

# EPROMER(5) Device Programmer - User's Manual

## General Description

The Epromer(5) Device programmer is an electronic device that allows the user to program several programmable electronic chips.

This Device is to be used for small to medium programming quantities, for hobby or industry applications. The on-board electronics, allows the device to communicate with a PC parallel port for all programming sequences and algorithms.

The on-board voltage generator, is able to produce the most common Programming Voltages, 12.5V, 21V or 25Vdc, based on simple DC adapter of 9Vdc@300mA.

The small size and low consume, makes the Epromer(5) ideal for bench or portable application. Its low cost reach a large of users that can not afford expensive units, even that the Epromer(5) does exactly the same job. In an emergency, this unit can run on a fresh 9V battery for alsmot 2 hours of operation.

The Epromer(5) is driven by a Windows Program, and runs under Windows98, Windows98SE, WindowsME, Windows2000 and WindowsXP platforms. This windows program is updated in regular bases, as soon we incorporate more devices in the list of selection, available for download at:

<http://www.ustr.net/epromer5/download.shtml>

## Absolute Maximum Rates

Maximum power supply DC Jack Voltage: 12Vdc  
Average current consume: 60 to 70mA  
Operation Temperature: From 0 to +50C (+32C to +122F)

## Physical Information

Size: 82 x 102 x 22mm (3.23 x 4.04 x 0.85 in)  
Weigth: 80g (~3 oz)  
Mounting Holes: 4 x 5mm (0.19 in)

## Device Connections

The Epromer(5) Device programmer has 3 connections - The Parallel Port DB25 female connector, the power DC Jack and the chip socket (32 pins) in form of regular chip socket or Zero Insert Force (ZIF) Aries 32 pins socket.

The DB25 female connector uses a 25 wires cable, either round cable or flat cable, with male DB25 connector on both sides. This connection cable should be as short as possible to avoid noise and communication problems. A cable of 36 to 48 inches is in order, and should work flawless. The DB25 cable connects at your computer back LPT1 or LPT2 female DB25 connector. We do not recommend to connect the Epromer(5) via a cable switcher. You can always install a second LPT port card at your computer and leave the original LPT1 port connected to your local printer, while using the new LPT2 only to the Epromer(5).

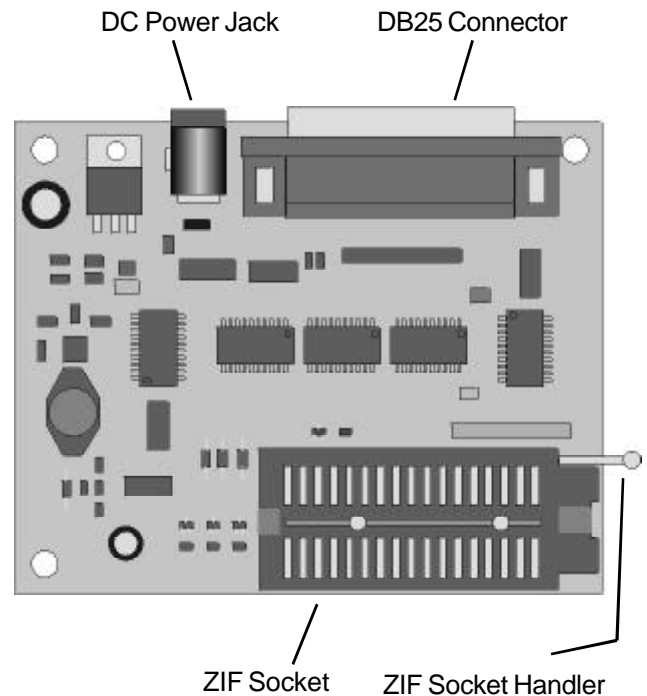
The power DC Adapter jack, accept female 5.5mm external diameter with 2.1mm internal diameter, center positive. The board expects to receive Voltage DC between 7.8 and 12Vdc. Below 7.8Vdc the device can not have enough Voltage to drive the circuits, and above 12Vdc, the VPP 12.5V can be dangerously higher to the Eproms and devices that requires no more than 12.7Vdc as programming voltage.

