The Development Board is a printed circuit board, size 108x71x15 mm and prototypical field 71x48 mm (hole pitch 2.54 mm) with installed high-performance version of the 8-bit microcontroller 80C51 AT89C5130A or AT89C5131A (DD1) of the company ATMEL in the housing VQFP-64 with flash memory and full-speed USB-connection.

AT89C5130A/AT89C5131A supports functions of ATMEL 80C52 and is characterized by increasing the volume of flash memory till 16/32 kB, internal RAM till 256 bytes, 4-level interrupt system, 32 lines I/O, three 16-bit timer-counters (T0/T1/T2), full-duplex UART and built-in generator, contains built-in expandable RAM sized of 1024 bytes, a dual data pointer, a 16-bit reversing timer, programmable counter array, till 4 programmable current sources for control of LEDs, programmable hardware watchdog timer and reset circuit at power. Supply voltage of controller is +5 V.

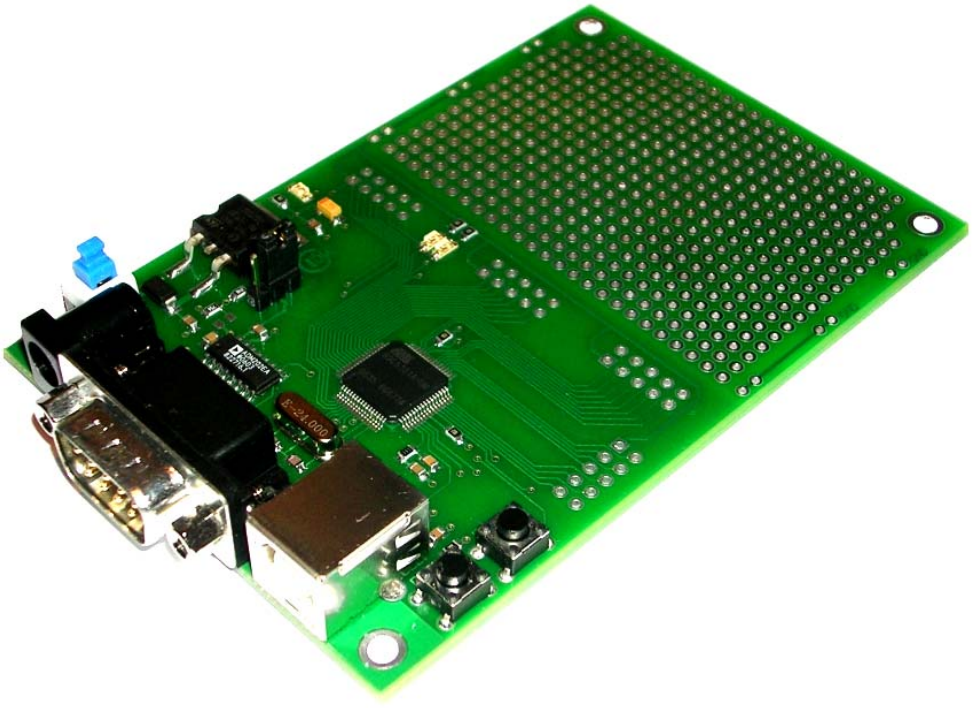


Fig. 1. General view of the development board.

The development board is intended for prototyping devices designed on microcontrollers AT89C5130A and AT89C5131A, and also for assembly completed devices by mounting necessary components on the prototypical field of the board. Use of the kit allows minimizing the implementation time of the product on the market.

The board has the 9-contact connector DB-9 (XS3) to connect «direct» cable to the consecutive port RS-232 of the computer. The board has a driver of interface RS232 ADM202EARN (DD2).

The jumper XS2 is intended for the choice of power supply.


Powered by USB connector (5 V, 500 mA)


Powered by external source 9...12 V via connector XS1

Frequency of the microcontroller is given by the quartz resonator ZQ1 24 MHz. SW3 button is used to turn on and off the external power supply. LED VD2 indicates power-on state.

SW2 button (RESET) intended for hardware reset to restart the controller.

