**Device Support:**

- ATtiny12
- ATtiny13
- ATtiny15
- ATtiny22
- ATtiny26
- ATtiny2313

- AT90S1200
- AT90S2313
- AT90S2323
- AT90S2343
- AT90S2333
- AT90S4414
- AT90S4433
- AT90S8515
- AT90S8535

- ATmega48
- ATmega8
- ATmega88
- ATmega8515
- ATmega8535
- ATmega16
- ATmega161
- ATmega162
- ATmega163
- ATmega168
- ATmega169
- ATmega32
- ATmega323
- ATmega64
- ATmega103
- ATmega128

PC Requirements:

- Win95/98/ME/XP
- Win2000/NT4

**Order Code**:

NAVRISP

# AVR ISP

## In-System Programming for AVR Devices

## Parallel (Printer) Port Programmer

### In-System Programming

Configuring your system for In-System-Programming is simple. All you need is a header on your board. You then power-up the board, plug in the Kanda cable and you are ready for ISP.

### Production Programming

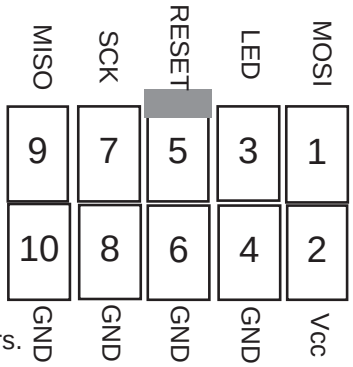
Customise your products at the end of the line, and tailor them to your sales. Or just build your product and program the microcontroller later - no more gang programmer and adapter worries.

### Field Upgrades/Repairs

Do you have standard fixes that can be corrected with set files? ISP is a quick and easy way to program in the field. Connects to most laptops via the parallel port. Note: if you require a serial port connection, then view our PSI-ISP programmer

### ISP - Connector

The ISP Connector required on your target system is the same as that on the STK200, STK300 and the Kanda Keyfobs. Widely accepted as the “standard” ISP connector for AVR Microcontrollers.




### Device List

This ISP programmer programs all the features of all the following devices:

- ATtiny12
- ATtiny15
- ATtiny15
- ATtiny22
- ATtiny15
- AT90S1200
- AT90S2313
- AT90S2323
- AT90S2343
- AT90S4433
- AT90S8535
- AT90S8515
- ATmega48
- ATmega8
- ATmega8515
- ATmega8535
- ATmega16
- ATmega161
- ATmega162
- ATmega163
- ATmega169
- ATmega32
- ATmega323
- ATmega64
- ATmega103
- ATmega128

### Other Features

- Device support update available from internet
- Uses standard Kanda connector (now AVR standard)
- AVR ISP for Windows Software to program your devices includes:
- Project Management
- File Load/Save/Modify- Supports Intel Hex, Atmel Generic & Motorola S-Record Formats
- Buffer editing -full ASCII/HEX data manipulation

### Related Products

Do also check out our AVR PSI product. This offers vastly superior programming times compared to the AVR ISP. It also has a serial port as well as a parallel port connection. We also have a range of development boards (STK200, STK300) which are available bundled with this product.

### OS Support

This product has support for most Windows versions including Win 3.1, 95, 98, 2000, XP and ME. A separate upgrade is available if you already own a Kanda AVR ISPand want new OS support or support for newer AVR devices - see order code AVRISPUP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**Fax: +44 (0) 8707 446 807**
**Email: sales@kanda.com**
**Web: www.kanda.com**

## Target Circuit Layouts

This section deals with connections to the AVR microcontroller for In System Programming. The rules and suggestions given do not have to be followed in all circumstances but failure to include some features may lead to problems with In System Programming.

