

BS
U

ALL-11P3

USER'S MANUAL

UNIVERSAL PROGRAMMER
& TESTER

USB

HILL SYSTEMS

© 2002 HI-LO SYSTEM RESEARCH CO., LTD.

Information provided in this document is proprietary to HI-LO System Research Co., Ltd.

The information in this publication is believed to be accurate in all respects at the time of publication, but is subject to change without notice.

HI-LO assumes no responsibility for any errors or omissions, and disclaims responsibility for any consequence resulting from the use of the information included herein.

Trademarks

HI-LO is a trademark of HI-LO System Research Co., Ltd.

AMD is a trademark of Advanced Micro Devices, Inc.

Windows 95/98/Me/NT/2000/XP are trademarks of Microsoft Corporation.

IBM is a trademark of IBM Corporation.

All other trademarks are the property of their respective owners.

Contents

1. Intruduction	1
1.1 Programmer and accessories	1
1.2 PC System Requirements	2
2. Installation	3
2.1 Hardware Installation	3
2.2 USB driver Installation	7
2.3 Software Installation	22
3. Utilization	30
3.1 Starting the system	30
3.2 Load disk file into buffer	35
3.3 Read contents from master IC to buffer	36
3.4 Insert a blank IC into the socket.	38
3.5 Program buffer contents to IC	39
3.6 Expansion adapter and converter	40
4. Glossary	42
4.1 EPROM, EEPROM, PROM and MPU	42
4.2 PLD, PAL, GAL, PEEL, CPLD, EPLD and FPGA	47

1. Intruduction

ALL-11P3, the programmer, works with IBM PC through USB (Universal Serial Bus) or parallel port to perform a high-speed data transmission and accurate programming waves. ALL-11P3 is embeded with a 1Mbit memory to support the programming capacity for most E(E)PROM 、MCU/MPU and PLD. The software automatically uses PC memory If the buffer for the device is over 1 Mbit. This manual contains how to install the system and work under environment of IBM PC Windows 95/98/Me/NT/2000/XP.

1.1 Programmer and accessories

Each ALL-11P3 package contains following items:

- Docking system and PACK as ordered.
- An AC power cable, 1.8 M.
- A USB signal cable converting A type to B type; 1 meter long.
- A parallel port cable for DB-15 to DB-25, 1 M.
- A CD-ROM for Driver Files.
- User's manual

1.2 PC System Requirements

- PC /Pentium above
- Microsoft compatible mouse
- A harddisk with at least 20 Mbyte usable capacity
- A CD-ROM drive
- 1 USB port for programmer
- 1 Parallel port: EPP or ECP or bi-directional mode
- Operating system: Windows 95/98/Me/NT/2000/XP

2. Installation

2.1 Hardware Installation

One free parallel port or USB port is needed for the programmer.

Step 1:

Make certain that PC and the docking system are at "OFF" state. Tilt the PACK, Slide PACK into the insertion slot on the side of the docking system, then press down the holding end till it completely matches the socket as below:



Insertion



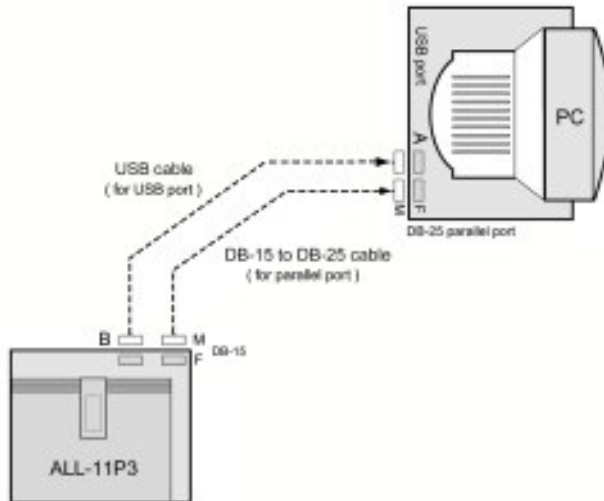
Press down



Remove

Step: 2

Connect programmer and PC according to following diagram:



- a) When a USB cable is used,
Connect the female B type end of the cable to the male B type connector on the programmer, connect the female A type end of the cable to the male A type connector on the PC.
- b) When a parallel cable is used,
Use the DB-15 to DB-25 cable, connect the DB-15 male end to DB-15 female end on programmer and DB-25 male end to the parallel port on PC.

Step 3:

Connect one end of the power cable to programmer(socket is next to switch of the programmer), the other end to the outlet of power source. Switch on PC first, then the programmer. Once the programmer is on, signals on LED should show as follows:

ON LED - lit

Busy LED - off

Good LED - off

If LEDs do not lit as above mentioned, you need to do the first check by turning off PC and programmer, then check connections between programmer and USB port or parallel port. Later, turn on PC and programmer a second time to check the LED again. If error message remains, other hardware peripherals may have conflict with the I/O address you are applying now.

2.2 USB driver Installation

After connecting your PC and programmer with the USB cable, switch the programmer on. The PC will detect the new hardware and a window will open showing “Add New Hardware Wizard” with the name HiLo Systems --- USB Drivers. To install the USB driver with Windows 95/98/Me, please refer to the procedures from 2.2.1 to 2.2.7. For Windows NT/2000/XP please refer to the procedures from 2.2.8 to 2.2.15.

2.2.1 Click “Next” to continue.



2.2.2 Click on "Search for the best driver" and then "Next".



2.2.3 Click “Browse..” and select the USB_DRIVER folder located on the provided CD-ROM. After this is selected, click “Next” to continue.



