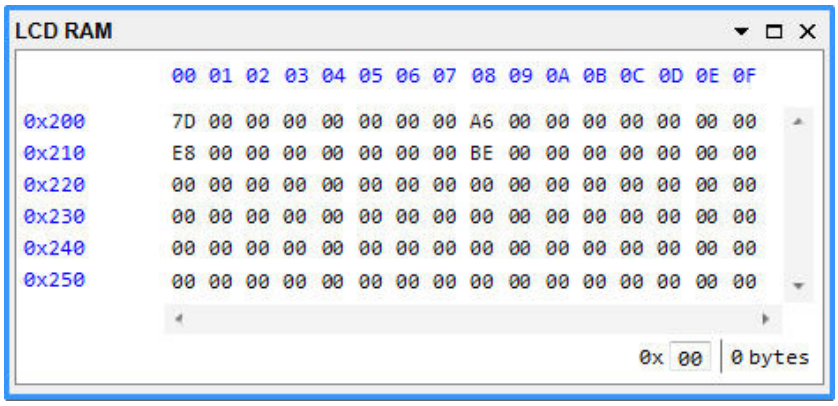
2.2.3.5 Memory Window

Show the values of the selected memory type in hexadecimal by default. The changed memories while debugging are shown in red. The memory project of assembly project is shown on the left, and the memory project of C language is shown on the right.



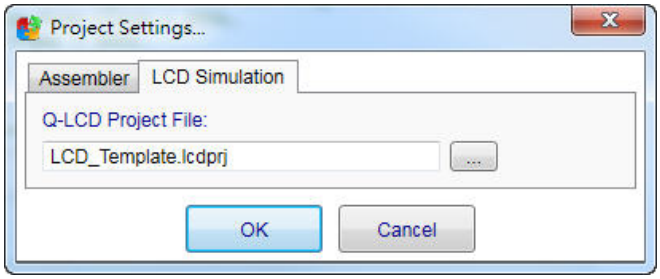
2.2.3.6 LCD Memory

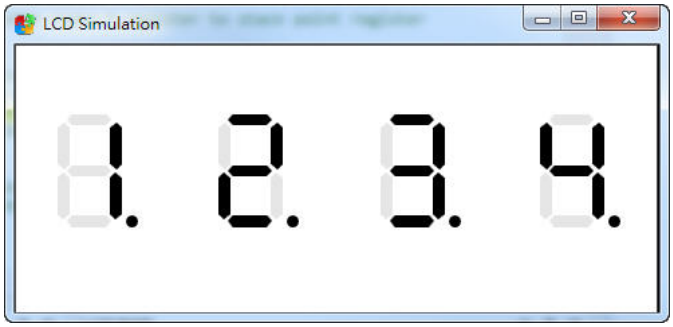
Show the values of the selected LCD memory type in hexadecimal by default. The changed memories while debugging is shown in red. This function is only for NY8L series.



2.2.3.7 LCD Simulation

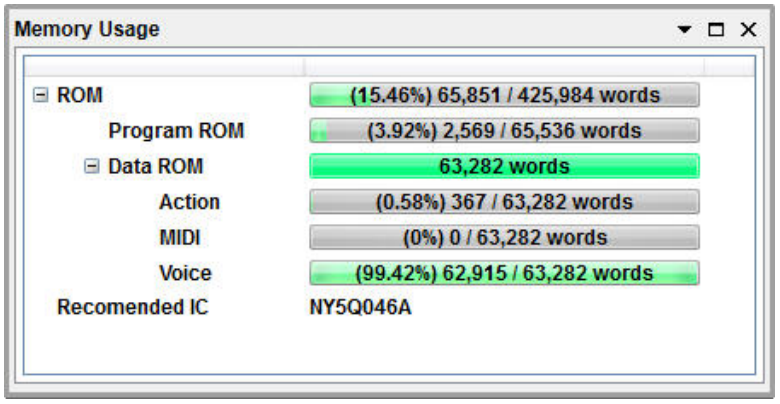
Import *Q-LCD* project file on the LCD Simulation tab of Project Setting window, the simulation result will be shown while debugging.



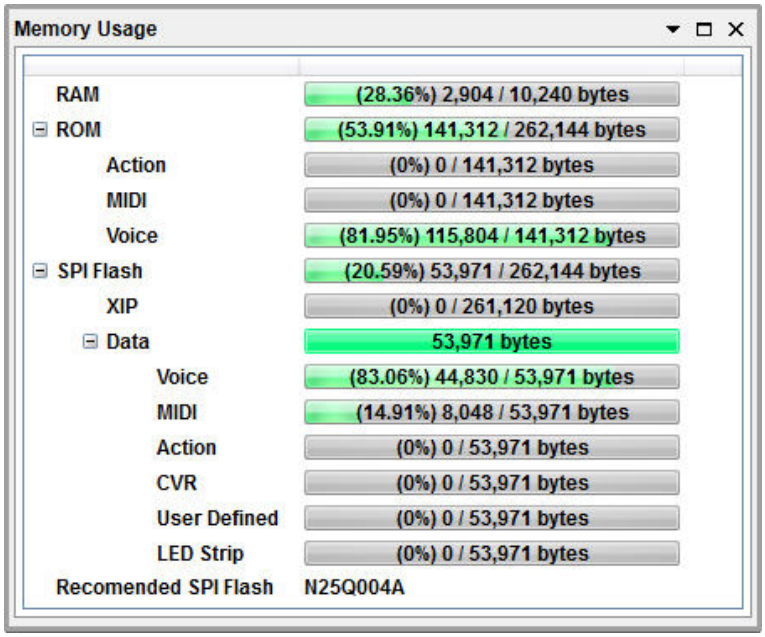


2.2.3.8 Memory Usage Information

After compiling finished, it will show the below window for memory usage information. If there is over ROM, it will show in red words. If the project is not for NX1 series IC, *NYIDE* will show the column of Recommended IC. The recommendation is based on the ROM size used by program, and provides the same series of ICs for selection.

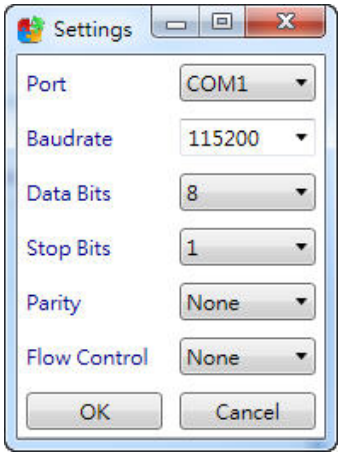


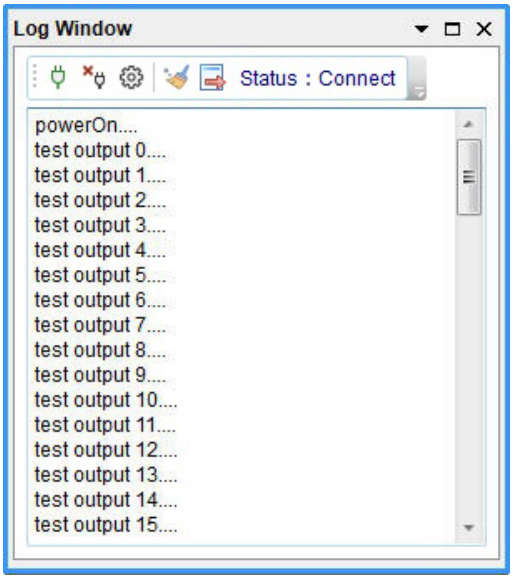
If the project is for NX1 series, *NYIDE* will show the column of Recommended SPI Flash. The recommendation is based on the settings of SPI_Encoder project or the SPI Flash size used by program, and provides the suitable N25Q series IC for selection.



2.2.3.9 Log

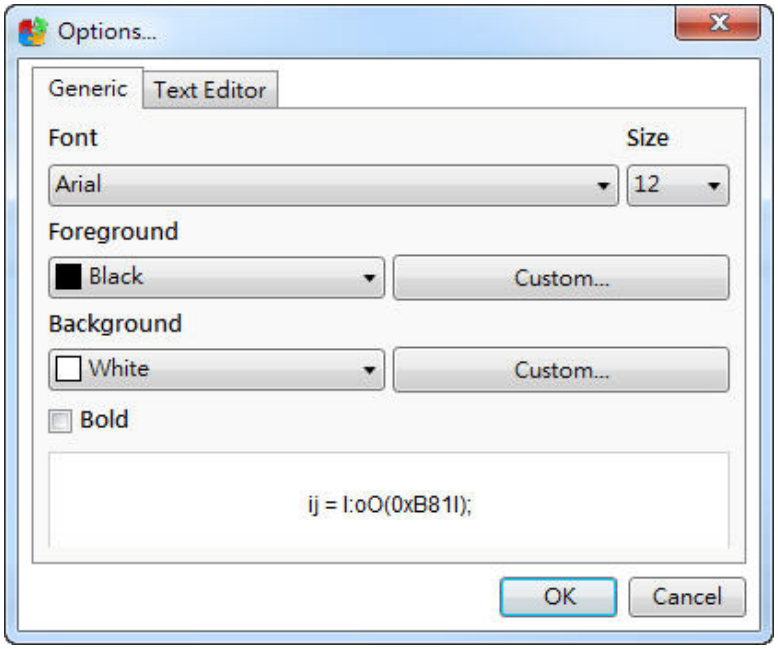
Receive information sent by UART. Use the setting screen (as shown on the left below) to set the Port / Baudrate / Parity and other related settings, click the connect button to start data reception

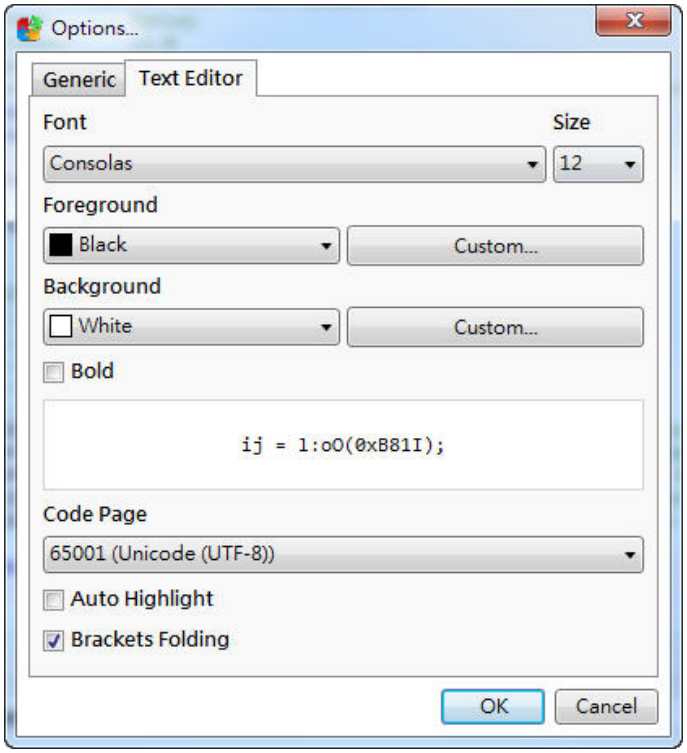




2.2.3.10 Options

Set the generic interface (display interface except the text editor) and the font, size and other options displayed on the text editor. After pressing OK, the settings will be applied to the corresponding interface. The setting screen is as follows:





In addition to font settings, the text editor page also provides features such as Code Page selection, Auto Highlight, and Brackets f Folding. A brief description of these features is as follows:

Code Page: Allows you to switch the default code page used to read files. If a file added by the user is not in the default UTF-8 format, this feature can be used to switch to the correct encoding and resolve garbled text display issues.

Auto Highlight: When this feature is enabled, all occurrences of the selected text will be automatically highlighted.

As shown in the figure below:

The selected text is highlighted with a yellow background, while matching text is highlighted with a blue background.

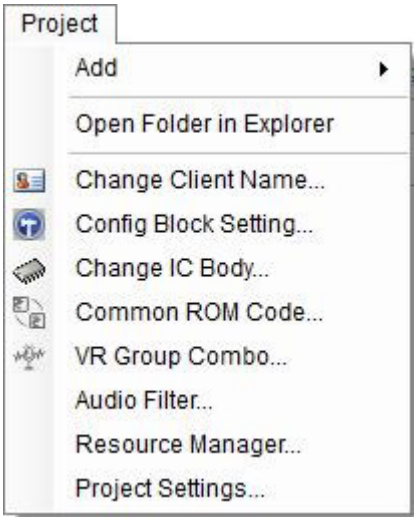
```
    while(1)
    {
        CLRWDT();
/   ;---- While PB4 inputs High/Low ,then PB2 outputs High/Low ----
        if(PORTBbits.PB4)
            PORTBbits.PB2=1;
        else
            PORTBbits.PB2=0;
/   ;---- While PB1 inputs High/Low ,then PB0 outputs High/Low ----
        if(PORTBbits.PB1)
            PORTBbits.PB0=1;
        else
            PORTBbits.PB0=0;
    }
```

Brackets Folding: Enabling the auto-folding for brace content feature will display a folding icon to the left of each brace. Clicking the icon allows user to collapse or expand the content within the braces. Additionally, this feature provides bracket matching support: when the cursor is placed

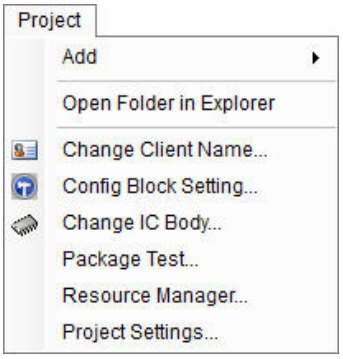
before or after a brace, the corresponding matching brace will be automatically highlighted. As shown in the figure below:

```
19  void main(void)
20  {
21
22  //;Initial GPIO
23  //    ; PORTB I/O state
24  //    ; PB4 set input mode and enable pull-high resistor
25  //    ; PB2 set output mode
26  //    ; PB1 set input mode and enable pull-low resistor
27  //    ; PB0 set open-drain output mode
28      BODCON = C_PB0_OD;                  // set PB0 open-drain output mode
29      BPLCON = (unsigned char)~C_PB1_PLB; // Enable PB1 Pull-Low Resistor,others disable
30      BPHCON = (unsigned char)~C_PB4_PHB; // Enable PB4 Pull-High Resistor,others disable
31      IOSTB =  C_PB4_Input | C_PB1_Input; // Set PB4 & PB1 to input mode,others set to output mode
32      PORTB = 0x05;                       // PB2 & PB0 output high
33
34      while(1)
35      {
36          CLRWDT();
37  //  ;---- While PB4 inputs High/Low ,then PB2 outputs High/Low ----
38          if(PORTBbits.PB4)
39              PORTBbits.PB2=1;
40          else
41              PORTBbits.PB2=0;
42  //  ;---- While PB1 inputs High/Low ,then PB0 outputs High/Low ----
43          if(PORTBbits.PB1)
44              PORTBbits.PB0=1;
45          else
46              PORTBbits.PB0=0;
47      }
48  }
49
```

2.2.4 Project

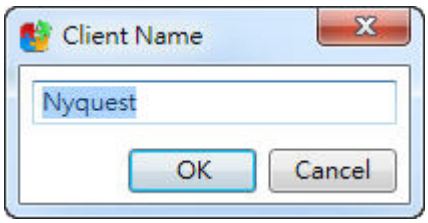


Item	Descriptions
Add	Add item into the current editing project.
Open Folder in Explorer	Open project folder in Explorer.
Change Client Name	Input client name.
Config Block Setting	Config Block settings.
Change IC Body	Select IC body.
Checksum Options	Set the checksum to be generated or not. (Only in NY8 series)
Common ROM Code	Option for enabling or disabling Common ROM function (Only in NX1 series).
VR Group Combo	Set various combinations of VR groups. (This option only supports NX1 series)
Audio Filter	Set the number of the audio filters and parameters. (only available ofr NX1 series)
Package Test	Enable the package test function, and select the intput and output pin. (Only available for NY4, NY5 and NY7 series)
Resource Manager	Open the interface of resource manager.
Project Settings	Open the interface of project setting.



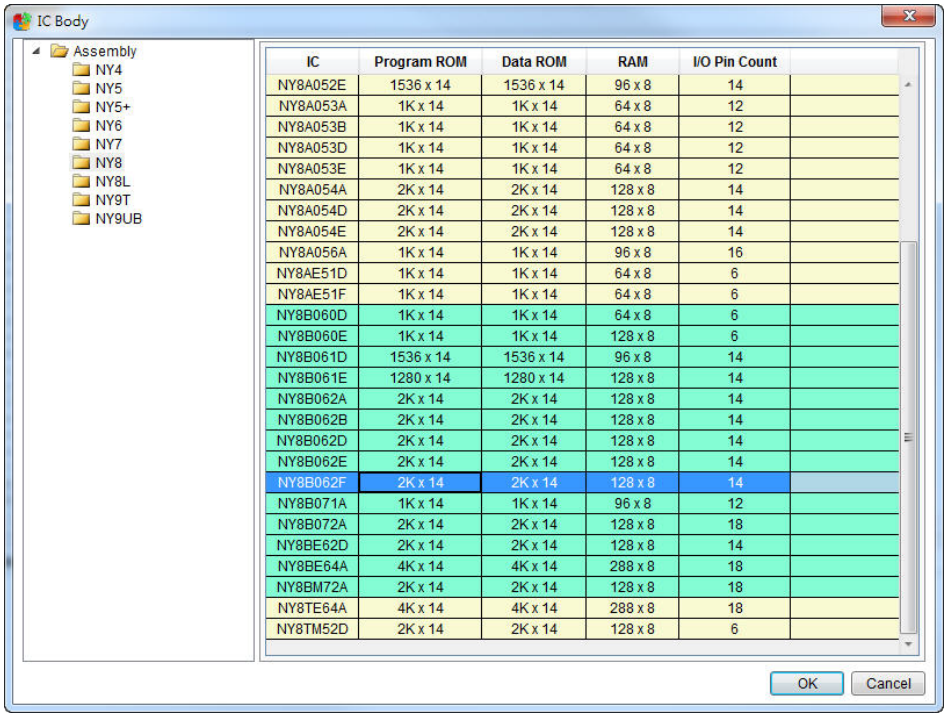
2.2.4.1 Change Client Name

When user selects [Change Client Name…], *NYIDE* will pop-up the following window for changing client name. (This column must be filled.)



2.2.4.2 Change IC Body

When user selects [Change IC Body…], *NYIDE* will pop-up the following window for selecting IC body. (Changing IC body may lead to incorrect result.)



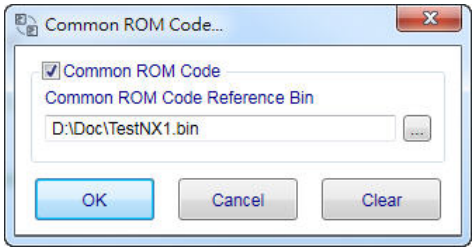
IC	Program ROM	Data ROM	RAM	I/O Pin Count
NY8A052E	1536 x 14	1536 x 14	96 x 8	14
NY8A053A	1K x 14	1K x 14	64 x 8	12
NY8A053B	1K x 14	1K x 14	64 x 8	12
NY8A053D	1K x 14	1K x 14	64 x 8	12
NY8A053E	1K x 14	1K x 14	64 x 8	12
NY8A054A	2K x 14	2K x 14	128 x 8	14
NY8A054D	2K x 14	2K x 14	128 x 8	14
NY8A054E	2K x 14	2K x 14	128 x 8	14
NY8A056A	1K x 14	1K x 14	96 x 8	16
NY8AE51D	1K x 14	1K x 14	64 x 8	6
NY8AE51F	1K x 14	1K x 14	64 x 8	6
NY8B060D	1K x 14	1K x 14	64 x 8	6
NY8B060E	1K x 14	1K x 14	128 x 8	6
NY8B061D	1536 x 14	1536 x 14	96 x 8	14
NY8B061E	1280 x 14	1280 x 14	128 x 8	14
NY8B062A	2K x 14	2K x 14	128 x 8	14
NY8B062B	2K x 14	2K x 14	128 x 8	14
NY8B062D	2K x 14	2K x 14	128 x 8	14
NY8B062E	2K x 14	2K x 14	128 x 8	14
NY8B062F	2K x 14	2K x 14	128 x 8	14
NY8B071A	1K x 14	1K x 14	96 x 8	12
NY8B072A	2K x 14	2K x 14	128 x 8	18
NY8BE62D	2K x 14	2K x 14	128 x 8	14
NY8BE64A	4K x 14	4K x 14	288 x 8	18
NY8BM72A	2K x 14	2K x 14	128 x 8	18
NY8TE64A	4K x 14	4K x 14	288 x 8	18
NY8TM52D	2K x 14	2K x 14	128 x 8	6

2.2.4.3 Config Block Setting

NYIDE will pop up the corresponding setting window based on the selected IC body. For the detailed setting and descriptions, please refer to Chapter 3.2.

2.2.4.4 Common ROM Code

Common ROM Code is used for codes having the same structure or function, but different contents. The replacement content is placed in SPI Flash, and you can have different effects by simply replacing SPI Flash. In order to maintain the main ROM content consistent, the following screen will pop up for setting.



When Common ROM Code is enabled, *NYIDE* will automatically collect all the ROM reference XIP functions and create a jump table to ensure that all external function addresses will not change. Common ROM CodeReference Bin is to select the bin file created before, NYIDE will automatically compare the ROM data in the current bin file to ensure that the ROM data is completely consistent.

The basic development of Common ROM application process is as follows:

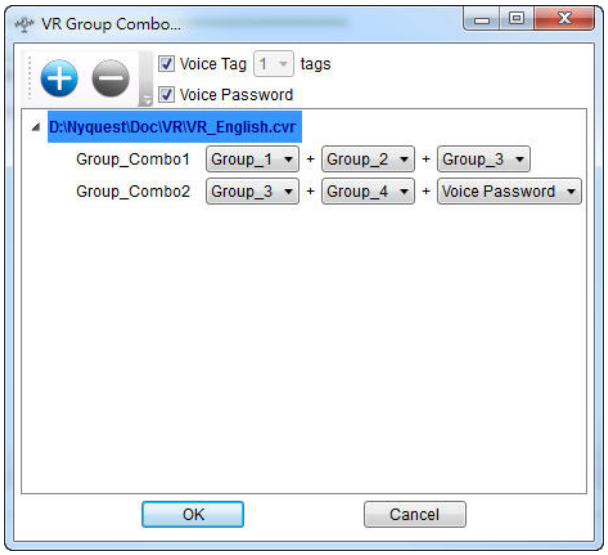
1. Enable Common ROM on the first development.
2. For subsequent development programs, Common ROM Code needs to be enabled and the first generated bin file be assigned as the comparison file.

According to the above operation, *NYIDE* can automatically ensure that the ROM data produced is consistent, otherwise an error will be issued.

P.S. It is recommended to use the XIP program in the *_xip.c file. Try to avoid using the __XIP attribute definition to prevent NYIDE from automatically generating a jump table error.

2.2.4.5 VR Group Combo

The VR file might contain numbers of group, and the different group combinations will occupy different memory size. To calculate the maximum usage of memory size, *NYIDE* provides the following operating window for setting the group combinations.

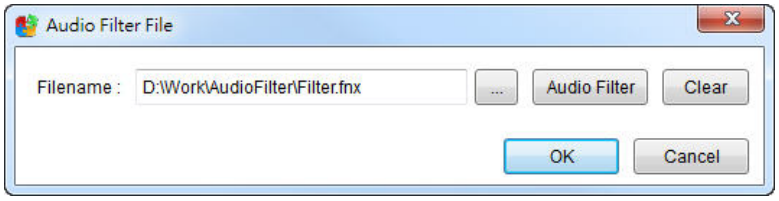


The usage of this setting window is as follows:

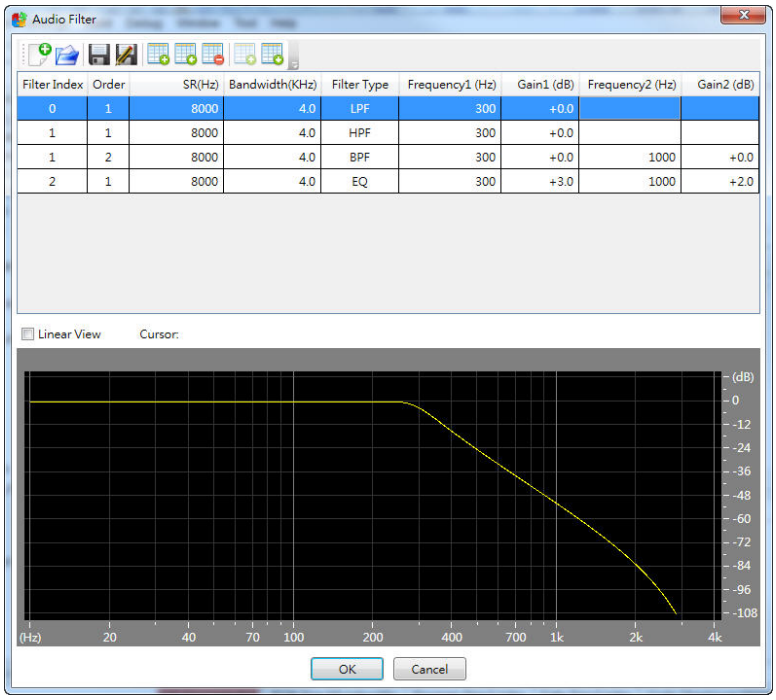
1. If user adds voice recognition files to the VR_Module directory (using VR from the OTP) or adds to SPI Flash project (using VR through SPI Flash), *NYIDE* will show the added VR files on the interface.
2. User can select the desired files for adding to groups, then clicking the ”+” from the upper bar to combine the groups, and set the combinations through the drop-down menu. (Each combination can add up to 3 groups)
3. To delete the group combo, user can click on the desired combo, and the “-” from upper bar will light up. Click the “-” to delete.
4. To support the Voice Tag or Voice Password function, user must tick the options first. The Voice Tag can select 1~8 tags. The Voice Password is only available when the Voice Tag is ticked. (When the Voice Tag or Voice Password is enabled, the corresponding settings of nx1_conifg.h (_VR_VOICE_TAG or _VR_VOICE_PASSWORD) must set ENABLE as well, otherwise, the error message will show up while compiling)
5. After enabling the Voice Tag or Voice Password function, user can set the function as Voice Tag or Voice Password at the last column of the group.
6. Click the OK button to finish setting.
7. According these setting, *NYIDE* will calculate the maximum usage of memory size and provide it to C_Module in the process of compiler.

2.2.4.6 Audio Filter

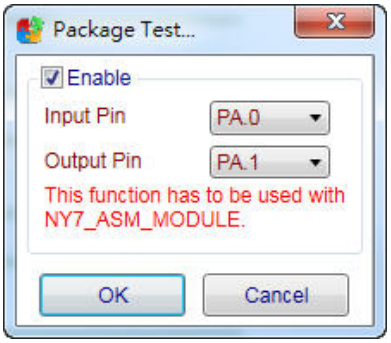
The setting window is shown below. User can directly select the edited .fnx file, or call the audio filter to generate .fnx files. Click “Clear” button to undo settings.



After clicking the"Audio Filter" button, the edit window is shown below. It can set multiple filters, user can set the sample rate (Hz), bandwidth (KHz) and the filter type of each filter, the supported types are LPF, HPF, BPF, and EQ. After selecting the filter type, input the required frequency, range and gain value to complete the setting. *NYIDE 5.40* or above supports the composite filter consisting of 2 sets of audio filters, the following picture shows Filter Index 1 is a composite filter consisting by an HPF and BPF. The saved file extension is .fnx, which is convenient for repeated use. *NYIDE* will save the current file path of the .fnx file to project and convert the filter relevant parameters that provide for NX1 C Module to use. Next time user opens the audio interface, the settings in the file will also be displayed directly.

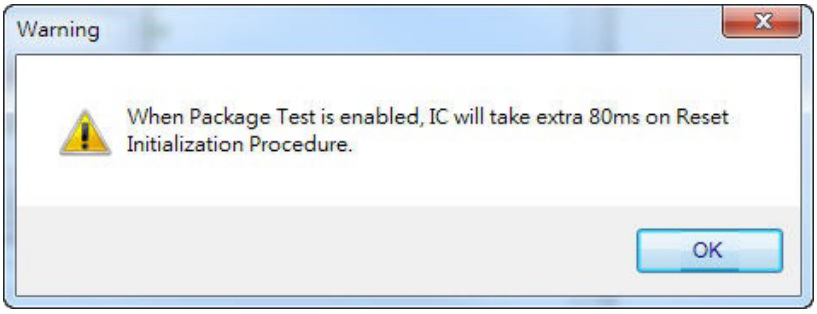


2.2.4.7 Package Test



When user needs to test the basic functions of the package IC, please tick the Enable box to start

verifying the following functions: Open/Short, Standby Current, OSC and Checksum. After pressing “OK”, a warning message will show up to prompt that the IC will take extra 80ms on reset initialization procedure.



Note:

1. Only NY4 / NY5 / NY7 series support this function.

2. The option is default as Disable.

3. The test program will occupy a small amount of ROM size after enabling the option. If the IC body is NY7 series, please work with ASM module developed by Nyquest to assemble the program correctly。

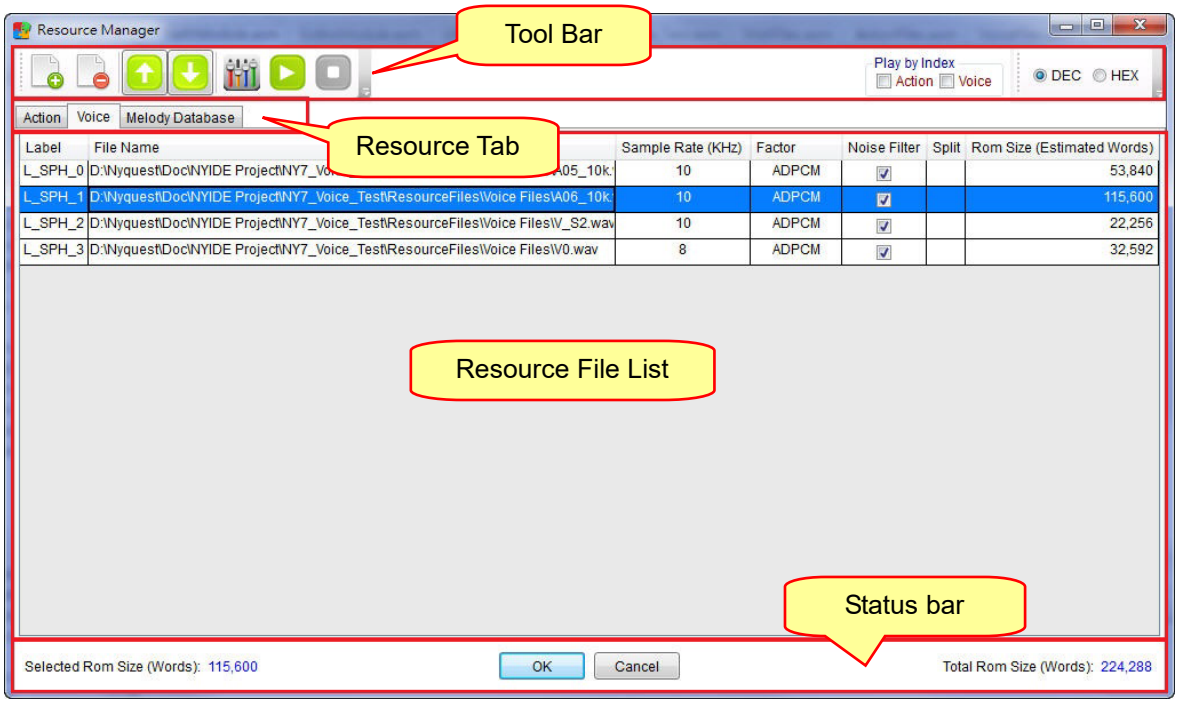
4. To perform IC Package Testing flow, user package method must fit Nyquest standard pin out, it will be regarded as the standard process and executed package test before shipment.

5. Because the pin configuration of NY5 cannot be changed after set, the input and output pin configuration must meet the following table. If the pin column is empty, please modify the related settings of Config Block Setting.

Package test pin	Configuration
Command input pin	Input Floating
	Input Pull-High
Signal output pin	Initial Output Low
	Initial Output High

2.2.4.8 Resource Manager

An easy-to-use Resource Manager is provided to manage resource files and the related settings.



The window contains all tabs of resource types supported by selected IC body. The descriptions are as follows.

Tool Bar: This tab contains various editing functions, such as add / remove file, upward / downward, invoke *Q-Sound* and play/stop file. When user selects a file from the list, the available tool will be highlighted and the unusable tool will be grayed-out. The Play By Index function will automatically generate index table in Resource.asm, the index table can be used for resource playback.

Resource Tab: It shows the resource types that supported by current IC body. User can click different tab to switch.

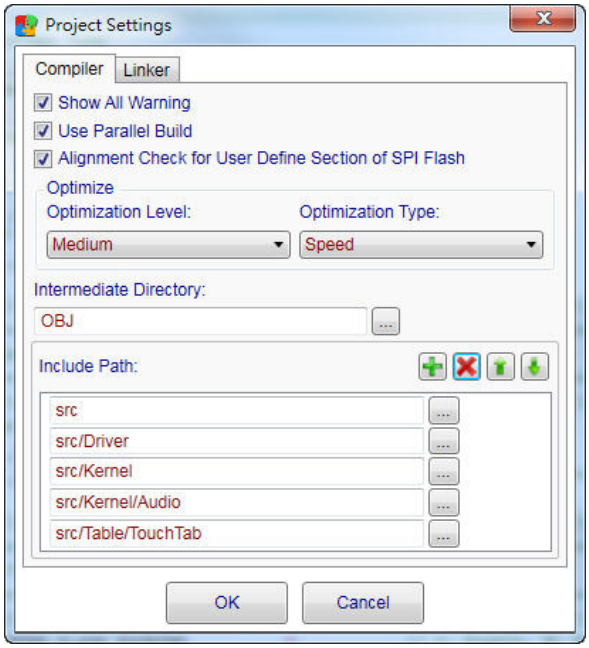
Resource File List: It shows the current added resource files and various file attributes. When user moves mouse to the desired column for editing, it would enter edit mode if the column can be edited.

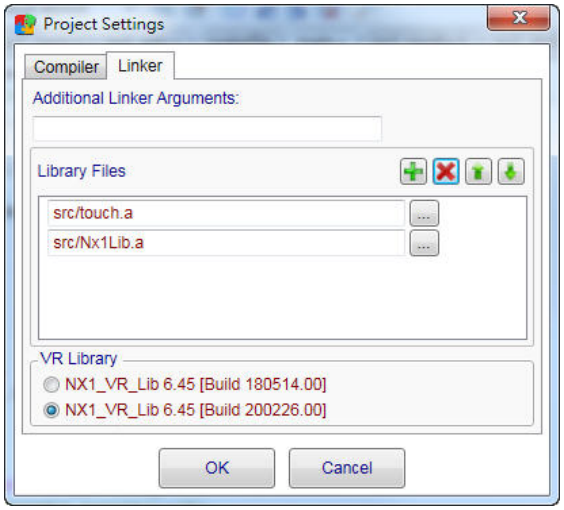
Status Bar: It provides the OK, Cancel function and Rom Size relative information.

2.2.4.9 Project Settings

The Project Settings function provides the related parameter settings of Compiler and Linker.

NX1 series:





Compiler tab:

- Show All Warning: Show all warming message or not.
- Use Parallel Build: Use parallel build or not. (Tick to speed up the compiler)
- Alignment Check for User Define Section of SPI Flash:

  This option is for checking the Alignment, file size of User Define Section and the erase-related commands from SPI Flash. If an erase-related command is used and the file size of the User Define Section is not a multiple of the alignment value, a warning message will pop-up in the process of compile to alert the user that the program might work improperly, because erasing other unnecessary blocks. If the user's program does not need to pay special attention to this situation, user can cancel the option, then it will not check again when compiling.
- Optimize:
  - Optimization Level: Select the optimization level. There are 4 options: None, High, Medium and Low.
  - Optimization Type: Select the optimization type as Size or Speed.
- Intermediate Directory: Set the intermediate directory of compiler.
- Additional Compiler Arguments: Send addtional compiler arguments, it is not recommended to use without special needs.
- Include Path: Set the referred file path of compiler.

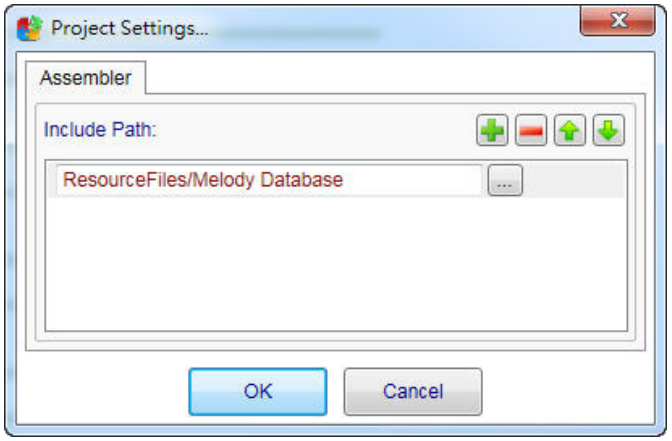
Linker tab:

- Additional Linker Arguments: Additional arguments for the linker, and is not recommended if

there are no special needs.

- Library Files: Set the link to file path of library.
- VR Library: Select the version of VR Library to link. This option will display all currently installed VR Library versions. Once a version is selected, it will be linked to this version after building.

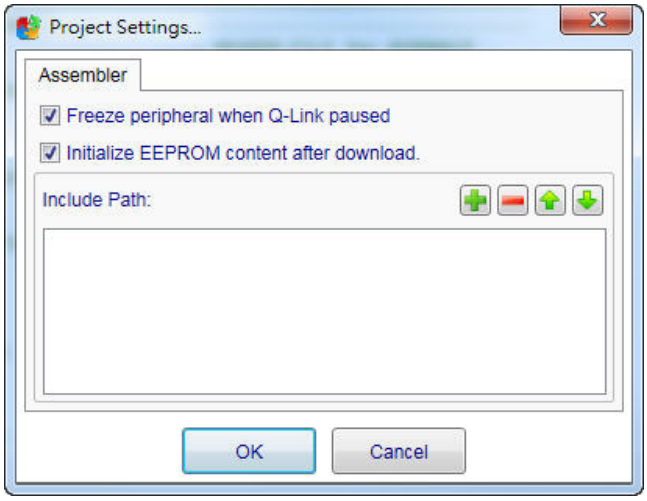
NY4 / 5 / 6 / 7 / 9 series:



Assembler tab:

- Include Path: Set the referred file path of assembler.

NY8 Assembly：



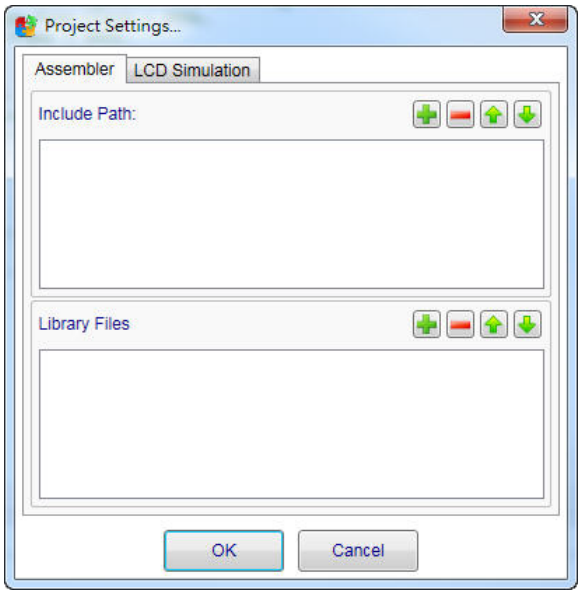
Assembler tab:

- Freeze peripheral when Q-Link paused: When the debug of Q-Link is in the pause status, set the peripheral clock (e.g. PWM, Timer.., etc) as freeze at the same time. The default is open which means the peripheral also freezes simultaneously. If the PWM is in high level while paused, it may cause the connected output device to burn. If user closes this option, the

peripheral clock won't freeze at the same time. Please note that the accessed data of related peripheral registers will different than expected, and continuously jump to the interrupt program while executing single step. (The option is only available for the IC body that supported by Q-Link debug)

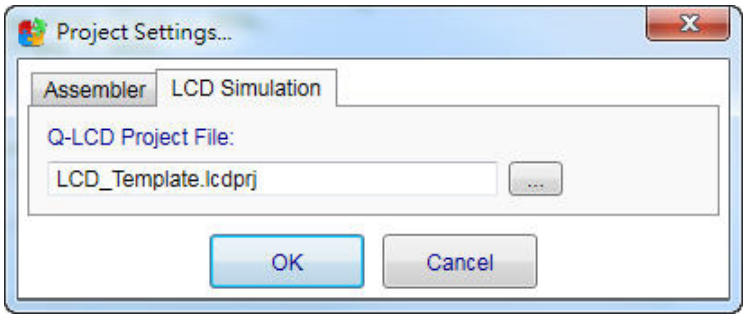
- Set whether to initialize EEPROM data after downloading. The default value is to enable initialization. If EEPROM Overwrite Data is set, it will be initialized according to the set data, otherwise all data will be initialized to 0. If user chooses to disable the initialization option, the original data in the EEPROM will be kept without modification after downloading.
- Include Path: Set the referred file path of assembler.

NY8L Assembly:



Assembler tab:

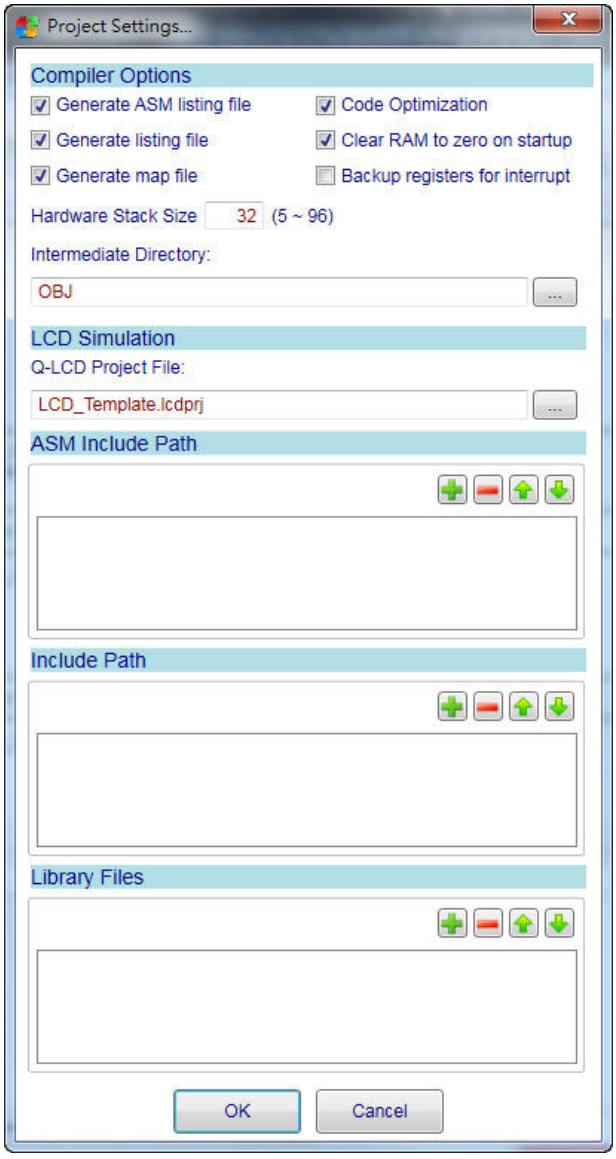
- Include Path: Set the referred file path of assembler.
- Library Files: Set the referred library path of assembler.



LCD Simulation tab:

- *Q-LCD* Project File: Set *Q-LCD* project file to which user wants to simulate.

NY8L C language:

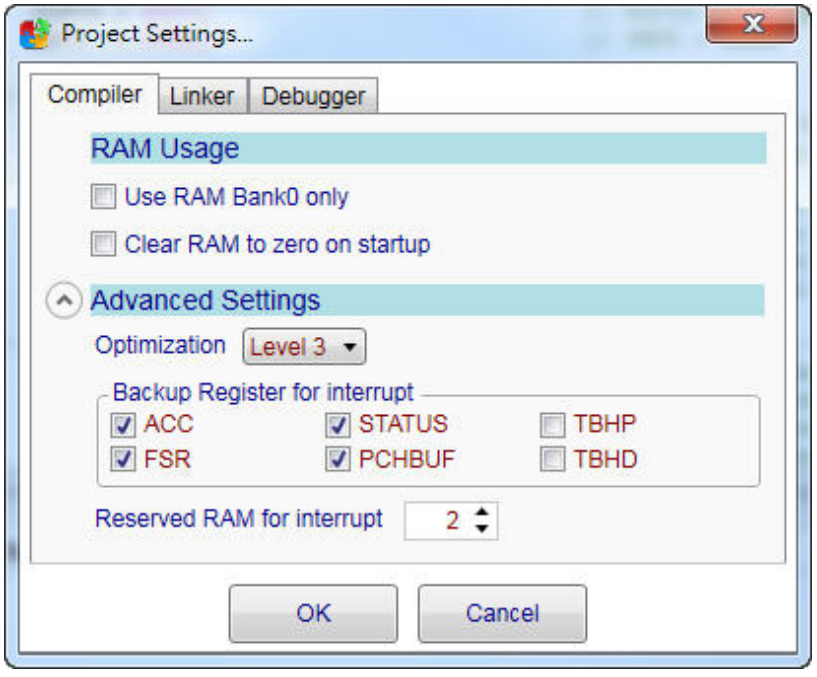


Compiler Options:

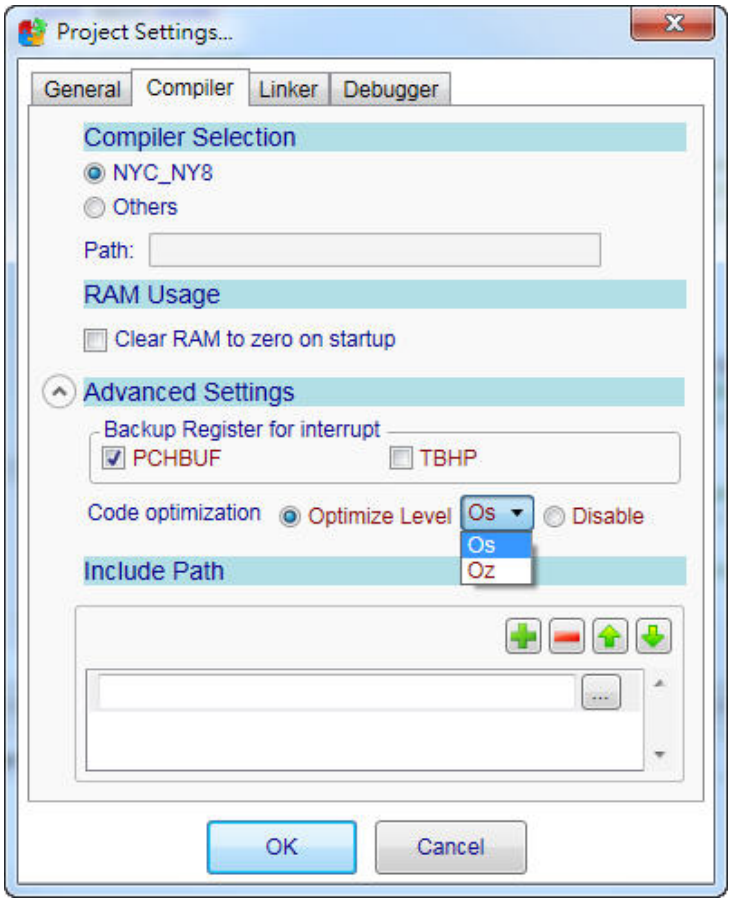
- Generate ASM listing file: The listing file named *.lst will be produced after assembling, deselecting this option can speed up the compiling speed.
- Generate listing file: The listing file named *.link.lst will be produced after linking. This file is the disassembled result of the final .bin file. Deselecting this option can speed up the compiling speed.
- Generate map file: The listing file named *.map will be produced after linking. This file contains address assignment information. Deselecting this option can speed up the compiling speed.
- Code Optimization: Select whether to open code optimization function or not.
- Clear RAM to zero on startup: Tick to clear RAM to zero on startup (the global variable with initial value is not included).

- Backup registers for interrupt: After entering the interrupt, tick to backup the register data. The default is close. User can tick the options to backup register data while the interrupt program executes complex operations to avoid data abnormal. It takes time to backup register, so the lower system rate might cause the interrupt process fail. In addition, the backup register will also use hardware stacks. According to the complexity of the project, up to 14 hardware stacks can be used. If NMI is enabled, the consumption will be doubled. Therefore, user needs to note to whether this function will exceed the originally set hardware stack usage, if it exceeds the expected program, it will cause execution abnormal.
- Hardware Stack Size: Set the hardware stack size. The hardware stack is used to resume the state through saving the state before entering the interrupt and the function. This option provides the user with the ability to adjust the stack size as needed by the program.
- Intermediate Directory: Set the intermediate directory of compiler.
- LCD Simulation: Import Q-LCD project file on the LCD Simulation.
- ASM Include Path: Set the referred file path of Assembly compiler.
- Include Path: Set the referred file path of compiler.
- Library Files: Set the referred library path of assembler.

NY8 C language: Please refer to chapter 3.4 Option of *NYC_NY8* UM for details of each option.



NY8 16-bit Project Settings window:



Compiler Page:

RAM Usage:

- Use RAM Bank0 only: This option is related to the generating code size. Some IC body only has a single Bank and this option is forced to select.
- Clear RAM to zero on startup: Whether to clear all the memory before starting the main function. (The global initial variable is not affected by this option.)

