

- Portable
- Compact
- One button operation
- Comprehensive device support
- Field or production use



AVR Keyfob Field Programmer

A portable ISP in a Keyfob package



Device Support: 4V minimum

- ATtiny12
- ATtiny13
- ATtiny15
- ATtiny22
- ATtiny26
- ATtiny2313
- AT90S2313
- AT90S2323
- AT90S2343
- AT90S2333
- AT90S4414
- AT90S4433
- AT90S8515
- AT90S8535
- ATmega48
- ATmega8
- ATmega88
- ATmega8515
- ATmega8535
- ATmega16
- ATmega161
- ATmega162
- ATmega163
- ATmega168
- ATmega169
- ATmega32
- ATmega323

32KB only, 64KB version available

- ATmega64
- ATmega103
- ATmega128

For full 128KB Plus EEPROM, see Hand-held Programmer - HH0010M

The Keyfob

The ultimate programming tool for AVR microcontrollers, in the field or on the production line - so easy a child can use it! The smallest stand-alone programmer for AVR available, just load it once and then program target devices again and again and again.

One Keyfob Starter Kit = Many Keyfobs

You require just one starter kit for your PC and you can load as many keyfobs as you need. Just connect the starter kit to your printer port and run the master software. Select your program and EEPROM data files, device type and Fuse settings and now you can load the keyfobs with your program or test code in seconds. As the Keyfob is battery powered during load, you don't need any power supplies or cabling, just plug a Keyfob into the simple adapter supplied. Once a Keyfob is loaded, it is completely portable and can be used where you need it, not where your PC is located.



LOAD



MOVE



PROGRAM

Field Updates

Think how often you need a simple upgrade to a vending machine, slot machine or other equipment such as lifts, security controls or medical equipment - simple, except it is hundreds of miles away.

The rugged design and simple operation of this unique programmer means that you can "let the Keyfob do the walking" by sending the Keyfob rather than an expensive engineer. The Keyfob includes a 12V battery so your target system does not have to be powered for occasional programming although you will need power from the target for multiple programming to save battery life.

For continuous use or for unpowered targets or low voltage targets, we recommend the Hand Held programmer. This uses a 9V PP3 battery with more life and has the facility to connect a 9V power supply. It is also available in 128 KB version for ATmega128 devices. The order code is HH0020 for 32KB version and HH0020M for 128KB version.

Kanda.com

Starter Kit Contents:

- ◆ One Keyfob programmer with battery included.
- ◆ One Parallel port Keyfob loader.
- ◆ An adapter for Keyfob loading.
- ◆ One spare battery.
- ◆ PC software for Keyfob loading

Compatible with windows
95/98/2000/NT/ME/XP

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Production line

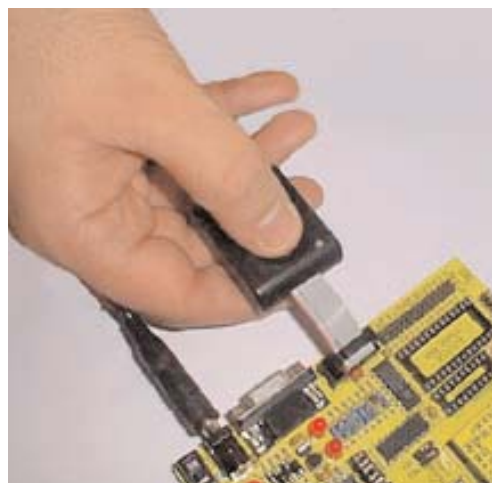
Wouldn't it be nice to have a simple to use, completely portable yet low cost programmer, which can be loaded with different program code or test vectors, available where required on the production floor? Not possible? It is now, with the Keyfob programmer - one button operation, auto sensing of target, auto verification and error indicator - that's really simple to use. Fits on a keyring and weighs less than one ounce - that's portable! Less than \$100 - that's low cost!

Device Support

You need flexibility when it comes to choosing a device so we have made sure that the Keyfob supports as many devices as possible. All AVR devices are supported except the Tiny range, although there is a maximum code size limitation of 32 Kbytes. However, an upgrade is available to support up to 64 Kbytes for the MegaAVR. Of course, just the programming code is not enough, so the Keyfob automatically loads and verifies the data EEPROM and device Fuses (on devices which support Serial Fuse Programming). Last but not least, the lockbits are programmed as part of the sequence.

Programmer details

Small, light and completely portable, the Keyfob is the most flexible programming tool around. It measures just 4.5 by 3 by 1.3 cm - which is 1.8 by 1.3 by 0.5 inches for you non-metric types! It weighs just 27g (one ounce) so it is great value and easy to post or carry on your keyring. To give you really long life, the Keyfob can be loaded with new code thousands of times as it uses serial E2 technology. The 12V alkaline battery fitted in the Keyfob, mostly used for loading the Keyfob from the PC, can power more than 50 reloads. This battery is a standard car remote control type so it is easy to source and we even include a spare in the starter kit.



Order Numbers

To help you get just what you need for your application, we can offer you a range of options.

Product	Order Number	64KB Version
Keyfob Starter kit	KF0010	KF0010M
Individual Keyfob Only	KF0020	KF0020M
Multipack (pack of 5 keyfobs)	KF0030	KF0030M
Field Service Pack (Starter kit plus 5 keyfobs)	KF0040	KF0040M

YOU MUST HAVE A KEYFOB STARTER KIT TO LOAD THE INDIVIDUAL KEYFOBS

For full 128KB flash support plus EEPROM, see our Hand-held programmer - **HH0010M**. This programmer has additional benefits including 9V PP3 battery, power supply socket, better low voltage support (down to 1.8V) and increased programming speeds.

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Battery

Battery Specification

SIZE: 23A - 26mm x 10mm Diameter (1 inch x 0.4 inches)
 TYPE: ALKALINE
 VOLTAGE: 12V
 CAPACITY: 38mAH (current drawn not specified).
 AVAILABILITY: Auto warehouses/motor factors (standard car keyfob battery)

Current Consumption

1) Loading Keyfob from PC

KEYFOB during firmware download : 12mA
 KEYFOB in idle mode (connected to PC) : 6mA
 KEYFOB during EEPROM programming : 15mA

2) Target Programming

Target Vcc greater than 4V : 280uA
 Target Vcc 4V or less (NOT RECOMMENDED): TARGET Dependent

One battery should be able to power 50 Keyfob loads from PC. If target board voltage is greater than 4V, 100 hours of device programming should be possible.

Unpowered or Low Voltage Targets

An unpowered target or target with less than 4V Vcc will drain battery very quickly and only a few programming operations will be possible. Look at Hand Held programmer (HH0020) if you want to program unpowered or low voltage targets frequently.

Connector

ALL ground pins must be connected as different lines are needed by the keyfob power supply circuit.

This behavior is different from standard ISP where only one line must be connected.

LED is an indicator line and can be omitted if not required.

Do NOT have pullup resistors of more than 1K on Reset or programming lines.

If you require an adapter to a 6-way connector, connect all ground pins to a single pin and omit LED, which is an indicator line.

MISO	SCK	RESET	LED	MOSI
9	7	5	3	1
10	8	6	4	2
GND	GND	GND	GND	Vcc

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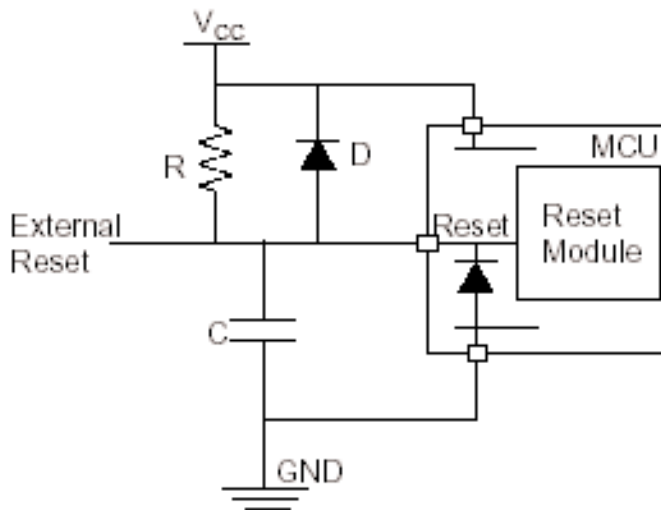
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Target Circuit Layouts

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.

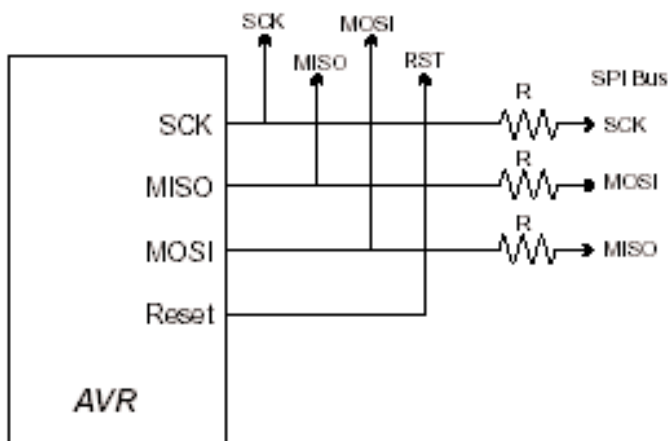


Atmel's recommended Reset Circuit

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 will not cause a problem as long as they are less than 100nF, otherwise programming speeds must be reduced.

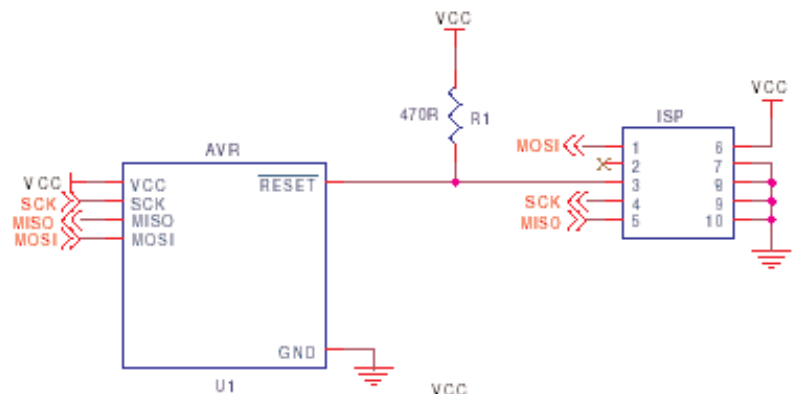
The following diagrams of correct and incorrect circuits do not include any capacitors. As long as capacitors are placed next to the AVR pins, then they will not affect the circuit.

GENERAL

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

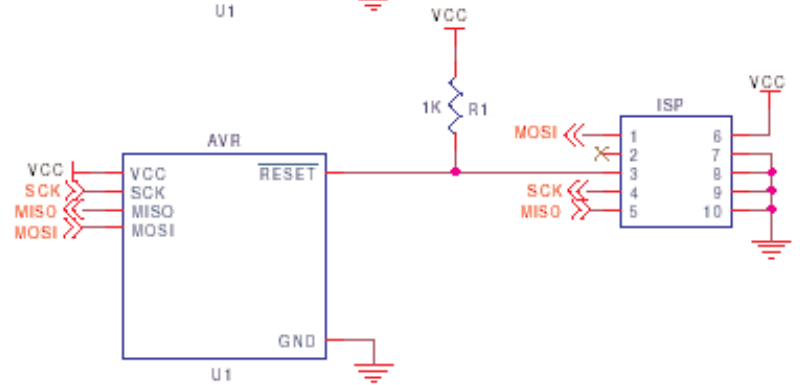
NO

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



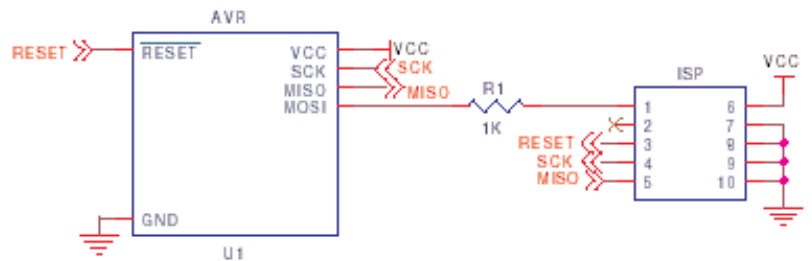
YES

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



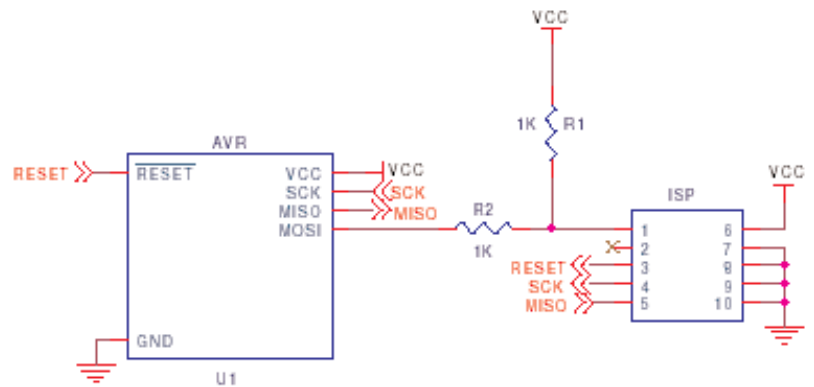
YES

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



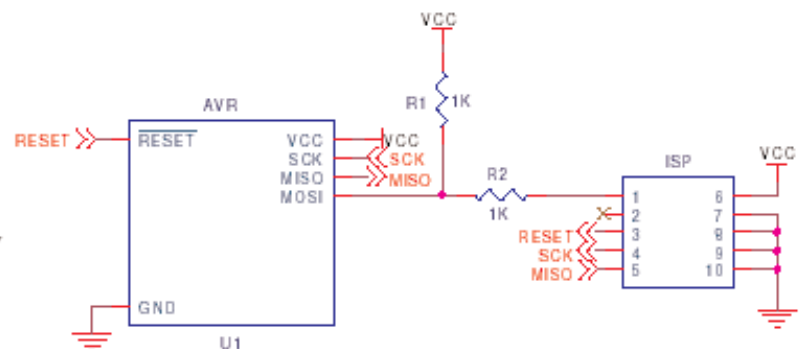
YES

Again, the series resistor will have no effect.



