

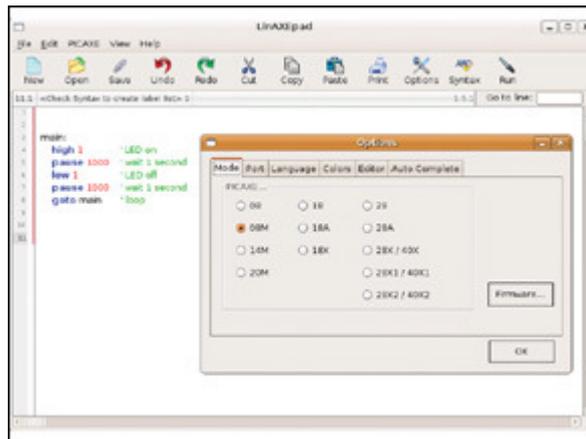
AXEpad

Cross-Platform Development for PICAXE Chips

Version 2.0.1

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Introduction

AXEpad is a cross-platform development tool for PICAXE chips. It supports BASIC programming of PICAXE chips on Windows, Macintosh and Linux operating systems.

AXEpad is a 'notepad' type application for the development of PICAXE programs. It supports all PICAXE chips and has all the normal development features such as source code colour syntax highlighting, auto indentation, syntax check and download, debug and terminal windows etc. This is the recommended tool for Linux and Macintosh support of the PICAXE system.

Although a Windows version is also available, we would recommend use of the PICAXE Programming Editor instead.

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System Requirements

Linux

- x86-based Linux distributions with GTK+ 2.8 or higher
- glibc-2.4
- CUPS (Common UNIX Printing System)
- libstdc++.so.6

Compatible Linux Distributions include -

- Xandros on Eee PC
- Ubuntu 6.10 (Edgy Eft) and later
- SUSE Linux Enterprise Desktop 10
- Red Hat Enterprise Linux 5

Macintosh

- Mac OS X 10.2 (Jaguar) or later, Intel or PowerPC processor

Windows

- Windows 2000 or later, including Windows XP, Windows Vista

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Latest Documentation

The latest version of this document can be downloaded from Revolution Education Ltd's web site at -

<http://www.rev-ed.co.uk/docs/pad001.pdf>

Linux Installation

Requirements

Please note that LinAXEpad requires an INtel x86-based Linux distribution with GTK+ 2.8 or higher, glibc-2.4, CUPS (Common UNIX Printing System) and libstdc++.so.6 installed.

Compatible Linux Distributions include; Xandros on Eee PC, Ubuntu 6.10 (Edgy Eft) or later, SUSE Linux Enterprise Desktop 10 and Red Hat Enterprise Linux 5.

Downloading LinAXEpad

The LinAXEpad download is a single gzipped tar archive (frequently known as a "tarball") which can be downloaded from Revolution Education Ltd's web site at -

<http://www.rev-ed.co.uk/software/LinAXEpad.tar.gz>

Save the *LinAXEpad.tar.gz* file on hard disk, memory stick or card, CD or DVD which can be accessed by the Linux PC upon which LinAXEpad will be installed.

Installing LinAXEpad

LinAXEpad is delivered as an application binary distribution and does not require the compilation of any source code. Providing the system requirements are met it can simply be installed then run.

There are numerous and varying distributions of Linux and it is recommended that the documentation which accompanies your particular distribution is consulted before installation.

Installing LinAXEpad for Eee PC

Launch the Work > File Manager application

Create or select a folder to extract the LinAXEpad application to. For example, create a "LinAXEpad" folder in "My Home".

Locate the *LinAXEpad.tar.gz* file previously downloaded.

Click on *LinAXEpad.tar.gz* to view the zipped contents, select all the files and folders and drag to your new folder.

Alternatively, right-click on *LinAXEpad.tar.gz* and select 'Extract All'. Select your new folder as the destination, click 'OK', then, when extraction has completed, navigate to your new folder.

When done, you will see three sub-folders - *compiler_linux*, *datasheets* and *syntax* - plus the *LinAXEpad* application executable.

Right-click on *LinAXEpad*, select 'Properties', then select the 'Permissions' tab.

Ensure the 'Exec' option is checked for Owner, Group and Others then click on the 'OK' button.

Move into the *compiler_linux* folder and for all PICAXE compilers, right-click, select 'Properties' then the 'Permissions' tab and ensure the 'Exec' option is checked for Owner, Group and Others.

To launch AXEpad, double click on the *LinAXEpad* file.

Adding a LinAXEpad icon to an EEEpc running Xandros

Start a Terminal Console (Ctrl+Alt+T), then change to the *AsusLauncher* folder (note that case is important) -

```
cd /opt/xandros/share/AsusLauncher
```

Make a backup of the original *simpleui.rc* file -

```
sudo cp simpleui.rc simpleui.rc.backup
```

Open the *simpleui.rc* file in a text editor such as *kate* -

```
sudo kate simpleui.rc
```

Scroll to near the bottom of the file and add in a new parcel section exactly as below (assuming the LinAXEpad folder is located in 'My Home' which is known as */home/user/*) -

```
<parcel simplecat="Work" extraargs="/home/user/axepad/LinAXEpad"
  icon="documents_norm.png"
  selected_icon="documents_hi.png">
  <name lang="en">LinAXEpad</name>
  <desc lang="en">LinAXEpad for PICAXE</desc>
</parcel>
```

Save the file and restart the EEEpc.

Note: You can change *simplecat="Work"* to *simplecat="Learn"* or even *simplecat="Play"* depending on which section you feel is appropriate for your PICAXE projects to appear in.

Installing LinAXEpad for Ubuntu

Launch Nautilus or your favourite file manager and locate the *LinAXEpad.tar.gz* file previously downloaded.

Double-click on *LinAXEpad.tar.gz* and this will launch the File Roller Archive Manager. Alternatively, right-click on *LinAXEpad.tar.gz* and select 'Open with Archive Manager'.

Click on the 'Extract' toolbar icon or use the Archive then Extract menu option to load the *LinAXEpad.tar.gz* archive.

Create or select a folder to extract the LinAXEpad application to. For example, create a "LinAXEpad" folder in your 'Home Folder'. Ensure the 'All Files', 'Re-Create Folders' and 'Overwrite Files' options are all ticked; note that preferences previously selected in LinAXEpad will not be overwritten nor altered. Click the 'Extract' button.

