UWTR

OTP/Flash Writer *for* EM78 Series

USER'S GUIDE

(Applicable to UWriter Software Version 1.04.00 or later)

Doc. Version 1.4

ELAN MICROELECTRONICS CORP.

April 2010

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Handbook Revision History		
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1.0	User's Guide Initial Version Release	2009/07/31
1.1	1. Added "Load with EEPROM Data" option in the Load Dialog (see Section 3.2.3). 2. Added flash effect in the different address after compare (see Section 3.2.5). 3 Modified Log Setting Dialog (see Section 4.3).	2009/09/24
1.2	1. Modified Target board VDD and Code Option dialog (see Sections 3.1.1 and 3.2.2). 2. Modified Log Setting Dialog (see Section 4.3). 3. Added UWTR Self Test function (see Section 4.4). 4. Added list on UWTR Supported ICs (see Appebdix A).	2009/10/28
1.3	Added new Adapter Board figure showing its pin height (see Figure 1-3b)	2009/12/29
1.4	Modified CDS file cannot be written into chip. (See Section 3.2.1)	2010/04/23

Chapter 1
Introduction

1.1 Overview

This User's Guide provides a comprehensive operating guide for ELAN's UWTR Writer System in programming of ELAN EM78 Series FLASH chips and industrial/commercial grade OTP chips (see separate Application Note *AN-UWTR 0001* for the detailed list of the supported chips). The system consisted of an UWTR Writer (the hardware device) and the UWriter software. The software incorporates the software peripheral driver that drives the UWTR Writer. The latest version of the UWriter software and it accompanying UWTR driver can be downloaded from ELAN'S Website

NOTE

Visit the ELAN website http://www.emc.com.tw to download the latest UWriter software which incorporates the UWTR Writer Driver.

The UWTR Writer device supports both on-line and offline (stand-alone) programming operations.

1.1.1 What You Should Get?

- One UWTR Writer

- One Adaptor Board

- One each USB Cable, ISP Cable, & Power Adaptor

Figure 1-1 UWTR Writer Hardware Package

The UWriter software, its accompanying UWTR driver, and this User's Guide are available and can be downloaded from ELAN'S Website.

1.2 Writer Hardware Attributes

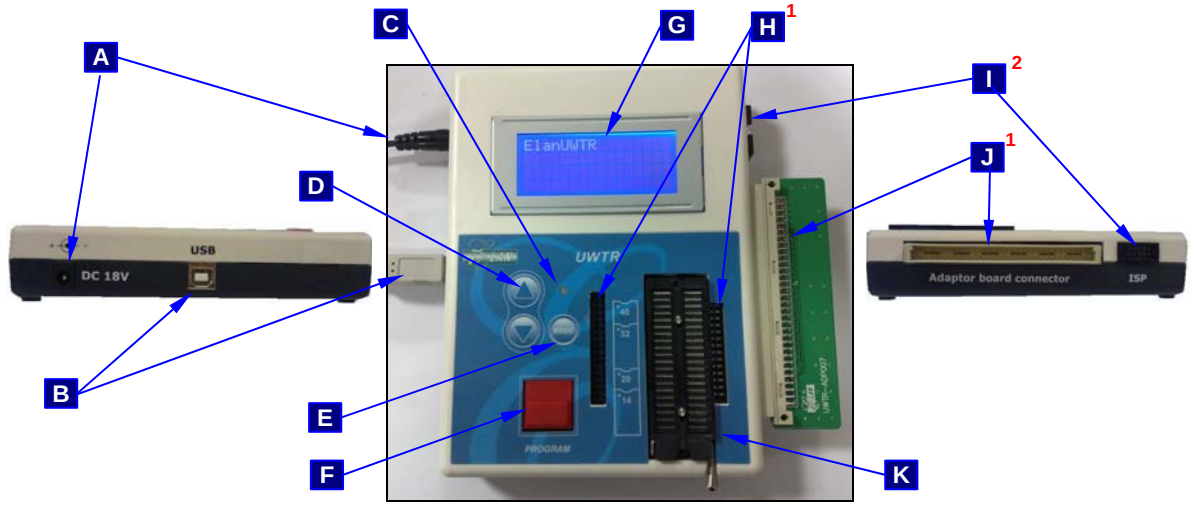
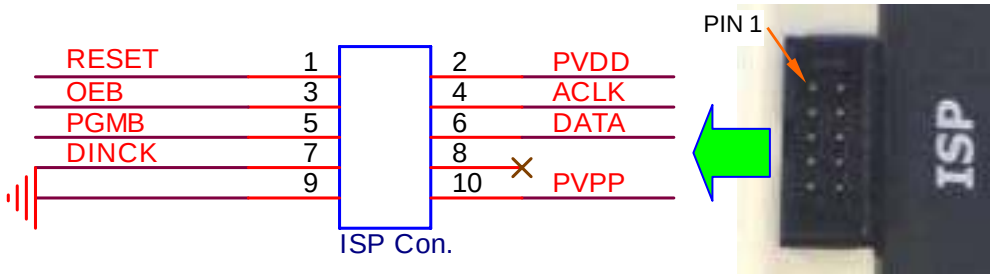


Figure 1-2a UWTR Writer and its Major Components

A	DC Power Jack (18V 800mA)	G	LCD Panel (display programming data/status)
B	USB B Type Port (connects to PC)	H	Connectors for SOP/SSOP/QFP/LQFP[1] & other unique IC packaging adapter boards
C	LED (indicates result status**:** Pass: green, Fail: amber)		
D	Up & Down Buttons (scan & select modes/info)	I	Extension Connector for target board ISP[2]
E	Mode Button (set the selected program mode function)	J	Universal Connector for unique IC PCB adapter[1]
F	Program Button (run the set program mode function	K	Textool for DIP ICs

[1] *See the Application Note **AN-UWTR 0001** for the detailed list of applicable SMD socket/Textool and PCB adapter for each of the supported chips*

[2] *In-System-Programming extended pins***:**



Applicable pins for OTP chips**:** **2:** PVDD **3:** OEB **4:** ACLK **5:** PGMB **6:** DATA **7:** DINCK **9:** GND **10:** PVPP

Applicable pins for FLASH chips**:** **1:** RESET **2:** PVDD **6:** DATA **7:** DINCK **9:** GND

Figure 1-2b In-System-Programming (ISP) Connector Pin Assignments

1.2.1 Textool (Socket)

1.2.1.1 Textool for DIP Packaged Chips

The Textool can accommodate various sizes of DIP packaged OTP/FLASH chips. When mounting a 40-pin chip into Textool, make sure that the chip is positioned in such a way that its notch (Pin 1) is on top (pointing away from the Textool locking lever). If the OTP /FLASH chip has less than 40 pins, the chip should be installed bottom aligned with the Textool as illustrated at right. This position ensures that the pin numbers of both chip and the Textool are matched. Otherwise, the UWTR Writer will not function properly

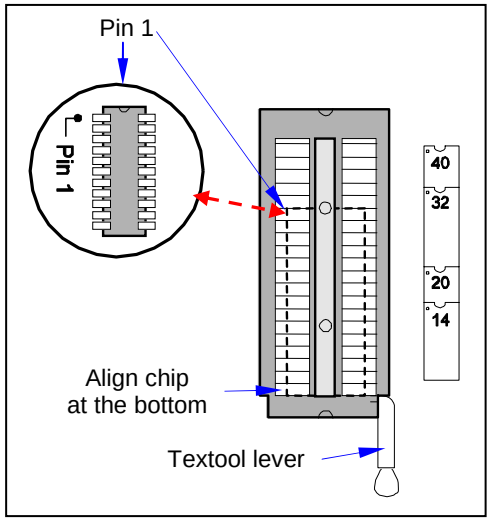


Figure 1-3a Proper Mounting of Chip into Textool

1.2.1.2 SMD Textool + Adaptor Board for SOP/SSOP/QFP/LQFP Packaged Chips

SMD Textool mounted on an applicable adaptor board is used to accommodate various sizes of SMD **SOP/SSOP/QFP/LQFP** packaged OTP/FLASH chips. The adapter board is inserted into the two connectors adjacent to the DIP Textool (attribute “H” in Figure1-2a in Section 1.2 above).

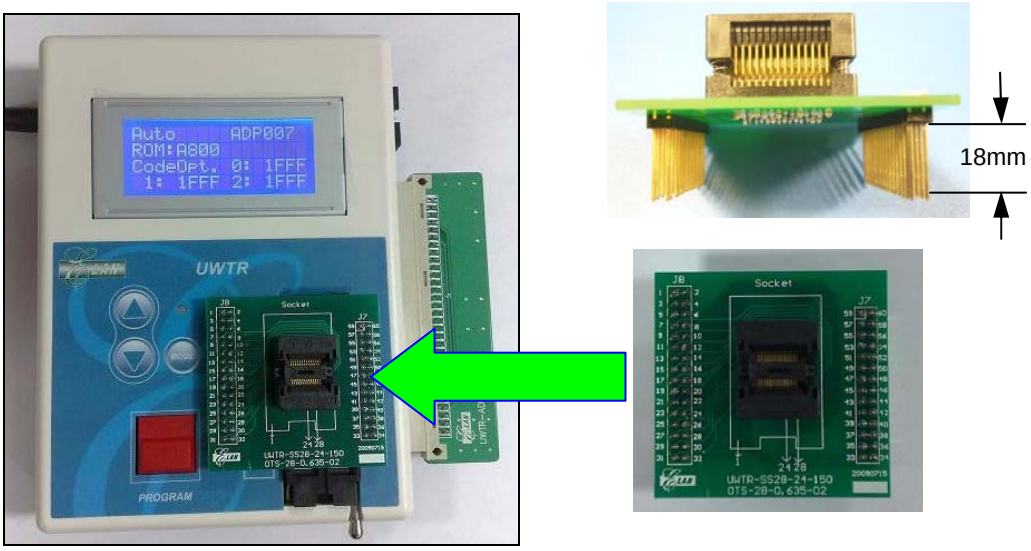


Figure 1-3b Mounting SMD Textool + Adaptor Board (with Pin Height of 18mm) on UWTR Writer

1.2.2 Programming/Mode/Up&Down Button Functions and LCD Panel Display

The LCD panel turns on as soon as power is supplied to the UWTR Writer. It displays the instructions and corresponding information as set through the **Program/Mode/Up&Down** buttons during offline (stand-alone) operation. It also displays the results of such instructions after pressing the red **Program** button.

1.2.2.1 LCD General Functions Display Allocation

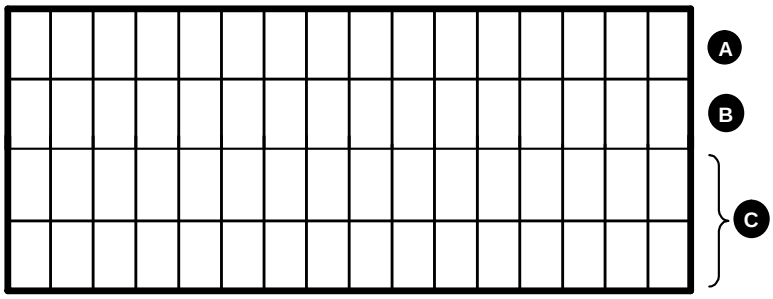


Figure 1-4 LCD Panel Display Allocation

Area A) Displays mode setting and program results status**:**

- When in offline (stand-alone) status, this area will initially display the currently applicable adaptor board number ***ADPXXX***.
- Press **Mode** button to activate the program function selection mode on Area A. Then press **Up/Down** buttons to scan and select for required function, i.e., ***Erase (****Flash chip only****)*** → ***B/Check*** → ***Write*** → ***Verify*** → ***Auto***. Next, press **Mode** button again to apply the selected setting and press the red **Program** button to execute (if the info displayed in Area B & C are okay).

- If the executed function is successful, ****Pass**** will display at the right end of this area and the LED lights up with green color. Otherwise, it will show ****Fail**** and the LED lights up with amber color.

Area B) Displays OTP/FLASH checksum or failure message**:**

- Under normal condition, this area will initially display the source code checksum.
- When the installed Adaptor Board does match with the loaded source code, this area will display ***Adap-Board Error***.
- If the target chip is not installed or not correctly positioned on the Textool, ***Check on Socket*** message will display on this area.
- If the selected target chip type and the Adaptor Board do not match, or the chip is not correctly positioned on Textool, this area will show ***Check on Socket*** or ***IC doesn't Match***.

Area C) Displays Program information

- When in offline (stand-alone) status, this area will initially display the UWTR Writer hardware device version.
- Press **Up/Down** buttons to select for the required programming status information, i.e., ***Code Option → IRC/WDT Frequency → Written Count → Summary Count → Rolling Code***.

NOTE

All UWTR buttons are disabled when it is connected to PC.

