Nuvoton
ISP/ICP Gang Programmer

User Manual

Revision 7.15, 2015/Apr/24

Table of Contents

Revision History

Revision	Description	Date
v4.00	The first formal released version for the 'ISP/ICP Gang Programmer'.	2010/04/01
v5.00	(1) Supported ICP gang programming for NUC100-series. (2) Update the application program to v5.00. (The GUI display for "CONFIG Setting" becomes more user-friendly.)	2010/08/13
v5.02	(1) Supported ICP gang programming for M051-series. (2) Fixed the HEX-to-BIN conversion error when the hex input file has a binary code size more than 64K. (The application program is updated to v5.02.)	2010/11/15
v5.05	(1) Supported Tool Project File (TPJ) for GUI setting management. (2) Supported read/verify operation of single chip in one of the 4 sockets.	2011/01/18
v5.31	(1) Supported NUC102/NUC122 series. (2) Fixed some software bugs.	2011/04/08
v5.50	(1) Supported ICP gang programming for N79E855/4/3, N79E845/4/3 and N79E815/4/3. (2) Supported ICP gang programming for N79E375/374 and N79A903/902. (3) Supported to show "PASS" or "FAIL" (beep for 3 seconds for any failed programming) when programming is finished. (4) When programming is finished, the green/red LEDs will be turned off when the programmed chip is taken out from the socket and a new chip is placed into the socket. (5) Supported 'Update Chips' for on-line operation.	2011/06/15
v5.51	Fixed minor bugs in the PC-site AP of v5.50.	2011/07/26
v5.52	(1) Fixed ICP programming problem of N79E855/4/3, N79E845/4/3 and N79E815/4/3 when VDD=3.3V. (2) Fixed some minor GUI bugs.	2011/09/02
v5.60	(1) Renamed parts W78E051D~W78E516D. (2) Supported N79E8432 and N79E8132. (3) Supported to show PASS/FAIL message on screen when gang programming is finished.	2011/10/20
v5.70	(1) Supported N79A8211A. (2) Improved programming stability when NuGang is powered by the USB port instead of a DC9V power adaptor.	2011/11/07
v6.00	(1) Fixed some minor software bugs. (2) Supported to show the failed sockets number on the LCD module when gang programming is finished.	2011/12/20
v6.02	(1) Supported N512 Family. (2) Fixed some minor software bugs.	2012/02/01
v6.04	Fixed ICP programming problem in the following parts: N79E855/4, N79E845/4, N79E815/4, N79E8432 and N79E8132.	2012/02/29
v6.10	(1) Supported the 'serial number programming' function. (cf. Section 6.1) (2) Supported the 'chip counter' function. (cf. Section 6.2)	2012/03/26
v6.12	Fixed a software bug that makes "Auto Synchronization of Buffer Data" failed.	2012/04/26
v7.10	Removed support for W78E051D.	2013/11/15
v7.15	Supported N79E715.	2015/04/24

1   Introduction

The Nuvoton proprietary "ISP/ICP Gang Programmer" provides four-chip gang programming function. It is designed especially for mass-production in the customer site. After on-line downloading the programming data into the programmer, the user may start the off-line gang programming by pressing the AUTO-key on the programmer.

The "ISP/ICP Gang Programmer"
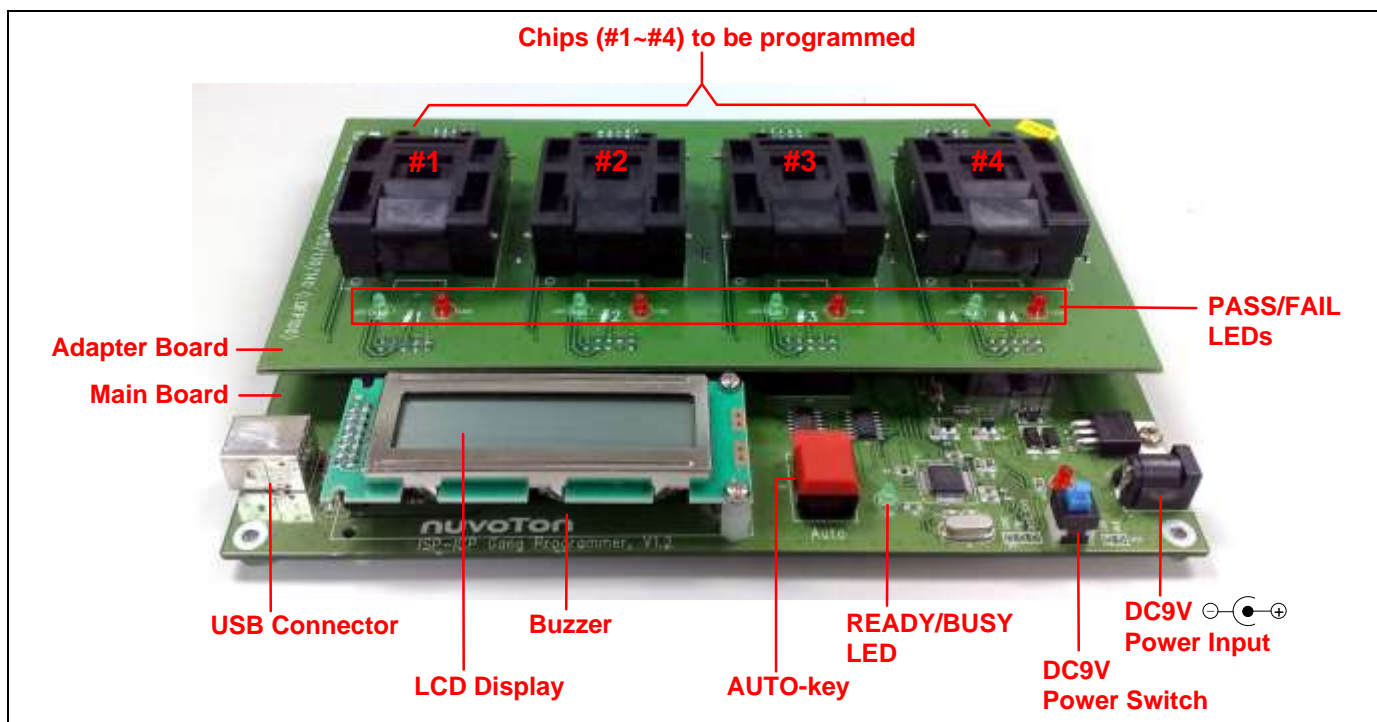
Component Description

