



# Evalu8r

State-of-the Art Evaluation  
Module for 8, 20 & 40-pin  
Microcontrollers

## PRODUCT GUIDE

(Version 2.00)



**The Embedded Solutions Company**

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## Introduction

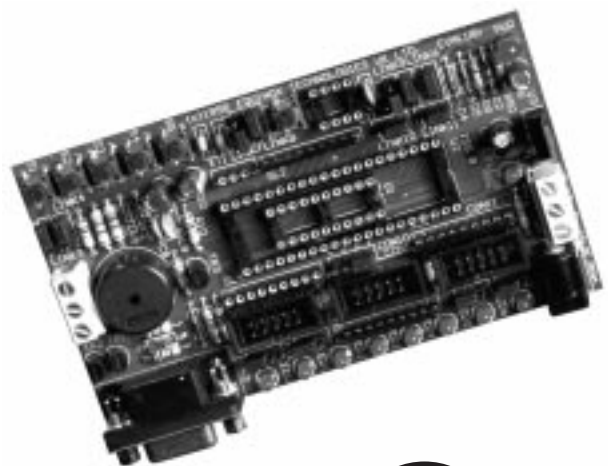
**The Evalu8r is a feature-packed evaluation module which has been specially designed to support a variety of different single-chip microcontrollers. Support is offered for for Atmel 8-pin, 20-pin and 40-pin AVR microcontrollers, together with support for 20-pin and 40-pin 8051 microcontrollers. The module supports a wealth of typical microcontroller peripherals including LED's, push buttons, sounder, A/D and serial communications. There is also the provision for two 8-bit ports to be brought out via headers allowing the user to develop off-board circuitry.**

The Evalu8r module features an In-System Programming (ISP) port which allows the Atmel microcontrollers which support ISP to be programmed in-situe in the socket. The ISP port is designed to interface to any Equinox serial programmer including the 'Micro-ISP' and 'Activ8r'. Even the new Atmel AVR 8-pin microcontroller family (AT90S2323/AT90S2343) is supported by this module. It is also possible to place serial EEPROM's in the 8-pin socket and then communicate to these device from the master microcontroller.

The 'Evalu8r' module is now supplied as standard in both AVR and 8051 microcontroller systems. Many sample application programs based on this module are already in existence.

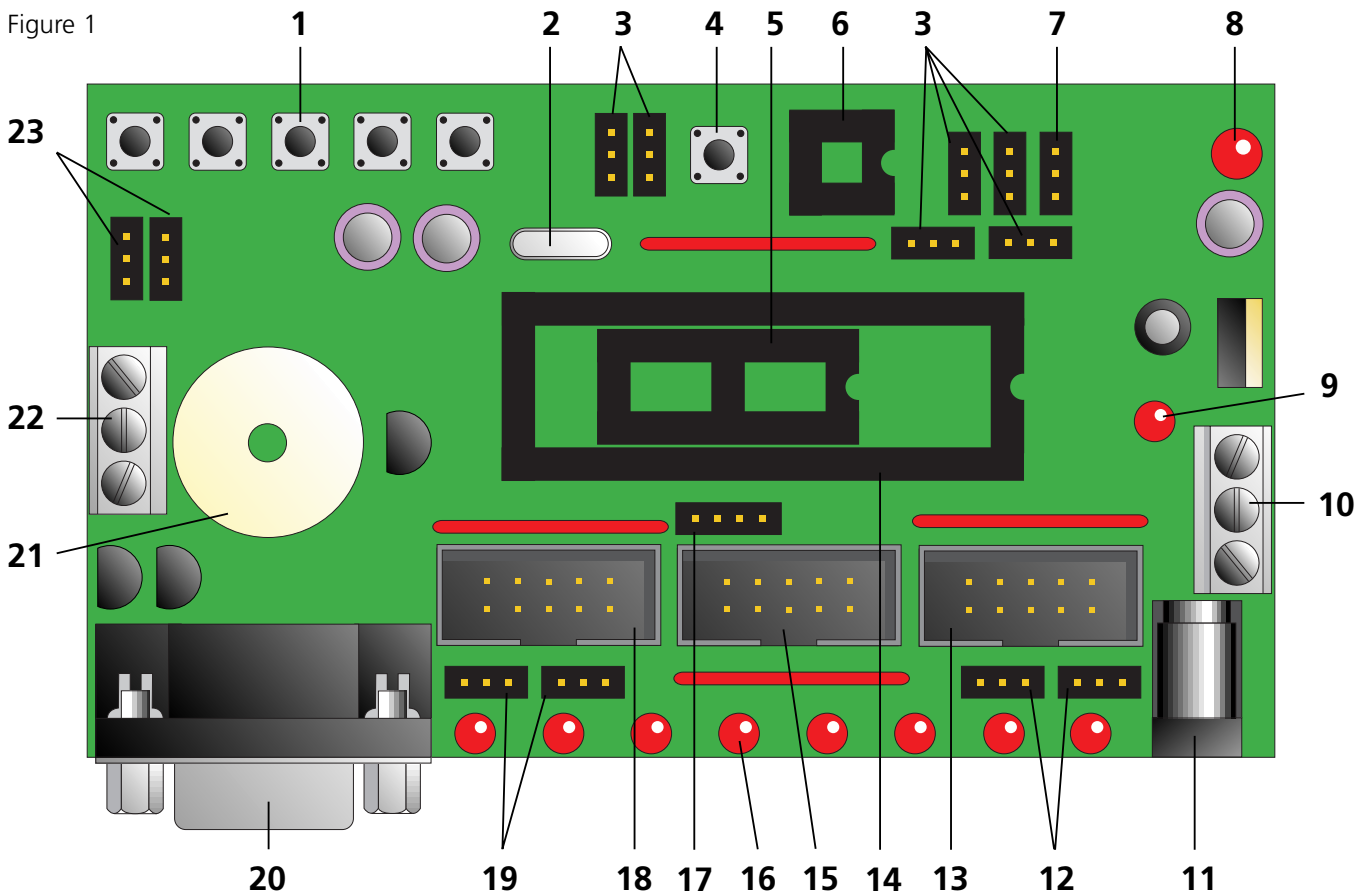
### MODULE HIGHLIGHTS

- Supports Atmel 8, 20 and 40-pin Microcontrollers
- Supports NEW Atmel 8-pin AVR microcontrollers
- Supports 8-pin serial EEPROM's
- Features In-System Reprogramming (ISP) Port
- User configurable RESET Polarity to support both 8051 and AVR microcontrollers
- 8 x Light Emitting Diodes (LED's)
- 5 Push Button Switches
- RS-232 Communications Driver Circuitry
- Simple Analogue to Digital (A/D) Converter using on-chip Comparator
- Two ports brought out to headers allowing external circuitry to be connected
- On-board power supply
- Pluggable Crystal



