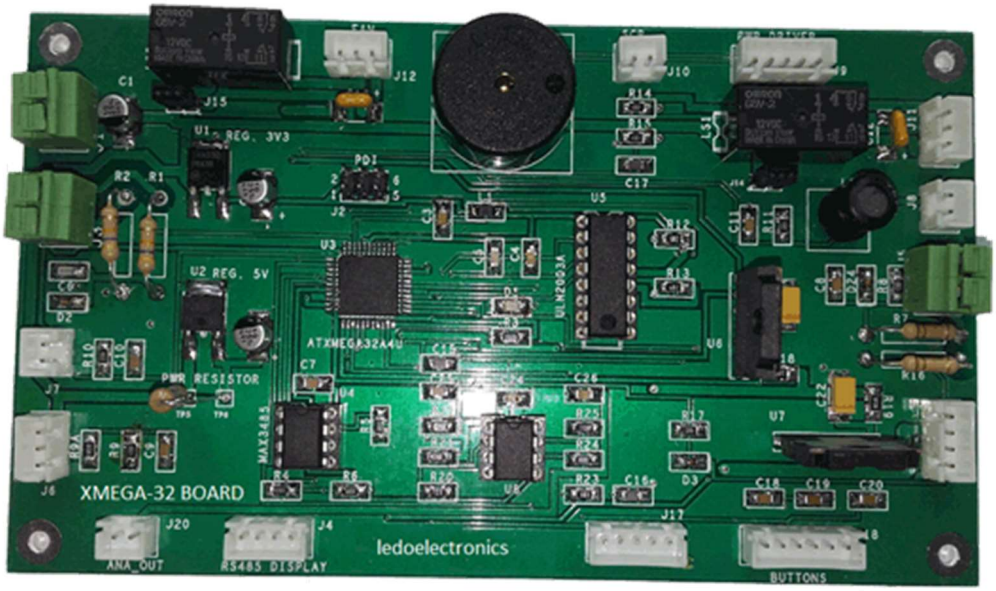
AtXmega32a4u Application Board



- **Atxmega32a4u programmable in system**
- **Supply voltage 9 ... 15V**
- **Two 12-bit analog inputs for ntc temperature sensors**
- **One analog input 12 bits 0 ... 10V / 0 ... 1V / 0 ... 3.3V / 4-20 mA**
- **An analog comparison input**
- **Two 0 ... 10V analog outputs with 12-bit resolution**
- **Zero cross detector**
- **Connector for the connection of three push buttons**
- **Eight general purpose digital inputs / outputs**
- **Two relay outputs**
- **Two ULN2003A transistor outputs**
- **Control of a stepper motor up to 2.5 A or two DC motors**
- **Buzzer**
- **CPU status LED**
- **Rs485 interface**
- **Connector for LCD display Rs485 from Ledoelectronics.**

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More than a development board, we are in the presence of a highly versatile universal application board that is very comfortable to adapt to a large number of automations and small control systems, with a large number of analog and digital inputs and outputs.

The brain of the system is the powerful Atmel Atxmega32a4u microcontroller, which can be programmed on the board itself through its PDI interface on connector J2, with Pinout compatible with all AVR programmers.

The application can be compiled with any of the following IDE:
- Free Ide of Atmel "Atmel Studio"
- Codevision AVR
- AVR IAR Compiller
- ATmanAVR
- MicroC PRO AVR
- BASCOM
- Others.

To program the xmega32 you can use any ISP programmer, such as the AVRISP mkII and compatible, or one of the debuggers like the Atmel-ICE.
From the web ww.ledoelectronics.com you can download sample codes in C and C ++, which show how to use the different drivers to configure the CPU and all the peripherals used on the board.

Board Schematics.

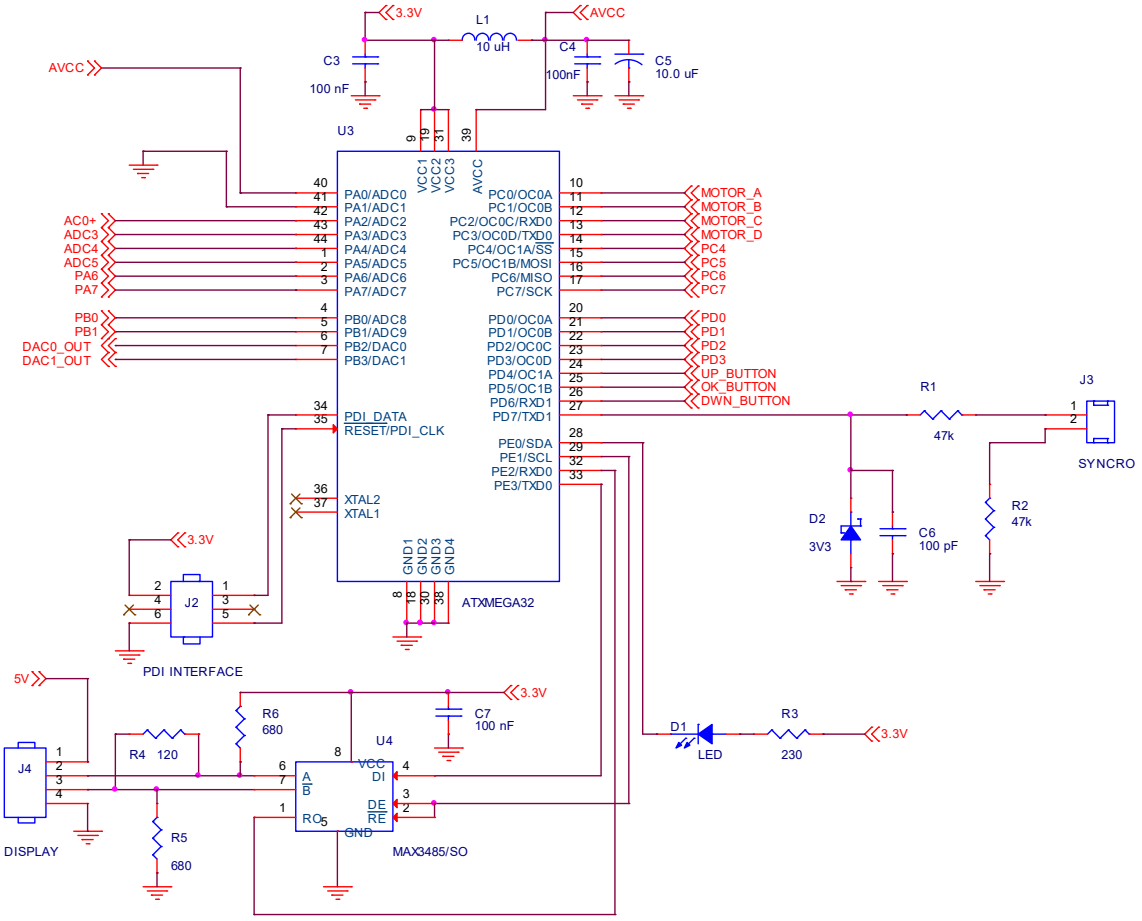


Fig.1. CPU Connections and signals.

In connector J4, the LCD screen can be connected with the Rs485 interface of ledoelectronics, or the Rs485 interface can be used for other purposes, such as half duplex in master or slave mode.
The connector J3 can be used to synchronize the CPU with the AC network, in case you want to perform a control with SCRs.

Analog Inputs

The analog inputs are taken to the micro from connectors J5, J6, J7 and J8. You can vary the values of the resistors of the voltage dividers R7, R8, R9, R9A, R10 and R11, to adapt the levels as appropriate.