Main Board & Adapter Board:
The programmer consists of main board and adapter board. The main board is for gang programming control while the adapter board just contains the sockets for the MCU chips to be programmed. Note that different chip package will have different adapter board.

USB Connector:
Connect to PC for on-line downloading of the programming data.

LCD Display:
Show the programmer's information and status.

Buzzer:
Show the programmer's status by a sound message.

AUTO-key:
Press this key to start off-line gang programming.

READY/BUSY LED:
Show the programmer's status: 'on' means READY while 'off' means BUSY.

DC9V Power Input and Switch:
DC 9V power supply is for off-line operation. Note the programmer is always powered on by host when connected to the USB port.

PASS/FAIL LEDs:
Show the individual programming result for chips #1 to #4: 'green' means PASS while 'red' means FAIL.

Why Called "ISP/ICP Gang Programmer"?

Because this programmer can function either as an *ISP Gang Programmer* or as an *ICP Gang Programmer*, it is called *ISP/ICP Gang Programmer*. It is designed especially for gang programming of the Nuvoton MCU products which are equipped with ISP function or ICP function.

The user can directly program the MCU chips with ICP function by this programmer. However, for the MCU chips with ISP function, the chips should have the '*Nuvoton standard ISP code*' pre-programmed in the LDROM before they can be programmed by this programmer.

2   Driver and Application Program

2.1   Installing the Driver

This ISP/ICP Gang Programmer has the USB-to-Serial bridge chip (PL-2303) built inside. When connected to host, it will appear as a *USB-to-Serial COM port* in the System\Hardware\Device Manager. Before starting to use this programmer, the user has to install the driver if the PL-2303 driver has never been installed in this host. The user can also find this driver in the folder [(1) Driver].

2.2   Installing the Application Program

The setup file for the application program is included in the folder [(2) Application Program]. Doubly click it to install the application program. Using the default installation setting, you will find a new item *"Nuvoton Tools \ ISP-ICP Utility, v?.??"* appears in the Windows START-menu after the installation is finished successfully.

2.3   Introduction to the GUI

3   Starting to Use the Gang Programmer

The programmer can be configured as an 'ISP Gang Programmer' or an 'ICP Gang Programmer' through the PC-site application program.