Pressing SW1 (PSEN) button before connecting the card to the computer's USB port allows entering the programming mode In-System.

In-System Programming of the controller is carried out via the USB port (XS2) with the help of the program loader FLIP.

Working with FLIP

1. Start FLIP;
2. The main window FLIP (Fig. 2);
3. Open the window of selecting the type of controllers (Fig. 3) Device\Select (or press Ctrl+S);
4. Choose the type of controller AT89C5131 or AT89C5130;
5. Transfer the board in programming mode In-System. If you are using a USB line voltage supply, then disconnect the USB cable from the

board, press and hold SW1, connect the USB cable to the board, release SW1. If you use an external power supply connected to the connector XS1, then turn off the power board by pressing SW3, connect the USB cable to the board, press SW1, turn the power on by pressing SW3, then release the button SW1;

6. The operating system will report that new hardware is found (if you connect the board for the first time, you need to install the driver for a microcontroller, pointing the way to the driver in the folder with installed FLIP: C:\Program Files\Atmel\FLIP 3.1.1\usb\atmel_usb_dfu.inf);
7. To gain access to the buttons of the main window FLIP it is need to select the type of programming port and connect to it ; open the window (Fig. 4) Settings\Communication\USB (or press Ctrl+U) and press the button «Open»;
8. If all the points have been carried out correctly, so all menu items of the main window will be available, and you can begin programming the microcontroller. If you receive a message that the port is not open, then carefully read and repeat the points of menu again;
9. Then choose in the menu File\Open File and download the file of program for microcontroller with extension HEX. Uncheck item BLJB of the program FLIP and press RUN;
10. After programming the microcontroller and the testing completion, restart the controller for execution by pressing SW2 (RESET), or turn off and turn on the power.

