Enhanced/Dual Powered

Willem EPROM Programmer

User Guide

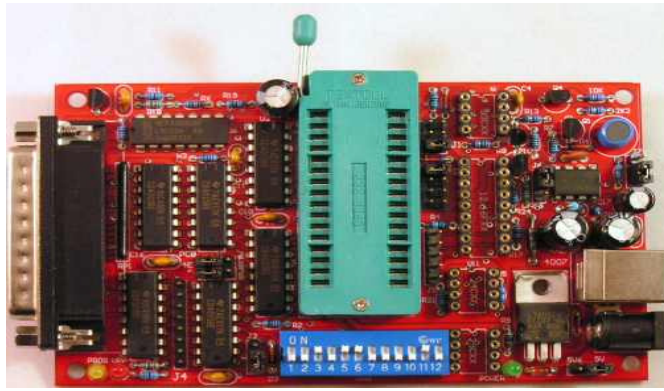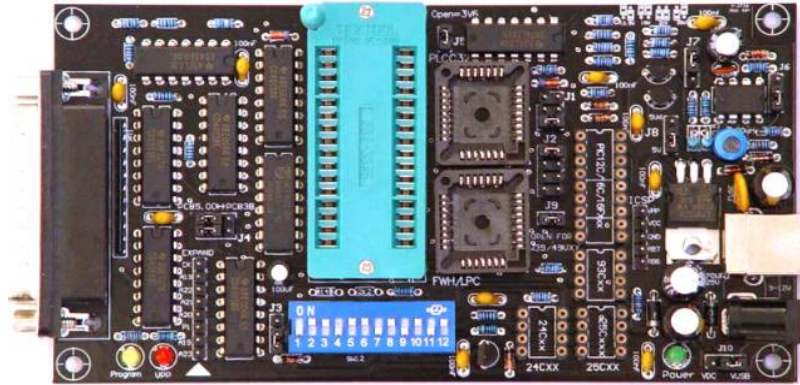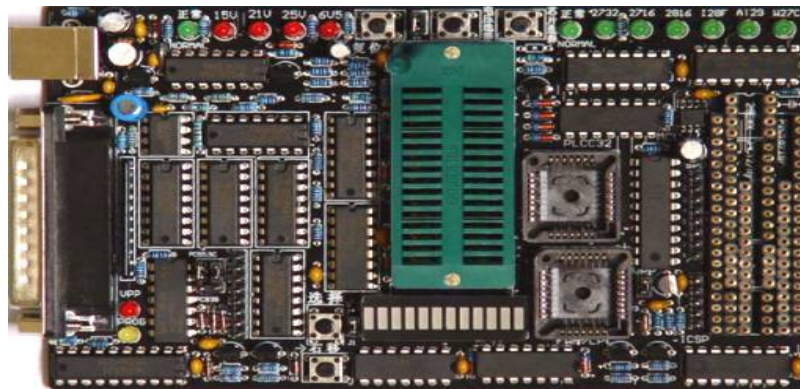[Willem Package Item Image](#)

Main Board / Cables

Main Board PCB3.5
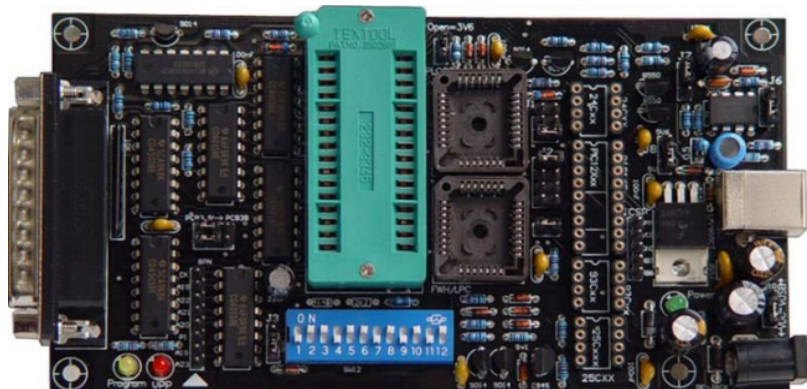
Main Board PCB4E

Main Board PCB5.0
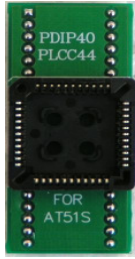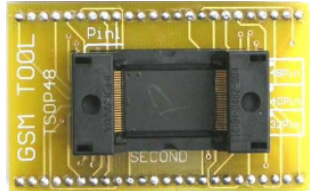
Main Board PCB5.5C

Parallel Data Cable (Printer extension cable, with male-female 25 pin connector, and pin to pin through)	A-A type USB cable(for power)

Optional Items:

ATMEL 89 Adapter	ATMEL PLCC 44 Adapter	TSOP 48 Adapter

FWH/HUB PLCC32Adapter	PLCC32 Adapter	SOIC Adapter(Simplified)
On-Board	On-Board	
AC or DC Power Adapter (9V or 12V, 200mA)	SOIC Adapter(Professional)	