3.1   Functioning as an 'ISP Gang Programmer'
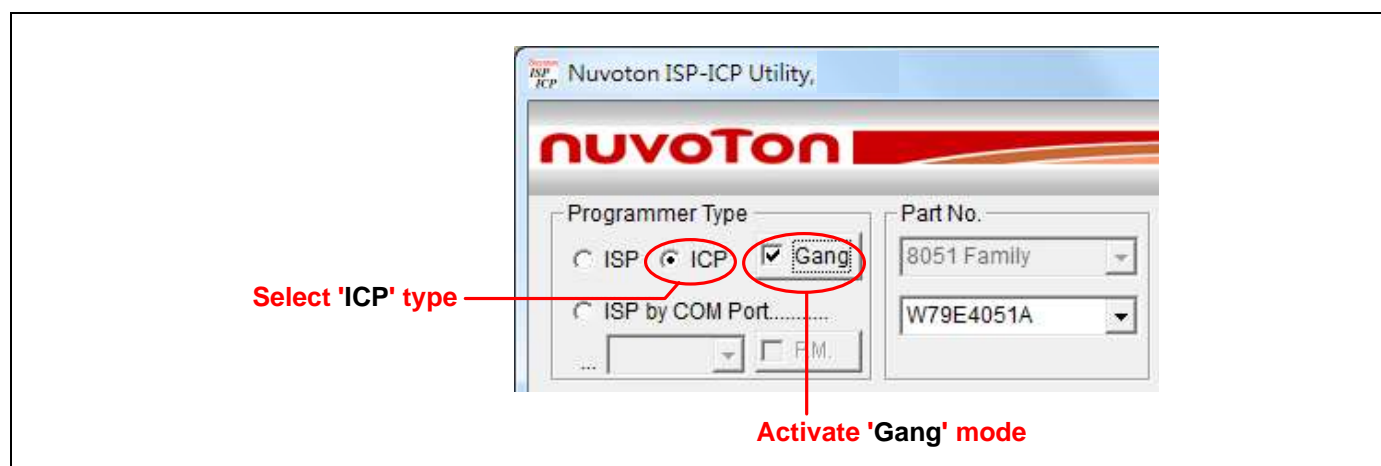
To function as an ISP Gang Programmer, select the programmer type as '**ISP**' with '**Gang**' mode activated on the application program, as shown below.
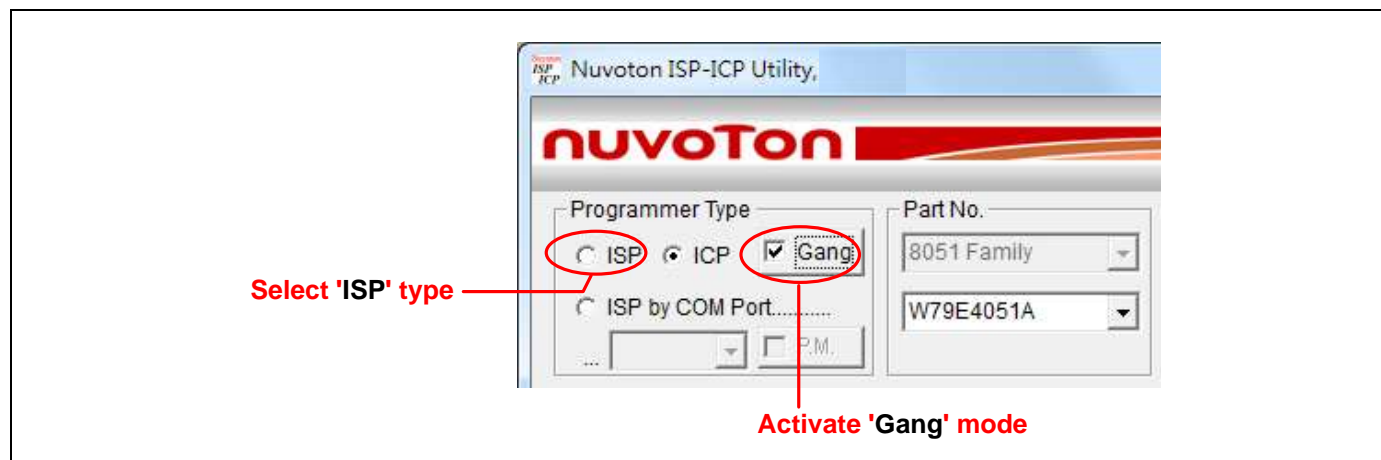
3.2   Functioning as an 'ICP Gang Programmer'

To function as an ICP Gang Programmer, please select the programmer type as '**ICP**' with '**Gang**' mode activated on the application program, as shown below.

3.3   Operation Examples

Example-1: W78E054D (Using ISP Gang Programmer)

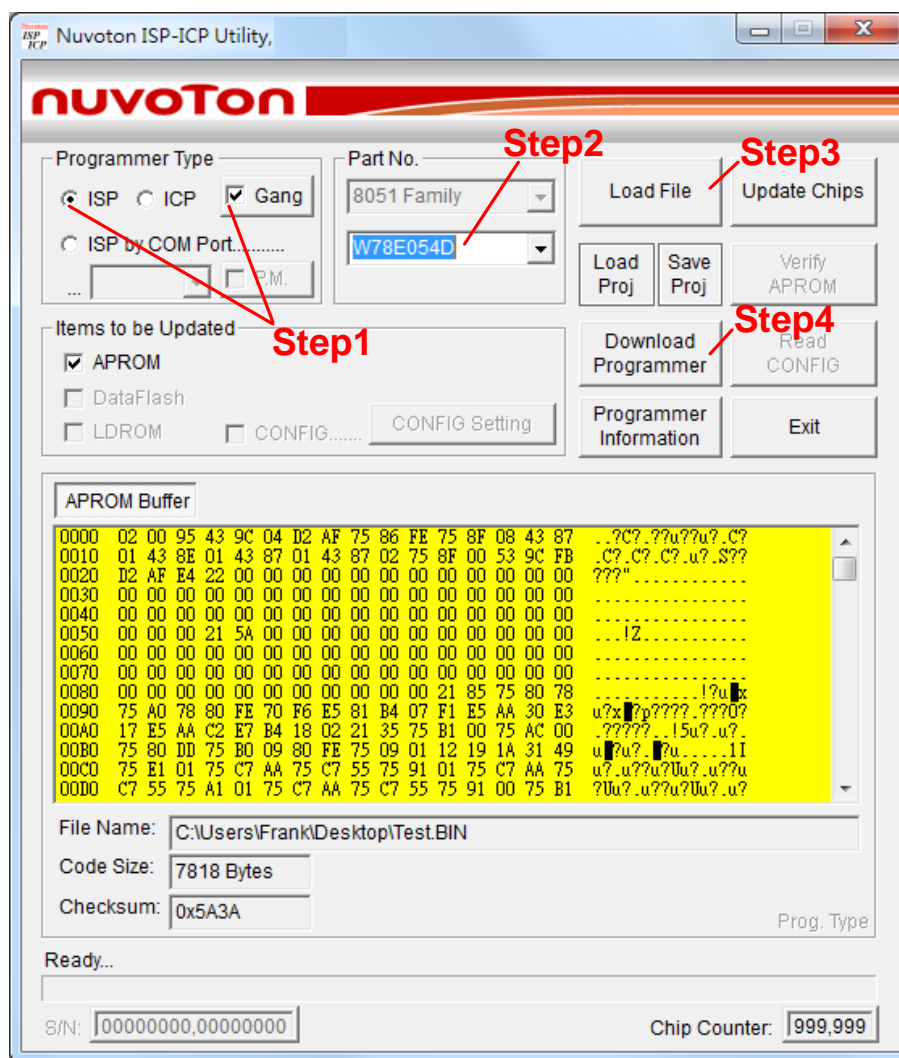To do the ISP gang programming for W78E054D, please follow the steps listed below.