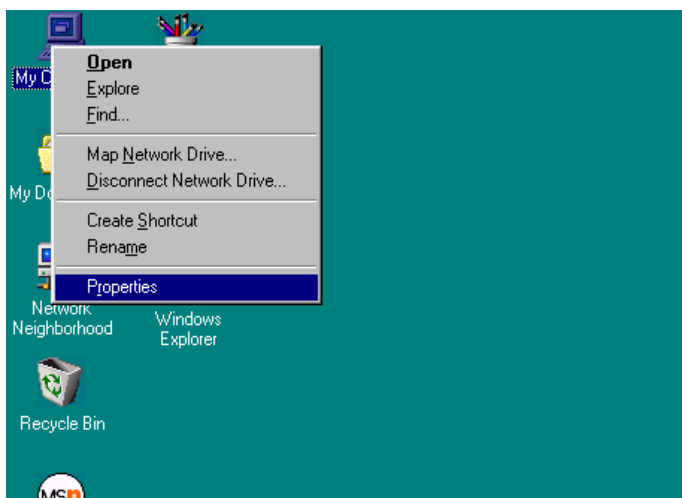
2.2.4 Windows should automatically select “FTD2XX.INF”. Click “Next” to continue.



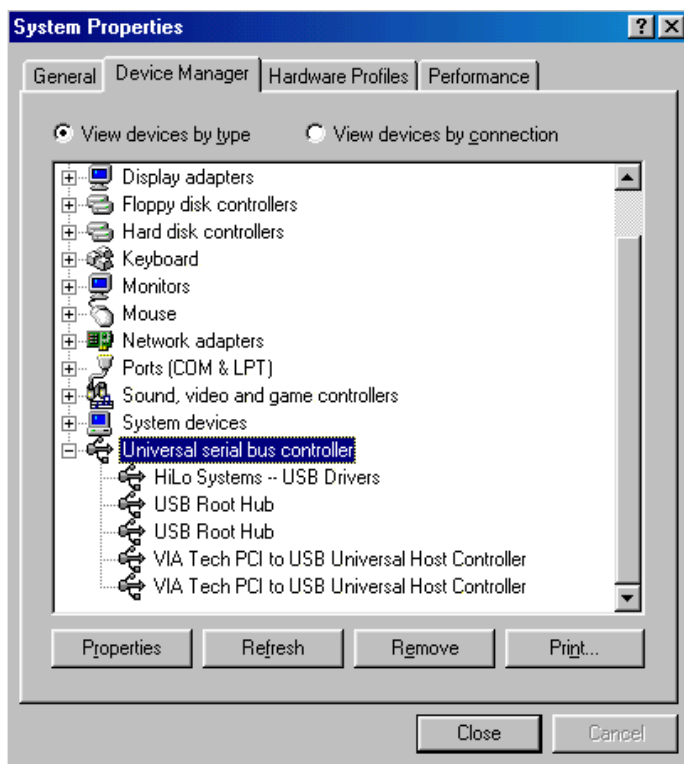
2.2.5 Click “Finish” to complete the USB driver installation.



2.2.6 Once the installation is complete, you can confirm the status of the new hardware by right clicking the My Computer icon on the desktop and then selecting Properties.



2.2.7 Choose the Device Manager tab on the top and expand the Universal serial bus controller by left clicking the “+” sign. “HiLo Systems -- USB Drivers” should appear in the list of devices.



Return to the desktop to start the software installation.

2.2.8 (For Windows NT/2000/XP)

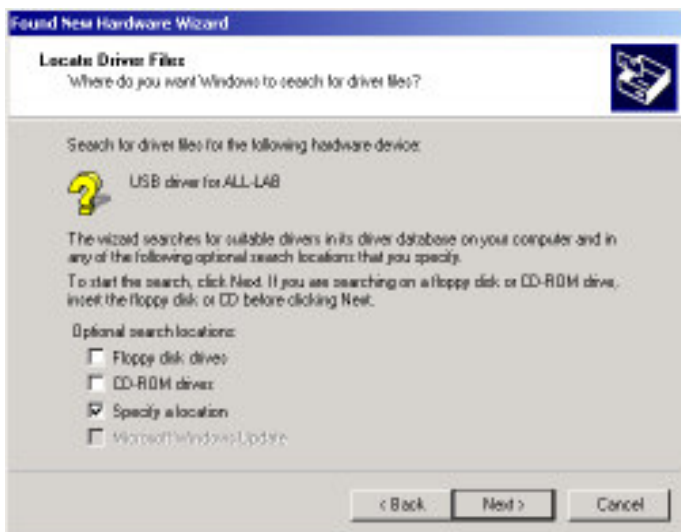
Click "Next" to continue.



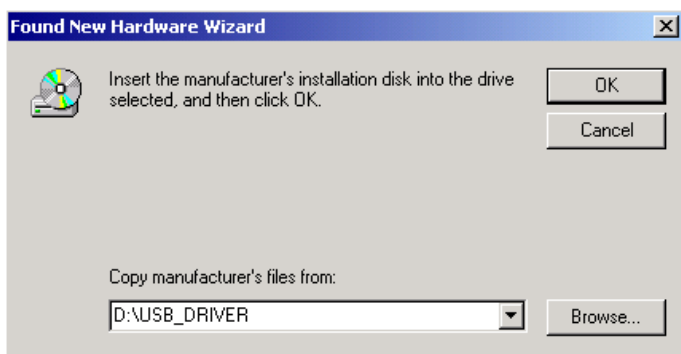
2.2.9 Click on “Search for a suitable driver for my device” and then “Next”.



