FlashPro 400

Intelligent Universal Programmer

User’s Manual

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1. introduction

FlashPRO series device programmer is an advanced device programmer, which was improved from traditional standard speed programming, limited device table, to a high cost/function ratio, high reliability, fast speed, direct link to PC host via USB connection, USB driver is easy to install.

The FlashPRO series device programmer is a high performance intelligent PC-based universal programmer that works with your PC via USB connection. It has a 48-pin ZIF sockets, supports all popular chips in the market such as CPLD, EPROM, EEPROM, Serial EEPROM, Flash memory and MCU, extremely high throughput, it provides functions of device insertions and continuity check. In some case, special adaptors are needed for some kinds of device packing, this make our customers more flexible to program new chips in the market...

1.1 Features:
★ fashion outlook: Our engineer use new industrial idea to designing the outlook, with the consideration of human interface, good for operation.
★ Reliable: Over current protection and 4 layers PCB are used. Together with several improvement to make a reliable system.
★ Over current protection: to avoid accident and damage, system over current protection is set to 500mA.
★ USB interface: USB interface is used to connect programmer to PC, so the PC can be maximize its usage, user can running other application programs while programmer is still working.
★ Pin Continuity Check: can detect device wrong insertion,
miss-aligns inserted, wrong direction, bad chip.

★ Human interface menu: easy to operate, high efficiency, file management capability is available for user to managing their files.

★ Operating Systems: support Windows NT/2000/XP以及Vista。

★ file formats supported:
  • unformatted (raw) binary
  • HEX: Intel, Intel EXT, Motorola S-record, Altera POF, JEDEC ABEL, CUPL, PALASM, TANGO PLD, Tektronix(standard or ext.).、Jed、POF。

★ Integrated environment for full screen buffer editing:
  Includes clear, fill, allocated search, swap.

★ Function of serial number generating: support automatic generating of the programming serial number.

★ Intelligent mass production Mode: Auto start while device is inserting to the socket, faction of automatic programming will promote the production efficiency and reduce the cost.

★ Off line operating function: CF card is used to replace PC system to store both programming software and user data while offline programming.

This offline programming method enable the non mature user to operate the programmer easily. (offline operating is depending on model number.)

1.2 System requirements:

★ IBM–PC 586or Pentium compatible, desktop or notebook, at least one USB serial interface.

★ Windows 2000/XP or Vista operating system.

★ CD ROM drive.

★ hardisk capacity: 80M space available.
1. Packing List

Shown as Figure 1-1:

★ Programmer main unit------1 ea.
★ USB Cable (1.6 metre) ------1 ea.
★ Power supply----------------1 ea.
★ Cod ROM containing installation software------1 ea.
★ User Manu------------------1 ea.
★ Warrantee Card-------------1 ea.

![Figure 1-1](image)

2. Installation

2.1 Software Installation to host PC

★ In the CD Rom directory of the Flashpro Programmer, search for the filename “setup.exe”, starting to install the programmer software by clicking it.
If you want to stop installation, clicking the “conceal” button on the screen. Click the “continue” button to enter the next step. The “agreement” terms will be prompted on the screen.

Please read the contents of the agreement terms carefully. If you accept the agreement, select the “accept” and go to next step. Or select “conceal” to exit the installation procedure. Please refer to Figure 2-2.
Figure 2-2
Figure 2-3
★ The installation path—click “Browse” to select a different installation path. If you want to use the default installation path, you may click the “next step”.

Figure 2-4
★ Installation is completed automatically, then select “finish” to complete and terminate installation.
2.2 Hardware Installation

Before installation, please make sure that there is a USB port available in your compute, therefore you can connect the Flashpro programmer to the USB port.

Step 1: Installing Power unit

Connect the attached power adaptor to power supply connector at the rear panel of the Flashpro programmer, as shown in Figure 2-6:

1. Connect the FlashPro to USB Port using the cable supplied.
2. Turn the FlashPro power on.
Step 2: Connecting Flashpro Main unit to PC

Refer to Figure 2-7, use the attached USB cable and connect the “B-type” connector to the programmer and connect other end of the USB cable to PC.