## Hardware Overview

Figure 1



**KEY:**

- |                                          |                                             |
|------------------------------------------|---------------------------------------------|
| 1 Push Button Switches                   | 13 Port 2                                   |
| 2 Crystal                                | 14 40-pin Microcontroller Socket            |
| 3 Configuration Jumpers for U4           | 15 ISP Programming Socket                   |
| 4 Reset Switch                           | 16 LED's x 8                                |
| 5 20-pin Microcontroller Socket          | 17 U2 Configuration (CON10)                 |
| 6 8-pin Microcontroller Socket           | 18 Port 0                                   |
| 7 Configuration Jumper for Piezo Sounder | 19 Jumpers No: 1 & 2                        |
| 8 Power LED                              | 20 Serial Communications (RS-232) Connector |
| 9 Program LED                            | 21 Piezo Sounder                            |
| 10 Power Supply Screw Terminals          | 22 A/D Inputs                               |
| 11 Power Supply Input +9/+26v DC Unreg   | 23 Jumpers 3 & 4                            |
| 12 Jumpers No: 13 & 14                   |                                             |

## Jumper Configurations

### Notes:

- 1 To disable LED's, remove SIL resistor pack SL1.
- 2 Pin 1 of SIL's denoted by square pad.

Key	Link	Purpose	1-2	2-3
19	1	LED0 / A/D Select	LED0	AREF
19	2	LED1 / A/D Select	LED1	AIN
23	3	Reset Sense	8051	AVR
23	4	Reset Sense	8051	AVR
-	5	Not Used	-	-
7	6	Sounder Enable	On	Off
3	7	U4/2 Configuration	XTAL1	P1.2
3	8	U4/3 Configuration	XTAL2	P1.4
3	9	U4/4 Configuration	GND	P1.1
3	10	U4/5 Configuration	GND	P1.5
3	11	U4/7 Configuration	SCK2	P1.7
3	12	U4/1 Configuration	RESET	P1.3
12	13	P1.2 Configuration	LED2	AREF
12	14	P1.3 Configuration	LED3	AIN

Figure 2

CON10. U2 Configuration		
Pin	8051	AVR
1	Vcc	Vcc
2	EA	ICP
3	ALE	ALE
4	PSEN	OC1B



As viewed in fig: 1 featured on page 2

Figure 3

## Module Specifications

### Evalu8r Technical Specification

- Power Input** .....: a. +9 volts DC nominal (+25 volts Max)  
b. +9v DC unregulated, or +5v DC regulated.
- Power Connectors** .: a. Standard 2.5mm ROKA type-centre positive.  
Accepts Equinox Power Supply  
b. Screw Terminals to accept external bench PSU.  
Pin 1 +5v  
Pin 2 +9v  
Pin 3 0v.
- Serial Port**.....: 3-wire asynchronous Communications interface, TxD, RxD, GND (RS-232 compatible).
- Serial Connector** ....: 9 way female D-type connector, PC compatible via. 1:1 cable  
Pin 2 - TxD Output from Evalu8r  
Pin 3 - RxD Input to Evalu8r  
Pin 5 - GND Signal Ground connection
- A/D Convertor**.....: Simple current source and comparator technique  
GND Signal Ground  
REF Voltage ramp from 65uA into  
100nF approx.  
AIN Input to Evalu8r. Max range 0v to  
+5v (clamped)  
Noise filter built-in 10K/100nF approx.
- Status Indication**....: Power-ON & PROG LED's.
- Sounder** .....: PIEZO type
- Device profiles** .....: 8, 20 and 40-pin devices are supported. There is room to fit either a 20-pin or a 40-pin ZIF socket if required.
- ISP Compatibility** ....: Equinox standard 10-way Header
- Other I/O** .....: 5 switches and 8 LED's on 20/40 pin microcontroller port pins.



# Device Support

## Atmel 20-pin 8051 microcontrollers

Device Family	Microcontroller Socket	Number Of Pins	RESET Configuration			ISP
			Polarity	Link 3	Link 4	
AT89C1051 (U)	U1	20	HIGH	1-2	1-2	NO
AT89C2051	U1	20	HIGH	1-2	1-2	NO
AT89C4051	U1	20	HIGH	1-2	1-2	NO

Figure 4

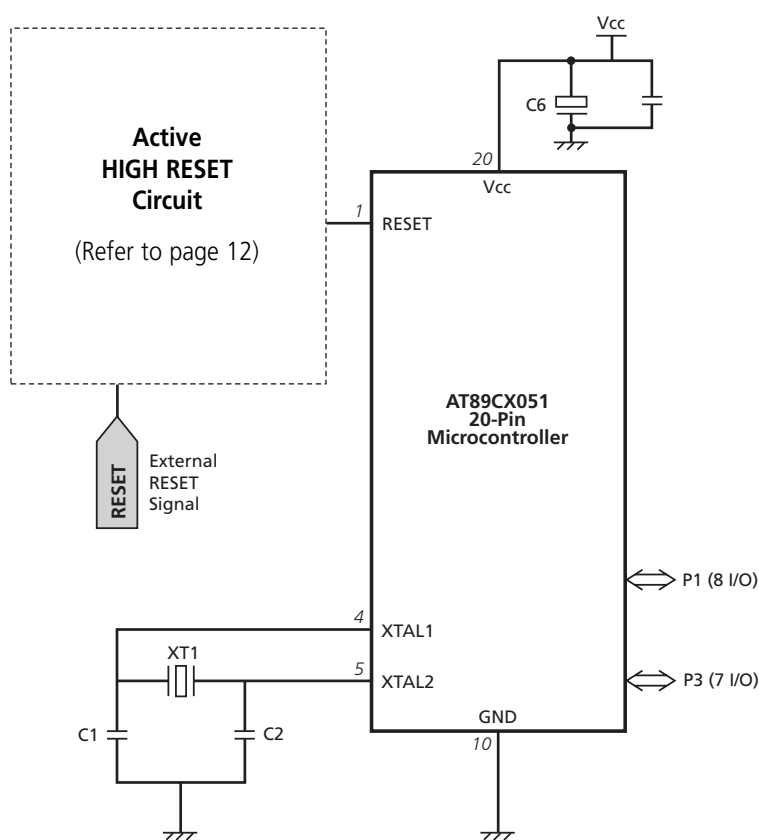
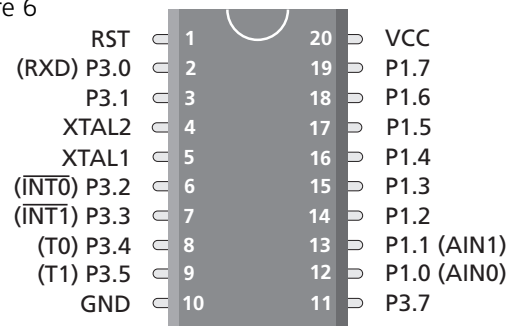