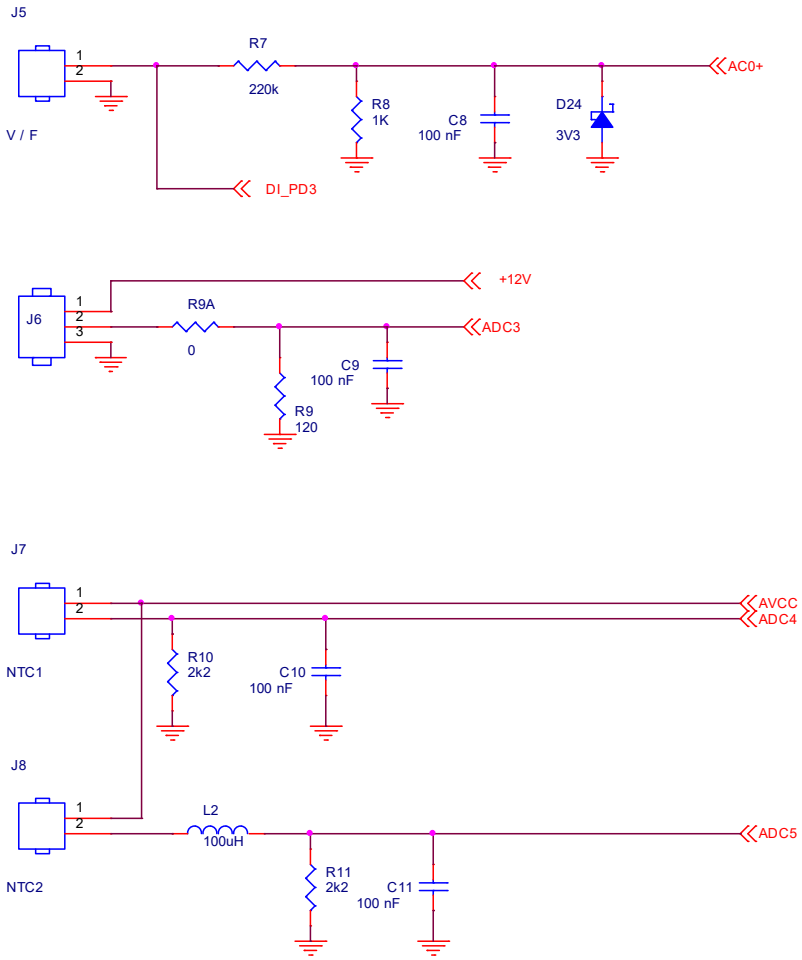


Fig.2. Analog Inputs wiring.

J5 gives access to the analog comparator present in the microcontroller Xmega32a4u, and pin PD3 of the micro, through a second voltage divider shown in fig.3.
The coil L2 can be suppressed, although its presence does not disturb the temperature measurement with an ntc; It was planned to filter the signal in a high frequency application where the noise levels were very high.
J6 allows reading any DC voltage or current signal, depending on the values of resistors R9 and R9A.
J7 and J8 are enabled to connect the temperature sensor thermistors.