Supported Device List

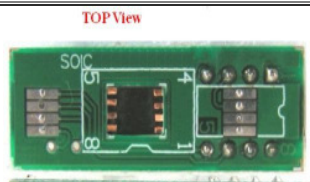| Memory/MCU	Model #
EPROM (Not include 13.5V Vpp chip)	27C16, 27C32,27C64,27C128, 27C256,27C512,27C010,27C020, 27C040, 27C1001 M27C1001,M27C2001, M27C4001 27C080,M27C801,M87C257 2716(Vpp25V), 2732, 2764, 27128, 27256, 27512, 27010
16 bit EPROM(DIP40) (1-4Mbit)	27C1024 (27C210), 27C2048 (27C2002), 27C4096 (27C4002) Eprom 16bit DIP40 adaptor is needed
16 bit EPROM(DIP42) (4-32Mbit)	M27C400(DIP40), 27C800, 27C160, 27C322 Eprom 16bit DIP42 adaptor is needed
Erasable EPROM	W27E512, W27E010, W27C010, W27C020, W27C040 SST27SF256, SST27SF512, SST27SF010, SST27SF020 MX26C4000 Vcc = 3.3-3.6V SST37VF512, SST37VF010, SST37VF020, SST37VF040
EEPROM	28C65, 28C64, 28C128, 28C256, 28C512, 28C010, 28C020, 28C040 M28C16A/17A (DIP28) 28C16, XLS2816 (DIP24) AT28C64B, AT28C256, AT28C512, AT28C010, AT28C020, AT28C040
FLASH Memory	28F64, 28F128, 28F256, 28F512, 28F010, 28F020 MX26C1000, MX26C2000, MX28F1000, MX28F2000 Am28F256A, Am28F512A, Am28F010A, Am28F020A intel: i28F001BX, 28F004, 28F008, 28F016 SST28SF040A, LE28F4001 29F64, 29F128, 29F256, 29F512, 29F010, 29F020, 29F040, 29F080 29F001,29F002, 29F004, 29F008, 29F016, 29F032 AT29C256, AT29C512, AT29C010A, AT29C020, AT29C040, AT29C040A W29EE512, W29EE011, W29EE012, W29C020(128),W29C040 PH29EE010(W29EE011) ASD AE29F1008 (AT29C010), AE29F2008 (AT29C020) AT49F512, AT49F010, AT49F020, AT49F040 SST39SF010, SST3S9F020, SST39SF040 AT49F001, AT49F002, AT49F008A Am29F512, Am29F010, Am29F020, Am29F040.HY29F080 29F002, 29F002T, Pm29F002T
with TSOP48 Adapter:	Am29F400, Am29F800, 29F160, 29F320 (read/write byte mode) HY29F200, HY29F400, HY29F800, AT49F2048A, AT49F4096A, AT49F8192A
with TSOP48 Adapter (Vpp12V):	i28F200,i28F400, i28F800, i28F160 (TSOP48) 28F001(DIP32 or PLCC32)

with TSOP48LV Adapter:	29LV200, 29LV400, 29LV800, 29LV160, 29LV320 (read/write byte mode)
with Firmware Hub/LPC (PLCC32) adapter	Firmware Hub: 82802AB, 82802AC, AT49LW040, AT49LW080 SST49LF002A, SST49LF003A, SST49LF004A, SST49LF008A LPC flash: SST49LF020, SST49LF040
Serial (I2C)EEPROM	24C02, 24C04, 24C08, 24C16, 85C72, 85C82, 85C92 24C32, 24C64, 24C128, 24C256, 24C512 (allC/LC series) PCF8572,8572, PCF8582, 8582, PCF8592, 8592
Microwire EEPROM	8 mode:93C06, 93C46, 93LC46, 93C56, 93C57, 93C66, 93C76, 93C86,93C13,93C14 16 mode:AT59C11, AT59C22, AT59C13 CAT35C102, CAT35C104, CAT35C108 93C06A ,93C46X,93C56,93C66,93C76,93C86 (NS)
PIC embedded MCU	16C5X,17XXX,18XXX series
with PIC embedded MCU adapter:	12C508,12C508A,12C509,12C509A 12CE518,12CE519 12C671,12C672,12CE673,12CE674 16C505 16C61,16C620,16C621,16C622A 16F627,16F628,16C71,16C715 16C84,16F83,16F84,16F84A 16C64A,16C65A,16C65B,16C67 16C74A,16C74B,16C77 16F871,16F874,16F877 16C62A,16C62B,16C63,16C63A,16C66 16C72,16C72A,16C73A,16C73B,16C76 16F870,16F872,16F873,16F876
SPI EEPROM	Atmel:AT25010,020, 040 (A8-A0) AT25080, 160, 320, 640, 128, 256 (A15-A0) ST:W95010....256, Microchip 25x010 - 25x640 25010,25020,25040 25C080,25C160,25C320,25C640,25C128,25C256,25C512 AT25HP256,AT25HP512 AT25HP1024 CAT64LCxxx (16 Data I/O) CAT64LC010, CAT64LC020, CAT64LC040
Test SRAM,Lossless SRAM Function	DS1220,DS1225Y, DS1230Y/AB, DS1245Y/AB, DS1249Y/AB 6116, 6264, 62256, 62512, 628128
Embedded MCU with Atmel AT89 dapter	89 series: Atmel:AT89C51,52,55, AT89LV51,52,55 AT89S8252 (8K+2K), AT89S53, AT89LS8252,AT89LS53 AT89C1051,AT89C2051,AT89C4051 (20pin) AT89C51RC (32KB), AT89C55WD (6.2V) SST89C54/58, SI89C52 Intel:i87C51, i87C51FA, i87C51FB i8xC51,i8xC52,i8xC54,i8xC58 90 series: AT90S1200,AT90S2313
Embedded MCU with 51-AVR+ dapter	89 series: Atmel:AT89C51,52,55, AT89LV51,52,55 AT89S8252 (8K+2K), AT89S53, AT89LS8252,AT89LS53 AT89C1051,AT89C2051,AT89C4051 (20pin) AT89C51RC (32KB), AT89C55WD (6.2V) SST89C54/58, SI89C52 Intel:i87C51, i87C51FA, i87C51FB i8xC51,i8xC52,i8xC54,i8xC58 90 series: AT90S1200,AT90S2313 90S2333, 90S4433, 90S4414, 90S8515, 90S4434, 90S8535,AT90S2313
with Atmel AT89 PLCC44 adapter	P8048AH, P8049AH,P8050AH, P8042AH (Vea = 12V) P8041, P8042 OTP (read/verify/Progam) P8748,P8749H,P8742H(Vea = 18V) EPROM (read/verify/Progam) D8748,D8749,D8742,D8741, D8742(Vea = 18V)

Hardware Installation & Configuration

Installation Steps

- Check the parallel printer port setting in the bios, it should be EPP or Normal.
- Check there are any active resident programs that use the printer port, such as TWAIN drivers. You may have to remove it.
- Connect one end of the 25 pin SubD parallel cable to PC printer port
- Connect the other end of parallel cable to 25 Pins port of the programmer
- Connect USB power cable or AC adaptor (Note: if you are working on the EPROM programming. You may need use a AC adaptor, so that you can get Vcc 5.6V and 6.2V when doing programming)
- The yellow power normal indicator of the programmer should light up, then the programmer power supply is normal.
- Run the software

- Select devices type
- Click the Willem in toolbar to change to PCB3
- Set the DIP switch based on the displayed pattern.