Figure 5

Figure 6



Pinout for the AT89X051

Figure 7

Port	I/O	Function
P1	8	LED x 8
P3	7	Push Button + Communications

## Device Support Continued

### Atmel 40-pin 8051 microcontrollers

Device Family	Microcontroller Socket	Number Of Pins	RESET Configuration			ISP	EA HIGH
			Polarity	Link 3	Link 4		
AT89C51	U2	40	HIGH	1-2	1-2	NO	CON 10 1-2
AT89C52	U2	40	HIGH	1-2	1-2	NO	CON 10 1-2
AT89C55	U2	40	HIGH	1-2	1-2	NO	CON 10 1-2
AT89S8252	U2	40	HIGH	1-2	1-2	YES	CON 10 1-2
AT89S53	U2	40	HIGH	1-2	1-2	YES	CON 10 1-2

Figure 8

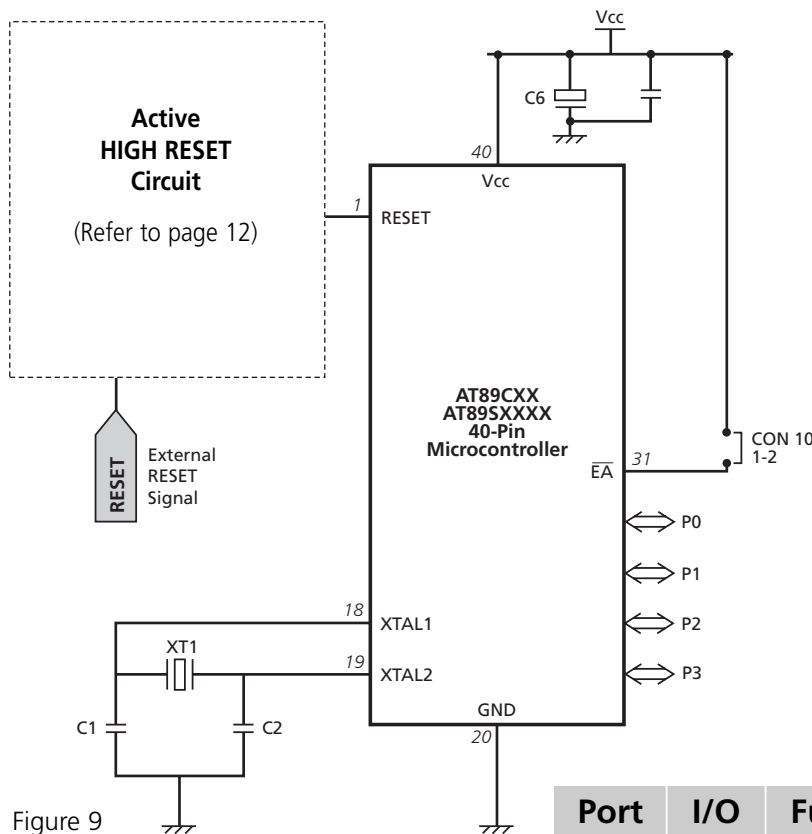


Figure 9

Figure 10

(T2) P1.0	1	40	VCC
(T2 EX) P1.1	2	39	P0.0 (AD0)
P1.2	3	38	P0.1 (AD1)
P1.3	4	37	P0.2 (AD2)
( $\overline{SS}$ ) P1.4	5	36	P0.3 (AD3)
(MOSI) P1.5	6	35	P0.4 (AD4)
(MISO) P1.6	7	34	P0.5 (AD5)
(SCK) P1.7	8	33	P0.6 (AD6)
RST	9	32	P0.7 (AD7)
(RXD) P3.0	10	31	$\overline{EA}/VPP$
(TXD) P3.1	11	30	ALE/ $\overline{PROG}$
( $\overline{INT0}$ ) P3.2	12	29	PSEN
( $\overline{INT1}$ ) P3.3	13	28	P2.7 (A15)
(T0) P3.4	14	27	P2.6 (A14)
(T1) P3.5	15	26	P2.5 (A13)
( $\overline{WR}$ ) P3.6	16	25	P2.4 (A12)
( $\overline{RD}$ ) P3.7	17	24	P2.3 (A11)
XTAL2	18	23	P2.2 (A10)
XTAL1	19	22	P2.1 (A9)
GND	20	21	P2.0 (A8)

Pinout for the AT89S8252

Port	I/O	Function
P0.X	8	I/O Box Header (Con 11)
P1.X	8	LED x 8 + ISP (3)
P2.X	8	I/O Box Header (Con 9)
P3.X	8	Push Button + Serial Communications

Figure 11

## Device Support Continued

### Atmel 40-pin AVR microcontrollers

Device Family	Microcontroller Socket	Number Of Pins	RESET Configuration			ISP
			Polarity	Link 3	Link 4	
AT90S4414	U2	40	LOW	2-3	2-3	YES
AT90S8515	U2	40	LOW	2-3	2-3	YES

