FIRMWARE UPGRADABLE

Activ8r

Combined Serial and Parallel Programmer for Atmel microcontrollers

USER MANUAL

(Revision 1.03)

CE

EQUINOX TECHNOLOGIES

EQUINOX TECHNOLOGIES UK LIMITED

The Embedded Solutions Company

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Electromagnetic Compatibility (EMC) Compliance

Statement of Conformity

The Activ8r Programmer is a CE Approved Product. It is designed only for use in a development environment. This means that the user must ensure that there is no possibility of damage from electrostatic discharge (ESD). Since the devices and equipment to which this product is likely to be connected may well themselves be susceptible to ESD, this should not pose any difficulty.

For example, if you are handling microcontrollers and EEPROMS etc. then you will already be used to appropriate precautions, such as the use of anti-static mats, wrist straps and so on. You should treat your Activ8r with the same care as you would these type of device. Always ensure that you are not yourself carrying a static charge before handling the product. Wearing an earthed anti-static wrist strap is recommended.

Equinox have taken great care in designing this product to be compliant with the European EMC directive. When using the equipment be sure to follow the instructions provided. Do not use any other mains power supply to power the Activ8r, so as to maintain the high standard of immunity to mains-borne interference afforded by the original power supply. Use of any cable to connect to the users' target system other than that supplied may cause an increase in RF emissions. Although RF emissions are within prescribed limits, care should be taken if you are using the product near to sensitive apparatus. If you experience any difficulty please refer to Equinox technical support.

Activ8r System Contents as declared Compliant with the EMC Directive:

- Equinox Power Supply Unit.
- Activ8r Programmer PCB assembly.
- 9 Way PC Serial Cable.
- 10 Way ISP Ribbon Cable.

ESD Points to remember

- Work in a static-free environment.
- Wear an earthed wrist strap when handling either the programmer and/or any programmable device.

Technical Support

It is often the case that users experience problems when installing or using a product for the first time. Due to the low-cost nature of this product, Equinox are unable to answer technical support questions about this product or its use by telephone.

If you have a technical support problem, please consult the following list for help:

1 This manual

2 Troubleshooting Guide (see page 26)

3 On-line help

Press <F1> for help at any time.

The help system is context-sensitive. Simply press <F1> on any error message and the possible causes of the error should be listed. This help system is updated on a regular basis. Please see software update details for information on keeping up-to-date with software revisions.

4 Internet Web Site

Equinox have setup an AVR microcontroller support page on our web site. This page is designed to provide up-to date information on all issues concerning both AVR microcontrollers and support tools.

The AVR support page can be found at: ***www.equinox-tech.com/avr***

The 8051 support page can be found at: ***www.equinox-tech.com/8051***

5 E-mail

Please e-mail any technical support questions about this product to: ***activ8r@equinox-tech.com***

Equinox will try our best to answer your questions about this product as quickly as possible. However, we can not promise an immediate reply. Please consult our web site for new software updates as the problem that you are enquiring about may have already been fixed in a new version.

6 Fax

Please fax any technical support questions about this product to: ***+44 (0) 1204 535555***

Equinox will try our best to answer your questions about this product as quickly as possible. However, we can not promise an immediate reply. Please consult our web site for new software updates as the problem that you are enquiring about may have already been fixed in a new version.

Contacts

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Web site ..... **: www.equinox-tech.com**

For technical support on this product please e-mail us at: activ8r@equinox-tech.com

Software Updates

In line with our policy of continuous improvement, the 'Meridian for Windows' software is updated on a regular basis. If you would like to receive an automatic e-mail every time a new version is released, please make sure you have registered your system with Equinox and you have quoted your e-mail address. You may cancel this service at any time.

The Meridian software updates can currently be downloaded from the following places:

Internet : www.equinox-tech.com

ftp site : ftp.equinox-tech.com

Atmel BBS : +1 408 436-4309

About Atmel Microcontrollers

Data sheets for these devices can be viewed and printed using the Acrobat pdf reader software supplied on the Atmel CD-ROM. As data sheets are often updated on a regular basis, it is recommended that you consult the Atmel web site for the latest information.

A few sources of further information about Atmel microcontrollers are listed below:

Atmel web site : www.atmel.com

Equinox web site : www.equinox-tech.com

If you have any silicon related technical support question about Atmel microcontrollers which can not be answered by looking at the Atmel/Equinox web sites, please e-mail:

For 8051 devices : ***mcu@atmel.com*** with a detailed description of the problem.

AVR devices : ***avr@atmel.com*** with a detailed description of the problem.

Important - Please note

Equinox Technologies are unable to answer direct technical support questions concerning AVR microcontrollers. Please contact your local Atmel distributor or sales office if you require any further information.

Contents

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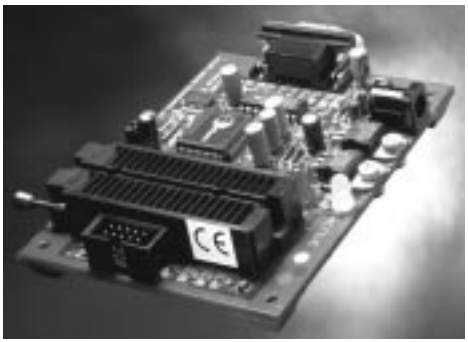
Introduction

The Activ8r is a state-of-the-art device programmer designed to support programming of Atmel microcontrollers. The programmer supports both parallel and serial (ISP) programming of many devices making it the ideal development programmer for either the Atmel AVR or 8051 microcontrollers.

The programmer features a quality 40-pin Zero Insersion Force (ZIF) socket which accepts most 8-pin, 20-pin and 40-pin dual-in-line (DIL) microcontrollers directly. Fast parallel programming in the ZIF socket is possible which also allows all the AVR fuse bits such as SPIEN and RCEN to be programmed.

The Activ8r also supports in-system programming (ISP) of suitable Atmel microcontrollers which feature serially downloadable FLASH/EEPROM memory. The Activ8r is supplied with an ISP cable which connects between the programmer and a suitable socket on the user target system. This allows microcontrollers to be programmed in-situe on the target system without physically removing the device from the socket.