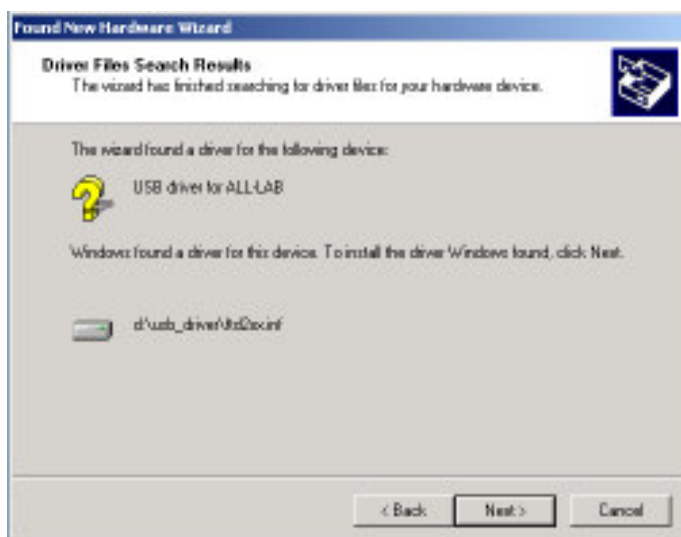
2.2.10 Choose “Specify a location” and then Click “Next” to continue.



2.2.11 Click "Browse.." and select the USB_DRIVER folder located on the provided CD-ROM. After this is selected, click "OK" to continue.



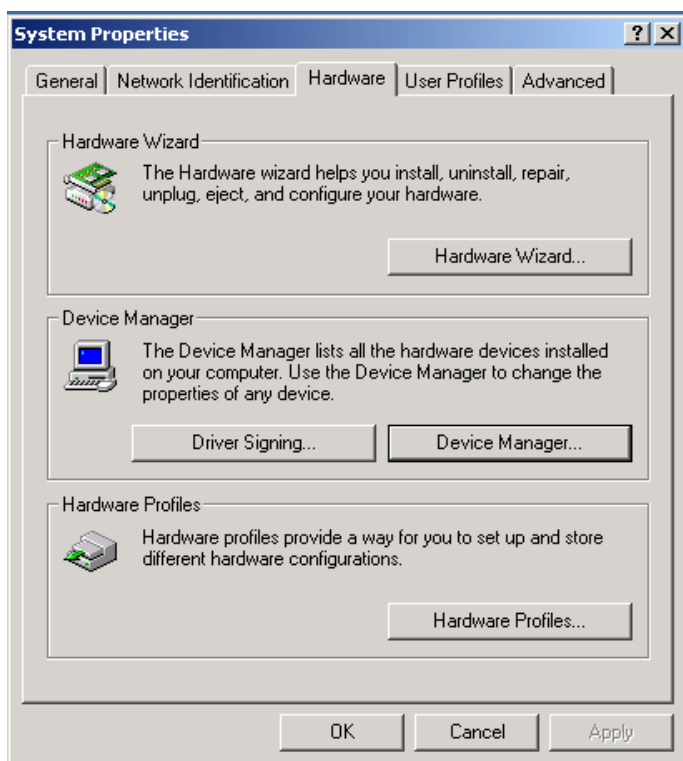
2.2.12 Windows should automatically select “FTD2XX.INF”. Click “Next” to continue.



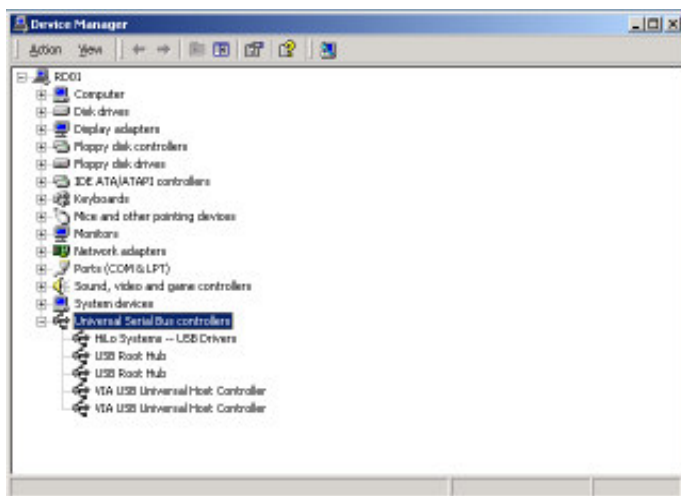
2.2.13 Click “Finish” to complete the USB driver installation.



2.2.14 Once the installation is complete, you can confirm the status of the new hardware by right clicking the My Computer icon on the desktop and then selecting Properties. Choose the Hardware tab and then click on the Device Manager Button to confirm the presence of the new hardware.



2.2.15 Expand the “Universal Serial Bus controllers” by left clicking the “+” sign. “HiLo Systems --- USB Drivers” should appear in the list of devices.



Return to the desktop to start the software installation.