1.3 Programming Operation Flowchart

NOTE
It would be helpful to print this page and use it as ready reference while programming

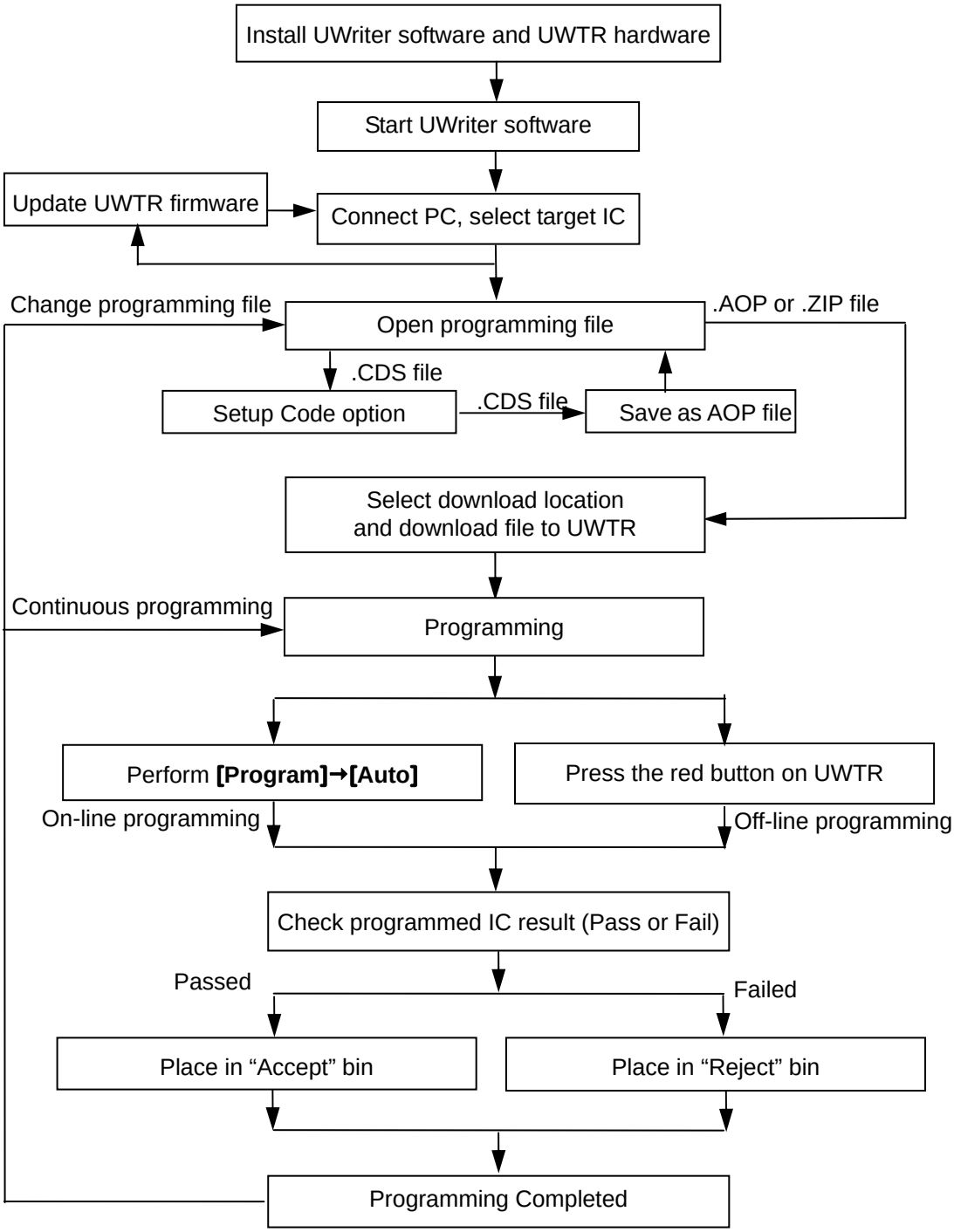


Figure 1-5 Programming Flow Chart

Chapter 2
System Installation

2.1 System Requirements

2.1.1 Host Computer

The UWTR Writer System requires a host that meets the following configuration**:**

1. IBM PC or compatible computer
2. Runs under Windows 2000, NT, XP, or Vista
3. 6MB free hard disk space
4. Mouse

2.1.2 External Power Source

Requires power source of +18.0VDC, 800mA (power adapter) to provide power for UWTR Writer Main Board.

NOTE
Use of ELAN provided AC power adapter is recommended

2.1.3 USB Cable

Use the standard USB cable with A & B male connectors. Length of cable should not exceed two meters (6.6 feet)

NOTE
Use of ELAN provided USB cable is highly recommended

2.2 Hardware Installation and Setup

2.2.1 Connecting UWTR to Host Computer and Power Source

CAUTION!

Be sure the Textool is empty before supplying power to UWTR. Otherwise, the OTP chip could be damaged.

1. Choose the appropriate Adaptor Board for the target chip and carefully plug it into 64-pin "Adaptor Board Slot" on the right side of the UWTR Writer. Make sure the pins are correctly aligned, not shifted to left or right.
2. Plug the power adapter (DC +18V) power jack to the UWTR Writer power connector and plug the adapter to a power source. The LCD should display ***ElanUWTR***.
3. Plug the USB cable between UWTR Writer and PC anytime you want to connect and control the writer with UWriter program with PC. If the UWriter program is running in your PC, it will auto-detect and link with the UWTR Writer. Note that all buttons on UWTR Writer are disabled when it is connected to PC.
4. Plug the target chip on Textool by referring to Section 1.2.1 for proper procedure. Also be sure that the Adaptor Board matches with your target chip.

Figure 2-1 Connecting UWTR Writer Assembly to Host Computer

2.3 Installing the Software (UWriter Program & UWTR Driver)

2.3.1 Downloading UWriter from ELAN Website

The latest version of UWriter software (incorporating the non-integrated software peripheral UWTR Writer driver) is available from the ELAN's website (http://www.emc.com.tw). To access the software, do the following:

1. From ELAN homepage, click **Technical Support → Supporting Tools → Microcontroller** as illustrated below.

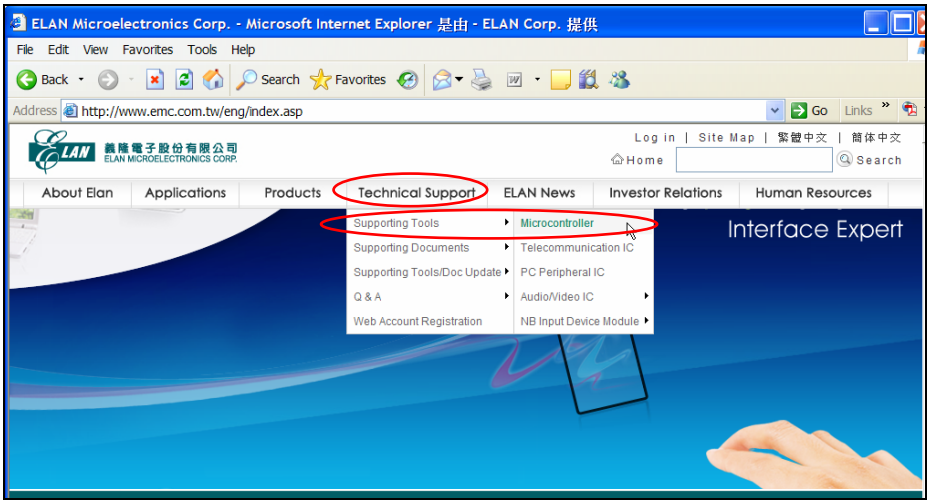


Figure 2-2a ELAN Website Homepage with "Technical Support" Button → "Supporting Tools" → "Microcontroller" Selected

2. Then under "**IC Part No.**" column of the "Microcontroller" list of ICs, look for "EM78F651N/EM78F651N" (or for "UWTR" under "**Tools**" column) near the bottom of the list. Then click, **File** button under the "**Download**" column as illustrated below.

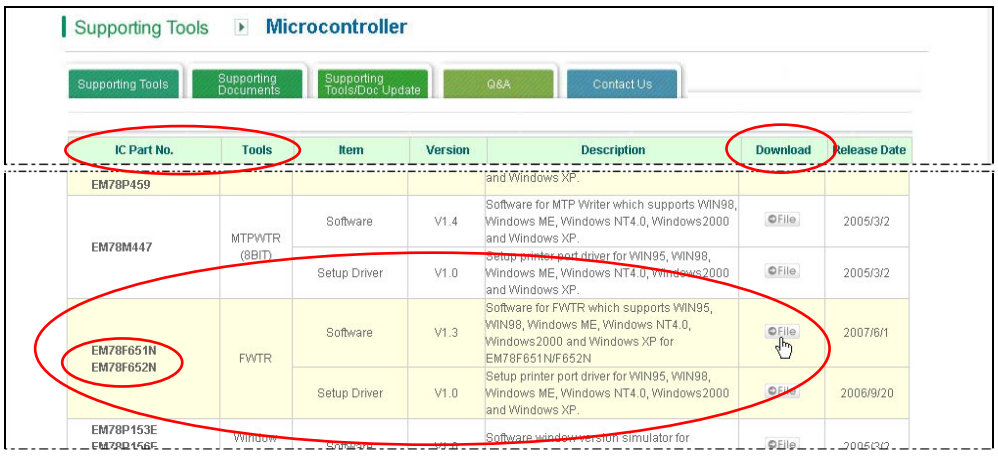


*Figure 2-2b Accessing UWriter Software by Clicking "**File**" Button*

3. You will then be prompted to either "Open" or "Save" the "**UWriter installer X.XX.XX.exe**" file. If you choose to open the file directly, the web browser will download the file to a temporary folder and execute it. If you choose to save the file, you have to execute the installer from your PC.

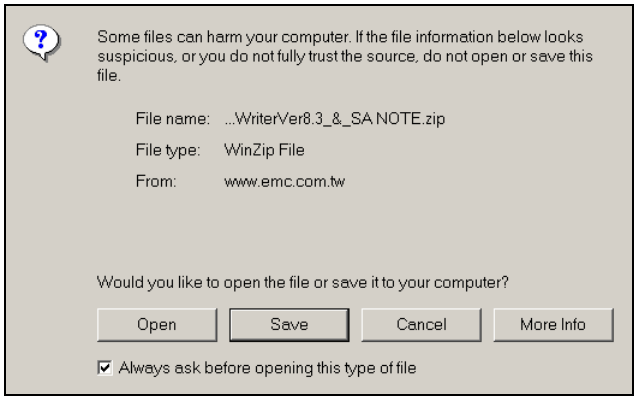


Figure 2-2c UWriter Installer File Option Dialog

2.3.2 UWriter Program / UWTR Driver Installation

NOTE

If this is your first time to install UWriter software, it is recommended that you pre-connect the UWTR Writer hardware device to your PC with its power on. Otherwise, the UWTR Writer driver portion of the software may not install properly.

1. At on-line execution of the installer file, the splash screen (shown at right) will appear.

The same installer splash screen will appear if you click the installer icon from your PC (i.e., when executing the installer file locally).

Figure 2-3a UWriter Installer Splash Screen

2. Then the **UWriter Setup Wizard** dialog pops up (figure at right) with welcome message. Click the **Next** button to continue as instructed.

Figure 2-3b UWriter Installer Welcome/Setup Dialog

3. You are now prompted to select the UWriter components to be included in the installation by selecting the check boxes of the options provided as shown in the right figure. After selecting, click the **Next** button to continue to the next step.

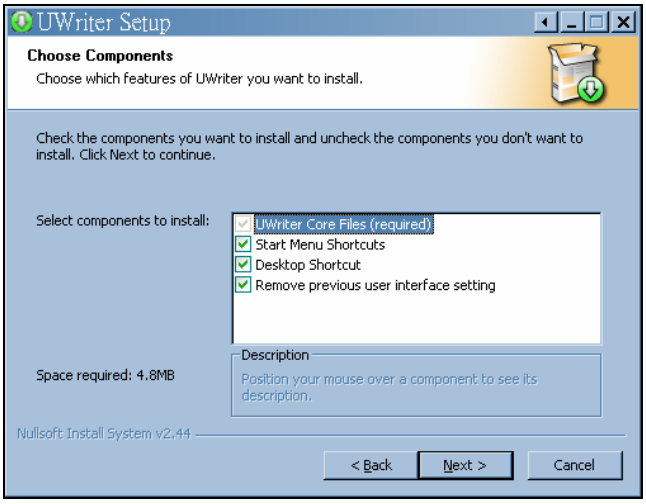


Figure 2-3c UWriter Installer Components Selection

4. Define a folder location with which to install and store the UWriter program. The default folder path is "***C:\ProgramFiles\ELAN\UWriter***." Click **Install** button o start installation.

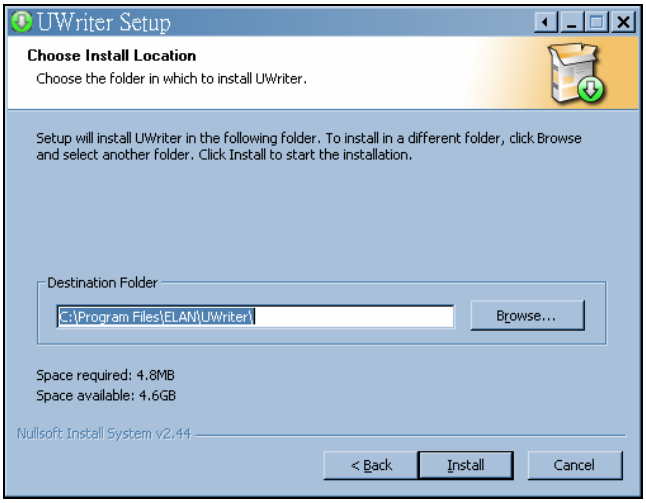


Figure 2-3d Define UWriter Installer Folder Location

5. For first time installation, the **UWTR Driver Installer** dialog will also appear to prompt you to install the UWTR Writer driver. Make sure the UWTR Writer device is linked with your computer with power turned on, then click the "**Install**" button to continue.

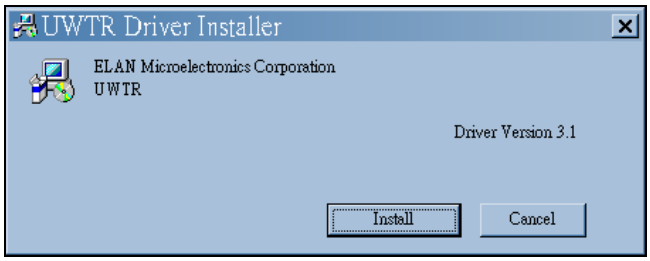


Figure 2-3e UWTR Driver Installer Dialog

NOTE

This dialog will not appear in the subsequent installation of the UWriter program unless the UWTR Driver has previously been removed from the computer.

6. When the whole installation process is completed, the completion message will display as shown in the right figure. You may also choose the option to run UWriter automatically after clicking the "**Finish**" button.