(Note: the LPT port of PC MUST set to ECP or ECP+EPP during BIOS setup. To enter the BIOS setting mode, you need press "Del" key or "F1" key during the computer selftest, which is the moment of computer just power up.)
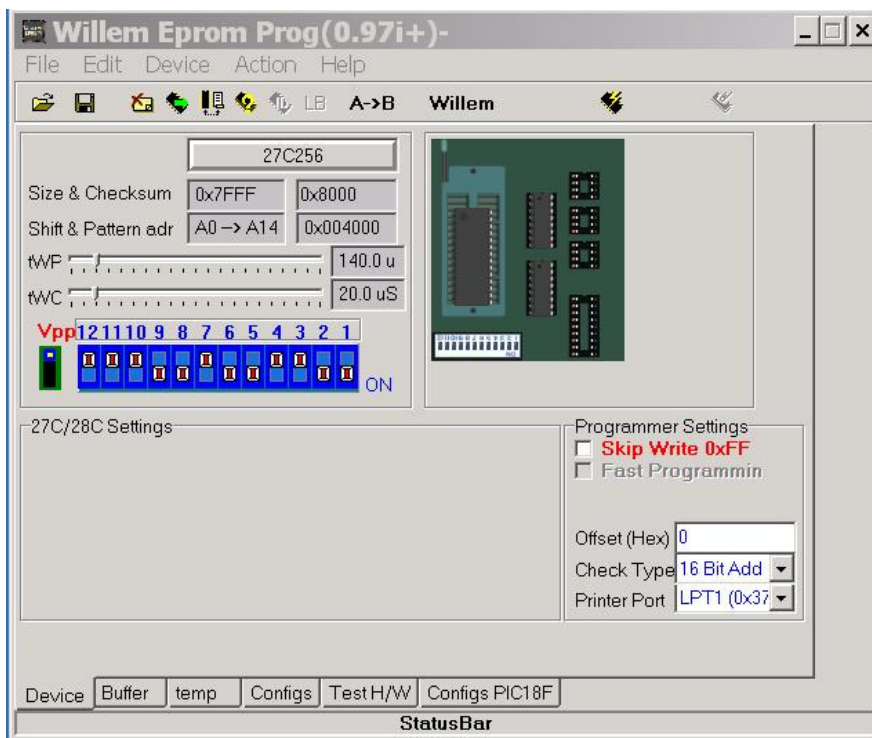
Software Version To Use

The software can be download from download.mcumall.com

There are board hardware selection jumper on the board. When set the jumper to PCB3B, then user have to use 0.97ja and before version software.

If the board selection set to PCB3.5, PCB5.0, PCB5.5C, then the software 0.98D6 should be used.
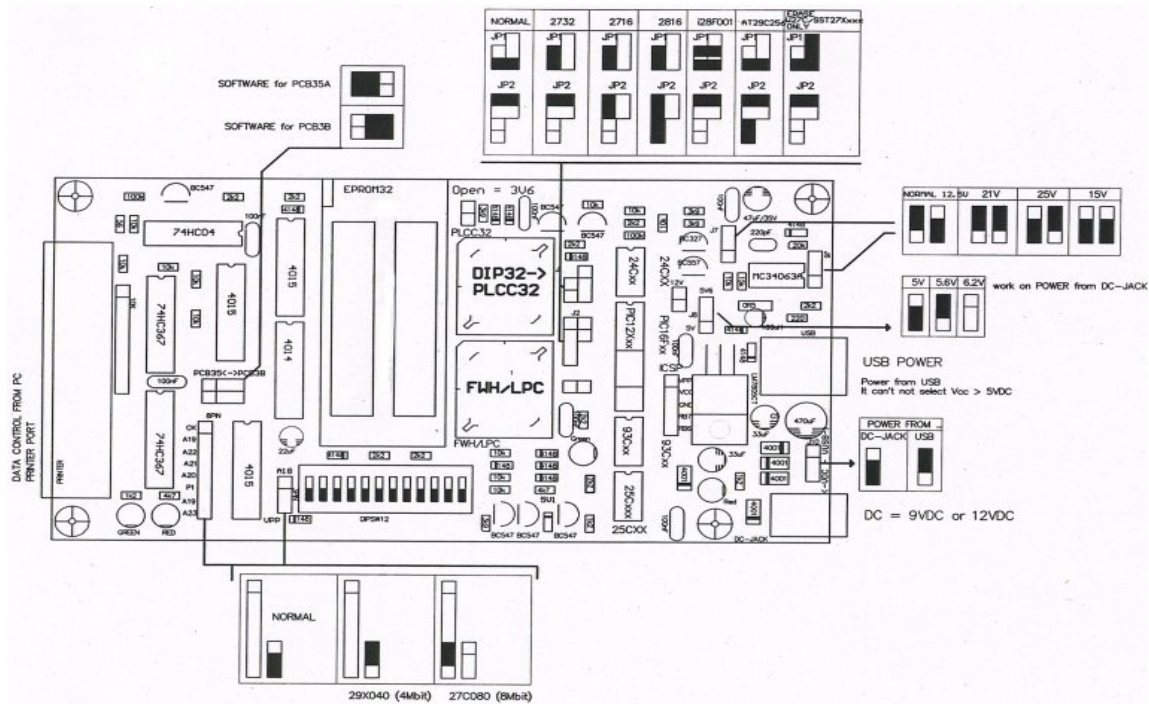
The software interface:

Hardware Check

After start the program, click test hardwar under Help menu. If the connection and power supply is normal, then appears: "Hardware present"   Otherwise check if the programmer connects well with PC, or power supply is normal.
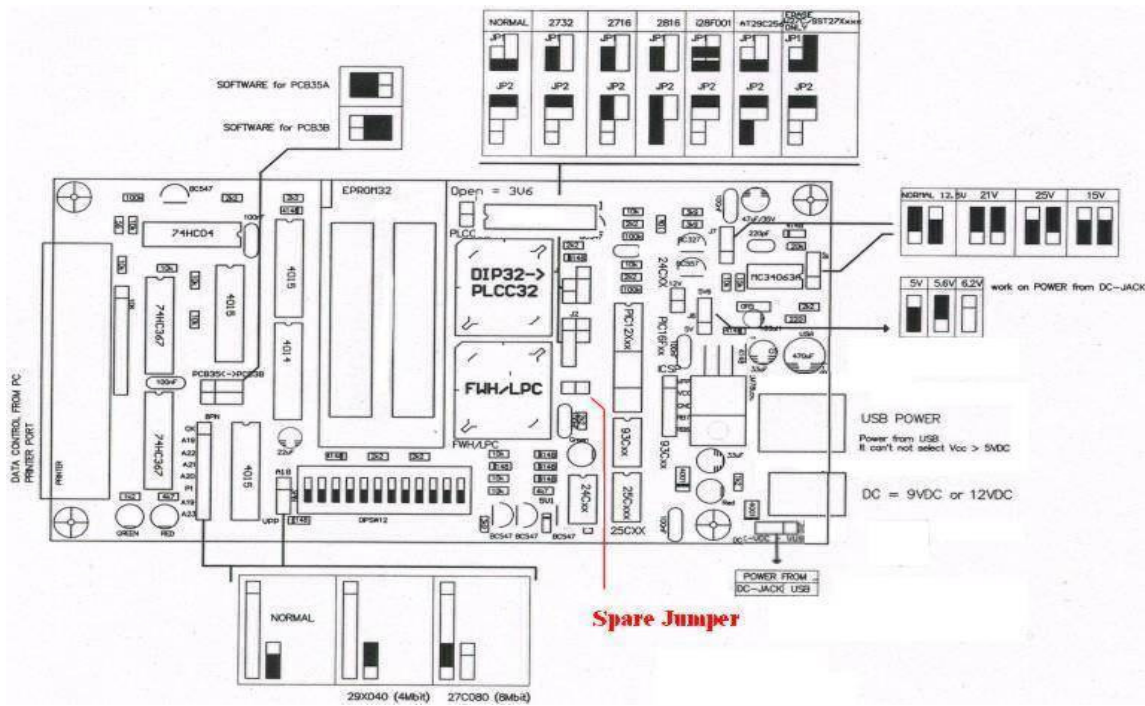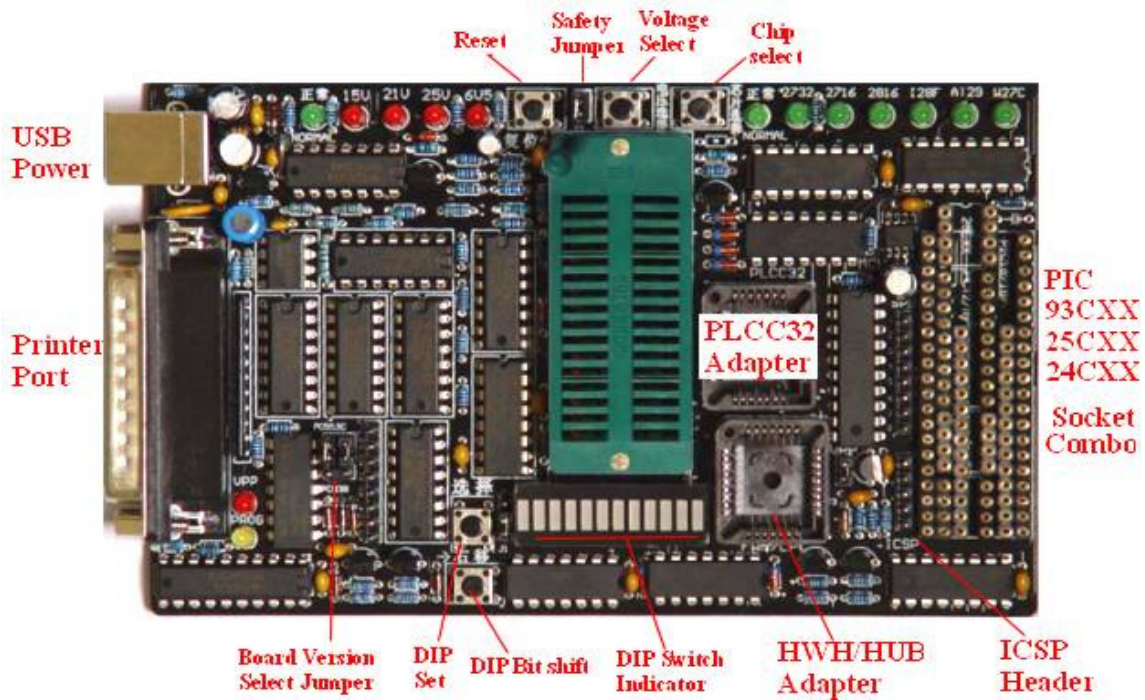
Jumper Configuration

PCB3.5/PCB4E

(Two PLCC32 adapter is not applied on the PCB4E)

PCB5.0

PCB5.5C

Note: the Vcc setting jumper only has effect when you are using AC adaptor as power source. For the USB power only 5V Vcc is available.

For the PCB5.5C, set DIP steps:

1. press DIP Set button twice to check current DIP bit position. Then set it again for ON or OFF.

2. press DIP Bit shift button to shift the DIP bit position to where need to set. And then press DIP Set button twice to check current DIP bit position. Then set it again for ON or OFF.

3. Repeat those steps till all DIP bit ae set same as software indicated.

For PCB5.5C voltage and Special chip selection:

1. Put back the safety jumper.

2. Press the voltage button and hold for 1 second, the voltage LED should move to next. Repeat till desired voltage LED light up.

3. Press the chip selection button and hold for 1 second, the chip LED should move to next. Repeat till desired LED light up.