2.3 Software Installation

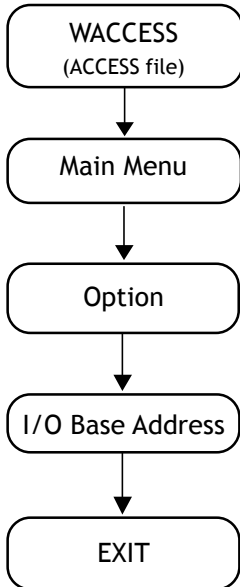
Insert the CD-ROM to your CD-ROM drive, go to directory of ALL-11P3 under File Manager to execute the SETUP.EXE file, or activate the SETUP.EXE from START menu of WINDOWS and follow all steps accordingly as follows:



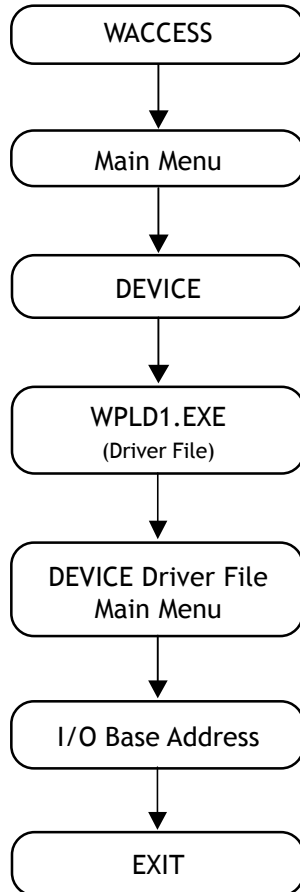
Cautions and Descriptions:

1. Log in with “Administrator” to install the S/W if under Windows NT/2000/XP.
2. Apply File Manger to check the completion of S/W installation over WACCESS.EXE, individual driver file and other utilities.
WACCESS.EXE is a main system file that provides fairly easy way to select IC manufacturer, type and special driver file needed. Each single driver file can also be run separately from WACCESS.EXE rule. A programming file usually support a series of relevant ICs. For instance, WMEM1.EXE is able to program 2716 to 27C512 EPROM.
3. An automatic self-check over the programmer will work either a driver file or the option function of WACCESS.EXE is executed. If message shows programmer does not exist, stop all your operation and check your installation again.
4. Two alternatives to check the existence of the programmer:
Method 1: Execute “Option” function under WACCESS menu
Method 2: Execute selected driver file under WACCESS menu

Method 1



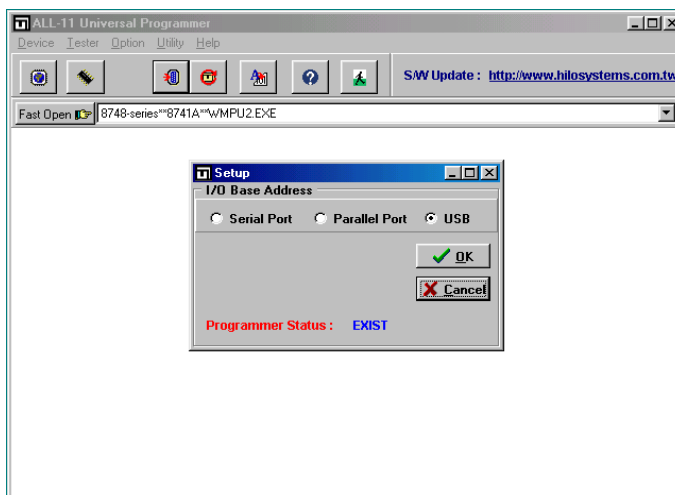
Method 2



Method 1: Execute "Option" function under WACCESS menu
Select "WACCESS" under File Manager or press "Start" and "program files" then click "Programmer" to evoke the following display.



Click "I/O Base Address" under "Option" to evoke the following display:



The I/O Base Address set for current S/W will show on the screen, the system will then check the existence of programmer automatically. When "Programmer Status: Exist" appears, the H/W installation is completed.

When "Programmer Status:Not Exist" message appears, the failure could be caused by following 5 reasons:

1. I/O Base Address conflict between S/W and H/W
2. IRQ setting of I/O port conflicts with other cards added on PC.
3. Poor connections between cable and interface card
4. Programmer is powered off.
5. Poor connections between PACK and Docking System

Following Steps will guide you to find the fact.

1. Make sure the PACK sits properly in Docking system, then the green LED must be lit when powered on.
2. Check if cable firmly connected between programmer and USB or parallel port of the PC .
3. If the USB port setting is not working, please ensure the PC's BIOS setup has USB Controller enabled
4. Check BIOS setting of the PC when parallel port is applied; and make certain that the parallel port is set at ECP or EPP or bi-directional mode instead of normal mode.

Remark:

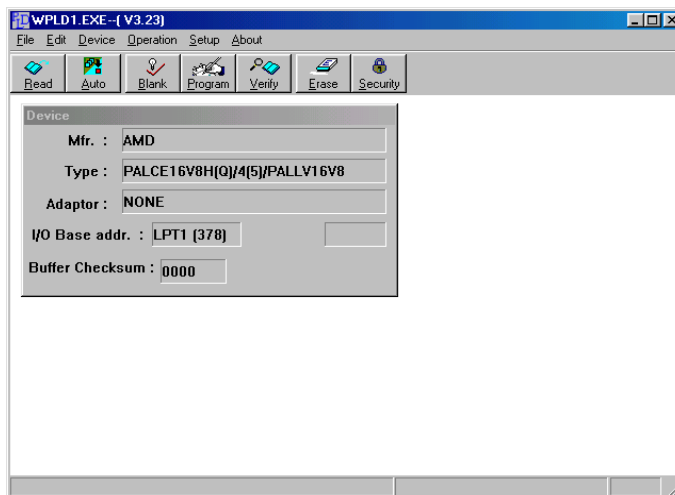
When exit the programming program, I/O address will be saved for future utilization.