Figure 2-3f UWriter Installer: Finish

2.3.3 UWriter Program / UWTR Driver Re-installation

If for some reasons you want to reinstall the UWriter software, you need to first remove the existing program from the computer (see next section for the proper uninstall procedure of the program). Otherwise, the following dialog with a reminder message will display.

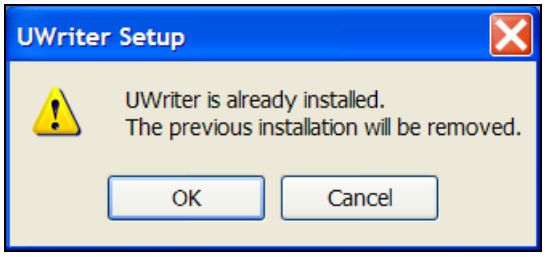


Figure 2-4a "UWriter Already Installed" Message

However, if you click the "**OK**" button of the dialog, the **UWriter Uninstall Welcome** dialog (see Figure 2-6a below) will automatically appear to make you perform the required UWriter uninstall process as described in the next section. After the uninstall process is completed, the installation process dialog (described in the previous section) will then automatically follow.

The **UWriter Uninstall** applies to the UWriter program only. The UWTR Writer driver will remain intact and not affected by the UWriter uninstall process. If you attempt to reinstall the UWTR driver by executing the **UWTR Driver Installer** (see Fig 2-4e) from Windows Start Menu without removing the driver first, the following message will appear. See Section 2.4.2 below for proper way of uninstalling the UWTR driver.

Figure 2-4b Message when Attempting to Reinstall the UWTR Driver Prior to its Removal

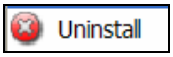
2.4 Uninstalling the Software (UWriter Program & UWTR Driver)

2.4.1 Uninstalling the UWriter Program

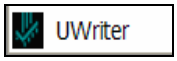
You may uninstall the UWriter program with one of the following**:**

Figure 2-5a UWriter Uninstall Welcome Dialog

1 Execute the UWriter installer again in the system without removing the previously installed UWriter. The **UWriter Uninstall Welcome** dialog (figure at right) will automatically display as explained in previous Section 2.3.3.



2. Execute **Uninstall** icon from Windows Start Menu (**[Start] → [Programs] → [ELAN] → [UWriter] → Uninstall**). The above dialog will then appear.



3. Execute the "**Add/ Remove Programs**" from the Control Panel. Then find and click the **UWriter** from the list of programs. When the **Change/Remove** button is clicked, the **UWriter Uninstall Welcome** dialog (figure above) pops up.

From the **UWriter Uninstall Welcome** dialog, click the **Next>** button to continue.

The **UWriter Uninstall** dialog will then show the path where the UWriter will be removed from. Click **Uninstall** button to continue.

After uninstall process is completed, the dialog will announce the completion and prompt you to close the uninstall wizard (figure below)

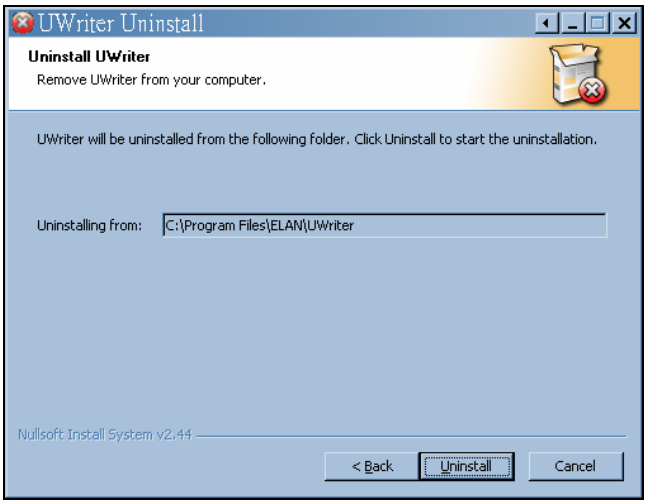


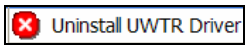
Figure 2-5b UWriter Uninstall Dialog Showing Program Location

Figure 2-5c UWriter Uninstall Dialog Announcing Uninstall Completion

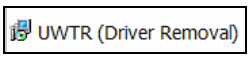
The **UWriter Uninstaller** will not remove the UWTR Writer driver as it is not advisable to do so. However, if for some reasons you find it necessary to remove the UWTR driver, you may do so by following the steps described in the following section.

2.4.2 Uninstalling the UWTR Driver

You may uninstall the UWTR driver with one of the following**:**



1. Execute **Uninstall UWTR Driver** icon from Windows Start Menu (**[Start] → [Programs] → [ELAN] → [UWriter] → [Driver] → [Uninstall UWTR Driver]**). The dialog illustrated below will then appear.



2. Execute the "**Add/ Remove Programs**" from the Control Panel. Then find and click the **UWTR (Driver Removal)** from the list of programs. When the **Change/Remove** button is clicked, the dialog shown below will then pops up.

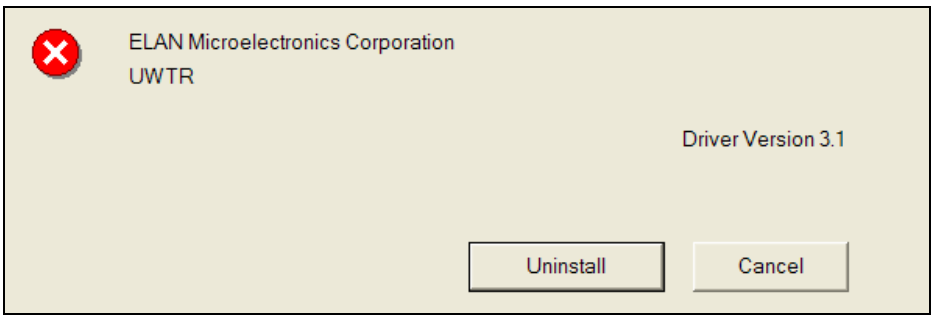


Figure 2-6 UWTR Uninstall Dialog

Click the **Uninstall** button to apply uninstall.

Chapter 3
Getting Started with UWriter System

3.1 Starting the UWriter Software

With the powered-up UWTR Writer properly connected to your PC, execute the UWriter program either from desktop shortcut, or from Windows Start Menu (**[Start] → [Programs] → [ELAN] → [UWriter] → [UWriter]**). The main UWriter window will then display as shown below.

Click **Program → Select MCU** to display **Select MCU** dialog if it does not appear

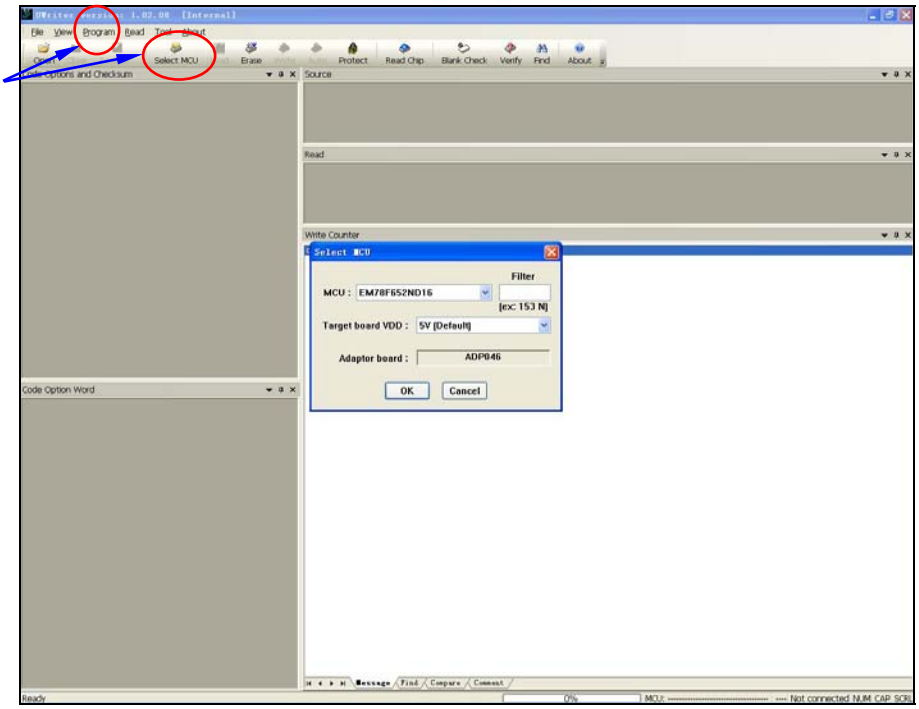


Figure 3-1a UWriter Main Window Before Data are Entered

The **Select MCU** dialog will pop-up if your UWTR Writer is already connected to PC. Otherwise, from Menu Bar, click **[Program] → [Select MCU]** to manually display the dialog (or click the **Select MCU** icon from the toolbar). If the UWTR is not connected, an error message "**Connection is lost**" will display instead.

Note that the above main window is blank and shows no data. After the required data are provided in the **Select MCU** dialog, the main window is then filled with corresponding data as shown below.

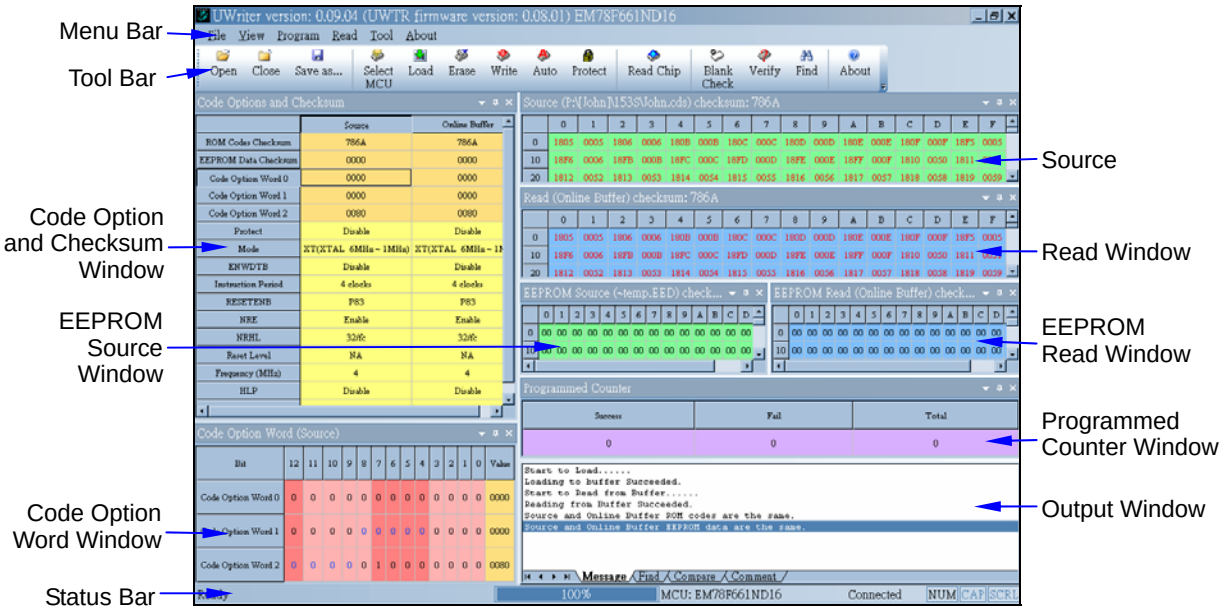


Figure 3-1b UWriter Main Window After Data are Entered

The size or location of each window can be changed. The Menu Bar and Tool Bar (its corresponding shortcut keys) can be customized.

3.1.1 Select MCU Dialog

From the dialog, select your target **MCU** and **target board VDD**. Make sure the Adaptor Board that is connected to your UWTR Writer matches with the model number shown in the dialog.

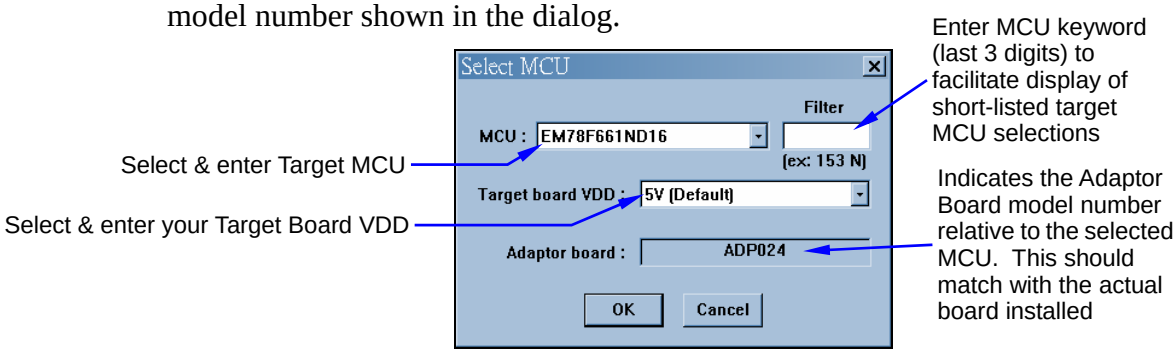


Figure 3-2a UWriter Program "Select MCU" Dialog

By entering the keyword (last 3 digits) of your target MCU on the **Filter** text box will cause the **MCU** drop-down combo box to display only the short-listed selections of the MCUs and speed-up the selection process as illustrated below.

