九齊科技股份有限公司
Nyquest Technology Co., Ltd.

User Manual

NY8 Code Converter

Easy 8-bit MCU Code Converter

Version 3.9
Aug. 15, 2025

Table of Contents

1 Introduction

NY8 Code Converter is a converting program for NY8 8-bits MCU IC series that developed by Nyquest Ltd, co. It's an new integrated development system which can convert the original file to Nyquest IC. This system provides an integrated working environment and powerful functions to improve your work efficiency.

Content:

1.1 What is *NY8 Code Converter*

NY8 Code Converter is the converting software tool for 8-bits MCU IC. It not only provides a user-friendly graphical interface, but also brings more accuracy, efficiency and simplicity.

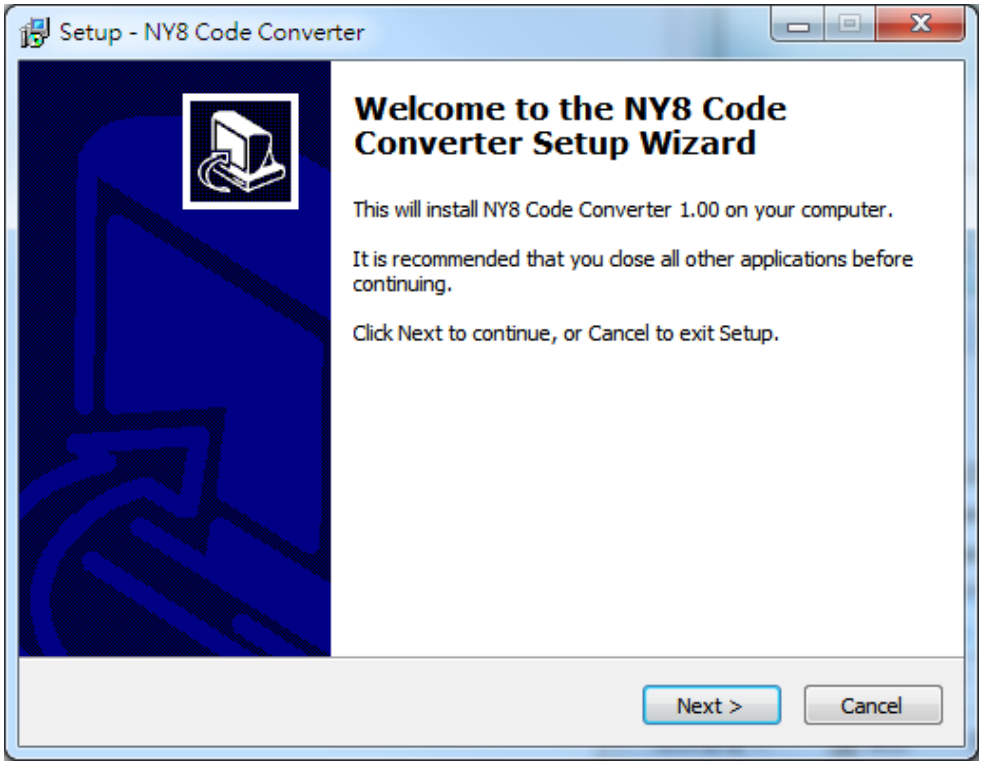
1.2 Install *NY8 Code Converter*

Please contact Nyquest Technology to acquire the updated *NY8 Code Converter* program. To install *NY8 Code Converter*, unzip the .zip file to a specific folder and then double-click on the .exe file in the folder to start the installation. Follow the instructions of the installation wizard to complete the installation.

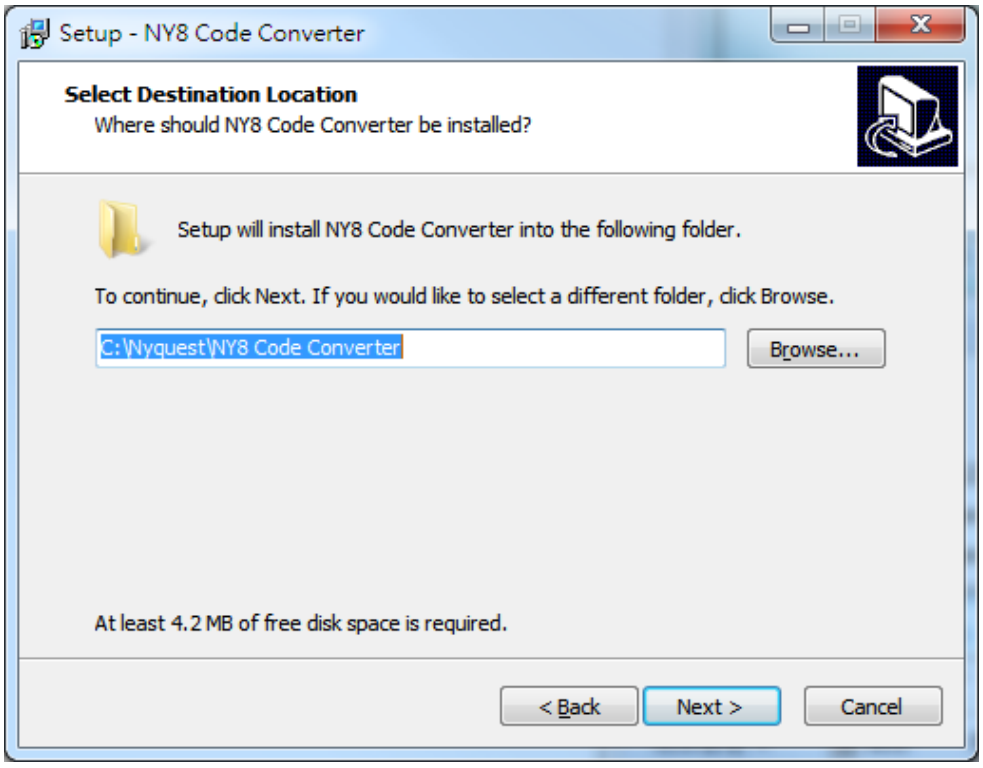
System Requirements:

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

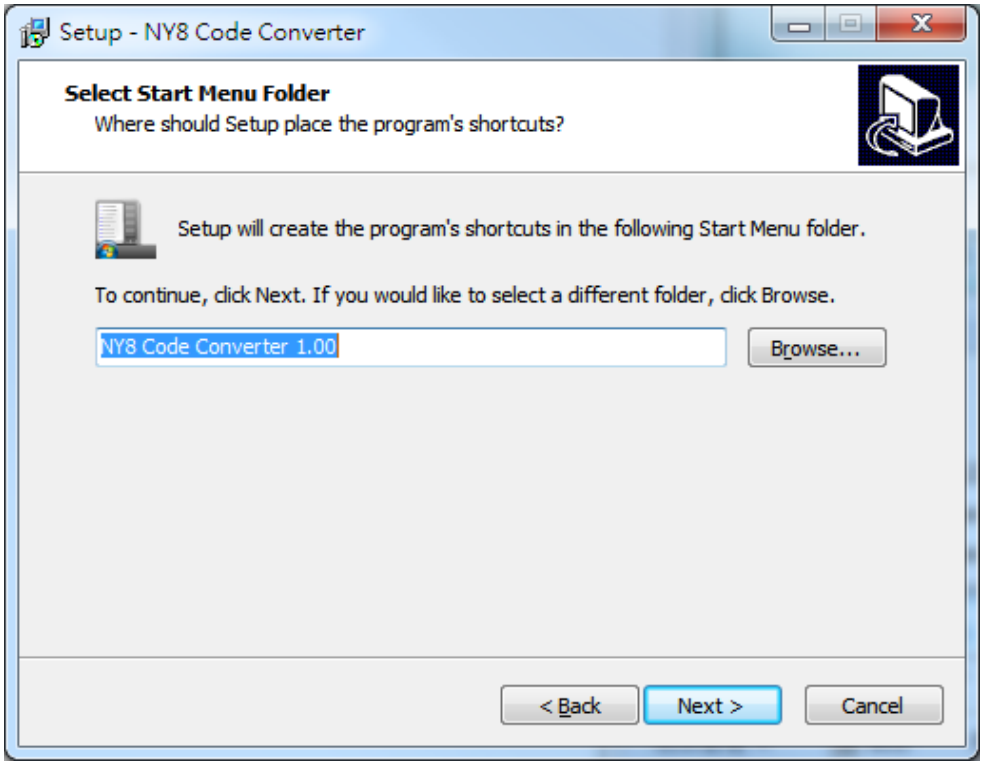
Step 1: Click on the installation file of *NY8 Code Converter* for getting start.



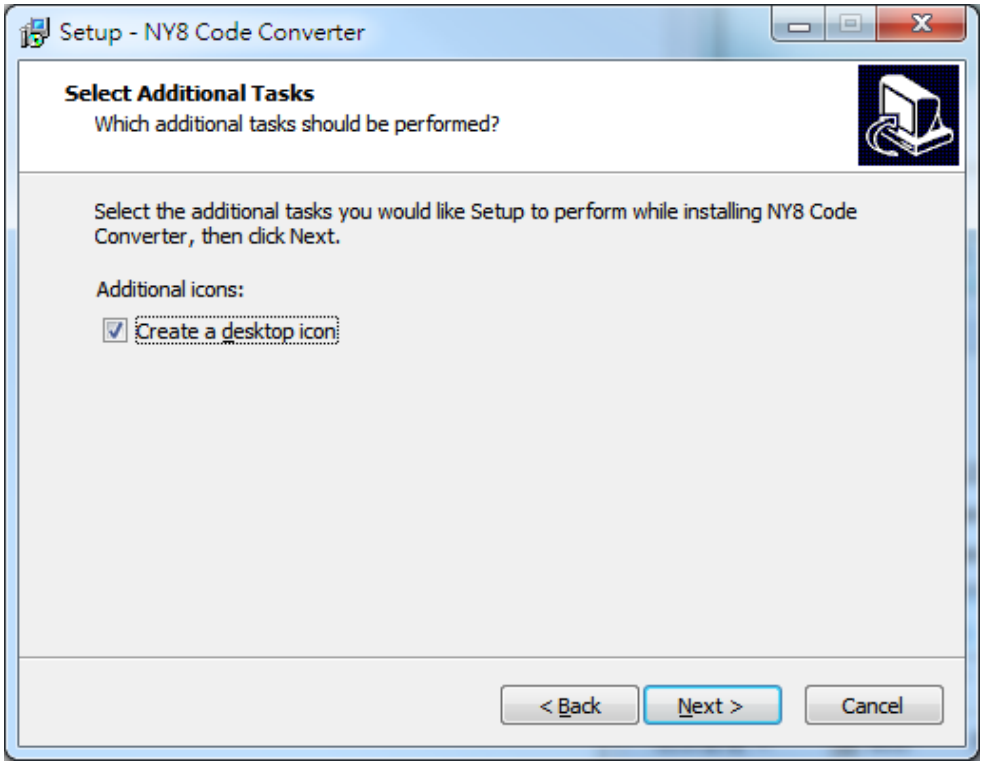
Step 2: The default destination location. If user wants to change location, please press Browse to select a different folder. Then press Next.



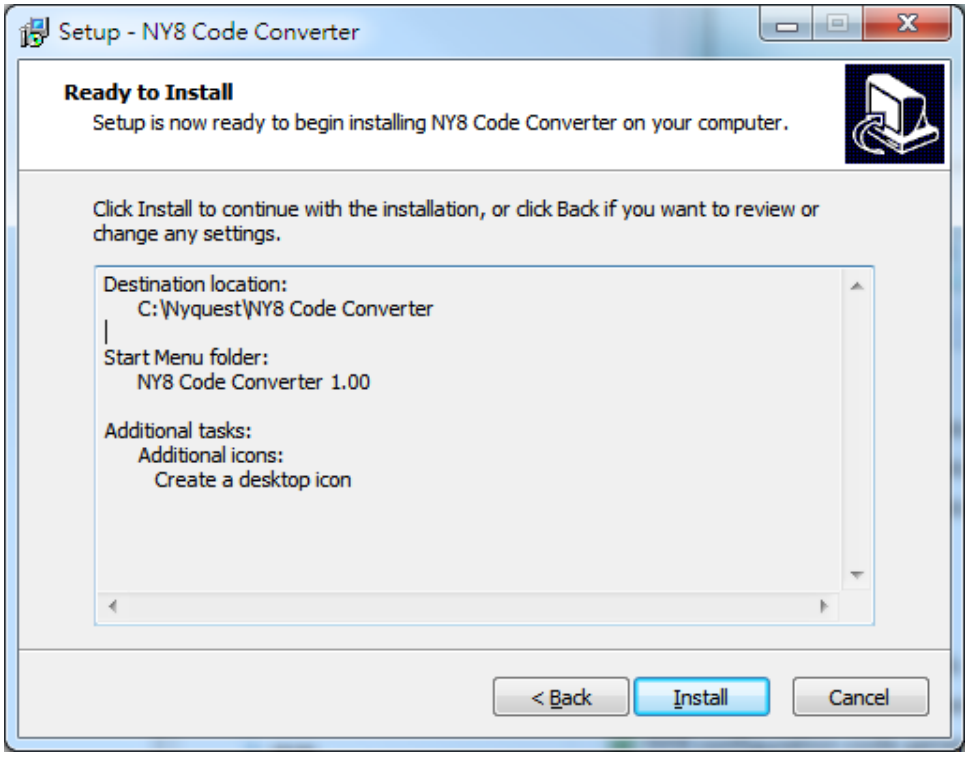
Step 3: The default start menu folder. If user wants to change, please key in the desired folder name or press Browse to select folder. Then press Next.



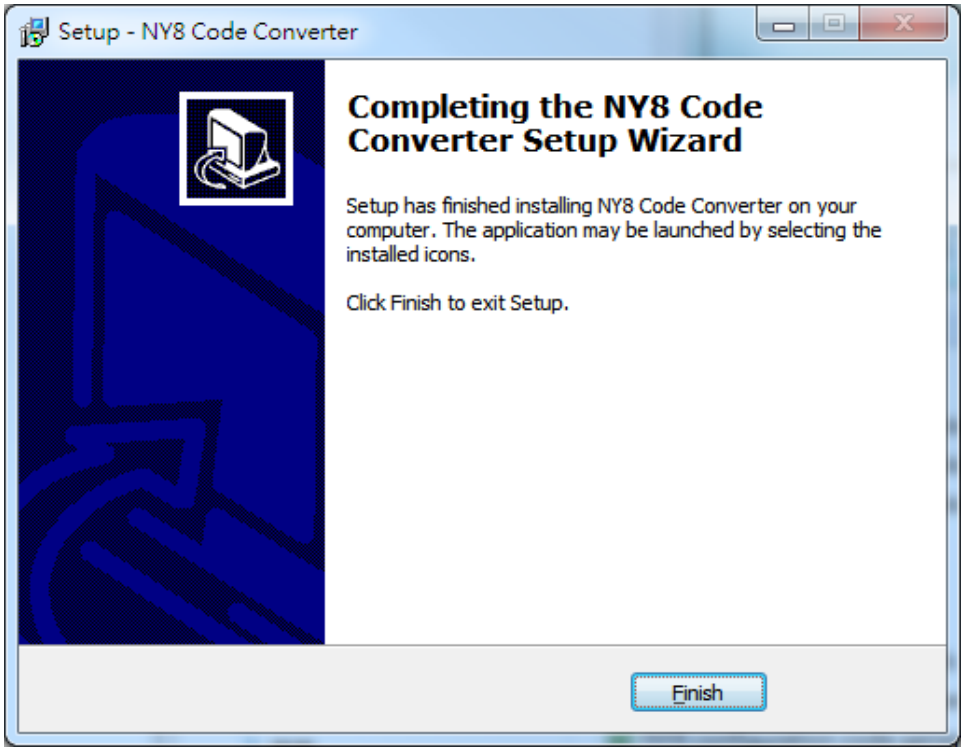
Step 4: Tick to build a shortcut on desktop or not. Then press Next.



Step 5: The setup wizard will show the installation settings. If the settings are correct, please click on Install for getting started.



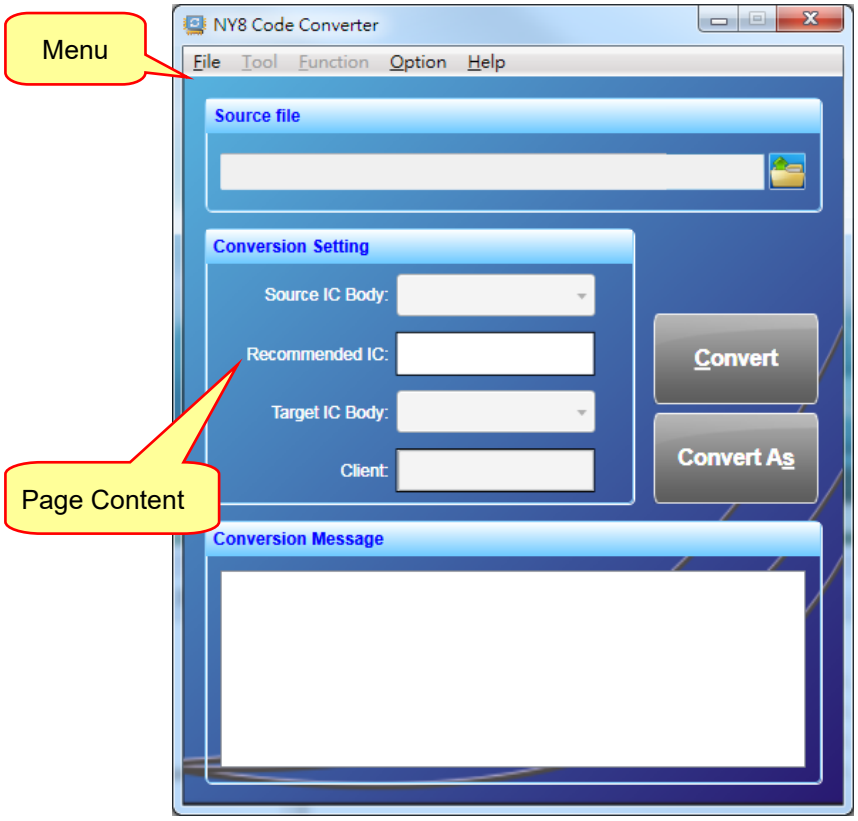
Step 6: After completing the installation, a pop-up dialogue will be shown to inform user. Please press Finish to exit setup.



2 Using *NY8 Code Converter*

2.1 Interface

When executing *NY8 Code Converter*, the main interface will be shown.



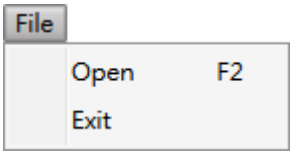
2.2 Menu

The Menu contains File, Tool, Function, Option and Help.

File Tool Function Option Help

2.2.1 File

By clicking [File] on the Menu bar and the menu is shown below.



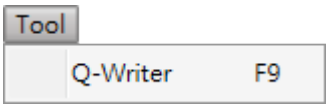
Open: Open an original file.

Note: The current supported file formats are .cds(EM78Pxxxx), .ftc(FM8xxxx or AT8xxxx), .bin(AM8EBxxxx or NY8AxxxA), .hex(PIC16xxx or PIC12xxxx) and .s19(MC30Pxxxx) filename extension.

Exit: Exit *NY8 Code Converter*.

2.2.2 Tool

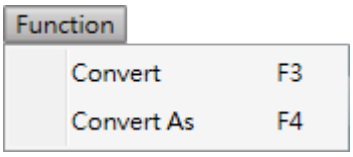
By clicking [Tool] on the Menu bar and the menu is shown below.



Q-Writer : *Q-Writer* is the software to download the .bin file to the demo board. To use *Q-Writer*, users can simply click on [Q-Writer] on the menu.

Note: Please install Q-Writer before executing Q-Writer, otherwise this function will not work properly.

2.2.3 Function

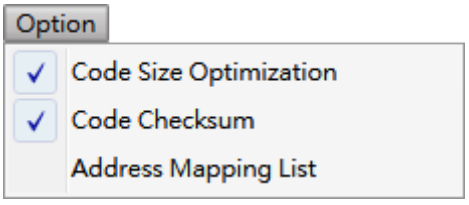


Convert: A file folder [filename-NY] will be saved in the same file path and convert the original files as a .bin file; besides, an .asm configuration file and a check list .htm file with the same name will be generated, and all be saved in the [filename-NY] folder.

Convert As: When executing the [Convert] function, a dialogue box [Converter As] will be shown. User can select a different folder and rename files to save.

2.2.4 Option

By clicking on the [Option] on Menu Bar and the menu is shown below.



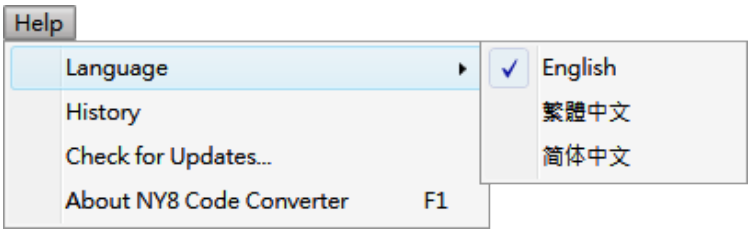
Code Size Optimization: Choose the optimized Rom Size, reduce the size of Rom.

Code Checksum: When Code Checksum function is tickled, assembler will retain the last two available address space of Rom. *Q-Writer* will burn Code Checksum value to Rom reserved space.

Address Mapping List: *NY8 Code Converter* will add some program code while converting. User can open the Address Mapping List option, it will generate another named [filename Address Mapping] .lst file after conversion completed which will show the result of before and after address mapping.

2.2.5 Help

By clicking on the [Help] on Menu Bar and the menu is shown below.



Language: Select UI display language. *NY8 Code Converter* provides 3 languages: English, Traditional Chinese and Simplified Chinese.

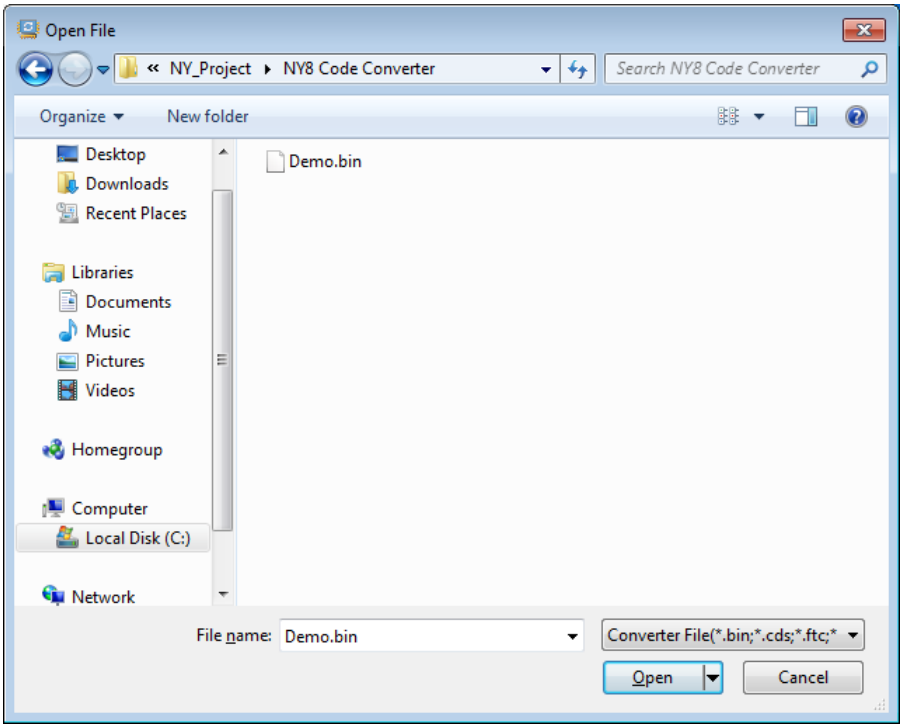
History: See the revision history of *NY8 Code Converter*.

Check for Updates…: Check for the latest version of *NY8 Code Converter.* This function will connect to the Internet.

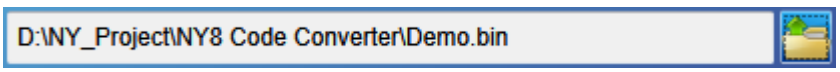
About NY8 Code Converter: Show current *NY8 Code Converter* version.

2.3 Open

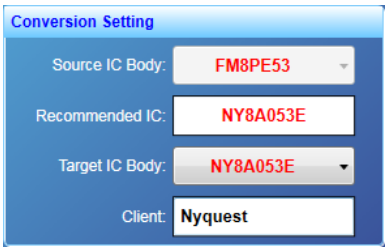
Click on  for opening an original file.



The filename and file path will be shown after opening an original file.



2.4 Information



After opening an original file, the information of the file will show the related information.

Source IC Body: The original IC body name.

Recommended IC: Selectable IC Body.

Target IC Body: Select a type of NY8A IC as the target IC.

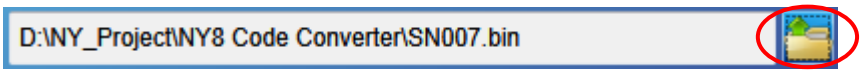
Client：Set the client name.

Note: The client name on this page will be included in the Checking List and Confirm Table. This is to protect the copyright of the programmer. The client name is the only "required" on this page, a warning message will display when compiling if this column is blank.

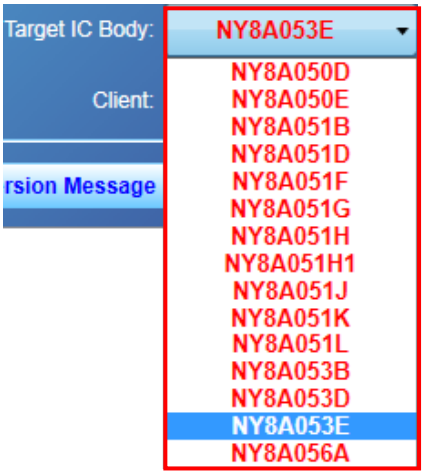
2.5 Converting Files

2.5.1 The Converter Flow

Step 1: Click on  button for selecting a source file.



Step 2: Select a target IC Body.



Please refer to the available types of Source IC and Target IC in chapter 4.1.

Note: When converting NY8xxxxx series, user only can change IC configuration options.

Step 3: Enter client name.

Note: When converting NY8xxxxx series, user cannot modify client name.

Step 4-1: Click on [Convert], a file folder [filename-NY] will be saved in the same file path and convert the original files as a .bin file; besides, an .asm configuration file and a check list .htm file with

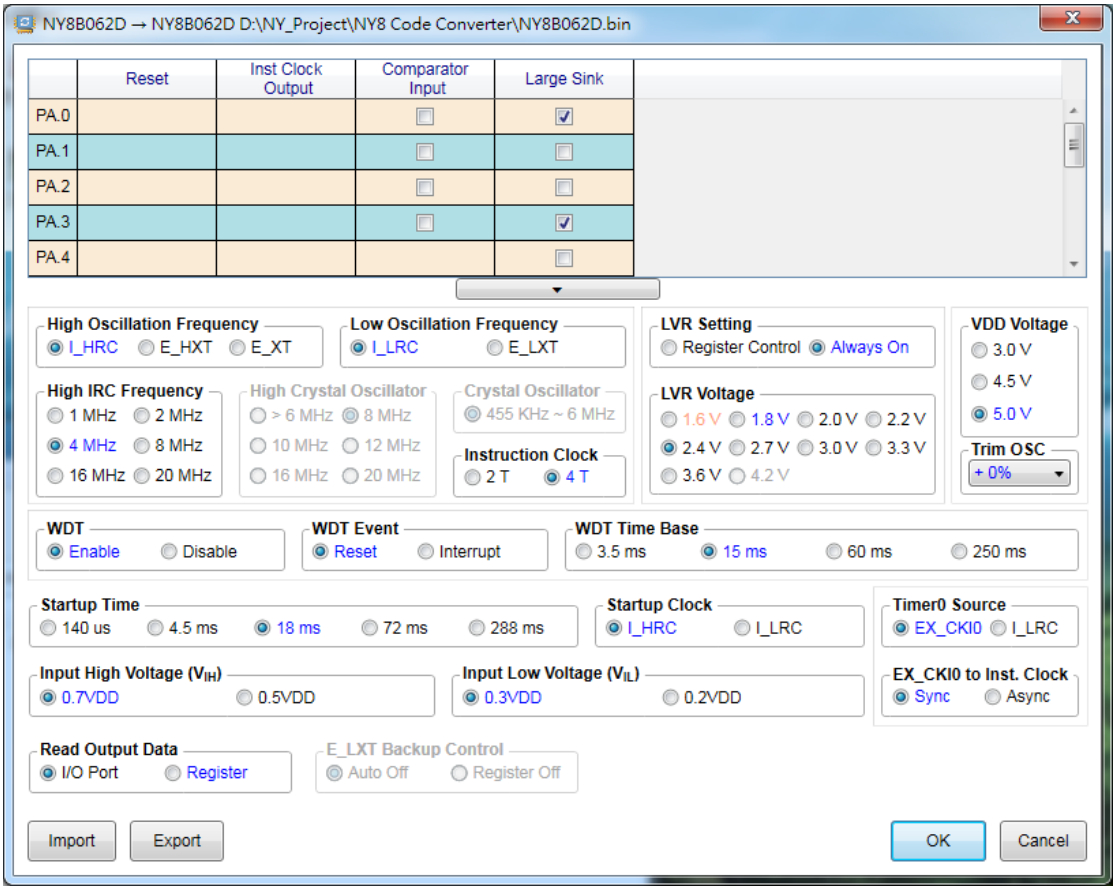
the same name will be generated, and all be saved in the [filename-NY] folder.

Ex. The original filename is Demo.cds, the converted file will be Demo.bin, the configuration filename wil be Demo.asm and the check list will be Demo.htm.

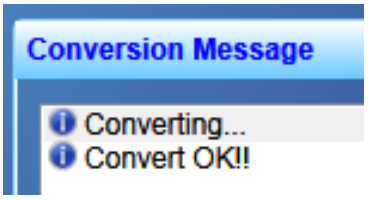
Step 4-2: When user clicks on [Convert As] for converting file, a “Save file as” dialogue box will also pop up. User can select different file path and rename filename through this dialogue box.

Note: When converting NY8xxxxx series, user only can change IC configuration options, the .asm file won’t be generated.

Step 5: During the converting, the Converter will give the user a configuration dialog box to set options. For more details, please refer to 3 IC Configuration Options. If the source file contains the configuration information, the options will be the same setting.



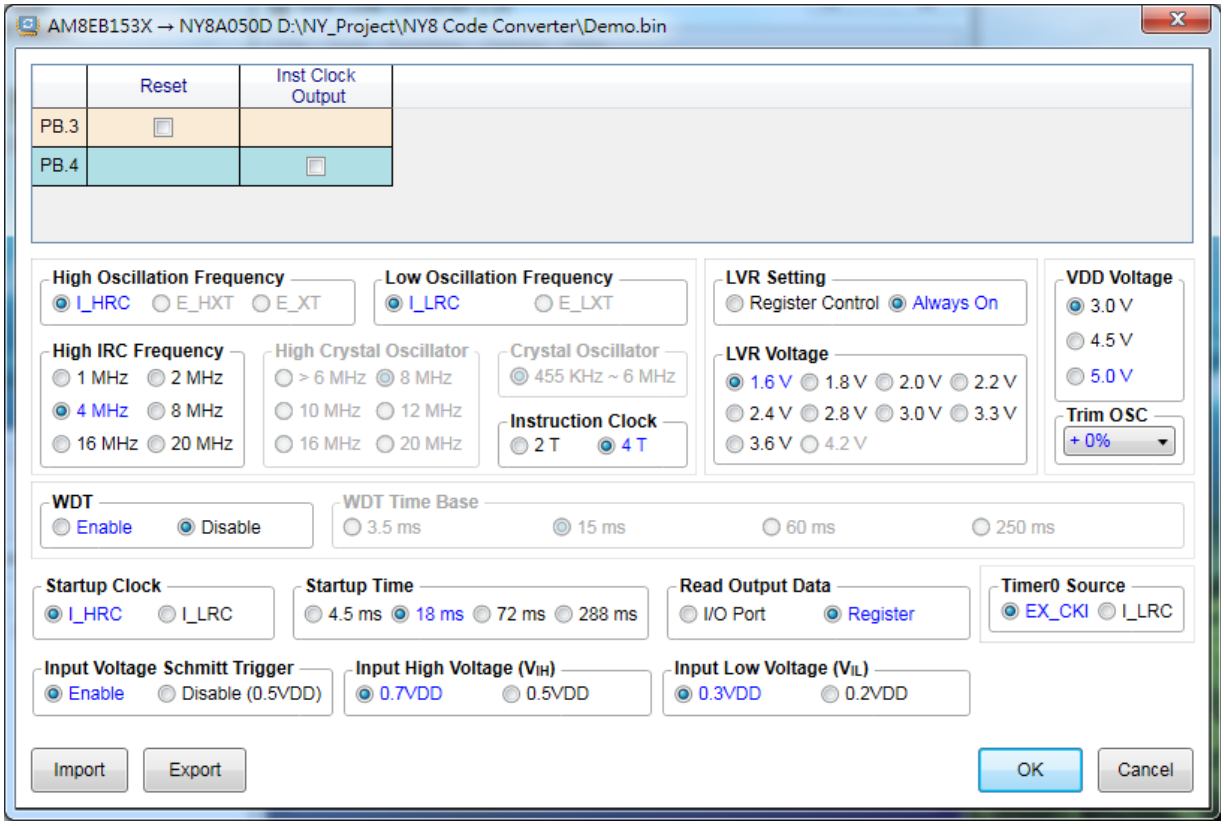
Step5: If the file conversion is successful, the “Convert OK!” message will be shown.