The Activ8r Programmer can currently be supplied as a component of following systems:

AVR Professional Starter System
(AVR2-ST) Supports programming of the Atmel AVR (90S) RISC microcontrollers

AVR Professional Development System
(AVR1-8K-DV) A comprehensive suite of development tools for the Atmel AVR (90S) RISC microcontrollers

8051 FLASH Microcontroller Starter System
(EQ-8051-ST1) Supports programming of the Atmel 8051 & AVR microcontrollers

Programmer Highlights

- **Supports Atmel 8051 Microcontrollers in:**
  - Parallel Programming mode when using the ZIF socket
  - In-System Programming mode via ribbon cable (provided)
- **Supports Atmel AVR Microcontrollers in:**
  - Parallel Programming mode when using the ZIF socket
  - In-System Programming mode via ribbon cable (provided)
- **Support for Atmel ATmega Microcontrollers available as a chargeable upgrade**
- **Supports read/write of on-chip special function bits and security fuses**
- **Upgradable firmware stored in FLASH memory**
- **Connects to spare PC serial port**
- **Powerful PC interface software for Windows**
- **Compatible with Windows 3.1, 95 & NT**
- **CE compliant**

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Device Support

It is possible to program most Atmel AVR microcontroller devices using two different methods:

1 Parallel Programming Mode

In this mode the target device must be placed in the programmer Zero Insertion Force (ZIF) socket. It is possible to set certain 'Special Option' fuses in this mode which can not be altered in ISP mode.

2 Serial In-System Programming (ISP) Mode

This mode allows a device in a remote target system to be programmed without removing the device from the board. A special ISP cable is supplied with the programmer which plugs into the user target system.

This programmer supports in-system programming with a target Vcc of +5V only. When programming low voltage devices (e.g. @ +3V) it is necessary to use a voltage translator circuit, e.g. Order code: UISP-EXP1

Please note:

- Atmel AT89C1051, AT89C1051U, AT89C2051 & AT89C4051 microcontrollers can only be programmed in parallel programming mode.
- Atmel AT89S8252 and AT89S53 devices can only be programmed in serial programming mode.
- Atmel AT90S8535 and AT90S4434 microcontrollers are only supported in serial programming mode.
- Atmel ATmega microcontrollers can only be supported in serial programming mode. A chargeable upgrade is required to program these devices

Device Support Continued

The Activ8r Programmer has been designed to support Atmel AVR or Atmel 8051 microcontrollers depending on which system you have purchased. It is **NOT** possible to program both AVR & 8051 devices using the same programmer.

System	AVR2-ST		AVR1-8K-DV		EQ-8051-ST1	
	ZIF	ISP	ZIF	ISP	ZIF	ISP
Atmel 8051 Microcontrollers						
AT89C1051	✘	✘	✘	✘	✔	✘
AT89C1051U	✘	✘	✘	✘	✔	✘
AT89C2051	✘	✘	✘	✘	✔	✘
AT89C4051	✘	✘	✘	✘	✔	✘
AT89S8252	✘	✘	✘	✘	✘	✔
AT89LS8252	✘	✘	✘	✘	✘	✔
AT89S53	✘	✘	✘	✘	✘	✔
AT89LS53	✘	✘	✘	✘	✘	✔
Atmel AVR Microcontrollers						
AT90S1200(A)	✔	✔	✔	✔	✘	✘
AT90S2313	✔	✔	✔	✔	✘	✘
AT90S2323	✔	✔	✔	✔	✘	✘
AT90S2343	✔	✔	✔	✔	✘	✘
AT90S4414	✔	✔	✔	✔	✘	✘
AT90S8515	✔	✔	✔	✔	✘	✘
AT90S2333	✘	✔	✘	✔	✘	✘
AT90S4433	✘	✔	✘	✔	✘	✘
AT90S4434	✘	✔	✘	✔	✘	✘
AT90S8535	✘	✔	✘	✔	✘	✘
Please Note: Support for the ATmega is available as a chargeable update **Please Note**: Order Code - **ACT-UPG1**						
Atmel ATmega AVR Microcontrollers						
ATmega603(L)	✘	✔	✘	✔	✘	✘
ATmega103(L)	✘	✔	✘	✔	✘	✘

Key

ISP - In-System Programming

ZIF - Zero Insertion Force (Socket)

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System Specifications

Minimum PC Requirements

The minimum hardware and software requirements to ensure that the programmer operates correctly are as follows:

100% IBM compatible 386+

Windows 3.1 or higher

Minimum 4MB RAM

Minimum 1MB free hard disk space

Spare PC serial port

Activ8r Programmer Specifications

Programmer Size	10.5 x 8 x 2 cm
Shipped Weight	approx 1.5kg
PSU	15V DC @250mA
Port connection	Serial 9-way D-socket
ZIF socket	Quality 40way socket Accepts both 0.3/0.6" pitch devices
ISP Target Voltage	+5V DC
ISP Header	10-way IDC
ISP Vcc max current	20mA

Hardware/Software Installation Overview

The Hardware/Software Overview for the installation process of the Activ8r programmer is detailed diagrammatically below. Please refer to the following pages for a more detailed explanation.

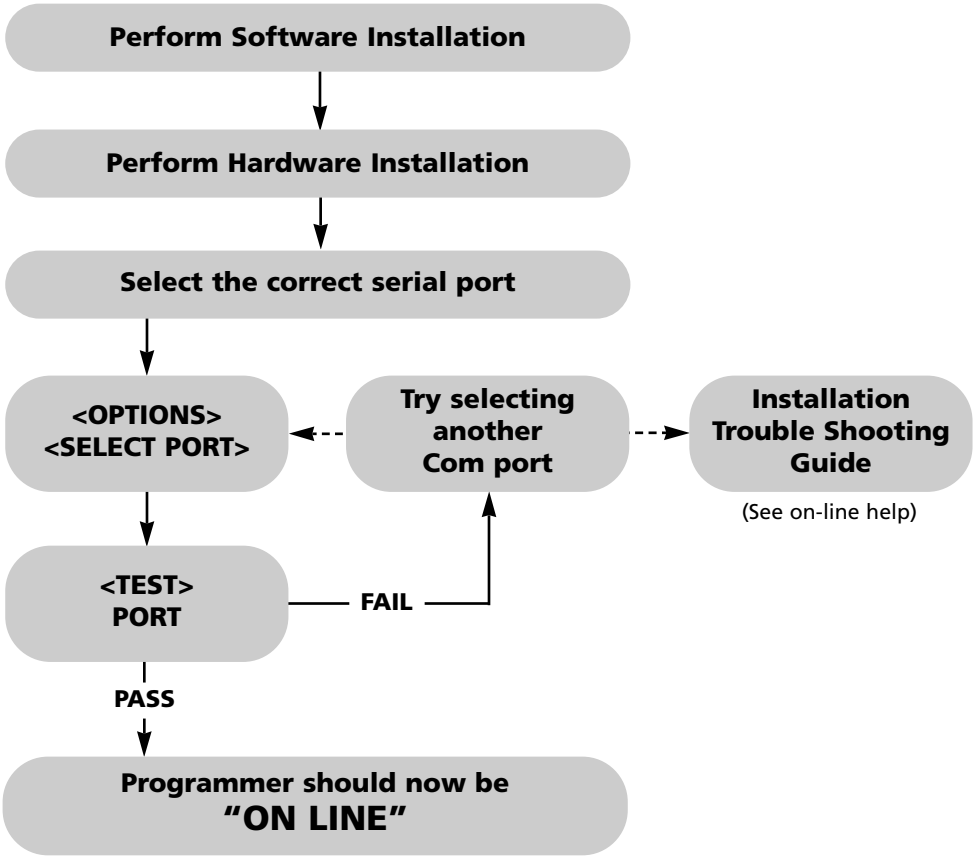

Figure 1

Software Installation

The Activ8r programmer is supplied with 'Meridian for Windows' PC driver software. This software is supplied on one 3.5" floppy disk.