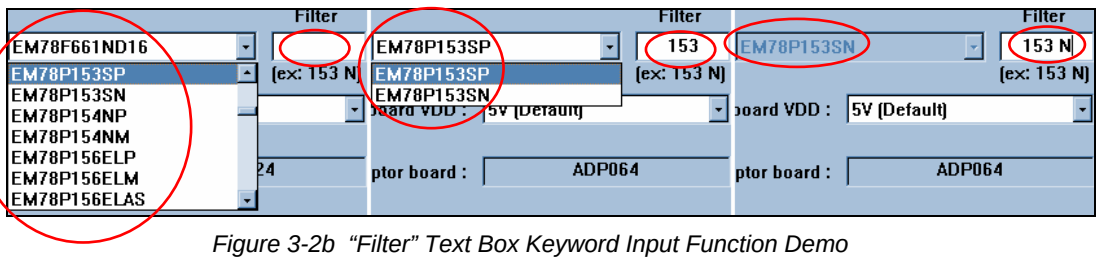


Figure 3-2b "Filter" Text Box Keyword Input Function Demo

Every **MCU** support one or more programming voltage (**Target board VDD**). The **Target board VDD** combo box will list all the support programming voltage according to the target **MCU** you selected in the **MCU** combo box. It should to be note that the **target board VDD** you select will infect the UWriter supported count of IRC frequency and LVR level. Please refer to the section "3.2.2 Code Option Dialog" for detail.

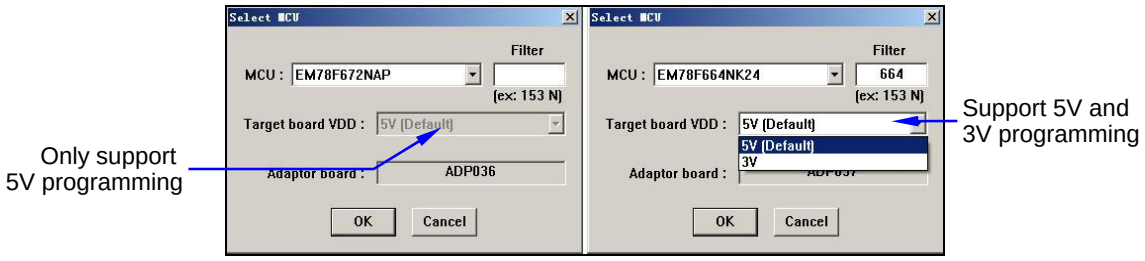


Figure 3-2c every MCU support one or more programming voltage

NOTE

- *You can process your "*.CDS, *.OPTION, *.AOP, *.EED, *.TXT, *.ZIP" files in the UWriter main window without connecting your PC with the UWTR Writer.*
- *After connecting your PC to UWTR later, click on the "Select MCU" icon from Tool Bar (or click **[Program] → [Select MCU]** from Menu Bar) to manually display the **Select MCU** dialog.*
- *If you set the **Target board VDD** to 5V first and change it to 3V in the same UWTR instance, an error message dialog will pop-up and we will close the opened file if it include the Code Option which 3V doesn't support.*
- *For factory firmware, every time after you select target MCU, the **Log Setting** dialog will pop-up automatically to make a log for your according operation.*

3.1.2 Status Bar

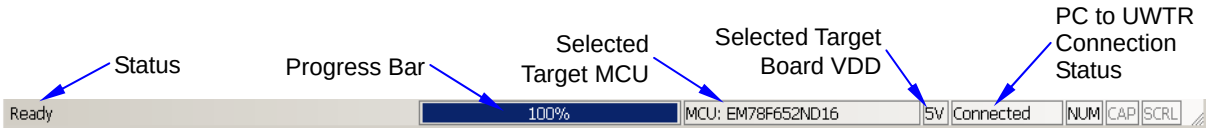


Figure 3-3 UWriter Program Status Bar

Where**:**

Status "Ready" indicates UWTR is ready to process next command. It will also display the command selected from Menu and Tool bars and the "Running" while the command is running.

Progress Bar Shows the progress (% completed) of the executed command

Selected Target MCU Shows the current target MCU on programming processes

Connection Status Shows the PC to UWTR connection status. If UWTR is not connected to PC, [**Not connected]** will also display on Title bar.

Selected Target board VDD Show the current target board VDD value

3.2 Loading Source File to UWTR Buffer

3.2.1 Open File Dialog

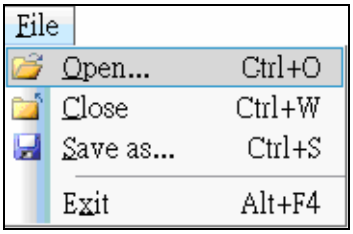


Figure 3-4a "Open" Source File Command from "File" Menu

From Menu bar click **[File]→[Open…]**. When the **Open** dialog displays, select and open the applicable source file (i.e., *.CDS, *.OPTION, *.AOP, *.EED, *.TXT, or *.ZIP") for the target MCU from your folder.

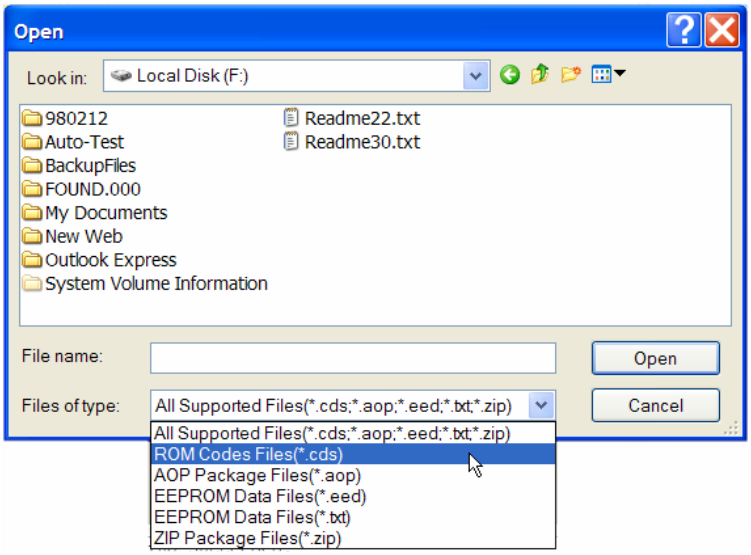


Figure 3-4b Opening a Source File from Folder

NOTE

- *For EEPROM type MCUs, you can open the *****.EED source file any time you want.*
- *If your target is an EEPROM type MCU and you have not opened the *****.EED file, you can directly key-in the data into the EEPROM Source window. This is only allowed if you have not opened the *****.AOP file.*
- *For outsourced factory firmware, every time after you open a new or different *****.CDS or *****.AOP file, the Log Setting dialog will pop-up automatically to prompt you to log-in the new *****.CDS or *****.AOP file.*
- *DO not open file (*****.AOP, *****.ZIP, or *.OPTION) with a Code Option that is not supported by the currently set Target Board VDD. You must change the Target Board VDD setting to match with the file and try again.*
- ROM Codes File(*.cds) cannot be written into chip. User must save as AOP Packages File(*.aop), and open AOP Packages File(*.aop) to write to chip.

3.2.2 Code Option Dialog

Once you have opened the *.CDS file, the Code Option dialog will pop-up. You only have to click on the items that you need, then click **OK** button to confirm your selection and apply it to **Code Option and Checksum** window. You can display the dialog again to modify your selection anytime by executing **[Program]→[Set option]** from Menu bar.

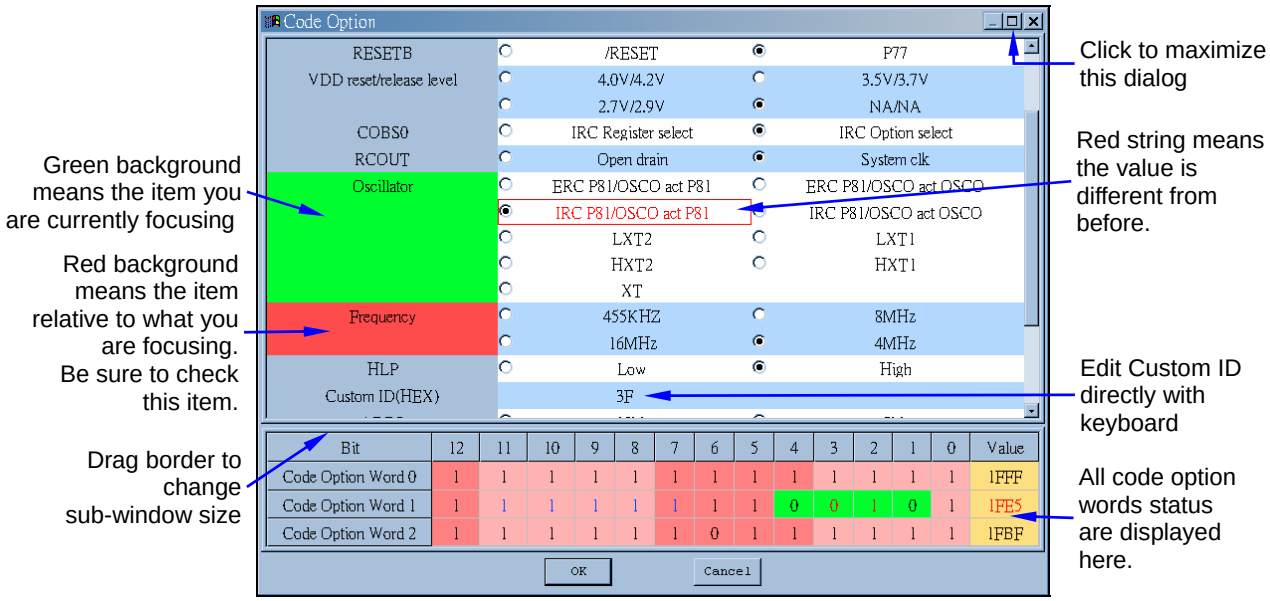


Figure 3-5a UWriter "Code Option" Dialog

If you select **IRC mode** as **Oscillator mode**, the IRC frequency will be calibrated in the programming process. In this process, the **MCU** should work properly. However, in some frequencies, the MCU will only work properly under specific programming voltage (**Target board VDD**). Hence, the **Code Option** dialog will only display the frequency value that supports the programming voltage you have selected in the **Select MCU** dialog.

In addition, if you set the **Target board VDD** combo box at 3V, it is assumed that your application circuit power supply voltage is 3V. If you select the LVR level which is above 3V in the **Code Option** dialog, the MCU can not be properly setup under this condition. To avoid this situation, the LVR level which value is above 3V is masked if you set the **Target board VDD** to 3V.

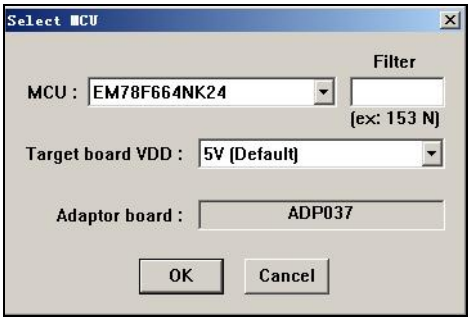


Figure 3-5b Setting the Target Board VDD at 5V.

When 5V is selected as the **Target board VDD**, all four IRC frequencies and LVR level are supported and displayed in the **Code Option** Dialog

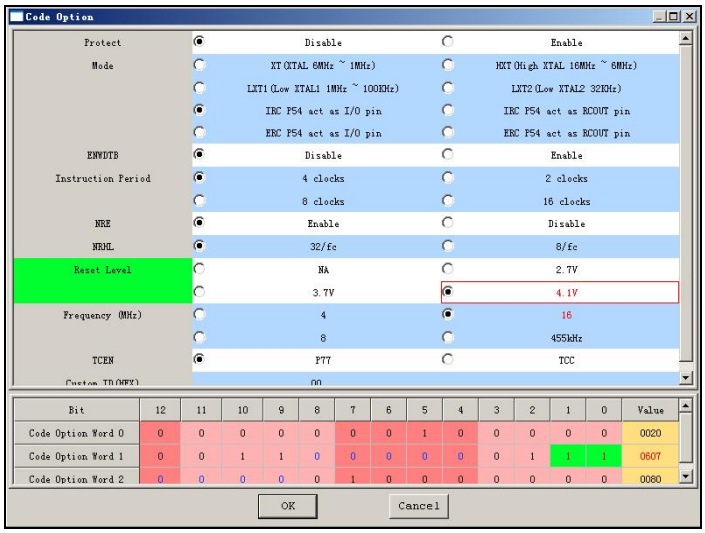


Figure 3-5c the 5V according Code Option dialog

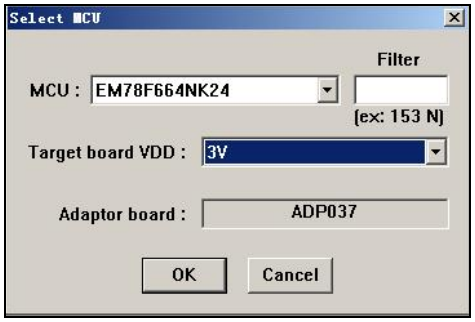


Figure 3-5d Setting the Target Board VDD at 3V.

When 3V is selected as the **Target board VDD**, the MCU can not work properly under this condition as the IRC is 16MHz and the LVR level is set at above 3V. Hence, IRC and LVR values are not displayed in the **Code Option** Dialog.

Figure 3-5e the 3V according Code Option dialog

3.2.3 Load Dialog

From Menu bar, click **[Program]→[Load]** to display the Load dialog. (Figure 3-6a). Select the **Load Region** option box first. Its default value is *Online*. If you want to use offline program, select the *Offline* option. In addition, the default programming count limit is "**0**" or unlimited. If you want a limited count, enter a quantity value. And if you want to use Rolling Code, enable the **Use Rolling Code for ROM Codes** check box. See Section 3.8 for Rolling Code details.

