

Programming the WTS701 on an Application Board

When the WTS701 is soldered on to an application board, it may be difficult to reprogram it with updated firmware or a new language/voice. In an embedded application, the simplest way is to bring out the pins of the SPI interface of the WTS701 and connect these to the Winbond ES701 demo board. The PC application can then download new firmware and corpus to the customer application board.

Required modifications

The ES701 board must be modified so that the WTS701 already on the board does not interfere with the customer board. Either of these two methods works:

1. Remove the WTS701 from the board.
2. Lift the grounded end of R12 and connect to V_{CC} instead. This pulls CS\ HIGH and the WTS701 will no longer respond to SPI commands.

The customer application board must be modified so that the SPI pins as well as the R/B\ and INT\ pins can be externally controlled. If a microcontroller controls the SPI interface, the following methods may work:

1. Remove the microcontroller if socketed.
2. Hold the microcontroller in reset if the I/O pins are tri-stated while the part is reset.
3. Cut SPI, INT\ and R/B\ traces and put in temporary jumpers to select external or internal SPI control.

Required connections

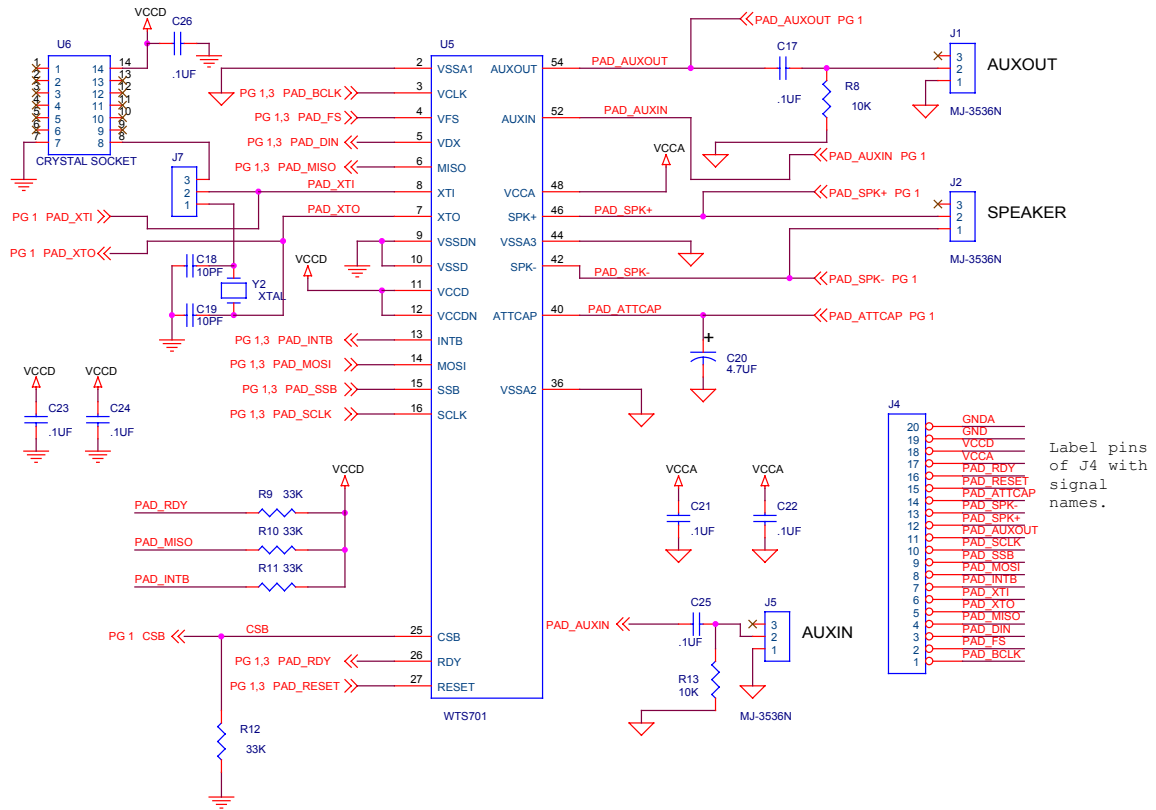
The pins that need to be connected from the ES701 demo board to the part to be programmed are listed in the table below. The pull-up resistors are already in place on the ES701 but it does not matter if they are replicated on the customer board as long as they are not stiff enough [resistance too low] to prevent the pins from going LOW.

| <i>Connector on ES701</i> | <i>Function</i> | <i>Requires Pull-Up</i> |
|---------------------------|-----------------|-------------------------|
| J4 pin 4 | MISO | Yes |
| J4 pin 7 | INT\ | Yes |
| J4 pin 8 | MOSI | No |
| J4 pin 9 | SSB | No |
| J4 pin 10 | SCLK | No |
| J4 pin 16 | R/B\ | Yes |
| J4 pin 19 | GND | No |

The ES701 must be powered up through a 5 VDC power supply, as the level converters need to be powered up.

It is important to use a short cable of good quality between the demo board and the application board. Poor cable connectors or cable picking up excessive noise can cause errors manifesting themselves as audio glitches or a chip that does not execute commands correctly.

ES701 Schematics



In the schematics above, header J4 shows the SPI signals brought out that are used to connect to the customer board.

R9, R10 and R11 are the pull-up resistors for the SPI and control lines

The connection of R12 to the CS\ signal is shown in the bottom left corner. Remove the connection to ground and connect to V_{CCD} before attempting to send commands to another board connected to the SPI interface.