To install 'Meridian for Windows' software:

- Boot the PC into Windows environment (Win 3.1, Win 95 & Win NT)
- Insert 'Meridian for Windows' disk into floppy disk drive (A: / B:)
- Select the 'Run...' command from the 'File' menu in the Program Manager
- Select 'Browse' and navigate to the floppy drive (A: / B:)
- Select 'Meridian.exe'
- Select the 'OK' button

The software installation program should now display an introductory screen. Please follow the on-screen prompts in order to complete the software installation process.

On completion, the installation program will install the 'Meridian' icon within a new program group called 'Meridian'.

To launch the software, simply double-click on the 'Meridian' icon.

Hardware Installation

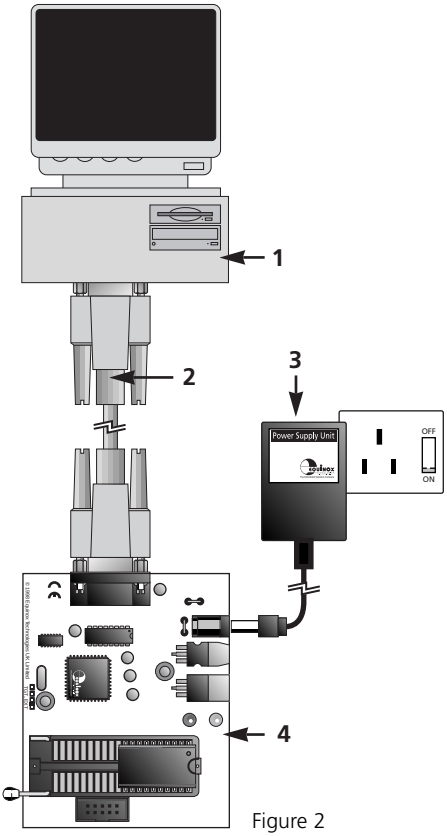

Figure 2

Key to main diagram

1 User PC
2 Serial Cable
3 Power supply Unit (PSU)
4 Activ8r programmer

1 Place programmer on flat surface.

2 Connect serial cable between programmer and spare PC serial (COM) port as shown in fig 3

3 Ensure the ZIF socket is empty.

4 Plug power connector into programmer.

5 Plug power supply unit into suitable wall socket and switch on mains power 'Power LED' (red) should now illuminate.

6 Select correct Serial (COM) Port (see Serial Port selection).

7 The installation is now complete.

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Serial Port Selection (Select Port)

The Activ8r programmer plugs into a spare serial port of any IBM compatible PC including the majority of laptop machines.

TO SELECT THE CORRECT SERIAL PORT

i. From the menu bar select <Options> <Select Port>

The available COM ports on your computer are now displayed.

ii. Select the COM port to which the programmer is connected

ii. Select a baud rate e.g. 56K

iii. Select <Test>
A programmer communications test is now performed.

This tests both the programmer, cable and PC serial port.

COMMUNICATIONS TEST PASS

The programmer has been detected OK by the Meridian software. If you now <Cancel> out of the <Test Port> dialogue box, the words 'ON LINE' should now be displayed at the bottom right of the Meridian Window.

Installation is complete and the programmer should now be ready to-use.

COMMUNICATIONS TEST FAIL

The programmer was not detected on the COM port selected. Please check that the correct COM port was selected, and if not, repeat the <Select Port> < Test> operation.

If your PC is not fast enough to operate at the default highest communication speed, it may be necessary to slow the communication down. This can be achieved by choosing a slower baud rate from the list provided.

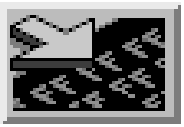
If the programmer is still not detected, please refer to the Installation Troubleshooting Guide located in the "On-Line" help.

Software Overview

The **Meridian for Windows** software features many powerful functions which can be activated by simply clicking a single icon. Other utilities and commands are available by selecting the relevant menu option.

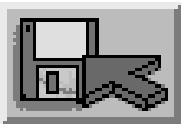
For further information about the **Meridian for Windows** software , please refer to the 'On-line Help System' supplied with the software (F1).

The most commonly used functions for which an icon exits are listed below.



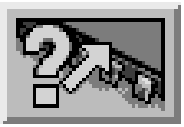
LOAD FILE TO BUFFER (F9 or Ctrl + L)

Allows you to select a file or multiple files and load the file(s) into the programmer buffer area(s). Currently supports Intel Hex and Binary file formats as standard.



SAVE TO DISK (Ctrl + S)

Allows you to save the contents of the buffer(s) to a file.
Currently supports Intel Hex and Binary file formats as standard.

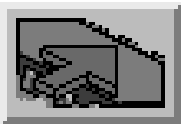


BLANK CHECK

Checks if the currently selected device is blank.
i.e. All locations = FFh

VERIFY DEVICE

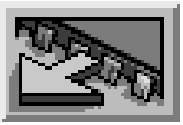
Compares the contents of the buffer area(s) with the contents of the currently selected device.



WRITE DEVICE

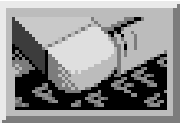
Writes with contents of the buffer into the device

Software Overview continued



DEVICE READ

Reads the contents of the currently selected device into the programmer buffer area(s).



ERASE DEVICE

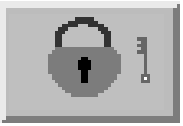
Performs an ELECTRONIC erase on the currently selected device.

DEVICE AUTO-PROGRAM

Performs a complete programming cycle including Signature Check, Erase, Blank check, Write, Special Options, Security etc.

SPECIAL OPTIONS

Allows you to READ/WRITE the special option bits of certain devices which support non-standard features.



SECURITY

Allows you to READ/WRITE the security lock bits of any device which supports this feature.