Figure 12

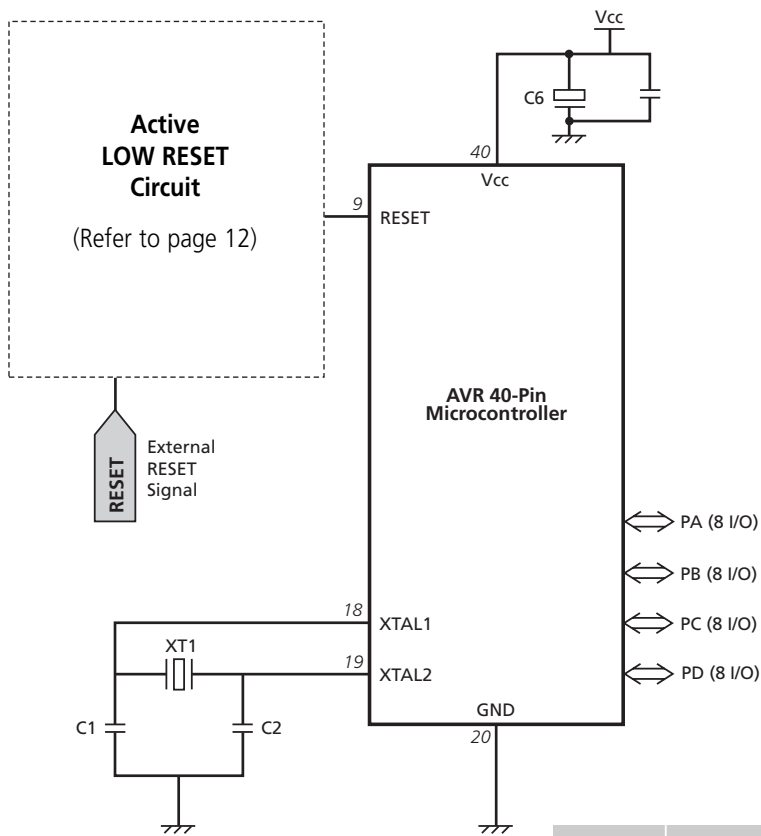


Figure 13

Figure 14

(T0) PB0	1	40	VCC
(T1) PB1	2	39	PA0 (AD0)
(AIN0) PB2	3	38	PA1 (AD1)
(AIN1) PB3	4	37	PA2 (AD2)
(SS) PB4	5	36	PA3 (AD3)
(MOSI) PB5	6	35	PA4 (AD4)
(MISO) PB6	7	34	PA5 (AD5)
(SCK) PB7	8	33	PA6 (AD6)
$\overline{\text{RESET}}$	9	32	PA7 (AD7)
(RXD) PD0	10	31	ICP
(TXD) PD1	11	30	ALE
(INT0) PD2	12	29	OC1B
(INT1) PD3	13	28	PC7 (A15)
PD4	14	27	PC6 (A14)
(OC1A) PD5	15	26	PC5 (A13)
( $\overline{\text{WR}}$ ) PD6	16	25	PC4 (A12)
( $\overline{\text{RD}}$ ) PD7	17	24	PC3 (A11)
XTAL2	18	23	PC2 (A10)
XTAL1	19	22	PC1 (A9)
GND	20	21	PC0 (A8)

Pinout for the AT90S8515 and AT90S4414

Figure 15

Port	I/O	Function
PA.X	8	I/O Box Header (Con 11)
PB.X	8	LED x 8 + ISP (3)
PC.X	8	I/O Box Header (Con 9)
PD.X	8	Push Button + Serial Communications

**PLEASE NOTE:** The Evalu8r module does not support the Atmel AT90S8535 and AT90S4434 40-pin AVR devices

ICP, ALE and OC1B are brought out to Con10

## Device Support Continued

### Atmel 20-pin AVR microcontrollers

Device Family	Microcontroller Socket	Number Of Pins	RESET Configuration			ISP
			Polarity	Link 3	Link 4	
AT90S1200	U1	20	LOW	2-3	2-3	YES
AT90S1200A	U1	20	LOW	2-3	2-3	YES
AT90S2313	U1	20	LOW	2-3	2-3	YES

Figure 16

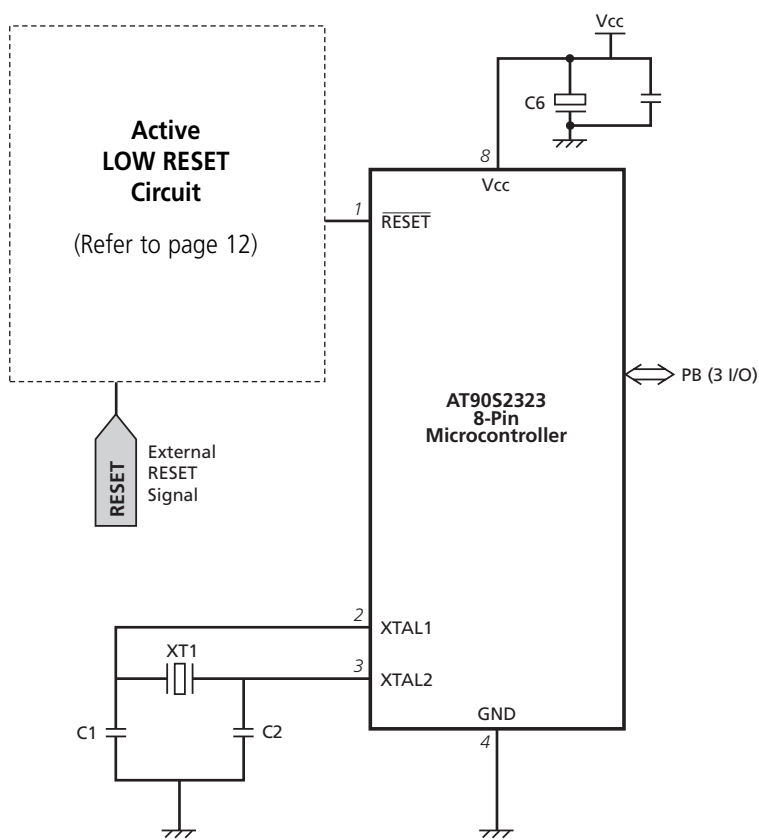


Figure 17

Figure 18

RESET	1	20	VCC
(RXD) PD0	2	19	PB7 (SCK)
(TXD) PD1	3	18	PB6 (MISO)
XTAL2	4	17	PB5 (MOSI)
XTAL1	5	16	PB4
(INT0) PD2	6	15	PB3 (OC1)
(INT1) PD3	7	14	PB2
(T0) PD4	8	13	PB1 (AIN1)
(T1) PD5	9	12	PB0 (AIN0)
GND	10	11	PD6 (ICP)

Pinout for the AT90S2313

Port	I/O	Function
PB	8	LED x 8 + ISP (3)
PD	8	Push Button + Serial Communications

Figure 19

## Device Support Continued

### Atmel 8-pin AVR microcontrollers

Figure 20

Device Family	Microcontroller Socket	Number Of Pins	RESET Configuration			ISP
			Polarity	Link 3	Link 4	
AT90S2323	U4	8	LOW	2-3	2-3	YES
AT90S2343	U4	8	LOW	2-3	2-3	YES

The Evalu8r module supports the Atmel 8-pin AVR devices. As there are many different modes in which these devices can be used, each pin of the 8-pin socket (U4) has been brought out to a jumper.

The 8-pin AVR table (figure 24) shows how to configure the jumpers so that the AT90S2323 can be operated from an external crystal and also in-system programmed.

Pin	Function	Link	Jumper
1	RESET Pin	12	1-2
2	XTAL 1	7	1-2
3	XTAL 2	8	1-2
4	GROUND	9	1-2
5	P1.1	10	2-3
6	P1.6	-	-
7	P1.7	11	2-3
8	Vcc	-	-

