



# Megawin 8051 ISP Programmer User Manual

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*v3.32b*

## Contents

- [1. Chip Configuration for ISP](#)
- [2. Install PC-site AP and Driver for the ISP Programmer](#)
- [3. Use the ISP Programmer](#)
- [4. Simple Manual for GUI of the ISP Programmer](#)
- [5. Notice about P3.1 \(used as ISP's DTA\)](#)



## 1. Chip Configuration for ISP

Two steps have you enjoy the convenience provided by our ISP function.

Step1) Configure **ISP-memory** to 1K bytes (or 1.5K bytes for MPC82L(E)54 ) and make **HWBS** option enabled by a Writer or Programmer.

(Users may use the “Megawin proprietary 8051 Writer” or the “Hi-Lo ALL-11 Universal Programmer”, refer to the following pages for their simple manual).

Step2) Program the Megawin-provided standard ISP code, "**ISP\_DUT\_v4.02.bin**" in the [ **ISP Code** ] folder, into the ISP-memory.

### *Note:*

*To let users easily use the ISP feature, from 01/01/2006, the MPC89L(E)51~515 manufactured by Megawin will have the default factory setting:*

*(1) ISP-memory is configured with 1K bytes and “HWBS” option is enabled*

*(2) “LOCK” and “SB” options are enabled*

*So, if your MCU has been configured by Megawin, you have no need to do it by yourself.*



## 1.1 Using the “Megawin Proprietary 8051 Writer”

Please follow the steps (also shown in the following picture):

Step1: Select the Part No.

Step2: Select Target Zone: ISP-memory

Step3: Load the ISP code: “*ISP\_DUT\_v4.02.bin*”

Step4: Configure the Option: 1KB, or 1.5KB for MPC82L(E)54, of ISP-memory and HWBS enabled

Step5: Click “Program Option” to program the Option

Step6: Click “Auto” to program the ISP code into the ISP-memory.

The screenshot shows the Megawin 8051 Writer (v3.00) software interface. The interface includes a title bar, a logo, and several sections for configuration and programming. Red annotations with arrows point to specific elements:

- Step 1:** Select Part No. (Points to the Part Number dropdown menu showing MPC82L54)
- Step 2:** Select Target Zone = ISP-memory (Points to the Target Zone radio button selection for [ISP-memory])
- Step 3:** Load "ISP\_DUT.bin" (Points to the Load File button)
- Step 4:** Configure the Option (Points to the ISP-memory size dropdown menu showing 0x0800-0x0FFF (1KB))
- Step 5:** Click "Program Option" to program Option (Points to the Program Option button)
- Step 6:** Click "Auto" for auto programming (Points to the Auto button)

The interface also displays a Binary Code Buffer with a hex dump, an Options section with checkboxes for MOVCL, SB, LOCK, F2WDTCR, OSCDN, and HWBS (checked), and a status bar at the bottom showing File, CodeSize, and CheckSum.



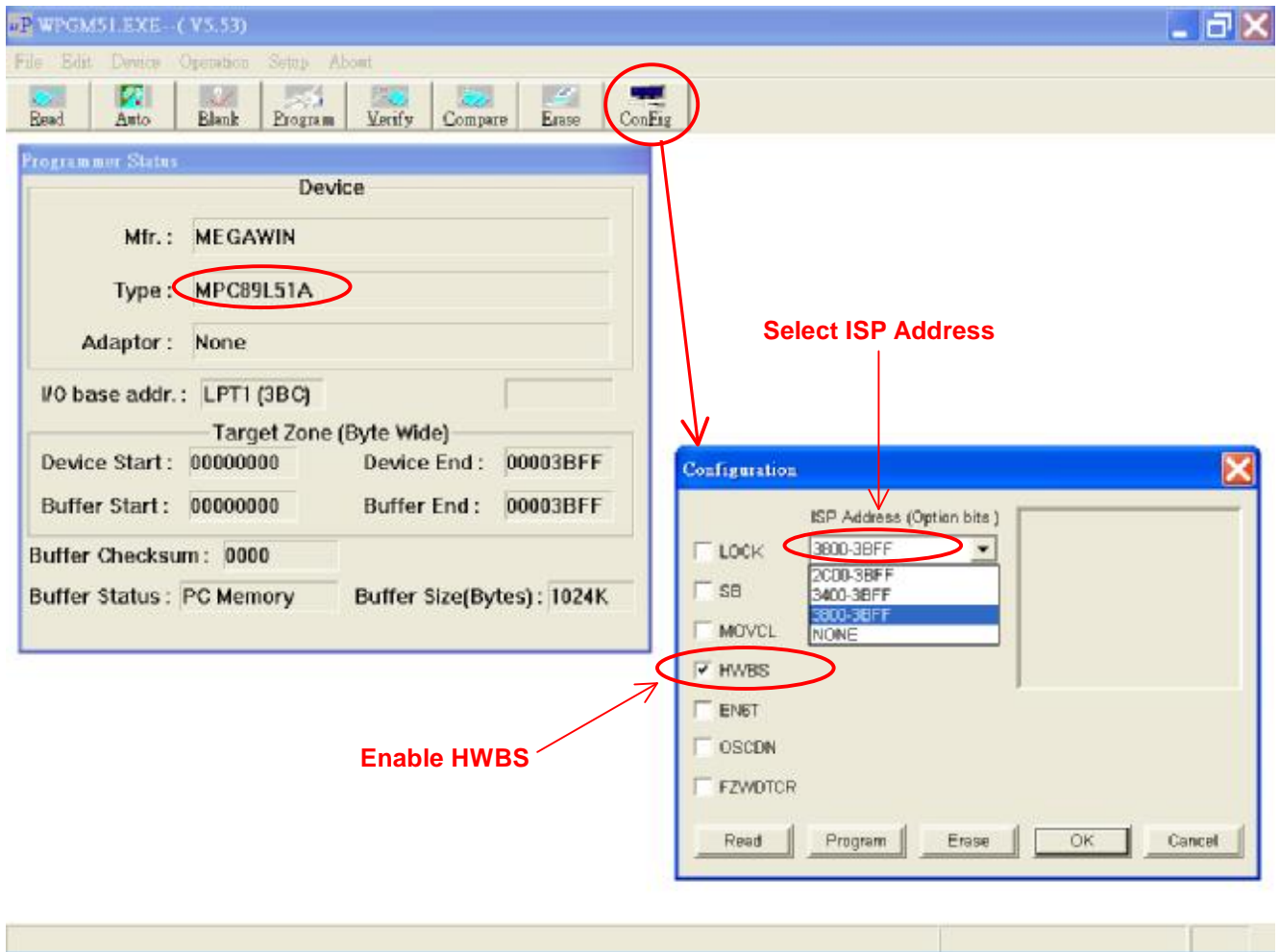
## 1.2 Using the “Hi-Lo ALL-11 Programmer”