Hardware Overview

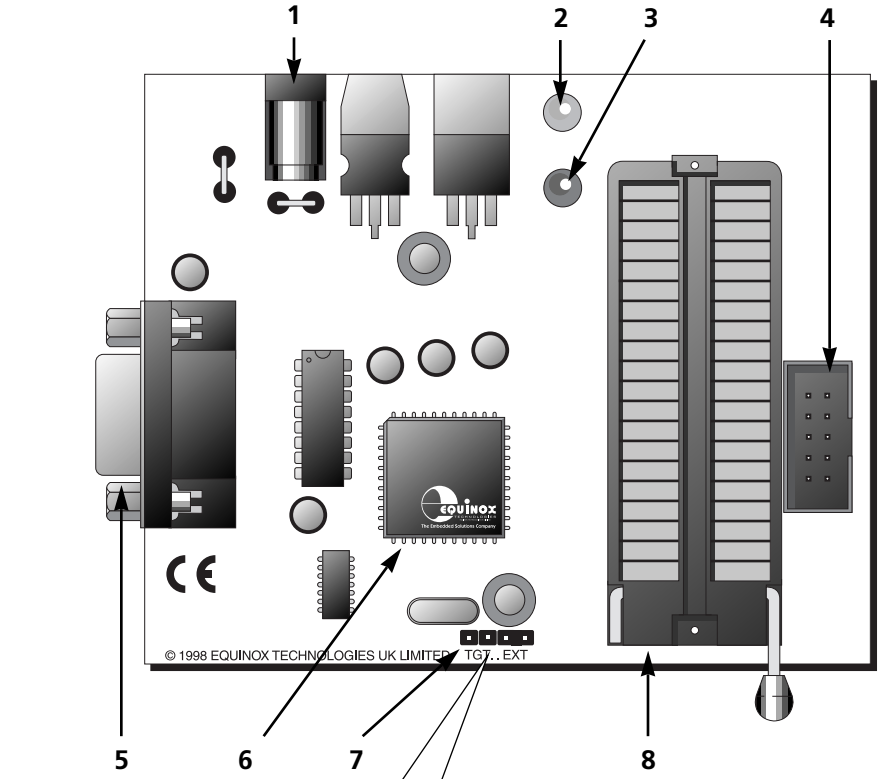
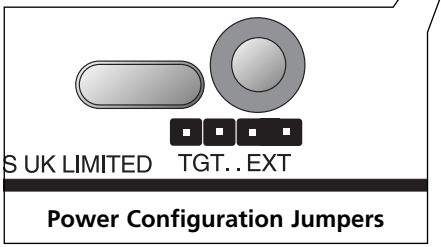


Figure 3



Power Configuration Jumpers

Key

1 PSU input
2 Active LED (Yellow)
3 Power LED (Red)
4 ISP Connector (10-way IDC Header Socket)
5 Serial Cable Connection to PC
6 Controller Chip
7 Power Configuration Jumpers
8 ZIF (Zero Insertion Force) socket (40-way)

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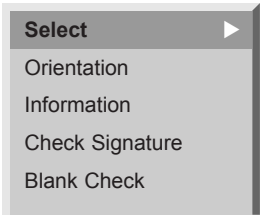
Device Programming Guide

It is necessary to select the particular device to be programmed as follows:

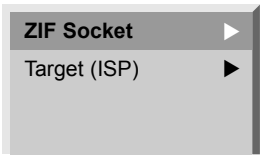
e.g. To select the Atmel **AT90S1200** microcontroller as the current device

1 Select the **DEVICE** menu and choose **SELECT**



2 You will now be presented with 2 options

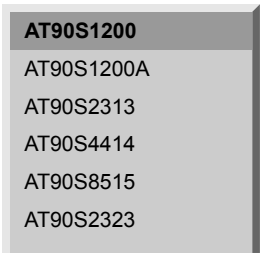
- **A ZIF Socket** Select this option if you wish program devices in the programmer ZIF socket
- **B Target (ISP)** Select this option if you wish program devices In-System via the ISP cable



3 A list of microcontroller devices currently supported is now displayed.

Select the device you require i.e. **AT90S1200**

The currently selected device is now active



To program a device in the ZIF Socket

1 Connect programmer as shown in the diagram

2 Ensure that the ISP lead is removed i.e. No remote target system is connected

3 Make sure that both power jumpers are inserted (see figure 5)

4 Select required device

5 Lift ZIF arm upwards

6 Insert device to be programmed in the correct position in the ZIF socket see fig 6 on page 14.

7 Close ZIF arm

8 Select required operation e.g. <READ> etc.

The 'Active LED' should illuminate during any programming operation.

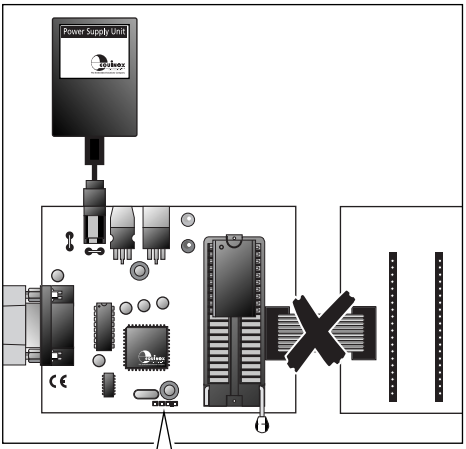
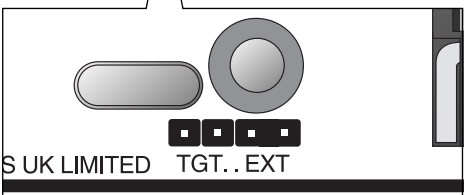
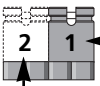


Figure 4



Power Configuration Jumpers

TGT/EXT



Jumper 1
Must be fitted at all times

Jumper 2

Fitted - Activ8r supplies power to the target system. For parallel programming mode it does not matter whether this jumper is fitted or not.

Not Fitted - Target system requires its own separate power supply.

Figure 5

NOTE!

Before inserting devices in the ZIF socket set up the software to configure your Activ8r appropriately. **YOU MAY CAUSE DAMAGE** to your devices or the programmer itself if you do not observe the above precautions. Equinox Technologies UK Limited or its distributors are not liable for any damage or losses which might be sustained under such circumstances.

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Device Position & Orientation

The Activ8r programmer accepts devices in dual-in-line (DIL) packages. The Zero Insertion Force (ZIF) socket caters for DIL devices with up to 40 pins and can also accept both 0.3" and 0.6" pitch devices.

To program SOIC, PLCC, TQFP or PQFP devices, you will need an adaptor, see 'Miscellaneous Accessories' appendix on page 26.