Figure 21

#### AT90S2323 Scenario

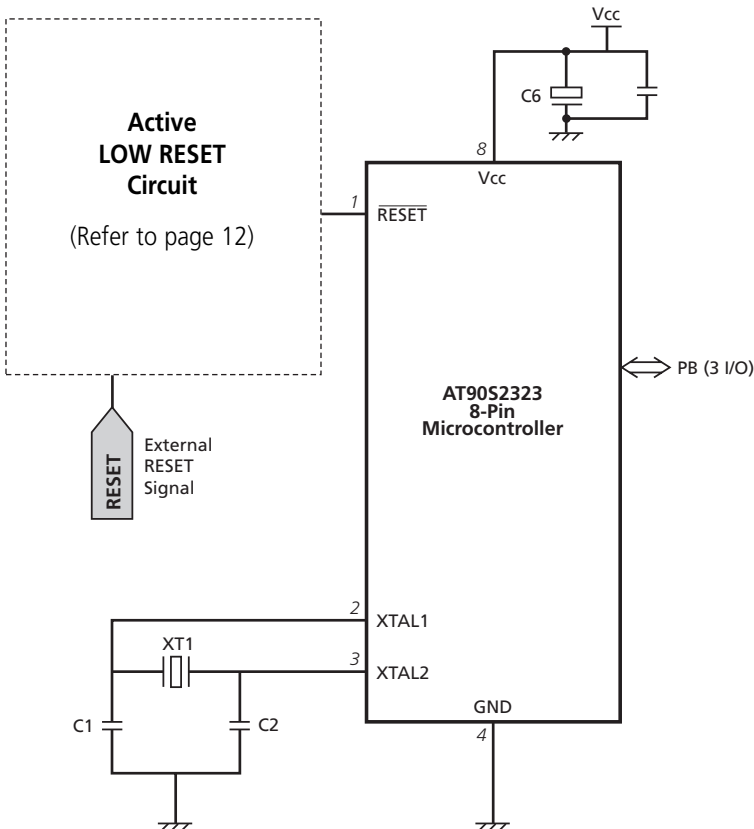
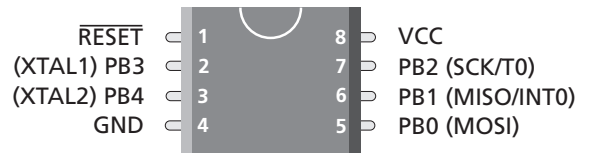


Figure 22

Figure 23



Pinout for the AT90S2323

- Configuration with external Crystal Oscillator
- 3 I/O lines are available

Port	I/O	Function
PB	3	Spare I/O
		PB2 Con 3 Link 11
		PB3 LED6
		PB0 Con 3 Link 10

Figure 24

## Device Support Continued

### AT90S2343 Scenario

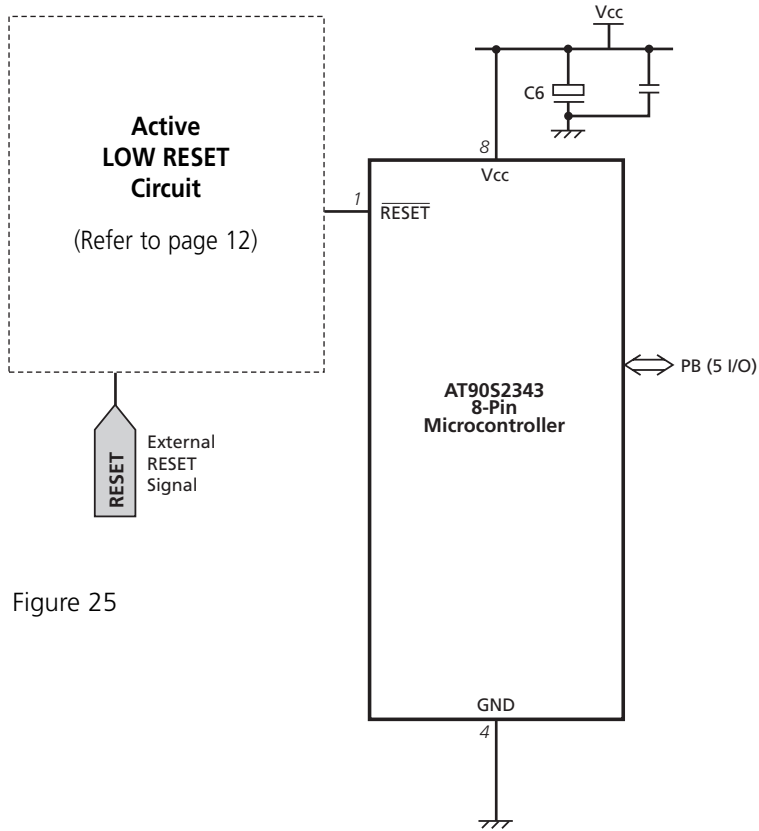


Figure 25

Figure 26



Pinout for the AT90S2343

- Configuration with internal RC Oscillator enabled
- 5 I/O lines are available

Port	I/O	Function
PB	5	Spare I/O
		PB0 Con3 Link11
		PB1
		PB2 Con3 Link11
		PB3 LED6
		PB4

Figure 27

## **Device Support** Continued

### **Atmel 8-pin Serial EEPROM Devices**

The Evalu8r module also supports connection of a Serial EEPROM device in the 8-pin socket (U4). The EEPROM power and I/O is configurable via jumpers. For more information on how to set the jumpers for a particular device please refer to the Evalu8r circuit schematic, attached at the back of this guide and consult the relevant data sheet of the EEPROM.

<b>Device Family</b>	<b>Microcontroller Socket</b>	<b>Number Of Pins</b>	
<b>24C</b>	U4	8	Consult device data sheet
<b>25C</b>	U4	8	Consult device data sheet
<b>93C</b>	U4	8	Consult device data sheet

Figure 28

## RESET Configurations

An important difference between the Atmel 89C/89S and AVR microcontrollers is the polarity of the RESET pin. The 89C/89S devices feature an ACTIVE HIGH Reset, whereas the AVR devices feature an ACTIVE LOW Reset. The Evalu8r module features user configurable RESET polarity. It is necessary to change only two jumper settings as detailed below to support either ACTIVE HIGH or ACTIVE LOW RESET polarity.

### Active High RESET Function

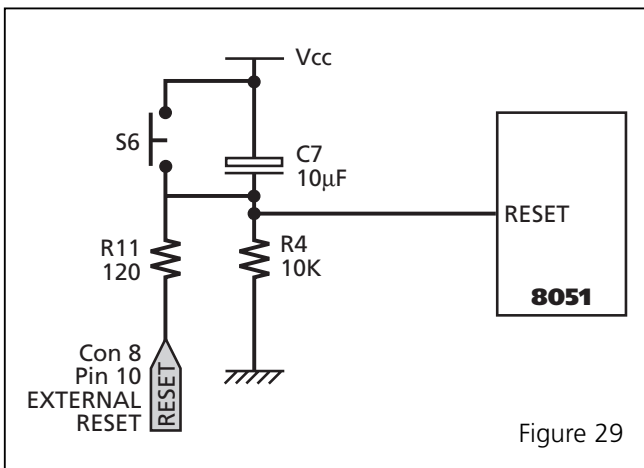


Figure 29

Suitable for 8051 microcontroller family  
e.g. 87C/89C/89S devices

Figure 31

Link 3	Link 4
1-2	1-2

### Active Low RESET Function

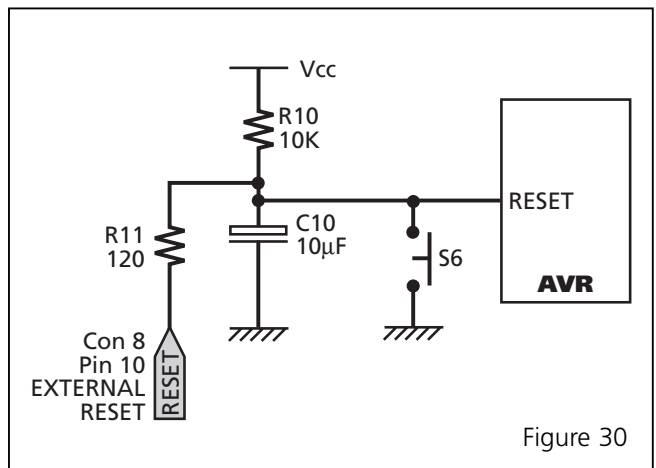


Figure 30

Suitable for:  
All AVR microcontrollers

Figure 32

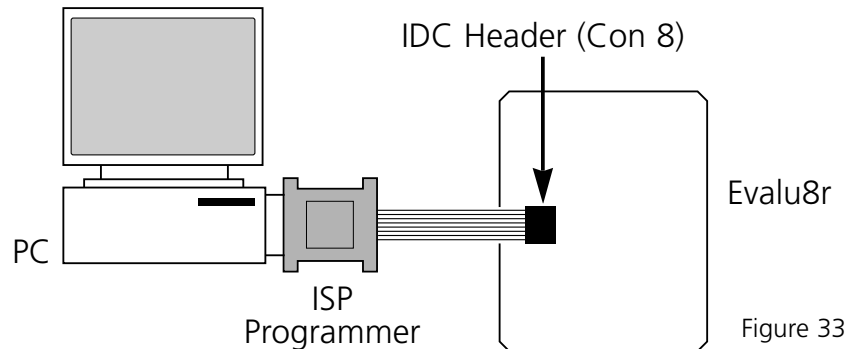
Link 3	Link 4
2-3	2-3

*Please note the use of a C/R RESET circuit will not prevent corruption of the on-chip AVR EEPROM*



## ISP (In-System Programming)

The Evalu8r is capable of supporting the In-System Programming (ISP) functionality available on the Atmel 89S and 90S(AVR) microcontroller derivatives. To facilitate ISP it is necessary to connect an Equinox 'Micro-ISP' or Activ8r programmer to the ISP header (Con 8) on the module as detailed in the figure below. Alternatively the ISP connection on the Equinox Activ8r may be used to connect to the Evalu8r.



### Prog LED

The Serial programmer will illuminate the 'PROG' LED (LED 9) on the Evalu8r during programming.

### ISP LED's

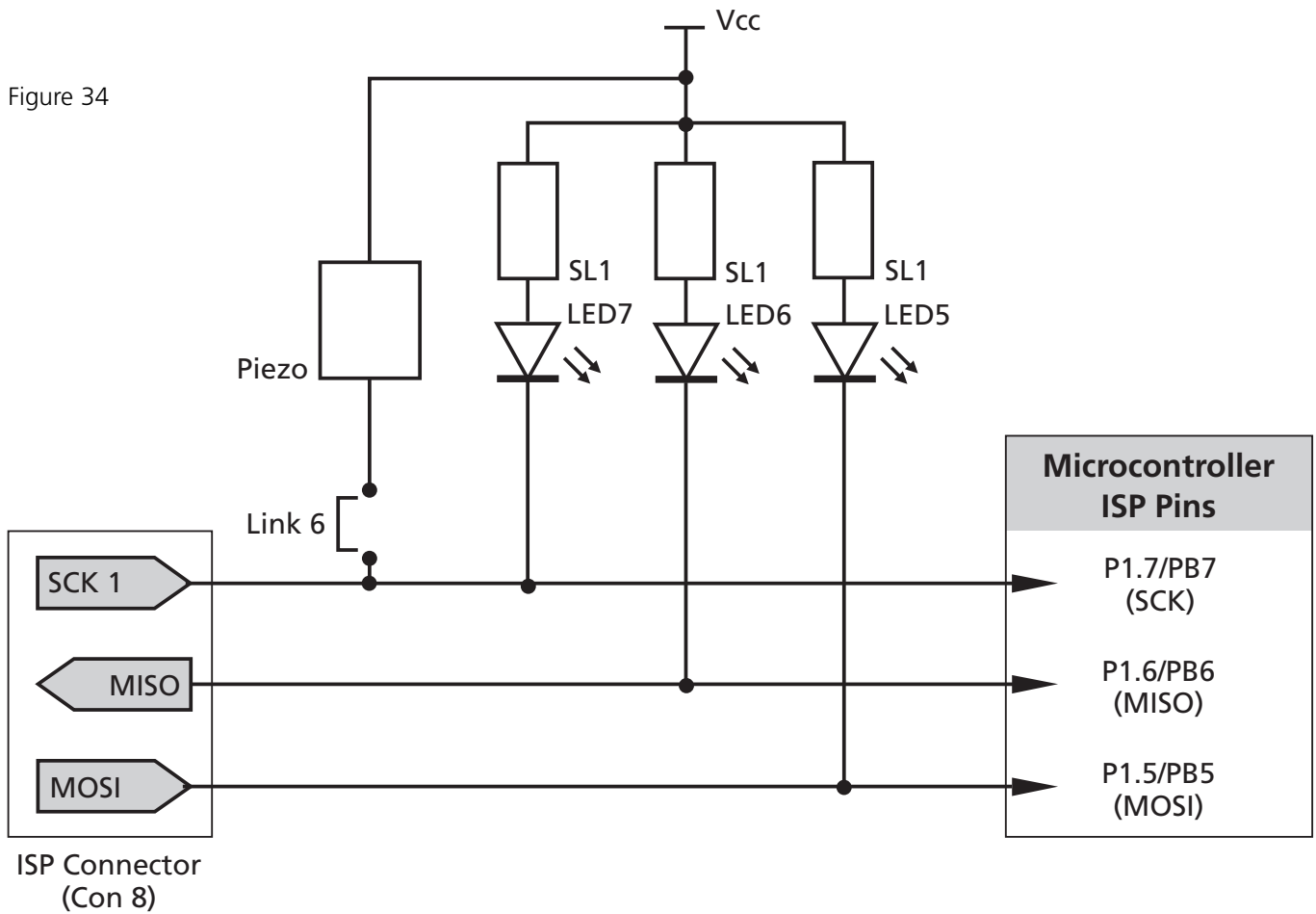
The MOSI/MISO/SCK lines from the serial programmer are shared with LED 5/6/7. During serial programming these LED's will flicker on and off. If any problems are encountered during programming it is possible to disconnect all 8 LED's by removing the resistor SIL pack (SL1).

### Piezo Sounder

The Evalu8r module is shipped with the Piezo Sounder enabled by default. This will make a noise during programming and is useful as an audible indication that ISP is working. To disable the sounder, simply remove link 6.