Different programmers have more or less tolerance to deviation from these rules, but in general they should be followed. Atmel give recommendations for circuits connected to reset pin and programming lines that that err on the side of caution. These circuits are shown here with Kanda recommendations on the following pages**.**

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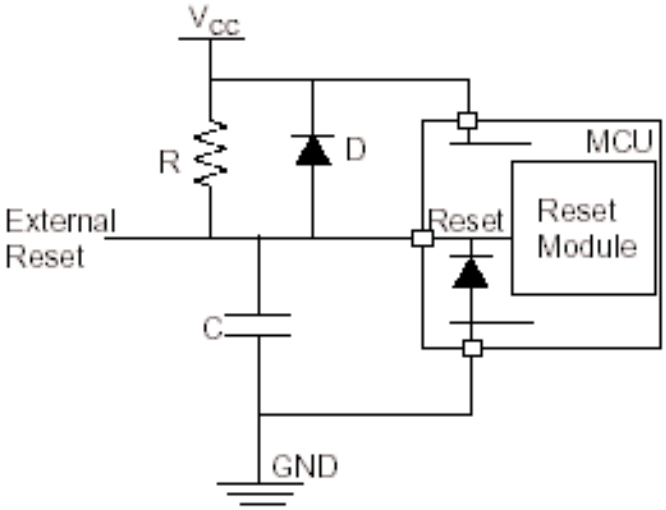


### Atmel's recommended Reset Circuit

Note that Atmel recommend a diode in the reset circuit. This is not generally required for Kanda programmers.

Atmel recommend a 10 nF capacitor and a 4K7 resistor. We favour a 100nF capacitor and 10K resistor. Choose something in this range.

Note: 1. Typical values are:
R = 4.7 kΩ
C = 10 nF
D = 1N4148

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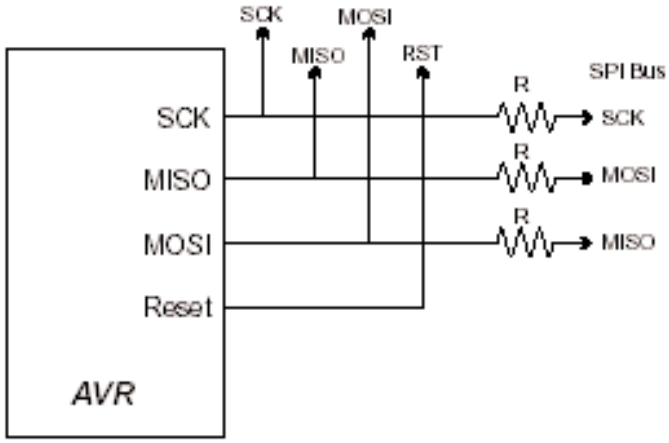


### Atmel's recommended Programming Lines Circuit

The recommended resistor values are 4K7 to isolate user applications from programming lines.

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## Capacitors on Reset Line

We do recommend that a capacitor is included on the Reset line. It should be placed as close as possible to the Reset Pin on the AVR i.e. it should be closer to the Reset Pin than any resistor. We recommend a 100nF capacitor and a 10K resistor. Larger capacitors may mean that the programming speed must be reduced. Capacitors on the programming lines will not cause a problem as long as they are less than 100nF, otherwise programming speeds must be reduced.

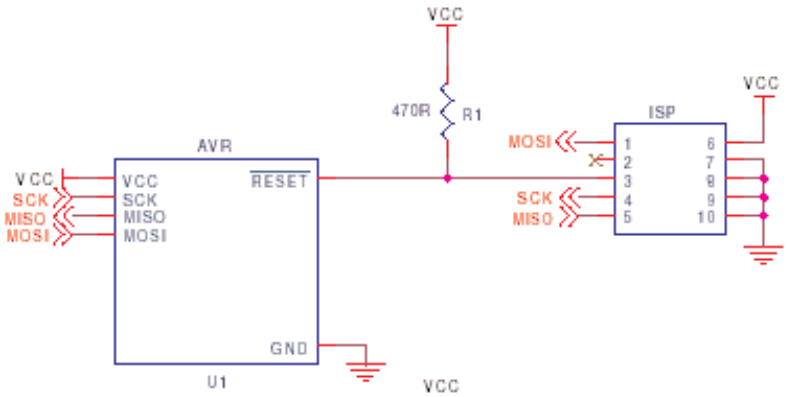
The following diagrams of correct and incorrect circuits do not include any capacitors. As long as capacitors are placed next to the AVR pins, then they will not affect the circuit.

# GENERAL

Examples apply to all programming lines (MOSI,MISO,SCK and RESET). Applies equally to pulldown resistors.

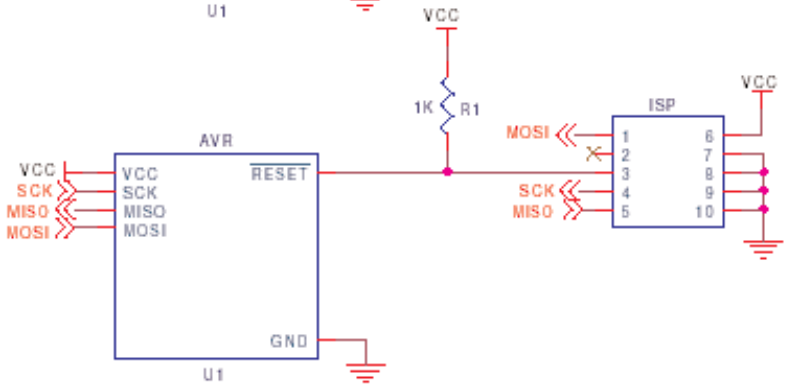
## NO

The Pull-up resisitor, R1, is too strong.



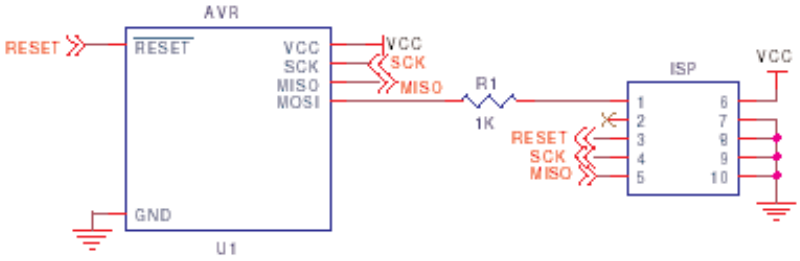

## YES

The Pull-up resisitor, R1, is no stronger than 1K



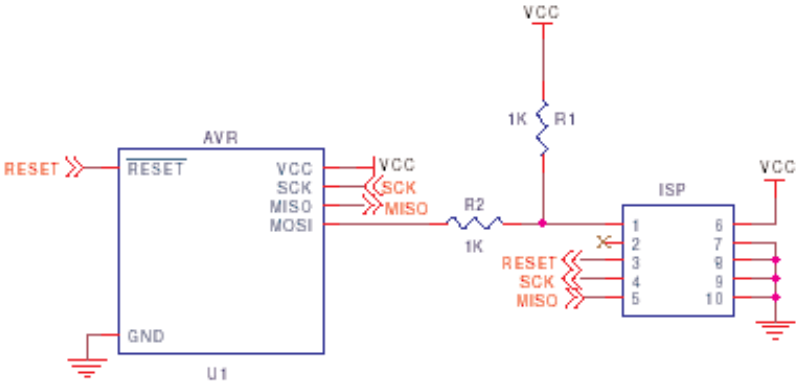

## YES

A resistor in series; by its's self, will have no effect.



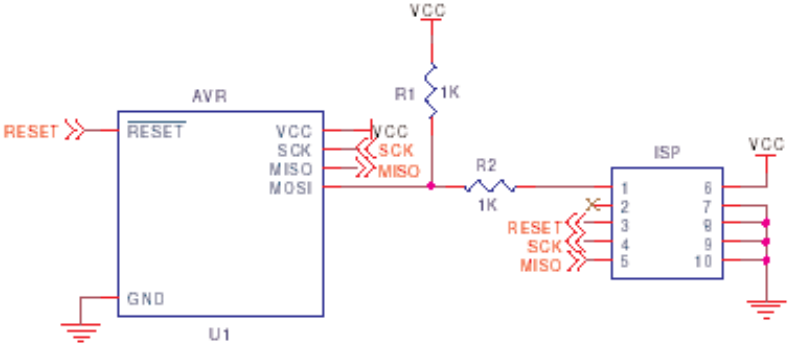

## YES

Again, the series resistor will have no effect.




## NO

This is a potential problem. As the series resistor will weaken the programmer's ability to act on the programming line.