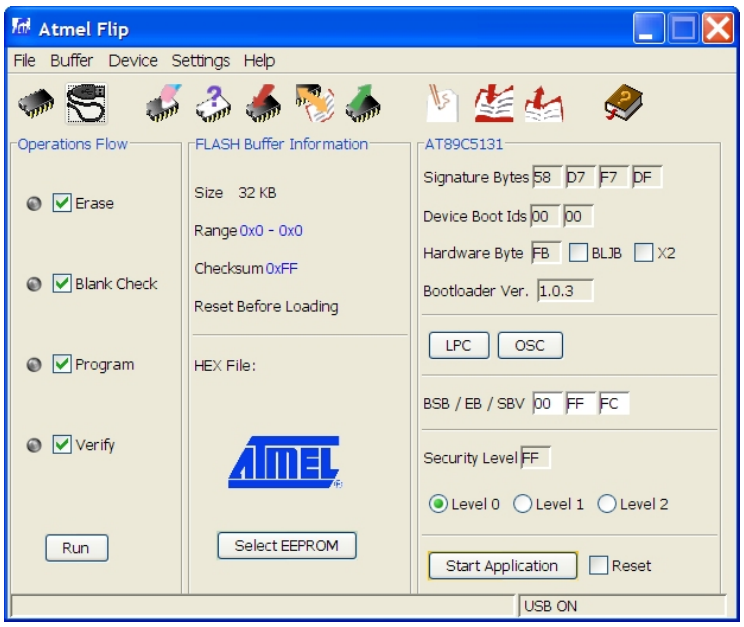


Fig. 2. The main window of the program FLIP

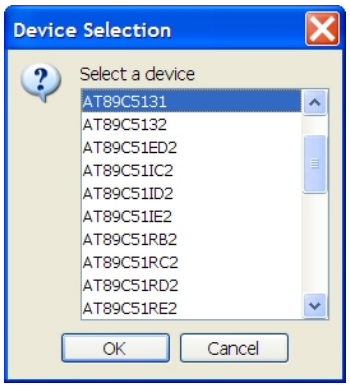


Fig. 3. The window of selecting the type of controllers

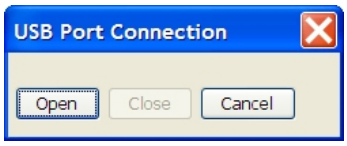


Fig. 4. The window of connection the port USB

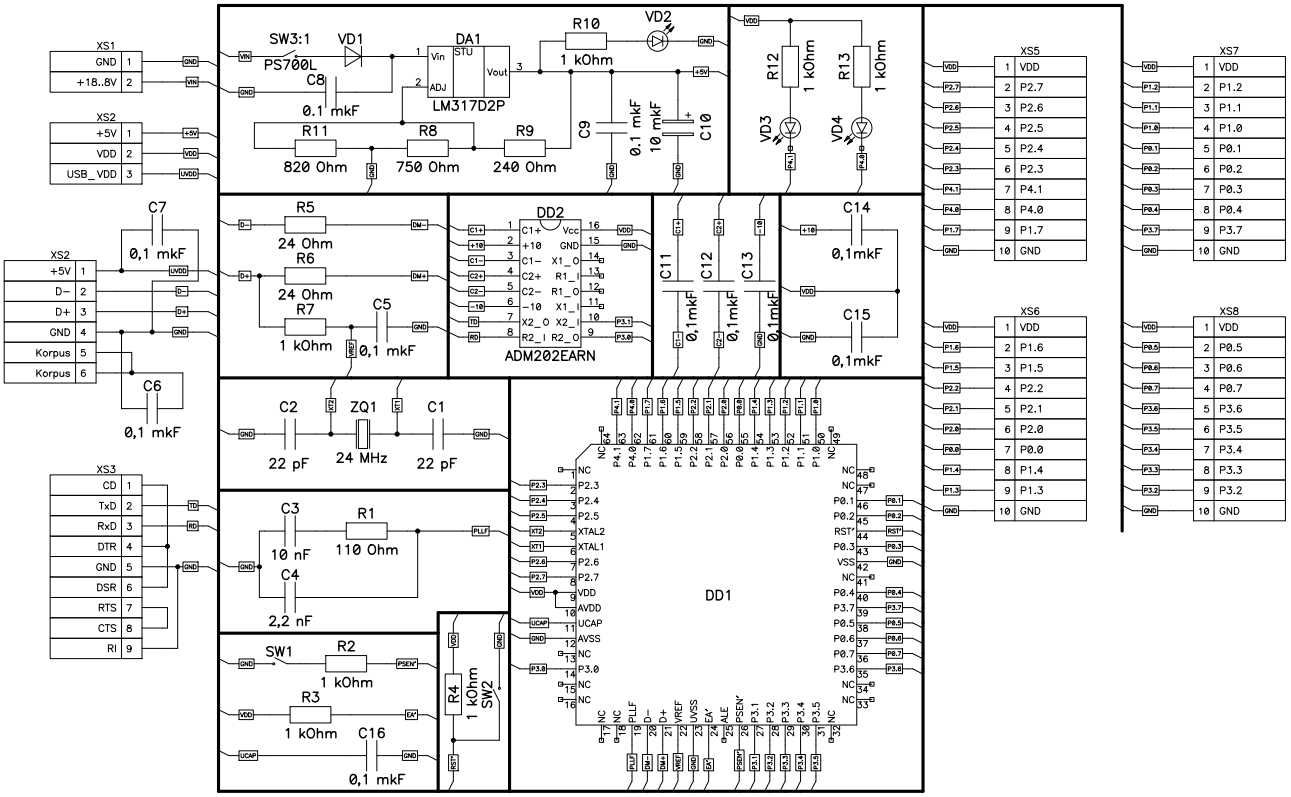
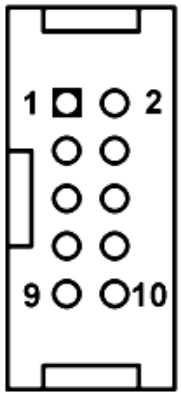


Fig. 5. The electrical scheme.