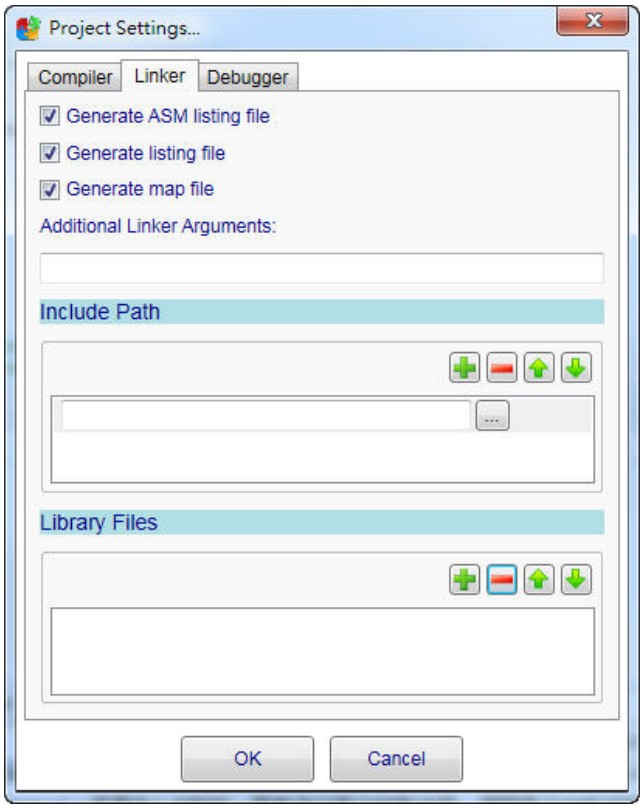
Advanced Settings:

- Optimization: Users can select Level 1~3 for optimization. The higher level, the better the optimized program. Please note that this option might cause abnormal while working with the inline assembly language.
- Code optimization: This option is only available for NY8 16-bit IC body, set it as Optimize Level or Disable. The Optimize Level provides Os and Oz to select.
  - Os: Aimed at reducing ROM size with minimal impact on execution efficiency.
  - Oz:Focused on minimizing ROM size.

  Default option is Os. Use Oz if smaller ROM size is required, but it may reduce execution efficiency and does not always produce smaller code. If debugging issues occur (e.g.,

breakpoints or single-step errors), try disabling optimization and test again.

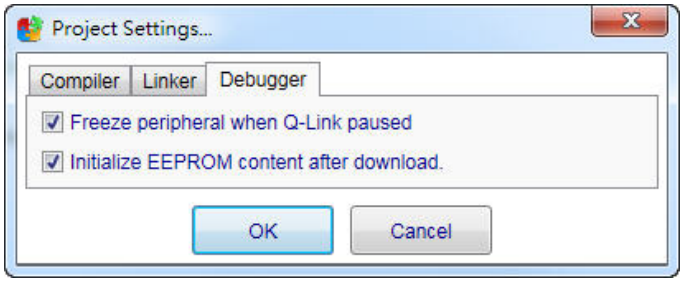
- Backup Register for Interrupt: After entering the interruption, it needs the register to backup. Turn off the backup function may cause the program to fail to resume execution after the interrupt is off. It is not recommended to turn off the backup function if it is not a special need.
- Reserved RAM for interrupt: Reserved RAM used by the Interrupt Service Routine (ISR), saving the current function's variable state before entering the interrupt. The minimum value is 0. In a no-function call reserved state, the maximum value is 13. The larger the setting value, the longer the entry time of the interruption service program will be, because more instructions must be used to back up the current state. For details, the comparison table of additional instructions required can refer to *NYC_NY8* UM.



Link Page:

- Generate ASM listing file: The listing file named *.lst will be produced after assembling, deselecting this option can speed up the compiling speed.
- Generate listing file: The listing file named *.link.lst will be produced after linking. This file is the disassembled result of the final .bin file. Deselecting this option can speed up the compiling speed.

- Generate map file: The listing file named *.map will be produced after linking. This file contains address assignment information. Deselecting this option can speed up the compiling speed.
- Include Path: Set the referred file path of compiler.
- Library Files: Set the referred library files for compile.

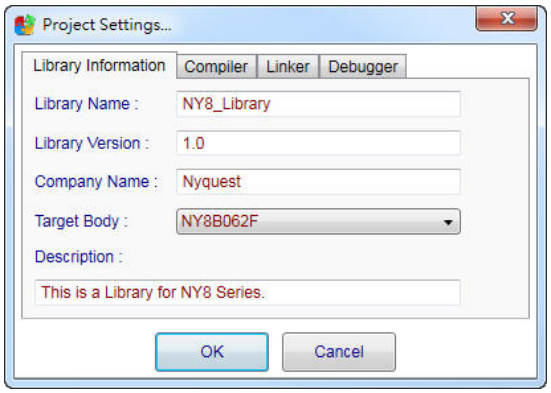


Debugger Page:

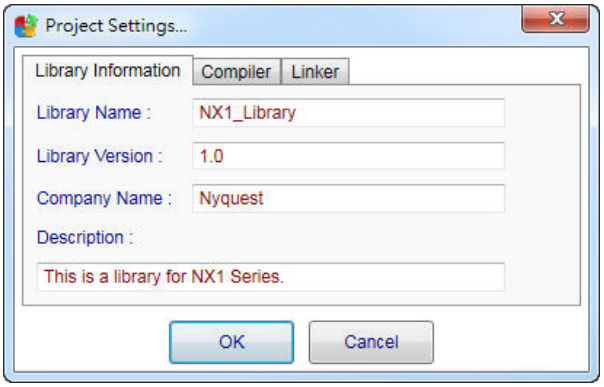
- Freeze peripheral when Q-Link paused: Freeze peripheral when Q-Link paused: When the debug of Q-Link is in the pause status, set the peripheral clock (e.g. PWM, Timer.., etc) as freeze at the same time. The default is open which means the peripheral also freezes simultaneously. If the PWM is in high level while paused, it may cause the connected output device to burn. If user closes this option, the peripheral clock won't freeze at the same time. Please note that the accessed data of related peripheral registers will different than expected, and continuously jump to the interrupt program while executing single step. (The option is only available for the IC body that supported by Q-Link debug)
- Initialize EEPROM content after download: The default is enabled to initialize EEPOM content. If user sets EEPROM Overwrite Data, *NYIDE* will initialize data according to the settings, or all the EEPROM content will be initialized as 0. If this option is un-ticked, the content will be reserved after download.

Library Project:

For NY8 series



For NX1 series



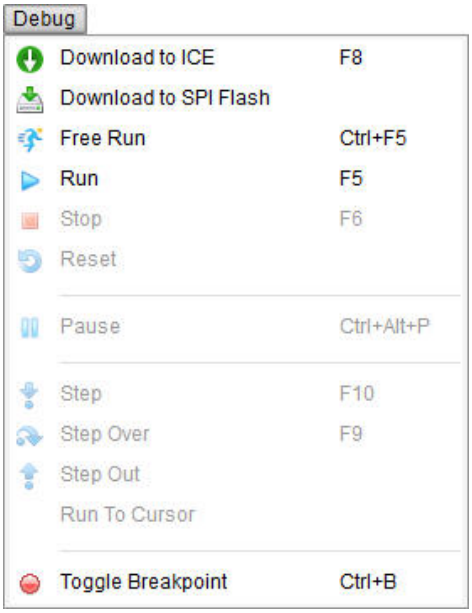
- Library Name: Set the library.
- Library Version: Define the library version.
- Company Name: Set the company name.
- Target Body: Set the target IC body that is only available for NY8 series to check the compilation correctness.

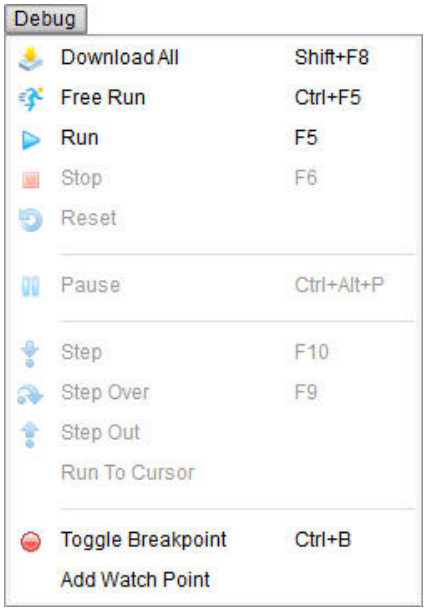
- Description: Set the description of library.

2.2.5 Build

Item	Descriptions
Build Solution	Build solution by dependencies
Rebuild Solution	Rebuild the solution.
Clean Solution	Clean the files generated by Build.
Build [Project Name]	Functions are same to above items, but only applied to projects. User can switch projects via Project window.
Rebuild [Project Name]	
Clean [Project Name]	

2.2.6 Debug





Item	Descriptions
Download to ICE	Build and sent .bin file to ICE.
Download to SPI Flash	If users add SPI Project, the _SPI.bin file can be downloaded to SPI Flash. (Only NY6 series supports this function.)
Download All	Without any check and debug, download all the areas of .bin files.. (Only NX1 series supports this function.)
Free run	Execute ICE, which cannot be interrupted.
Run	Execute ICE, which can be interrupted.
Stop	Stop ICE.
Reset	Reset.
Pause	Pause ICE.
Step	Execute ICE step by step.
Step over	Execute ICE to the next line without entering macro or function.
Step out	Step out of the current macro or function
Run to cursor	Execute ICE to the cursor position.
Breakpoint	Set breakpoints.

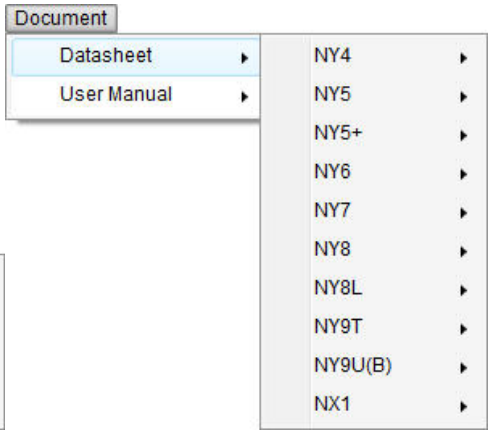
2.2.7 Tool

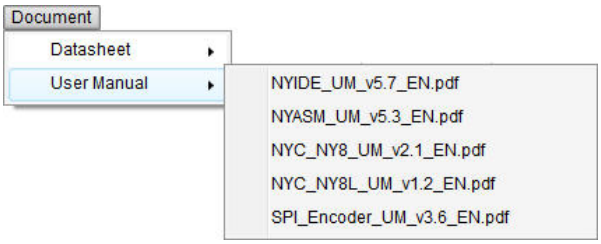
Click [Tools] to open other Nyquest software tools.

About NY8 Program Assistant, please refer to NY8 Program Assistant user manual.

2.2.8 Document

Clicking [Document] will retrieve the corresponding datasheets and user manuals for the selected platform from the Nyquest website. The selected document will automatically open in the default web browser. (This feature requires an internet connection. If no network is available, clicking [Document] will have no effect.)

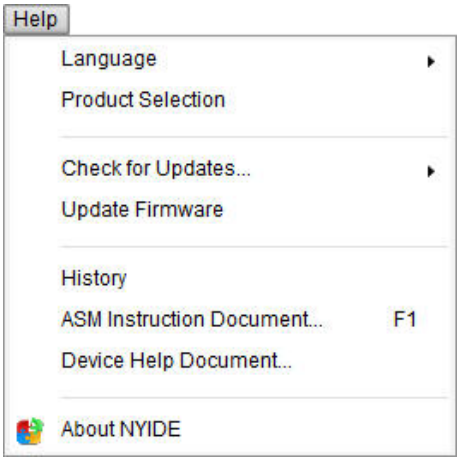




2.2.9 Window

Item	Descriptions
Next Window	Switch the current editing window to next or previous window.
Prev Window	
Split	Split window as upper and down windows for editing one file easily.
Close All Documents	Close all opened files.
File List	List the opened files and tick the editing file.

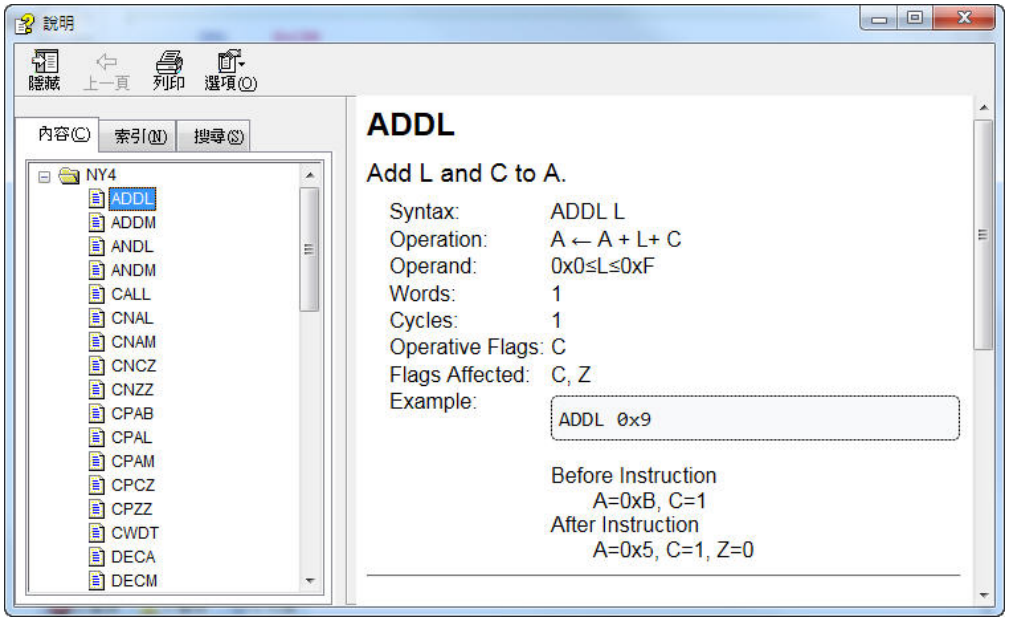
2.2.10 Help



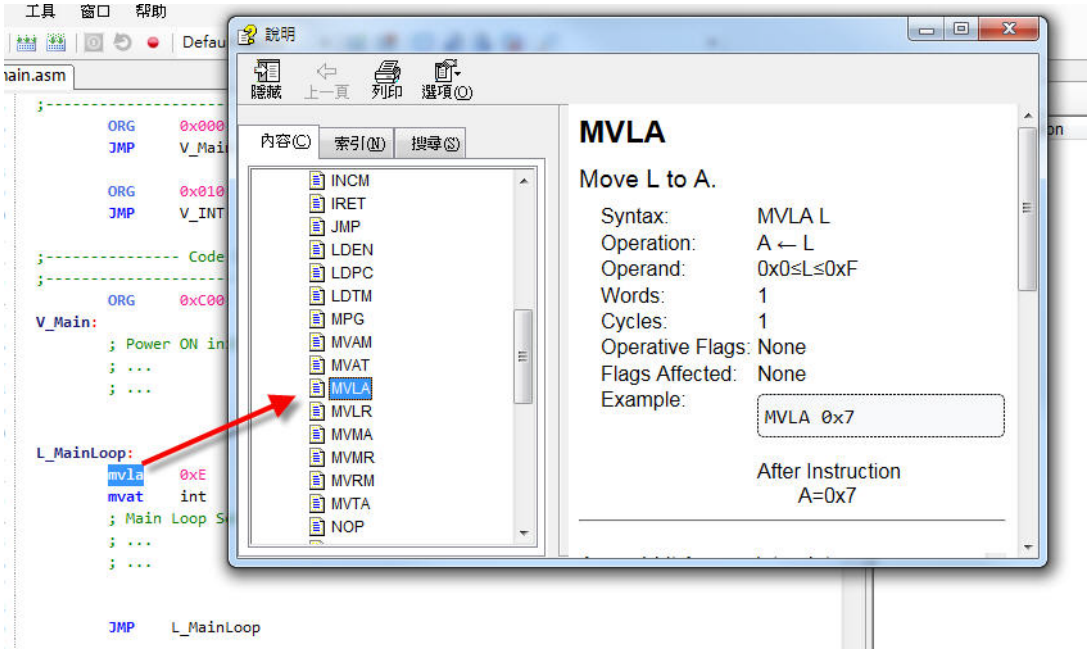
Item	Descriptions
Language	Switch the language of *NYIDE*.
Prodcut Selection	Select the available product from *NYIDE*.
Check for Updates…	Check for the latest software version. Choose software to check. This function will connect to the Internet.
Update Firmware	Update the firmware to the curruent version manually.
History	Show the revision history
ASM Instruction Document	Show the assembly language document for instruction used.
Device Help Document	Show the device help document for indications.
About *NYIDE*	Show the related information of *NYIDE*.

2.2.10.1 Show ASM Instruction Document

Click on this item or use the hot key F1 to open the ASM instrunction document for the instruction used as shown below. (Currently it only supports assembly instructions for the NY4/5/6/7/8 series.)

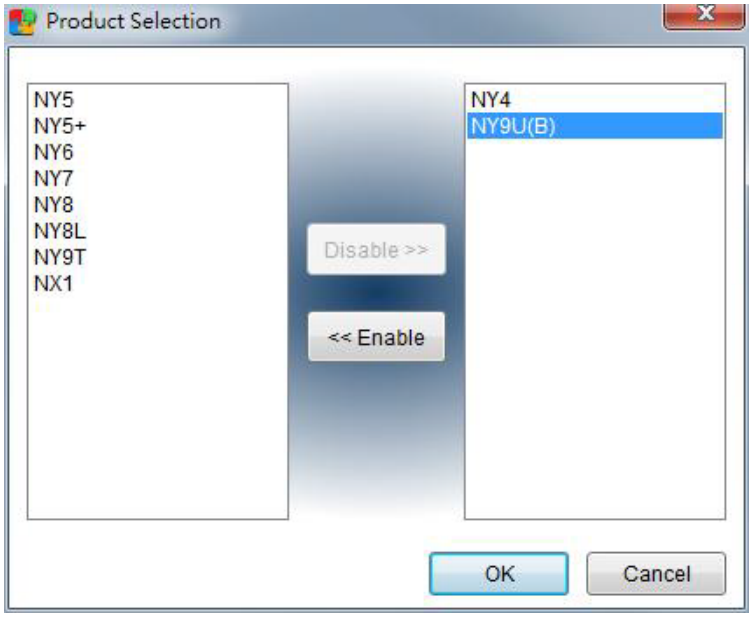


If in the edit mode, the instruction to be queried can be selected, or the cursor is placed on the instruction to be queried, and press F1, *NYIDE* will automatically check whether the selected item is a supported instruction. If yes, open the corresponding instruction page for viewing. If not, the help document will only be opened as shown above. The figure below is a schematic diagram of the instruction to open the help document.



2.2.10.2 Product Selection

Click “Product Selection” will display the following window, and user can select the target series to use in *NYIDE*.

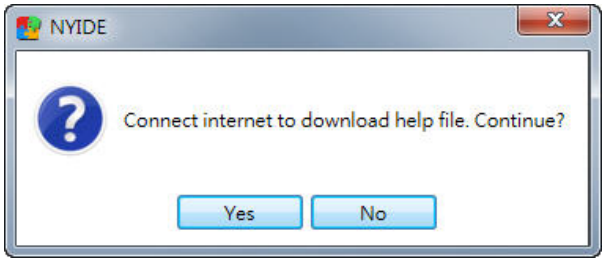


The left box is a list of enabled products, and the right box is a list of disabled products. To remove a target IC series, user can click the series in the enabled list, and the “Disable” button will be activated at the same time, and click “Disable” to move the series to the disabled list. Conversely, if you want to re-open a series, click the series in the disable list, and the “Enable” button will be activated. Click “Enable” to move the series to the enable list. After pressing OK, *NYIDE* will start automatically to activate the settings. Products that have been closed will no longer be displayed in the menu for creating new projects, changing IC bodies, etc.

2.2.10.3 Device Help Document

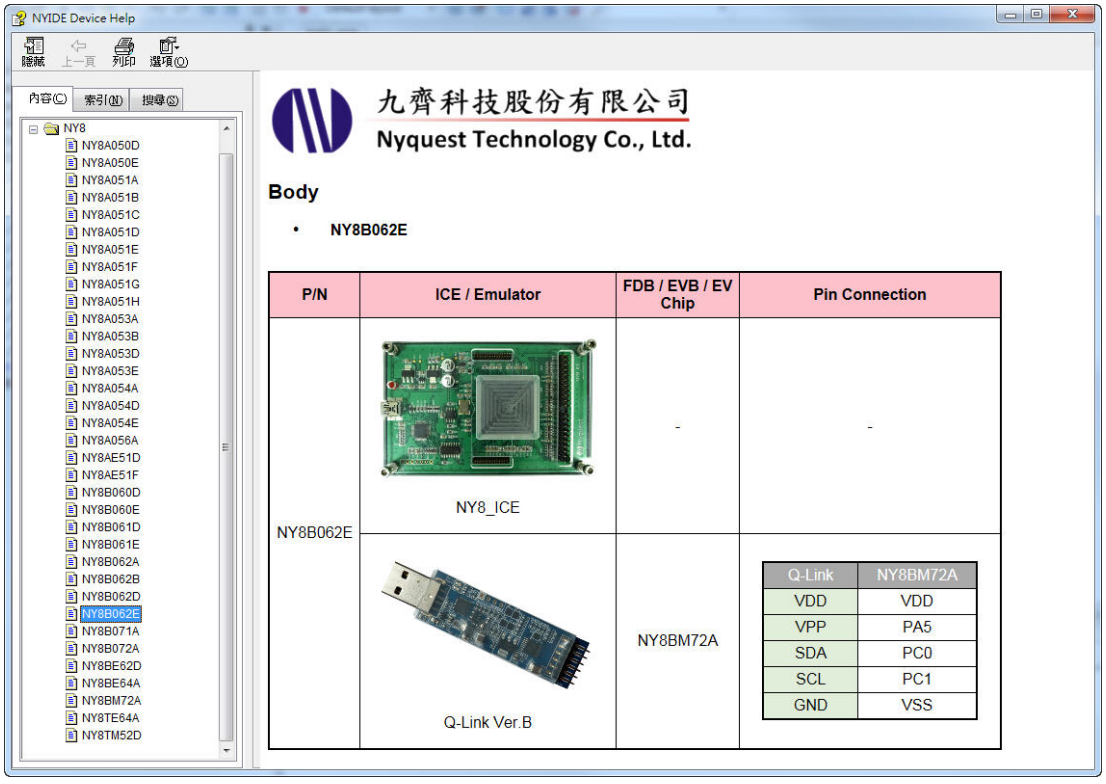
This option currently only supports NY8 series-related hardware devices to indicate instructions, please connect to the internet to download the help document. According to the selected device, the opened instructions will be different. The descriptions are as follows.

1. If the user never downloaded this document or the kept document version is too old, the following pop-up box will notify user to connect the computer to the internet for document download. Click “Yes” to automatically connect and download file.

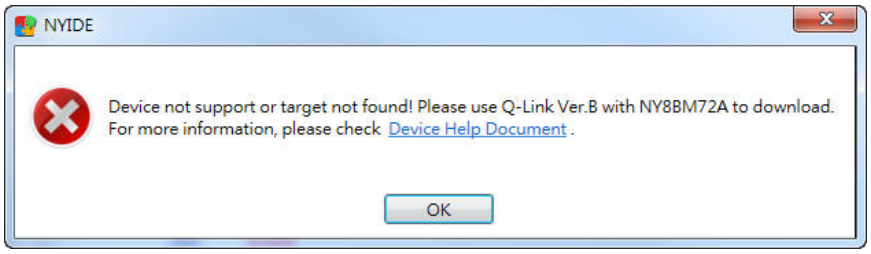


2. If the project is not opened, *NYIDE* will show the following window.

3. If the project is opened, it will shows the IC body of project as the following example shows below (Ex. NY8B062E)



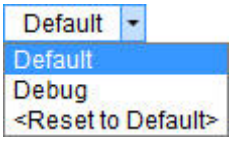
This file can be downloaded by clicking on the item. When executing the "Download to ICE", "Execute" or "Execute without debugging" functions, and the correct device is not connected, the error message will pop up as shown below. Please click on the hyperlink to open this document, the document will be displayed directly on the page of the current IC body.



2.3 Tool Bar

2.3.1 Managing Layout

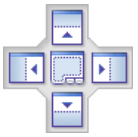
NYIDE can remember the previous used location of screen layout. *NYIDE* built-in two kinds of layout: Default Layout and Debug Layout. User also can build own layout by using <Edit>. While switching layouts or close program, *NYIDE* will auto save layout.



Note: If the screen layout is disorderly, user can select <Reset to defaults> to restore layout defaults.

2.3.2 Adjusting Screen Layout

User can adjust screen layout by dragging sub-windows to directions that are indicated by the point icons. User must click on the name title of sub-window then move the selected sub-window to the available position. A blue shadow will mark the destination. The point icons are shown on the right.



2.4 Hot Key

User can use various hotkeys to trigger different functions of *NYIDE* quickly. The hotkeys are listed below.

Function	Hot Key
New File	Ctrl + N
New Project/Solution	Ctrl + Shift + N
Open an Existing File	Ctrl + O
Open Project/Solution	Ctrl + Shift + O
Close File	Ctrl + F4
Close Solution	Ctrl + Shift + F4
Reload File	Ctrl + Shift + U
Save	Ctrl + S
Save All	Ctrl + Shift + S
Print	Ctrl + P
Undo	Ctrl + Z
Redo	Ctrl + Y
Cut	Ctrl + X
Copy	Ctrl + C
Paste	Ctrl + V
Format - Indent	Ctrl + I
Select All	Ctrl + A
Add/Remove Bookmarks	Ctrl + M
Prev Bookmark	Ctrl + F2
Next Bookmark	F2
Add Comment	Ctrl + E
Remove Comment	Ctrl + U
Manage Project	Ctrl + Alt + L
Edit Message	Ctrl + Alt + O

Function	Hot Key
Watch window	Ctrl + Alt + W
Register window	Ctrl + Alt + R
System Register window	Ctrl + Alt + S
Memory window	Ctrl + Alt + M
Disassembler window	Ctrl + Alt + D
Local Variable window	Ctrl + Alt + V
Log window	Ctrl + Alt + G
LCD Memory window	Ctrl + Alt + A
LCD Simulation window	Ctrl + Alt + U
Build Solution	F7
Rebuild Solution	Alt + F7
Download to ICE	F8
Execute Without Debug	Ctrl + F5
Execute	F5
Stop ICE	F6
Pause ICE	Ctrl + Alt + P
Step Over	F9
Single-Step Execution	F10
Execute to cursor	F11
Move to breakpoint	Ctrl + B
Go To	Ctrl + G
Find	Ctrl + F
Find Next	F3
Replace	Ctrl + R
Next Window	Ctrl + TAB
Previous Window	Ctrl + Shift + TAB
Show Help Document	F1

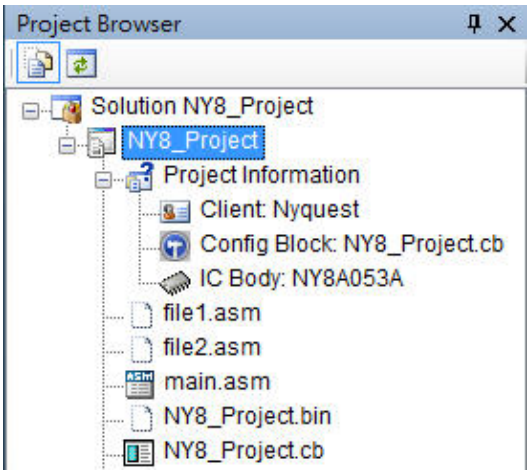
2.5 Project Manager

The Project manager window contains the build function (Build/Rebuild/Clean), add/remove function, basic editing function (Cut/Paste/Rename), properties, setting entry point, etc.

The project browser shows Project Information and supports the double-click modification of corresponding information For the descriptions, please refer to 2.2.4.1 Change Client Name, 2.2.4.2 Change IC Body and 3.2 Change Settings of Project.

When user presses the [Show all files] button, the directory will list all files of the project folder. User can add/remove file (e.g., file1.asm and file2.asm) and these icons can be distinguished as project files.

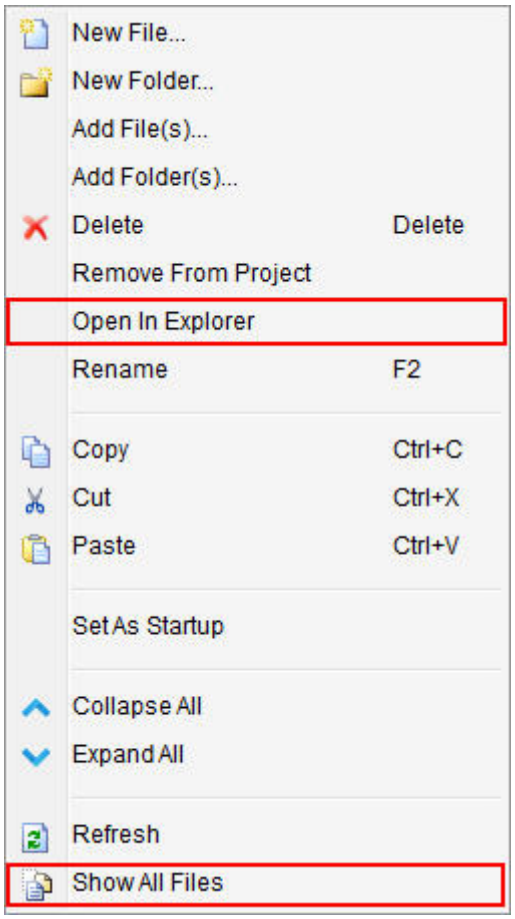
Note: .naprj file is an assembly project file, .nysln is a solution file. Those files are part of a solution.

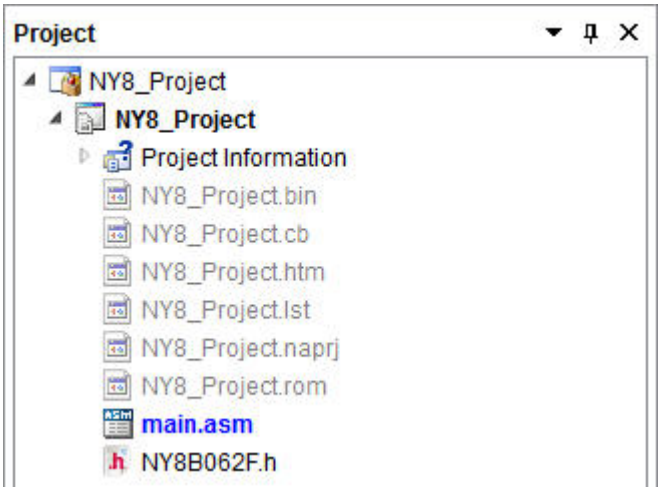


The Project window provides the “Open In Explorer” and “Show All Files” function for users to check files easily, shown in the red box in following illustration.

Open In Explorer: Open the file directoy of the selected file to review the file location.

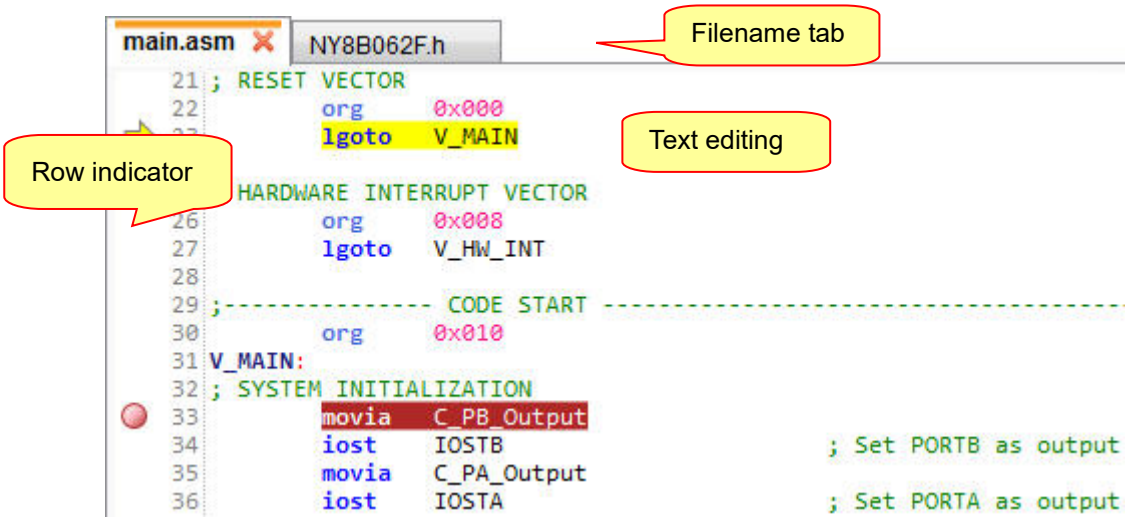
Show All Files: The greyed-out files mean they are listed in the project directory but not imported into the project. This function is convenient for the user to add the un-imported files into NYIDE.





2.6 Text Window

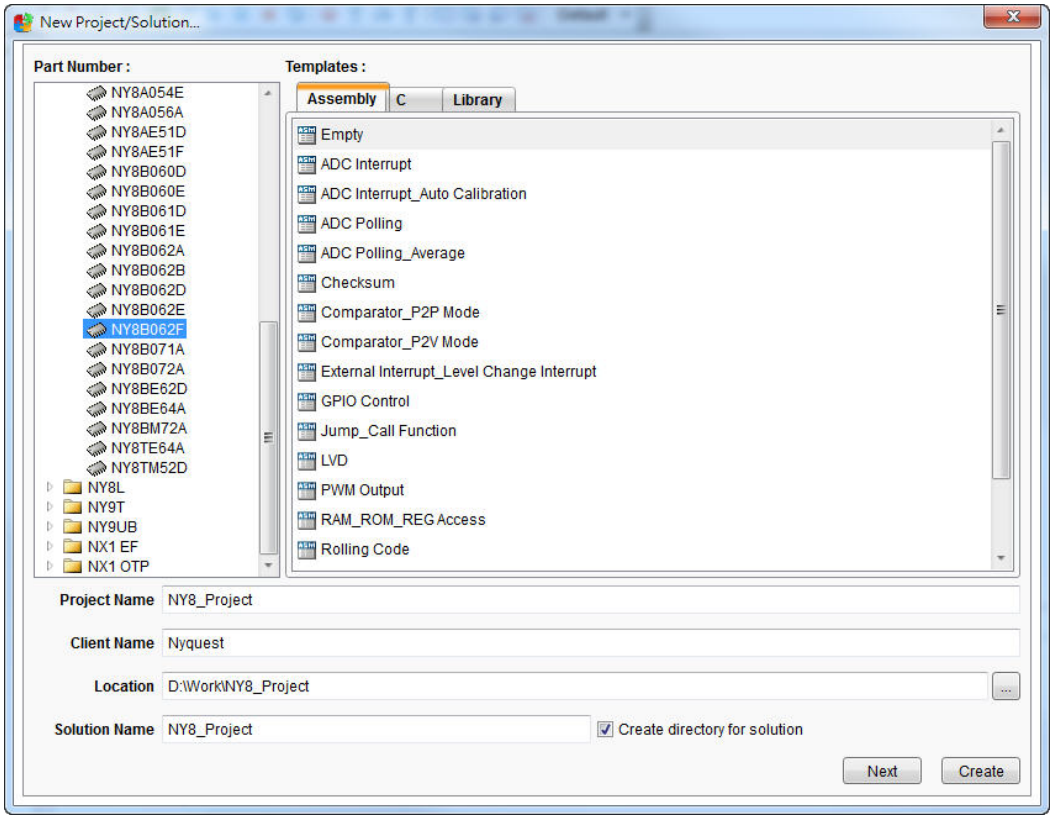
- Filename tab: Show the filenames, click for switching tab.
- Row indicator: Show the icons of run, breakpoints, bookmarks, etc.
- Text editing: Show and edit the text content.



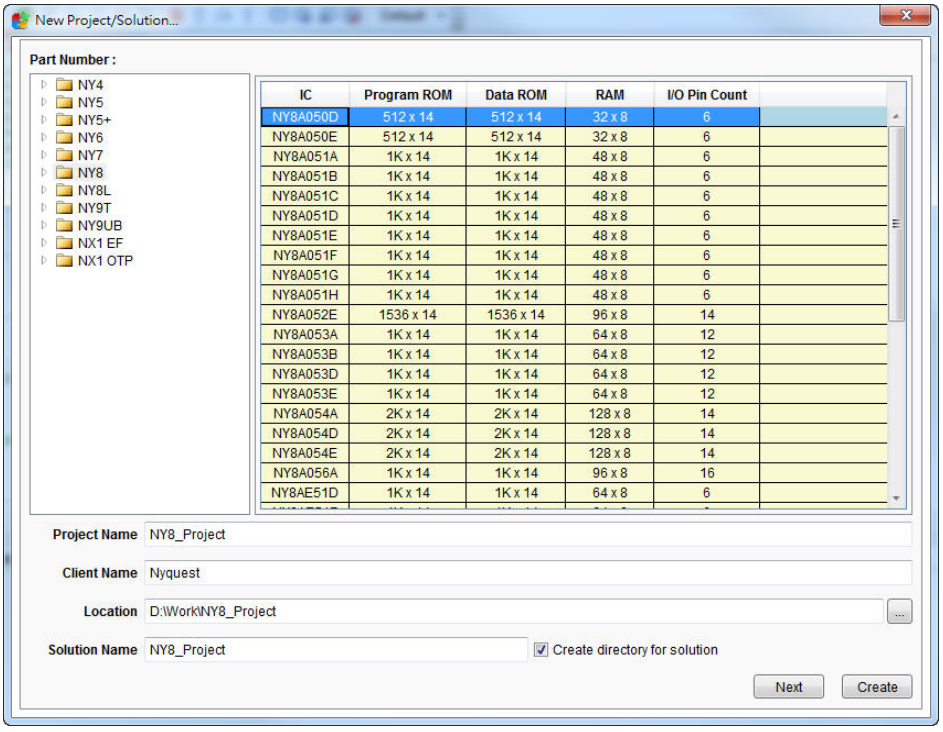
3 Start Using *NYIDE*

3.1 Build Project/Solution

[File] → [New] → [New Project/Solution…]

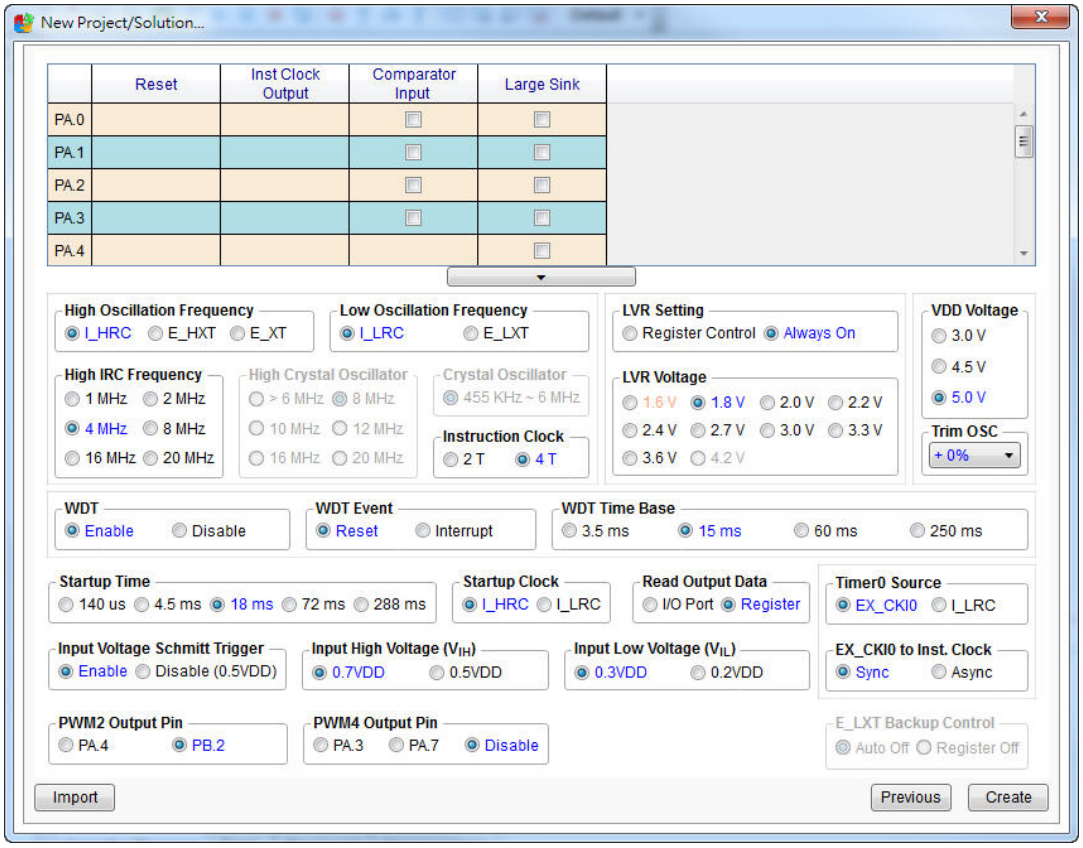


1. Select the IC series of project.



2. Select template type.
3. Use the built-in project template to edit the content and structure of project.
4. For protect the interests of clients, please key in client name.
5. Key in project name.
6. Key in the location of solution/project.
7. Select folder by using the graphics icon.
8. Set solution name (default the name and project name are the same).
9. Create directory for solution or not. Untick for storing the project and solution in the same folder. Tick for creating a folder with project name in the directory of solution.

Press [Create] and the Select IC Body window will pop up.



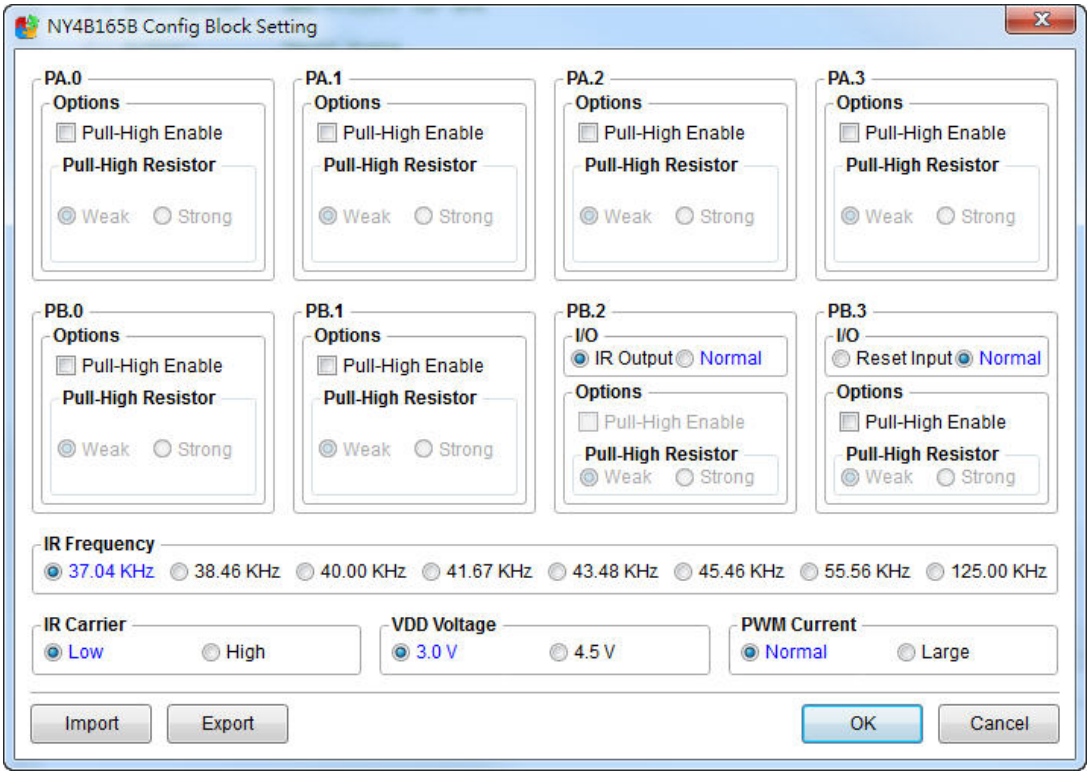
Please refer to 3.2 Change Setting of Project for detailed descriptions. After setting, click [Create] to start building a new project, or click [Previous] back to the project setting page.

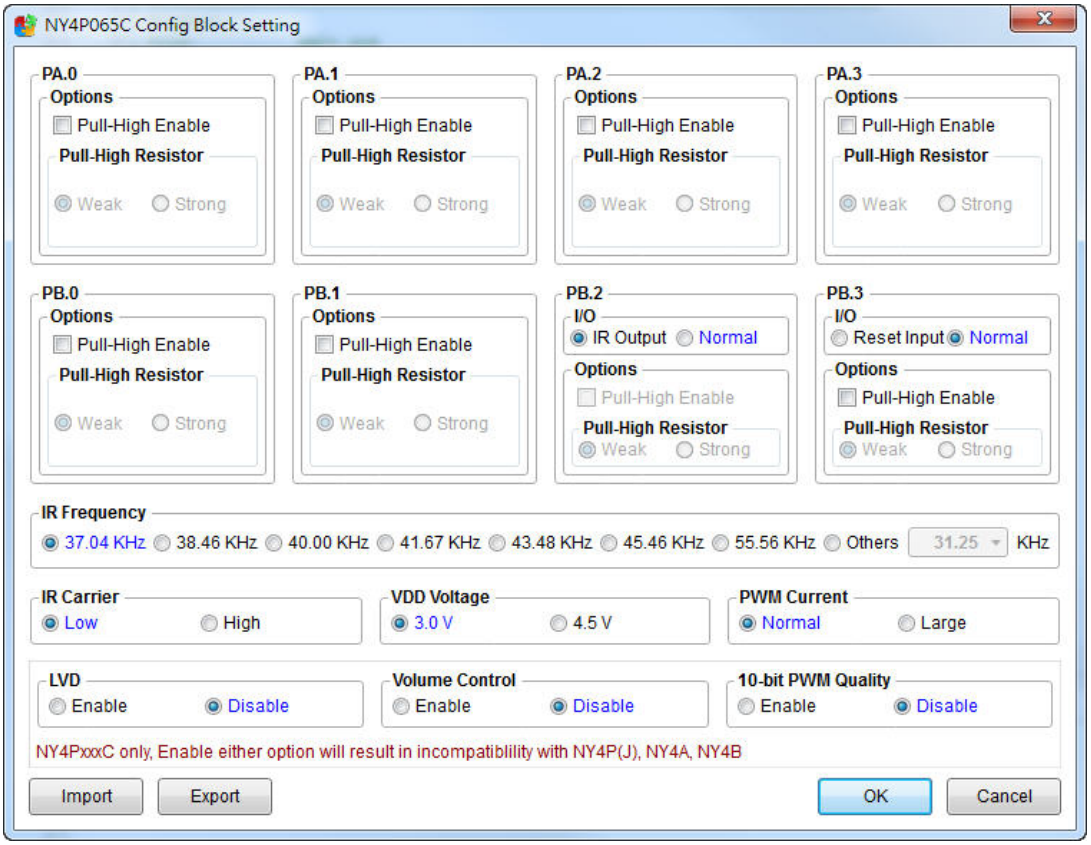
3.2 Change Settings of Project

There are ways to change setting options of project. The Wizard window will pop up for user to reset. Press [Cancel], the changed options will not be saved, but user can review settings.

- In Project manager area, select project and click [Project]→ [Config Block Setting…] from Main Menu.
- In Project manager area, click right mouse button on project and select [Config Block Setting…].
- In Project manager area, double-click on file of the .cd filename extension.

3.2.1 NY4 Series Config Block Setting



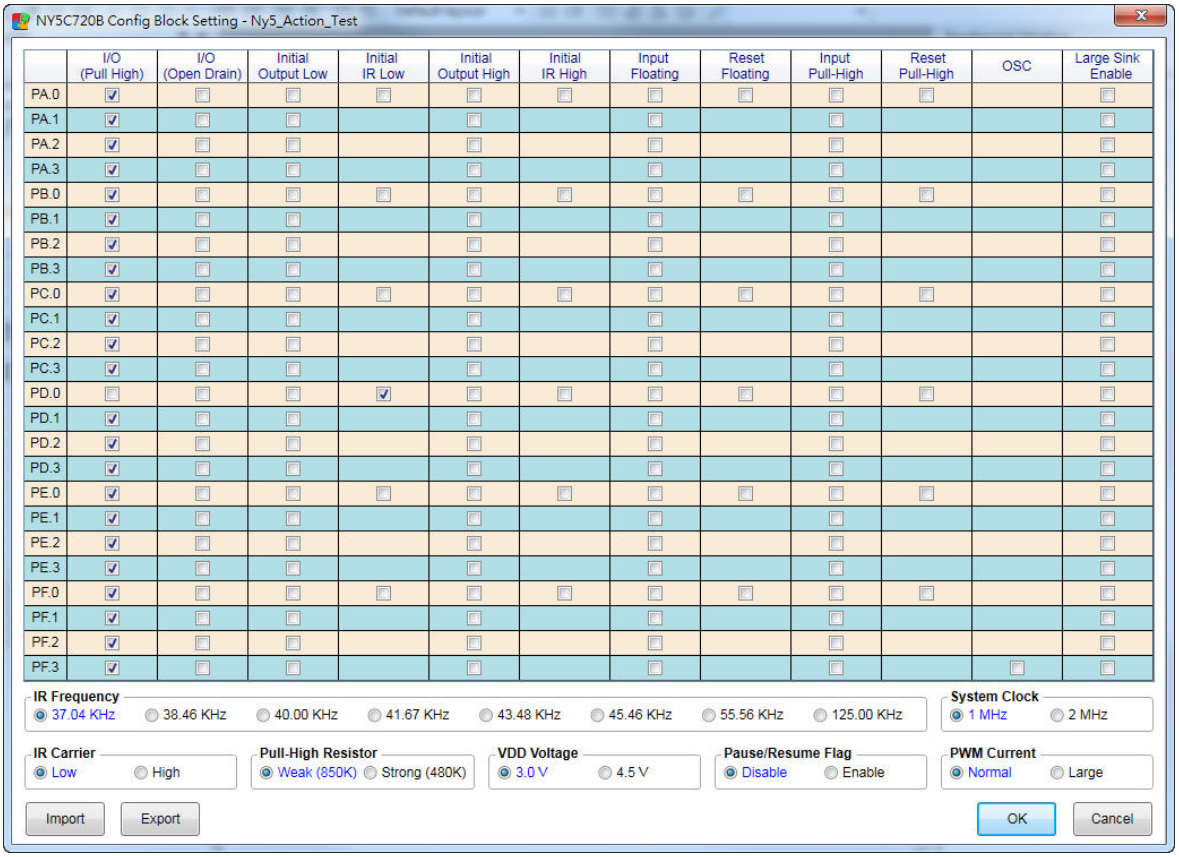


The above illustration is the setting window of NY4 series. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default. The descriptions are as follows.

