VX-Mega16

ATmega16 Microcontroller board

1. Features

● Support ATmega16/32/8535. On-board includes ATmega16 Flash memory of 16KB (expandable to 32KB with ATmega32)

● Clock rate of 16MHz

● I/O port of microcontroller are in 100 mil socket and INEX's standard PCB-3 pin connector.

● Expanable Display I/O extension board includes the LCD16x2 module, 3 of Push button switch, a Knob and Serial port interface circuit which is placed on top of Main microcontroller board.

● 7-ch. Analog input with 10-bit Analog to Digital Converter

● Support In-system Programming via ISP connector with PX-400 Programmer

● Supply voltage +9V from external. +5V 500mA on-board regulator.

***Includes** : Main microcontroller board, Display I/O board, CX-4 serial port cable and Documentation.*

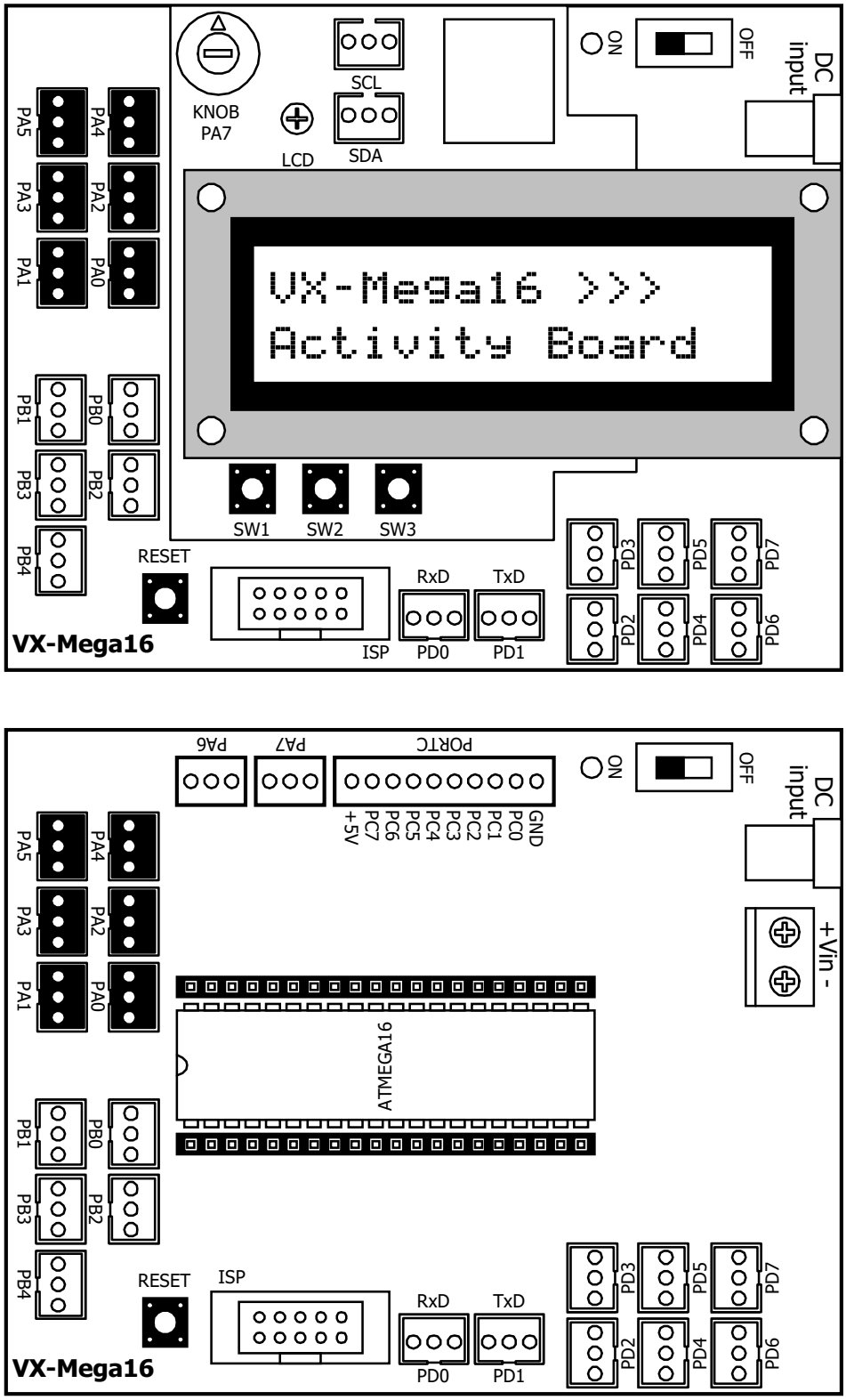


Figure 1 Layout of VX-mega16 microcontroller includes the Display I/O board plugged on-top in above and only the main board's layout in bottom.