When the files have been extracted, close the Archive Manager and use Nautilus to navigate to the folder the LinAXEpad application was extracted to. You will see three sub-folders - *compiler_linux*, *datasheets* and *syntax* - plus the *LinAXEpad* application executable.

Right-Click on *LinAXEpad*, select 'Properties', then select the 'Permissions' tab.

Ensure the 'Execute: Allow executing file as program' option has been ticked then click on the 'Close' button.

Right-Click on *LinAXEpad* and select 'Make Link'. This will create a *Link to LinAXEpad* file in the current folder.

Right-Click on *Link to LinAXEpad* and select 'Cut'. Then navigate to your 'Home Folder', then into

'Desktop'. Right-click in the right pane and select 'Paste'. This will move the link to your desktop which will then be available when Nautilus has been closed. Close Nautilus.

To launch AXEpad, double click on the *Link to LinAXEpad* file on your desktop. The *Link to LinAXEpad* file can be renamed if desired.

Installing LinAXEpad from a Command Shell

Login as a *root* user then open a Command Shell; under Gnome that will be *Terminal*, under KDE that will be *Konsole*. Create a *LinAXEpad* directory under the Home Directory and move into that directory. For example -

```
user@linux:~$ mkdir ~/LinAXEpad
user@linux:~$ cd ~/LinAXEpad
user@linux:~/LinAXEpad$
```

Locate the downloaded *LinAXEpad.tar.gz* file then use the *tar* command to extract the contents into the *LinAXEpad* directory. The *path* will be the directory where the *LinAXEpad.tar.gz* file was downloaded to -

```
user@linux:~/LinAXEpad$ tar -xvzf path/LinAXEpad.tar.gz
```

Use the *chmod* command to ensure the LinAXEpad application is executable -

```
user@linux:~/LinAXEpad$ chmod 755 LinAXEpad
```

Launch the LinAXEpad Application using -

```
user@linux:~/LinAXEpad$ LinAXEpad
```

Installing an AXE027 USB Download Cable

Please see the AXE027.pdf file for instructions on installing the AXE027 USB Download Cable drivers.

This document can be viewed when LinAXEpad has been installed by clicking on the 'Help' then 'AXE027 USB Download Cable' menu options, clicking on the 'USB Help' button in the 'View', 'Options', 'Port' configuration window, or by downloading from Revolution Education Ltd's web site at -

<http://www.rev-ed.co.uk/docs/axe027.pdf>

Note it is not necessary to install any additional software drivers for the AXE027 USB Download Cable.

Installed files

base	---	----	LinAXEpad	Executable Application
	---	compilers_lin	PICAXE Compilers for Linux	
	---	datasheets	PICAXE Manuals and datasheets (PDF)	
	`---	syntax	Colour syntax highlighting definitions	

Preferences File

Preferences for LinAXEpad are remembered on a per-user basis and are held in the normally hidden *.LinAXEpad* sub-directory of the user's home directory as an *axepad.ini* text file. Please note the leading period, full-stop or dot, which marks the directory as hidden. It may be necessary to enable the display of hidden directories depending upon file manager application used.

The *axepad.ini* file is created and automatically updated as necessary by LinAXEpad when run. It is not normally necessary nor recommended to manually edit the *axepad.ini* file.

Macintosh Installation

Requirements

Please note that MacAXEpad requires Mac OS X 10.2 (Jaguar) or later, Intel or PowerPC processor.

Downloading MacAXEpad

The MacAXEpad download is a single compressed Macintosh application bundle which can be downloaded from Revolution Education Ltd's web site at -

<http://www.rev-ed.co.uk/software/MacAXEpad.app.tar.gz> - Intel

<http://www.rev-ed.co.uk/software/MacAXEpadPCC.app.tar.gz> - PowerPC

Save the *MacAXEpad.app.tar.gz* or *MacAXEpadPCC.app.tar.gz* file on hard disk, memory stick or card, CD or DVD which can be accessed by the Macintosh upon which MacAXEpad will be installed.

Installing MacAXEpad

To install simply double-click the *MacAXEpad.app.tar.gz* or *MacAXEpadPCC.app.tar.gz* file to extract the MacAXEpad application bundle.

To launch AXEpad, double-click on the *MacAXEpad* icon.

Installing AXE027 USB Download Cable Drivers

Please see the AXE027.pdf file for instructions on installing the AXE027 USB Download Cable drivers.

This document can be viewed when MacAXEpad has been installed by clicking on the 'Help' then 'AXE027 USB Download Cable' menu options, clicking on the 'USB Help' button in the 'View', 'Options', 'Port' configuration window, or by downloading from Revolution Education Ltd's web site at -

<http://www.rev-ed.co.uk/docs/axe027.pdf>

The latest AXE027 Software Drivers for Macintosh can be downloaded from Revolution Education Ltd's web site at -

http://www.rev-ed.co.uk/software/axe027_mac_intel.dmg.zip - Intel

http://www.rev-ed.co.uk/software/axe027_mac_powerpc.dmg.zip - PowerPC

Installed files

<i>base</i>	----	MacAXEpad	Executable
	---	compilers_mac	PICAXE Compilers for Mac
	---	datasheets	PICAXE Manuals and datasheets (PDF)
	`---	syntax	Colour syntax highlighting definitions

Preferences File

Preferences for MacAXEpad are remembered on a per-user basis and are held in an *axepad.ini* text file stored in the user's preferences directory which will normally be -

:Users:*username*:Library:Preferences:

The *axepad.ini* file is created and automatically updated as necessary by MacAXEpad when run. It is not necessary, nor recommended, to manually edit the *axepad.ini* file.

Windows Installation

Requirements

Please note that WinAXEpad requires Windows 2000 or later. WinAXEpad will work with Windows XP and Windows Vista. The PICAXE Programming Editor will work with any Windows 32-bit Operating System, Windows 95 and later.

We recommend the use of the PICAXE Programming Editor for PICAXE development under Windows.

Downloading WinAXEpad

The WinAXEpad download is a single compressed installer which can be downloaded from Revolution Education Ltd's web site at -

<http://www.rev-ed.co.uk/software/WinAXEpad.exe>

Save the *WinAXEpad.exe* file on hard disk, memory stick or card, CD or DVD which can be accessed by the Windows PC upon which WinAXEpad will be installed.

Installing WinAXEpad for Windows

Ensure you are logged on to Windows with Administrator privileges.