- PA.0~PB.3: Set the pin. Each pin can be set as Pull-High by needs. If setting a pin as Pull-High, user can select Weak or Strong Pull-High Resistor. Some pins can be set as special functions (e.g., IR Output, Reset Input).
- IR Frequency: Set the IR frequency. (This option is enabled when achieving IR Output) If tick the Others option for NY4PxxxC, user can select all the supported frequency.
- IR Carrier: If user sets IR Carrier as Low, IR Output pin will output IR signals when the value of IO Port register is Low, vice versa. (This option is enabled when achieving IR Output)
- VDD Voltage: Set the VDD voltage.
- PWM Current: Set the PWM current.
- LVD: Enable the LVD option or not.
- Volume Control: Enable the Volume Control or not.
- 10-bit PWM Quality: Enable the10-bit PWM option or not.

Note: The LVD, Volume Control, and 10-bit PWM Quality options are only available for NY4PxxxC.

3.2.2 NY5 Series Config Block Setting

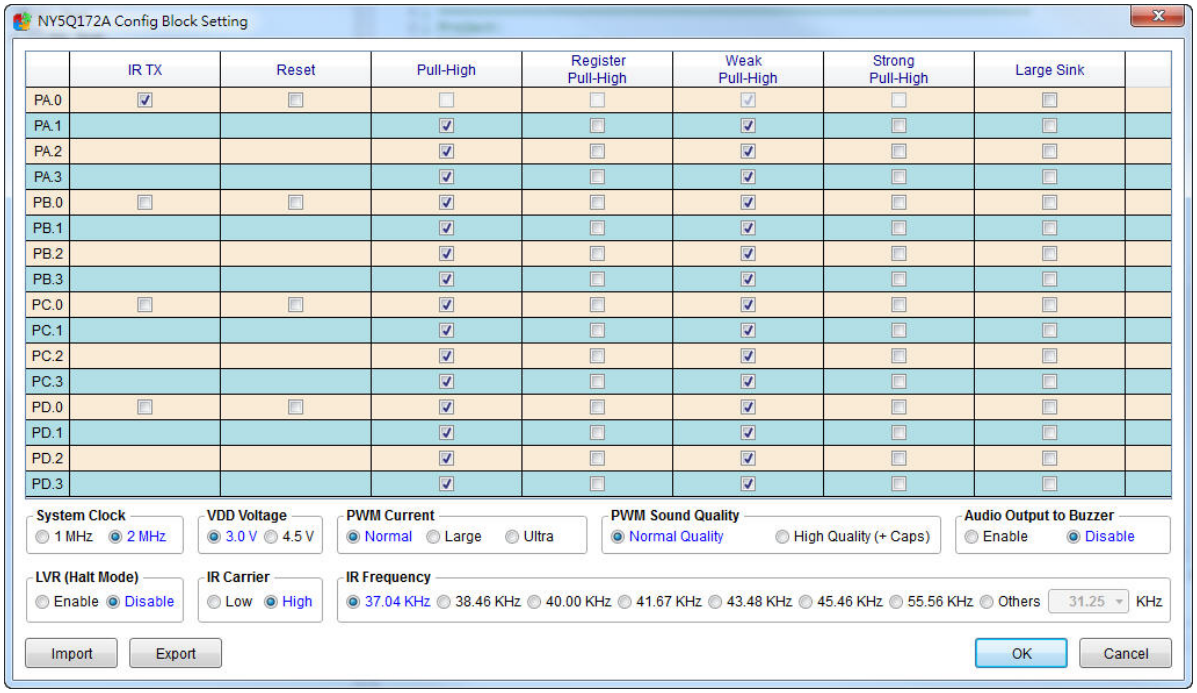


The above illustration is the setting window of NY5 series. The grayed-out parts mean the selection

cannot be ticked. Words in blue mean the default. The descriptions are as follows.

- Pin: User can select the functions of each pin (e.g., I/O, Input, Output, IR, Reset, OSC and so on) and whether to achieve large sink by needs.
- IR Frequency: Set the IR frequency. (This option is enabled when achieving IR Output)
- IR Carrier: If user sets IR Carrier as Low, IR Output pin will output IR signals when the value of IO Port register is Low, vice versa. (This option is enabled when achieving IR Output)
- System Clock: Set the system clock.
- I/O Port Pull-High Resistor: Set the Pull-High resistor of I/O Port.
- VDD Voltage: Set the VDD voltage.
- Pause/Resume Flag: Set the pause/resume flag.
- PWM Current: Set the PWM current.

3.2.3 NY5+ Series Config Block Setting



The above illustration is the setting window of NY5+ series. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default. The descriptions are as follows.

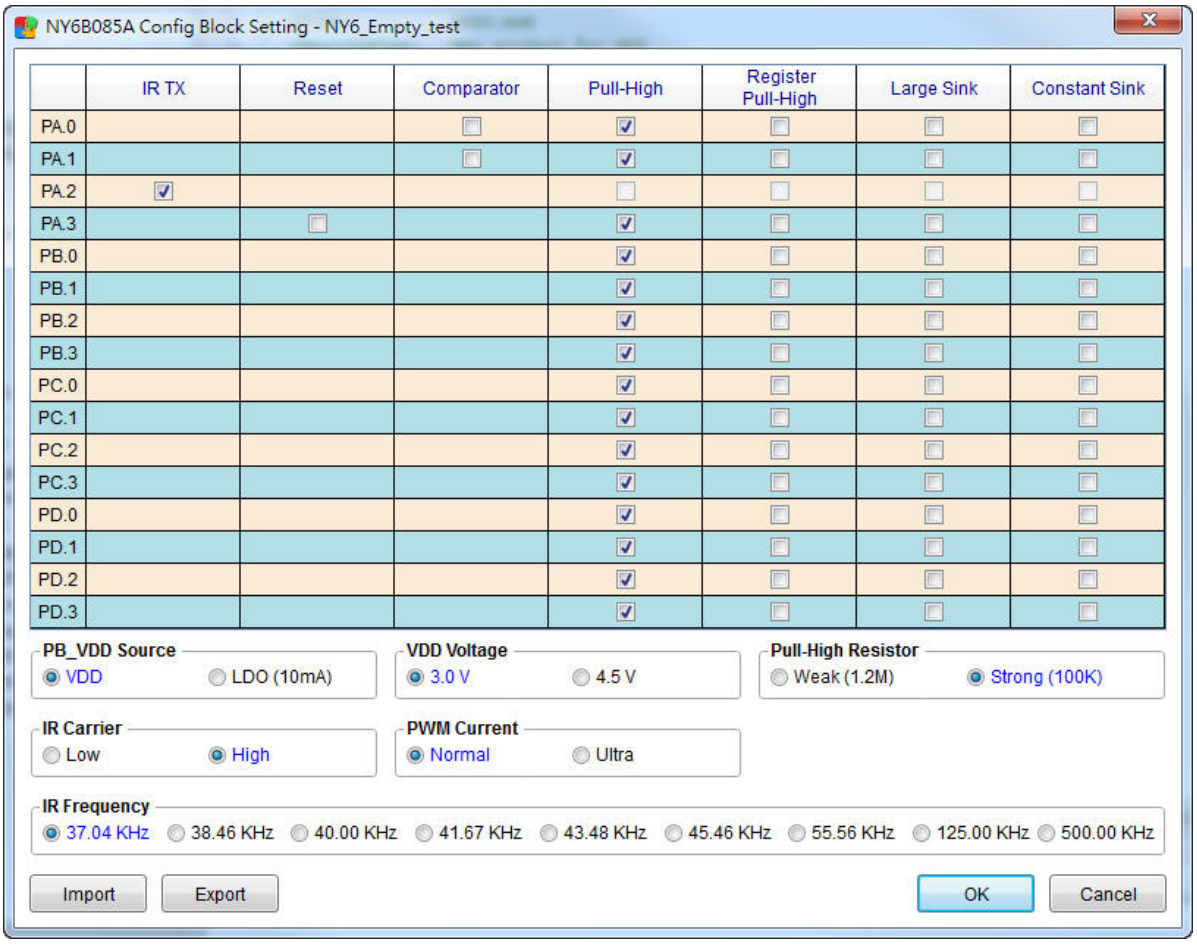
- Pin: User can select the functions of each pin (e.g., IR, Reset, PWM-IO and so on). The Input mode can select Floating/Pull-High/Register Pull-High. The current mode can select Normal Sink / Large Sink by needs.
- IR Frequency: Set the IR frequency. (This option is enabled when achieving IR Output) User could

tick the Others option to select other available frequency.

- IR Carrier: If user sets IR Carrier as Low, IR Output pin will output IR signals when the value of IO Port register is Low, vice versa. (This option is enabled when achieving IR Output)
- System Clock: Set the system clock.
- VDD Voltage: Set the VDD voltage.
- PWM Current: Set the PWM current.
- PWM Sound Quality: The PWM Sound Quality provides 2 options: Normal Quality and High Quality. User can set the option by the actual applications.
- Audio Output to Buzzer: User should enable this option when sound output to Buzzer.
- LVR (Halt Mode): Enable the LVR function in the Halt mode or not.

Note: The PWM Sound Quality setting is only effective obviously for NY5QxxxA OTP, whereas not effective for FDB demonstration and ICE simulation.

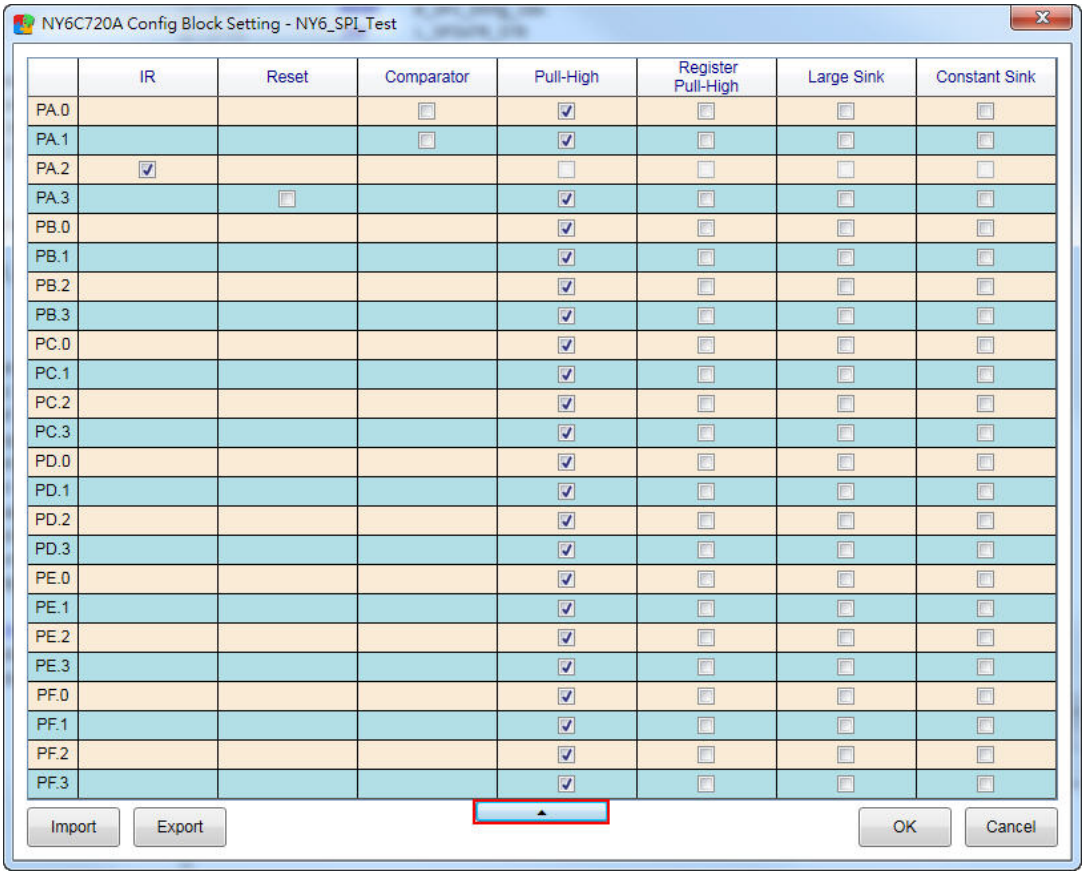
3.2.4 NY6 Series Config Block Setting



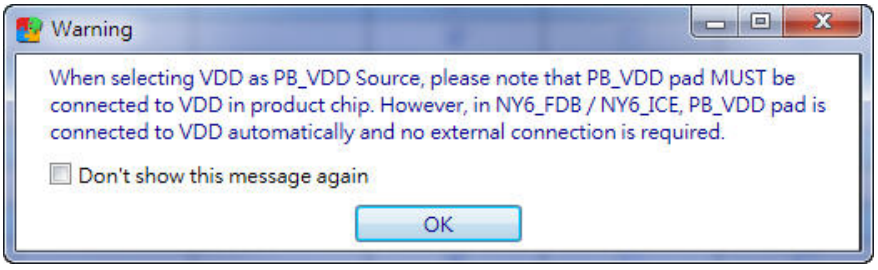
The above illustration is the setting window of NY6 series. The grayed-out parts mean the selection

cannot be ticked. Words in blue mean the default. The descriptions are as follows.

- Pin: The pins are default as I/O, and some pins provide special functions (e.g., IR, Reset and Comparator). Input pin can be Floating, Pull-High or Register Pull-High. There are 3 sink current modes: Normal Sink, Large Sink and Constant Sink. Below pin setting is a dropdown button (as shown in the red box). Pushing this button will show all the pin settings shown as below. Pushing button again can back to original window.



- PB_VDD Source: Select the operating voltage source of PB.
  - After selecting VDD and press OK button, a warning will be pop up:



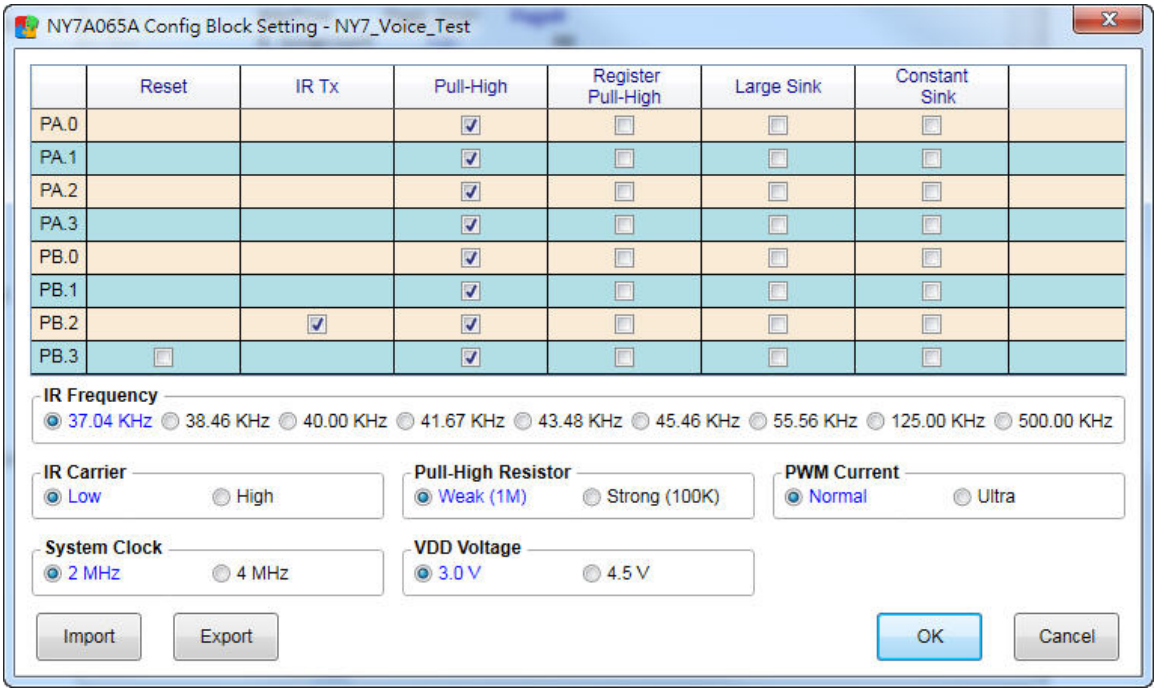
When using NY6_FDB or NY6_ICE for verification, PB_VDD pin will connect to VDD automatically. However, in production process, user has to be sure that the PB_VDD pin is connected to VDD via external connection. This warning message will pop up each time user selects VDD and click “OK” button. If user has fully understood this notification, may tick “Don’t

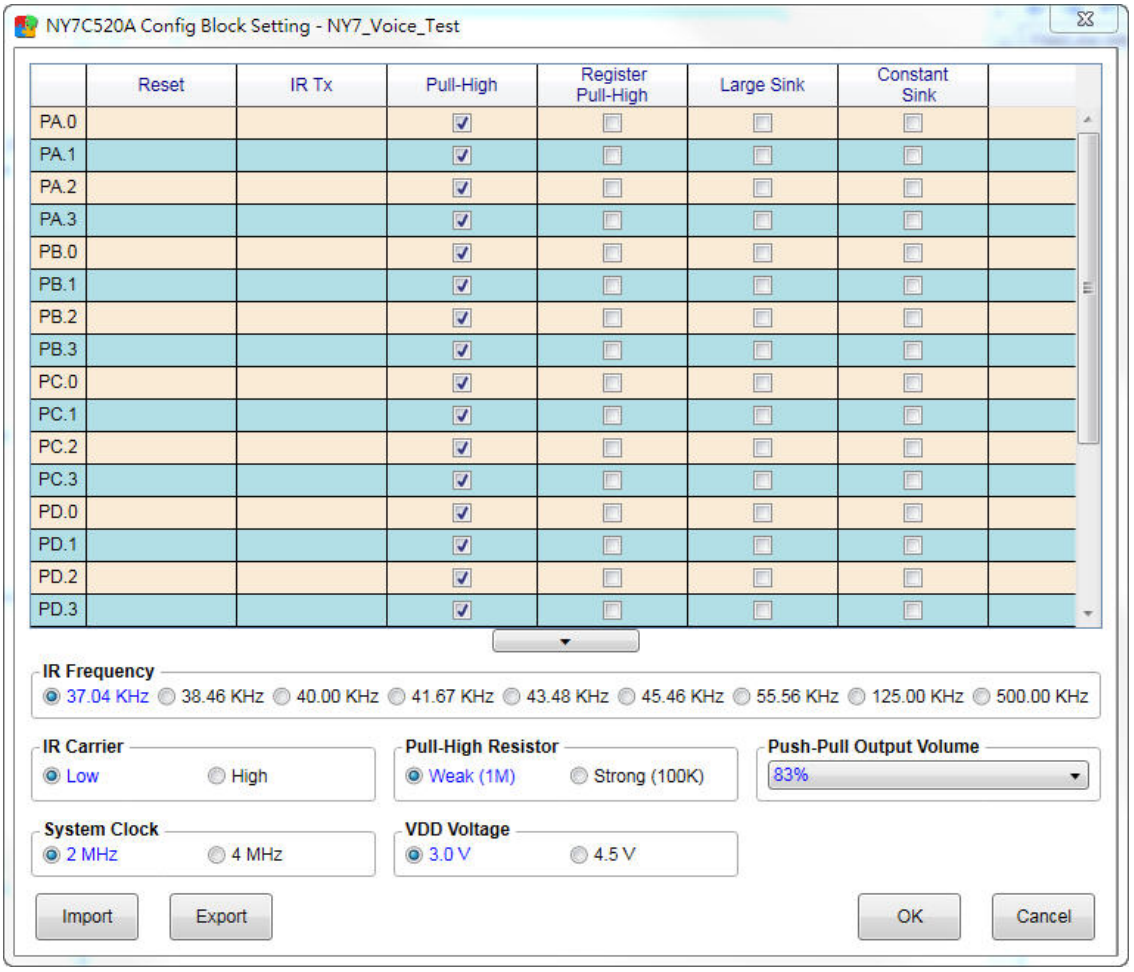
show this message again" to suppress the warning.

- When selecting LDO (10mA) as PB_VDD Source, LDO on/off can be controlled by register SPIV bit 1. If the bit is set (SPIV.bit1=1), internal LDO is provided to PB_VDD; if the bit is clear (SPIV.bit1=0), LDO will be turned off, and an external power should be provided to PB_VDD or PB will not function.

- VDD Voltage: Set the VDD voltage.
- Pull-High Resistor: Set the Pull-High resistor of I/O Port.
- PWM Current: Set the PWM current.
- IR Frequency: Set the IR frequency. (This option is enabled when achieving IR Output)
- IR Carrier: If user sets IR Carrier as Low, IR Output pin will output IR signals when the value of IO Port register is Low, vice versa. (This option is enabled when achieving IR Output)

3.2.5 NY7 Series Config Block Setting





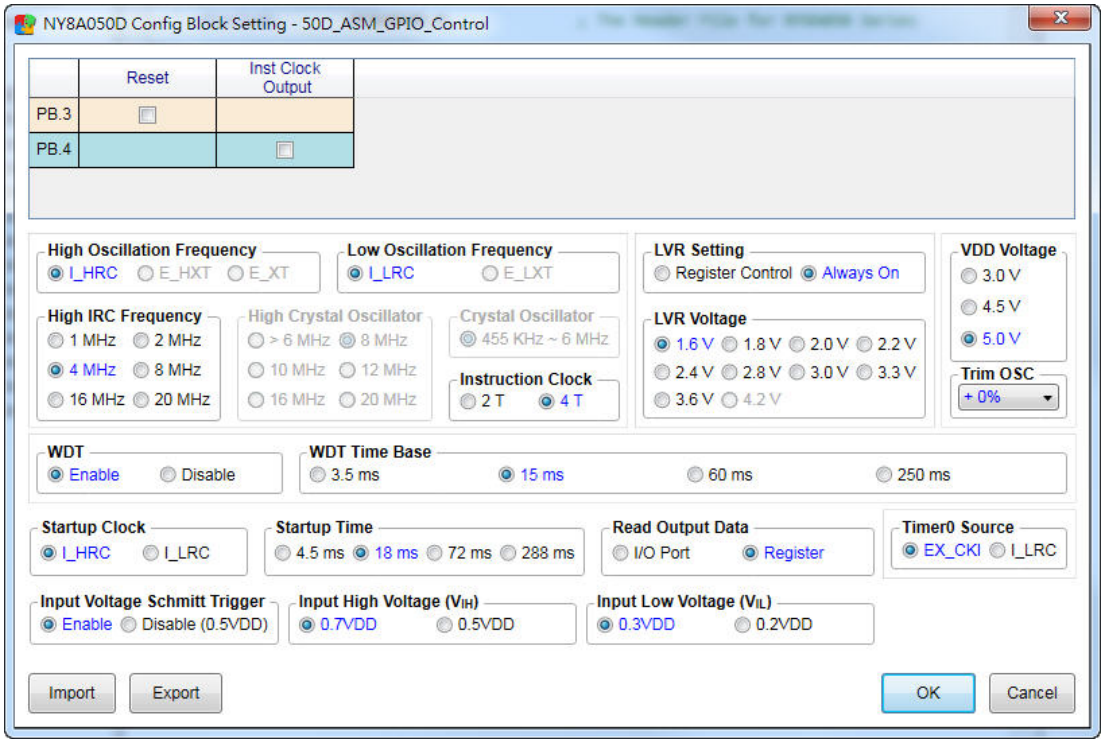
The above illustration is the setting window of NY7 series. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default. The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., IR, Reset). User can select Floating, Pull-High or Register Pull-High as the input mode and Normal Sink, Large Sink or Constant Sink as the sink mode.
- IR Frequency: Set the IR frequency. (This option is enabled when achieving IR Output)
- IR Carrier: If user sets IR Carrier as Low, IR Output pin will output IR signals when the value of IO Port register is Low, vice versa. (This option is enabled when achieving IR Output)
- System Clock: Set the system clock.
- I/O Port Pull-High Resistor: Set the Pull-High resistor of I/O Port.
- VDD Voltage: Set the VDD voltage.
- PWM Current: Set the PWM current.
- Push-Pull Output Volume: Set the Push-Pull output volume.

3.2.6 NY8A/8B Series Config Block Setting

3.2.6.1 NY8A050D

The NY8A050D setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, PWM, Buzzer and so on).

- High Oscillation Frequency

Option	Descriptions
I_HRC	Internal high RC oscillator.

- Low Oscillation Frequency

Option	Descriptions
I_LRC	Internal low RC oscillator.

- Instruction Clock

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

  For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- LVR Setting

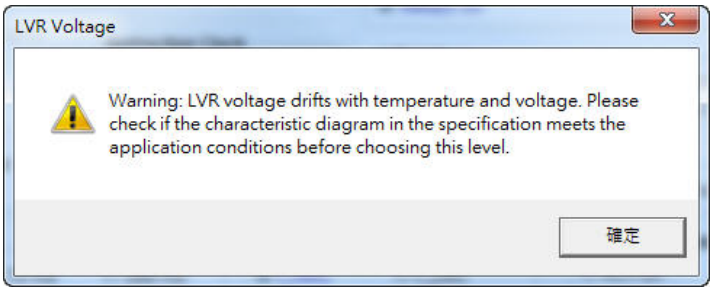
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage:

  If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting. For NY8 series, there are 9 different selections of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.8V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A050D. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	2	3	4
3.5ms	15ms	60ms	250ms

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8A050D series, there are 4 available options of Startup time.

1	2	3	4
4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt

trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

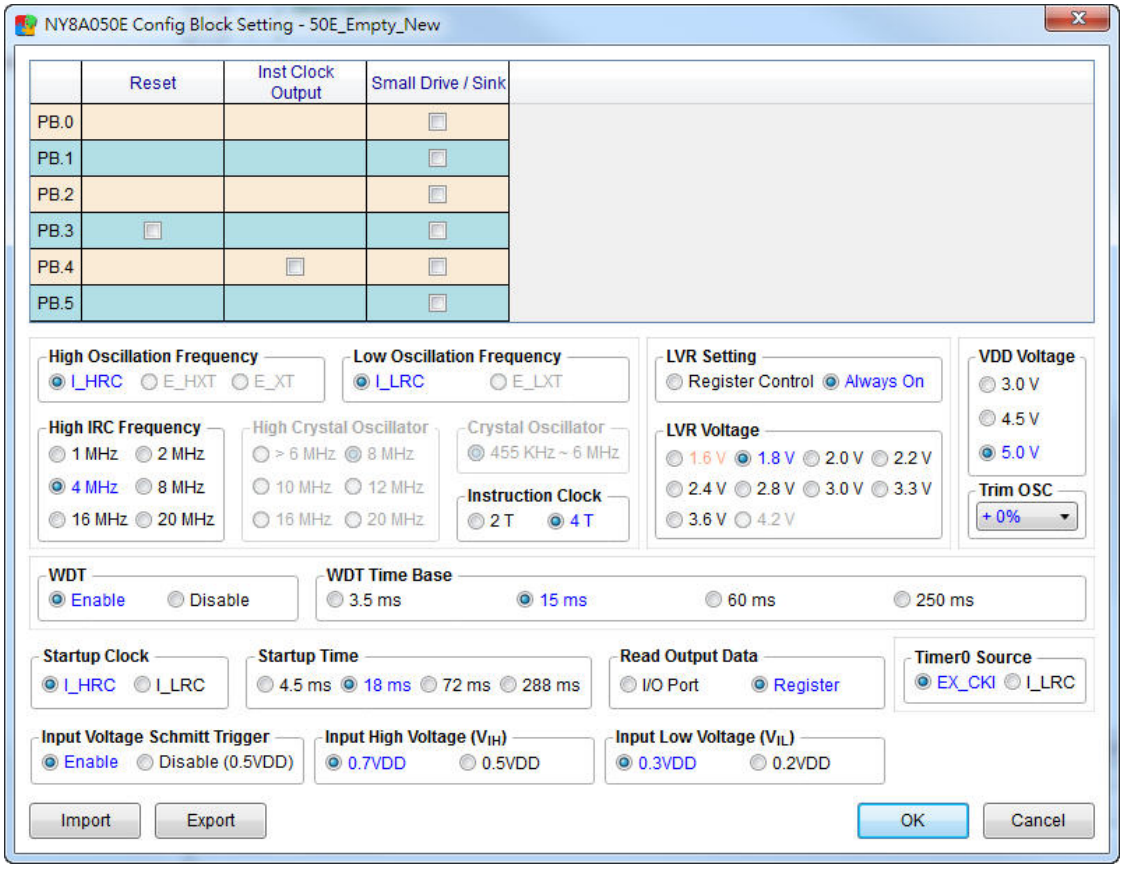
- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.2 NY8A050E

The NY8A050E setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output etc.)
- High Oscillation Frequency

Option	Descriptions
I_HRC	Internal high RC oscillator

- Low Oscillation Frequency

Option	Descriptions
I_LRC	Internal low RC oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 2 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

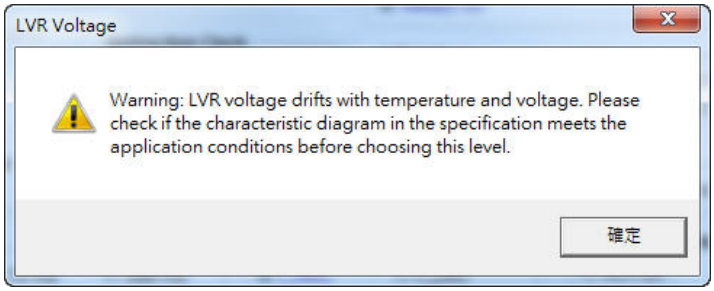
- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a

warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs. temperature diagram in specification of NY8A050E. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

  Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8A050E, there are 4 available options of Startup time.

1	*2*	*3*	*4*
4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- Read Output Data

The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- VDD Voltage

The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Voltage Schmitt Trigger

The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

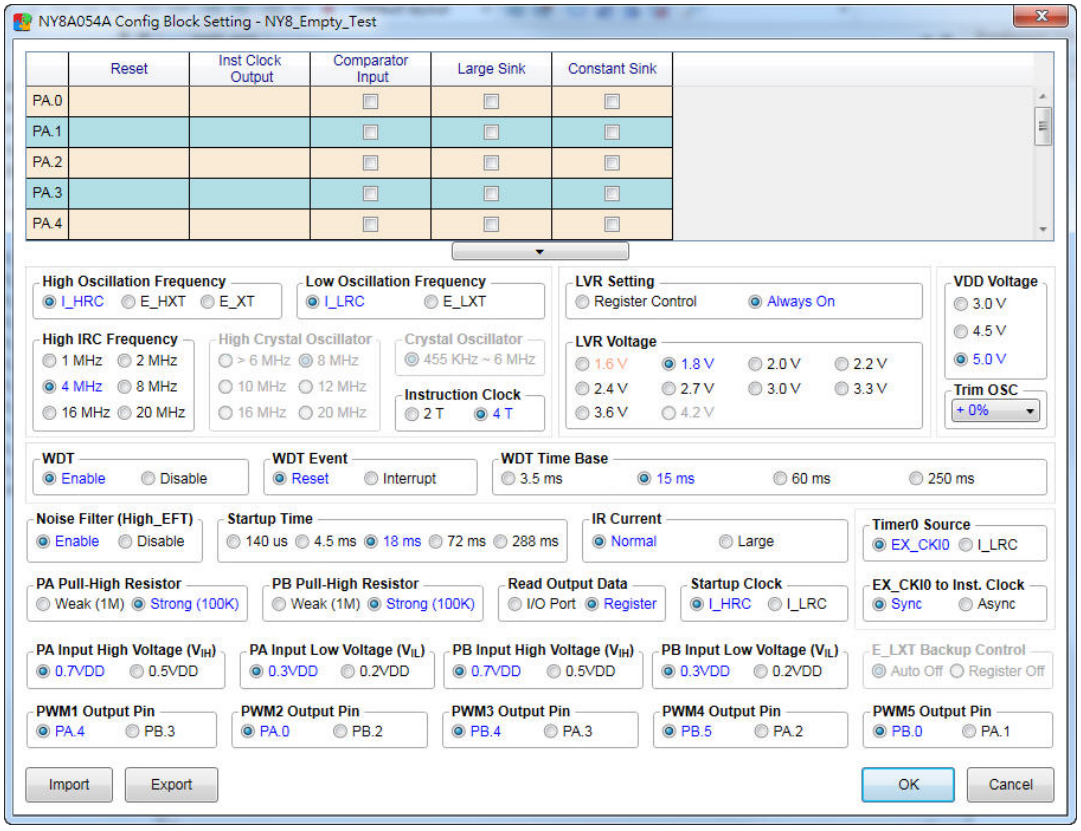
- Input Low Voltage (V_{IL})

There are 2 options for selecting the input low voltage.

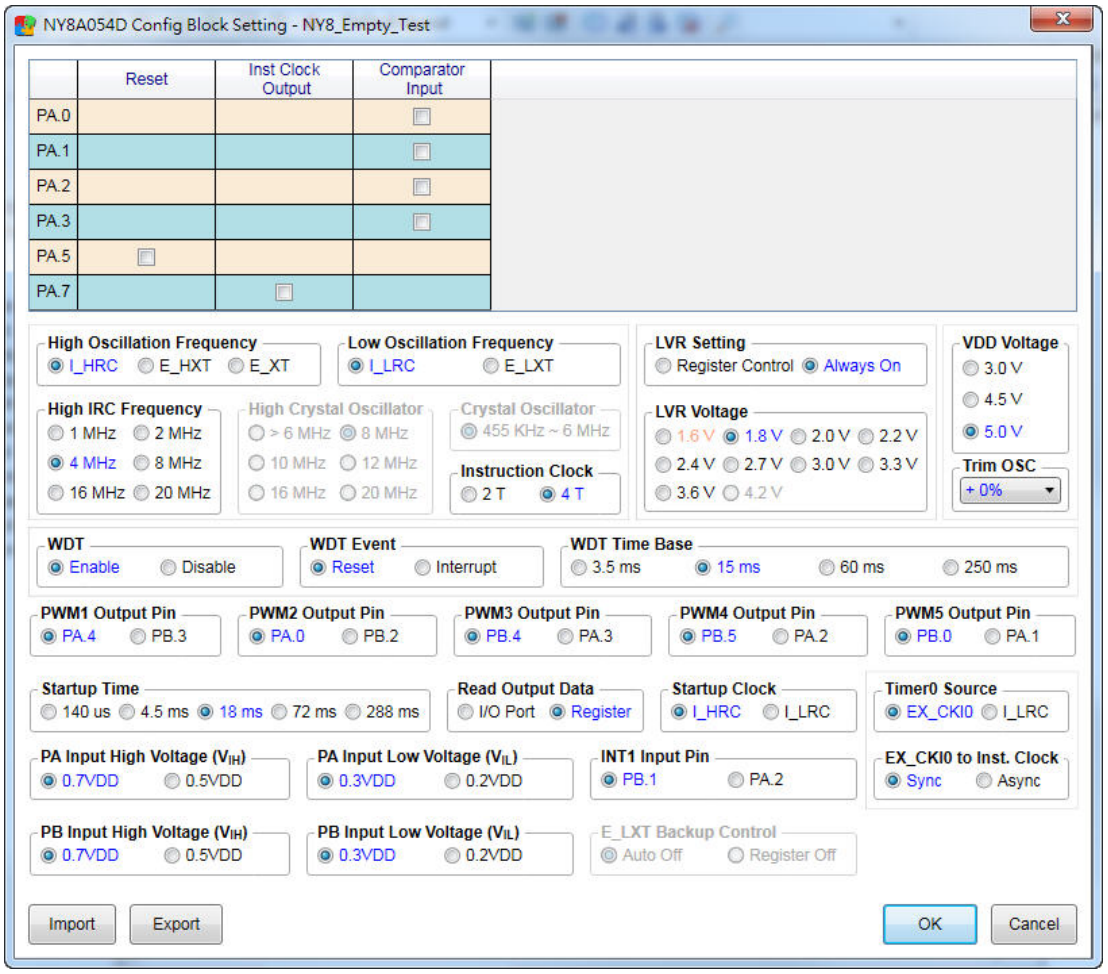
Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.3 NY8A054A/54D/54E/54E1

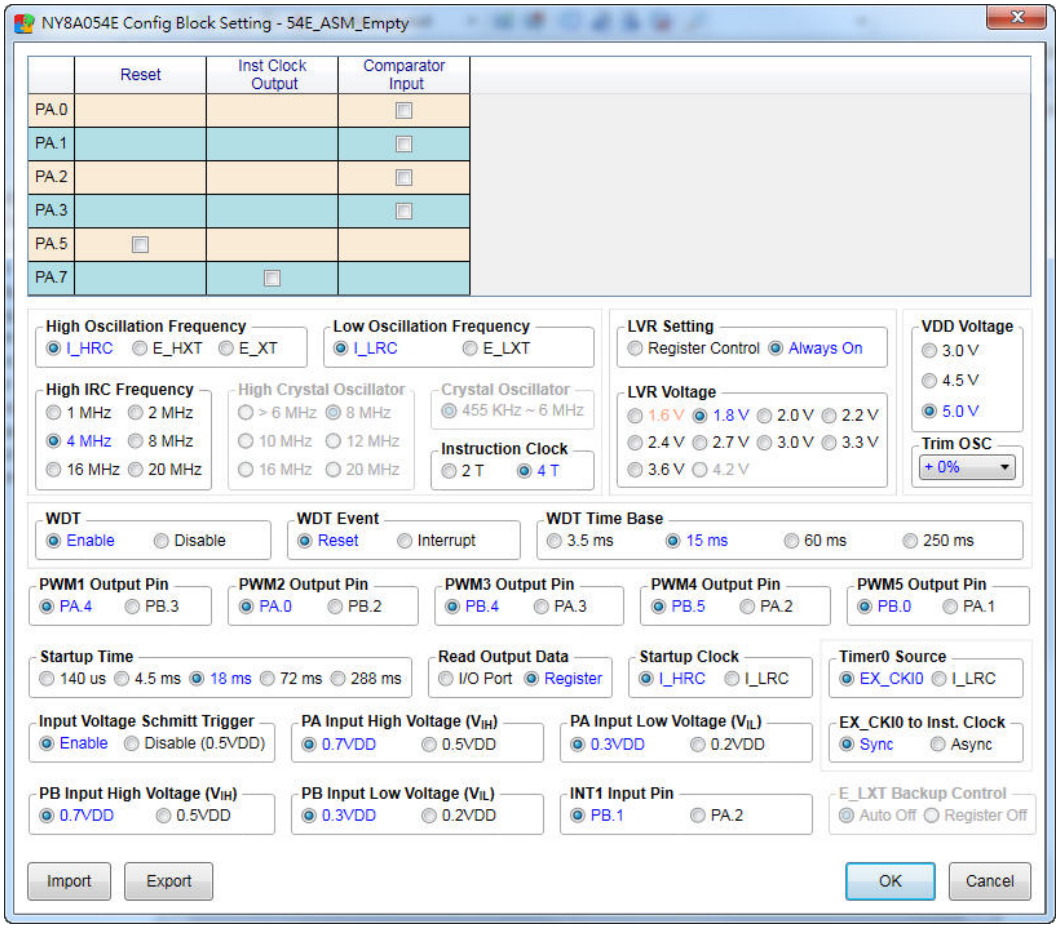
The NY8A054A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



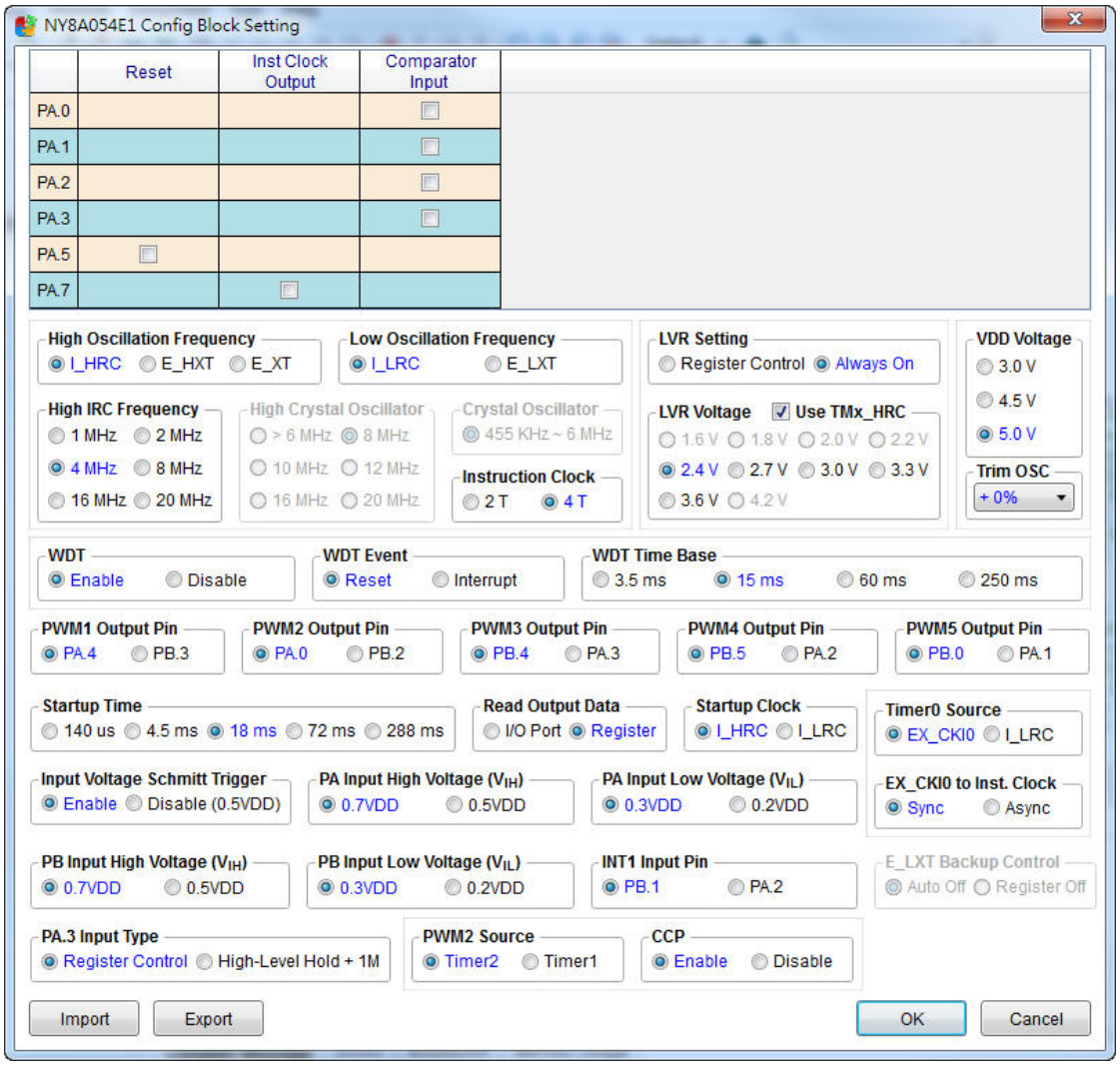
The NY8A054D setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The NY8A054E setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The NY8A054E1 setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output etc.)

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 2 options of LVR setting.

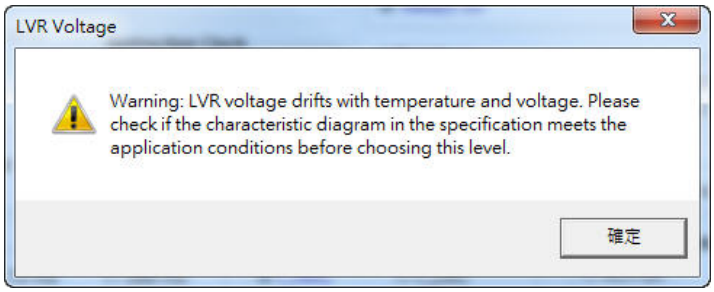
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage:

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	2	3	4	5	6	7	8	9
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs. temperature diagram in specification of NY8A054A/NY8A054D/NY8A054E/NY8A054E1. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

The WDT Time Base function can be set as 4 different options of WDT time base.

1	2	3	4
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable. (Only NY8A054A supports this function)

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Pull-High Resistor

  The Pull-High Resistor set the resistor on the pin. There are two different Pull-High resistors to choose in NY8 series.

Option	Descriptions
Weak	Internal 1MΩ Pull-High resistor.
Strong	Internal 100kΩ Pull-High resistor.

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- IR Current

  The IR Current function can be set as 2 different options of current. (This function only supports NY8A054A)

Option	Descriptions
Normal	60mA IR current provided internally.
Large	340mA IR current provided internally.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- INT1 Input Pin

  There are 2 options for INT1 input pin. The default INT1 output pin is PB.1. When the INT1 function is disabled, PB.1 can be used as a general I/O. (This function only supports NY8A054D/54E)

Option	Descriptions
PB.1	Set PB.1 to INT1 input pin.
PA.2	Set PA.2 to INT1 input pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC

production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD. (Only available for NY8A054E/54E1)

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- PWM Output Pin

  There are 5 sets of PWM output pin in NY8A054A/54D/54E/54E1, each pin has 2 options. Options and the default of each PWM are as follows.

  PWM1:

Option	Descriptions
PA.4	Set PA.4 as PWM1 output pin. (Default)
PB.3	Set PB.3 as PWM1 output pin.

  PWM2:

Option	Descriptions
PA.0	Set PA.0 as PWM2 output pin. (Default)

PB.2	Set PB.2 as PWM2 output pin.

PWM3:

Option	Descriptions
PB.4	Set PB.4 as PWM3 output pin. (Default)
PA.3	Set PA.3 as PWM3 output pin.

PWM4:

Option	Descriptions
PB.5	Set PB.5 as PWM4 output pin. (Default)
PA.2	Set PA.2 as PWM4 output pin.

PWM5:

Option	Descriptions
PB.0	Set PB.0 as PWM5 output pin. (Default)
PA.1	Set PA.1 as PWM5 output pin.

- Input Type

  User can select the resistor of input type for different applications. For NY8A054E1, there are 2 options to select.

Option	Descriptions
Register Control	User can decide the input type by using the register control.
High-Level Hold + 1M	When the button is pressed, the IC has an internal pull-up resistor of 1MΩ; and when the button is released, the IC has an internal pull-up resistor of 85KΩ.

- PWM2 Source

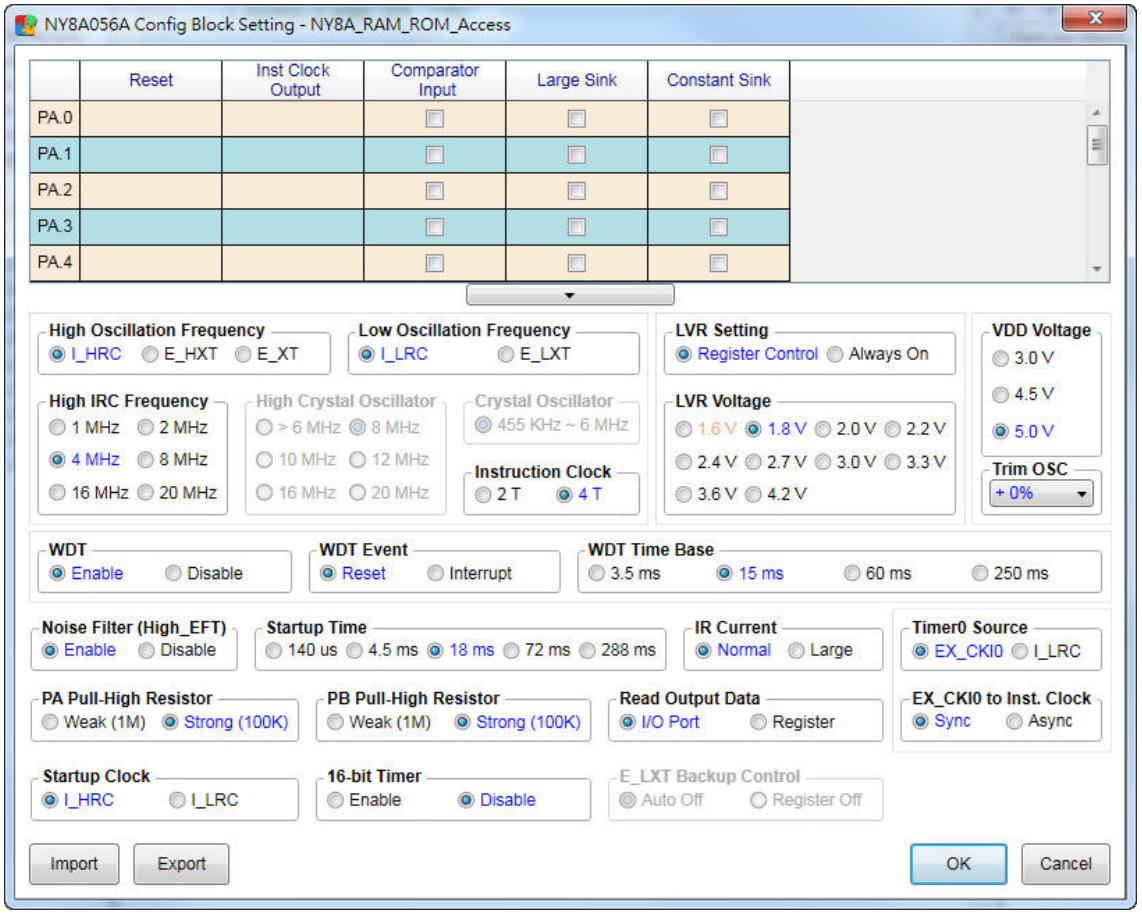
  The PWM2 Source setting determines the signal source that drives the PWM2.If the option is set to Timer2, the PWM2 signal source will be controlled by Timer2. If the option is set to Timer1, the PWM2 signal source will be controlled by Timer1.

- CCP

  Enabling the CCP module allows the IC to perform capture, compare, or PWM functions. Additional program coding is required to fully activate the module.

3.2.6.4 NY8A056A

The NY8A056A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pull-High Resistor

  The Pull-High Resistor set the resistor on the pin. There are two different Pull-High resistors to choose in NY8 series.

Option	Descriptions
Weak	Internal 1MΩ Pull-High resistor.
Strong	Internal 100kΩ Pull-High resistor.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If user sets Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI0 to Inst. Clock

  Set EX_CKI0 to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI0 synchronizes with Instruction Clock.
Async	EX_CKI0 is asynchronous with Instruction Clock.

- Read Output Data

  Read Output Data sets program to read the source of the output port state. There are 2 different sources to choose in NY8 series.

Option	Descriptions
I/O Port	Direct read pin state.
Register	Read the pin corresponding register state.