3 IC Configuration Options

User can set the IC configuration options quickly via clicking. Although each IC equips different functions, most functions are similar, e.g. High Oscillation Frequency, Low Oscillation Frequency and Instruction Clock etc., user can easily complete setting via the configuration dialog box.

3.1 NY8A050D Configuration Options



3.1.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high frequency oscillation for NY8A050D, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.1.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low frequency oscillation for NY8A050D, only I_LRC is available.

Option	Descriptions
I_LRC	Internal low RC oscillator

3.1.3 Instruction Clock

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

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

3.1.4 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

3.1.5 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.

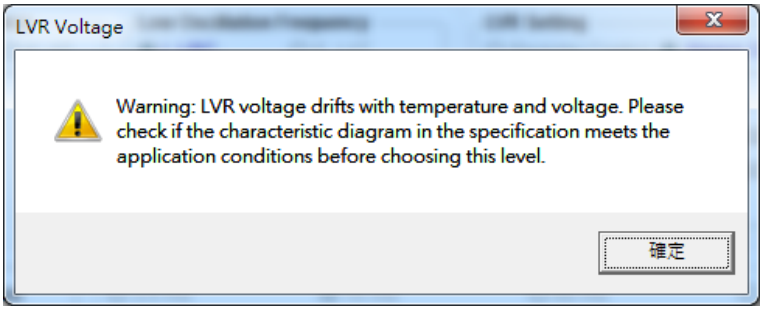
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.1.6 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A050D, 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	2.8V	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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.1.7 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.

3.1.8 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

3.1.9 Startup Time

The Startup Time function can be used to adjust the time period 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

3.1.10 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.

3.1.11 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC, Low-frequency oscillator will be clock source.

3.1.12 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.

3.1.13 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 disable, the voltage level threshold is 0.5VDD.

3.1.14 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.

3.1.15 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.

3.1.16 Reset

Set input pin as reset.

3.1.17 Inst Clock Output

Set output pin as instruction clock.

3.1.18 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

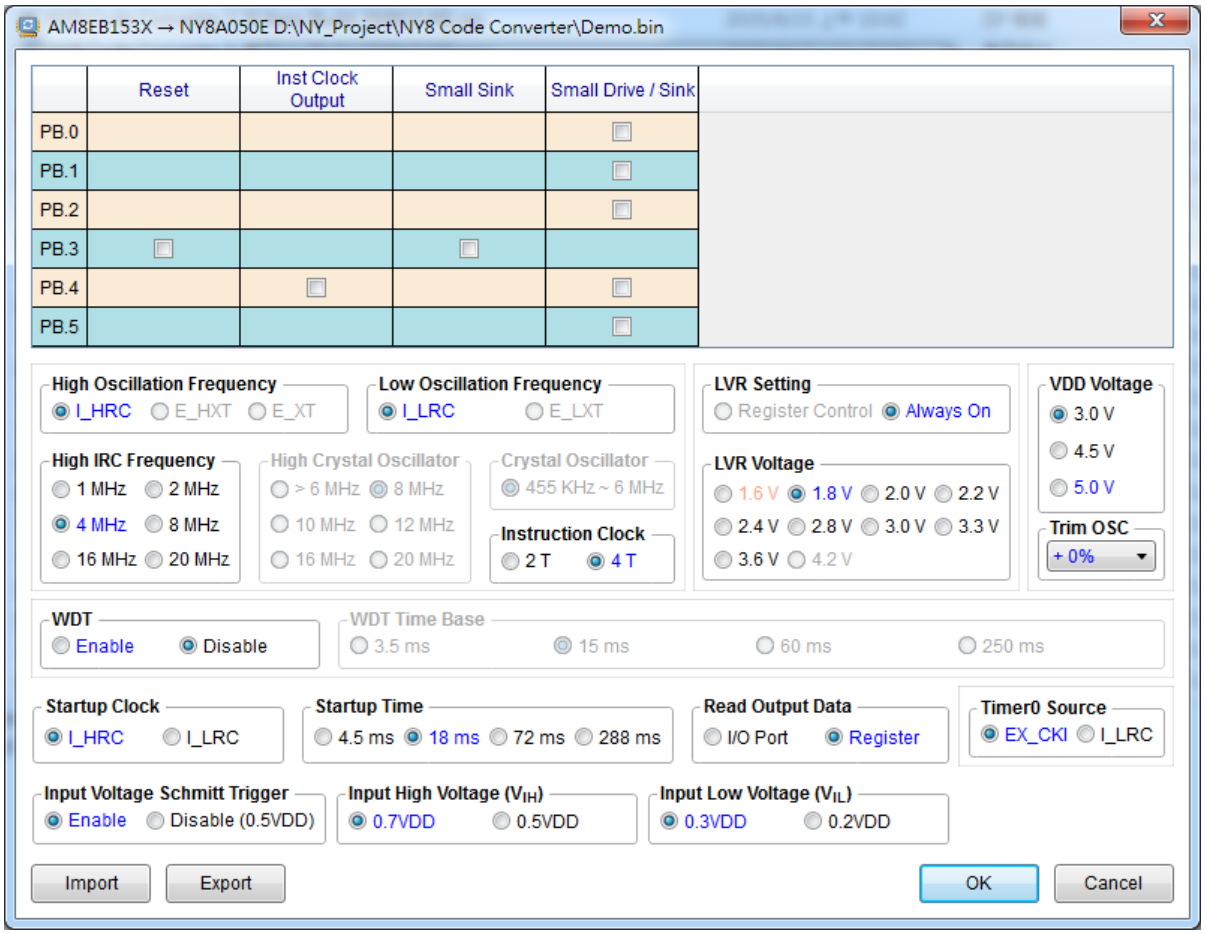
NY8 series, there are 3 available options of voltage.

1	2	3
3.0V	4.5V	5.0V

3.1.19 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%.

3.2 NY8A050E Configuration Options



3.2.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high frequency oscillation for NY8A050E, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.2.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low frequency oscillation for NY8A050E, only I_LRC is available.

Option	Descriptions
I_LRC	Internal low RC oscillator

3.2.3 Instruction Clock

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

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

3.2.4 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

3.2.5 LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8 series, there are 1 options of LVR setting.

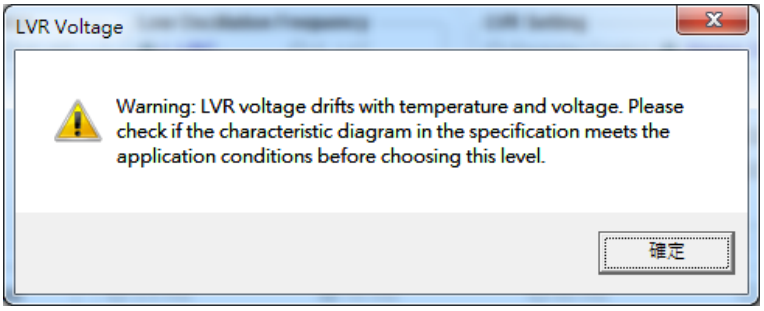
Option	Descriptions
Always On	Always turn on LVR.

3.2.6 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A050E, 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	2.8V	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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.2.7 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.

3.2.8 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

3.2.9 Startup Time

The Startup Time function can be used to adjust the time period 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

3.2.10 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.

3.2.11 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC, Low-frequency oscillator will be clock source.

3.2.12 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.

3.2.13 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 disable, the voltage level threshold is 0.5VDD.

3.2.14 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.

3.2.15 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.

3.2.16 Reset

Set input pin as reset.

3.2.17 Inst Clock Output

Set output pin as instruction clock.

3.2.18 Small Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.2.19 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.2.20 VDD Voltage

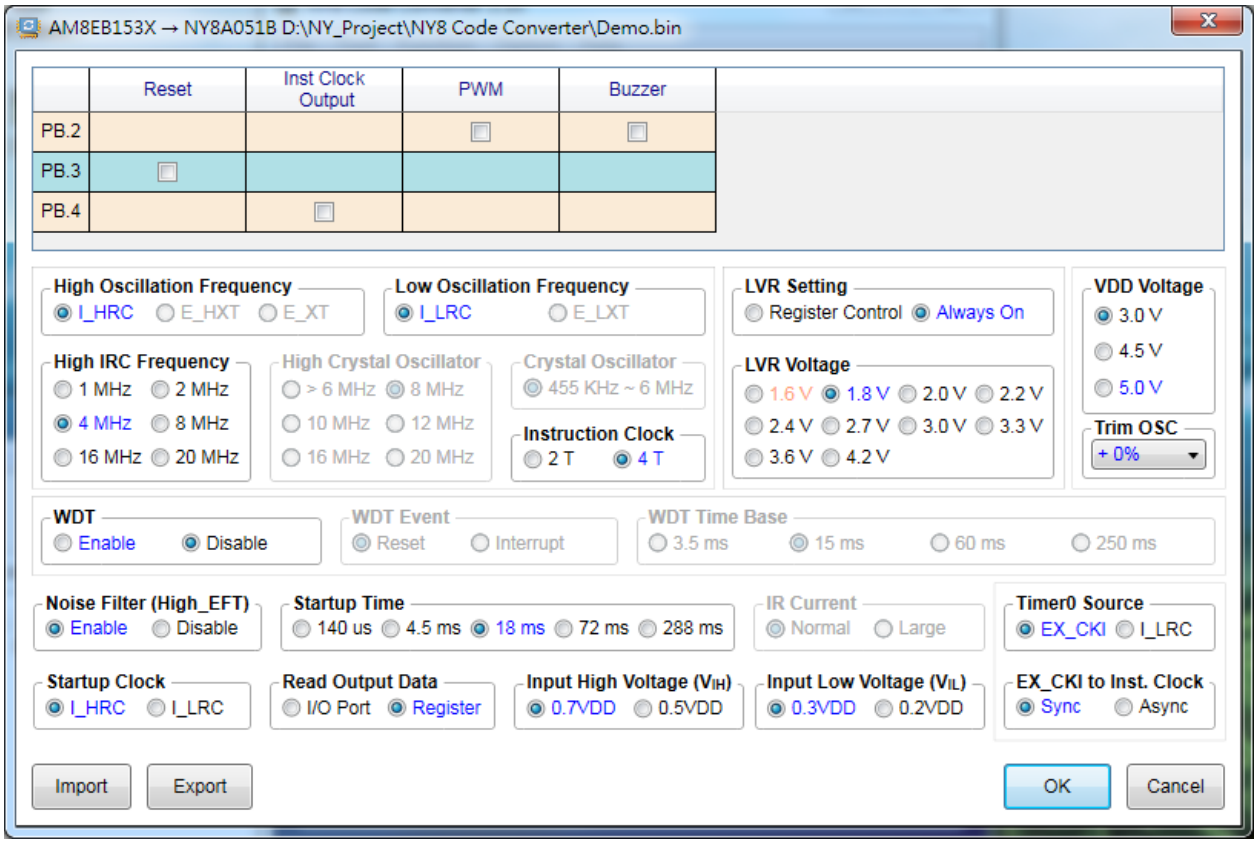
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.2.21 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%.

3.3 NY8A051B Configuration Options



3.3.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency for NY8A051B, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.3.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low frequency oscillation for NY8A051B, only I_LRC is available.

Option	Descriptions
L_IRC	Internal low RC oscillator

3.3.3 Instruction Clock

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

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

3.3.4 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

3.3.5 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.

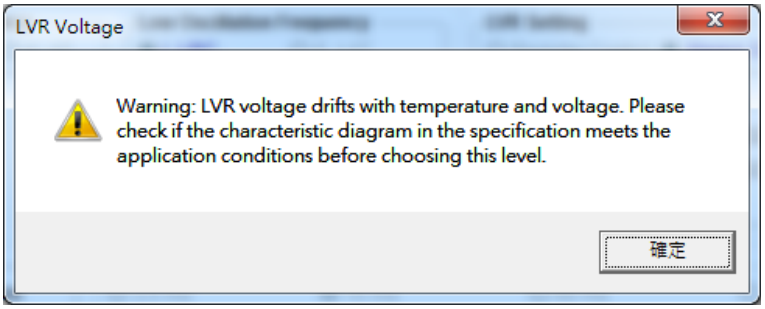
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.3.6 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A051B, 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 to be higher than the LVR voltage and make the LVR function fail. 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. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.3.7 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.

3.3.8 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.

3.3.9 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

3.3.10 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.

3.3.11 Startup Time

The Startup Time function can be used to adjust the time period 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

3.3.12 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.

3.3.13 Startup Clock

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

3.3.14 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.

3.3.15 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.

3.3.16 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.

3.3.17 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.

3.3.18 Reset

Set input pin as reset.

3.3.19 Inst Clock Output

Set output pin as instruction clock.

3.3.20 PWM

Set the pin as PWM output pin.

3.3.21 Buzzer

Set the pin as Buzzer output pin.

3.3.22 VDD Voltage

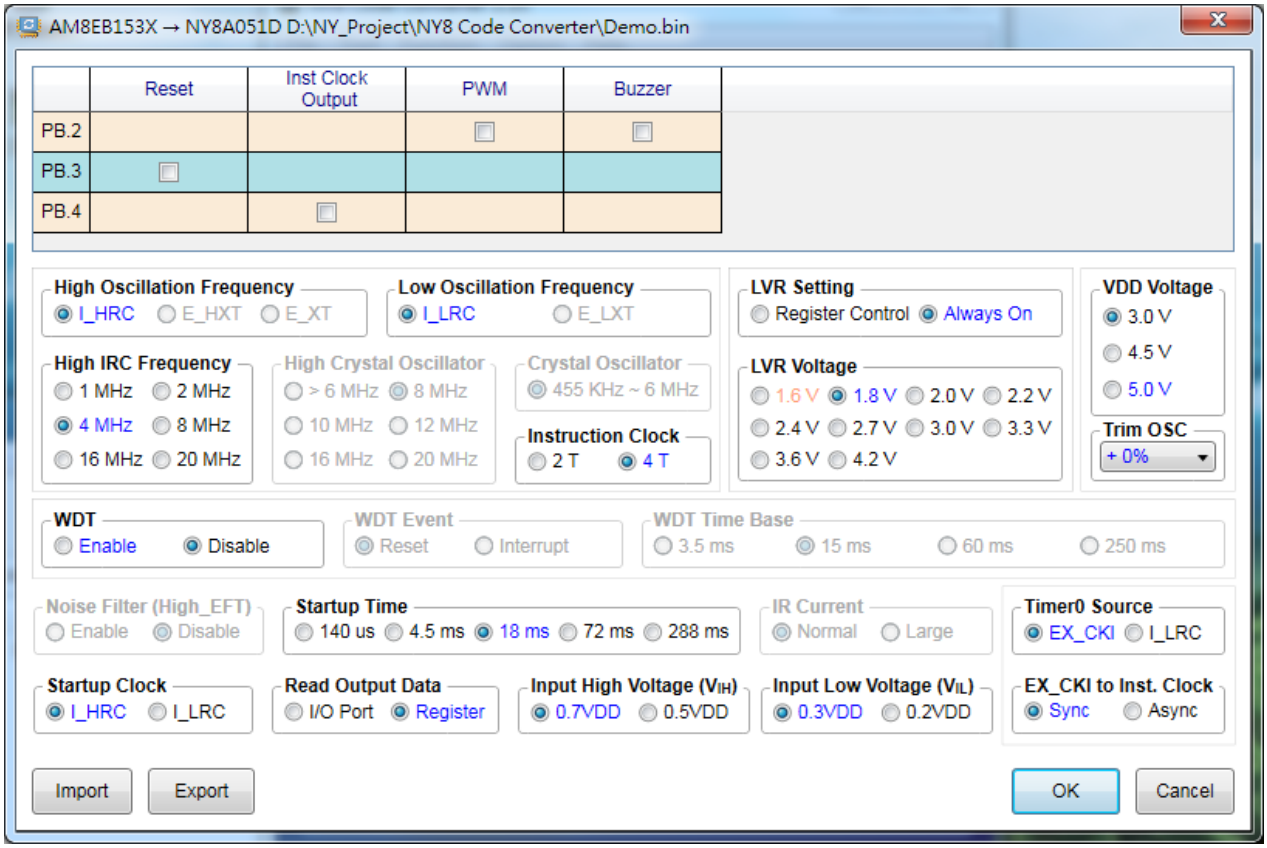
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.3.23 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%.

3.4 NY8A051D Configuration Options



3.4.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency for NY8A051D, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.4.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low frequency oscillation for NY8A051D, only I_LRC is available.

Option	Descriptions
L_IRC	Internal low RC oscillator

3.4.3 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.

3.4.4 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

3.4.5 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.

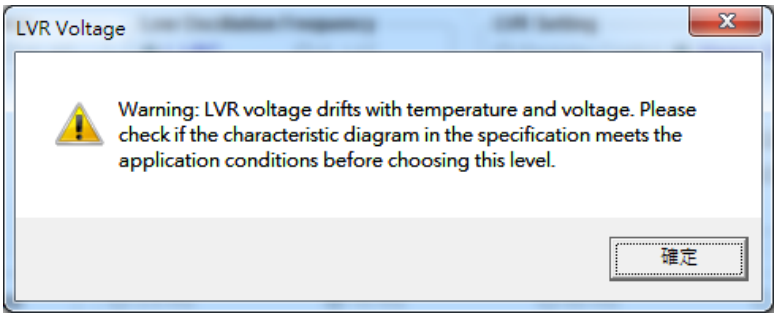
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.4.6 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A051D, there are 10 available options of LVR voltage.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 to be higher than the LVR voltage and make the LVR function fail. 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 NY8A051D. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.4.7 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.

3.4.8 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.

3.4.9 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

3.4.10 Startup Time

The Startup Time function can be used to adjust the time period 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

3.4.11 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

3.4.12 Startup Clock

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

3.4.13 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.

3.4.14 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.

3.4.15 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.

3.4.16 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.

3.4.17 Reset

Set input pin as reset.

3.4.18 Inst Clock Output

Set output pin as instruction clock.

3.4.19 PWM

Set the pin as PWM output pin.

3.4.20 Buzzer

Set the pin as Buzzer output pin.

3.4.21 VDD Voltage

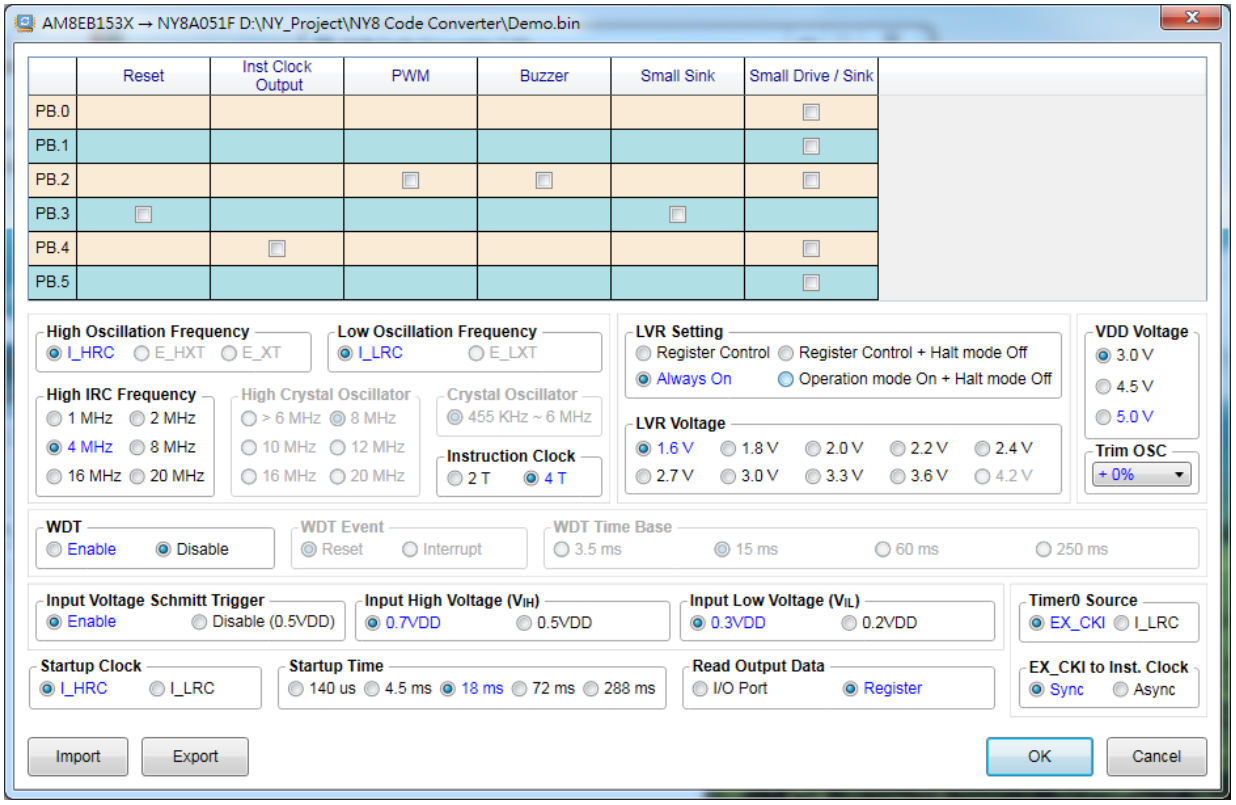
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.4.22 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%.

3.5 NY8A051F Configuration Options



3.5.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high frequency oscillation for NY8A051F, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.5.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low frequency oscillation for NY8A051F, only I_LRC is available.

Option	Descriptions
L_IRC	Internal low RC oscillator

3.5.3 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.

3.5.4 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

3.5.5 LVR Setting

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

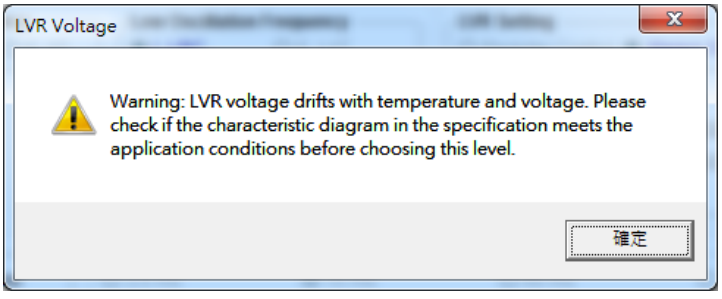
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.5.6 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.5.7 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.

3.5.8 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.

3.5.9 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

3.5.10 Startup Time

The Startup Time function can be used to adjust the time period 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

3.5.11 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.

3.5.12 Startup Clock

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

3.5.13 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.

3.5.14 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.

3.5.15 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 disable, the voltage level threshold is 0.5VDD.

3.5.16 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.

3.5.17 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.

3.5.18 Reset

Set input pin as reset.

3.5.19 Inst Clock Output

Set output pin as instruction clock.

3.5.20 PWM

Set the pin as PWM output pin.

3.5.21 Buzzer

Set the pin as Buzzer output pin.

3.5.22 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.5.23 VDD Voltage

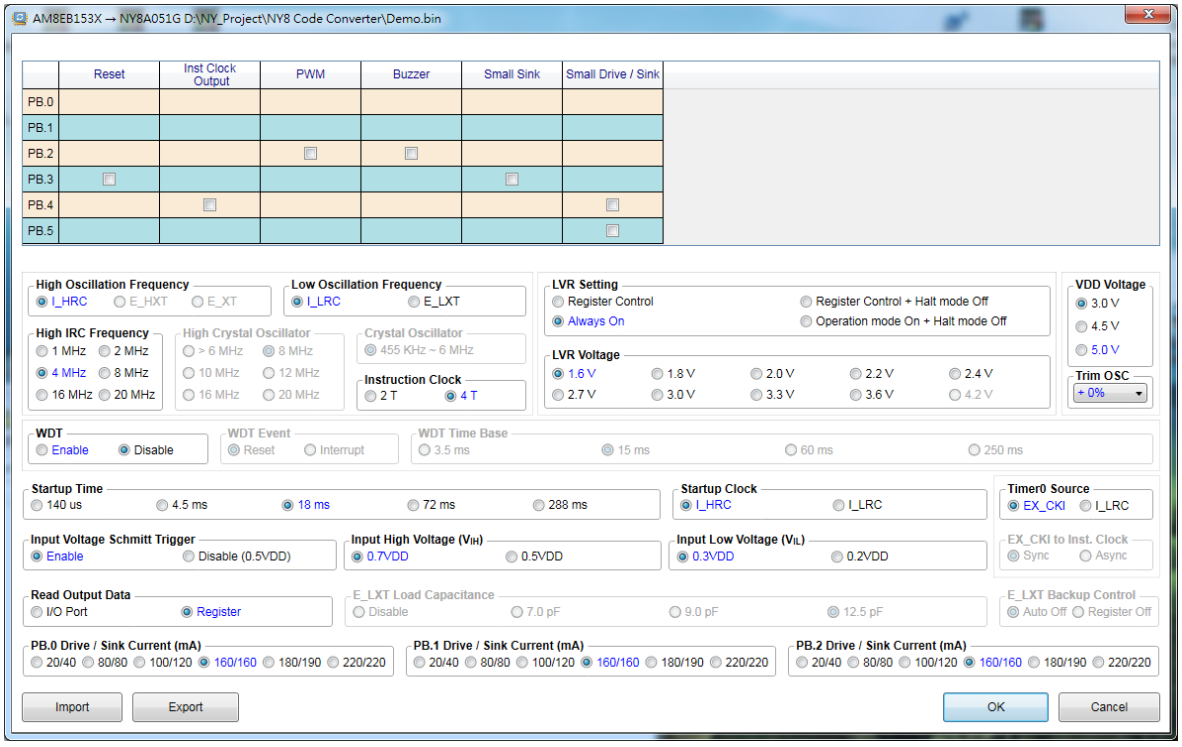
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.5.24 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%.

3.6 NY8A051G Configuration Options



3.6.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high frequency oscillation for NY8A051G, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.6.2 Low Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects low frequency oscillation for NY8A051G, there are 2 options available.

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

3.6.3 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.

3.6.4 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

3.6.5 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.

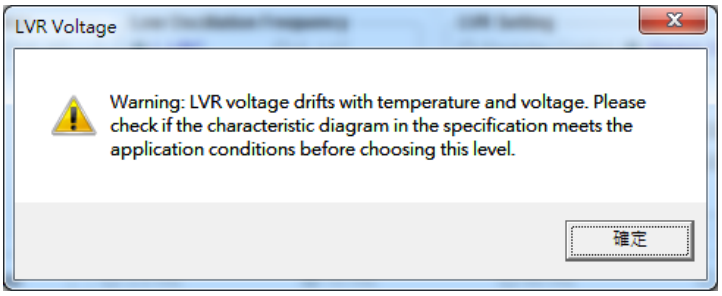
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.6.6 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.6.7 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.

3.6.8 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.

3.6.9 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

3.6.10 Startup Time

The Startup Time function can be used to adjust the time period 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

3.6.11 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.

3.6.12 Startup Clock

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

3.6.13 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.

3.6.14 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.

3.6.15 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.

3.6.16 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.

3.6.17 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.

3.6.18 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.

3.6.19 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.

Option	Descriptions
Disable	User can use plug-in capacitance (Xin to VSS and Xout to VSS)
7.0pF	External Crystal Load Capacitance is 7.0pF.
9.0pF	External Crystal Load Capacitance is 9.0pF.
12.5pF	External Crystal Load Capacitance is 12.5pF.

3.6.20 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.

Option	Descriptions
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.

3.6.21 Reset

Set input pin as reset.

3.6.22 Inst Clock Output

Set output pin as instruction clock.

3.6.23 PWM

Set the pin as PWM output pin.

3.6.24 Buzzer

Set the pin as Buzzer output pin.

3.6.25 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.6.26 VDD Voltage

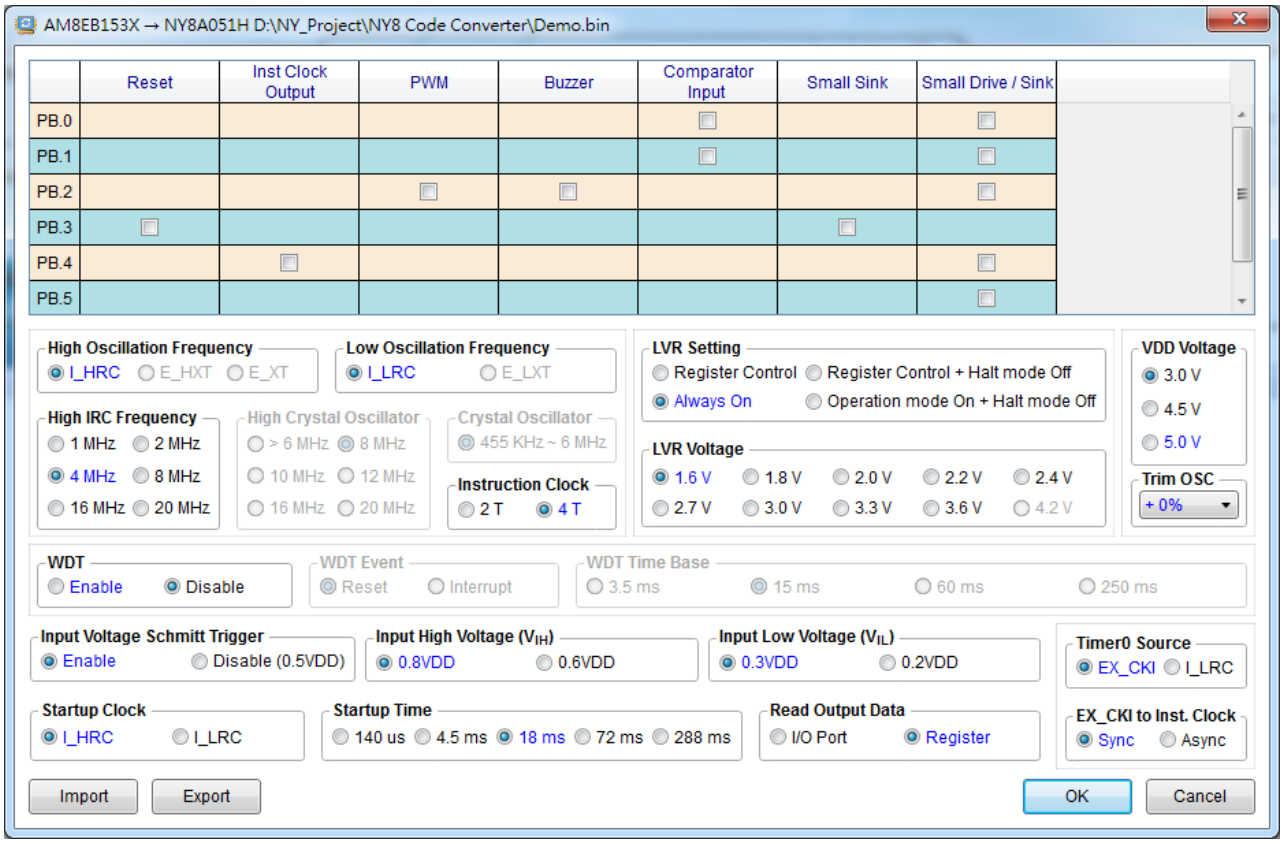
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.6.27 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%.

3.7 NY8A051H Configuration Options



3.7.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency for NY8A051H, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.7.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low frequency oscillation for NY8A051H, only I_LRC is available.

Option	Descriptions
L_IRC	Internal low RC oscillator

3.7.3 Instruction Clock

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

Option	Descriptions

2T	2 cycles.
4T	4 cycles.

3.7.4 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

3.7.5 LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A051H series, there are 4 options of LVR setting.

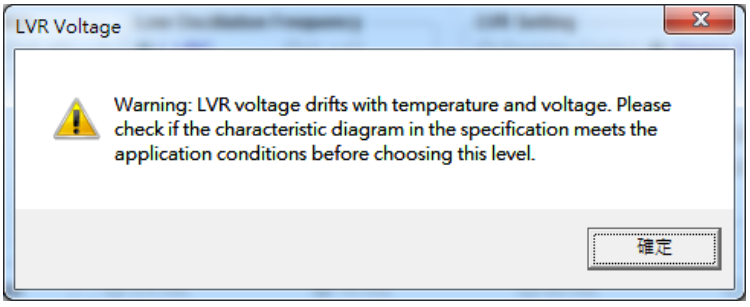
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.7.6 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 to be higher than the LVR voltage and make the LVR function fail. 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. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.7.7 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.

3.7.8 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.

3.7.9 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

3.7.10 Startup Time

The Startup Time function can be used to adjust the time period 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

3.7.11 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.

3.7.12 Startup Clock

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

3.7.13 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.

3.7.14 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.

3.7.15 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 disable, the voltage level threshold is 0.5VDD.

3.7.16 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.

3.7.17 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.

3.7.18 Reset

Set input pin as reset.

3.7.19 Inst Clock Output

Set output pin as instruction clock.

3.7.20 PWM

Set the pin as PWM output pin.