2.3 Installing USB Driver

Double click the set up ‘setup.exe’ ICON will start the Installation program.
Connect the programmer to PC computer via USB port, turn on the power supply of the programmer. The display will prompt “new device is found” if the programmer is connected to the PC first time, as shown in Figure 2-8:

![Figure 2-8](image)

At this time select “No, not at this moment (T)”, then click next step.

![Figure 2-9](image)
Select “Installation automatically (recommended) (I)”, click “next step” to go to Figure 2-12, or you may select to install from following list locations (Advanced)” then click “next”, to jump to Figure 2-11, after specifying the USB driver, click next step to go to Figure 2-12, please wait, it will take a moment to install the USB driver.
Figure 2-11

★ select “search for driver in following location (S)”, also select “searching including following path (O)” in the check box by a check to specify the USB installation path.
Figure 2-12
★ Please click “Continue (C)”.

Figure 2-13
★ Please click “Finish”. Now The USB driver has been successfully installed.
If the programmer is failing to communicate with the PC computer due to fail to follow the installation procedure, the problem can be fixed as following:
Windows 2000 (Win XP): if the power of the programmer is “on”, right click “my Computer”, select “property”, enter into the property dialog box, in the “hardware” item, select the “device management”, you may find a USB device with a question mark which means the device was non-successfully installed, for instance in Figure 2-15.
There is a “other USB device” with a question mark to it on above Figure, clicking the mouse right button after it is selected, select “update driver (P)” on the popped up menu, go to Figure 2-11, restart the driver installation again.

3、Quick Start

After install the software, user may follow the quick start section to program the device.

This chapter will help user to understand the full
procedure to program a device. This chapter will help you to have a basic understanding above the whole procedure of how to use the programmer to programming a device includes:

★ menu of the software displayed on the screen. User interface of the application software

★ Go through the procedures step by step

### 3.1 Software menu

After execution of the Flashpro software, following screen will be displayed as Figure 3-1:

![Figure 3-1](image)

A. Menu column: all the executable commands that FlashPRO will execute can be found in the menu.

B. tool column: provide a quick way to execute those frequent used functions such as open, save etc.
C. Device information: include device manufacturer, model, capacity, adaptor application path, check sum etc.

D. communication status indicator: used to indicate current communication status: if light is in green and the message showed “programmer is connected”, which means the programmer is in normal and can be used for application. But if the light is in red color and the message status shows “disconnected”, that means the communication between computer and programmer is not yet established, in this case the software in the PC will enter into “demo” mode automatically.

E. operating message window: display operating message.

F. status progress bar: display current task status progress.

G. device operating column: Functions of programming, verify etc. can be easily selected. Not only step by step function can be selected, you can also select “auto” function or “semi auto function”. But before it, you must editing the batch file to execute the function and sequences that you are going to performed.

3.2 Procedure to programming a device

3.2.1 Selecting Device under programming

The device selecting window will prompt by clicking the “Device select” button in the tool bar or clicking the “device select” button in the main menu, as shown in Figure 3-2.
3.2.2 Loading Device Data

Programming a device means use the data in the buffer area and programmed to the device memory cell according to the manufacturer’s specifications.

Click the “open file” button in the tool bar on the main menu. Dialogue box prompts out:
Figure 3-3

After selecting the file from the directory, a file dialog box will prompt out while clicking the “open” button or double clicking the file name.
Select the desired file format, byte “filling” is not applied, select address, once “confirm” button selected, the data need to be programmed are filled to buffer area.

note:
★ byte filling is not used: default is used unless special request to fill “00” or “ff” by project engineer, different filling method will affect the check sum vale, but will not affect the application.
★ start address of the buffer area: first byte of the file loaded into the buffer will be put into the buffer area starting from this address, user can modified this address. This address must be modified while multi files are loaded into the buffer area for programming into the same device.

3.2.3 Programming Device Chip
If the package of the device under programming is not a dip, you can check the adaptor information after device type is selected.

Correct device adaptor must be used to insert the chip into it.

To put the device under programming into the socket, please refer to following procedure.

★ If the device is erasable and must be erase before programming, please add the erase function into bath file.

★ Blank Check, you may skip the blank check if it is a brand new chip.