- 16-bit Timer

  NY8A056A provides user to combine two 8-bit Timer into a 16-bit Timer or not. The default is “Disable”. Timer1 and Timer2 each is 8-bit Timer. The 16-bit Timer is enabled when achieving “Enable”.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”**,** meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- Analog Input

  Set the pin to the analog input.

- Large Sink

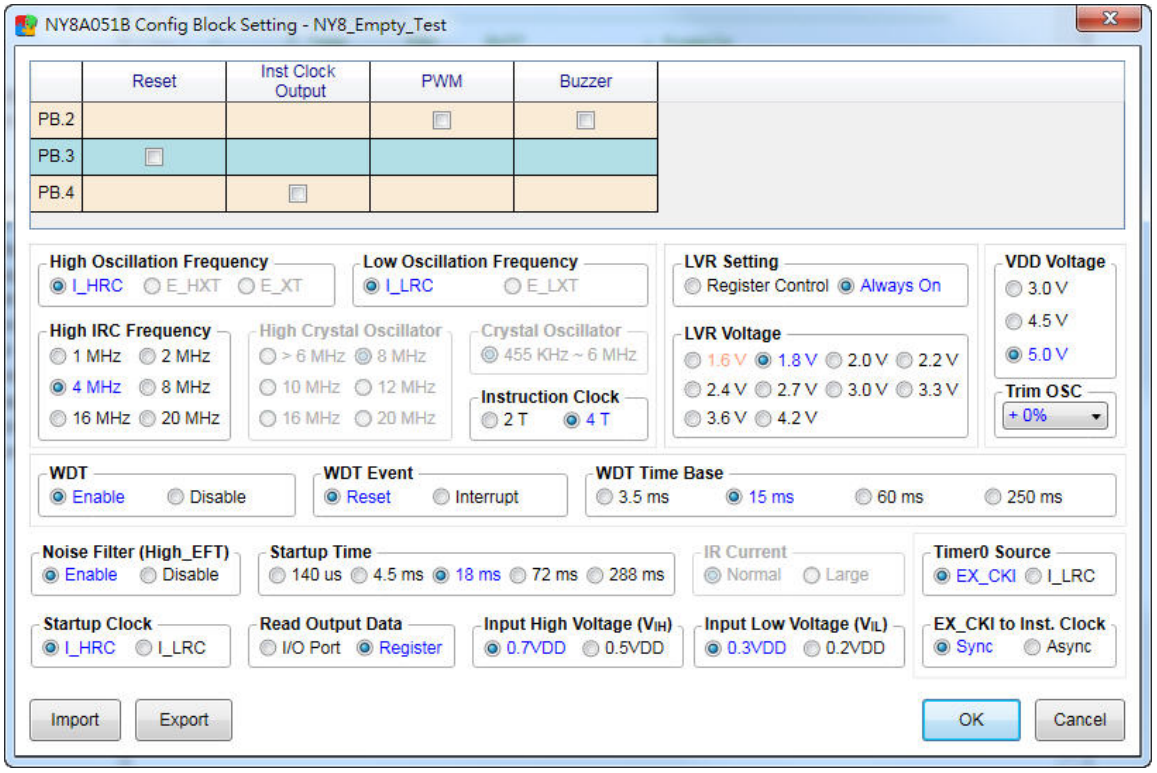
Set the output current of the pin to 60mA.

- Constant Sink

  Set the output current of the pin to the 20mA constant current.

3.2.6.5 NY8A051B/51D

The NY8A051B/51D setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, PWM, Buzzer and so on).

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. But for NY8A051B/51D series, there is only one high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator.

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. But for NY8A051B/51D series, there is only one low oscillation frequency.

Option	Descriptions

I_LRC	Internal low RC oscillator.

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 2 options of LVR setting.

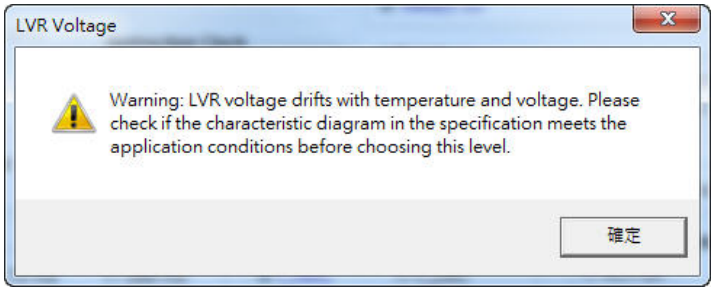
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 10 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V	4.2V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A051B/51D. If

the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

  Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

  The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable. NY8A051D does not support this function.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8A051B, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator

will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL}):

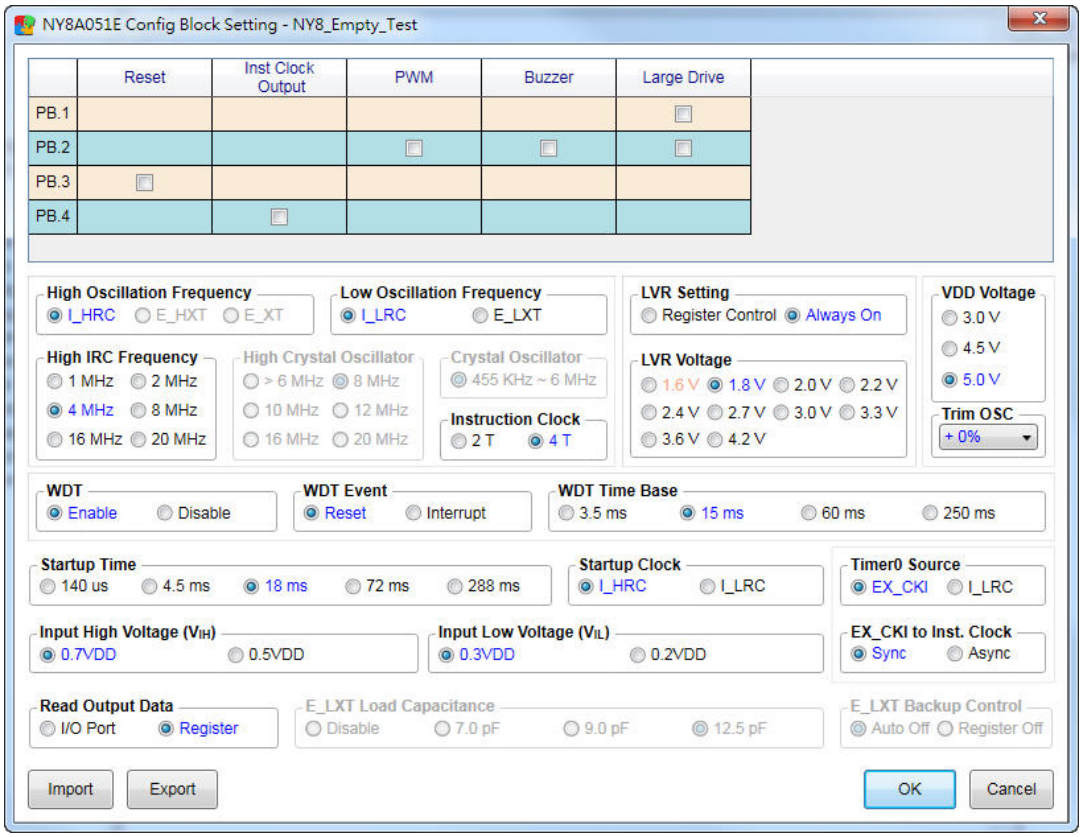
  There are 2 options for selecting the input low voltage.

Option	Descriptions

0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.6 NY8A051E

The NY8A051E setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock, Output, PWM, Buzzer and so on).

- Low Oscillation Frequency

Option	Descriptions
I_LRC	Internal low RC oscillator.
E_LXT	External low crystal oscillator.

- High Oscillation Frequency

Option	Descriptions
I_HRC	Internal high RC oscillator.

- Instruction Clock

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- Startup Time

It needs a certain period to reach the suitable working voltage after IC started up. The Startup Time function can be used to adjust the time length of IC starting up.

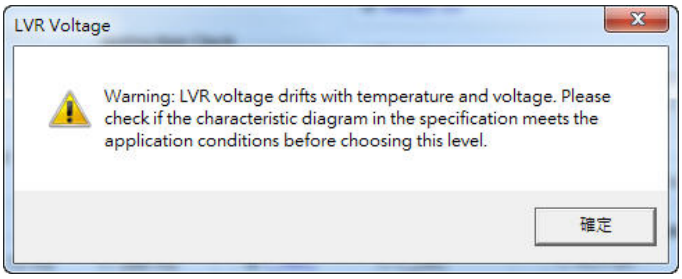
- LVR Setting

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage

If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting.

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A051E. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- VDD Voltage

The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator:

The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Event

Option	Descriptions
Reset	Reset program.
Interrupt	Execute the interruption of subroutine.

- WDT Time Base

  Set the time base of the Watchdog Timer.

- Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 are input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions

0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (VIL)

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”**,** meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

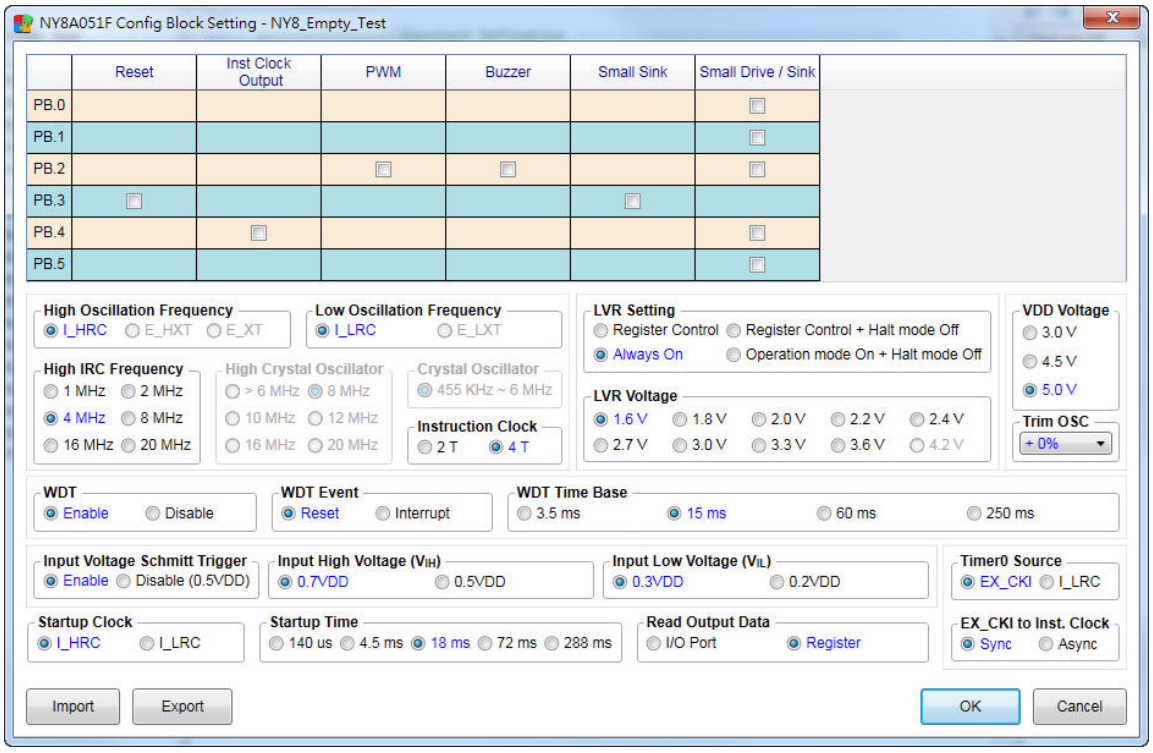
Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- E_LXT Load Capacitance:

  Set the E_LXT Load Capacitance. Please set the corresponding load capacitance according to using E_LXT.

3.2.6.7 NY8A051F

The NY8A051F setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock, Output, PWM, Buzzer and so on).

- Low Oscillation Frequency

Option	Descriptions
I_LRC	Internal low RC oscillator.
E_LXT	External low crystal oscillator.

- High Oscillation Frequency

Option	Descriptions
I_HRC	Internal high RC oscillator.

- Instruction Clock

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- Startup Time

  It needs a certain period to reach the suitable working voltage after IC started up. The Startup Time function can be used to adjust the time length of IC starting up.

- LVR Setting

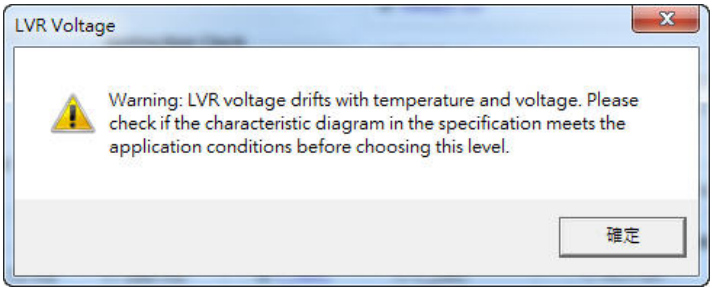
  When VDD voltage is suddenly lower than the LVR Volta Startup Time, IC will be reset. For NY8A051F series, there are 4 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

  If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting.

  Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



  When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A051F. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will

be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Event

Option	Descriptions
Reset	Reset program.
Interrupt	Execute the interruption of subroutine.

- WST Time Base

  Set the time base of the Watchdog Timer.

- Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 are input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- Input Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

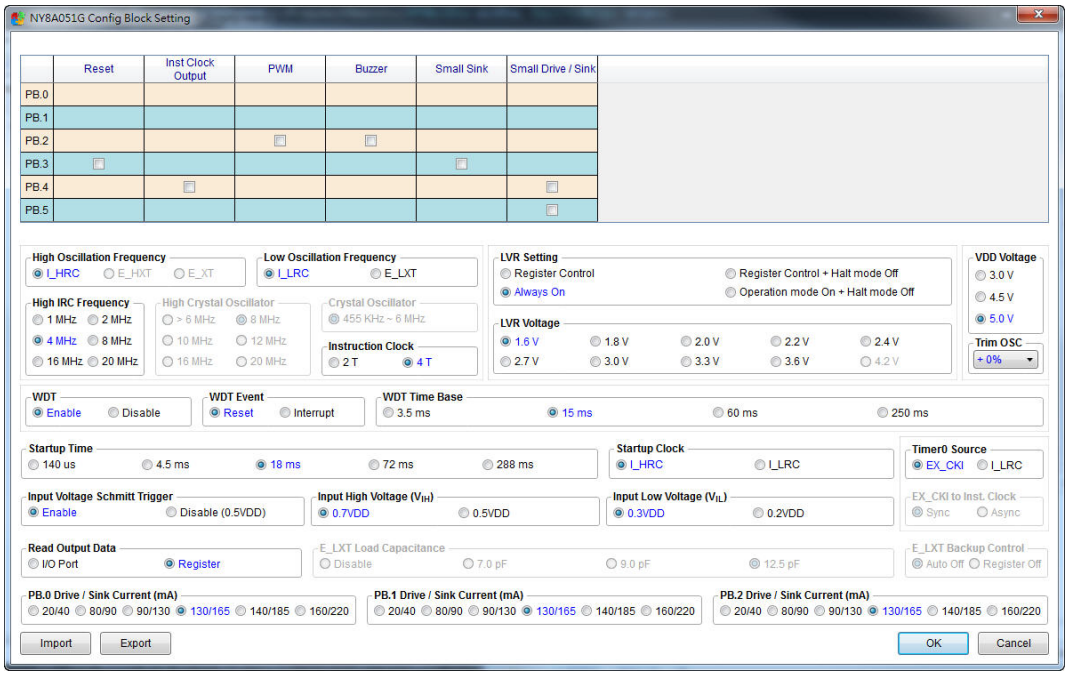
- Input Low Voltage (VIL)

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.8 NY8A051G

The NY8A051G setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, PWM, Buzzer and so on).

- Low Oscillation Frequency

  NY8 series provides the frequency oscillation option. When user selects low oscillation frequency for NY8A051G, only I_LRC is available.

Option	Descriptions
I_LRC	Internal low RC oscillator

- High Oscillation Frequency

  NY8 series provides the oscillation frequency option. When user selects high frequency oscillation for NY8A051G, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

- Instruction Clock

  The Instruction Clock function can set 2 kinds of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 oscillator periods.
4T	4 oscillator periods.

- High IRC Frequency

  For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- LVR Setting

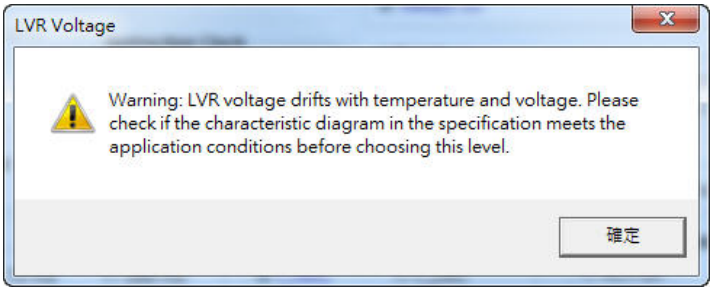
  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A051G series, there are 4 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

  If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting.

  Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



  When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A051G. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of

internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Event

Option	Descriptions
Reset	Reset program.
Interrupt	Execute the interruption of subroutine.

- WST Time Base

  Set the time base of the Watchdog Timer.

- Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 are input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.

Option	Descriptions
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- E_LXT Load Capacitance

  There are 3 kinds of options for selecting external Crystal Load Capacitance or user can use plug-in capacitance by themselves.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections-- Input High Voltage (VIH) and Input Low Voltage (VIL). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (VIH)

  There are 2 options for selecting the input high voltage.

Option	Descriptions

0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (VIL)

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

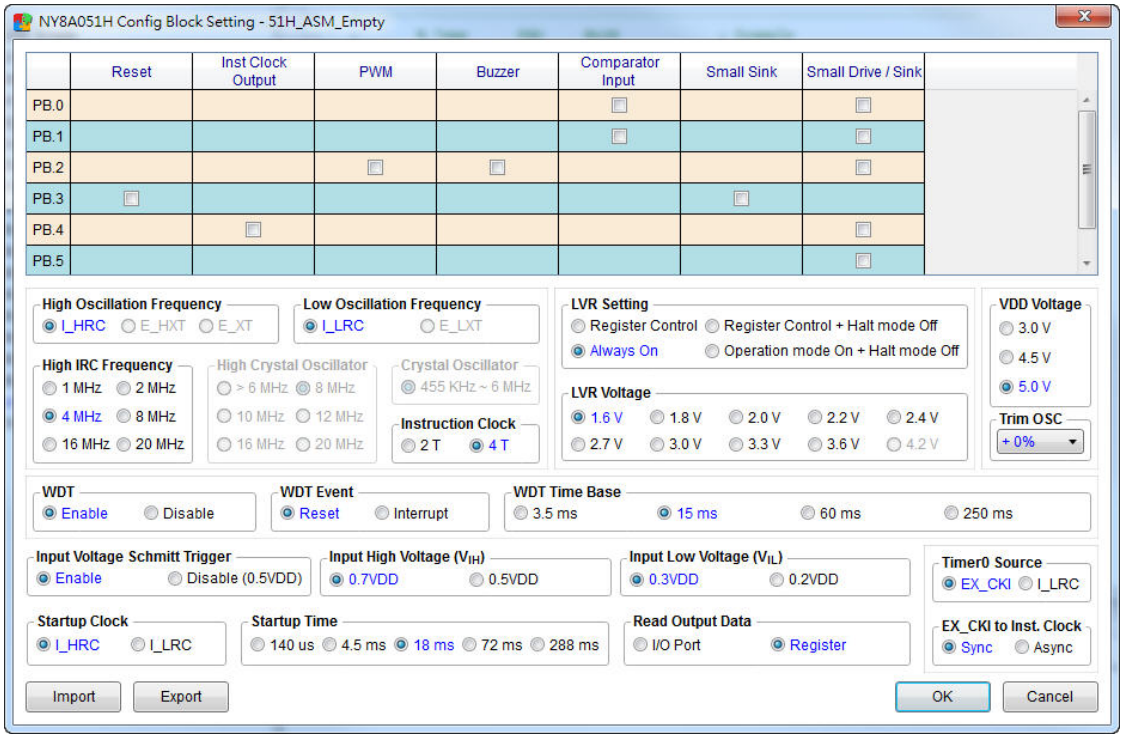
- Drive / Sink Current

  There are 6 options of Drive / Sink current set for user.

Option	Descriptions
20/40	Set the default Drive current of pin as 20mA and Sink current as 40mA.
80/90	Set the default Drive current of pin as 80mA and Sink current as 90mA.
90/130	Set the default Drive current of pin as 90mA and Sink current as 130mA.
130/165	Set the default Drive current of pin as 130mA and Sink current as 165mA.
140/185	Set the default Drive current of pin as 140mA and Sink current as 185mA.
160/220	Set the default Drive current of pin as 160mA and Sink current as 220mA.

3.2.6.9 NY8A051H/NY8A051H1

The NY8A051H/NY8A051H1 setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, PWM, Buzzer and so on)

- Low Oscillation Frequency

Option	Descriptions
I_LRC	Internal low RC oscillator

- High Oscillation Frequency

Option	Descriptions
I_HRC	Internal high RC oscillator

- Instruction Clock

Option	Descriptions
2T	2 oscillator periods.
4T	4 oscillator periods.

- Startup Time

  It needs a certain period to reach the suitable working voltage after IC started up. The Startup Time function can be used to adjust the time length of IC starting up.

- Low Voltage Reset Setting

  When VDD voltage is suddenly lower than the LVR Volta Startup Time, IC will be reset. For

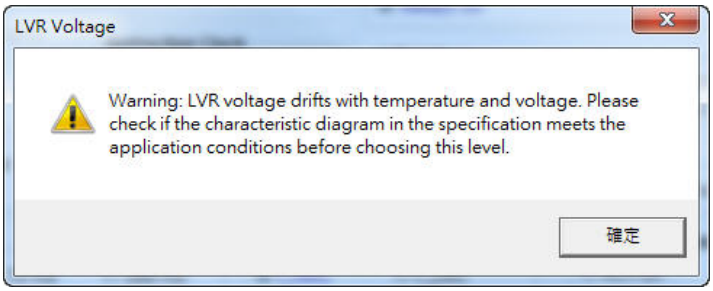
NY8A051H/NY8A051H1 series, there are 4 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

  If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting.

  Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



  When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A051H/NY8A051H1. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to

detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Event

Option	Descriptions
Reset	Reset program.
Interrupt	Execute the interruption of subroutine.

- WDT Time Base

  Set the time base of the Watchdog Timer.

- Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 are input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- Input Schmitt Trigger

The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

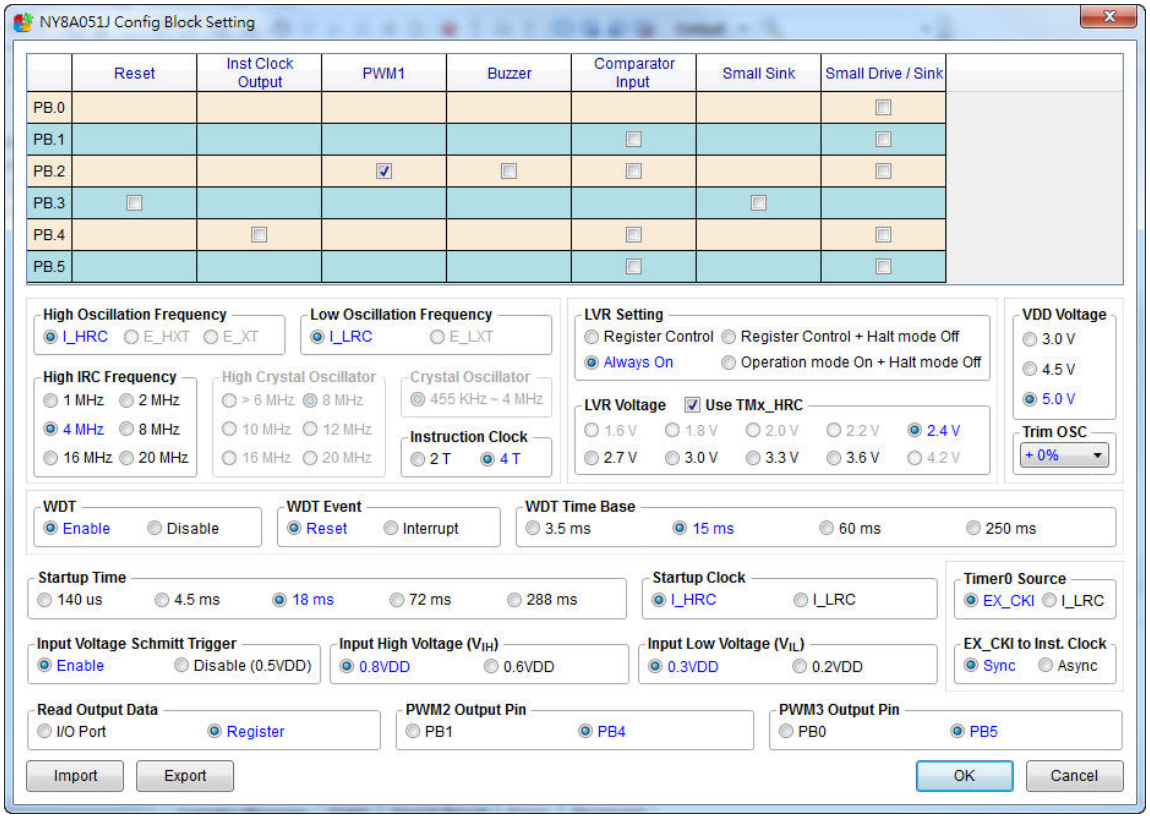
- Input Low Voltage (VIL)

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.10 NY8A051J

The NY8A051J setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, PWM, Buzzer and so on)
- Low Oscillation Frequency

Option	Descriptions
I_LRC	Internal low RC oscillator

- High Oscillation Frequency

Option	Descriptions
I_HRC	Internal high RC oscillator

- Instruction Clock

Option	Descriptions
2T	2 oscillator periods.
4T	4 oscillator periods.

- Startup Time

It needs a certain period to reach the suitable working voltage after IC started up. The Startup Time function can be used to adjust the time length of IC starting up.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Volta Startup Time, IC will be reset. For NY8A051J, there are 4 options of LVR setting.

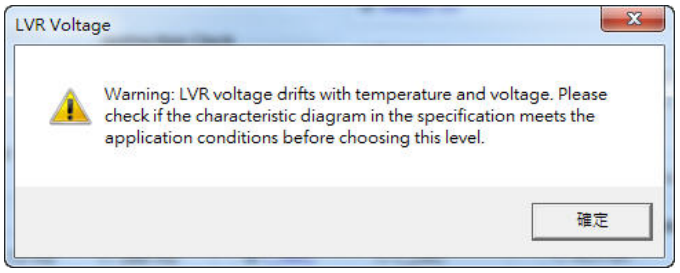
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting. When the TMx_HRC=1, the VOPL will be increased, the LVR option will also be limited. If TMx_HRC=0, user can un-tick the “Use TMx_HRC” option and set the lower LVR voltage option. If the “Use TMx_HRC” option is un-ticked, please fully verify the situation when the

working voltage is low to avoid malfunctions.

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A051J. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Event

Option	Descriptions
Reset	Reset program.
Interrupt	Execute the interruption of subroutine.

- WDT Time Base

Set the time base of the Watchdog Timer. Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 are input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- Input Voltage Schmitt Trigger

The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

There are 2 options for selecting the input high voltage.

Option	Descriptions
0.8VDD	Set the input high voltage (V_{IH}) as 0.8VDD.
0.6VDD	Set the input high voltage (V_{IH}) as 0.6VDD.

- Input Low Voltage (V_{IL})

There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- PWM2 Output Pin

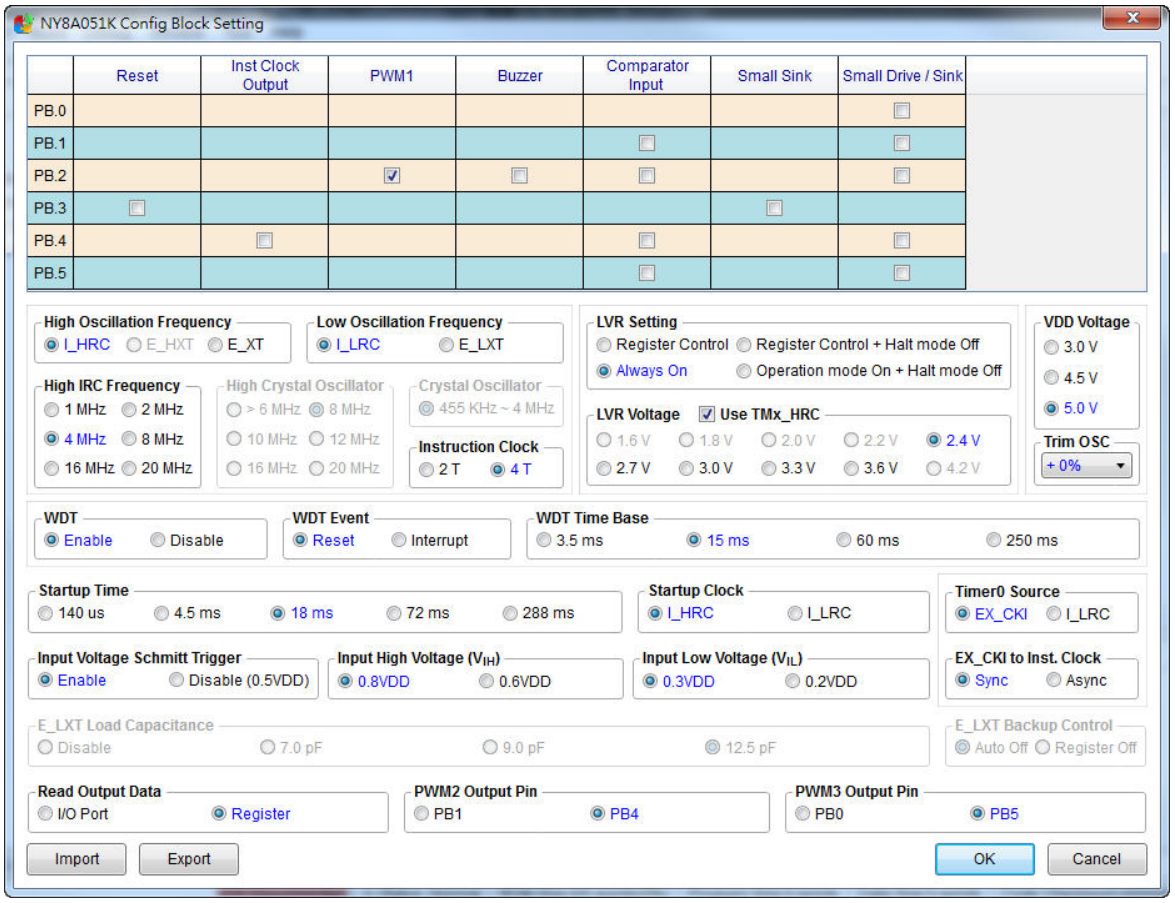
Option	Descriptions
PB.4	Set PB.4 as PWM2 output pin.(Default)
PB.1	Set PB.1 as PWM2 output pin.

- PWM3 Output Pin

Option	Descriptions
PB.5	Set PB.5 as PWM3 output pin.(Default)
PB.0	Set PB.0 as PWM3 output pin.

3.2.6.11 NY8A051K

The NY8A051K setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, Buzzer and so on)

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8A051K, there are 2 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8A051K series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- Startup Time

It needs a certain period to reach the suitable working voltage after IC started up. The Startup Time function can be used to adjust the time length of IC starting up.

- Low Voltage Reset Setting

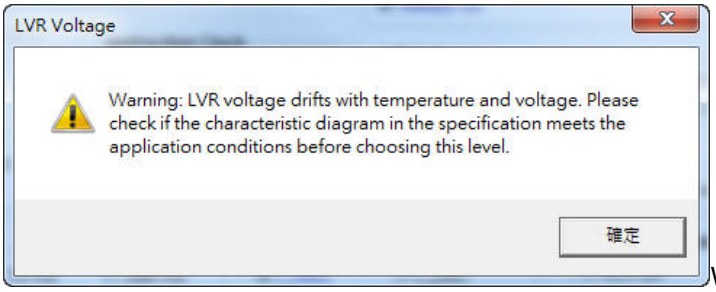
When VDD voltage is suddenly lower than the LVR Volta Startup Time, IC will be reset. For NY8A051K series, there are 4 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting. When the TMx_HRC=1, the VOPL will be increased, the LVR option will also be limited. If TMx_HRC=0, user can un-tick the “Use TMx_HRC” option and set the lower LVR voltage option. If the “Use TMx_HRC” option is un-ticked, please fully verify the situation when the working voltage is low to avoid malfunctions.

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A051K. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Event

Option	Descriptions
Reset	Reset program.
Interrupt	Execute the interruption of subroutine.

- WDT Time Base

  Set the time base of the Watchdog Timer.

- Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 are input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- Input Voltage Schmitt Trigger

The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

There are 2 options for selecting the input high voltage.

Option	Descriptions
0.8VDD	Set the input high voltage (V_{IH}) as 0.8VDD.
0.6VDD	Set the input high voltage (V_{IH}) as 0.6VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- E_LXT Load Capacitance

  Set the E_LXT Load Capacitance. Please set the corresponding load capacitance according to using E_LXT.

- PWM2 Output Pin

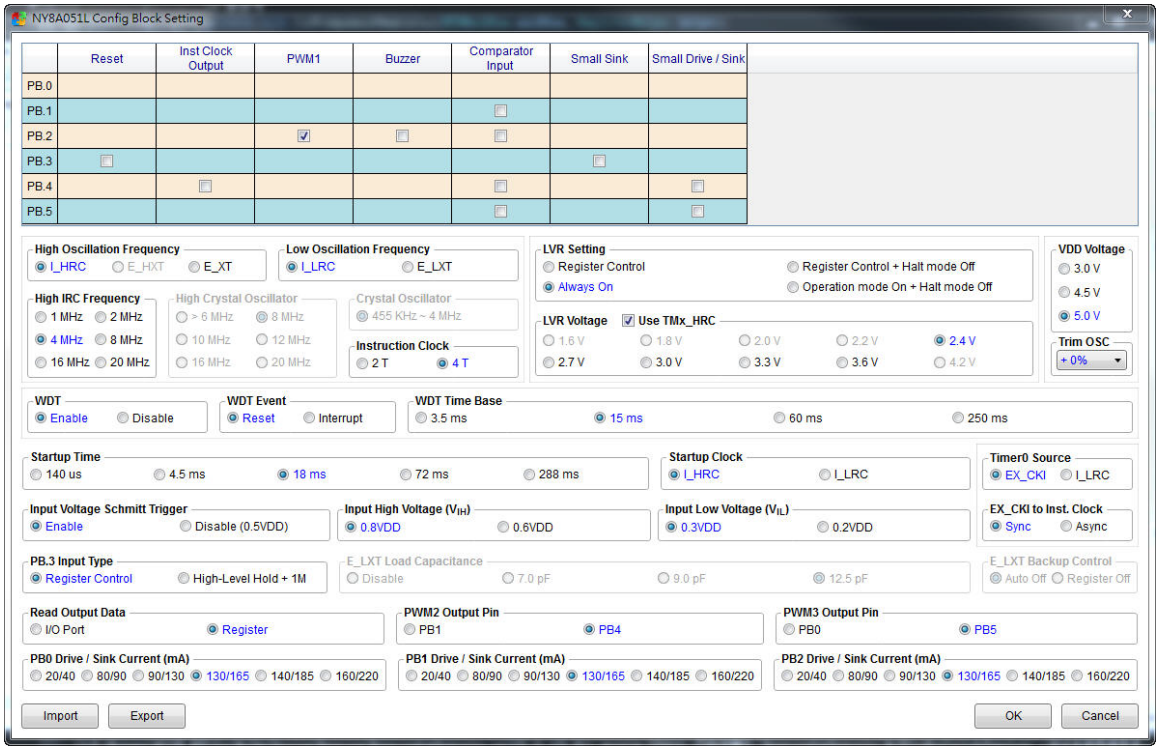
Option	Descriptions
PB.4	Set PB.4 as PWM2 output pin. (Default)
PB.1	Set PB.1 as PWM2 output pin.

- PWM3 Output Pin

Option	Descriptions
PB.5	Set PB.5 as PWM3 output pin. (Default)
PB.0	Set PB.0 as PWM3 output pin.

3.2.6.12 NY8A051L

The NY8A051L setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, Buzzer and so on)

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8A051L, there are 2 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8A051L series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- Startup Time

It needs a certain period to reach the suitable working voltage after IC started up. The Startup Time function can be used to adjust the time length of IC starting up.

- Low Voltage Reset Setting

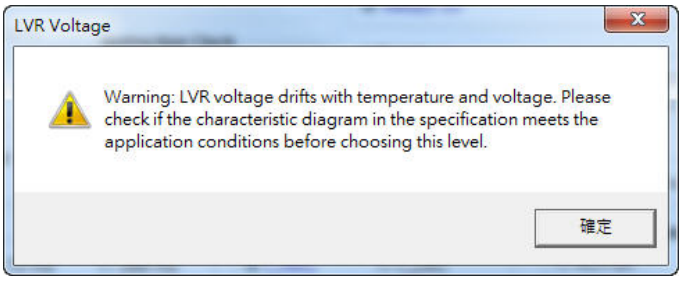
When VDD voltage is suddenly lower than the LVR Volta Startup Time, IC will be reset. For NY8A051L series, there are 4 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting. When the TMx_HRC=1, the VOPL will be increased, the LVR option will also be limited. If TMx_HRC=0, user can un-tick the “Use TMx_HRC” option and set the lower LVR voltage option. If the “Use TMx_HRC” option is un-ticked, please fully verify the situation when the working voltage is low to avoid malfunctions.

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A051L. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Event

Option	Descriptions
Reset	Reset program.
Interrupt	Execute the interruption of subroutine.

- WDT Time Base

  Set the time base of the Watchdog Timer.

- Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 are input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the

clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.8VDD	Set the input high voltage (V_{IH}) as 0.8VDD.
0.6VDD	Set the input high voltage (V_{IH}) as 0.6VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”,

meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- E_LXT Load Capacitance

  Set the E_LXT Load Capacitance. Please set the corresponding load capacitance according to using E_LXT.

- PWM2 Output Pin

Option	Descriptions
PB.4	Set PB.4 as PWM2 output pin. (Default)
PB.1	Set PB.1 as PWM2 output pin.

- PWM3 Output Pin

Option	Descriptions
PB.5	Set PB.5 as PWM3 output pin. (Default)
PB.0	Set PB.0 as PWM3 output pin.

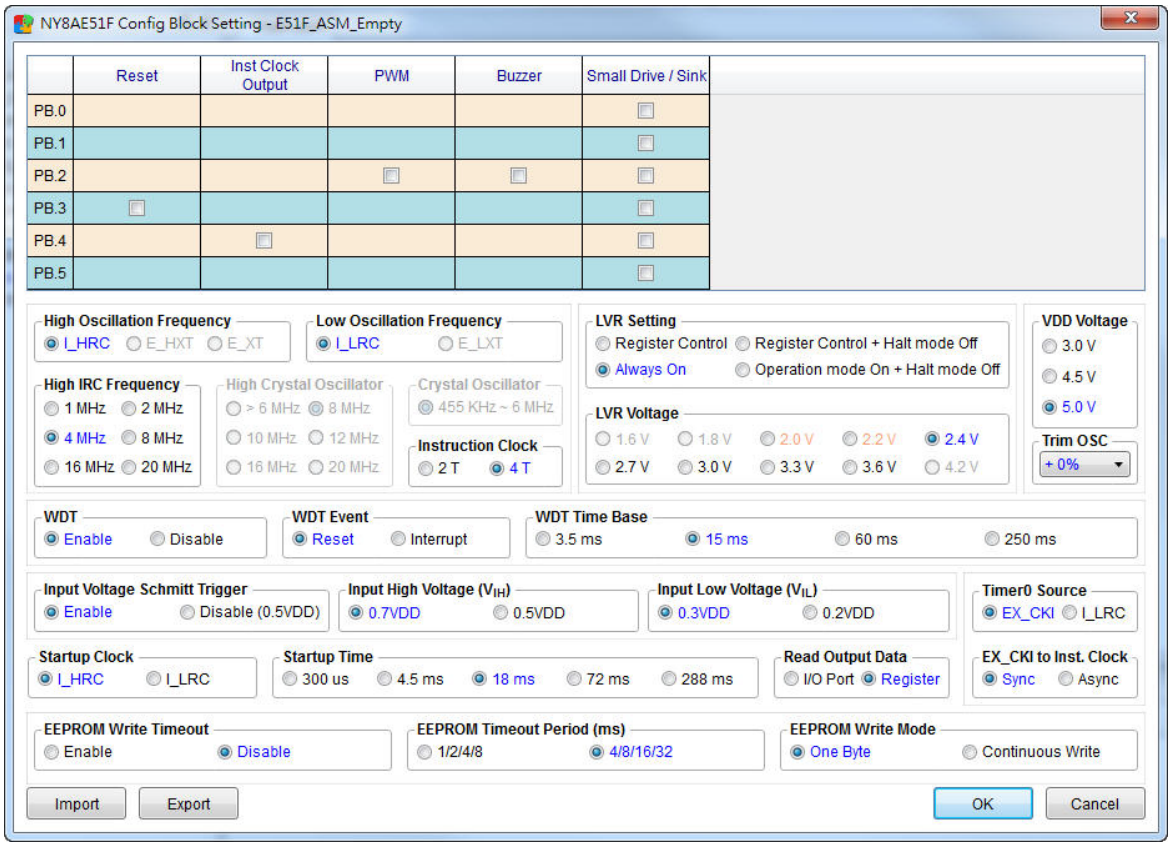
- Drive / Sink Current

  There are 6 options of Drive / Sink current set for user.

Option	Descriptions
20/40	Set the default Drive current of pin as 20mA and Sink current as 40mA.
80/90	Set the default Drive current of pin as 80mA and Sink current as 90mA.
90/130	Set the default Drive current of pin as 90mA and Sink current as 130mA.
130/165	Set the default Drive current of pin as 130mA and Sink current as 165mA.
140/185	Set the default Drive current of pin as 140mA and Sink current as 185mA.
160/220	Set the default Drive current of pin as 160mA and Sink current as 220mA.

3.2.6.13 NY8AE51F

The NY8AE51F setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



- Pin: Each pin is default as I/O, some pins provide special functions (e.g.,Reset, Inst Clock Output, 、PWM, Buzzer and so on)
- High Oscillation Frequency

Option	Descriptions
I_HRC	Internal high RC oscillator.

- Low Oscillation Frequency:

Option	Descriptions
I_LRC	Internal low RC oscillator.

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up.

- LVR Setting

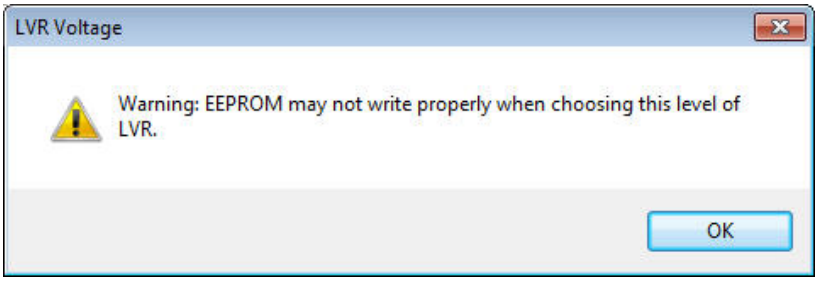
  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8AE51F, there are 4 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

  If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting.

  Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



  The LVR of EEPROM is recommend as 2.4V, if the voltage is lower than 2.4V, it may cause EEPROM cannot write properly. If user doesn't apply the EEPROM function, it's ok to ignore the warning message and select lower LVR voltage.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Time Base

  Set the time base of the Watchdog Timer.

- Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 are input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High

Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- EEPROM Write Timeout

  Enable or disable the EEPROM Writer Timeout.

- EEPROM Timeout Period

  There are 2 combinations for EEPROM Timeout Period: 1/2/4/8 ms and 4/8/16/32 ms. User can decide the detection cycle through EETO register later. (Please refer to the description of EETO regiser from Datasheet)

- EEPROM Write Mode

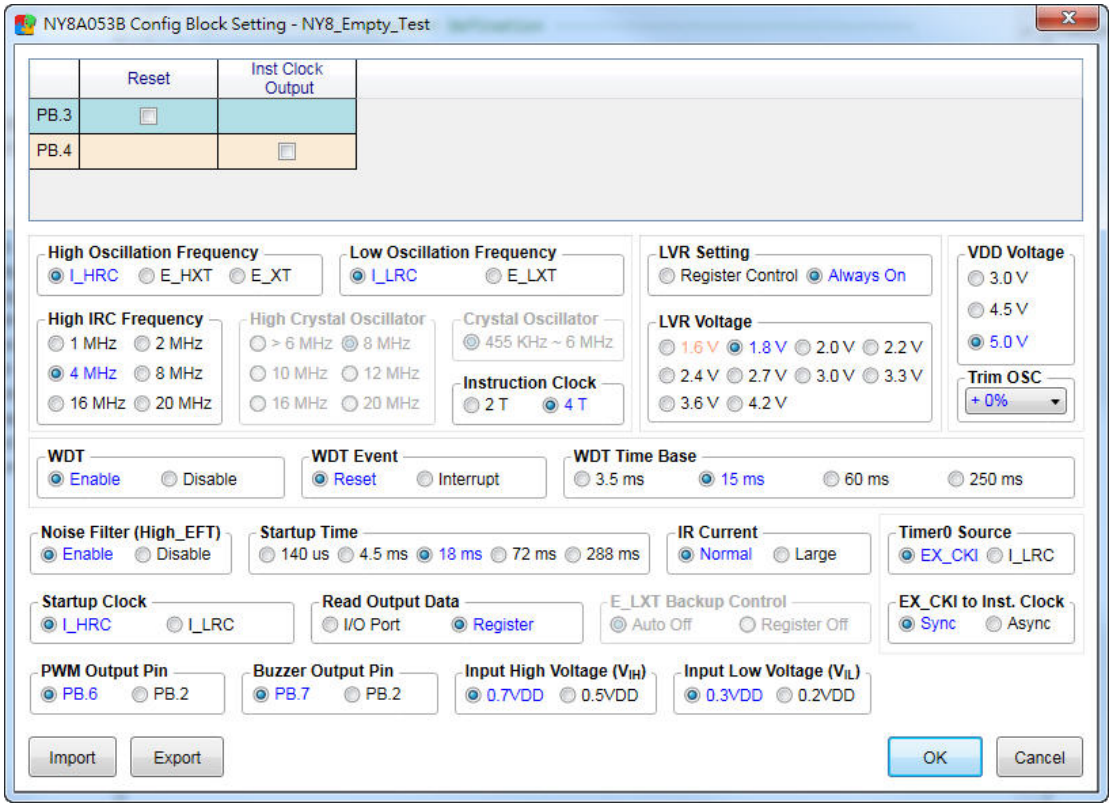
  There 2 options for selecting EEPROM write mode.

Option	Descriptions
One Byte	The EEPROM write process is 1. Unlock the write protection. 2. Write one byte. 3. The write protection will be automatically turned on.
Continuous Write	The EEPROM write process is 1. Unlock the write protection. 2. Write the needed data. 3. Turn on the write protection manually

3.2.6.14 NY8A053B/53D

The NY8A053B/53D setting window is below. The grayed-out parts mean the selection cannot be

ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
Option	**Descriptions**
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 2 options of LVR setting.

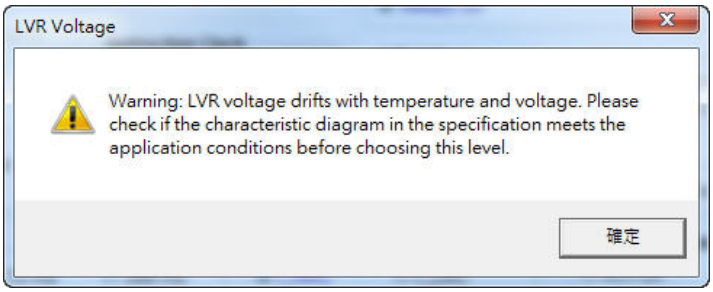
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 10 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V	4.2V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A053B/NY8A053D. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

  Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

  The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable. (Only NY8A053B provides this function.)

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8

series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- IR Current

  The IR Current function can be set as 2 different options of current. (Only NY8A053B provides this function.)

Options	Descriptions
Normal	60mA IR current provided internally.
Large	340mA IR current provided internally.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- PWM Output Pi

There are 2 options to set the output pin of PWM. The default PWM output pin is PB.6, user can set PB2 as PWM output pin. User can enable or disable PWM function dynamically by register. When PWM is disabled, PB.6 or PB2 can be general I/O.

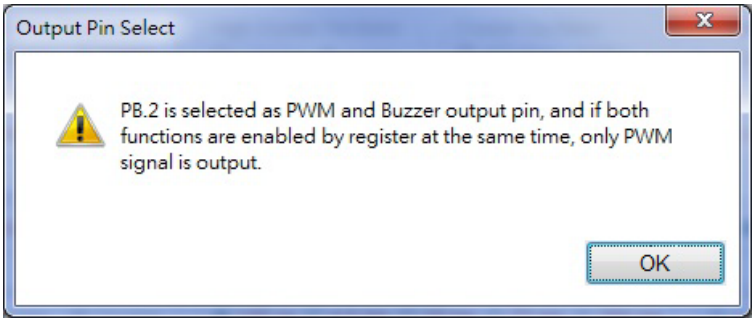
Option	Descriptions
PB.6	Set PB.6 as PWM output pin.
PB.2	Set PB.2 as PWM or Buzzer output pin.

- Buzzer Output Pin

There are 2 options to set the output pin of Buzzer. The default Buzzer output pin is PB.7, user can set PB2 as Buzzer output pin. User can enable or disable PWM / Buzzer function dynamically by register. When Buzzer is disabled, PB.7 or PB2 can be general I/O.

Option	Descriptions
PB.7	Set PB.7 as Buzzer output pin.
PB.2	Set PB.2 as PWM or Buzzer output pin.

If PB.2 is set as PWM and Buzzer output pin, the following dialog box will pop up, and explain that if both functions are enabled by register at the same time, only PWM signal is output.



- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- PWM

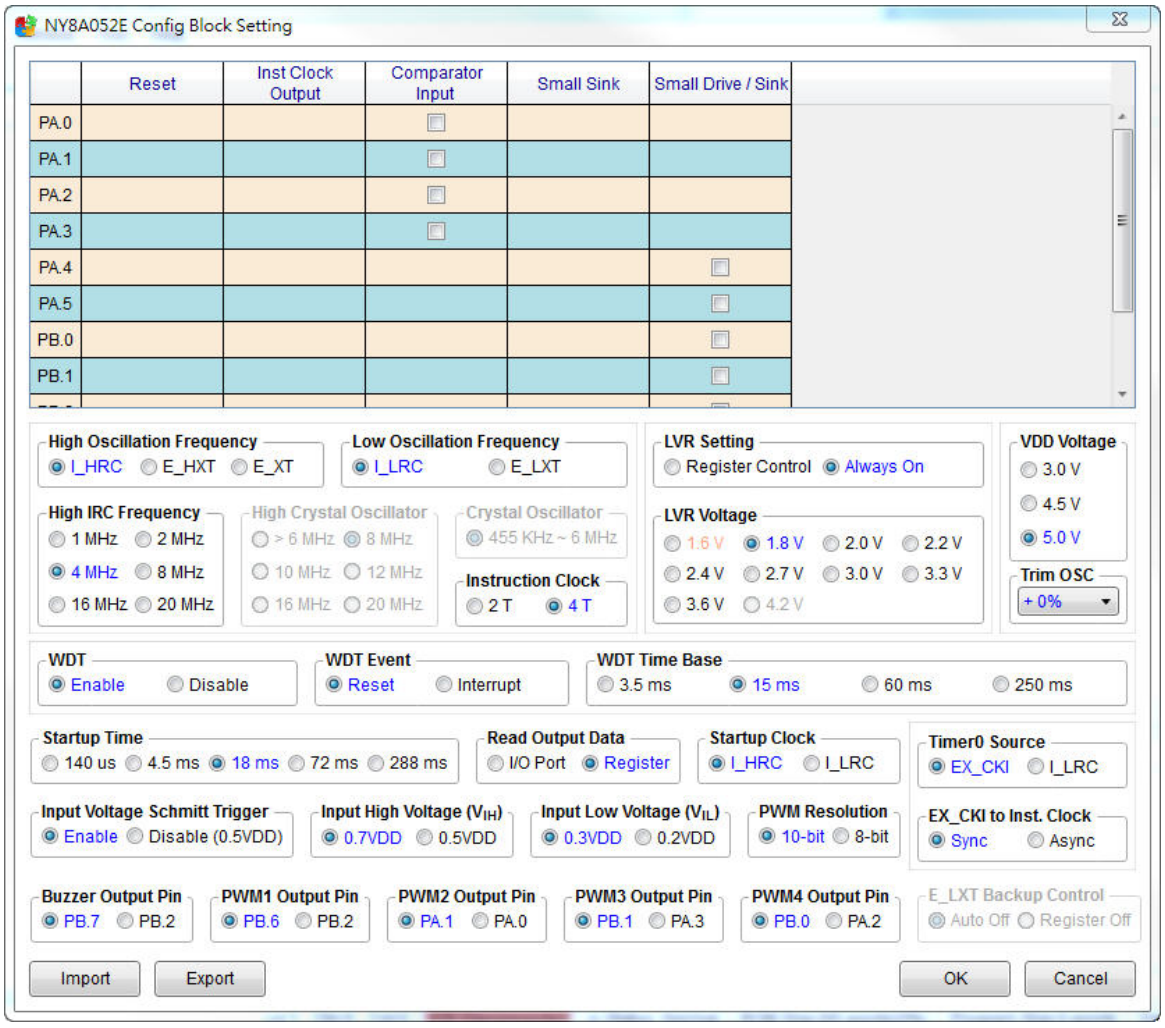
  Set the pin as PWM output pin.

- Buzzer

  Set the pin as Buzzer output pin.

3.2.6.15 NY8A052E

The NY8A052E setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output and so on)

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

  The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

  For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- High Crystal Oscillator

  For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

  Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 2 options of LVR setting.

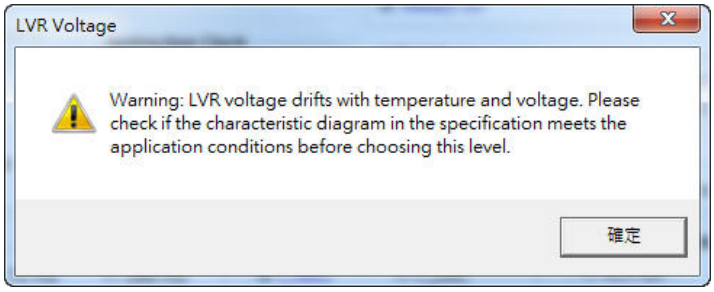
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	2	3	4	5	6	7	8	9
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A052E. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

The WDT Time Base function can be set as 4 different options of WDT time base.

1	2	3	4
3.5ms	15ms	60ms	250ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- PWM Resolution

  The PWM Resolution can be set as 2 different options of resolution.

Option	Descriptions
10-bit	Set the PWM resolution output as 10-bit. (Default)
8-bit	Set the PWM resolution output as 8-bit.

- 脈衝寬度調變輸出腳位（PWM Output Pin）:

  There are 4 sets of PWM output pin in NY8A052E, each pin has 2 options. Options and the default of each PWM are as follows.

  PWM1:

Option	Descriptions
PB.6	Set PB.6 as PWM1 output pin. (Default)
PB.2	Set PB.2 as PWM1 output pin.

  PWM2:

Option	Descriptions
PA.1	Set PA.1 as PWM2 output pin. (Default)
PA.0	Set PA.0 as PWM2 output pin.

  PWM3:

Option	Descriptions
PB.1	Set PB.1 as PWM3 output pin.
PA.3	Set PA.3 as PWM3 output pin.

  PWM4:

Option	Descriptions
PB.0	Set PB.0 as PWM4 output pin. (Default)

PA.2	Set PA.2 as PWM4 output pin.

- Buzzer Output Pin

There are 2 options to set the output pin of Buzzer. The default Buzzer output pin is PB.7, user can set PB2 as Buzzer output pin. User can enable or disable PWM / Buzzer function dynamically by register. When Buzzer is disabled, PB.7 can be general I/O

Option	Descriptions
PB.7	Set PB.7 as Buzzer output pin.
PB.2	Set PB.2 as PWM or Buzzer output pin.

- Input Voltage Schmitt Trigger

The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

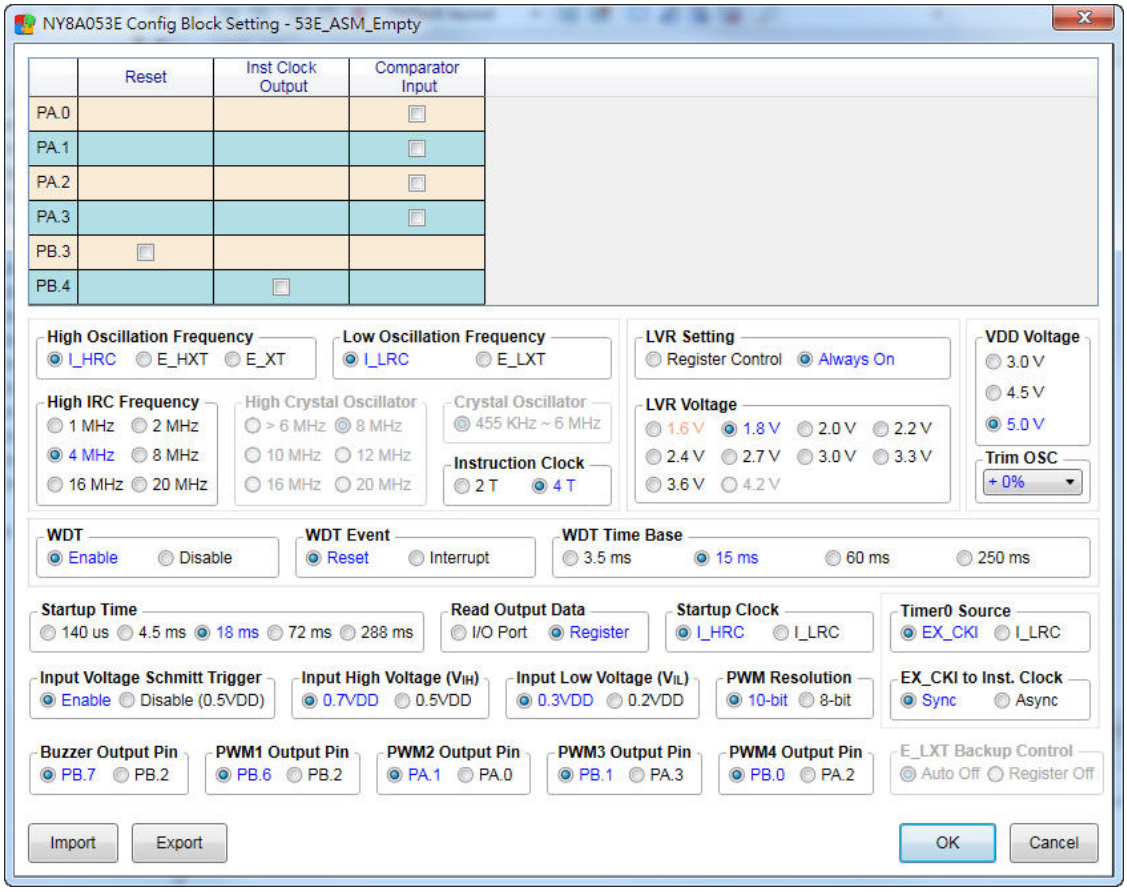
- Input Low Voltage (V_{IL})

There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.16 NY8A053E

The NY8A053E setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, PWM, Buzzer and so on).

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 2 options of LVR setting.

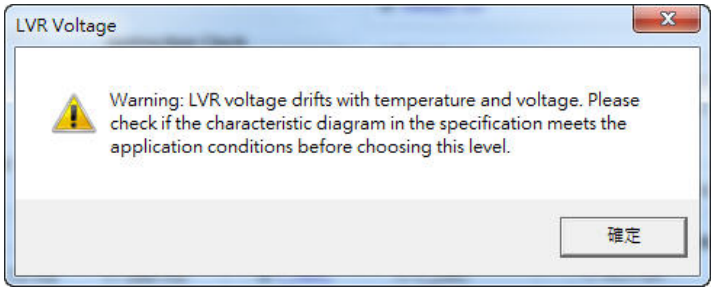
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	2	3	4	5	6	7	8	9
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8A053E. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

  Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

  The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	2	3	4
3.5ms	15ms	60ms	250ms

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8

series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”**,** meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- PWM Resolution

  The PWM Resolution can be set as 2 different options of resolution.

Option	Descriptions
10-bit	Set the PWM resolution output as 10-bit. (Default)
8-bit	Set the PWM resolution output as 8-bit.

- PWM Output Pin

  There are 4 sets of PWM output pin in NY8A053E, each pin has 2 options. Options and the default of each PWM are as follows.

  PWM1:

Option	Descriptions
PB.6	Set PB.6 as PWM1 output pin. (Default)
PB.2	Set PB.2 as PWM1 output pin.

  PWM2:

Option	Descriptions
PA.1	Set PA.1 as PWM2 output pin. (Default)
PA.0	Set PA.0 as PWM2 output pin.

  PWM3:

Option	Descriptions
PB.1	Set PB.1 as PWM3 output pin.
PA.3	Set PA.3 as PWM3 output pin.

PWM4:

Option	Descriptions
PB.0	Set PB.0 as PWM4 output pin. (Default)
PA.2	Set PA.2 as PWM4 output pin.

- Buzzer Output Pin

  There are 2 options to set the output pin of Buzzer. The default Buzzer output pin is PB.7, user can set PB2 as Buzzer output pin. User can enable or disable PWM / Buzzer function dynamically by register. When Buzzer is disabled, PB.7 can be general I/O

Option	Descriptions
PB.7	Set PB.7 as Buzzer output pin.
PB.2	Set PB.2 as PWM or Buzzer output pin.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

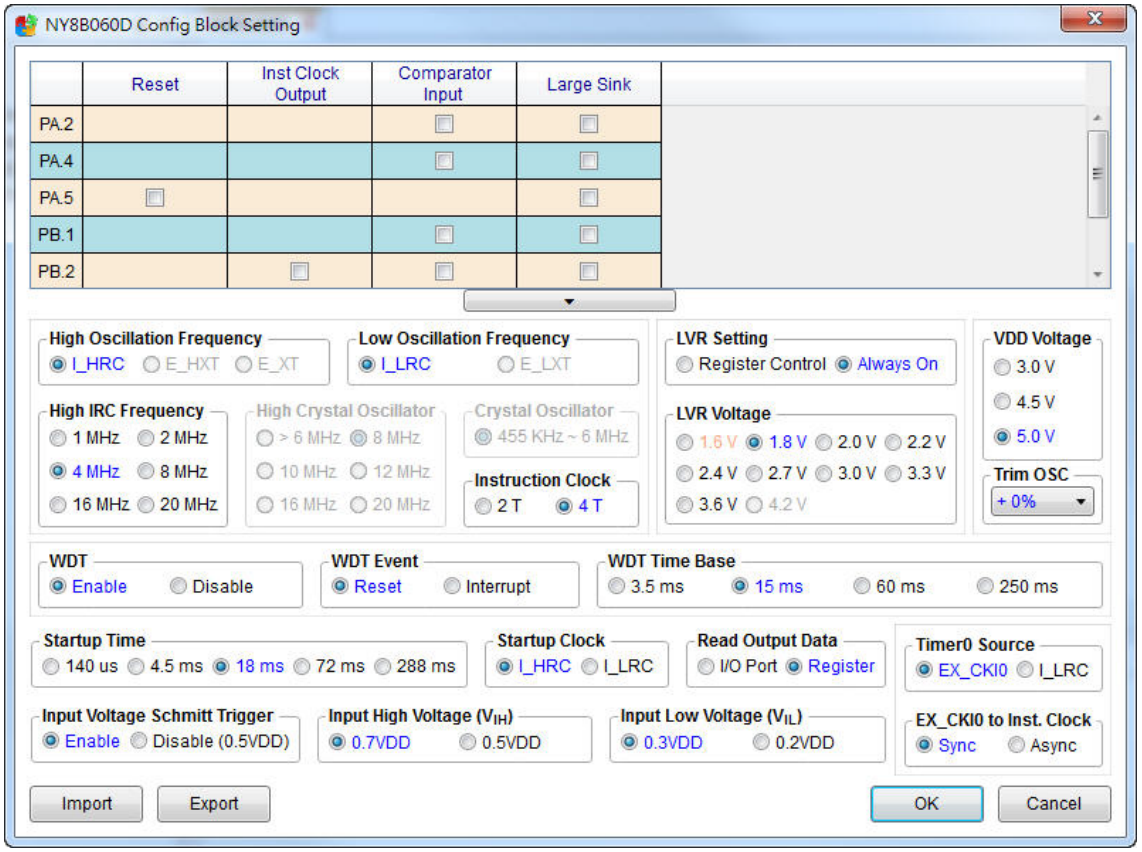
- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.17 NY8B060D

The NY8B060D setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, Comparator Input and so on).
- Low Oscillation Frequency

Option	Descriptions
I_LRC	Internal low RC oscillator.

- High Oscillation Frequency

Option	Descriptions
I_HRC	Internal high RC oscillator.

- Instruction Clock

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- Startup Time

  It needs a certain period to reach the suitable working voltage after IC started up. The Startup Time function can be used to adjust the time length of IC starting up.

- LVR Setting

  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8B060D there are 2 options of LVR setting.

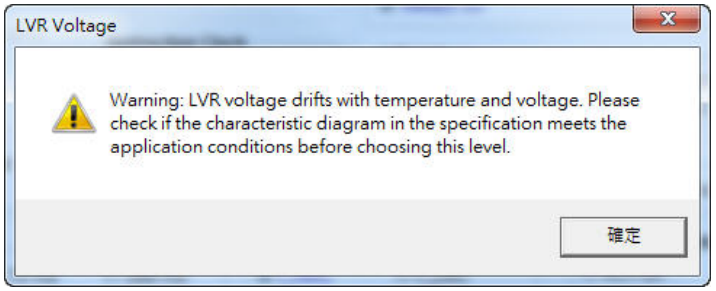
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage

  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8B060D. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Event

Option	Descriptions
Reset	Reset program.
Interrupt	Execute the interruption of subroutine.

- WDT Time Base

  Set the time base of the Watchdog Timer.

- Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 is input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections-- Input High Voltage (VIH) and Input Low Voltage (VIL). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (VIH)

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

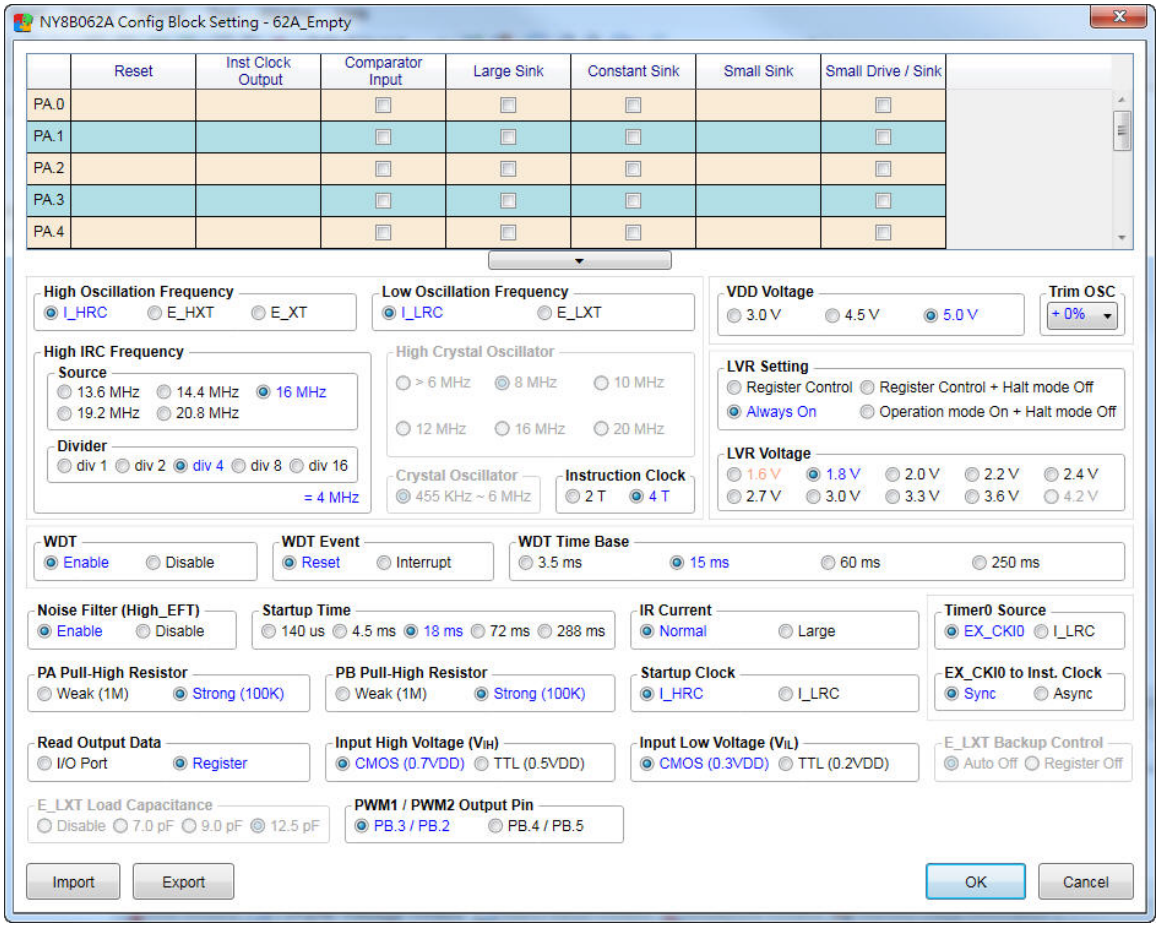
- Input Low Voltage (VIL)

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.18 NY8B062A

The NY8B062A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).
- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency:

For NY8B062A, there are 5 available options of frequency.

1	*2*	*3*	*4*	*5*
13.6MHz	14.4MHz	16MHz	19.2MHz	20.8MHz

- Frequency Divider

After setting the high oscillation frequency, user can decide the output frequency by selecting the frequency divider. For NY8B062A, there are 5 available options.

1	*2*	*3*	*4*	*5*
div 1	div 2	div 4	div 8	div 16

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8B062A, there are 4 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.

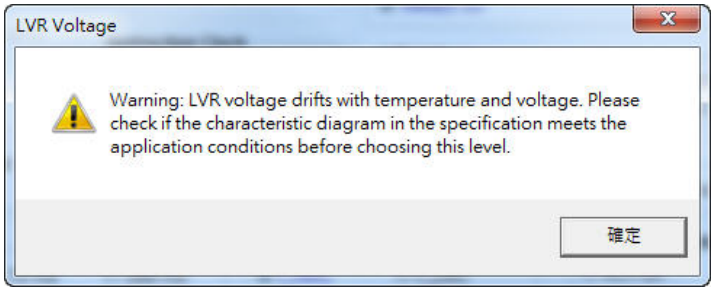
Option	Descriptions
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8B062A. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- IR Current

  The IR Current function can be set as 2 different options of current.

Options	Descriptions
Normal	60mA IR current provided internally.
Large	340mA IR current provided internally.

- Pull-High Resistor

  The Pull-High Resistor set the resistor on the pin. For NY8 series, there are 2 available options of Pull-High Resistor.

Options	Descriptions
Weak	Internal 1MΩ Pull-High resistor.
Strong	Internal 100kΩ Pull-High resistor.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”**,** meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- E_LXT Load Capacitance

  Select the load capacitance of the external quartz oscillator. Please select the corresponding load capacitance value option according to the quartz oscillator used.

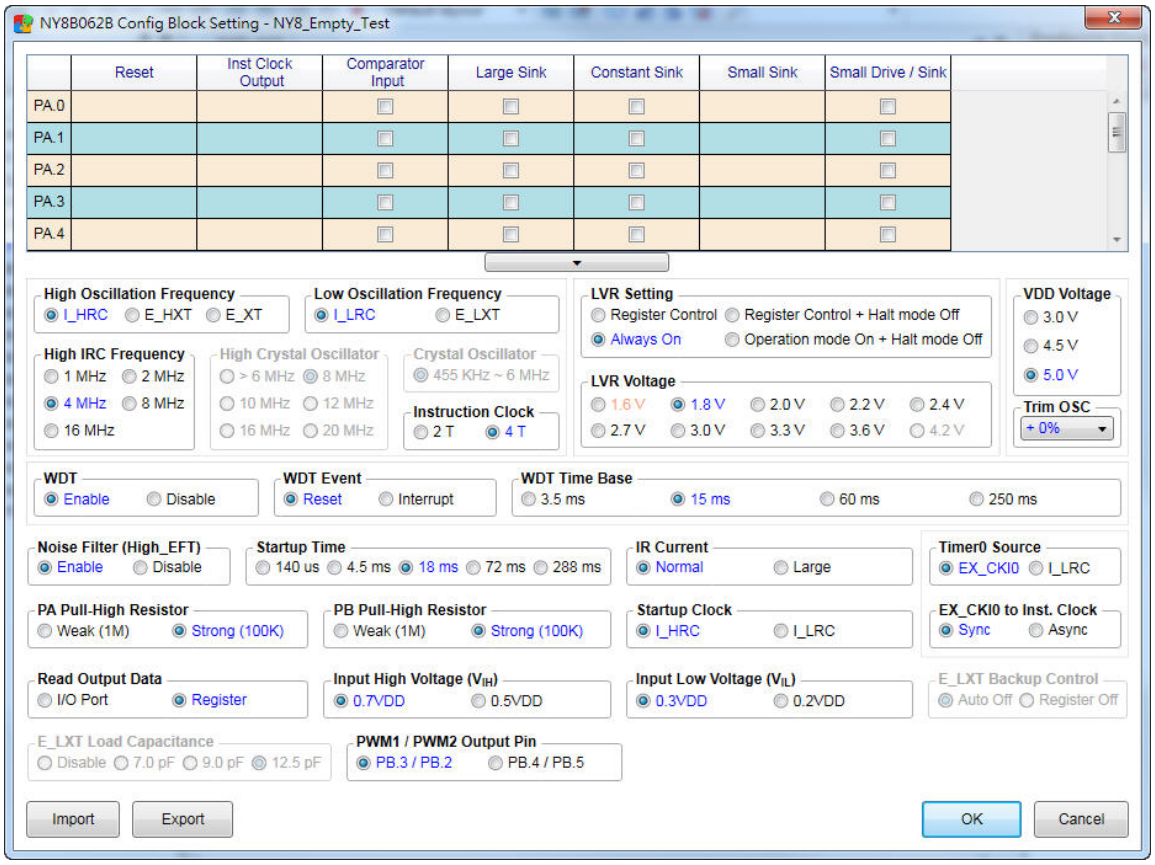
- PWM Output Pin

  There are 3 sets of PWM output pin for NY8B062A, the PA2 is the fixed output pin of PWM3, but user can select output pins as PWM1 or PWM2. There are 2 sets to choose from.

Option	Descriptions
PB.3 / PB.2	Set PB.3 as PWM1 output pin, PB.2 as PWM2 output pin.
PB.4 / PB.5	Set PB.4 as PWM1 output pin, PB.5 as PWM2 output pin.

3.2.6.19 NY8B062B

The NY8B062B setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).
- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For NY8B062B, there are 5 available options of frequency.

1	*2*	*3*	*4*	*5*
13.6MHz	14.4MHz	16MHz	19.2MHz	20.8MHz

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8B062B, there are 4 options of LVR setting.

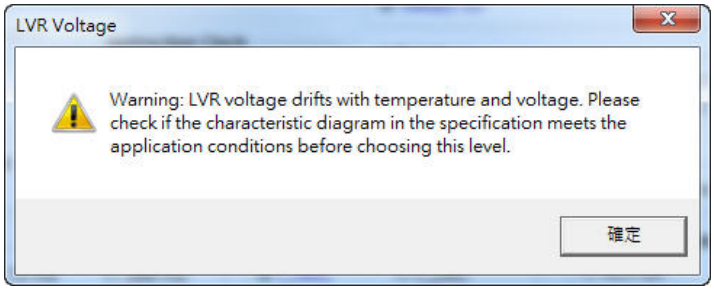
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	2	3	4	5	6	7	8	9
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8B062B. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

The WDT Time Base function can be set as 4 different options of WDT time base.

1	2	3	4
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- IR Current

  The IR Current function can be set as 2 different options of current.

Options	Descriptions
Normal	60mA IR current provided internally.
Large	340mA IR current provided internally.

- Pull-High Resistor

  The Pull-High Resistor set the resistor on the pin. For NY8 series, there are 2 available options of Pull-High Resistor.

Options	Descriptions
Weak	Internal 1MΩ Pull-High resistor.
Strong	Internal 100kΩ Pull-High resistor.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can

set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”**,** meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input High Voltage (V_{IH})

There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- E_LXT Load Capacitance

  Select the load capacitance of the external quartz oscillator. Please select the corresponding load capacitance value option according to the quartz oscillator used.

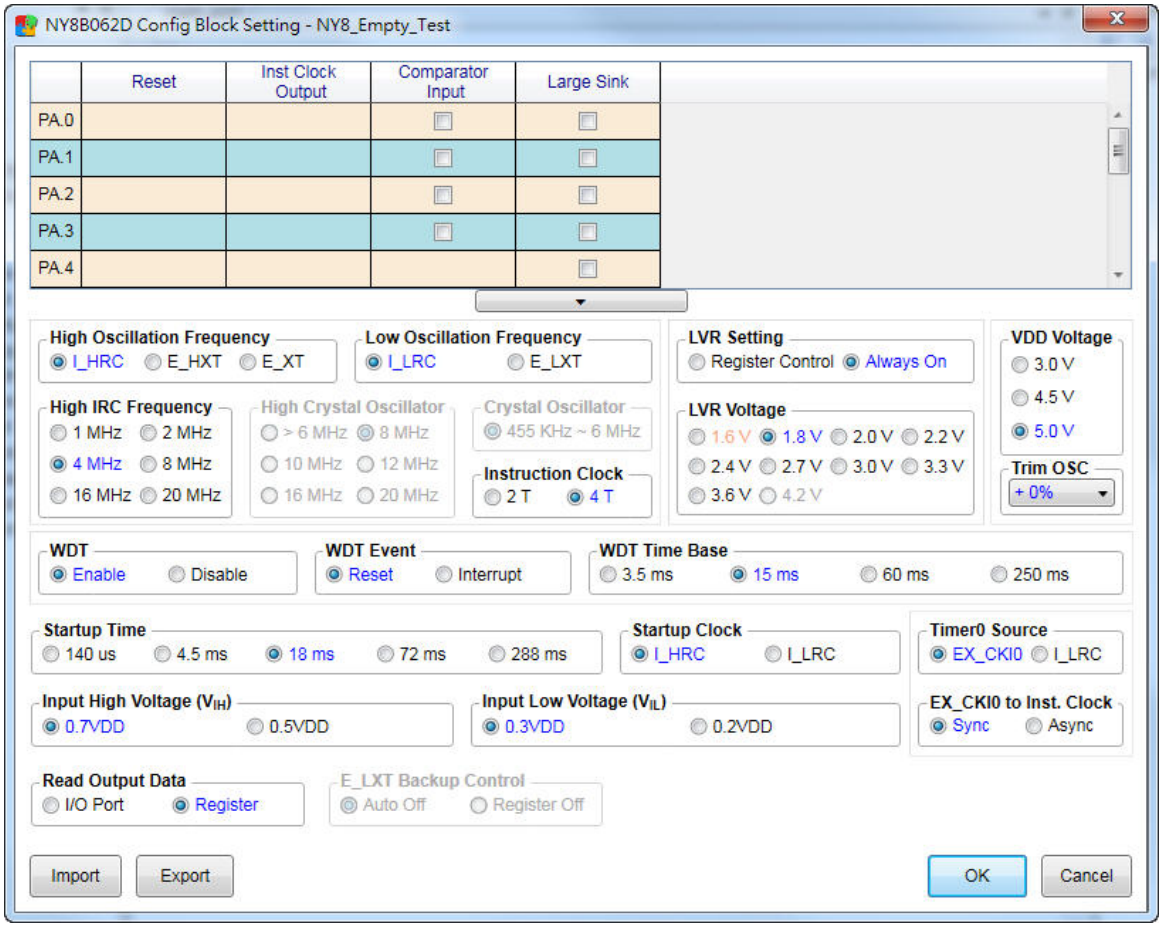
- PWM Output Pin

  There are 3 sets of PWM output pin for NY8B062B, the PA2 is the fixed output pin of PWM3, but user can select output pins as PWM1 or PWM2. There are 2 sets to choose from.

Option	Descriptions
PB.3 / PB.2	Set PB.3 as PWM1 output pin, PB.2 as PWM2 output pin.
PB.4 / PB.5	Set PB.4 as PWM1 output pin, PB.5 as PWM2 output pin.

3.2.6.20 NY8B062D

The NY8B062D setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).
- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 2 options of LVR setting.

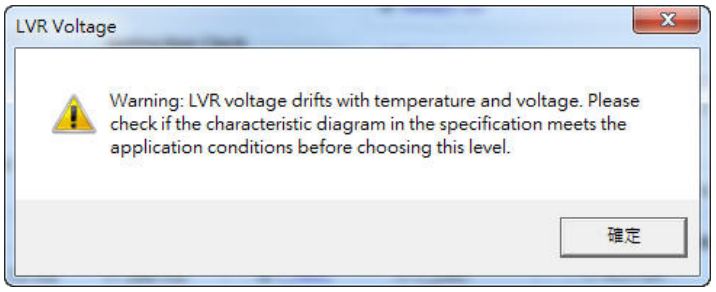
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8B062D. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Startup Time

The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is

selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage:

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	2	3

3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

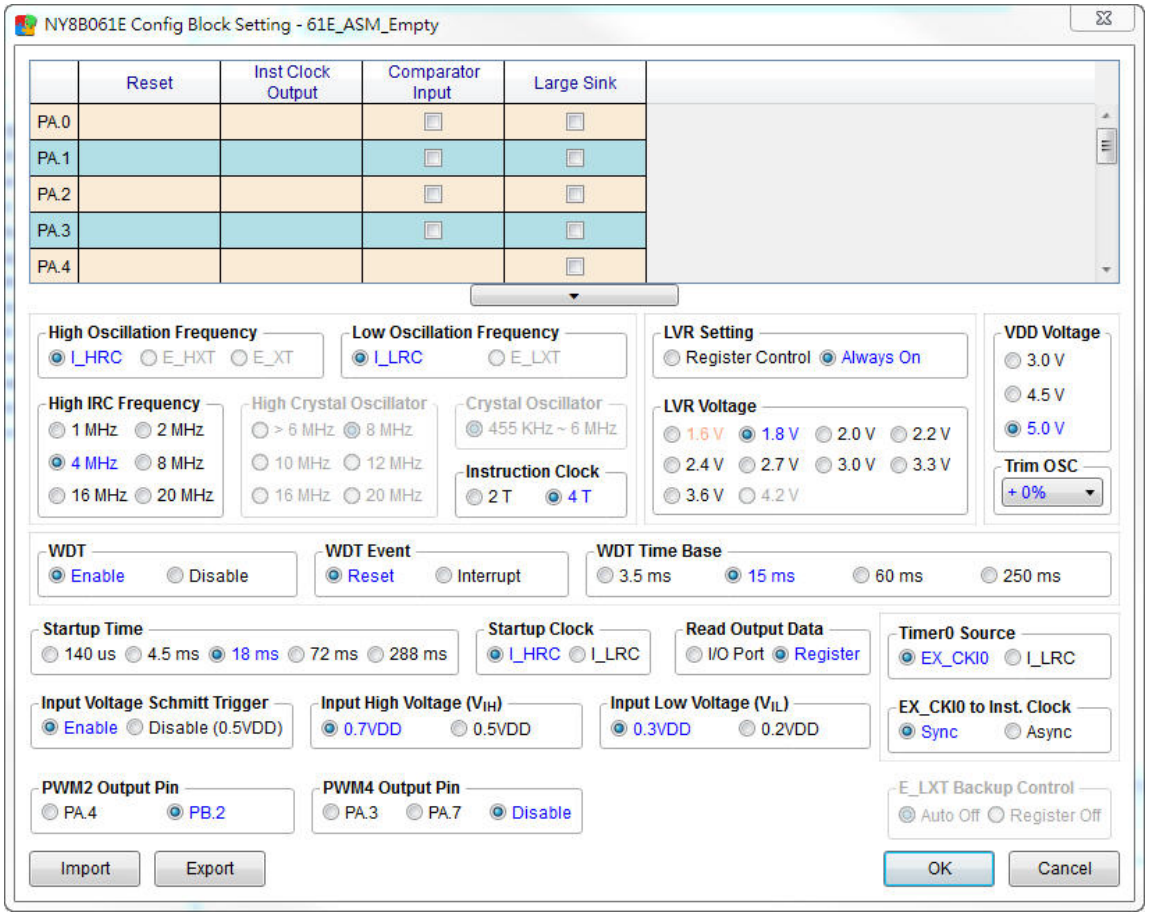
- Input Low Voltage (V_{IL})

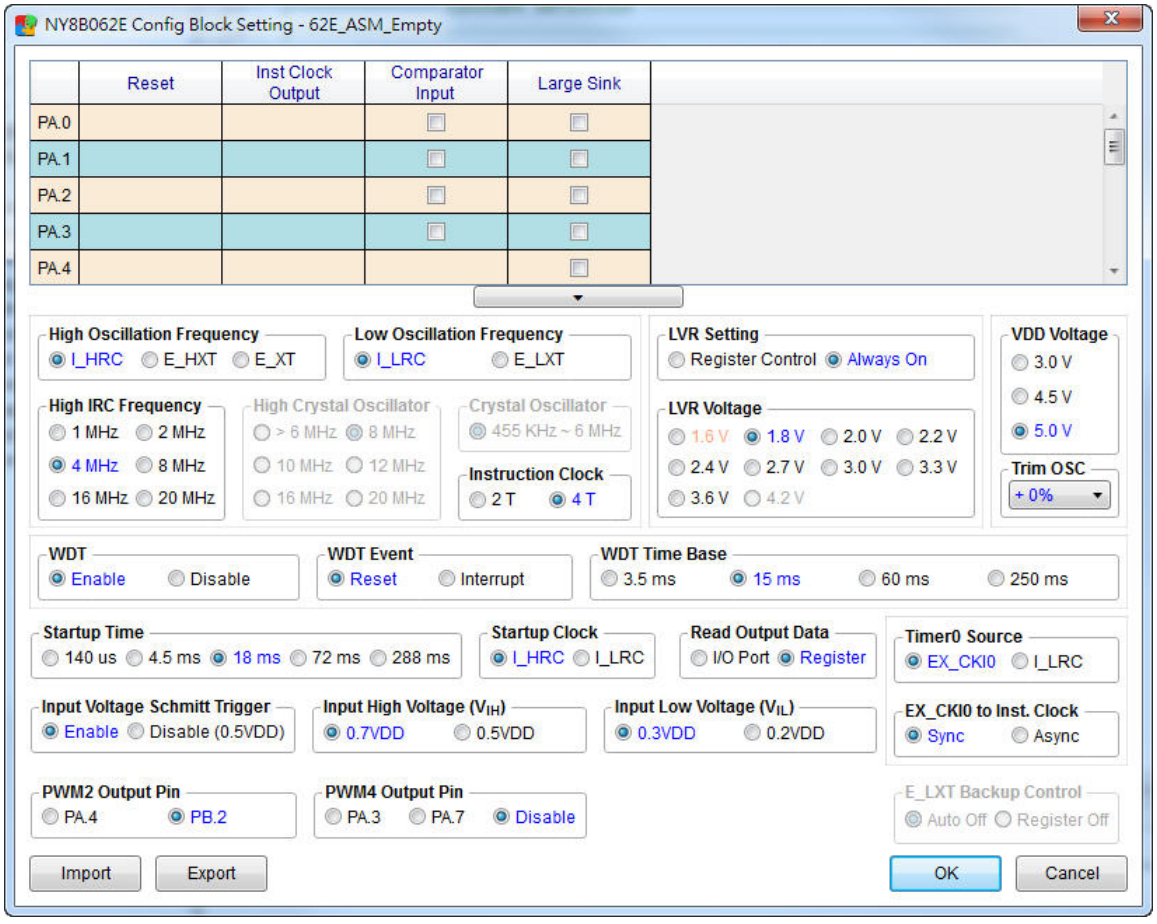
  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.21 NY8B061E/NY8B062E/NY8B062F

The NY8B061E/NY8B062E/NY8B062F setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.


NY8B061E Config Block Setting - 61E_ASM_Empty
Reset
Inst Clock Output
Comparator Input
Large Sink
PA.0
PA.1
PA.2
PA.3
PA.4
High Oscillation Frequency
I_HRC E_HXT E_XT
Low Oscillation Frequency
I_LRC E_LXT
LVR Setting
Register Control Always On
VDD Voltage
3.0 V
4.5 V
5.0 V
High IRC Frequency
1 MHz 2 MHz
4 MHz 8 MHz
16 MHz 20 MHz
High Crystal Oscillator
> 6 MHz 8 MHz
10 MHz 12 MHz
16 MHz 20 MHz
Crystal Oscillator
455 KHz ~ 6 MHz
Instruction Clock
2 T 4 T
LVR Voltage
1.6 V 1.8 V 2.0 V 2.2 V
2.4 V 2.7 V 3.0 V 3.3 V
3.6 V 4.2 V
Trim OSC
+ 0%
WDT
Enable Disable
WDT Event
Reset Interrupt
WDT Time Base
3.5 ms 15 ms 60 ms 250 ms
Startup Time
140 us 4.5 ms 18 ms 72 ms 288 ms
Startup Clock
I_HRC I_LRC
Read Output Data
I/O Port Register
Timer0 Source
EX_CKI0 I_LRC
Input Voltage Schmitt Trigger
Enable Disable (0.5VDD)
Input High Voltage (VIH)
0.7VDD 0.5VDD
Input Low Voltage (VIL)
0.3VDD 0.2VDD
EX_CKI0 to Inst. Clock
Sync Async
PWM2 Output Pin
PA.4 PB.2
PWM4 Output Pin
PA.3 PA.7 Disable
E_LXT Backup Control
Auto Off Register Off
Import
Export
OK
Cancel



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_LXT	External low crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 2 options of LVR setting.

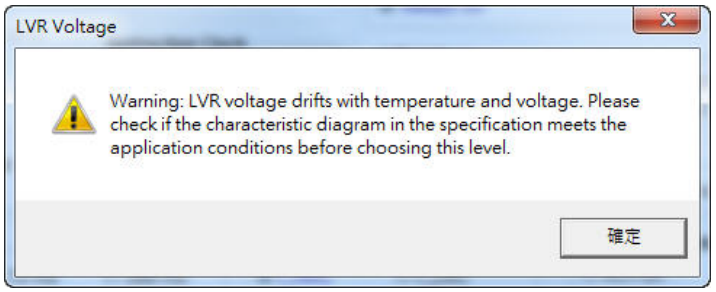
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of N8B061E/62E/62F. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

  Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

  The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to

I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”**,** meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage:

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- PWM Output Pin

  There are 2 sets of PWM output pin for NY8B062E. (This feature is not available yet)

  PWM2

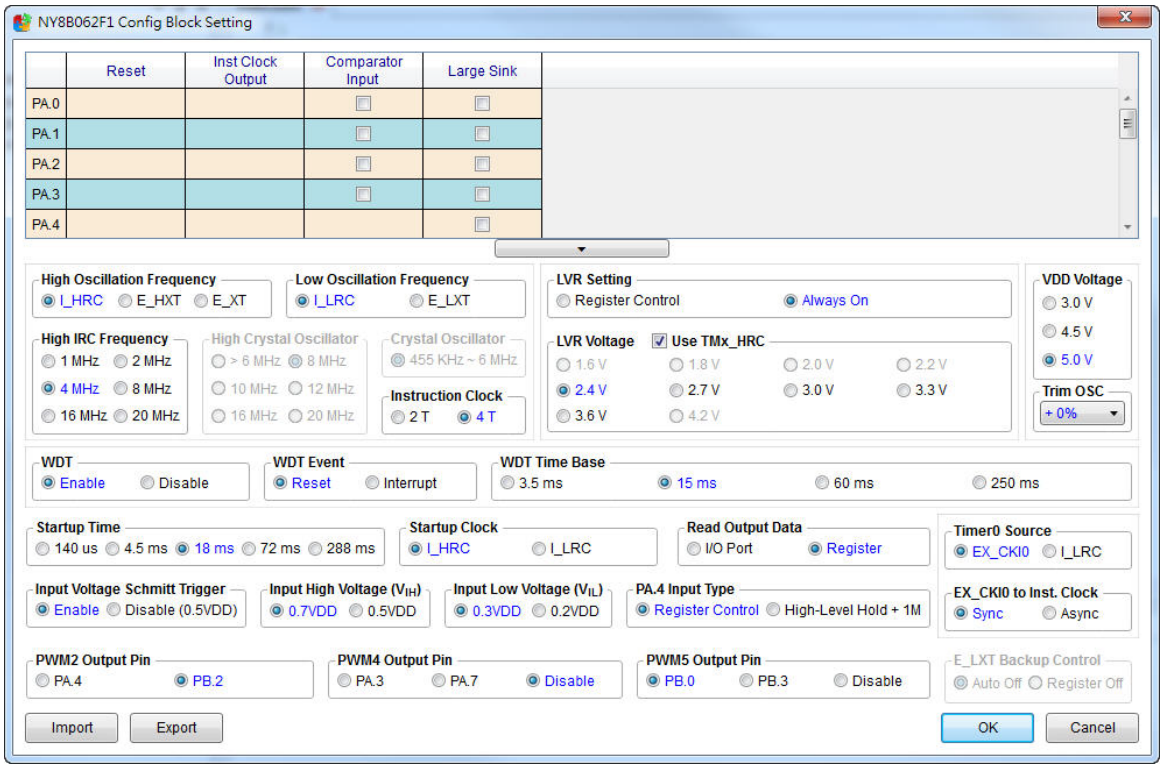
Option	Descriptions
PA.4	Set PA.4 as PWM2 output pin.
PB.2	Set PB.2 as PWM2 output pin.

  PWM4

Option	Descriptions
PA.3	Set PA.3 as PWM4 output pin.
PA.7	Set PA.7 as PWM4 output pin.
Disable	Set PWM4 as disabled.

3.2.6.22 NY8B062F1

The NY8B062F1 setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).
- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_LXT	External low crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 2 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

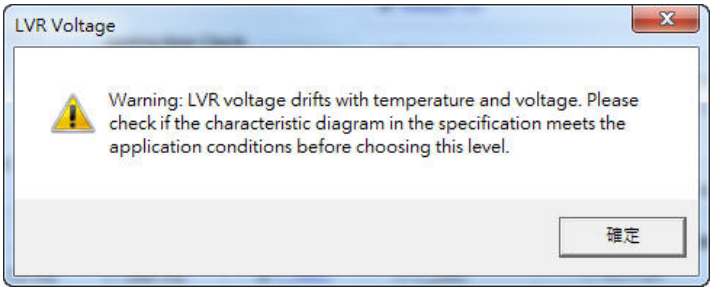
- LVR Voltage

If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting. When the TMx_HRC=1, the VOPL will be increased, the LVR option will also be limited. If TMx_HRC=0, user can un-tick the “Use TMx_HRC” option and set the lower LVR voltage option. If the “Use TMx_HRC” option is un-ticked, please fully verify the situation when the working voltage is low to avoid malfunctions

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a

warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of N8B062F1. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

  Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

  The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to

I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”**,** meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage:

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- 輸入型態（Input Type）:

  User can select the resistor of input type for different applications. For NY8B062F1, there are 2 options to select.

Option	Descriptions
Register Control	User can decide the input type by using the register control.
High-Level Hold + 1M	When the button is pressed, the IC has an internal pull-up resistor of 1MΩ; and when the button is released, the IC has an internal pull-up resistor of 85KΩ.

- PWM Output Pin

  There are 2 sets of PWM output pin for NY8B062E. (This feature is not available yet)

  PWM2

Option	Descriptions
PA.4	Set PA.4 as PWM2 output pin.
PB.2	Set PB.2 as PWM2 output pin.

  PWM4

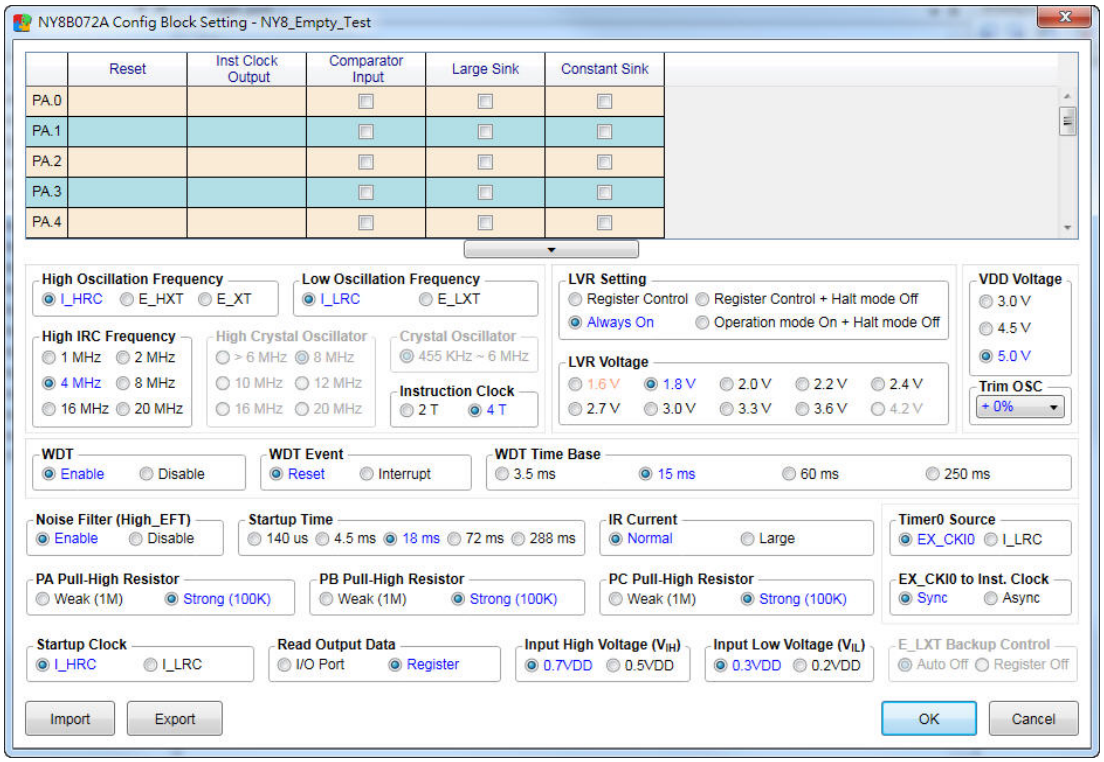
Option	Descriptions
PA.3	Set PA.3 as PWM4 output pin.
PA.7	Set PA.7 as PWM4 output pin.
Disable	Set PWM4 as disabled.

PWM5

Option	Descriptions
PB.0	Set PB.0 as PWM5 output pin.
PB.3	Set PB.3 as PWM5 output pin.
Disable	Set PWM5 as disabled.

3.2.6.23 NY8B072A

The NY8B072A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of

high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

  The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

  For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- High Crystal Oscillator

  For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

  Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8B072A, there are 4 options of LVR setting.

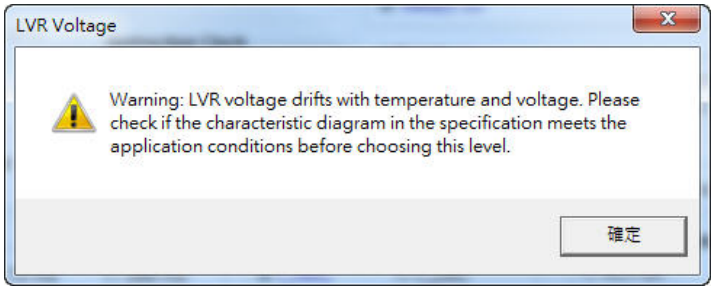
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8B072A. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Pull-High Resistor

  The Pull-High Resistor set the resistor on the pin. For NY8 series, there are 2 available options of Pull-High Resistor.