Step 1. Configure the option: Enable HWBS and select ISP Address

- (1) For MPC89L(E)51/52/53: select **0x3800-0x3BFF** (1K bytes for Megawin-provided ISP code)
- (2) For MPC89L(E)54/58/515: select **0xF800-0xFBFF** (1K bytes for Megawin-provided ISP code)
- (3) For MPC82L(E)52: select **0x1C00-0x1FFF** (1K bytes for Megawin-provided ISP code)
- (4) For MPC82L(E)54: select **0x3800-0x3DFF** (1.5K bytes for Megawin-provided ISP code)

See the following example:

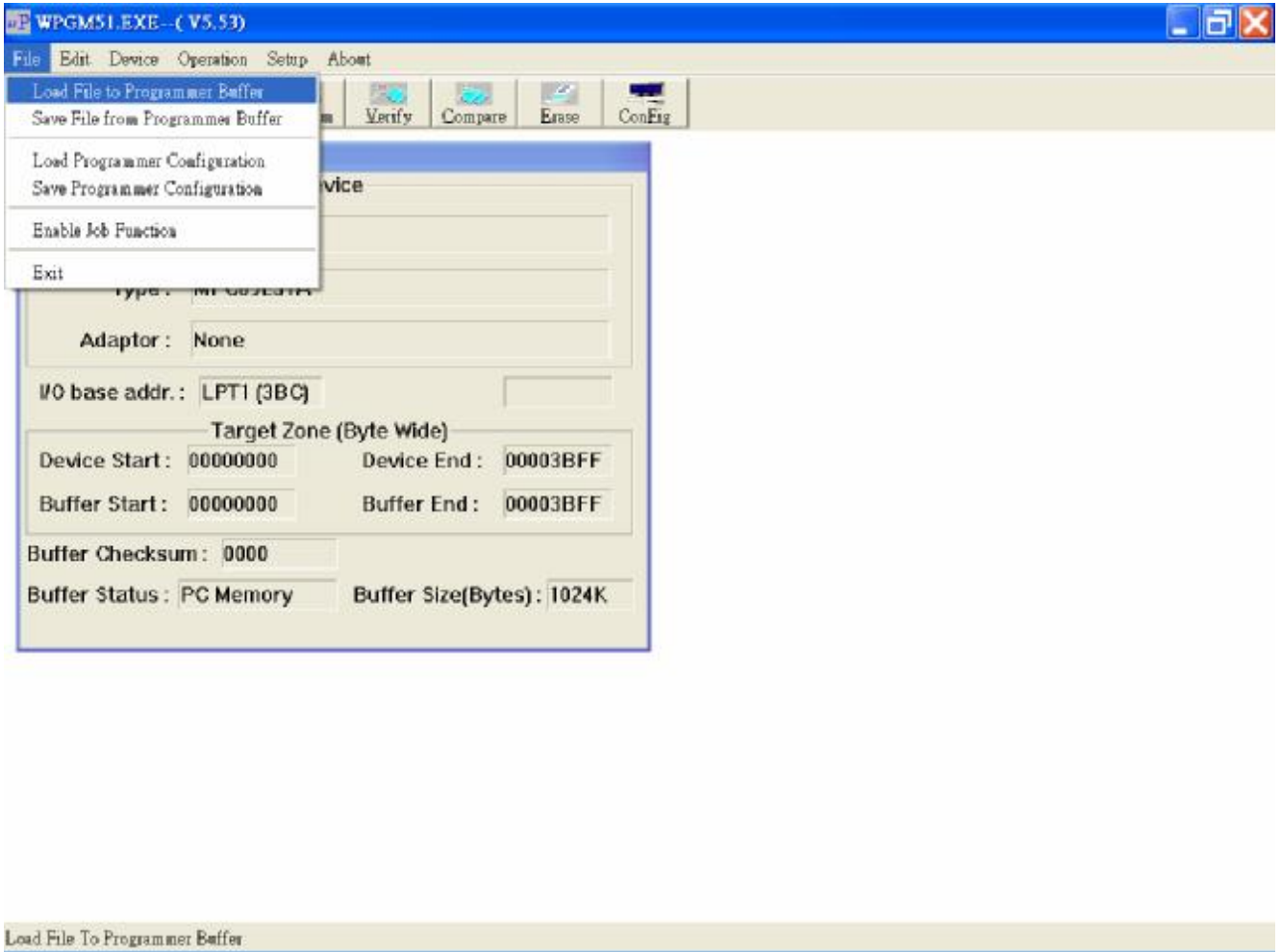
For MPC89L(E)51/52/53:





Step 2a. Load the “ISP code” to the Programmer’s buffer

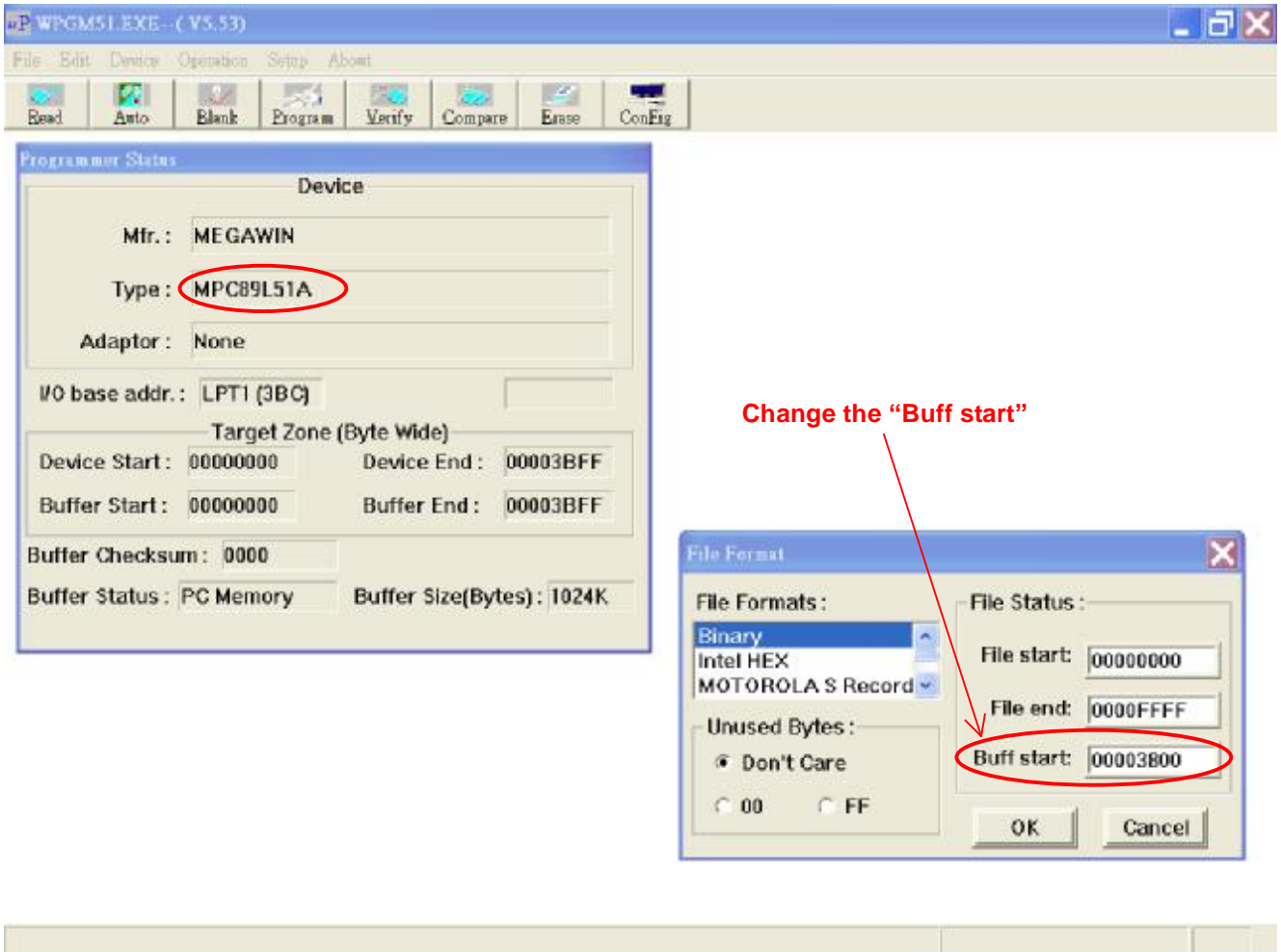
As the following figure, select “Load File to Programmer Buffer”, and input a file.  
Now, goto Step 2b.