Digital Inputs / Outputs

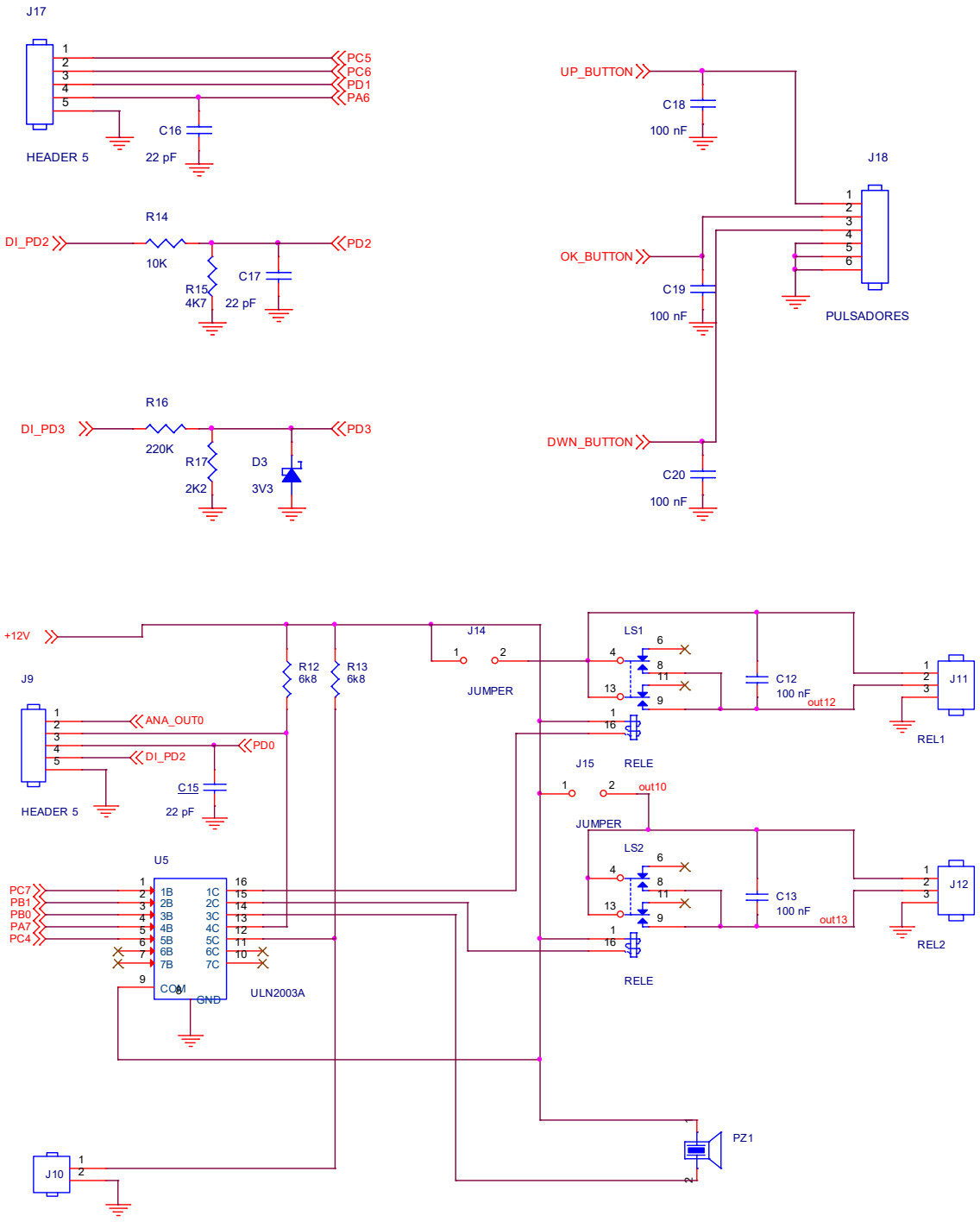


Fig.3. Digital I/O wiring.

J8 connector has been enabled to connect three control pushbuttons, but its signals can be used for other purposes, either as inputs or outputs with 3.3V logic, as the signals of connector J17.
The jumpers J14 and J15, offer a lot of comfort, since they allow that the Relay outputs are of free potential, or with voltage to drive any load of 12V DC.
In connector J9 we have a mix of diverse signals: Two transistor power outputs, one analog output 0 ... 10V and two 3.3V digital output inputs.

Analog Outputs

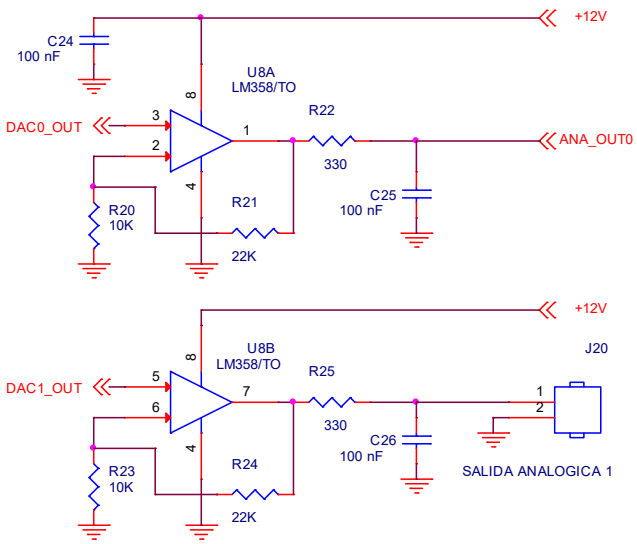


Fig.4. Two 0…10V analog Outputs.