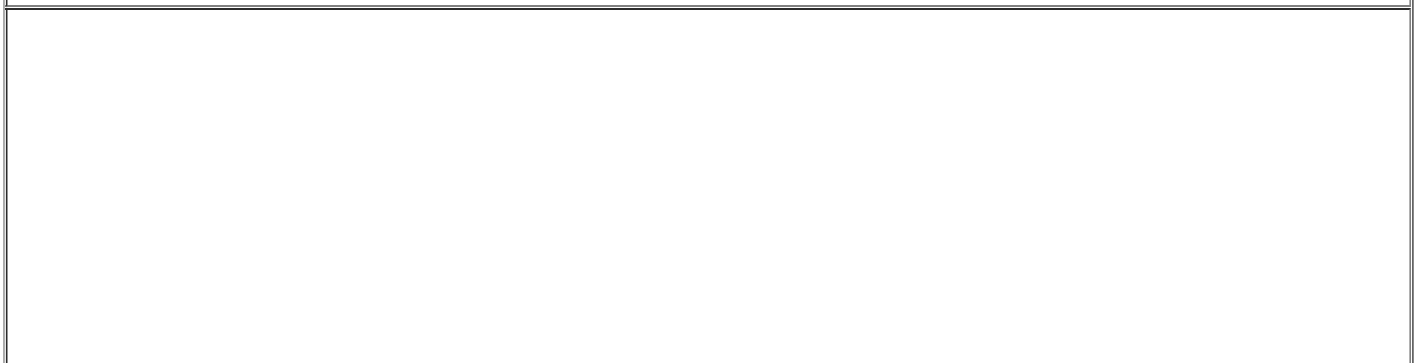4. Remove the safety jumper to lock the selected voltage and chip selection
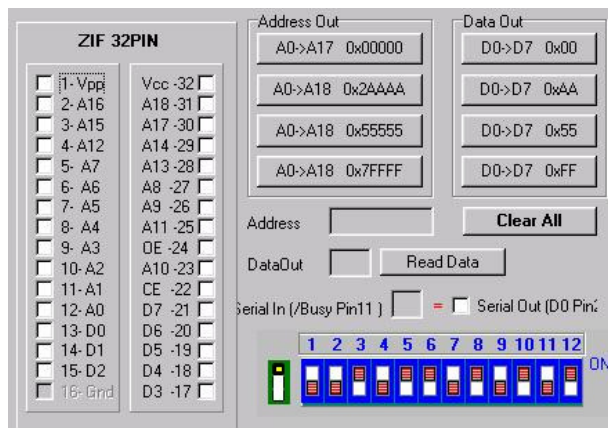

DIP Switch (PCB3.5, PCB5.0)
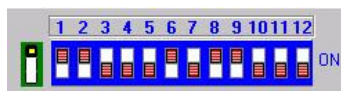
When programming one chip, follow the program prompt to set DIP switch .

Self Test Function

The screen :

Steps:

- Before test, set the DIP switch, jumper setup to software prompted
- Address Pin Test: click the one of the push button in the Address Out group, use multimeter detect output signal in the ZIF32 socket. Or directly input the adress data, the range is:0--7FFFFH A0-PIN 12, A1-PIN 11, A2-PIN 12, A3-PIN 9, A4-PIN 8, A5-PIN 7, A6-PIN 6, A7-PIN 5, A8-PIN 27, A9-PIN 26,A10-PIN 23, A11-PIN 25, A12-PIN 4, A13-PIN 28, A14-PIN 29,A15-PIN 3, A16-PIN 2, A17-PIN 30
- Data Pin Test: click one of the push button in Data Out group, use multimeter confirm the data from ZIF socket. Alternatively, input the test data, the range is: 0--FFH; D0-PIN 13, D1-PIN 14, D2-PIN 15, D3-PIN 17, D4-PIN 18, D5-PIN 19, D6-PIN 20, D7-PIN 21
- VPP (programming voltage) Test: Turn on the programming voltage by click on pin 1 (1-Vpp) check box, measure the voltage between PIN 16 and PIN 1. It should show the Vpp voltage your set. (12V, 15V, 21V, 25V. Note : there mybe 0.5V tolerance of voltage reading)
- Clear All: Clear the whole control signal, address and data output. Then you measure should be all 0V.

Software Interface & Function

The software interface :
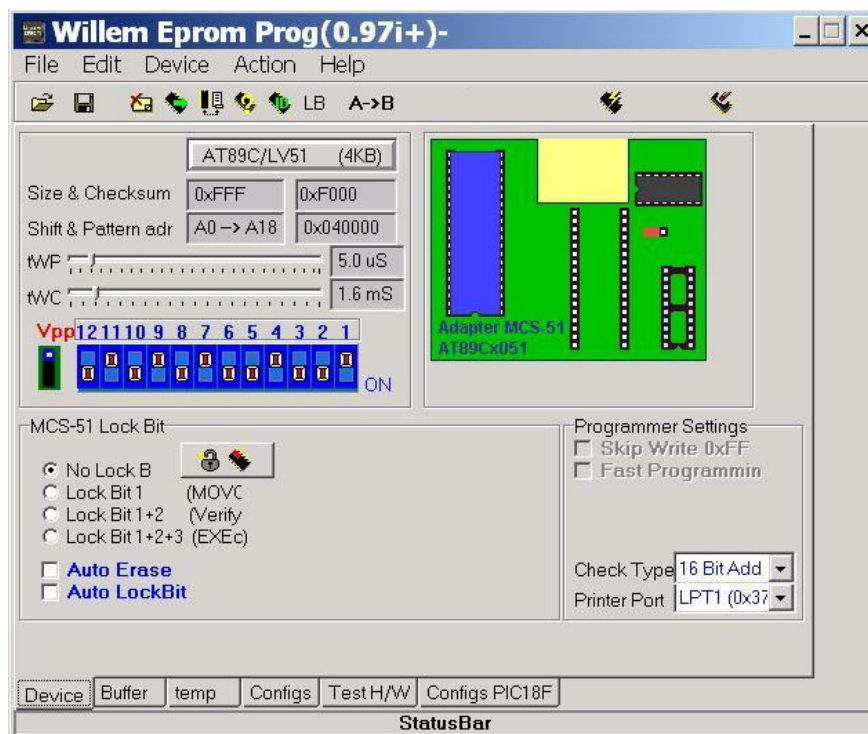
Tool bar:

 Read data file to buffer, it can be : Intel HEX (*.hex); Binary (*.bin); Motorola S Record (*.s); ALL Eprom File (*.bin, *.hex, *.s)

 Save data to a file from buffer

 Clear buffer of programmer software

 Read data from chip to programmer buffer

 Blank verify. Verify the chip if it is blank

 Display chip's factory ID

 Programming/Test. Programm the chip or test the SRAM.

