

«NPF Mechatronica-Pro» LTD

***EmuOK - JTAG-emulator for programming and debugging of
microcontrollers Texas Instruments***

Technical manual

Rev. 1.00

This technical manual corresponds to USB–JTAG emulator EmuOK rev. 1.00. Correspondence of this manual to other versions of the emulator should be specified on website of developer – «NPF Mechatronica- Pro» LTD – www.mechatronica-pro.com.

1. Purpose

USB–JTAG emulator EmuOK is a device for programming and debugging of microcontrollers Texas Instruments (TI), as well as for evaluation OF their functional capabilities.

The device is operating in USB Full Speed mode (up to 12 Mbit/s), it can be implemented in field of power electronics, since the device is operating stably with emission of interference*, which is caused by commutation of power switches.

**A USB-cable with ferrite filter is recommended to be used provided there is a high level interference emission.*

The following lines of TI microcontrollers are supported:

- C2000 (Piccolo, Delfino, ARM Cortex-M3, F28M3*, C28**)
- C5000 (C55**)
- C6000 (C64**, C67**)
- Davinci Video Processors
- ARM Cortex-A8 Sitara

Physical configuration of the emulator is shown in fig 1.



Fig. 1. Physical configuration of the emulator EmuOK

The emulator is connected to the microcontroller board by means of flat cable with 2x7 Pin connector. Pitch of the connector: 2.54mm. Length of the flat cable 65mm.

The JTAG-connector is shown in fig. 2.

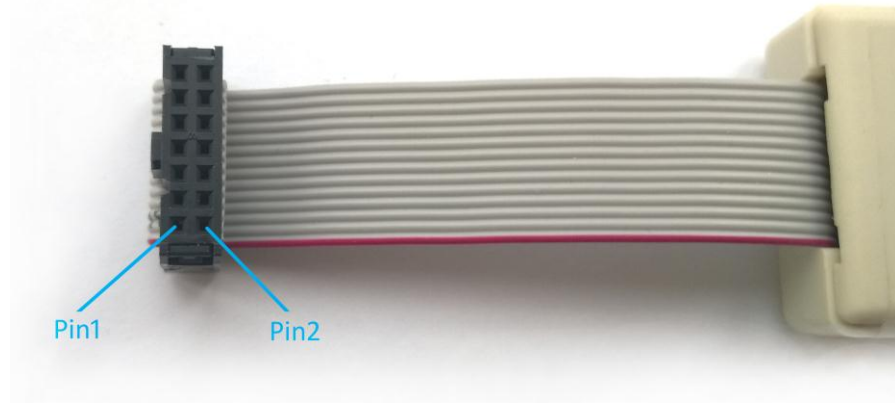


Fig. 2. JTAG-connector of EmuOK for connection to the microcontroller board

In table 1 are specified the signals of JTAG-connector.

Table 1. Specification of JTAG-connector	
1	TMS
2	~TRST
3	TDI
4	GND
5	NC
6	NC
7	TDO
8	GND
9	TCK
10	GND
11	TCK
12	GND
13	NC
14	NC

NC – not connected (empty contacts).

On front panel of the emulator a MiniUSB port is mounted to connect a USB – miniUSB cable, as well as two single LED indicators are mounted.

The front panel of the emulator is shown in fig. 3.



Fig. 3. Front panel of the emulator

LED «**Power**» is on, when the emulator is connected to computer via USB.

LED «**Status**» is blinking, when the emulator is connected to personal computer (PC); when microcontroller is programmed and debugged.

2. Connection procedure

First, emulator EmuOK is connected to the microcontroller board, and then USB-cable is inserted into emulator and PC. Functional diagram of connection is shown in fig. 4.



Fig. 4 – Functional diagram of connection

To reset the emulator you need to disconnect the USB cable and re-connect it once more. At first connection of EmuOK and PC the drivers should be installed.