Options	Descriptions
Weak	Internal 1MΩ Pull-High resistor.
Strong	Internal 100kΩ Pull-High resistor.

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- IR Current

  The IR Current function can be set as 2 different options of current. (Only NY8A053B provides this function.)

Options	Descriptions
Normal	60mA IR current provided internally.
Large	340mA IR current provided internally.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of

internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

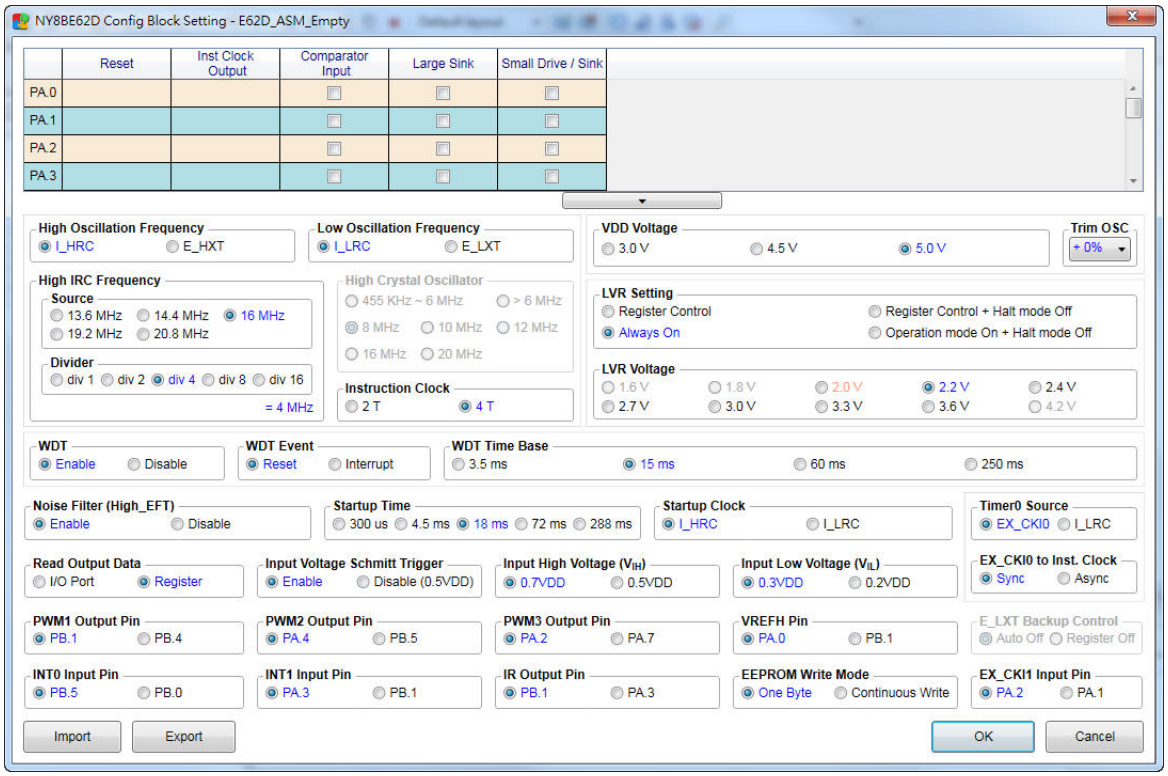
- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.6.24 NY8BE62D

The NY8BE62D setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.



The descriptions are as follows.

- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).
- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 5 available options of frequency.

1	*2*	*3*	*4*	*5*
13.6MHz	14.4MHz	16MHz	19.2MHz	20.8MHz

- Divider

After setting the high oscillation frequency, user can decide the output frequency by selecting the divider. For NY8BE62D, there are 5 available options.

1	*2*	*3*	*4*	*5*
div 1	div 2	div 4	div 8	div 16

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8BE62D there are 4 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.

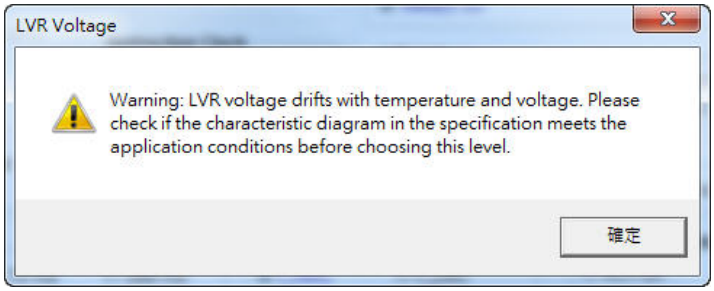
Option	Descriptions
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8BE62D. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Voltage Schmitt Trigger

The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- EEPROM Write Mode

  There are 2 different options for EEPROM write mode.

Option	Descriptions
One Byte	The write flow of EEPROM: 1. Unlock to write protect. 2. Write one byte. 3. The write protection will be turned on automatically.
Continuous Write	he write flow of EEPROM: 1. Unlock to write protect. 2. Write the needed data. 3. The write protection will be turned on manually.

- PWM Output Pin

  There are 5 sets of PWM output pin for NY8BE62D, and the available output pins for PWM1/PWM2/PWM3 are as follows.

  PWM1

Option	Descriptions
PB.1	Set PB.1as the output pin of PWM1.
PB.4	Set PB.4 as the output pin of PWM1.

  PWM2

Option	Descriptions
PA.4	Set PA.4 as the output pin of PWM2.
PB.5	Set PB.5 as the output pin of PWM2.

  PWM3

Option	Descriptions
PA.7	Set PA.7 as the output pin of PWM3.
PA.2	Set PA.2 as the output pin of PWM3.

- INT Input Pin

There are 3 sets of INT input pin for NY8BE62D. The input pin of INT0 and INT1 has 2 options. When the external interrupt function is off, the selected pin can be general I/O. The pins for INT input are described below.

INT0

Option	Descriptions
PB.0	Set PB.0 as the input pin of INT0
PB.5	Set PB.5 as the input pin of INT0

INT1

Option	Descriptions
PB.1	Set PB.1 as the input pin of INT1
PA.3	Set PA.3 as the input pin of INT1

- EX_CKI1 Input Pin

  There are 4 sets of timer (Timer0~3) for NY8BE62D. The Timer4 and Timer5 can use external clock as its clock source. The available pins are described below.

Option	Descriptions
PA.1	Set PA.1 as the input pin of EX_CKI1
PA.2	Set PA.2 as the input pin of EX_CKI1

- VREFH Pin

  The available pins are described below.

Option	Descriptions
PA.0	Set PA.0 as VREFH pin.
PB.1	Set PB.1 as VREFH pin.

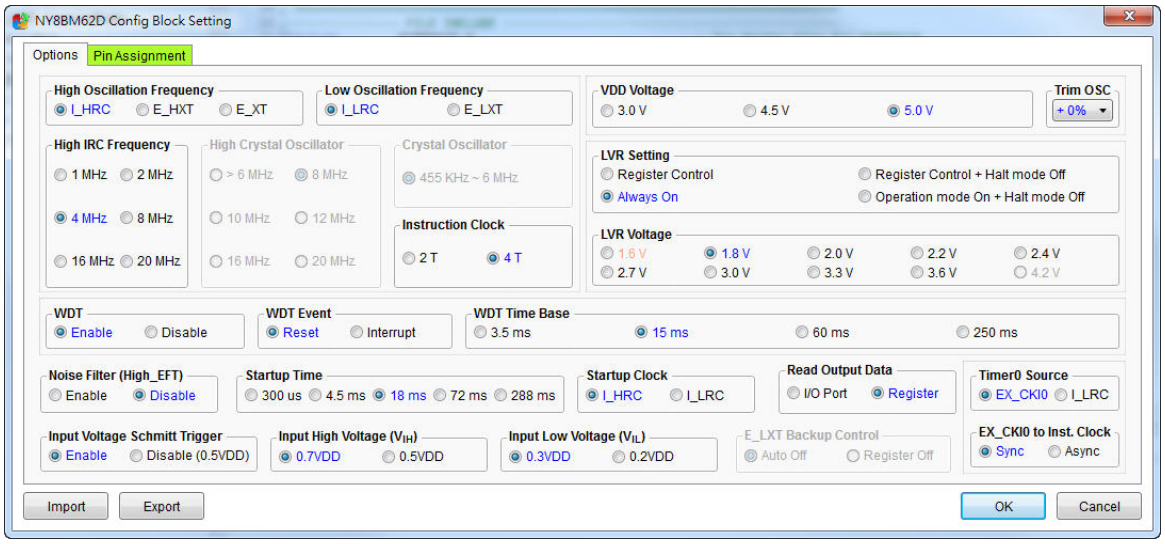
- IR Output Pin

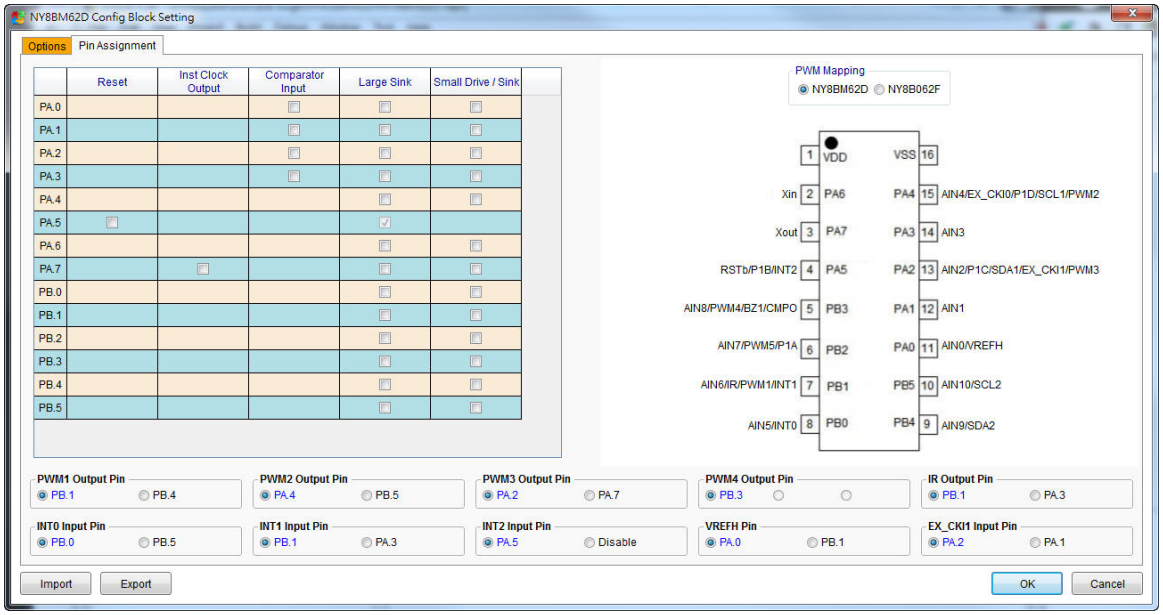
  The available pins are described below.

Option	Descriptions
PB.1	Set PB.1 as IR output pin.
PA.3	Set PA.3 as IR output pin.

3.2.6.25 NY8BM61D/NY8BM62D

The NY8BM61D/NY8BM62D setting window is divided into Options and Pin Assignment tabs. User can switch the interface through the tab. Set the configurations via the Options tab, and the pin and PWM setting via the Pin Assignment tab. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.





The descriptions are as follows.

- Pin Assignment tab
  - Set pins of the left side. Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).
  - The right side is the PWM Mapping options. The PWM pins of NY8BM61D / NY8BM62D are compatible with the pin assignment of NY8B062F. User can switch the pin assignment

by ticking the PWM Mapping IC.

- The bottom columns are special pin options, it's for specified functions for selecting output/input pin. When the options are changed, the function display on the package assignment will also be updated synchronously.

- High Oscillation Frequency

NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For NY8 series, there are 6 available options of frequency source.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz	16MHz	20MHz

(12MHz≦E_HXT<16MHz)	(16MHz≦E_HXT<20MHz)	(20 MHz≦E_HXT)

- Crystal Oscillator

  Crystal Oscillator can only be set as 455 KHz~6 MHz.

- LVR Setting:

  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8BM72A, there are 4 options of LVR setting.

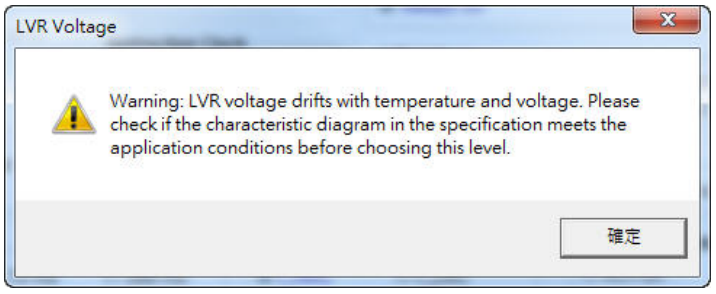
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8BM61D/NY8BM62D. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

  Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

  The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
300us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT,

Low-frequency oscillator will be clock source.

- EX_CKI to Inst. Clock

Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”**,** meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- PWM Output Pin

  There are 5 sets of PWM output pin in NY8BM61D/NY8BM62D, The PWM1/PWM2/PWM3 output pin could be the following options.

  PWM1

Option	Descriptions
PB.1	Set PB.1 as PWM1 output pin.
PB.4	Set PB.4 as PWM1 output pin.

  PWM2

選項	選項描述
PA.4	Set PA.4 as PWM2 output pin
PB.5	Set PB.5 as PWM2 output pin

- PWM3

Option	Descriptions
PA.7	Set PA.7 as PWM3 output pin.
PA.2	Set PA.2 as PWM3 output pin.

- INT Input Pin

There are 3 sets of INT input pin for NY8BE62D. The INT0 and INT1 have 2 options. When the external interrupt function is off, the selected pin can be general I/O. The pins for INT input are described below.

INT0

Option	Descriptions
PB.0	Set PB.0 as the input pin of INT0.
PB.5	Set PB.5 as the input pin of INT0.

INT1

Option	Descriptions
PB.1	Set PB.1as the input pin of INT1.
PA.3	Set PA.3as the input pin of INT1.

- EX_CKI1 Input Pin

There are 4 sets of timer (Timer0/1/4/5) for NY8BE62D. The Timer4 and Timer5 can use external clock as its clock source. The available pins are described below.

Option	Descriptions
PA.1	Set PA.1 as the input pin of EX_CKI1
PA.2	Set PA.2 as the input pin of EX_CKI1

- VREFH Pin

The available pins are described below.

Option	Descriptions
PA.0	Set PA.0 as VREFH pin.
PB.1	Set PB.1 as VREFH pin.

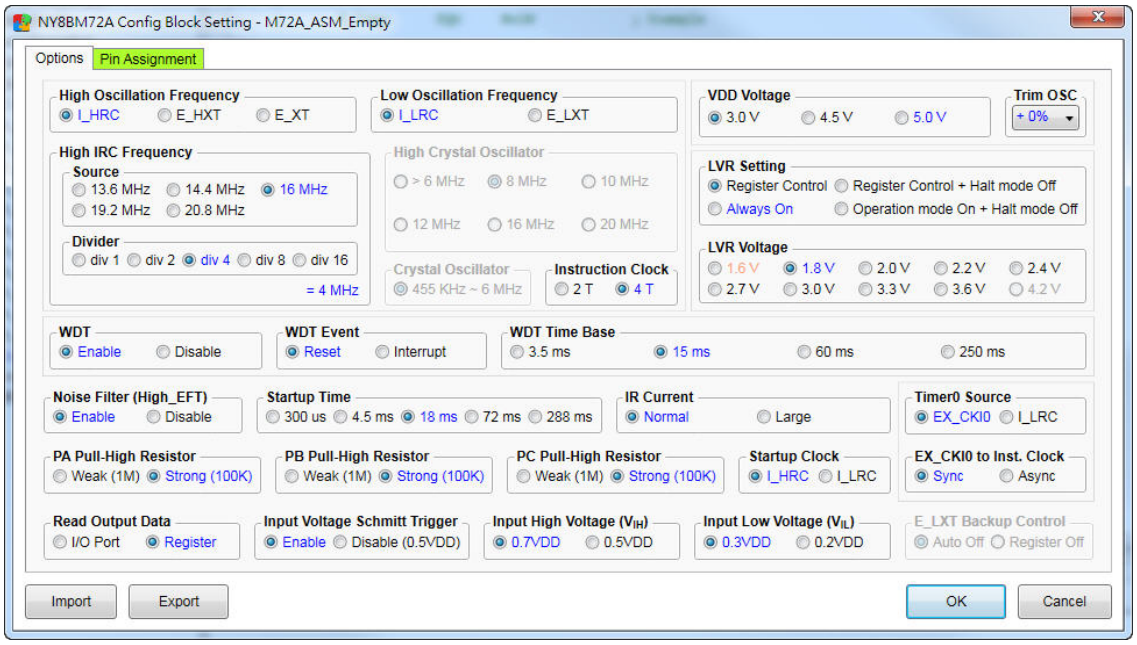
- IR Output Pin

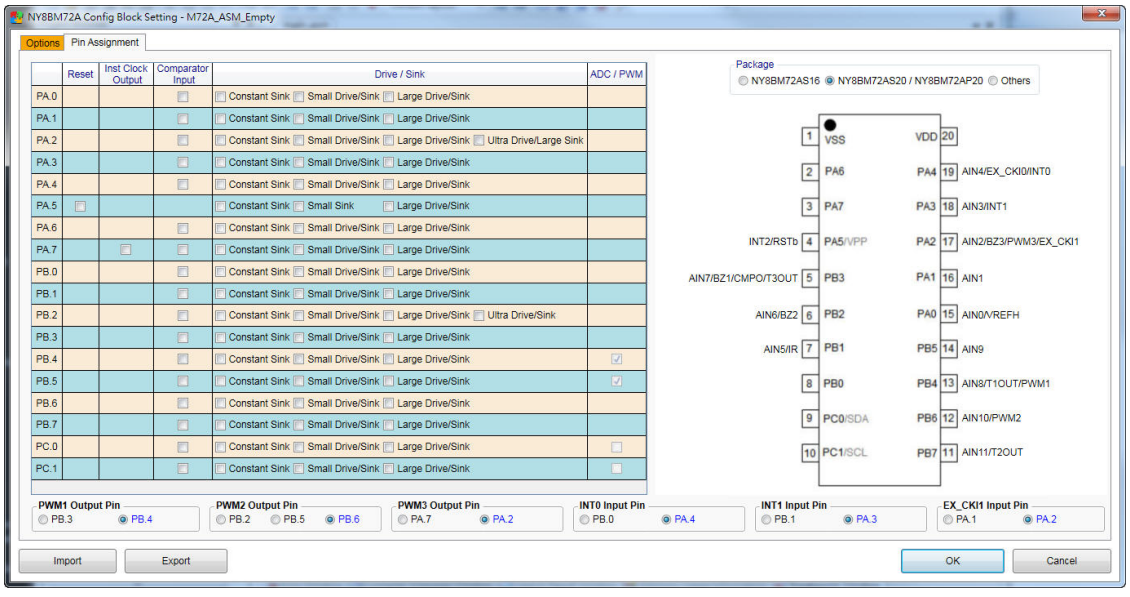
The available pins are described below.

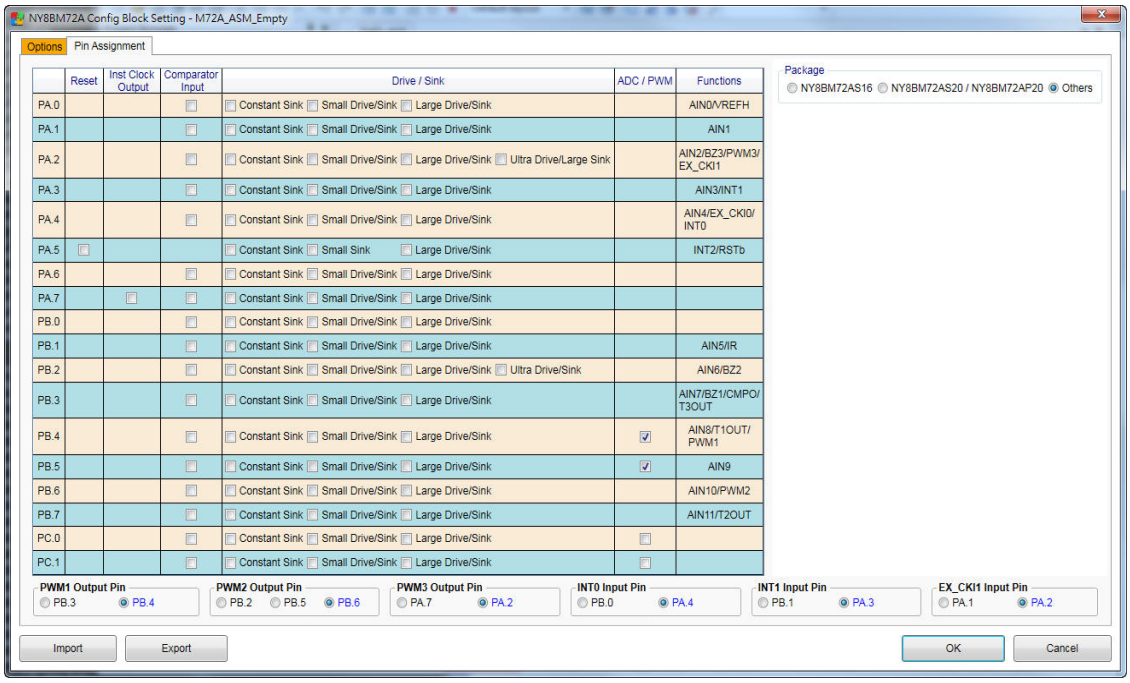
Option	Descriptions
PB.1	Set PB.1 as IR output pin.
PA.3	Set PA.3 as IR output pin.

3.2.6.26 NY8BM72A

The NY8BM72A setting window is divided into Options and Pin Assignment tabs. User can switch the interface through the tab. Set the configurations via the Options tab, and the pin and package setting via the Pin Assignment tab. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.







The descriptions are as follows.

- Pin Assignment tab
  - Set pins of the left side. Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on)
  - Set package options on the right side. For standard package of NY8BM72A, SOP16 or SOP20/DIP20, it shows corresponding package diagram and pin function below. For Others, it shows pin function in the Function column of Pin Assignment table. When user selects SOP16, PB4/PB5/PB6/PB7 are not available, and the PB4/PB5 for ADC/PWM will be switched to PC0/PC1. When user selects SOP20/DIP20, ADC/PWM is set to PB4/PB5. When Others is selected, it is flexible to set PB4/PB5 or PC0/PC1 as the output for ADC/PWM.
  - For non-standard Nyquest packages, please tick “Others” and the pin functions will be shown in the left table. User can set the output pin PB4/PB5 or PC0/PC1 as ADC/PWM.
  - The bottom columns are special pin options, it’s for specified functions for selecting output/input pin. When the options are changed, the function display on the package assignment will also be updated synchronously.

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

  The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency Source

  For NY8BM72A, there are 5 available options of frequency source.

1	*2*	*3*	*4*	*5*
13.6MHz	14.4MHz	16MHz	19.2MHz	20.8MHz

- Divider

  After setting the high oscillation frequency, user can decide the output frequency by selecting the divider. For NY8BM72A, there are 5 available options.

1	*2*	*3*	*4*	*5*
div 1	div 2	div 4	div 8	div 16

- High Crystal Oscillator

  For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

  Crystal Oscillator can only be set as 455 KHz~6 MHz.

- LVR Setting:

  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8BM72A, there are 4 options of LVR setting.

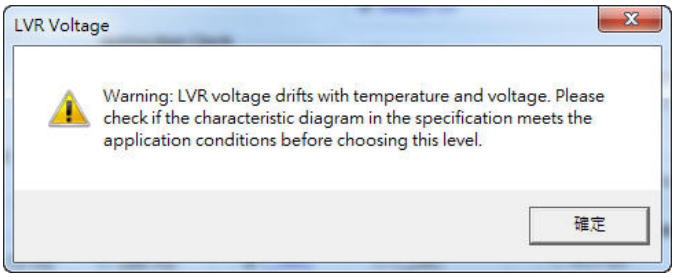
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

  When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8BM72A. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

  Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog,

the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable.

- Startup Time

The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
300us	4.5ms	18ms	72ms	288ms

- Timer0 Source

The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI0 is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- IR Current

The IR Current function can be set as 2 different options of current. (Only NY8A053B provides this function.)

Options	Descriptions
Normal	60mA IR current provided internally.
Large	340mA IR current provided internally.

- Pull-High Resistor

The Pull-High Resistor set the resistor on the pin. For NY8 series, there are 2 available options of Pull-High Resistor.

Options	Descriptions
Weak	Internal 1MΩ Pull-High resistor.
Strong	Internal 100kΩ Pull-High resistor.

- Startup Clock

The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI0 to Inst. Clock

Set EX_CKI0 to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI0 synchronizes with Instruction Clock.
Async	EX_CKI0 is asynchronous with Instruction Clock.

- Read Output Data

The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- PWM Output Pin

  There are 3 sets of PWM output pin for NY8BM72A.

  PWM1

Option	Descriptions
PB.3	Set PB.3 as the output pin of PWM1
PB.4	Set PB.4 as the output pin of PWM1.

  PWM2

Option	Descriptions
PB.2	Set PB.2 as the output pin of PWM2

Option	Descriptions
PB.5	Set PB.5 as the output pin of PWM2
PB.6	Set PB.6 as the output pin of PWM2

PWM3

Option	Descriptions
PA.7	Set PA.7 as the output pin of PWM3
PA.2	Set PA.2 as the output pin of PWM3

- INT Input Pin

  There are 3 sets of INT input pin for NY8BM72A. The input pin of INT0 and INT1 has 2 options. When the external interrupt function is off, the selected pin can be general I/O. The pins for INT input are described below.

  INT0

Option	Descriptions
PB.0	Set PB.0 as the input pin of INT0
PA.4	Set PA.4 as the input pin of INT0

  INT1

Option	Descriptions
PB.1	Set PB.1 as the input pin of INT1
PA.3	Set PA.3 as the input pin of INT1

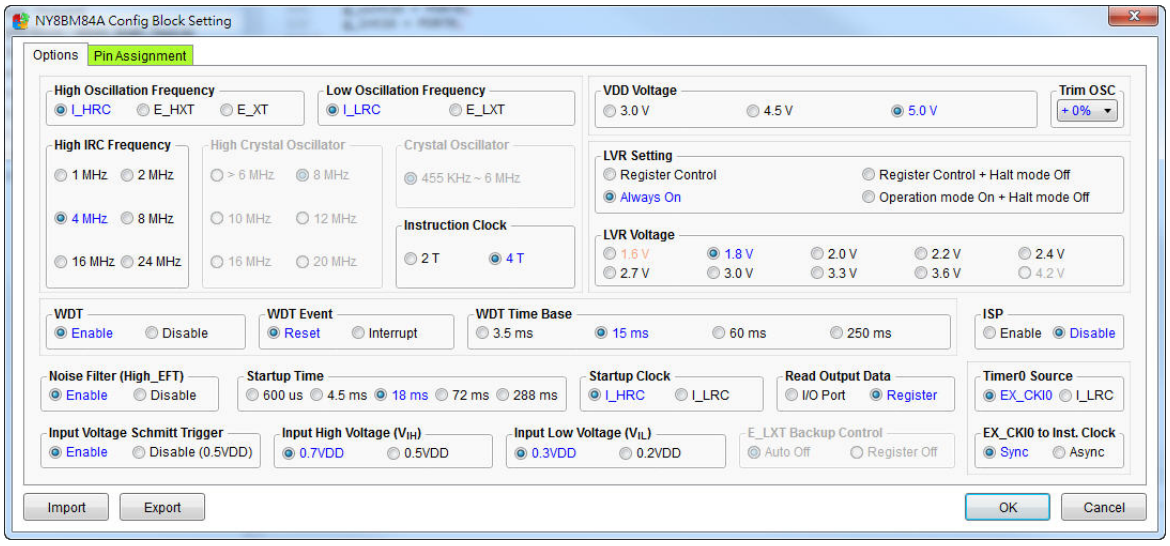
- EX_CKI1 Input Pin

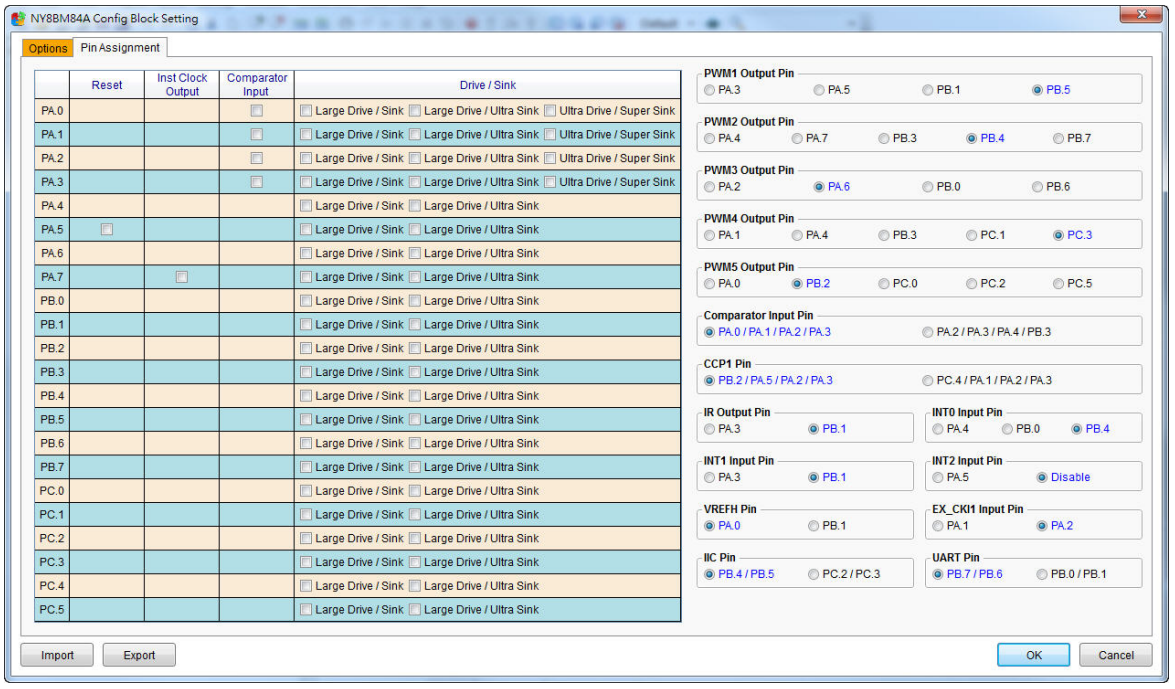
  There are 4 sets of timer (Timer0~3) for NY8BM72A. The Timer2 and Timer3 can use external clock as its clock source. The available pins are described below.

Option	Descriptions
PA.1	Set PA.1 as the input pin of EX_CKI1
PA.2	Set PA.2 as the input pin of EX_CKI1

3.2.6.27 NY8BM84A

The NY8BM84A setting window is divided into Options and Pin Assignment tabs. User can switch the interface through the tab. Set the configurations via the Options tab, and the pin and PWM setting via the Pin Assignment tab. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.





The descriptions are as follows.

- Pin Assignment tab
  - Set pins of the left side. Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).

- The right side is special pin options, it's for specified functions for selecting output/input pin.

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

  The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

  For NY8 series, there are 6 available options of frequency source.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	24MHz

- High Crystal Oscillator

  For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6 MHz.

- LVR Setting:

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8BM82A, there are 4 options of LVR setting.

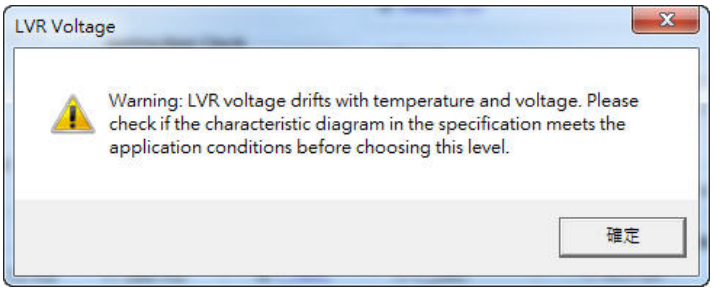
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 9 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8BM84A. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog,

the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

  The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
600us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI0 is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI0 to Inst. Clock

  Set EX_CKI0 to synchronize with Instruction Clock or not, the default is “Sync”. Users also can

set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI0 synchronizes with Instruction Clock.
Async	EX_CKI0 is asynchronous with Instruction Clock.

- Read Output Data

The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

Set the acceleration oscillation automatically stop or not when the IC starts up, the default is “Auto Off”. In order to ensure the E_LXT start-up, it can set as “Register Off”. Users can use program to count after a certain time by register to stop acceleration oscillation, and avoid increasing current consumption.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Voltage Schmitt Trigger

The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- PWM Output Pin

  There are 5 sets of PWM output pin for NY8BM84A.

  PWM1

Option	Descriptions
PA.3	Set PA.3 as the output pin of PWM1.
PA.5	Set PA.5 as the output pin of PWM1.
PB.1	Set PB.1 as the output pin of PWM1.
PB.5	Set PB.5 as the output pin of PWM1.

  PWM2

Option	Descriptions
PA.4	Set PA.4 as the output pin of PWM2.
PA.7	Set PA.7 as the output pin of PWM2.
PB.3	Set PB.3 as the output pin of PWM2.
PB.4	Set PB.4 as the output pin of PWM2.
PB.7	Set PB.7 as the output pin of PWM2.

  PWM3

Option	Descriptions
PA.2	Set PA.2 as the output pin of PWM3.
PA.6	Set PA.6 as the output pin of PWM3.
PB.0	Set PB.0 as the output pin of PWM3.
PB.6	Set PB.6 as the output pin of PWM3.

  PWM4

Option	Descriptions
PA.1	Set PA.1 as the output pin of PWM4.
PA.4	Set PA.4 as the output pin of PWM4.

PB.3	Set PB.3 as the output pin of PWM4.
PC.1	Set PC.1 as the output pin of PWM4.
PC.3	Set PC.3 as the output pin of PWM4.

PWM5

Option	Descriptions
PA.0	Set PA.0 as the output pin of PWM5.
PB.2	Set PB.2 as the output pin of PWM5.
PC.0	Set PC.0 as the output pin of PWM5.
PC.2	Set PC.2 as the output pin of PWM5.
PC.5	Set PC.5 as the output pin of PWM5.

- INT Input Pin

  There are 3 sets of INT input pin for NY8BM84A. When the external interrupt function is off, the selected pin can be general I/O. The pins for INT input are described below.

  INT0

Option	Descriptions
PA.4	Set PA.4 as the input pin of INT0.
PB.0	Set PB.0 as the input pin of INT0.
PB.4	Set PB.4 as the input pin of INT0.

  INT1

Option	Descriptions
PB.1	Set PB.1 as the input pin of INT1.
PA.3	Set PA.3 as the input pin of INT1.

  INT2

Option	Descriptions
PA.5	Set PA.5 as the input pin of INT2.
Disable	Disable the intput pin of INT2.

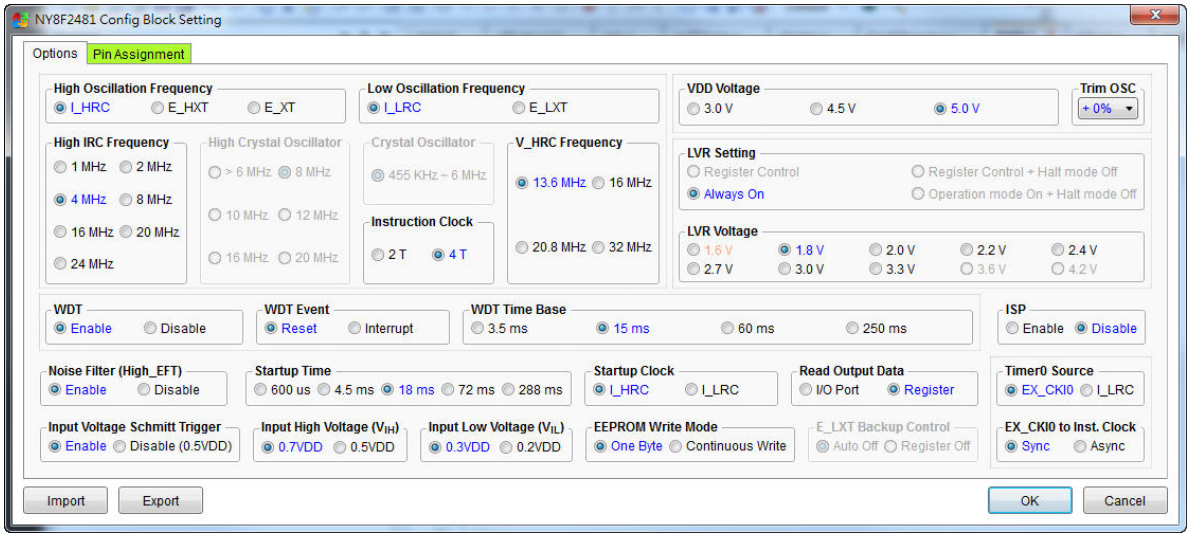
- EX_CKI1 Input Pin

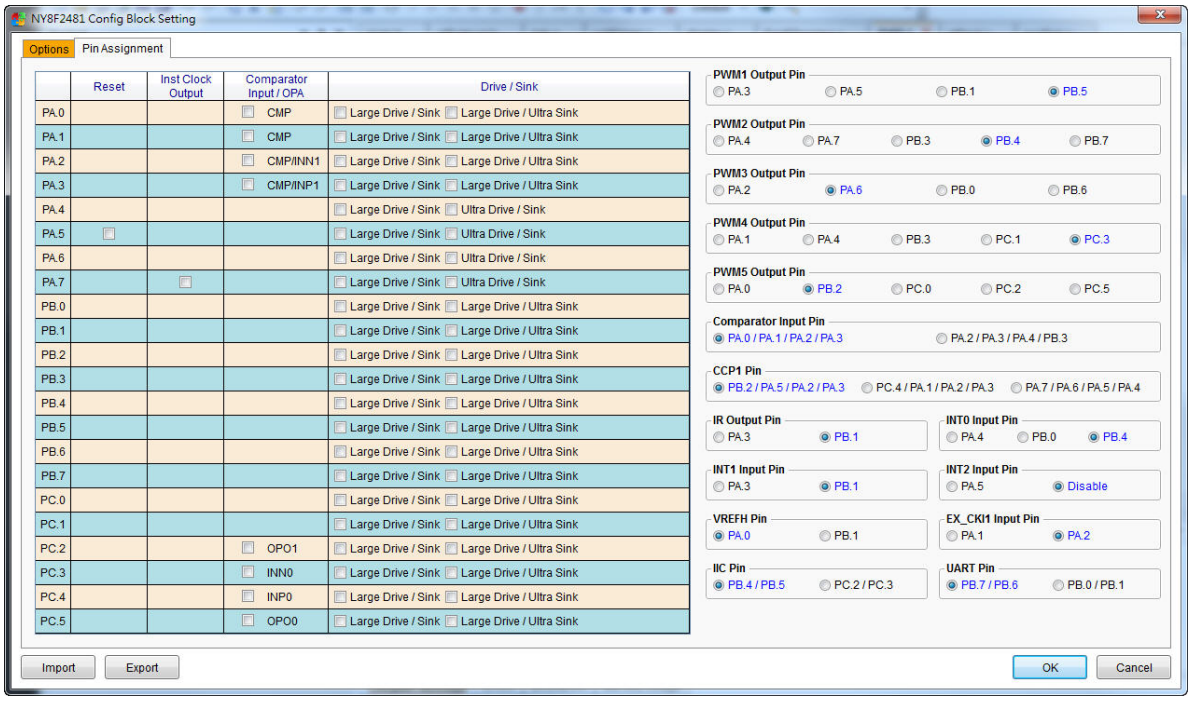
  The Timer4 and Timer5 of NY8BM84A can use external clock as its clock source. The available pins are described below.

Option	Descriptions
PA.1	Set PA.1 as the input pin of EX_CKI1.
PA.2	Set PA.2 as the input pin of EX_CKI1.

3.2.6.28 NY8F2481

The NY8F2481 setting window is divided into Options and Pin Assignment tabs. User can switch the interface through the tab. Set the configurations via the Options tab, and the pin and PWM setting via the Pin Assignment tab. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.





The descriptions are as follows.

- Pin Assignment tab
  - Set pins of the left side. Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock and so on).
  - The right side is special pin options, it's for specified functions for selecting output/input pin.

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

  The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency Source

  For NY8 series, there are 7 available options of frequency source.

1	*2*	*3*	*4*	*5*	*6*	*7*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz	24MHz

- High Crystal Oscillator

  For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

  Crystal Oscillator can only be set as 455 KHz~6 MHz.

- LVR Setting

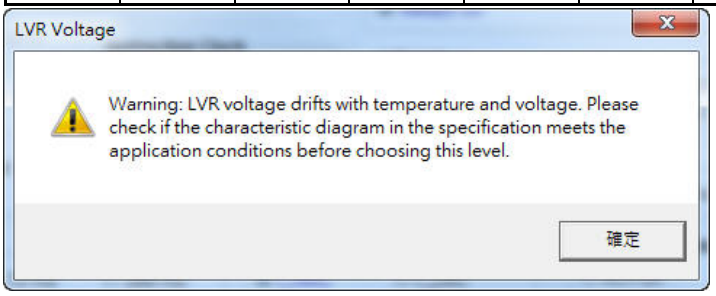
When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8F2481, the option Always On is available only.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8F2481, there are 8 available options of LVR voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1.6V	1.8V	2.0V	2.2V	2.4V	2.7V	3.0V	3.3V



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8F2481. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

  The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
600us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI0 is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI0 to Inst. Clock

  Set EX_CKI0 to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI0 synchronizes with Instruction Clock.
Async	EX_CKI0 is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation.

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (V_{IL})

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- PWM Output Pin

  There are 5 sets of PWM output pin for NY8F2481.

  PWM1

Option	Descriptions
PA.3	Set PA.3 as the output pin of PWM1.
PA.5	Set PA.5 as the output pin of PWM1.
PB.1	Set PB.1 as the output pin of PWM1.
PB.5	Set PB.5 as the output pin of PWM1.

  PWM2

Option	Descriptions
PA.4	Set PA.4 as the output pin of PWM2.
PA.7	Set PA.7 as the output pin of PWM2.
PB.3	Set PB.3 as the output pin of PWM2.
PB.4	Set PB.4 as the output pin of PWM2.
PB.7	Set PB.7 as the output pin of PWM2.

  PWM3

Option	Descriptions
PA.2	Set PA.2 as the output pin of PWM3.
PA.6	Set PA.6 as the output pin of PWM3.
PB.0	Set PB.0 as the output pin of PWM3.
PB.6	Set PB.6 as the output pin of PWM3.

  PWM4

Option	Descriptions
PA.1	Set PA.1 as the output pin of PWM4.
PA.4	Set PA.4 as the output pin of PWM4.

PB.3	Set PB.3 as the output pin of PWM4.
PC.1	Set PC.1 as the output pin of PWM4.
PC.3	Set PC.3 as the output pin of PWM4.

PWM5

PA.0	Set PA.0 as the output pin of PWM5.
PB.2	Set PB.2 as the output pin of PWM5.
PC.0	Set PC.0 as the output pin of PWM5.
PC.2	Set PC.2 as the output pin of PWM5.
PC.5	Set PC.5 as the output pin of PWM5.
PA.0	Set PA.0 as the output pin of PWM5.

- INT Input Pin

  There are 3 sets of INT input pin for NY8F2481. When the external interrupt function is off, the selected pin can be general I/O. The pins for INT input are described below.

  INT0

Option	Descriptions
PA.4	Set PA.4 as the input pin of INT0.
PB.0	Set PB.0 as the input pin of INT0.
PB.4	Set PB.4 as the input pin of INT0.

  INT1

Option	Descriptions
PB.1	Set PB.1 as the input pin of INT1.
PA.3	Set PA.3 as the input pin of INT1.

  INT2

Option	Descriptions
PA.5	Set PA.5 as the input pin of INT2.
Disable	Disable the intput pin of INT2.

- EX_CKI1 Input Pin

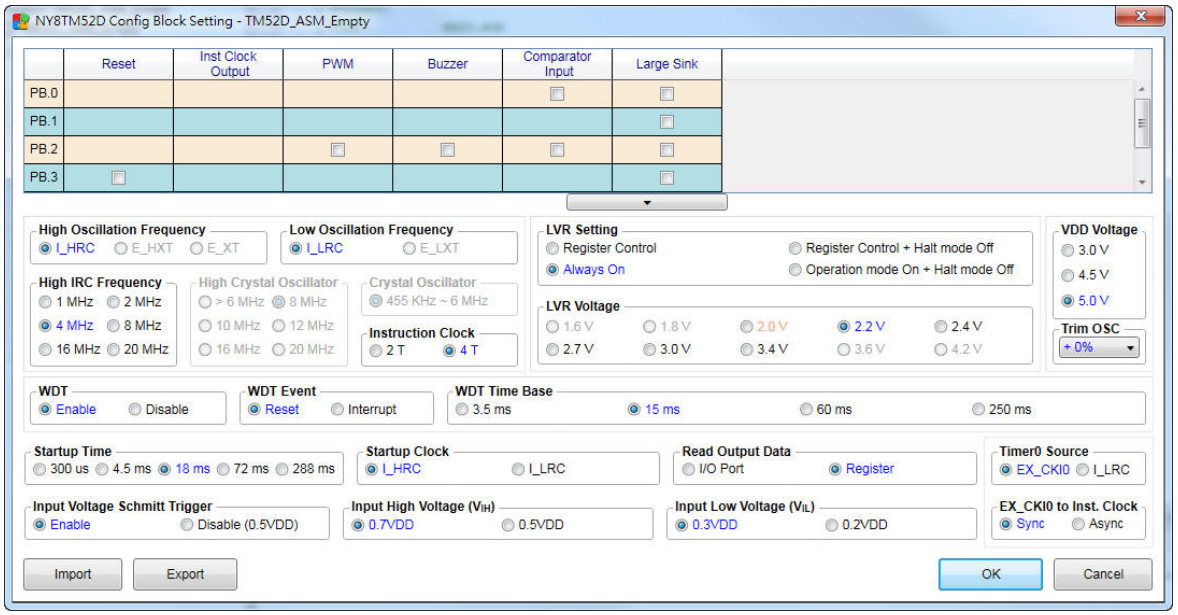
  The Timer4 and Timer5 of NY8F2481 can use external clock as its clock source. The available pins are described below.

Option	Descriptions
PA.1	Set PA.1 as the input pin of EX_CKI1.
PA.2	Set PA.2 as the input pin of EX_CKI1.

3.2.7 NY8T Series Config Block Setting

3.2.7.1 NY8TM52D

The NY8TM52D setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.



Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, PWM, Buzzer and so on).

- Low Oscillation Frequency

Option	Descriptions
I_LRC	Internal low RC oscillator

- High Oscillation Frequency

Option	Descriptions
I_HRC	Internal high RC oscillator

- Instruction Clock

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. ◦

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8TM52D, there are 4 options of LVR setting.

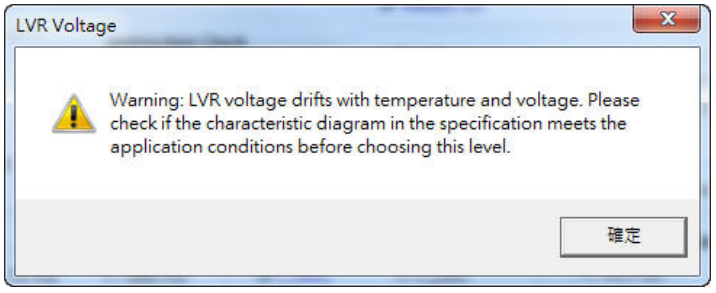
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation mode (Normal mode, Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 6 available options of LVR voltage.

1	2	3	4	5	6
2.0V	2.2V	2.4V	2.7V	3.0V	3.4V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8TM52D. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- VDD Voltage

The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production.

- Trim Oscillator

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- WDT

  Set the Watchdog Timer function of IC for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal will restore system to normal operation.

- WDT Event

Option	Descriptions
Reset	Reset program.
Interrupt	Execute the interruption of subroutine.

- WDT Time Base

  Set the time base of the Watchdog Timer.

- Timer0 Source

Option	Descriptions
EX_CKI	The signals of Timer0 are input by external clock.
I_LRC	The signal resource of Timer0 is set as low frequency clock input.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. If users set Startup Clock as I_HRC, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC, Low-frequency oscillator will be the clock source.

- EX_CKI to Inst. Clock

  Set EX_CKI to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI synchronizes with Instruction Clock.
Async	EX_CKI is asynchronous with Instruction Clock.

- Read Output Data

  The Read Output Data setting decides the source that program reads the status of output data. For NY8 series, there are 2 options for selecting source.

Option	Descriptions
I/O Port	Read the pin status directly.
Register	Read the corresponding register status of pin.

- Input Voltage Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (VIH)

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

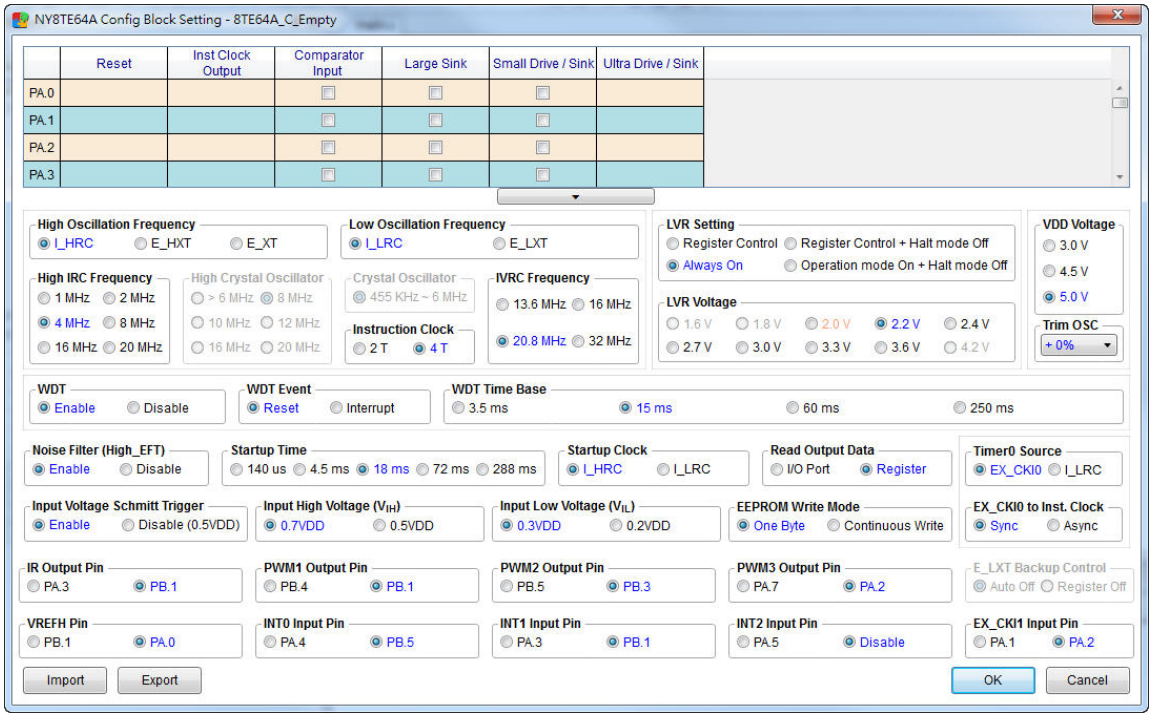
- Input Low Voltage (VIL)

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

3.2.7.2 NY8BE64A / NY8TE64A

The NY8TE64A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.