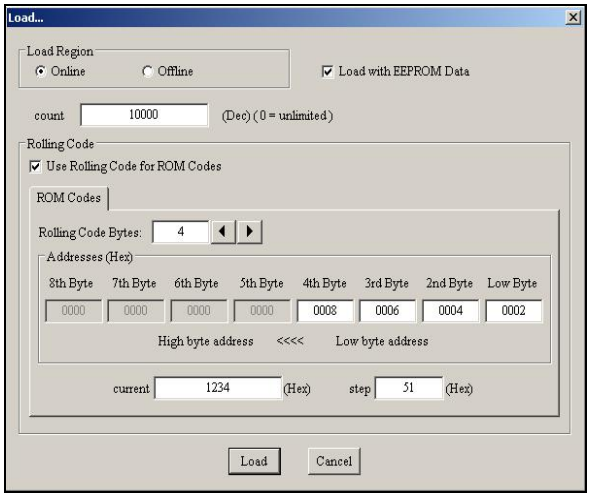


Figure 3-6a UWriter "Load" Dialog

For ICs which are equipped with EEPROM, the "**Load with EEPROM Data**" check box option is available for selection. If this option is enabled, the UWriter will load ROM code and EEPROM data into the buffer at the same time. Otherwise, the UWriter will only load ROM code to the buffer, and all the data in "**EEPROM Source**" window will show "-". For ICs without EEPROM, this option is not available or disabled.

> **NOTE**
> *Some particular ICs that are equipped with EEPROM will have this option enforced as default. Hence, the check box is enabled but the option is grayed. You cannot change the setting. The default load operation is for the UWriter to load ROM code and EEPROM data into the buffer at the same time.*

Finally, press the **Load** button load data into buffer and observe the **Output** window displays the following when loading is successfully carried out.

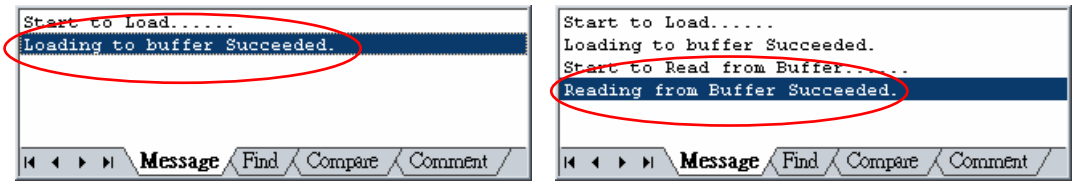


Figure 3-6b "Output" Window Successful Data Loading Messages

3.2.4 Read Buffer

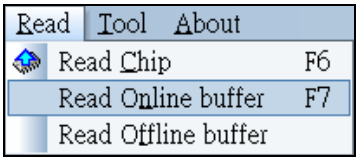


Figure 3-7 "Read Online Buffer" Command

After loading process is completed, the system will automatically read the data from the buffer. You can also manually read the buffer by executing **[Read]→[Read Online Buffer]** from the Menu bar anytime.

After reading, the **Output** window will also display successful reading result as illustrated in the right figure of Figure 3-6b above.

3.2.5 Compare

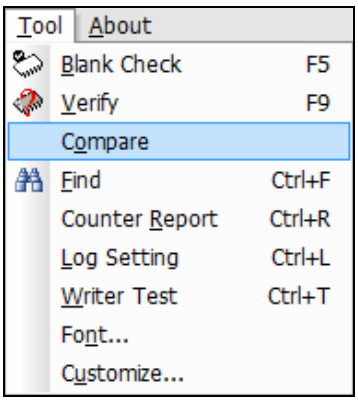


Figure 3-8a "Compare" Command

After successful loading and reading, the system will automatically execute **Compare** function to check and confirm that the data in the buffer matches with that of the source file. In fact, whenever the **Source** window contents or the **Read** window content changes, **Compare** will immediately execute automatically. You may also execute **Compare** command manually by clicking **[Tool]→[Compare]** from Menu bar.

If there are differences after **Compare,** The different address will flash continuous to position difference quickly and obviously.

Results of the **Compare** function are displayed in the **Output** window **Message** tab. If the message announces a number of differences, click the **Compare** tab to display the details of the differences. Double click on the highlighted line(s) pointing to the dissimilar codes; it will jump to the address where the differences occur in both **Source** and **Read** windows.

Note that the data in both **Source** and **Read** windows are partitioned into different shades of background (top section is darker than bottom section). But the background color will changed when address crosses a page.

When the background colors are steady, this means the codes are matched. When the background color flashes, it indicates difference in data exists as illustrated in the figure below.

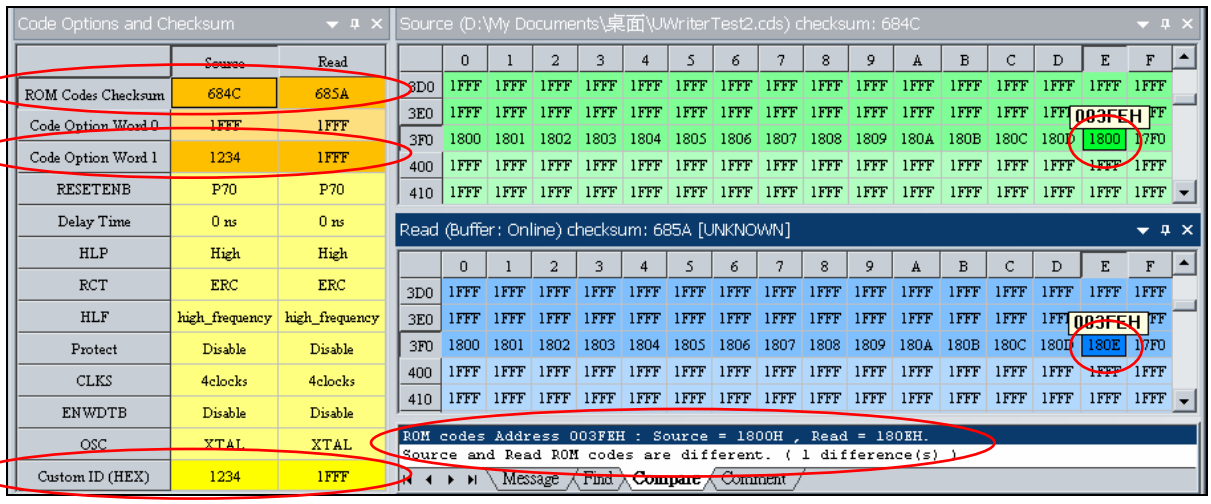


Figure 3-8b UWriter Display Showing Different Data Occurs after "Comparison" Function

3.3 Saving File

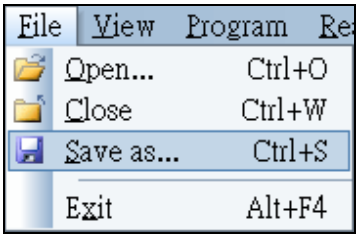


Figure 3.9a "Save as…" Command

To save the data to your folder, from Menu bar click **[File]→[Save as…]**. Then just select the file type you want the data to be saved into. For example, if you want to save it as AOP file, then select "*AOP Packege Files(*.aop)*" as illustrated below.

When saving as AOP file type, the EEPROM data of EEPROM type MCU are also saved together with the file.

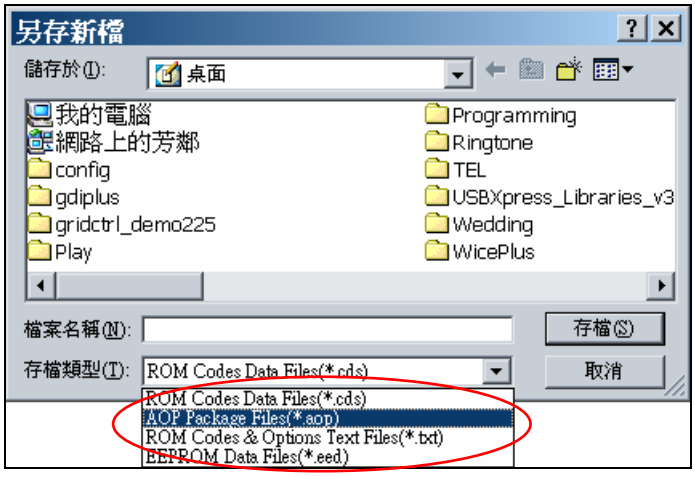


Figure 3.9b Selecting a File Type to Save the UWriter Processed Data

3.4 Programming of OTP/FLASH Chip on Textool

Programming of your ICs can be carried out in 2 ways; namely online with PC or offline (stand-alone) without PC.

NOTE

*If programming is successful, ***Pass*** will display at the top-right of the LCD and the LED lights up with green color. Otherwise, LCD will show ***Fail*** and the LED lights up with amber color.*

3.4.1 Programming Online

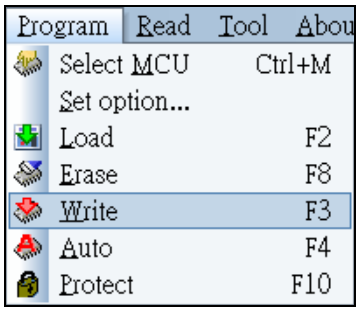


Figure 3-10a "Write" Command

With installation completed with no problem and the source file properly loaded with **Online** selected on the **Load Region** option box of **Load** dialog, you can now place your OTP/Flash chip into correct position on Textool (see Section 1.2.1). From Menu bar, click **[Program]→[Write]** or **[Program]→[Auto]** to start and process programming.

Write command starts programming of the OTP/FLASH chip on the Textool. Then read and compare the OTP/FLASH chip codes against the source file. Then the execution result is displayed on the **Output** window.

Auto command is the same as **Write** but performs some other tasks before **Write**. It will run **Blank Check** command to check and ensure the OTP/FLASH chip on the Textool is blank (writable).

- If the chip is blank, it will carry out **Write** command directly.
- If the chip is not blank and the chip is a FLASH chip, it will erase the chip data first, and then run **Write** command.
- If the chip is not blank and the chip is an OTP chip, the **Write** command will not be executed and the procedure will stop.

NOTE

*If you have set a count limit or activated Rolling Code (or both) in the **LOAD** dialog during source file loading process, you cannot execute **Write** command. You must execute the **Auto** command.*

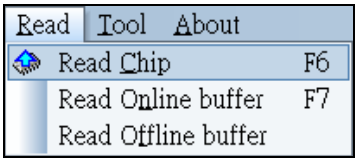


Figure 3-10b "Read Chip" Command

After the **Write** or **Auto** command is successfully executed, the **Read Chip** command will execute automatically. Moreover, the internal frequency (if applicable) is displayed. Then the **Compare** command will automatically follow to compare data contents between source file and that of the programmed chip. If you want to execute **Read Chip** manually, click **[Read]→[Read Chip]** from Main menu. Refer to Section 3.2 for detailed information on **Load** dialog, **Source** & **Read** windows, **Compare**, etc.

Then remove the programmed chip and place another blank OTP/FLASH chip on the Textool, and repeat the procedure.

3.4.2 Offline (Stand-Alone) Programming (Without PC)

WARNING!

1. *The USB cable must be disconnected from UWTR Writer to perform offline (stand-alone) programming.*
2. *The following LCD error messages (if displayed) have to be corrected before offline programming can be carried out.*
   - *"**Adap-Board Error**" (Adaptor Board does not match with the loaded source code for the target MCU).*
   - *"**Check on Socket**" (Chip is not installed or not correctly positioned on Textool).*
   - *"**IC doesn't Match**" (Error message may occur when the chip and the Adapter Board do not match or the chip is not correctly positioned on Textool)*

codes are matched

1. Disconnect the USB cable and plug the power jack of the power adapter DC +18V to the UWTR power connector. The UWTR LCD will then initially display the UWTR Writer hardware device version. Two seconds later, the LCD display auto-changes to show source code checksum and code option (Fig 3-11a).

NOTE

*Make sure the Adaptor Board is properly installed and the Source Code has been correctly selected and the **Load Region** option box of **Load** dialog has the **Offline** selected.*

Figure 3-11a LCD Start-up Display & Subsequent Auto-Display of Source Code Checksum & Code Option

2. Press the **Down/Up** button to scan and view the programming setup status information (sample figures below shows **Down** arrow being pressed).

Figure 3-11b Programming Rolling Code Information

Figure 3-11c Programming Summary Counter Information

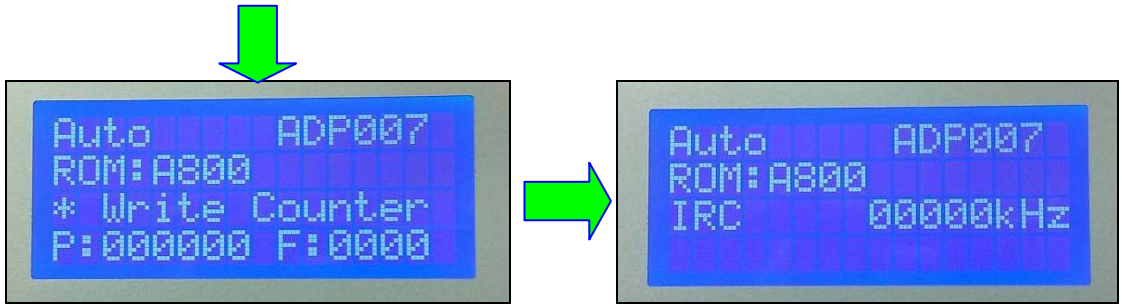


Figure 3-11d Programming Write Counter Information

Figure 3-11e Programming IRC/WDT Informatio

Pressing the **Down** arrow again will return you to *Source Code Checksum & Code Option* information as shown Figure 1-11a above.

3. Press the **Mode** button then press the **Up/Down** buttons to scan and select the desired program mode functions and press the **Mode** button again to set the selected mode (sample figures shows **Down** arrow being pressed).

