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

User Manual

Q-Light for NY1 Series

Easy LED Control & Drive Programmer

Version 2.5

Aug. 11, 2023

Table of Contents

1 Introduction

Q-Light is Nyquest's brand new integrated development tool for LED Control and Drive IC of NY1 series. The intuitive interface, well-regulated pages, and real-time simulation bring more convenience to programmers. Cooperate with its powerful peripherals, *Q-Writer*; it would make work much more efficient.

Contents:

1.1 What Is *Q-Light*

Q-Light is a new integrated development tool for LED Control and Drive IC provided by Nyquest Technology Corporation Limited (Nyquest). It is designed to be very easy and intuitive to use that would bring product development process more simplicity, accuracy and efficiency.

1.2 Getting Started

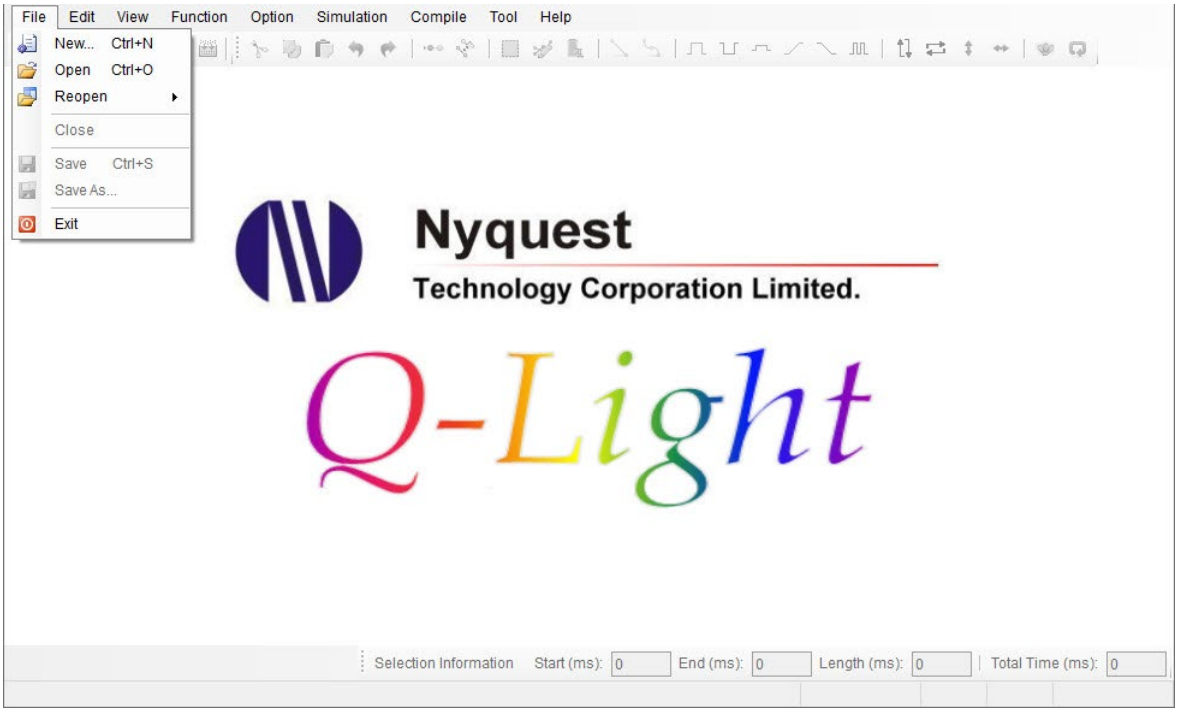
Please contact Nyquest Technology to acquire the updated *Q-Light* program. To install *Q-Light,* unzip the .zip file to a specific folder and then double-click on the .exe file in the folder to start the installation. Follow the instructions of the installation wizard to complete the installation.

System Requirements:

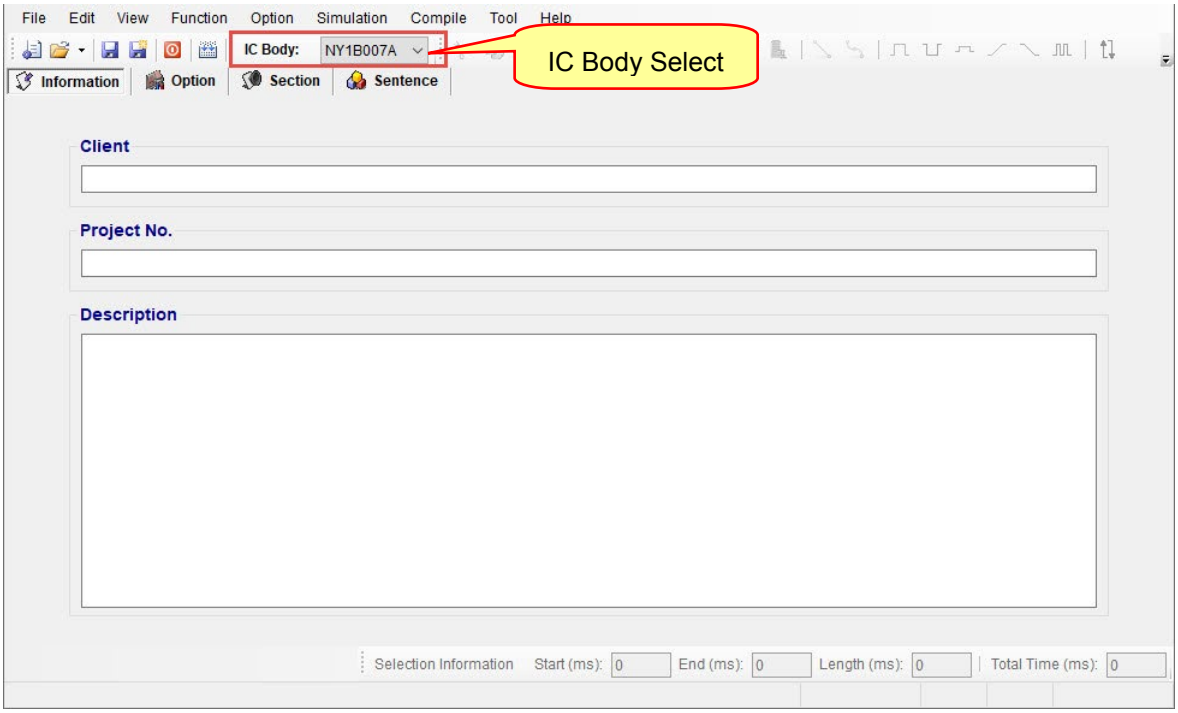
- Pentium 1.3GMHz CPU or above, Windows 7/ 8 / 10/ 11.
- At least 1G of SDRAM.
- At least 2G free space on hard disc.
- A display card and monitor that support 1366x768 resolution or higher.
- Microsoft .NET Framework 4.8 installed.

1.3 The Main Interface of *Q-Light*

When executing *Q-Light,* the initial window with menus and buttons will show up. Then select [New] or [Open] form [File], or just click on the [New] button to get start.



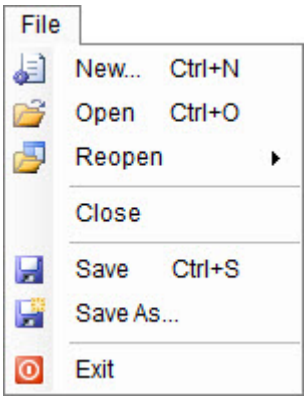
At first, select IC body to start editing.



1.4 Menu

1.4.1 [File] Menu

The File Menu provides commands for dealing with file status. By clicking on the header [File] on the Menu bar and the menu is shown below.



New…: Create a new *Q-Light* project.

Open: Open an existing *Q-Light* project.

Reopen: Open a recently accessed *Q-Light* file.

Close: Close the currently open *Q-Light* project.

Save: Save the current *Q-Light* project.

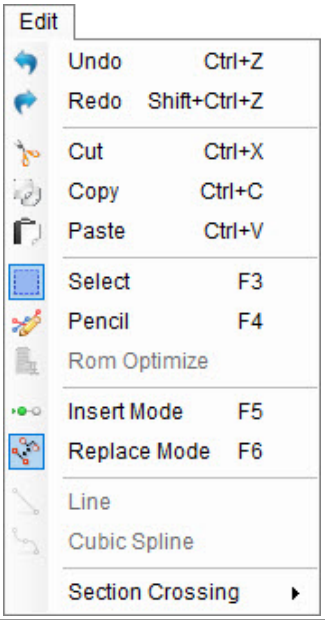
Save As…: Save a *Q-Light* project as another name or to another path.

Exit: Exit *Q-Light*.

Note: All files saved by Q-Light will have the .prj extension.

1.4.2 [Edit] Menu

The Edit Menu provides commands such as copy and paste command for editing exiting signals. By clicking on the [Edit] on Menu Bar and the menu is shown below.



1.4.2.1 Undo

Undo command reverses the last action in Section page.

1.4.2.2 Redo

Redo command redoes the last undone action in Section page.

1.4.2.3 Cut

In Section page, Cut command removes highlighted signals of currently editing channel.

1.4.2.4 Copy

In Section page, Copy command copies the highlighted signals of currently editing channel.

1.4.2.5 Paste

In Section page, Paste command pastes the highlighted signals of currently editing channel.

1.4.2.6 Select Mode

Select Mode offers quick signals editing function in Section page. Please see Chapter 6.1.1 for details.

1.4.2.7 Pencil Mode

Pencil Mode is designed for adding, deleting or changing the signal position in Section page. Please see Chapter 6.1.2 for details.

1.4.2.8 ROM Optimize

Optimize ROM by providing user the optimum signal position while editing signals in Section page.

1.4.2.9 Insert Mode

In the Section page, user can add the cut or copied signals at the point or selection. Please see Chapter 6.2.1 for details.

1.4.2.10 Replace Mode

In the Section page, user can remove old data and replace it with the cut or copied signals. Please see Chapter 6.2.2 for details.

1.4.2.11 Line

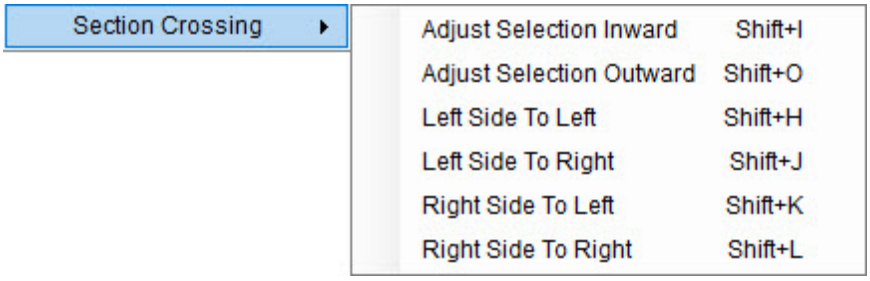
In the Section page, Pencil Mode can be used to add points for drawing straight lines.

1.4.2.12 Cubic Spline

In the Section page, Pencil Mode can be used to add points for drawing cubic splines.

1.4.2.13 Section Crossing

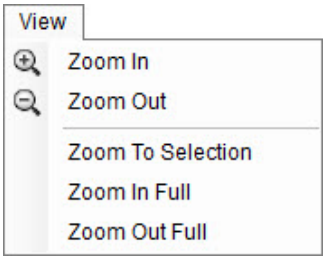
In Select Mode, users can change the selection through the hotkeys - Keyboard Shortcuts.



Adjust Selection Inward: Move both range boundaries inward simultaneously.
Adjust Selection Outward: Move both range boundaries outward simultaneously.
Left Side To Left: Move the left range boundary leftward to expand the selection.
Left Side To Right: Move the left range boundary rightward to decrease the selection.
Right Side To Left: Move the right range boundary leftward to decrease the selection.
Right Side To Right: Move the right range boundary rightward to expand the selection.

1.4.3 [View] Menu

The View Menu offers commands that allow user to zoom in or out on the waveform and signals. User can zoom in to the point where the samples of the waveform can be clearly seen, or zoom out till the entire waveform and signals can be clearly seen. By clicking on the [View] on Menu Bar and the menu is shown right.



Zoom In: Zoom in on the center of the visible waveform. Show more detail of the waveform and signals.

Zoom Out: Zoom out on the center of the visible waveform. Show less detail of the waveform and signals.

Zoom To Selection: Maximize the selected waveform to full screen.

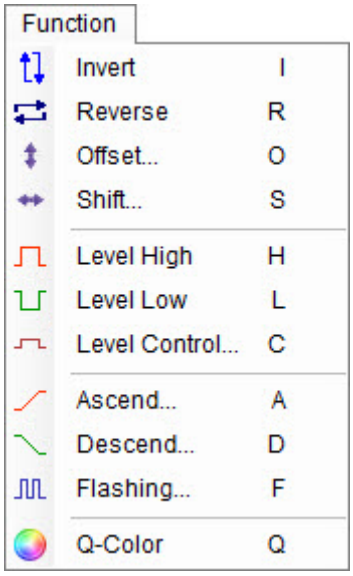
Zoom In Full: Maximize the waveform to full screen.

Zoom Out Full：Display the full waveform.

Note: The scroll wheel of mice is also applicable for zooming in or out.

1.4.4 [Function] Menu

In Functions Menu, there are some basic graphic tools for editing signals, such as Level High and Level Low. These basic tools offer user to draw simple geometric lines, such as straight lines, slopes, and curves. By clicking on the [Functions] on Menu Bar and the menu is shown below.



1.4.4.1 Invert

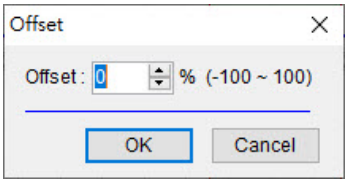
Invert the highlighted signals by 180 degrees. It turns the wave upside down. For example, the percentage of signal is x%, after inversion, the percentage is turned to (100-x)%.

1.4.4.2 Reverse

Reverse the highlighted signals from right to left so it plays backwards.

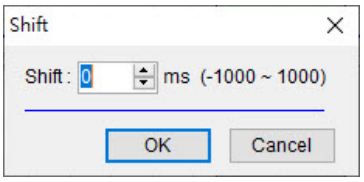
1.4.4.3 Offset

Offset command adds an integer to the entire currently highlighted signals, and the value can be positive or negative. Parameter allows any integer between -100 and 100. A positive



offset shifts UP all highlighted signals whereas a negative offset shifts DOWN all highlighted signals. When the value is shifted to over 100% or under 0%, it will stay at the limit (100% or 0%).

1.4.4.4 Shift



Shift command shifts the highlighted signals to right or left by an integer, and the value can be positive or negative. Parameter allows any integer between -1000 and 1000; the unit of the shift value is millisecond. A positive value shifts all highlighted signals to right whereas a negative value shifts all highlighted signals to left. The signals shifted to out of the highlighted area will disappear.

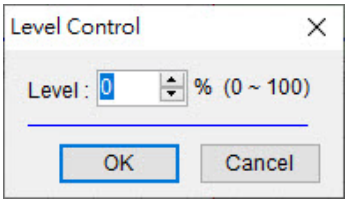
1.4.4.5 Level High

Level High sets the currently selected signals to the ceiling; the signals would be brought to 100%.

1.4.4.6 Level Low

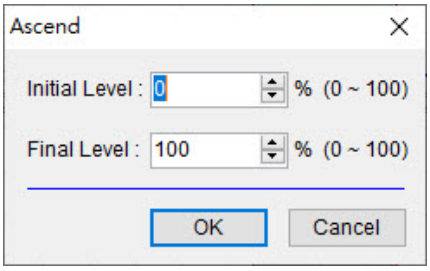
Level Low sets the currently selected signals to the bottom; the signals would be brought to 0%.

1.4.4.7 Level Control



Here sets the currently selected signals to an integer level. Any integer between 0 and 100 can be keyed in.

1.4.4.8 Ascend

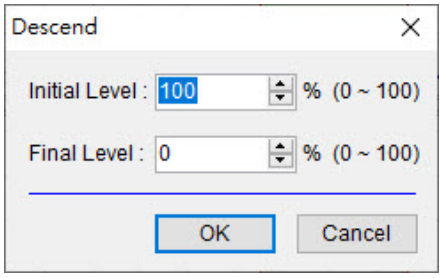


Ascend command replaces the highlighted signals with a positive slope, which increases signals from the initial level to the final level gradually during the highlighted region. Any integer between 0 and 100 is allowed to set in the dialog boxes, but please note that the value of final level must be greater than the value of initial level. If the initial level is greater than the final level, an error message will show as user press “OK”, since it is not an ascending slope.

Initial Level: The start level of the highlighted region.

Final Level: The end level of the highlighted region.

1.4.4.9 Descend

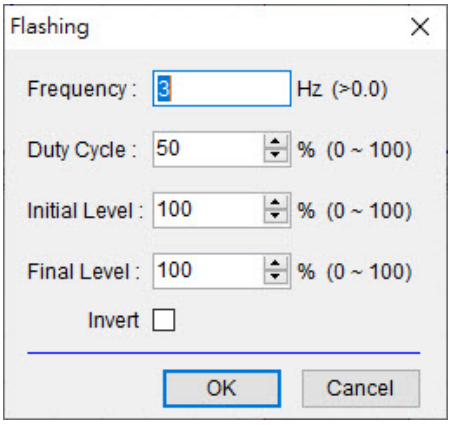


Descend command replaces the highlighted signals with a negative slope, which decreases signals from the initial level to the final level gradually during the highlighted region. Any integer between 0 and 100 is allowed to set in the dialog boxes, but please note that the value of initial level must be greater than the value of final level. If the final level is greater than the initial level, an error message will show as user press “OK”, since it is not a descending slope.

Initial Level: The start level of the highlighted region.

Final Level: The end level of the highlighted region.

1.4.4.10 Flashing



Flashing replaces the currently highlighted signals with signals alternating between 0% and 100%, and the frequency must be positive.

Frequency: The flashing frequency of the highlighted region.

Duty Cycle: The duty cycle decides the duration ratio of 100% and 0%, and it can be any integer between 0 and 100.

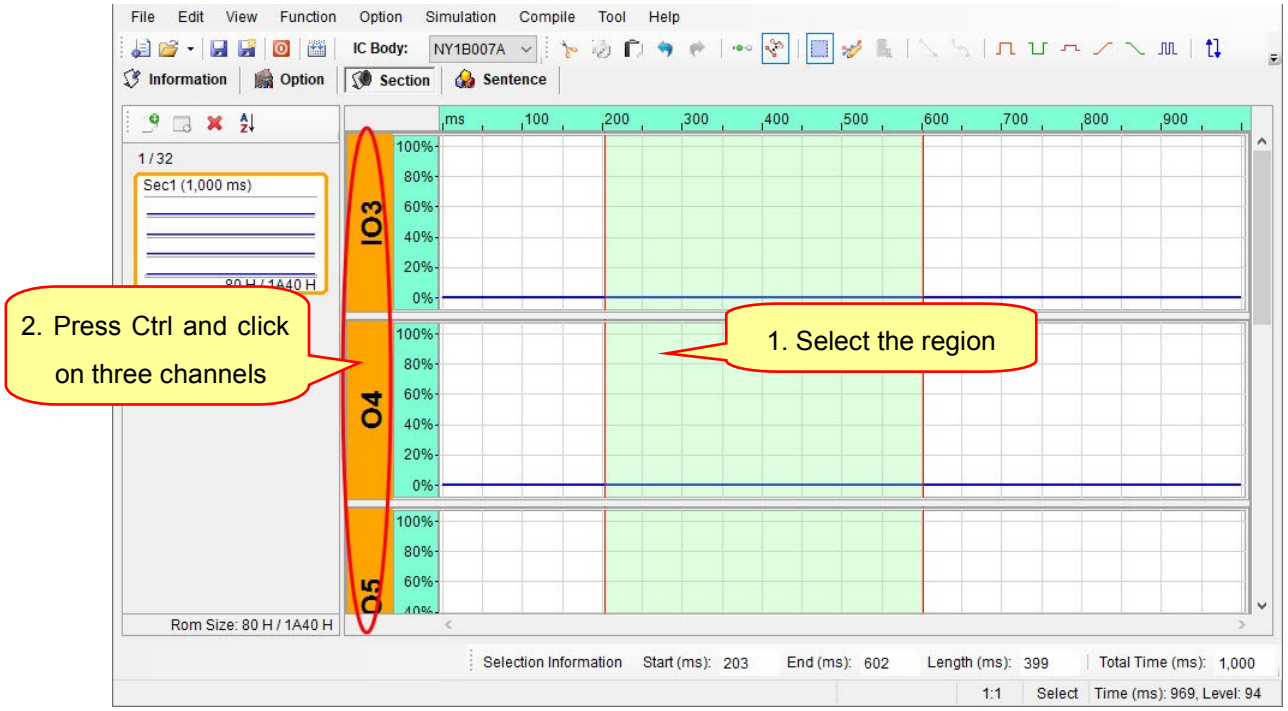
Initial Level: The start level of the highlighted region.

Final Level: The end level of the highlighted region. When the initial level is not identical to Final level, user can edit ladder shape flashing signals.

Invert: The Invert option inverts the flashing signals. Initial value can start from 0% level.

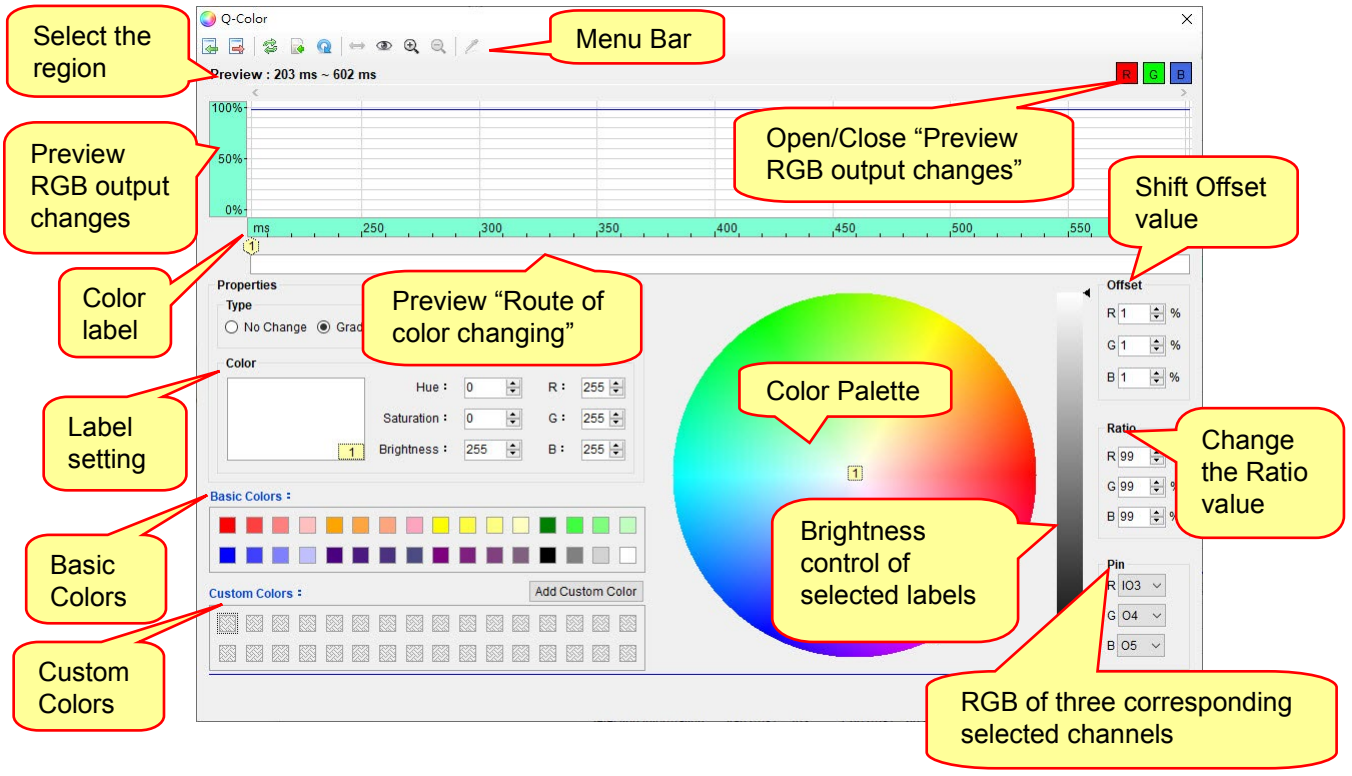
1.4.4.11 Q-Color

Q-Color is designed to help user to complete the application with interactive RGB (Red, Green, Blue) color control. As we know, most colors in visible light spectrum can be obtained by mixing three primary colors RED, GREEN and BLUE with precisely controlling the relative brightness for each color. Thus, using three channels to control three primary color LEDs, most colors can be composed. But the difficult is how can we determine the relative intensity of each primary color to get a desired color? Don’t worry! Q-Color offers the best way for easy and interesting color mixing. First select a region, then click on three channels simultaneously (press Ctrl and click on desired channels in Channel Editing Zone), the color editing work can be easily done.



Note: If user does not select three channels and the current channel number is more than three or equal to three, Q-Color still can be executed during selecting a range. In this case, the previous three channels will be fixed as the selected channels.

After executing Q-Color, a color palette will be shown below.



a) Menu Bar

Here provides the preview way to adjust RGB or to choose the output signal. The function is as follows.

Import: Import custom colors.

Export: Export custom colors.

Reverse: Reverse the sequence of all color labels.

Reset: Clear all color points except the start one.

Loop: Connect the end point to the start point, which makes the color route start and end at the same color. If Loop option is unchecked, it will end as the color that the last point stays.

Equal Interval: This sets the value ranges in each label equal in size. Or user can press"Ctrl" key to select 2 labels (more than 2 colors between) to make equall interval.

View: Switch the label style of route of color changing. Display number and color label respectively, the color labels in three forms, namely a single color, gradient color and trajectory colors.

 No Change: There is single color between two labels.

