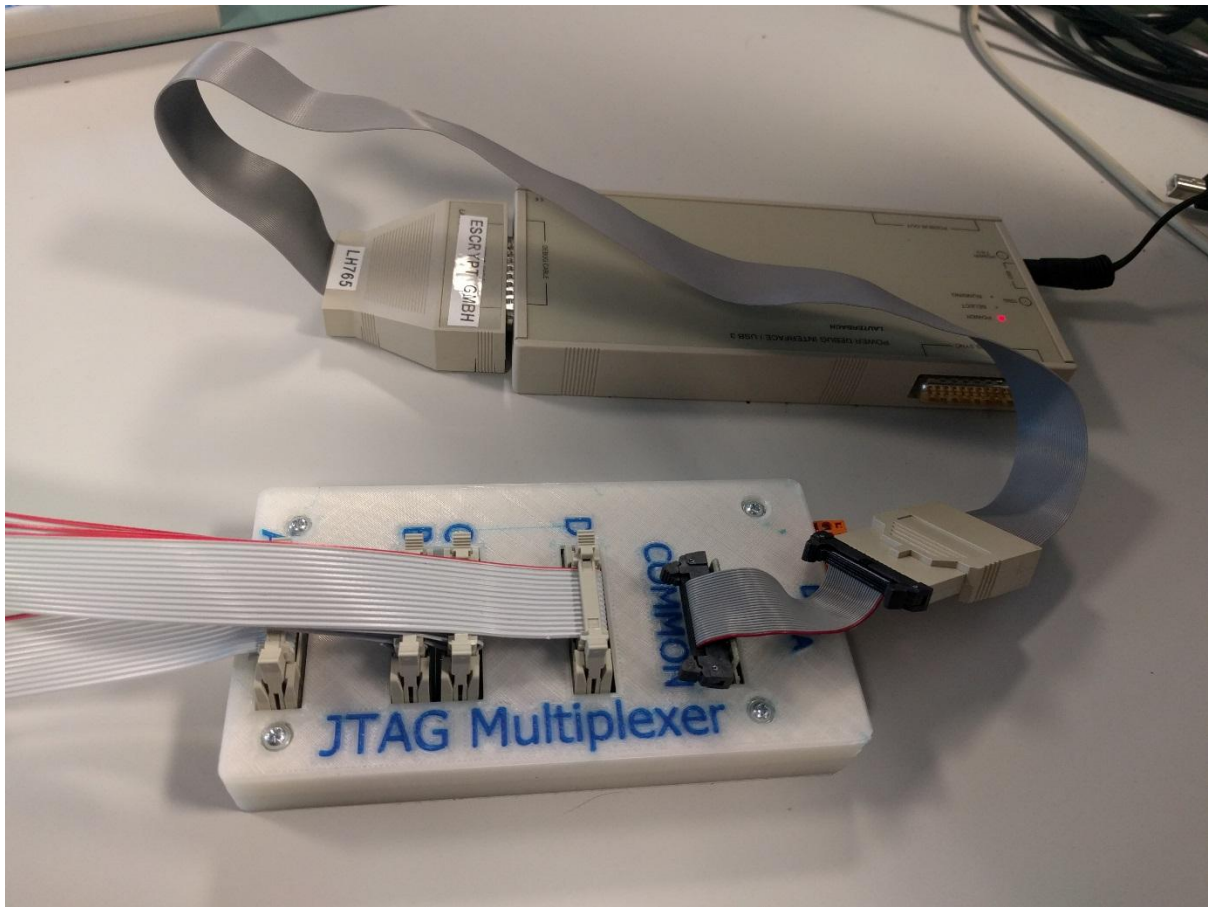


JTAG Multiplexer description and user guide

Mark McLean, 6th May 2016



Description

JMUX is a signal multiplexer specifically designed to be use with JTAG cables. It is a one-to-four multiplexer, and it switches all the signals relevant to a JTAG cable. Relays are used to switch the JTAG signals providing low resistance, low capacitance and isolation from the control circuitry. It does not switch the grounds. See below for details and pinouts, different versions are available for different hardware targets.

JMUX also provides two auxiliary normally-open relay contacts to switch other equipment such as power supplies.

JMUX is USB controlled and powered. There is complete isolation between the USB cable and the JTAG cables. It is a HID (Human Interface Device) meaning that no drivers are needed. A simple console application is provided to control it, this permits easy control from scripts, etc.

Commands

The multiplexer is intended to be controlled through a simple C# Console application called JMux.exe

The following commands are supported:

--node=<x>	Switch the multiplexer to the specified node, valid nodes are A, B, C or D e.g. to select the third node: <code>jmux --node=C</code>
--relays=<x><x>	Control either or both of the auxiliary relays, valid values are: 0 - switch off 1 - switch on T - toggle X - don't change e.g. to switch on relay 1 and leave relay 2 unchanged: <code>jmux --relays=1X</code>
--name=<SN>	Optional parameter to indicate which multiplexer the command is intended for when there is more than one connected. Must precede other options if used. e.g. to switch multiplexer JM-1001 to node D: <code>jmux --name=JM-1001 --node=D</code>
--set_sn=<SN>	Set the multiplexer's serial number. The serial number may not contain a space. This command is not compatible with the --name parameter, and should not be used if more than one multiplexer is connected to the PC. e.g. to set the multiplexer's serial number to PPC1: <code>jmux --set_sn=PPC1</code>
--diag	Get diagnostic information about the multiplexer(s) connected to the PC. This includes the version number of the multiplexer firmware. e.g. <code>jmux --diag</code>
--help	Get a listing of the available commands, and the version number of the C# software.

Specifications

USB powered, max current approx 280mA @ 5V (with all relays energised).

Auxiliary relay contacts are rated for 24V DC at 1A. The relays are Omron part number G5V-1 5VDC.

JTAG relay contacts are rated for 30V DC at 1A. The relays are Panasonic part number TXS2-4.5V.

Appendix A, Pinouts

Shaded squares are switched, un-shaded squares are always connected. These are either GND or N/C.

Power PC

TDI	1	2	GND
TDO	3	4	GND
TCK	5	6	GND*
#EVTI	7	8	N/C
#RESET	9	10	TMS
JTAG_VTREF	11	12	GND
#RDY	13	14	JCOMP

Renesas RH850

TCK	1	2	GND
#TRST	3	4	FLMDO
TDO	5	6	N/C*
TDI	7	8	Vcc
TMS	9	10	N/C
#RDY	11	12	GND
#RESET	13	14	GND

Aurix

TMS	1	2	VTREF
TDO	3	4	GND
CPUCLOCK	5	6	GND*
TDI	7	8	#RESET
TRST	9	10	#BRKOUT
TCK	11	12	GND
#BRKIN	13	14	#OCDSE
RESERVED	15	16	GND

* Pin 6 is grounded via an optional resistor. This should be fitted for PowerPC and Aurix, but omitted for Renesas RH850.

Appendix B, Photos

This photo shows the PowerPC version, with 14 pin connectors.