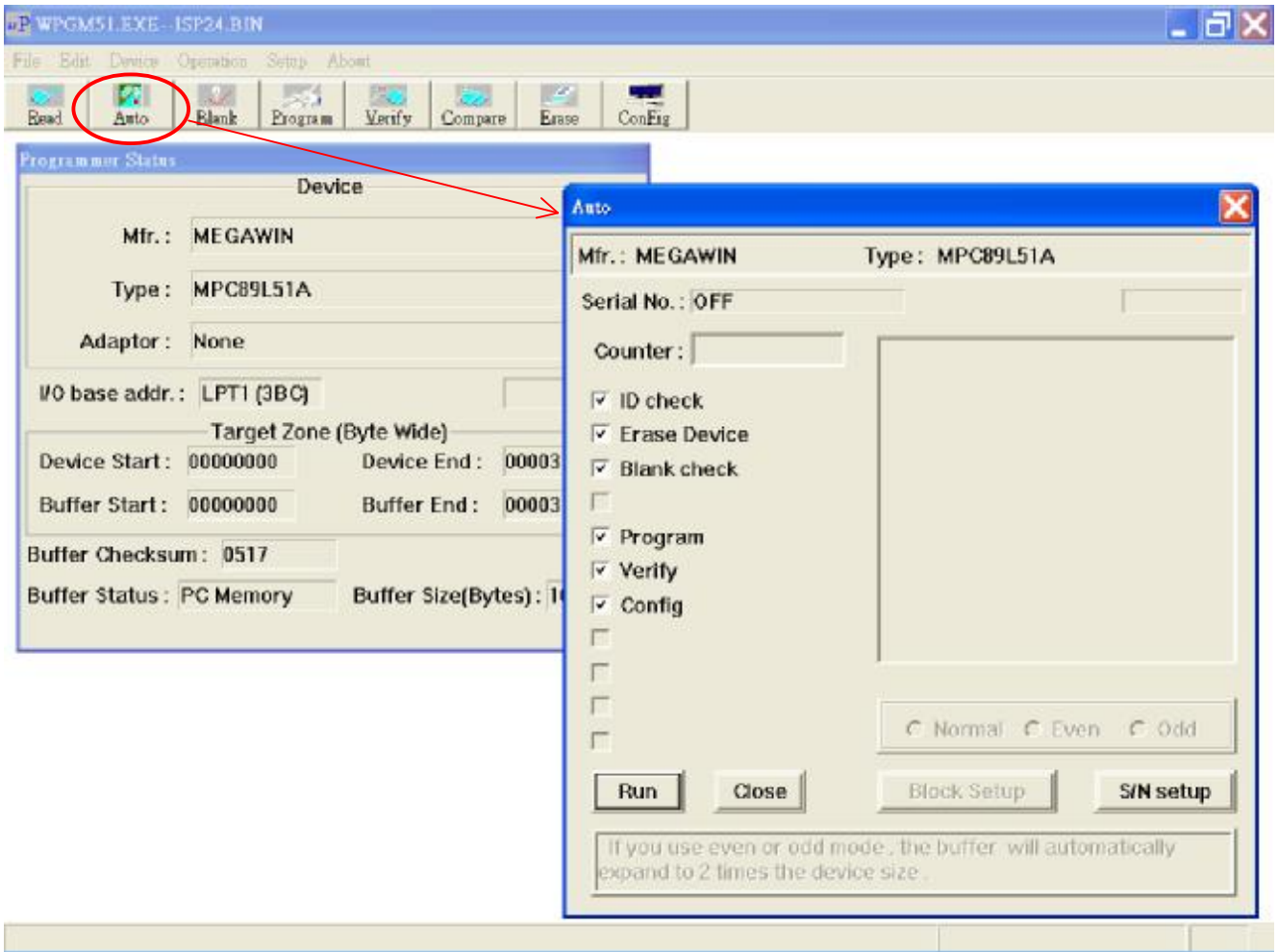
Step 2b. Change the "Buff start" to MCU's ISP start address

- (1) For MPC89L(E)51/52/53: change to **0x3800**
- (2) For MPC89L(E)54/58/515: change to **0xF800**
- (3) For MPC82L(E)52: change to **0x1C00**
- (4) For MPC82L(E)54: change to **0x3800**