The Device 32 pins socket is used to receive the programming devices, in different pinout sizes. All Eproms 27C010 and higher would use all the 32 pins of the socket, smaller devices with lower pin count, should be aligned to the bottom of the socket, close to the edge of the board - or the ZIF socket handler. Follow device orientation information in the following pages.

## Power:

Supply: 9Vdc @ 300mA DC Adapter.  
Connector: Female Jack 5.5mm (OD), 2.1mm (ID) Center Positive  
Real Average Consume: 70mA (~600mW)

## Component Location



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## Unpacking and Installation

The Epromer(5) Device programmer should be handled as any other electronic sensitive device, it uses CMOS microchips and it can be damaged by static electricity. Before handle the electronic board with your bare hands, please touch any metallic heavy surface or a grounded mass, as your computer, a window, large metallic frame, etc.

Unpack the device and rest it over a table. The unit has 4 rubber feet to avoid it to touch the bottom layer of the circuit board on any metallic elements over the desk. Make sure the desk is clean with no paper clips, coins, etc. A future feature of the Epromer5 will be a plastic enclosing case. Make sure no metallic flying objects can land over the Epromer5 board. If not sure, we recommend always to turn the board upside down and shake it a bit, trying to remove any undesirable element before applying power to the unit.

The unit is supplied without a protective case as a way to reduce cost for the user, as most of the users really don't care about the enclosing case. However we recommend the users to purchase the enclosing protective case when available, as a way to protect better the device.

Connect the parallel cable supplied, any side, to the DB25 connector, the other side of the cable should be connected to the LPT port on back of your computer. You can use another parallel cable if you want, but try to keep the cable length less than 48 inches (4 ft). The high speed communication between the PC and the board can suffer loss of data with longer cables.

If you intend to use often the unit, we recommend you to purchase and install a second LPT port. This can be done by installing a small card at the ISA or PCI slots of your computer. This kind of card is relatively cheap, you can find it from \$12 to \$36 in computer related stores. Try to purchase one that has "bidirectional" feature.

This second LPT port, will allow you to keep the Epromer5 constantly connected to your computer, without needing to unplug the printer cable, replug, etc.

We DO NOT recommend to use a parallel cable SWITCH box, since it can introduce lots of noises, signal loss and problems when operating the EPROMER5 in high speed.

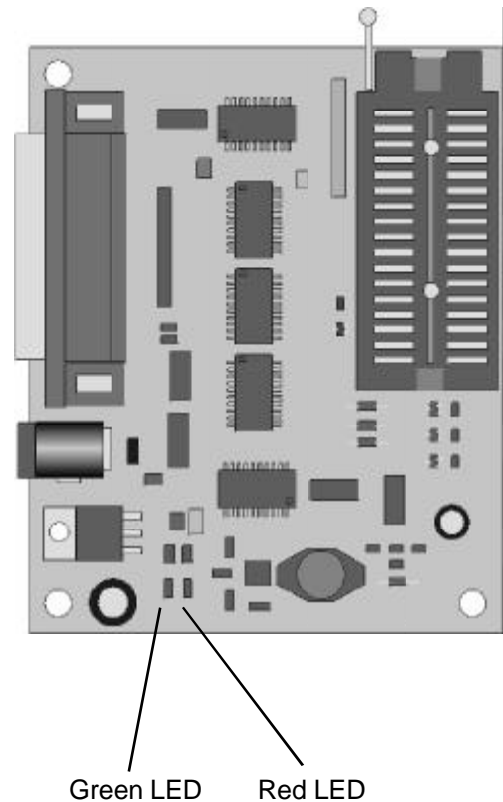
Plug the power DC Adapter to a 110VAC power outlet, and then the DC female Jack to the Epromer5 power input jack. You should notice immediately the GREEN LED lit bright. Sometimes the RED LED can also lit, don't worry, this is because the Epromer5 is not initialized yet.