★ Program

★ Verify, this step is a must step, only those chips passed “verify” are sure pass programming step.

★ If the device need to be security protected, add the security protect function after programming, verify. (Security or Protect). User may select “auto” to complete all functions. If this is the first time to use a programmer, please refer to Chapter 4 for further detail information, it will help understanding more about each step.
4. Function Description of FlashPRO series

This chapter is a detail description of the Flash pro programmer software and its function and detail operation.

★ Menu Introduction
★ Tool Bar
★ Device Message
★ Editing “auto operating”
★ device function operation windows
★ message windows

4. 1 Menu
4. 1. 1 file Command

File command menus are listed in Figure 4-1.

<table>
<thead>
<tr>
<th>Open File</th>
<th>Ctrl+O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save file</td>
<td>Ctrl+S</td>
</tr>
<tr>
<td>Open Project</td>
<td></td>
</tr>
<tr>
<td>Save Project</td>
<td></td>
</tr>
<tr>
<td>Exit</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4-1

4. 1. 1. 1 Open File
Load File to Buffer
Menu File / Load File
This Function loads a file from disk into the memory buffer. The type of files that can be loaded for a device depends on the device type. Click the mouse button to select the file to be loaded or type the filename in the box provided. You can also type in a file type (e.g. *.hex) while menu is prompted. All the files correlate to the specified suffix will be listed, and you may select the file required to be loaded.

Loading binary file or hex file had been introduced on Chapter 3.23.2.2.

4. 1. 1. 2 Save File

File Commands

Save Buffer to File
Menu File / Save Buffer
This function is used to save the memory buffer to a file and stores it to hard disk. When the dialogue box appeared, you may using the mouse to select a file name that you want to overwrite, or type in the file name in the box
If a suffix (e.g. *.hex) is typed. File type related to the suffix will be displayed; you can then select the file name that you want to overwrite.

4. 1. 1. 3 Open project

**Project File Commands**

Load Project

Menu Project / Load Project File

This function loads the desired project file into the buffer area. After the project file which include the data and configure words are loaded, and ready for starting the chip programming process the using the data and setup functions selected.

4. 1. 1. 4 Save project

Menu Project / Save Project

This function saves both data and configuration information during setting up into a project file. The file includes devices selected, buffer data, operation options setup, and device configuration setup. You can also attach a footnote to this project file. The project file is executed as macro command, which eliminating the trivial through every procedure again and again in further programming.

4. 1. 1. 5 Exit

The system will exit the software if you select “exit” button.
4. 1. 2 Menu for buffer editing

4. 1. 2. 1 Buffer area: Data buffer management.

★ Clear: Clear buffer area.
★ Fill: To fill the data to a specified address area, its starting and ending address can be specified by user.
★ positioned: move cursor to certain address or data location.
★ Search: search for Hex data or strings in the buffer area.
★ exchange: [byte exchange]: exchange the data between the even and odd address byte.
   [half byte exchange]: exchange the high limo and low limo.
★ Close: exit the buffer area.

![Buffer Window](image)

**Figure 4-2**

4. 1. 3 menu for selecting Device

Chapter 3.2.1 has introduced.

4. 1. 4 Menu operating
Device operating command menu is explained in Figure 4-3.

```
Program
Read
Verify
Blank_check
Erase
Protect

Compare

Auto(\text{\textregistered})

Half automatic mode
```

Figure 4-3

4.1.4.1 Program

Program the data inside the buffer area into the chip. There are two kinds of data verification method for programming the chip, one is to verify the programmed area while programming is still in-process, this can make sure that the chip is well programmed basically. this process will stop and prompt the error message while error is detected. Another method is to program the chip without verify in-process, the programming process will stop only at the end address. The message "programming complete" will be prompted afterward, "programming status only stand for that "programming" is undergoing till it finishes the whole process, the user may check if the device is well programmed or not by performing the verify process to see if the programming result is successful or not.

4.1.4.2 Read

Read the data out from the chip and store it into the PC buffer area, the data can be check from the window of the buffer area.
Note:
1) Protected chip, if the chip is protected, the data can not be readout, even if you can read it out, the data could be in-correct.
2) If a chip contains configure data, such a data can be read out and store in the buffer area also.
3) PLD test vector does not exist in side the chip, so it can not be read out.

