

About AVR Microcontrollers

Atmel now manufacture a complete family of AVR microcontrollers each with differing FLASH, EEPROM, SRAM and number of I/O pins. Data sheets for these devices can be viewed and printed using the Actobat 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 AVR microcontrollers are listed below:

Atmel web site : www.atmel.com

Equinox web site : www.equinox-tech.com/avr.htm

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

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Introduction

The Micro-ISP is a state-of-the-art device programmer supporting the new range of In-System Programmable (ISP) microcontrollers from Atmel. These microcontrollers feature serially downloadable memory allowing both CODE and DATA (if device features EEPROM) areas to be updated in-system without physically removing the target device from the application board. The serial programming is based around the industry standard SPI protocol which is a 3-wire bus featuring two data lines and a clock line.

The Micro-ISP programmer currently supports the Atmel 89S and AVR™(90S) microcontroller families as standard. Future support is planned for serial SPI EEPROM's, microcontroller + EEPROM and multiple microcontroller ISP scenarios. This will be made available as an additional chargeable library

The Micro-ISP programmer features extremely fast programming speeds due to the use of dedicated hardware to generate the SPI waveforms.

Please Note:

This programmer is designed for development use only.

MICRO-ISP DEVICE PROGRAMMER HIGHLIGHTS

- State-of-the-art Device Programmer
- Supports serial programming of:
 - Atmel 89S microcontroller family
 - Atmel 90S(AVR™) microcontroller family
- Device Manufacturer Certification for many algorithms
- Connects to spare PC Serial Port
- Straightforward hardware/software installation
- Supports programming of security lock bits

FAST programming times due to:

- Enhanced serial programming algorithm
- SPI programming waveforms generated by dedicated hardware

Future support (chargeable update):

- SPI EEPROMS's
- Multiple Microcontroller ISP scenarios
- Microcontroller + SPI EEPROM scenarios

Device Support

ATMEL 89S FLASH MICROCONTROLLER FAMILY

AT89S8252
AT89S53

ATMEL 89LS FLASH MICROCONTROLLER FAMILY

AT89LS8252*
AT89LS53*

* See the low voltage section on page 23

ATMEL 90S (AVR) MICROCONTROLLER FAMILY

AT90S1200
AT90S1200A (same as AT90S1200 with RCEN Enabled)
AT90S2313
AT90S2323
AT90S4414
AT90S8515

ATMEL AT MEGA FLASH MICROCONTROLLER FAMILY

ATMEGA103
ATMEGA103L

Please Note:

Some of the above devices may have been at silicon sample stage at the time of writing this manual. Please obtain a software update from the Equinox web site to make sure you have the most up-to-date version

System Specifications

MINIMUM SYSTEM CONTENTS

The Micro-ISP programmer is available as a stand alone item or as part of a larger system. The minimum system contents are as follows:

Micro-ISP Device Programmer
'Meridian for Windows' Software Disk

MICRO-ISP SERIAL PROGRAMMER SPECIFICATIONS

Programmer Size : 55 x 53 x 16mm
Shipped Weight : Approx 0.10kg
PC Connection : Serial Port 25-pin female D Connector
Programming Cable : Length 300mm
Header : 10-way IDC 0.1" pitch
bump polarised
Power Supply : Requires power from target system or external power supply
V_{cc}: 4.0 - 5.8v
I_s (supply): 50mA max

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

Hardware Overview

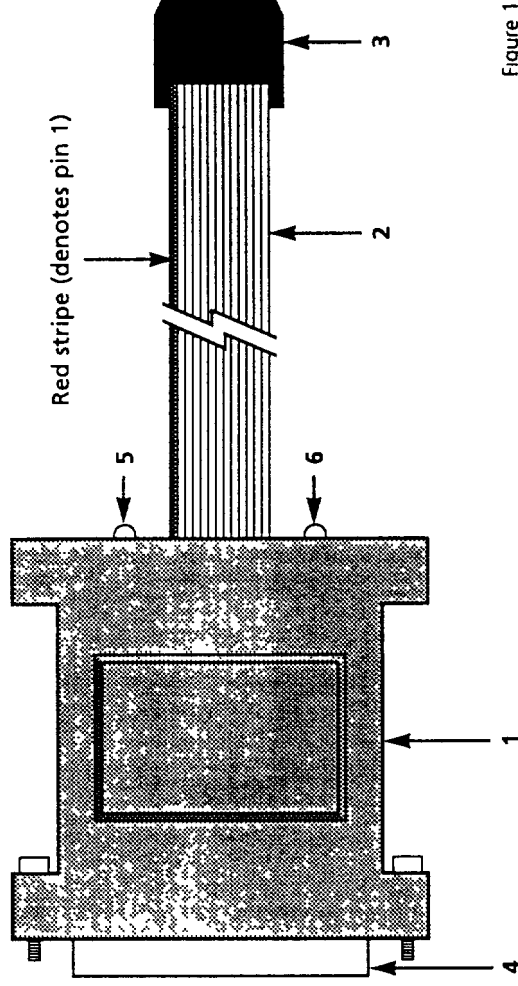


Figure 1

Key

- 1 Micro-ISP Programmer
- 2 Serial Programming Cable (length approx 300mm)
- 3 10-way IDC Header Plug
- 4 25 pin female D-Connector (plugs into PC serial port)
- 5 Power LED
- 6 Active LED

Hardware/Software Installation Overview

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

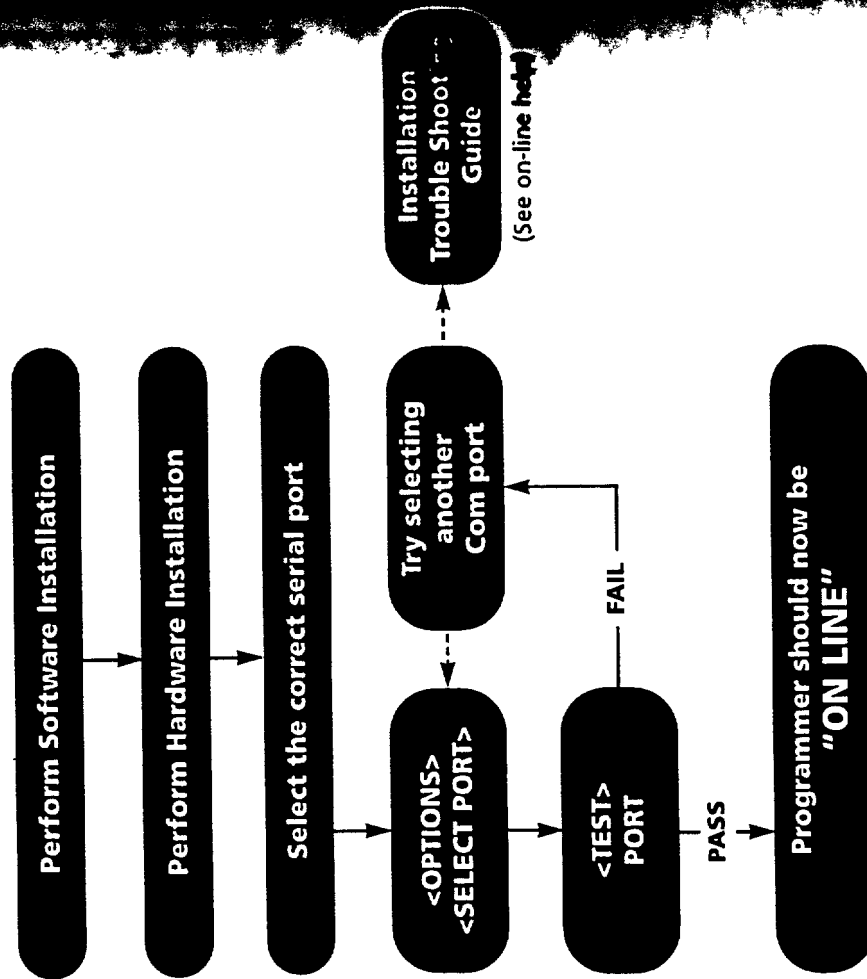


Figure 2

Software Installation

The Micro-ISP 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 or Win 95)
- 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 'Equinox'.



