UST
Research Inc.

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EPROMER   Device Programmer - User's Manual

General Description

The EPROMER programmer allows the user to program eprom, eeprom and flash chips, when the unit is connected to a common PC.

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 algoritms.

The on-board switching voltage convertion is able to generate the most common Programming Voltages, 12.5V, 21V or 25Vdc, based on simple DC adapter from 7Vdc to 12Vdc @ 300mA.

The small size and low power consume, makes the Epromer ideal for bench or portable application. Its low cost is perfectly fit for most of the users that can not afford expensive units, even that the Epromer does exactly the same job. In an emergency, this unit can run on a fresh 9V battery for more than 60 minutes of operation.

The Epromer is driven by a Windows Program, and runs under Windows98, Windows98SE, WindowsME, Windows2000 and WindowsXP platforms. The program is updated in regular bases, as soon we incorporate more devices in the list of selection, or provide better features or minor corrections, available for download at: *http://www.ustr.net/epromer*

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)

Device Connections

The Epromer 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 supplied round 3ft 25 wires cable, with DB25 male connector on both sides. This connection cable should be as short as possible to avoid noise and communication problems. A cable of 3 to 4ft 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 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.

The power DC Adapter jack accepts a mini female (1mm), center positive. The board expects to receive Voltage DC between 7 and 12Vdc. Below 7Vdc 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.
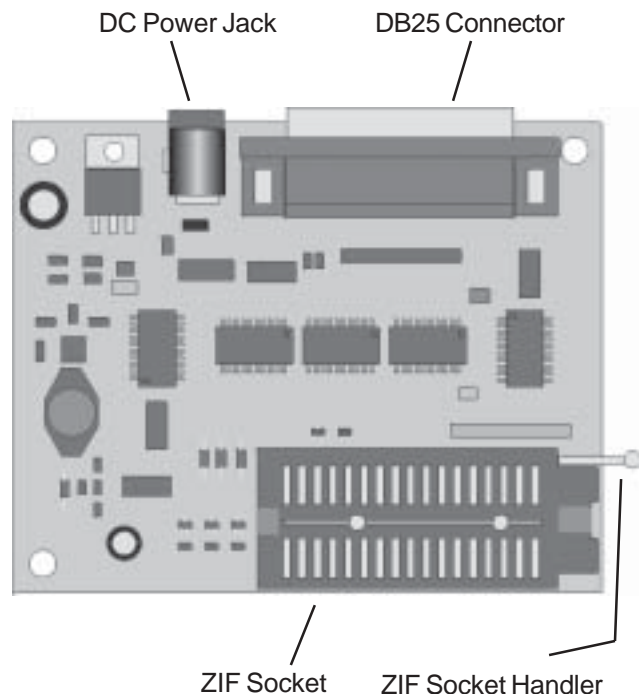
Physical Information

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), covered with rubber feet.

Power:

Supplied: 7Vdc @ 600mA DC Adapter.
Connector: Female mini Jack (1mm) Center Positive
Real Average Consume: 70mA (~600mW)

Component Location

DC Power Jack   DB25 Connector

ZIF Socket   ZIF Socket Handler

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Unpacking and Installation

The Epromer Device programmer should be handled as any other electronic sensitive device, it uses CMOS microchips and it can be damaged by static electricity.   Before handling the electronic board with your bare hands, please touch any metalic heavy surface or a grounded mass, as your computer, a window, large metalic 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 metalic elements over the desk. Make sure the desk is clean with no paper clips, coins, etc. In the future we will put available a plastic enclosing case. Make sure no metalic flying objects can land over the Epromer board. If not sure, we recommend always to turn the board upside down and shake it a bit, trying to remove any undesireable 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 no more 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 Epromer 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 EPROMER in high speed.

Plug the power DC Adapter to a 110VAC power outlet, and then the DC female mini jack (1mm) to the Epromer power input connector. You should notice immediately the GREEN LED lit bright. Sometimes the RED LED can also lit, don't worry, this is because the Epromer is not initialized yet.

Connect the Parallel DB25 cable to the Epromer 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.