Erase. Erase content of chip.

LB Programming bit control. For MCS51, AVR

File : Open, Save, Exit.

Edit: Edit buffer
Device: Selection of target device/chip.

Action: The operations for the taget device/chip.

Help: Help infomation.

Main area in software: From left to right there are four sections
1, chip selection and parameterrea
2, hardware jumper and setting indication picture.
3, MCU chip's parameter setting, such as lock bit.
4, programming parameter setting and fine adjustment. Normally a default value can be used.

Tab page selection:

The bottom of main program screen is series tab window button.

Click "Buffer" button,display buffer content. The first column of data is data address, last column is the data ASCII code, the middle is data hex value. If internal EEPROM exists in PIC MCU, the EEPROM data content displays automatically.


Status bar : Displays programmer's current status: the chip write in is not correct, wrong programming position, programmer problem and so on.
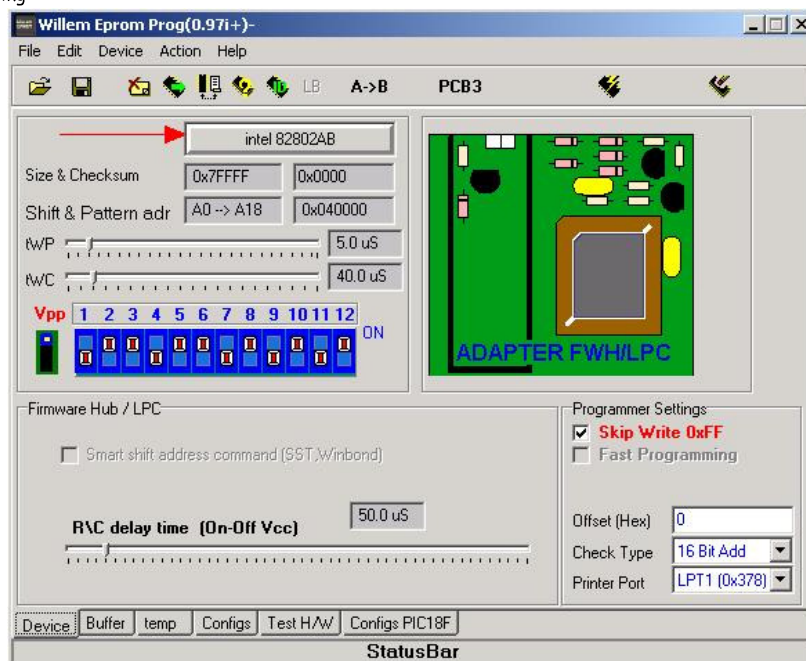

BIOS/Flash Setting & Programming

Programming the BIOS on Willem programmer is easy, as long as we selected right chip type and right jumper. Here is an example for programming on a N82802AB of Intel845 mother board(3.3V):

1, select chip type and software setting
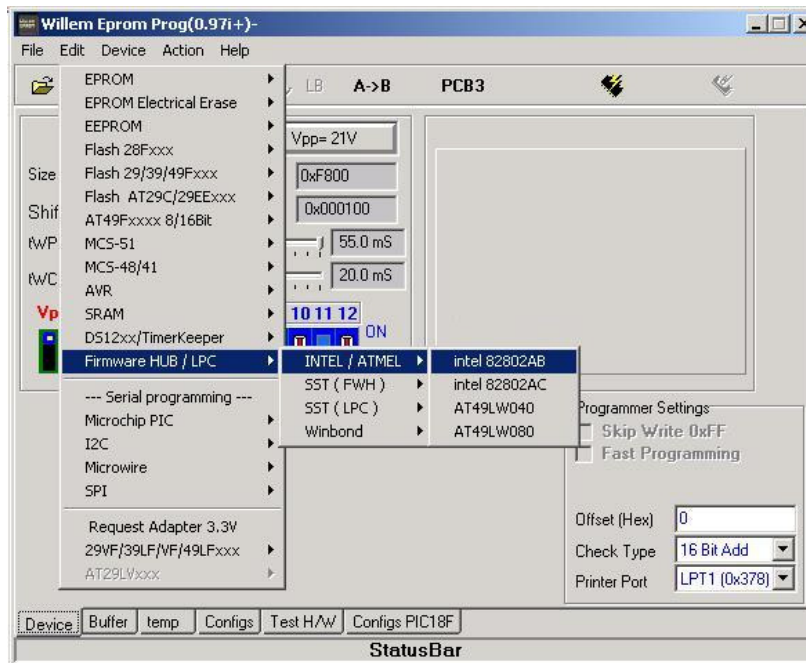
now you can see following setting:

DIP position: OFF,ON,ON,OFF,ON,ON,OFF,ON,OFF,ON,OFF,ON

Chip's parameter is showed below the Chip Select Button. Normaly, those parameters are no need to adjusted, using default value.

Size&checksum: shows chip's capacity and data buffer's checksum.

Shift&pattern adress: shows chip's address line to be used and highest address bit.

tWP/WC: shows programming pulse width and delay time.

2. check chip's position

After DIP set, check the chip's position. For BIOS chip, it should be placed in the 32 pins ZIF socket. For N82802AB chip, the program prompt user need a FWH/LPC adaptor.

Please make sure the pin one position on the FWH/LPC adaptor.

Note: 1,Displayed chip's parameter is no need to be ajusted.
      2, DIP is different when programming different chip
      3, For EPROM chip, we need resetting the DIP, speicial chip and special valtage follow the prompt of software.

3, read from chip

After selected the chip, we can click on the "Read" button. All data will be put into the buffer.