NO

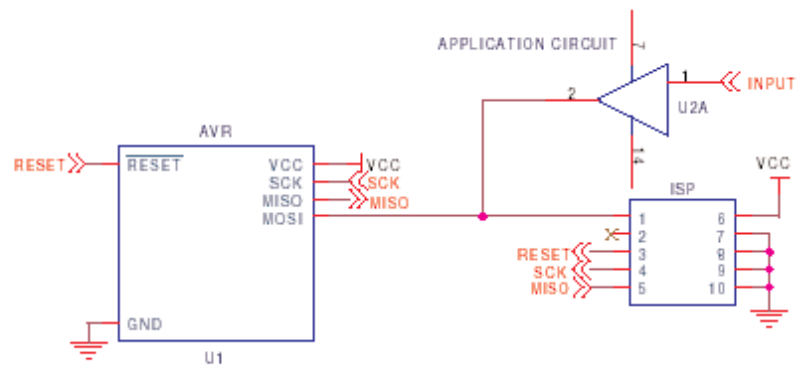
This is a potential problem. As the series resistor will weaken the programmer's ability to act on the programming line.



APPLICATION CIRCUIT USING ISP PORT PINS

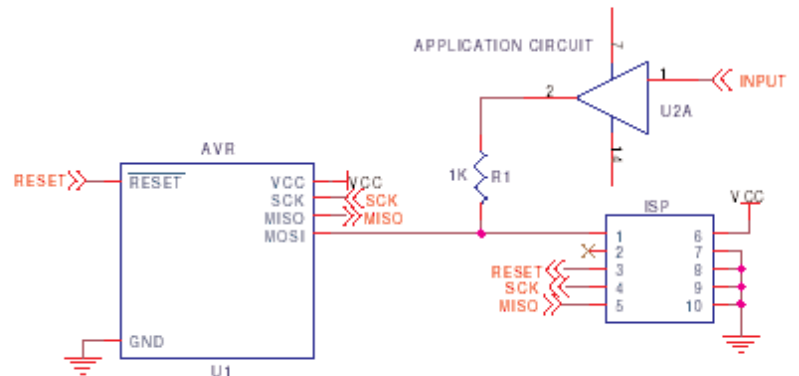
NO

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



YES

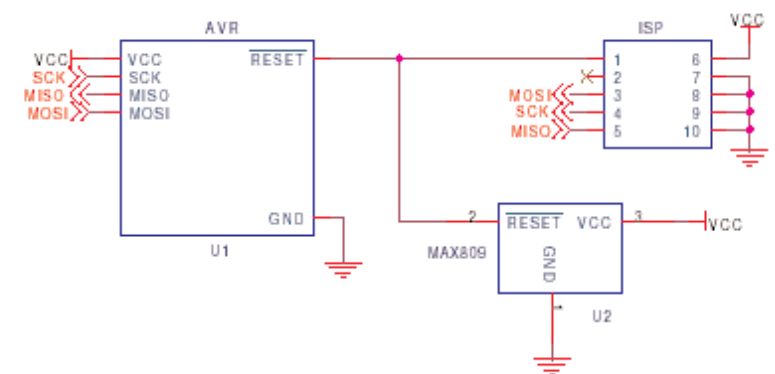
Again, PB5 is used as an INPUT to read the output of U2, but this time; The output of U2 is sufficiently decoupled by R1



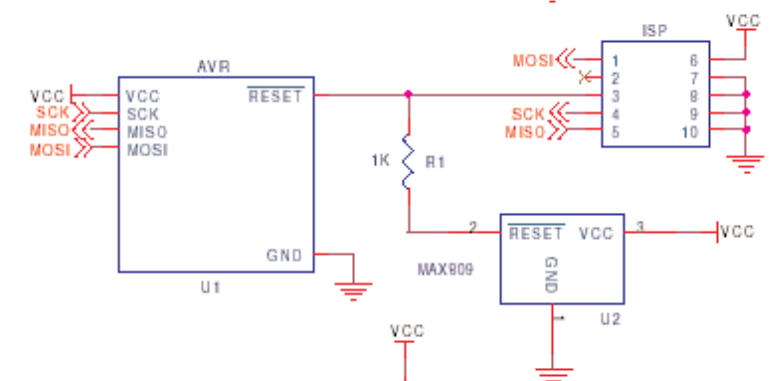
RESET IC's

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.