Green LED   Red LED
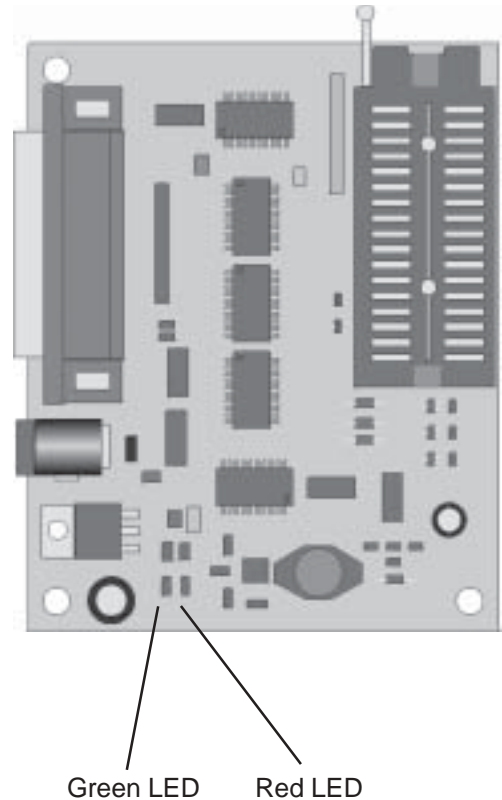
CAUTION

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 Device programmer Windows software should be downloaded free from the Internet at this address:
http://www.ustr.net/epromer

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 Epromer program. - We recommend you install the program in the default directory, that will be C:\Windows\Program Files\Epromer.

After the installation completion, you will be able to run the EpromerXX.Exe file, that will give you control above the Epromer 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. As per Nov/1st/2004 the latest version is Epromer6aj.exe

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 Epromer Software

Port and Model Identification

When you run the Epromer 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.

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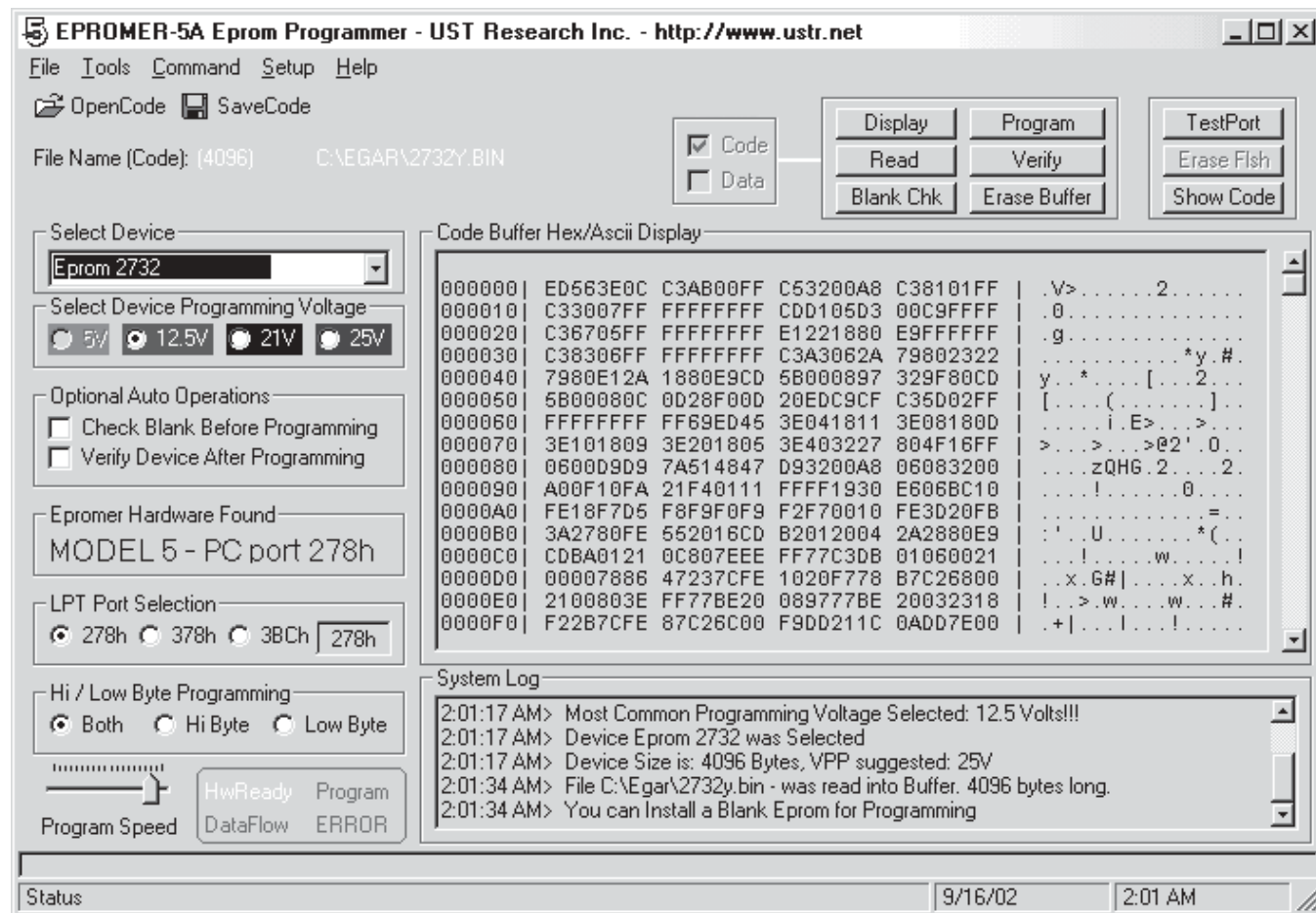
Device Selection