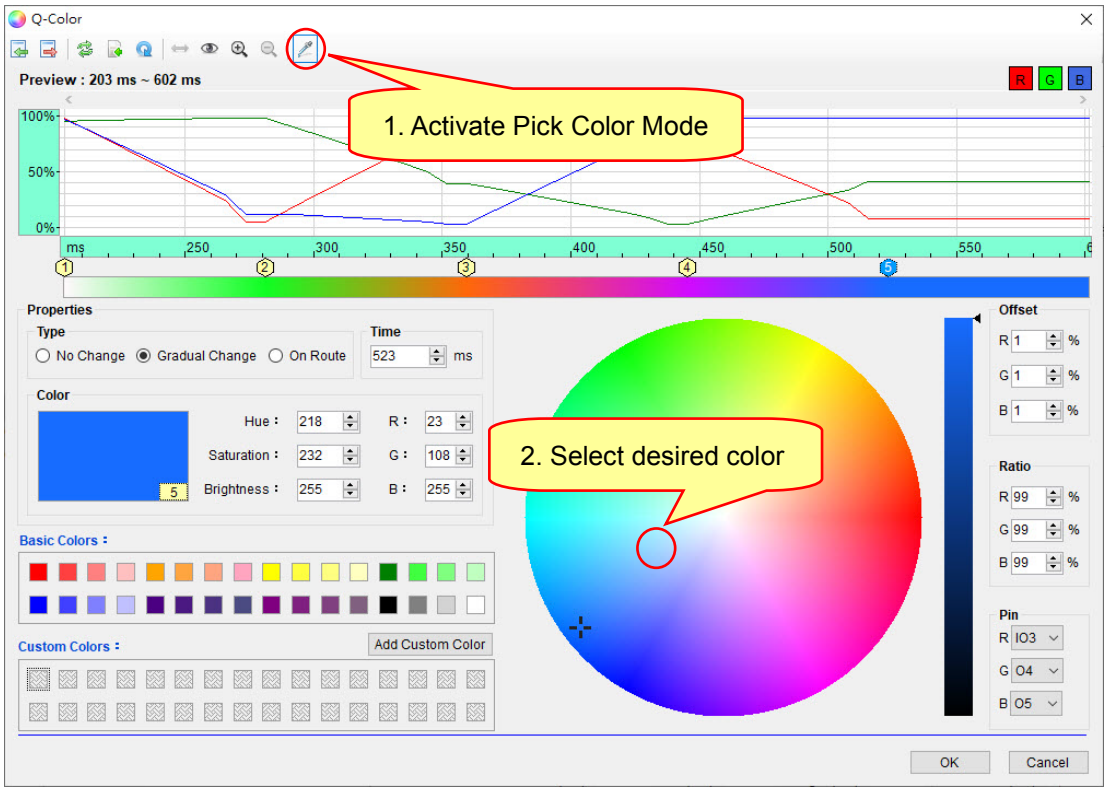
 Gradual Change: The color is gradual changing between two labels.

 On Route: Route of color changing between two labels.

Zoom In: Zoom in on the center of the visible RGB waveform to show more detail.

Zoom Out: Zoom out on the center of the visible RGB waveform to show less detail.

Pick Color Mode: To activate Pick Color Mode, just select the desired color from the “Preview Route of color changing” or “Color Palette”, and then press  in Menu Bar. In this mode, users can select color in “Color Palette”, as shown below.



Note: While executing import function, Custom Colors will be added in the Custom Colors area until no blank to add. The amount of Custom Colors is limited.

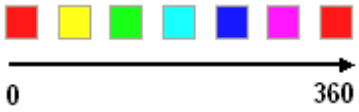
b) Properties

Properties for the selected labels, including Label Type, Label Time and Label Color.

Type: Set the color type of selected label.

Time: Set the time of selected label.

Color: Set the color of selected label. Colors can be specified according to hue, saturation, and brightness, just as colors can be represented in terms of the R, G, and B components. As seen in the following illustration.



- Hue: Set property of color which is described according to its similarity in the color, the range is 0~360. The higher variation the Hue value, the more obvious the color change. When Hue value increases, it goes counterclockwise in Color Palette. For example: Color parameters R: 255, G: 24, B: 24, the range is 0~360, the change interval is 60, the color change status is shown at right.
- Saturation: Set the dominance of hue in the color, the range is 0~255. The higher the Saturation value, the more colorful the color; meanwhile Saturation value increases, it goes outward in Color Palette.
- Brightness: Set the brightness of color, the range is 0~255. The higher the Brightness value, the more brilliant the color.
- R, G, B (Red, Green, Blue): Set the R, G, and B components of color, the range is

0~255.

c) Custom Colors

Add the custom color to the Custom Colors area by pressing  button.

d) Pin

Arrange the three channels to RED, GREEN, and BLUE respectively. To change the current setting, just use the drop-down list.

Note: After using the Edit function of Q-Color, this option will update the settings of Pin and RGB Group simultaneously in order to execute Simulation or Loop Simulation.

e) Offset

Offset command adds a constant value as data output, and the default value is 1. The Offset dialog box will be shown by clicking Offset color bar to shift value. The value can be positive or negative. Parameter allows any integer between -100 and 100: a positive offset shifts UP all highlighted data whereas a negative offset shifts DOWN all highlighted data. When the value is shifted to over 100% or under 0%, it will stay at the limit (100% or 0%).

f) Ratio

Increase/Decrease a ratio value of signal as data output.

g) Preview Bar

Add / Delete / Move / Multiple Choose in route of color changing tab to modify the color changing sequence.

Add – To add a label, just move the mouse to the area then press Insert key or choose Add in right-click menu.

Delete – Left-click to delete the label, and then press Delete key or choose Delete in right-click menu.

Move – Directly click desired label, then press and hold the left mouse button to move the location.

Multiple Choose – Press and hold Ctrl key or select multiple labels with Shift key then left-click the desired labels to change / move /delete at the same time.

h) Palette

User can Add / Delete / Insert / Move / Multiple Choose label to modify the color changing sequence in Palette.

Add – Left-click to add the label, and then press “Insert” key or choose Add in right-click

menu.

Delete – Left-click to delete the label, and then press “Delete” key or choose Delete in right-click menu.

Insert – Move the mouse over the straight lines joining the two labels, when the mouse icon becomes 「+」, user can insert a label.

Move – Directly click desired label, then press and hold the left mouse button to move the location.

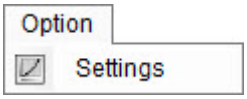
Multiple Choose – Press and hold Ctrl key or select multiple labels with Shift key then left-click the desired labels to change/move /delete at the same time.

i) Brightness

Choose the brightness of desired label.

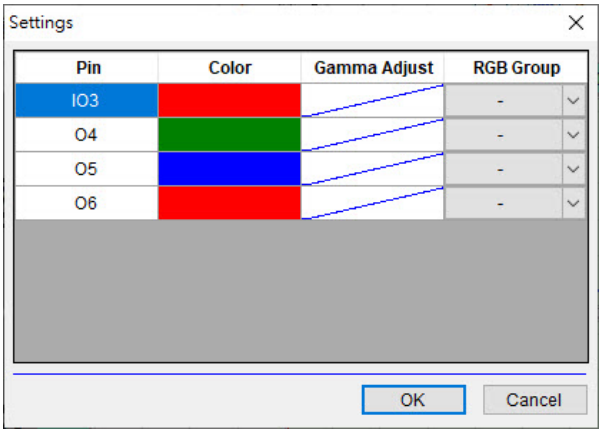
1.4.5 [Option] Menu

By clicking the [Option] on Menu Bar, the menu is shown as below:



Settings: This feature is for setting Simulation or Loop Simulation functions. User could use this function via Color, Gamma Adjust, and RGB Group.

The illustration of opening Settings is shown below:



◆ **Pin**

List the current names of Pin that are set as output.

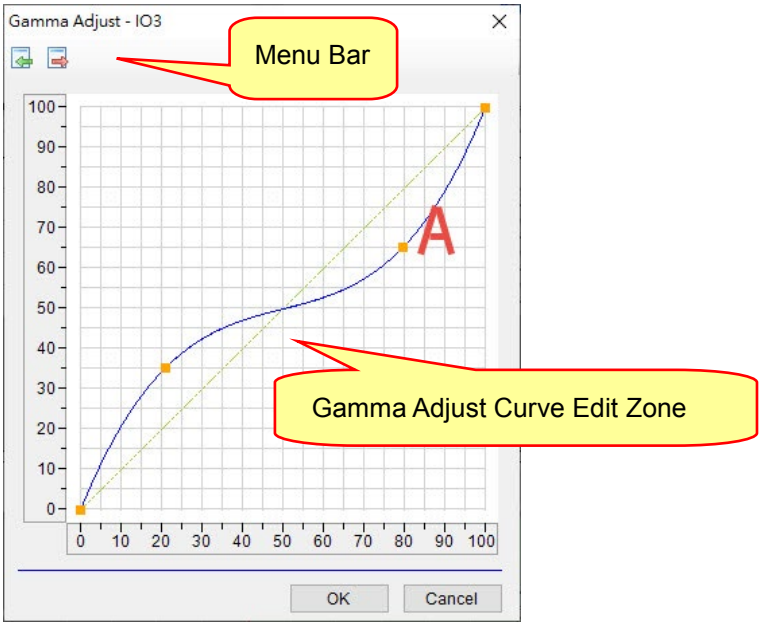
◆ **Color**

Assign the color of Pin when user executes Simulation.

◆ **Gamma Adjust**

This feature is to construct offset for the non-linearity between the physical characteristics of passive components (e.g. LED) and the duty cycle of PWM. When LED is connected with IC output port, the brightness of LED is controlled by the duty cycle of PWM. The actual output power and the duty

cycle of PWM are in direct ratio, but human sense of brightness is not necessarily so. User could adjust the non-linearity via Gamma Adjust.



a) Menu Bar

Menu Bar provides the functions of Import and Export. Described as follows:

Import: Import the previous completed gamma adjust curve.

Export: Export the completed gamma adjust curve.

b) Gamma Adjust Curve Edit Zone

The feature could modify and control the non-linearity. User could add and drag a control point to draw a gamma adjust curve in order to displace the original output energy (the X axis) and actual output energy (the Y axis). As shown above, user could draw a gamma adjust curve of displacement, modifying the original 70% energy into the actual 60% energy. Explicit described as follows:

Add – Click the left mouse button to add a control point in the desired location.

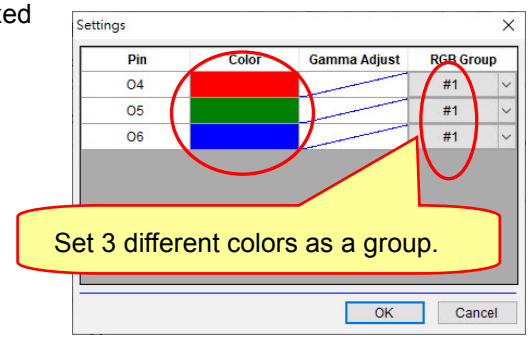
Remove – Click the right mouse button to remove the control point in the desired location.

Drag – Drag-drop the control point to change location via left mouse button.

Reset – Reset the gamma adjust curve as default via the right-click menu.

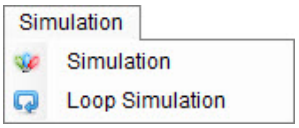
◆ **RGB Group**

User could assign three Pins to simulate RGB mixed colors via RGB Group.



1.4.6 [Simulation] Menu

By clicking on the [Simulation] on Menu Bar, the menu is shown below.



Simulation: The feature provides users to ouput the color variation of Simulation.

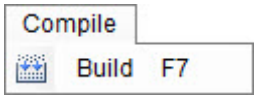
- At Section page, when a region is selected, execute Simulation will output the results according to colors and groups in settings.
- At Sentence page, when Sentence Demo is assigned, execute Simulation will output the results according to colors and groups in settings.

Loop Simulation: The feature provides users to ouput the color variation of Loop Simulation.

- At Section page, when a region is selected, execute Loop Simulation will output the results repeatedly according to colors and groups in settings.
- At Sentence page, when Sentence Demo is assigned, execute Loop Simulation will output the results repeatedly according to colors and groups in settings.

1.4.7 [Compile] Menu

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



Build: This feature is for compiling current *Q-Light* **.prj** file into binary file.

1.4.8 [Tool] Menu

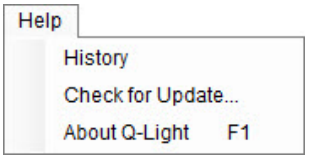
By clicking on the [Tools] on Menu Bar and the menu is shown below.

Q-Writer: *Q-Writer* is the software which enables user to download BIN file to the Flash Demo Board for verification.

Note: Q-Writer must be installed, or it can't be functional.

1.4.9 [Help] Menu

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



History: See the revision history of *Q-Light*.

Check for Update…: Check for the latest version of *Q-Light*. This function will connect to the Internet.

About Q-Light: Show current *Q-Light* version and the contact information for technical support.

1.5 Shortcut

Shortcut is located below the main menu bar. The buttons on Shortcut list can activate functions that are commonly used, and it allows user to access needed functions quickly instead of accessing them from the main menu bar.

New: Create a new *Q-Light* project.

Open: Open an existing *Q-Light* project.

Reopen: Open a recently accessed *Q-Light* file.

Save: Save the current *Q-Light* project.

Save As: Save a *Q-Light* project as another name or to another path.

Exit: Exit *Q-Light*.

Build: Compile current *Q- Light* file into binary file.

IC Body: Select IC Body.

Cut: Remove highlighted signals of currently editing channel.

Copy: Copy the highlighted signals of currently editing channel.

Paste: Paste the highlighted signals of currently editing channel.

Undo: Undo command reverses the last action in Section page.

Redo: Redo command redoes the last undone action in Section page.

Insert Mode: In the Section page, user can add the cut or copied signals at the point or selection.

Replace Mode: In the Section page, user can remove old data and replace it with the cut or copied signals.

Select Mode: Offer quick signals editing function in Section page.

Pencil Mode: Designed for adding, deleting or changing the signal position in Section page.

ROM Optimize: Optimize ROM by providing user the optimum signal position while editing signals in

Section page.

Line: In the Section page, Pencil Mode can be used to add points for drawing straight lines.

Cubic Spline: In the Section page, Pencil Mode can be used to add points for drawing cubic splines.

Level High: Set the currently selected signals to the ceiling, the signals would be brought to 100%.

Level Low: Set the currently selected signals to the bottom, the signals would be brought to 0%.

Level Control: Set the currently selected signals to an integer level.

Ascend: Replace the highlighted signals with a positive slope.

Descend: Replace highlighted signals with a negative slope.

Flashing: Replace the currently highlighted signals with signals alternating between 0% and 100%.

Invert: Invert the highlighted signals by 180 degrees. It turns the wave upside down. For example, the percentage of signal is x%, after reversal, the percentage has been turned to (100-x)%.

Reverse: Reverse the highlighted signals from right to left so it plays backwards.

Offset: Offset command adds an integer to the entire currently highlighted signals.

Shift: Shift command shifts the highlighted signals to right or left by an integer.

Simulation: The feature provides users simulate the ouput of color variation. Decribe as follows.

- At Section page, when a region is selected, execute Simulation will output the results according to colors and groups in settings.
- At Sentence page, when Sentence Demo is assigned, execute Simulation will output the results according to colors and groups in settings.

Loop Simulation: The feature provide users ouput the color variation of Loop Simulation. Describe as follows.

- At Section page, when a region is selected, execute Loop Simulation will output the results repeatedly according to colors and groups in settings.
- At Sentence page, when Sentence Demo is assigned, execute Loop Simulation will output the results repeatedly according to colors and groups in settings.

1.6 Toolbar

Toolbar displays the data and complete signal information of current *Q-Light* project, including Selection Information, Total Time and Select Mode.

Selection Information: Display currently selected waveform Information and provide user quickly select the waveform. The illustration is as following.

Start: Start of selected waveform, the unit is millisecond (ms).

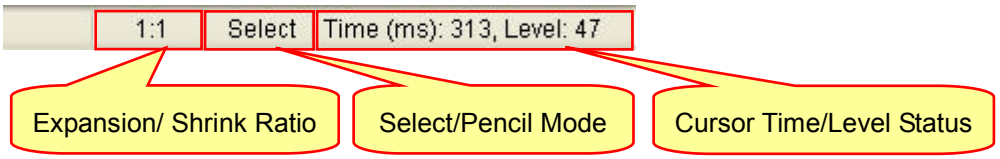
End: End of selected waveform, the unit is millisecond (ms).

Length: The length of selected waveform, the unit is millisecond (ms).

Total Time: The total time of selected waveform, the unit is millisecond (ms). Minimum length is 8 ms.

1.7 Status Bar

Status Bar displays different information about the current state of *Q-Light* project, Including Expansion/ Shrink Ratio, Select/Pencil Mode and the Cursor Time/Level Status information.

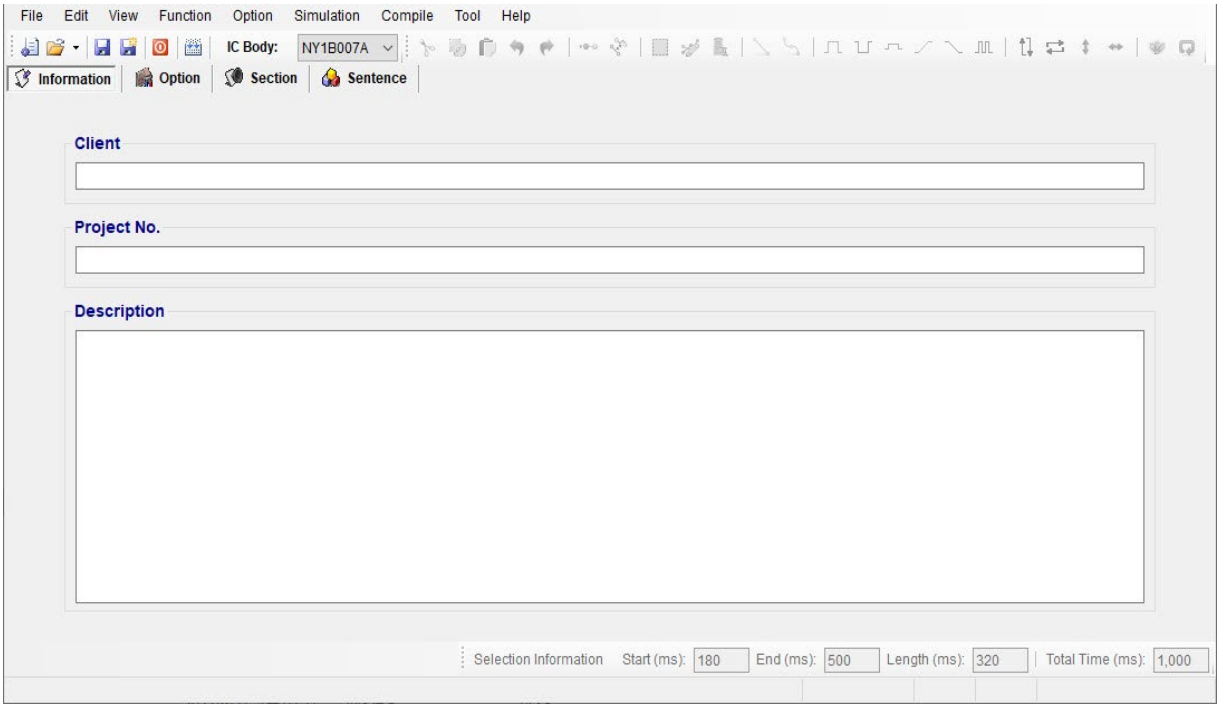


1.8 Controlling the Pages

Page contents vary for different IC series. There are four pages available in the window: Information, Option, Section and Sentence. To view a page, simply click on the corresponding page tab. Then, user can edit contents.

1.8.1 Information Page

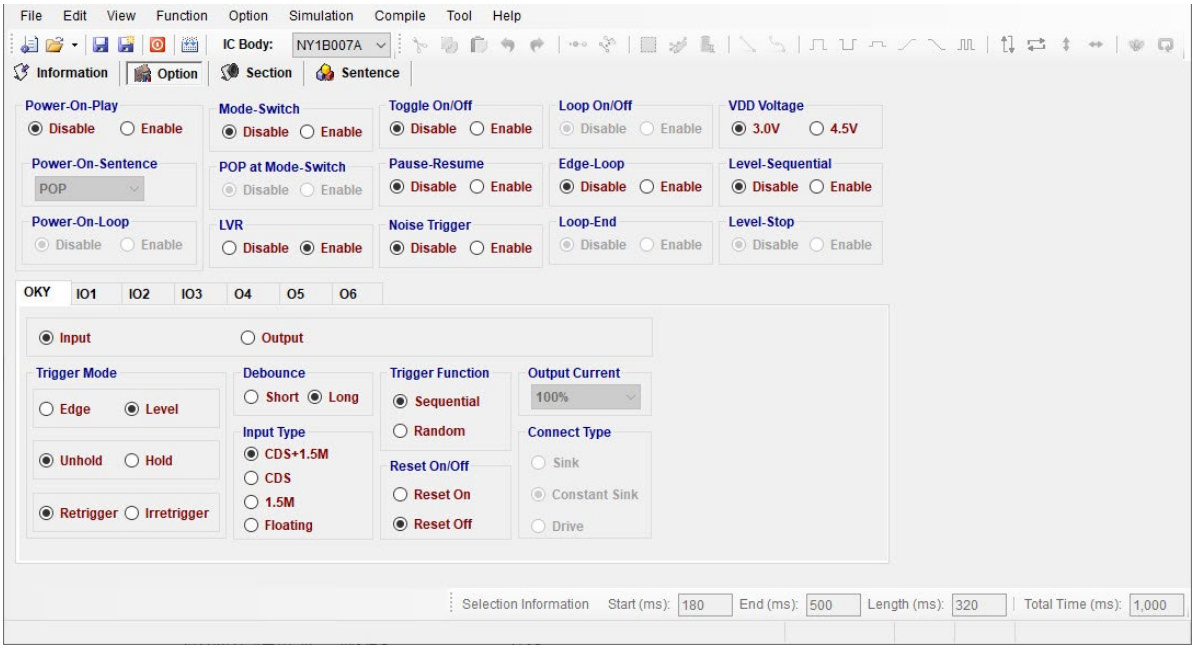
The Information Page is designed for recording the client name, project information and important points to be noted. The information on this page is for your reference and will be saved only in the **.prj** file. It will not be checked, compiled and included in the **.bin** file except the client name.



Note: The "Client" column is required! Project building fails if "Client" left blank.

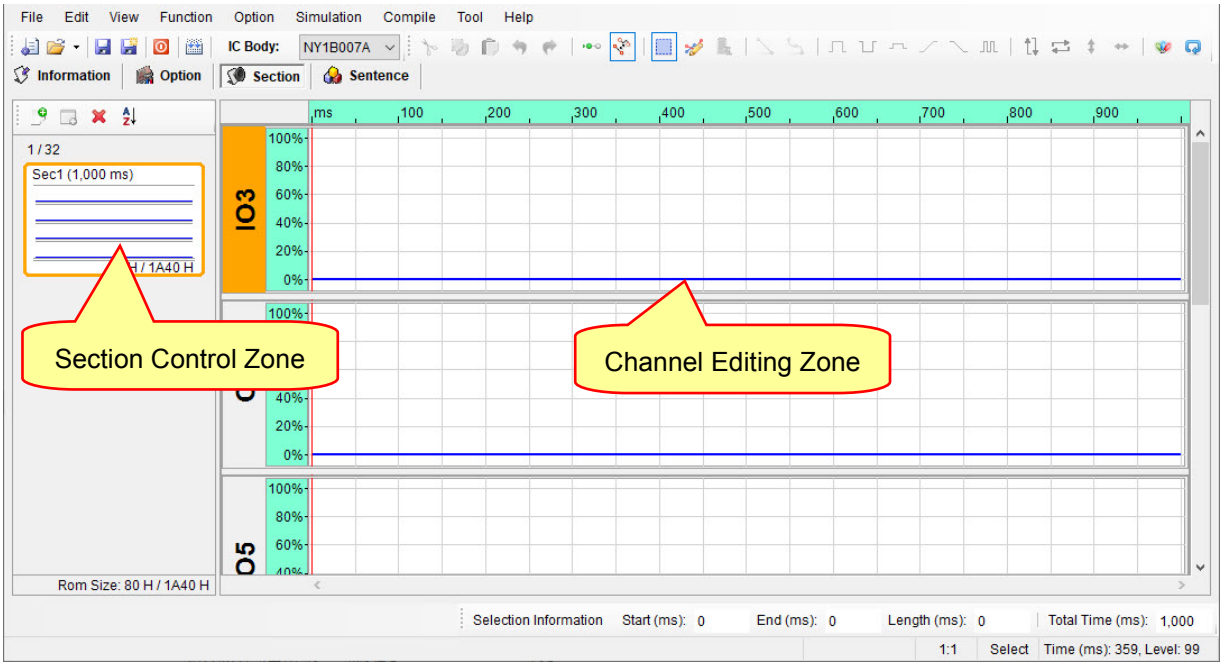
1.8.2 Option Page

Here is designed for setting mask options to control IC functions. Functions of different IC series are not the same, so the appearance of the Option page will be different for different IC series.



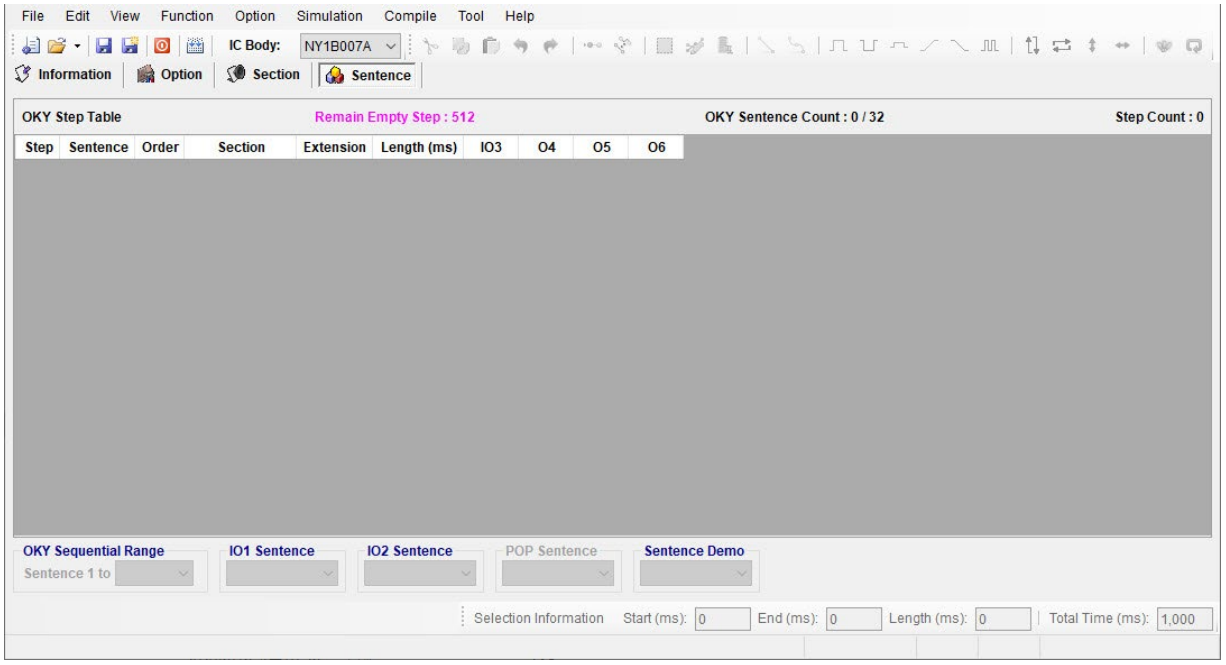
1.8.3 Section Page

The Section Page is designed for editing and managing sections. User can add or remove sections to edit signals. After sections appropriately included here, they could be arranged on the Sentence page later.



1.8.4 Sentence Page

The Sentence Page is designed for arranging sentences. By altering steps of a sentence, different combinations of sections could be created for effects. Functions of different IC series are not the same, so the appearance of the Sentence page will be different for different IC series.



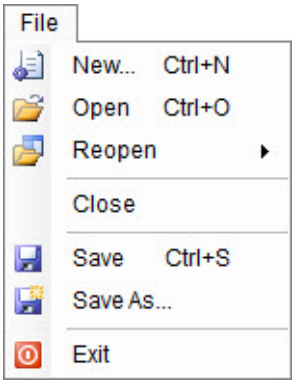
2 Using *Q-Light* for NY1Ax03A / NY1Ax03B Series

In this chapter, the details of using *Q-Light* for NY1Ax03A / NY1Ax03B will be presented step by step.

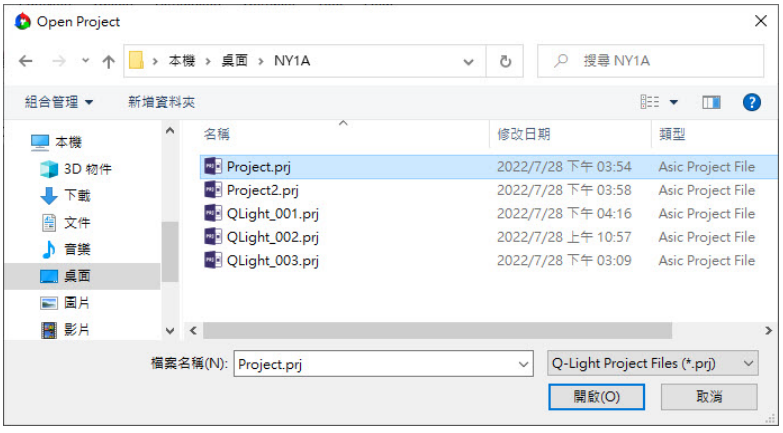
Contents:

2.1 Creating a *Q-Light* Project

After selecting [New…] or [Open] form [File], or clicking the [New] button on the Shortcut directly, then select NY1Ax03A / NY1Ax03B series to start edit.

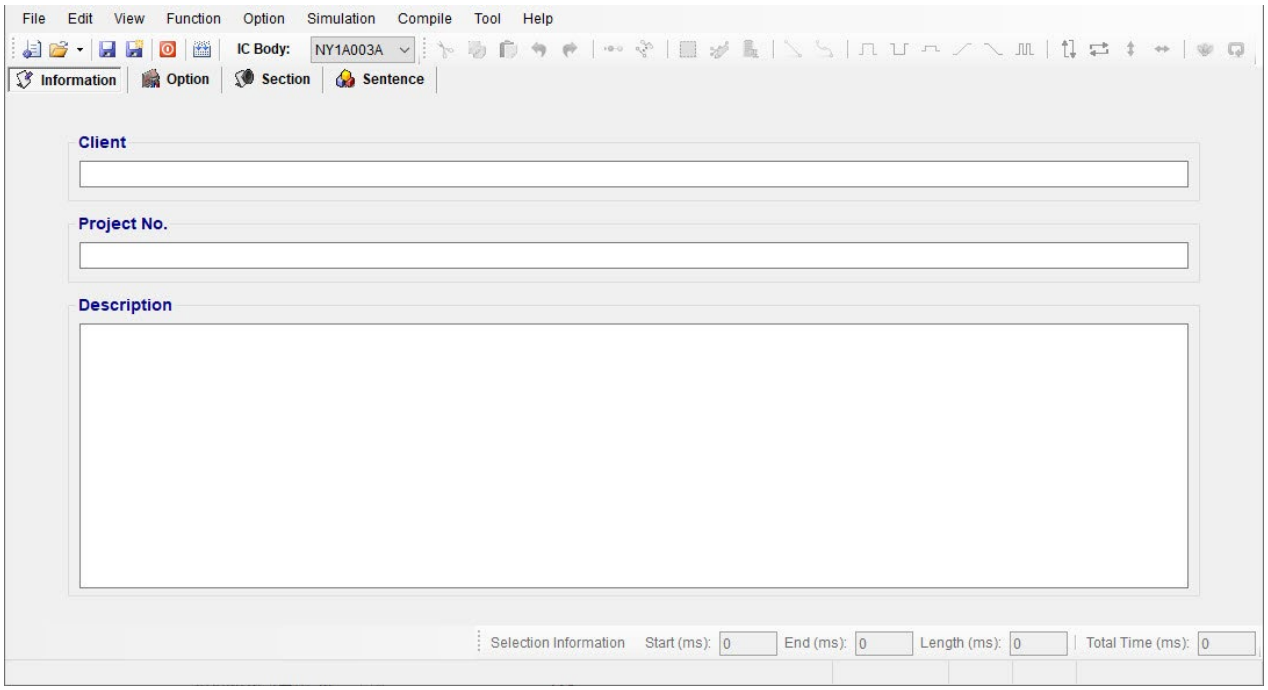


To modify an existing file, select [Open] from the [File] menu, and a dialog box for opening file will display shortly. After selecting a desired file within the [Open Project] dialog box, press [Open] button, or double-click it directly, and the existing file will be opened. If the file to be opened has been edited recently, it can be found on the list of [Reopen] option and could be opened directly.



2.2 Filling in the Information

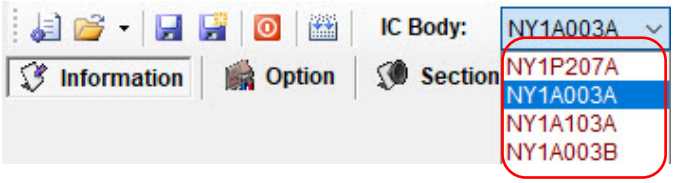
The Information page will be shown immediately after the file is opened. Any words can be typed in the blanks of this page, and the information on this page will be saved completely in the *Q-Light* file (**.prj**). Since the information on this page, except [Client] blank, is just for user to annotate or record, no error checking will be performed by *Q-Light.* All information will not be included in the **.bin** file except the client name.



Note: The client name on this page will be included in the Checking List and Confirm Table after compiling. 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.

2.3 Selecting the IC Body

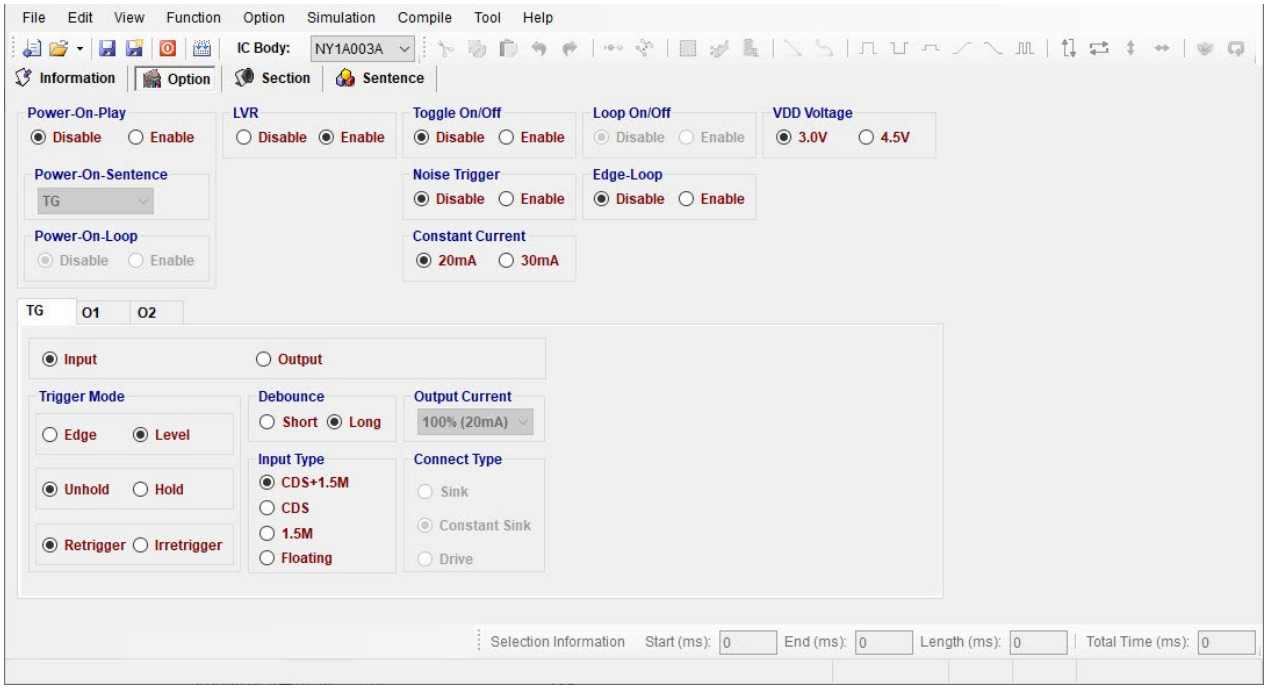
The [IC Body] drop-down list is at the top of the window. By clicking the Down button of it, all available IC bodies will be listed for selection. IC body could be changed during editing a project, but an error message in red word may display if the total ROM size of current sections exceeds the capacity of selected IC body.



2.4 Selecting the Mask Options

By selecting different mask options in Option page, the complicated functions could be accomplished quickly. Although different series IC have different functions, there are usually similar items in Option page.

Such as Debounce Time, Trigger Mode, etc, could be set easily in Option page.



2.4.1 Power-On-Play

When Power-On-Play option is enabled, IC will play the POP Sentence one time when power is on. The trigger mode is fixed as Edge / Unhold / Retrigger.

When cooperating with Power-On-Loop function, the POP Sentence will be played in loop until other key-trigger happened. When another key is triggered, it stops playing the POP Sentence and immediately plays the assigned sentence of triggered key.

Note: When the function is enabled, the POP Sentence can be assigned in Sentence page.

2.4.2 Power-On-Sentence

The Power-On-Sentence option allows user to set the IC to play TG Sentence or POP Sentence one time when power is on.

Note: 1. This option can be set only at Power-On-Play status is enabled.

2. For NY1Ax03A / NY1Ax03B series, the Power-On-Sentence is fixed as TG.

2.4.3 Power-On-Loop

When Power-On-Loop option is enabled, IC will play the POP Sentence in loop when power is on.

Note: This option can be set only when Power-On-Play status is enabled.

2.4.4 Toggle On/Off

The Toggle On/Off function allows user to immediately stop playing by pressing the same input button

again. “Toggle On/Off” option is default as Disable. To enable this function, switch it to “Enable”, and specify the key in “Toggle Key” column (and the specific trigger will be fixed as Unhold and Retrigger).

2.4.5 Noise Trigger

By antenna effect, it takes place an input signal when larger noise happens outside.

2.4.6 Edge-Loop

When Edge-Loop option is enabled, then it will play the assigned sentence in loop while the key is triggered.

2.4.7 Loop On/Off

When the key function is Edge-Loop, enabling the Loop On/Off option can achieve Toggle On/Off function. That is, the first trigger plays first sentence in loop, and the second trigger stops playing. Once the key is triggered again, it plays the next sentence in loop, and stops playing if triggered again during playing, and so on.

Note: Loop On/Off and Toggle On/Off cannot coexist.

2.4.8 LVR

When VDD voltage is lower than 1.5V, IC will automatically reset. The default setting of LVR function is “Enable”. Choose “Disable” can turn off this function.

Note: 1. If both Power-On-Play option and LVR option are “Enable”, the POP Sentence will be played after LVR acts.

2. As LVR option is enabled, the TG Sentence will be played after LVR acts if TG is held.

2.4.9 VDD Voltage

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

2.4.10 Trigger Mode

The mode of a trigger must be specified to completely define the input functions. Specify the trigger mode by choosing from the following three types of options:

- The Edge and Level options specify whether the trigger should respond to the rising edge or the high level of the input signal.
- The Hold and Unhold options specify whether you need to keep on pressing the trigger button to execute the whole sentence. When the option is Hold, trigger button is fixed as Irretrigger.
- The Retrigger and Irretrigger options specify whether the trigger can be functional when a sentence is playing.

2.4.11 Debounce Time

Debounce Time is a playback-speed-dependent function. There are two kinds of debounce time to be selected. The long debounce time is used for debouncing the push button trigger input while the short debounce time is used for debouncing the electrical transition such as CDS input. Selecting the right debounce time can avoid unwanted double triggers by the bouncing of trigger button.

2.4.12 Input Type

The Input Type usually represents the Pull-Low setting of an input. There are 4 input type options corresponding to different applications.

Option	Input Type Description
CDS + 1.5M	Normal selection for button trigger. 1.5MΩ Pull-Low resistance when button is pressed. Inside the IC is a Pull-Low resistance of approximately 250KΩ in parallel with 1.5 MΩ + 300 KΩ when button is released
CDS	Internal 300KΩ Pull-Low resistance, usually for photo-resistor trigger. Floating when button is pressed and 300KΩ Pull-Low resistance when button is released.
1.5M	Internal 1.5MΩ Pull-Low resistance, reserved for some special applications.
Floating	No internal resistor connection, and is usually connected to other output pin or connected to GND by an external resistor.

2.4.13 Connect Type

When TG or other Ox is set as output, user could specify a status signal as the output signal. There are 3 connect type options corresponding to different applications as below.

Option	Connect Type Description
Sink	Output pin connects LED to VDD and offers 4 different output current options including 100%, 83%, 50% and 33%.
Constant Sink	Output pin connects LED to VDD, output current is constant, and the LED brightness will not be affected by VDD differences. It offers 4 different output current options including 100%, 83%, 50% and 33%.
Drive	Output pin connected LED to GND, there is only a current (100%).

2.4.14 Output Current

When TG or other Ox is set as output, user could specify an output current which offers available options corresponding to different connect type. There are 3 connect type options corresponding to different output current as below.

Option	Output Current Description
Sink	Offering 4 different output current (100%, 83%, 50% and 33%).
Constant Sink	Offering 4 different output current (100%, 83%, 50% and 33%).
Drive	There is only a current (100%).

2.4.15 Constant Current

Constant current function provides 2 options of setting current: 20mA and 30mA. When the connect type is set as Constant Sink, there are 4 choices of output current. User could see the percentage and corresponding mA parameters.

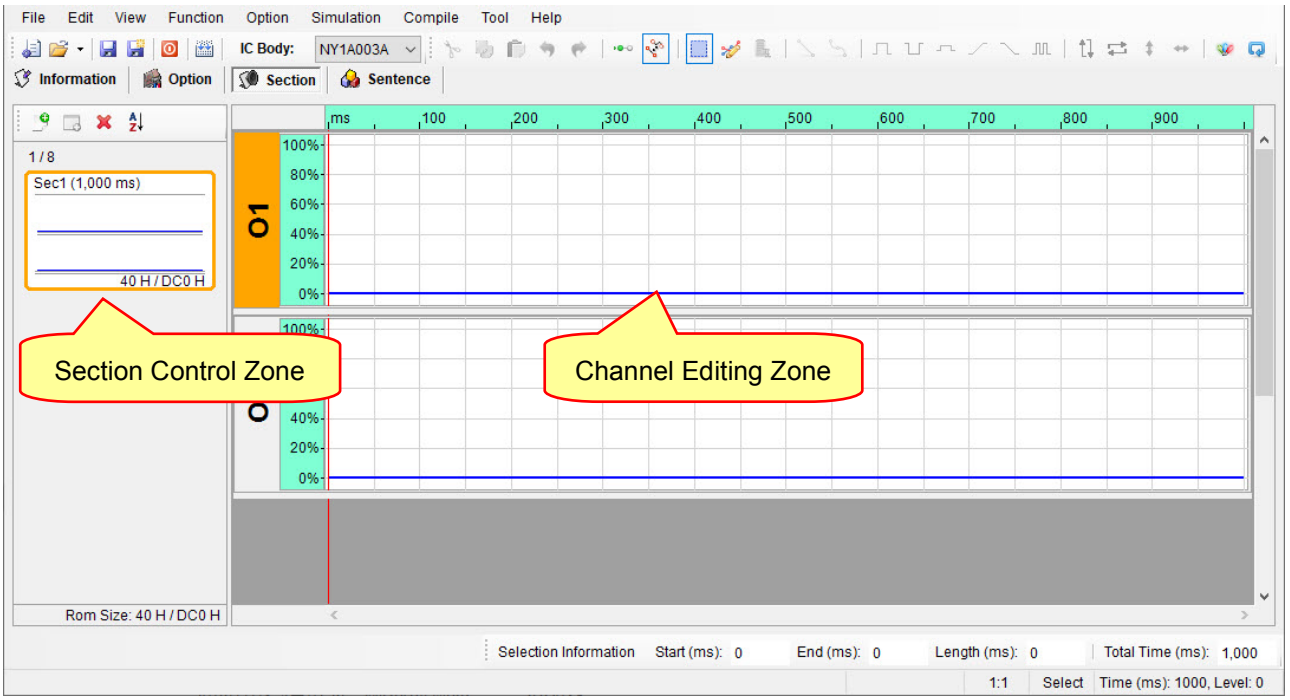
Options	Constant Current Descriptions
20mA	Offering 4 different output current (100%=20mA、83%=16.7mA、50%=10mA、33%=6.7mA).
30mA	Offering 4 different output current (100%=30mA、83%=25mA、50%=15mA、33%=10mA).

Note: 1. Only when IC Body is NY1A003A, NY1A103A, NY1A003B, NY1A103B , NY1C007A or NY1P207A is the function available.

2. When IC Body is NY1P207A, and the current is 30mA, only OKY, IO1 and IO2 are available.

2.5 Managing the Sections

Section page allows user to manage and edit sections, and it allows 8 sections maximum in NY1Ax03A / NY1A03B series.



2.5.1 Section Control Zone

Section Control Zone allows user to add, remove and arrange the sequence of sections.

Functions of toolbar are shown below:

Add Section：Create a new section.

Add Mute Section：Create a new mute section, the maximum duration will be reduced by the amount of output Pin.

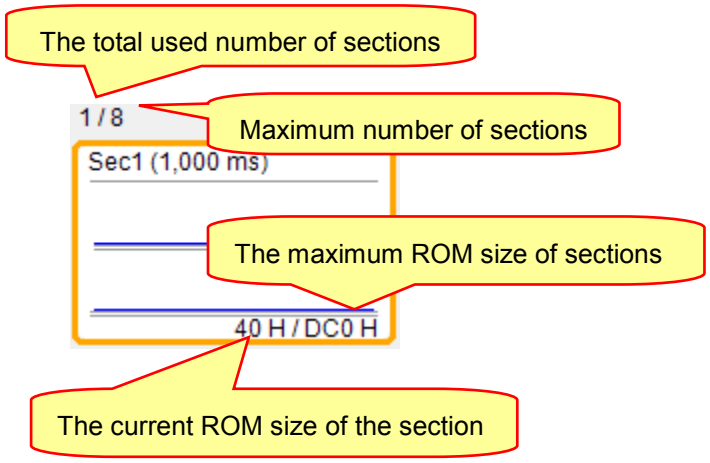
Remove Section：Delete the selected section.

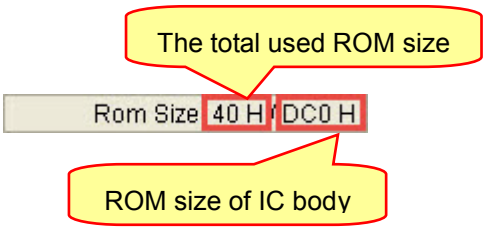
Sort：Sort sections by number or title.

User can add or remove sections with toolbar, or right-click in Section Control Zone; meanwhile, user can change the name or length of section through Section Properties.

The total number of sections and the total used ROM Size are displayed at the bottom of the page. The total used ROM Size must not exceed the available total ROM Size. The following table is the detailed specifications.

IC	Section			Total (H)
	Resolution (H)	Max (H)	Count	
NY1A003A	40	DC0	8	DC0
NY1A003B	40	DC0	8	DC0
NY1A103A	80	1B80	8	1B80
NY1A103B	80	1B80	8	1B80





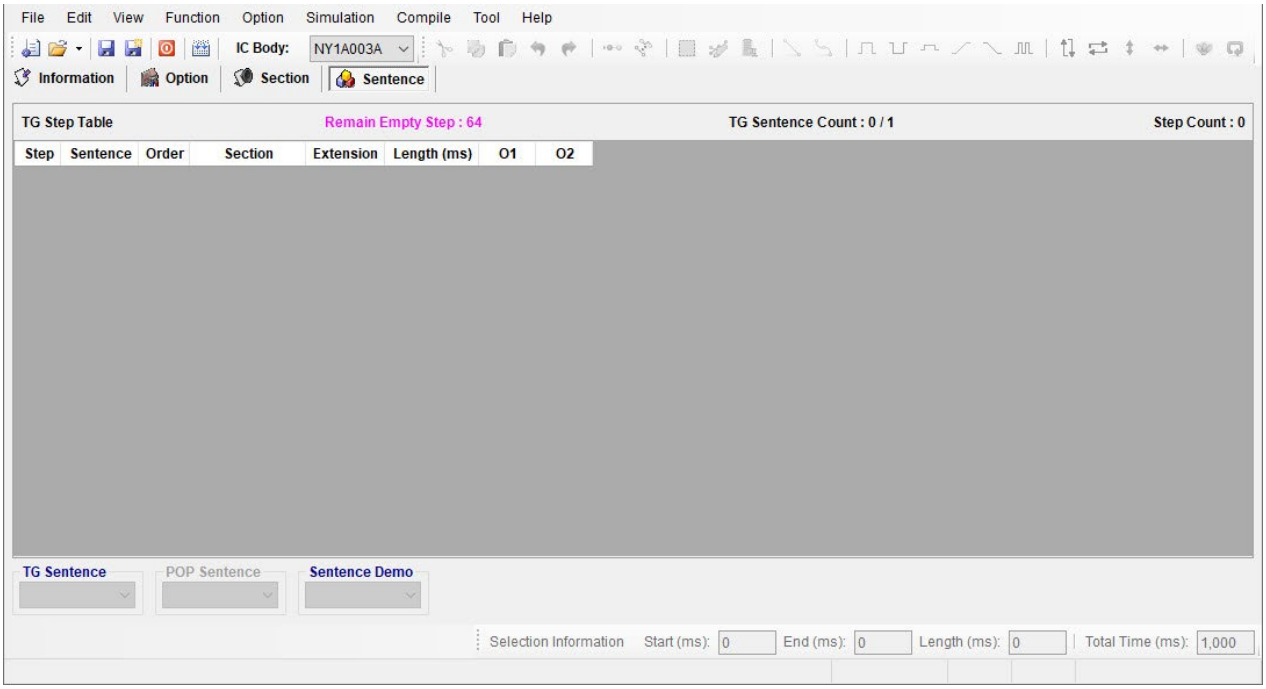
Note: It does not allow coexisting sections with the same file name.

2.5.2 Channel Editing Zone

Channel Editing Zone displays all output channels, providing user to edit signals. Clicking on an existing section in Section Control Zone can select section for further editing, and then user can quick edit signals through Hot Key or buttons on Shortcut.

2.6 Arranging the Sentences

A “sentence” means a combination of sections to be played when triggered. For NY1Ax03A / NY1Ax03B series there is only 1 sentence available under the limit of total 64 steps.



2.6.1 Step Column

For NY1Ax03A / NY1Ax03B there are total 64 steps that can be defined for the step table. Every step can have a section or a mute section with associated output actions. The total number of defined steps is shown beyond the step table in this window.

2.6.2 Sentence Column

The Sentence column shows the sentence numbers the steps belong to. For NY1Ax03A / NY1Ax03B, there is only 1 (1 to 1) sentence available. To add a step, right-click the mouse and select “Add Step” from the pop-up menu. To insert a sentence, select the step that is desired to be inserted and then right-click the mouse and select “Insert Step” from the pop-up menu. To remove a step, select the step and right-click the mouse to select “Remove Step” or “Clear”.

2.6.3 Order Column

The Order column shows the sequence numbers of the steps contained in each sentence. *Q-Light* will automatically generate the sequence numbers for all the steps in a sentence in ascending order. When this sentence is executed due to an input trigger, step 1 will be played first, followed by step 2 and step 3, and so on.

2.6.4 Section Column

Selecting a section here means the corresponding section or mute on Section page will be arranged in the sentence.

2.6.5 Extension

The Extension column shows extension ratio to the original length of section. There are 4 extension ratio options (x1, x2, x4, x8) to be chosen. User can set the appropriate ratio to save Data Size, and each step can be specified a ratio of individually.

2.6.6 Length Column

Length applied to sentences refers to the settings on Section page, it cannot be edited at this page.

2.6.7 TG Column

When TG is set as output in Option page, then TG column is available for switching output channel On/Off, and each step can be set individually.

Note: When TG is set as "Output" in Option page, the play function is restricted as Power-On-Play (POP).

2.6.8 Ox Column

The Ox column shows the status (On/Off) of each output channel. Each step can be set with unique output status respectively.

2.6.9 TG Sentence

TG Sentence is available only when TG is set as input in Option page. User could specify which sentence will be executed when TG is triggered.

2.6.10 POP Sentence

POP Sentence is available only when Power-On-Play (POP) is enabled in Option page. User could specify which sentence will be executed when power is on.

2.6.11 Right-Click Menu

A right-click menu will show on the right by right-click. The functions of the menu items are as follows:

Menu Item	Function
Add Step	Add a new step.
Insert Step	Insert a step at the selected step.
Remove Step	Delete the selected step.
Add Sentence	Add a new sentence.
Insert Sentence	Insert a sentence.
Remove Sentence	Remove the selected sentence.
Clear	Remove all sentences.

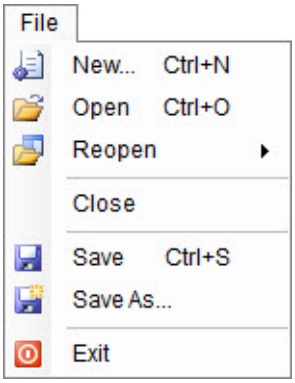
3 Using *Q-Light* for NY1Bx05A Series

In this chapter, the details of using *Q-Light* for NY1Bx05A will be presented *step* by step.

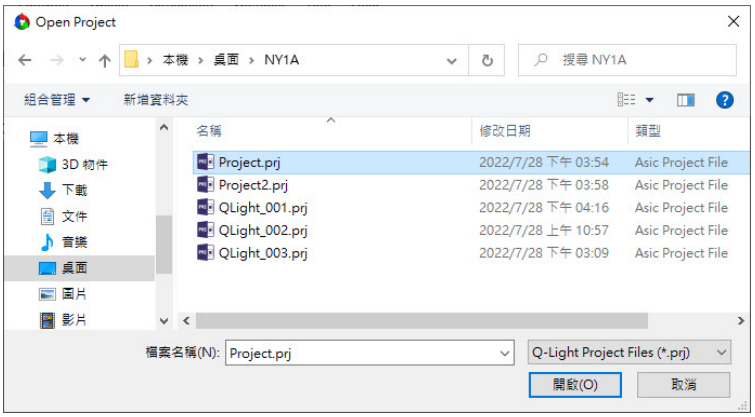
Contents:

3.1 Creating a *Q-Light* Project

After selecting [New…] or [Open] form [File], or clicking the [New] button on the Shortcut directly, then select NY1Bx05A series to start edit.

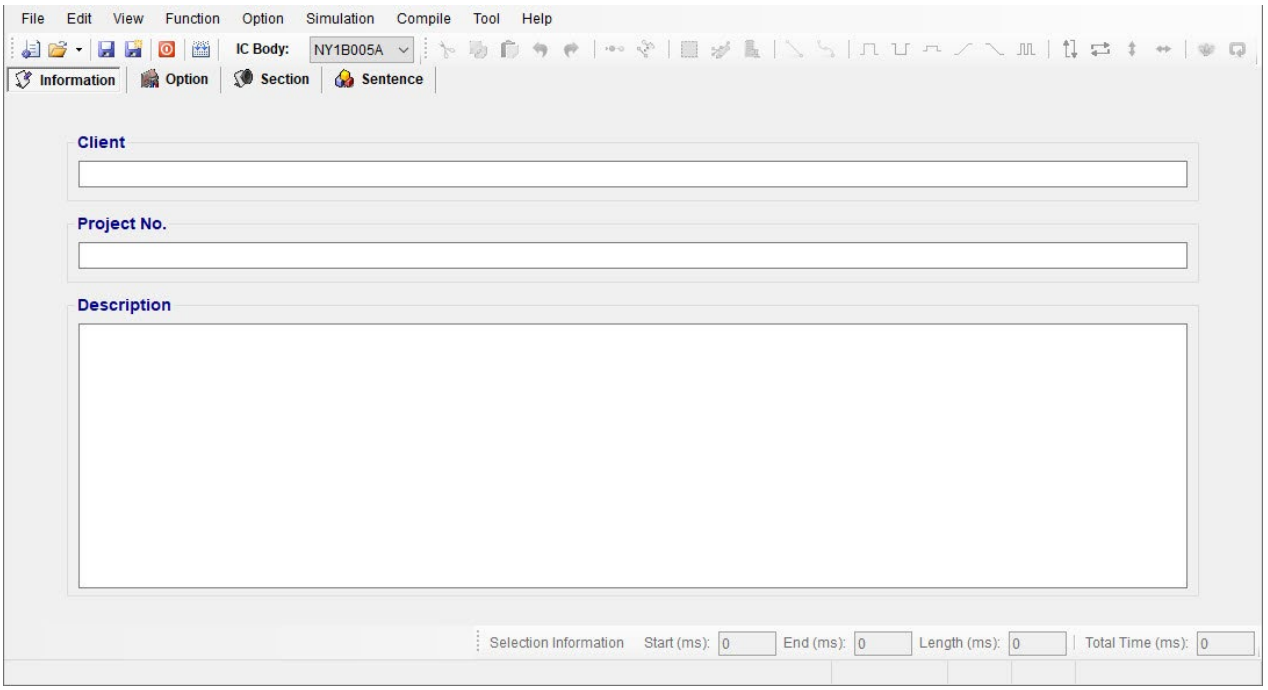


To modify an existing file, select [Open] from the [File] menu, and a dialog box for opening file will display shortly. After selecting a desired file within the [Open Project] dialog box, press [Open] button, or double-click it directly, and the existing file will be opened. If the file to be opened has been edited recently, it can be found on the list of [Reopen] option and could be opened directly.



3.2 Filling in the Information

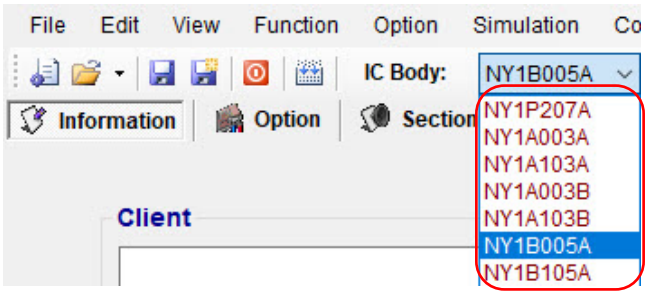
The Information page will be shown immediately after the file is opened. Any words can be typed in the blanks of this page, and the information on this page will be saved completely in the *Q-Light* file. Since the information on this page, except [Client] blank, is just for user to annotate or record, no error checking will be performed by *Q-Light*. All information will not be included in the **.bin** file except the client name.



Note: The client name on this page will be included in the Checking List and Confirm Table after compiling. 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.

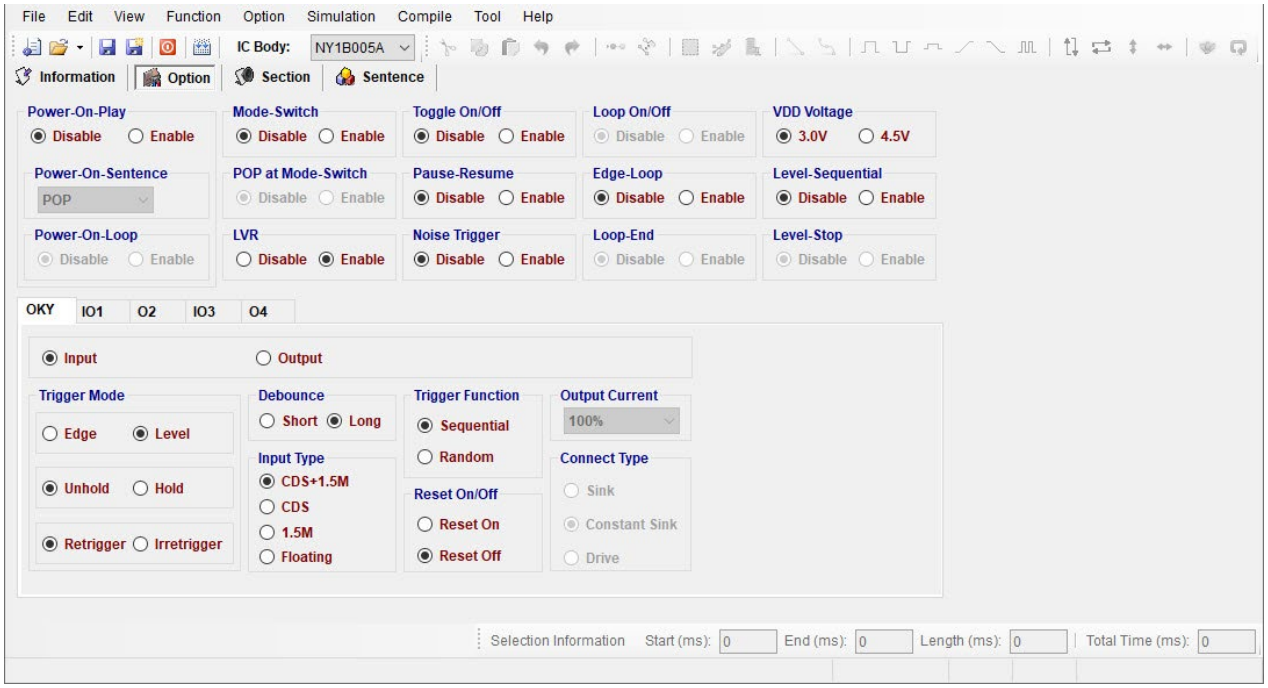
3.3 Selecting the IC Body

The [IC Body] drop-down list is at the top of the window. By clicking the Down button of it, all available IC bodies will be listed for selection. IC body could be changed during editing a project, but an error message in red word may display if the total ROM size of current sections exceeds the capacity of selected IC body.



3.4 Selecting the Mask Options

By selecting different mask options in Option page, the complicated functions could be accomplished quickly. Although different series IC have different functions, there are usually similar items in Option page. Such as Debounce Time, Trigger Mode, etc, could be set easily in Option page.



3.4.1 Power-On-Play

When Power-On-Play option is enabled, IC will play the POP Sentence or sequentially play OKY Sentence one time when power is on. The trigger mode is fixed as Edge / Unhold / Retrigger.

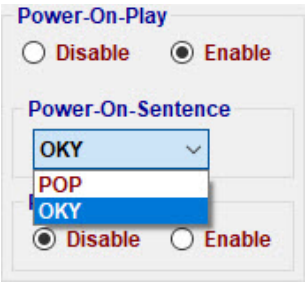
When cooperating with Power-On-Loop function, the POP Sentence or OKY Sentence will be played in loop until other key-trigger happened. When another key is triggered, it stops playing the designated sentence and immediately plays the assigned sentence of triggered key.

If POP cooperates with Mode-Switch function, the POP will be executed first when power is on.

Note: When the function is enabled, the POP Sentence can be assigned in Sentence page.

3.4.2 Power-On-Sentence

The Power-On-Sentence option allows user to set the IC to play OKY Sentences or POP Sentence one time when power is on.



Note: 1. This option can be set only at Power-On-Play status is enabled.

2. When OKY is set as output, the Power-On-Sentence is fixed as POP.

3.4.3 Power-On-Loop

When Power-On-Loop option is enabled, IC will play the POP Sentence in loop when power is on.

Note: This option can be set only when Power-On-Play status is enabled.

3.4.4 POP at Mode-Switch

When POP at Mode-Switch is enabled, IC will play the POP Sentence once as Mode switched.

Note: POP at Mode Switch option is not available until both Mode-Switch and Power-On-Play are enabled.

3.4.5 Mode-Switch

Mode-Switch enables inputs to have 2 kinds of functions with the same key. IO3 can be set as Switch Pin, and then IO3 connecting can be switched between GND (the 1st Mode) and VDD (the 2nd Mode) to realize Mode-Switching. Although input functions can be different between modes, the output functions (current & connect type) must be the same between modes.

3.4.6 Toggle On/Off

The Toggle On/Off function allows user to immediately stop playing by pressing the same input button again. “Toggle On/Off” option is default as Disable. To enable this function, switch it to “Enable”, and specify the key in “Toggle Key” column (and the specific trigger will be fixed as Unhold and Retrigger).

3.4.7 Pause-Resume

If OKY key is triggered during playing, the OKY Sentence will pause and LED will stop flashing. When the key is triggered again, it will play the sentence form previous pause.

Note: 1. Pause-Resume and Level-Stop cannot coexist.

2. When opening Pause-Resume, Toggle On/Off function is invalid.

3.4.8 Noise Trigger

By antenna effect, it takes place an input signal when larger noise happens outside.

3.4.9 Level-Sequential

Level-Sequential is a special application of OKY. When OKY is triggered and held, it plays assigned sentences sequentially in loop (S1, S2, S3, S1, S2, S3, …). When key is released, it stops playing immediately (under Hold mode), or stops playing at end of current sentence (under Unhold mode). Triggering again, it will start from the next sentence, playing sequentially in loop as key is held.

Cooperating with Edge-Loop function, it plays assigned sentences sequentially in loop (S1, S2, S3, S1, S2, S3, …) when OKY is triggered (but not held). Triggering again when playing, it will play next sentences sequentially in loop.

Cooperating with both Edge-Loop and Loop On/Off function, it plays the assigned sentences sequentially in loop (S1, S2, S3, S1, S2, S3, …) when OKY is triggered (but not held), and stops playing when triggered again. If the key is triggered again after being toggled off, it will play the next sentences sequentially in loop.

3.4.10 Edge-Loop

Edge-Loop is a special application of OKY. When the specific key is triggered, it will play the assigned sentence in loop.

Cooperating with OKY Sequential function, the first trigger plays first sentence in loop, the second trigger plays second sentence in loop, the third trigger plays third sentence in loop, and so on.

Cooperating with OKY Sequential and Loop On/Off function, the first trigger plays first sentence in loop, and the second trigger stops playing. Once the key is triggered again, it plays the next sentence (with OKY Sequential) in loop, and stops playing if triggered again during playing, and so on.

3.4.11 Loop On/Off

When the key function is Edge-Loop, enabling the Loop On/Off option can achieve Toggle On/Off function. That is, the first trigger plays first sentence in loop, and the second trigger stops playing. Once the key is triggered again, it plays the next sentence (with OKY Sequential) in loop, and stops playing if triggered again during playing, and so on.

Note: Loop On/Off and Toggle On/Off cannot coexist.

3.4.12 Loop-End

Loop-End will stop playing when triggering at the playing of the last OKY Edge-Loop sentence. Triggering again after stop, it will start from the first OKY sentence and play it in loop again (S1→ S2 → S3 → Stop → S1).

Note: Loop On/Off and Loop-End cannot coexist.

3.4.13 Level-Stop

When Level-Stop option is enabled, IC will stop playing when OKY1 (as input) is pressed more than 2 seconds.

Note: Pause-Resume and Level-Stop cannot coexist.

3.4.14 LVR

When VDD voltage is lower than 1.5V, IC will automatically reset. The default setting of LVR function is “Enable”. Choose “Disable” can turn off this function.

Note: 1. If both Power-On-Play option and LVR option are “Enable”, the POP Sentence will be played after LVR acts.

2. As LVR option is enabled, the sentence 1 of OKY will be played after LVR acts if OKY is held.

3.4.15 VDD Voltage

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

3.4.16 Trigger Mode

The mode of a trigger must be specified to completely define the input functions. Specify the trigger mode by choosing from the following three types of options:

- The Edge and Level options specify whether the trigger should respond to the rising edge or the high level of the input signal.
- The Hold and Unhold options specify whether you need to keep on pressing the trigger button to execute the whole sentence. When the option is Hold, trigger button is fixed as Irretrigger.
- The Retrigger and Irretrigger options specify whether the trigger can be functional when a sentence is playing.

3.4.17 Debounce Time

Debounce Time is a playback-speed-dependent function. There are two kinds of debounce time to be selected. The long debounce time is used for debouncing the push button trigger input while the short debounce time is used for debouncing the electrical transition such as CDS input. Selecting the right debounce time can avoid unwanted double triggers by the bouncing of trigger button.

3.4.18 Input Type

The Input Type usually represents the Pull-Low setting of an input. There are 4 input type options corresponding to different applications.

Option	Input Type Description
CDS + 1.5M	Normal selection for button trigger. 1.5MΩ Pull-Low resistance when button is pressed. Inside the IC is a Pull-Low resistance of approximately 250KΩ in parallel with 1.5 MΩ + 300 KΩ when button is released
CDS	Internal 300KΩ Pull-Low resistance, usually for photo-resistor trigger. Floating when button is pressed, and 300KΩ Pull-Low resistance when button is released.
1.5M	Internal 1.5MΩ Pull-Low resistance, reserved for some special applications.
Floating	No internal resistor connection, and is usually connected to other output pin or connected to GND by an external resistor.

3.4.19 OKY Trigger Function

The OKY Trigger Function allows user to set the IC to play sentences in a sequential or random manner for two consecutive triggers applied to OKY pin. When sequential trigger function is selected, the IC will play the “next” sentence whereas a random sentence will be played when random trigger function is selected.

3.4.20 OKY Reset On/Off

When Reset is ON, the IC will reset the sentence sequential pointer once another input pin (IOx) is pressed. It means after IOx is pressed, pressing OKY will lead to the playing of sentence 1. When Reset is OFF, the playing sequence of OKY will keep unaffected.

3.4.21 Connect Type

When OKY, IO1 or other Ox is set as output, user could specify a status signal as the output signal. There are 3 connect type options corresponding to different applications as below.

Option	Connect type Description
Sink	Low active signal output during playing and offers 4 different output current options including 100%, 83%, 50% and 33%.
Constant Sink	Low active signal output during playing, output current is constant, and the LED brightness will not be affected by VDD differences. It offers 4 different output current options including 100%, 83%, 50% and 33%.
Drive	High active signal output during playing, there is only a current (100%).

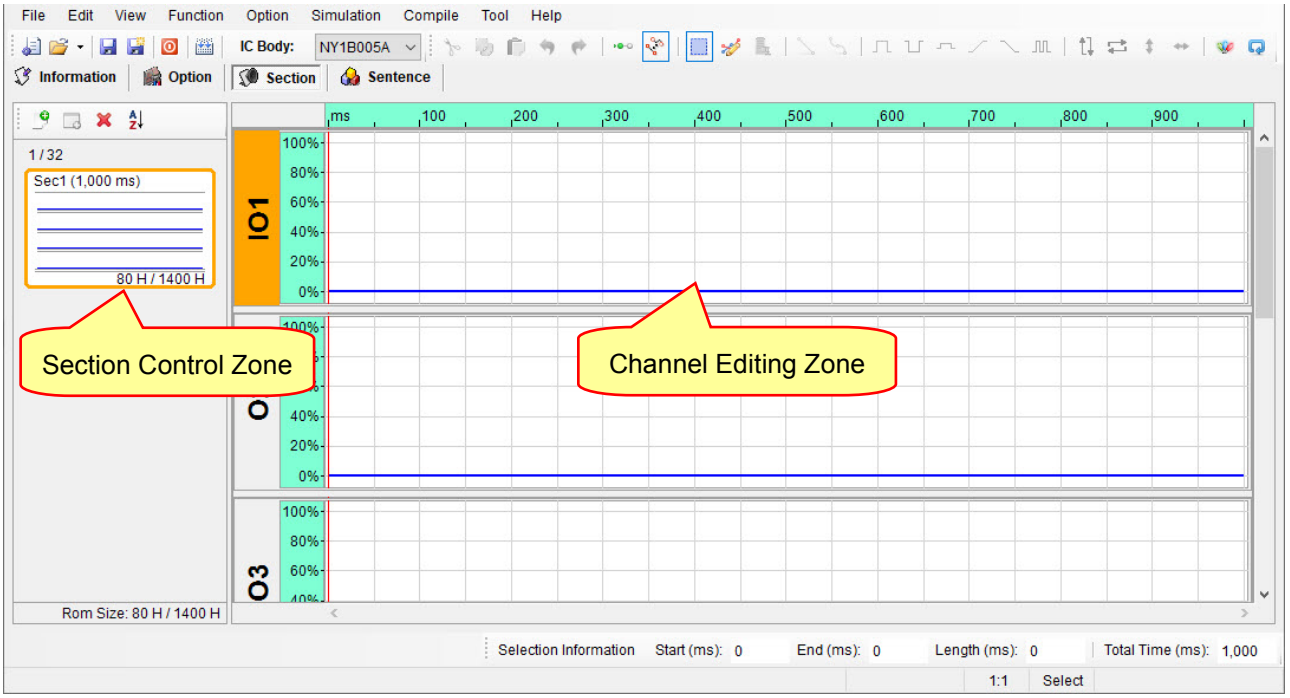
3.4.22 Output Current

When OKY, IO1 or other Ox is set as output, user could specify an output current which offers available options corresponding to different connect type. There are 3 connect type options corresponding to different output current as below.

Option	Output Current Description
Sink	Offering 4 different output current (100%, 83%, 50% and 33%).
Constant Sink	Offering 4 different output current (100%, 83%, 50% and 33%).
Drive	There is only a current (100%).

3.5 Managing the Sections

Here allows user to manage and edit sections, and it allows 32 sections maximum in NY1Bx05A series.



3.5.1 Section Control Zone

Section Control Zone allows user to add, remove and arrange the sequence of sections.

Functions of toolbar are shown below.

Add Section：Create a new section.

Add Mute Section：Create a new mute section, the maximum duration will be reduced by the amount of output Pin.

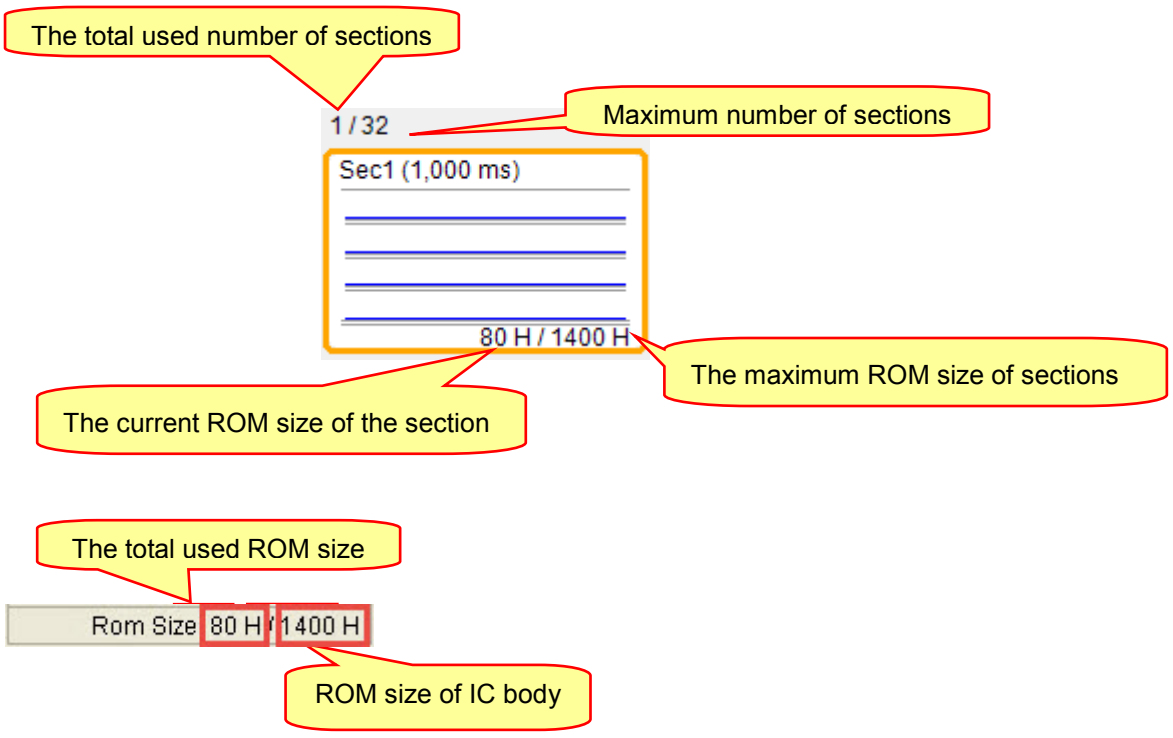
Remove Section：Delete the selected section.

Sort：Sort sections by number or title.

User can add or remove sections with toolbar, or right-click in Section Control Zone; meanwhile, user can change the name or length of section through Section Properties.

The total number of sections and the total used ROM Size are displayed at the bottom of the page. The total used ROM Size must not exceed the available total ROM Size. The following table is the detailed specifications.

	Section			Total (H)
	Resolution (H)	Max (H)	Count	
NY1B005A	40	1400	32	1400
NY1B105A	80	1FFE	32	2800



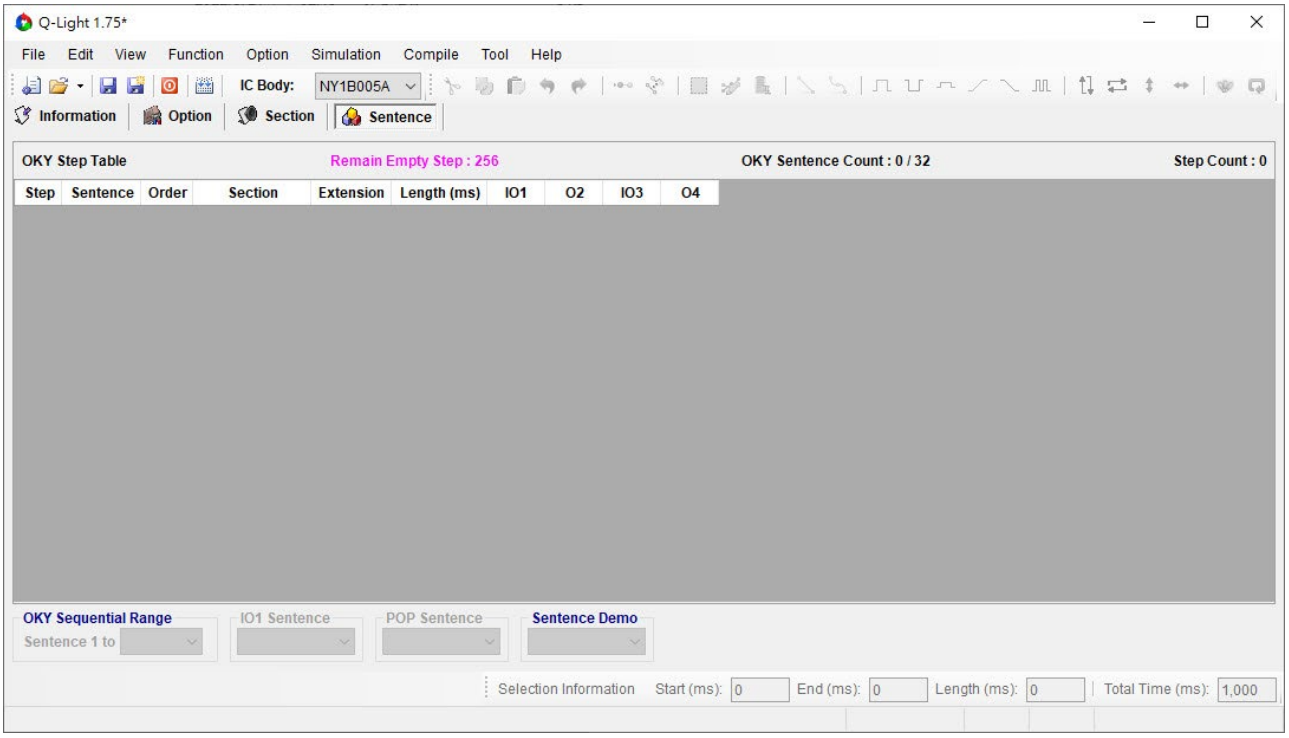
Note: It does not allow coexisting sections with the same file name.

3.5.2 Channel Editing Zone

Channel Editing Zone displays all output channels, providing user to edit signals. Clicking on an existing section in Section Control Zone can select section for further editing, and then user can quick edit signals through Hot Key or buttons on Shortcut.

3.6 Arranging the Sentences

A “sentence” means a combination of sections to be played when triggered. For NY1Bx05A series there are 32 sentences available under the limit of total 256 steps.



3.6.1 Step Column

For NY1Bx05A there are total 256 (000 to 255) steps that can be defined for the step table. Every step can have a section or a mute section with associated output actions. The total number of defined steps is shown beyond the step table in this window.

3.6.2 Sentence Column

This column shows the sentence numbers the steps belong to. For NY1Bx05A, there are 32 (1 to 32) sentences available. Every sentence, which may contain several steps, can specify which section to play. To add a sentence, click on the last step of sentence column and select the next number from the drop-down list. A sentence cannot be inserted directly in the step table. To insert a sentence, select the step that is desired to be inserted and then right-click the mouse and select “Insert Step” from the pop-up menu. To remove a step, select the step and right-click the mouse to select “Remove Step” or “Clear” from the pop-up menu.

3.6.3 Order Column

The Order column shows the sequence numbers of the steps contained in each sentence. *Q-Light* will automatically generate the sequence numbers for all the steps in a sentence in ascending order. When this sentence is executed due to an input trigger, step 1 will be played first, followed by step 2 and step 3, and so on.

3.6.4 Section Column

Selecting a section here means the corresponding section or mute in Section page will be arranged in the sentence.

3.6.5 Extension Column

The Extension column shows extension ratio to the original length of section. There are 4 extension ratio options (x1, x2, x4, x8) to be chosen. User can set the appropriate ratio to save Data Size, and each step can be specified a ratio of individually.

3.6.6 Length Column

Length applied to sentences refers to the settings in Section Page, and they cannot be edited at this page.

3.6.7 OKY and IO1 Column

When OKY or IO1 is set as output in Option page, then OKY or IO1 column is available for switching output channel On/Off, and each step can be set indivisually.

3.6.8 Ox Column

The Ox column shows the status (On/Off) of each output channel. Each step can be set with unique output status respectively.

3.6.9 OKY Sequential Range

When the OKY Trigger Function is sequential, the Sequential Range means it will loop sentences in the range by triggering OKY. For example, if this range is S1~S4, triggering OKY repeatedly will play sentences S1,S2,S3,S4,S1,S2,S3,S4, and so on. When the OKY Trigger Function is random, the Random Range means the range of random selection for the next executing sentence. In other words, if this range is S1~S4, an OKY trigger will lead to the execution of a random sentence in the range from sentence S1 to sentence S4.

3.6.10 IO1 Sentence

IO1 Sentence is available only when IO1 is set as input in Option page. User could specify which sentence will be executed when IO1 is triggered.

3.6.11 POP Sentence

POP Sentence is available only when Power-On-Play (POP) is enabled in Option page. User could specify which sentence will be executed when power is on.

3.6.12 Right-Click Menu

A right-click menu will show on the right by right-click. The functions of the menu items are as follows:

Menu Item	Function
Add Step	Add a new step.
Insert Step	Insert a step at the selected step.
Remove Step	Delete the selected step.
Add Sentence	Add a new sentence.
Insert Sentence	Insert a sentence.
Remove Sentence	Remove the selected sentence.
Clear	Remove all sentences.

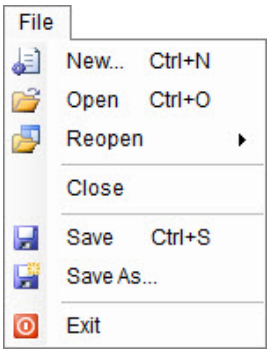
4 Using *Q-Light* for NY1Bx07A Series / NY1C007A / NY1P207A

In this chapter, the details of using *Q-Light* for NY1Bx07A series / NY1C007A / NY1P207A will be presented step by step.

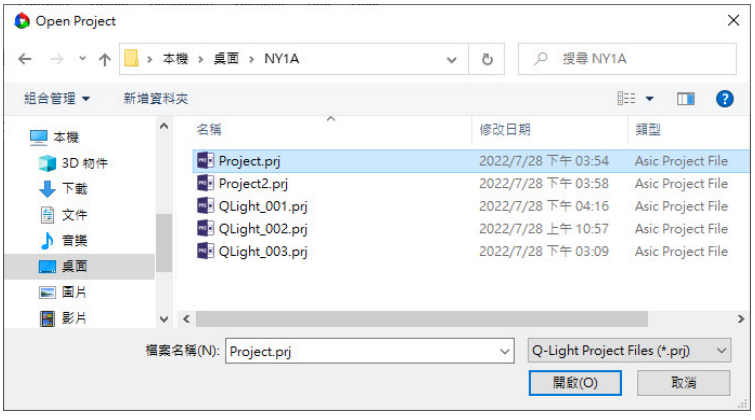
Contents:

4.1 Creating a *Q-Light* Project

After selecting [New…] or [Open] from [File], or clicking the [New] button on the Shortcut directly, then select NY1Bx07A series / NY1C007A / NY1P207A to start edit.

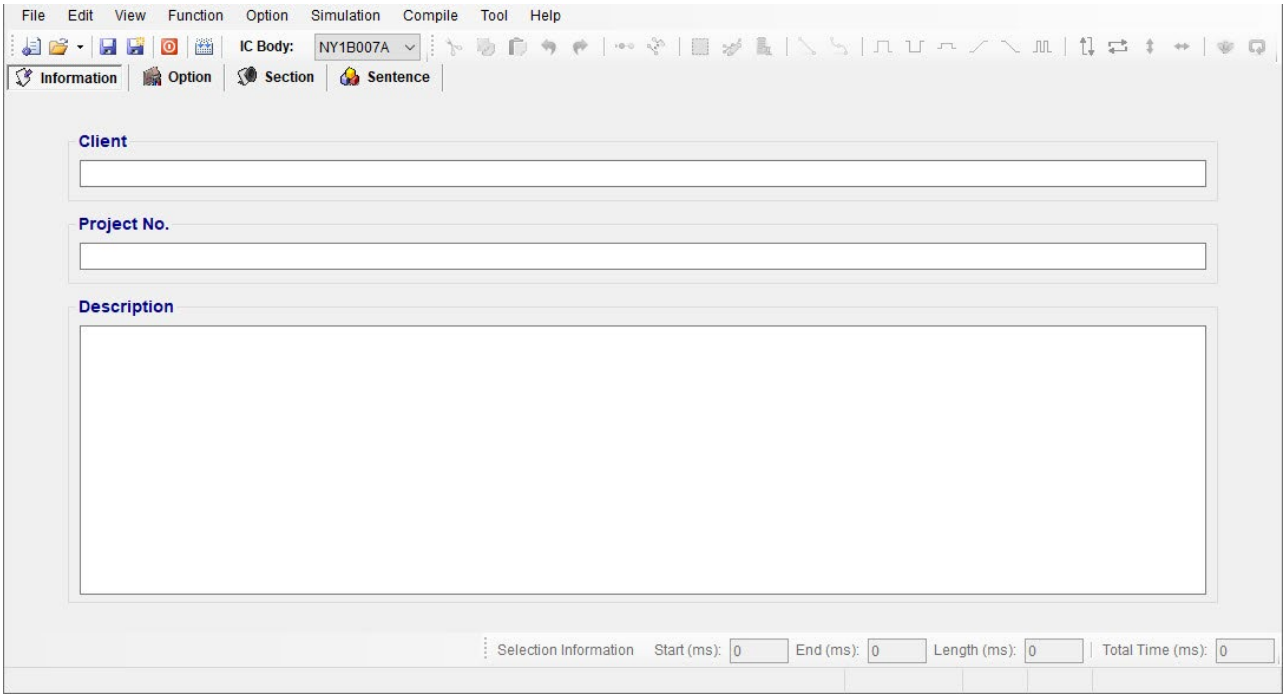


To modify an existing file, select [Open] from the [File] menu, and a dialog box for opening file will display shortly. After selecting a desired file within the [Open Project] dialog box, press [Open] button, or double-click it directly, and the existing file will be opened. If the file to be opened has been edited recently, it can be found on the list of [Reopen] option and could be opened directly.



4.2 Filling in the Information

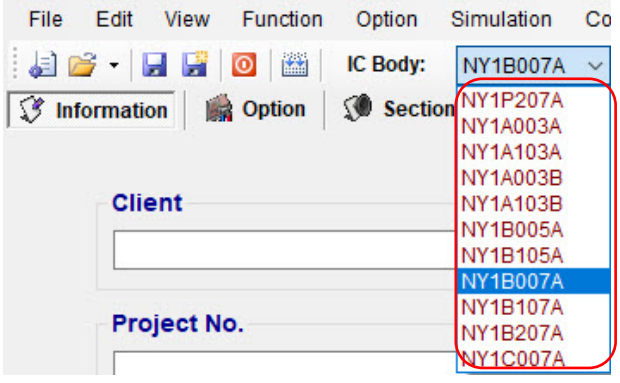
The Information page will be shown immediately after the file is opened. Any words can be typed in the blanks of this page, and the information on this page will be saved completely in the *Q-Light* file (**.prj**). Since the information on this page, except [Client] blank, is just for user to annotate or record, no error checking will be performed by *Q-Light.* All information will not be included in the **.bin** file except the client name.



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

4.3 Selecting the IC Body

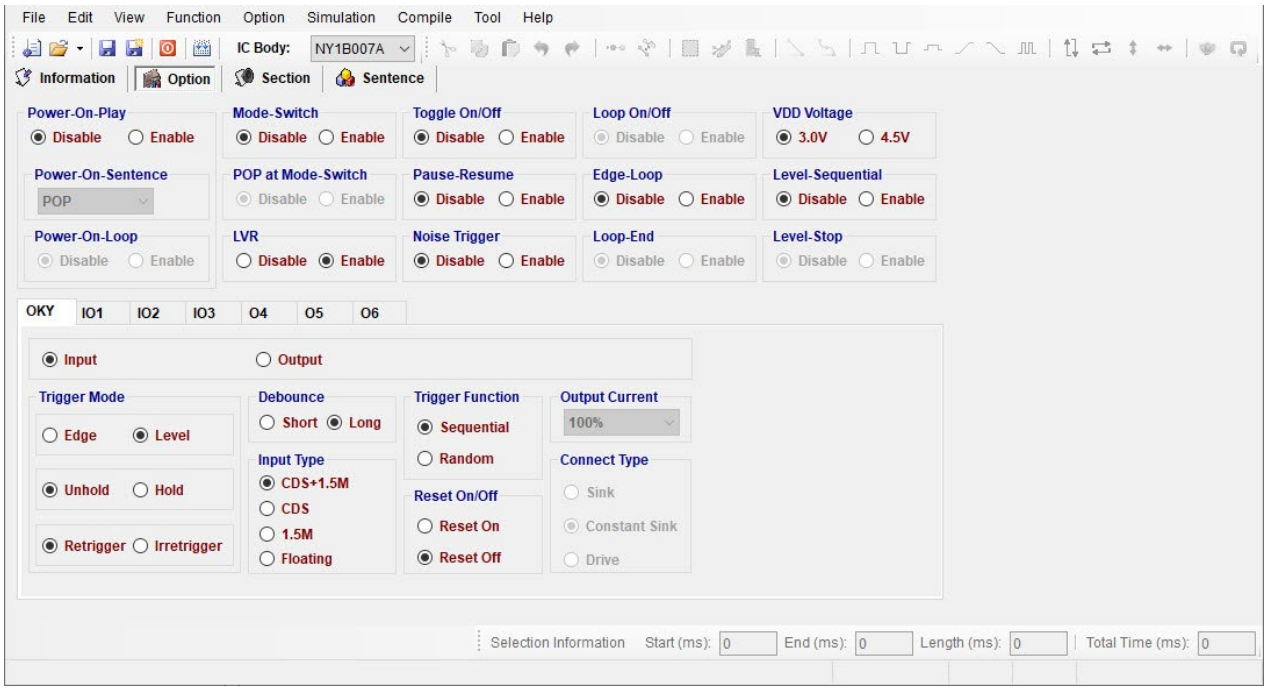
The [IC Body] drop-down list is at the top of the window. By clicking the Down button of it, all available IC bodies will be listed for selection. IC body could be changed during editing a project, but an error message in red word may display if the total ROM size of current sections exceeds the capacity of selected IC body.



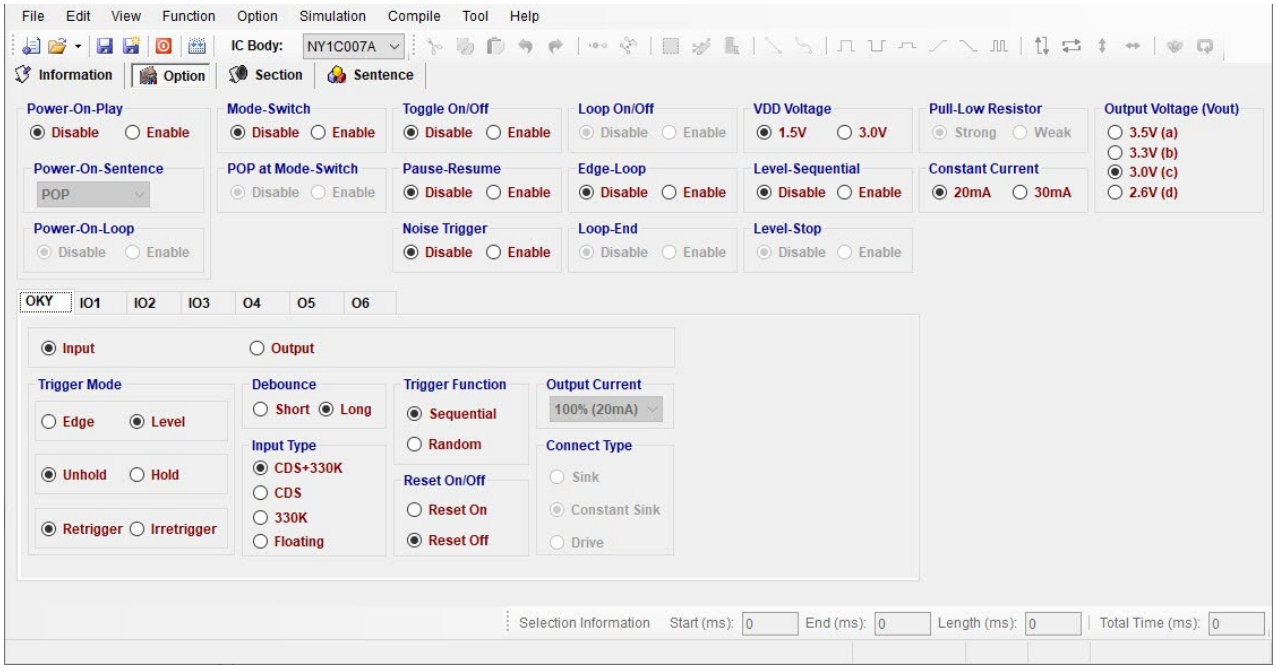
4.4 Selecting the Mask Options

By selecting different mask options in Option page, the complicated functions could be accomplished quickly. Although different series IC have different functions, there are usually similar items in Option page. Such as Debounce Time, Trigger Mode, etc, could be set easily in Option page.

The following figure shows NY1Bx07A Series / NY1P207A Option Page:



The following figure shows NY1C007A Option Page:



4.4.1 Power-On-Play

When Power-On-Play option is enabled, IC will play the POP Sentence or the Sentence of OKY one time sequentially when power is on. The trigger mode is fixed as Edge / Unhold / Retrigger.

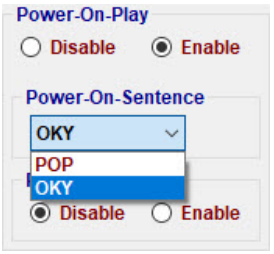
When cooperating with Power-On-Loop function, the POP Sentence or the Sentence of OKY will be played in loop until other key-trigger happened. When another key is triggered, it stops playing the POP Sentence and immediately plays the assigned sentence of triggered key.

If POP cooperates with Mode-Switch function, the POP will be executed first when power is on.

Note: When the function is enabled, the POP Sentence can be assigned in Sentence page.

4.4.2 Power-On-Sentence

The Power-On-Sentence option allows user to set the IC to play OKY Sentences or POP Sentence one time when power is on.



Note: 1. This option can be set only at Power-On-Play status is enabled.

2. When OKY is set as output, the Power-On-Sentence is fixed as POP.

4.4.3 Power-On-Loop

When Power-On-Loop option is enabled, IC will play the POP Sentence in loop when power is on.

Note: This option can be set only when Power-On-Play status is enabled.

4.4.4 POP at Mode-Switch

When POP at Mode-Switch is enabled, IC will play the POP Sentence once as Mode-Switched.

Note: POP at Mode Switch option is not available until both Mode-Switch and Power-On-Play are enabled.

4.4.5 Mode-Switch

Mode-Switch enables inputs to have 2 kinds of functions with the same key. IO3 can be set as Switch Pin, and then IO3 connecting can be switched between GND (the 1st Mode) and VDD (the 2nd Mode) to realize Mode-Switching. Although input functions can be different between modes, the output functions (current & connect type) must be the same between modes.

4.4.6 Toggle On/Off

The Toggle On/Off function allows user to immediately stop playing by pressing the same input button again. “Toggle On/Off” option is default as Disable. To enable this function, switch it to “Enable”, and specify the key in “Toggle Key” column (and the specific trigger will be fixed as Unhold and Retrigger).

4.4.7 Pause-Resume

If OKY key is trigger, the OKY Sentence will pause to play and LED will stop flashing. When the key is triggered again, it will play the sentence form previous pause.

Note: 1. Pause-Resume and Level-Stop cannot coexist.

2. When opening Pause-Resume, Toggle On/Off function is invalid.

4.4.8 Noise Trigger

By antenna effect, it takes place an input signal when larger noise happens outside.

4.4.9 Level-Sequential

Level-Sequential is a special application of OKY. When OKY is triggered and held, it plays assigned sentences sequentially in loop (S1, S2, S3, S1, S2, S3, …). When key is released, it stops playing immediately (under Hold mode), or stops playing at end of current sentence (under Unhold mode). Triggering again, it will start from the next sentence, playing sequentially in loop as key is held.

Cooperating with Edge-Loop function, it plays assigned sentences sequentially in loop (S1, S2, S3, S1, S2, S3, …) when OKY is triggered (but not held). Triggering again when playing, it will play next sentences sequentially in loop.

Cooperating with both Edge-Loop and Loop On/Off function, it plays the assigned sentences sequentially in loop (S1, S2, S3, S1, S2, S3, …) when OKY is triggered (but not held), and stops playing when triggered again. If the key is triggered again after being toggled off, it will play the next sentences sequentially in loop.

4.4.10 Edge-Loop

Edge-Loop is a special application of OKY. When the specific key is triggered, it will play the assigned sentence in loop.

Cooperating with OKY Sequential function, the first trigger plays first sentence in loop, the second trigger plays second sentence in loop, the third trigger plays third sentence in loop, and so on.

Cooperating with OKY Sequential and Loop On/Off function, the first trigger plays first sentence in loop, and the second trigger stops playing. Once the key is triggered again, it plays the next sentence (with OKY Sequential) in loop, and stops playing if triggered again during playing, and so on.

4.4.11 Loop On/Off

When the key function is Edge-Loop, enabling the Loop On/Off option can achieve Toggle On/Off function. That is, the first trigger plays first sentence in loop, and the second trigger stops playing. Once the key is triggered again, it plays the next sentence (with OKY Sequential) in loop, and stops playing if triggered again during playing, and so on.

Note: Loop On/Off and Toggle On/Off cannot coexist.

4.4.12 Loop-End

Loop-End will stop playing when triggering at the playing of the last OKY Edge-Loop sentence. Triggering again after stop, it will start from the first OKY sentence and play it in loop again (S1→ S2 → S3 → Stop → S1).

Note: Loop On/Off and Loop-End cannot coexist.

4.4.13 Level-Stop

When Level-Stop option is enabled, IC will stop playing when OKY1 (as input) is pressed more than 2 seconds.

Note: Pause-Resume and Level-Stop cannot coexist.

4.4.14 LVR

When VDD voltage is lower than 1.5V, IC will automatically reset. The default setting of LVR function is “Enable”. Choose “Disable” can turn off this function.

Note: 1. If both Power-On-Play option and LVR option are “Enable”, the POP Sentence will be played after LVR acts.

2. This function is unavailable when choosing NY1C007A.

4.4.15 VDD Voltage

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

IC Body	VDD Voltage
NY1Bx07A series	3.0V / 4.5V
NY1P207A	3.0V / 4.5V
NY1C007A	1.5V / 3.0V

4.4.16 Pull-Low Resistor

There are 2 options for Pull-Low Resistor: Strong and Weak, and it varies automatically with VDD Voltage selection.

Strong: When VDD Voltage is set as 1.5V, Pull-Low Resistor is Strong (aka Strong Current) by default.

Weak: When VDD Voltage is set as 3.0V, Pull-Low Resistor is Weak (aka Weak Current) by default.

Note: This function is only available when choosing NY1C007A. When Pull-Low Resistor is Strong but powered over 2.0V, it will cause higher power consumption and shorten the battery life. When Pull-Low Resistor is Weak but powered with 1.5V or lower, it will cause floating and make it vulnerable to noise interference.

4.4.17 Output Voltage (Vout)

There are four settings for 3.5V / 3.3V / 3.0V / 2.6V output voltage. Electricity can be saved if choosing appropriate output voltage.

Note: This function is only available when choosing NY1C007A.

4.4.18 Trigger Mode

The mode of a trigger must be specified to completely define the input functions. Specify the trigger mode by choosing from the following three types of options:

- The Edge and Level options specify whether the trigger should respond to the rising edge or the high level of the input signal.
- The Hold and Unhold options specify whether you need to keep on pressing the trigger button to execute the whole sentence. When the option is Hold, trigger button is fixed as Irretrigger.
- The Retrigger and Irretrigger options specify whether the trigger can be functional when a sentence is playing.

4.4.19 Debounce Time

Debounce Time is a playback-speed-dependent function. There are two kinds of debounce time to be selected. The long debounce time is used for debouncing the push button trigger input while the short debounce time is used for debouncing the electrical transition such as CDS input. Selecting the right debounce time can avoid unwanted double triggers by the bouncing of trigger button.

4.4.20 Input Type

The Input Type usually represents the Pull-Low setting of an input.

There are 4 input type options corresponding to different applications for NY1C007A:

- When VDD Voltage is 1.5V.

Option	Input Type Description
CDS + 330K	Normal selection for button trigger. 330KΩ Pull-Low resistance when button is pressed. Inside the IC is a Pull-Low resistance of approximately 125KΩ in parallel with 200 KΩ+ 330 KΩ when button is released.

Option	Input Type Description
CDS	Internal 200KΩ Pull-Low resistance, usually for photo-resistor trigger. Floating when button is pressed, and 200KΩ Pull-Low resistance when button is released.
330K	Internal 330KΩ Pull-Low resistance, reserved for some special applications.
Floating	No internal resistor connection, and is usually connected to other output pin or connected to GND by an external resistor.

◆ When VDD Voltage is 3.0V.

Option	Input Type Description
CDS + 380K	Normal selection for button trigger. 380KΩ Pull-Low resistance when button is pressed. Inside the IC is a Pull-Low resistance of approximately 39KΩ in parallel with 43 KΩ+ 380 KΩ when button is released.
CDS	Internal 43KΩ Pull-Low resistance, usually for photo-resistor trigger. Floating when button is pressed, and 43KΩ Pull-Low resistance when button is released.
380K	Internal 380KΩ Pull-Low resistance, reserved for some special applications.
Floating	No internal resistor connection, and is usually connected to other output pin or connected to GND by an external resistor.

There are 4 input type options of NY1Bx07A series / NY1P207A:

Option	Input Type Description
CDS + 1.5M	Normal selection for button trigger. 1.5MΩ Pull-Low resistance when button is pressed. Inside the IC is a Pull-Low resistance of approximately 250KΩ in parallel with 300 KΩ+ 1.5MΩ when button is released.
CDS	Internal 300KΩ Pull-Low resistance, usually for photo-resistor trigger. Floating when button is pressed, and 300KΩ Pull-Low resistance when button is released.
1.5M	Internal 1.5MΩ Pull-Low resistance, reserved for some special applications.
Floating	No internal resistor connection, and is usually connected to other output pin or connected to GND by an external resistor.

4.4.21 OKY Trigger Function

The OKY Trigger Function allows user to set the IC to play sentences in a sequential or random manner for two consecutive triggers applied to OKY pin. When sequential trigger function is selected, the IC will play the “next” sentence whereas a random sentence will be played when random trigger function is selected.

4.4.22 OKY Reset On/Off

When Reset is ON, the IC will reset the sentence sequential pointer once another input pin (IOx) is pressed. It means after IOx is pressed, pressing OKY will lead to the playing of sentence 1. When

Reset is OFF, the playing sequence of OKY will keep unaffected.

4.4.23 Connect Type

When OKY, IOx or other Ox is set as output, user could specify a status signal as the output signal. There are 3 connect type options corresponding to different applications as below.

Option	Connect Type Description
Sink	Low active signal output during playing and offers 4 different output current options including 100%, 83%, 50% and 33%.
Constant Sink	Low active signal output during playing, output current is constant, and the LED brightness will not be affected by VDD differences. It offers 4 different output current options including 100%, 83%, 50% and 33%.
Drive	High active signal output during playing, there is only a current (100%).

4.4.24 Output Current

When OKY, IOx or other Ox is set as output, user could specify an output current which offers available options corresponding to different connect type. There are 3 connect type options corresponding to different output current as below.

Option	Output Current Description
Sink	Offering 4 different output current (100%, 83%, 50% and 33%).
Constant Sink	Offering 4 different output current (100%, 83%, 50% and 33%).
Drive	There is only a current (100%).

Note: When IC Body is NY1C007A and the Connected Type is set as Constant Sink, Output Current is fixed as 100%.

4.4.25 Constant Current

Constant current function provides 2 options of setting current: 20mA and 30mA. When the connect type is set as Constant Sink, there are 4 choices of output current. User could see the percentage and corresponding mA parameters.

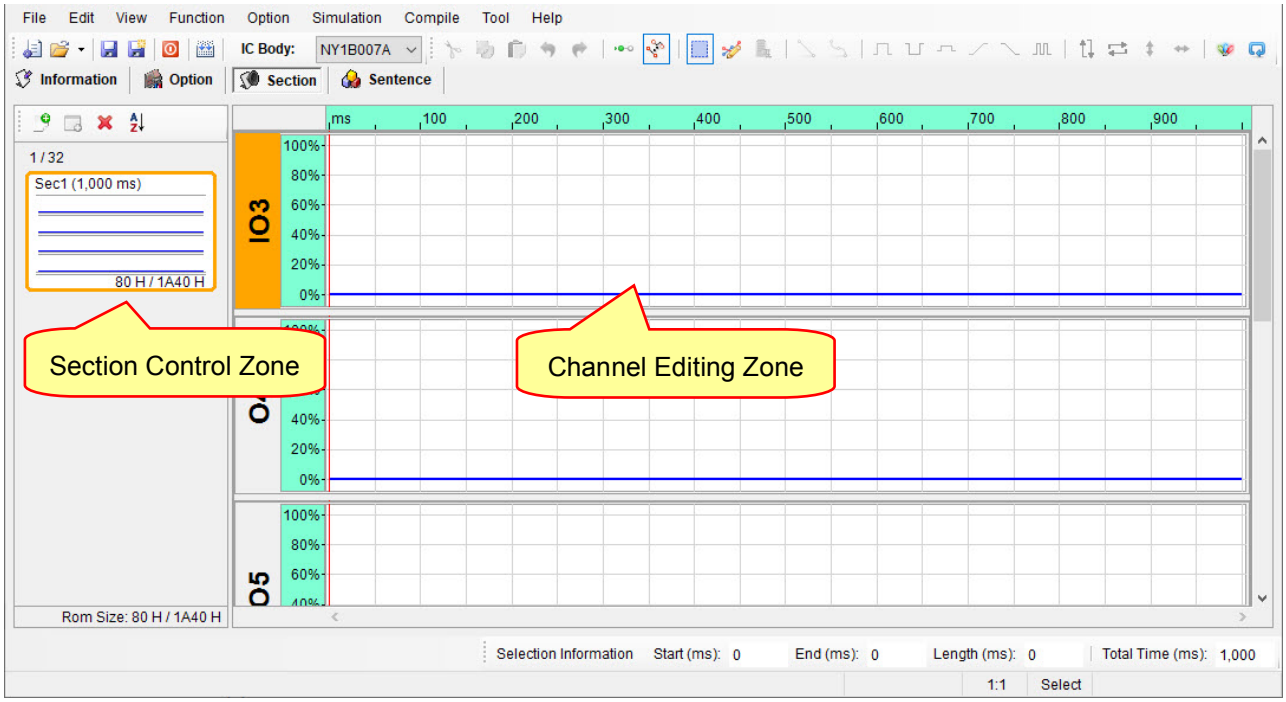
Options	Output type Descriptions
20mA	Offering 4 different output current (100%=20mA, 83%=16.7mA, 50%=10mA, 33%=6.7mA).
30mA	Offering 4 different output current (100%=30mA, 83%=25mA, 50%=15mA, 33%=10mA).

Note: 1. Only when IC Body is NY1A003A, NY1A103A, NY1A003B, NY1A103B, NY1C007A or NY1P207A is the function available.

2. When IC Body is NY1P207A, and the current is 30mA, only OKY, IO1, and IO2 are available.

4.5 Managing the Sections

Section page allows user to manage and edit sections, and it allows 32 sections maximum in NY1Bx07A series / NY1C007A / NY1P207A.



4.5.1 Section Control Zone

Section Control Zone allows user to add, remove and arrange the sequence of sections.

Functions of toolbar are shown below.

Add Section：Create a new section.

Add Mute Section：Create a new mute section, the maximum duration will be reduced by the amount of output Pin.

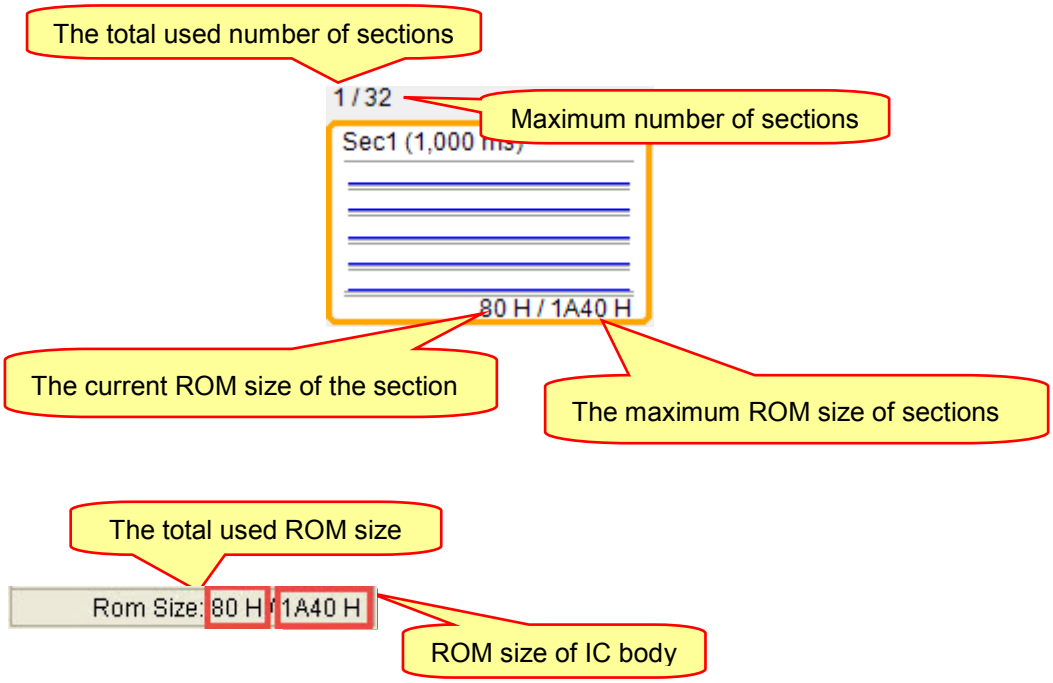
Remove Section：Delete the selected section.

Sort：Sort sections by number or title.

User can add or remove sections with toolbar, or right-click in Section Control Zone; meanwhile, user can change the name or length of section through Section Properties.

The total number of sections and the total used ROM Size are displayed at the bottom of the page. The total used ROM Size must not exceed the available total ROM Size. The following table is the detailed specifications.

IC	Section			Total (H)
	Resolution (H)	Max (H)	Count	
NY1B007A	40	1A40	32	1A40
NY1B107A	80	1FFE	32	3480
NY1B207A	100	1FFE	32	6900
NY1C007A	40	1A40	32	1A40
NY1P207A	40	7E00	1984	7E00



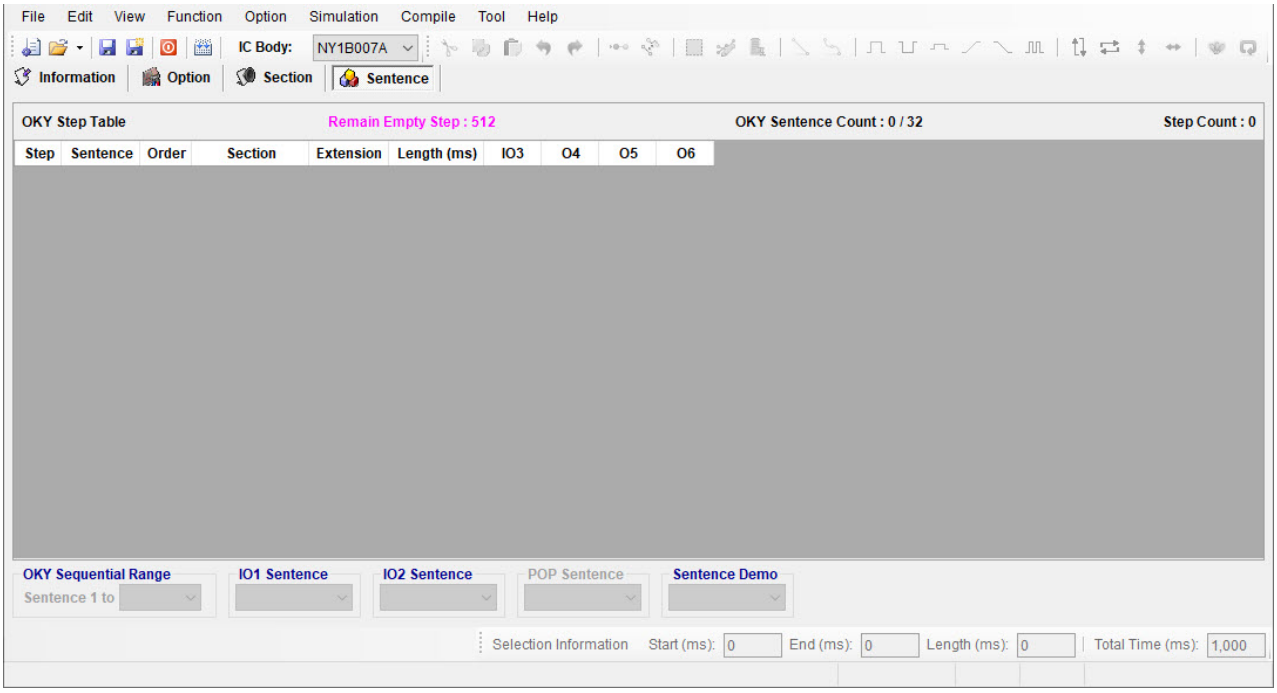
Note: It does not allow coexisting sections with the same file name

4.5.2 Channel Editing Zone

Channel Editing Zone displays all output channels, providing user to edit signals. Clicking on an existing section in Section Control Zone can select section for further editing, and then user can quick edit signals through Hot Key or buttons on Shortcut.

4.6 Arranging the Sentences

A “sentence” means a combination of sections to be played when triggered. For NY1Bx07A series / NY1C007A / NY1P207A, there are 32 sentences available. For NY1Bx07A series / NY1C007A, there are 512 sentences available. And for NY1P207A, there are 1984 sentences available.



4.6.1 Step Column

For NY1Bx07A series / NY1C007A, there are total 512 steps and for NY1P207A, there are total 1984 steps that can be defined for the step table. Every step can have a section or a mute section with associated output actions. The total number of defined steps is shown beyond the step table in this window.

4.6.2 Sentence Column

The Sentence column shows the sentence numbers the steps belong to. For NY1Bx07A series / NY1C007A / NY1P207A, there are 32 (1 to 32) sentences available. Every sentence, which may contain several steps, can specify which section to play. To add a sentence, click on the last step of sentence column and select the next number from the drop-down list. A sentence cannot be inserted directly in the step table. To insert a step, select the step that is desired to be inserted and then right-click the mouse and select “Insert Step” from the pop-up menu. To remove a step, select the step and right-click the mouse to select “Remove Step” or “Clear”.

4.6.3 Order Column

Here shows the sequence numbers of the steps contained in each sentence. *Q-Light* will automatically generate the sequence numbers for all the steps in a sentence in ascending order. When this sentence is executed due to an input trigger, step 1 will be played first, followed by step 2 and step 3, and so on.

4.6.4 Section Column

Selecting a section here means the corresponding section or mute in Section page will be arranged in the sentence.

4.6.5 Extension Column

The Extension column shows extension ratio to the original length of section. There are 4 extension ratio options (x1, x2, x4, x8) to be chosen. User can set the appropriate ratio to save Data Size, and each step can be specified a ratio of individually.

4.6.6 Length Column

Length applied to sentences refers to the settings in Section Page, and they cannot be edited at this page.

4.6.7 OKY, IO1 and IO2 Column

When OKY, IO1 or IO2 is set as output in Option page, then OKY, IO1, or IO2 column is available for switching output channel On/Off, and each step can be set individually.

4.6.8 Ox Column

The Ox column shows the status (On/Off) of each output channel. Each step can be set with unique output status respectively.

4.6.9 OKY Sequential Range

When the OKY Trigger Function is sequential, the Sequential Range means it will loop sentences in the range by triggering OKY. For example, if this range is S1~S4, triggering OKY repeatedly will play sentences S1,S2,S3,S4,S1,S2,S3,S4, and so on. When the OKY Trigger Function is random, the Random Range means the range of random selection for the next executing sentence. In other words, if this range is S1~S4, an OKY trigger will lead to the execution of a random sentence in the range from sentence S1 to sentence S4.

4.6.10 IO1 / IO2 Sentence

IO1 Sentence or IO2 Sentence is available only when IO1 or IO2 is set as input in Option page. User can specify which sentence will be executed when IO1 or IO2 is triggered. Any sentence can be set as IO1

Sentence or IO2 Sentence when the number of defined sentences is below 29, but IO1 Sentence and IO2 Sentence must be restrict to 30 and 31 respectively if the number of defined sentences exceeds 30.

4.6.11 POP Sentence

POP Sentence is available only when Power-On-Play (POP) is enabled in Option page. User could specify which sentence will be executed when power is on in Sentence Page. Any POP Sentence can be set when the number of defined sentences is below 31, but POP Sentence must be restrict to 32 if the number of defined sentences exceeds 31.

When Mode-Switch is disabled, any sentence can be set as POP Sentence when the number of sentences is below 31, but POP Sentence must be restrict to 32 if the number of sentences exceeds 31.

When Mode-Switch is enabled, any sentence can be set as POP Sentence when the number of OKY sentences is below 15, but POP Sentence must be restrict to 16 if the number of OKY sentences exceeds 15.

4.6.12 Right-Click Menu

A right-click menu will show on the right by right-click. The functions of the menu items are as follows:

Menu Item	Function
Add Step	Add a new step.
Insert Step	Insert a step at the selected step.
Remove Step	Delete the selected step.
Add Sentence	Add a new sentence.
Insert Sentence	Insert a sentence.
Remove Sentence	Remove the selected sentence.
Clear	Remove all sentences.

5 How to Release Code

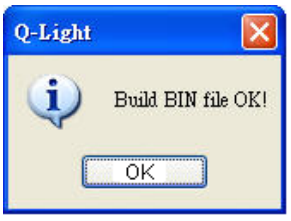
After finishing *Q-Light* editing, please follow instructions in this chapter to release the code.

5.1 Saving the Project

By selecting [Save] from the [File] menu or by clicking the [Save] button on the Shortcut, the current *Q-Light* project will be saved. Choose [Save As…] if in need of saving the project with a different name and/or to a different location. Names of *Q-Light* project files will have the **.prj** extension.

Note: Due to Q-Light does not provide the auto-save function, please save the undone project frequently in order to avoid unexpected Windows system crash or power failure causing data missing.

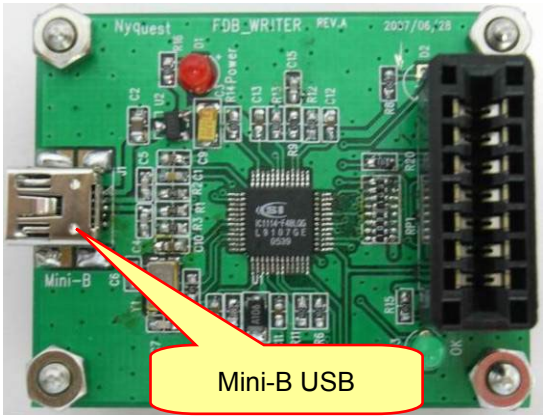
5.2 Building Up the .bin File

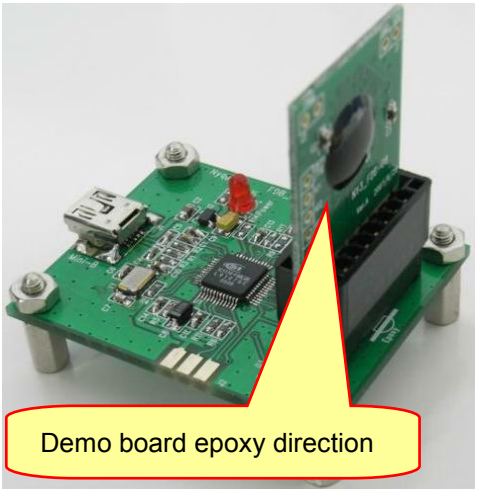


By selecting [Build] from the [Compile] menu or by clicking the [Build] button on the Shortcut, the compiling process will start. *Q-Light* will check all the settings and options first. If there are no errors, the target file **(.bin)** and checking list file **(.htm)** will be generated. These two files will be put in the same folder as the project file **(.prj)** folder. If the compiling is successfully completed, a dialog box that says “Build BIN file OK!” will pop up. If any unexpected system errors occur during the compiling, please contact the engineers of Nyquest.

5.3 Demonstration

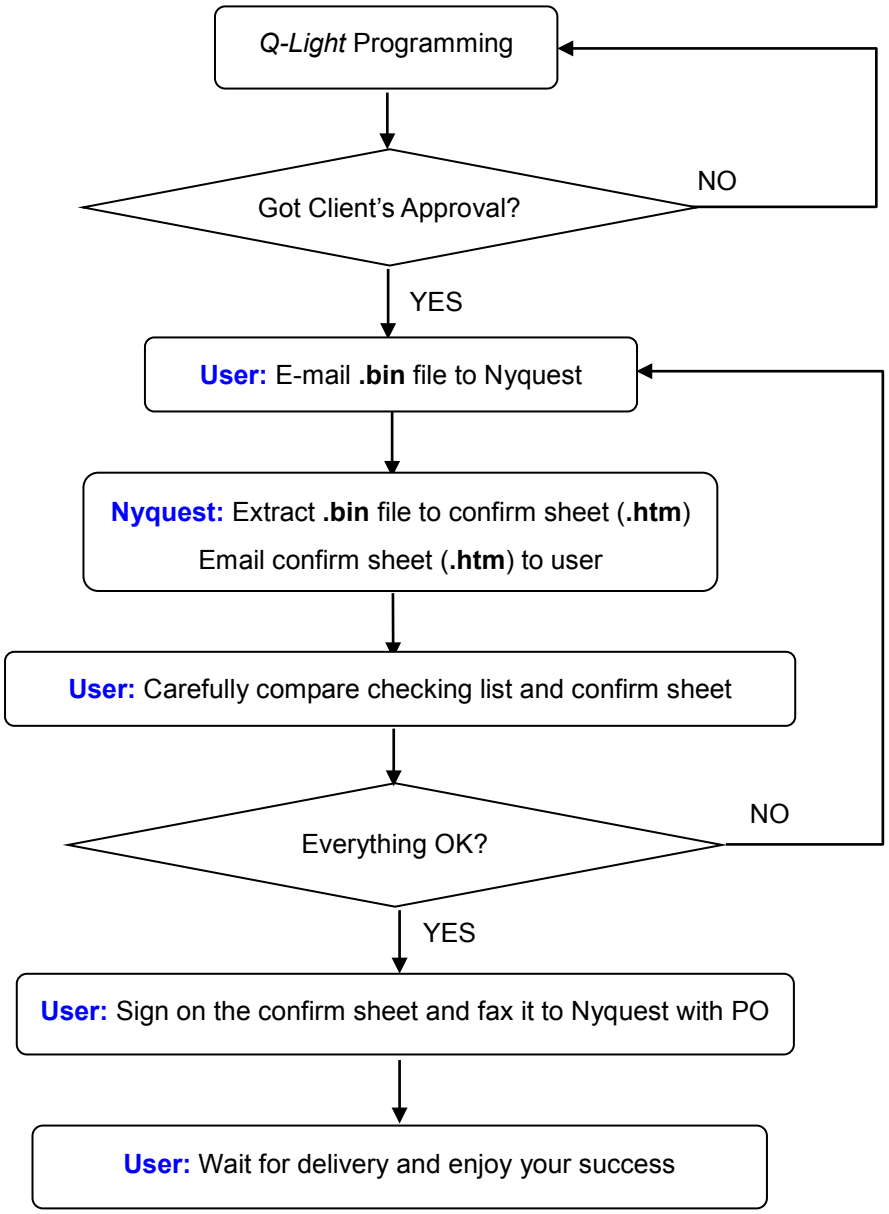
To make a demonstration, please write the target file **(.bin)** into NY1_FDB demo board by Nyquest *FDB_Writer* with *Q_Writer* provided by Nyquest. To launch *Q-Writer* software, User can simply select [Q-Writer] from the [Tools] menu.





5.4 New Code Release Flow

When the client approves of the project, a target file (.bin) and checking list (.htm) will be generated after *Q-Light* 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 "NY1A003A-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.



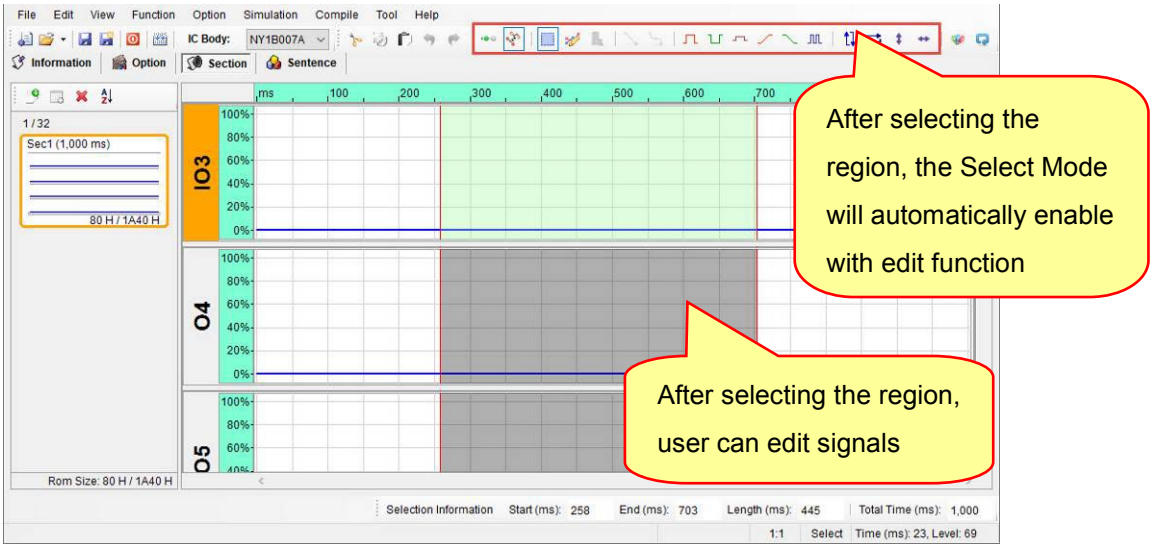
6 Appendix

6.1 Editing Signals

Q-Light provides two different modes for editing signals, including Select Mode and Pencil Mode. The introduction is as following.

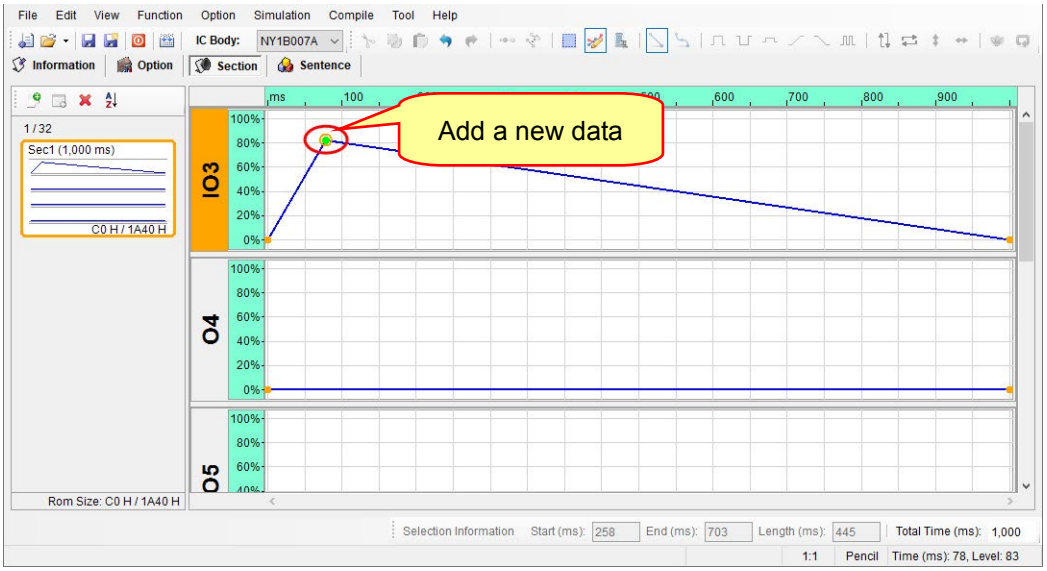
6.1.1 Select Mode

User can click the button on Shortcut to activate Select Mode which is designed for editing signals in the selected region, user can use the Shortcut to edit signals, as shown in the figure below.



6.1.2 Pencil Mode

User can click the button on Shortcut to activate Pencil Mode which is designed for adding, deleting or changing the data position, as shown in the figure below.

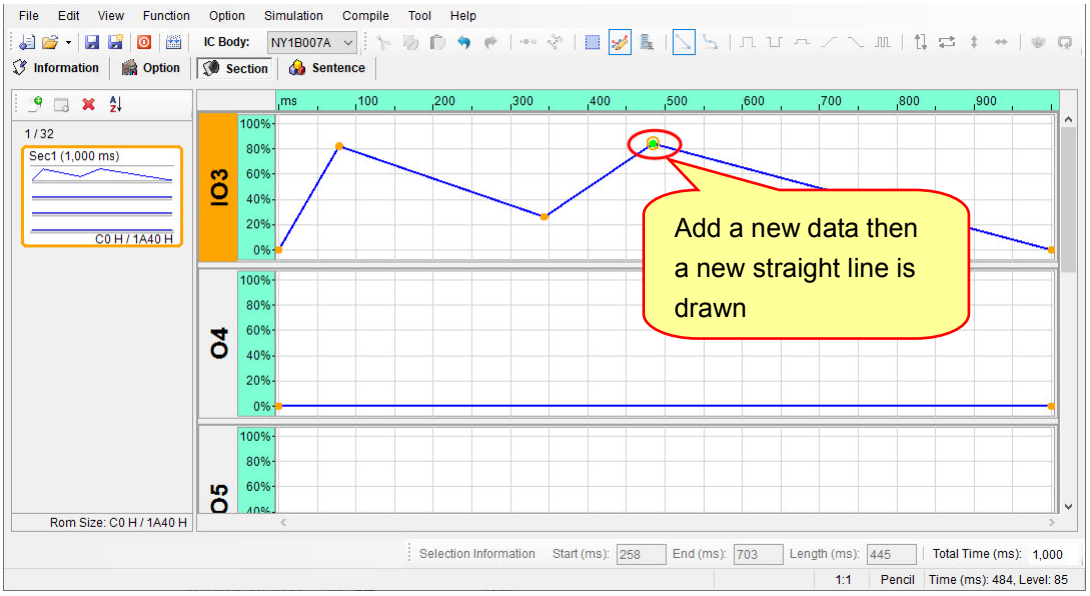


There are two methods that user can apply to draw lines with Pencil Mode. User can use Shortcut to

activate Pencil Mode for drawing straight lines (with Line Mode) or cubic splines (with Cubic Spline Mode), the introduction is as following.

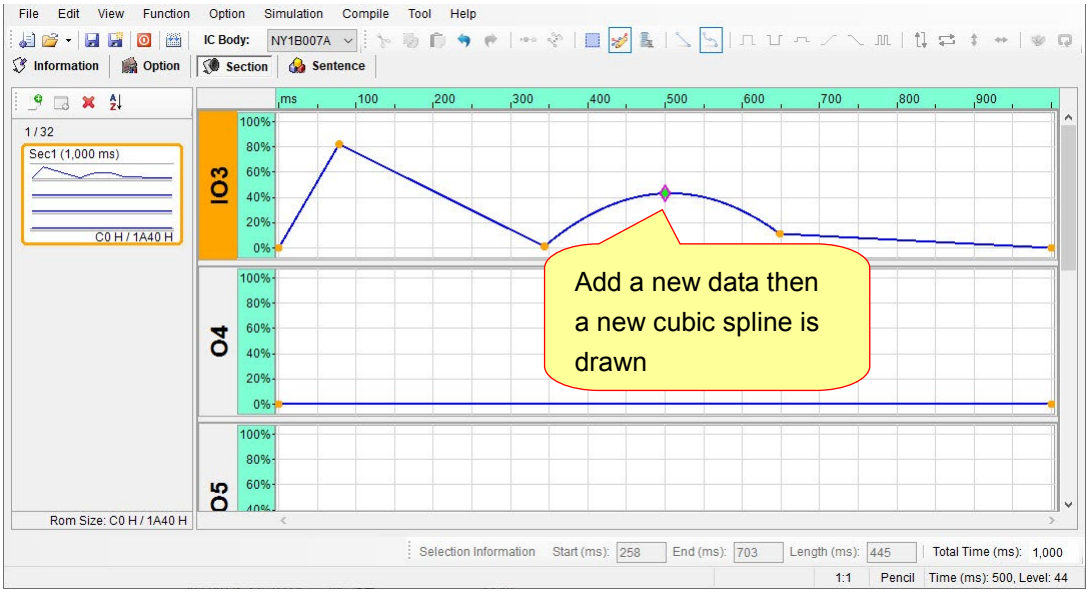
6.1.2.1 Line Mode

In Pencil Mode, user can click the button on Shortcut to activate Line Mode, which is designed for drawing straight lines. Move the cursor to create a new location in the Editing Zone and click once. A new straight line is drawn that is connected to the end of the nearest data, as shown in the figure below.



6.1.2.2 Cubic Spline Mode

In Pencil Mode, user can click the button on Shortcut to activate Cubic Spline Mode, which is designed for drawing cubic splines. Move the cursor to create a new location in the Editing Zone and click once. A new cubic spline is drawn that is connected to the end of the nearest data, as shown in the figure below.



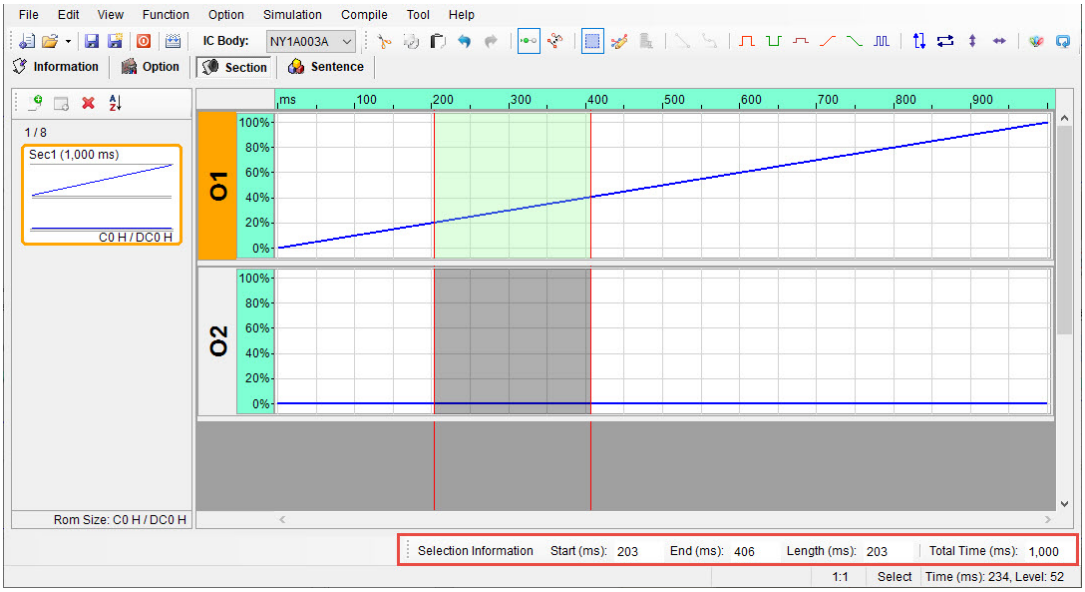
6.2 Cut and Paste Mode introduction

In Select Mode, *Q-Light* provides Insert Mode and Replace Mode for user to achieve easy and quick editing signals.

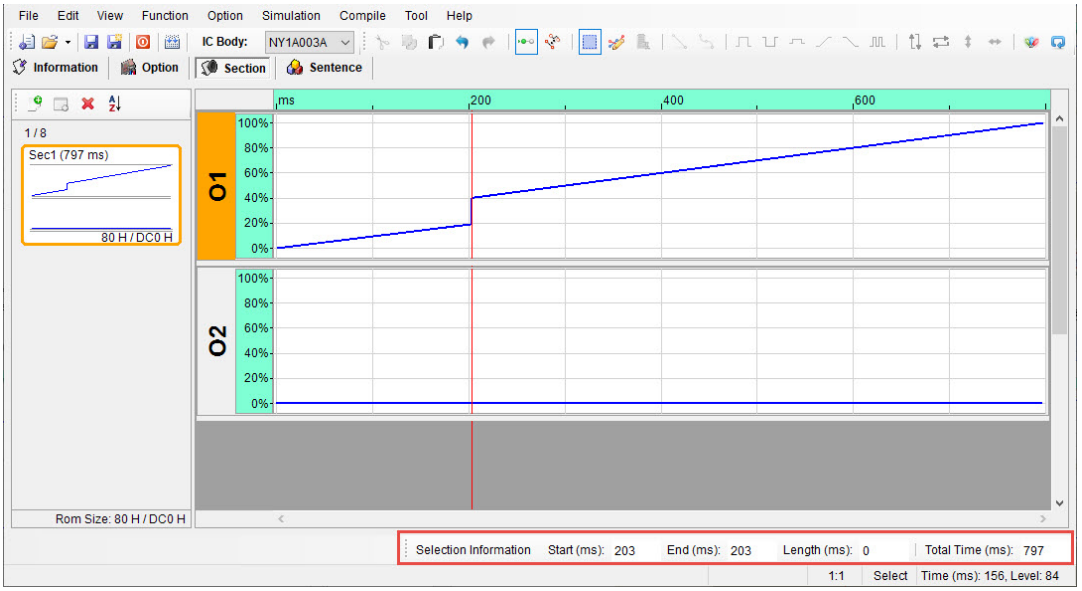
6.2.1 Insert Mode

The main purpose of Insert Mode is to insert or replace the target region with full signals on the clipboard, so the total length of signal will change. The following description shows the variation while using cut and paste command.

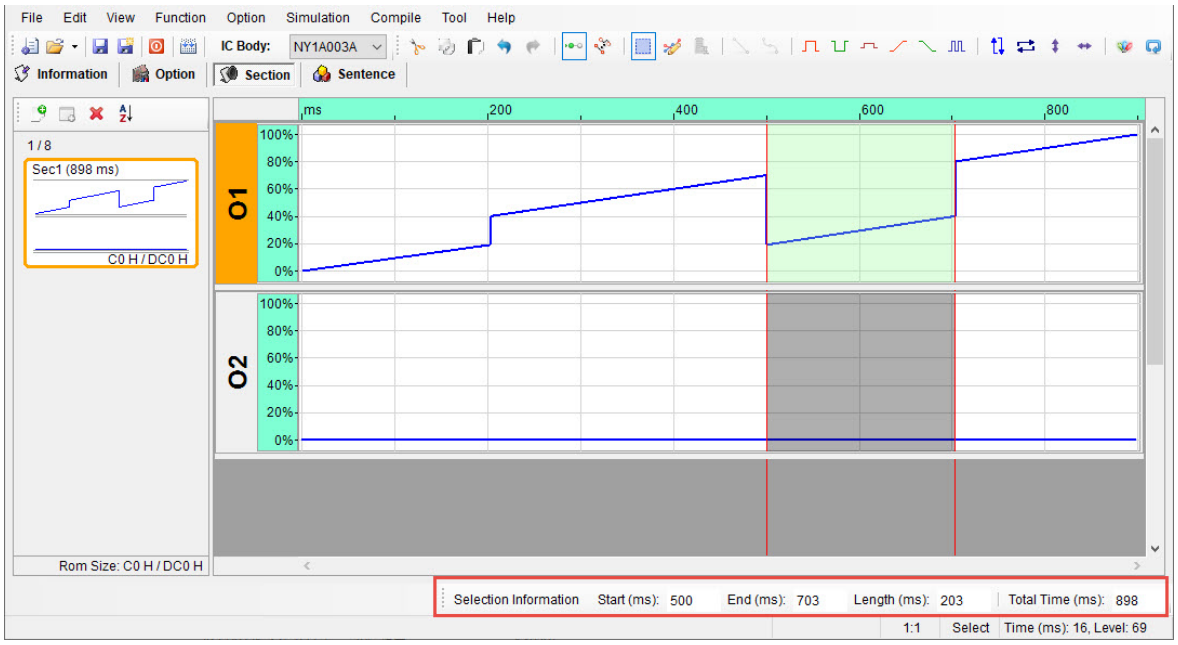
1) Take a 1000ms ascending waveform as an example, as shown in the figure below.



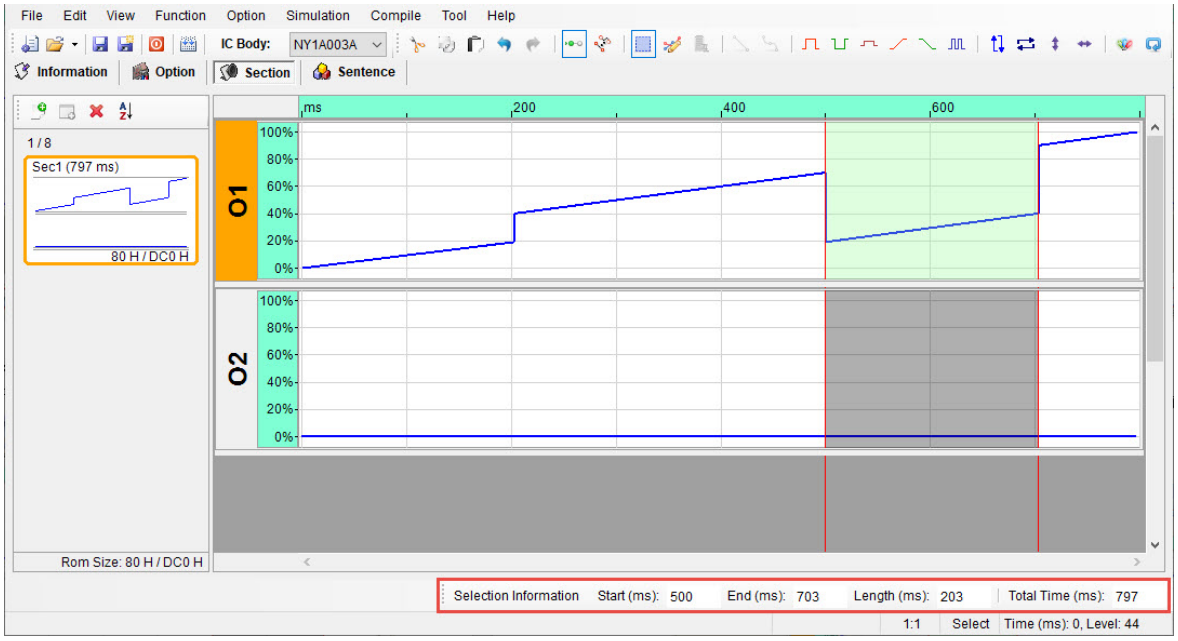
2) Cut the range from 203ms to 406ms (203ms), and the signals of selection will disappear. The total length of signals become shorter, as shown in the figure below



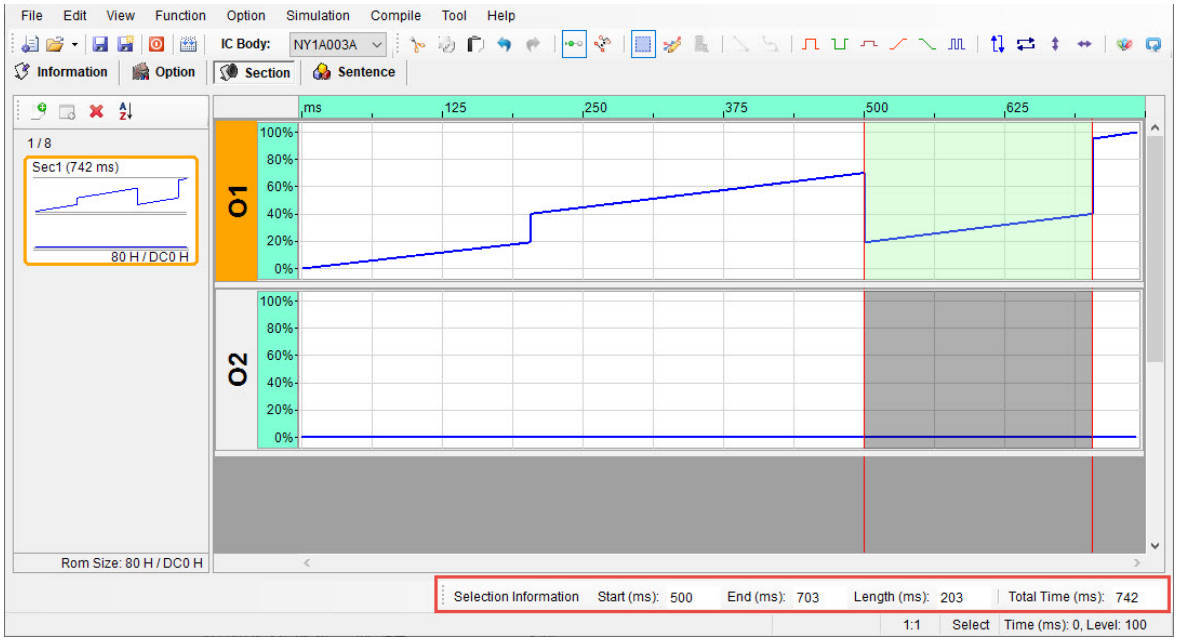
3) Select the range from 500ms to 602ms (102ms) as the pasted range which is shorter than the cut length (203ms). The selection is replaced with the cut signals. The total length of signals become longer, as shown in the figure below.



4) Select the range from 500ms to 703ms (203ms) as the pasted range which is identical to the cut length (203ms).Therefore, full length will be pasted in the selected region. The total length of signals is still the same, as shown in the figure below.



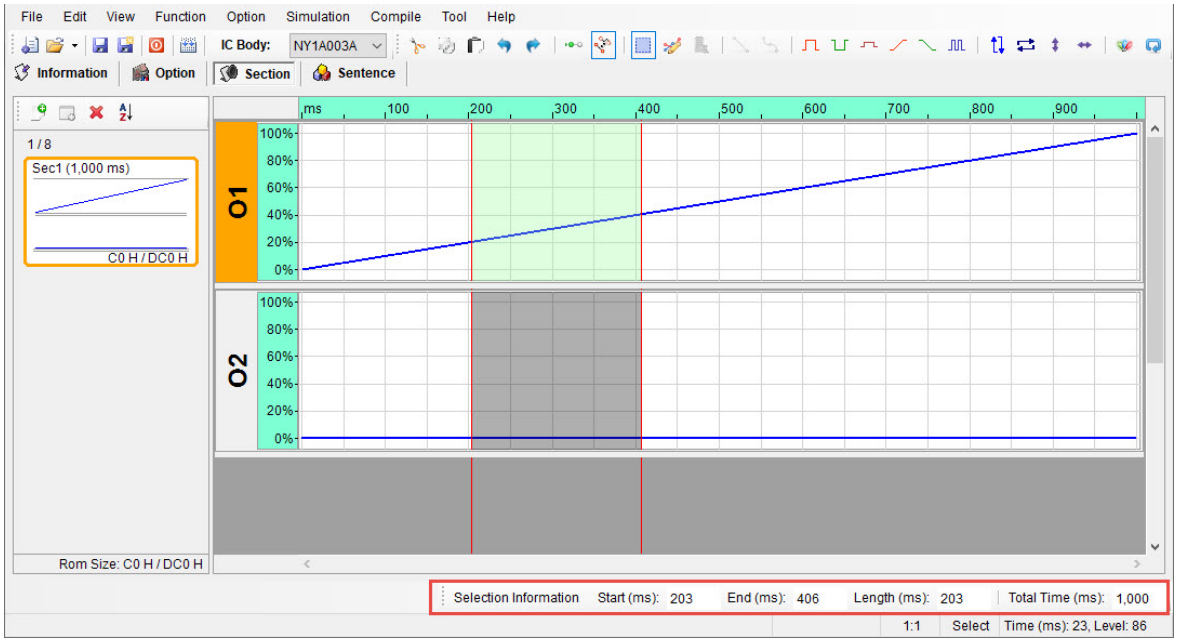
5) Select the range from 500ms to 758ms (258ms) as the pasted range which is longer than the cut length (203ms). Meanwhile, the 203ms will be pasted in the selected region. The total length of become shorter, as shown below.



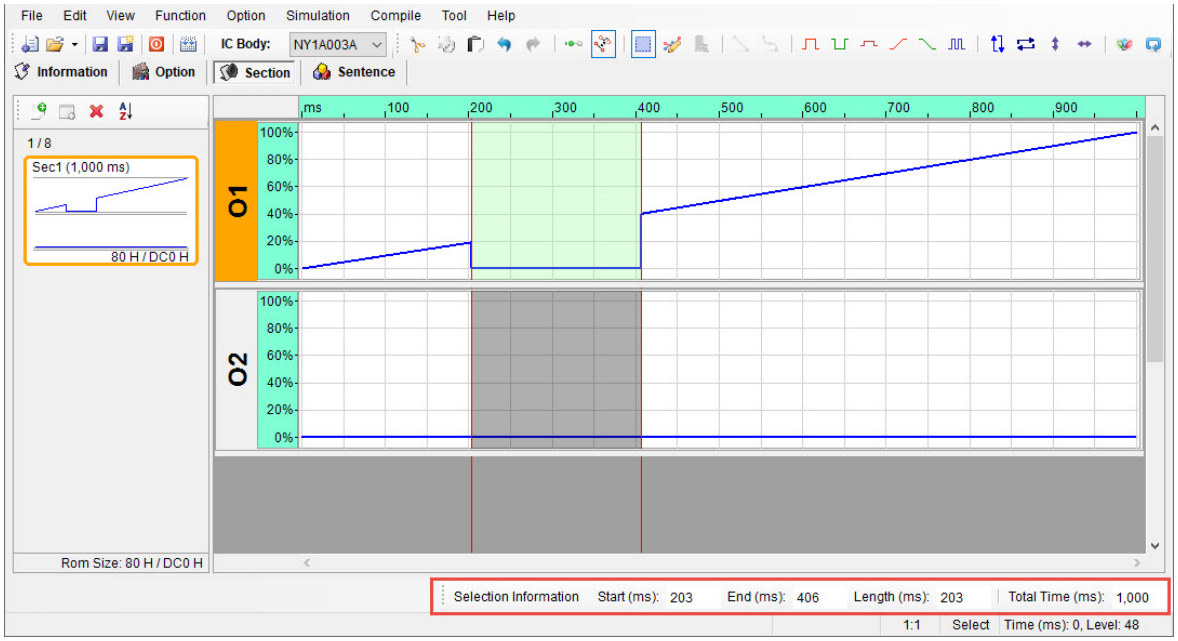
6.2.2 Replace Mode

The main purpose of Replace Mode is to replace signals in the target region only, and it will not change the signal length. The following steps showing the variation of cut and paste command.

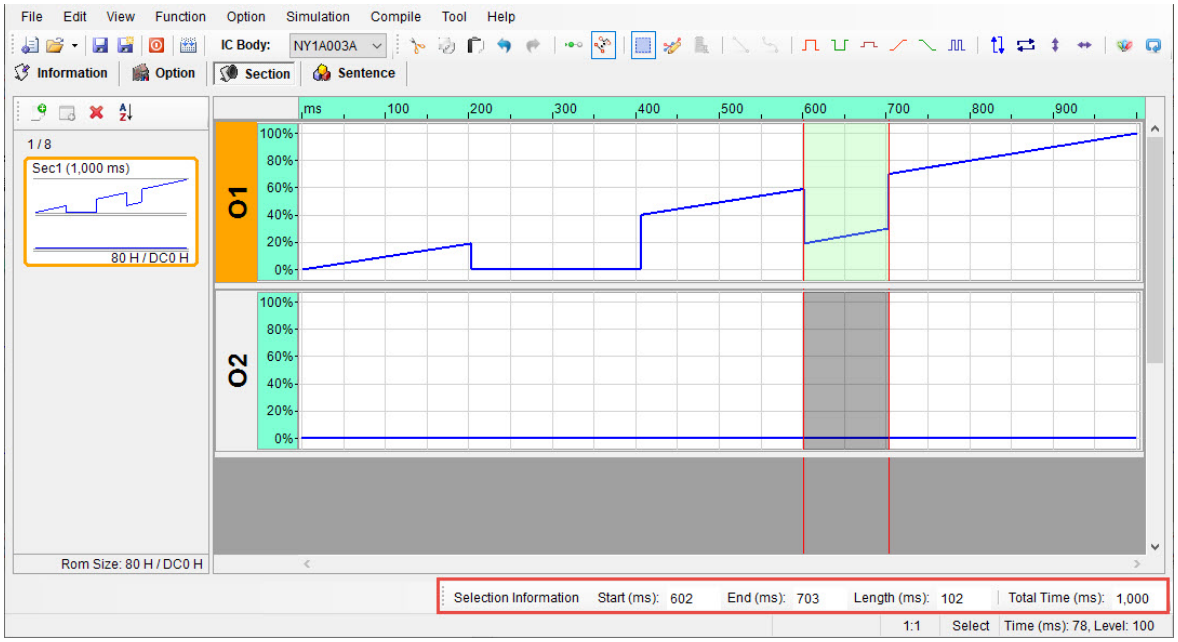
1) Take a 1000ms ascending waveform as an example, as shown in the figure below.



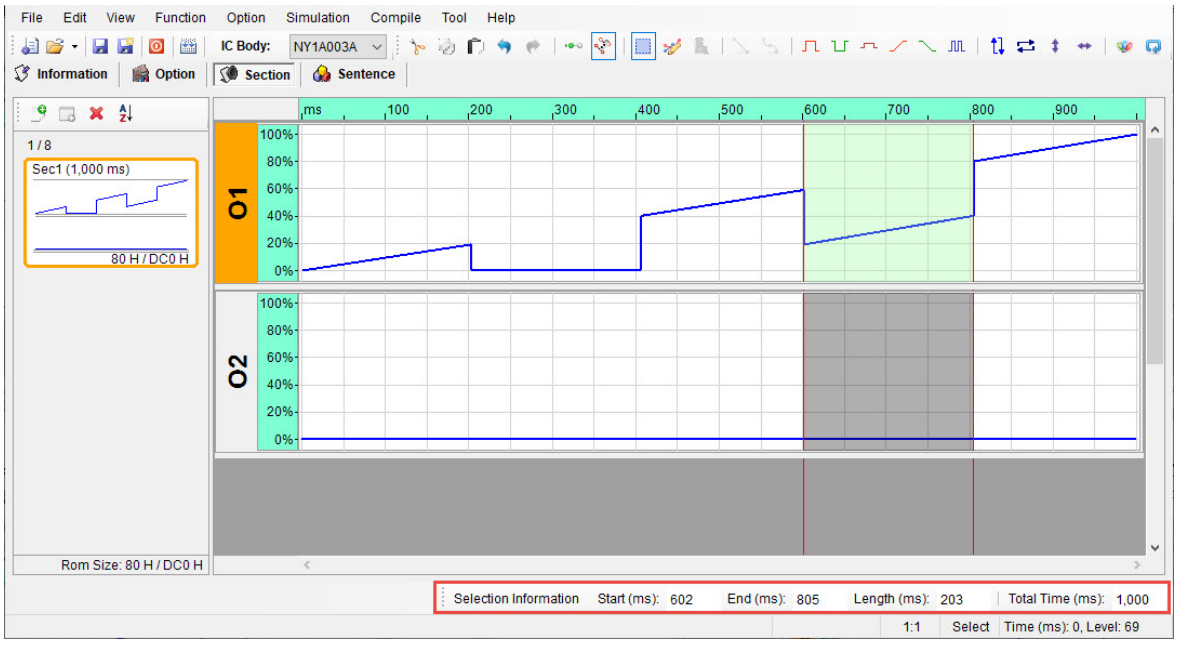
2) Cut the range form 203ms to 406ms (203ms), and the range will become Level Low. The total length of signals remains unchanged, as shown in the figure below.