The diagram below shows the correct position and orientation of the target device in the ZIF socket. The position of pin 1 of the target device is marked by a dot.

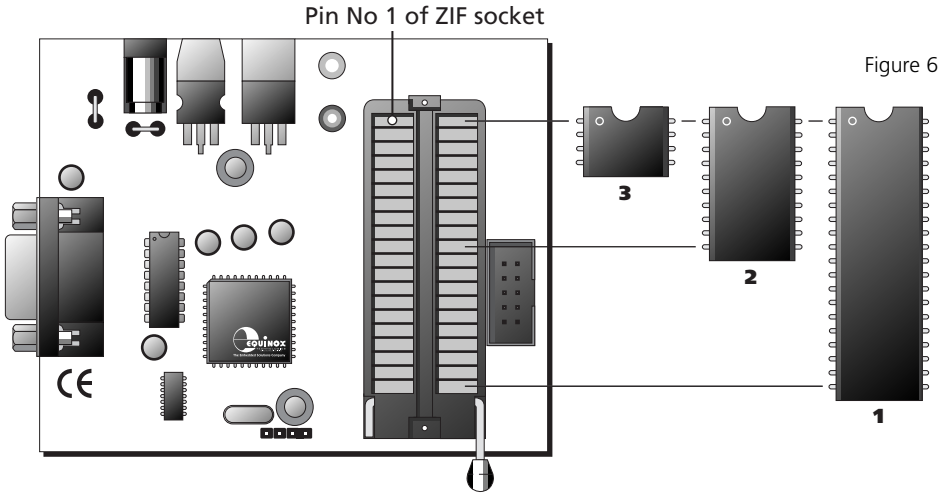

Figure 6

The correct position and orientation for the currently selected device can be displayed by selecting <Device><Orientation>.

IMPORTANT NOTICE

Equinox Technologies or it's distributors will not be held responsible for damaged caused to the programmer and/or the device being programmed due to incorrect insertion of the device in the ZIF socket.

Device Position & Orientation Key

1 Microcontroller (40 pin - 0.6" pitch)
e.g. AT90S4414, AT90S8515

2 Microcontroller (20 pin - 0.3" pitch)
e.g. AT90S1200, AT89C2051

3 Microcontroller (8 pin)
e.g. AT90S2323, AT90S2343

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To program a device in a user Target System

1 Make sure the programmer power & target system power is OFF

2 Perform <Device><Select> operation.

3 Make sure that both power jumpers are inserted (see figure 8)

4 Connect the programmer to target system using the ISP cable supplied see fig: 7.

5 Ensure that the ZIF socket is empty.

6 Make sure TGT/EXT power jumper selector is in the correct position.

7 Apply power to programmer and target system.

8 Select required programmer operation e.g. <Read> etc.

The 'Active LED' should illuminate during any programming operation.

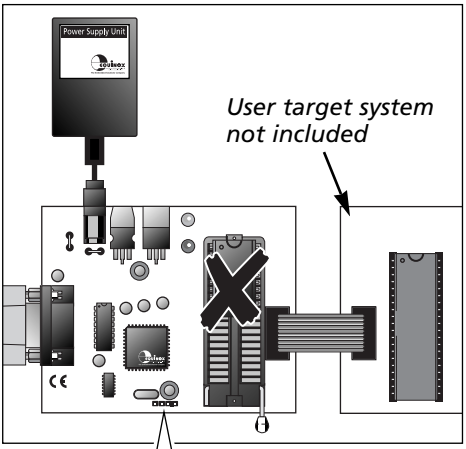
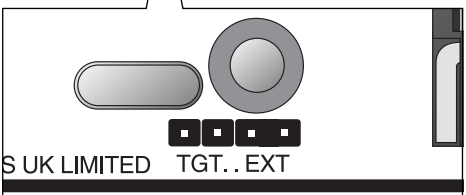
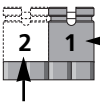


Figure 7



Power Configuration Jumpers

TGT/EXT



Jumper 1
Must be fitted at all times

Jumper 2

Fitted - Activ8r supplies power to the target system. For parallel programming mode it does not matter whether this jumper is fitted or not.

Not Fitted - Target system requires its own separate power supply.

Figure 8

NOTE!

1 Be careful not to exceed the maximum current of 20mA which can be drawn from the Activ8r

2 Before connecting the ISP ribbon cable to your target system, set up the software to configure your Activ8r appropriately. **YOU MAY CAUSE DAMAGE** to your devices, target system or programmer itself if you do not observe the above precautions. Equinox Technologies UK Limited or its distributors are not liable for any damage or losses which might be sustained under such circumstances.

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In-System Programming Overview

It is possible to In-System Program (ISP) members of the Atmel AVR(90S) microcontroller by utilising a serial programming algorithm based around the popular SPI 3-wire bus protocol. The Activ8r programmer implements ISP of these devices by generating the necessary SPI programming waveforms under control of PC software.

Atmel AVR™ microcontrollers feature a hardware SPI 'Programming' port. This consists of a 3 wires:

MOSI Master OUT Slave Input
MISO Master INPUT Slave Output
SCK Serial Clock

In order to place the target device into programming mode, it is necessary to assert the RESET pin of the target microcontroller as detailed in fig 8 on page 18

SPI Master/Slave definitions

The Activ8r programmer operates on the principle that during any programming operation the programmer is the SPI Master and the target device to be programmed is the SPI Slave.

Activ8r Programmer Target ISP Microcontroller(s)	SPI Bus Master SPI Bus Slave(s)

This status is only the case during ISP. The target microcontroller can be a master or slave during program execution (i.e. when it is programming code).

Typical Hardware Configuration for In-System Programming (ISP) Mode

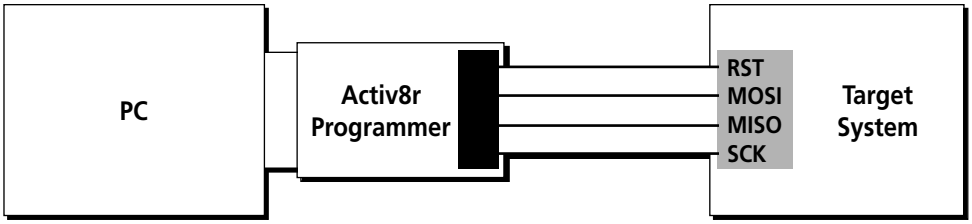


Figure 9

4-Wire ISP Scenario

In the simplest scenario where only one target ISP device is to be re-programmed, it is necessary to connect a minimum of FOUR control lines to your target system in order to implement ISP (see table below).