## Port sharing between ISP and LED's

Figure 34



### Port sharing between ISP and LED's etc.

8051	AVR	Function	ISP
P1.7	PB7	LED7/Piezo	SCK
P1.6	PB6	LED6	MISO
P1.5	PB5	LED5	MOSI

Figure 35

## ISP (In-System Programming) Continued

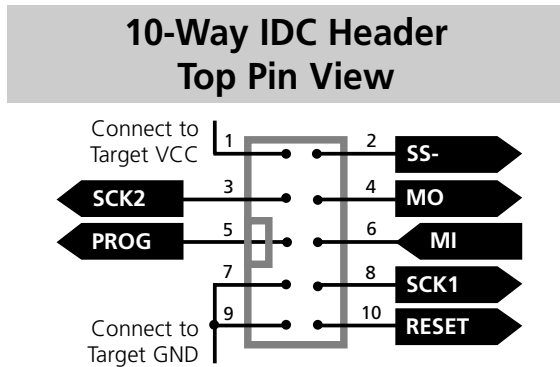


Figure 36

### ISP Connector Con 8

**Note:**

*This is the view of the connector fitted to the target (e.g. Evalu8r) board, as seen from above (the component side).*

Pin	Name	I/O	Connected to:
1	VCC	-	Module Vcc
2	$\overline{SS}$	O	Target $\overline{SS}$
3	SCK2	O	N/C
4	MO	O	Target MOSI
5	PROG	O	PROGRAM LED
6	MI	I	Target MISO
7	GND	-	Module GND
8	SCK1	O	Target SCK
9	GND	-	Module GND
10	RESET	O	Module RESET Circuit

Figure 37

## Pin Assignments

### 20-pin microcontrollers

Pin	8051		AVR		Function	Evalu8r
	Func1	Func2	Func1	Func2		
1	RST		RST		RESET pin	8051/AVR/ISP/RESET circuit
2	P3.0	(RXD)	PD0	(RXD)	Serial UART RECEIVE	RS-232 Serial RECEIVE
3	P3.1	(TXD)	PD1	(TXD)	Serial UART TRANSMIT	RS-232 Serial Transmit
4	XTAL2		XTAL2		Oscillator Output	Pluggable Crystal
5	XTAL1		XTAL1		Oscillator Input	Pluggable Crystal
6	P3.2	INT0	PD2	INT0	External Interrupt 0	PB Switch 5
7	P3.3	(INT1)	PD2	INT1	External Interrupt 1	PB Switch 4
8	P3.4	T0	PD4	T0	Timer0 Input	PB Switch 2
9	P3.5	(T1)	PD5	T1	Timer1 Input	PB Switch 3
10	GND				System GROUND connection	GROUND
11	P3.7		PD6	ICP		PB Switch 1
12	P1.0	AIN0	PB0	AIN0	Analogue Input 0	LED 0 or A/D INPUT
13	P1.1	AIN1	PB1	AIN1	Analogue Input 1	LED 1 or A/D REF
14	P1.2		PB2			LED 2
15	P1.3		PB3	OC1		LED 3
16	P1.4		PB4			LED 4
17	P1.5		PB5	MOSI	SPI - Master OUT, Slave IN	LED 5 & SPI
18	P1.6		PB6	MISO	SPI - Master IN, Slave OUT	LED 6 & SPI
19	P1.7		PB7	SCK	SPI - Serial Clock	LED 7 & SPI
20	VCC				System Vcc	Vcc

Figure 38

## Pin Assignments Continued

Figure 39

Pin	8051	Function	Evalu8r	AVR	Function
1	P1.0		LED1	PB0	T0
2	P1.1		LED0	PB1	T1
3	P1.2		LED2 or A/D Reference	PB2	AIN0
4	P1.3		LED3 or A/D Input	PB3	AIN1
5	P1.4		LED4	PB4	SS
6	P1.5		LED5 & SPI	PB5	MOSI
7	P1.6		LED6 & SPI	PB6	MISO
8	P1.7		LED7 & SPI	PB7	SCK
9	RST	Reset Pin	Links 3 & 4/CON8-10	RESET	
10	P3.0	RXD		PD0	RXD
11	P3.1	TXD		PD1	TXD
12	P3.2	INT0	SWITCH 5	PD2	INT0
13	P3.3	INT1	SWITCH 4	PD3	INT1
14	P3.4	T0	SWITCH 2	PD4	
15	P3.5	T1	SWITCH 3	PD5	OC1A
16	P3.6			PD6	WR
17	P3.7		SWITCH 1	PD7	RD
18	XTAL2			XTAL2	
19	XTAL1			XTAL1	
20	GND		CON9-10	GND	
21	P2.0		CON9-2	PC0	A8
22	P2.1		CON9-3	PC1	A9
23	P2.2		CON9-4	PC2	A10
24	P2.3		CON9-5	PC3	A11
25	P2.4		CON9-6	PC4	A12
26	P2.5		CON9-7	PC5	A13
27	P2.6		CON9-8	PC6	A14
28	P2.7		CON9-9	PC7	A15
29	PSEN		CON10-4	OC1B	
30	ALE		CON10-3	ALE	
31	EA		CON10-2	ICP	
32	P0.7		CON11-9	PA7	AD7
33	P0.6		CON11-8	PA6	AD6
34	P0.5		CON11-7	PA5	AD5
35	P0.4		CON11-6	PA4	AD4
36	P0.3		CON11-5	PA3	AD3
37	P0.2		CON11-4	PA2	AD2
38	P0.1		CON11-3	PA1	AD1
39	P0.0		CON11-2	PA0	AD0
40	Vcc		CON11-1	Vcc	

## 40-pin microcontrollers

## I/O Headers

### 10-Way IDC Header Top Pin View

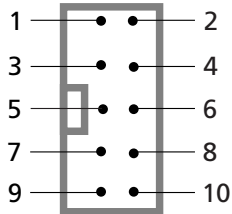


Figure 40

**Note:**

*This is the view of the connector fitted to the target (e.g. Evalu8r) board, as seen from above (the component side).*

The Evalu8r module features two I/O headers which each bring out a full 8-bit microcontroller port plus power and ground

Connector	8051 (40-pin)	AVR (40-pin)
CON 9	P2.X	PC0.X
CON 11	P0.X	PA0.X

Figure 41

Pin	Name	I/O
1	Vcc	-
2	PX.0	I/O
3	PX.1	I/O
4	PX.2	I/O
5	PX.3	I/O
6	PX.4	I/O
7	PX.5	I/O
8	PX.6	I/O
9	PX.7	I/O
10	GND	-

Figure 42

## LED Port

The Evalu8r module features 8 LED's connected to one contiguous 8-bit microcontroller I/O port. As some of the I/O ports have dual functionality it is necessary to set certain jumpers to ensure that all 8 LED's are connected.

The table below shows jumper settings and also the port assignments for 8051 & AVR microcontrollers.

To disconnect all LED's simply remove the resistor SIL pack SL1.