Connect the Parallel DB25 cable to the Epromer5 connector, other end connect to your PC Parallel Port LPT1 or LPT2 DB25 female connector.

One or both LEDs should be bright.

Disconnect the DB25 cable and the Power Adapter cable.

Proceed with software installation.



**CAUTION:** Always remove any chip from the ZIF socket before applying power to the Epromer5 board. Applying power with a chip on the socket, may damage the chip, if by any reason the on-board voltage generator applies 12.5, 21 or 25Vdc on the chip. Only after you start the Epromer5 Windows software, it automatically initializes the board and then, only after select the chip model, it will be safe to install any chip at the ZIF socket.

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## Software Installation

The Epromer(5) Device programmer Windows software should be downloaded free from the Internet at this address:  
<http://www.ustr.net/epromer5/download.shtml>

The first time, you should download the large ZIP file (more than 2MegaBytes), that contains all the necessary files and installation procedures. Download to a known directory and after download finishes, unzip the file using your favorite UNZIP windows program, and run the SETUP program. It will automatically guide you to Epromer5 program. - We recommend you install the program in the default directory, that will be C:\Windows\Program Files\Epromer5.

After the installation completion, you will be able to run the Epromer5n.Exe file, that will give you control above the Epromer5 hardware board. We recommend you to create a shortcut of this software to your desktop, so you can locate and launch it faster.

New devices software routines are constantly updated at the software, you would want to download the upgrades. You don't need to download the large installation ZIP file again, just download the available Epromer5n.Exe file (around 200kBytes) from the same webpage, and replace the same filename already existent at your installation directory.

Some Windows installation can have newer files already installed, if and when the installation asks you about replace your new files with "our" old files, answer "no", meaning to keep your newer files installed. Some of this can happens if you are running Windows XP.

## Running the Epromer5 Software

### Port and Model Identification

When you run the Epromer(5) Windows software by the first time, it will first test your parallel ports. To do so, it send reset command to the ports. If you have two parallel ports, or a printer connected to any port being tested, you can see and hear the printer resetting, moving head or something like that. That is normal.

After the program identify in what port the Epromer board was found, it will test the board to identify which Epromer board Model it is. Once it states the Model number, it will post on the Epromer5 software screen the LPT port and Model found.

This information will be recorded to the EPROMER.INI file on your hard-disk, so next time you start the program it will read this file and will know exactly what to do. If by any reason you move the board to another LPT port, or change the Epromer board model, just click the button identified as TEST PORT on the top right of the Epromer5 software, it will start another port location and test routine, what will end up saving a new data to the Epromer.INI file.

**5 EPROMER-5A Eprom Programmer - UST Research Inc. - <http://www.ustr.net>**

File Tools Command Setup Help

OpenCode SaveCode

File Name (Code): (4096) C:\EGAR\2732Y.BIN

Command2

Code  
 Data

Display Program TestPort  
Read Verify Erase Flash  
Blank Chk Erase Buffer Show Code

Select Device: Eprom 2732

Select Device Programming Voltage: 5V 12.5V 21V 25V

Optional Auto Operations:  
 Check Blank Before Programming  
 Verify Device After Programming