When reading the chip, the yellow LED will be light up, indicats that the valtage is been applied on the chip.
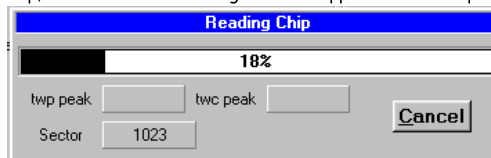
4, Programming

   After insert the chip, click on "Open file" to open your data file. Then click on "Programm Chip" button. Note, some of chip need erase before write.
   When programming, the yellow LED will be on. If the chip need a Vpp programming voltage, the red LED will be on.
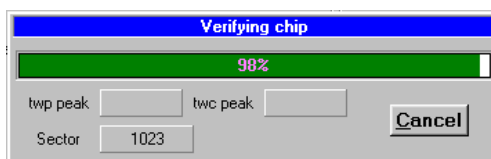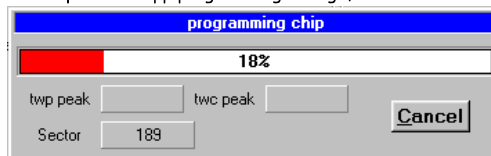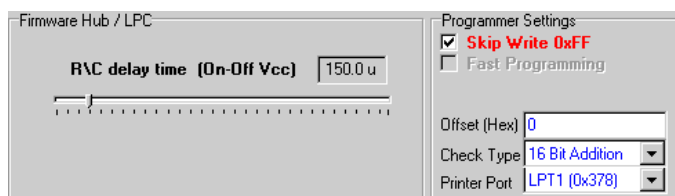

5, copy a chip:
 1), Select the chip type and then put in the original chip.

 2), "read" the data into buffer.

 3), Put in the target chip and then click "Programm Chip".

Note: the chip may be damaged if wrong chip type selectd or chip in a wrong direction in socket.

 The following parameter is for advanced user only.

R/C delay time: programming pulse delay. If your computer is too fast, you may need increase the delay.

Skip Write 0xFF: Enable this setting will skip the 0xFF when programming.
Fast Programming: For a fast programming mode if it is enabled.
Printer Port: LPT1(0X378), printer port selected.
Offset: setting programming start offset affress.
Check Type: You can select the way to check either 32 bit CRC or 16 bit add.

                         Note:

                         1, some of chip need to be erased in order to programming. Such as SST39SF020.
                         2 Always put the chip in the programmer at the last step. Because the programmer is in a unstable
                         state then windows is starting.
                         3, Do not interrupt the programming procedure. Press the "Stop" button if needed.

EPROM Chip Programming

The operation to EPROM chip is similar to general BIOS chip. The main diffrence is: the programmer jumper needs relevant ground setup. As an example: write a 27C16(programming voltage is 12.5V), also you need change the Vcc voltage setting accordingly. Some chips need the Vcc set to 6.2V when doing programming.

1. Select the chip and configuration

Set the chip and make sure the jumper for that chip is correct , the program displays the DIP switch setting. Follow the figure to set up the DIP switch, includes the jumper next to DIP switch.
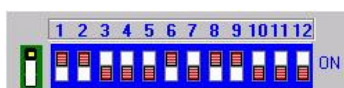
The DIP switch setup is: toward to upper side is on, toward to bottom side is off. As to above figure, the DIP switch is: ON, ON, OFF, OFF, OFF, ON, OFF, ON, ON, OFF, OFF, OFF.

2. Fix the chip position

After DIP switch set-up, insert the chip to 32 PIN ZIF socket, check the special chip setting is correct.

For the chips have capacity less than 1M, PIN fewer than 32 PIN, the chip installation is shown the right figure, align with the bottom of ZIF socket:

The follows operation is read in data file, programming. When programming, the red indicator lights up. This shows the programmer has corect voltage Vpp.
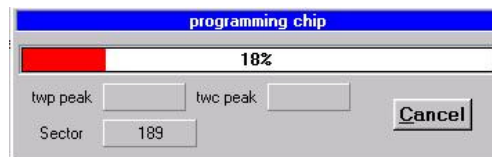
Note:if wrongly selected the chip type, the EPROM chip may be damaged.

EEPROM Chip Programming

Some EPROM chip, like W27C512 or W27C512,they are 27series, but no erasing window on the top. Then, they have to be erased electronically. When programming this type, besides the DIP setup and insert tion of IC to 32 PIN ZIP socket, the special chip and special voltage button have to be adjusted accordingly.

1. WinBond EEPROM
The programmer supports: W27E512,W27E010,W27C010,W27C020,W27C040
Operation steps:

1) Setup the 12 bit DIP, select the chip model W27CXX
2) Set the programming voltage VPP to 15V, special model jumper to W27C position
3) Insert W27CXX to 32PIN ZIP socket, click the software upper right corner erase button, the program indicator lamp flashs and progress bar is not moving, then directly press reset button, the chip starts to erase.
4) Verify the result.

2. SST EEPROM
This programmer supports: 27SF256, 512, 010, 020, 040;37VF512, 010, 020, 040.
Operation steps (Vpp keeps as 12V):

1) Setup the 12 bit DIP, select the chip model W27CXX
2) Set the programming voltage VPP auto to 15V, special chip jumper to W27C position.
3) Insert W27CXX to 32PIN ZIP socket, click the software upper right corner erase button, the program indicator lamp flashs and progress bar is not moving, then directly press reset button, the chip starts to erase.
4) Verify the result.

3. MX26C4000 EEPROM
Operation steps (VPP keeps as 12V):

1) Setup the 12 bit DIP, select the chip model W27CXX
2) Set the programming voltage VPP to 15V, special model jumper to W27C position.
3) Insert W27CXX to 32PIN ZIP socket, click the software upper right corner erase button, the program indicator lamp flashs and progress bar is not moving, then directly press reset button, the chip starts to erase.
4) Verify te result.