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

Hardware Installation Instructions

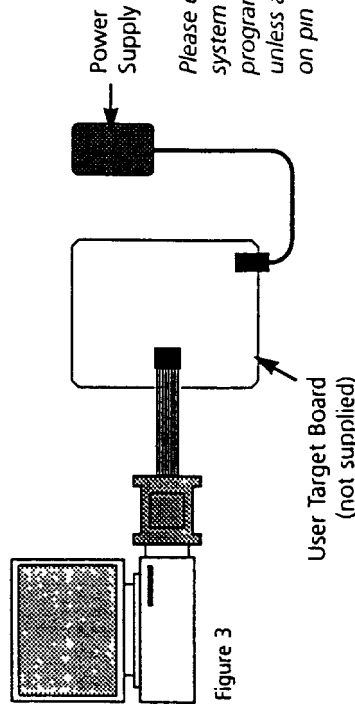
OVERVIEW

The Micro-ISP programmer connects to any spare PC **serial** (COM) port. If you only have one serial port and this is in use for eg. a modem, it may be possible to add another serial port to your machine by inserting a new I/O card.

For further hardware installation help, please refer to the: **Installation Troubleshooting Guide**.

Connect the programmer to the PC as follows:

- 1 Plug Micro-ISP programmer into spare PC serial port.
- 2 Connect IDC plug at the end of the serial programming cable into the 10-way IDC header on the user target board (not supplied).
- 3 Apply power to the target board (The Micro-ISP draws its power from the target)



Serial Port Selection (Select 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 Micro-ISP 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.

The Micro-ISP 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

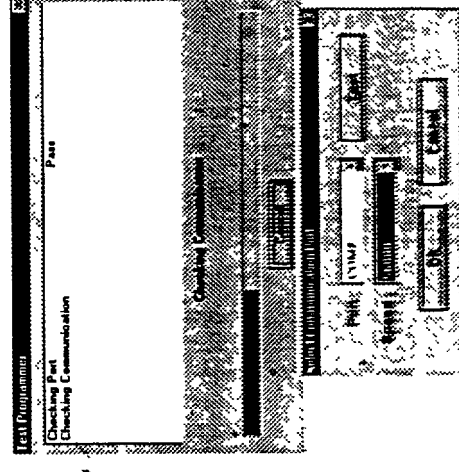
- ii. Select the COM port to which the programmer is connected

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

- iii. Select <Test>

A programmer communications test is now performed.

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



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 exists 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. ie. 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



RESET

Controls the reset line of the target ISP device
(Not currently implemented)

Micro-ISP Power-On Conditions

Signal power-on conditions

Figure 4

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

ISP Header Pin Assignments

Micro-ISP - 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 complementary male 10-way IDC header on the target system. The pin-out of the header is shown in figure 5

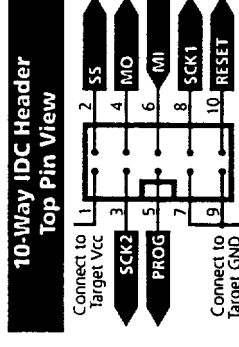


Figure 5

Note:
This is the view of the connector fitted to the target
(e.g. Eval8r) board, as seen from above
(the component side)

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

Y This connection must be made
x Optional

Figure 6

Connector recommendations

The IDC connector supplied with the Micro-ISP 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.

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 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



In-System Programming Overview

It is possible to In-System Program (ISP) members of the Atmel 90S(AVR™) microcontroller by utilising a serial programming algorithm based around the popular SPI 3-wire bus protocol. The Micro-ISP 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 16

SPI Master/Slave definitions

The Micro-ISP 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.

Micro-ISP Programmer
Target ISP Microcontroller(s)

SPI Bus Master
SPI Bus Slave(s)

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

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

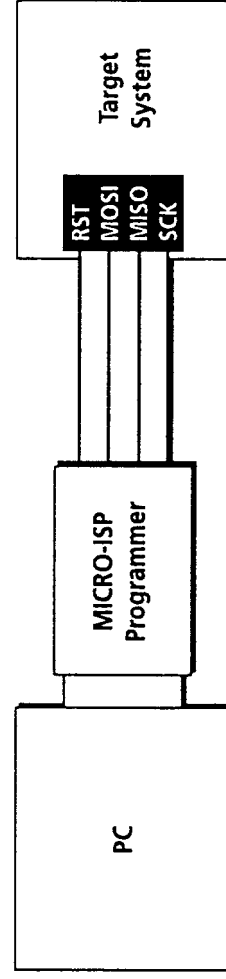


Figure 7

Target System Requirements

The following target system requirements must be met for the Micro-ISP 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 (eg AT90S1200)

- **Power**

The Micro-ISP 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 90S 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**

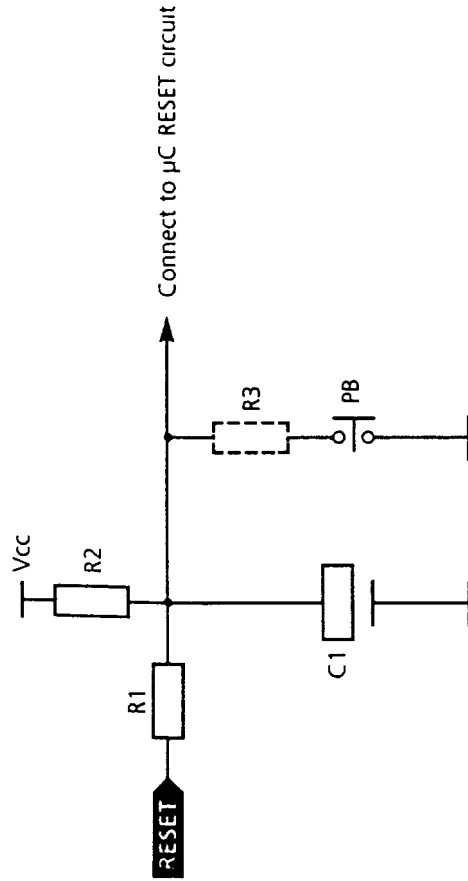
The SPI Enable Fuse (SPIEN) must be ENABLED in the target microcontroller device for ISP programming to work. The SPIEN fuse can only be programmed in parallel programming mode with the device in the ZIF socket

RESET Circuits

Active Low Reset Circuit

Suitable for the Atmel 90S(AVR™) microcontroller family

Figure 8



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 C/R2 network. The resistor R1 is required to protect the programmer from a transient spike of current when the RESET line is asserted externally

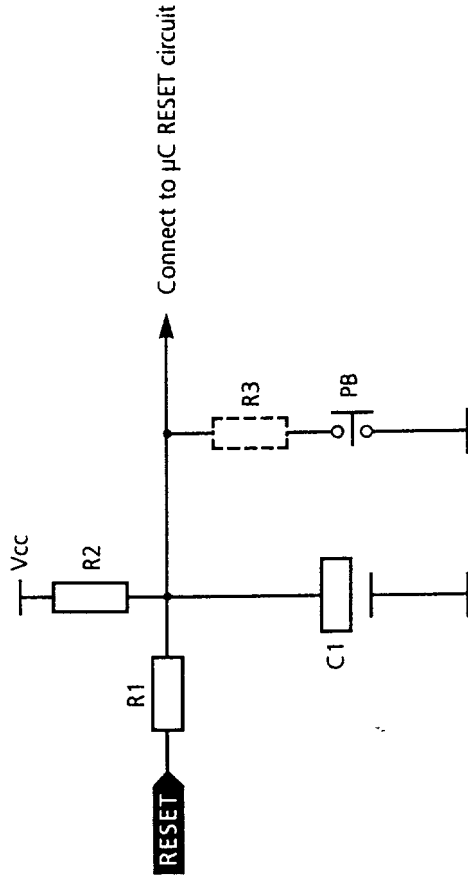
Note for this and subsequent circuit diagrams:
Suggested circuits are offered in good faith,
will not be liable in any way for any
which might arise out of their use.

RESET Circuits Continued

Active Low Reset Circuit

Suitable for the Atmel 90S(AVR™) microcontroller family

Figure 9



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

* Please see disclaimer on page 16

89S Microcontroller & Watchdog

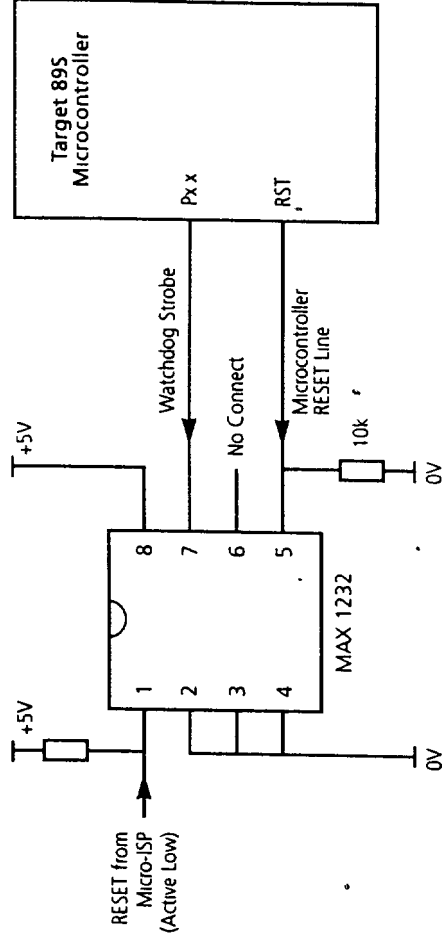


Figure 10

* Please see disclaimer on page 16

AVR Microcontroller & Watchdog

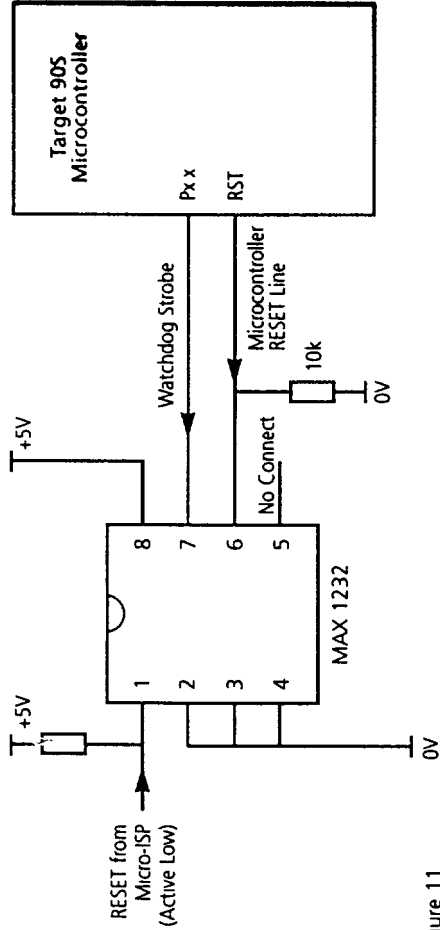
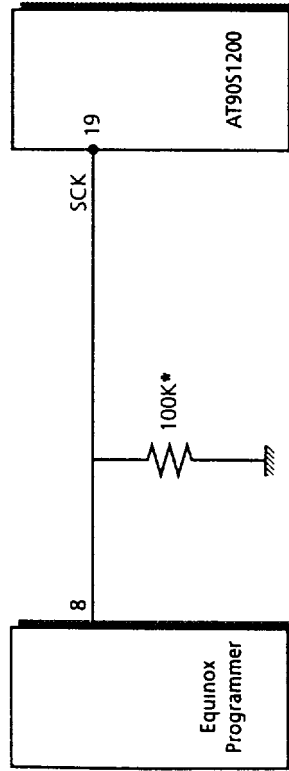


Figure 11

* Please see disclaimer on page 16

AT90S1200 ISP Notes



* May be required to overcome feature in silicon

It is necessary to have nominal pull-down resistance on the SCK line when using the AT90S1200 microcontroller. This can help to prevent spurious noise from entering the SCK pin. In extreme circumstances, omission of this component may prevent the target device from going into programming mode.

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	I/O	Connection on target μ C
4	O	MOSI (SI) Incoming data from Micro-ISP (master)
6	I	MISO (SO) Outgoing data from target μ C (slave)
8	O	SCK
10	O	RST

μ C = Microcontroller

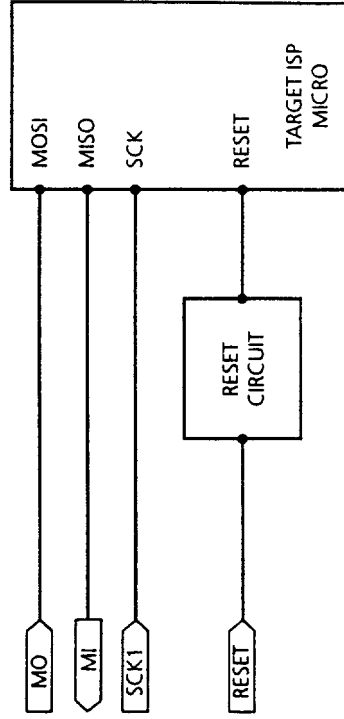


Figure 12

* Please see disclaimer on page 16

4 Wire ISP Scenario Continued

Advanced ISP Scenario

Some devices such as the 89S8252 feature a $\overline{SS}$ (Slave Select) pin which is also part of the SPI port. This pin is only used when the target microcontroller is in execution mode (ie running user code) and does not take any part in the serial re-programming algorithm of these devices. This pin need therefore not be connected to the Micro-ISP for ISP.

It is possible to use the Micro-ISP programmer to assert the $\overline{SS}$ pin when the target microcontroller is in execution mode. This may be useful during testing of user target code. The $\overline{SS}$ pin would need to be connected to the Micro-ISP programmer to implement this functionality.

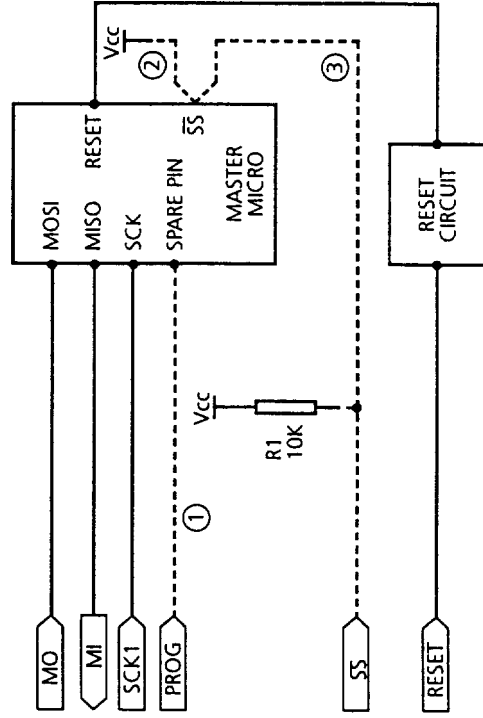


Figure 13

Serial Downloading Waveforms

1. 89S Microcontroller Family

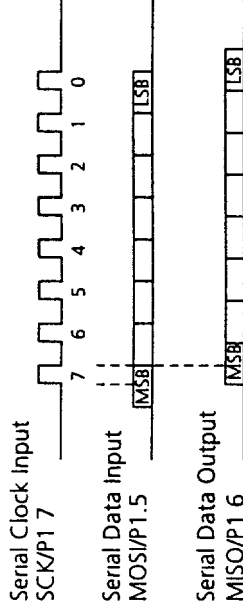


Figure 14

2. 90S Microcontroller Family

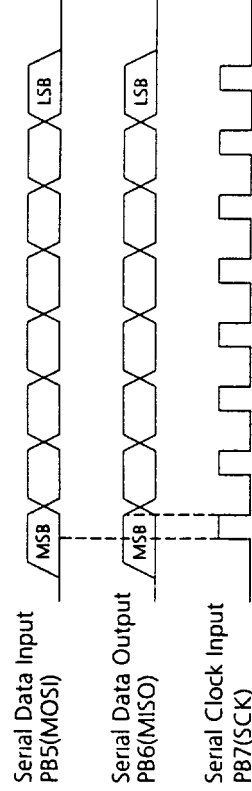


Figure 15

Information Source

AT90S1200 Data sheet (Chapter 2) in the Atmel AVR™ Data Book (May 97)

Disclaimer

Whilst information is supplied in good faith we are not liable for any errors or omissions

Low Voltage ISP Programming Support Issues

Both the 'Micro-ISP' and 'Activ8r' programmers have been designed to support the function of in-system programming of an Atmel microcontroller when the target supply is +5V. If your target system operates from a lower voltage supply than +5V, it is necessary to implement a simple hardware interface to protect both your target system and the programmer from possible damage.

The Micro-ISP programmer derives its operating power from the user's target system via the 10-way ribbon cable supplied. This supply should have a common ground (0V) line to the user's target. One way to effect this would be to use a simple adaptor cable with the +5V line brought out separately to, e.g., a bench power supply. (see fig. 16)

This adaptor should also be used to incorporate current limiting series resistors in the data lines. This is because the voltage swings on those signals generated by the programmer are between +5 volts and ground and, as such, will exceed the Vcc rail on a low voltage target system. Without the inclusion of some form of current limiting, this swing could cause damage to the target's microcontroller. We suggest the use of 4K7 series resistors so as to limit current to approximately 1mA.

Further, it is good practice to include similar resistors in the signal lines from the target to the programmer. This prevents excess current from flowing if the programmer is unpowered but the target has power applied. The target RESET line is clamped to the target Vcc by a low drop diode, with a lower value series resistor to give a low impedance RESET signal.

Further notes:

Care should be taken in the design of the user target system so as to ensure that the programmer can switch all signal lines to 0V and the supply. If series limiting resistors are used as suggested above, please ensure that any other pull-up or pull-down resistors on the SPI bus do not prevent the programmer from switching these lines properly. If in doubt, remove any other SPI pull-up/down resistors and then try programming.

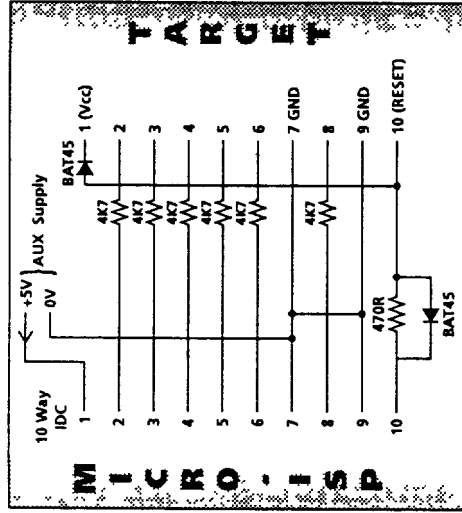


Figure 16
The target RESET line is clamped to the target Vcc by a low drop diode, with a lower value series resistor to give a low impedance RESET signal

AVR™ & 89S Microcontroller Support Products

Part code	Description
Device Programming Systems	
NEW MPW51	"Micro-Pro Device Programming System (without security dongle, CD & databook)"
NEW UISP-S3-SYS	Micro-ISP Serial Programming System for the Atmel 89S90S Microcontroller Families
Atmel AVR™(90S) Microcontroller Support Products	
NEW AVR2-ST	AVR™ Professional Starter System
NEW SS-90S8515-P	Atmel 90S8515 - AVR™ ISP Socket Stealer(DIL-40)
NEW SS-90S8515-J	Atmel 90S8515 - AVR™ ISP Socket Stealer (PLCC-44)
NEW EVALU8R-1P	Universal Microcontroller Evaluation Module
NEW AVR-BAS-LITE	AVR™ BASIC Lite
Programming/Package Adaptors	
AD-PLCC44-A	Package adaptor - PLCC-44 to DIL-40 (for programming/package conversion)
AD-DIL40-PLCC44-A	Package adaptor - PLCC 44 to DIL-40 (for emulation/package conversion)
AD-SOIC20-A	SOIC-20 to DIL-20 Adaptor Module (for AT90S1200/2313 SOIC packages)
Atmel Microcontroller Evaluation & Development Modules	
OEM-µC-20/40	"Generic microcontroller Single-chip OEM module (supports 20 & 40pin 87C, 89C, 89S, AVR™, derivatives)"
Atmel 89S (80S1) ISP Microcontroller Support Products	
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)
AT-89S-ISP-ST	ISP Starter System for the Atmel 89S Microcontroller Family (Includes Keil PK51-2K)
AT-89S-SS-DIL	Atmel 89S8252 ISP 80S1 socket-stealer module (DIL-40)
AT-89S-SS-PLCC	Atmel 89S8252 ISP 80S1 socket-stealer module (PLCC-44)

Associated Products

Micro-ISP Compatible Target Systems

The products listed below have been specially designed to interface with the Micro-ISP programmer

- **Evalu8r**

The Evalu8r is a feature-packed evaluation module which has been specially designed to support a variety of different single-chip microcontrollers. Support is offered for Atmel 8 pin, 20-pin and 40-pin AVR microcontrollers, together with support for 20-pin and 40-pin 8051 microcontrollers

- **8051 ISP Socket Stealer (AT-895-SS-DIL)**

Plugs into most 40-pin DIL generic 8051 microcontroller sockets. Ideal for 89S ISP evaluation and small production runs where target board redesign would be more expensive or where time constraints have been imposed

- **OEM-20/40 Module (OEM-UC-20/40)**

Universal OEM Module for the AVR™ Family (features ISP header - also supports most 8051 derivatives).

- **ISP-EXT**

Serial port extension cable

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 Micro-ISP?
- Have you selected the correct COM port?
- Is the serial port already in use by another application?

2 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 Micro-ISP?
- Is the target system powered up to +5V?
- Is the target microcontroller ISP enabled (ie SPIEN = ENABLED)?
- Is the target oscillator (internal or external) running?
- Is the target SPI frequency correct for the target oscillator frequency being used

Micro-ISP

Series III

Serial Programming System
for the Atmel 89S and AVR™
microcontroller families
(Development use only)

USER MANUAL

(Version 2.02)



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Every effort was made to ensure accuracy in this manual and to give appropriate credit to persons, companies and trademarks referenced herein.

Electromagnetic Compatibility (EMC) Compliance

The Micro-ISP 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 Micro-ISP 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. 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.



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 24)
- 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 microcontroller support page can be found at: www.equinox-tech.com

- 5 E-mail**
Please e-mail any technical support questions about this product to microisp@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

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

For technical support on this product please e-mail us at:
microisp@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](ftp://ftp.equinox-tech.com)

Atmel BBS : +1 408 436-4309