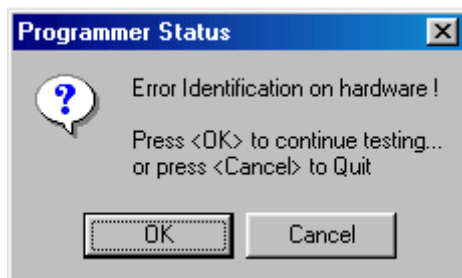
Method 2: Execute selected driver file under WACCESS menu

When manufacturer and type info are entered for each IC, the driving file will be automatically called by WACCESS. You can also execute the driver file without through WACCESS.

Take WPLD1, a file for programming GAL, as an example. When WPLD1.EXE is executed, it will search for WPLD1.DAT first. If the file is in the default disk, all its parameters including I/O Base Address, manufacturer, type will be loaded as default value. If not, then COM2, AMD(manufacturer), PALCE16V8H(type) will be taken as default value.

Execution of a driver file is H/W checking inclusive. When all checks are passed, the system is ready for programming and the main menu will appear as follows:





When an error message as above appears, you need to consider following 5 reasons:

1. I/O port Address conflicts with that of the S/W
2. Conflict between IRQ of additional PC card and COM port
3. The programmer is switched off
4. Poor connections between PACK and Docking system
5. Conflict of baud rate between the actual one and the setting

If a parallel port is used, check the BIOS setting of the PC to make sure that ECP or EPP or Bi-directional mode is used instead of normal mode. However if a USB port is used, you have to make sure the PC's BIOS setup has USB controller enabled.

When the error remains after checking, you may apply the following solutions:

1. Back to programming main menu by pressing OK key, then select "I/O SETUP" via "SETUP" menu, select parallel port address

then try each of available parallel port till the "Programmer Status: Exist" appears.

If USB port is applied, then you should select "USB" through "I/O setup".

2. When the first solution fails, you may exit the menu by pressing "Q", then check if any conflict between IRQ setting and other PC peripherals. If yes, reselect IRQ first, then port address of parallel port address.

3. When above both ways fail, please contact your local dealer.

Remark:

Most of problems are due to poor connection between cables or between PACK and Docking system.

3. Utilization

3.1 Starting the system

A brief introduction about how to enter WACCESS, the main program, and proceed other relevant functions like Device selection, Data loading, blank check and programming etc. will be presented below by taking AMD GAL PALCE16V8 as an example.

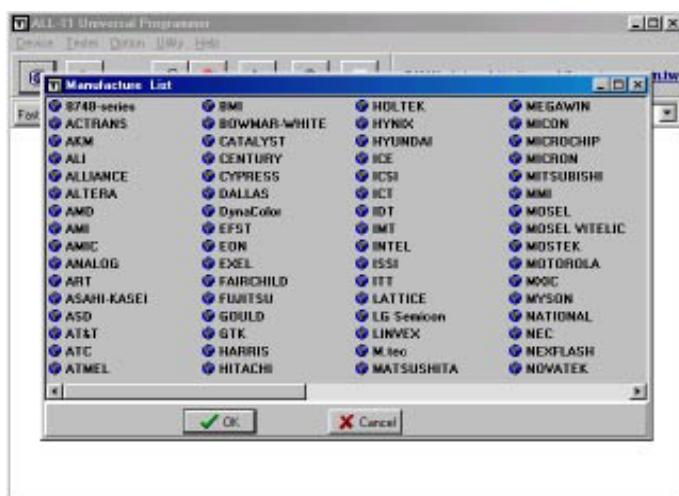
3.1.1 Begin with WACCESS

Click the icon of WACCESS to activate WACCESS.EXE and get following display on the window.



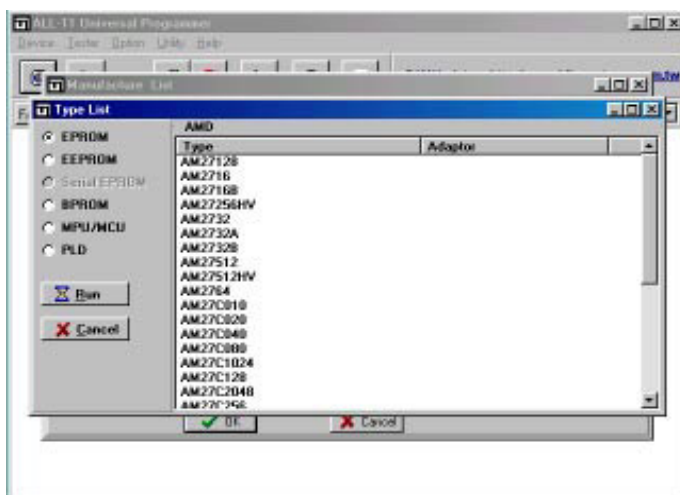
3.1.2 Select the manufacturer

Click "Device" to display all manufacturers for selection as following display. Then click "AMD" and press OK key to get the next display with menu of IC groups and types.