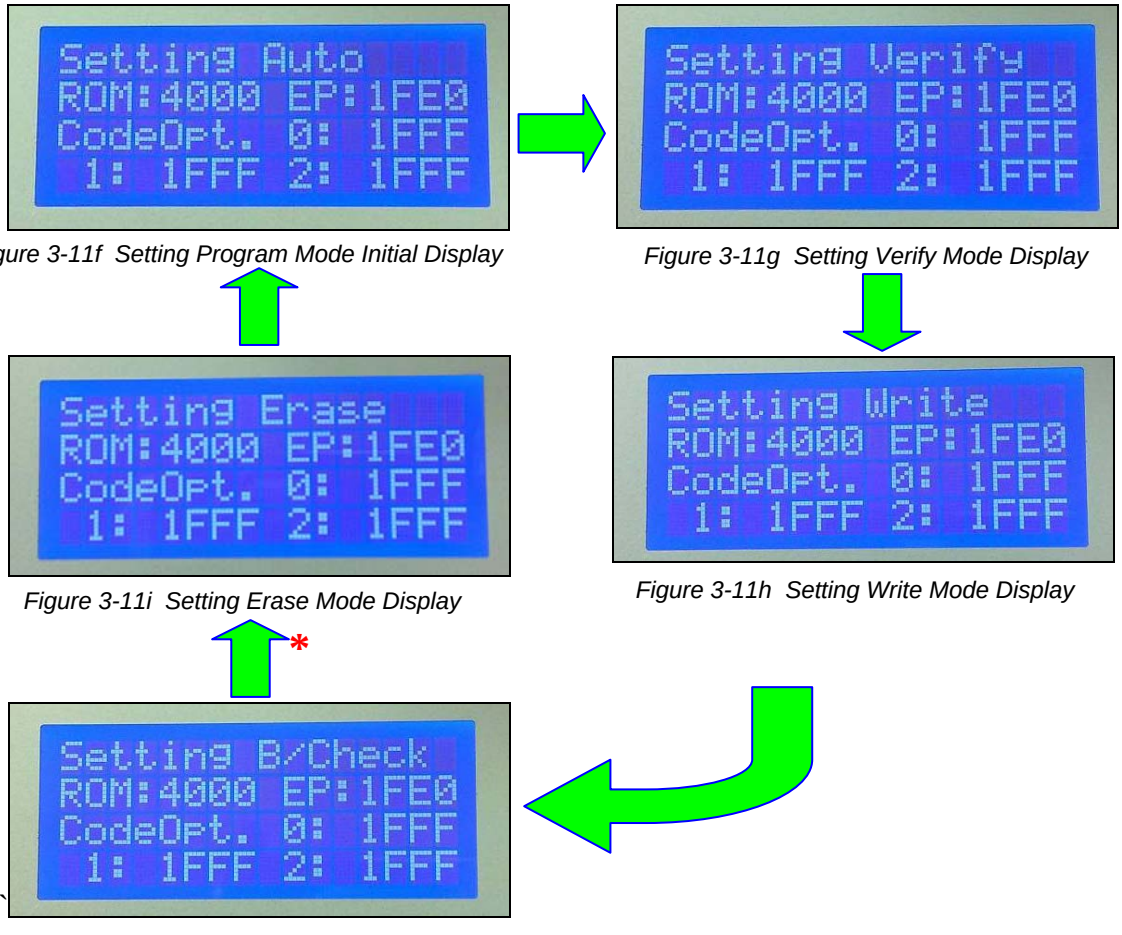


Figure 3-11f Setting Program Mode Initial Display

Figure 3-11g Setting Verify Mode Display

Figure 3-11i Setting Erase Mode Display

Figure 3-11h Setting Write Mode Display

Figure 3-11j Setting Blank Check Mode Display

* *If target is a Flash IC, the "Setting Erase" mode will display at this interval. Otherwise it will skip to "Initial Display" mode.*

4. With the target chip properly installed on Textool, press the red **Program** button to start auto run.
5. Observe the Green LED extinguishes while the LCD displays the programming progress status.
6. When programming is successfully completed, the buzzer will beep once and the LCD will display ***Pass***, while the LED lights up with a green light at the same time.
7. If the programming result fails, the buzzer will beep twice and the LCD will display ****Fail**, while the LED lights up with amber color at the same time.
8. Remove the programmed IC, place another blank OTP/FLASH chip on the Textool, and repeat the whole procedure.

3.5 Counter Report

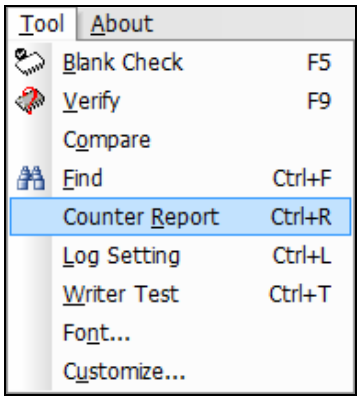


Figure 3-12a "Counter Report" Command

The UWTR Writer device has two counters, the Write Counter and Summary Counter.

The Write Counter is displayed as a sub-window of the UWriter main window as illustrated below. It counts and displays the total programming performed including the number of successful and failed programming. After each source code loading, these numbers are reset to zero.

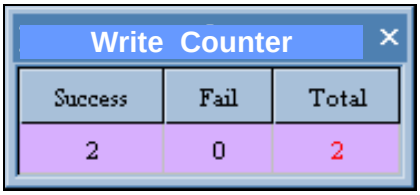


Figure 3-12b Write Counter Window

The Summary Counter is accessed by clicking the **Counter Report** command from Menu bar (**[Tool] → [Counter Report]**). The **Counter Report** dialog then displays showing the Summary Counter. Unlike Write Counter, it also counts and displays the total programming performed including the number of successful and failed programming continuously regardless of number of code loading performed. It will only reset to zero when the **Reset** button of the dialog is pressed.

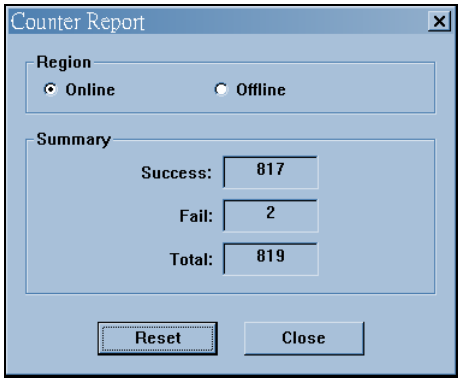


Figure 3-12c Counter Report Dialog

3.6 Programming of New Set of OTP/FLASH Chip

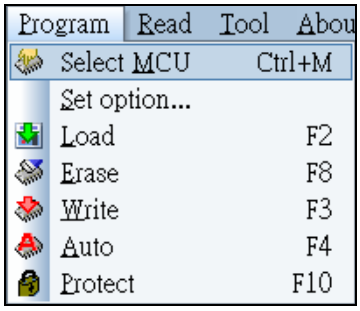


Figure 3-13 "Select MCU" Command

When switching into another set of target chip (with different part number), you need to start the whole procedure again. From the Main menu, click on **[Program] → [Select MCU]** command. Then the **Select MCU** dialog (Figure 3-2a in Section 3.1.1) will prompt you to enter your new target chip part number. Refer to Sections 3.2 to 3.4 for the subsequent procedures.

Note that when you switch to different set of chips, all the data in RAM of PC are cleared. Also remember to replace the Adaptor Board with compatible one before proceeding.

3.7 Erasing FLASH Chip Contents

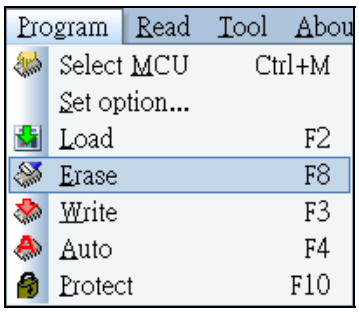


Fig.3-14 "Erase" Command

To erase existing contents of FLASH chip, mount the chip on UWTR Writer and click **[Program] → [Erase]** command from the main menu.

Observe the **Output** window for the display of the progress and result of the **Erase** command execution.

3.8 Rolling Code

3.8.1 Rolling Code Application

When the data of several fixed addresses in each one of the programmed chips need to be individually unique for easy tracing or other identification purposes, the Rolling Code feature is the answer for such application.

3.8.2 ROM Codes Data that are Applicable to Rolling Code

If the ROM code instruction is one of the following**;**

```
MOV A,K
RETL K
```

Then, Rolling Code can be applied. Rolling Code will modify the "K" byte.

3.8.3 Setting

To use Rolling Code, you have to setup its pertinent options for loading in the **Load** dialog as shown below.

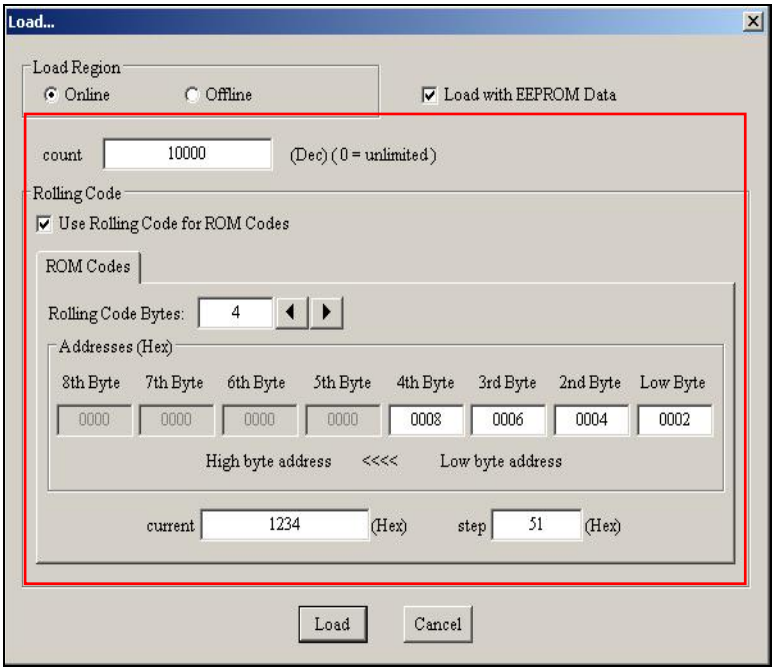


Figure 3-15 Rolling Code Setup in Load Dialog

Where:

count: Set the quantity of chips to be programmed for this particular Load session. If Rolling Code is not used, you can still give a number limit of count. But for Rolling Code application, you must provide a quantity value and you cannot set this count to zero. In addition, the count cannot exceed the upper bound or exceed reasonable value (count * step + current must be less than the max value that Rolling Code bytes can accommodate). Count is a number.

Rolling Code Bytes: Is the number of instructions needed to be modified by Rolling Code. Each instruction has one byte (K) that can be modified. Minimum bytes in a Rolling Code is 2, maximum is 8.

Address (Hex): Sets the addresses of instructions that need to be modified by Rolling Code. Please take note of the address high & low relationship. Address is a hexadecimal number.

current: Sets the start value to be modified with in each "K" byte. "**current**" is a hexadecimal number.

step: Sets the increment value to be added at "K" byte after programming of each chip. "**step**" is a hexadecimal number.

■ *Examples:*

The following source code is based on the Rolling Code setting the **Load** dialog shown in Figure 3-15 above. Please take note of each value entered in each text boxes of the **Load** dialog.

```
MOV A, @0xFF     ; address 0x2
NOP              ; address 0x3
RETL @0xFF       ; address 0x4
NOP              ; address 0x5
MOV A, @0xFF     ; address 0x6
NOP              ; address 0x7
RETL @0xFF       ; address 0x8
```

As the current initial value is ***0x00001234***, the following source code is written to the first chip.

```
MOV A, @0x34     ; address 0x2
NOP              ; address 0x3
RETL @0x12       ; address 0x4
NOP              ; address 0x5
MOV A, @0x00     ; address 0x6
NOP              ; address 0x7
RETL @0x00       ; address 0x8
```

As the incremental value change is ***0x1234+0x51=0x1285***, so the following source code will be written the second chip.

```
MOV A, @0x85     ; address 0x2
NOP              ; address 0x3
RETL @0x12       ; address 0x4
NOP              ; address 0x5
MOV A, @0x00     ; address 0x6
NOP              ; address 0x7
RETL @0x00       ; address 0x8
```

These steps are repeatedly written to subsequent programmed chips until the10000th chip is reached. If you want to start another writing scheme, set up new setting in the **Load** dialog again.

3.9 Updating UWTR Firmware

Normally, the UWriter program has to match with UWTR firmware and both should have the same version number. If the UWriter version is older than that of UWTR firmware, connection between PC and UWTR cannot be established. You must download and install the latest version of the UWriter program in this case.

If the UWriter program is of newer version than that of UWTR firmware, connection between PC and UWTR can be accomplished, but the UWriter will immediately prompt you with an UWTR firmware update notice (see below) upon establishing connection.

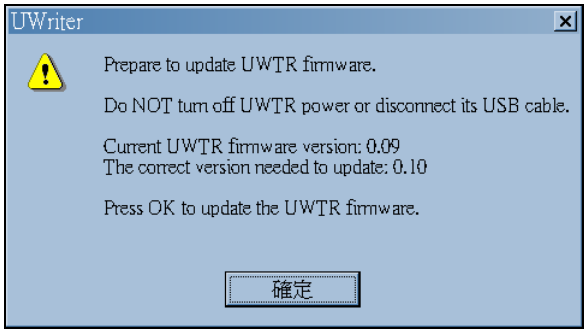


Figure 3-16a UWTR Firmware Update Notice

When updating the UWTR firmware, be sure the UWTR power is on and is connected to PC via USB cable as warned in the **Output** window.

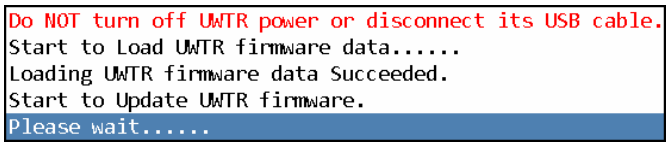


Figure 3-16b UWTR Firmware Loading Messages

After updating the UWTR firmware, UWriter will try to reconnect with UWTR. You can hear a beep sound and see "***Connecting Succeeded***" and "***Updating is over***" displayed in the **Output** window.

