

AN111: AVR-Programming

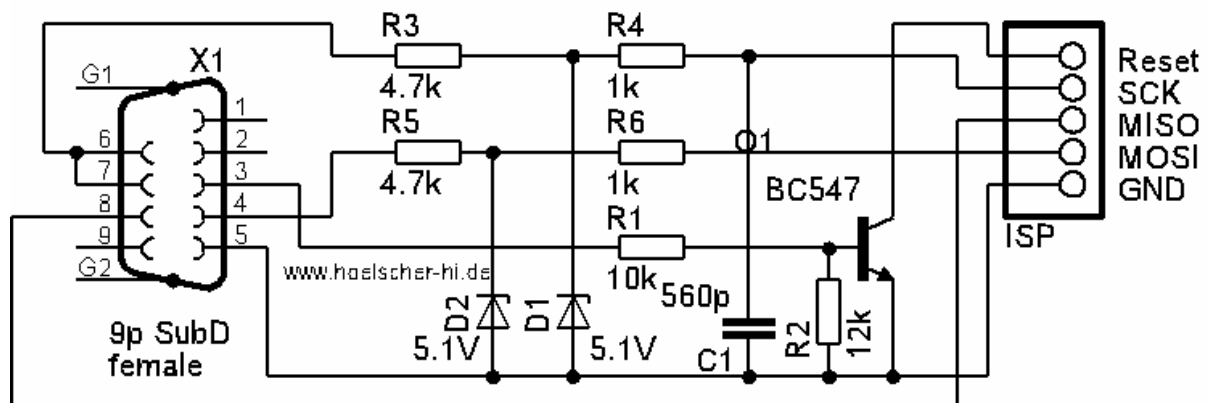
Introduction

This application note shows how to program AVR controllers with PonyProg. It was written for the DMX-Transceiver but should work with other target boards, too. The schematics of this application note are based on the projects of Scott-Falk Hühn.

Hardware

serial programmer (SI-PROG)

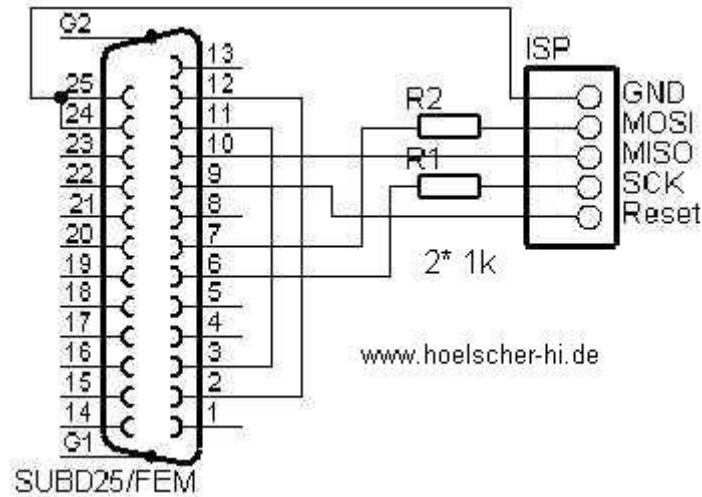
- + reliable
- + cheap
- more components than parallel programmer
- uses RS232-Port



pic1: SI-PROG

parallel programmer (PAR-PROG)

- + very easy to build
- + very cheap
- doesn't work with some printer ports (Device missing)



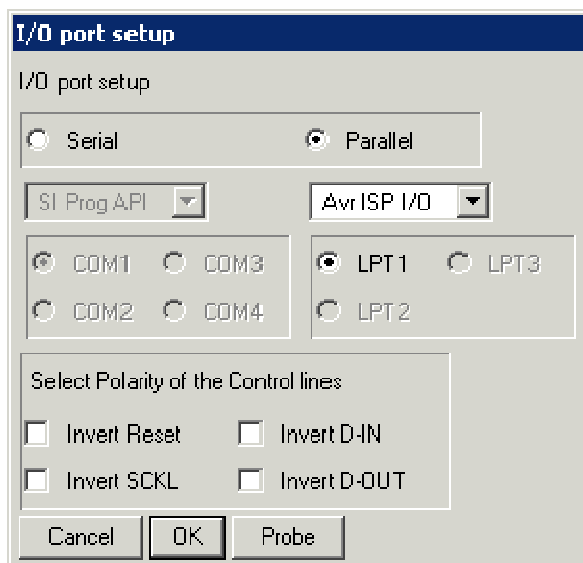
pic2: PAR-PROG

Installation

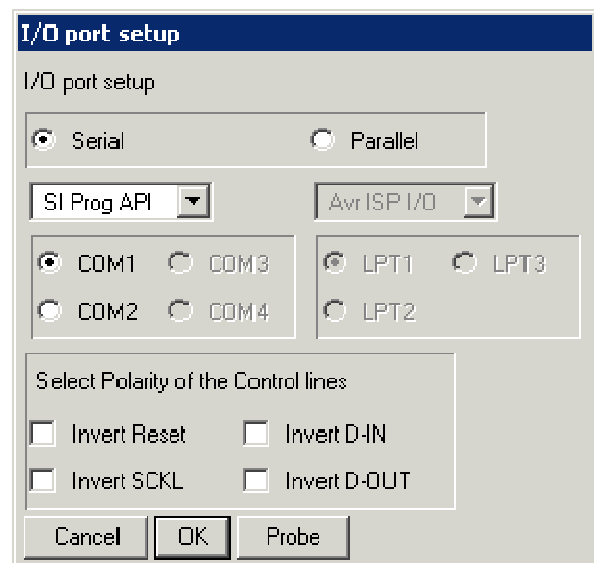
Download the latest release of PonyProg (v2.06f) from <http://www.lancos.com/ppwin95.html> and install it.

Setup

Click on „Setup“ to choose your programmer. Please use the following screenshots for configuration:



pic3a: PAR-PROG Setup

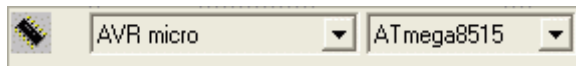


pic3b: SI-PROG Setup

After that, you should run a calibration.

Programming AVR

1. Choose the „ATmega8515“ from „AVR micro“ as the target device (pic4).
2. Open your .hex-file as device file.
3. Close other programs that could influence the programming procedure.
4. Connect your DMX-Transceiver with the PSU. (There should be 5.0V between pin20 and pin40 of the AVR's socket.)
5. Connect your DMX-Transceiver with the programmer and your PC with the programmer.
6. Now you can flash the AVR by clicking on „Write Device“.

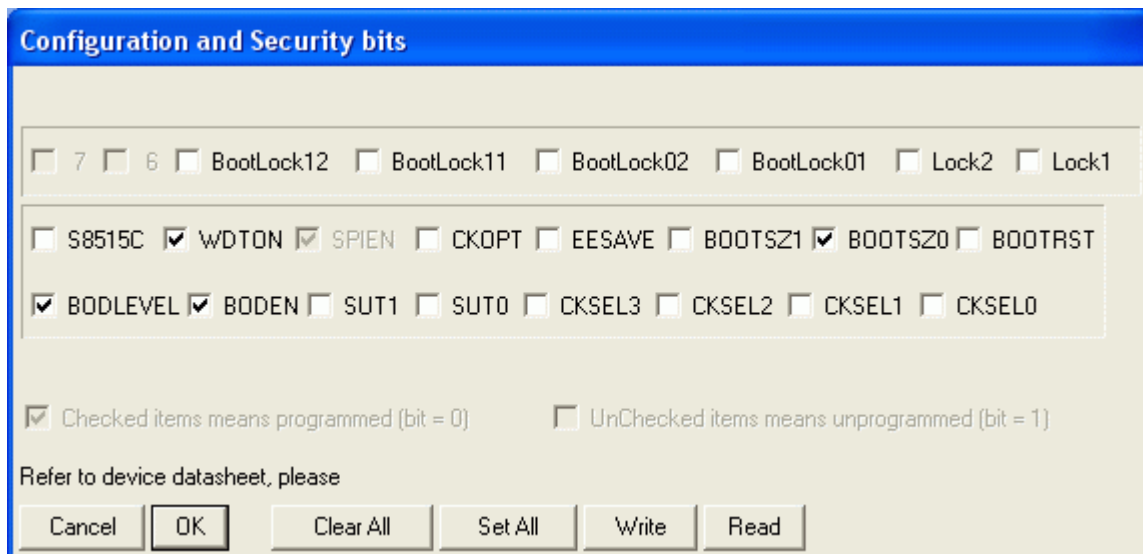


pic4: device selection

Setting fuse bits

The internal RC-Oscillator (1MHz) is chosen as clock source as factory default. Being too slow for DMX, you have to choose the external crystal (8MHz). This is done by the following procedure:

1. Open the „Configuration and Security bits“ menu by clicking on the lock icon.
2. Read back the current settings.
3. Change the settings according to pic5.
4. Write the fuse bits.



pic5: fuse bits (crystal settings, brown out detection enabled, watchdog enabled)

board.hex

This is a test file for the DMX-Transceiver.

1. Download this file.
2. Write it in your AVR's flash.
3. Select the external crystal by changing the fuse bits.
4. Now your Transceiver is ready for the real firmwares.

Test functions:

All DIPs off:

The flashing red LED indicates the running test application.

All DIPs on:

All DIPs are connected if the green LED is on.

1st DIP on:

If the green LED is on, fuses have been changed. (Clock is OK!)

2nd DIP on:

If the green LED is on, your transceiver is connected with a valid DMX signal.
Flashing of the green LED indicates a wrong connection of D+ and D-.

3rd DIP on:

If the green LED is on, the zc-detection is OK. (Of course this test function works only if a zc-detection is connected.)