Epromer Hardware Found: MODEL 5 - PC port 278h

LPT Port Selection: 278h 378h 3BCh 278h

Hi / Low Byte Programming: Both Hi Byte Low Byte

Program Speed: HwReady Program DataFlow ERROR

Code Buffer Hex/Ascii Display:

```
000000| ED563E0C C3A800FF C53200A8 C38101FF | .V>.....2.....  
000010| C33007FF FFFFFFFF CDD105D3 00C9FFFF | .0.....  
000020| C36705FF FFFFFFFF E1221880 E9FFFFFF | .g.....  
000030| C38306FF FFFFFFFF C3A3062A 79802322 | .....*y.#.  
000040| 7980E12A 1880E9CD 5B000897 329F80CD | y..*...[...2...  
000050| 5B00080C 0D28F00D 20EDC9CF C36D02FF | [...(.....)]...  
000060| FFFFFFFF FF69ED46 3E041811 3E08180D | .....E>...>...  
000070| 3E101809 3E201806 3E403227 804F16FF | >...>...>@2'.0...  
000080| 0600D9D9 7A514847 D93200A8 06083200 | .....zQH6.2...2.  
000090| A00F10FA 21F40111 FFFF1930 E606BC10 | .....!.....0...  
0000A0| FE18F7D5 F8F9F0F9 F2F70010 FE3D20FB | .....=...  
0000B0| 3A2780FE 552016CD B2012004 2A2880E9 | :...U.....*(...  
0000C0| CDBA0121 0C807EEE FF77C3DB 01060021 | ...!.....w.....!  
0000D0| 00007886 47237CFE 1020F778 B7C26800 | ...x.G#|...x...#.  
0000E0| 2100803E FF77BE20 089777BE 20032318 | !...>...w...w...h.  
0000F0| F22B7CFE 87C26C00 F9DD211C 0ADD7E00 | |...+|...!.....
```

System Log:

```
2:01:17 AM> Most Common Programming Voltage Selected: 12.5 Volts!!!  
2:01:17 AM> Device Eprom 2732 was Selected  
2:01:17 AM> Device Size is: 4096 Bytes, VPP suggested: 25V  
2:01:34 AM> File C:\EGar\2732y.bin - was read into Buffer. 4096 bytes long.  
2:01:34 AM> You can Install a Blank Eprom for Programming
```

Status 9/16/02 2:01 AM

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## Device Selection

Middle left of the screen there is a pull-down menu, where you should select the device type to be inserted into the device's ZIF socket.

Just click on the right arrow on that pull-down menu, and scroll down to select the type of device desired. N/A in front of a device in the list means the device routine is not available yet, probably in the new software version it will be available. Make sure you are running the last version available at the Internet.

Selecting a device, a special setup will run internally at the software according to the device selection, including Voltage selection.



If you select a device that could require programming voltage different from the regular 12.5V, such as 2732 eprom devices, a selection for 21 and 25V will be enable, so you could select the proper programming voltage for that device, as shown below;



## Caution.

You should check with the Eprom manufacturer, which is the correct programming voltage for that particular eprom you will use. Some Eproms show printed on its body the correct programming voltage. You can damage an Eprom by using a higher voltage than the required. Most 2732 eproms should use 21V, except the 2732B and 27C32B units. When in doubt, you can start using 12.5V, if programming fails, you can climb up to 21, then 25V.

## Epromer5 Memory Areas

The Epromer5 Windows software has two basic memory areas;

1) The main programming data area, that holds all data FROM and TO the device. When you open a file containing data to be programmed into the device, all this data goes into this memory area. When you read a device memory, the read data goes into this area. When you save a file, its contents will come from this area. This area is identified as CODE BUFFER HEX/ASCII DISPLAY

2) A temporary Device Display memory area. This area is used when you click DISPLAY button, it will read a chunk of data from the device installed at the ZIF socket and will post into this temporary area. The data from this area is the only use to display on screen. This area is identified as DEVICE BUFFER HEX/ASCII DISPLAY.

## Epromer5 Windows Software COMMANDS



The Display Button will read a chunk of data from the device installed at the ZIF socket and move this data to the DEVICE BUFFER HEX/ASCII DISPLAY memory, so you can see the device contents in a fast way, without needing to read the whole device's contents.

After clicking this button, data from the device's memory will be shown at the HEX/ASCII Display area on screen. Click on the sliding bar will bring another chunk of data, based on the relative position of the slider, the program will calculate the address into the device to bring the data.

This situation continues until you click another button, as READ or even the SHOW CODE button, that will switch the screen area to display the CODE BUFFER memory.



The Read Button will in true read the device's memory contents in a whole and transfer it to the CODE BUFFER memory area. After the whole data is transfered, the HEX/ASCII screen area will show the CODE BUFFER data. The use of the slider will change the address to show data from the CODE BUFFER.

Using this button, will wipe out any other data existent into the CODE BUFFER.