3. Drivers installation

3.1. Not connecting the emulator to the microcontroller board, connect EmuOK to PC by means of mini-Usb cable.

3.2. LED «**Power**» should start to light on.

3.3. LED «**Status**» should blink 4-5 times, thereafter the computer has to initiate the drivers installation.

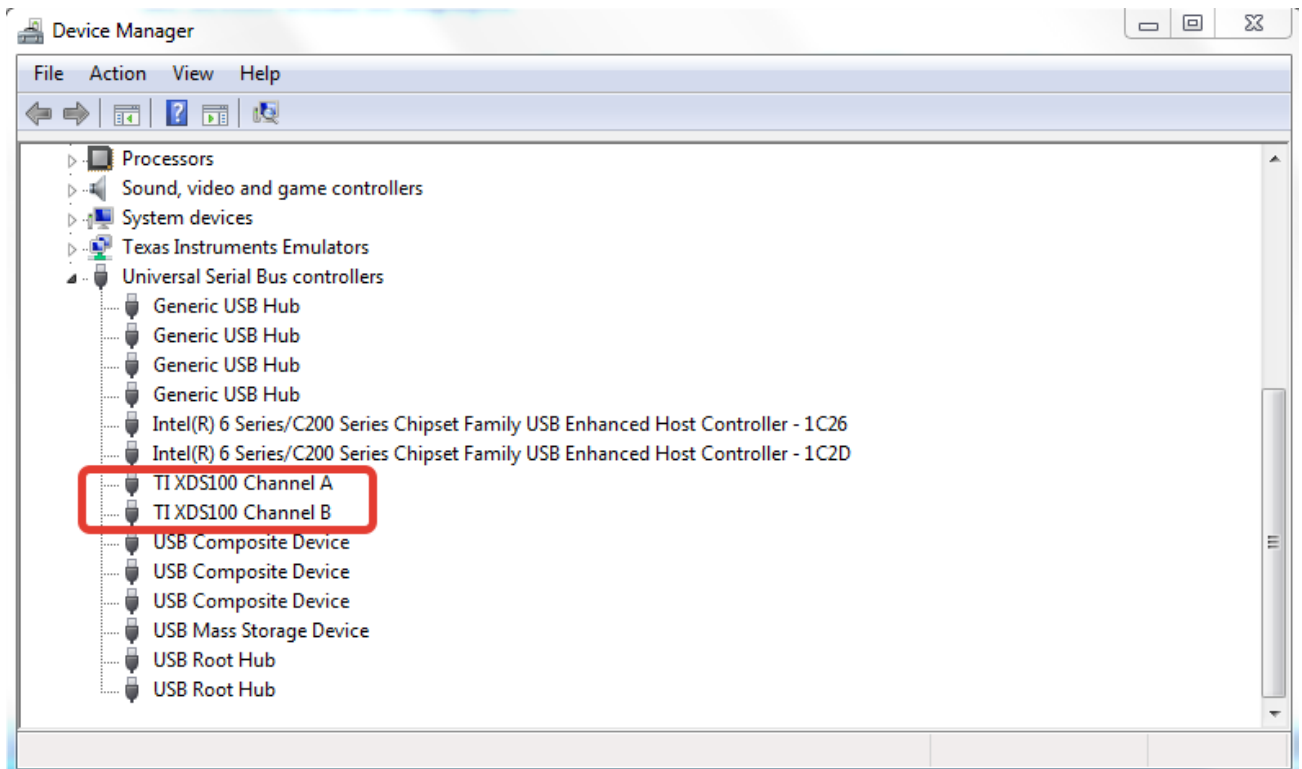
3.4. In case of successful automatic installation of the drivers in menu:

«**Control Panel->System and Security->System-> Device Manager -> USB controllers**»
two devices should be displayed:

- Texas Instruments Inc. XDS100 Version 1.0 A
- Texas Instruments Inc. XDS100 Version 1.0 B

OR

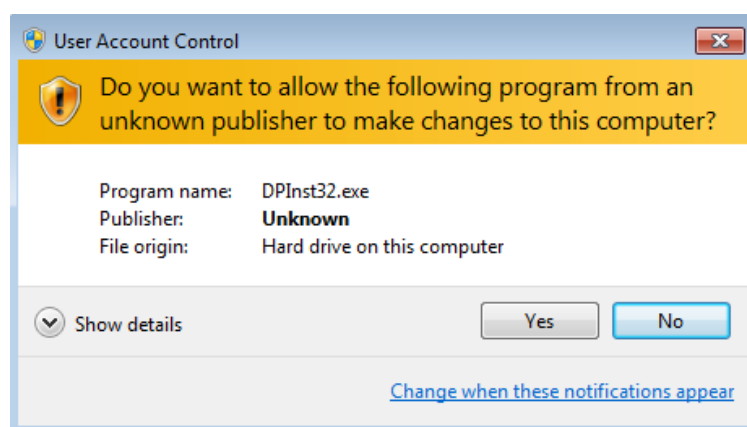
- TI. XDS100 Version Channel A
- TI. XDS100 Version Channel B.