Pin	Name	I/O	Connection on target µC
4	MO	O	MOSI (SI) Incoming data from Activ8r (master)
6	MI	I	MISO (SO) Outgoing data from target µC (slave)
8	SCK1	O	SCK
10	RESET	O	RST

µC = Microcontroller

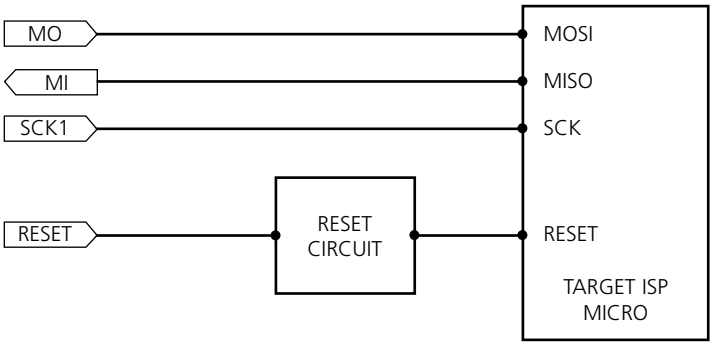


Figure 10

Target System Requirements

The following target system requirements must be met for the Activ8r programmer to operate correctly :

- **Target oscillator**

  The target microcontroller oscillator must be running between certain prescribed frequencies. These can be found in the relevant microcontroller data sheets. The oscillator could be an external crystal/resonator or could be an internal RC oscillator (e.g. AT90S1200 and AT90S2343).

- **Power**

  The Activ8r requires a regulated DC supply to operate. This supply can be taken either from the user target system or an external power supply unit (PSU). The programmer should operate correctly between the specified operating voltage limits (see hardware specifications).

- **RESET circuit**

  The serial programming mode of the 89S and AVR family devices is initiated by asserting the RESET pin in the correct sense for a certain period of time. The programmer must, therefore, be able to assert the RESET pin on the user target microcontroller. External control of the RESET pin can be implemented in a number of different ways. A typical example of a possible RESET circuit is shown in Fig: 8 on page 18.

Family	Reset Polarity
89S	Active High
AVR (90S)	Active Low

- **SPI Enable Fuse**

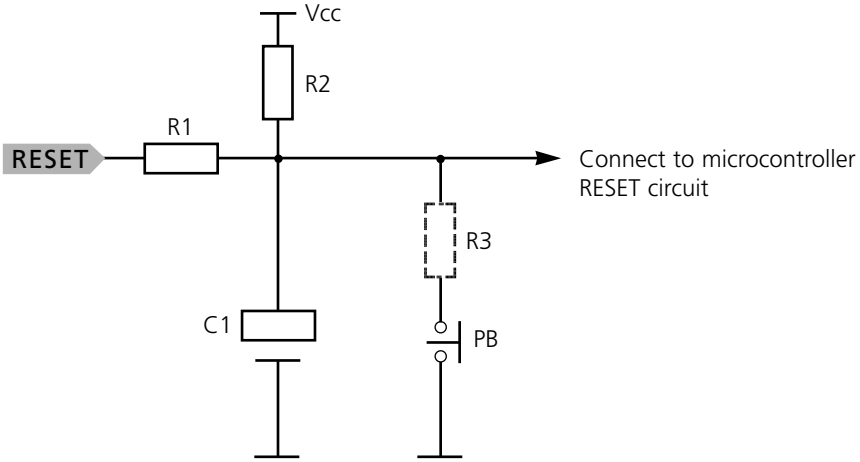
  The SPI Enable Fuse (SPIEN) must be ENABLED in the target microcontroller device for ISP programming to work. The SPIEN fuse can only be programmed in parallel programming mode with the device in the ZIF socket

RESET Circuits

Active Low Reset Circuit

Suitable for the Atmel AVR(90S) microcontroller family

Figure 11



Component	Typical Value	Function
R1	120 OHM	Current Limiting Resistor
R2	10k	Reset Time Constant
R3	1k	Optional Current Limiting Resistor
C1	10µF	Reset Time Constant
PB	-	Push Button Reset Switch

This reset circuit generates an ACTIVE LOW reset pulse when the push button PB is pressed and then released. The duration of the reset pulse can be adjusted by varying the values of the C1/R2 network. The resistor R1 is required to protect the programmer from a transient rush of current when the RESET line is asserted externally.

Important note:

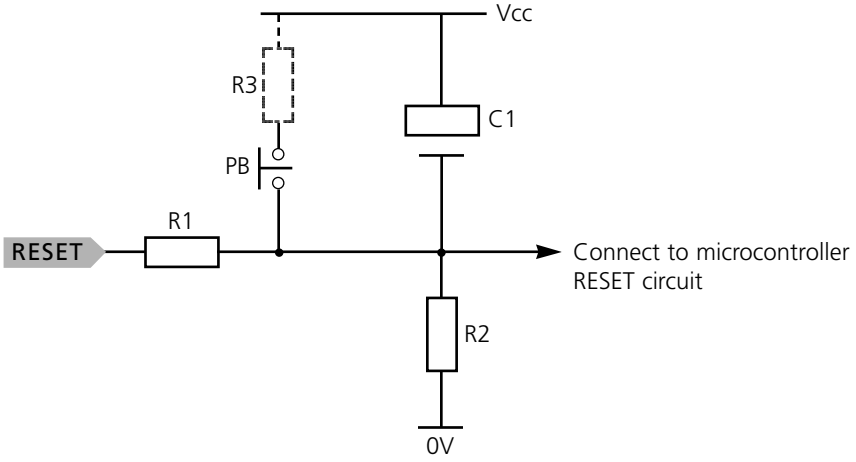
The above RESET circuit will not protect the microcontroller from EEPROM corruption in brownout conditions. Use of a suitable brownout protection circuit is highly recommended.

RESET Circuits Continued

Active High Reset Circuit

Suitable for the Atmel 8051 microcontroller family

Figure 12



Component	Typical Value	Function
R1	120 OHM	Current Limiting Resistor
R2	10k	Reset Time Constant
R3	1k	Optional Current Limiting Resistor
C1	10µF	Reset Time Constant
PB	-	Push Button Reset Switch

This reset circuit generates an ACTIVE HIGH reset pulse when the push button PB is pressed and then released. The duration of the reset pulse can be adjusted by varying the values of the C1/R2 network. The resistor R1 is required to protect the programmer from a transient rush of current when the RESET line is asserted externally.

Important note:

The above RESET circuit will not protect the microcontroller from EEPROM corruption in brownout conditions. Use of a suitable brownout protection circuit is highly recommended.