After the CODE BUFFER is filled with device's memory contents, you can SAVE this data to a binary file, or program a blank (erased) device.

This function is fast, but it can take almost 60 seconds to read a whole memory contents from a large eprom such as 27C801 (8MegaBits) device.

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## Blank Chk

The Blank Button will check the whole device's memory for "0x0FF" contents. If all bytes are verified as decimal 255, then the device is titled as "Erased". If any byte has a different value than 255, it means some bits are not "1", and the device is not erased.

Eprom devices require exposure to strong Ultra-Violet light to erase all its bytes to decimal 255. Other devices as flash memories and eeproms can do it electrically by pressing the ERASE FLASH button. This button will only be enabled when a device capable of electric erase is selected.

## Verify

The Verify Button will compare the contents of the device's whole memory against the CODE BUFFER. This function can be launched at any time you want to make sure the device's memory contents is exactly the same of some binary file or against what is into the buffer.

Suppost an eprom is not labeled, but you suspect it was programmed with binary file ABC.BIN. All you need to do is just open the ABC.BIN file, it will read its contents into the CODE BUFFER, select the device at the device selection list, and click the Verify button. It will compare and report if the device's memory matches the contents of the file ABC.BIN read into the CODE BUFFER.

## Erase Buffer

The Erase Buffer button, will immediately wipe out any data from the CODE BUFFER, will write decimal 255 (0x0FF) all over the buffer.

## TestPort

The Test Port button, will launch a routine to locate the Epromer board connected to any LPT port at your PC. It will issue RESET commands to all possible ports installed. If it finds the Epromer board, it will identify which parallel port and what Epromer model is it (Epromer4 or Epromer5). This information will be reported on screen (left middle) and the data will be saved to the EPROMER.INI file to be used next time you run the program. As this function sends RESET to all parallel ports, you can notice any printer installed to reset itself, sometimes moving head or cleaning the paper path. This is normal.