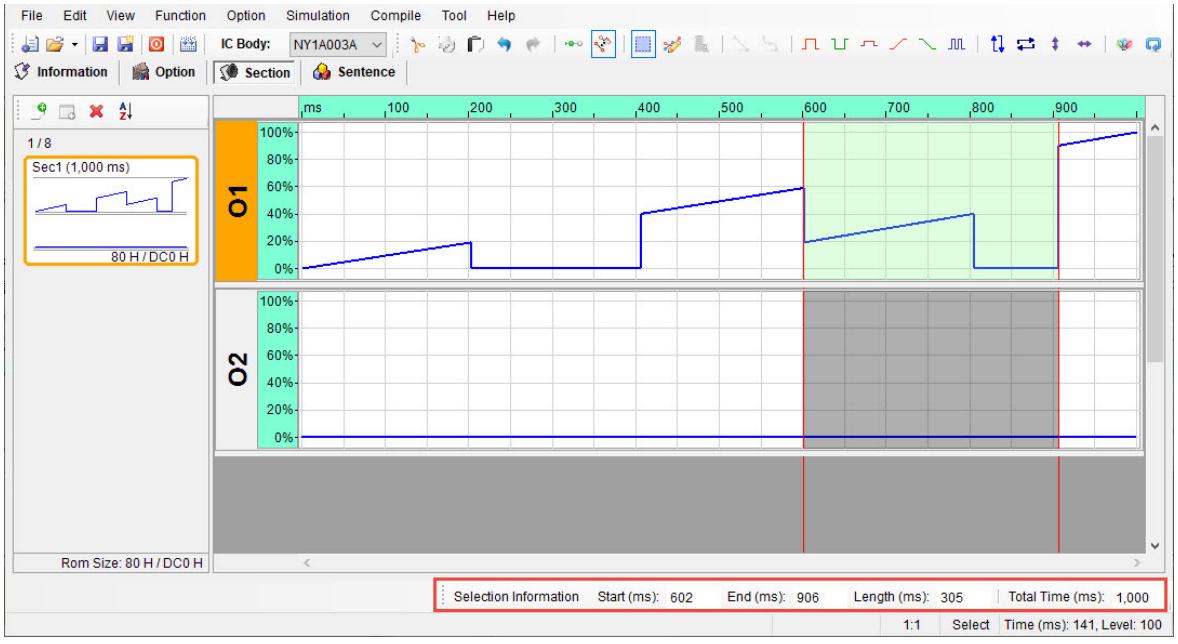
3) Select the range from 602ms to 703ms (102ms) as the pasted range which is shorter than the cut length (203ms).Therefore, only 102ms will be pasted in the selected region. The total length of signals is still the same, as shown in the figure below.



4) Select the range from 602ms to 805ms (203ms) as the pasted range which is identical to the cut length (203ms).Therefore, full length will be pasted in the selected region. The total length of signals is still the same, as shown in the figure below.



5) Select the range from 602ms to 906ms as the pasted range which is longer than the cut length (203ms). Meanwhile, the 203ms will be pasted in the selected region and the rest of signals will be presented as flat state. The total length of signals remains unchanged, as shown below.

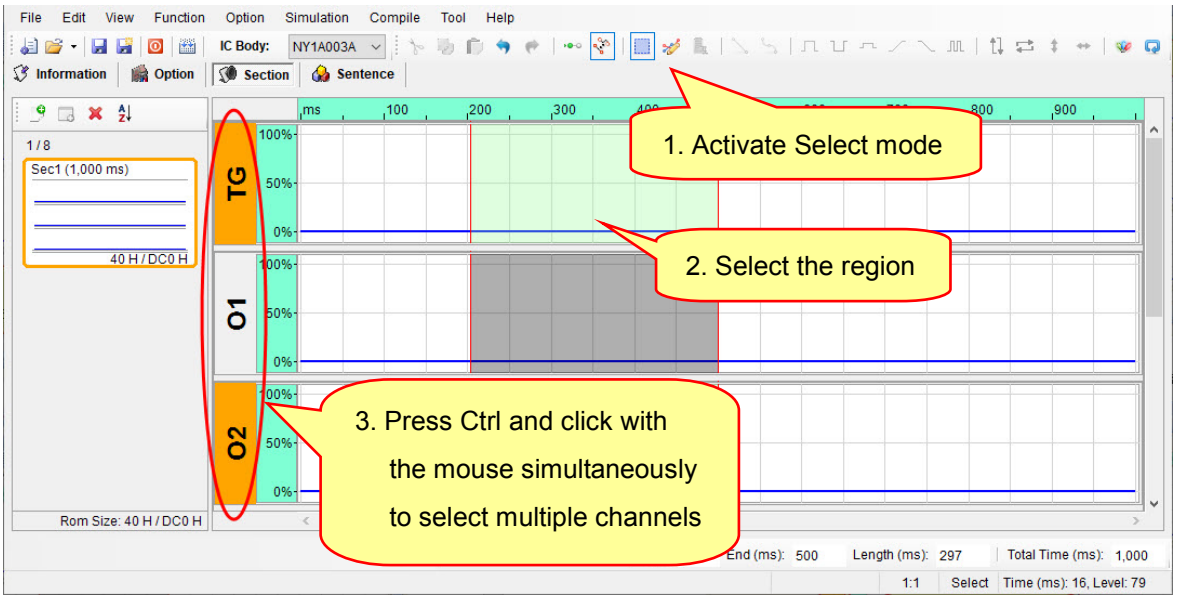


6.3 Managing the Multiple Channels

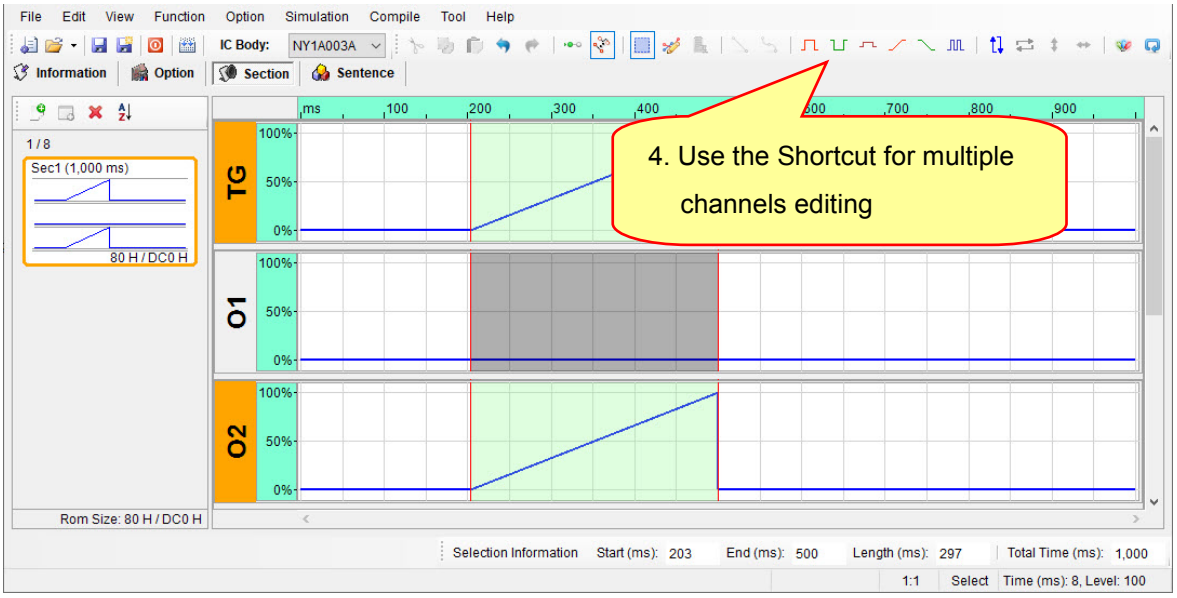
In Section page, user can press Ctrl and click with the mouse on the desired channels to edit or paste signals through Functions menu. The introductions are as following.

6.3.1 Multiple Channels Editing

1) Activate Select Mode through on Shortcut. To select multiple channels, press Ctrl and click with the mouse simultaneously to select multiple channels in Editing Zone, as shown below.



2) Use the Shortcut to edit the signals in selected region. It will produce signals while clicking channels, as shown in the following figure:

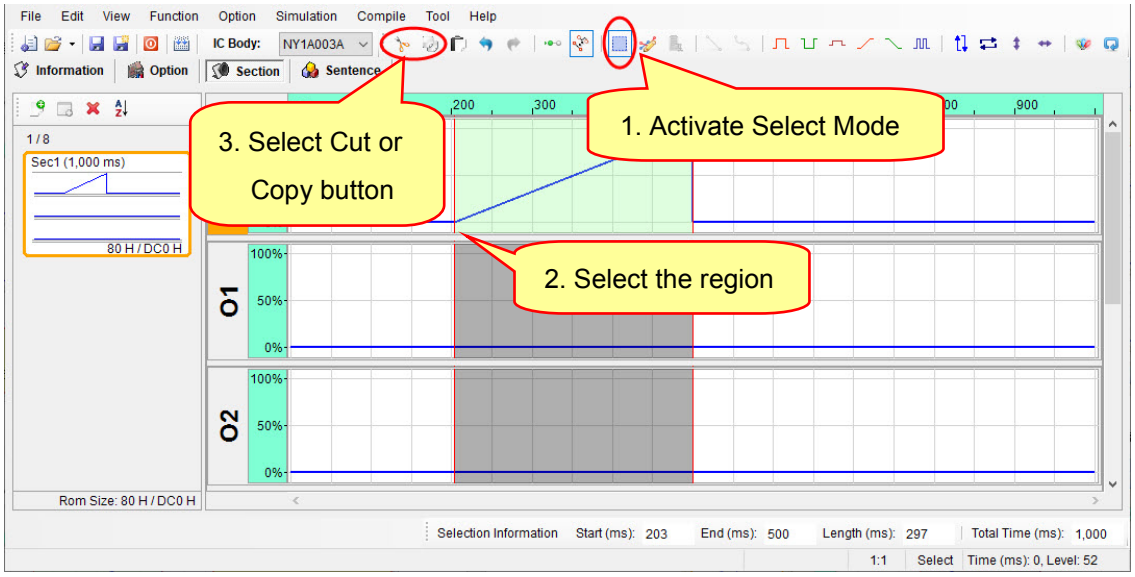


6.3.2 Multiple Channels Pasting

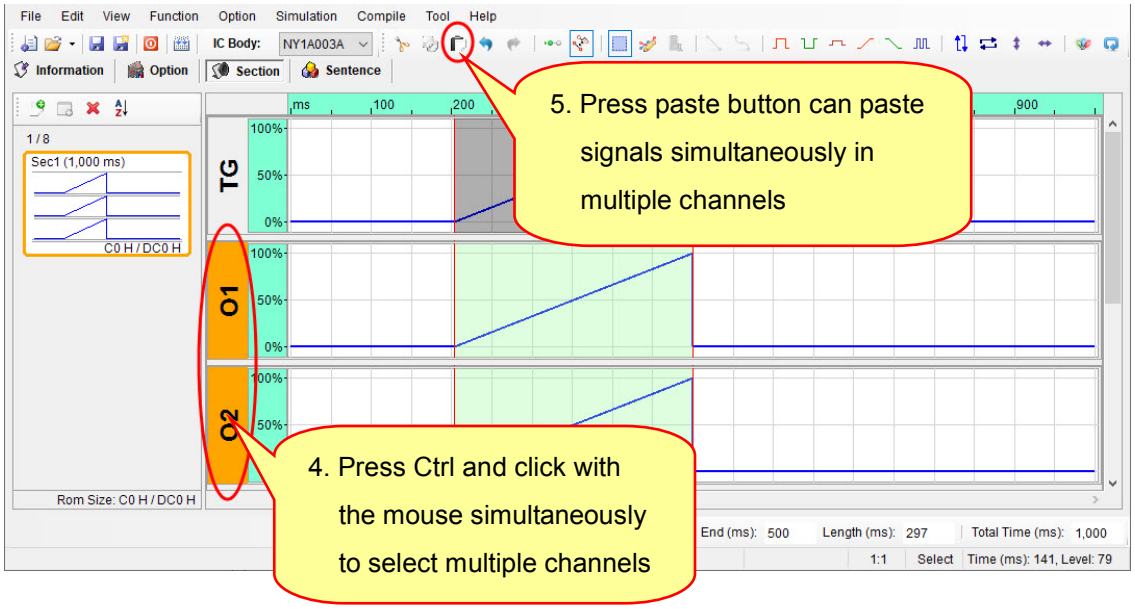
The paste is divided into multiple channels Cut/Copy and single channel Cut/Copy, and each has different operation. Users can edit for the individual need.

6.3.2.1 Single Channel Cut/Copy

1) User can click the button on Shortcut to activate Select Mode which is designed for cutting or pasting signals in the selected region, as shown in the figure below.



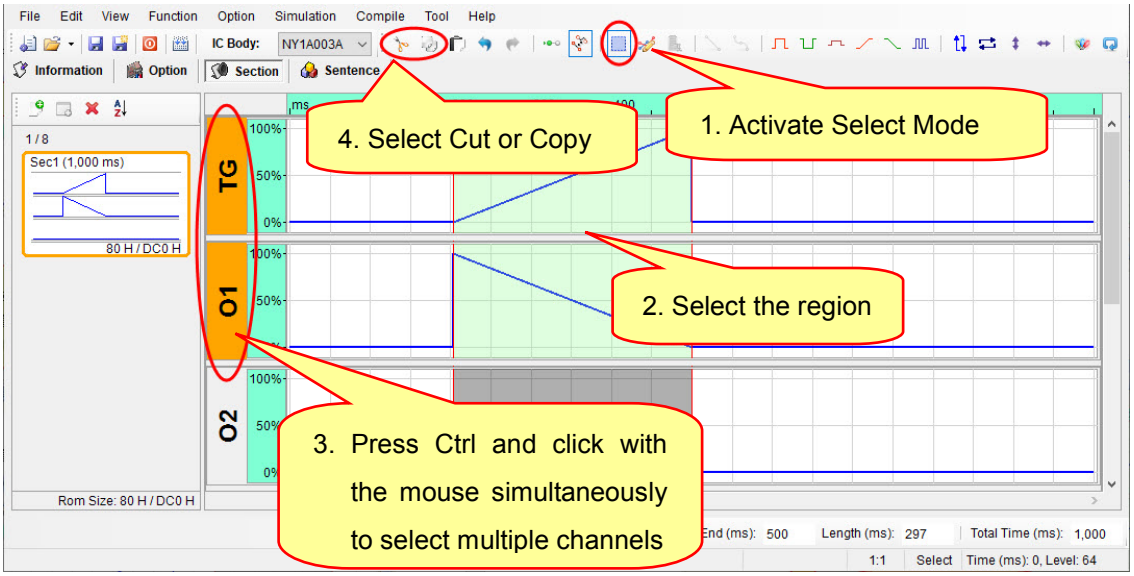
2) Press Ctrl and click with the mouse simultaneously to select multiple channels in order to paste signals into selected destination channels, as shown in the figure below.



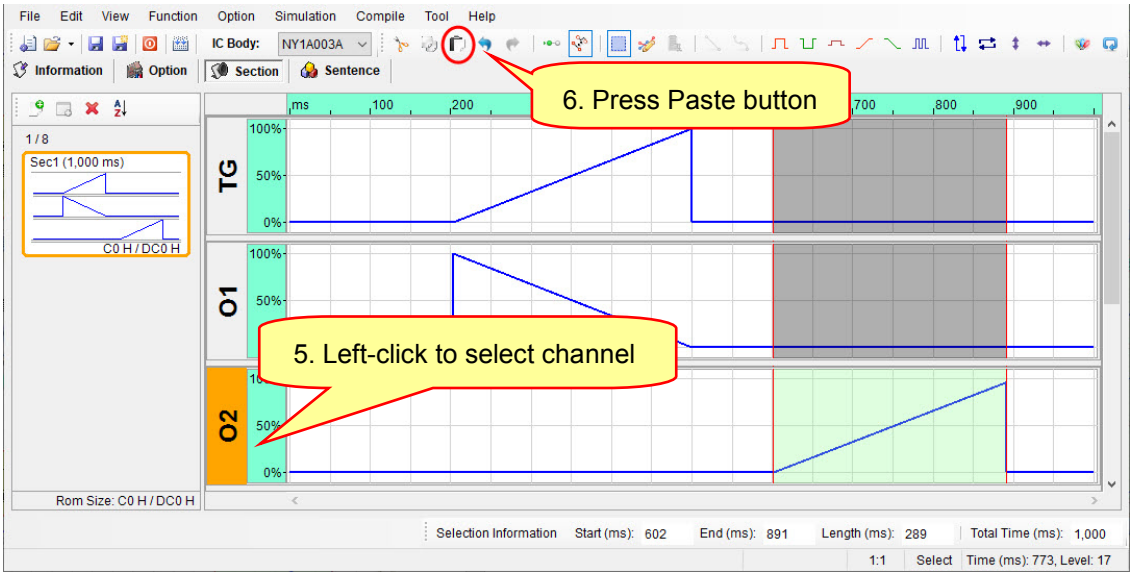
6.3.2.2 Multiple Channels Cut/Copy

Rule of pasting multiple channels is pasting channels in order. Signals are always pasted into the same channel numbers which it was cut or copied. Irrespective of the number of channels on the pasted selection.If the number of pasted channel is less than copied, it will paste the same channel number in order; If the number of pasted channel is more than copied, it will paste the same selected channel number in order, and the rest of selected channel remain unchanged.

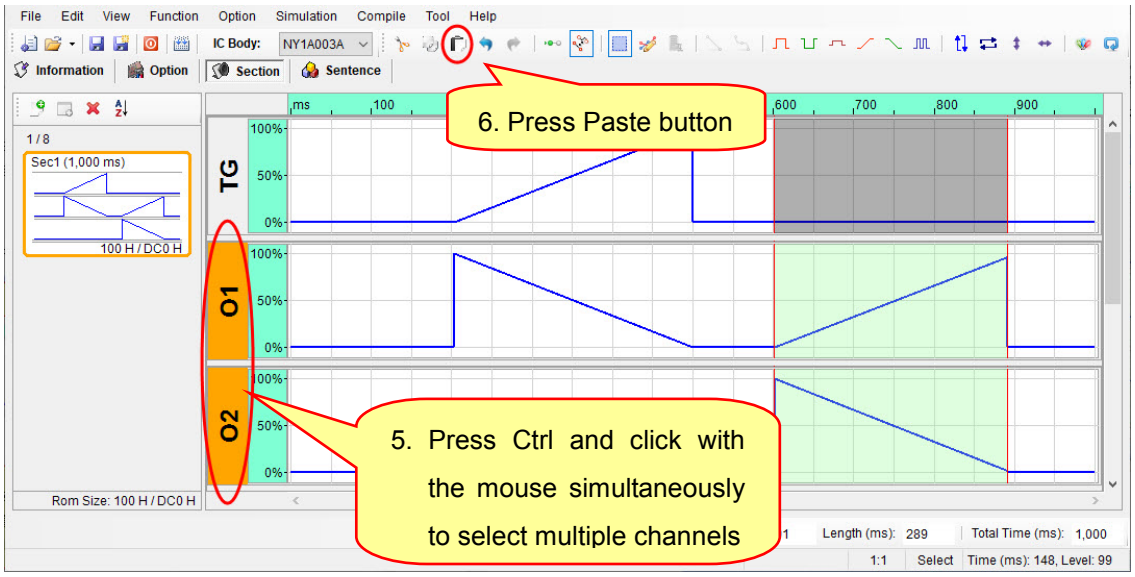
1) User can click the button on Shortcut to activate Select Mode. First select a range, and then hold down Ctrl and left-click on multiple channels to cut or copy, as shown below.



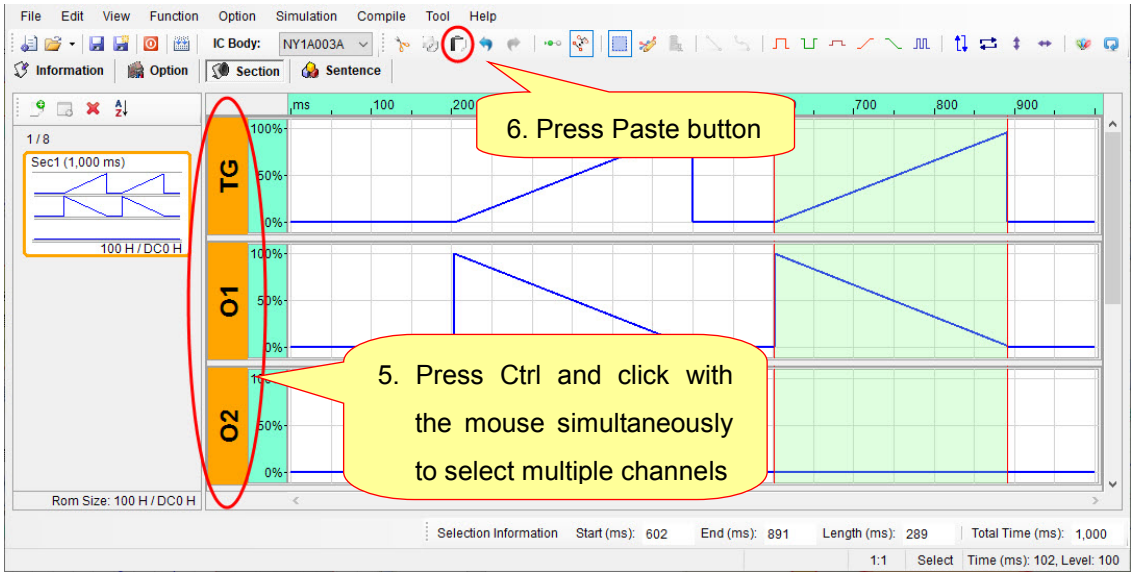
2) If the number of pasted channel is less than copied channel, then it will paste the same channel number in sequence, as shown below.



3) If the number of pasted channel is identical to copied, it will paste the same channel number in sequence, as shown below.



4) If the number of pasted channel is more than copied, it will paste the same selected channel number in sequence, and the rest of selected channel remain unchanged.



6.4 Hot Key

Menu	Function	Hot Key	Comment
File	New	Ctrl + N	Create a new project.
	Open	Ctrl + O	Open an existing project.
	Save	Ctrl + S	Save the current project.
Edit	Undo	Ctrl + Z	Reverse the last action.
	Redo	Shift + Ctrl + Z	Redo the last undone action.
	Cut	Ctrl + X	Remove highlighted signals of currently editing channel.
	Copy	Ctrl + C	Copy the highlighted signals of currently editing channel.
	Paste	Ctrl + V	Replace currently highlighted signals with that from Editing Zone.
	Select	F3	Select Mode offers quick signals editing function.
	Pencil	F4	Pencil Mode is designed for adding, deleting or changing the signal position.
	Insert Mode	F5	Execute cut or paste command with Insert signals.
	Replace Mode	F6	Execute cut or paste command with replacement.
	Select All	Ctrl + A	Select the entire signals of currently editing channel.
	Adjust Selection Inward	Shift + I	Move both range boundaries inward simultaneously.
	Adjust Selection Outward	Shift + O	Move both range boundaries outward simultaneously.
	Left Side To Left	Shift + H	Move the left range boundary leftward to expand the selection.
	Left Side To Right	Shift + J	Move the left range boundary rightward to decrease the selection.
	Right Side To	Shift + K	Move the right range boundary leftward to decrease the selection.
	Right Side To Left	Shift + L	Move the left range boundary leftward to decrease the selection.
Functions	Invert	I	Invert highlighted signals by 180 degrees. It turns the waveform upside down.
	Reverse	R	Reverse highlighted signals from right to left so it plays backwards.
	Offset	O	Add an integer to the entire currently highlighted signals.
	Shift	S	Shift the highlighted signals to right or left by an integer.
	Level High	H	Level High sets the currently selected signals to the ceiling, namely the signal would be brought to 100%.

Menu	Function	Hot Key	Comment
	Level **L**ow	L	Level Low sets the currently selected signals to the bottom, namely the signal would be brought to 0%.
	Level **C**ontrol	C	Level Control sets the currently selected signals to an integer level.
	Ascend	A	Ascend command replaces the highlighted signals with a positive slope.
	Descend	D	Descend command replaces the highlighted signals with a negative slope.
	Flashing	F	Flashing replaces the currently highlighted signals with signals alternating between 0% and 100%.
Compile	Build	F7	Build the edited file as a **.bin** file.
Tools	Q-Writer	F9	Launch *Q-Writer*, which enables user to download BIN file to Flash Demo Board for verification.
Help	About Q-Light	F1	Show current *Q-Light* version and the contact information for technical support.

7 Revision History

Version	Date	Description	Modified Page
1.0	2011/11/14	The first version.	-
1.1	2012/02/03	1. Modify Q-Color. 2. Modify NY1Bx05A Arranging the Sentence.	14 46
1.2	2012/04/20	1. Add the instructions of Options of Menu. 2. Add the instructions of Constant Current for NY1Ax03A Series and NY1P207A.	18 29, 51
1.3	2012/07/10	1. Add the Section Crossing function. 2. Move the commands of Invert, Reverse, Offset and Shift to the Functions menu.	11 12
1.4	2012/11/01	1. Add ROM Optimize function. 2. Modify Setting function. 3. Add Simulation and Loop Simulation function.	10, 22 19 21, 22
1.5	2012/11/22	Add note in Pin setting description.	18
1.6	2013/04/30	1. Please use Windows XP or above operating system version, then install Microsoft .NET Framework 4.0 before using *Q-Light*. 2. Modify the descriptions of IC series maximum ROM size.	7 33, 44, 57
1.7	2013/11/10	Add NY1A003B and NY1A103B IC Body.	27
1.8	2014/05/16	1. Add the table of total number of sections and the total used ROM Size of NY1AX03A/ NY1AX03B IC. 2. Add the table of total number of sections and the total used ROM Size of NY1BX05A IC. 3. Add the table of total number of sections and the total used ROM Size of NY1Bx07A/ NY1P207A IC	34 45 58
1.9	2016/02/18	Add the “Check for Update” function.	22
2.0	2018/01/25	Add NY1C007A IC.	49
2.1	2018/05/03	1. Add the function option page of NY1C007A. 2. Add the NY1C007A description of VDD Voltage. 3. Add the description of Pull-Low Resistor. 4. Add the NY1C007A description of Input Type.	51 54 55 56
2.2	2018/11/09	Modify NY1C007A Output Voltage and Input Type.	51, 55, 56
2.3	2019/06/25	1. Modify the table of total number of sections of NY1B105A. 2. the table of total number of sections of NY1B107A and NY1B207A.	44 59

Version	Date	Description	Modified Page
2.4	2019/11/13	Remove the option of Undervoltage-Lockout (UVLO, 2.8V)	-
2.5	2023/08/11	In Trigger Mode, when the option is Hold, the trigger button is fixed as Irretrigger.	30, 41, 54