To install simply double-click the *WinAXEpad.exe* file to run the Microsoft Installer.

To launch AXEpad, from the Start Menu, select *All Programs, Revolution Education, AXEpad, WinAXEpad*.

Installing AXE027 USB Download Cable Drivers

It will not be necessary to re-install the AXE027 drivers if they have already been installed for the PICAXE Programming Editor.

Please see the AXE027.pdf file for instructions on installing the AXE027 USB Download Cable drivers.

This document can be viewed when WinAXEpad has been installed by clicking on the 'Help' then 'AXE027 USB Download Cable' menu options, clicking on the 'USB Help' button in the 'View', 'Options', 'Port' configuration window, or by downloading from Revolution Education Ltd's web site at -

<http://www.rev-ed.co.uk/docs/axe027.pdf>

The latest AXE027 Software Drivers for Windows can be downloaded from Revolution Education Ltd's web site at -

<http://www.rev-ed.co.uk/software/axe027.zip> - XP, 2000, 2003, Vista
<http://www.rev-ed.co.uk/software/axe027x64.zip> - XP (64-Bit)

Installed files

<i>base</i>	---.---	WinAXEpad.exe	Executable Application
	---	WinAXEpad_libs	Windows support files
	---	compilers_win	PICAXE Compilers for Windows
	---	datasheets	PICAXE Manuals and datasheets (PDF)
	`---	syntax	Colour syntax highlighting definitions

Preferences File

Preferences for WinAXEpad are remembered on a per-user basis and are held in an *axepad.ini* text file stored in the user's preferences directory which will normally be -

C:\Documents and Settings*username*\Application Data

The *axepad.ini* file is created and automatically updated as necessary by WinAXEpad when run. It is not necessary, nor recommended, to manually edit the *axepad.ini* file.

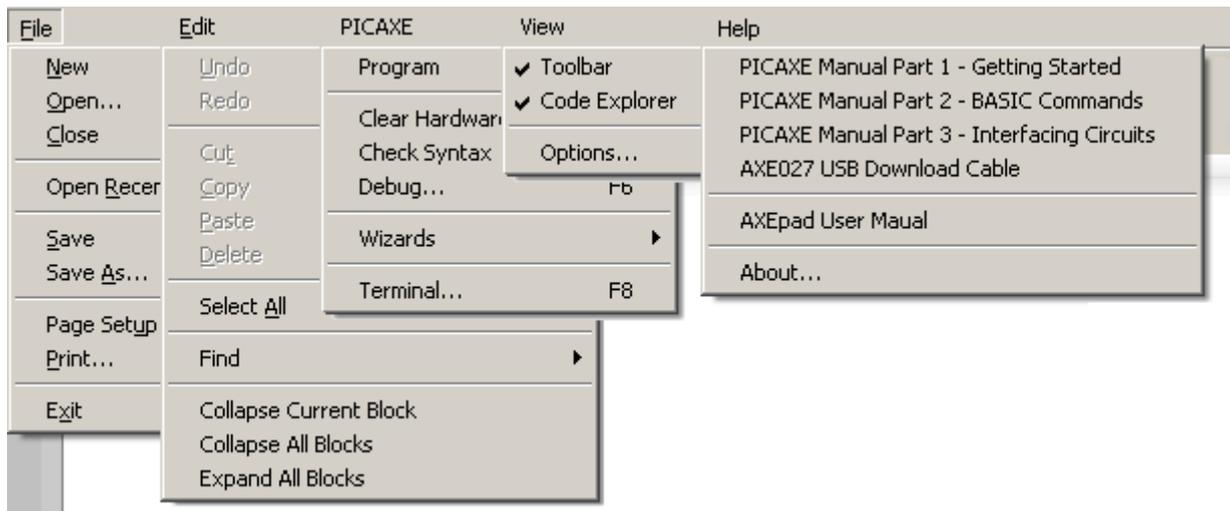
Note that preferences for WinAXEpad are entirely separate to preferences for the PICAXE Programming Editor; altering preferences in one will not affect preferences in the other if both are installed.

Using AXEpad

PICAXE programmers who have used the PICAXE Programming Editor should find AXEpad to be very familiar to work with. Those who have not should find AXEpad to be intuitive and straight-forward to use.

The following sections detail the main aspects of AXEpad.

Menu Bar



File

New	Create a new program
Open	Open an existing program file
Close	Close the current program
Open Recent	Open a recently used file
Save	Save the current program
Save As	Save the current program
Page Setup	Configure the printer
Print	Print the program
Exit	Close AXEpad

Edit

Undo	Undo previous changes
Redo	Redo previous changes
Cut	Remove selected text from program
Copy	Copy selected text of program
Paste	Paste text into program
Delete	Delete the selected text
Select All	Select all text
Find	Find within program text
Collapse Current Block	Collapse current collapsible block
Collapse All Blocks	Collapse all collapsible blocks
Expand All Blocks	Expand all collapsible blocks

PICAXE

Program	Download program to PICAXE
Clear Hardware Memory	Clear the PICAXE program and data memory
Check Syntax	Check the syntax of the program
Debug	Start the Debug Display
Wizards	Launch a Programming Wizard
Terminal	Start the serial Terminal

View

Toolbar	Show or hide the toolbar
Code Explorer	Show or hide the Code Explorer
Options	Select configuration options

Help

PICAXE Manual 1	View the Getting Started manual
PICAXE Manual 2	View the Basic Commands manual
PICAXE Manual 3	View the Circuit Interfacing manual
AXE027 USB Download Cable	View the AXE027 instruction manual
AXEpad User Manual	View AXEpad user manual
About	Show AXEpad version details

Tool Bar

The Toolbar provides graphical one-click access to common operations within AXEpad.

The Toolbar will displayed when the *View, Toolbar* menu option is ticked.



To perform a Toolbar operation, simply move the mouse over the required icon and single left-click. Each icon will perform an associated and equivalent menu bar operation -

New	File, New	Create a new program
Open	File, Open	Open an existing program file
Save	File, Save	Save the current program
Undo	Edit, Undo	Undo previous changes
Redo	Edit, Redo	Redo previous changes
Cut	Edit, Cut	Remove selected text from program
Copy	Edit, Copy	Copy selected text of program
Paste	Edit, Paste	Paste text into program
Print	File, Print	Print the program
Options	View, Options	Select configuration options
Syntax	PICAXE, Check Syntax	Check the syntax of the program
Program	PICAXE, Program	Download program to PICAXE

Code Explorer

The Code Explorer shows a list of all constants, variables and labels which have been used in the PICAXE Basic program being edited. This list is updated whenever a Syntax Check is performed, the program is downloaded into a PICAXE or the heading of the Code Explorer is clicked.