4.1.4.3 Verify

The purpose of verify is to check if the inside the chip is identical to the buffer area. During the verification, the verification process will be stopped as long as an error occurred. For most of the memory device and MCU, the error messages include address and data; but that of a PLD is depended on the project data. A device that passed verify process means it is programmed successfully.

4.1.4.4 Blank Check

To check if the device contains any data. The blank status is specified in the device spec. if the function to filling the buffer area is selected after device selecting, the buffer area in the HEX/ASCII buffer area are filled with all “FF” or “00” (hexadecimal), fuse buffer area are all “1” or all “0”.

The status of a device after protected can be shown as “blank”. It is no need to perform “blank check” to an over-writable EEPROM.

How to clear a chip to empty?
1) Performed the erase function if the device is electrical erasable.
2) If the device is “UV light erasable, use UV eraser to proceed clean the chip for 3 to 30 minutes.
3) If the device is an OTP, the data can not be erase once it is programmed.

4. 1. 4. 5 Erase

Erase the chip to make the contents inside the chip empty. Such a function can be found only on those chips can be erased. EEPROM that can be over-written do not needed to erase it first, in this case if a empty chip is needed, you can program the data "00" or "ff" inside its contents to make it empty. Some of the electrical eraser device can be configure as partial OTP device to avoid over write the data. Please refer to separate chip specifications.

4. 1. 4. 6 Compare

Compare the data inside the chip and the PC or programmer buffer area, result of the comparison cab be save to a text file and save it under the installation path.

4. 1. 4. 7 Auto

Auto programming mode, this function provide user to program a device according to a pre-edit and checked batch file. Please refer to the menu in the "editing the automation batch".

4. 1. 4. 8 Semi-auto mode

"semi auto" mode is used while in mass device programming mode. By the pin continuity function, the programmer can detect the chip inserting and chip take away to complete the function of automation or semi automation. Mass production mode eliminate the handling of mouse and keyboard. While you selecting the auto or semi auto mode if the message area prompt the no such a mode is supported, that means such a device was not supported for mass production.

Here we suggest: select device that it wants to program, complete the editing of auto mode(Auto) "while this editing
is pass the programming, then select” auto mode (take a hook on the selecting box), please do as indicated in the operating message box for operation.

In case “semi auto mode” is selected, the pin continuity window will prompted at the right hand side of the windows, numbers on each side indicates the pin numbers, those squire in red color indicates un-used pins of the test sockets, bad pins or bad contacts, the green squire pins means normal pin contacts are detected.

As in Figure 4-4 which shows chip contact status of chip W29C040, Total 32 pins, among them pin 16 and pin 17 have damage pin or bad contacts.

Figure 4-4

Information of the operating message:
★ Please insert a new device on socket! remind the user should put the chip into the socket for programming, or there is
an error in putting the chip.

★ Please remove the device on socket!, remind the user to take away the chip that has been programmed., at the mean time user should judge the result from the operating message window to decide the chip is well programmed or not. If user wants to terminate the “semi auto process”, take off the hook off the “semi auto” check box.

4. 1. 5 setting Menu

Command of the operating menu is described as following:

![Figure 4-5](image)

4.1.5.1 Operating selection

The Operating includes:

★ Pin continuity check

This function only apply to device pin numbers within 48 pins (includes device adaptors are engaged to reduce the final contact pin numbers within 48 pins).

If this function is selected, programmer will perform the pin continuity check first before execute the programming step, at this step, pin bad contact, device reversed insertion or wrong insertion will be checked,; Figure 4-4 will be prompted to show the status of actual pin continuities status.
If errors are found in pin continuity check, it may result from followings:
If the device pin is detected with errors, it may be caused by:
Case 1:

Figure 4-7
No device found on the socket, please install device.
Case 2:
Bad contact or damaged pin are founded after device is inserted to the testing socket. Which is shown in above figure 4-8, both pin 15 and 25 were detected with bad contact problems.

To fix the problem: Take out the chip and check if the above specified pin visually, if the above pins re found not good, replace a new chip and continue to next. If above bad contact can not be double verified by visual, replace a new chip and make sure the programmer is in good condition.