ISP Header Pin Assignments

Activ8r - Target System Connection Details

The 10-way ribbon cable supplied is terminated with a standard 10-way 0.1" pitch IDC plug. This is designed to mate with the complimentary male 10-way IDC header on the target system. The pin-out of the header is shown in figure 10:

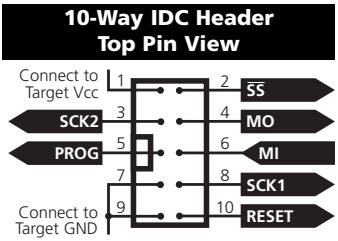


Figure 13

ISP Pin Assignments

Pin	Name	I/O	Micro-ISP	MCU	Connect
1	Vcc	-	Programmer Power (+Vcc)	Vcc	Y
2	$\overline{SS}$	O	SPI - Slave Select	x	x
3	SCK2	O	SPI - Serial Clock 2	N/C	x
4	MO	O	SPI - Master Output	MOSI	Y
5	PROG	O	Program LED / Assert	x	x
6	MI	I	SPI - Master Input	MISO	Y
7	GND	-	Programmer GND connection	GND	Y
8	SCK1	O	SPI - Serial Clock 1	SCK	Y
9	GND	-	Programmer GND connection	GND	Y
10	RESET	O	Target RESET control pin	RST	Y

Figure 14

Y This connection must be made
x Optional

Connector recommendations

The IDC connector supplied with the Activ8r programmer is 'bump' polarised so that it can not be inserted the wrong way around in a polarised socket. If the connector used on the target system is not polarised, it is advised that measures are taken to prevent the connector being plugged in the wrong way around. This could be achieved by removing pin 9 (a second ground) from the target header and placing a blanking piece of plastic in pin 9 of the cable header.

ISP Power-On Conditions

Signal power-on conditions

Signal Name	Signal Description	Header Pin	Power on condition
$\overline{SS}$	SPI - Slave Select	2	Tristate
MO (MOSI)	SPI - Master Output	4	Tristate
MI (MISO)	SPI - Master Input	6	Tristate
SCK1	SPI - Serial Clock 1	8	Tristate
SCK2	SPI - Serial Clock 2	3	Tristate
PROG	Program LED / Assert	5	Tristate
RESET	Target RESET control pin	10	Tristate

Figure 15

Upgrading the programmer firmware

This programmer features upgradable firmware technology which allows the actual control code within the programmer to be updated in the field. Upgrading the programmer firmware allows new features, new device algorithms and bug corrections to be added to the product in the future by means of a straightforward Windows reprogramming utility without having to return the product to Equinox. All new programmers are shipped with the latest firmware from Equinox, but if your system has been purchased from a distributor and has been in stock for a long period of time, it may be that the firmware version is out-of-date.

How do I check what version of firmware my programmer is running?

i. Make sure the programmer is plugged into a spare COM port and is powered up

ii. Launch the Meridian software -> The software should display "On Line"

iii. Select <Options><Programmer Info> -> The firmware revision and date of loading are displayed.

How do I update the programmer firmware?

If the firmware version of your programmer is older than that on the Equinox Web Site, please download the new files from the 'Software Updates' page. It is important that you download both the latest 'meridian.exe' and 'configit.exe' programs. If you follow the instructions supplied with the 'configit.exe' program, the whole process should take less than 90 seconds.

What do I do if there any problems?

If the firmware update fails for any reason, please check the instructions supplied with 'configit.exe' in the first instance. If the problem persists or he program reports that a code is needed from Equinox, please e-mail or fax the full details below to Equinox, and we will attempt to get you up and running as quickly as we can.

Details required:

Name, Company name, telephone number, fax number, e-mail, place of purchase, programmer serial number (usually printed on a label on the programmer) and any update code you are prompted to send.

Please note:

It is possible that the firmware upgrade process may fail and there might be a delay in receiving license codes back from Equinox. **PLEASE DO NOT** attempt to upgrade your firmware if your immediate design process depends on it!

AVR Support Products

Order code	Description
PROGRAMMING SYSTEMS	
AVR2-ST	Professional AVR Microcontroller Starter System
AVR1-8K-DV	Professional AVR Microcontroller Development System
AVR1-820K	Atmel AT90S1200/AT90S23x3 AVR Microcontroller Starter Kit
MPW-PLUS	Micro-Pro Professional Device Programming System
UISP-S3-SYS	Micro-ISP Series III Professional Serial Programming System
UISP-UPG1	Micro-ISP Upgrade: Atmel ATmega programming support
ACT-UPG1	Activ8r Upgrade: Atmel ATmega programming support
UISP-EXP1	Low Voltage (+3V) In-System Programming (ISP) Expansion Module
EVALUATION/OEM MODULES	
OEM-UC-20/40	Universal 8051/AVR Microcontroller OEM Module
EVALU8R-1P	Evalu8r - Universal 8051/AVR Microcontroller Evaluation Module
PACKAGE ADAPTORS ETC.	
AD-PLCC44-A	Programming adaptor - 44-pin PLCC to DIL-40
AD-DIL40-PLCC44-A	Emulation adaptor - 44-pin PLCC on target system to 40-pin DIL
AD-SOIC20-A	Microcontroller Programming adaptor - 20-pin SOIC to 20-pin DIL
AD-SOIC8-A	Microcontroller Programming adaptor - 8-pin SOIC to 8-pin DIL
AD-8535-A	Parallel programming adaptor - Atmel AT90S8535/AT90S4434 (40-pin DIL)
AD-TQFP44-A	Programming adaptor - 44-pin TQFP to 40-pin DIL
SS-90S8515-P	ISP Socket Stealer Module fitted with Atmel AT90S8515 microcontroller (DIL)
SS-90S8515-J	ISP Socket Stealer Module fitted with Atmel AT90S8515 microcontroller (PLCC)
AVR BASIC Programming Language	
AVR-BAS-LITE	AVR BASIC LITE Version (1K bytes - AT90S1200 support only)
AVR-BAS-8K	AVR BASIC 8K Version (8K bytes - All AVR derivatives supported)
AVR-BAS-FULL	AVR BASIC Full Version (8K bytes - All AVR derivatives supported)
AVR-BAS-8KF	AVR BASIC 8K to FULL version upgrade
IAR AT90S Language Tools	
EWA90BAS-EE	"IAR Baseline Tool Set" - C compiler, assembler, debugger (8K code limit)
EWA90	"IAR Full AT90S Version" - C compiler, assembler, debugger (unrestricted code)
DO-BOX (Dynamically Optimised BASIC Box) + Accessories	
DOBOX-ST1	DO-BOX Starter System 1
DOBOX-DV1	DO-BOX Development System 1
DOBOX-MOD1	DO-BOX Module 1
DOBOX-PM1	DO-BOX Prototyping Module
DOBOX-AM1	DO-BOX Applications Module 1
LITERATURE	
CD-AT98	Atmel CD-ROM Databook 1998
DB-AVR-981	Atmel AVR Microcontroller Data Book (Paper format)
MAN-AVRBAS-REF	AVR BASIC Reference Guide
MAN-AVRBAS-GS	AVR BASIC Getting Started Guide
MISCELLANEOUS	
CAB-SER1	PC Serial Cable Adaptor Kit (9W-25W & 25W-9W)
CAB-PAR25MM	PC Parallel Cable (25W to 25W M/M 2M)