Step1: Set the programmer type to be '*ISP Gang Programmer*'.

Step2: Select the wanted part no., W78E054D.

Step3: Load the programming data into APROM buffer. *(Note Step2~3 can be completed by loading a TPJ file. Please refer to* Chapter 4*.)*

Step4: Download the buffer's data into the programmer.

Step5: Now, disconnect the programmer from the host, and press the AUTO-key on the programmer to start off-line gang programming.

Example-2: N78E517A (Using ISP Gang Programmer)

To do the ISP gang programming for N78E517A, please follow the steps listed below.

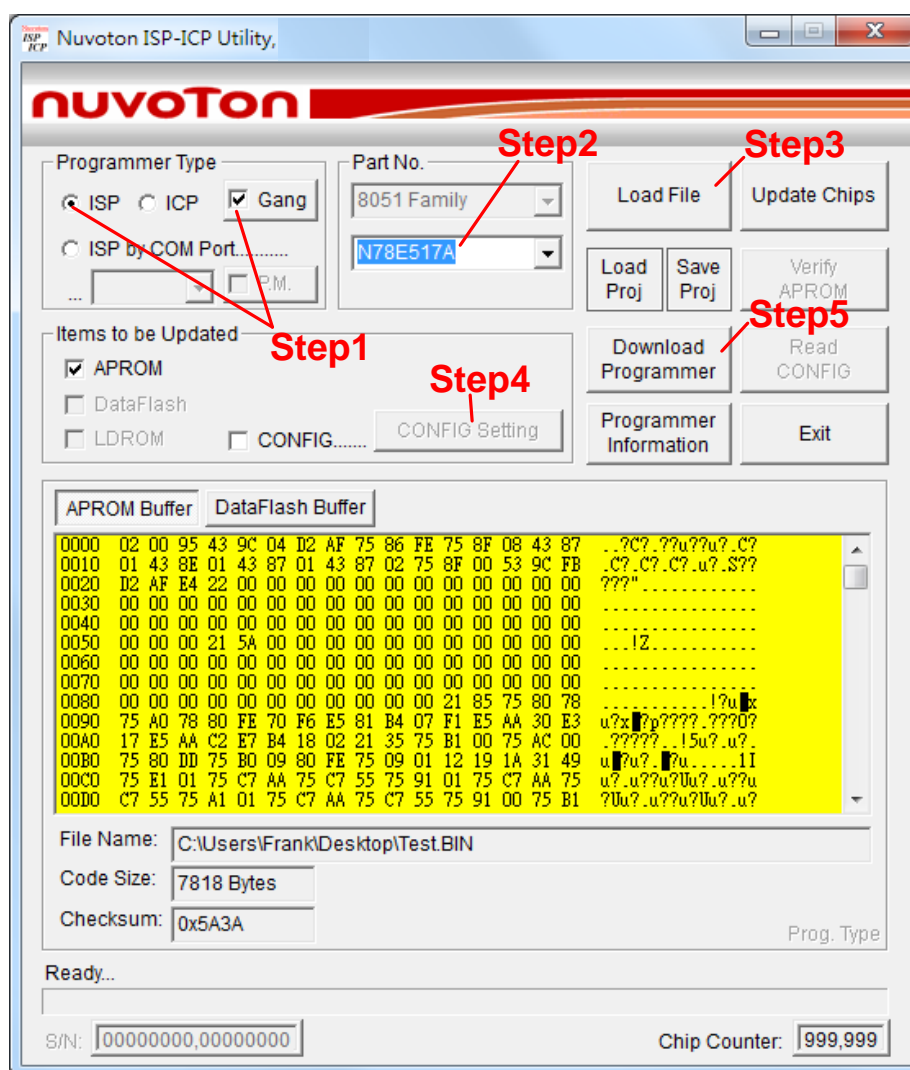Step1: Set the programmer type to be '*ISP Gang Programmer*'.

Step2: Select the wanted part no., N78E517A.

Step3: Load the programming data into APROM/Data Flash buffers by clicking 'APROM Buffer then Load File' and 'DataFlash Buffer then Load File', respectively.

Step4: Set the CONFIG bits. *(Note Step2~4 can be completed by loading a TPJ file. Please refer to Chapter 4.)*

Step5: Download the buffers' data and CONFIG setting into the programmer.

Step6: Now, disconnect the programmer from the host, and press the AUTO-key on the programmer to start off-line gang programming.

Example-3: W79E4051A (Using ICP Gang Programmer)

To do the ICP gang programming for W79E4051A, please follow the steps listed below.

Step1: Set the programmer type to be '*ICP Gang Programmer*'.

Step2: Select the wanted part no., W79E4051A.

Step3: Load the programming data into APROM/DataFlash buffers by clicking 'APROM Buffer then Load File' and 'DataFlash Buffer then Load File', respectively.

Step4: Set the CONFIG bits. *(Note Step2~4 can be completed by loading a TPJ file. Please refer to Chapter 4.)*

Step5: Download the buffers' data and CONFIG setting into the Gang Programmer.