The pin numbers specified in above figure are device pin numbers, If an adaptor is applied, the pin numbers specified is the DIP socket pin numbers, for instance if a 84 Plcc chips is installed to the programming socket by an adaptor, the pin number quoted is the dip pin number on the adaptor instead of 84 pin numbers on the chip.

User may terminate the current status by “stop current operation” if pin continuities are detected. Also “retry” can be used to repeat the operation, user may select “Ignore” to ignore the current status and go to next step.

★ ID Check

Device ID(Electronic Identifier Code) can be read out from the chip to check the manufacture and its programming algorithm code. The default device ID check is turn on if device is selected and “function selection” dialog box is opened. So the error message will be prompt if a mismatched
device is inserted and checked after device selection step is completed.

Figure 4-9

User may either click the "confirm" button to continue, which will ignore the "ID error" of course. User may abandon operation by clicking the "Cancel" button.

★ Buzzer indication

During the programming operation, the buzzer in the programmer will have different sounds to show different processes or different results, for instance in pin continuity check process or ID mismatch, programming failure or success. The buzzer may be turned on or off.

★ Selecting Verification item listing

After a chip is finished its programming (Program) process, verify if the programming is successful or fail is necessary. Voltages applied to the chips during verification is differed from manufacture's.

1st: applied CC (±/− 5%) or (±/− 10%) for verification, if VCC=5.00V is applied for verifying, then VCC=4.75V and VCC=5.25V also are applied, or VCC=4.50V and VCC=5.50V may be applied next (±/− 10%).

2nd: Verify using Minimum (Min Vcc) voltage and Maximum voltage (Max Vcc) to Verify.

★ Programming Area

User may specify the memory area inside the device to be
programmed, this function is good for most of the E/EPROM(FLASH) devices.

For instance: if device of MACRONIX MX29F200B TSOP48 is selected, it is a 16 bit flash device, its re写able starting address is “0”, its ending address is 1FFFF (hex), size of the data buffer (in byte) is (1FFFF+1) *2=40000(hex). The size of the data buffer is twice of that of the device since it is a 16 bit device.

The default programming area is from the starting address to the ending address of the chip. If only the rear half area is going to be programmed, we can modify the start address from “0” to 2000 (Hex) and keep the ending address the same, the mapped data buffer area should be from 10000*2=20000(HEX) to 0000(HEX).

Modifications of the starting and ending address may vary from device to device, for instance, most of the MCU are not allowed user modifications of either starting or ending address.

4.1.5.2 Device configure byte

There are some configuration words on some of the MCU devices, multi-pages may be applied, each page should be well set prior to programming.

Configurations differs from device to device, Even some of the flash device are using this method to protect or to display certain buffer area. Please refer to discrete IC Manu.
**4.1.5.3 Configuring serial number**

Configure the serial number for device programming is to use continuous memory area reserved in the chips for special application Area. Usually is to record a simple message related to device programming?

In general a 8 continuous bytes (default) is reserved,
after each successful programming, the programmer will modified the said area by a certain methods.

Remark:
① Function of Serial number configuration is disabled under off-line mode
② If above function is chosen, Checksum that is displayed on the screen main menu will be changed depend on the device programming results.

Figure 4-11

4. 1. 5. 4 Language Swapping
★ Simplified Chinese: Operating screen is switched to simplified Chinese.
★ English: operating screen is switched to English.

4. 1. 6 About Menu

Command summaries in the menu as following Figure 4-12

<table>
<thead>
<tr>
<th>Information Hint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Information</td>
</tr>
<tr>
<td>Help</td>
</tr>
<tr>
<td>About</td>
</tr>
</tbody>
</table>

Figure 4-12

4. 1. 6. 1 Message prompt

Showed the current device message, for instance: current device operating voltage, programming voltage VPP.

Figure 4-13

4. 1. 6. 2 Help information

The topics is displayed in the help area in file format
corresponding message can be found in the area in case the Manual was lost.

4.1.6.3 About message information

Display the equipment manufacturer and software and hardware revision.