Step 3. Click the “Auto” button to program the ISP code and Option into 8051





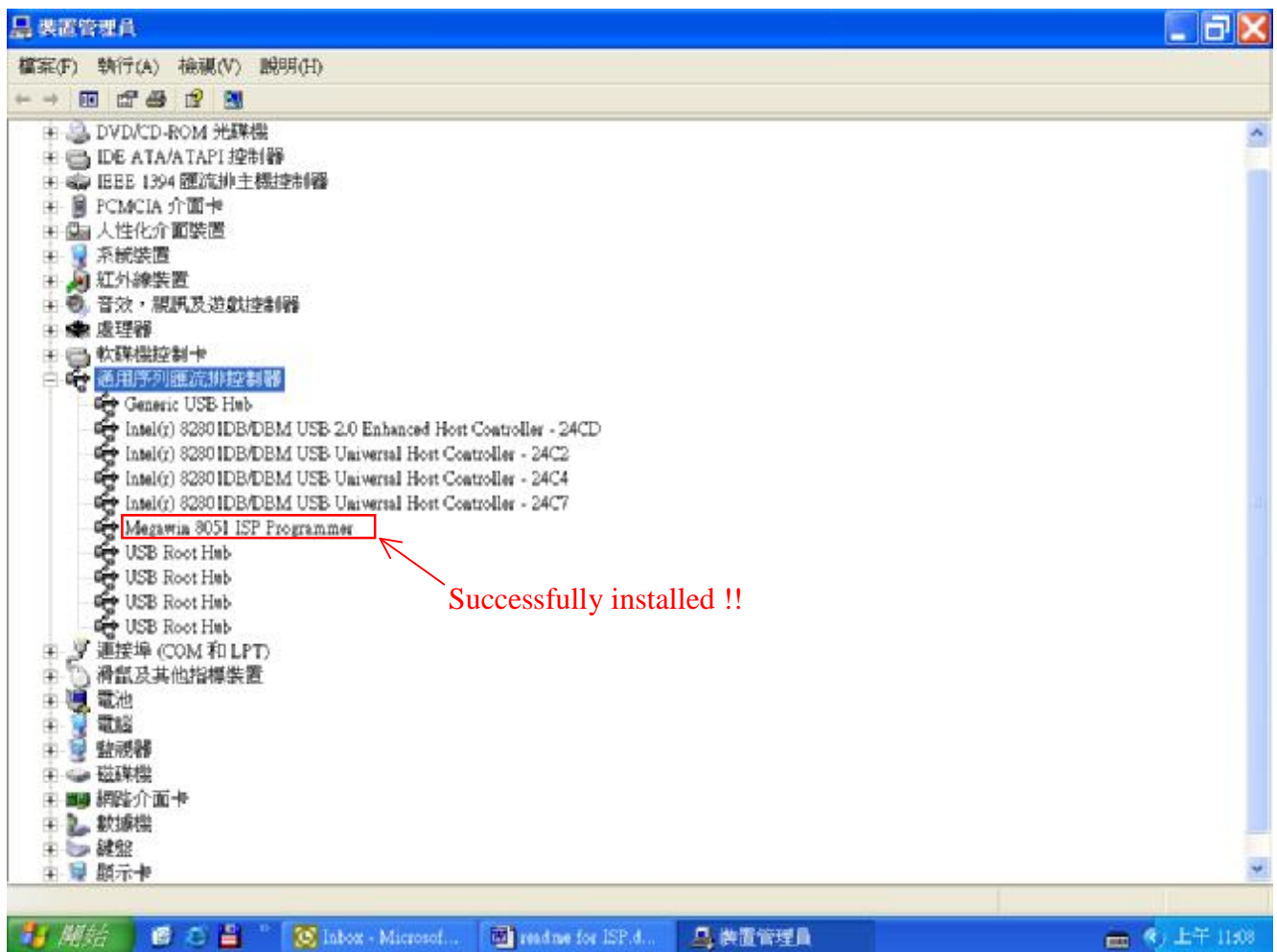
## 2. Install the PC-site AP and Driver for the ISP Programmer

### 2-1. Install the AP

Run “**Setup.exe**” (in the [ISP Programmer \ AP ] folder) to install the application program “Megawin 8051 ISP Programmer” on your PC. Using its default installing setting, you will find the item “**Megawin Utilities \ Megawin 8051 ISP Programmer (v3.32)**” from the Windows’ START-menu.

### 2-2. Install the Driver

Plug the “ISP Programmer” into a PC’s USB port, tell host where the driver “**Mega0302\_8051ISP\_v2.00.inf**” is located to install the device driver. (It is located in the [ ISP Programmer \ Driver ] folder.) After the driver is successfully installed, you will see the following page in the “System\Hardware\Device Manager”.