Clicking on one of the Code Explorer entries will cause entries which match that clicked upon to be cycled through in the PICAXE Basic program being edited.

The Code Explorer will be shown when the *View, Show Code Explorer* menu option is ticked.

Label List

The Label List, when clicked upon, pops-up a list of all labels which have been defined in the PICAXE Basic program being edited. This list is updated whenever a Syntax Check is performed, the program is downloaded into a PICAXE or the heading of the Code Explorer is clicked (if shown).

Clicking on one of the List Label entries will cause labels which match that clicked upon to be cycled through in the PICAXE Basic program being edited.

Goto Line

The Goto Line entry field allows a line in the PICAXE Basic program to be quickly selected.

Simply enter the line number desired and press return. The line specified will be located and highlighted in the PICAXE program.

Keyboard Shortcuts

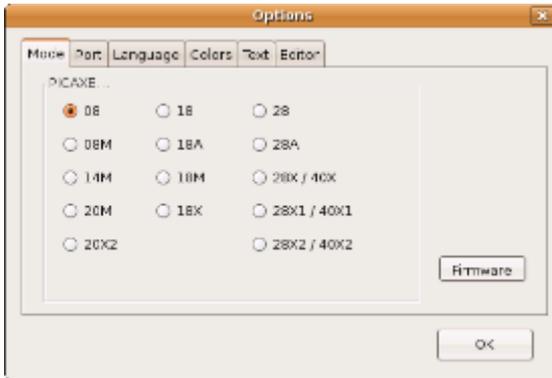
AXEpad provides a number of keyboard shortcuts to provide the speedy undertaking of a number of common activities which will occur when developing PICAXE programs. The keyboard shortcuts available are as follows -

Ctrl-A	Edit, Select All	Select all of program
Ctrl-C	Edit, Copy	Copy selected text of program
Ctrl-N	File, New	Create a new program
Ctrl-O	File, Open	Open an existing program file
Ctrl-P	File, Print	Print the program
Ctrl-Q	File, Quit	Quite AXEpad
Ctrl-S	File, Save	Save the current program
Ctrl-V	Edit, Paste	Paste text into program
Ctrl-X	Edit, Cut	Remove selected text from program
Ctrl-Z	Edit, Undo	Undo previous changes
Shift + Ctrl-Z	Edit, Redo	Redo previous changes
F4	PICAXE, Check Syntax	Check the syntax of the program
F5	PICAXE, Program	Download program to PICAXE
F6	PICAXE, Debug	Start the Debug Display
F8	PICAXE, Terminal	Start the serial Terminal

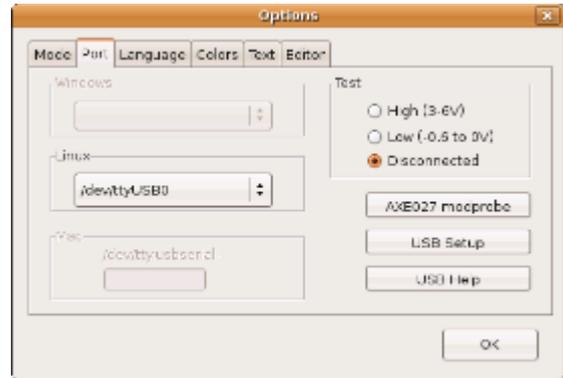
Options

AXEpad can be configured for use with a particular PICAXE type and for user preferences using the Options settings.

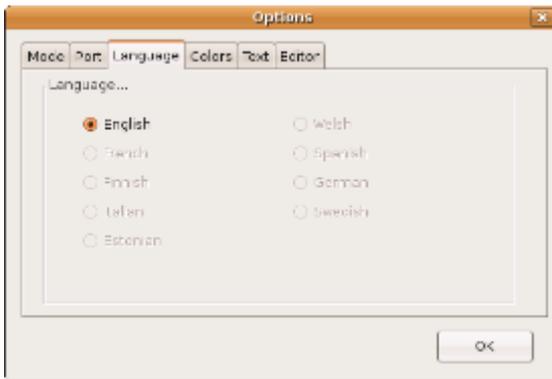
Options settings are accessed by clicking on the *View, Options* menu option. This will present a tabbed panel through which a variety of settings can be changed. Settings are remembered in a preferences file and are unique for each user of the computer, that is, each user can choose preferences which best suit themselves -



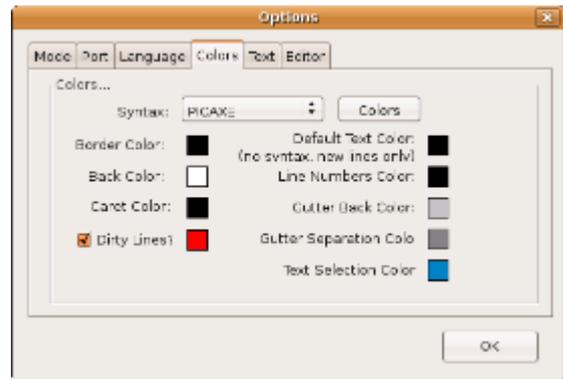
Mode Options



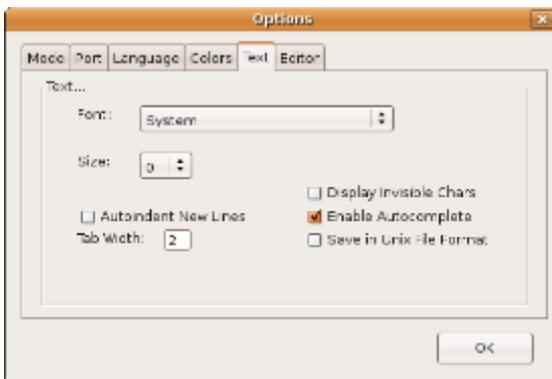
Port Options



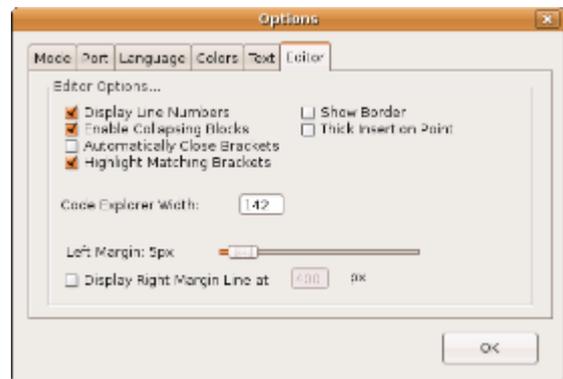
Language Options



Color Options



Text Options



Editor Options

Mode

The Mode panel is used to select the PICAXE type being used; this should match the PICAXE you have installed in your hardware or that which you are developing code for.