ATMEL Chip Programming

Select the target MCU chip, the program prompts the relevant adapter. Meanwhile, dispaly the options to select the lock bit:
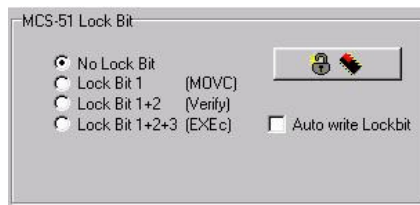
MCS-51encryption setup, lock bit functions:
No LockBit:no
LockBit1:forbiden MOVC instruction and programming again.
LockBit1+2:include the above functions and forbiden test (forbiden readout FLASH)
LockBit1+2+3:include the above functions and forbiden external program memory

PIC Chip Programming

After select the relevant PIC chip type, the program prompts the needed socket:
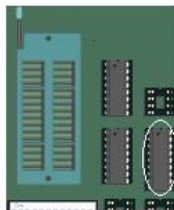
Meanwhile, in the chip setup area, display the relevant setup to select PIC MCU configuration parameters
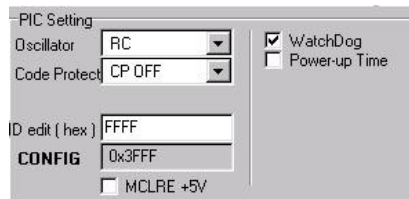
PIC MCU configuration parameters:
Oscillator types:
LP:low power consumption
XT:crystal/ceramic

HS:high speed crystal/ceramic
RC:resistance
IntRC:internal 4Mhz resistant
ExtRC:external resistant
ExtClock:external clock(24Mhz)
E4:external clock with PLL(6Mhz)
H4:crystal/ceramic with PLL(6Mhz)
IntRC RB4:internal resistant
IntRC CLKOUT:internal resistant,RB4 output clock ExtRC RB4:external resistant
ExtRC CLKOUT:external resistant,RB4 output clock
IntRC I/O:internal resistant
intRC CLKOUT:internal resistant, output clock
ER I/O:external resistance
ER CLKOUT:external resistance,output clock
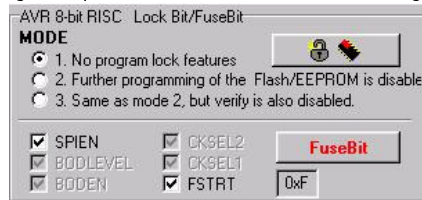Code protect:encrypt PIC MCU program, prevent read out
Watch Dog:turn on/off watch dog

Power-up Time:upper power delay selection

AVR Chip Programming

As to AVR chip, choose the target chip,the program prompts the correct adapter socket.

Meanwhile, at the chip configuration area, display the right setup list in order to choose PIC MCU configuration parameters.

CKSEL0...2:Reset delay selection
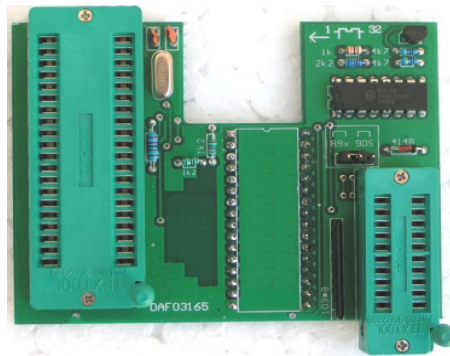BODEN:BOD(power off test)permission
BODENLEVEL:BOD strike voltage selection
FSTRT:upper start time selection
RCEN:internal RC oscillation permission
SPIEN:SPI serial programming permission

ATMEL89 Adapter

By using this adapter, it is able to program MCS-51 series MCU. The MCU includes ATMEL & INTEL.

It supports:

- 89 series MCU:
  AT89C1051,AT89C2051,AT89C4051,AT89C51,AT89LV51,AT89C52,AT89LV52,AT89C55,AT89LV55,AT89S8252,AT89LS8252,AT89S53,AT89LS53
  AT87F51,AT87F52 i87C51,i87C51FA,i87C51FB,i87C51FC,i87C52,i87C54,i87C58 (*)AT89C51RC (32KB), AT89C55WD
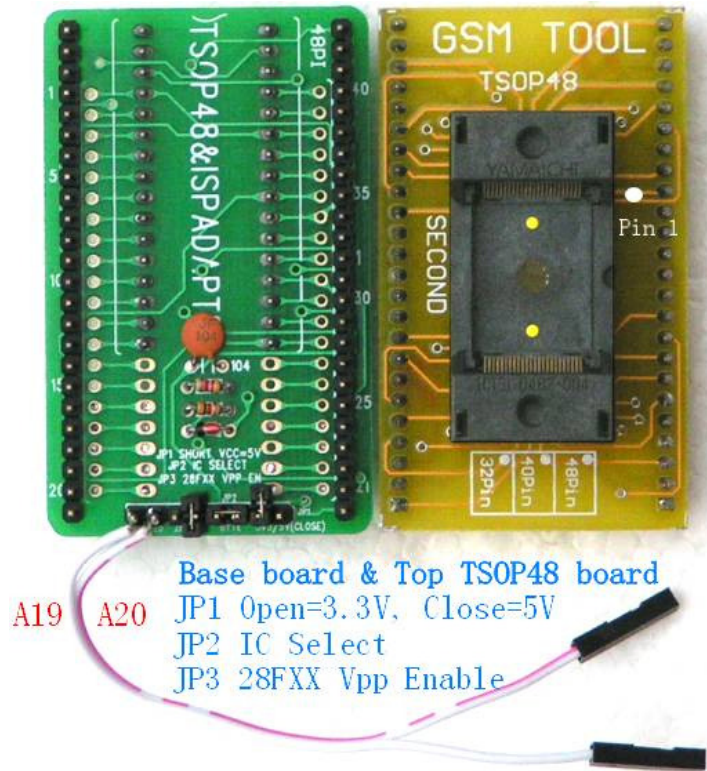- 90 series AVR 8-bit RISC: AT90S1200,AT90S2313

Other AVR chips need 51-AVR+ adator, such as 90S2333, 90S4433, 90S4414,90S8515, 90S4434, 90S8535

ATMEL PLCC44 Adapter
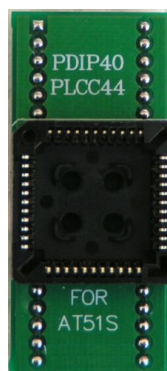
This adaptor is able to program MCS-51 series PLCC MCU, such as 89C51PLCC44. Please note, it is used with ATMEL89 Adapor.

TSOP48 Adapter

This adaptor is able to program TSOP48 flash chip. More details please see supported device list. The default jumper setting on the base board is above. Please change it as needed. JP2 jumper keep it close normorlly. It will increase the compatibility betwwen the similar device . Only try to open it for some chip if programming fail. The JP2 jumper is not in the original design and it also not documented for the most of chip.

Bellow is the TSOP48 adaptor on board, please reffer to jumper setting section for A19 and A20 connection: