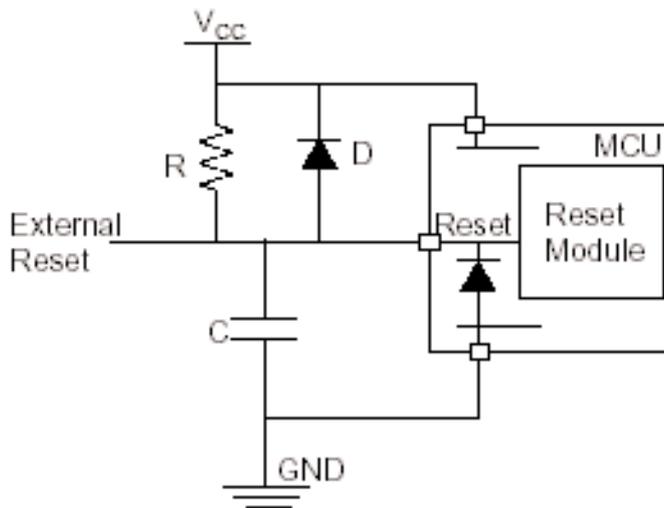


Target Circuit Layouts

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 err on the side of caution. These circuits are shown here with Kanda recommendations on the following pages.

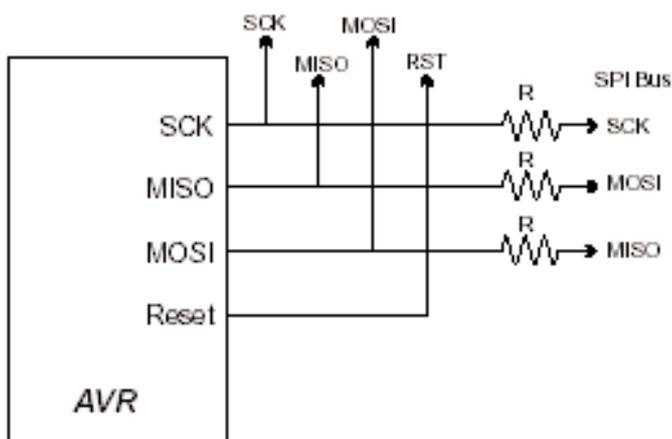


Atmel's recommended Reset Circuit

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



Atmel's recommended Programming Lines Circuit

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

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 should be avoided where possible, otherwise programming speeds may have to be reduced. If you must include them, then less than 10nF is suggested.

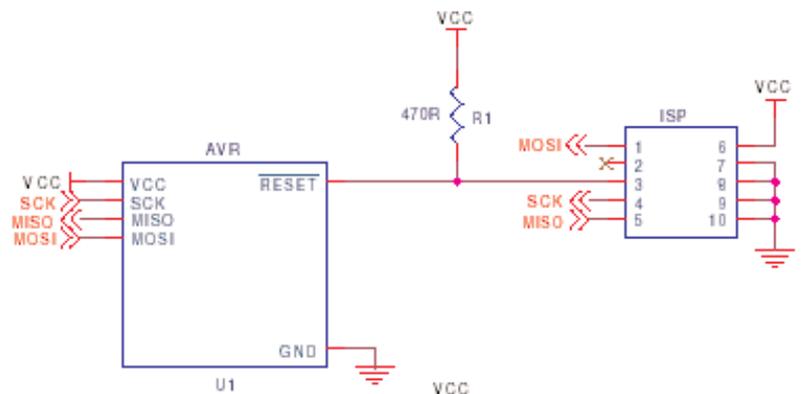
The following diagrams of correct and incorrect circuits do not include any capacitors. As long as capacitors are placed next to the AVR pins, then they will not affect the circuit, but see previous paragraph.