The 'Firmware' button will identify or confirm the PICAXE type installed in your hardware and its

Firmware Version Number. Use the Port panel to select the serial connection used to connect to your hardware.

The selection of PICAXE type affects the operation of the Debug Display and pre-configures the Ring Tone Tune and PWM Wizards. Please select the correct PICAXE type before using those facilities.

Port

The Port panel is used to specify the serial connection you have to your hardware.

Windows

The Windows drop-down list will show all serial ports which have been installed. Select the physical port to which the download cable has been connected or the port name Windows has allocated to a USB-to-serial cable. If a USB-to-serial cable is inserted while Options are open, close Options and re-open using the *View, Options* options or the *Options* toolbar icon. Added serial ports will automatically be found.

The 'USB Setup' button will launch Windows Device Manager to allow USB-to-serial cables to be identified and configured.

The 'USB Help' button will show the AXE027 Installation Instruction manual.

Linux

The Linux drop-down list will allow a physical serial port or a USB-to-serial port to be selected. Select the physical port to which the download cable has been selected or the USB port which represents the connected USB-to-serial cable.

The 'USB Setup' button will identify the USB ports available on your system; these will have a name commencing with */dev/ttyUSB*.

The 'AXE027 modprobe' button will execute a *modprobe* command as may be required for your Linux installation. Please see the AXE027 Installation Instruction manual for further details -

The 'USB Help' button will show the AXE027 Installation Instruction manual.

Macintosh

The 'USB Setup' button will identify the USB ports available on your system; these will have a name commencing with */dev/tty.usbserial-*.

Identify the port to which you have connected your USB-to-serial cable and enter the digits following */dev/tty.usbserial-* into the text box.

The 'USB Help' button will show the AXE027 Installation Instruction manual.

Language

The Language panel is used to select the language in which you wish AXEpad to operate in.

Colors

The Colors panel allows AXEpad Syntax Highlighting to be configured.

Text

The Text panel allows basic text operations for AXEpad to be configured.

Font - Selects the font to be used for the display.

Size - Selects font size to be used for the display.

Display Invisible Chars - When ticked, characters such as spaces, tabs and end of lines which are not visible in the source code will be indicated.

Auto-Indent New Lines - When ticked, pressing return at the end of a program line will automatically indent the next line to the same horizontal position.

Tab Width - Sets how many spaces a tab character in the source program will be converted to.

Enable Auto-Complete - When ticked, the editor will keep track of what is being entered and maintain a list of PICAXE Basic commands and constants may be being entered (like SMS predicative text entry). This allows commands and constants to be quickly entered by typing the first few characters of the command or constant and pressing the *Tab* key. A list of possible commands and constants will appear in a pop-up allowing that desired to be selected or the word will be auto-completed if there is only one possible option.

Save In Unix File Format -When ticked, files will be saved using the standard Unix-style end of line character.

Editor

The Editor panel allows basic editing functions of AXEpad to be configured.

Enable Collapsing Blocks - When ticked, program statement blocks (for-next, do-loop, { } braces and so on) can be collapsed to make the program source more readable during editing.

Display Line Numbers - When ticked, line numbers are shown for each line of the source program.

Show Borders - When ticked, a border around the text editing area will be shown.

Thick Insertion Point - When ticked, the caret which indicates where next text typed will be entered in the source program is made thicker and more visible than standard.

Automatically close braces - When ticked, typing an opening bracket or brace will automatically create a closing one.

Highlight Matching Brackets - When ticked, while moving the editing cursor within the program across opening and closing brackets and braces, the matching bracket or brace will be highlighted.

Left Margin - The left margin of where the edited text appears on the display can be adjusted by using the slider bar.

Display Right Margin - When ticked, a right hand margin will be drawn on the editing area of the display.

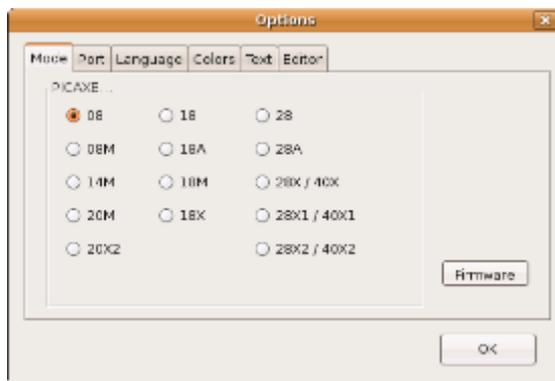
PICAXE Programming

Programming a PICAXE consists of four steps; writing the PICAXE program to be executed, checking the program's syntax for correctness, physically programming the PICAXE chip, plus testing and debugging as necessary to confirm correct operation of the program.

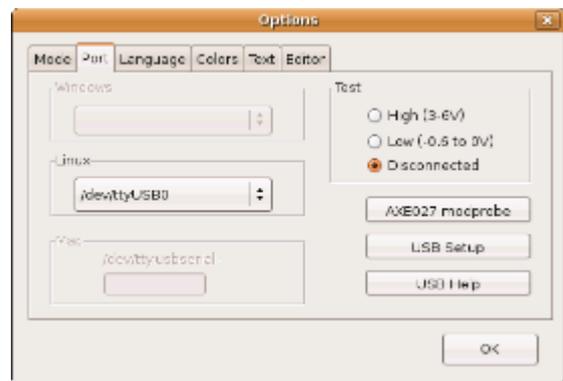
This section details the mechanisms for getting a PICAXE program into a physical PICAXE chip.