3.7.21 Buzzer

Set the pin as Buzzer output pin.

3.7.22 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.7.23 Comparator Input

This setting can set default pin as the comparator input.

3.7.24 VDD Voltage

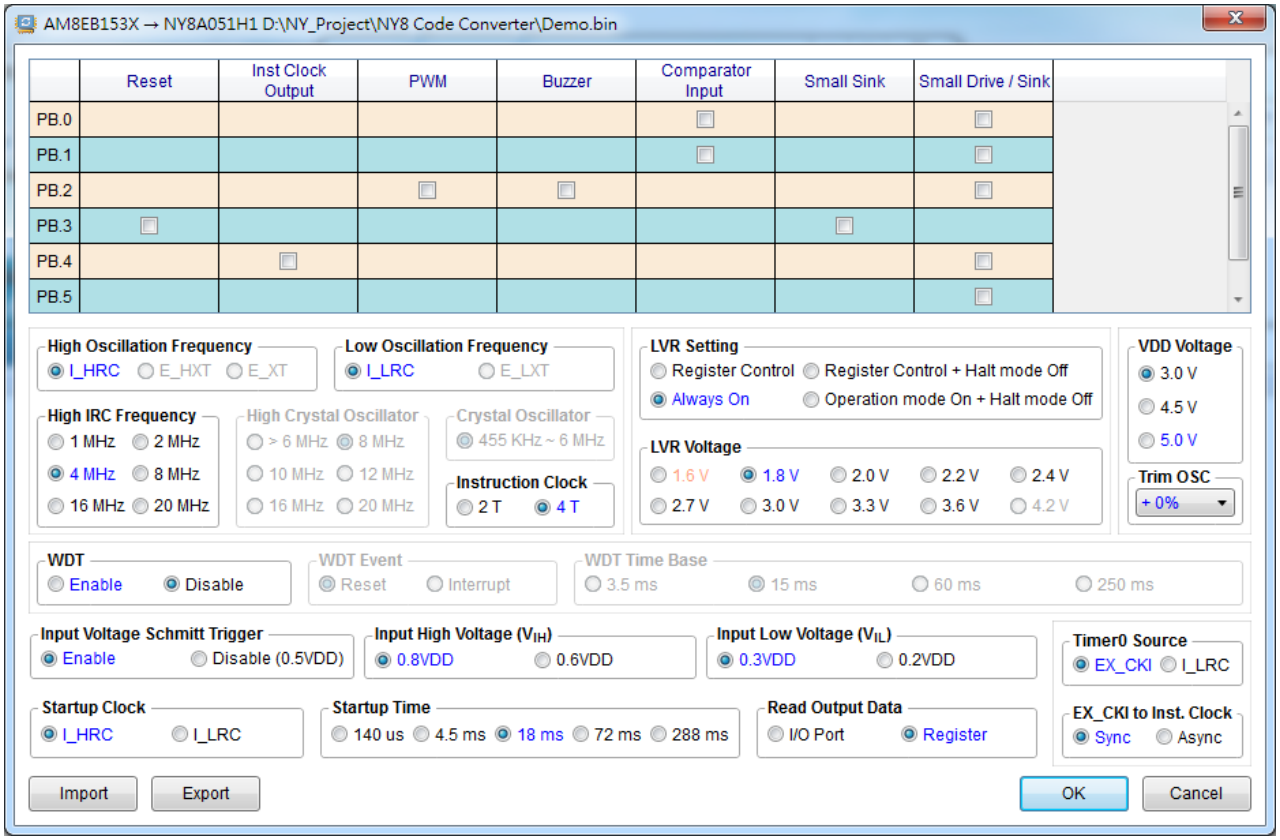
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.7.25 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%.

3.8 NY8A051H1 Configration Options



3.8.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency for NY8A051H1, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.8.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low frequency oscillation for NY8A051H1, only I_LRC is available.

Option	Descriptions
L_IRC	Internal low RC oscillator

3.8.3 Instruction Clock

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

Option	Descriptions

2T	2 cycles.
4T	4 cycles.

3.8.4 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

3.8.5 LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A051H1 series, there are 4 options of LVR setting.

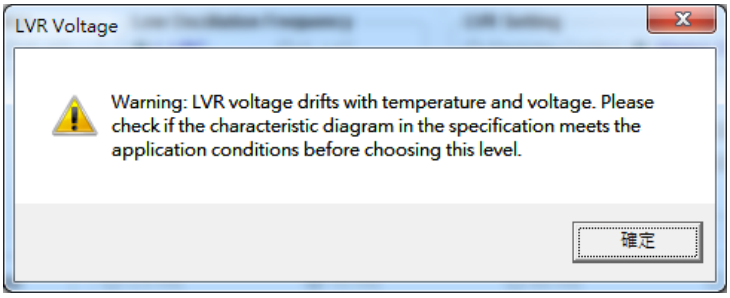
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.8.6 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 to be higher than the LVR voltage and make the LVR function fail. 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 NY8A051H1. If user may choose a LVR lower

than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.8.7 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.

3.8.8 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.

3.8.9 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

3.8.10 Startup Time

The Startup Time function can be used to adjust the time period 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

3.8.11 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.

3.8.12 Startup Clock

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

3.8.13 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.

3.8.14 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.

3.8.15 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 disable, the voltage level threshold is 0.5VDD.

3.8.16 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.

3.8.17 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.

3.8.18 Reset

Set input pin as reset.

3.8.19 Inst Clock Output

Set output pin as instruction clock.

3.8.20 PWM

Set the pin as PWM output pin.

3.8.21 Buzzer

Set the pin as Buzzer output pin.

3.8.22 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.8.23 Comparator Input

This setting can set default pin as the comparator input.

3.8.24 VDD Voltage

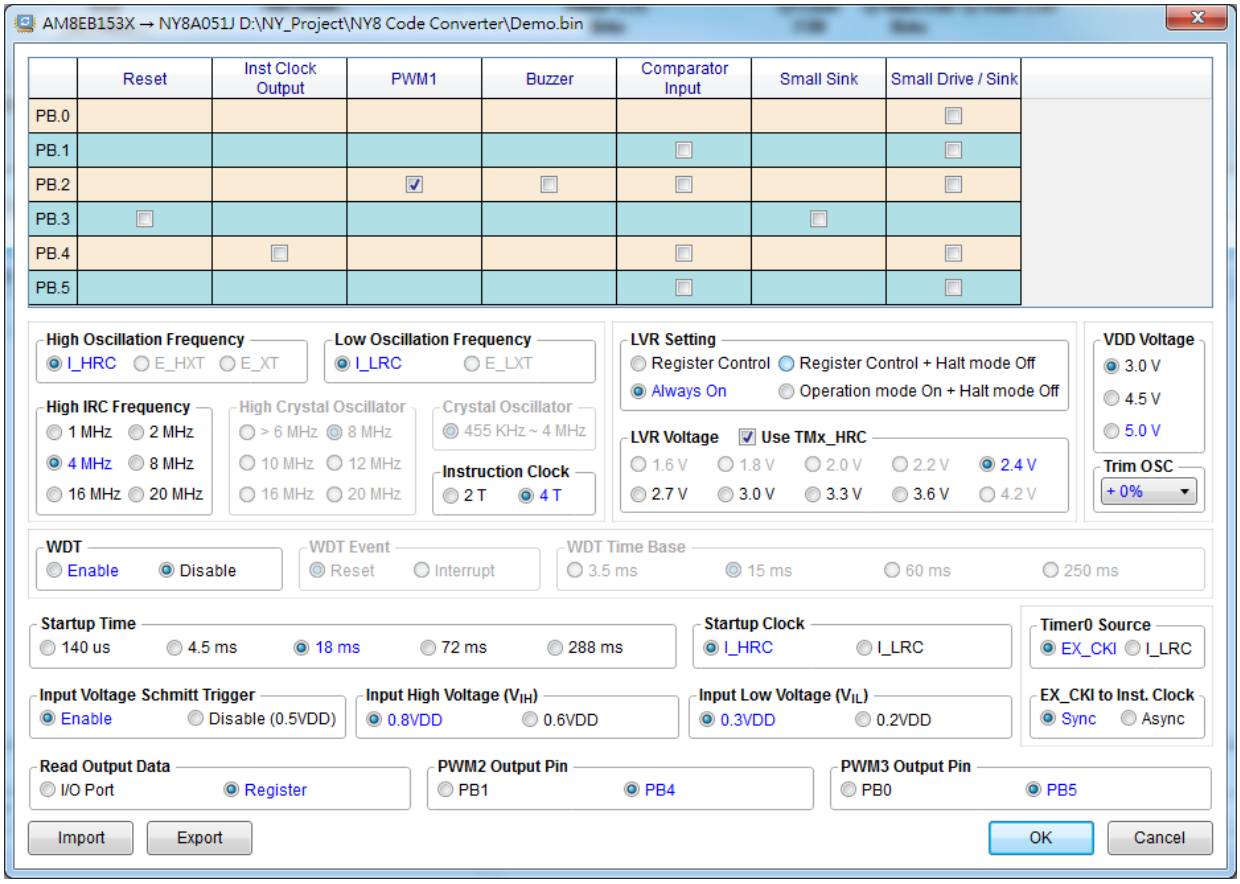
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.8.25 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%.

3.9 NY8A051J Confuguration Options



3.9.1 High Oscillation Frequency

NY8 series provides the frequency oscillation options. When user selects high oscillation frequency for NY8A051J, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.9.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low frequency oscillation for NY8A051J, only I_LRC is available.

Option	Descriptions
L_IRC	Internal low RC oscillator

3.9.3 Instruction Clock

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

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

3.9.4 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

3.9.5 LVR Setting

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

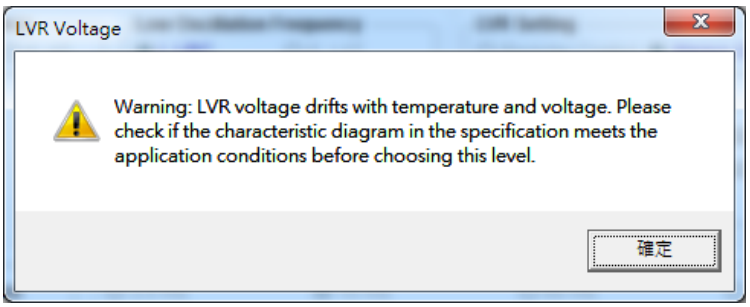
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.9.6 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.9.7 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.

3.9.8 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.

3.9.9 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

3.9.10 Startup Time

The Startup Time function can be used to adjust the time period 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

3.9.11 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.

3.9.12 Startup Clock

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

3.9.13 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.

3.9.14 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.

3.9.15 PWM Output Pin

The NY8A051J has total of three PWM output pins. PWM2 and PWM3 have 2 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM2:

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

PWM3:

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

3.9.16 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 disable, the voltage level threshold is 0.5VDD.

3.9.17 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.

3.9.18 Input Low Voltage (V_{IL})

here 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.

3.9.19 Reset

Set input pin as reset.

3.9.20 Inst Clock Output

Set output pin as instruction clock.

3.9.21 PWM

Set the pin as PWM output pin.

3.9.22 Buzzer

Set the pin as Buzzer output pin.

3.9.23 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.9.24 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.9.25 Comparator Input

This setting can set default pin as the comparator input.

3.9.26 VDD Voltage

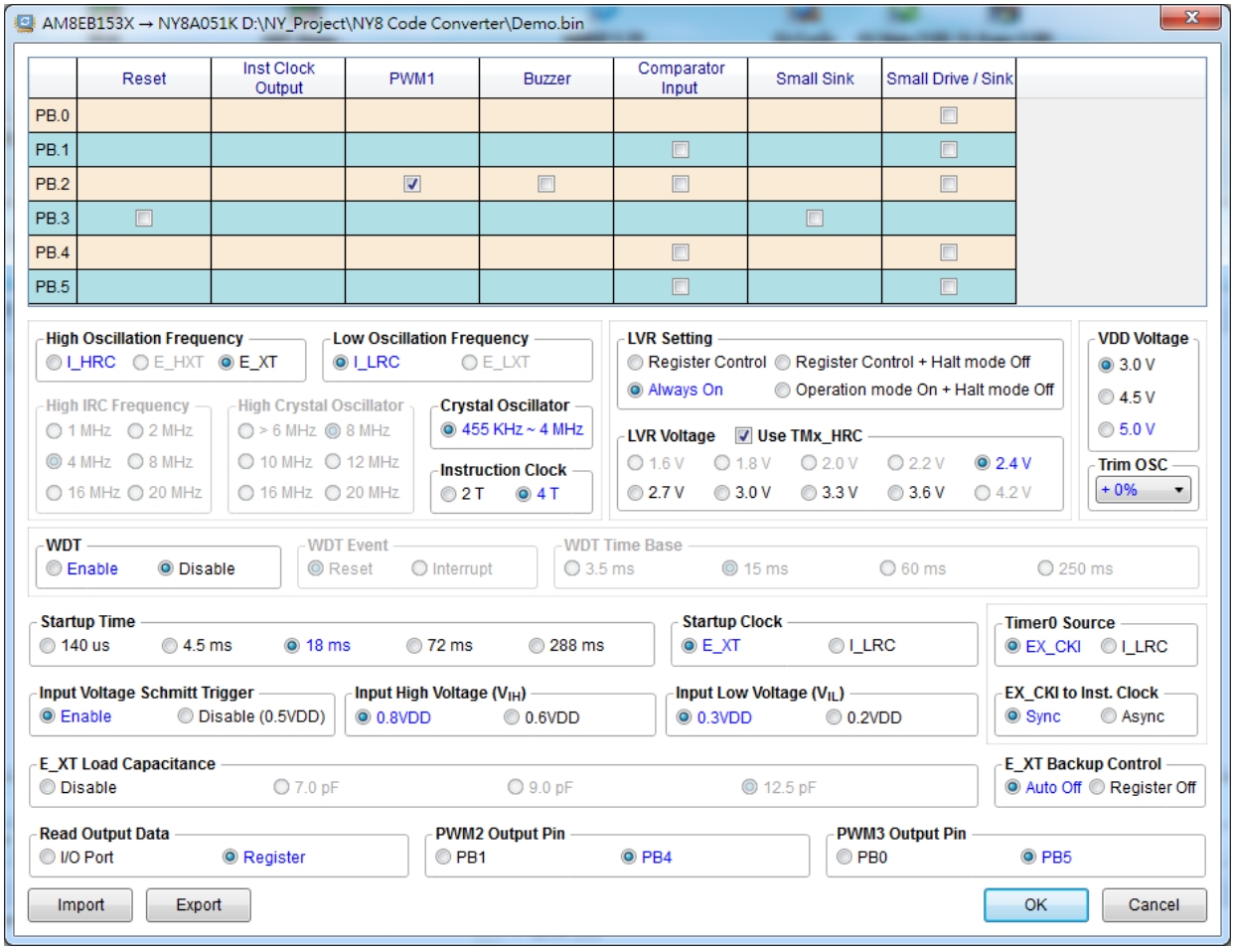
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage

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

3.9.27 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%.

3.10 NY8A051K Configuration Options



3.10.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency for NY8A051K, there are 2 options available.

Option	Descriptions
I_HRC	Internal high RC oscillator
E_XT	External crystal oscillator

3.10.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation frequency for NY8A051K, there are 2 options available.

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

3.10.3 Instruction Clock

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

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

3.10.4 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

3.10.5 Crystal Oscillator

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

3.10.6 LVR Setting

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

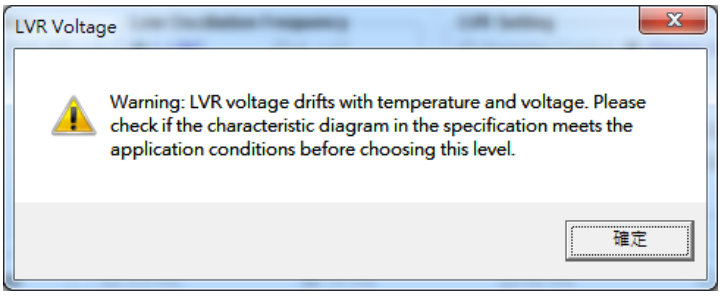
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.10.7 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.10.8 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.

3.10.9 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.

3.10.10 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

3.10.11 Startup Time

The Startup Time function can be used to adjust the time period 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

3.10.12 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.

3.10.13 Startup Clock

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

3.10.14 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.

3.10.15 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.

3.10.16 E_XT / 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_XT / 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.

3.10.17 PWM Output Pin

The NY8A051K has total of three PWM output pins. PWM2 and PWM3 have 2 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM2:

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

PWM3:

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

3.10.18 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 disable, the voltage level threshold is 0.5VDD.

3.10.19 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.

3.10.20 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.

3.10.21 E_XT / E_LXT Load Capacitance

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

Option	Descriptions
Disable	User can use plug-in capacitance (Xin to VSS and Xout to VSS)
7.0pF	External Crystal / external low-speed Crystal Load Capacitance is 7.0pF.
9.0pF	External Crystal / external low-speed Crystal Load Capacitance is 9.0pF.
12.5pF	External Crystal / external low-speed Crystal Load Capacitance is 12.5pF.

3.10.22 Reset

Set input pin as reset.

3.10.23 Inst Clock Output

Set output pin as instruction clock.

3.10.24 PWM1

Set the pin as PWM1 output pin.

3.10.25 Buzzer

Set the pin as Buzzer output pin.

3.10.26 Small Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.10.27 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.10.28 Comparator Input

This setting can set default pin as the comparator input.

3.10.29 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

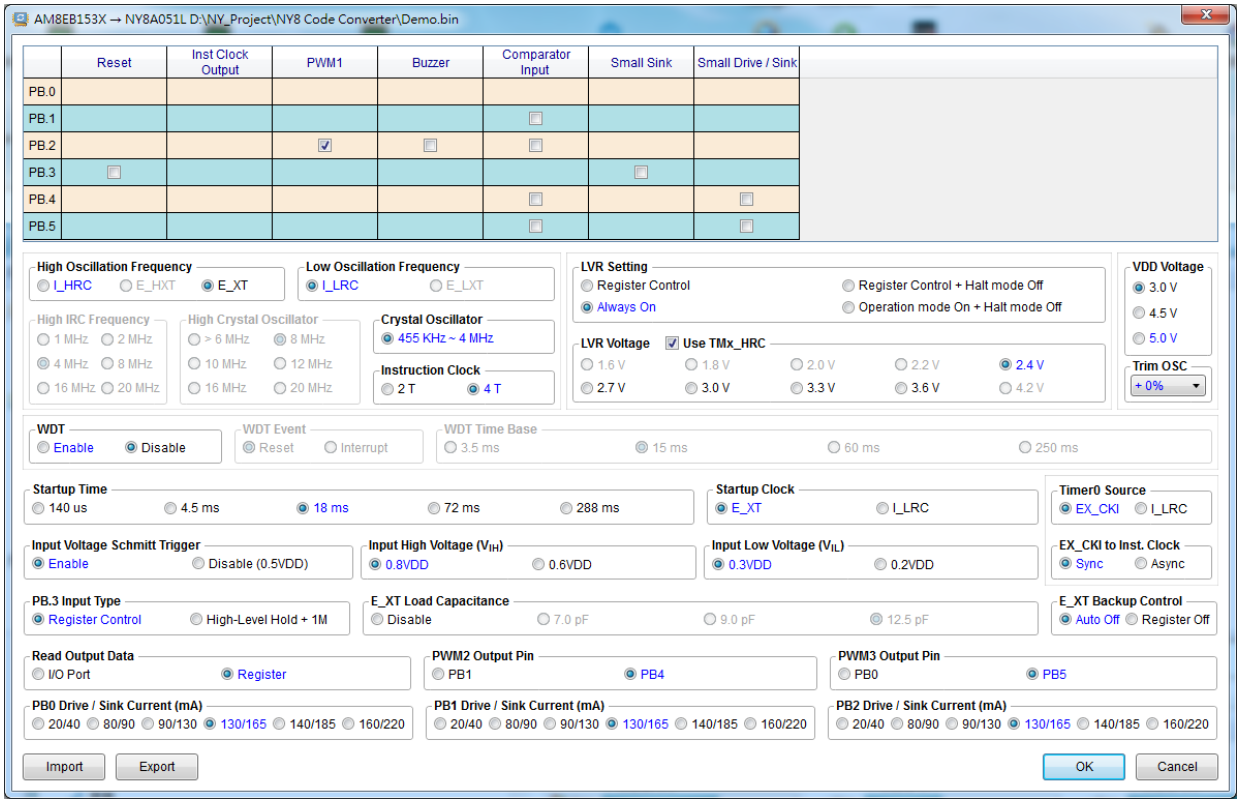
NY8 series, there are 3 available options of voltage.

1	2	3
3.0V	4.5V	5.0V

3.10.30 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%.

3.11 NY8A051L Configuraiton Options



3.11.1 High Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects high frequency oscillation, for NY8A51L, there are 2 options available.

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

3.11.2 Low Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects low frequency oscillation, NY8A51L provides the I_LRC option.

Option	Descriptions
I_LRC	Internal low RC oscillator.

3.11.3 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.

3.11.4 High IRC Frequency

For NY8 series, there are 6 available options of frequency to be set.

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

3.11.5 Crystal Oscillator

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

3.11.6 LVR Setting

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

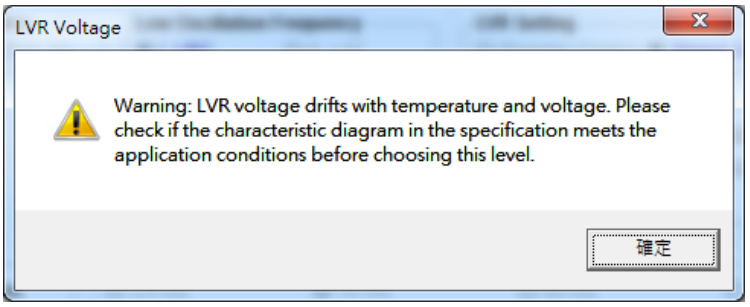
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.11.7 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A051L, 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.11.8 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.

3.11.9 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.

3.11.10 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

3.11.11 Startup Time

The Startup Time function can be used to adjust the time period 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

3.11.12 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_LRC/E_LXT, the signal source will be input from low frequency clock.

3.11.13 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC, Low-frequency oscillator will be clock source.

3.11.14 EX_CKI to Inst. Clock

Set EX_CKI to synchronize with Instruction Clock of Timer0 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.

3.11.15 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.

3.11.16 E_XT / 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_XT / 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.

3.11.17 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 disable, the voltage level threshold is 0.5VDD.

3.11.18 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.

3.11.19 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.

3.11.20 Input Type

User can select the resistor of input type for different applications. For NY8A051L, 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.

3.11.21 E_XT / E_LXT Load Capacitance

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

Option	Descriptions
Disable	User can use plug-in capacitance (Xin to VSS and Xout to VSS)
7.0pF	External Crystal / external low-speed Crystal Load Capacitance is 7.0pF.
9.0pF	External Crystal / external low-speed Crystal Load Capacitance is 9.0pF.
12.5pF	External Crystal / external low-speed Crystal Load Capacitance is 12.5pF

3.11.22 PWM Output Pin

The NY8A051L has total of three PWM output pins. PWM2 and PWM3 have 2 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM2:

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

PWM3:

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

3.11.23 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.

Option	Descriptions
160/220	Set the default Drive current of pin as 160mA and Sink current as 220mA.

3.11.24 Reset

Set input pin as reset.

3.11.25 Inst Clock Output

Set output pin as instruction clock.

3.11.26 PWM1

Set the pin as PWM1 output pin.

3.11.27 Buzzer

Set the pin as Buzzer output pin.

3.11.28 Comparator Input

This setting can set default pin as the comparator input.

3.11.29 Small Sink

This setting can set the sink current of output pin as 6mA.

3.11.30 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.11.31 VDD Voltage

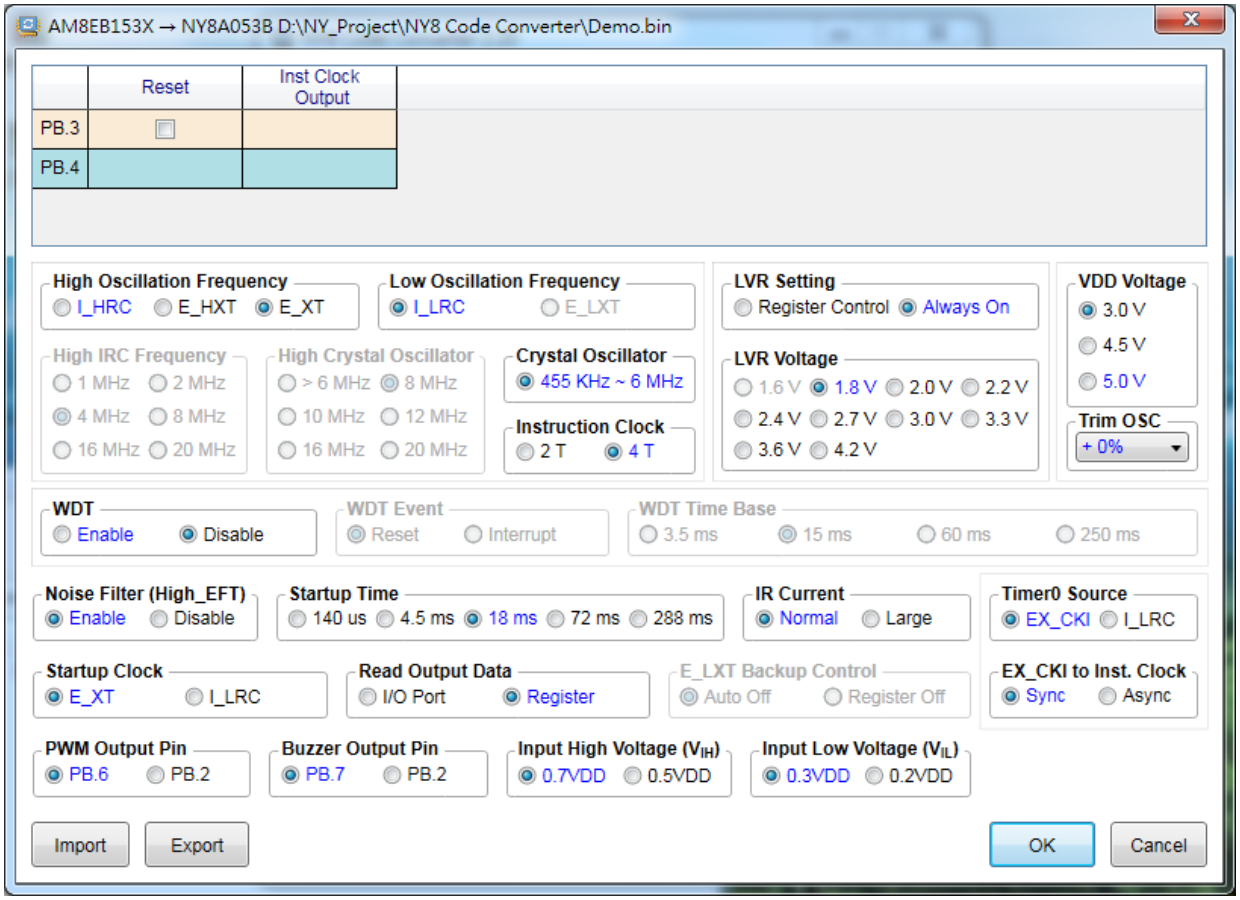
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.11.32 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%.

3.12 NY8A053B Configuration Options



3.12.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency, there are 3 options available.

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

3.12.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation frequency, there are 2 options available.

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

3.12.3 Instruction Clock

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

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

3.12.4 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

3.12.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.12.6 Crystal Oscillator

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

3.12.7 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.

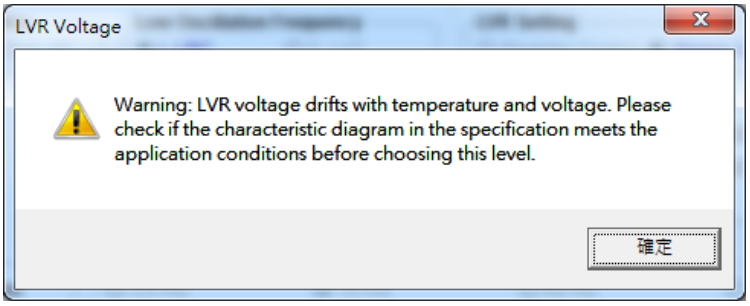
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.12.8 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A053B, 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 to be higher than the LVR voltage and make the LVR function fail. 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. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.12.9 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.

3.12.10 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.

3.12.11 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

3.12.12 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.

3.12.13 Startup Time

The Startup Time function can be used to adjust the time period 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

3.12.14 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.

3.12.15 IR Current

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

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

3.12.16 Startup Clock

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

3.12.17 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.

3.12.18 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.

3.12.19 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.

3.12.20 PWM Output Pin

The NY8A053B has total of two PWM output pins. In NY8A053B, 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.

3.12.21 Buzzer Output Pin

There are 2 options to set the output pin of Buzzer. In NY8A053B, 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.

3.12.22 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.

3.12.23 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.

3.12.24 Reset

Set input pin as reset.

3.12.25 Inst Clock Output

Set output pin as instruction clock.

3.12.26 VDD Voltage

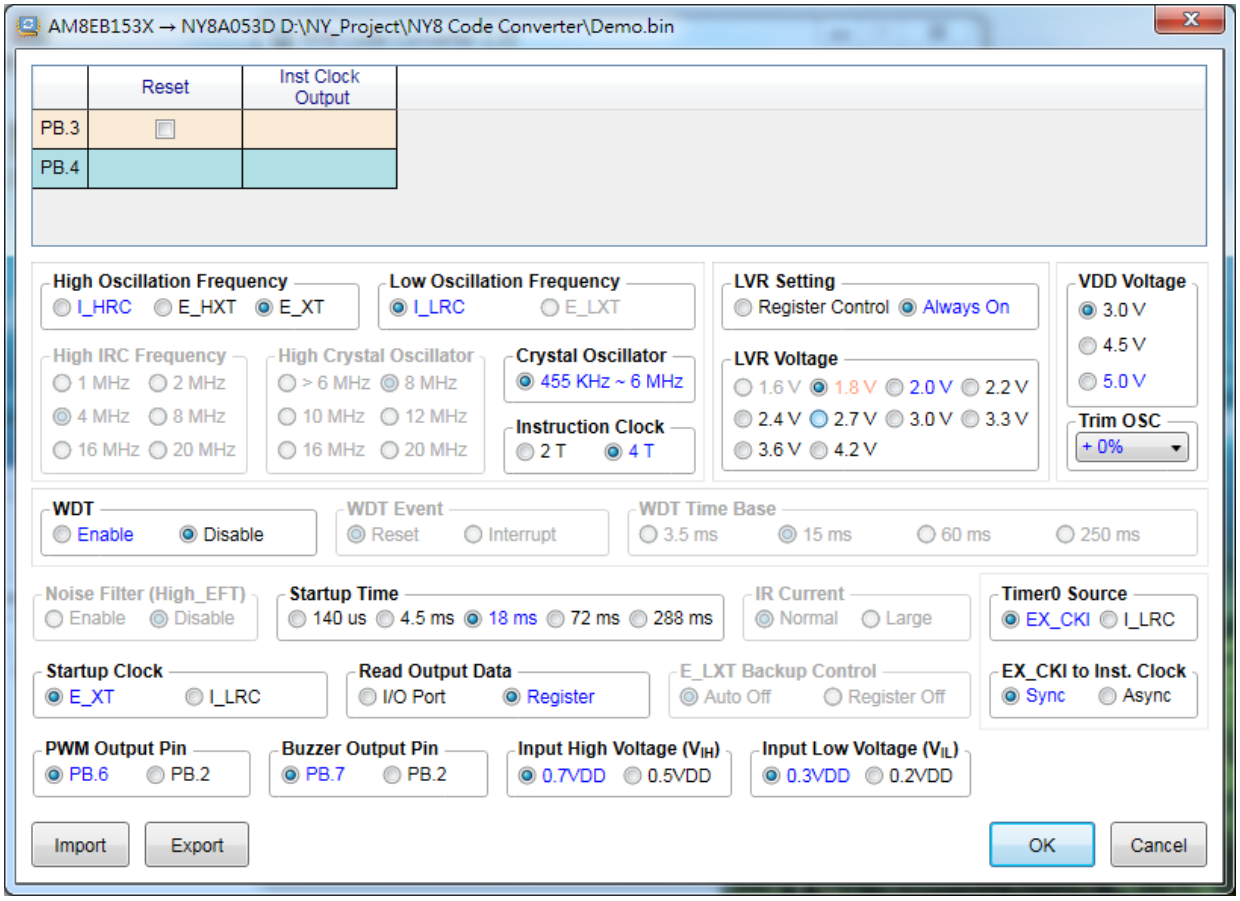
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.12.27 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%.

3.13 NY8A053D Configuration Options



3.13.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency, there are 3 options available.

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

3.13.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation frequency, there are 2 options available.

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

3.13.3 Instruction Clock

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

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

3.13.4 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

3.13.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.13.6 Crystal Oscillator

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

3.13.7 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.

