Universal Cable (unicab)

The Universal Cable (unicab) is a dongle device, which is designed to be plugged into the PC parallel port (LPT) . In unicab there is a chip of programmable logic (Xilinx CPLD XCR3128XL), which may be configured to act in different ways. This way, unicab is able to support a number of different configurations, which emulate standard JTAG cables or programmers.

The device is assembled in a box for parallel port dongle with DB-25 connectors at both sides. One of the sides has a male connector. This is the side to be plugged into the parallel port of the PC using the cable for lengthening the parallel port, which is included in the package. The other side has a female connector. To this connector are attached the cables that connect to the user system. On the dongle there are three LEDs: green, yellow and red, and a jumper (or a button). The green one is used to indicate the presence of power supply. The yellow one is on when the device is in reconfiguring mode. The red LED is connected to one of the signals at the user side and may be used for some indication; this LED does not have any special function.

The jumper (the button) is used to switch the device into reconfiguring or user mode. When unicab is in reconfiguring mode, the yellow LED is on. The button needs to be kept pressed until the process of reconfiguration is running.

Unicab is designed to use power supply from the user system. There is no other possibility to supply it.

The power supply voltage may be in the range from 3 to 6 volts. In unicab is embedded LDO type of voltage regulator. This regulator produces power supply voltage of 3.3V for the programmable logic chip.

WARNING! Unicab does not have any type of protection against incorrect power supply connection or overvoltage. If a mistake is made, the device goes out!

SPECIAL CHARACTERISTICS: The used chip of programmable logic is powered with 3.3V. This is the reason all the output signals to have a logical high level voltage of 3.3V (LVTTL compatible). This may introduce some problems in target systems that require 5V levels. Please, refer to the datasheet of the target device that unicab is connected to. The inputs of unicab are 5V tolerant. This way, the device may be connected without any problems into target system that is 5V.

Standard configurations, supported by unicab:

1) Xilinx Parallel Cable III
2) ARM Wiggler
3) ARM Wiggler Chinese variant for RDI driver
4) ARM Raven
5) Atmel AVR STK200
6) MSP430 TI FET

Cables for the standard configurations:

1) Xilinx Parallel Cable III

This cable has no standard layout of the connector to Xilinx JTAG. That's why here is described only the connection to the user side of unicab. It is up to the user to select the most suitable to the needs connector pair.

Xilinx Parallel Cable III		
DB25F, pin	**Signal name**	**Notes**
1	VCC	Unicab is powered from this pin
2	TMS	
3	TCK	
4	TDO	
5	TDI	
18-25	GND	Common ground

2) ARM Wiggler
3) ARM Wiggler Chinese variant for RDI driver
4) ARM Raven

This configuration has a standard 20-pin (IDC 2X10) connector to connect to JTAG of the ARM CPU.

ARM Wiggler, ARM Raven – Cable type ARM-20			
DB25F, pin	**Signal**	**IDC2X10, pin**	**Notes**
1	VCC	1, 2	Unicab is powered from this pin
2	TMS	7	
3	TCK	9	
4	TDO	13	
5	TDI	5	
6	TRST	3	
7	RESET	15	
11	RTCK	11	Not used
18-25	GND	4,6,8,10,12,14,16,18,20	Common ground

5) AVR STK200

This configuration works with standard 10-pin (IDC 2X5) connector for the ISP port of the AVR family CPUs.

AVR STK200 – Cable type AVR-STK200-10			
DB25F, pin	**Signal**	**IDC2X5, pin**	**Notes**
1	VCC	2	Unicab is powered from this pin
2	LED	3	
3	SCK	7	
4	MISO	9	
5	MOSI	1	
6	RST	5	
18-25	GND	4,6,8,10	Common ground

6) MSP430

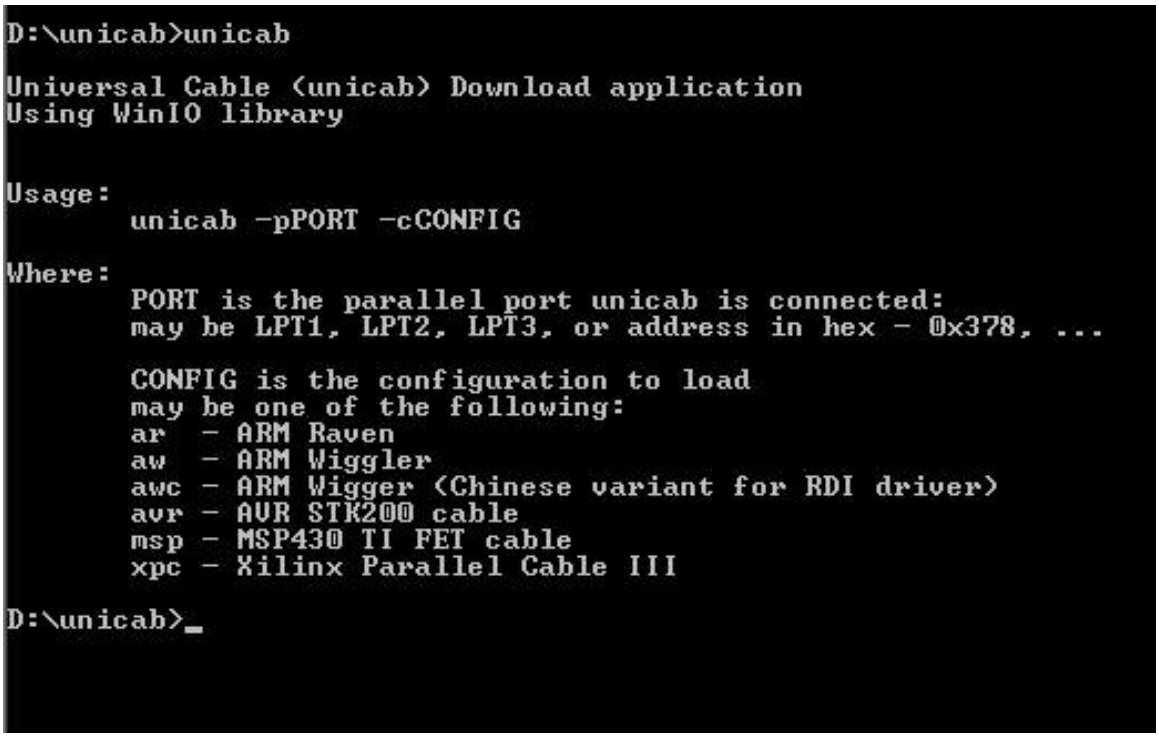
This configuration uses 14-pin (IDC 2X7) connector to the JTAG port of the MSP430 family CPUs.

MSP430 – Cable type MSP430-14			
DB25F, pin	**Signal**	**IDC2X7, pin**	**Notes**
1	VCC	2	Unicab is powered from this pin
2	TMS	5	
3	TCK	7	
4	TDO	1	
5	TDI	3	
10	RST	11	
16	TCLK	6	
17	TST	8	
18-25	GND	9	Common ground

Software for downloading of the configurations to unicab (program unicab.exe)

The program unicab.exe is Windows console application, which loads the selected configuration into unicab.

When the program is started without any option on the command line, instructions for usage are printed:



To be able to load a configuration in unicab, the following must be done:

1. Unicab must be powered (the green LED must be on);
2. The jumper must be in position this way, that the yellow LED must be on (or the button must be held down).

After the configuration is loaded, the jumper must be placed in a way that the yellow LED is off. This is the position for usage of the downloaded configuration.

IMPORTANT:

1. The downloaded configuration is preserved in unicab even when it is powered off; there is no need to load it again after power-on. To reload a new configuration is necessary only when a change of the personality of the device is necessary.
2. The device is not designed to be used together with some standard PC peripherals that are connected to the parallel port. The device must be the only thing connected to the parallel port, when used.

Contents of the unicab package:

1) Unicab dongle – 1 piece;
2) Cable ARM-20 – 1 piece;
3) Cable MSP430-14 – 1 piece;
4) Cable AVR-STK200-10 – 1 piece;
5) Lengthening cable for the PC parallel port – 1 piece;

6) Compact disc, containing:
    a. This document in English and Bulgarian;
    b. The unicab.exe application
    c. Folder with RDI drivers for usage with ARM Wiggler Chinese variant.