Configuration

Prior to programming a PICAXE it is necessary to configure AXEpad for the PICAXE being used and the serial connection to your hardware. This is done through the AXEpad configuration options which can be accessed using the *View, Options* menu option or by clicking on the *Options* toolbar icon -



Mode Options



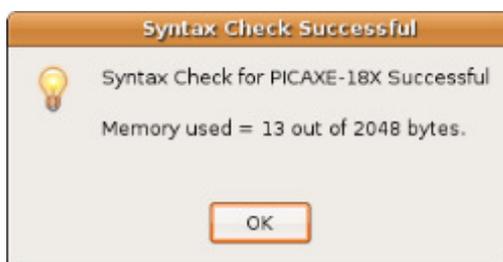
Port Options

Please see the earlier Options section for full details of AXEpad configuration.

Syntax Check

The syntax of a PICAXE program can be checked for correctness at any time by using the *PICAXE, Check Syntax* menu option, by using the *F4* function key or by clicking on the *Syntax* toolbar icon.

After the program has been checked for correctness a status report will be presented indicating a passed or failed result -



Successful Syntax Check



Failed Syntax Check

If the program syntax was correct, the Code Explorer and Label List will be updated to reflect the current PICAXE program.

Program

A PICAXE can be programmed by using the *PICAXE, Program* menu option, by using the *F5* function key or by clicking on the *Program* toolbar icon.

The syntax of the program being edited will be checked for correctness and any errors will be reported. If the program is error free then it will be downloaded to the PICAXE hardware and then executed.

A 'splash screen' will show download and programming progress -



After programming completes a status message will be produced providing information about the programming and PICAXE firmware as appropriate or the Debug Display will automatically launch if the program contains a debug command.

Clear Hardware Memory

A Clear Hardware Memory can be performed by using the *PICAXE, Clear Hardware Memory* menu option.

This will download a 'blank PICAXE program' into the PICAXE, similar to programming the PICAXE with any other program but one which will "do nothing".

After the PICAXE memory has been cleared a status message will be produced providing information about the programming and PICAXE firmware as appropriate.

Use of Clear Hardware Memory

It is always recommended to perform a Clear Hardware Memory on PICAXE chips which have configurable I/O pins before moving them to different hardware or when placing a PICAXE into storage for later use.

This avoids the potential for conflict between how the PICAXE has been configured and the hardware it is to be used with. It also prevents a program being left in the PICAXE memory which may prevent a Firmware Check or Program Download from functioning without a Reset or Hard Reset procedure. This may otherwise cause some confusion when the PICAXE is taken from storage and how it was previously used has been forgotten about; the PICAXE may initially appear not to be working properly when it is working and behaving exactly as it would be expected to.

Debug Display

The Debug Display can be used with a PICAXE Basic program to monitor the contents of variables and PICAXE chip configuration while that program is executing.

The Debug Display is launched using the Menu Bar, *PICAXE* then *Debug...* options or by using the *F8* function key. It will also be automatically launched whenever a PICAXE Basic program containing a debug statement has been downloaded -

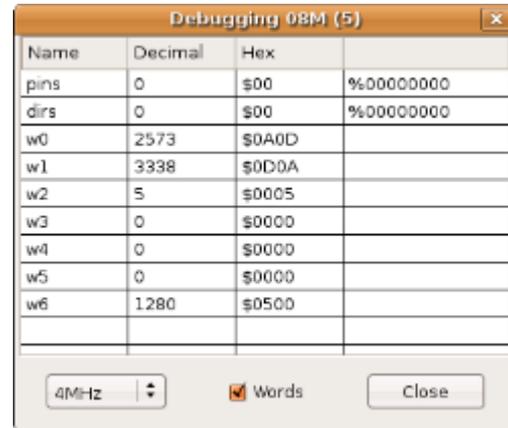


The screenshot shows a window titled "Debugging 08M (5)". It contains a table with four columns: Name, Decimal, Hex, and Binary. The data is as follows:

Name	Decimal	Hex	Binary
pins	0	\$00	%00000000
dirs	0	\$00	%00000000
b0	13	\$0D	%00001101
b1	10	\$0A	%00001010
b2	10	\$0A	%00001010
b3	13	\$0D	%00001101
b4	5	\$05	%00000101
b5	0	\$00	%00000000
b6	0	\$00	%00000000
b7	0	\$00	%00000000

At the bottom of the window, there is a frequency selector set to "4MHz", an unchecked "Words" checkbox, and a "Close" button.

Byte Display



The screenshot shows a window titled "Debugging 08M (5)". It contains a table with four columns: Name, Decimal, Hex, and Binary. The data is as follows:

Name	Decimal	Hex	Binary
pins	0	\$00	%00000000
dirs	0	\$00	%00000000
w0	2573	\$0A0D	
w1	3338	\$0D0A	
w2	5	\$0005	
w3	0	\$0000	
w4	0	\$0000	
w5	0	\$0000	
w6	1280	\$0500	

At the bottom of the window, there is a frequency selector set to "4MHz", a checked "Words" checkbox, and a "Close" button.

Word Display

Note that a PICAXE Basic program must contain at least one Debug statement to produce usable debugging information. The Debug Display is updated whenever (and only when) a Debug statement is executed. The Debug Display title bar will show "Waiting" until the first debugging information is received and then show a count of how many Debug statements have been executed.

The displayed information of the Debug Display will vary to match the PICAXE type which is being debugged. AXEpad should be configured through the *View, Options* menu option and *Mode* and *Port* panels before debugging commences.

Note that it is necessary to match the Debug Display operation to the speed of the executing PICAXE. PICAXE operating frequency is chosen using the selection box which allows a choice of 4MHz, 8MHz, 16MHz and 32MHz operating frequencies depending upon PICAXE type.

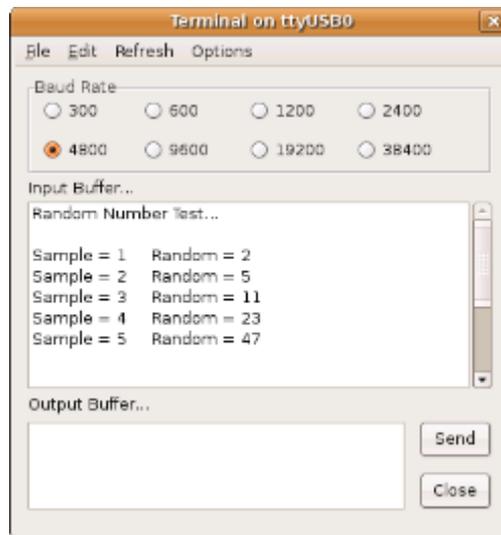
Data in PICAXE variables can be shown as byte or word data; tick the *Words* checkbox to display word data.