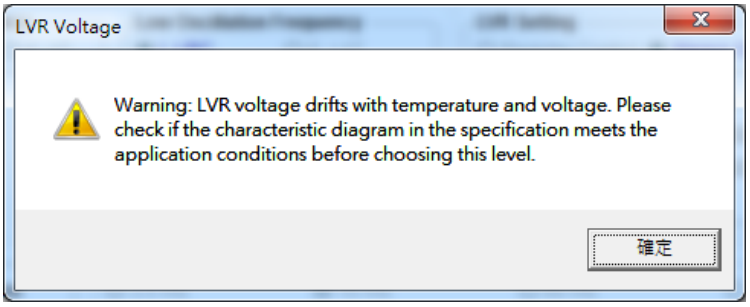
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.13.8 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A053D, 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 to be higher than the LVR voltage and make the LVR function fail. 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 NY8A053D. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.13.9 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.

3.13.10 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.

3.13.11 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

3.13.12 Startup Time

The Startup Time function can be used to adjust the time period 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

3.13.13 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.

3.13.14 Startup Clock

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

3.13.15 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.

3.13.16 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.

3.13.17 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.

3.13.18 PWM Output Pin

The NY8A053D has total of two PWM output pins. In NY8A053D, 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.

3.13.19 Buzzer Output Pin

There are 2 options to set the output pin of Buzzer. In NY8A053D, 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.

3.13.20 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.

3.13.21 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.

3.13.22 Reset

Set input pin as reset.

3.13.23 Inst Clock Output

Set output pin as instruction clock.

3.13.24 VDD Voltage

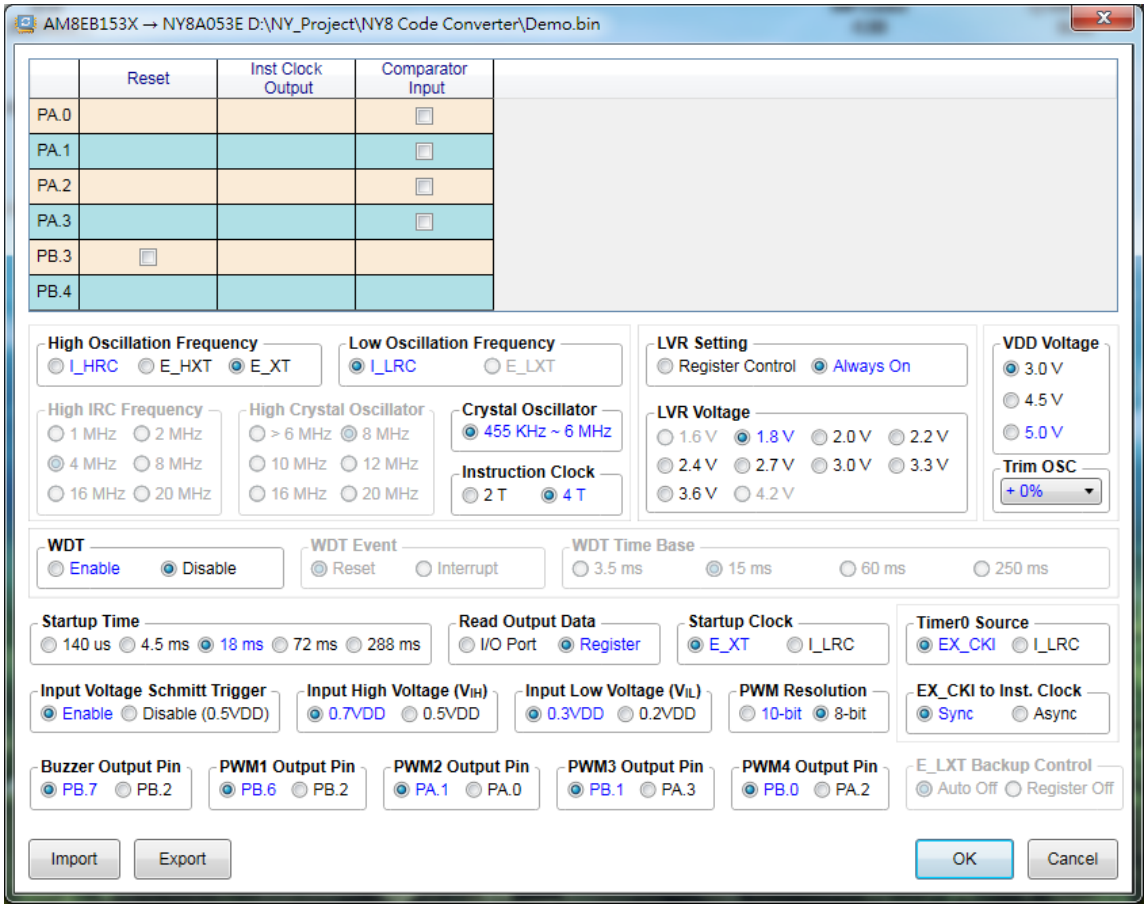
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.13.25 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%.

3.14 NY8A053E Configuration Options



3.14.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency, there are 3 options available.

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

3.14.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation frequency, there are 2 options available.

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

3.14.3 Instruction Clock

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

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

3.14.4 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

3.14.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.14.6 Crystal Oscillator

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

3.14.7 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.

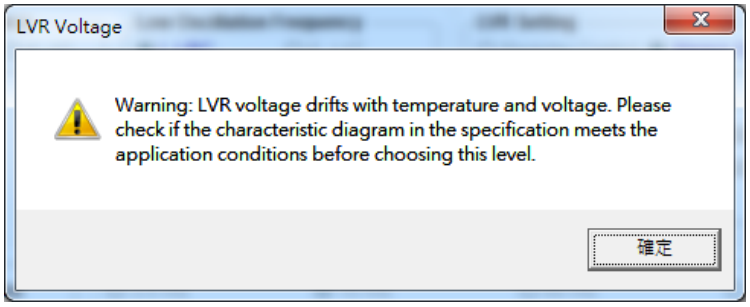
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.14.8 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.14.9 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.

3.14.10 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.

3.14.11 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

3.14.12 Startup Time

The Startup Time function can be used to adjust the time period 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

3.14.13 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.

3.14.14 Startup Clock

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

3.14.15 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.

3.14.16 Read Output Data

Read Output Data sets program to read the source of the output port state. For NY8 series, there are 2 available options of Read Output Data.

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

3.14.17 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.

3.14.18 PWM Output Pin

The NY8A053E has total of four PWM output pins. Each pin has 2 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

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. (Default)
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.

3.14.19 Buzzer Output Pin

There are 2 options to set the output pin of Buzzer output pin. In NY8A053E, the default Buzzer output pin is PB.7, user also can set PB2 as Buzzer output pin. User can enable or disable PWM function dynamically by register. When Buzzer is disabled, PB7 or PB2 can be general I/O.

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

3.14.20 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 disable, the voltage level threshold is 0.5VDD.

3.14.21 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.

3.14.22 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.

3.14.23 PWM Resolution

Set the output resolution by PWM Resolution. For NY8 series, there are 2 options for setting.

Option	Description
10-bit	Set the PWM resolution output as 10-bit.
8-bit	Set the PWM resolution output as 8-bit.

3.14.24 Reset

Set input pin as reset.

3.14.25 Inst Clock Output

Set output pin as instruction clock.

3.14.26 Comparator Input

Set input pin as comparator input.

3.14.27 VDD Voltage

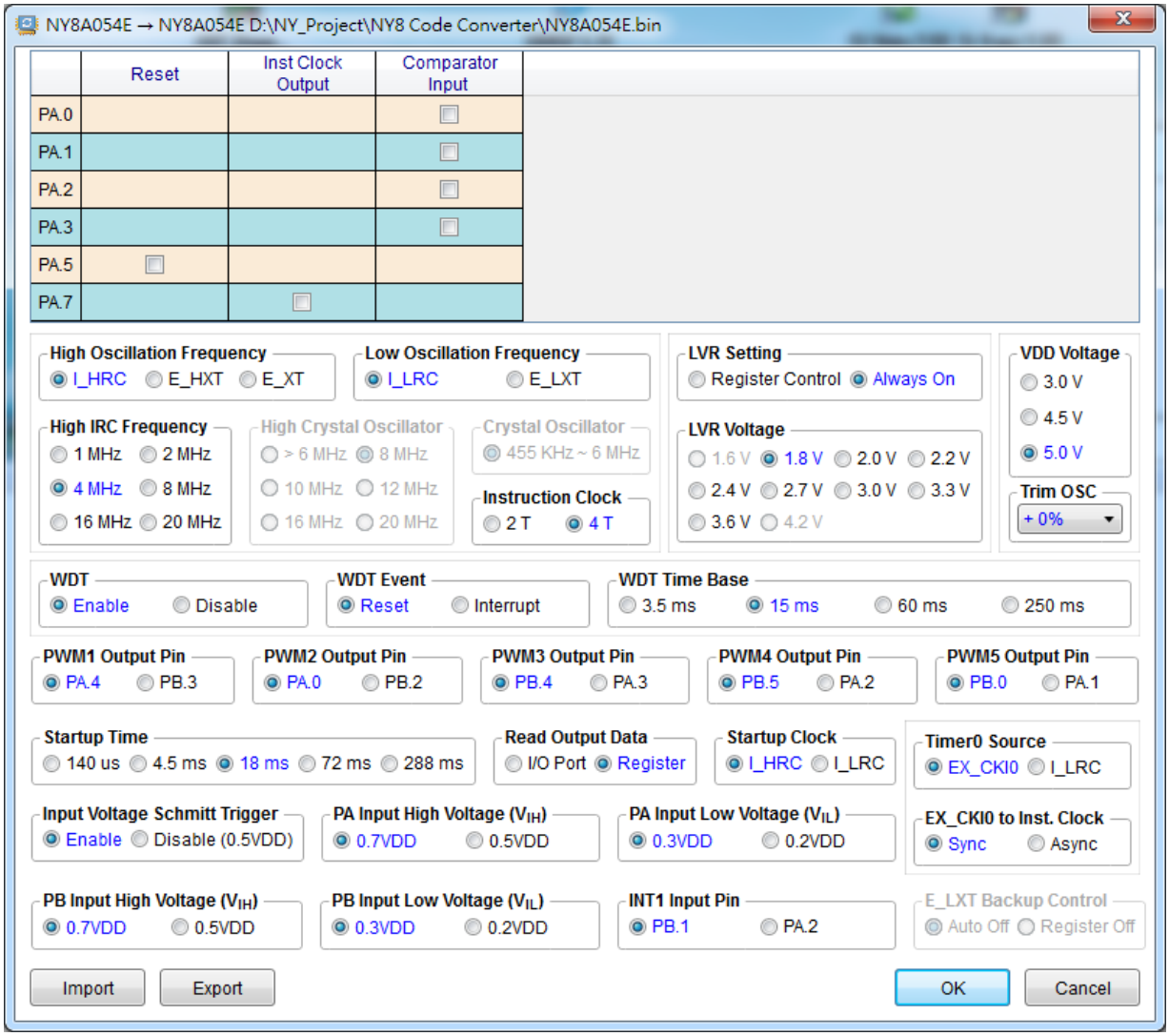
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

1	2	3
3.0V	4.5V	5.0V

3.14.28 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%

3.15 NY8A054E Configuration Options



3.15.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency, there are 3 options available.

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

3.15.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation frequency, there are 2 options available.

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

3.15.3 Instruction Clock

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

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

3.15.4 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

3.15.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.15.6 Crystal Oscillator

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

3.15.7 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.

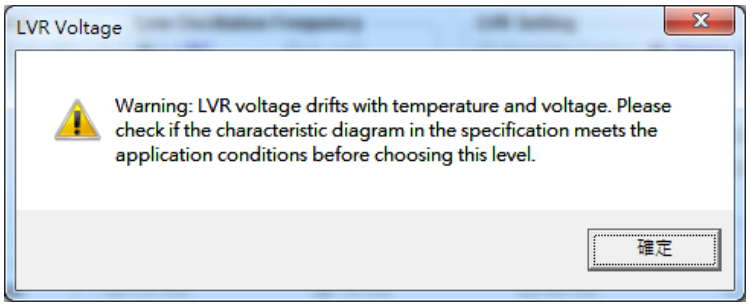
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.15.8 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A054E, 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

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 to be higher than the LVR voltage and make the LVR function fail. 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 NY8A054E. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.15.9 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.

3.15.10 WDT Event

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

Option	Descriptions
Reset	Reset IC.

Option	Descriptions
Interrupt	Implement interrupt subroutine.

3.15.11 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

3.15.12 Startup Time

The Startup Time function can be used to adjust the time period 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

3.15.13 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.

3.15.14 Startup Clock

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

3.15.15 EX_CKI 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.

3.15.16 Read Output Data

Read Output Data sets program to read the source of the output port state. For NY8 series, there are 2

available options of Read Output Data.

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

3.15.17 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.

3.15.18 PWM Output Pin

The NY8A054E has total of five PWM output pins. Each pin has 2 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM1:

Option	Descriptions
PA.1	Set PA.1 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.

3.15.19 INT Input Pin

The NY8A054E has total of two INT input pins. Among them, INT1 pin has 2 options, which can be dynamically enabled or disabled through control registers. When the external interrupt function is disabled, the corresponding interrupt pin reverts to general-purpose digital input/output (I/O). The following table lists the supported input pin options and default settings for each external interrupt source.

PWM1:

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

3.15.20 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 disable, the voltage level threshold is 0.5VDD.

3.15.21 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.

3.15.22 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.

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

3.15.23 Reset

Set input pin as reset.

3.15.24 Inst Clock Output

Set output pin as instruction clock.

3.15.25 Comparator Input

Set input pin as comparator input.

3.15.26 VDD Voltage

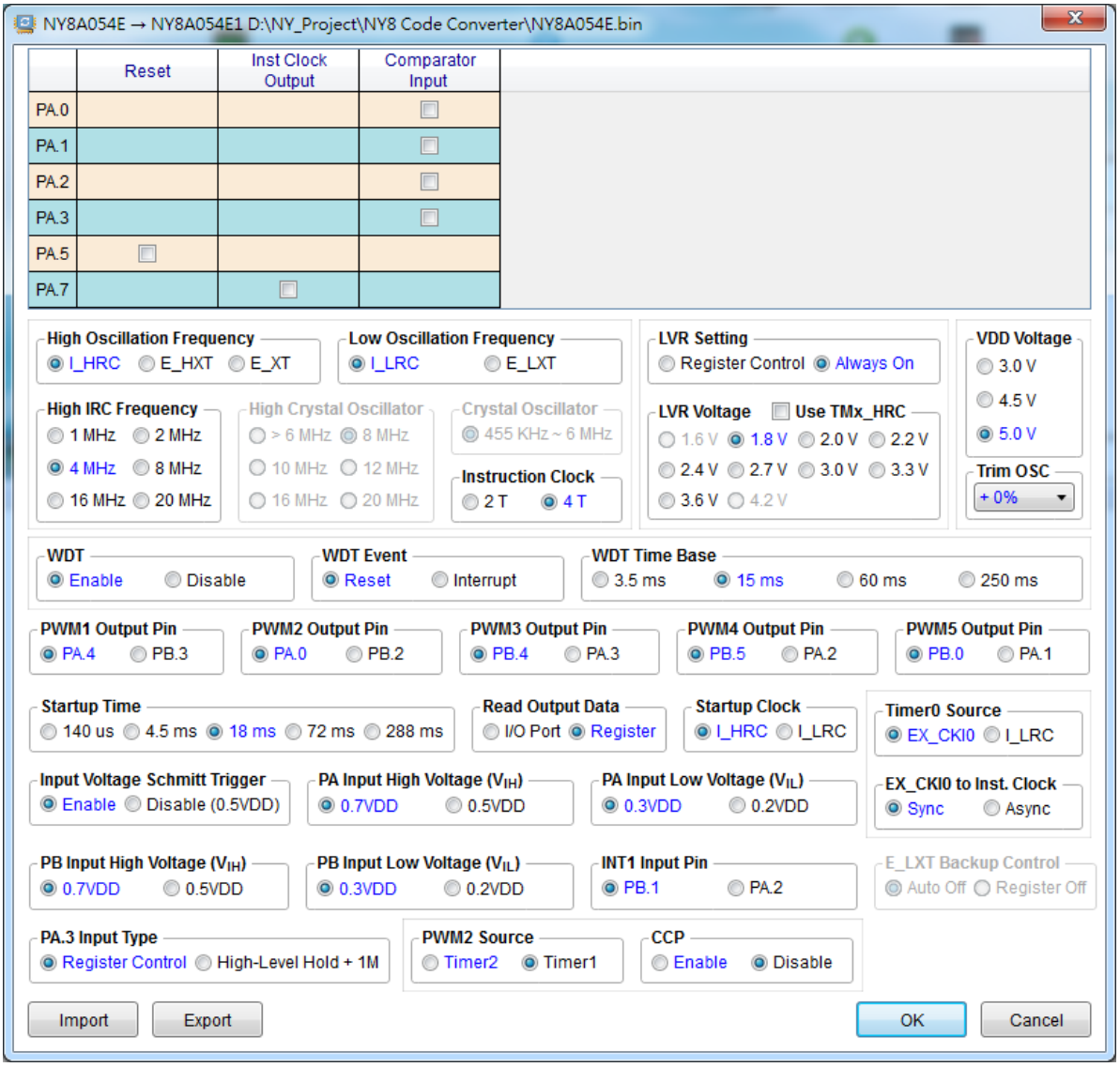
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.15.27 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%

3.16 NY8A054E1 Configuration Options



3.16.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency, there are 3 options available.

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

3.16.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation frequency, there are 2 options available.

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

3.16.3 Instruction Clock

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

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

3.16.4 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

3.16.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.16.6 Crystal Oscillator

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

3.16.7 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.

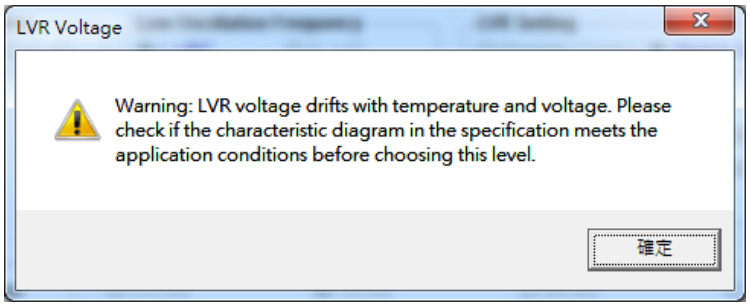
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.16.8 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A054E1, 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

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 to be higher than the LVR voltage and make the LVR function fail. 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 NY8A054E1. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.16.9 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.

3.16.10 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.

3.16.11 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

3.16.12 Startup Time

The Startup Time function can be used to adjust the time period 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

3.16.13 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.

3.16.14 Startup Clock

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

3.16.15 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.

3.16.16 Read Output Data

Read Output Data sets program to read the source of the output port state. For NY8 series, there are 2 available options of Read Output Data.

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

3.16.17 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.

3.16.18 PWM Output Pin

The NY8A054E1 has total of five PWM output pins. Each pin has 2 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM1:

Option	Descriptions
PA.1	Set PA.1 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)

Option	Descriptions
PA.1	Set PA.1 as PWM5 output pin.

3.16.19 INT Input Pin

The NY8A054E1 has total of two INT input pins. INT1 pin has 2 options, which can be dynamically enabled or disabled through control registers. When the external interrupt function is disabled, the corresponding interrupt pin reverts to general-purpose digital input/output (I/O). The following table lists the supported input pin options and default settings for each external interrupt source.

INT1:

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

3.16.20 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 disable, the voltage level threshold is 0.5VDD.

3.16.21 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.

3.16.22 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.

3.16.23 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.

3.16.24 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.

3.16.25 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.

3.16.26 Reset

Set input pin as reset.

3.16.27 Inst Clock Output

Set output pin as instruction clock.

3.16.28 Comparator Input

Set input pin as comparator input.

3.16.29 VDD Voltage

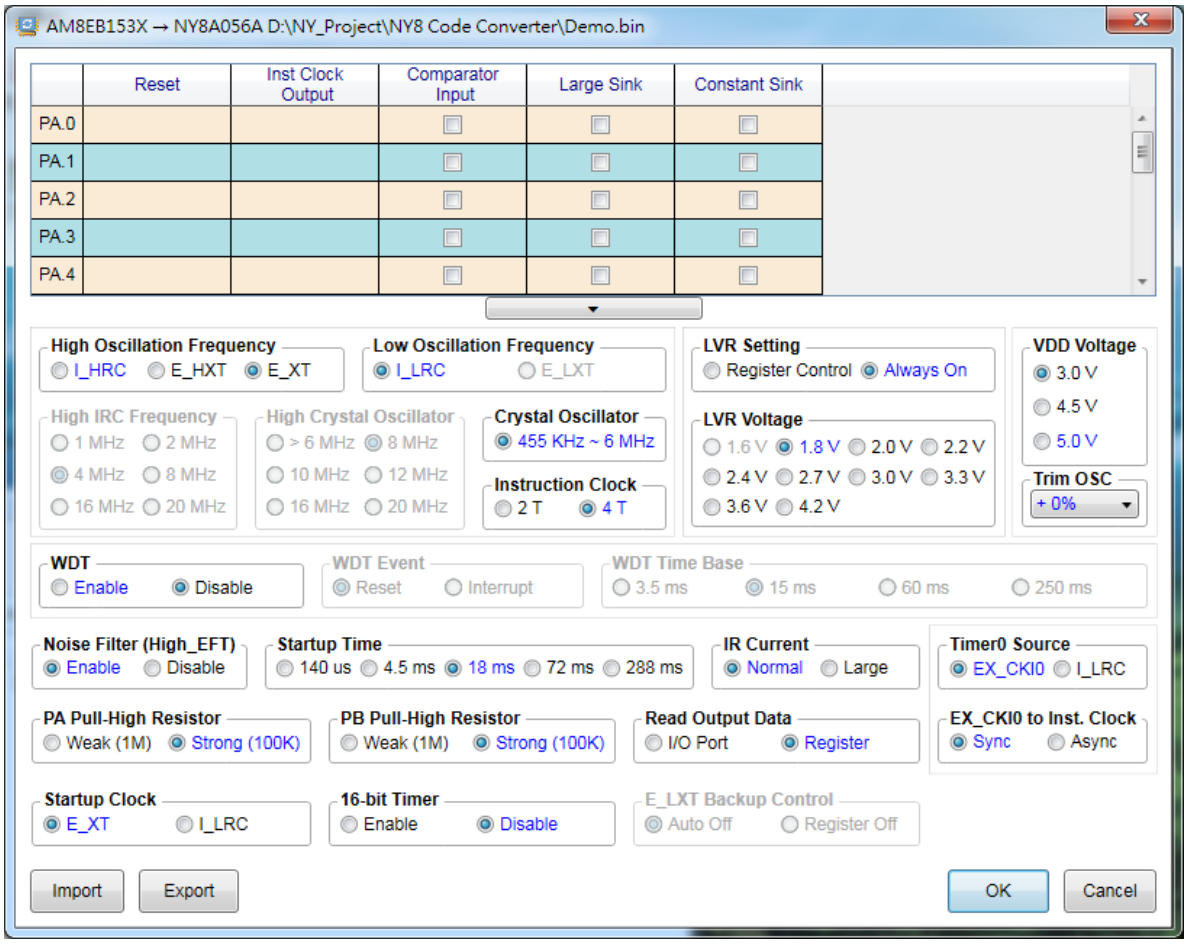
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.16.30 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%

3.17 NY8A056A Configuration Options



3.17.1 High Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects high frequency oscillation, there are 3 options available.

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

3.17.2 Low Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects low frequency oscillation, there are 2 options available.

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

3.17.3 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.

3.17.4 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

3.17.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.17.6 Crystal Oscillator

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

3.17.7 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.

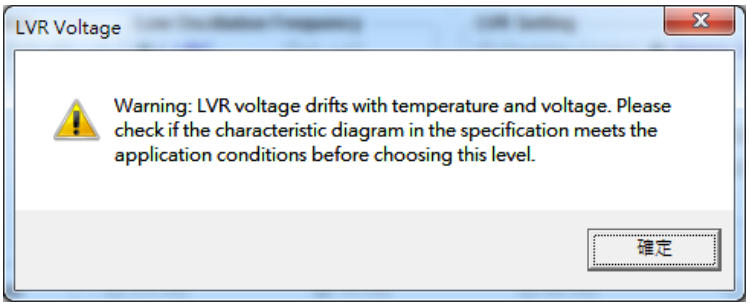
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.17.8 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8A056A, 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.



hen the temperature rises, the LVR voltage will also be decreased, which may cause the minimum working voltage of IC to be higher than the LVR voltage and make the LVR function fail. 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 NY8A056A. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet..

3.17.9 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.

3.17.10 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.

3.17.11 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

3.17.12 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.

3.17.13 Startup Time

The Startup Time function can be used to adjust the time period 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

3.17.14 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.

3.17.15 IR Current

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

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

3.17.16 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.

3.17.17 Startup Clock

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

3.17.18 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.

3.17.19 Read Output Data

Read Output Data sets program to read the source of the output port state. For NY8 series, there are 2 available options of Read Output Data.

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

3.17.20 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”.

3.17.21 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.

3.17.22 Reset

Set input pin as reset.

3.17.23 Inst Clock Output

Set output pin as instruction clock.

3.17.24 Comparator Input

Set input pin as comparator input.

3.17.25 Large Sink

Set the output current of the pin to 60mA.

3.17.26 Constant Sink

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

3.17.27 VDD Voltage

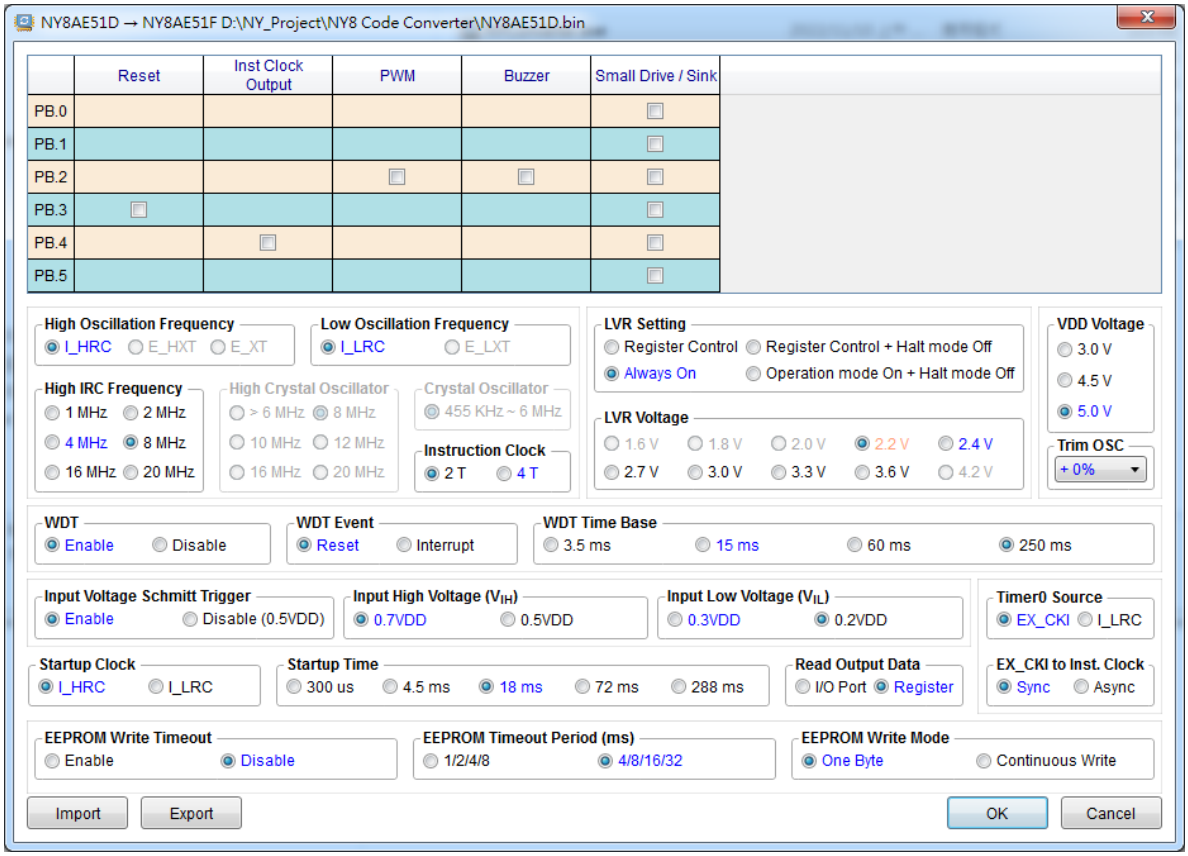
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.17.28 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%.

3.18 NY8AE51F Configuration Options



3.18.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high frequency oscillation for NY8AE51F, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.18.2 Low Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects low frequency oscillation for NY8AE51F, there is only 1 option available.

Option	Descriptions
L_IRC	Internal low RC oscillator

3.18.3 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.

3.18.4 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

3.18.5 LVR Setting

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

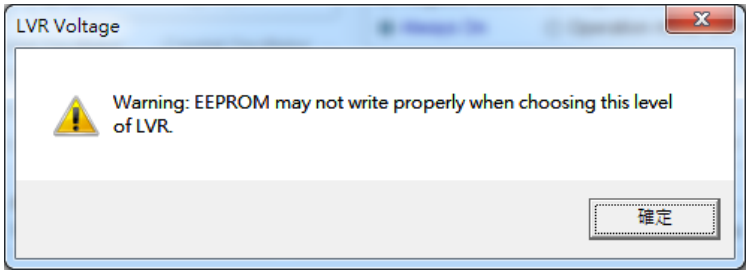
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.18.6 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.



The minimum working voltage for EEPROM is 2.4V, the EEPROM might fail to be programmed by selecting an LVR voltage under 2.4V. If the EEPROM function is not used, please ignore this dialog box and select a lower LVR voltage.

3.18.7 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.

3.18.8 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.

3.18.9 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

3.18.10 Startup Time

The Startup Time function can be used to adjust the time period 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

3.18.11 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.

3.18.12 Startup Clock

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

3.18.13 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.

3.18.14 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.

3.18.15 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 disable, the voltage level threshold is 0.5VDD.

3.18.16 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.

3.18.17 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.

3.18.18 EEPROM Write Timeout

Set the EEPROM Write Timeout to decide IC whether enables the detection. The EEPROM Write Timeout will send the interrupt signals to the system, and the system will exit the EEPROM write mode.

3.18.19 EEPROM Timeout Period

There are two combinations for EEPROM Timeout Period for user: 1/2/4/8ms and 4/8/16/32ms. User can decide the detection period through the EETO register. (Please refer to the EETO register descriptions from NY8AE51F datasheet)

3.18.20 EEPROM Write Mode

There are two different write modes for user:

Option	Description
One Byte	The flow of EEPROM is listed below 1. Unlock the write protection. 2. Write one byte. 3. Enable the write protection automatically
Continuous Write	The flow of EEPROM is listed below 1. Unlock the write protection. 2. Write the acquired data. 3. Enable the write protection manually.

3.18.21 Reset

Set input pin as reset.

3.18.22 Inst Clock Output

Set output pin as instruction clock.

3.18.23 PWM

Set the pin as PWM output pin.

3.18.24 Buzzer

Set the pin as Buzzer output pin.

3.18.25 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.18.26 VDD Voltage

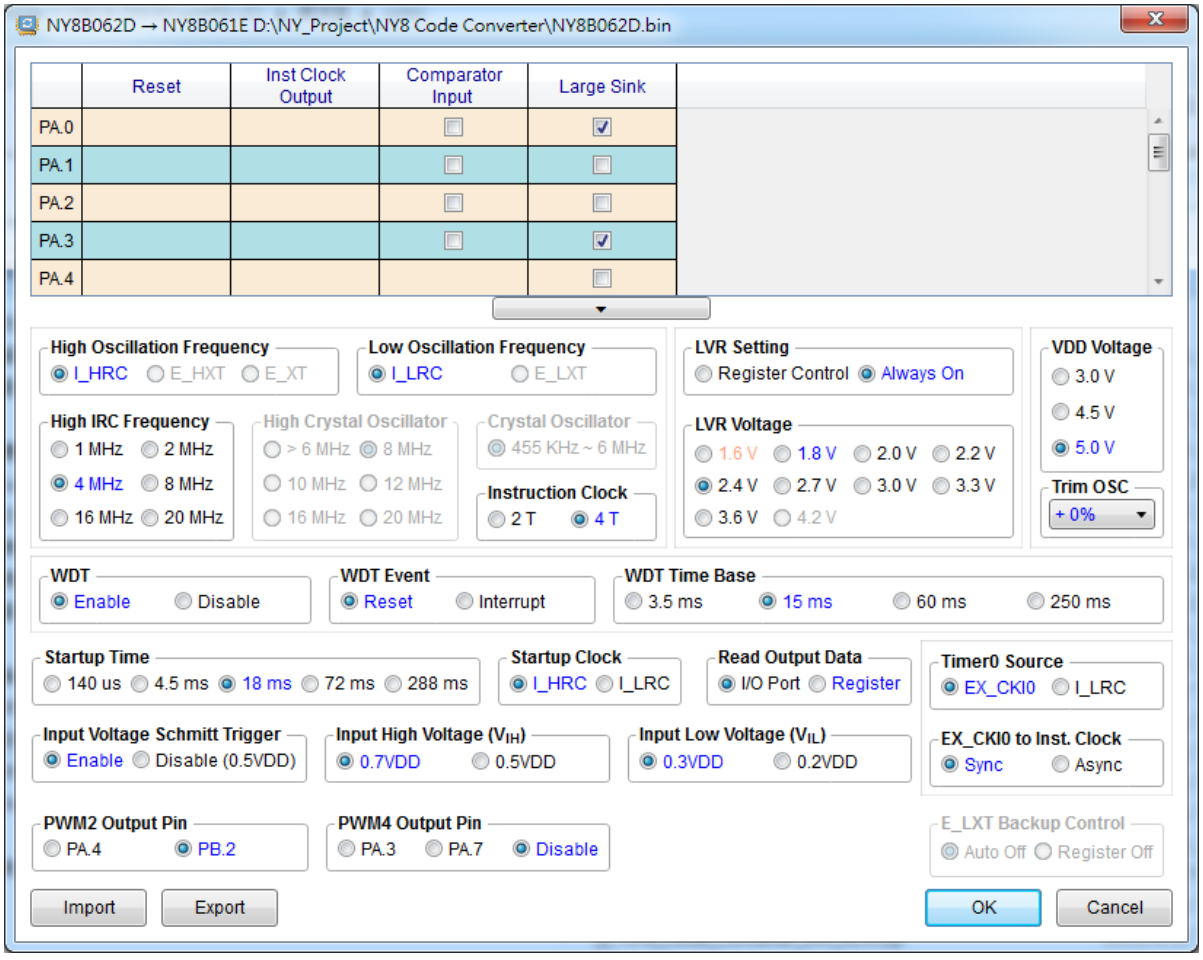
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.18.27 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%.