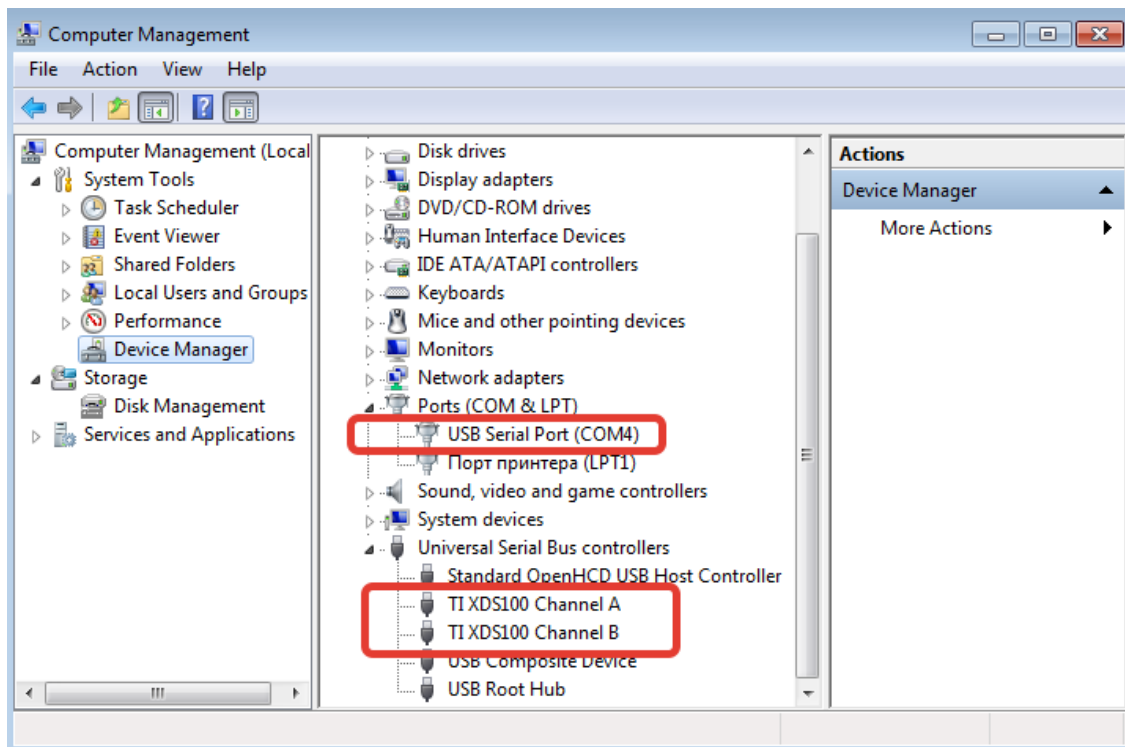
After successful drivers installation disconnect the emulator from PC. Now EmuOK can be used.
In case of problems during drivers installation follow further instructions!

- 3.5. Copy folder **XDS100_Drivers** with drivers into your preferable location.
- 3.6. In folder **ftdi** run file **DPInst32.exe** (for x86) or **DPInst64.exe** (for x64).

Select Yes:



3.10. In case of successful installation in Computer Management appear:



4. Specification

Main specification of emulator EmuOK is shown in table 2.

Table 2. Specification of EmuOK	
Power supply of emulator	Via port USB of PC (5 V \pm 5%)
Voltage of input/output signals of JTAG-port	3.3 V \pm 5%
Operating temperature	0...+60°C
Humidity	no more than 80%
Overall dimensions of enclosure, mm	36 x 59 x 16
Length of the flat cable, mm	65
Maximum allowed length of USB cable, m	1,8

5. Delivery set

EmuOK is delivered as a set of following components:

- Emulator EmuOK;
- Cable USB - miniUSB;

6. Contacts

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