8051 Support Products Guide

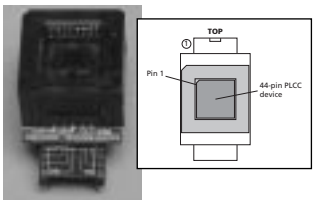
Order code	Description
Programming Systems	
AT-89C-2K-ST	Atmel 89C Microcontroller Starter System (Includes PK51-2K)
AT-89C-8K-DV	Atmel 89C Microcontroller Family Development System (Includes Keil PK51-8K)
MPW-PLUS	Micro-Pro Professional Device Programming System
EQ-8051-ST1	Flash 8051 Professional Starter System
UISP-S3-SYS	Micro-ISP Serial Programming System for the Atmel 89S/90S Microcontroller Families
AT-89S-ISP-TR-2K	Integrated 89S Microcontroller Training System (2K code)
AT-89S-ISP-TR-8K	Integrated 89S Microcontroller Training System (8K code)
AT-89S-ISP-SYS	ISP Programming System for the Atmel 89S Microcontroller Family
AT-89S-ISP-DV-8K	ISP Development System for the Atmel 89S Microcontroller Family (Includes Keil PK51-8K)
Evaluation/ OEM Modules	
AT-89C-X051-DEMO	Atmel 89C1051/2051 Credit Card Demo Module
AT-89C-X051-OEM	Atmel 89C1051/2051 OEM Module
EVALU8R-1P	Universal Microcontroller Evaluation Module
OEM-UC-20/40	Universal 8051/AVR Microcontroller OEM Module
Package Adaptors	
AD-PLCC44-A	Package Adaptor - PLCC-44 to DIL-40 (for programming/package conversion)
AD-DIL40-PLCC44-A	Package Adaptor - PLCC44 to DIL-40 (for emulation/package conversion)
AD-TQFP44-A	Programming adaptor - 44-pin TQFP to 40-pin DIL
AD-SOIC20-A	SOIC-20 to DIL-20 Adaptor Module
AD-8051-ICPP	In-Circuit Re-Programming Adaptor for the Atmel 89C & 89S Microcontroller Families
SS-89S8252-P	Atmel 89S8252 ISP 8051 Socket-Stealer Module (DIL-40)
SS-89S8252-J	Atmel 89S8252 ISP 8051 Socket-Stealer Module (PLCC-44)
Keil Development Language Tools	
PK51-2K	"Keil PK51 Lite - 2K C Compiler, Assembler & Software Simulator"
PK51-8K-UPG	Software Upgrade from PK51 Lite (2K) to PK51-8K version
PK51-8K-FULL	Software Upgrade from PK51-8K to Full version
PK51-MANUALS	"Keil Manual Set for PK51 (C51, A51 & Utilities)"
Literature	
CD-AT98	Atmel CD-ROM Data Book
DB-8051-981	Atmel 8051 Microcontroller Data Book
Miscellaneous	
LCD/KPD-V1	Intelligent LCD/Keypad OEM Module (RS-232 / 1K EEPROM)
Memory Emulation Products	
ICEPROM512K-80	icePROM EPROM/ Flash Emulation System
PLCC32 HEAD	icePROM 32 pin PLCC Adaptor
DIP40 HEAD	icePROM 40 pin DIP Adaptor

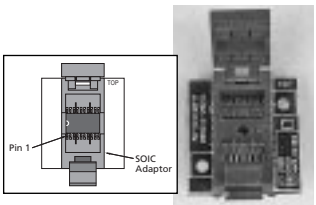
Miscellaneous Accessories

Adaptors

	AD-PLCC44-A	AD-SOIC20-A	AD-SOIC8-A	AD-TQFP44-A
Atmel AVR microcontrollers				
AT90S1200	✗	✔	✗	✗
AT90S1200A	✗	✔	✗	✗
AT90S2323	✗	✗	✔	✗
AT90S2343	✗	✗	✔	✗
AT90S4414	✔	✗	✗	✔
AT90S8515	✔	✗	✗	✔
AT90S4434	✔	✗	✗	✗
AT90S8535	✔	✗	✗	✗
Atmel 8051 microcontrollers				
AT89C1051	✗	✔	✗	✗
AT89C1051U	✗	✔	✗	✗
AT89C2051	✗	✔	✗	✗
AT89C4051	✗	✔	✗	✗
AT89C51	✔	✗	✗	✔
AT89C52	✔	✗	✗	✔
AT89C55	✔	✗	✗	✔
AT89S8252	✔	✗	✗	✔
AT89S53	✔	✗	✗	✔

44-pin PLCC adaptor illustrated





20-pin SOIC adaptor illustrated

Cables

CAB-PAR25MM

PC Serial Cable Adaptor Kit (9W-25W to 25W-9W)

Power Supplies

PSU-15250-UK, PSU-15250-US, PSU-15250-EU

Mains Power Supply Adaptor 15V@250mA
Suitable for use with : Micro-PRO Programmer
Activ8r Programmer

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Troubleshooting Guide

1 Installation problems

- Does your PC meet the minimum PC requirements of this product?
- Do you have spare PC serial port?
- Have you connected the serial cable from the PC COM port to the Activ8r?
- Have you selected the correct COM port?
- Is the serial port already in use by another application?

2 Programming Devices in the ZIF socket

- Have you selected 'ZIF Socket' from the <Device><Select> menu?
- Have you selected the correct device?
- Is the device in the correct position and orientation in the ZIF socket?

3 In-system programming (ISP)

- Are the MOSI, MISO, SCK1 and RESET connection from the target system correctly wired?
- Does the target RESET circuit allow remote control of the RESET line from the Activ8r?
- Is the target system powered up to +5V?
- Are the 'Power Configuration Jumpers' in the correct position?
- Is the target microcontroller ISP enabled (i.e. SPIEN = ENABLED)?
- Is the target oscillator (internal or external) running?

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