Step6: Now, disconnect the programmer from the host, and press the AUTO-key on the programmer to start off-line gang programming.
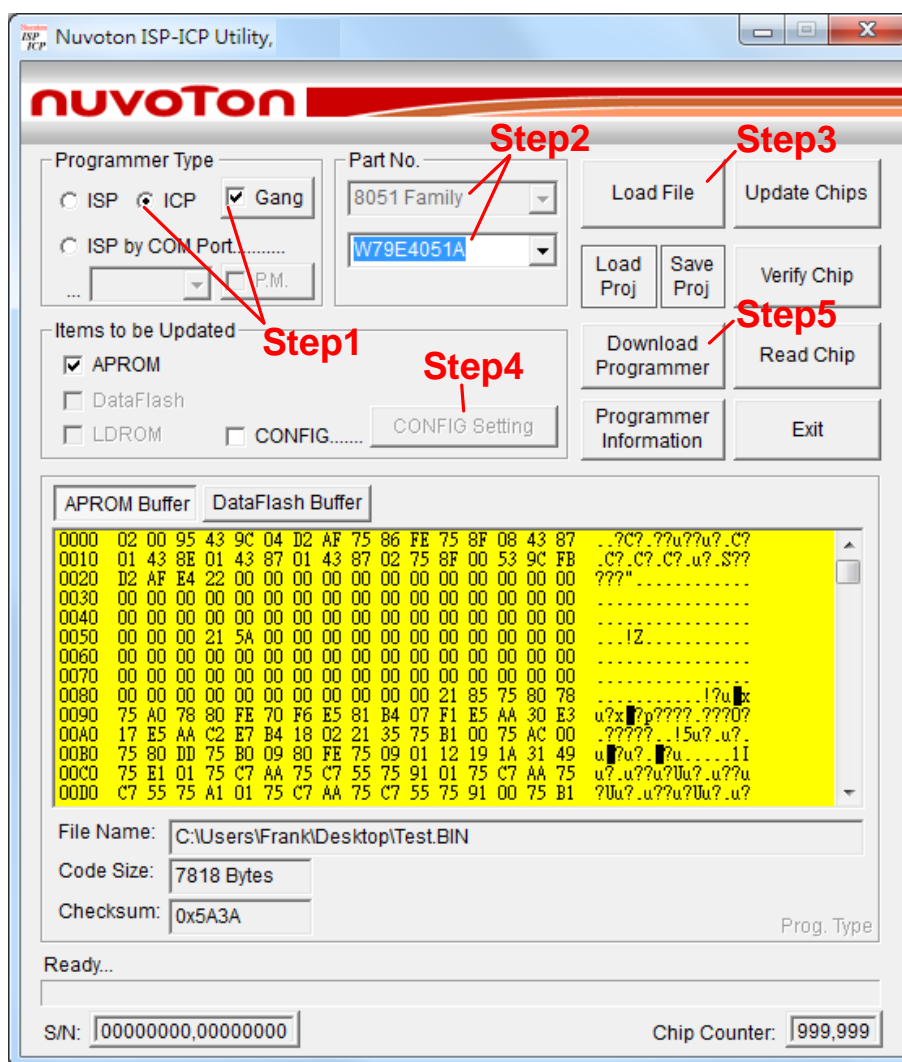
3.7   Detection of 'Chip-Removed-then-Placed'

Every time the gang programming is finished, the green/red LEDs on the adapter board will keep showing the last programming result until next pressing of the AUTO-key. Sometimes the operator might forget to press the AUTO-key after placing new chips into the sockets, thus the new chips are un-programmed and regarded as programmed 'PASS'. To prevent from this carelessness, the auto-detection function of 'chip-removed-then-placed' is supported, that is, the green/red LEDs will turn to off state once the 'chip-removed-then-placed' condition is detected. So, after the new chips are just placed into the sockets, the green/red LEDs will become off to indicate the chips have not been programmed yet.

3.8   Special Alert for Failed Programming

When programming is finished, if there is any chip failed, the buzzer will beep for 3 seconds to alert the operator. At this time, the operator should check the red LEDs to determine which chip(s) is/are failed in programming.

4   Tool Project File (TPJ)

The user may save all the GUI settings to the Tool Project (TPJ) file, and retrieve the GUI setting by loading the TPJ file previously saved. It is much helpful to the user to manage a variety of programming data by the 'project' type.

The GUI setting or the contents of the TPJ file include:

(1) Programmer type
(2) Part number
(3) Items to be updated
(4) APROM buffer data if APROM is one of the updated items
(5) DataFlash buffer data if DataFlash is one of the updated items
(6) LDROM buffer data if LDROM is one of the updated items
(7) CONFIG setting if CONFIG is one of the updated items