LED	Jumper Settings	8051	AVR
1	Link 1 1-2	P1.0	PB0
2	Link 2 1-2	P1.1	PB1
3	-	P1.2	PB2
4	-	P1.3	PB3
5	-	P1.4	PB4
6	-	P1.5	PB5
7	-	P1.6	PB6
8	-	P1.7	PB7

Figure 43

### High RESET Function

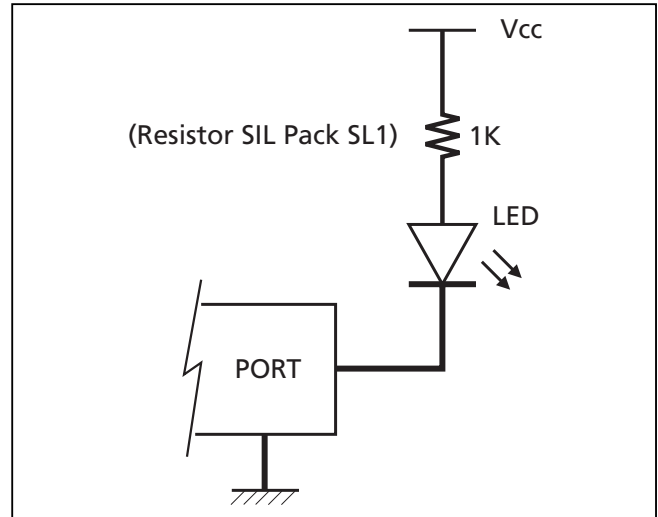


Figure 44

## AVR™ Support Products

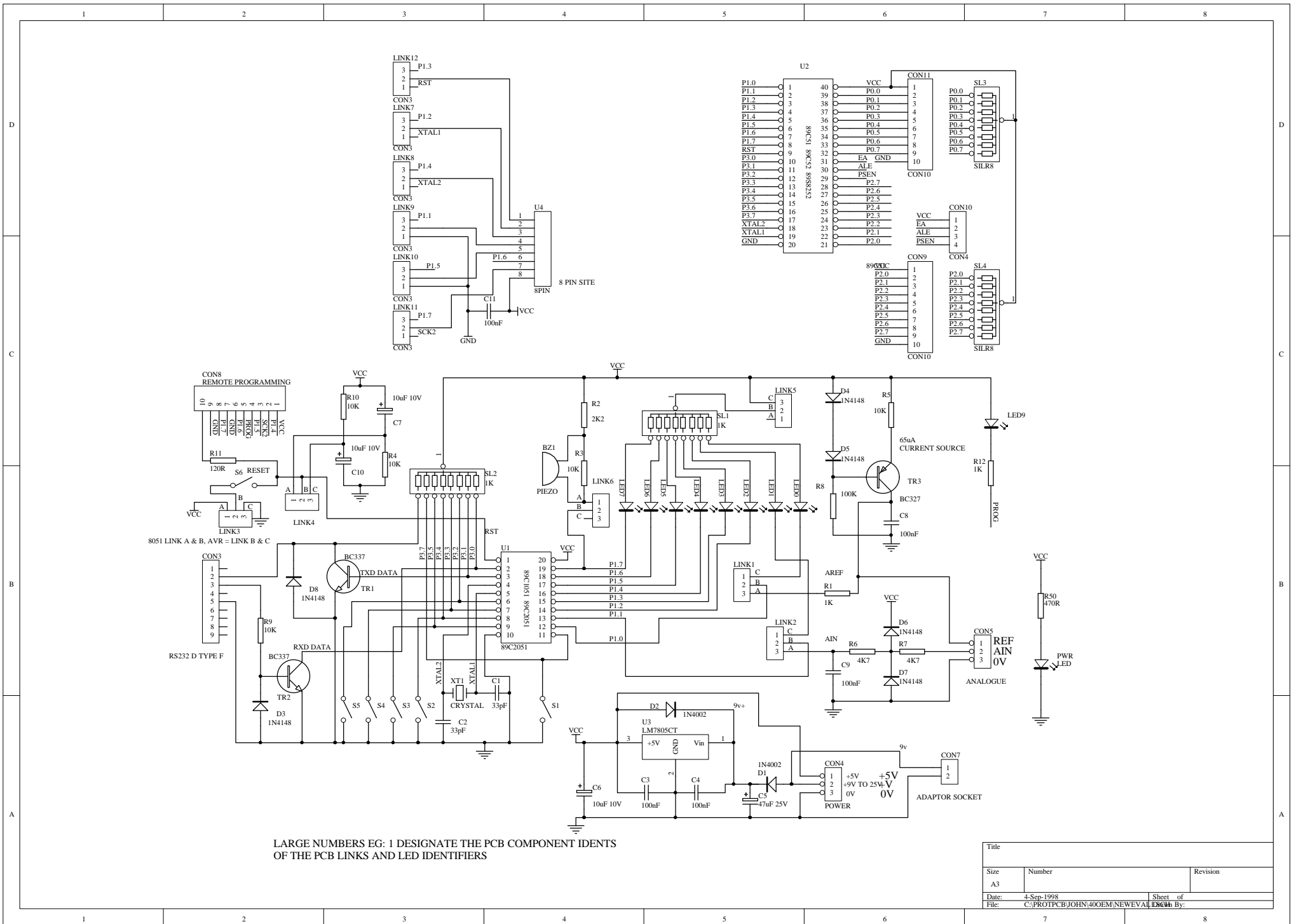
Order code	Description
<b>PROGRAMMING SYSTEMS</b>	
AVR2-ST	Professional AVR Microcontroller Starter System
AVR1-8K-DV	Professional AVR Microcontroller Development System
AVR1-820K	Atmel AT90S1200/AT90S23x3 AVR Microcontroller Starter Kit
MPW-PLUS	Micro-Pro Professional Device Programming System
UISP-S3-SYS	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
<b>EVALUATION/OEM MODULES</b>	
OEM-UC-20/40	Universal 8051/AVR Microcontroller OEM Module
EVALU8R-1P	Evalu8r - Universal 8051/AVR Microcontroller Evaluation Module
<b>PACKAGE ADAPTORS ETC.</b>	
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)
<b>AVR BASIC Programming Language</b>	
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
<b>IAR AT90S Language Tools</b>	
EWA90BAS-EE	"IAR Baseline Tool Set" - C compiler, assembler, debugger (8K code limit)
EWA90	"IAR Full AT90S Version" - C compiler, assembler, debugger (unrestricted code)
<b>DO-BOX (Dynamically Optimised BASIC Box) + Accessories</b>	
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
<b>LITERATURE</b>	
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
<b>MISCELLANEOUS</b>	
CAB-SER1	PC Serial Cable Adaptor Kit (9W-25W & 25W-9W)
CAB-PAR25MM	PC Parallel Cable (25W to 25W M/M 2M)





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LARGE NUMBERS EG: 1 DESIGNATE THE PCB COMPONENT IDENTIS OF THE PCB LINKS AND LED IDENTIFIERS

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