The 'Close' button will close the Debug Display and allow editing of the PICAXE Basic program to continue.

Terminal

The Terminal allows serial data sent by a PICAXE Basic program to be displayed on-screen and allows data to be sent to a PICAXE program.

The Terminal is launched using the Menu Bar, *PICAXE* then *Terminal* option or by pressing the *F8* function key -



Serial data sent from the PICAXE using the Sertxd or Serout commands will be displayed in the Input Buffer. The correct baud rate must be selected to match the baud rate the PICAXE is transmitting with. For the Sertxd command this will be 4800 baud, for a Serout command, whatever is specified in the command. The baud rate will need to be adjusted if over-clocking the PICAXE; 4800 baud will become 9600 baud at 8MHz, 19200 baud at 16MHz.

Data can be sent to the PICAXE to be received by a Serin or Serrxd command. The data to send is entered into the Output Buffer text area and the 'Send' button is clicked to send the data.

The *Options, Add 5ms delay between sent bytes* menu option when ticked will ensure there is a small delay between sending each character in the Output Buffer. The *Options, Add <CR> on send* menu option when ticked will cause a carriage-return character to be sent after the data in the Output Buffer is transmitted.

The *Edit, Clear Input Buffer* and *Copy Input Buffer* menu options will clear the Input Buffer display and copy whatever is held in the Input Buffer to the Clipboard respectively.

The *Refresh* menu option will clear the Input Buffer display, close and then re-open the serial input connection. This is convenient if the computer is buffering up a lot of serial data and it is desired to skip that data to what is currently being transmitted.

The 'Close' button and *File, Exit* menu option will close the Terminal and allow editing of the PICAXE Basic program to continue.

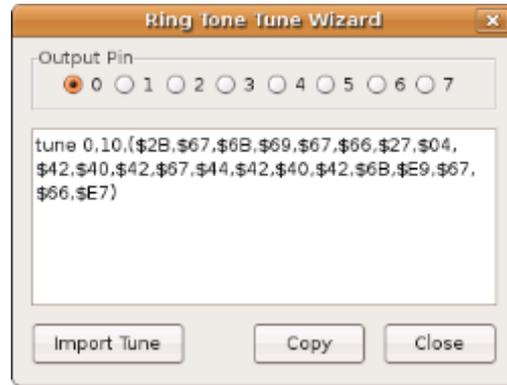
Ring Tone Tune Wizard

The Ring Tone Tune Wizard can be used to import Ring Tone Tune files (*.rtl and *.rtttl files) and convert them to appropriate numeric sequences which can be used with the PICAXE tune command.

The Ring Tone Tune Wizard is accessed using the Menu Bar, *PICAXE*, *Wizards*, then *Ring Tone Tunes...* options. This will launch the Ring Tone Tune Wizard interface -



PICAXE-08M Mode



Other PICAXE Modes

The 'Import Tune' button will allow a ring tone tune saved to disk to be loaded and converted to an equivalent Tune command.

For a PICAXE-08M, the 'Output LED' options will allow the LED Flashing which accompanies the playing of a tune to be selected. For other PICAXE variants, the 'Output Pin' options allow the output pin to which the tune will be directed to be selected (for example, an output pin with a piezo connected).

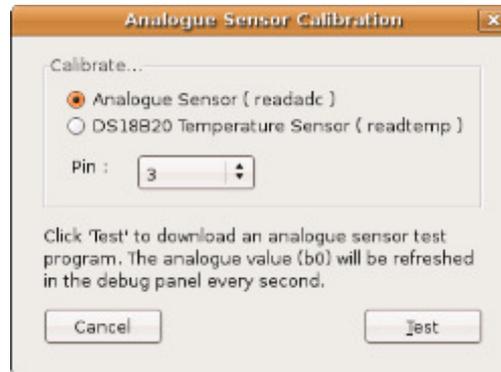
The 'Copy' button can be used to copy the converted tone command to the clipboard for pasting elsewhere and will automatically prompt to also paste the command into the PICAXE Basic program currently being edited.

The 'Close' button will close the Ring Tone Tune Wizard and allow editing of the PICAXE Basic program to continue.

Analogue Sensor Calibration Wizard

The Analogue Sensor Calibration Wizard can be used to quickly calibrate analogue sensors and DS18B20 temperature sensors.

The Analogue Sensor Calibration Wizard is accessed using the Menu Bar, *PICAXE,Wizards*, then *Analogue Sensor Calibration...* option. This will launch the Analogue Sensor Calibration Wizard interface -



First, select whether it is an analogue sensor or a DS18B20 temperature is to be calibrated, then select the pin to which the sensor is connected.

Finally click the 'Test' button to download a calibration program into the PICAXE. This will overwrite any program previously downloaded to the PICAXE but will not affect any source code currently being edited.

The 'Cancel' button will close the Wizard and allow editing of the PICAXE Basic program to continue without downloading the calibration program.

Once the calibration program has been downloaded, the Debug screen will appear and the sensor reading will be shown as variable b0 ("Sensor") and updated every second -

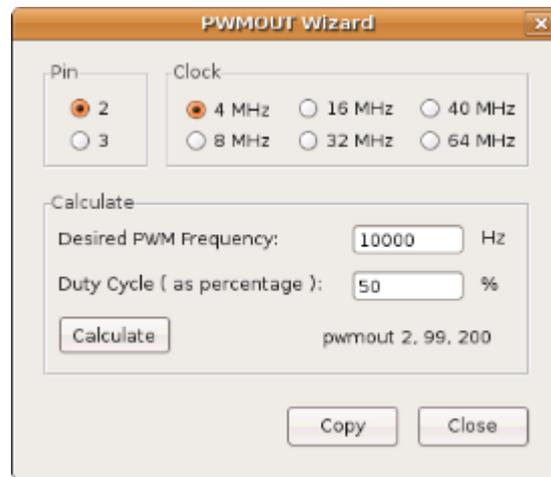


The 'Close' button will close the Debug screen when calibration of the sensor has been completed and allows editing of the PICAXE Basic program to continue.

PWMout Wizard

The PWMout Wizard can be used to quickly and easily determine parameters for the PICAXE `pwmout` command.