Save the GUI setting to a TPJ file

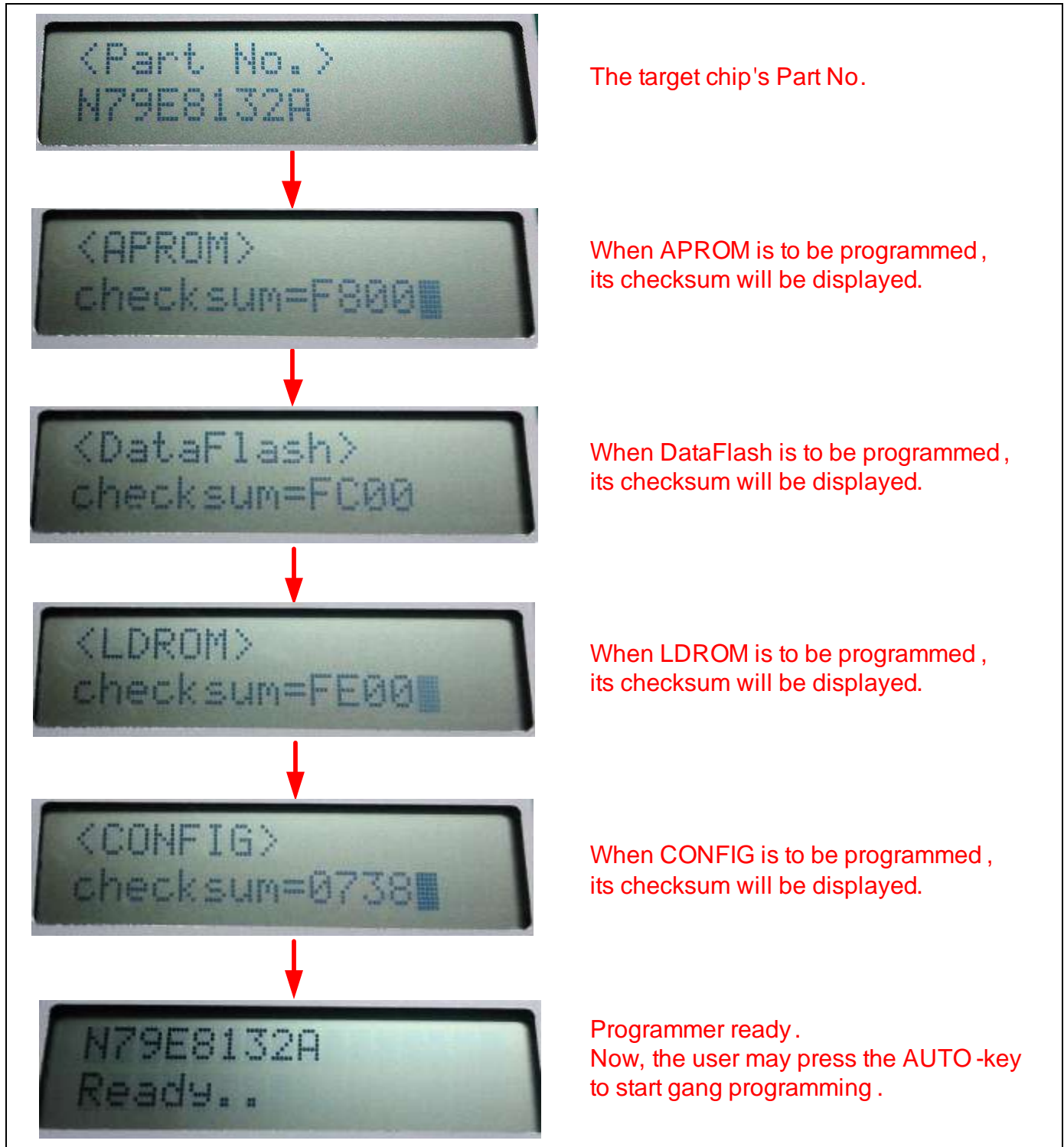Retrieve the GUI setting from a TPJ file
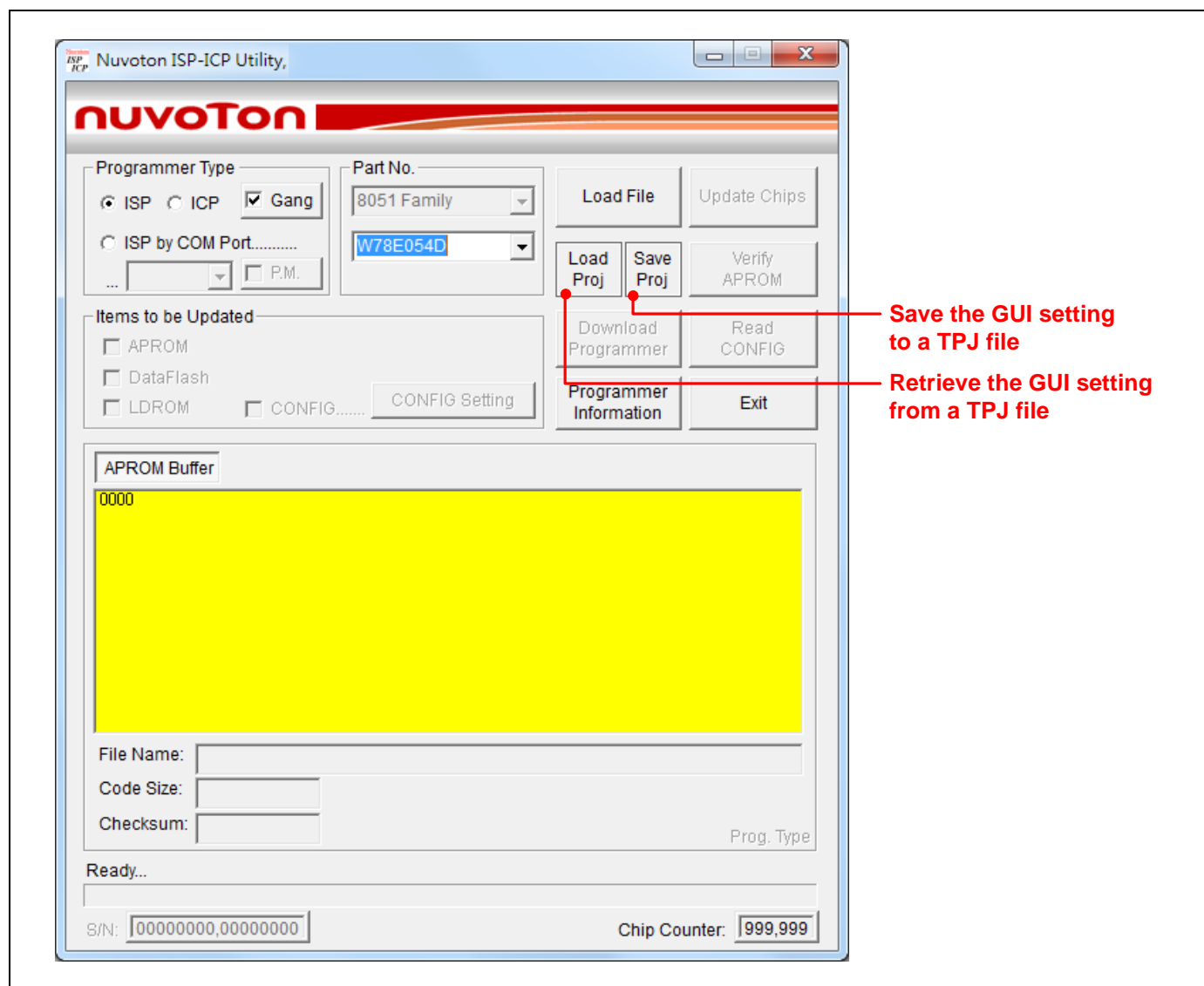
5   Programmer Information