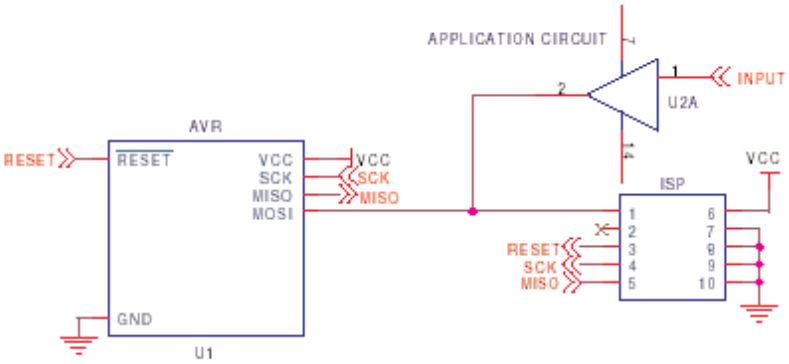

Kanda:com

web site: www.kanda.com
Phone/Fax: +44 (0)8707 446 807
email: sales@kanda.com

# APPLICATION CIRCUIT USING ISP PORT PINS

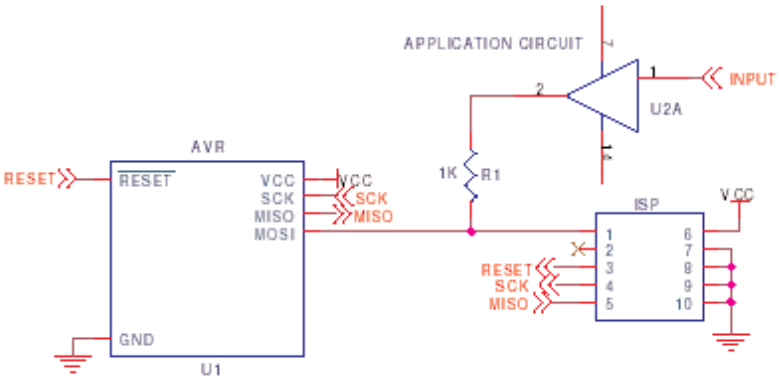
## NO

Here, the aplication uses PB5 as an INPUT to read the output of U2.
The state of the line is held by U2.




## YES

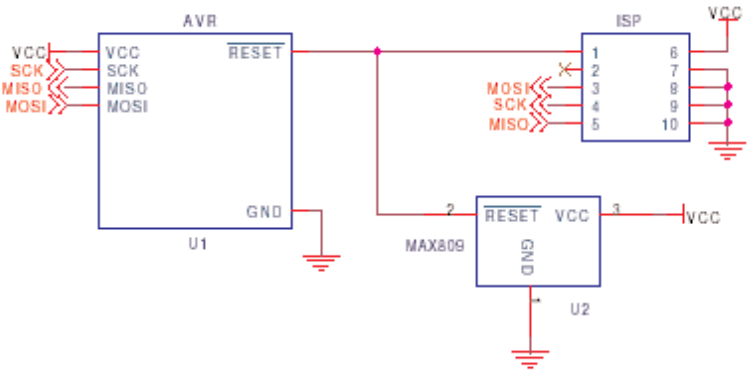
Again, PB5 is used as an INPUT to read the output of U2, but this time;
The output of U2 is sufficiently decoupled by R1



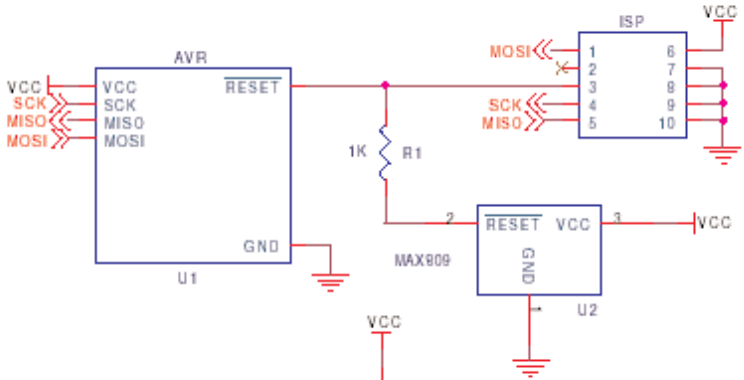

# RESET IC's

## NO

The commonly used brown-out IC MAX809 as a PUSH-PULL output. It will hold the RESET line high.




## YES




## YES

The MAX803 IC is equivalent to the MAX809 - BUT as an OPEN DRAIN output.