GENERAL

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

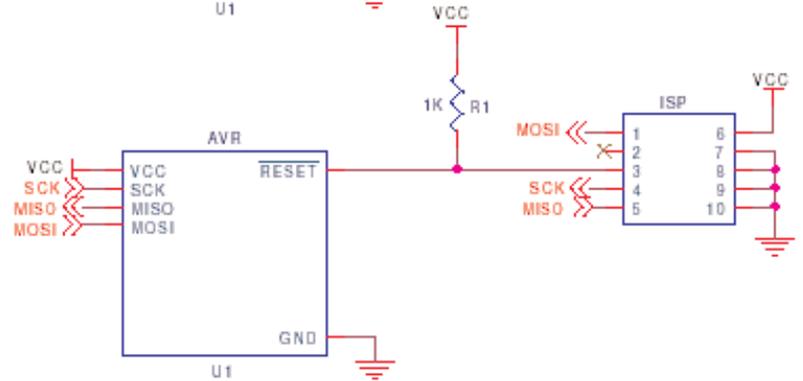
NO

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



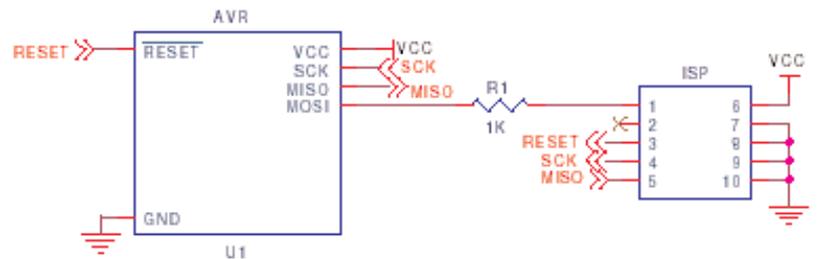
YES

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



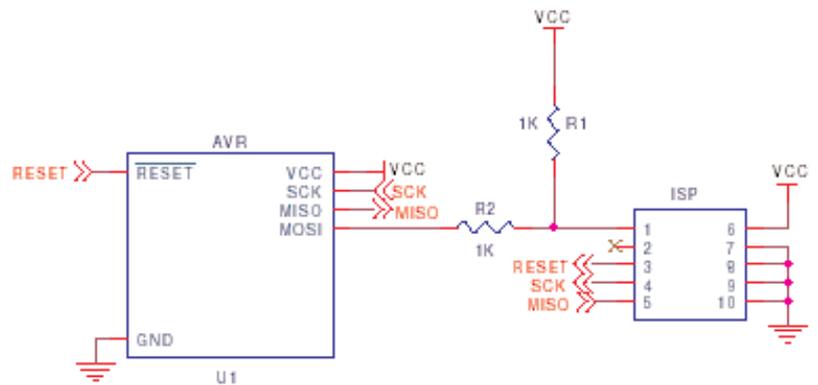
YES

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



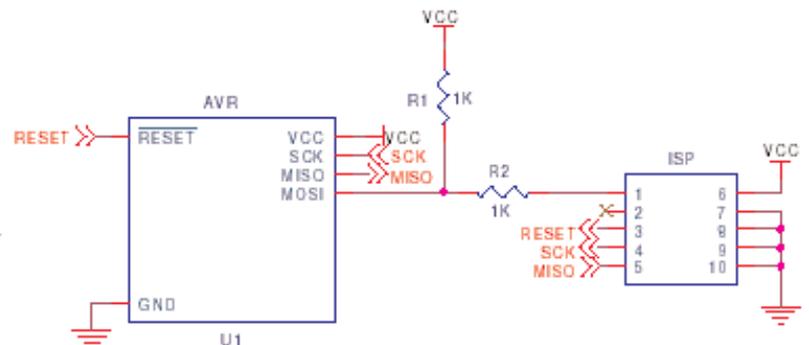
YES

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.