- Pin: Each pin is default as I/O, some pins provide special functions (e.g., Reset, Inst Clock Output, and so on).

- High Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 3 options of high oscillation frequency.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_HXT	External high crystal oscillator
E_XT	External crystal oscillator

- Low Oscillation Frequency

  NY8 series provides dual oscillation frequency setting. For NY8 series, there are 2 options of low oscillation frequency.

Option	Descriptions
I_LRC	Internal low RC oscillator
E_LXT	External low crystal oscillator

- Instruction Clock

The Instruction Clock function can set 2 options of period to execute the IC instruction cycle.

Option	Descriptions
2T	2 instruction cycles.
4T	4 instruction cycles.

- High IRC Frequency

For High IRC Frequency, there are 6 available options of frequency.

1	*2*	*3*	*4*	*5*	*6*
1MHz	2MHz	4MHz	8MHz	16MHz	20MHz

- IVRC Frequency

The IVRC Frequency setting can decide the frequency of interal variable RC oscillator. For NY8TE64A, there are 4 avaliable options.

1	*2*	*3*	*4*
13.6 MHz	16 MHz	20.8 MHz	32 MHz

- High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*
> 6MHz (6MHz < E_HXT < 8MHz)	8MHz (8MHz≦E_HXT<10MHz)	10MHz (10MHz≦E_HXT<12MHz)
4	*5*	*6*
12MHz (12MHz≦E_HXT<16MHz)	16MHz (16MHz≦E_HXT<20MHz)	20MHz (20 MHz≦E_HXT)

- Crystal Oscillator

Crystal Oscillator can only be set as 455 KHz~6MHz.

- LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8TE64A series, there are 4 options of LVR setting.

Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On	LVR is always turned on in the operation mode (Normal mode,

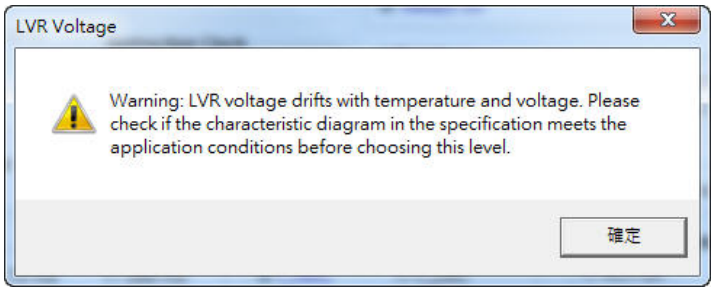
Option	Descriptions
+ Halt mode Off	Slow mode and Standby mode), and LVR is forcibly turned off in the halt mode.

- LVR Voltage

If the selected VDD voltage is lower than the lowest voltage, IC will reset based on the LVR Setting. For NY8 series, there are 7 options of LVR Voltage.

1	*2*	*3*	*4*	*5*	*6*	*7*
2.0V	2.2V	2.4V	2.7V	3.0V	3.3V	3.6V

Note: If selecting a LVR voltage lower than recommended LVR voltage, there will be a warning when converting.



When the temperature rises, the LVR voltage will also be decreased which may cause the minimum working voltage of IC higher than the LVR voltage and makes the LVR function failure. The default recommended LVR voltage can be operated normally in the range of IC operating temperature. Please refer to LVR vs temperature diagram in specification of NY8BE64A/NY8TE64A. If the user chooses a lower LVR, please check the characteristics from the datasheet first to make sure the applicated conditions are met.

- WDT

Set the WDT function for implementing the watchdog timer. WDT is used to detect and recover from malfunctions. If, due to a hardware fault or program error, it fails to restart the watchdog, the timer will elapse and generate a timeout signal. The timeout signal is used to initiate corrective action or actions and restore normal system operation.

- WDT Event

The WDT Event function can set the timeout mechanism set as 2 different options as below.

Option	Descriptions
Reset	Reset IC.
Interrupt	Implement interrupt subroutine.

- WDT Time Base

The WDT Time Base function can be set as 4 different options of WDT time base.

1	*2*	*3*	*4*
3.5ms	15ms	60ms	250ms

- Noise Filter (High_EFT)

  The Noise Filter (High_EFT) function can be Disabled or Enabled. When Noise Filter (High_EFT) is set as Enable, it can filter out the high frequency noise generated by the instant switching. The maximum tolerable of EFT is ±4KV. If user wants to turn off this function, please set the selection as Disable.

- Startup Time

  The Startup Time function can be used to adjust the time length of IC starting up. For NY8 series, there are 5 available options of Startup time.

1	*2*	*3*	*4*	*5*
140us	4.5ms	18ms	72ms	288ms

- Timer0 Source

  The Timer0 Source function selects the input signal source of low frequency clock. If EX_CKI is selected, user can control the signal of Time0 input from external clock by program. If it is set to I_LRC/E_LXT, the signal source will be input from low frequency clock.

- Startup Clock

  The Startup Clock set the clock source of the CPU when the power is on. NY8 series provide two clock oscillator settings. If users set Startup Clock as I_HRC/E_HXT/E_XT, the High-frequency oscillator will be the clock source when power is on. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

- EX_CKI0 to Inst. Clock

  Set EX_CKI0 to synchronize with Instruction Clock or not, the default is “Sync”. Users also can set as “Async” without synchronization with Instruction Clock.

Option	Descriptions
Sync	EX_CKI0 synchronizes with Instruction Clock.
Async	EX_CKI0 is asynchronous with Instruction Clock.

- Read Output Data

  Read Output Data sets program to read the source of the output port state. There are 2 different sources to choose in NY8 series.

Option	Descriptions
I/O Port	Direct read pin state.
Register	Read the pin corresponding register state.

- E_LXT Backup Control

  When using the E_LXT, the E_LXT Backup Control setting determines whether the acceleration oscillation at IC startup will stop automatically. By default, this function is set to “Auto Off”, meaning the acceleration oscillation will automatically stop once the oscillator has started. To ensure a stable startup of the E_LXT, the option can be set to “Register Off”. In this case, the user can control the stopping of the acceleration oscillation through program, for example by counting a certain delay period before disabling it via register, thereby preventing unnecessary current consumption caused by prolonged acceleration oscillation

Option	Descriptions
Auto Off	Automatically stop accelerating the oscillation function.
Register Off	Users can use the program to stop the acceleration oscillation function or not.

- VDD Voltage

  The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	*2*	*3*
3.0V	4.5V	5.0V

- Trim OSC

  The Trim OSC provides user to alter the frequency oscillator of IC. The trimmed frequency will be shown in percentage, and the adjustable range is the original frequency plus or minus 10%.

- Input Schmitt Trigger

  The input voltage can be selected to enable or disable the Schmitt trigger. When the Schmitt trigger is enabled, IC will decide the input voltage level based on the selections ─ Input High Voltage (V_{IH}) and Input Low Voltage (V_{IL}). When the Schmitt tiger is disabled, the voltage level threshold is 0.5VDD.

- Input High Voltage (V_{IH})

  There are 2 options for selecting the input high voltage.

Option	Descriptions
0.7VDD	Set the input high voltage (V_{IH}) as 0.7VDD.
0.5VDD	Set the input high voltage (V_{IH}) as 0.5VDD.

- Input Low Voltage (VIL)

  There are 2 options for selecting the input low voltage.

Option	Descriptions
0.3VDD	Set the input low voltage (V_{IL}) as 0.3VDD.
0.2VDD	Set the input low voltage (V_{IL}) as 0.2VDD.

- EEPROM Write Mode

  There 2 options for selecting EEPROM write mode.

Option	Descriptions
One Byte	The EEPROM write process is 1. Unlock the write protection. 2. Write one byte. 3. The write protection will be automatically turned on.
Continuous Write	The EEPROM write process is 1. Unlock the write protection. 2. Write the needed data. 3. Turn on the write protection manually

- PWM Output Pin

  There are 5 sets of PWM output pin in NY8TE64A, each pin has 2 options. Options and the default of each PWM are as follows.

  PWM1

Option	Descriptions
PB.1	Set PB.1 as PWM1 output pin.
PB.4	Set PB.4 as PWM1 output pin.

  PWM2

Option	Descriptions
PB.3	Set PB.3 as PWM2 output pin.
PB.5	Set PB.5 as PWM2 output pin.

  PWM3

Option	Descriptions
PA.7	Set PA.7 as PWM3 output pin.
PA.2	Set PA.2 as PWM3 output pin.

- INT Input Pin

  There are 3 sets of INT input pin for NY8TE64A. The input pin of INT0 and INT1 has 2 options. When the external interrupt function is off, the selected pin can be general I/O. The pins for INT input are described below.

  INT0

Option	Descriptions
PA.4	Set PA.4 as the input pin of INT0.
PB.5	Set PB.5 as the input pin of INT0.

  INT1

Option	Descriptions
PB.1	Set PB.1 as the input pin of INT1.
PA.3	Set PA.3 as the input pin of INT1.

  INT2

Option	Descriptions
PA.5	Set PA.5 as the input pin of INT2.
Disable	Disable the INT2 input pin function.

- EX_CKI1 Input Pin

  There are 4 sets of timer (Timer0/1/4/5) for NY8TE64A. The Timer4 and Timer5 can use external clock as its clock source. The available pins are described below.

Option	Descriptions
PA.1	Set PA.1 as the input pin of EX_CKI1
PA.2	Set PA.2 as the input pin of EX_CKI1

- VREFH Pin

  The available pins are described below.

Option	Descriptions
PA.0	Set PA.0 as VREFH pin.
PB.1	Set PB.1 as VREFH pin.

- IR Output Pin

  The available pins are described below.

Option	Descriptions
PB.1	Set PB.1 as IR output pin.
PA.3	Set PA.3 as IR output pin.

3.2.8 NY8L Series Config Block Setting

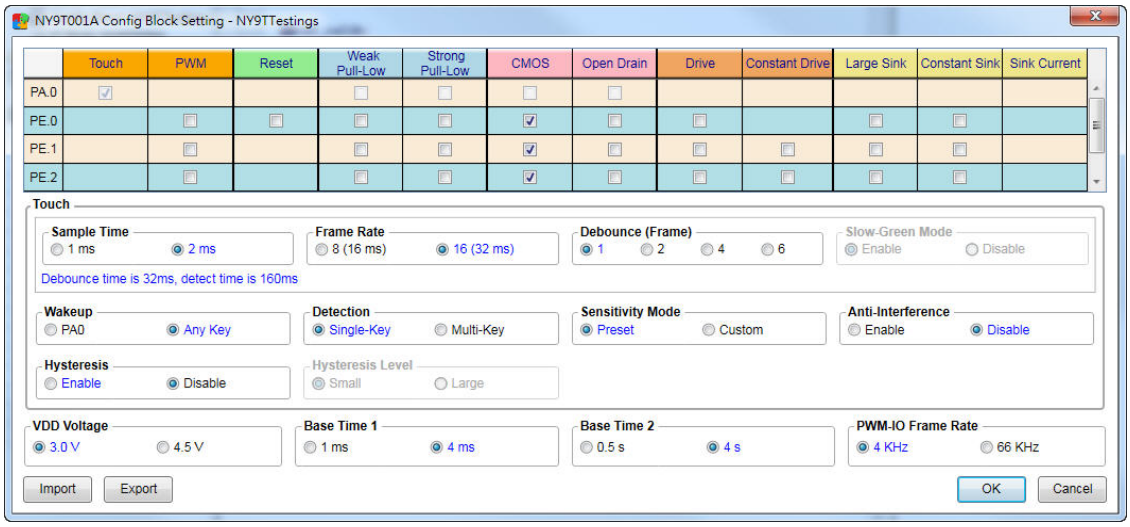
The NY8L setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.

- Pin: Each pin is default as I/O. The different pin can be set as different special function.
- LCD/LED Function: Select to enable LCD or LED.
- LCD Bias: Set LCD Bias. (LCD ratio of lowest voltage and highest voltage)
- LCD Duty: Set LCD Duty. (Ratio of every COM effective scanned time and whole scanned duration is duty cycle. It is fixed and equal to 1/COM)
- LCD Regulator: Enable / disable LCD Regular. When it is enabled, this function can adjust LCD Bias voltage (V1).
- LCD Charge Pump: Set LCD Charge Pump. It can be set when LCD Regulator is Disable. If not providing LCD driving voltage by the regulator, VDD can be used to Charge Pump as base voltage. (For example, when it is set as V1, the base voltage is provided by VDD; when it is set as VLCD, the LCD highest output voltage is the same with VDD.)
- LED Connect Type: Set as LED Drive Mode or LED Sink Mode.
- IR Frequency: Set the IR frequency. (This option is enabled when achieving IR Output)
- IR Carrier: If user sets IR Carrier as Low, IR Output pin will output IR signals when the value of IO Port register is Low, and vice versa. (This option is enabled when achieving IR Output)
- High IRC Frequency: Set the high IRC Frequency.
- VDD Voltage: Set the VDD voltage.
- WDT: Set the WDT enable or disable.

3.2.9 NY9T Series Config Block Setting

3.2.9.1 NY9T001A/08A

The NY9T001A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.



The NY9T008A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.

The descriptions are as follows.

- Pin: Each pin is default as I/O. The different pin can be set as different special function (e.g., Touch, PWM, Reset and so on). User can select Weak /Strong Pull-High or Floating as the

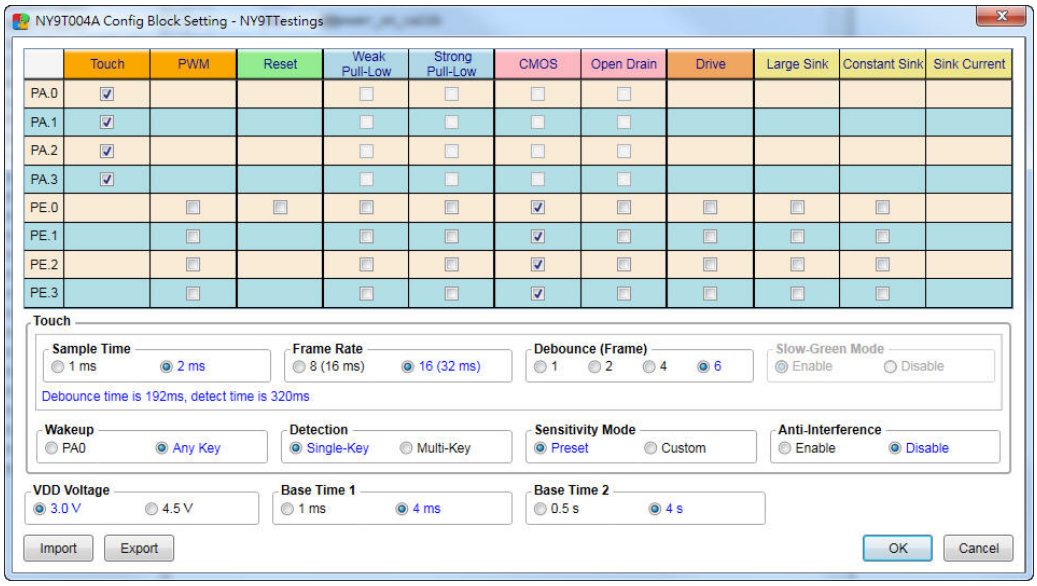
input mode, CMOS / Open Drain as the output mode, Drive / Constant Drive / Normal Sink / Large Sink / Constant Sink as the sink mode. If user selects Large / Constant Sink as the sink mode, the sink current can be 100%, 83%, 50% or 33%. And the PA.0 is fixed as Touch-Key.

- Slow-Green Mode: When Touch-Key sets more than 8 keys (include 8), user can enable or disable this function. The Slow-Green Mode is more energy efficient than Slow Mode, but the detection time will be longer. (Default=Enable)
- Sample Time: User can select the available scanning time of each Touch-Key in the unit time. The longer sampling time can get higher accuracy, but the scanning time is longer.
- Frame Rate: The number of samples in a Frame, that is the time of all Touch-Key scanning time. The greater the number, the less consumption, but the longer detecting time.
- Debounce (Frame): User can set the numbers of detected Frame as the threshold for activating Touch-Keys. The longer Debounce Time can get higher accuracy, but the scanning time is longer. It's recommended to select more frames in more external interference environment.
- Wakeup: User can select the Touch-Keys to wake IC up by PA0 or all Touch-Keys. (Default=AnyKey).
- Detection: User can select the detection of Touch-Keys: Single-Key and Multi-Key. The Single-Key accepts one single touched key at the same time, whereas the Multi-Key accepts multiple touched keys. (Default=Multi-Key).
- Sensitivity Mode: Set the mode through the sensitivity table which is built by *Q-Touch*. If user imports Touch-Key file (.t9x), this function will be set automatically and cannot be modified.
- Anti-Interference: This function can reduce interference of adjoining Touch-Keys, however, the sensitivity is also reduced slightly. If user imports Touch-Key file (.t9x), this function will be set automatically and cannot be modified.
- Hysteresis: Whether to enable Touch-Key Hysteresis function. User can adjust the after-touched sensitivity to avoid an unstable state caused by touching the edge of a pad. ***As the touch key is far away from the touch pin of IC or when it is too sensitive, that will need to enable the function. Please test on the real product to decide the option.***
- Hysteresis Level: Set the TouchKey Hysteresis level. The Small option can lower the threshold for one level, whereas the Large option can lower the threshold 50% off.
- VDD Voltage: Set the VDD voltage.
- LVR: Enable the LVR function or not.
- Base Time 1: Set Base Time 1.
- Base Time 2: Set Base Time 2.

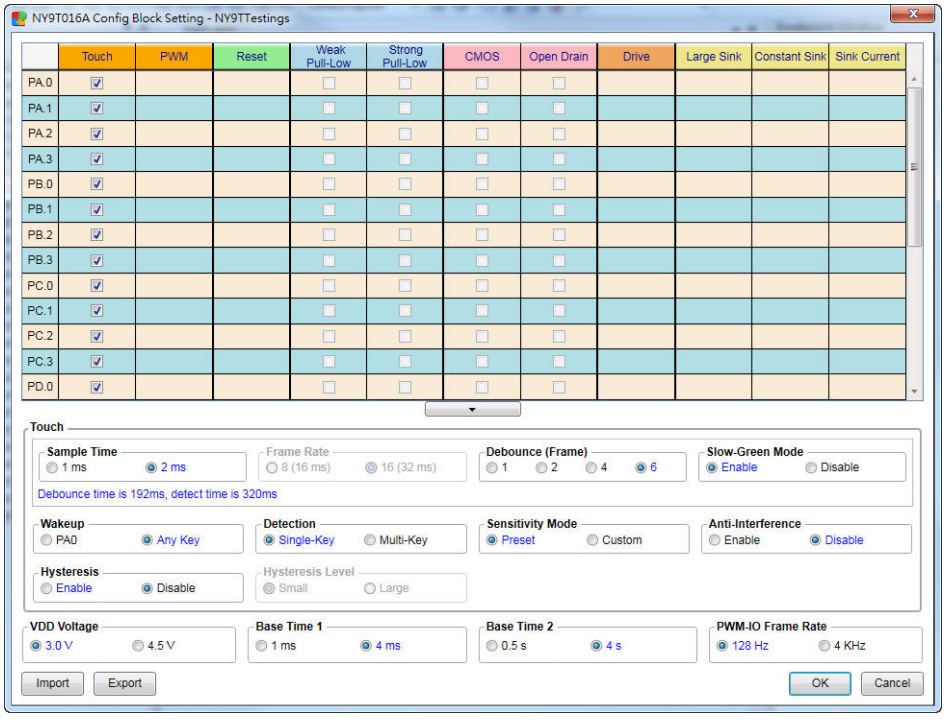
- PWM-IO Frame Rate: The refresh rate of PWM-IO signals. ***When the Frame Rate is set as 6KHz, PWM-IO can use PE0/PE1/PE2 pin, the rest pins only can be set as normal IO. When the Frame Rate is set as 66KHz, PWM-IO can use one pin only, the rest pins only can be set as normal IO. Only NY9T001A supports 66KHz.***

3.2.9.2 NY9T004A/16A

The NY9T004A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.



The NY9T004A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.

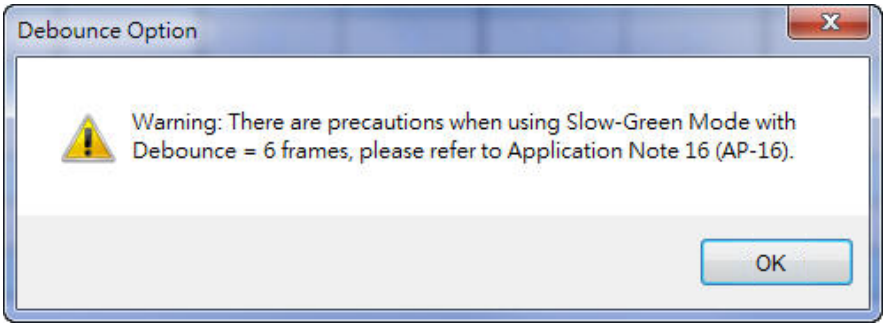


The different options between NY9T004A/16A and NY9T001A are described as follows.

- Pin: Each pin is default as I/O. The different pin can be set as different special function (e.g., Touch, PWM, Reset and so on). User can select Weak /Strong Pull-High or Floating as the input mode, CMOS / Open Drain as the output mode, Normal Sink, Large Sink or Constant Sink as the sink mode. If user selects Large / Constant Sink as the sink mode, the sink current can be 100%, 83%, 50% or 33%.

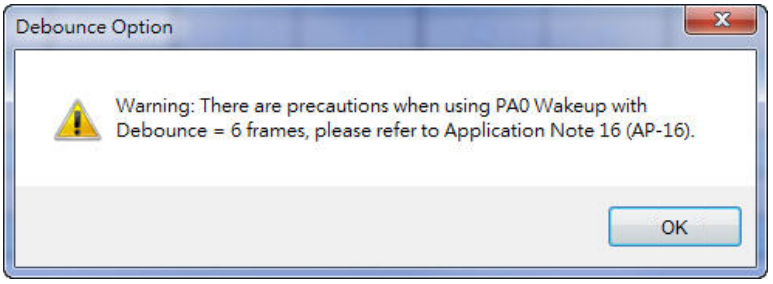
Note:

1. ***If using Slow-Green Mode with Debounce = 6 Frames, a warning dialog will pop-up after pressing "OK".***



There are precautions, please refer to the program example of Application Notice 16 (AP-16).

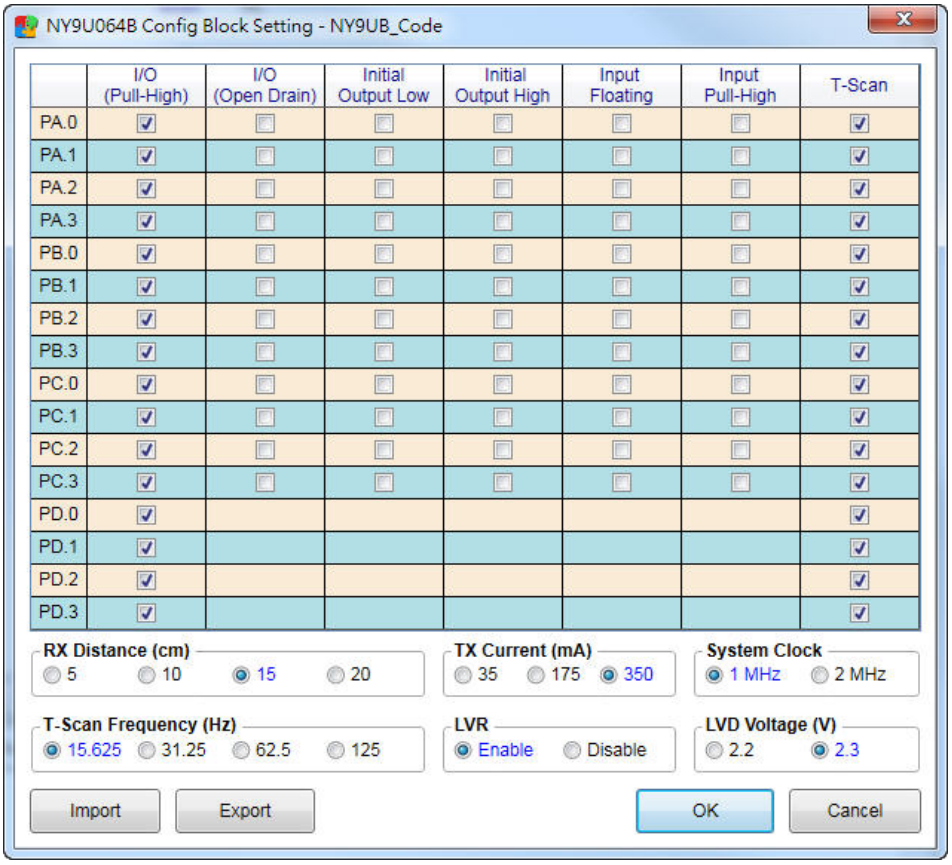
2. ***If using PA0 Wakeup with Debounce = 6 Frames, a warning dialog will pop-up after pressing "OK".***



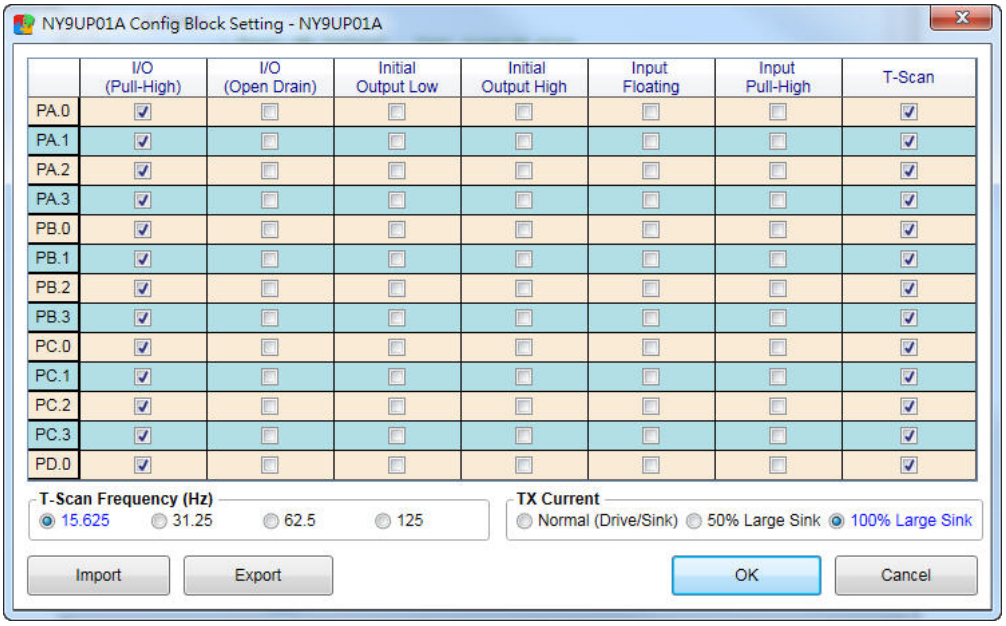
There are precautions, please refer to the program example of Application Notice 16 (AP-16).

3.2.10 NY9UB / NY9UP Series Config Block Setting

The NY9UB series setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.



The NY9UP01A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.



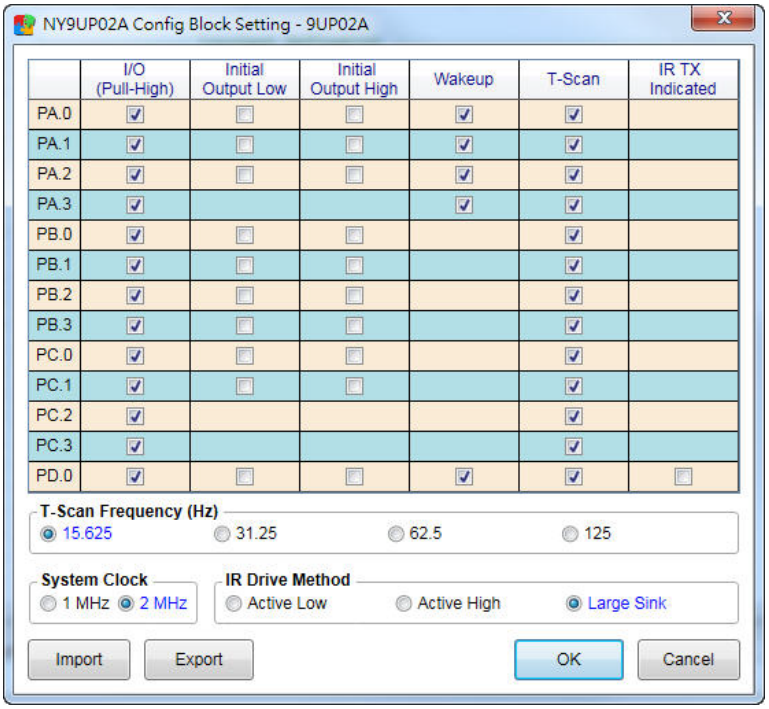
The descriptions are as follows.

- Pin: Each pin is default as I/O (Pull-High). The pins of PD can be set as I/O (Pull-High) only, but user

can modify their status by the corresponding register. The rest of pins can be set as different functions (e.g., I/O (Pull-High), I/O (Open Drain), Initial Output Low, Initial Output High and so on). Besides, each pin can be optioned as T-Scan function or not.

- RX Distance: Set the receiving distance of IR receiver.
- TX Current: Set the output current of IR transmitter.
- System Clock: Set the system clock.
- T-Scan Frequency: Set the T-Scan frequency.
- LVR Voltage: Set the LVR voltage.
- LVD Voltage: Set the LVD voltage.

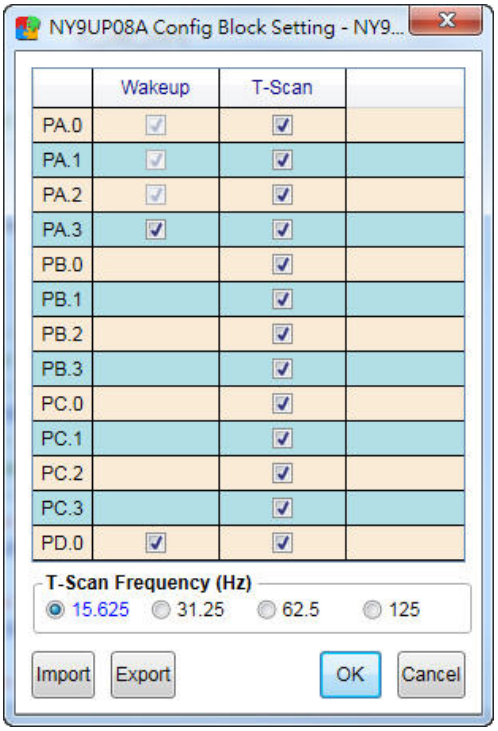
The NY9UP02A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.



The descriptions are as follows.

- Pin: Each pin is default as I/O (Pull-High). The pin can be set as I/O (Pull-High), Initial Output Lowa, Initial Output High and so on. Besides, each pin can be ticked to enable the Wakeup and T-Scan function.
- System Clock: Set the system clock rate.
- T-Scan Frequency: Set the T-Scan frequency.

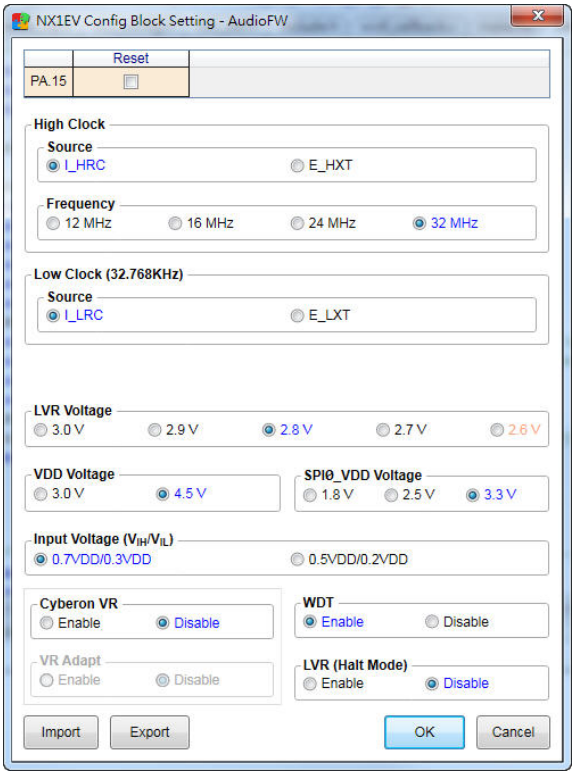
The NY9UP08A setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default.



The descriptions are as follows.

- Pin: Each pin can be ticked as T-Scan function or not. The Wakeup function of PA.3 and PD.0 can be ticked as on or off. If user untickes the Wakeup function, the T-Scan function won't be available, too. (User only can untick the Wakeup function for one of PA.3 and PD.0, they cannot be unticked at the same time.)
- T-Scan Frequency: Set the T-Scan frequency.

3.2.11 NX1 OTP Config Block Setting



The NX1 OTP series setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.

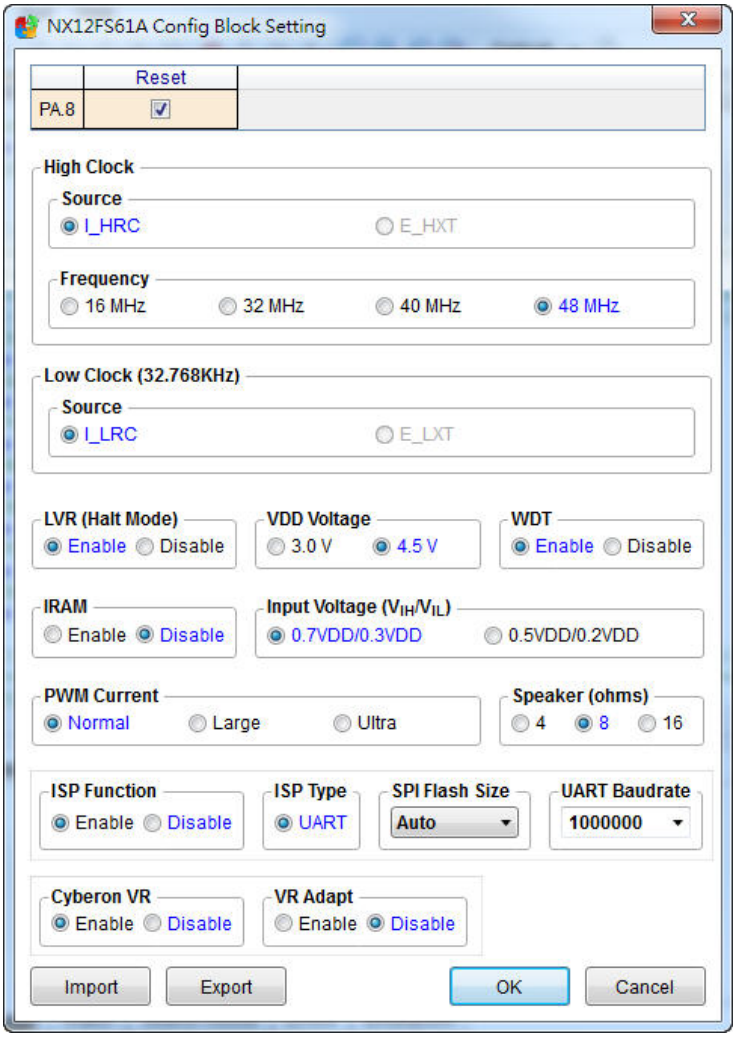
- High Clock Source: Set the high clock source. (If user selects the source as E_HXT, it will show the required frequency of external oscillator below.)
- High Clock Frequency: Set the high clock frequency.
- Low Clock Source: Set the low clock source. (If user selects the source as E_LXT, it will show the required frequency of external oscillator below.)
- Core / SPI Flash Voltage: Set the core voltage of SPI Flash. (This setting is available for NX11M2xA, NX12M5xA and NX13M5xA only.)
- LVR Voltage: Set the LVR voltage.
- VDD Voltage: Set the VDD voltage.
- SPI0_VDD Voltage: Set the voltage of SPI0_VDD.
- WDT: Set the WDT enable or disable.
- LVR(Halt Mode): Enable the LVR function in the Halt mode or not.
- Input Voltage (V_{IH}/V_{IL}): Set the input voltage as 0.7VDD / 0.3VDD, or 0.5VDD / 0.2VDD.
- Cyberon VR: Tick to use Cyberon Voice Recognition functions or not, and NYIDE will use 16 bit or 32 bit algorithm according to the CVR file. Algorithm of 32-bit has a better recognition

accuracy and lower rate of false trigger, but code size and ram usage will increase.

- VR Adapt: Set the VR Adapt enable or disable. System will choose the adapted mode of voice recognition mode and all groups in voice recognition files will be effective when this function is executed.

Note: The use of Cyberon VR will be charged an additional license fee for product chip.

3.2.12 NX1 EF Config Block Setting



The NX1 EF series setting window is below. The grayed-out parts mean the selection cannot be ticked. Words in blue mean the default, while words in orange remark warning.

- Reset Pin: Set the corresponding pin as Reset pin.
- LVR(Halt Mode): Enable the LVR function in the Halt mode or not.
- VDD Voltage: Set the VDD voltage.
- WDT: Set the WDT enable or disable.
- IRAM: Enable the instruction RAM function or not. (It will occupy 512 bytes general memory

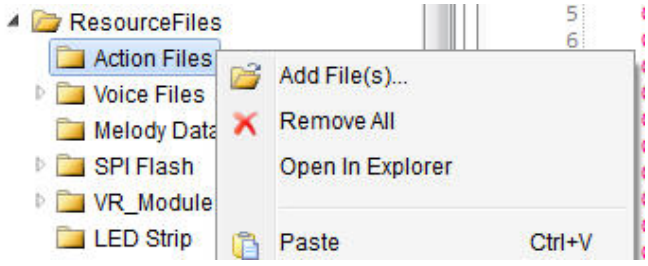
capacity after enabling this option)

- Input Voltage (V_{IH}/V_{IL}): Set the input voltage as 0.7VDD / 0.3VDD, or 0.5VDD / 0.2VDD.
- PWM Current: Set PWM current.
- Speaker: Set the impedance.
- ISP Function: Set to enable/disable the ISP (In System Program) function.
  - ISP Type: Set the ISP type. Currently only UART is supported, and UART communication uses the PD.0/1 pins. For more detailed ISP operation and instructions, please refer to the appendix of the *NYISP* user manual.
  - SPI Flash Size: Set the used SPI Flash capacity. `User can select Auto to let the system automatically determine the usage. This option is not open for selection if the IC is a MCP (Multi-Chip Package).
  - UART Baudrate: Set the UART Baudrate.
- Cyberon VR: Tick to use Cyberon Voice Recognition functions or not, and NYIDE will use 16 bit or 32 bit algorithm according to the CVR file. Algorithm of 32-bit has a better recognition accuracy and lower rate of false trigger, but code size and ram usage will increase.
- VR Adapt: Set the VR Adapt enable or disable. System will choose the adapted mode of voice recognition mode and all groups in voice recognition files will be effective when this function is executed.

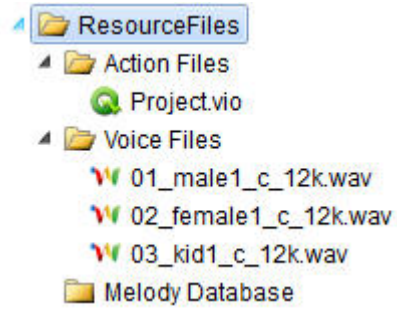
Note: The use of Cyberon VR will be charged an additional license fee for product chip.

3.3 Editing Resource

- There are many methods to edit resource files, the descriptions are as follows.
- In Project manager area, select project and click [Project]→ [Resource Manager…] from Main Menu. Please refer to 2.2.4.4. Resource Manager.
- When user creates a project, *NYIDE* will build a resource type folder that supported by selected IC body automatically. Please right-click the mouse on the specified folder and select [Add File(s)…], user can add the desired files.



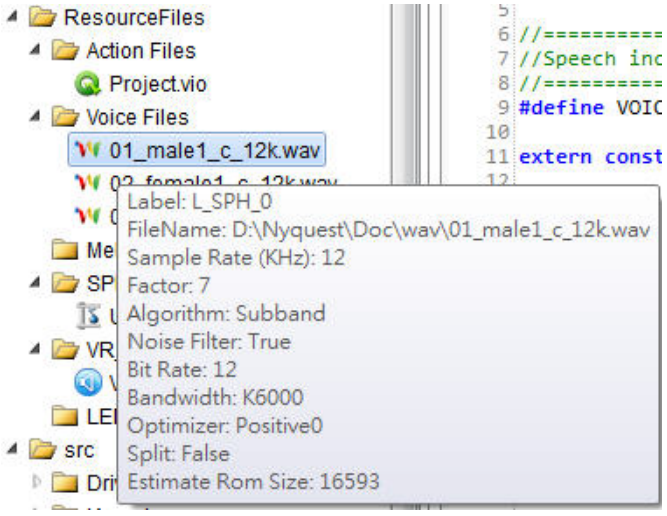
- User also can drag the files form Windows File Explorer to the corresponding resource type folder. No matter in what way adding resource files, the added files will be shown as link in the corresponding resource type directory of Project Manager area. (The added files aren't copied to the directory)



After adding file, *NYIDE* will generate Resource.asm file automatically, which contains Label, filename and other information.

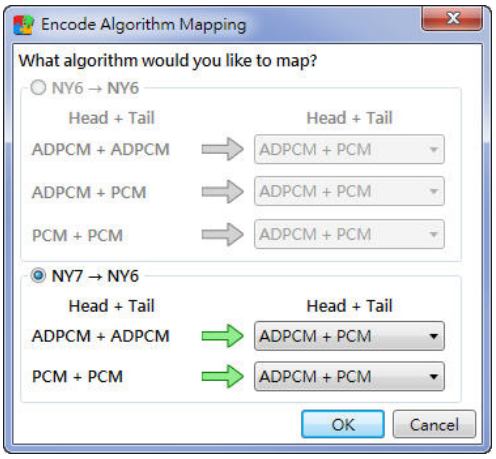
```
;=============================================================
;Speech included area
;=============================================================
L_SPH_0:
        DW (Low(0xA3D))
        DW (0x01 << 10)|(Mid(0xA3D))
        #INCLUDATA  "ResourceFiles\Voice Files\A05_10k.v7x"

L_SPH_1:
        DW (Low(0xA3D))
        DW (0x01 << 10)|(Mid(0xA3D))
        #INCLUDATA  "ResourceFiles\Voice Files\A06_10k.v7x"

L_SPH_2:
        DW (Low(0xA3D))
        DW (0x01 << 10)|(Mid(0xA3D))
        #INCLUDATA  "ResourceFiles\Voice Files\V_S2.v7x"

L_SPH_3:
        DW (Low(0x831))
        DW (0x01 << 10)|(Mid(0x831))
        #INCLUDATA  "ResourceFiles\Voice Files\V0.v7x"
```

If user wants to review the relative information and settings of resource files, please move cursor to the specified file, the tooltip will show information.

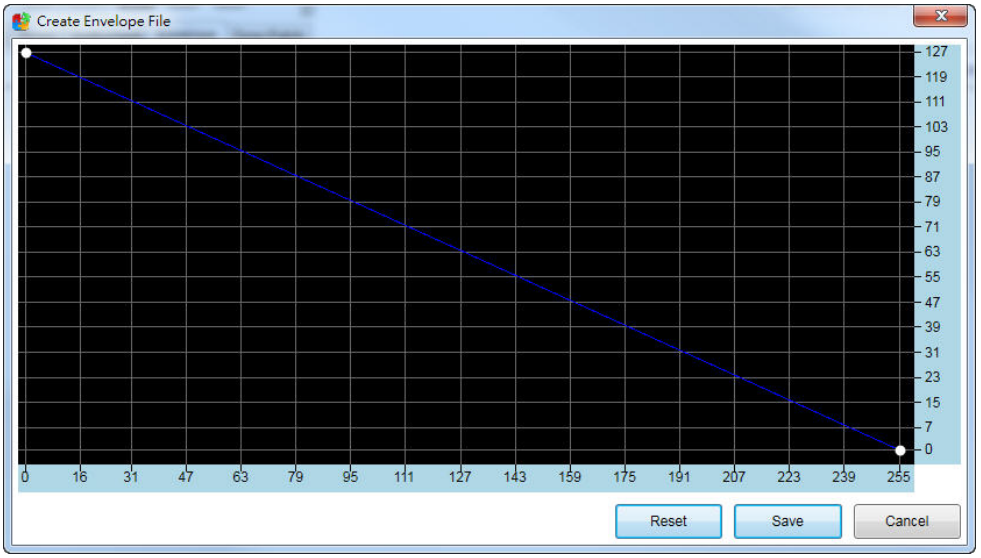


- NY6 / NY7series supports adding .qmd files of Melody Database. If the IC series of the added .qmd file is different from the editing project (ex. Add .qmd file of NY7 to NY6 project), the “Encode Algorithm Mapping” box will pop up for setting converting.

  After setting, a dialog box will pop up for selecting converted filename and then enter converting process. The successful converted file will be added to resource manager interface. If conversion fails, *NYIDE* will turn back to the resource manager interface.



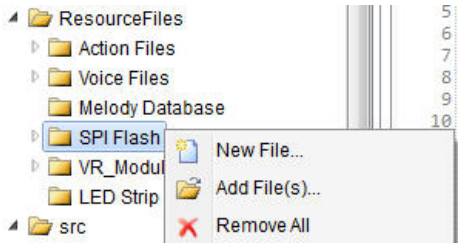
- When NY8L series plays Tone, it is necessary to add instrument files, music files and envelope files simultaneously to convert files. User can add .wav or converted .v8lx files to instrument files that supports up to 16 files. Add .env file to envelope files or use the “Create Envelope” function to create .env files, at least 2 files must be added and support up to 16 files. Add the .mid file to music file for converting files.



- The resource files will be converted while building. To speed up building time, *NYIDE* will only convert the files that have been modified.

3.3.1 SPI Resource Files

- NY6 series supports external SPI Flash, user can manage the resources file via the Resource Files/SPI Flash folder of browser panel.



New File…: Activate *SPI_Encoder* to edit the required resource files of SPI Flash. After saving the project and exiting *SPI_Encoder*, *NYIDE* will add the edited project to SPI Flash folder by a link.

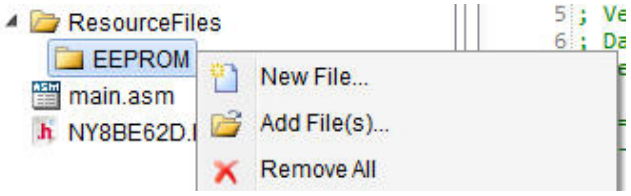
Add File(s)…: Add files to the previous edited *SPI_Encoder* project. Double-clicking to open *SPI_Encoder* and continue editing project.

Remove All: Remove the added *SPI Encoder* project.

- While building, *NYIDE* will convert the project as a programmable binary file of SPI Flash. To speed up building time, *NYIDE* will only convert the files that has been modified.
- *NYIDE* supports writing binary to SPI Flash on NY6_ICE / NX_Programmer. After connecting NY6_ICE / NX_Programmer, click / to write the converted binary file into SPI Flash.

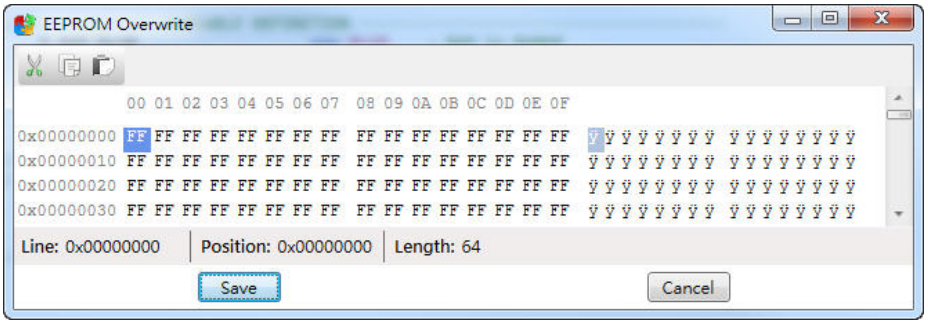
3.3.2 EEPROM Overwrite

The built-in EEPROM of NY8 series IC (NY8AE51D / NY8BE62D) supports the EEPROM Overwrite, *NYIDE* will write the data into .bin file in the process of compiling, then overwrite data in EEPROM during programming. The description of adding EEPROM Overwrite data is as follows.



Clicking the right mouse button on the EEPROM directory will bring up the above context menu. User can add new a file, existing file(s) or remove all files through the context menu.

- New File: Build a new EEPROM Overwrite file. A window will pop-up after clicking.



User can enter the desired value at the corresponding position. Click the Create button after

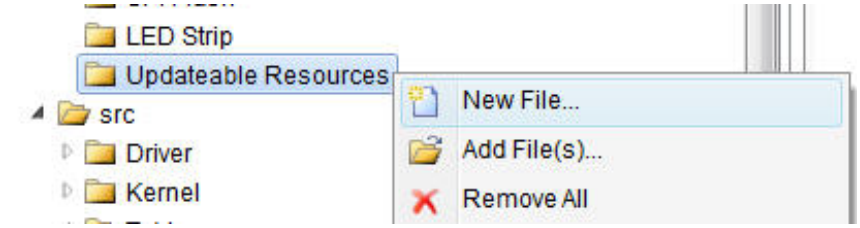
finishing. Please enter the filename in the pop-up dialog box. The entered filename will be listed in the EEPROM directory.