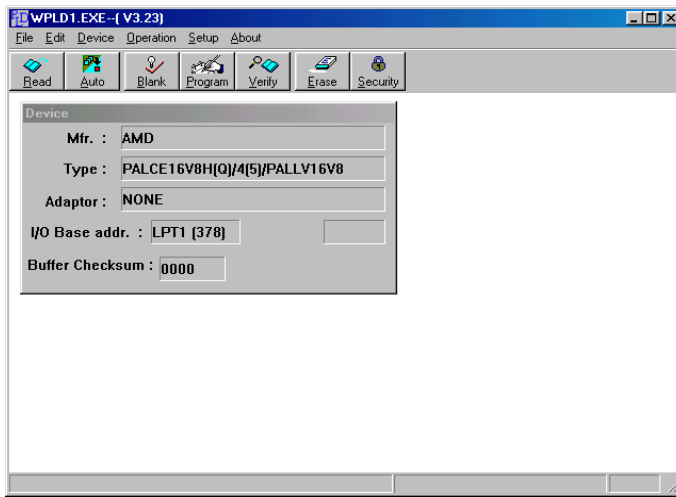
3.1.3 Select the IC group and type

For this default example, you may click "PLD", then search and click on the desired type in the right side menu followed by clicking <Run> key.



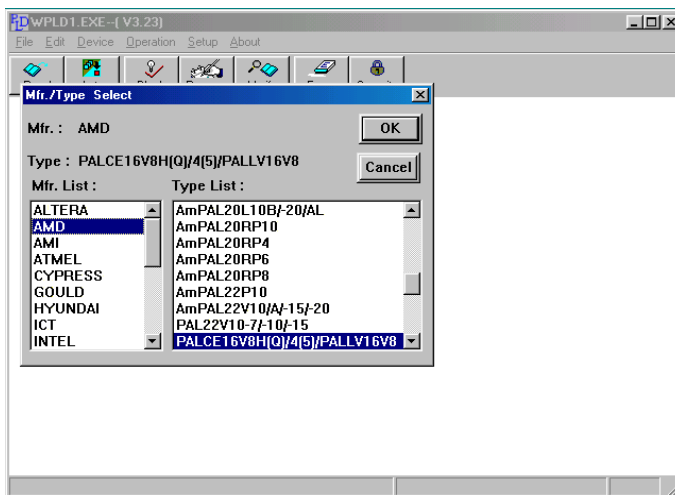
After the execution of <Run>, WACCESS file will automatically activate all related functions to get WPLD1.EXE ready for execution.

You may also run a specific driver file directly without going through WACCESS. You can select all parameters in its main menu by first click "Device" function, then followed by other selections as following display.



Main Menu of the Driver File

The main menu of programming file contains three vital parts. From top row down, you see the first row for main functions, the second row for quick function keys, and the rest provide detailed programming parameters about the selected IC, that includes manufacturer, type, ADAPTER required and current I/O Base Address etc.



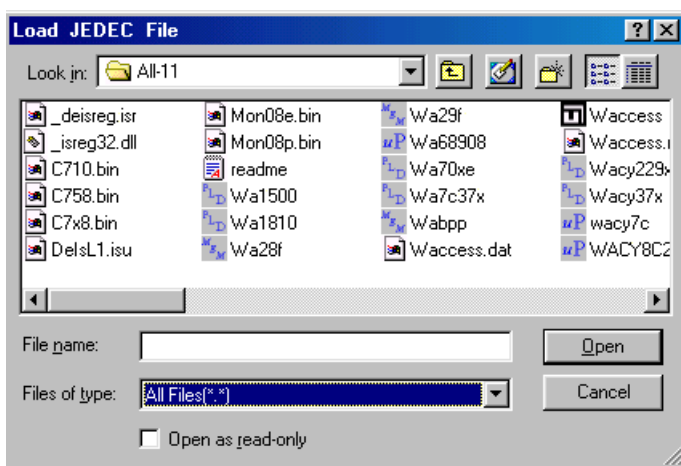
Remark:

When you change manufacturer and IC type all data in parameter window will be updated as well. The update including download the relevant driver file to programmer. If you see a message "File not found" appears, you need to check the missing of the installation and the existence of file in the CD-ROM, then ask your local dealer for assistance or download the file from our website.

If a specific adapter is needed, "File not found" message may appear too. That means the required S/W for the ADAPTER is not existed, you need to reinstall the S/W.

3.2 Load disk file into buffer

It is ready for IC programming after selecting manufacturer and type. You may use either of the two sources, one is the JEDEC format file saved in a disk, the other one from a master IC. This section explains the former way of downloading JEDEC file into buffer. When you click "Load JEDEC file" from "File" menu, the screen will display as follows:



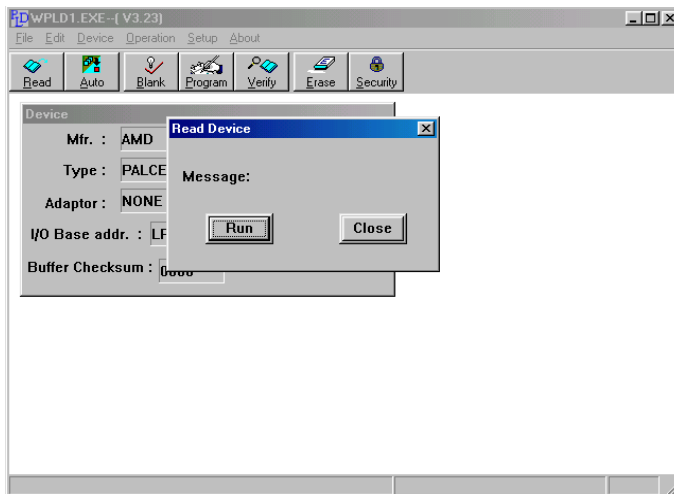
This function and its operation are similar to loading function under windows environment. You enter the file name to be downloaded and click OK, then the data file will be transmitted to the buffer of the programmer.