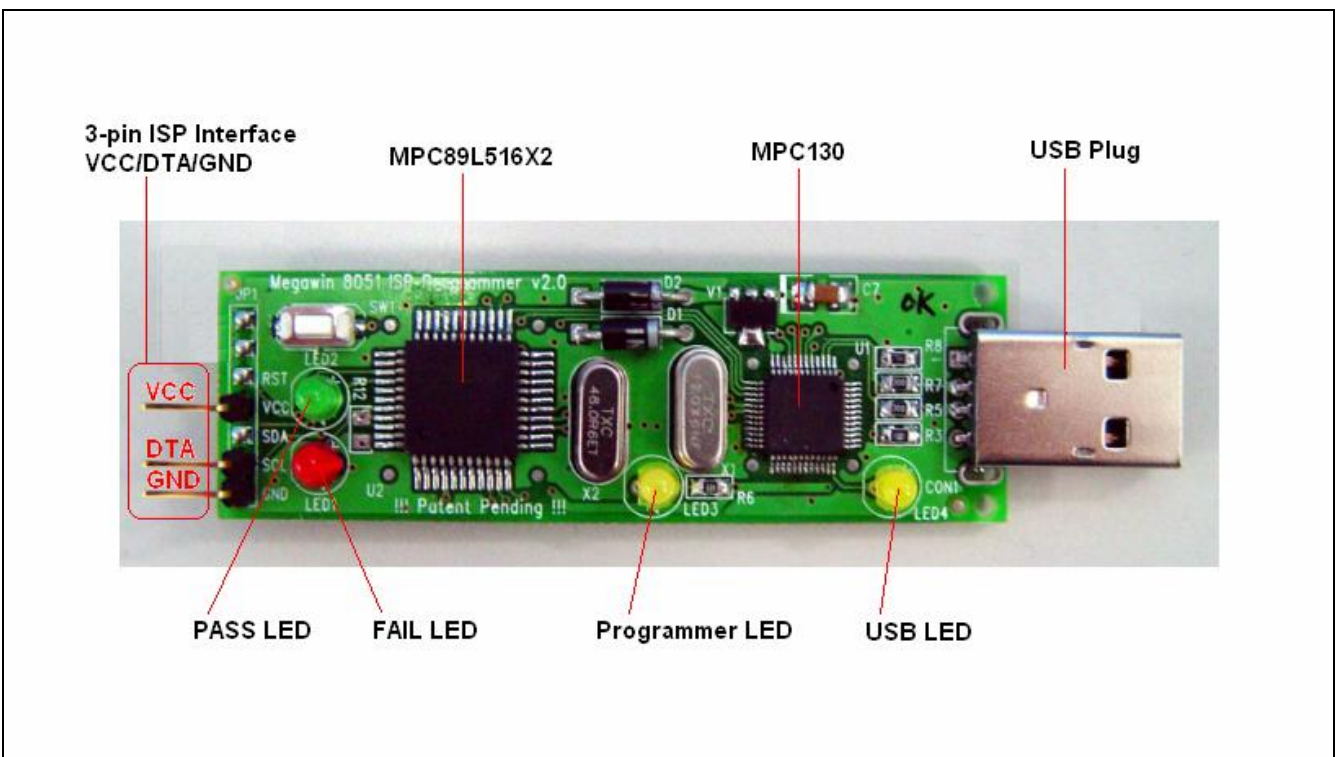
### 3. Use the ISP Programmer

#### 3-1. Introduction

The ISP Programmer, as shown below, consists of two main chips, the MPC130 (USB device controller) and the MPC89L516X2 (8051 MCU). The MPC130 functions as a USB bridge, which performs data transfer between MPC89L516X2 and the Host (the PC), while the MPC89L516X2 functions as non-volatile data storage and provides new code to the 8051 MCU in the customer's system (hereafter, called the Target MCU) for ISP processing.

Because the new code can be saved in the non-volatile data storage of the MPC89L516X2, this ISP Programmer is able to work stand-alone without the AP's intervention. This feature is especially useful in the place without a PC, such as a production line. picture

#### Picture of the ISP Programmer





### 3-2. Operation Mode

There are three operation modes for the ISP Programmer:

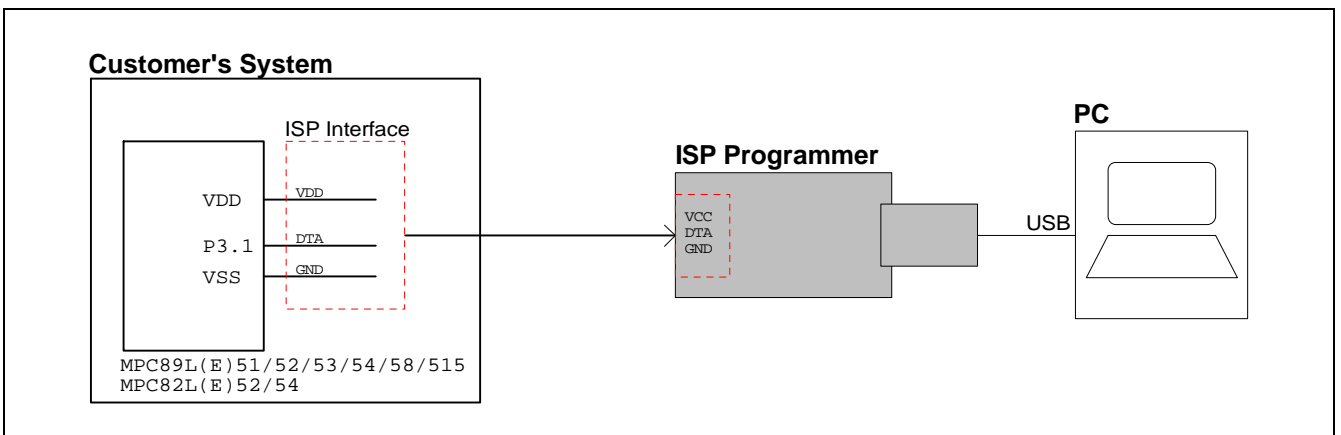
Mode-1: With PC and customer's system connected:

In this condition, the ISP Programmer works with the AP running. Two main buttons can be clicked: the “**Update Programmer**” button is used to download new code (to be programmed into the Target MCU) into the non-volatile data storage of the MPC89L516X2, while the “**Update Target**” button includes the download action and further programs the new code into the Target MCU.