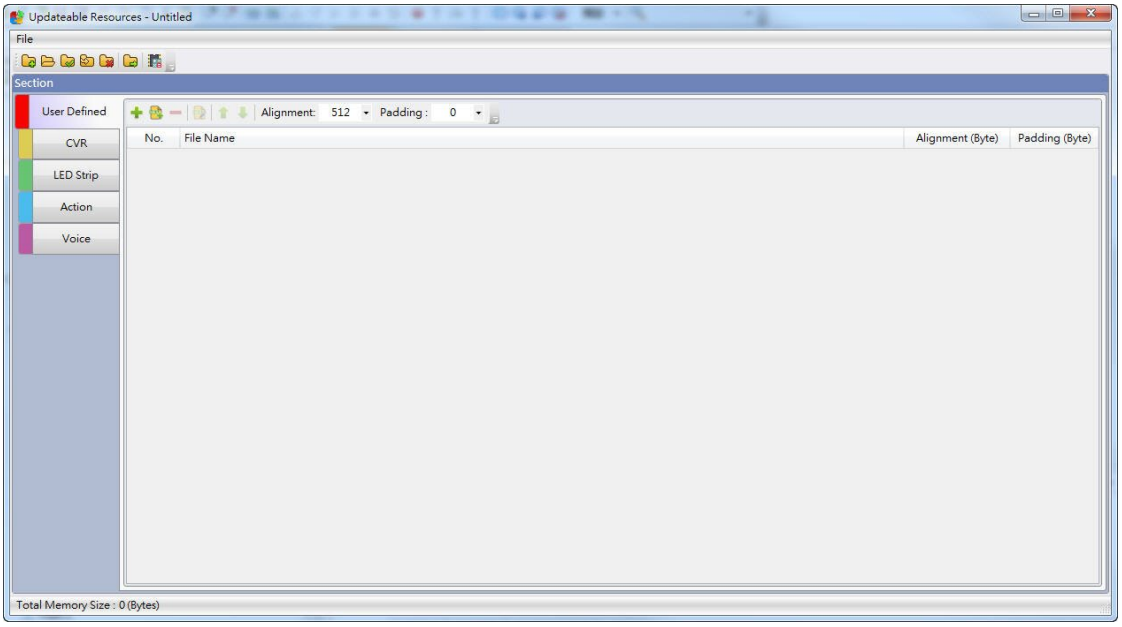
- Add File(s): Add an existing binary file (.hex). If there are a previous edited binary file, user can directly add the file to the EEPROM directory.
- Remove All: Remove all the files from the EEPROM directory.
- Edit the EEPROM Overwrite data: If user needs to modify the content of the added file, please double-click on the desired file in the EEPROM directory, user can edit content in the pop-up window. Click the Save button after finishing, and the edited data will be saved in the original file.

Note: The memory size depends on the built-in EEPROM of different IC bodies. If the added file length exceeds EEPROM, the exceeded data will be discarded. If the added file length os less than EEPROM, the insufficient part will be filled with 0xFF.

3.3.3 Updateable Resources

➢ NX1 EF series supports the Updateable Resources setting, user can add resource files of this area into the internal Flash. The initiating location would execute the alignment for replacing or erasing, which can make it more convenient to replace resource files when using Q-Transfer, NYISP, or IAP Downloader to update the files in this area





New File…: Envoke the Updateable Resources editing window (as the above illustration) to edit resource files. Each files can set its alignment and padding, these two settings will affect whether future updates can be executed individually for this file. Retaining the flexibility of replacement will definitely waste some ROM space, please set it according to actual needs.

Alignment: Align the initiating location of the file, the range is 0~65536, its default value is 512. If user set the value as 0 or 1, it means no need to align files, the files will continue with the ending location of the previous file. Files that are not aligned will not be able to be updated separately in the future

Padding: Pad the data for the ending file , the range is 0~10240, it default value is 0. This setting is used to reserve space and retain the flexibility to replace files that may take up more space in the future

After editing, users can save the project as .udrprj file and exit the editing window. *NYIDE* will add the edited project as a link to the Updateable Resources directory.

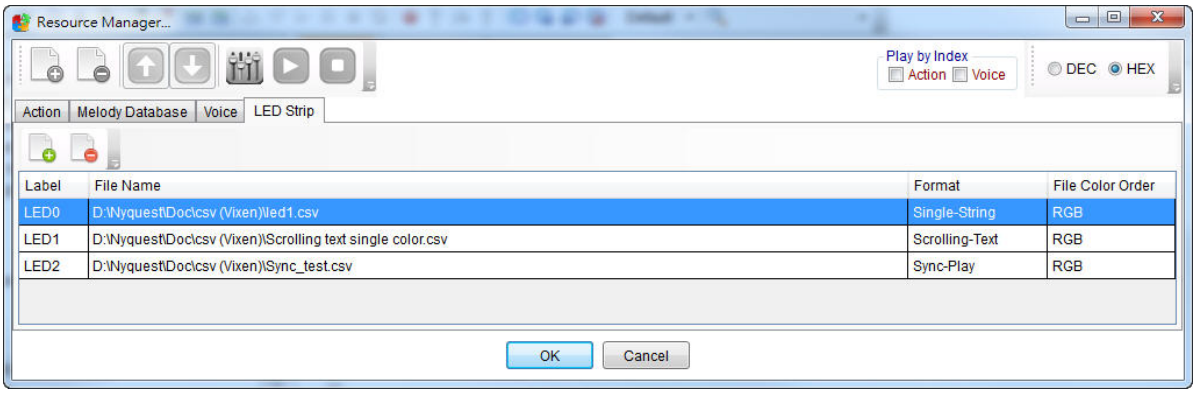
Add File(s)…: Add the edited Updateable Resources project directly. Users can edit the project by double-clicking to open the editing window.

Remove All: Remove the added Updateable Resources files.

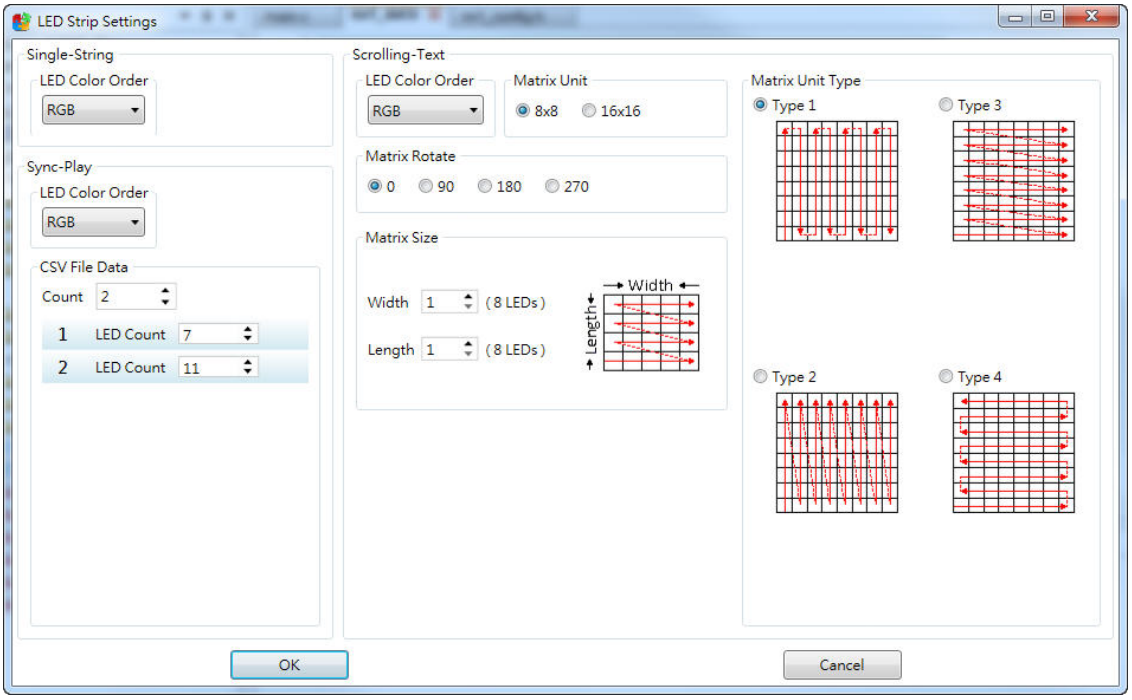
- While building, *NYIDE* will convert the project as a programmable binary file and build the resource project with other files. To speed up building time, *NYIDE* will check whether the files have been modified.
- When the users open the file edited by NYIDE 5.02 (inclusive) or an earlier version, and the file also contains the settings of User Defined Section or VR Module, please edit the file with NX1_C_Module 3.30 (inclusive) or a later version. A new file with the same name as the project will be automatically generated by NYIDE 5.10 (inclusive) or a later version, and these settings will be applied to the project.

3.3.4 LED Strip Settings

The NX1 series supports the LED Strip function. User can add one or more csv files of Vixen Lights through the resource menage interface and set the Format and File Color Order as shown below.



The different output formats need different parameter settings, please click the Setting => [LED Strip…] from the menu to open the setting interface as shown below.



The LED Strip Setting currently supports 3 formats: Single-String / Sync-Play / Scrolling-Text, the parameter descriptions are described as follows.

- LED Color Order: The LED Color Order providez 6 different RGB orders.
- CSV File LED Strip Count: The strip counts for the CSV file, NX1 only supports 16 strips.
- LED Count: The LED counts for each strip, NX1 only supports LED counts up to 300 for each strip.

◆ Matrix Unit: The unit for strip matrix that provide 2 types of unit.

Matrix Unit	Description
8x8	8x8 matrixfor strips.
16x16	16x16 matrix for strips.

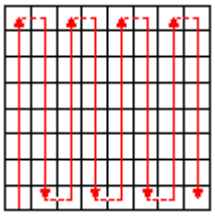
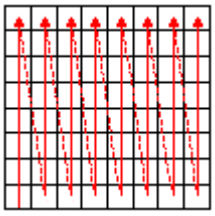
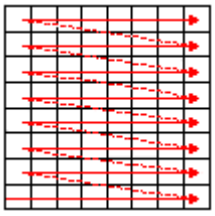
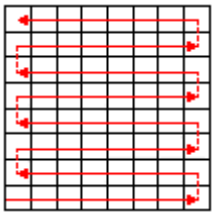
◆ Matrix Rotate: The Matrix Rotate provides 4 different rotation degrees.

Rotation	Description
0	undo.
90	Rotate 90 degrees clockwise.
180	Rotate 180 degrees clockwise.
270	Rotate 2700 degrees clockwise.

◆ Matrix Width: The matrix width only supports 256 LEDs for NX1 series.

◆ Matrix Length: The matrix length only supports 256 LEDs for NX1 series.

◆ Matrix Type: The matrix type supports 4 types of arrangement.

Arrangement Type	Pattern
Type1	
Type2	
Type3	
Type4	

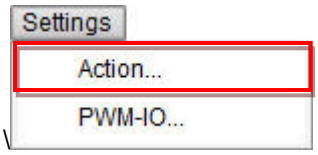
If the set parameters are inconsistent with the added csv content, it will cause a conversion error.

Remark: There is only one LED Strip settong for the whole project. If the added SPI_Encoder project or

Updateable Resources project contains the csv file of LED strip, it will complie to the convert setting of NYIDE, rather that the original setting of SPI_Encoder/Updateable Resources. (The settings of SPI_Encoder/Updateable Resources is used for the software internal to convert bin file independently.)

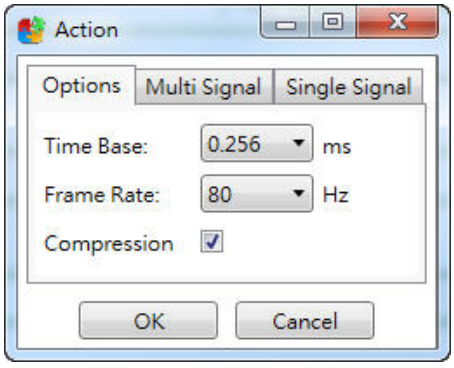
3.3.5 Action Settings

NY4/NY5/NY5+/NY6/NY7/NY9T/NX1 series supports the Action Settings. User can add one or several .vio files through the Resource Manager. Then click on the Action Settings button through the Resource Settings from Project Browser. The Action Settings window is shown below.



There are 3 tabs for Action Settings window: Options / Multi Signal / Single Signal, the descriptions of each tab is described below.

- Options



The Options tabe provides the following settings.

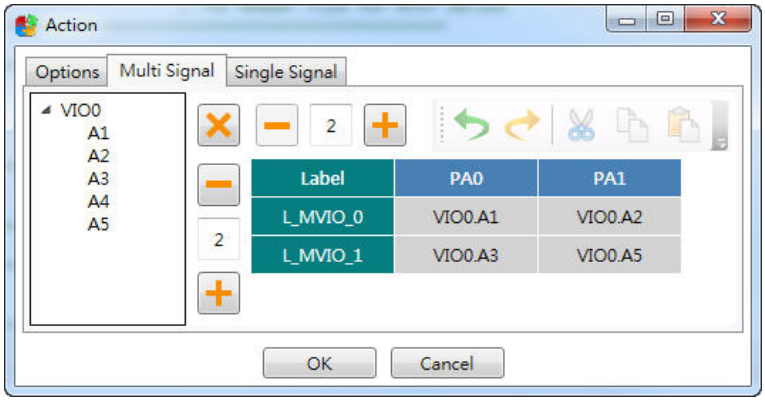
Time Base: The least unit of measurement of time, its unit is ms.

Frame Rate: Frame Rate is the number of signals that are displayed per second, the unit is Hz.

Compression: If the Level changing outputs continuously as 0 or 100%, user can tick this option to reduce the usage of ROM size.

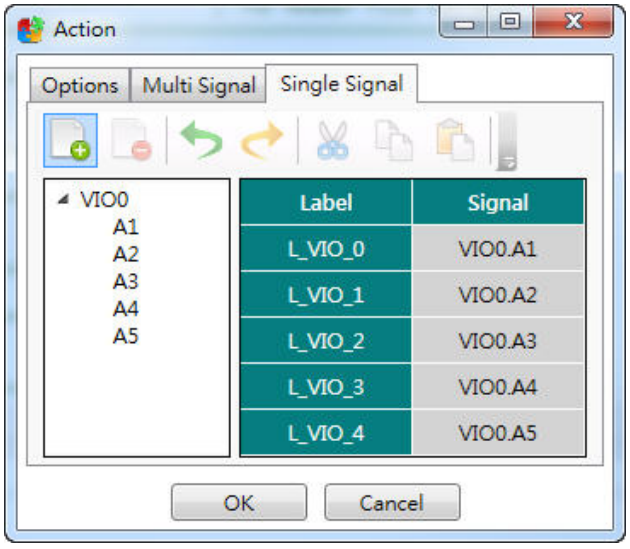
NX1 series doesn't support the Options tab, the relevant settings please refer to the Resource Manager.

- Multi Signal



The Multi Signal tab can set the output configuration of multi signals that will output to the corresponding pins simultaneously while playing signals. The .vio file added from the Resource Manager and its signals is shown on the left side. The output configuration must include 2 pins, user can adjust the pin number through the upper +/- icon, user can set the needed pin after adding a new pin. The output signal of Action uses Port as its unit, if only one pin of the Port is used, the rest pins will output blank signals and occupy the ROM size. The +/- icon on the left can adjust the number of configurations, each configuration will convert a corresponding .vdx file for ASM Module playback.

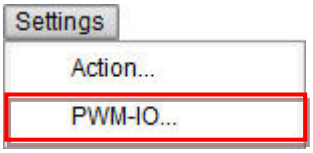
- Single Signal



Set the output configuration of the single signal. Each configruation only contains one signal which will convert one corresponding .vix file for ASM Module playback. The *NYIDE* versions before *NYIDE* 4.61(included) only support the single signal output, *NYIDE* 4.70 will convert the previous setting to the new format.

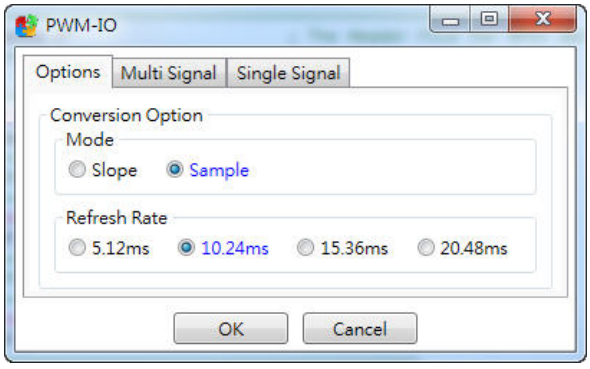
3.3.6 PWM-IO Settings

NY5+ series supports the PWM-IO Settings. User can add one or several .vio files through the Resource Manager. Then click on the PWM-IO Settings button through the Resource Settings from Project Browser. The PWM-IO Settings window is shown below.



There are 3 tabs for PWM-IO Settings window: Options / Multi Signal / Single Signal, the descriptions of each tab is described below.

- Options

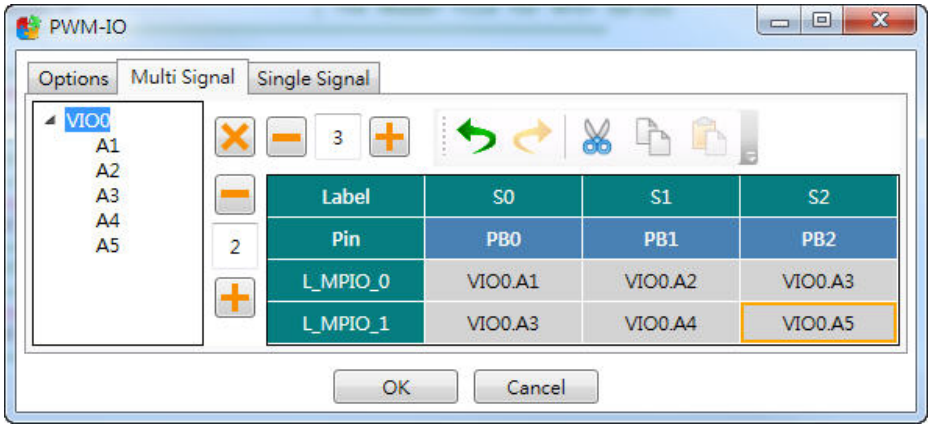


The Options tabe provides the following settings.

Mode: Uses the slope method for data conversion, and uses the Sample method of aligning sampling points for data conversion. When using Sample mode, more ROM is consumed, and when using Slope mode, more RAM is consumed.

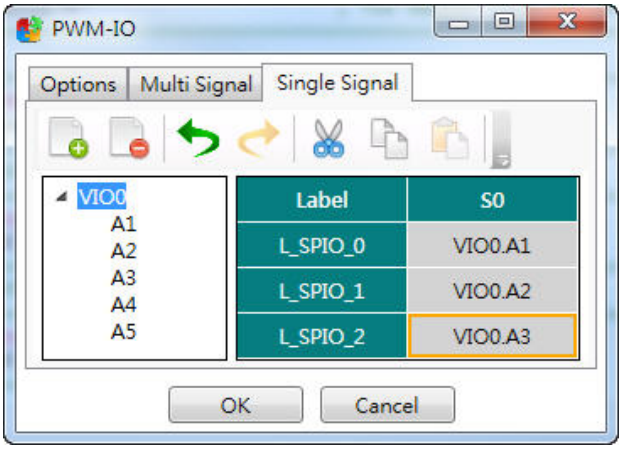
Refresh Rate: The sampling interval of the data. The smaller the interval, the larger the amount of data.

- Multi Signal



User can set the output configuration of multi-signal. It will output to the corresponding pin at the same time during playback. The .vio file added from the Resource Manager and its signals is shown on the left side. At least 2 pins are required, and the number of pins can be adjusted by +/-, then set the needed pin after adding a new pin. The +/- icon on the left can adjust the number of configurations, each configuration will convert a corresponding .pdx file for ASM Module playback.

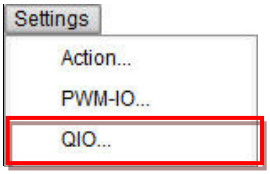
- Single Signal



Set the output configuration of the single signal. Each configruaton only contains one signal that will convert one corresponding .pix file for ASM Module playback.

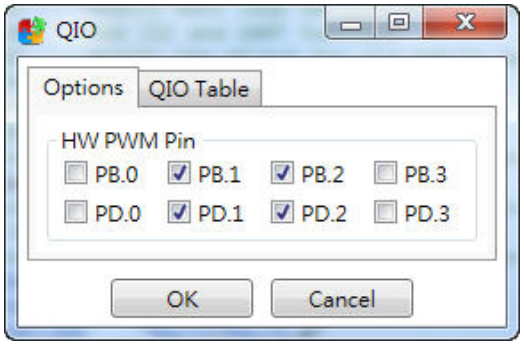
3.3.7 QIO Signal Settings

The NY5+ series supports QIO signal settings, user can select the “QIO” option of [Setting] from the menu, and its setting window will pop up.



There are two tabs for QIO signal settings: Options and QIO Table. The following descriptions will explain their contents.

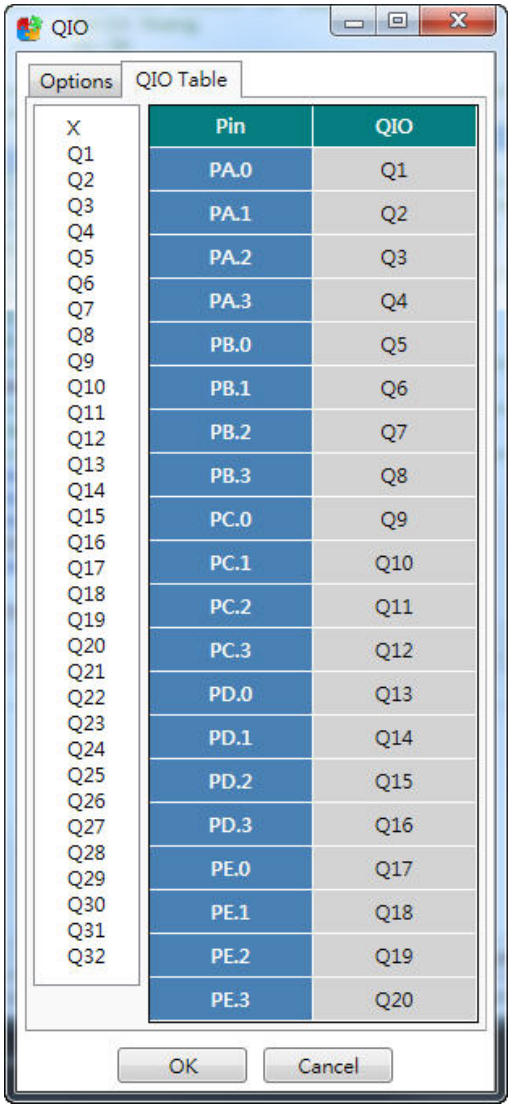
- Options



The Options tab provides the following settings:

HW PWM Pin: Select pins to output QIO signals by using HW PWM.

- QIO Table



Set the corresponding relations for QIO signals and pins via this tab, please set the HW PWM pin as well for selecting QIO signals output by hardware or software.

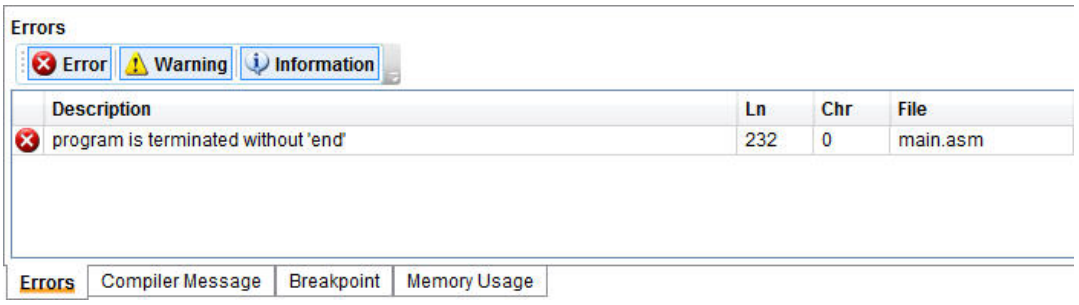
Note: This setting must work with the above version of NYIDE 5.10 and NY5+_ASM_Module 1.31, otherwise the QIO signals will be output by software.

3.4 Build Project

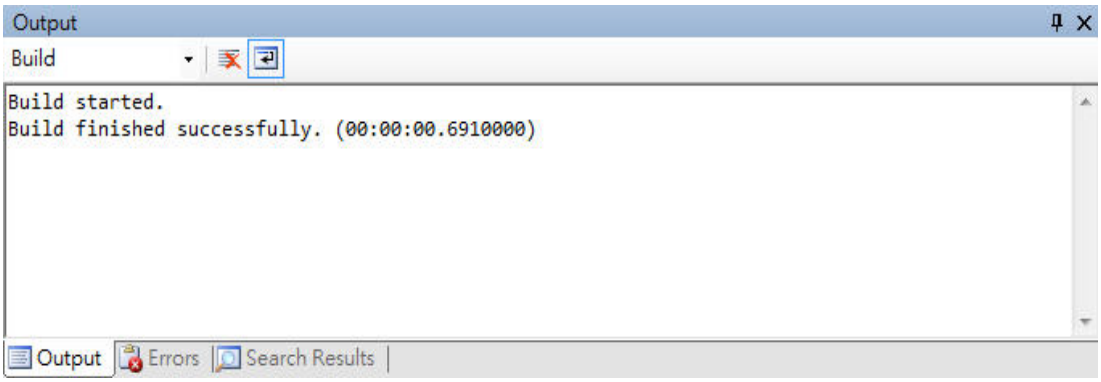
(1) Set an entry path on the Project Manager window for .asm file. Then click right mouse button on the .asm file and select [As Entry Point]. (The starting point is indicated in blue)

(2) Press [Build] →[Build Solution] or [Build "Project Name"] to implement *NYASM* to build .bin file.

(3) If the Errors window shows error message, please double-click on the error item, cursor will jump to the error address, user can revise the address right away.



(4) If the Build action succeeds, the Output window sill show “Build finished successfully”.



(5) In NX1 series, if the project includes the *SPI_Encoder* project, it will produce an additional _SPI.bin and _Pack.bin files after building. The SPI.bin file contains the SPI Flash data, while the _Pack.bin file includes both programs and SPI Flash data at the same time. These files can be used to decide the burn target in *Q-Writer*. (Individually burn ROM/SPI Flash, or burn them at the same time.)

3.5 Debug

After build action succeeds, the generated bin file needs to be tested. Please click ▶ to execute the debugging mode.

NYIDE will transmit the .bin file to ICE and a yellow indicator will stop at the starting address of program, and the layout mode will switch to “Debug layout” automatically. If failed to download, please check which ICE is connected to PC correctly or not.

The debugging methods:

- Debug line by line through using “Step”.
- Execute debugging and stop at the cursor position by using “Run To Cursor”.
- Pause the program immediately by using “Pause”.
- Set “Breakpoint” and execute “Run”, the debugging process will stop at the breakpoint automatically.

Note:

1. If user executes sleep mode by using Step, user cannot wake up the IC by implementing the

Watchdog Timer function

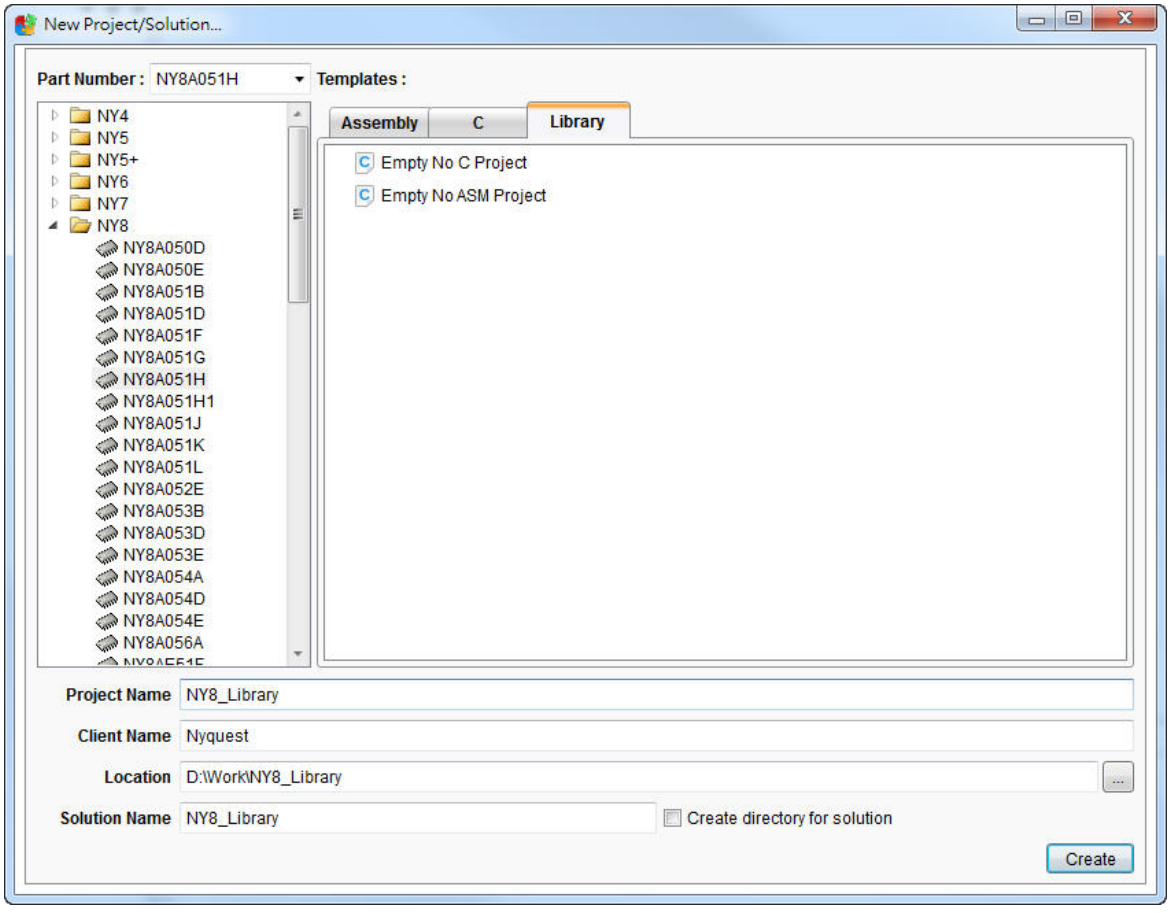
2. ***If user set breakpoint under the next line of Sleep command, after Free Run to the sleep mode, user cannot wake up the IC by implementing the Watchdog Timer function.***
3. ***It will cause wake-up failure when using Q-Link to execute detection, set Timer as the wakeup source of Standby mode, and the breakpoint is in the next line after entering Standby mode. To avoid wake-up failure, the breakpoint cannot be set in the next line of OSCCR command while using Q-Link detection.***

3.6 Create Library Project

During the software development process, it may be necessary to develop a library to improve the efficiency of shared programs or to provide certain functionalities to the client without exposing the source code. Currently, both the NX1 and NY8 series support creating library projects in C language, and the NY8 series also supports this in assembly language. A brief introduction to the usage is provided below.

- Create a new library project

  [File] → [CreateProject…]



Select the product number corresponding to the NX1 or NY8 series as the base, and choose Library as the template. To create a new C language project, select the Empty NO C Project template; for assembly language, select the Empty NO ASM Project template.

Enter the required information and click **Create** to generate a library project without any files. You can then add new blank .c or .asm files via [File] → [New File...] to start coding, or add existing .c or .asm source files to the project.

- Library project settings

  Use [Project]→[Project Settings…] to set the related settings. For detailed description, please refer to 2.2.4.9 Project Settings.

- Build library

  After the program is coded and the relevant settings are set, please refer to 3.4 Build Project for building the project. If the project is successfully created, a library file with the filename extension .a will be generated. This library file is only applied to *NYIDE.*

- Use library

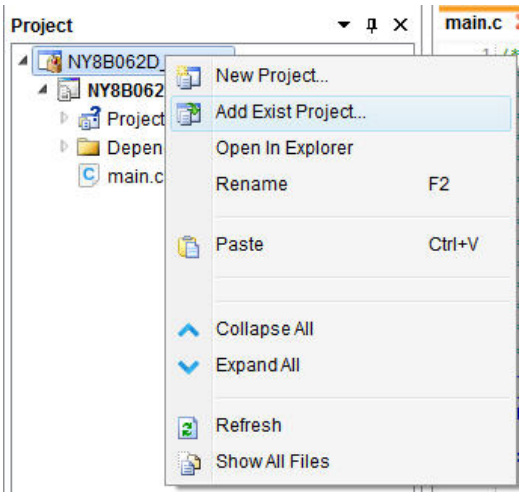
  To use a library in your project, go to [Project] → [Project Settings...] → Library Files and add the generated library file. Then, include the corresponding header file in your source code using #include to access the library's functionality.

  For assembly language libraries, insert the line #include "lib.asm" at an appropriate location in the entry point file of the assembly project. This ensures the project compiles successfully. (Note: The lib.asm file does not need to physically exist.)

- Debug library

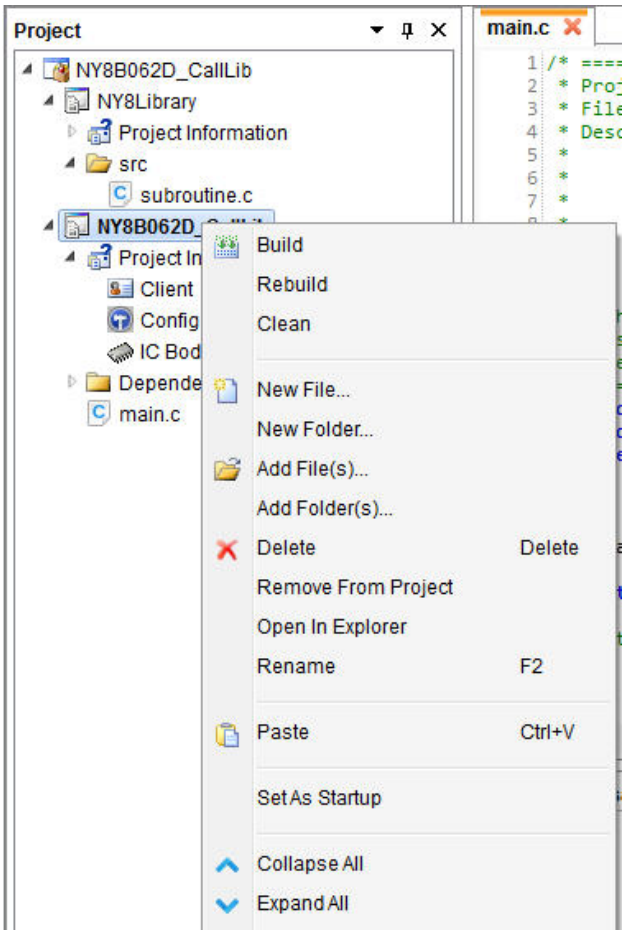
  Because the library cannot be debugged separately, it must work with a C language project that is downloaded to the device. Detailed steps are as follows：

  1. Open or create a C Language project that uses the same IC series with the target project, then right-mouse click on the project manager interface to open the context menu, select [Add] →[Existing Project…]. The library project is also added to the solution.



  2. Please refer to the above library to add the target library into C Language code.
  3. In the project manage interface, select C Language project and click on [Project→[Set as StartUp Project] to set the project as the startup project (displayed in bold). This setting is to specify the C

Language project for debugging.



4. Please refer to 3.5 Debug for the related steps. In the process of debugging, user can use “Step” to debug the programmed code of the library.

4 Revision History

Version	Date	Description	Pages Modified
1.0	2014/08/29	The first version.	-
1.1	2014/11/25	1. Update interface. 2. Add notes to the descriptions of Breakpoint window.	- 13
1.2	2015/02/11	1. Update Search menu. 2. Add chapter of Hot Key. 3. Modify the description of Build Project/Solution. 4. Add notes for Debug.	24 26 28 30
2.0	2015/05/29	1. Update UI. 2. Add the introductions of NY4/5/7/9T ICE. 3. Update “File” menu. 4. Update “Project” menu. 5. Add “Change Client Name” function. 6. Add “Change IC Body” function. 7. Add “Config Block Setting” function. 8. Add “Help” menu. 9. Modify the description of “Build Project/Solution”.	- 6 14 17 17 17 18 44 47
2.1	2015/08/31	1. Add “System Register” function. 2. Add descriptions for “Checksum Options”. 3. Add descriptions for “NY8A056A Config Block Setting”. 4. Modify the description of “NY9T series Config Block Setting”.	15 17 25 37
2.2	2015/11/27	1. Update NY8 series Config Block Setting interface. 2. Add the description of “NY9T001A Config Block Setting”. 3. Add the description of “NY9UB series Config Block Setting”.	22, 25 37 41
2.3	2016/02/25	1. Update NY8 series Config Block Setting interface. 2. Add “NY8A051B Config Block Setting” descriptions. 3. Add “NY8A053B Config Block Setting” descriptions. 4. Update NY9T series Config Block Setting interface. 5. Add the warning dialog of NY9T004A/16A Debounce Time.	22, 25 27 31 37, 39 40

Version	Date	Description	Pages Modified
2.4	2016/05/27	1. Add “Resource Manager” function. 2. Add “NY6 series Config Block Setting” descriptions. 3. Add NY8A051C/51D to Config Block Setting. 4. Add the descriptions of “Editing Resource”	17 20 22 47
2.5	2016/08/24	1. Update NY6 Config Block Setting. 2. Update NY7 Config Block Setting. 3. Update NY8A053B Config Block Setting. 4. Add the descriptions of NY8A053D Config Block Setting. 5. Update NY9UB Config Block Setting. 6. Hotkey add “Add Comment” and Remove Comment”. 7. Add the description of NY6 / NY7 supports adding .qmd file. 8. Add “SPI Flash Resource Files” chapter.	20 21 31 37 41 45 50 50
2.6	2016/11/30	1. Add the “Project Option” function. 2. Update “Build Project ” interface. 3. Add NY8A051C Config Block Setting. 4. Update NY8A053B / 53D Config Block Setting. 5. Add NY8B071A Config Block Setting. 6. Add NY9UP01A Config Block Setting. 7. Add NX1 series Config Block Setting.	20 25 36 40 47 56 58
2.7	2017/02/21	1. Update “Resource Manager” interface. 2. Update “Build” interface. 3. Update NY8A051B / 51C / 51D Config Block Setting and descriptions. 4. Update NY8A053B / 53D Config Block Setting and descriptions. 5. Update NY8B071A Config Block Setting and descriptions. 6. Update NY9UP01A Config Block Setting and descriptions. 7. Update NX1 series Config Block Setting and descriptions. 8. Add the description for NX1 series producing _Pack.bin file.	19 21 36 41 47 57 58 62

Version	Date	Description	Pages Modified
2.8	2017/05/23	1. Add automatic installation description. 2. Add LCD debug related windows and descriptions. 3. Add NY4 / 5 / 6 / 7 / 8 / 8L / 9T series Project Setting function. 4. Add NY8A054A Config Block Setting and descriptions. 5. Add NY8L series Config Block Setting and descriptions. 6. Add NY8L Tone conversion description.	13 18, 20 25 39 62 70
2.9	2017/08/21	1. Add descriptions for Conditional Breakpoint, Watch Point and Edit Break Condition. 2. Add the descriptions of NY8 C language Project Setting. 3. Add “NY8A054D Config Block Setting” descriptions. 4. Update NX1 series Config Block Setting and descriptions.	18 28 43 72
3.0	2017/11/30	1. Add NY8L hardware descriptions. 2. Update the descriptions and interface of NY8 C language Project Setting. 3. Add “NY8A051E Config Block Setting” descriptions. 4. Update NY8L Series Config Block Setting descriptions. 5. Update NX1 series Config Block Setting and descriptions.	13 29 56 71 77
3.1	2018/02/27	1. Update all series Config Block Setting. 2. Add “NY8B062D Config Block Setting” descriptions. 3. Add “NY9UP08A Config Block Setting” descriptions. 4. Add “NX1 LVR” descriptions. 5. Add “security setting of SPI Flash” descriptions.	- 68 85 87 91
3.2	2018/05/31	1. Update “Project Manager” interface. 2. Update “Register Window” interface.. 3. Update “Memory Usage Information” interface. 4. Update “Change IC Body” interface. 5. Add the descriptions of NY8L C language project setting. 6. Update the interface and descriptions of NY8 C language project setting.	17, 35 22 25 26, 37 29 31

Version	Date	Description	Pages Modified
		7. Update “Debug” menu descriptions. 8. Add “NY8B072A Config Block Setting” descriptions. 9. Update NX1 series Config Block Setting interface.	32 81 94
3.3	2018/08/14	1. Update “Help” interface and description. 2. Update NX1 series Config Block Setting interface.	34 95
3.4	2018/11/23	1. Update “Project” interface and description. 2. Add “Common OTP” interface and description. 3. Update “NX1 Project Settings” interface and description. 4. Update “Help” interface and description. 5. Add “Show Help Document” interface and description. 6. Add “NY8B062A Config Block Setting” descriptions.	27 31 36 47 47 128
3.5	2019/02/26	1. Update “Memory Usage Information” interface and description. 2. Update “NX1 Project Setting” interface and description. 3. Update “Debug” interface and description. 4. Add “NY8A051F Config Block Setting” descriptions. 5. Update “NY8B062A Config Block Setting” descriptions. 6. Update “NY9UP08A Config Block Setting” descriptions.	25 36 45 90 128 233
3.6	2019/05/30	1. Update “ LCD Simulation” description. 2. Add “VR Group Combo” interface and description. 3. Update “NX1 Project Setting” interface and description. 4. Update “NY8L C Language Project” interface and description. 5. Update “NY8 C Language Project” interface and description. 6. Add “NY8A050D Config Block Setting” interface and description. 7. Add “NY8AE51D Config Block Setting” interface and description. 8. Add “NY8B062B Config Block Setting” interface and description. 9. Update “NX1 Config Block Setting” interface and description. 10. Add “EEPROM Overwrite” interface and description.	25 31 36 39 40 64 95 150 234 239

Version	Date	Description	Pages Modified
3.7	2019/08/23	1. Update “Memory Usage Information” interface and description. 2. Add “NY8A051G Config Block Setting” interface and description.	25 95
3.8	2019/11/29	1. Add “Q-Link device” description. 2. Update “NY8 C Language Project Setting” interface and description. 3. Add “Library Project Setting” interface and description. 4. Update “NY8A050D Config Block Setting” interface and description. 5. Update “NY8A054A/NY8A054D Config Block Setting” interface and description. 6. Update “NY8A051F Config Block Setting” interface and description. 7. Update “NY8A051G Config Block Setting” interface and description. 8. Update “NY8AE51D Config Block Setting” interface and description. 9. Update “NY8B062A Config Block Setting” interface and description. 10. Update “NY8B062B Config Block Setting” interface and description. 11. Update “NY8B062D Config Block Setting” interface and description. 12. Update “NY8B071A Config Block Setting” interface and description. 13. Update “NY8B072A Config Block Setting” interface and description. 14. Add “NY8BM72A Config Block Setting” interface and description. 15. Remove “SPI_Encoder Security Setting” interface and description. 16. Add “Create Library Project” interface and description.	11 30 31 46 52 69 73 78 88 94 100 104 109 115 - 136
3.9	2020/03/03	1. Update “File” interface and description. 2. Update “Project Settings” interface and description. 3. Update “NY8 High Crystal Oscillator” interface and description. 4. Update “NY8AE51D Config Block Setting” interface.	16 27 54 77
4.0	2020/05/22	1. Update “Debug” interface and description. 2. Remove “NY8A051A/NY8A053A Config Block Setting” interface and description. 3. Remove “NY8A051C Config Block Setting” interface and description. 4. Remove “NY8B071A Config Block Setting” interface and description. 5. Update the description of “NY8 Input High Voltage / Input Low Voltage”. 6. Update the “NX1 Config Block Setting” interface and description.	33 - - - 49 121

Version	Date	Description	Pages Modified
4.1	2020/09/02	1. Update “Project” interface and description. 2. Update “VR Group Combo” interface and description. 3. Add “Package Test” interface and description. 4. Update “NY8 C Language” interface and description. 5. Add “NY8A054E Config Block Setting” interface and description. 6. Add “NY8B061D Config Block Setting” interface and description. 7. Update “NY8BM72A Config Block Setting” interface and description.	23 25 26 31 50 97 108
4.2	2020/11/30	1. Add “NY8 Assembly” interface and description. 2. Update “NY8L C Language” Project Settings interface and description. 3. Update “NY8 C Language” Project Settings interface and description. 4. Update “Tool” interface and description. 5. Add “NY8A053E Config Block Setting” interface and description. 6. Update “NY8BM72A Config Block Setting” interface and description. 7. Add “NY9UP02A Config Block Setting” interface and description. 8. Update “NX1 Config Block Setting” interface and description. 9. Update “Debug” notes.	29 31 32 34 88 115 130 132 138
4.3	2021/01/27	1. Add “NY8B062E Config Block Setting” interface and description. 2. Add “NY8TM52D Config Block Setting” interface and description. 3. Update“NX1 Config Block Setting” interface and description.	116 141 154
4.4	2021/05/31	1. Update the ”Project” interface and description. 2. Add “Audio Filter” interface and description. 3. Add “NY5+ Config Block Setting” interface and description. 4. Add “NY8B060E Config Block Setting” interface and description 5. Add “NY8BE62D Config Block Setting” interface and description. 6. Update “NY8BM72A Config Block Setting” interface. 7. Update “EEPROM Overwrite” description.	22 25 45 95 127 134 158

Version	Date	Description	Pages Modified
4.5	2021/09/30	1. Update the “Project” interface and description. 2. Update“Common ROM Code” interface and description. 3. Update “NY8 C Language” Project Settings interface and description. 4. Update “Help” interface and description. 5. Add “Product Selection” interface and description. 6. Add “NX1 EF Config Block Setting” interface and description. 7. Update “EEPROM Overwrite” description.	23 24 34 39 41 134 137
4.6	2021/11/23	1. Update the illustration and description of “Audio Filter”. 2. Update the illustration and description of “Package Test”. 3. Update “NY5+ Config Block Setting” interface and description. 4. Add “NY8TE64A Config Block Setting” interface and description.	26 27 46 132
4.7	2022/02/25	1. Update “NY8 C Language” Project Settings interface and description. 2. Add “NY8A051H Config Block Setting” interface ans description. 3. Add “NY8AE51F Config Block Setting” interface and description.	34 81 89
4.8	2022/05/25	1. Update “NY8AE51F Config Block Setting” interface and description. 2. Add “NY8B060D Config Block Setting” interface and description. 3. Update “EEPROM Overwrite” interface and description. 4. Add “ActionSettings” interface and description. 5. Add “PWM-IO Settings”interface and description.	103 140 239 240 246
4.9	2022/08/31	1. Add the illustration and description of NY8_ICE. 2. Update NY5+ Config Block Setting interface. 3. Update NY6 Config Block Setting interface. 4. Update NY8B061E / NY8B062E Config Block Setting interface. 5. Update NY8BE64A / NY8TE64A Config Block Setting interface.	9 48 49 126 163
5.0	2022/11/22	1. Add Device Help Document interface and description. 2. Update “NY8B061E / NY8B062E / NY8B062F Config Block Setting” interface and decription.	40, 42 127
5.1	2023/02/17	1. Update “NY4 Config Block Setting” interface and description. 2. Update “NY5+ Config Block Setting” interface and description. 3. Add “NY8A050E Config Block Setting” interface and description.	57 59 67

Version	Date	Description	Pages Modified
5.2	2023/05/25	1. Update illustraionns and descriptions for 5.00 latest version. 2. Update ” NX1 EF series Config block Setting” interface and descriptios.	- 188
5.3	2023/08/25	1. Add “NY8A052E Config Block Setting” interface and description. 2. Add “Updateable Resources” interface and description. 3. Add “LED Strip Settings” interface and description. 4. Add “QIO Signal Settings” interface and description.	109 199 201 206
5.4	2023/11/17	1. Update “NY4 Config Block Setting” interface and description. 2. Update “NY5+ Config Block Setting” interface and description. 3. Update NY8BM72A Config Block Setting” description.	51 53 163, 164
5.5	2024/02/26	1. Update “Watch Window” illustration and description 2. Update “Project Manager” illustration and description. 3. Update “NY5+ Config Block Setting” interface and description. 4. Add “NY8BM61D/NY8CM62D Config Block Setting” interface and description. 5. Update NY8 LVR warning message and its illustration. 6. Update“NX1 EF Block Setting” illustration and description.	22 48 54 160 - 195
5.6	2024/08/26	1. Update the illustration and description of “Audio Filter”. 2. Update the illustration and description of “NY8C Language“ setting. 3. Update the illustration of “Tool”: 4. Remove “NY8AE51D Config Block Setting”. 5. Remove “NY8B060E Config Block Setting” 6. Remove “NY8B061D Config Block Setting”. 7. Update the illustration and description of “LED Strip Settings”.	30 38 43 - - - 200

Version	Date	Description	Pages Modified
5.7	2025/02/26	1. Update “NY8A051G Config Block Setting” interface and description. 2. Add “NY8A051J Config Block Setting”. 3. Add “NY8A051K Config Block Setting”. 4. Add “NY8A051L Config Block Setting”. 5. Update “NYBM61D/NY8BM62D Config Block Setting” interface and description. 6. Update “NX1 EF Config Block Setting” interface.	95 103 108 113 185 235
5.8	2025/05/28	1. Update “Option” interface and description. 2. Add “Document” interface and description. 3. Update “NY8A051H/NY8A051H1Config Block Setting”. 4. Add “NY8B062F1 Config Block Setting”. 5. Add “NY8BM84A Config Block Setting”. 6. Update “Create Library Project“ interface and description.	27 46 99 167 200 250
5.9	2025/08/27	1. Update NY8 C language project settings and its decsriptions. 2. Add “NY8A054E1 Config Block Setting”. 3. Update “NY8BM84A Config Block Setting” interface and description. 4. Add “NY8F2481 Config Block Setting”.	40 71 200 207