5.1   Checking through PC-site AP

To check the information of the programming data previously downloaded in the programmer, connect it to host and then click the 'Programmer Information' button. Now, a dialog box of Programmer Information will pop out to show the information of previous downloaded data, as shown below.
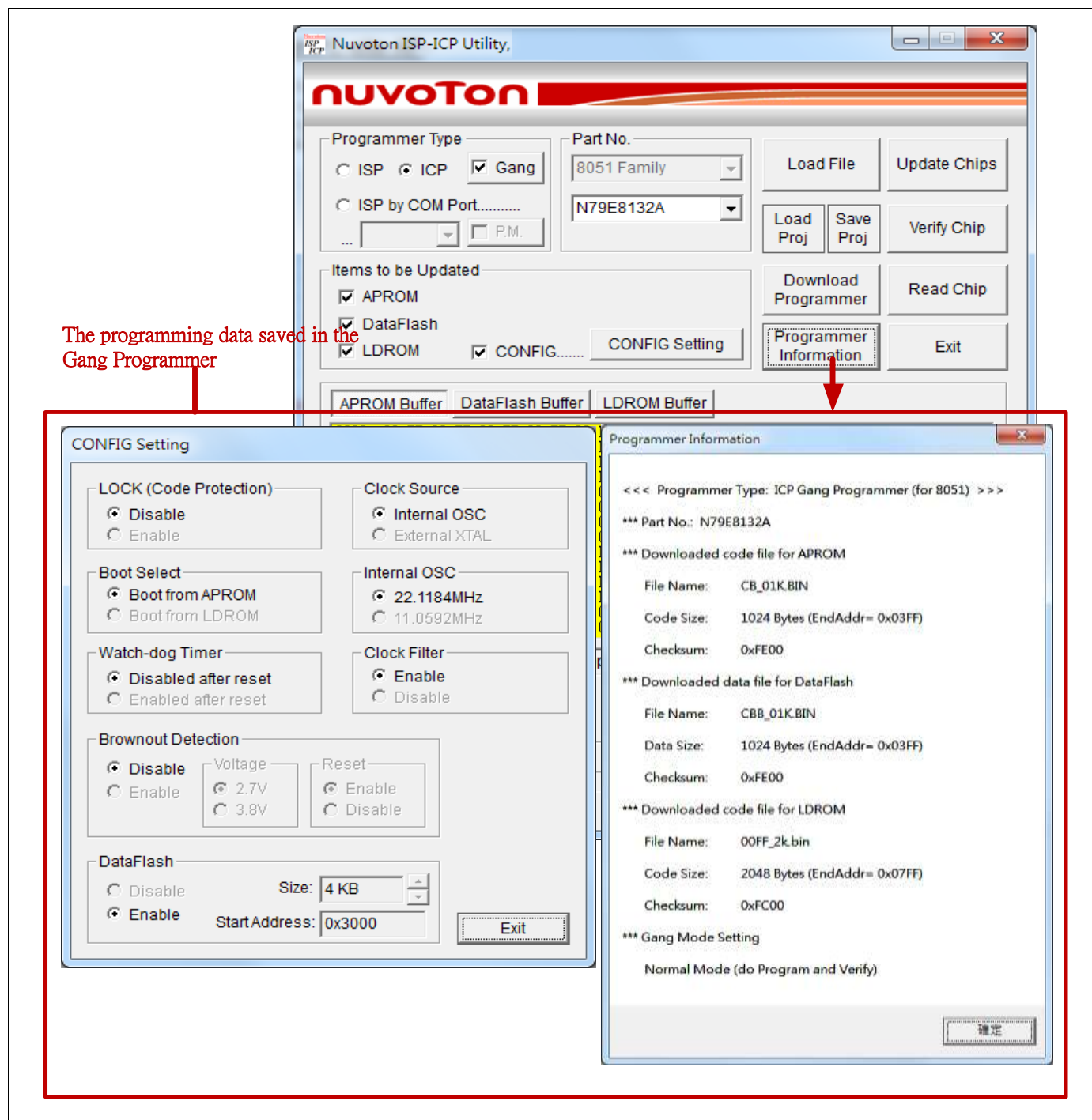
5.2 Checking through LCD Display

Every time the programmer is just powered on, the LCD module will sequentially display the information of the programming data previously downloaded, as shown below.