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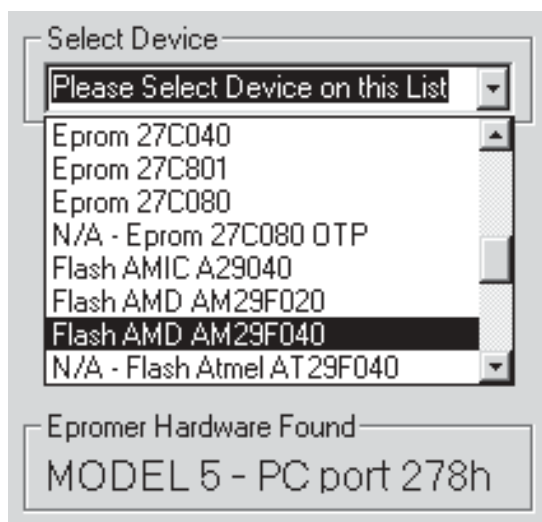
If you select a device that could require programming voltage different from the regular 12.5V, such as 2732 eprom devices, a selection for 21 and 25V will be enable, so you could select the proper programming voltage for that device, as shown below;

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.

Epromer Memory Areas

The Epromer 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.

Epromer 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 calculare 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 tittled 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 lauched 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, Epromer5 or Epromer6 boards). 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 iself, sometimes moving head or cleaning the paper path. This is normal.
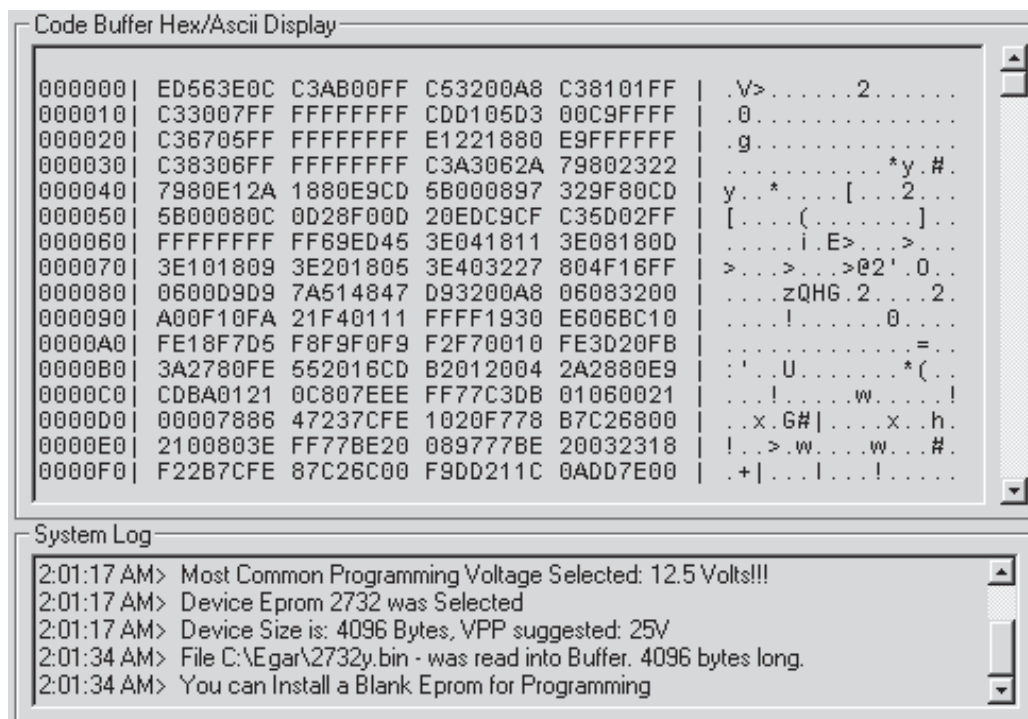
Erase Flsh