3.19 NY8B061E Configuration Options



3.19.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency for NY8B061E, only I_HRC is available.

Option	Descriptions
I_HRC	Internal high RC oscillator

3.19.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low frequency oscillation for NY8B061E, only I_LRC is available.

Option	Descriptions
I_LRC	Internal low RC oscillator

3.19.3 Instruction Clock

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

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

3.19.4 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

3.19.5 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.

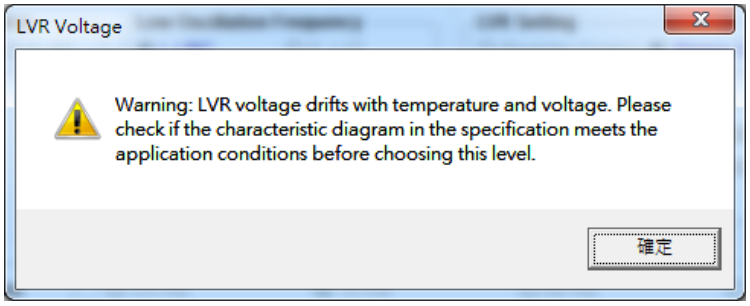
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.19.6 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 to be higher than the LVR voltage and make the LVR function fail. 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 NY8B061E. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.19.7 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.

3.19.8 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.

3.19.9 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

3.19.10 Startup Time

The Startup Time function can be used to adjust the time period 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

3.19.11 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, the signal source will be input from low frequency clock.

3.19.12 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC, Low-frequency oscillator will be clock source.

3.19.13 EX_CKI0 to Inst. Clock

Set EX_CKI0 to synchronize with Instruction Clock of Timer0 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.

3.19.14 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.

3.19.15 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.

3.19.16 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.

3.19.17 Reset

Set input pin as reset.

3.19.18 Inst Clock Output

Set output pin as instruction clock.

3.19.19 Comparator Input

Set input pin as comparator input.

3.19.20 Large Sink

Set the output current of the pin to 60mA.

3.19.21 VDD Voltage

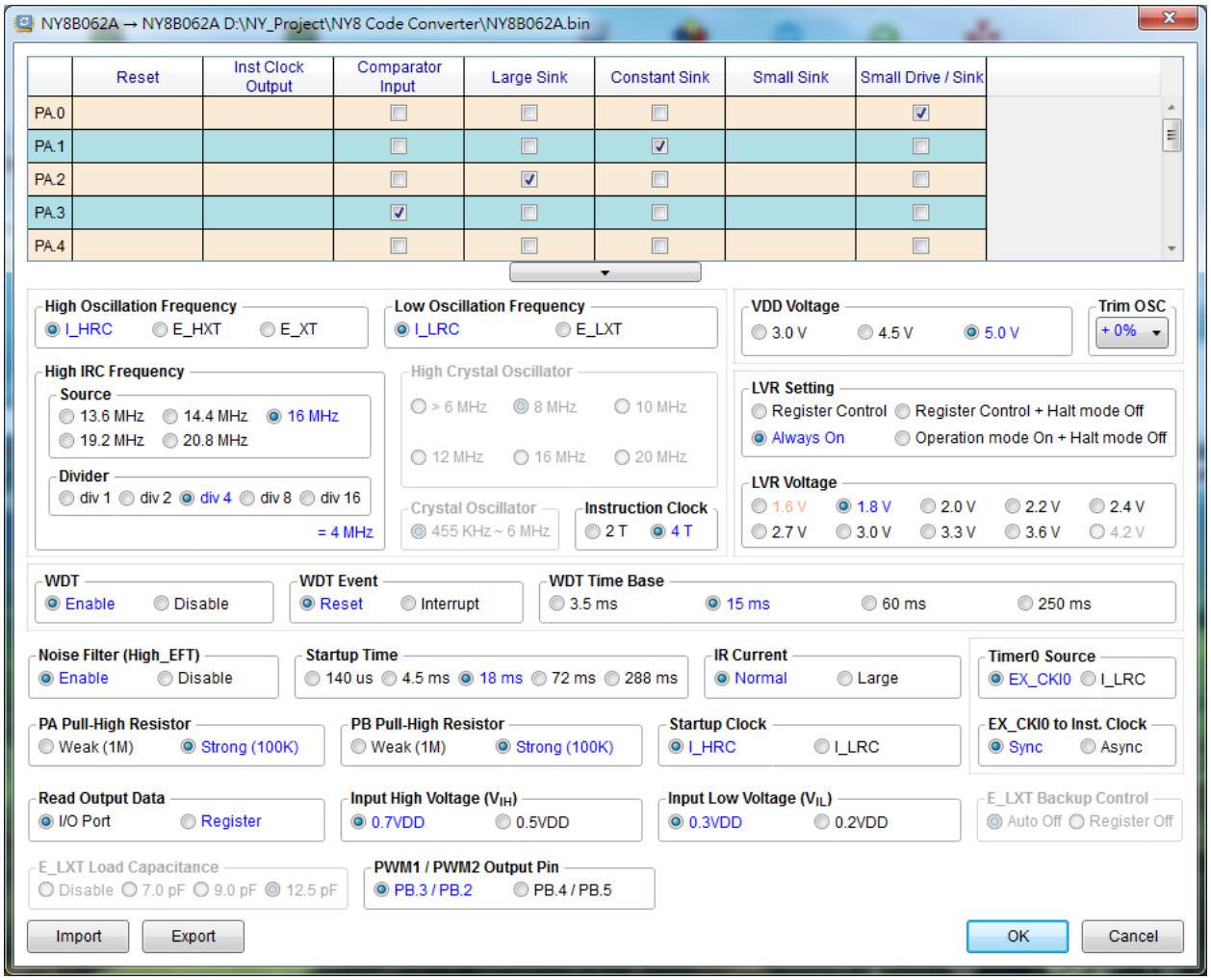
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.19.22 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%.

3.20 NY8B062A Configuration Options



3.20.1 High Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects high frequency oscillation, there are 3 options available.

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

3.20.2 Low Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects low frequency oscillation, there are 2 options available.

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

3.20.3 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.

3.20.4 High IRC Frequency

For NY8B062A, there are 5 available frequency options of Source and 5 available options of Divider.

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

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

3.20.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.20.6 Crystal Oscillator

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

3.20.7 LVR Setting

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

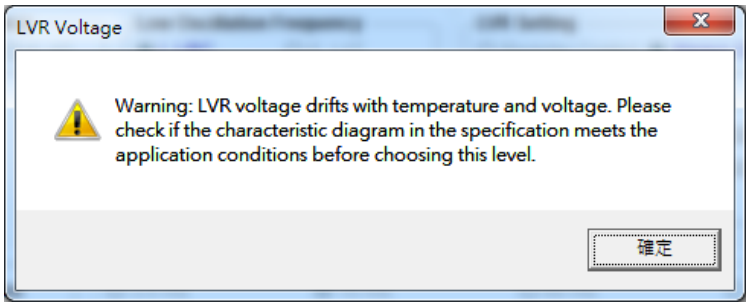
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.20.8 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8B062A, 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.20.9 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.

3.20.10 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.

3.20.11 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

3.20.12 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.

3.20.13 Startup Time

The Startup Time function can be used to adjust the time period 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

3.20.14 IR Current

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

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

3.20.15 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_LRC/E_LXT, the signal source will be input from low frequency clock.

3.20.16 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.

3.20.17 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

3.20.18 EX_CKI0 to Inst. Clock

Set EX_CKI0 to synchronize with Instruction Clock of Timer0 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.

3.20.19 Read Output Data

Read Output Data sets program to read the source of the output port state. For NY8 series, there are 2 available options of Read Output Data.

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

3.20.20 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.

3.20.21 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.

3.20.22 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.

3.20.23 E_LXT Load Capacitance

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

Option	Descriptions
Disable	User can use plug-in capacitance (Xin to VSS and Xout to VSS)
7.0pF	External Crystal Load Capacitance is 7.0pF.
9.0pF	External Crystal Load Capacitance is 9.0pF.
12.5pF	External Crystal Load Capacitance is 12.5pF.

3.20.24 PWM Output Pin

The NY8B062A has total of three PWM output pins. PWM1 and PWM2 pin have 2 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM1:

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

PWM2:

Option	Descriptions
PB.2	Set PB.2 as PWM2 output pin. (Default)
PB.5	Set PB.5 as PWM2 output pin.

3.20.25 Reset

Set input pin as reset.

3.20.26 Inst Clock Output

Set output pin as instruction clock.

3.20.27 Comparator Input

This setting can set default pin as the comparator input.

3.20.28 Large Sink

Set the output current of the pin to 60mA.

3.20.29 Constant Sink

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

3.20.30 Small Sink

This setting can set the sink current of output pin as 6mA.

3.20.31 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.20.32 VDD Voltage

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

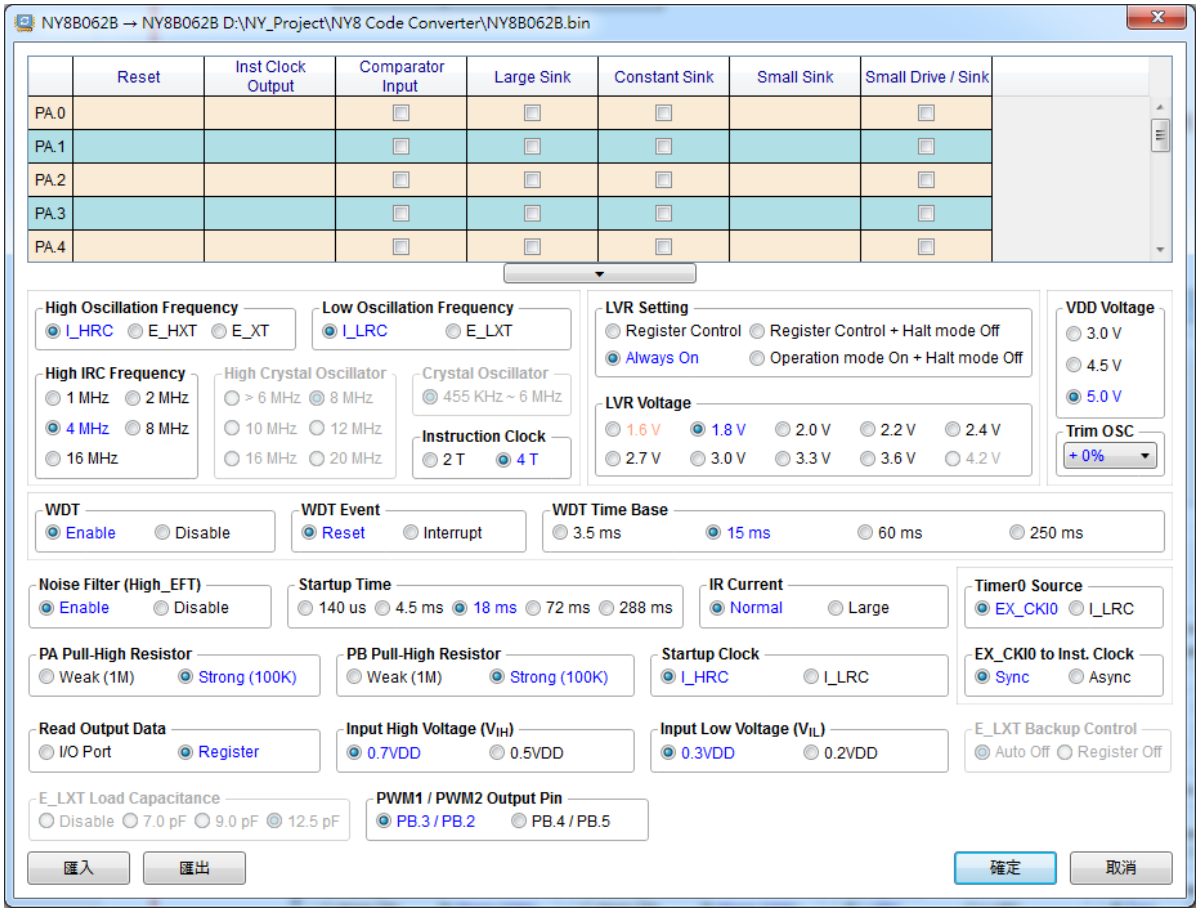
internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.20.33 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%.

3.21 NY8B062B Configuration Options



3.21.1 High Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects high frequency oscillation, there are 3 options available.

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

3.21.2 Low Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects low frequency oscillation, there are 2 options available.

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

3.21.3 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.

3.21.4 High IRC Frequency

For NY8B062B, there are 6 available options of frequency to be set.

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

3.21.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.21.6 Crystal Oscillator

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

3.21.7 LVR Setting

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

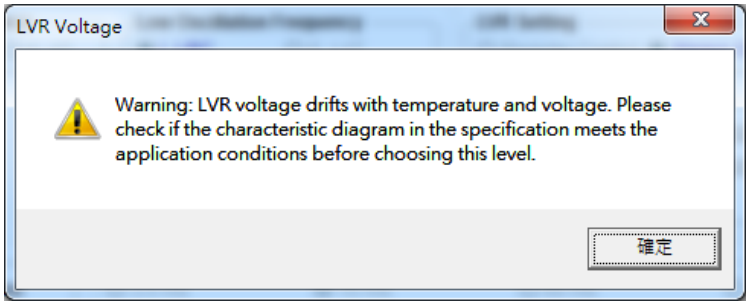
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.21.8 LVR Voltage

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8B062B, 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.21.9 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.

3.21.10 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.

3.21.11 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

3.21.12 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.

3.21.13 Startup Time

The Startup Time function can be used to adjust the time period 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

3.21.14 IR Current

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

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

3.21.15 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_LRC/E_LXT, the signal source will be input from low frequency clock.

3.21.16 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.

3.21.17 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

3.21.18 EX_CKI0 to Inst. Clock

Set EX_CKI0 to synchronize with Instruction Clock of Timer0 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.

3.21.19 Read Output Data

Read Output Data sets program to read the source of the output port state. For NY8 series, there are 2 available options of Read Output Data.

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

3.21.20 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.

3.21.21 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.

3.21.22 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.

3.21.23 E_LXT Load Capacitance

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

Option	Descriptions
Disable	User can use plug-in capacitance (Xin to VSS and Xout to VSS)
7.0pF	External Crystal Load Capacitance is 7.0pF.
9.0pF	External Crystal Load Capacitance is 9.0pF.
12.5pF	External Crystal Load Capacitance is 12.5pF.

3.21.24 PWM Output Pin

The NY8B062B has total of three PWM output pins. PWM1 and PWM2 pin have 2 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM1:

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

PWM2:

Option	Descriptions
PB.2	Set PB.2 as PWM2 output pin. (Default)
PB.5	Set PB.5 as PWM2 output pin.

3.21.25 Reset

Set input pin as reset.

3.21.26 Inst Clock Output

Set output pin as instruction clock.

3.21.27 Comparator Input

This setting can set default pin as the comparator input.

3.21.28 Large Sink

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

3.21.29 Constant Sink

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

3.21.30 Small Sink

This setting can set the sink current of output pin as 6mA.

3.21.31 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.21.32 VDD Voltage

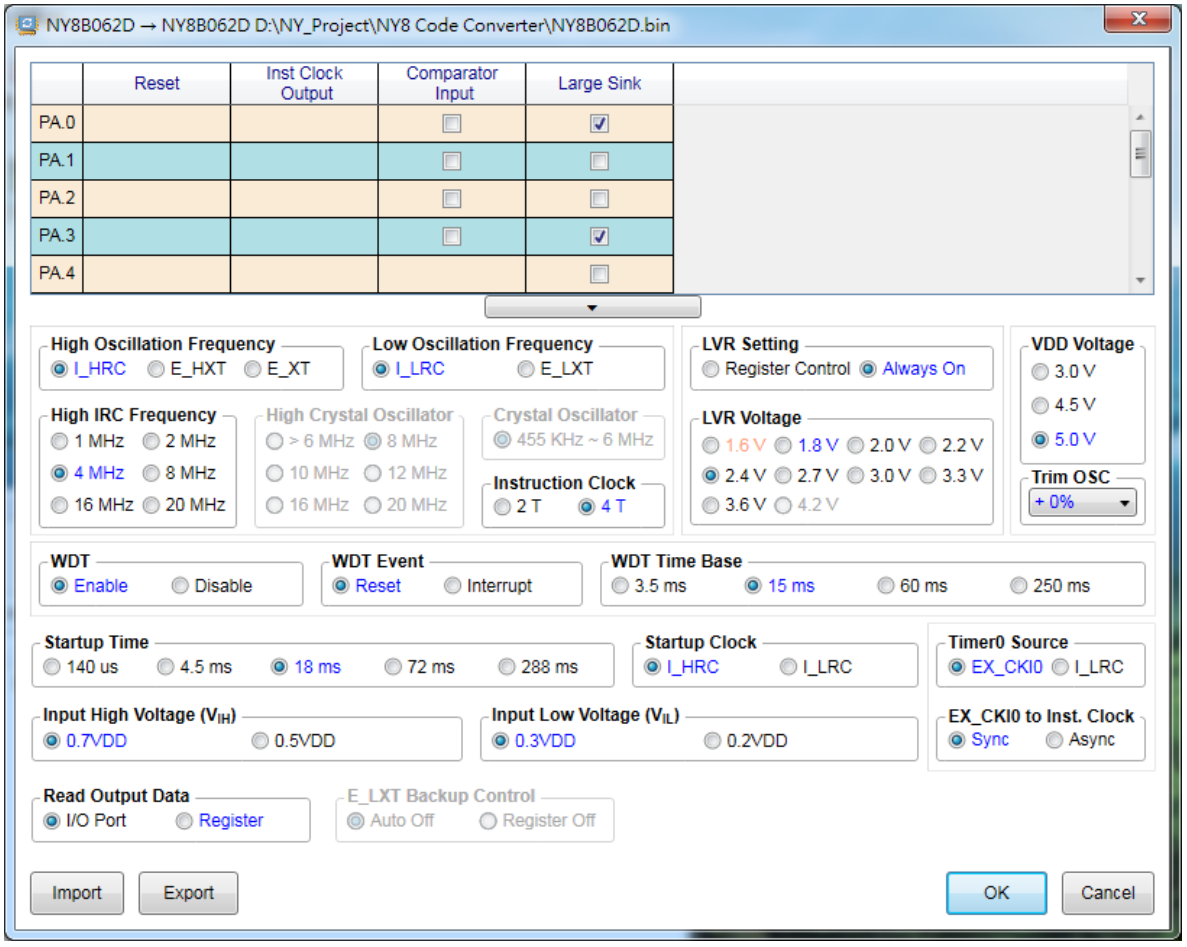
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.21.33 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%.

3.22 NY8B062D Configuration Options



3.22.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency, there are 3 options available.

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

3.22.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation frequency, there are 2 options available.

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

3.22.3 Instruction Clock

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

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

3.22.4 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

3.22.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.22.6 Crystal Oscillator

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

3.22.7 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.

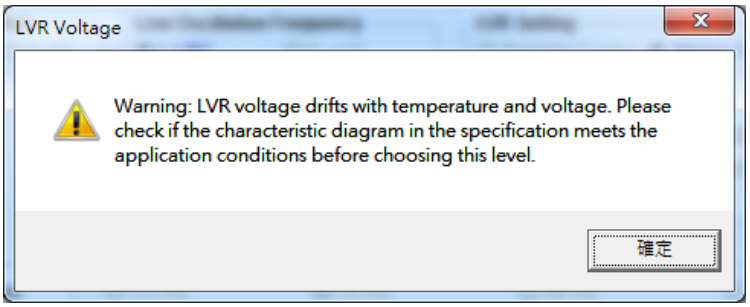
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.22.8 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.22.9 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.

3.22.10 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.

3.22.11 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

3.22.12 Startup Time

The Startup Time function can be used to adjust the time period 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

3.22.13 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.

3.22.14 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

3.22.15 EX_CKI0 to Inst. Clock

Set EX_CKI0 to synchronize with Instruction Clock of Timer0 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.

3.22.16 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.

3.22.17 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.

3.22.18 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.

3.22.19 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.

3.22.20 Reset

Set input pin as reset.

3.22.21 Inst Clock Output

Set output pin as instruction clock.

3.22.22 Comparator Input

Set input pin as comparator input.

3.22.23 Large Sink

Set the output current of the pin to 60mA.

3.22.24 VDD Voltage

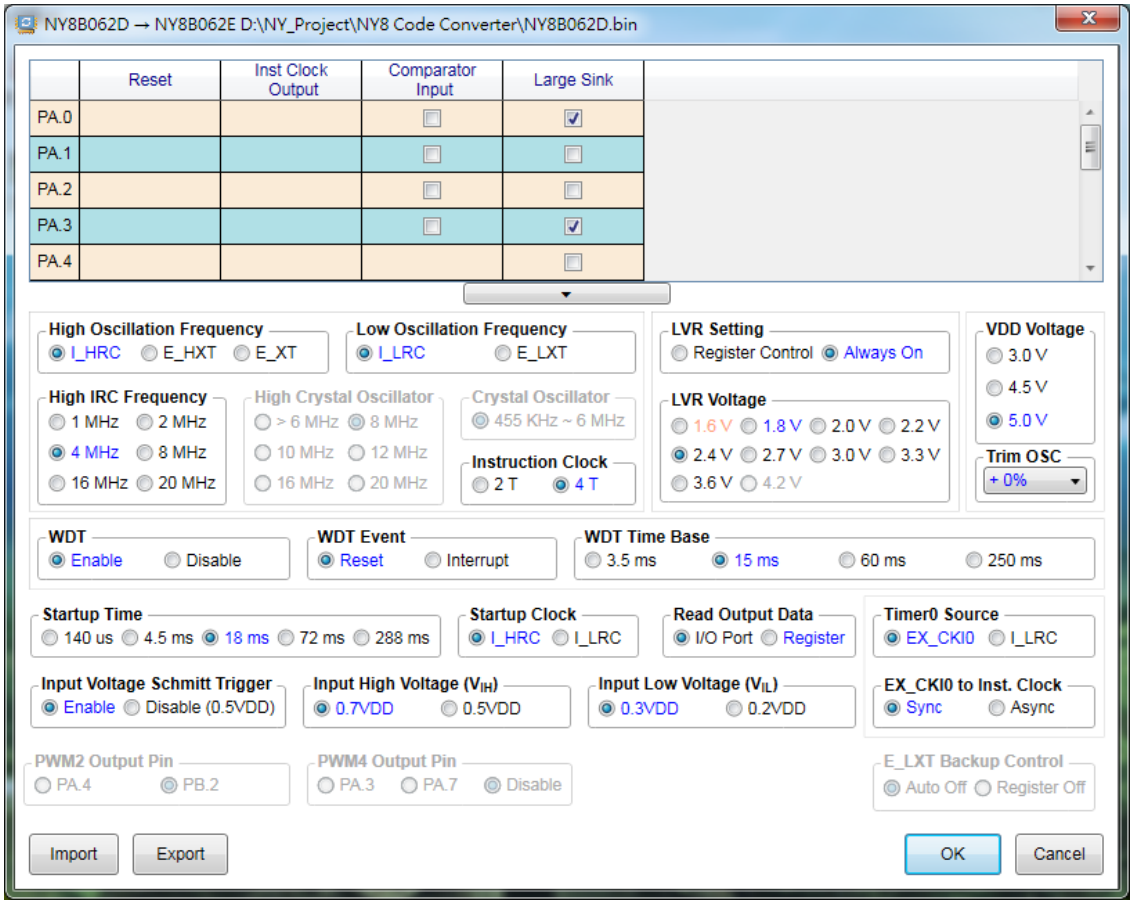
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.22.25 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%.

3.23 NY8B062E Configuration Options



3.23.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency, there are 3 options available.

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

3.23.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation frequency, there are 2 options available.

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

3.23.3 Instruction Clock

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

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

3.23.4 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

3.23.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.23.6 Crystal Oscillator

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

3.23.7 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.

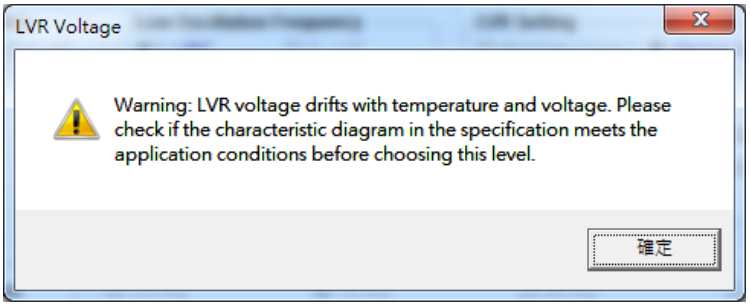
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.23.8 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 to be higher than the LVR voltage and make the LVR function fail. 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 NY8B062E. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.23.9 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.

3.23.10 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.

3.23.11 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

3.23.12 Startup Time

The Startup Time function can be used to adjust the time period 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

3.23.13 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.

3.23.14 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

3.23.15 EX_CKI0 to Inst. Clock

Set EX_CKI0 to synchronize with Instruction Clock of Timer0 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.

3.23.16 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.

3.23.17 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.

3.23.18 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 disable, the voltage level threshold is 0.5VDD.

3.23.19 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.

3.23.20 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.

3.23.21 PWM Output Pin

The NY8B062E has total of four PWM output pins. PWM2 pin has 2 options, PWM4 pin has 3 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM2:

Option	Descriptions
PA.4	Set PA.4 as PWM2 output pin.
PB.2	Set PB.2 as PWM2 output pin. (Default)

PWM4:

Option	Descriptions
PA.3	Set PA.3 as PWM4 output pin.
PA.7	Set PA.7 as PWM4 output pin.
Disable	Disable the PWM4 output. (Default)

3.23.22 Reset

Set input pin as reset.

3.23.23 Inst Clock Output

Set output pin as instruction clock.

3.23.24 Comparator Input

Set input pin as comparator input.

3.23.25 Large Sink

Set the output current of the pin to 60mA.

3.23.26 VDD Voltage

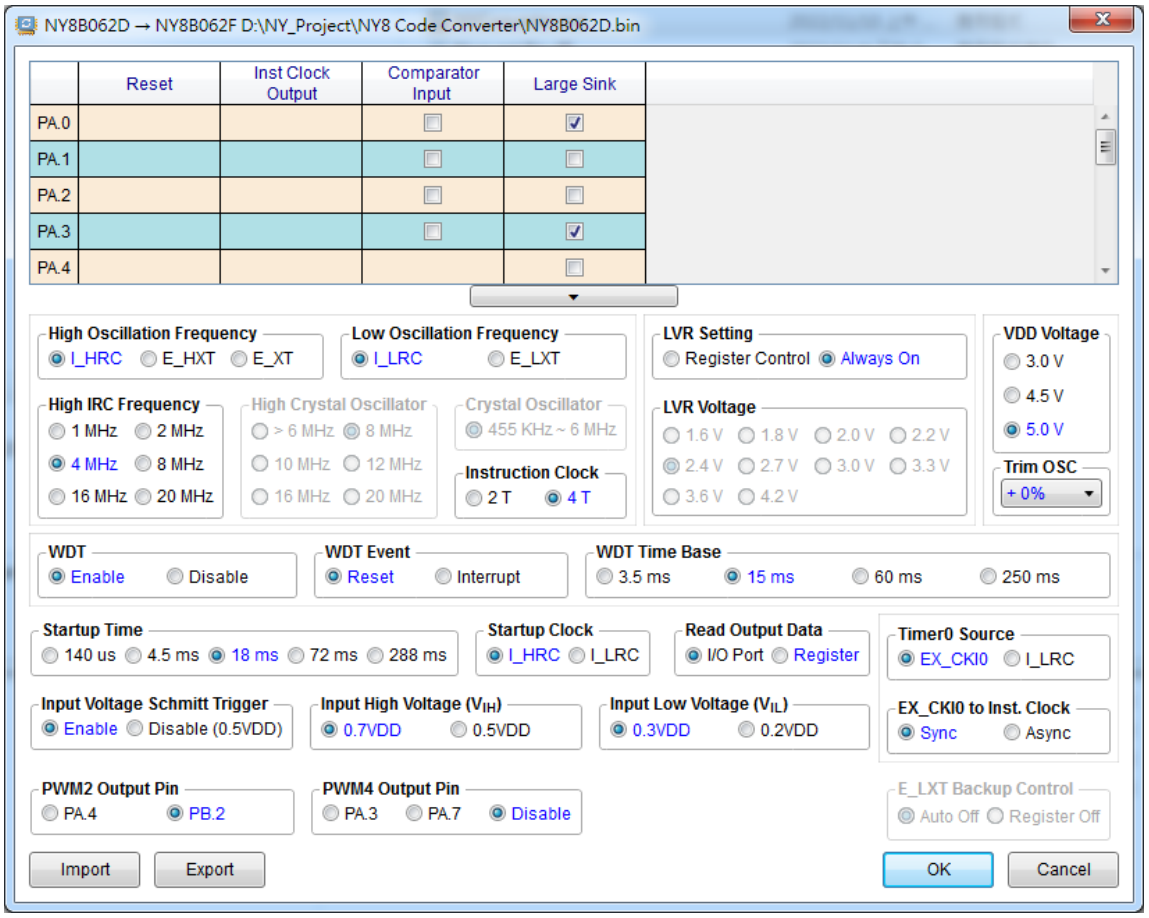
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.23.27 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%.

3.24 NY8B062F Configuration Option



3.24.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency, there are 3 options available.

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

3.24.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation frequency, there are 2 options available.

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

3.24.3 Instruction Clock

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

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

3.24.4 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

3.24.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.24.6 Crystal Oscillator

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

3.24.7 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.

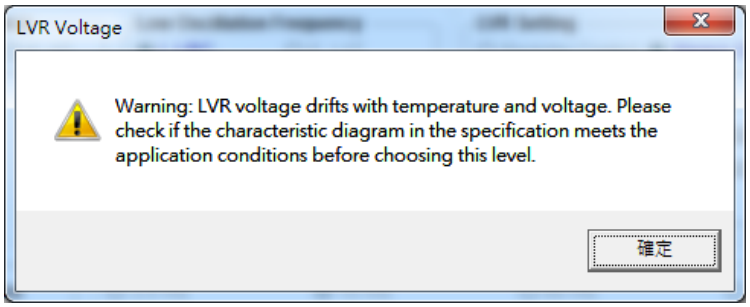
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.24.8 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 to be higher than the LVR voltage and make the LVR function fail. 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 NY8B062F. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.24.9 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.

3.24.10 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.

3.24.11 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

3.24.12 Startup Time

The Startup Time function can be used to adjust the time period 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

3.24.13 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.

3.24.14 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

3.24.15 EX_CKI0 to Inst. Clock

Set EX_CKI0 to synchronize with Instruction Clock of Timer0 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.

3.24.16 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.

3.24.17 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.

3.24.18 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 disable, the voltage level threshold is 0.5VDD.

3.24.19 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.

3.24.20 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.

3.24.21 PWM Output Pin

The NY8B062F has total of four PWM output pins. PWM2 pin has 2 options, PWM5 pin has 3 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM2:

Option	Descriptions
PA.4	Set PA.4 as PWM2 output pin.
PB.2	Set PB.2 as PWM2 output pin. (Default)

PWM4:

Option	Descriptions
PA.3	Set PA.3 as PWM4 output pin.
PA.7	Set PA.7 as PWM4 output pin.
Disable	Disable the PWM4 output. (Default)

3.24.22 Reset

Set input pin as reset.

3.24.23 Inst Clock Output

Set output pin as instruction clock.

3.24.24 Comparator Input

Set input pin as comparator input.

3.24.25 Large Sink

Set the output current of the pin to 60mA.