<Part No.>
N79E8132A

The target chip's Part No.

<APROM>
checksum=F800▌

When APROM is to be programmed , its checksum will be displayed.

<DataFlash>
checksum=FC00

When DataFlash is to be programmed , its checksum will be displayed.

<LDROM>
checksum=FE00▌

When LDROM is to be programmed , its checksum will be displayed.

<CONFIG>
checksum=0738▌

When CONFIG is to be programmed , its checksum will be displayed.

N79E8132A
Ready..

Programmer ready .
Now, the user may press the AUTO -key to start gang programming .

!

_

!!!

6 Advanced Functions

6.1 Serial Number Programming

The serial number programming is supported when the programmer functions as an 'ICP Gang Programmer' and operates in on-line mode. The serial number is BCD coded and 8 bytes long, which supports 16 decimal digits. Only APROM area can be programmed with the serial number. The following figure shows how to open the configuration dialog box for serial number programming.
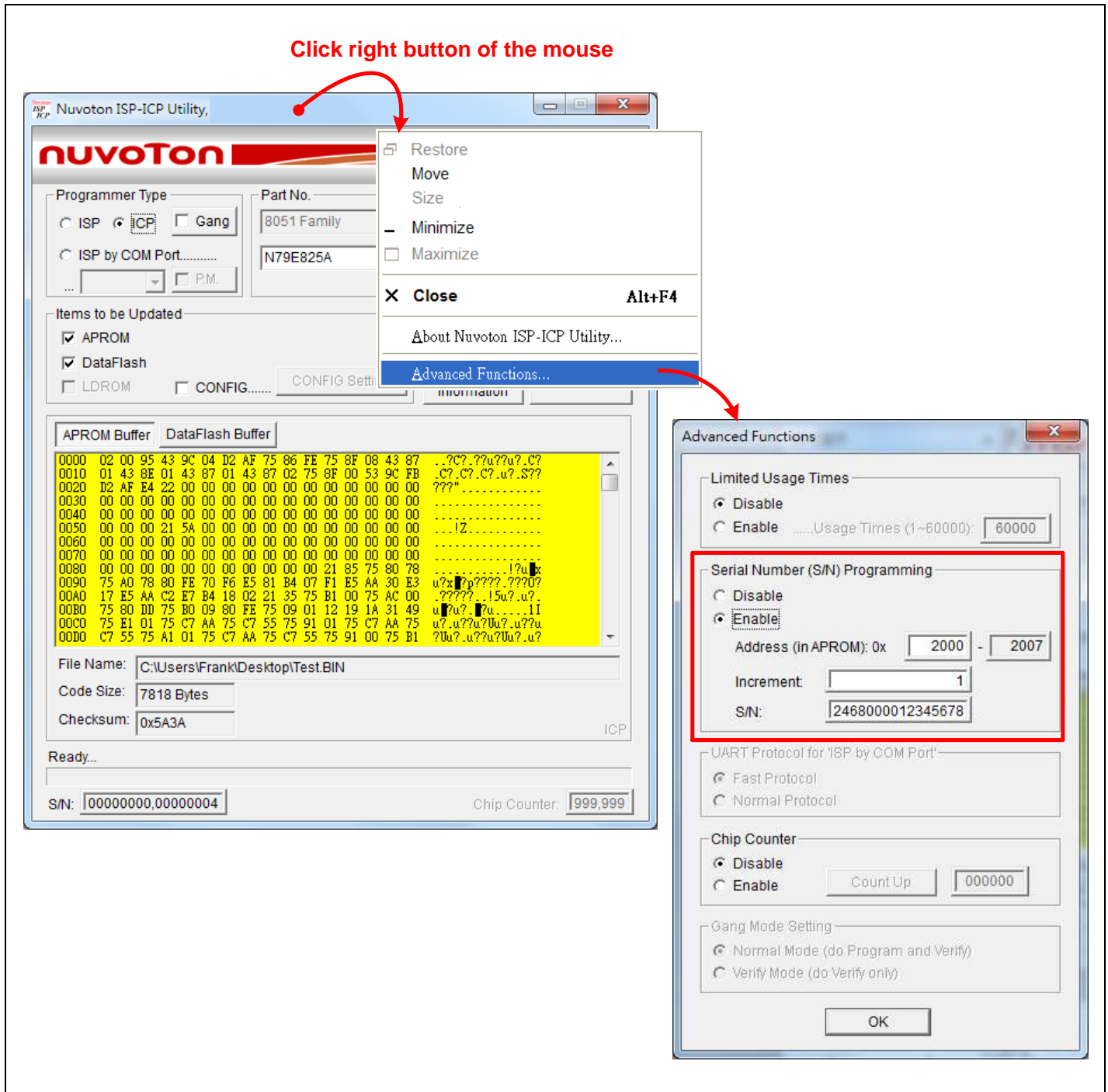
As shown in the above figure, '2468000012345678' is to be programmed at address 0x3FF8 in APROM area. The BCD-coded serial number programmed in the chip has a '*what you see is what you get*' format, as shown below.

6.2 Chip Counter

The chip counter is used to calculate the successfully programmed chips. The user may configure the counter as up counter or down counter, and set the initial counter value. The following figure shows how to enable the chip counter and its various configuration.