Of course, user must select “**Part No.**” and then “**Load File**” before clicking the “Update Programmer” or “Update Target” button. Also, the ISP-key can be used to start ISP processing after the “Update Programmer” button is executed.

As shown in the following figure, we strongly recommend users to connect the ISP Programmer to PC first, then to customer's system (*which must be powered off*). After connection ok, power on the customer's system. At this time, the Target MCU is kept reset state and will boot from ISP-memory once its RST-pin is released (by the ISP Programmer). When the Target MCU boots from the ISP-memory, it executes the ISP code, which makes handshaking to the ISP Programmer and will start ISP processing if the handshaking succeeds.

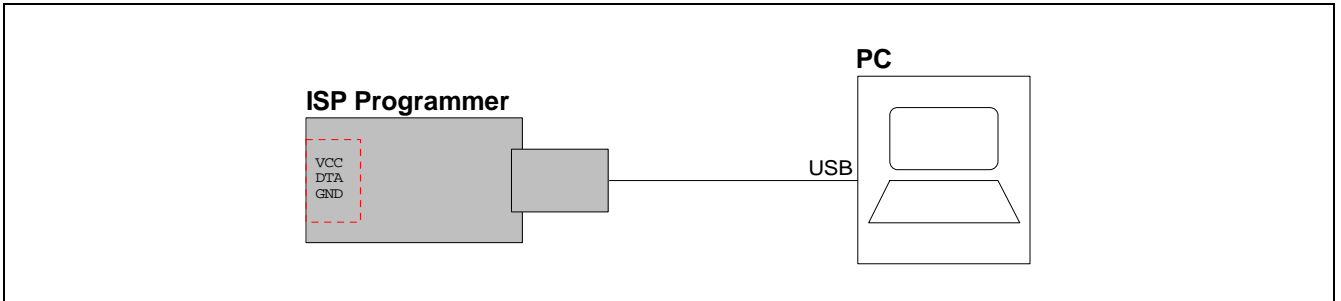
If ISP processing succeeds, the green LED is lighted, otherwise the red LED is lighted. Now, user can disconnect the ISP Programmer to let the system start running new code.





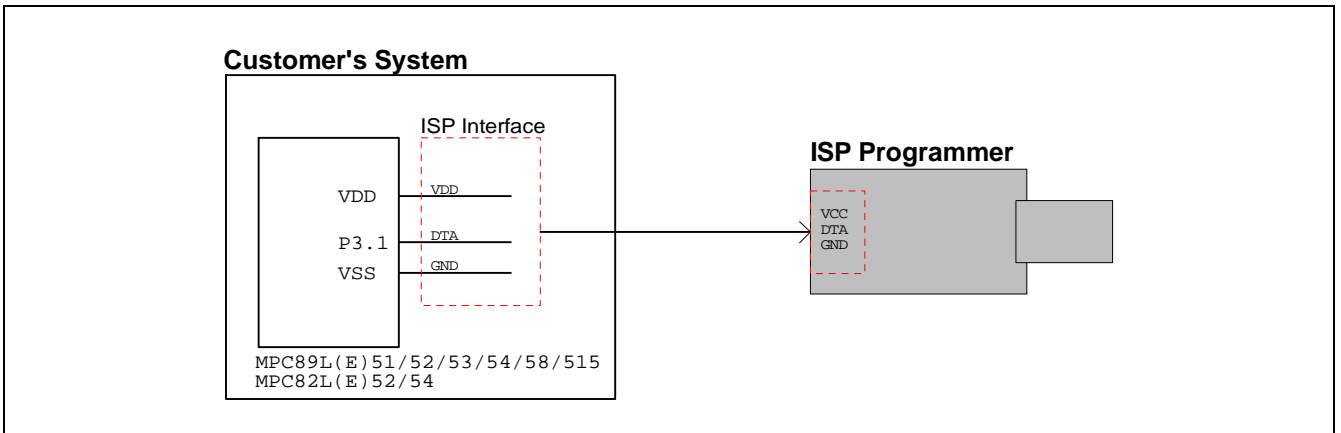
Mode-2: Only PC connected:

In this condition, the ISP Programmer works with the AP running and only the “**Update Programmer**” button can be clicked. User downloads new code (to be programmed into the Target MCU) into the non-volatile data storage of the MPC89L516X2 for later use.



Mode-3: Only customer's system connected:

In this condition, the ISP Programmer works stand-alone without the AP's intervention. First, connect the ISP Programmer to the customer's system, *which must be powered off*. Then, press the **ISP-key** for ISP processing after the customer's system is powered on. If ISP processing succeeds, the green LED is lighted, otherwise the red LED is lighted. Now, user can disconnect the ISP Programmer to let the system start running new code. Of course, user can power off the system and then disconnect the ISP Programmer.





### **3-3. “USB LED” and “Programmer LED”**

The “USB LED” will keep “ON” state while the Programmer is successfully connected to host (PC) and no data transfer between the Programmer and the host.

The “USB LED” will blink while:

- (1) data is being downloaded into the Programmer, or
- (2) the host is waiting for the ISP processing result.