3.24.26 VDD Voltage

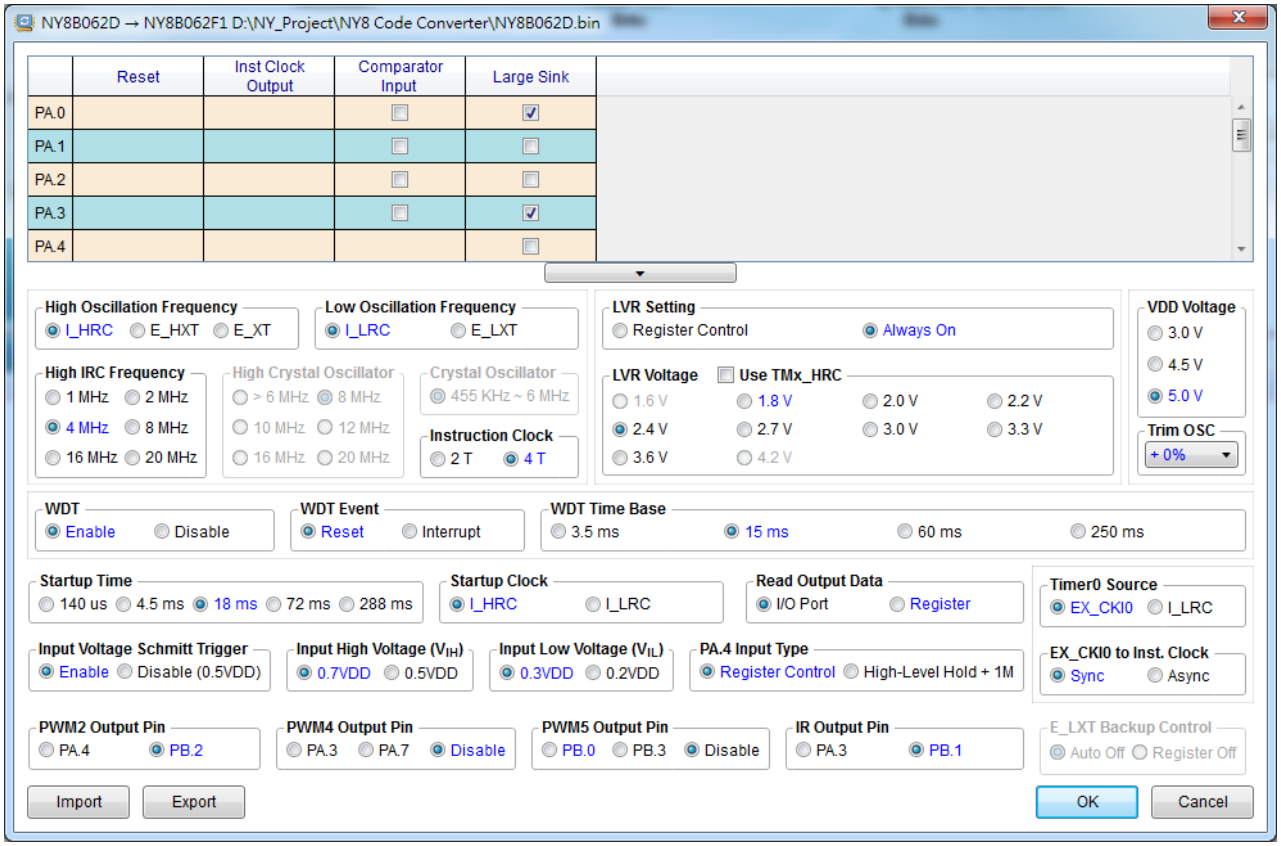
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

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

3.24.27 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%.

3.25 NY8B062F1 Configuration Options



3.25.1 High Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects high oscillation frequency, there are 3 options available.

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

3.25.2 Low Oscillation Frequency

NY8 series provides 2 kinds of frequency oscillation options. When user selects low oscillation

frequency, there are 2 options available.

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

3.25.3 Instruction Clock

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

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

3.25.4 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

3.25.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.25.6 Crystal Oscillator

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

3.25.7 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.

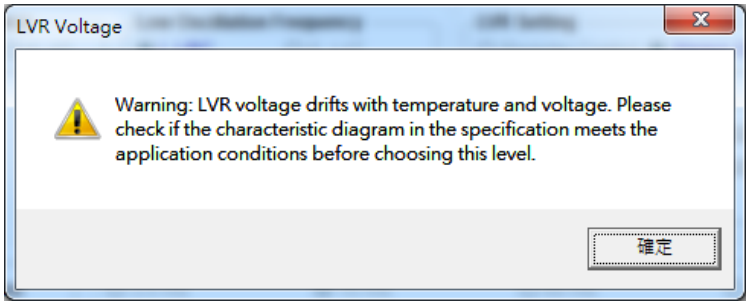
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.

3.25.8 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 to be higher than the LVR voltage and make the LVR function fail. 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 NY8B062F1. If user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.25.9 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.

3.25.10 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.

3.25.11 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

3.25.12 Startup Time

The Startup Time function can be used to adjust the time period 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

3.25.13 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.

3.25.14 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

3.25.15 EX_CKI0 to Inst. Clock

Set EX_CKI0 to synchronize with Instruction Clock of Timer0 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.

3.25.16 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.

3.25.17 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.

3.25.18 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 disable, the voltage level threshold is 0.5VDD.

3.25.19 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.

3.25.20 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.

3.25.21 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.

3.25.22 PWM Output Pin

The NY8B062F1 has total of five PWM output pins. PWM2 pin has 2 options, PWM4 and PWM5 pin

have 3 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM2:

Option	Descriptions
PA.4	Set PA.4 as PWM2 output pin.
PB.2	Set PB.2 as PWM2 output pin. (Default)

PWM4:

Option	Descriptions
PA.3	Set PA.3 as PWM4 output pin.
PA.7	Set PA.7 as PWM4 output pin.
Disable	Disable the PWM4 output. (Default)

PWM5:

Option	Descriptions
PB.0	Set PB.0 as PWM5 output pin.
PB.3	Set PB.3 as PWM5 output pin.
Disable	Disable the PWM4 output. (Default)

3.25.23 IR Output Pin

There are 2 options to set the IR output pin in NY8B062F1.

Option	Descriptions
PA.3	Set PA.3 as IR output pin.
PB.1	Set PB.1 as IR output pin. (Default)

3.25.24 Reset

Set input pin as reset.

3.25.25 Inst Clock Output

Set output pin as instruction clock.

3.25.26 Comparator Input

Set input pin as comparator input.

3.25.27 Large Sink

Set the output current of the pin to 60mA.

3.25.28 VDD Voltage

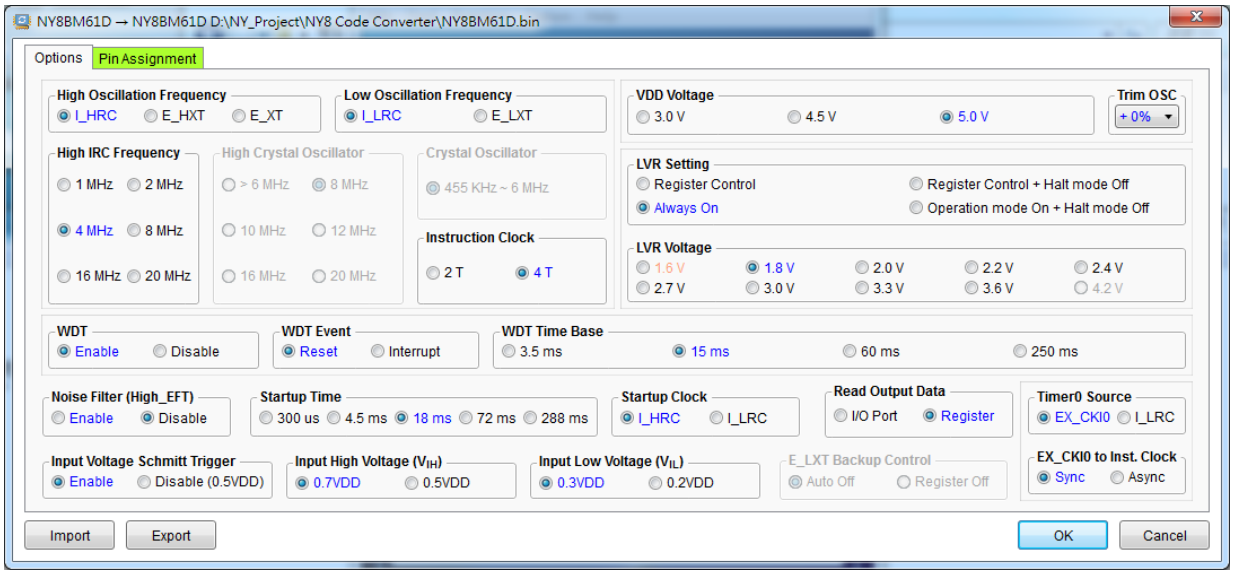
The IC oscillation frequency will be shifted at different operating voltage. For accuracy of internal-resistor oscillation, VDD voltage must be selected for OSC fine tuning during IC production. For NY8 series, there are 3 available options of voltage.

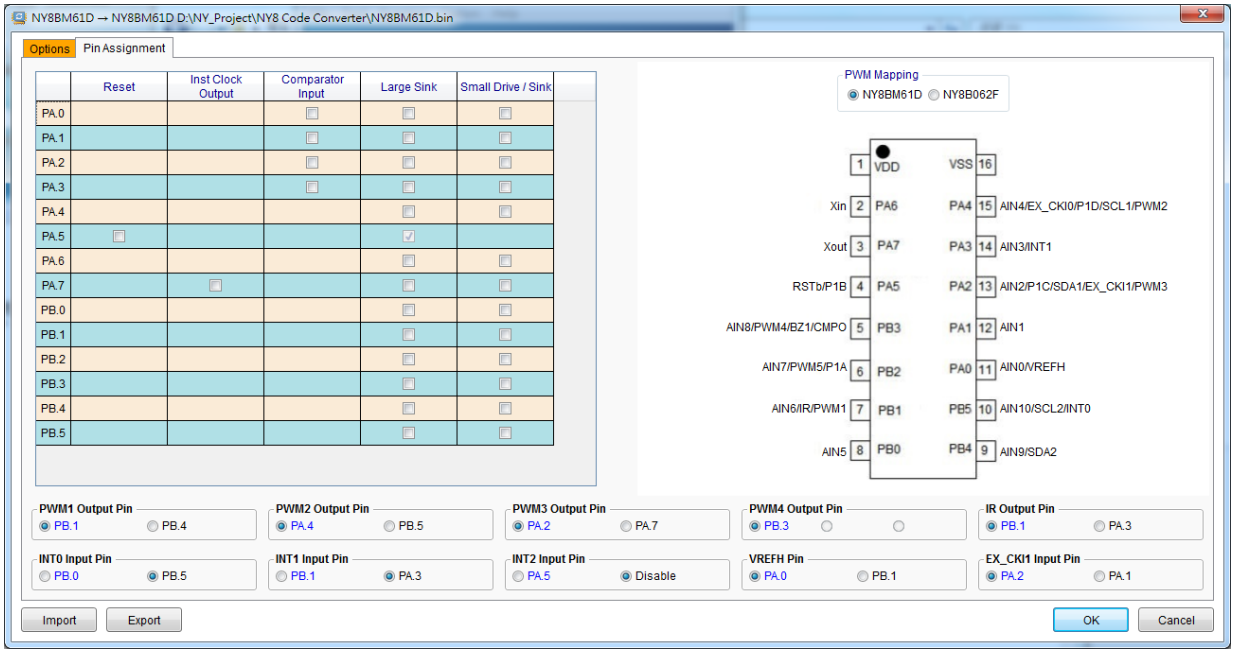
1	*2*	*3*
3.0V	4.5V	5.0V

3.25.29 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%.

3.26 NY8BM61D/NY8BM62D Configuration Options





3.26.1 High Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects high frequency oscillation, there are 3 options available.

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

3.26.2 Low Oscillation Frequency

NY8 series provides 2 kinds of oscillation frequency options. When user selects low frequency oscillation, there are 2 options available.

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

3.26.3 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.

3.26.4 High IRC Frequency

For NY8B062B, there are 6 available options of frequency to be set.

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

3.26.5 High Crystal Oscillator

For High Crystal Oscillator, there are 6 options available.

1	*2*	*3*	*4*	*5*	*6*
> 6MHz	8MHz	10MHz	12MHz	16MHz	20MHz

3.26.6 Crystal Oscillator

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

3.26.7 LVR Setting

When VDD voltage is suddenly lower than the LVR Voltage, IC will be reset. For NY8BM61D / NY8BM62D, there are 4 options of LVR setting.

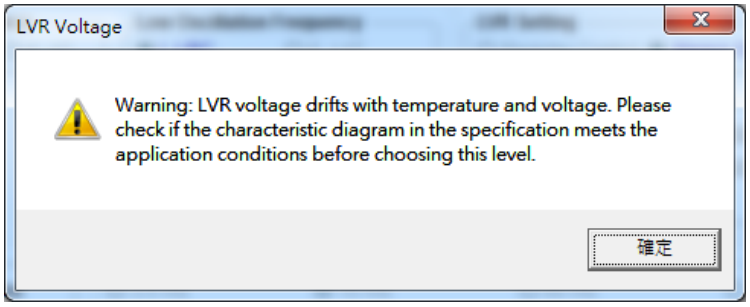
Option	Descriptions
Register Control	Turn on LVR by using register control.
Always On	Always turn on LVR.
Register Control + Halt mode Off	Turn on LVR by using register control. However, LVR is forcibly turned off in halt mode.
Operation mode On + Halt mode Off	LVR is always turned on in the operation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

3.26.8 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 to be higher than the LVR voltage and make the LVR function fail. 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 user may choose a LVR lower than recommended LVR voltage. Please refer to IC features in the specification of datasheet.

3.26.9 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.

3.26.10 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.

3.26.11 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

3.26.12 Startup Time

The Startup Time function can be used to adjust the time period 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

3.26.13 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_LRC/E_LXT, the signal source will be input from low frequency clock.

3.26.14 Startup Clock

The Startup Clock set the clock source of the CPU when the power is started. 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 start up. And if set I_LRC/E_LXT, Low-frequency oscillator will be clock source.

3.26.15 EX_CKI0 to Inst. Clock

Set EX_CKI0 to synchronize with Instruction Clock of Timer0 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.

3.26.16 Read Output Data

Read Output Data sets program to read the source of the output port state. For NY8 series, there are 2 available options of Read Output Data.

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

3.26.17 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.

3.26.18 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 disable, the voltage level threshold is 0.5VDD.

3.26.19 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.

3.26.20 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.

3.26.21 PWM Output Pin

The NY8BM61D and NY8BM62D have total of five PWM output pins. PWM1 and PWM2 pin have 3 options, PWM3 pin has 2 options, PWM4 pin has 4 options, and user can enable or disable PWM function dynamically by register. When the PWM function is disabled, the PWM output pin can be general I/O. The following tables show each supported and default output pin.

PWM1:

Option	Descriptions
PB.1	Set PB.1 as PWM1 output pin.

PB.3	Set PB.3 as PWM1 output pin.
PB.4	Set PB.4 as PWM1 output pin.

PWM2:

Option	Descriptions
PA.4	Set PA.4 as PWM2 output pin.
PB.2	Set PB.2 as PWM2 output pin.
PB.5	Set PB.5 as PWM2 output pin.

PWM3:

Option	Descriptions
PA.2	Set PA.2 as PWM3 output pin.
PA.7	Set PA.7 as PWM3 output pin.

PWM4:

Option	Descriptions
PA.3	Set PA.3 as PWM4 output pin.
PA.7	Set PA.7 as PWM4 output pin.
PB.3	Set PB.3 as PWM4 output pin.
Disable	Disable the PWM4 output.

3.26.22 IR Output Pin

There are 2 options to set the IR output pin in NY8BM61D / NY8BM62D.

Option	Descriptions
PA.3	Set PA.3 as IR output pin.
PB.1	Set PB.1 as IR output pin. (Default)

3.26.23 INT Input Pin

The NY8BM61D and NY8BM62D have total of tree INT input pins. Each pin has 2 options, which can be dynamically enabled or disabled through control registers. When the external interrupt function is disabled, the corresponding interrupt pin reverts to general-purpose digital input/output (I/O). The following table lists the supported input pin options and default settings for each external interrupt source.

NT0：

選項	選項描述

PB.0	Set PB.0 as INT0 input pin. (Default)
PB.5	Set PB.5 as INT0 input pin.

INT1：

選項	選項描述
PB.1	Set PB.1 as INT1 input pin. (Default)
PA.2	Set PA.2 as INT1 input pin.

INT2：

選項	選項描述
PA.5	Set PA.5 as INT2 input pin. (Default)
Disable	Disable the INT2 input.

3.26.24 VREFH Input Pin

The VREFH Input Pin setting determines which pin is used as the external reference voltage input for the analog-to-digital converter (ADC). For the NY8BM61D / NY8BM62D, two pins are available for selection.

Option	Descriptions
PA.0	Set PA.0 as VREFH input pin. (Default)
PB.1	Set PB.1 as VREFH input pin.

3.26.25 EX_CKI Input Pin

The NY8BM61D and NY8BM62D have total of two EX_CKI input pins. EX_CKI1 pin has 2 options, which can be dynamically enabled or disabled through control registers. When the external interrupt EX_CKI function is disabled, the corresponding interrupt pin reverts to general-purpose digital input/output (I/O).

EX_CKI1：

Option	Descriptions
PA.2	Set PA.2 as EX_CKI1 input pin. (Default)
PA.1	Set PA.1 as EX_CKI1 input pin.

3.26.26 Reset

Set input pin as reset.

3.26.27 Inst Clock Output

Set output pin as instruction clock.

3.26.28 Comparator Input

This setting can set default pin as the comparator input.

3.26.29 Large Sink

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

3.26.30 Small Drive / Sink

This setting can set the drive current of output pin as 1.5mA and sink current as 6mA.

3.26.31 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

3.26.32 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%.

4 Conversion Notes and Precautions

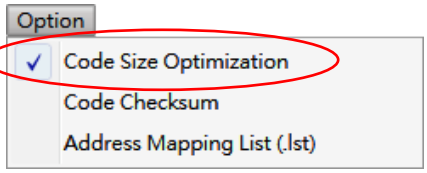
4.1 IC Body Correspondence Table

The following table lists the available types of Source IC and Target IC.

Source IC Body	*Target IC Body*
AM8EB150X, AM8EB151X, AT8P513CM, AT8PE513M, FM8P513CM, FM8PE513M, PIC12F508, PIC12F509, MC30P6040(MC30P081)	NY8A051H1
AM8EB153X, AT8PB53B , AT8PE53M, EM78P153, EM78P153A, EM78P153K, EM78P153S, EM78P173N, FM8PB53B, FM8PE53, FM8PE53B, FM8PS53, MC30P6030(MC30P011), MC30P6060, MC30P6080	NY8A053E
AM8EB156X, AM8EB157X, AT8PB56B, AT8PE56M, EM78156E, EM78156EL, EM78P156E, EM78P156EL, EM78P156K, EM78P156N , EM78P447N, FM8PB56B, FM8PE56M, FM8PE54, FM8PE55, FM8PE56 , FM8PE57, PIC16C54 , PIC16C55 , PIC16C57, PIC16F54, PIC16C56 , PIC16F57	NY8A056A

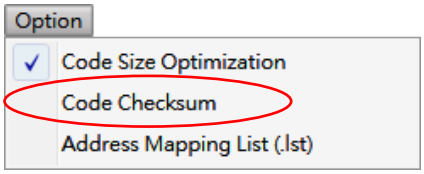
4.2 Conversion Precautions

1. Source IC and NY8 register definitions may not be compatible. If Code Size Optimization is set, the conversion is based on line-to-line instruction mapping, thus will not overrun ROM size. Despite the fact that bit definition of Source IC register may be different from NY8, the register will still convert to a corresponding NY8 register. This will result in conversion and function error if their register bit definitions are not compatible. Users must pay attention to whether the conversion between incompatible registers will cause abnormal in function. If register bit should be converted to its related bit in a different register, user may deselect the Code Size Optimization in Option. However, this may result in ROM size inflation and out of ROM size, because it will need to add instructions to make bit shift and logic operate in conversion. The default conversion mode is unable the Code Size Optimization option.



2. If DB or DW is used in the program to define table values, table values may be identified as instruction and causes table values error.
3. If indirect addressing is used, and the address of mapped IC register is different, it may not work properly after conversion. Users must pay close attention to it.
4. If the instruction before the hardware interrupt vector is converted into multi-line instructions, it will cause the address of instruction of hardware interrupt vector shift and error.
5. It's strongly recommended that users check the warning messages of their impact to program after successful conversion, and write to OTP for verification.
6. The last two words in NY8 Rom address are reserved for Code Checksum by default. If program runs

out of Rom Space, users may cancel the reservation by unchecking the Code Checksum in Option. It's strongly recommended reserving space for Code Checksum for code verification.



4.3 Precautions of Converting AM series

1. T0MODE register Bit6 and Bit7 are not the compatible with NY8. If program reads or writes to the register, it may cause the function error after converting.

   NY8A T0MD Register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
NA	**T0MD**	LCKTM0	INTEDG	T0CS	T0CE	PS0WD	PS2	PS1	PS0

   AM8EB15XX T0MODE register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
NA	**T0MODE**	INTEDG	INTF	TS	TE	PSC	PS2	PS1	PS0

2. Bit5 of STATUS register has different definition. NY8 Address Mode uses PCHBUF Bit1 and Bit2 as high bit of PC. If program uses page change and jump address, user should care if the jump address is right or not. Bit7 (RST) has no corresponding bit with NY8A. If program uses RST bit to do a reset when IC waken up by PortB pins, it will be ineffective.

   NY8A STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	**STATUS**	GP7	GP6	GP5	/TO	/PD	Z	DC	C

   AM8EB150X/AM8EB151X/AM8EB153X STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	**STATUS**	RST	GP	PAGE0	TO	PD	Z	DC	C

   AM8EB156X STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	**STATUS**	GP	GP	PAGE0	TO	PD	Z	DC	C

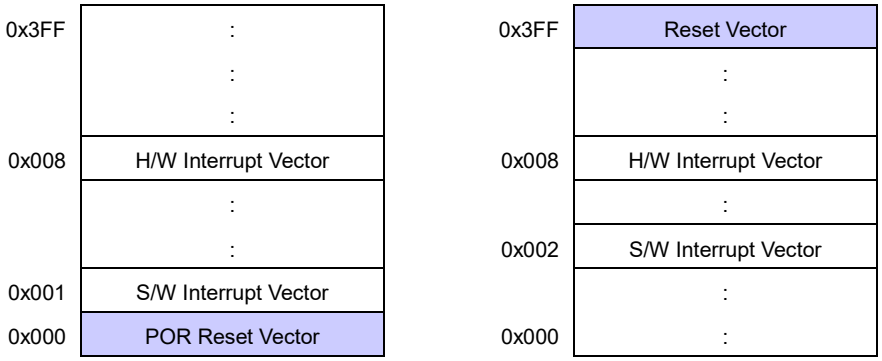
3. The Functional Enhancement Control register of AM8EB150X has no corresponding register in NY8A.

   AM8EB150X FEC Register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xD	**FEC**	ODB3	LVDIE	LVDIF	LVDMD	-	LPRWSP	LVDWSP	RD_SB

4.4 Precautions of Converting FM/AT series

1. Because the Reset Vector of FM/AT is 0x3FF and NY8 series is 0x000, the content of Reset Vector in 0x3FF will be moved to 0x000 when converting. If there is instruction in original 0x000, it cannot be moved, and the error message “Convert failed!” will pop up. Users need to manually modify the .asm file, copy the Jump instruction in 0x3FF to 0x000. Then use *NYIDE* to compile the .asm to .bin file.



2. NY8A has no corresponding bit to the STATUS register Bit 7 (RST). If program uses RST bit to do a reset when IC waken up by PortB pins, it will be ineffective.

   NY8A STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	GP7	GP6	GP5	/TO	/PD	Z	DC	C

   FM8PE5X STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	RST	GP	GP	/TO	/PD	Z	DC	C

3. Bit7 of INTEN register has different definition with NY8. Instead, it corresponds to Bit7 of NY8 PCON1 register. If program reads or write the register, it may cause function error after conversion. But if use BCR/BSR/BTRSC/BTRSS instructions, the register address will be converted correctly to PCON1 register.

   NY8A INTE register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xE	INTE	-	WDTIE	-	-	T1IE	INTIE	PBIE	T0IE

NY8A PCON1 register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xF	PCON1	GIE	-	GP5	GP4	GP3	GP2	GP1	T0EN

AT8P/FM8P INTEN register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xE	INTEN	GIE	-	-	-	-	INTIE	PBIE	T0IE

4. FSR Register Bit6 and Bit7 are not the same as NY8, but there will be neither problems nor errors after conversion.

NY8A FSR register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x4	FSR	BK1	BK0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]

AT8PB53B/B56B/B56M/E53M/FM8PB53B/56B/56M/FM8PE53/53B/54/56/FM8PS53 FSR register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x4	FSR	-	-	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]

FM8PE55/57 FSR register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x4	FSR	RP1	RP0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]

4.5 Precautions of Converting EM series

1. Bit7 (RST) of EM78P153K/153S STATUS Register has no correspondence with NY8A. If program uses RST bit to do a reset when IC wake up by PortB pins, status change will be ineffective.

NY8A STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	GP7	GP6	GP5	/TO	/PD	Z	DC	C

EM78P153K/153S STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	RST	GP1	GP0	T	P	Z	DC	C

2. Bit5~6 of EM78P447N STATUS register correspond to Bit1~2 of NY8 PCHBUF register. The high bit of PC address may set up error after conversion, and make CALL and JMP address error.

NY8A STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	GP7	GP6	GP5	/TO	/PD	Z	DC	C

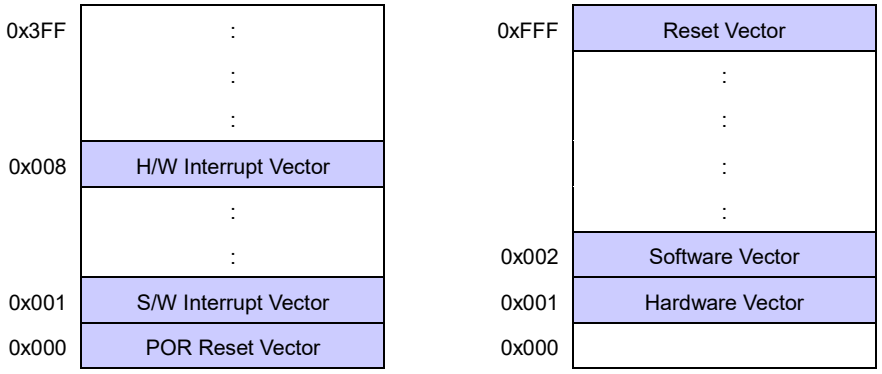
NY8A PCHBUF register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xA	PCHBUF	-	-	-	-	-	GP5	PCHBUF1	PCHBUF0

EM78P447N STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	GP	PS1	PS0	T	P	Z	DC	C

3. The Interrupt address of EM78P447N is different from NY8. The interrupt content will be moved to corresponding address when converting. If the destination address has already occupied with instruction, the interrupt content cannot be moved and may not work correctly.



NY8A Rom Mapping　　EM78P447N Rom Mapping

4.6 Precautions of Converting PIC series

1. Bit5~6 (PA0 and PA1) of STATUS Register correspond with Bit1~2 of NY8 PCHBUF register. The high bit of PC address may set error after conversion, and make CALL and JMP address wrong. Bit7 (GPWUF) of PIC12F508/509 has no corresponding function in NY8A. If the program uses GPWUF bit to do a reset when IC waken up by PortB pins, it will be ineffective.

NY8A STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	GP7	GP6	GP5	/TO	/PD	Z	DC	C

NY8A PCHBUF register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xA	PCHBUF	-	-	-	-	-	GP5	PCHBUF1	PCHBUF0

PIC16C54/F54/C55/C56/C57/F57 STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	PA2	PA1	PA0	/TO	/PD	Z	DC	C

PIC12F508/509 STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	GPWUF	-	PA0	/TO	/PD	Z	DC	C

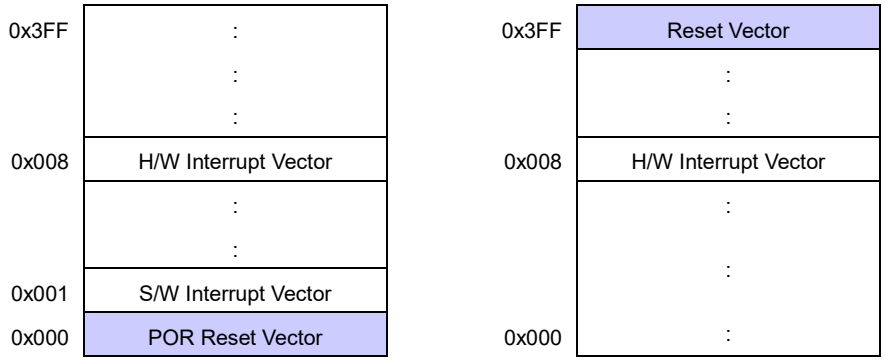
2. The OSCCAL register of PIC12F508 and PIC12F509 have no corresponding register in NY8, and NY8 does not need to calibrate.

PIC12F508/509 OSCCAL STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x5	OSCCAL	CAL6	CAL5	CAL4	CAL3	CAL2	CAL1	CAL0	-

4.7 Precautions of Converting MC series

1. The POR Reset Vector address of MC30P6030/6040 is 0x3FF, whereas NY8 is 0x000. Therefore, the content of 0x3FF will be moved to 0x000 when converting. If the destination address has already occupied with instruction, the content of Reset Vector cannot be moved and may not work correctly. It will need to manually edit .asm file to move the JMP instruction of address 0x3FF to 0x000. Save the .asm file after editing and use NYIDE to compile the .asm file to generate the .bin file.



NY8A Rom Mapping　　MC30P Rom Mapping

2. Bit7 (RST) of MC30P STATUS Register has no correspondence with NY8A. If the program uses RST bit to do a reset when IC waken up by PB pins, it will be ineffective.

NY8A STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	GP7	GP6	GP5	/TO	/PD	Z	DC	C

MC30P STATUS register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x3	STATUS	RST	GP1	GP0	T	P	Z	DC	C

3. FSR Register Bit6 and Bit7 are not the same as NY8, but there will be no problems and will have no errors after conversion.

NY8A FSR register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x4	FSR	BK1	BK0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]

MC30P FSR register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x4	FSR	-	-	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]

4. The LVD function of register and bits have different definition and if user uses the LVD function in program, it may cause malfunction after converting: LVDEN of PCON Bit0 corresponds to NY8A051F/51H/51H1/51J/51K/51L/56A PCON Bit5 ; LVDIF of PCON Bit2 corresponds to NY8A051F/51H/51H1/51J/51K/51L/56A INTF Bit4. But if use BCR/BSR/BTRSC/BTRSS instructions, the register address and bit can be converted correctly.

NY8A051B51D/51E/51G/53B/53D PCON register (No LVD function):

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x8	PCON	WDTEN	EIS	GP5	GP4	LVREN	GP2	GP1	GP0

NY8A051F/51H/51H1/NY8A056A PCON register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x8	PCON	WDTEN	EIS	LVDEN	GP4	LVREN	CMPEN	GP1	GP0

NY8A051F/51H/51H1/51J/51K/51L/56A INTF register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xF	INTF	-	WDTIF	T2IF	LVDIF	T1IF	INTIF	PBIF	T0IF

MC30P6040 PCON register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x8	PCON	WDTEN	EIS	-	-	-	LVDIF	LVDSEL	LVDEN

MC30P6060/80 PCON register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x8	PCON	WDTEN	EIS	LVDIF	LVDSEL3	LVDSEL2	LVDSEL1	LVDSEL0	LVDEN

The setting values of LVD detecting voltage are different, so they cannot correspond to each other: MC30P6040 is PCON Bit1, MC30P6060/80 is PCON Bit1~4, NY8A056A is PCON1 Bit2~5, and NY8A051F/51H/51H1/51J/51K/51L is PCON Bit2~5. User has to modify the converted program manually for correct LVD voltage.

NY8A051F/NY8A056A PCON1 register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xF	PCON1	GIE	LVDOUT	GP5	LVDS2	LVDS1	LVDS0	GP1	T0EN

NY8A051F/51H/51H1/51J/51K/51L PCON1 register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xF	PCON1	GIE	LVDOUT	LVDS3	LVDS2	LVDS1	LVDS0	GP1	T0EN

The LVDS value and voltage of MC30P6040/6060 vs. NY8A are shown below.

Voltage	MC30P6040 LVDS[0]	MC30P6060/80 LVDS[3:0]	NY8 LVDS[2:0]
1.8V	-	0000	-
1.08V	-	0001	-
2.0V	-	0010	000
2.1V	-	0011	-
2.2V	-	0100	001
2.4V	0	0101	010
2.5V	-	0110	-
2.6V	-	0111	-
2.7V	-	1000	011
2.8V	-	1001	-
3.0V	-	1010	100
3.2V	-	1011	-
3.3V	-	1100	101
3.6V	1	1101	110
4.0V	-	1110	-
4.2V	-	1111	-
4.3V	-	-	111

5. Bit7 of INTEN register has different definition with NY8. Instead, it corresponds to Bit7 of NY8 PCON1 register. If program reads or write the register, it may cause malfunction after conversion. But if use BCR/BSR/BTRSC/BTRSS instructions, the register address will be converted correctly as 0xF to PCON1 register.