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.

```
┌─ Code Buffer Hex/Ascii Display ──────────────────────────────────┐
│                                                                  │
│ 000000|  ED563E0C  C3AB00FF  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  C35D02FF  |  [....(.......]..  │
│ 000060|  FFFFFFFF  FF69ED45  3E041811  3E08180D  |  .....i.E>...>...  │
│ 000070|  3E101809  3E201805  3E403227  804F16FF  |  >...>...>@2'.O..  │
│ 000080|  0600D9D9  7A514847  D93200A8  06083200  |  ....zQHG.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..h.  │
│ 0000E0|  2100803E  FF77BE20  089777BE  20032318  |  !..>.w....w...#.  │
│ 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         │
└──────────────────────────────────────────────────────────────────┘
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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 EPROMER.BUF. Double clicking over the System Log area will copy all the log into a filename EPROMER.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.
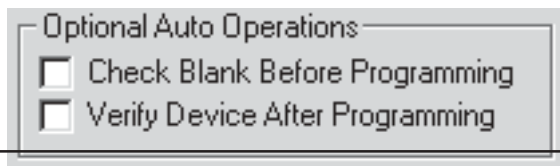
DUAL MEMORY DEVICES

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.
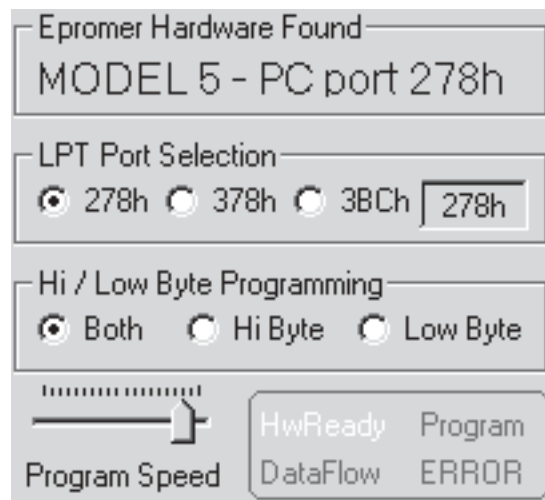
PORT SELECTION
Hi/LOW BYTE PROGRAMMING
PROGRAM SPEED
SYSTEM INDICATORS

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 more 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.
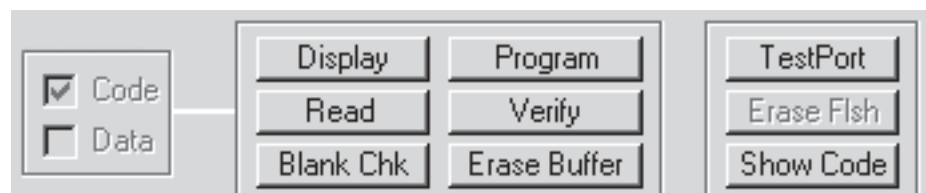
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Command Menu

The Command Menu is basicaly a mirror of the control buttons, where you can command READ, VERIFY, PROGRAM, etc.

An extra bonus is the last command, SHOW FLASH CODE ID#, it reads and shows at the SystemLog area, the CodeID (Manufacturer and Device ID) numbers hidden into the Flash microchip. You can identify those numbers, or even recognize if the device is really a Flash Memory unit.

To use this function, select any flash unit from the device selection pull down menu, install the chip at the socket, and run this command. Read the result at the SystemLog display area.
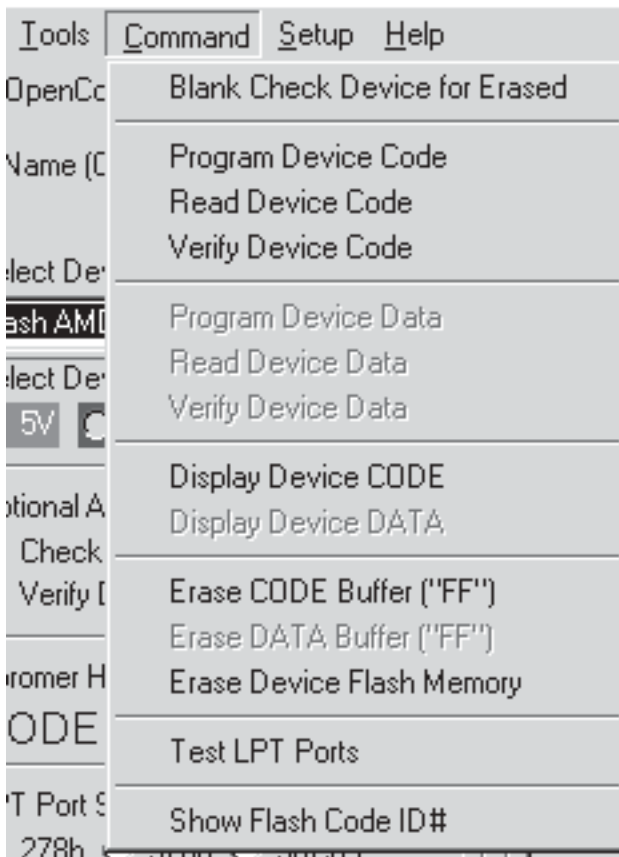
Setup Menu

The Setup Menu allows you to use the "memory" function of the Epromer5 software. Suppose you use frequently to program a specific eprom chip, with a specific binary file. You can save this setup to make your life easier each time you need to program this chip.

Just setup everything, ready to program the chip, as, open the binary file, select the eprom type, then click SETUP menu, and click one of the SAVE 4 options, #1 to #4.
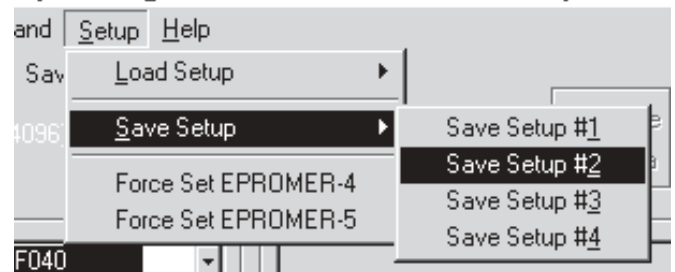

When you click any of those options, used or empty, it will appear a text input screen, asking you to name this setup. You can enter any name you want, with spaces or not, is up to you to identify this special setup of the Epromer.
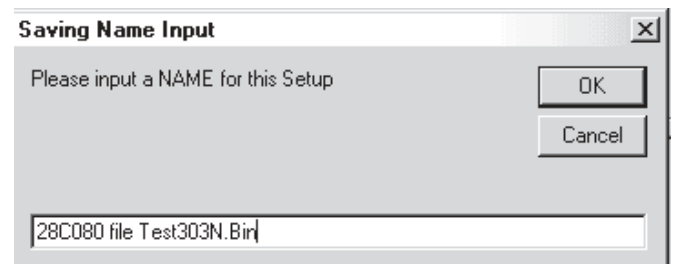
Once you press OK at the input text screen, everything on the Epromer5 will be saved into a file identified by the name SETUP1, 2, 3 or 4.