Normally, the “Programmer LED” always keeps “ON” except some error happens in the Programmer. Once some error happens, this LED will keep blinking, and now, the only thing the user needs to do is:

*Disconnect the Programmer from customer’s system and PC, then re-connect to PC to re-download the program data into the Programmer.*



## 4. Simple Manual for GUI of the ISP Programmer

### 4-1. Introduction to the GUI Panel

As shown below.

**Select Part No.**

**Load program code into Code Buffer**

**Download program code (in Code Buffer) and OptionBits into the non-volatile storage of the ISP Programmer**

**In addition to "Update Programmer", further update the Target MCU**

**Code size of binary program code**

**Checksum in Code Buffer**

**Option Bits**

- EN6T
- OSCDN
- FZWDTCR

**Available only for MPC89L(E)51-515**

**Code Buffer**

```
0000 02 00 C3 D2 96 D2 97 22 30 96 FD 30 97 FD 00 00 .....".0...
0010 00 00 00 00 C2 96 00 00 00 22 D2 97 30 97 FD 00 .....".0...
0020 00 00 00 00 00 C2 96 00 00 00 22 C2 96 00 00 00 .....".0...
0030 D2 97 30 97 FD 00 00 00 00 00 D2 96 00 00 00 .....".0...
0040 00 00 00 22 C0 E0 C0 00 EF 75 00 08 C2 97 33 92 .....".u...3.
0050 96 00 00 00 00 00 D2 97 30 97 FD 00 00 00 D5 .....".0...
0060 00 EA C2 97 D2 96 00 00 00 00 00 D0 00 D0 E0 .....".0...0.
0070 22 D2 97 30 97 FD 30 96 04 7F FF 80 02 7F 00 00 .....".0...0.
0080 00 00 C2 97 00 00 00 00 00 22 C0 E0 C0 00 75 .....".u...
0090 00 08 D2 97 30 97 FD A2 96 33 00 00 C2 97 00 .....".0...3...
00A0 00 00 00 00 00 D5 00 EA FF D0 00 D0 E0 22 C2 96 .....".0...
00B0 D2 97 30 97 FD 00 00 C2 97 D2 96 00 00 00 00 .....".0...
00C0 00 00 22 75 81 21 75 21 00 12 00 ED 78 03 12 01 .....".u!...x...
00D0 25 7E 00 7F 7D 12 01 54 12 01 28 7E 00 7F 7D 12 %~...).T.(~...).
00E0 01 54 D8 EA 7E 01 7F 77 12 01 54 80 DF 78 03 12 .T.~.w.T.x...
00F0 01 1F 12 01 25 12 01 2B 12 01 31 7E 00 7F 7D 12 ...%.+..1~...).
```



## 4-2. Two Examples

### Ex. 1:

**How to download new data (which consist of user's application code and non-volatile data) into the Programmer?**

Step 1: Select MCU's Part No.

Step 2: Click "Load File", both HEX format and BIN format are acceptable, and the code size is based on its binary format.

For **MPC89L(E)51/52/53**, the maximum code size is 15K-1K=**14K** bytes, which includes IAP data.

For **MPC89L(E)54/58/515**, the maximum code size is 63K-1K=**62K** bytes, which includes IAP data.

For **MPC82L(E)52**, the maximum code size is 8K-1K=**7K** bytes, which includes IAP data.

For **MPC82L(E)54**, the maximum code size is 15.5K-1.5K=**14K** bytes, which includes IAP data.

Where, 1K bytes [ or 1.5K bytes for MPC82L(E)54 ] are used by the ISP code.

Step 3: Configure the Option Bits. (Only available for MPC89L(E)51~515)

Step 4: Click "Update Programmer".

### Ex. 2:

**How to update the MCU's AP-memory and IAP-memory? (which consist of user's application code and non-volatile data)**

Step 1: Select MCU's Part No.

Step 2: Click "Load File", both HEX format and BIN format are acceptable, and the code size is based on its binary format.

For **MPC89L(E)51/52/53**, the maximum code size is 15K-1K=**14K** bytes, which includes IAP data.

For **MPC89L(E)54/58/515**, the maximum code size is 63K-1K=**62K** bytes, which includes IAP data.

For **MPC82L(E)52**, the maximum code size is 8K-1K=**7K** bytes, which includes IAP data.

For **MPC82L(E)54**, the maximum code size is 15.5K-1.5K=**14K** bytes, which includes IAP data.

Where, 1K bytes [ or 1.5K bytes for MPC82L(E)54 ] are used by the ISP code.

Step 3: Configure the Option Bits. (Only available for MPC89L(E)51~515)

Step 4: Click "Update Target".



## 5. Notice about P3.1 (used as ISP's DTA)

The I/O pin P3.1 is now used as the **DTA** of the ISP interface. Users should pay attention to its normal function and ISP operation to let both them work well. (Of course, the best case is that P3.1 dedicates itself to the ISP operation.)

During ISP operation, P3.1 functions for bi-directional data transfer. It may output logic-1 or logic-0, and also, it may receive logic-1 or logic-0 while as input. So, users should consider if the system's other components will be damaged by this ISP operation.

If P3.1 is not dedicated for ISP operation, there is a requirement for P3.1. That is **P3.1 must act as an output pin in its normal operation**, and meet a little restriction as shown in the following applications.