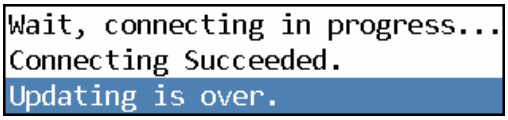


Figure 3-16c UWTR Firmware Successful Loading Messages

WARNING!!

Do NOT turn off UWTR power or disconnect its USB cable during UWTR firmware updating process. If UWTR lost its power during updating process, UWTR device might be damaged and have to be sent back to ELAN.

If for some reasons, you really need to reinstate the old firmware version into UWTR, click this command **[About]→[Force to reinstate the old firmware version into UWTR]** from the Main menu. However take note that this it is NOT recommended.

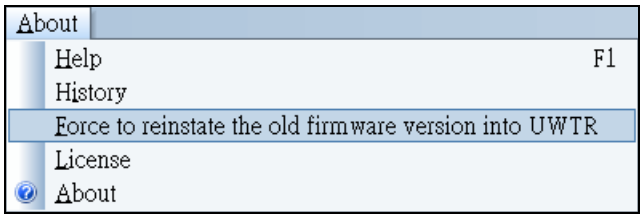


Figure 3-16d Reinstating Old UWTR Firmware Command

Chapter 4
Other UWriter Software Functions

4.1 Modifying Window Layout

Except for **Output** sub-window, all other sub-windows of UWrter can be repositoned, semi-hidden, completely hidden, or made to float on the main window.

4.1.1 Repositioning Sub-Windows with Title Bar Tools

Each sub-window is equipped with 3 smal icons at the right end of the title bar (illustrated beow) which can be used as tools for changing its position in the main window.

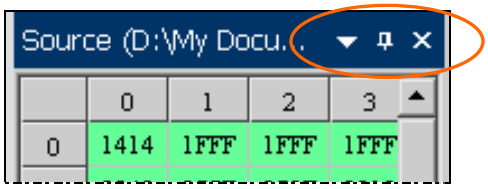


Figure 4-1a Sub-Window Repositioning Tools

Clicking this tool will allow you to switch the sub-window into either “Floating”, “Docking”, “Auto Hide”, or “Hide” format.

Clicking this tool will allow you to switch the sub-window between “Auto Hide” and “Docking”.

Clicking this tool will allow you to hide the sub-window.

To re-display a hidden sub-window, click **[View]** from the Menu bar and enable the check box of the of the pertinent sub-window. Executing **Reset window layout** will restore the main window default layout

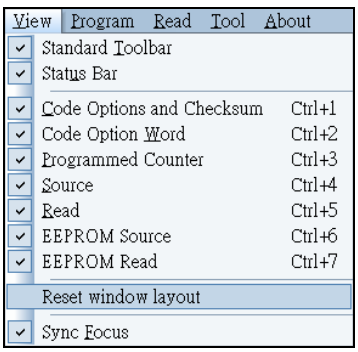


Figure 4-1b “View” Sub-Menu

4.1.2 Repositioning by Dragging Sub-Windows

■ Docking into new position with docking assistance icons

You can drag and drop a window to the new position by clicking and dragging on the title bar of a sub-window. The “docking assistance icons” (see figure below) will appear as you drag the sub-window. “Main window docking icons” appear at four sides of the main window, while “Sub-window docking icons” appear at the center of the sub-window you are approaching. The docking icons mark the positions where you can drop the the sub-window you are dragging as further illustrated below.

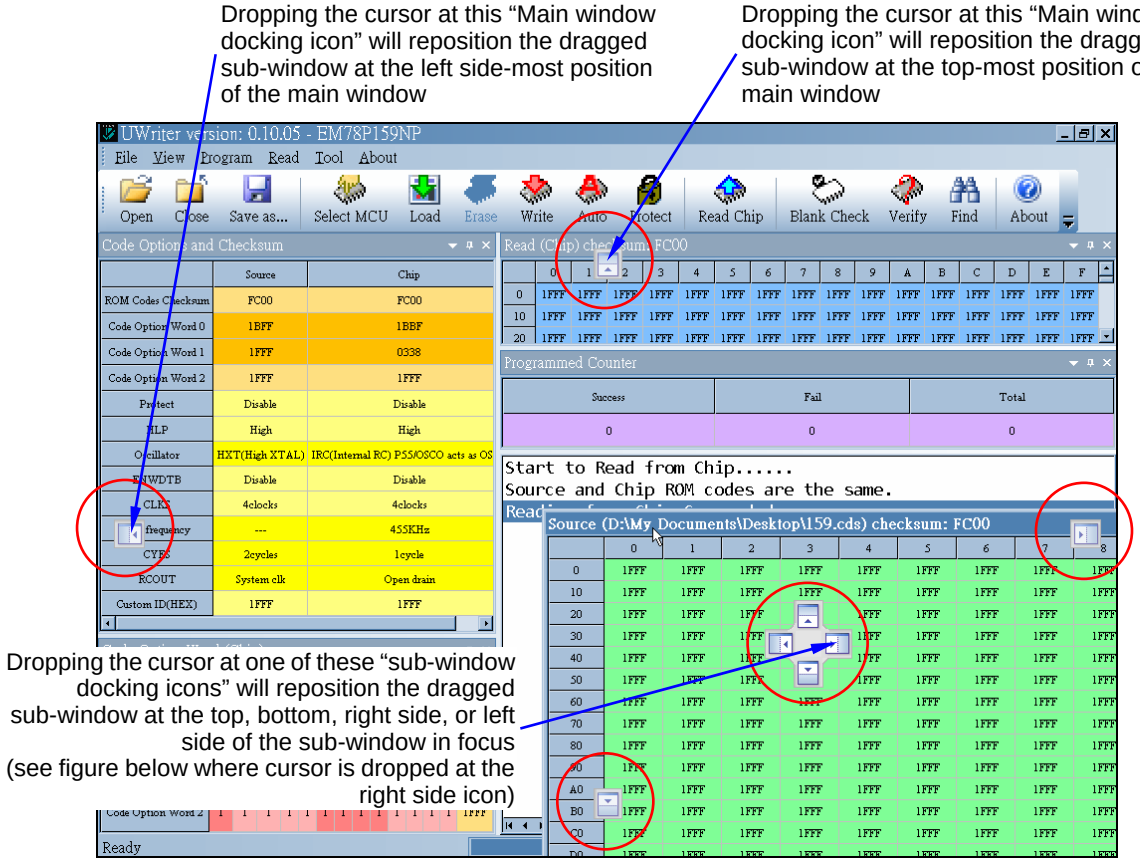


Figure 4-2a Main Window Showing How to Use the Docking Assistance Icons

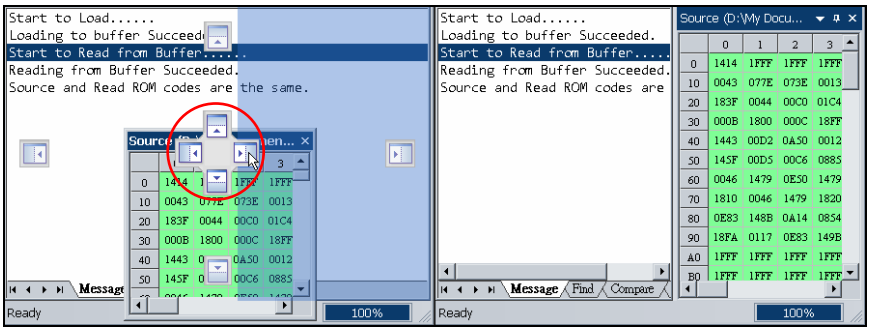


Figure 4-2b Docking a Sub-Window at Right Side of the “Sub-Window Docking Icons”

■ **Merging sub-windows**

If you want to merge two or more sub-windows into a single sub-window position, drag and drop the title bar of the sub-windows to be merge into the recipient sub-window. The sub-windows are merge into tab sheets. Active sub-widow changes as you select and click which sub-menu to activate from the tabs.

The **Output** window has no title bar, so you cannot merge any sub-window into **Output** window nor the other way around.

■ **Transforming sub-window into floating mode**

If you want a sub-window to float on the main window, click and hold on its title bar, then move the cursor slightly without releasing the mouse button. When the sub-window transforms into miniature sub-window, drag and drop it to float at any area of the main window but away from any of the docking assistance icons.

4.1.3 Reset Window Layout

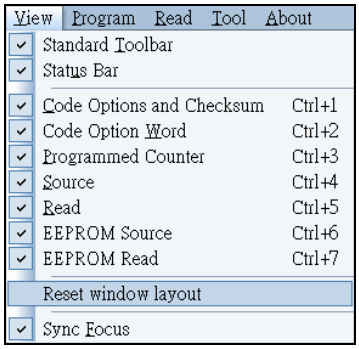


Figure 4-3 "Reset Window Layout" Command

If you want to reset window layout to the default status, just click **[View]→[Reset window layout]** command of main menu.

4.2 Finding a Specific Content

4.2.1 Find Command

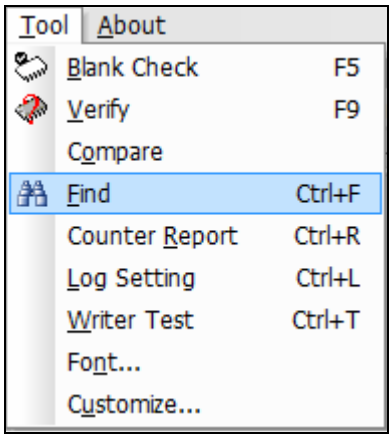


Figure 4-4a "Find" Command

You can find the specific value or address in the **Find** dialog (figure below). Access **Find** dialog by clicking **[Tool]** → **[Find]** command from Menu bar.

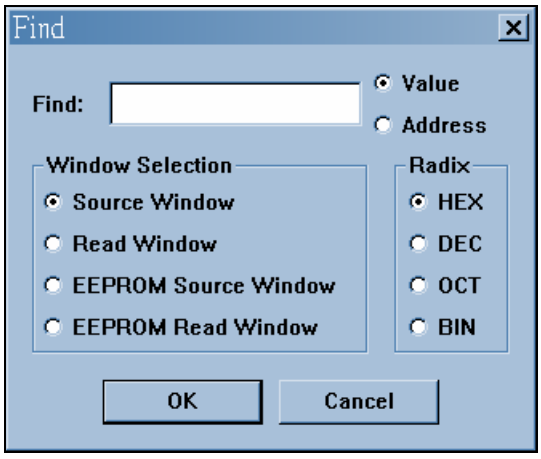


Figure 4-4b "Find" Dialog

Options are for **Source Window**, **Read Window**, **EEPROM Source Window**, and **EEPROM Read Window**. Select **Value** to find a specific value you want. You can enter hexadecimal number, decimal number, octal number, or binary number. The results can be found in the **Output** window (shown below) after pressing the **OK** button. Double clicking at any of the result lines will link and jump to its corresponding address automatically.

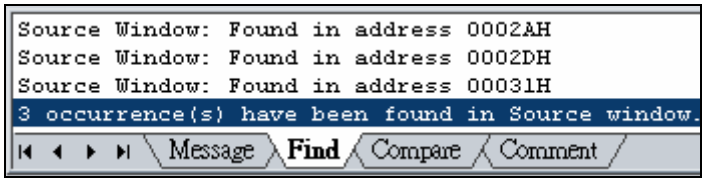


Figure 4-4c Find "Value" Results Shown in the Output Window

The other option is to find a specific address by selecting **Address** in the **Find** dialog. This method will jump to the address you are looking for directly.

4.2.2 Sync Focus

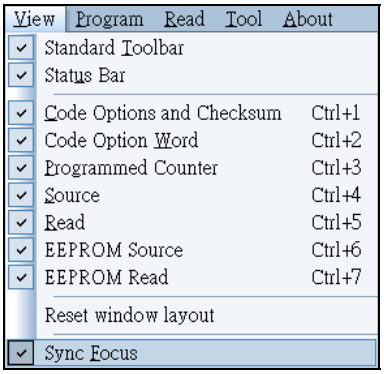


Figure 4-5 "Sync Focus" Command

Sync Focus means that the focus changes in the **Source** and **Read** sub-window are synchronal. For example, when you click Address 0x123 in **Source** sub-window, the **Read** sub-window will jump to 0x123 immediately. It can help you compare the contents of the two sub-windows. **EEPROM Source** and **EEPROM Read** sub-windows are affected by this option too.

The default setting of this option is enabled. If you want to disable this option, click **[View] → [Sync Focus]** command from the Menu bar.

This option also affects the jump function when double clicking on the **Output** sub-window address

4.3 Log Setting

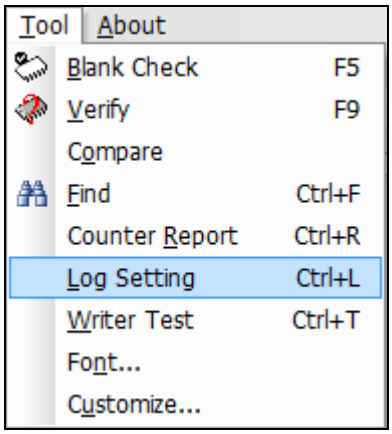


Figure 4-6a "Log Setting" Command

You can write data to log file when you are operating online by clicking **[Tool] → [Log Setting]** command from Menu bar. The **Log** dialog then appears (figure below).