Controller leads and bus power are connected to the prototyping field and allow setting connectors of the type IDC-10MS:



XS5	XS6	XS7	XS8
1 – Vdd	1 – Vdd	1 – Vdd	1 – Vdd
2 – P2.7	2 – P1.6	2 – P1.2	2 – P0.5
3 – P2.6	3 – P1.5	3 – P1.1	3 – P0.6
4 – P2.5	4 – P2.2	4 – P1.0	4 – P0.7
5 – P2.4	5 – P2.1	5 – P0.1	5 – P3.6
6 – P2.3	6 – P2.0	6 – P0.2	6 – P3.5
7 – P4.1	7 – P0.0	7 – P0.3	7 – P3.4
8 – P4.0	8 – P1.4	8 – P0.4	8 – P3.3
9 – P1.7	9 – P1.3	9 – P3.7	9 – P3.2
10 – GND	10 – GND	10 – GND	10 – GND

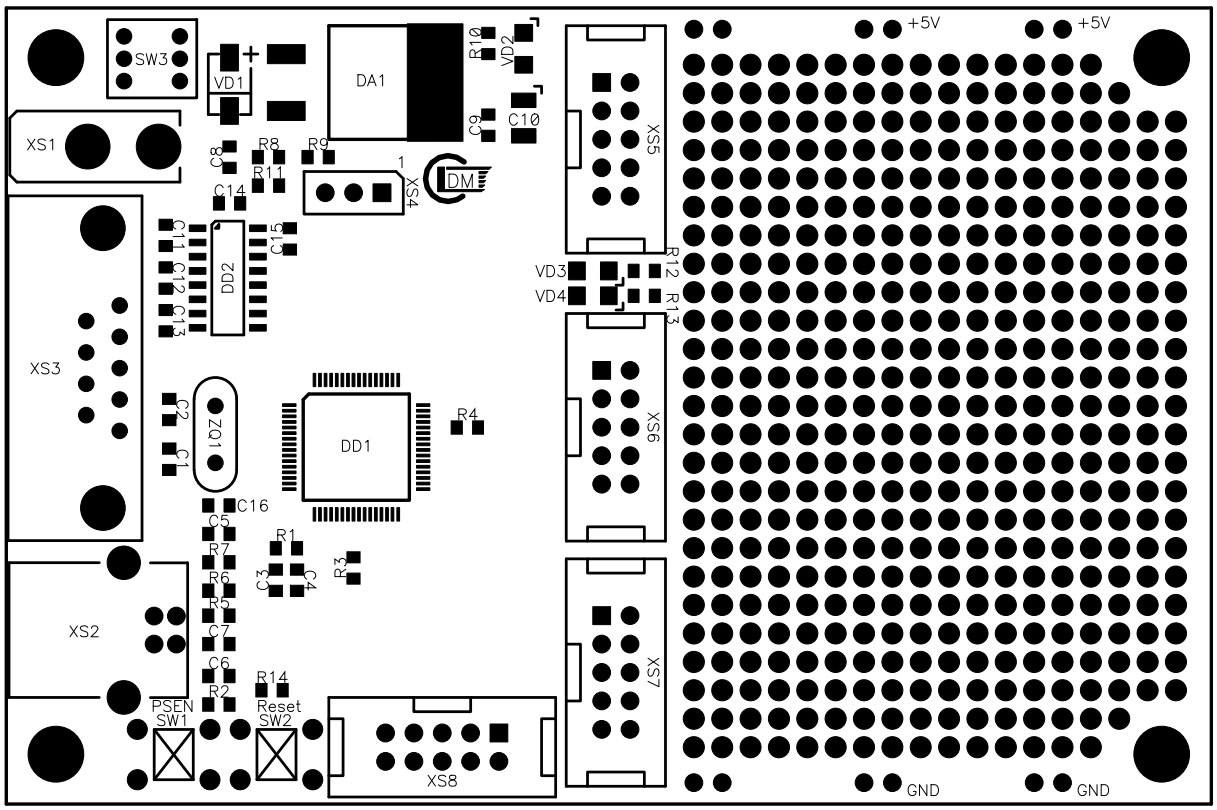


Fig. 6. External view of the printing board.

Packaging arrangements:

- The development board;
- The cable USB A-B;
- Description of the development board;
- The compiler Keil;
- The program FLIP for in-circuit programming;
- Description of the controller.