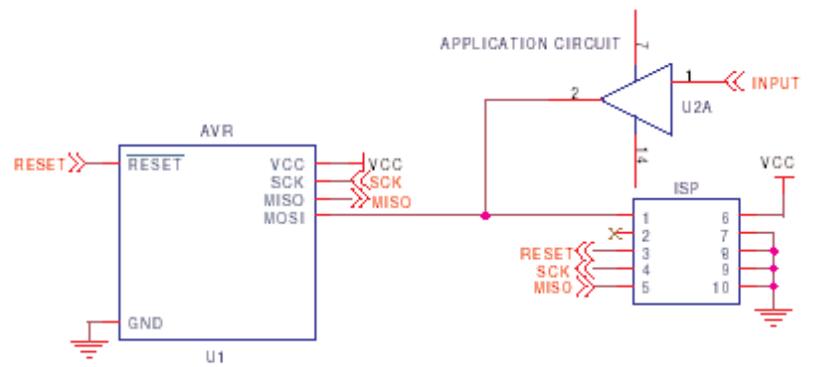
Kanda.com

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

APPLICATION CIRCUIT USING ISP PORT PINS

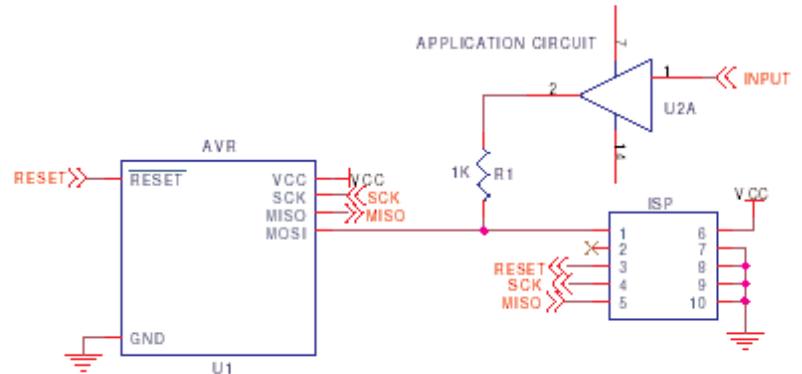
NO

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



YES

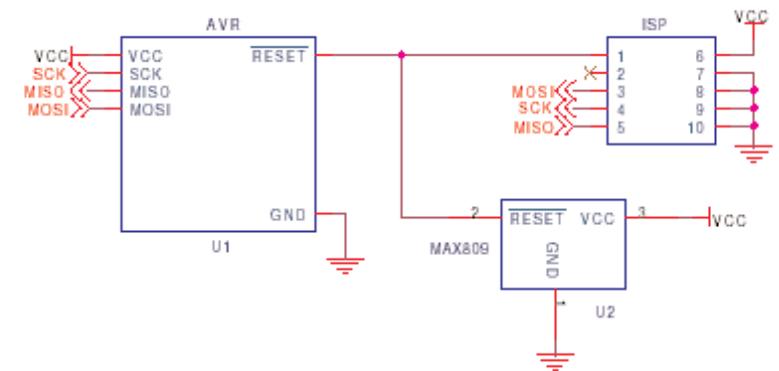
Again, PB5 is used as an INPUT to read the output of U2, but this time; The output of U2 is sufficiently decoupled by R1



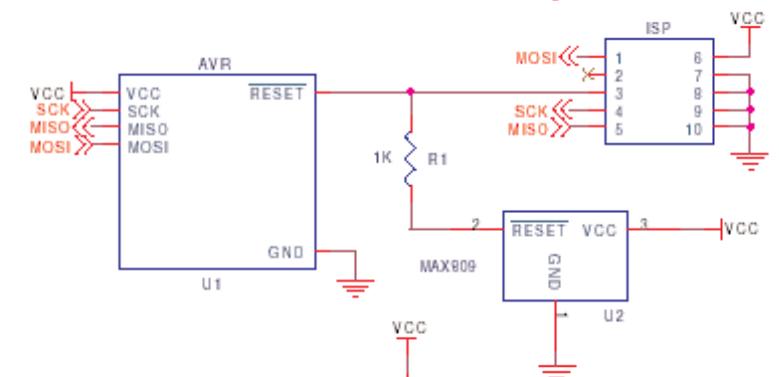
RESET IC's

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.