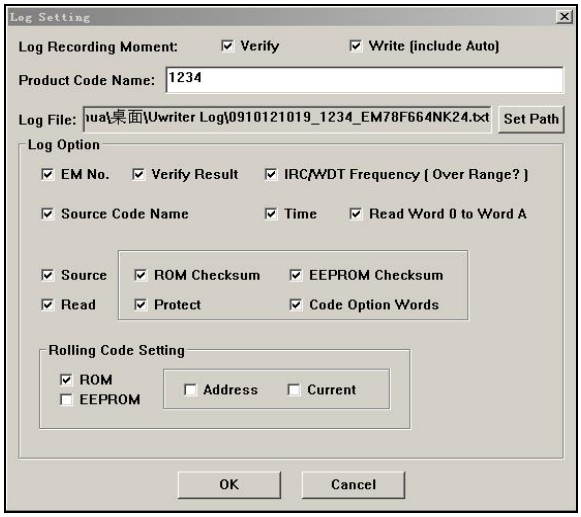


Figure 4-6b "Log Setting" Dialog

The Uwriter will generate the following Log File format after you enter the Product Code Name in the edit box**:**

"***Time_ Product Code Name_MCU Name.txt***"

Where "Time": is the time when you opened the Log Setting Dialog. The default path that stores the log file is -
"*C:\Documents and Settings\Username\Desktop\Uwriter Log*"

You may click the **Set Path** button to change the default path.

The first options on this dialog is explained below**:**

Verify: Write log file when executing "Verify".

Write (include Auto): Write log file when executing "Write" or "Auto".

Then, you have to enter the product code name. The UWriter will generate the log file automatically according to the product code name you have entered in the current log file path. If you want to change the log file path, click the **Set Path** button and select a path you want.

Finally, select the data you want to write into log file and press the **OK** button.

NOTE

*The **Rolling Code Setting** data can be written to log file only when the "**Write [include Auto)**" check box has been selected.*

For outsourced factory firmware, the "**Verify**" checkbox is pre-selected by default and you cannot disabled it. The "**Write [include Auto]**" check box can disabled or enabled according to actual requirement.

4.4 UWTR Self Test

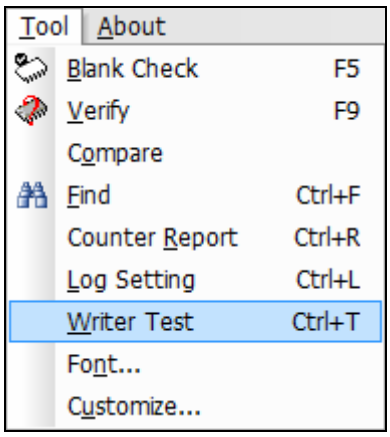


Figure 4-7 "Writer Test" Command

The UWTR Self Test function tests all the parameters of UWTR. You can use this function to determine whether the UWTR is working properly.

You should install the test board and connect the UWTR to PC first and then click **[Tool] → [Writer Test]** to execute the Self Test function.

4.5 Font Setting

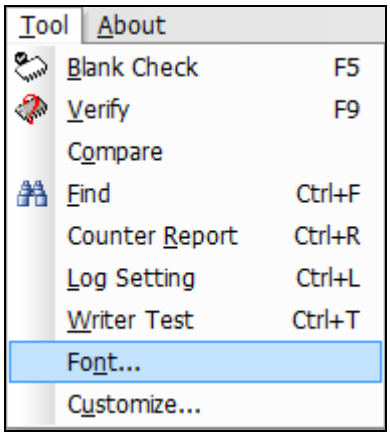


Figure 4-8a "Font…" Command

You can change the font type and size of text for each sub-window by clicking **[Tool]** → **[Font]** command from Menu bar. The resulting **Font...** dialog is shown below.

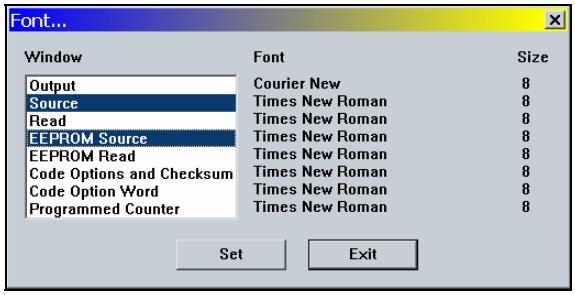


Figure 4-8b "Font" Dialog

Select by clicking the sub-window with which to change its font from the **Window** list box. You also can select a group or range of sub-windows by pressing Shift key while selecting. To remove a single sub-window from the selected ones, click while pressing Ctrl key. To add a single sub-window to the selected ones, also click while pressing Ctrl key.

Then press the **Set** button to display the Windows standard font setting dialog. You can freely change the font type and its font size settings. All selected sub-windows will be set with the new font type together.

4.6 Customizing UWriter UI

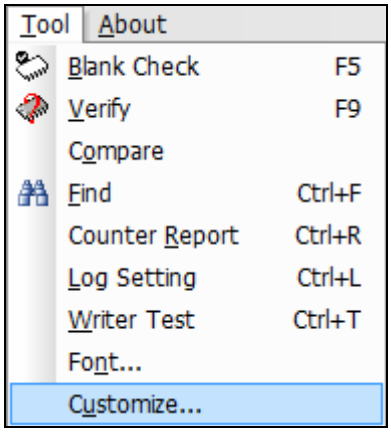


Figure 4-9a "Customize…" Command

To customize the UWriter user interface, click **[Tool]** → **[Customize…]** command from Menu bar. The **Customize** dialog will displays with its five tabs as shown below.

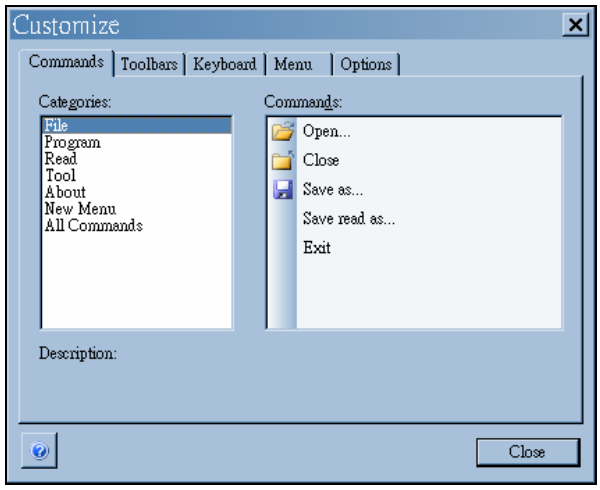


Figure 4-9b "Customize" Dialog with the "Commands" Tab Active

4.6.1 Commands Tab

Select "**Commands**" tab (illustrated above) to display all available UWriter commands under the selected category. Then drag and drop a command into Toolbars, Menu bar, or into a Drop-down command menu (from Menu bar). To restore default settings, go to **Toolbars** tab and click **Reset All** button.

4.6.2 Toolbars Tab

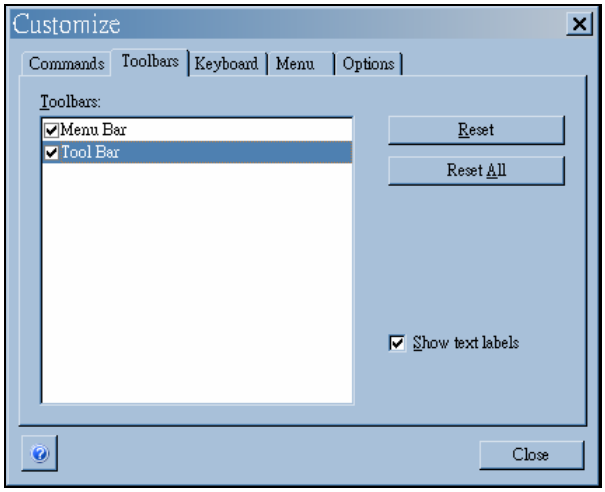


Figure 4-10 "Customize" Dialog with the "Toolbars" Tab Active

The **Toolbars** tab allows you to enable/disable the "**Tool Bar"** but not the "**Menu Bar."** However, if you click **Reset** or **Reset All** button, either toolbar, or both can be reset to its default settings. You can also restore/remove the text labels from all icons in the Toolbar by toggle clicking on the **Show text labels** check box.

4.6.3 Keyboard Tab

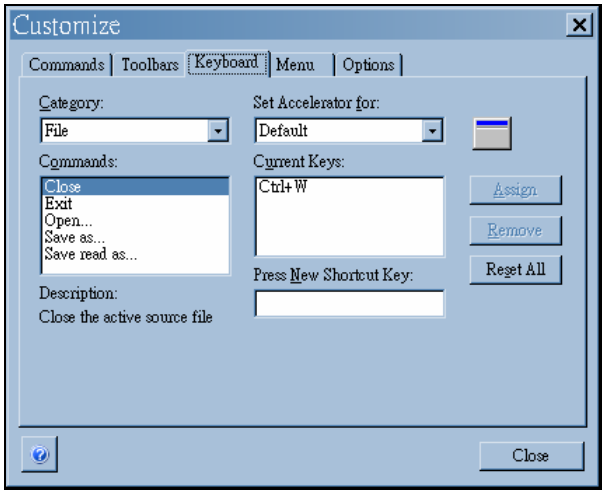


Figure 4-11 "Customize" Dialog with the "Keyboard" Tab Active

The **Keyboard** tab allows you to create/remove shortcut keys for the commands of a selected command category. The procedure is explained below**:**

■ **Creating a shortcut key**

After selecting a **Category** and **Commands** option from their respective boxes, enter your custom shortcut key into the **Press New Shortcut Key** text box. UWriter will auto–detect whether the new shortcut key has already been assigned or not. If it has already been assigned, the pertinent command name (with which the shortcut key is currently assigned) will display under a pop-up **Assigned to:** field and you need to directly enter another shortcut key. Otherwise, ***[Unassigned]*** will pop-up. Then click **Assign** button to apply.

If the **Assigned to:** field displays question marks (***????***), it means the shortcut key you just entered is reserved and is not user definable.

■ **Removing an existing shortcut key**

After selecting a **Category** and a **Commands** option from their respective boxes, the corresponding command shortcut key (if available) will appear in the **Current Keys** box. Select the corresponding shortcut key and click **Remove** button to delete.

■ **Restoring all shortcut keys to their default settings:**

Click **Reset All** to reset all command shortcut keys to its default settings.

4.6.4 Menu Tab

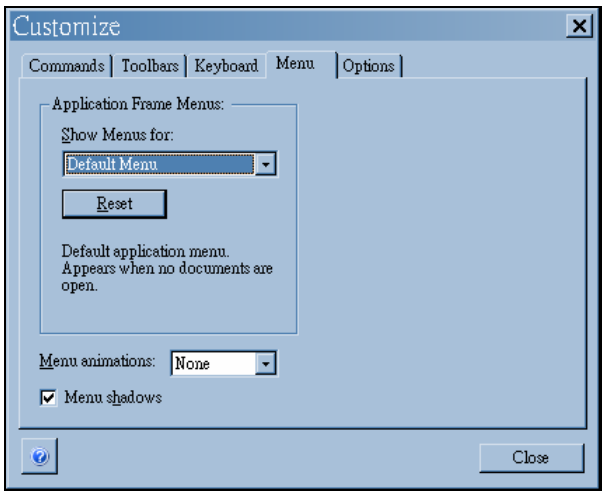


Figure 4-12 "Customize" Dialog with the "Menu" Tab Active

If you want to reset the Menu bar, press **Reset** button from this tab. This function is similar with that of **Toolbar** tab desribed in Section 4.6.2 above.

In addition, you can add animation feature to the drop-down command menu of Menu bar by selecting an option in the **Menu animation** drop-down list box.

4.6.5 Options Tab

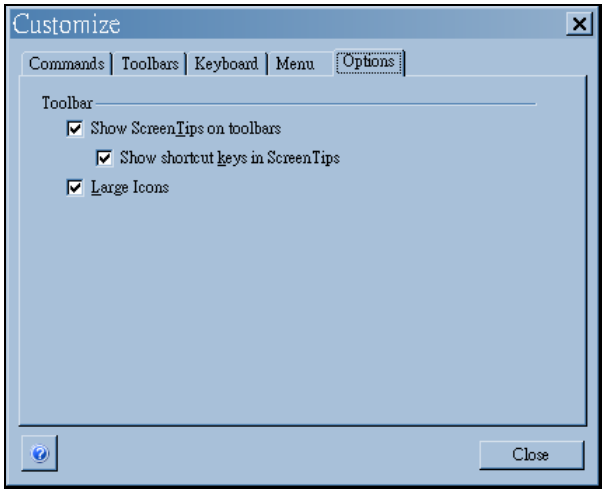


Figure 4-13 "Customize" Dialog with the "Options" Tab Active

Use the **Options** tab to set the size of the toolbar buttons and specify whether to display screen tips and shortcut keys (where applicable) when pointing at the button.

Appendix A
UWriter Supported ICs

A.1 EM78 Series Supported by UWriter Version 1.04.00 or later

A.1.1 OTP Type

EM78P131A	EM78P134N	EM78P152SN	EM78P163N	EM78P164N
EM78P418N				

A.2 EM78 Series Supported by UWriter Version 1.03.00 or later

A.2.1 FLASH Type

EM78F541N	EM78F542N	EM78F544N	EM78F548N	EM78F561N
EM78F562N	EM78F564N	EM78F568N	EM78F641N	EM78F648N
EM78F651N	EM78F652N	EM78F668N	EM78F672N	

A.2.2 OTP Type

EM78P132	EM78P141	EM78P142	EM78P143	EM78P153A
EM78P1541N	EM78P202N	EM78P210N	EM78P220N	EM78P256N
EM78P311N	EM78P312N	EM78P330N	EM78P331N	EM78P342N
EM78P349N	EM78P458	EM78P459	EM78P469	EM78P507N
EM78P520N	EM78P570	EM78P5840N	EM78P5841N	EM78P5842N
EM78P809N				

A.3 EM78 Series Supported by UWriter Version 1.00.00 or later

A.3.1 FLASH Type

EM78F642N	EM78F644N	EM78F661N	EM78F662N	EM78F664N

A.3.2 OTP Type

EM78P153S	EM78P154N	EM78P156EL	EM78P156N	EM78P157N
EM78P159N	EM78P257	EM78P259N	EM78P346N	EM78P447N
EM78P447S	EM78P451S	EM78P468L	EM78P468N	