The PWMout Wizard is accessed using the Menu Bar, *PICAXE*, *Wizards*, then *PWMout...* option. This will launch the PWMout Wizard interface -



First, select the output pin on which PWM will be generated and choose the operating frequency the PICAXE will be using. Available options will be presented according to the PICAXE type being used. The PICAXE type can be changed using the Options settings described earlier.

Secondly, select the PWM output frequency desired (in Hz) and the duty of the PWM signal required (as a percentage).

Click on the 'Calculate' button and the required `pwmout` command parameters will be calculated.

The 'Copy' button can be used to copy the determined `pwmout` command to the clipboard for pasting elsewhere and will automatically prompt to also paste the command into the PICAXE Basic program currently being edited.

The 'Close' button will close the PWMout Wizard and allow editing of the PICAXE Basic program to continue.

PICAXE-X2 Conversion Wizard

The PICAXE-X2 Conversion Wizard can be used to quickly convert existing PICAXE programs for use with the PICAXE-28X2 and 40X2.

The PICAXE-X2 Conversion Wizard is accessed using the Menu Bar, *PICAXE*, *Wizards*, then *Convert to X2...* option. This will launch the PICAXE-X2 Conversion Wizard interface -



Click the 'Cancel' button to abort the conversion, otherwise select the conversion options and click 'Convert'. The source code being edited will be converted for use with an X2 PICAXE according to the options specified.

When conversion completes, a new editing window will be created which contains your converted program which may then be edited. Your original source code will not have been changed in its editing window.

The converted program is not automatically saved to disk; you will be prompted to save the file to disk if you have not already done so when its editing window or AXEpad is closed.

Detailed information on the X2 conversion process can be found in the PICAXE-X2 Conversion Wizard manual which can be viewed by clicking on the 'Help' then 'PICAXE-X2 Conversion Wizard Manual' menu options. The latest version of that document can be downloaded from Revolution Education Ltd's web site at -

<http://www.rev-ed.co.uk/docs/x2w001.pdf>

Additional Information for Linux Users

Linux distributions and individual installations can often be very different to others. While AXEpad for Linux has been designed to work with the majority of common distributions it may require configuration tuning to work with your particular distribution or installation.

Configuration tuning can be performed by editing the *axepad.ini* file that is held in the hidden *./LinAXEpad* folder below your home folder. It is not required nor recommended to edit *axepad.ini* other than for such configuration tuning.

Before performing configuration tuning, ensure that LinAXEpad has been executed (this will create the default *axepad.ini* file) and ensure the LinAXEpad application has been closed before making any changes or they will be lost when LinAXEpad does close.

PDF Viewer Configuration

There are a variety of PDF viewer applications which may be installed under Linux and AXEpad will attempt to find and use a suitable PDF viewer which has been installed. AXEpad will look for and select for use one of the following PDF viewer applications (in this order) -

```
acroread
evince
xpdf
kpdf
foxit
gv
```

If AXEpad cannot find a PDF viewer or you wish to use an alternative viewer to that which AXEpad selects, you can edit the *axepad.ini* file.

Locate the following lines -

```
[Configuration for Linux]
LinuxPdfApplication=name
```

Change the *name* entry to that of your preferred PDF viewer application. For example, if your PDF viewer were "XyzyPdfViewer", use -

```
[Configuration for Linux]
LinuxPdfApplication=XyzyPdfViewer
```

Configuration for the *modprobe* command

This configuration tuning will likely be required by those using Ubuntu and wishing to use the 'AXE027 modprobe' button when configuring the serial port.

In order to perform a *modprobe* in response to clicking on the 'AXE027 modprobe' button while configuring the serial port, the *modprobe* command to use is defined within *axepad.ini* -

```
[ModProbe Commands for Linux]
Cmd1=
Cmd2=sudo modprobe ftdi_sio vendor=0x0403 product=0xbd90
```

It should not be necessary to change this command. If it is, it will be necessary to consult the documentation which came with your Linux distribution to determine what the suitable command should be.

Where the *sudo* command executed to give the *modprobe* access rights to make the change requires a password (such as with Ubuntu), this may be specified by adjusting the *Cmd1* entry which will be executed before the *Cmd2* entry. For example, if your Super User or Root password were "Xyzy", you could use the following commands -

```
[ModProbe Commands for Linux]
Cmd1=echo Xyzy | sudo -v
Cmd2=sudo modprobe ftdi_sio vendor=0x0403 product=0xbd90
```

This command sequence should be suitable in most cases. If it is not, it will be necessary to consult the documentation which came with your Linux distribution to determine what the suitable command should be.

Additional Information for Macintosh Users

Macintosh installations are usually standardised but depending upon hardware connected an installation may become user specific and differ to others. While AXEpad for Macintosh has been designed to work with the majority of common configurations it may require tuning to work with your particular configuration.

Configuration tuning can be performed by editing the *axepad.ini* file stored in the user's preferences directory which will normally be -

```
:Users:username:Library:Preferences:
```

It is not required nor recommended to edit *axepad.ini* other than for such configuration tuning.

Before performing configuration tuning, ensure that MacAXEpad has been executed (this will create the default *axepad.ini* file) and ensure the MacAXEpad application has been closed before making any changes or they will be lost when MacAXEpad does close.

USB Serial Port Configuration

MacAXEpad is configured to use USB serial ports which appear with names in the form */dev/tty.usbserial-XXXX* where 'XXXX' will be a unique identifier for a particular USB serial port. Some USB Serial cables may present themselves differently to this, for example, */dev/tty.usbserial* or similar.

If your USB serial port does not use the */dev/tty.usbserial-XXXX* naming convention this can be changed by editing the *axepad.ini* file.

Locate the following lines -

```
[Target]
Port=0000101D
[Target for Mac]
MacPortPrefix=/dev/tty.usbserial-
```

Change the *MacPortPrefix* and *Port* entries so the two when concatenated will form the correct USB serial port to use. For example, to use */dev/tty.usbserial* the following would be suitable -

```
[Target]
Port=usbserial
[Target for Mac]
MacPortPrefix=/dev/tty.
```

The *MacPortPrefix* (*"/dev/tty."*) plus *Port* (*"usbserial"*) entries will give a concatenated USB serial port descriptor of *"/dev/tty.usbserial"* as required.

As an alternative, the following would be equally suitable -

```
[Target]
Port=serial
[Target for Mac]
MacPortPrefix=/dev/tty.usb
```

Again, the *MacPortPrefix* plus *Port* entries will give a concatenated USB serial port descriptor of *"/dev/tty.usbserial"* as required.