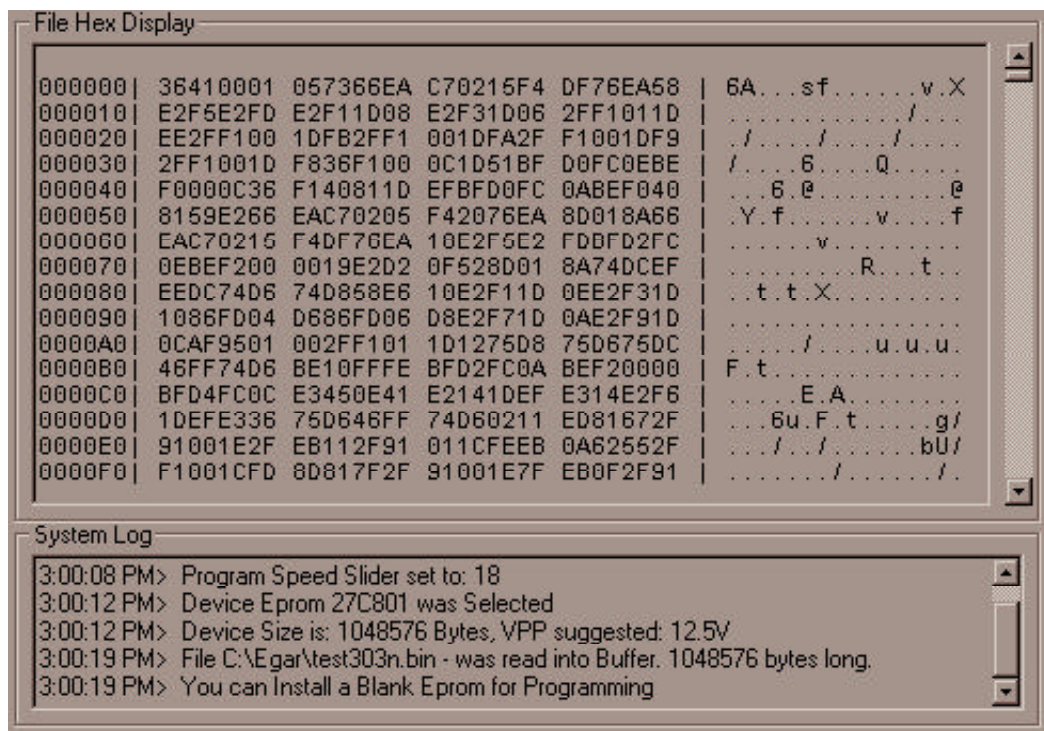
## Erase Flash

The Erase Flash button will only be enabled when a correspondent device (flash or eeprom) is selected. This button will wipe out any data from the device's memory, and write all decimal 255 (0x0FF).

Some Flash units as the AMIC A29040 requires to be erased prior to receive new data (program) into its memory. By a good rule of thumb, it would be wise to always erase a flash memory before program it. Some devices present programming failure if you try to program them while their memory contents contains previous programmed data.

## Show Code

The Show Code button, changes the origem of data to be shown on the HEX/ASCII screen area. When pressing this button, the presented data will be coming from the CODE BUFFER, showing data to be programmed into the chip, from a binary file, or read from the chip. The left part of the screen shows the HEX values, while the right side shows the ASCII representation.



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## FILE AREA DISPLAY & SYSTEM LOG

The File Area Display (Hex/Ascii screen) shows the contents of CODE BUFFER or the DEVICE Display, as we already saw on the previous page.

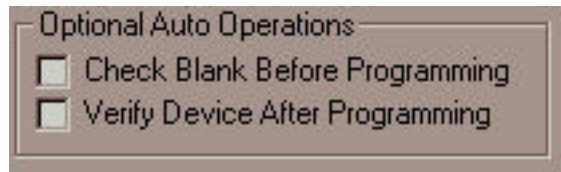
The SYSTEM LOG records all activities done with the software. It logs date/time and activity done, as well the results of those activities.

If necessary for some reason or debug or problem determination, it can be useful for the technical support to examine both areas.

If requested, a double-click with the mouse left button over the File Area screen, will copy it into a filename EPROMER5.BUF. Double clicking over the System Log area will copy all the log into a filename EPROMER5.LOG. You can email those files to the tech support if requested.

## OPTIONAL AUTO COMMANDS

Auto commands can be run automatically if selected. Check device for Blank and Verify after programming. Just click to select.

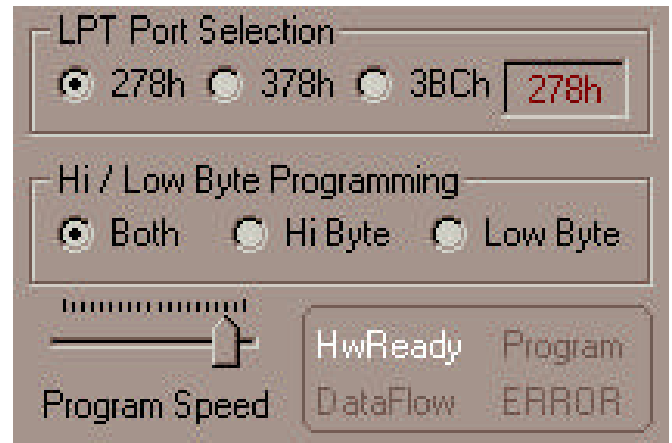


## DUAL MEMORY DEVICES

Above you can see the command buttons and at the left, a block with CODE and DATA selections (disabled) and CODE is selected.

This block of selection turns enable when you select a device with double memory, such as the microcontroller Atmel AT90S2313. This device has a code memory and an internal eeprom. When you select the AT90S2313, this block turns enable, and allows you to select which memory will the buttons act upon.

If CODE is selected, then the main flash device's memory is worked on, all the display, read, program, verify will be related to this memory on the device. If the DATA is selected, then all the commands will be related to the Eeprom of the device. Normally for Eproms this block is disabled and automatically CODE is selected.



## PORT SELECTION HI/LOW BYTE PROGRAMMING PROGRAM SPEED SYSTEM INDICATORS

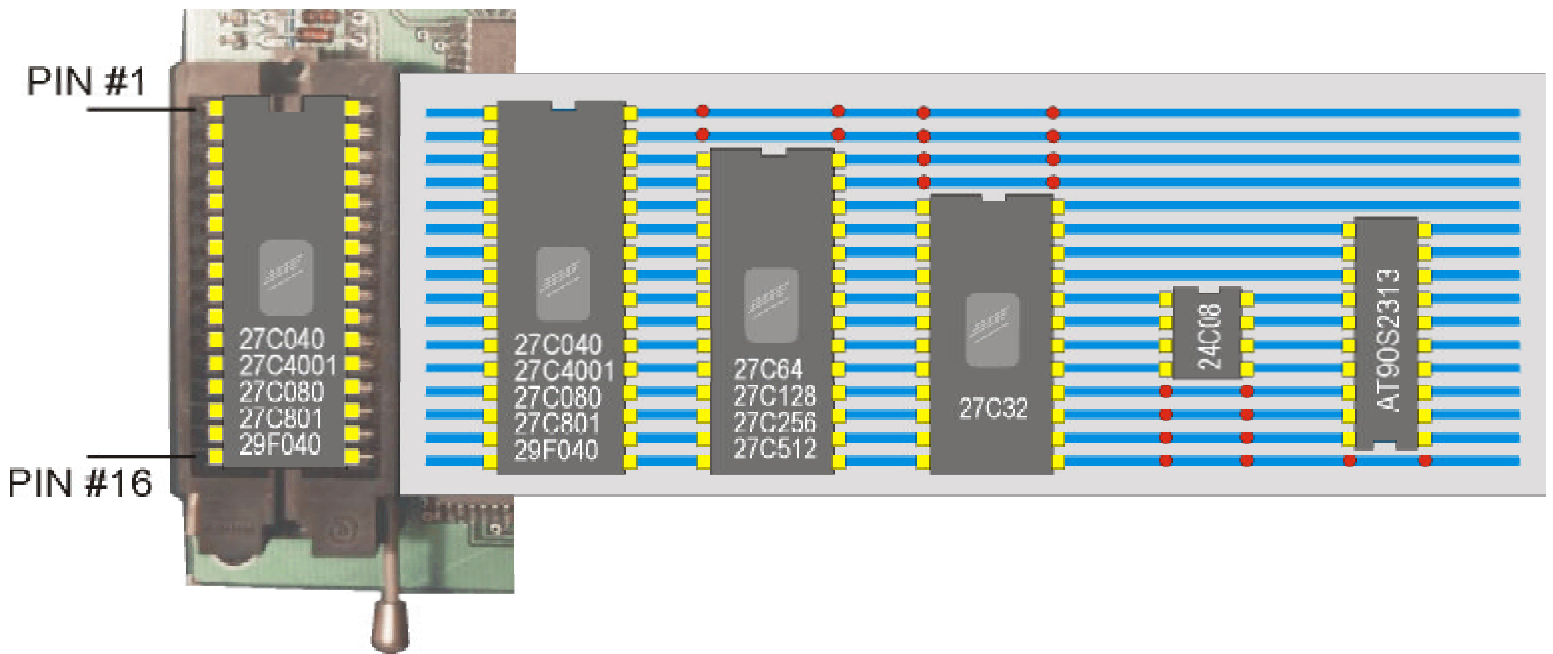
The Lower Left of the program screen shows LPT Port Selection, the user can force changing of the port if necessary. The TEST PORT function changes this selection according to what it found.

**HI/LOW** Byte Programming - Used to program 8 bits devices with file contents designed to 16 bits. If HI is selected, then the device will be programmed with all the EVEN address bytes from the binary file. If LOW is selected, then the programming will be done with only the ODD address bytes. If BOTH is selected, then it is the normal way, all bytes, odd and even will be programmed into the device.

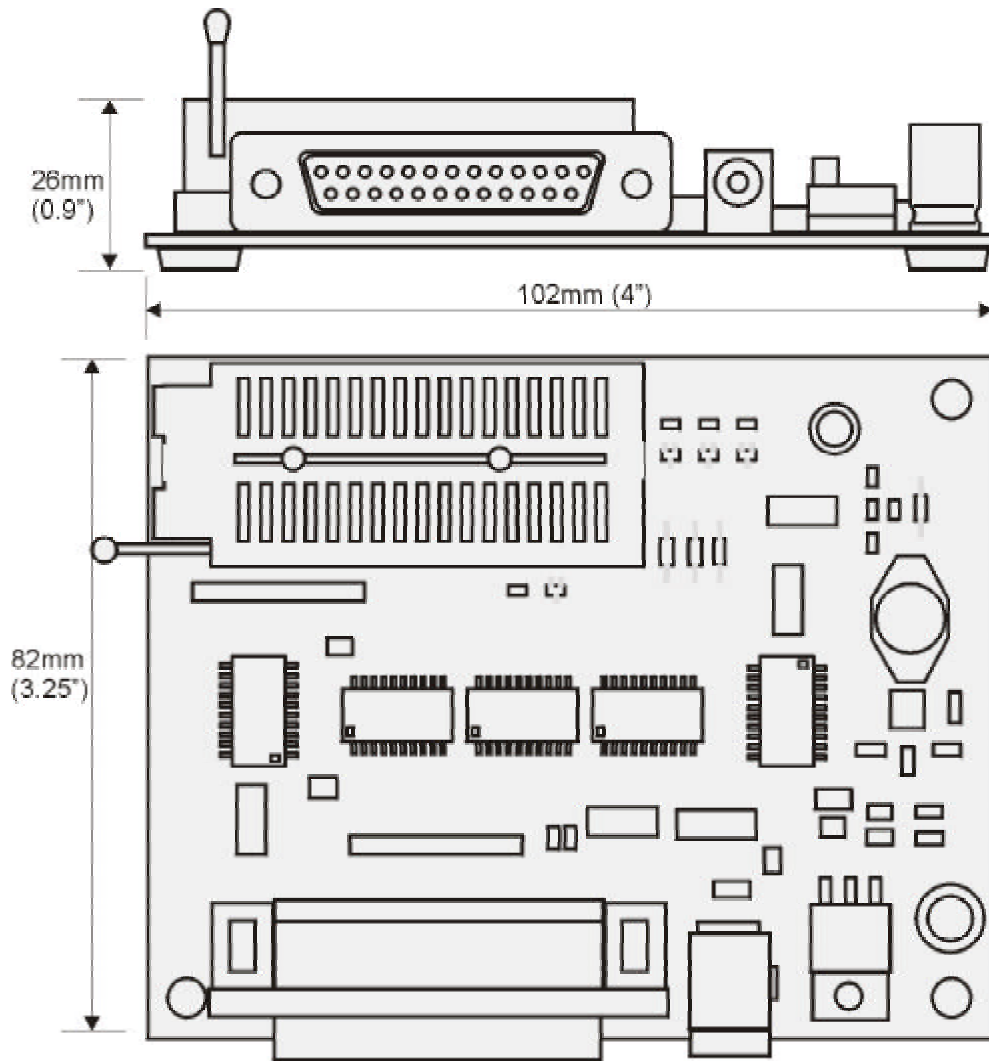
**PROGRAM SPEED** - Just accelerate or slows down the program execution speed. Some slow eproms requires you to push the slider to the left. You can always try to program with the slider as far to the right (speedier) as possible. In case of programing failures, you should move the slider to the left and repeat the programming. When programming OTP devices, it is recommended to move the slider to far left, so you will not have a second chance to program the device, once something wrong is programmed, you can not erase it, so the chip is lost.

**SYSTEM INDICATORS** - Show the program status of the running function. In case of error, the ERROR indicator will be bright and you should CLICK OVER IT to reset the error situation and resume operation of the program.

## DEVICES ORIENTATION



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