Caution: Disk driver and path must be correct

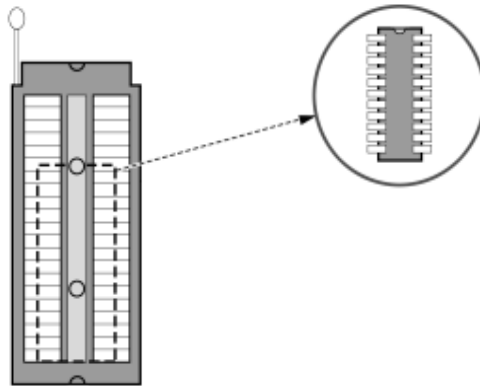
Select and click the correct driver and folder that the file belongs to. If it cannot be operated by mouse, you may apply <TAB>, <UP>, <DOWN> and <ENTER> keys for selecting and confirming.

3.3 Read contents from master IC to buffer

When data is stored in an IC instead of a disk, you may press "R" key on the keyboard or click the "READ" button on screen to read data from IC and transfer it to Buffer. The screen show as follows:



Release the socket lever, set IC in position, pin 1 of IC on the same side as the lever, if IC has less pin numbers than the socket, the Pin 1 alignment is from the opposite side of the lever as following diagram:



Press down socket lever to fasten the IC in position, then click **"Run"** on screen or press down **"Y"** key of keyboard or press **"YES"** key on programmer to start the function. As the function is in process, the screen will show following message.

Reading Now

When **OK!** message appears, the reading function is completed. You may click **"Close"** button or press <ESC> key for returning to main menu.

3.4 Insert a Blank IC into the socket

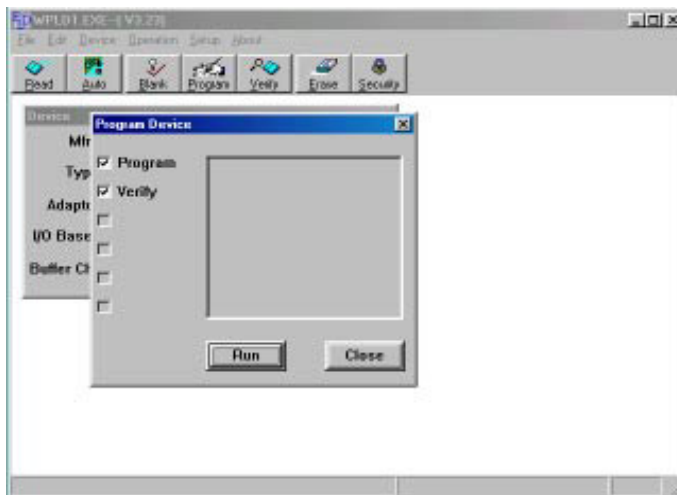
When programming data is read either from buffer or master IC, it is ready for programming operation and you have to insert a blank IC in position. Do follow correct IC positioning as stated on Section 3.3. Press "B" key on keyboard before programming to blank check the IC.

Attention!

Wrongly positioned IC may be damaged or be programmed to an unknown state.

3.5 Program buffer contents to IC

Right after an IC is well positioned, you may click “Program” from the menu or press “P” key on the keyboard to evoke the following display.



Then click “Run” button or press “Y” key on keyboard or “YES” key on the programmer to begin the programming on the blank IC. A verify job will be done automatically after the programming, that is to make verification on what read out from IC with that in buffer of the programmer. The “OK” LED will be lit to show a successful verification. For next IC programming you have to wait till the “BUSY” LED goes off, then replace the IC in socket with a blank one and repeat all required programming procedures.

You may click “Close” button or press <ESC> to go back to main menu.

3.6 Expansion ADAPTERs and CONVERTERs

Many more ADAPTERs and CONVERTERs were evolved according to different IC types and packages like PLCC, SOP, TSOP, QFP, PGA, etc. to meet the rapid development of programmable ICs.

ADAPTER:

Each ADAPTER comes with 40 pins that match the 40-pin socket on the programmer. Each ADAPTER has one or more programming files that to be copied to the same directory as WACCESS.

CONVERTER:

CONVERTERs support the conversion from DIP package to others like PLCC, SOP, TSOP etc. In application, no extra programming file is needed because it is only a simple pin conversion.

3.6.1 ADAPTER and CONVERTER installation

S/W Installation:

As what stated under ADAPTER, the S/W need be copied through the same directory as that for WACCESS file.

H/W Installation

Like positioning a 40-pin IC onto a socket, you release the socket lever on programmer, then proceed the insertion and fasten it by pressing down the socket lever. Following two pictures are for your reference.



Before insertion



After insertion

4. Glossary

4.1 EPROM, EEPROM, BPROM and MPU

■ Programmable DEVICE :

An integrated circuit (IC) that will be programmed or copied.

■ Bit, Nibble, Byte, Word and Double word :

Bit : A basic unit of Binary data.

Nibble : A group of 4-bit Binary data. A nibble's value ranges from 0H to FH.

Byte : A group of 8-bit Binary data. A byte's value ranges from 0H to FFH.

Word : A group of 16-bit Binary data. A word's value ranges from 0H to FFFFH.

Double Word :

A group of 32-bit binary data. A double word's value ranges from 0H to FFFFFFFFH.

■ Working Buffer :

A block of memory inside the programmer allocated by the device driver file. The working buffer is used by the device driver file as an intermediate storage.