NY8A INTE register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xE	INTE	-	WDTIE	-	-	T1IE	INTIE	PBIE	T0IE

NY8A PCON1 register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xF	PCON1	GIE	-	GP5	GP4	GP3	GP2	GP1	T0EN

MC30P INTEN register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0xE	INTEN	GIE	-	-	-	-	INTIE	PBIE	T0IE

6. The T1CBT and T1Load register of MC30P6030/6060correspond to TMR1 register of NY8. If write data to NY8 TMR1, the Reload Register value of Timer1 will be changed. If user uses the TMR1 function in program, it may cause malfunction after conversion.

NY8A TMR1 register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
S - 0x0	TMR1	TMR1[7]	TMR1[6]	TMR1[5]	TMR1[4]	TMR1[3]	TMR1[2]	TMR1[1]	TMR1[0]

MC30P6030/6060T1CNT register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x4D	T1CNT	T1C7	T1C6	T1C5	T1C4	T1C3	T1C2	T1C1	T1C0

MC30P6030/6060T1LOAD register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x4E	T1LOAD	T1LO7	T1LO6	T1LO5	T1LO4	T1LO3	T1LO2	T1LO1	T1LO0

7. The T1DATA register of MC30P6030/6060corresponds to PWM1DUTY register of NY8, but NY8 PWM1DUTY is a write-only register. If read-write the register in program, it may cause malfunction after conversion.

MC30P6030/6060T1DATA register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x4F	T1DATA	T1DATA7	T1DATA6	T1DATA5	T1DATA4	T1DATA3	T1DATA2	T1DATA1	T1DATA0
R/W Property		R/W							

NY8A PWM1DUTY register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
S - 0x03	PWM1DUTY	PWM1DUTY[7:0]							
R/W Property		W							

8. Bit2~0 Prescalar values of MC30P6030/6060T1CR register and NY8A T1CR2 register are different, so they cannot correspond to each other. User has to modify the converted program manually.

   The PS1SEL value of MC30P6030/6060vs. NY8A PS1SEL:

PS1SEL[2:0]	NY8	MC30P
000	1:2	1:1
001	1:4	1:2
010	1:8	1:4
011	1:16	1:8
100	1:32	1:16
101	1:64	1:32
110	1:128	1:64
111	1:256	1:128

9. The PWMCR/T1DATA1/T1DATA2 register of MC30P6060/80 has no corresponding register in NY8A.

   MC30P6060/80 PWMCR register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x48	PWMCR	PWM0OE	PWM1OE	PWM2OE	DBLCK	PWMM	PWMIN	PWM1E	PWM2E

   MC30P6060/80 T1DATA1 register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x49	T1DATA1	T1DATA17	T1DATA16	T1DATA15	T1DATA14	T1DATA13	T1DATA12	T1DATA11	T1DATA10

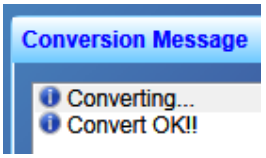
   MC30P6060/80 T1DATA2 register:

Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0x4A	T1DATA2	T1DATA27	T1DATA26	T1DATA25	T1DATA24	T1DATA23	T1DATA22	T1DATA21	T1DATA20

5 How to Release Code

After finishing a *NY8 Code Converter* editing, please follow the instructions in this chapter to release the code.

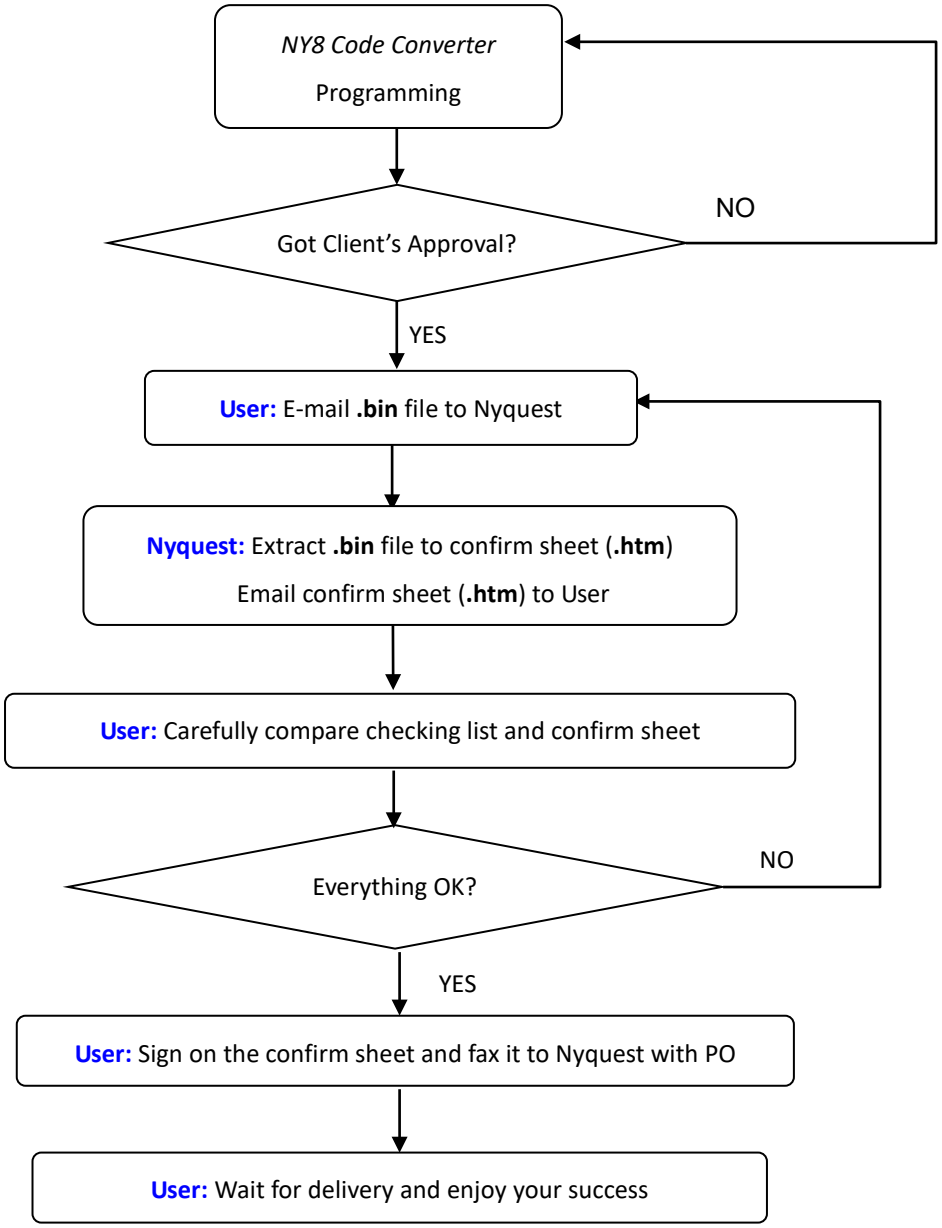
5.1 Building up the .bin File



By selecting [Tools] from the [Convert] or the [Convert As] menu, the compiling process will start. *NY8 Code Converter* will check all the settings and options first. If there are no errors, the target file (.bin) and checking list file (.htm) will be generated. If the compiling is successfully completed, the "Convert OK!" message will be shown. If any unexpected system errors occur during the compiling, please contact the engineers of Nyquest.

5.2 New Code Release Flow

When the client approves of the project, a target file (.bin) and checking list (.htm) will be generated after *NY8 Code Converter* finishing the compiling process. Please send the .bin file to Nyquest or Nyquest's agent. As Nyquest receives the file, Nyquest would offer a confirm sheet to the client for double checking, for example, a confirm sheet named "NY8A051H1-xxxx.htm" (XXXX is the code numbers provided by Nyquest). After a careful and thorough review, please send the confirm sheet with signatures via fax machine along with official PO to Nyquest. Nyquest will start IC mask production immediately. All our clients need to do is wait for our delivery and enjoy success. The complete flowchart is shown below.


NY8 Code Converter
Programming
Got Client's Approval?
NO
YES
User: E-mail .bin file to Nyquest
Nyquest: Extract .bin file to confirm sheet (.htm)
Email confirm sheet (.htm) to User
User: Carefully compare checking list and confirm sheet
Everything OK?
NO
YES
User: Sign on the confirm sheet and fax it to Nyquest with PO
User: Wait for delivery and enjoy your success

6 Revision History

Version	Date	Description	Pages Modified
1.0	2014/05/31	Formal release.	-
1.1	2014/08/20	Update IC Configuration Options descriptions.	14
1.2	2014/11/24	1. Modify the options of High Crystal Oscillator. 2. Modify the options of LVR Voltage. 3. Modify the options of WDT Time Base.	15, 20 16, 20 17, 21
1.3	2015/01/19	1. Add Option on menu bar. 2. Update the available types of Source IC and Target IC. 3. Add the descriptions of VDD Voltage and Trim OSC. 4. Update the Notes of Converting AM series 5. Update the AM series Correspondence Table.	10 12 18, 23 24 25
1.4	2015/05/25	1. Update the descriptions of Interface. 2. Update the available types of Source IC and Target IC. 3. Update Configuration Option picture. 4. Add the note of LVR Voltage. 5. Update FM/AT series Correspondence Table.	10 12 13, 14, 19 16, 20 27
1.5	2015/08/29	1. Adjust menu bar. 2. Add Code Checksum option. 3. Add NY8A056A Configuration Option picture. 4. Update the available types of Source IC and Target IC. 5. Add the Notes of Converting PIC series. 6. Add “IC Comparison Correspondence Table”.	14 15 41 58 62 70
1.6	2015/11/27	1. Update IC Configuration interface. 2. Update IC Body Correspondence Table. 3. Add Precautions of Converting MC series. 4. Update IC Comparison Correspondence Table.	- 58 63 70
1.7	2016/02/24	1. Add NY8A051B Configuration Options. 2. Add NY8A053B Configuration Options.	23 41
1.8	2016/05/23	1. Add NY8A051C/51D Configuration Options. 2. Update IC Comparison Correspondence Table.	28 58

Version	Date	Description	Pages Modified
1.9	2016/08/25	1. Add Address Mapping List to Option. 2. Add NY8A053D Configuration Options. 3. Update IC Comparison Correspondence Table.	15 47 58
2.0	2016/11/24	1. Update NY8A051C Configuration Options. 2. Update NY8A053B Configuration Options. 3. Update NY8A053D Configuration Options.	28 41 47
2.1	2017/02/08	1. Update NY8A051B Configuration Options. 2. Update NY8A051C Configuration Options. 3. Update NY8A051D Configuration Options. 4. Update NY8A053B Configuration Options. 5. Update NY8A053D Configuration Options.	23 28 32 41 47
2.2	2017/11/30	1. Update the Converter Flow picture. 2. Add NY8A051E Configuration Options. 3. Update NY8A056A Configuration Options picture and Comparator Input descriptions. 4. Update IC Body Correspondence Table. 5. Update Precautions of Converting MC series description. 6. Update Register Correspondence Table descriptions.	18 38 59, 64 65 71 79, 84
2.3	2018/02/21	Update IC Body Correspondence Table.	65
2.4	2019/02/27	1. Add NY8A051F Configuration Options. 2. Update the IC Comparison Correspondence Table.	51 106
2.5	2019/08/20	Add NY8A051G Configuration Options.	48
2.6	2019/11/20	1. Update Configuration Option and LVR description of NY8A051F. 2. Update Configuration Option and LVR description of NY8A051G. 3. Update IC Body Correspondence Table. 4. Update Precaution of Converting MC series0 5. Update Register Correspondence Table.	51 56 106 111 123
2.7	2020/05/20	1. Update Configuration Option and LVR description. 2. Add NY8A050D Configuration Options. 3. Add NY8A051G Configuration Options. 4. Add NY8B061D Configuration Options. 5. Add NY8B062D Configuration Options. 6. Update IC Body Correspondence Table.	31, 45, 錯誤! 尚未定義書籤。, 50, 55, 61, 96, 102 31 55 錯誤! 尚未定義書籤。

Version	Date	Description	Pages Modified
			128 187
2.8	2020/11/24	Add NY8A053E Configuration Options.	77
2.9	2021/01/24	Add NY8B062E Configuration Options.	100
3.0	2021/11/22	Update the IC Body Correspondence Table.	111
3.1	2022/02/14	Add NY8A051H Configuration Options.	62
3.2	2022/08/24	Add NY8A061E Configuration Options.	101
3.3	2022/11/22	1. Add NY8B062F Configuration Options. 2. Add NY8AE51D Configuration Options. 3. Add NY8AE51F Configuration Options.	119 125 130
3.4	2023/02/10	Add NY8A050E Configuration Options.	31
3.5	2023/05/29	1. Add PWM Resolution to NY8A053E. 2. Add NY8B062B Configuration Options. 3. Add NY8B062BConfiguration Options.	98 115 122
3.6	2024/08/29	1. Update the Information illustration. 2. Update the Convert Flow illustration. 3. Update LVR Voltage description. 4. Update the LVR Reset description of NY8A050E. 5. Update the IC Body Corresponding Table. 6. Remove the configurations of NY8A051A, NY8A051C, NY8A051E, NY8A053A、NY8B061Dand NY8AE51D.	23 23 26, 31, 36, 41, 46, 51 , 57, 62, 68, 75, 82, 87, 93, 100, 108, 113, 120, 126 31 131 -

Version	Date	Description	Pages Modified
3.7	2025/03/28	1. Update the description of NY8A051G Drive / Sink Current. 2. Add NY8A051J Configuration Options. 3. Add NY8A051K Configuration Options. 4. Add NY8A051L Configuration Options.	56 63 69 76
3.8	2025/05/26	1. Add NY8A051H1Configuration Options. 2. Add NY8B062F1 Configuration Options. 3. Update the IC Body Corresponding Table.	63 151 163
3.9	2025/08/15	1. Update NY8A050E Configuration Options. 2. Update the Input High Voltage description of NY8A051H. 3. Update the Input High Voltage description of NY8A051H1. 4. Add NY8A054E Configuration Options. 5. Add NY8A054E1 Configuration Options. 6. Add IR Output Pin description of NY8B062F1. 7. Add NY8BM61D/NY8BM62D Configuration Options.	35 64 69 108 115 177 178

Appendix A IC Comparison Correspondence Table

A.1 Instruction Correspondence Table

NY8A056/53/51		55
Mnemonic Operands	Cycles	Status Affected
NOP	1	-
SLEEP	1	TO,PD
CLRWDT	1	TO,PD
T0ME	1	-
ENI	1	
IOST F	1	-
RET	2	-
RETIE	2	-
DAA	1	C
DISI	1	-
T0MDR	1	-
IOSTR F	1	-
SFUN S	1	-
SFUNR S	1	-
MOVAR	1	-
MOVR R, d	1	Z
CLRA	1	Z
INT	3	-
TABLEA	2	-
CALLA	2	-
GOTOA	2	-
CLRR R	1	Z
ADDAR R, d	1	C,DC,Z
SUBAR R, d	1	C,DC,Z
INCR R, d	1	Z
DECR R, d	1	Z
COMR R, d	1	Z
ANDAR R, d	1	Z
IORAR R, d	1	Z
XORAR R, d	1	Z
RRR R, d	1	C
RLR R, d	1	C
SWAPR R, d	1	-
INCRSZ R, d	1 or 2	-
DECRSZ R, d	1 or 2	-
RETIA	2	-
MOVIA	1	-
ANDIA	1	Z
IORIA	1	Z
XORIA	1	Z
ADDIA	1	C,DC,Z
ADCIA	1	C,DC,Z
SUBIA	1	C,DC,Z
SBCIA	1	C,DC,Z
CALL	2	-
GOTO	2	-
ADCAR R, d	1	C,DC,Z
SBCAR R, d	1	C,DC,Z
CMPAR R	1	C,Z
BCR R, bit	1	-
BSR R, bit	1	-
BTRSC R, bit	1 or 2	-
BTRSS R, bit	1 or 2	-
LCALL	2	-
LGOTO	2	-

AM8EB157/56/53/51		55
Mnemonic Operands	Cycles	Status Affected
NOP	1	-
SLEEP	1	TO,PD
CLRWDT	1	TO,PD
T0MODE	1	-
ENI	1	
IOST F	1	-
RET	2	-
RETIE	2	-
DAA	1	C
DISI	1	-
T0MODER	1	-
IOSTR F	1	-
SFUN S	1	-
SFUNR S	1	-
MOVAR	1	-
MOVR R, d	1	Z
CLRA	1	Z
INT	3	-
TABLEA	2	-
CALLA	2	-
GOTOA	2	-
CLRR R	1	Z
ADDAR R, d	1	C,DC,Z
SUBAR R, d	1	C,DC,Z
INCR R, d	1	Z
DECR R, d	1	Z
COMR R, d	1	Z
ANDAR R, d	1	Z
IORAR R, d	1	Z
XORAR R, d	1	Z
RRR R, d	1	C
RLR R, d	1	C
SWAPR R, d	1	-
INCRSZ R, d	1 or 2	-
DECRSZ R, d	1 or 2	-
RETIA	2	-
MOVIA	1	-
ANDIA	1	Z
IORIA	1	Z
XORIA	1	Z
ADDIA	1	C,DC,Z
ADCIA	1	C,DC,Z
SUBIA	1	C,DC,Z
SBCIA	1	C,DC,Z
CALL	2	-
GOTO	2	-
ADCAR R, d	1	C,DC,Z
SBCAR R, d	1	C,DC,Z
CMPAR R	1	C,Z
BCR R, bit	1	-
BSR R, bit	1	-
BTRSC R, bit	1 or 2	-
BTRSS R, bit	1 or 2	-
LCALL	2	-
LGOTO	2	-

EM78P153/156		44
Mnemonic Operands	Cycles	Status Affected
NOP	1	-
SLEP	1	T, P
WDTC	1	T, P
CONTW	1	-
ENI	1	-
IOW R	1	-
RET	2	-
RETI	2	-
DAA	1	C
DISI	1	-
CONTR	1	-
IOR R	1	-
MOV R,A	1	-
MOV A,R	1	Z
CLRA	1	Z
INT	2	-
CLR R	1	Z
ADD/ADD	1	C, DC, Z
SUB/SUB	1	C, DC, Z
INCA/INC	1	Z
DECA/DEC	1	Z
COMA/COM	1	Z
AND/AND	1	Z
OR/OR	1	Z
XOR/XOR	1	Z
RRCA/RRC	1	C
RLCA/RLC	1	C
SWAP/SWAP	1	-
JZA/JZ	1/2	-
DJZA/DJZ	1/2	-
RETL k	2	-
MOV A,k	1	-
AND A,k	1	Z
OR A,k	1	Z
XOR A,k	1	Z
ADD A,k	1	C, DC, Z
SUB A,k	1	C, DC, Z
CALL k	2	-
JMP k	2	-
BC R,b	1	-
BS R,b	1	-
JBC R,b	1/2	-
JBS R,b	1/2	-
MOV R,R	1	Z

EM78P447		58
Mnemonic Operands	Cycles	Status Affected
NOP	1	-
SLEP	1	T, P
WDTC	1	T, P
CONTW	1	-
ENI	1	-
IOW R	1	-
RET	2	-
RETI	2	-
DAA	1	C
DISI	1	-
CONTR	1	-
IOR R	1	-
MOV R,A	1	-
MOV A,R	1	Z
CLRA	1	Z
INT	2	-
CLR R	1	Z
ADD/ADD	1	C, DC, Z
SUB/SUB	1	C, DC, Z
INCA/INC	1	Z
DECA/DEC	1	Z
COMA/COM	1	Z
AND/AND	1	Z
OR/OR	1	Z
XOR/XOR	1	Z
RRCA/RRC	1	C
RLCA/RLC	1	C
SWAP/SWAP	1	-
JZA/JZ	1/2	-
DJZA/DJZ	1/2	-
RETL k	2	-
MOV A,k	1	-
AND A,k	1	Z
OR A,k	1	Z
XOR A,k	1	Z
ADD A,k	1	C, DC, Z
SUB A,k	1	C, DC, Z
CALL k	2	-
JMP k	2	-
BC R,b	1	-
BS R,b	1	-
JBC R,b	1/2	-
JBS R,b	1/2	-
TBL		C, DC, Z
MOV R,R	1	Z

NY8A056/53/51		55
Mnemonic Operands	Cycles	Status Affected
NOP	1	-
SLEEP	1	TO,PD
CLRWDT	1	TO,PD
T0ME	1	-
ENI	1	
IOST F	1	-
RET	2	-
RETIE	2	-
DAA	1	C
DISI	1	-
T0MDR	1	-
IOSTR F	1	-
SFUN S	1	-
SFUNR S	1	-
MOVAR	1	-
MOVR R, d	1	Z
CLRA	1	Z
INT	3	-
TABLEA	2	-
CALLA	2	-
GOTOA	2	-
CLRR R	1	Z
ADDAR R, d	1	C,DC,Z
SUBAR R, d	1	C,DC,Z
INCR R, d	1	Z
DECR R, d	1	Z
COMR R, d	1	Z
ANDAR R, d	1	Z
IORAR R, d	1	Z
XORAR R, d	1	Z
RRR R, d	1	C
RLR R, d	1	C
SWAPR R, d	1	-
INCRSZ R, d	1 or 2	-
DECRSZ R, d	1 or 2	-
RETIA	2	-
MOVIA	1	-
ANDIA	1	Z
IORIA	1	Z
XORIA	1	Z
ADDIA	1	C,DC,Z
ADCIA	1	C,DC,Z
SUBIA	1	C,DC,Z
SBCIA	1	C,DC,Z
CALL	2	-
GOTO	2	-
ADCAR R, d	1	C,DC,Z
SBCAR R, d	1	C,DC,Z
CMPAR R	1	C,Z
BCR R, bit	1	-
BSR R, bit	1	-
BTRSC R, bit	1 or 2	-
BTRSS R, bit	1 or 2	-
LCALL	2	-
LGOTO	2	-

FM8P53		42
Mnemonic Operands	Cycles	Status Affected
NOP	1	-
SLEEP	1	TO,PD
CLRWDT	1	TO,PD
OPTION	1	-
IOST R	1	-
RETURN	2	-
RETFIE	2	-
DAA	1	C
MOVAR	1	-
MOVR R, d	1	Z
CLRA	1	Z
INT	2	-
CLRR R	1	Z
ADDAR R, d	1	C, DC, Z
SUBAR R, d	1	C, DC, Z
INCR R, d	1	Z
DECR R, d	1	Z
COMR R, d	1	Z
ANDAR R, d	1	Z
IORAR R, d	1	Z
XORAR R, d	1	Z
RRR R, d	1	C
RLR R, d	1	C
SWAPR R, d	1	-
INCRSZ R, d	1/2/3	-
DECRSZ R, d	1/2/3	-
RETIA	2	-
MOVIA	1	-
ANDIA	1	Z
IORIA	1	Z
XORIA	1	Z
ADDIA	1	C, DC, Z
SUBIA	1	C, DC, Z
CALL	2	-
GOTO	2	-
ADCAR R, d	1	C, DC, Z
SBCAR R, d	1	C, DC, Z
BCR R, bit	1	-
BSR R, bit	1	-
BTRSC R, bit	1/2/3	-
BTRSS R, bit	1/2/3	-
DAS	1	-

PIC12F508/509 /16C5X		33
Mnemonic Operands	Cycles	Status Affected
NOP	1	-
SLEEP	1	TO,PD
CLRWDT	1	TO,PD
OPTION	1	-
TRIS f	1	-
MOVWF f	1	-
MOVF f, d	1	Z
CLRW	1	Z
CLRF f	1	Z
ADDWF f, d	1	C, DC, Z
SUBWF f, d	1	C, DC, Z
INCF f, d	1	Z
DECF f, d	1	Z
COMF f, d	1	Z
ANDWF f, d	1	Z
IORWF f, d	1	Z
XORWF f, d	1	Z
RRF f, d	1	C
RLF f, d	1	C
SWAPF f, d	1	-
INCFSZ f, d	1/2	-
DECFSZ f, d	1/2	-
RETLW k	2	-
MOVLW k	1	-
ANDLW k	1	Z
IORLW k	1	Z
XORLW k	1	Z
CALL k	2	-
GOTO k	2	-
BCF f, b	1	-
BSF f, b	1	-
BTFSC f, b	1/2	-
BTFSS f, b	1/2	-

MC30P6030/40/60		55
Mnemonic Operands	Cycles	Status Affected
NOP	1	-
STOP	1	TO,PD
CLRWDT	1	TO,PD
RETURN	2	-
RETIE	2	-
DAA	1	C
MOVRA R	1	-
MOVAR/MOVR	1	Z
CLRA	1	Z
CLRR R	1	Z
ADDAR/ADDRA	1	C, DC, Z
RSUBAR/RSUBRA	1	C, DC, Z
INCAR/INCR	1	Z
DECAR/DECR	1	Z
COMAR/COMR	1	Z
ANDAR/ANDRA	1	Z
ORAR/ORRA	1	Z
XORAR/XORRA	1	Z
RRAR/RRR	1	C
RLAR/RLR	1	C
SWAPAR/SWAPR	1	-
JZAR/JZR	1/2	-
DJZAR/DJZR	1/2	-
RETAI K	2	-
MOVAI K	1	-
ANDAI K	1	Z
ORAI K	1	Z
XORAI K	1	Z
ADDAI K	1	C, DC, Z
ISUBAI K	1	C, DC, Z
CALL K	2	-
GOTO K	2	-
ADCAR/ADCRA	1	C, DC, Z
RSBCAR/RSBCRA	1	C, DC, Z
JBSET R, b	1/2	-
JBCLR R, b	1/2	-
BSET R, b	1	-
BCLR R, b	1	-
DSA	1	-

A.2 Register Correspondence Table

- NY8A051A/51B/51D/51E/51F/51G/51H and AM8EB151 Register Differences Table. Red means the differences need to be verified, and the differences marked with green can be ignored.

NY8A051 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	GP	GP	GP	/TO	/PD	Z	DC	C
4	FSR	BK1	BK0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	-	-	-	-	-	-	-	-	-
6	PORTB	GP	GP	PB5	PB4	PB3	PB2	PB1	PB0
7	-	-	-	-	-	-	-	-	-
8	PCON	WDTEN	EIS	GP	GP	LVREN	GP	GP	GP
9	BWUCON	-	-	WUPB5	WUPB4	WUPB3	WUPB2	WUPB1	WUPB0
A	PCHBUF	-	-	-	-	-	GP	PCHBUF1	PCHBUF0
B	BPLCON	/PLPB3	/PLPB2	/PLPB1	/PLPB0	-	-	-	-
C	BPHCON	-	-	/PHPB[5]	/PHPB[4]	GP	/PHPB[2]	/PHPB[1]	/PHPB[0]
D	-	-	-	-	-	-	-	-	-
E	INTE	-	WDTIE	-	-	T1IE	INTIE	PBIE	T0IE
F	INTF	-	WDTIF	-	-	T1IF	INTIF	PBIF	T0IF
10h~1fh	RAM Bank 0								
20h~3fh	RAM Bank 0								

AM8EB151 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	RST	GP	PA0	TO	PD	Z	DC	C
4	FSR	-	-	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	-								
6	PORTB	PB[7]	PB[6]	PB[5]	PB[4]	PB[3]	PB[2]	PB[1]	PB[0]
7	-								
8	-								
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	ISR	-	WDTIF	-	-	-	EXIF	PBIF	T0IF
10h~3fh	RAM Bank 0								

NY8A051 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	LCKTM0	INTEDG	T0CS	T0CE	PS0WDT	PS0SEL[2:0]		
0	-								
1	-								
2	-								
3	-								
4	-								
5	-								
6	IOSTB	GP	GP	IOPB5	IOPB4	IOPB3	IOPB2	IOPB1	IOPB0
7	-								
8	-								
9	-								
A	PS0CV	PS0CV[7]	PS0CV[6]	PS0CV[5]	PS0CV[4]	PS0CV[3]	PS0CV[2]	PS0CV[1]	PS0CV[0]
B	-								
C	BODCON	-	-	ODPB5	ODPB4	GP	ODPB2	ODPB1	ODPB0
D	-								
E	-								
F	PCON1	GIE	-	GP	GP	GP	GP	GP	T0EN

AM8EB151 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	INTEDG	INTF	TS	TE	PSC	PS2	PS1	PS0
0	-								
1	-								
2	-								
3	-								
4	-								
5									
6	IOSTB	IOPB7	IOPB6	IOPB5	IOPB4	IOPB3	IOPB2	IOPB1	IOPB0
7									
8									
9	BWUCON	PBEI7	PBEI6	PBEI5	PBEI4	PBEI3	PBEI2	PBEI1	PBEI0
A	PS0CV	PS0CV[7]	PS0CV[6]	PS0CV[5]	PS0CV[4]	PS0CV[3]	PS0CV[2]	PS0CV[1]	PS0CV[0]
B	BPLCON	PDB3	PDB2	PDB1	PDB0	PDB7	PDB6	PDB5	PDB4
C	BODCON	ODB7	ODB6	ODB5	ODB4	GP	ODB2	ODB1	ODB0
D	BPHCON	PHB7	PHB6	PHB5	PHB4	GP	PHB2	PHB1	PHB0
E	PCON	WDTE	EIS	LVRE	-	LPRE	CONC	-	-
F	INTE	-	WDTIE	-	-	-	EXIE	PBIE	T0IE

NY8A051 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	TMR1	TMR1[7]	TMR1[6]	TMR1[5]	TMR1[4]	TMR1[3]	TMR1[2]	TMR1[1]	TMR1[0]
1	T1CR1	PWM10EN	PWM10AL	-	-	-	T1OS	T1RL	T1EN
2	T1CR2	-	-	T1CS	T1CE	/PS1EN	PS1SEL[2:0]		
3	PWM1DUTY	PWM1DUTY[7:0]							
4	PS1CV	PS1CV[7]	PS1CV[6]	PS1CV[5]	PS1CV[4]	PS1CV[3]	PS1CV[2]	PS1CV[1]	PS1CV[0]
5	BZ1CR	BZ1EN	-	-	-	BZ1FSEL[3:0]			
6	IRCR	ROSC358M	-	-	-	-	IRCSEL	IRF57K	IREN
7	TBHP	-	-	-	-	-	TBHP[2]	TBHP[1]	TBHP[0]
8	TBHD	-	-	TBHD[5]	TBHD[4]	TBHD[3]	TBHD[2]	TBHD[1]	TBHD[0]
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	OSCCR	-	-	-	-	OPMD[1]	OPMD[0]	STPHOSC	SELHOSC

AM8EB151 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0									
1									
2									
3									
4									
5									
6	IRCR	IROSC	-	-	-	-	CARRIER	IRF	IREN
7	TBHP	-	-	-	-	-	-	D1	D0
8	TBHD	-	-	D5	D4	D3	D2	D1	D0
9									
A									
B									
C									
D									
E									
F									

- NY8A053B/53D/53E and FM8P53 Register Differences Table. Red means the differences need to be verified, and the differences marked with green can be ignored.

NY8A053 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	GP	GP	GP	/TO	/PD	Z	DC	C
4	FSR	BK1	BK0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	PORTA	GP	GP	GP	GP	PA[3]	PA[2]	PA[1]	PA[0]
6	PORTB	PB[7]	PB[6]	PB[5]	PB[4]	PB[3]	PB[2]	PB[1]	PB[0]
7	-	-	-	-	-	-	-	-	-
8	PCON	WDTEN	EIS	GP	GP	LVREN	GP	GP	GP
9	BWUCON	WUPB7	WUPB6	WUPB5	WUPB4	WUPB3	WUPB2	WUPB1	WUPB0
A	PCHBUF	-	-	-	-	-	GP	PCHBUF1	PCHBUF0
B	ABPLCON	/PLPB3	/PLPB2	/PLPB1	/PLPB0	/PLPA3	/PLPA2	/PLPA1	/PLPA0
C	BPHCON	/PBPH[7]	/PBPH[6]	/PBPH[5]	/PBPH[4]	GP	/PBPH[2]	/PBPH[1]	/PBPH[0]
D	-	-	-	-	-	-	-	-	-
E	INTE	-	WDTIE	-	-	T1IE	INTIE	PBIE	T0IE
F	INTF	-	WDTIF	-	-	T1IF	INTIF	PBIF	T0IF
10h~1fh	RAM Bank 0~1								
20h~3fh	RAM Bank 0								

FM8P53 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	RST	GP	GP	/TO	/PD	Z	DC	C
4	FSR	-	-	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	PORTA	-	-	-	-	IOA3	IOA2	IOA1	IOA0
6	PORTB	IOB7	IOB6	IOB5	IOB4	IOB3	IOB2	IOB1	IOB0
7	SRAM	GP	GP	GP	GP	GP	GP	GP	GP
8	PCON	WDTE	EIS	LVDTE	-	-	-	-	-
9	BWUCON	WUB[7]	WUB[6]	WUB[5]	WUB[4]	WUB[3]	WUB[2]	WUB[1]	WUB[0]
A	PCHBUF	-	-	-	-	-	-	2 MSBs Buffer of PC	
B	ABPLCON	-	/PDB2	/PDB1	/PDB0	/PDA3	/PDA2	/PDA1	/PDA0
C	BODCON	ODB[7]	ODB[6]	ODB[5]	ODB[4]	-	ODB[2]	ODB[1]	ODB[0]
D	BPHCON	/PHB7	/PHB6	/PHB5	/PHB4	-	/PHB2	/PHB1	/PHB0
E	INTE	GIE	-	-	-	-	INTIE	PBIE	T0IE
F	INTF	-	-	-	-	-	INTIF	PBIF	T0IF
10h~3fh	RAM Bank 0								

NY8A053 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	LCKTM0	INTEDG	T0CS	T0CE	PS0WDT	PS0SEL[2:0]		
0	-								
1	-								
2	-								
3	-								
4	-								
5	IOSTA	-	-	-	-	IOPA[3]	IOPA[2]	IOPA[1]	IOPA[0]
6	IOSTB	IOPB[7]	IOPB[6]	IOPB[5]	IOPB[4]	IOPB[3]	IOPB[2]	IOPB[1]	IOPB[0]
7	-								
8	-								
9	-								
A	PS0CV	PS0CV[7]	PS0CV[6]	PS0CV[5]	PS0CV[4]	PS0CV[3]	PS0CV[2]	PS0CV[1]	PS0CV[0]
B									
C	BODCON	ODPB[7]	ODPB[6]	ODPB[5]	ODPB[4]	GP	ODPB[2]	ODPB[1]	ODPB[0]
D	-								
E	-								
F	PCON1	GIE	-	GP	GP	GP	GP	GP	T0EN

FM8P53 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	-	INTEDG	T0CS	T0SE	PSA	PS2	PS1	PS0
0	-								
1	-								
2	-								
3	-								
4	-								
5	IOSTA	-	-	-	-	IOPA[3]	IOPA[2]	IOPA[1]	IOPA[0]
6	IOSTB	IOPB[7]	IOPB[6]	IOPB[5]	IOPB[4]	IOPB[3]	IOPB[2]	IOPB[1]	IOPB[0]
7									
8	-								
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	-								

NY8A053 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	TMR1	TMR1[7]	TMR1[6]	TMR1[5]	TMR1[4]	TMR1[3]	TMR1[2]	TMR1[1]	TMR1[0]
1	T1CR1	PWM1OEN	PWM1OAL	-	-	-	T1OS	T1RL	T1EN
2	T1CR2	-	-	T1CS	T1CE	/PS1EN	PS1SEL[2:0]		
3	PWM1DUTY	PWM1DUTY[7:0]							
4	PS1CV	PS1CV[7]	PS1CV[6]	PS1CV[5]	PS1CV[4]	PS1CV[3]	PS1CV[2]	PS1CV[1]	PS1CV[0]
5	BZ1CR	BZ1EN	-	-	-	BZ1FSEL[3:0]			
6	IRCR	IROSC358M	-	-	-	-	IRCSEL	IRF57K	IREN
7	TBHP	-	-	-	-	-	TBHP[2]	TBHP[1]	TBHP[0]
8	TBHD	-	-	TBHD5	TBHD4	TBHD3	TBHD2	TBHD1	TBHD0
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	OSCCR	-	-	-	-	OPMD[1]	OPMD[0]	STPHOSC	SELHOSC

FM8P53 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	-								
1	-								
2	-								
3	-								
4	-								
5	-								
6	-								
7	-								
8	-								
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	-								

- NY8A053B/53D/53E and M8EB153 Register Differences Table. Red means the differences need to be verified, and the differences marked with green can be ignored.

NY8A053 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	GP	GP	GP	/TO	/PD	Z	DC	C
4	FSR	BK1	BK0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	PORTA	GP	GP	GP	GP	PA[3]	PA[2]	PA[1]	PA[0]
6	PORTB	PB[7]	PB[6]	PB[5]	PB[4]	PB[3]	PB[2]	PB[1]	PB[0]
7	-	-	-	-	-	-	-	-	-
8	PCON	WDTEN	EIS	GP	GP	LVREN	GP	GP	GP
9	BWUCON	WUPB7	WUPB6	WUPB5	WUPB4	WUPB3	WUPB2	WUPB1	WUPB0
A	PCHBUF	-	-	-	-	-	GP	PCHBUF1	PCHBUF0
B	ABPLCON	/PLPB3	/PLPB2	/PLPB1	/PLPB0	/PLPA3	/PLPA2	/PLPA1	/PLPA0
C	BPHCON	/PBPH[7]	/PBPH[6]	/PBPH[5]	/PBPH[4]	GP	/PBPH[2]	/PBPH[1]	/PBPH[0]
D	-	-	-	-	-	-	-	-	-
E	INTE	-	WDTIE	-	-	T1IE	INTIE	PBIE	T0IE
F	INTF	-	WDTIF	-	-	T1IF	INTIF	PBIF	T0IF
10h~1fh	RAM Bank 0~1								
20h~3fh	RAM Bank 0								

AM8EB153 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	RST	GP	PA0	TO	PD	Z	DC	C
4	FSR	-	-	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	PORTA	-	-	-	-	PA[3]	PA[2]	PA[1]	PA[0]
6	PORTB	PB[7]	PB[6]	PB[5]	PB[4]	PB[3]	PB[2]	PB[1]	PB[0]
7	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-
A	-	-	-	-	-	-	-	-	-
B	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-
D	-	-	-	-	-	-	-	-	-
E	-	-	-	-	-	-	-	-	-
F	ISR	-	WDTIF	-	-	-	EXIF	PBIF	T0IF
10h~3fh	RAM Bank 0								

NY8A053 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	LCKTM0	INTEDG	T0CS	T0CE	PS0WDT	PS0SEL[2:0]		
0	-								
1	-								
2	-								
3	-								
4	-								
5	IOSTA	-	-	-	-	IOPA[3]	IOPA[2]	IOPA[1]	IOPA[0]
6	IOSTB	IOPB[7]	IOPB[6]	IOPB[5]	IOPB[4]	IOPB[3]	IOPB[2]	IOPB[1]	IOPB[0]
7	-								
8	-								
9	-								
A	PS0CV	PS0CV[7]	PS0CV[6]	PS0CV[5]	PS0CV[4]	PS0CV[3]	PS0CV[2]	PS0CV[1]	PS0CV[0]
B									
C	BODCON	ODPB[7]	ODPB[6]	ODPB[5]	ODPB[4]	GP	ODPB[2]	ODPB[1]	ODPB[0]
D	-								
E	-								
F	PCON1	GIE	-	GP	GP	GP	GP	GP	T0EN

AM8EB153 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	INTEDG	INTF	TS	TE	PSC	PS2	PS1	PS0
0	-								
1	-								
2	-								
3	-								
4	-								
5	IOSTA	-	-	-	-	IOPA[3]	IOPA[2]	IOPA[1]	IOPA[0]
6	IOSTB	IOPB[7]	IOPB[6]	IOPB[5]	IOPB[4]	IOPB[3]	IOPB[2]	IOPB[1]	IOPB[0]
7	-								
8	-								
9	BWUCON	PBEI7	PBEI6	PBEI5	PBEI4	PBEI3	PBEI2	PBEI1	PBEI0
A	PS0CV	PS0CV[7]	PS0CV[6]	PS0CV[5]	PS0CV[4]	PS0CV[3]	PS0CV[2]	PS0CV[1]	PS0CV[0]
B	ABPLCON	PDB3	PDB2	PDB1	PDB0	PDA3	PDA2	PDA1	PDA0
C	BODCON	ODB7	ODB6	ODB5	ODB4	GP	ODB2	ODB1	ODB0
D	BPHCON	PHB7	PHB6	PHB5	PHB4	GP	PHB2	PHB1	PHB0
E	PCON	WDTE	EIS	LVRE	ROC	LPRE	CONC	-	-
F	INTE	-	WDTIE	-	-	-	EXIE	PBIE	T0IE

NY8A053 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	TMR1	TMR1[7]	TMR1[6]	TMR1[5]	TMR1[4]	TMR1[3]	TMR1[2]	TMR1[1]	TMR1[0]
1	T1CR1	PWM1OEN	PWM1OAL	-	-	-	T1OS	T1RL	T1EN
2	T1CR2	-	-	T1CS	T1CE	/PS1EN	PS1SEL[2:0]		
3	PWM1DUTY	PWM1DUTY[7:0]							
4	PS1CV	PS1CV[7]	PS1CV[6]	PS1CV[5]	PS1CV[4]	PS1CV[3]	PS1CV[2]	PS1CV[1]	PS1CV[0]
5	BZ1CR	BZ1EN	-	-	-	BZ1FSEL[3:0]			
6	IRCR	IROSC358M	-	-	-	-	IRCSEL	IRF57K	IREN
7	TBHP	-	-	-	-	-	TBHP[2]	TBHP[1]	TBHP[0]
8	TBHD	-	-	TBHD5	TBHD4	TBHD3	TBHD2	TBHD1	TBHD0
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	OSCCR	-	-	-	-	OPMD[1]	OPMD[0]	STPHOSC	SELHOSC

AM8EB153 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0									
1									
2									
3									
4									
5									
6	IRCR	IROSC	-	-	-	-	CARRIER	IRF	IREN
7	TBHP	-	-	-	-	-	-	D1	D0
8	TBHD	-	-	D5	D4	D3	D2	D1	D0
9									
A									
B									
C									
D									
E									
F									

- NY8A053B/53D/53E and EM78P153 Register Differences Table. Red means the differences need to be verified, and the differences marked with green can be ignored.

NY8A053 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	GP	GP	GP	/TO	/PD	Z	DC	C
4	FSR	BK1	BK0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	PORTA	GP	GP	GP	GP	PA[3]	PA[2]	PA[1]	PA[0]
6	PORTB	PB[7]	PB[6]	PB[5]	PB[4]	PB[3]	PB[2]	PB[1]	PB[0]
7	-	-	-	-	-	-	-	-	-
8	PCON	WDTEN	EIS	GP	GP	LVREN	GP	GP	GP
9	BWUCON	WUPB7	WUPB6	WUPB5	WUPB4	WUPB3	WUPB2	WUPB1	WUPB0
A	PCHBUF	-	-	-	-	-	GP	PCHBUF1	PCHBUF0
B	ABPLCON	/PLPB3	/PLPB2	/PLPB1	/PLPB0	/PLPA3	/PLPA2	/PLPA1	/PLPA0
C	BPHCON	/PBPH[7]	/PBPH[6]	/PBPH[5]	/PBPH[4]	GP	/PBPH[2]	/PBPH[1]	/PBPH[0]
D	-	-	-	-	-	-	-	-	-
E	INTE	-	WDTIE	-	-	T1IE	INTIE	PBIE	T0IE
F	INTF	-	WDTIF	-	-	T1IF	INTIF	PBIF	T0IF
10h~1fh	RAM Bank 0~1								
20h~3fh	RAM Bank 0								

EM78P153K R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	RST	GP	GP	T	P	Z	DC	C
4	FSR	-	-	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	PORTA	-	-	-	-	PA[3]	PA[2]	PA[1]	PA[0]
6	PORTB	PB[7]	PB[6]	PB[5]	PB[4]	PB[3]	PB[2]	PB[1]	PB[0]
7	-								
8	-								
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	INTF	-	-	-	-	-	EXIF	ICIF	TCIF
10h~2fh	RAM Bank 0								

NY8A053 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	LCKTM0	INTEDG	T0CS	T0CE	PS0WDT	PS0SEL[2:0]		
0	-								
1	-								
2	-								
3	-								
4	-								
5	IOSTA	-	-	-	-	IOPA[3]	IOPA[2]	IOPA[1]	IOPA[0]
6	IOSTB	IOPB[7]	IOPB[6]	IOPB[5]	IOPB[4]	IOPB[3]	IOPB[2]	IOPB[1]	IOPB[0]
7	-								
8	-								
9	-								
A	PS0CV	PS0CV[7]	PS0CV[6]	PS0CV[5]	PS0CV[4]	PS0CV[3]	PS0CV[2]	PS0CV[1]	PS0CV[0]
B									
C	BODCON	ODPB[7]	ODPB[6]	ODPB[5]	ODPB[4]	GP	ODPB[2]	ODPB[1]	ODPB[0]
D	-								
E	-								
F	PCON1	GIE	-	GP	GP	GP	GP	GP	T0EN

EM78P153K F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	-								
0	-								
1	T0MD	GP	/INT	TS	TE	PAB	PSR2	PSR1	PSR0
2	-								
3	-								
4	-								
5	IOSTA	-	-	-	-	IOPA[3]	IOPA[2]	IOPA[1]	IOPA[0]
6	IOSTB	IOPB[7]	IOPB[6]	IOPB[5]	IOPB[4]	IOPB[3]	IOPB[2]	IOPB[1]	IOPB[0]
7									
8	-								
9	-								
A	-								
B	ABPLCON	-	/PD62	/PD61	/PD60	-	/PD52	/PD51	/PD50
C	BODCON	OD67	OD66	OD65	OD64	-	OD62	OD61	OD60
D	BPHCON	/PH67	/PH66	/PH65	/PH64	-	/PH62	/PH61	/PH60
E	PCON	WDTE	EIS	-	-	-	-	-	-
F	INTE						EXIE	ICIE	TCIE

NY8A053 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	TMR1	TMR1[7]	TMR1[6]	TMR1[5]	TMR1[4]	TMR1[3]	TMR1[2]	TMR1[1]	TMR1[0]
1	T1CR1	PWM1OEN	PWM1OAL	-	-	-	T1OS	T1RL	T1EN
2	T1CR2	-	-	T1CS	T1CE	/PS1EN	PS1SEL[2:0]		
3	PWM1DUTY	PWM1DUTY[7:0]							
4	PS1CV	PS1CV[7]	PS1CV[6]	PS1CV[5]	PS1CV[4]	PS1CV[3]	PS1CV[2]	PS1CV[1]	PS1CV[0]
5	BZ1CR	BZ1EN	-	-	-	BZ1FSEL[3:0]			
6	IRCR	IROSC358M	-	-	-	-	IRCSEL	IRF57K	IREN
7	TBHP	-	-	-	-	-	TBHP[2]	TBHP[1]	TBHP[0]
8	TBHD	-	-	TBHD5	TBHD4	TBHD3	TBHD2	TBHD1	TBHD0
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	OSCCR	-	-	-	-	OPMD[1]	OPMD[0]	STPHOSC	SELHOSC

EM78P153S S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	-								
1	-								
2	-								
3	-								
4	-								
5	-								
6	-								
7	-								
8	-								
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	-								

- NY8A053B/53D/53E and MC30P6030 Register Differences Table. Red means the differences need to be verified, and the differences marked with green can be ignored.

NY8A053 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	GP	GP	GP	/TO	/PD	Z	DC	C
4	FSR	BK1	BK0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	PORTA	GP	GP	GP	GP	PA[3]	PA[2]	PA[1]	PA[0]
6	PORTB	PB[7]	PB[6]	PB[5]	PB[4]	PB[3]	PB[2]	PB[1]	PB[0]
7	-	-	-	-	-	-	-	-	-
8	PCON	WDTE	EIS	GP	GP	LVRE	GP	GP	GP
9	BWUCON	WUPB7	WUPB6	WUPB5	WUPB4	WUPB3	WUPB2	WUPB1	WUPB0
A	PCHBUF	-	-	-	-	-	GP	PCHBUF9	PCHBUF8
B	ABPLCON	/PLPB3	/PLPB2	/PLPB1	/PLPB0	/PLPA3	/PLPA2	/PLPA1	/PLPA0
C	BPHCON	PBPH[7]	PBPH[6]	PBPH[5]	PBPH[4]	GP	PBPH[2]	PBPH[1]	PBPH[0]
D	-	-	-	-	-	-	-	-	-
E	INTE	-	WDTIE	-	-	T1IE	EXTIE	PBIE	T0IE
F	INTF	-	WDTIF	-	-	T1IF	EXTIF	PBIF	T0IF
10h~1fh	RAM Bank 0~1								
20h~3fh	RAM Bank 0								

MC30P6030 SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	T0CNT	T0C[7]	T0C[6]	T0C[5]	T0C[4]	T0C[3]	T0C[2]	T0C[1]	T0C[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	RST	-	-	/TO	/PD	Z	DC	C
4	FSR	-	-	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	P0	-	-	-	-	P03D	P02D	P01D	P00D
6	P1	P17D	P16D	P15D	P14D	-	P12D	P11D	P10D
7	GP	GP	GP	GP	GP	GP	GP	GP	GP
8	MCR	WDTE	EIS	-	-	-	-	-	-
9	KBIM	KBIM7	KBIM6	KBIM5	KBIM4	KBIM3	KBIM2	KBIM1	KBIM0
A	PCLATH	-	-	-	-	-	-	PCH1	PCH0
B	PDCON	-	P12PD	P11PD	P10PD	P03PD	P02PD	P01PD	P00PD
C	ODCON	P17OD	P16OD	P15OD	P14OD	-	P12OD	P11OD	P10OD
D	PUCON	P17PU	P16PU	P15PU	P14PU	-	P12PU	P11PU	P10PU
E	INTECON	GIE	-	-	-	-	INT0IE	KBIE	T0IE
F	INTFLAG	-	-	-	-	-	INT0IF	KBIF	T0IF
10h~3fh	RAM Bank 0								
40	-								
41	T0CR	-	INT0M	T0PTS	T0SE	T0PTA	T0PR2	T0PR1	T0PR0
42	-								
43	-								
44	-								
45	DDR0	-	-	-	-	DDR03	DDR02	DDR01	DDR00
46	DDR1	DDR18	DDR16	DDR15	DDR14	-	DDR12	DDR11	DDR10
47	-								
48	-								
49	-								
4A	-								
4B	TMCR	TBS						T1IE	T1IF
4C	T1CR	TMR1EN	PWMOUT	BUZOUT	T1PTS1	T1PTS0	T1PR2	T1PR1	T1PR0
4D	T1CNT	T1C7	T1C6	T1C5	T1C4	T1C3	T1C2	T1C1	T1C0
4E	T1LOAD	T1LOAD7	T1LOAD6	T1LOAD5	T1LOAD4	T1LOAD3	T1LOAD2	T1LOAD1	T1LOAD0
4F	T1DATA	T1DATA7	T1DATA6	T1DATA5	T1DATA4	T1DATA3	T1DATA2	T1DATA1	T1DATA0

NY8A053 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	LCKTM0	INTEDG	T0CS	T0CE	PS0WDT	PS2	PS1	PS0
0	-								
1	-								
2	-								
3	-								
4	-								
5	IOSTA	-	-	-	-	IOPA[3]	IOPA[2]	IOPA[1]	IOPA[0]
6	IOSTB	IOPB[7]	IOPB[6]	IOPB[5]	IOPB[4]	IOPB[3]	IOPB[2]	IOPB[1]	IOPB[0]
7	-								
8	-								
9	-								
A	PS0CV	PS0CV[7]	PS0CV[6]	PS0CV[5]	PS0CV[4]	PS0CV[3]	PS0CV[2]	PS0CV[1]	PS0CV[0]
B									
C	BODCON	ODPB[7]	ODPB[6]	ODPB[5]	ODPB[4]	GP3	ODPB[2]	ODPB[1]	ODPB[0]
D									
E									
F	PCON1	GIE	-	GP	GP	GP	GP	GP	T0EN

NY8A053 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	TMR1	TMR1[7]	TMR1[6]	TMR1[5]	TMR1[4]	TMR1[3]	TMR1[2]	TMR1[1]	TMR1[0]
1	T1CR1	PWM1OEN	PWM1OAL	-	-	-	T1OS	T1RL	T1EN
2	T1CR2	-	-	T1CS	T1SE	/PS1EN	PS1[2]	PS1[1]	PS1[0]
3	PWM1DUTY	PWM1D[7]	PWM1D[6]	PWM1D[5]	PWM1D[4]	PWM1D[3]	PWM1D[2]	PWM1D[1]	PWM1D[0]
4	PS1CV	PS1CV[7]	PS1CV[6]	PS1CV[5]	PS1CV[4]	PS1CV[3]	PS1CV[2]	PS1CV[1]	PS1CV[0]
5	BZ1CR	BZ1EN	-	-	-	BZ1FSEL[3]	BZ1FSEL[2]	BZ1FSEL[1]	BZ1FSEL[0]
6	IRCR	IROSC	-	-	-	-	IRCSEL	IRF57K	IREN
7	TBHP	-	-	-	-	-	TBHP[2]	TBHP[1]	TBHP[0]
8	TBHD	-	-	TBHD[13]	TBHD[12]	TBHD[11]	TBHD[10]	TBHD[9]	TBHD[8]
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	OSCCR					OPMD[1]	OPMD[0]	STPHOSC	SELHOSC

- NY8A051B/51D/51E/51F/51G/51H and MC30P6040 Register Differences Table. Red means the differences need to be verified, and the differences marked with green can be ignored.

NY8A051 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	GP	GP	GP	/TO	/PD	Z	DC	C
4	FSR	BK1	BK0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	-	-	-	-	-	-	-	-	-
6	PORTB	GP	GP	PB[5]	PB[4]	PB[3]	PB[2]	PB[1]	PB[0]
7	-	-	-	-	-	-	-	-	-
8	PCON	WDTE	EIS	GP	GP	LVRE	GP	GP	GP
9	BWUCON	-	-	WU[5]	WU[4]	WU[3]	WU[2]	WU[1]	WU[0]
A	PCHBUF	-	-	-	-	-	GP	PCHBUF9	PCHBUF8
B	BPLCON	PBPD[3]	PBPD[2]	PBPD[1]	PBPD[0]	-	-	-	-
C	BPHCON	-	-	PBPH[5]	PBPH[4]	PBPH[3]	PBPH[2]	PBPH[1]	PBPH[0]
D	-	-	-	-	-	-	-	-	-
E	INTE	-	WDTIE	-	-	T1IE	EXTIE	PBIE	T0IE
F	INTF	-	WDTIF	-	-	T1IF	EXTIF	PBIF	T0IF
10h~1fh	RAM Bank 0								
20h~3fh	RAM Bank 0								

MC30P6040 SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	T0CNT	T0C[7]	T0C[6]	T0C[5]	T0C[4]	T0C[3]	T0C[2]	T0C[1]	T0C[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	RST	-	-	/TO	/PD	Z	DC	C
4	FSR	-	-	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	P0	-	-	-	-	P03D	P02D	P01D	P00D
6	P1	-	-	P15D	P14D	P13D	P12D	P11D	P10D
7	GP	GP	GP	GP	GP	GP	GP	GP	GP
8	MCR	WDTE	EIS	-	-	-	LVDF	LVDSE	LVDEN
9	KBIM	-	-	KBIM5	KBIM4	KBIM3	KBIM2	KBIM1	KBIM0
A	PCLATH	-	-	-	-	-	-	PCH1	PCH0
B	PDCON	-	P12PD	P11PD	P10PD	P03PD	P02PD	P01PD	P00PD
C	ODCON	-	-	P15OD	P14OD	-	P12OD	P11OD	P10OD
D	PUCON	-	-	P15PU	P14PU	P13PU	P12PU	P11PU	P10PU
E	INTECON	GIE	-	-	-	-	INT0IE	KBIE	T0IE
F	INTFLAG	-	-	-	-	-	INT0IF	KBIF	T0IF
10h~3fh	RAM Bank 0								
40	-								
41	T0CR	-	INT0M	T0PTS	T0SE	T0PTA	T0PR2	T0PR1	T0PR0
42	-								
43	-								
44	-								
45	-								
46	DDR1	-	-	DDR15	DDR14	DDR13	DDR12	DDR11	DDR10
47	-								
48	-								
49	-								
4A	-								
4B	-								
4C	-								
4D	-								
4E	-								
4F	-								

NY8A051 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	LCKTM0	INTEDG	T0CS	T0CE	PS0WDT	PS2	PS1	PS0
0	-								
1	-								
2	-								
3	-								
4	-								
5	-								
6	IOSTB	GP	GP	PBIO[5]	PBIO[4]	PBIO[3]	PBIO[2]	PBIO[1]	PBIO[0]
7	-								
8	-								
9	-								
A	T0PSC	T0PSC[7]	T0PSC[6]	T0PSC[5]	T0PSC[4]	T0PSC[3]	T0PSC[2]	T0PSC[1]	T0PSC[0]
B	-								
C	BODCON	-	-	PBOD[5]	PBOD[4]	GP	PBOD[2]	PBOD[1]	PBOD[0]
D	-								
E	-								
F	PCON1	GIE	-	-	-	-	-	-	T0EN

NY8A051 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	TMR1	TMR1[7]	TMR1[6]	TMR1[5]	TMR1[4]	TMR1[3]	TMR1[2]	TMR1[1]	TMR1[0]
1	T1CR1	PWM1EN	PWM1OUT				T1MD	T1RL	T1EN
2	T1CR2			T1CS	T1SE	PS1DIS	PS1[2]	PS1[1]	PS1[0]
3	PWM1D	PWM1D[7]	PWM1D[6]	PWM1D[5]	PWM1D[4]	PWM1D[3]	PWM1D[2]	PWM1D[1]	PWM1D[0]
4	PS1CV	T1PSC[7]	T1PSC[6]	T1PSC[5]	T1PSC[4]	T1PSC[3]	T1PSC[2]	T1PSC[1]	T1PSC[0]
5	BZ1CR	BZ1EN				BZ1FREQ[3]	BZ1FREQ[2]	BZ1FREQ[1]	BZ1FREQ[0]
6	IRCR	IROSC					IRCARRIER	IRFREQ	IREN
7	TBHP							TBHP[1]	TBHP[0]
8	TBHD			TBHD[13]	TBHD[12]	TBHD[11]	TBHD[10]	TBHD[9]	TBHD[8]
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	OSCCR					OPMD[1]	OPMD[0]	STPHX	OSCMD

- NY8A053B/53D/53E and MC30P6060/80 Register Differences Table. Red means the differences need to be verified, and the differences marked with green can be ignored.

NY8A053 R-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	TMR0	TMR0[7]	TMR0[6]	TMR0[5]	TMR0[4]	TMR0[3]	TMR0[2]	TMR0[1]	TMR0[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	GP	GP	GP	/TO	/PD	Z	DC	C
4	FSR	BK1	BK0	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	PORTA	GP	GP	GP	GP	PA[3]	PA[2]	PA[1]	PA[0]
6	PORTB	PB[7]	PB[6]	PB[5]	PB[4]	PB[3]	PB[2]	PB[1]	PB[0]
7	-	-	-	-	-	-	-	-	-
8	PCON	WDTE	EIS	GP	GP	LVRE	GP	GP	GP
9	BWUCON	WUPB7	WUPB6	WUPB5	WUPB4	WUPB3	WUPB2	WUPB1	WUPB0
A	PCHBUF	-	-	-	-	-	GP	PCHBUF9	PCHBUF8
B	ABPLCON	/PLPB3	/PLPB2	/PLPB1	/PLPB0	/PLPA3	/PLPA2	/PLPA1	/PLPA0
C	BPHCON	PBPH[7]	PBPH[6]	PBPH[5]	PBPH[4]	GP	PBPH[2]	PBPH[1]	PBPH[0]
D	-	-	-	-	-	-	-	-	-
E	INTE	-	WDTIE	-	-	T1IE	EXTIE	PBIE	T0IE
F	INTF	-	WDTIF	-	-	T1IF	EXTIF	PBIF	T0IF
10h~1fh	RAM Bank 0~1								
20h~3fh	RAM Bank 0								

MC30P6060 SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	INDF	INDF[7]	INDF[6]	INDF[5]	INDF[4]	INDF[3]	INDF[2]	INDF[1]	INDF[0]
1	T0CNT	T0C[7]	T0C[6]	T0C[5]	T0C[4]	T0C[3]	T0C[2]	T0C[1]	T0C[0]
2	PCL	PCL[7]	PCL[6]	PCL[5]	PCL[4]	PCL[3]	PCL[2]	PCL[1]	PCL[0]
3	STATUS	RST	-	-	/TO	/PD	Z	DC	C
4	FSR	-	-	FSR[5]	FSR[4]	FSR[3]	FSR[2]	FSR[1]	FSR[0]
5	P0	-	-	-	-	P03D	P02D	P01D	P00D
6	P1	P17D	P16D	P15D	P14D	P13D	P12D	P11D	P10D
7	GP	GP	GP	GP	GP	GP	GP	GP	GP
8	MCR	WDTE	EIS	LVDF	LVDSEL3	LVDSEL2	LVDSEL1	LVDSEL0	LVDEN
9	KBIM	-	-	KBIM5	KBIM4	KBIM3	KBIM2	KBIM1	KBIM0
A	PCLATH	-	-	-	-	-	-	PCH1	PCH0
B	PDCON	-	P12PD	P11PD	P10PD	P03PD	P02PD	P01PD	P00PD
C	ODCON	P17OD	P16OD	P15OD	P14OD	-	P12OD	P11OD	P10OD
D	PUCON	P17PU	P16PU	P15PU	P14PU	P13PU	P12PU	P11PU	P10PU
E	INTECON	GIE	-	-	-	-	INT0IE	KBIE	T0IE
F	INTFLAG	-	-	-	-	-	INT0IF	KBIF	T0IF
10h~3fh	RAM Bank 0								
40	-								
41	T0CR	-	INT0M	T0PTS	T0SE	T0PTA	T0PR2	T0PR1	T0PR0
42	-								
43	-								
44	-								
45	DDR0	-	-	-	-	DDR03	DDR02	DDR01	DDR00
46	DDR1	DDR18	DDR16	DDR15	DDR14	DDR13	DDR12	DDR11	DDR10
47	-								
48	PWMCR	PWM0OE	PWM10E	PWM2OE	DBLCK	PWMMD	PWMINV	PWM1E	PWM2E
49	T1DATA1	T1DAT17	T1DAT16	T1DAT15	T1DAT14	T1DAT13	T1DAT12	T1DAT1	T1DAT0
4A	T1DATA2	T1DAT27	T1DAT26	T1DAT25	T1DAT24	T1DAT23	T1DAT22	T1DAT2	T1DAT0
4B	TM0CR	TBS						T1IE	T1IF
4C	T1CR	TMR1EN	PWMOUT	BUZOUT	T1PTS1	T1PTS0	T1PR2	T1PR1	T1PR0
4D	T1CNT	T1C7	T1C6	T1C5	T1C4	T1C3	T1C2	T1C1	T1C0
4E	T1LOAD	T1LOAD7	T1LOAD6	T1LOAD5	T1LOAD4	T1LOAD3	T1LOAD2	T1LOAD1	T1LOAD0
4F	T1DATA0	T1DAT07	T1DAT06	T1DAT05	T1DAT04	T1DAT03	T1DAT02	T1DAT01	T1DAT00

NY8A053 F-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
NA	T0MD	LCKTM0	INTEDG	T0CS	T0CE	PS0WDT	PS2	PS1	PS0
0	-								
1	-								
2	-								
3	-								
4	-								
5	IOSTA	-	-	-	-	IOPA[3]	IOPA[2]	IOPA[1]	IOPA[0]
6	IOSTB	IOPB[7]	IOPB[6]	IOPB[5]	IOPB[4]	IOPB[3]	IOPB[2]	IOPB[1]	IOPB[0]
7	-								
8	-								
9	-								
A	PS0CV	PS0CV[7]	PS0CV[6]	PS0CV[5]	PS0CV[4]	PS0CV[3]	PS0CV[2]	PS0CV[1]	PS0CV[0]
B									
C	BODCON	ODPB[7]	ODPB[6]	ODPB[5]	ODPB[4]	GP3	ODPB[2]	ODPB[1]	ODPB[0]
D									
E									
F	PCON1	GIE	-	GP	GP	GP	GP	GP	T0EN

NY8A053 S-Page SFR

Address	Name	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
0	TMR1	TMR1[7]	TMR1[6]	TMR1[5]	TMR1[4]	TMR1[3]	TMR1[2]	TMR1[1]	TMR1[0]
1	T1CR1	PWM1OEN	PWM1OAL	-	-	-	T1OS	T1RL	T1EN
2	T1CR2	-	-	T1CS	T1SE	/PS1EN	PS1[2]	PS1[1]	PS1[0]
3	PWM1DUTY	PWM1D[7]	PWM1D[6]	PWM1D[5]	PWM1D[4]	PWM1D[3]	PWM1D[2]	PWM1D[1]	PWM1D[0]
4	PS1CV	PS1CV[7]	PS1CV[6]	PS1CV[5]	PS1CV[4]	PS1CV[3]	PS1CV[2]	PS1CV[1]	PS1CV[0]
5	BZ1CR	BZ1EN	-	-	-	BZ1FSEL[3]	BZ1FSEL[2]	BZ1FSEL[1]	BZ1FSEL[0]
6	IRCR	IROSC	-	-	-	-	IRCSEL	IRF57K	IREN
7	TBHP	-	-	-	-	-	TBHP[2]	TBHP[1]	TBHP[0]
8	TBHD	-	-	TBHD[13]	TBHD[12]	TBHD[11]	TBHD[10]	TBHD[9]	TBHD[8]
9	-								
A	-								
B	-								
C	-								
D	-								
E	-								
F	OSCCR					OPMD[1]	OPMD[0]	STPHOSC	SELHOSC