Later on, when you need to repeat this eprom programming, just go to the SETUP menu, and select the LOAD based on the description you entered before, it will reset your Epromer5 software panel setup exactly as it was when you saved it. So, all you need to do is install the erased eprom and hit PROGRAM button.
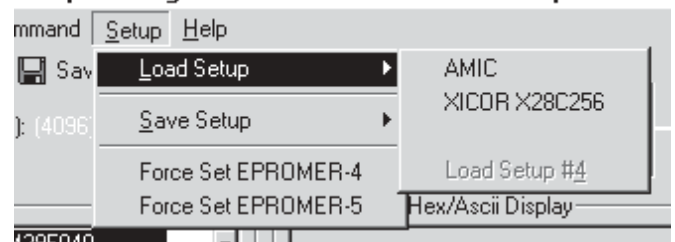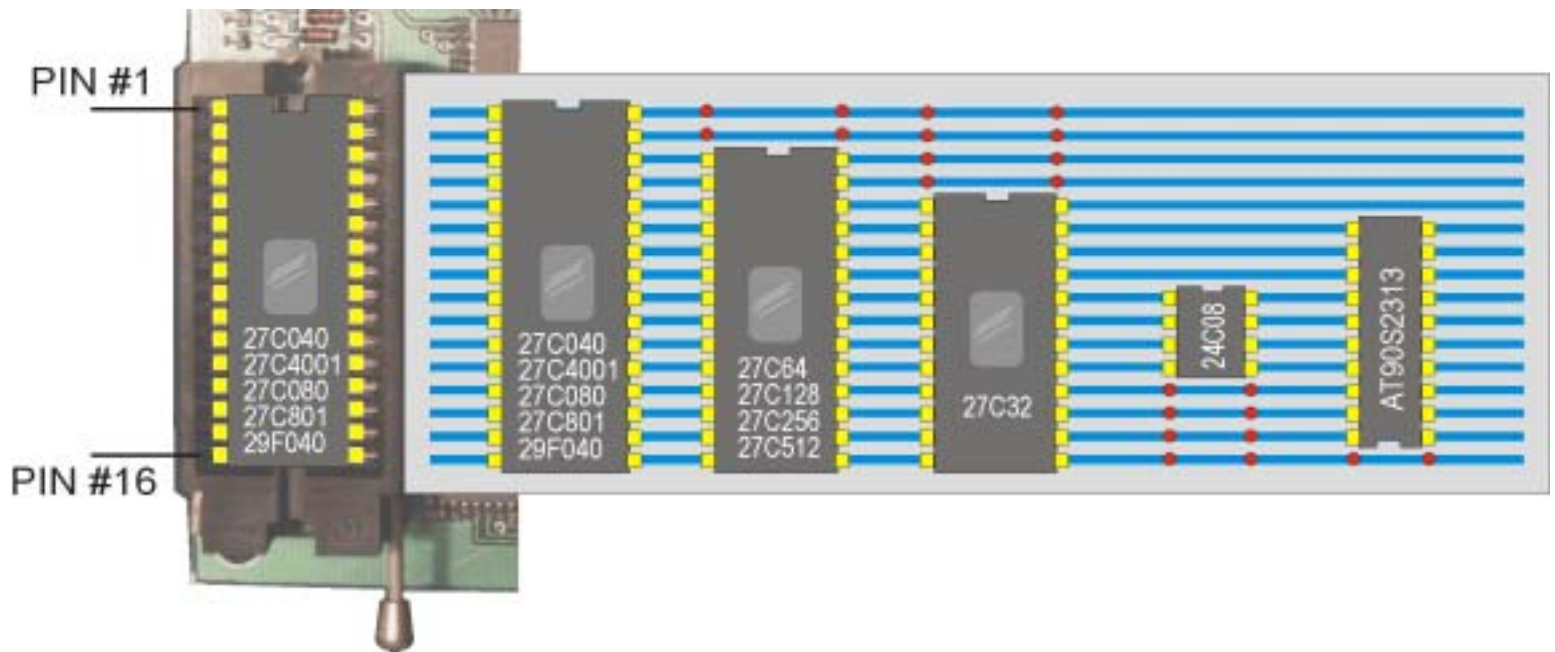

The Setup Menu also allows you to FORCE a type of Epromer board, type 4 or 5, just in case the auto system could not identify the board installed at the parallel port. If you FORCE the identification, the message at the left middle screen that shows the type of board, will display the message in PINK color, to remember you that you are using a board that was NOT auto-identified.
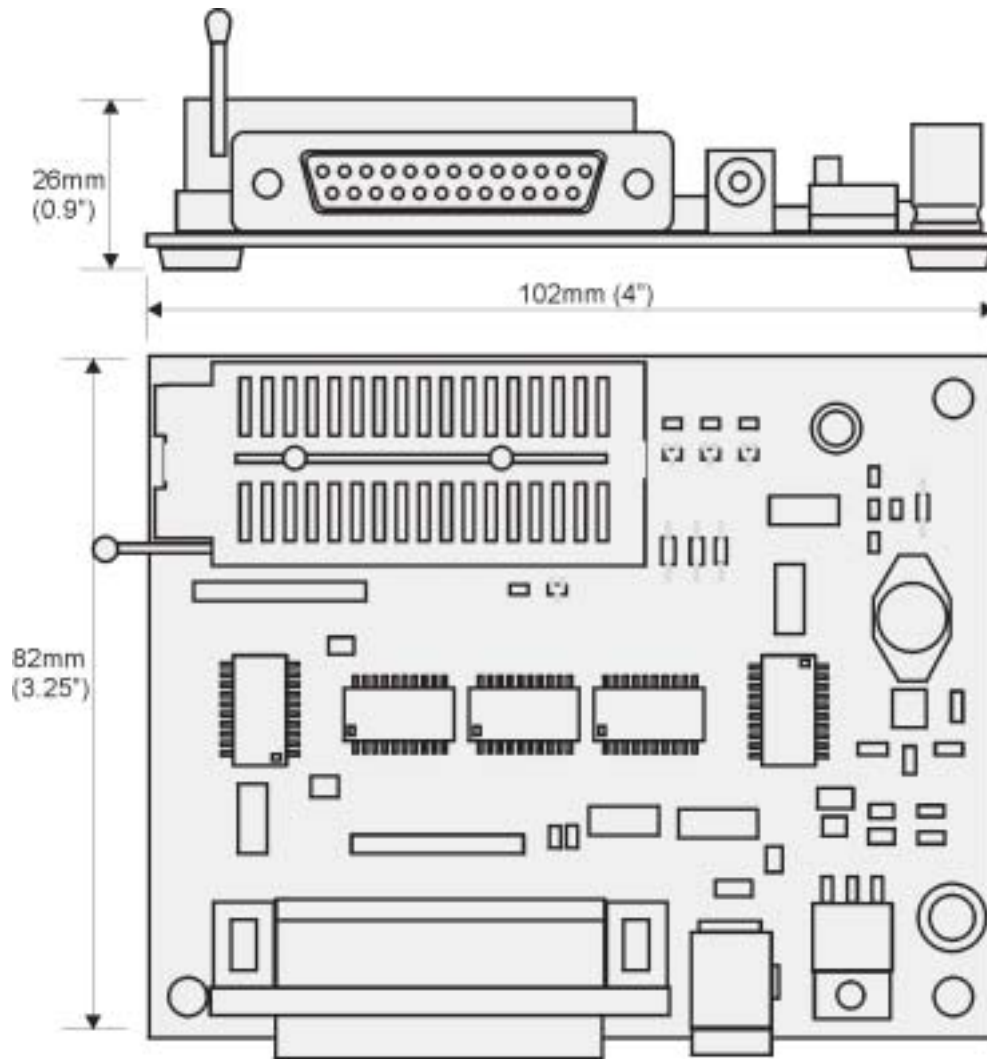
Buttons available are;
FORCE Set EPROMER4, EPROMER5 and EPROMER6.

DEVICES ORIENTATION

PIN #1

PIN #16

27C040
27C4001
27C080
27C801
29F040

27C040
27C4001
27C080
27C801
29F040

27C64
27C128
27C256
27C512

27C32

24C08

AT90S2313

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PRELIMINARY

USA Main Facility - Florida

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