AE0IS100 - Serial Adapter for In System Programming
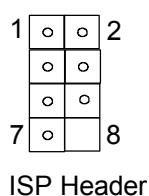
The AE0IS100 is an adapter for use between a PCs serial port and a microcontroller (or similar system) that uses a asynchronous serial link for programming and communication. It provides level translation between logic levels and normal RS-232 serial levels. It also provides two pulldowns controllable by the serial port handshaking lines that may be used to control the reset and program mode lines.

When used with appropriate serial download and terminal emulation programs the microcontroller can be automatically switched between program and run modes by the PC. If used with a terminal emulation program that gives direct control over the DTR line then the microcontroller can be reset from within the terminal emulation program.

The adapter provides program and run modes for use with less sophisticated programs to allow switching between programming and communication without needing to have and change jumpers or switches on the target board.

On Board Connection

The logic level interface uses a standard 8 pin 2 row header (4 pins/row) with the 8'th pin cut. This is compatible with the pinout standardized for the LPC2000 series of microcontrollers.

ISP Header

Pin	Function
1	Vcc, Nominal 3.0 to 5.0V
2	*Reset - an open drain connection that can be pulled low either by the reset switch or by the DTR line (if in auto mode).
3	*ISP - an open drain connection that can be pulled low by the RTS line when in auto mode. In program mode this line is held low.
4	RxD - serial input line on the microcontroller
5	Gnd - power return line
6	TxD - serial output line on the microcontroller

7[1]	N/C - no connect
8[1]	key - this pin should be cut to help ensure that the ribbon cable from the adapter is inserted correctly.

Operating Modes

The rotary mode switch gives the adapter three operating modes.

- Run - Equivalent to a standard 3-wire style RS-232 connection. TxD, RxD and Gnd are connected. The reset line (pin 2) is floating but can be pulled low by the reset button which shorts pin 2 to pin 5. The ISP line (pin 3) is left floating.

- Prog - Program mode. RxD, TxD, Gnd and Reset are connected as in run mode. The ISP line is pulled low (pins 3 and 5 are shorted).

- Auto - PC control mode. RxD, TxD and Gnd are connected as in run mode. The ISP (pin 3) and Reset (pin 2) lines may be shorted to Gnd (pin 5) by the RTS and DTR lines respectively.

Handshaking

The adapter has a set of jumpers that are used to set the behaviour of the RS-232 handshaking lines to the PC. Each of DCD, DSR, CTS and RI can be tied (on the logic level side) to Vcc, Gnd, DTR or RTS. The shipping default condition is shown in the table below. This acts as a null-modem connection.

Jumper	DB-9 Signal	Tied to
J7	DSR	Gnd
J8	DCD	Gnd
J9	CTS	Gnd
J10	RI	Vcc

The jumper options to control the handshake lines are laid out as follows:

- Jumper 1-2 connects Gnd to the signal.

- Jumper 3-4 connects Vcc to the signal.

- Jumper 5-6 connects DTR to the signal.

- Jumper 7-8 connects RTS to the signal.

---

[1] These pins may be left out to provide a smaller 6 pin connector. This is not recommended since it increases the risk of a misconnection and possible damage to the adapter and the target board.

Orderable Products

- AE0IS100   - Serial port ISP programmer. Assembled and tested.

- AE0IS101   - Isolated serial port ISP programmer. PC serial port and target are separated by galvanic isolation and an isolated DC-DC power supply. Assembled and tested.

- AE0KT100   - Bare board for building a serial port ISP programmer. Note: Please order this only if you are comfortable soldering surface mount devices. The components go as small as 0805 and the pitch as low as 0.025 inches.

- AE0KT101   - Replacement ribbon cable for AE0IS100.

- AE0KT102   - Complete kit for building a serial port ISP programmer. Includes Bare board, components, ribbon cable and case. Note: Please order this only if you are comfortable soldering surface mount devices. The components go as small as 0805 and the pitch as low as 0.025 inches.

Ratings

Absolute Maximums[2]

Temperature   0C - 70C

Vcc   -0.3V - +6V

*ISP, *Reset   10 mA

                     -0.3V - +10V

Typical Operating Conditions

Vcc   3.0V - 5.0V

Revision History

2004/05/11 - Revision A, First release.

2004/06/12 - Revision B, Add isolated verion as an orderable part.

---

[2] Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

http://www.aeolusdevelopment.com/