When you want to program a data file to a DEVICE, you first load the file to the working buffer. The contents in the working buffer are then programmed to the target DEVICE. When you read the contents of a master DEVICE, the data is stored in the working

buffer, that can then be edited or saved to disk for future reference.

■ **Buffer Start and Buffer End Addresses:**

The buffer start and end addresses are offset addresses specified from the base address of the Working Buffer. The data stored between the buffer start and buffer end addresses contains the sub-set of the programmer memory buffer is to be programmed to a target device. This is also the area of the buffer for CheckSum calculations.

■ **Checksum:**

This is the sum of all data contents between buffer start and end addresses. All data are added byte by byte and then the least significant 16 bits (4 HEX characters) are displayed as the checksum. Some bytes in the address range may not be added to the checksum as specified by the manufacturer of the particular DEVICE. CheckSums will be calculated during DEVICE reading, file loading, type changing or after buffer editing.

■ **Bit count of the data:**

NIBBLE width is 4.

BYTE width is 8.

WORD width is 16.

Double Word has a width of 32.

The bit count of MPU is usually 8 or 16, but is also available in 12, 14, or other counts as device type varies.

■ **Device Start and Device End Addresses:**

The DEVICE start and end addresses are offset addresses specified from the base address of the DEVICE. Data stored at the buffer start address in the working buffer will be programmed to a DEVICE beginning at the Device Start Address location.

NOTE :

In order to get correct programming data, some device files forbid users to change the address settings for Buffer Start, Buffer End, Device Start, and Device End.

■ **I/O Address :**

This is the I/O base address of the USB port or parallel port. Each I/O interface card on the PC expansion slot will occupy one or more I/O addresses.

■ Security Fuses:

Security fuses are present in many programmable devices. When a security fuse is programmed the data stored inside the device can not be read out correctly for reverse engineering purposes. Generally a device will be read as blank if the security fuse is blown. The device will operate functionally equivalent with the security fuse intact or blown.

Remark:

Please check with your data book before programming the security fuse of a UV erasable(windowed) device because some UV erasable devices can not be programmed again once the security fuse is programmed.

■ Lock Bits:

Some microcontrollers use lock bits in place of a single security fuse. Usually you have the option of selecting to program one lock bit or all lock bits to provide different levels of code protection. The definition of these bits varies from manufacturer to manufacturer. Please consult the data book of your target device for more details. For some devices like Microchip PIC series devices, if the Lock Bits in the data file are set, the checksum will be different.

■ **Encryption:**

Some MCU/MPU are encrypted for protection. For a programmed IC that has been encrypted, a correct decryption code must be given in order to read correct data.

■ **Protection Fuses:**

Some FLASH based memory devices have protection fuses. A Protection fuse is used to protect a sector of memory in the FLASH device from being accidentally programmed or modified by the target hardware where the device will be installed. This fuse must be reset by a specific series of procedures before the data in the particular sector can be programmed or changed to new values. Protection fuses are only programmed using the separate "Protection" function or the "Auto" function.

4.2 PLD, PAL, GAL, PEEL, CPLD, EPLD and FPGA

■ Programmable Logic Device (PLD):

Generally speaking, a device that can be programmed to perform many different logic operations is a PLD. PLDs are usually grouped into following five categories:

PLD : A one time programmable logic device such as a PAL device.

EPLD : A UV erasable PLD such as a EPLD, CPLD, or FPGA device. These devices contain a transparent window on top for UV light exposure.

EEPLD : An electrically erasable PLD such as a GAL, PEEL, CPLD, or FPGA device.

CPLD : A more complex PLD device.

FPGA : Field programmable gate array.

■ JEDEC Fuse Map File of a PLD Device:

The JEDEC fuse map file is the standard format which can be loaded to a programmer for programming PLD's. It contains fuse information(Blown/Intact) and the Function Test Vectors of the PLD(optional). Most PLD assemblers or compilers, such as the PALASM, OPAL, CUPL, ABEL, AMAZE and PDK-1, can produce a JEDEC fuse map file.

- **POF fuse map file for PLD devices:**

The POF fuse map file is a format used for programmable logic devices from Altera Corporation. POF files store programming fuse data for larger devices in a more compact way.

- **Fuse Blown and Intact:**

A new programmable device generally comes with all fuses in an intact state (i.e. logic 1 or blank state). The designer can only blow an Intact fuse into a Blown state i.e. logic 0 state. The initial state of some devices may be opposite to this depending upon the device manufacturing method. For those one time programmable(OTP) devices you cannot change the state of a fuse back to the unprogrammed state once it is blown (programmed). UV erasable devices come with windows. When the window is exposed to UV light long enough the fuses will be erased to its initial blank(or unprogrammed) state. Other devices are electrically erasable and can be erased by using an ERASE function on the Programmer.

- **Array Fuses & Configuration Fuses:**

Array fuses are the main logic fuses in a PLD. Different arrangements(Blown/Intact) have different logic functions. Configuration fuses indicate the I/O architecture of the PLD, such as Combinatorial/Registered, Output Feedback/Output Enable. Generally,

the user do not have to know the exact details of these fuses because the logic compiler used to translate your logic statements and equations into a JEDEC fuse map or another format for programming into a device will specify the value of these bits.

■ Security Fuses

Security fuses are present in many PLD devices. When the security fuse is programmed the data stored inside the PLD can not be read out correctly for reverse engineering purposes. Generally a device will be read as blank if the security fuse is blown. The device will carry on all functions and disregard the security fuse is intact or blown.

