

# Connecting to the target through the JTAG Interface

A minimum of 6 wires is required to connect JTAGICE mkII to the target board. These Signals are TCK, TDO, TDI, TMS, VTref and GND.

Optional line is the nSRST. The nTRST signal is not used, and is reserved for compatibility with other equipment.

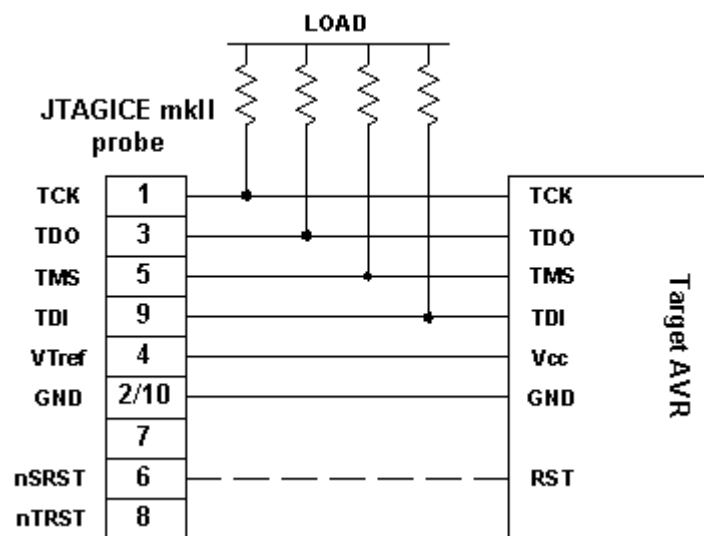
nSRST is used to control and monitor the target reset line. This is however not necessary for correct emulation. But if the application code sets the JTD bit in the MCUCSR, the JTAG Interface will be disabled. To enable the JTAGICE mkII to reprogram the target AVR, it will need to have control of the Reset Pin. Please note that the nSRST line is pulled high internally by a 10K ohm load.

**Note:** Vsupply is not connected on the JTAGICE mkII. Hence the JTAGICE mkII cannot be powered from the target application.

The following text and descriptions will assume a 6-wire connection between the target and JTAGICE mkII.

The figure below shows which JTAG lines should be connected to the target AVR to ensure correct operation. To avoid drive contention on the lines it is recommended that series resistors are placed between the JTAG lines and external circuitry. The value of the resistor should be chosen so that the external circuitry and the AVR do not exceed their maximum ratings (i.e. sinks or sources to much current). See the section [Hardware Description](#) for a detailed description of the hardware.

## Connecting JTAGICE mkII to Target Board



## Connecting JTAGICE mkII to several devices placed in a JTAG Chain

JTAGICE mkII support emulation of devices placed in a JTAG Chain. When connecting N devices in a JTAG scan chain all devices should connect to TMS and TCK in parallel. The first device should connect its TDI to the emulator while the TDO should be wired to TDI of the next device up to device N. The last device should connect its TDO to the emulator.

See the [Frontend Software](#) for information on configuring AVR Studio for debugging devices placed into a JTAG Chain.

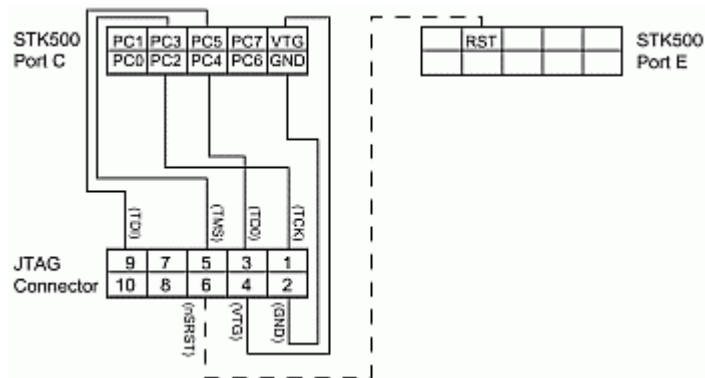
## Connecting JTAGICE mkII to STK500

STK500 does not have a dedicated JTAG interface connector. To connect the JTAGICE mkII to the STK500 board, the JTAG Probe must be strapped to the appropriate JTAG Port Pins of the target device using the squid cable.

Check the target device datasheet for the location of the JTAG pins on the appropriate device. Figure below shows an example on how the pins should be connected for an ATmega32 on the STK500. Remember to remove the reset jumper on the STK500 if the reset pin is going to be controlled from the JTAGICE mkII.

**Note:** Add-on cards for the STK500 like e.g. STK501/502 may have a dedicated JTAG connector.

### Connecting JTAGICE mkII to STK500 with ATmega32 using the squid cable

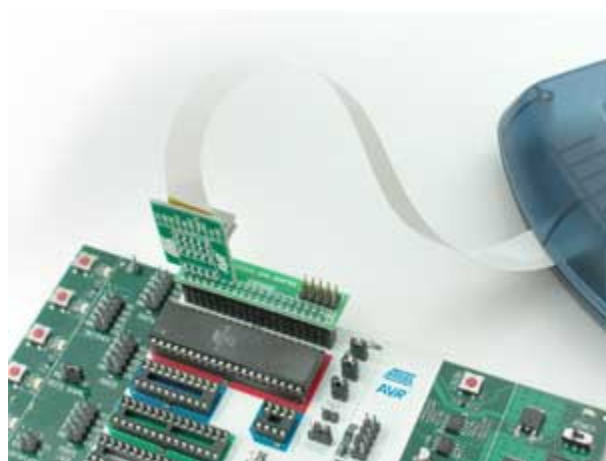


### STK500 JTAG Adapter



The STK500 JTAG Adapter, that comes with the JTAGICE mkII, can be used to simplify the connection to the STK500 for AVR devices with JTAG that mates with socket SCKT3100A3 and SCKT3000D3 on the STK500. Click [here](#) for a list of these devices.

### Easy JTAGICE mkII to STK500 connection



### Connecting through ISP

If the JTAGEN fuse (JTAG Enable) in the target device is un-programmed, the JTAG Interface will be disabled. This fuse cannot be programmed through the JTAG Interface and must therefore be programmed through e.g. the ISP Interface. This can be done from the JTAGICE mkII by connecting to the AVR device as described in the table

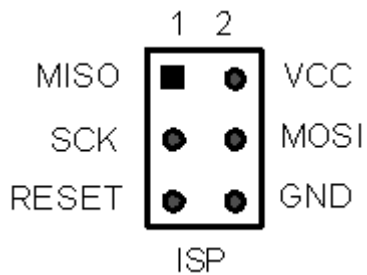
below using the squid cable that comes with the JTAGICE mkII.

JTAGICE mkII probe	Target pins	Squid Cable Colours	STK500 ISP pinout
Pin 1 (TCK)	SCK	Black	3
Pin 2 (GND)	GND	White	6
Pin 3 (TDO)	MISO	Grey	1
Pin 4 (VTref)	VTref	Purple	2
Pin 5 (TMS)	Not present	Blue	Not present
Pin 6 (nSRST)	RESET	Green	5
Pin 7 (Not connected)	Not present	Yellow	Not present
Pin 8 (nTRST)	Not present	Orange	Not present
Pin 9 (TDI)	MOSI	Red	4
Pin 10 (GND)	GND	Brown	Not present

**Note**

If using this ISP connection from JTAGICE mkII on a STK500, be sure to de-attach the RESET jumper on the STK500. And connect to the correct ISP header for the actual AVR device, guided by the colour code in the STK500 silk-print.

**STK500 ISP connector**



When the target connection is correctly set up, then [connect to the Host PC](#).