Step Motor Control.

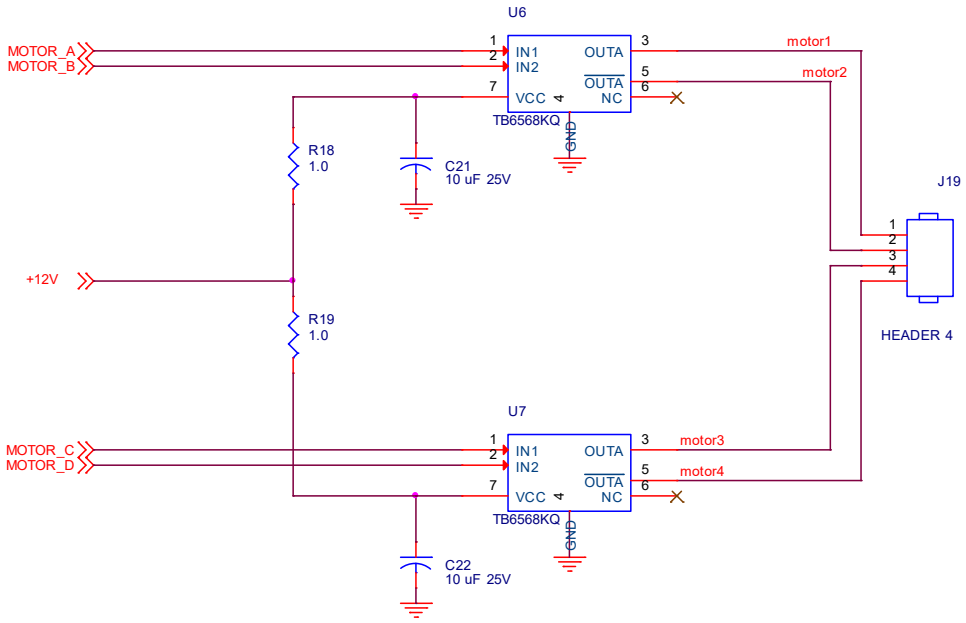
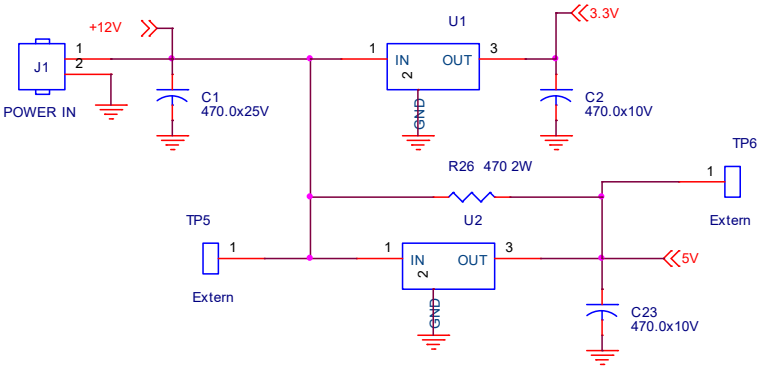


Fig.5. Step Motor Output.

The circuits used as drivers of the motors, solenoids or stepper motor, have internal protection against short circuit, overload and overheating. They also allow PWM modulation, and reverse the polarity of the output signal, since each of them is a H bridge with Power Mosfets.

Voltage Regulators



The regulator U1 generates the 3.3V that are used for the operation of the CPU atxmega32a4u.

The U2 regulator is used to power the LCD screen with 5.0V. It can be used to power other circuits, but without exceeding the maximum allowed power.