![Figure 4-14](image)

**Figure 4-14**

4.2 Tools Bar

Functions in the tool bar provided the user a fast way to select desired functions. Following is the list:

- A. Open File
- B. Save File
- C. Open Project
- D. Save Project
- E. Device select
- F. Buffer area
- G. Edit Auto
- H. Logic test
- I. Download
- J. Configure
K. Exit—exit the current application software.

Items of A, B, C, D, E, F have been introduced in their discrete menu. The project downloads are varied with different programmer.

4. 3 Device Message

Device message windows provide all the messages of different device.

![Figure 4-16](image)

★ Manufacturer: Manufacturer that produces the device.
★ model: name of the device.
★ Capacities: size of the device.
★ Adaptor: name of the adaptor needed to be used to program the device.
★ File: File and its path needed to programmed the device.
★ Checksum: verification check of the data in the buffer area.

4. 4 Editing Auto operation

In the window of device operation menu, separate default Auto mode can be found, it is the batch operation in mass production. This function can be edited by select and add the command functions to the list in right hand side so that the programmer will execute each command step by step while start button are pressed. For instance: to edit the auto mode for device ACT 93LC46, open “edit auto programming method” dialog box. At the left hand side is “Device Functions” items which lists all the items that can be applied. on the right hand side shows the list that is selected for “auto program mode (Auto)”. 
As shown in figure 4-17, you may see the user selected commands listed in the right hand side box, which will be execute one by one in sequence later.

![Edit Auto window](image)

**Figure 4-17**

According to the editing result for auto mode, the executing result will be similar to user press the command “Erase”, “Blank check”, “Program”, “Verify”.

★ “Add” button: select from Device Functions dialogue box in the left hand side by highlight the command and add it to the dialogue box in the right hand side.

★ “Delete” button: delete the command in the right hand side dialogue box by highlight it then click delete.

★ “Delete All” button: delete all the commands listed at the auto mode dialogue box.

Double click the command listed on the left hand side Device Functions dialogue box is similar to add an command to the right hand side box.” a double click to any command line listed
in the right hand side auto mode dialogue box is to delete such a function. Execute the auto mode function will result an empty operating if there is no commands inside the auto mode box. Efficiency will be increased if the auto mode command can be used skillfully.

### 4.5 Device operating Function Windows

Functions prompted on the device function windows provide all the commands necessary to operate a device.

![Figure 4-18](image)

In Above list each function is corresponding to each button. One may select a operation by click a single button, if you click the auto mode, you will enter into the auto-editing procedure.

### 4.6 Operate message windows

In the message exchange area, followings are displayed: operating procedure, operating result, message histories.

![Figure 4-19](image)

★ Time:0m 2s 985ms: execute “Erase”、“Blank Check”、“Program”、“Verify” it takes 2 sec and 985 mini sec.
There is a special status bar, which shows the status during commands in progress, the numbers of failure and succeed are recorded also. Once the auto mode functions are selected, the counting in the succeed count will be increased by 1, similarly, the fail counter will be increased by 1 if the device is failed.

Both the counters will be clear to zero by press the “reset” button.

Appendix

Warranty:
Main unit: 12 months
Power supply: 6 months
Above warranty do not include accessories such as user Manual, CD ROM, Service guide gif box and IC socket.

Warranty terms
The manufacturer, Secom Industrial Co., Ltd. Provides a guarantee on failure-free operating of the programmer and all its parts, materials and workmanship for 12 months from the date of purchase and upon the purchasing, user must send the Warranty card back to us. User or purchaser are requested not to open and repair
The programmer by themselves or by any unauthorized person. Only authorized repair center will repair or replace defective parts at no charge. Parts used for replacement and/or whole programmer are warranted only for the reminder of the original warranty period.
For repair within the warranty period, the customer must prove the date of purchase.
This warranty terms are valid for customers, who purchase a
programmer and send the warranty card to us. The warranty does not apply to products that are of wear and tear or mechanically damaged. Equally, the warranty does not apply to products opened and/or repaired and/or altered by personnel not authorized by Hexcom, or to products that have been Misused, abused, accident or those of improperly installed. For unwarrantable repairs you will be billed according to the costs of replacement materials, service time and freight. Hexcom or its distributors will determine whether the defective product should be repaired or replaced and judge whether or not the warranty applies.

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