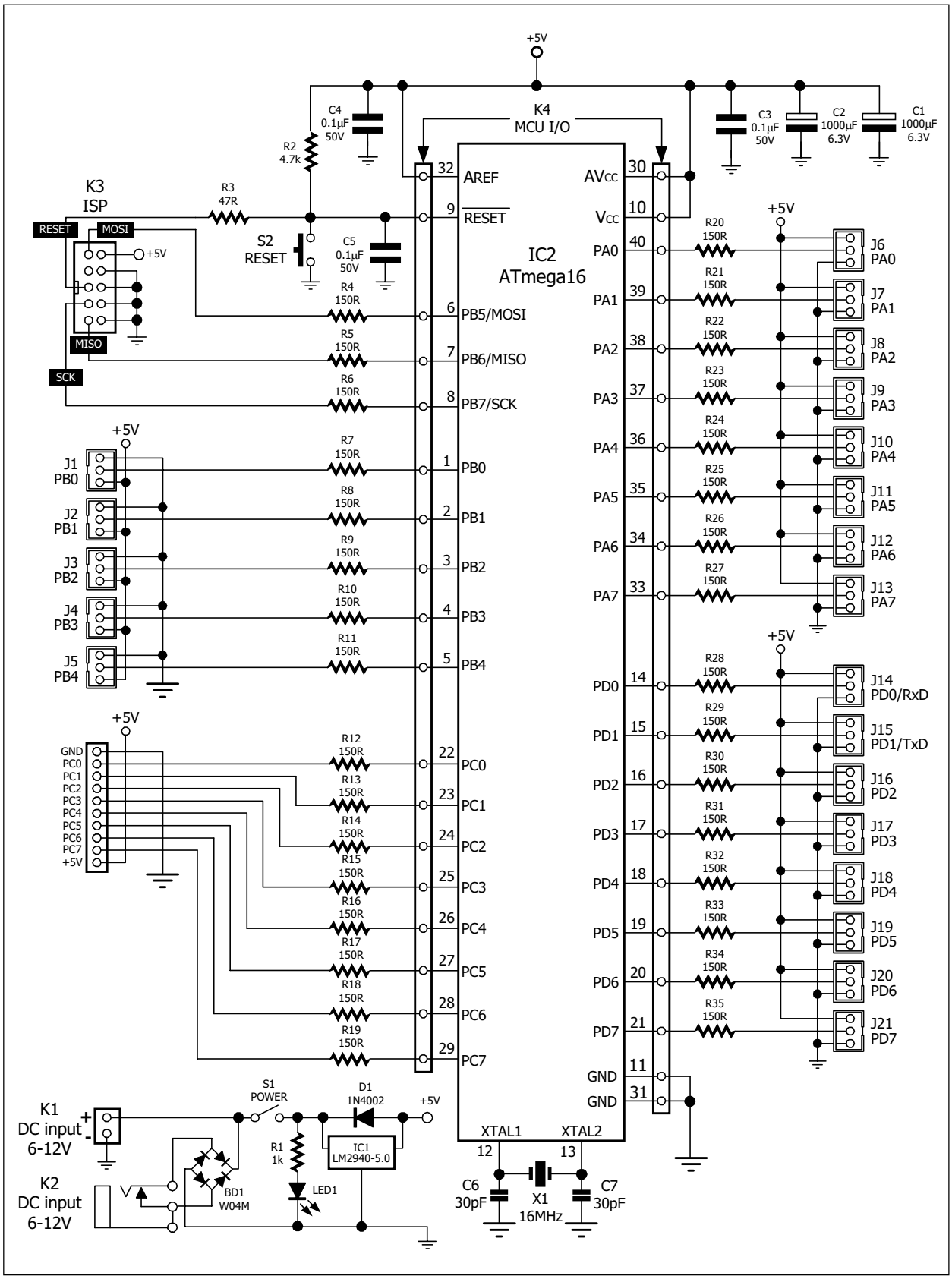


Figure 2 shows the schematic of VX-maga16 main board

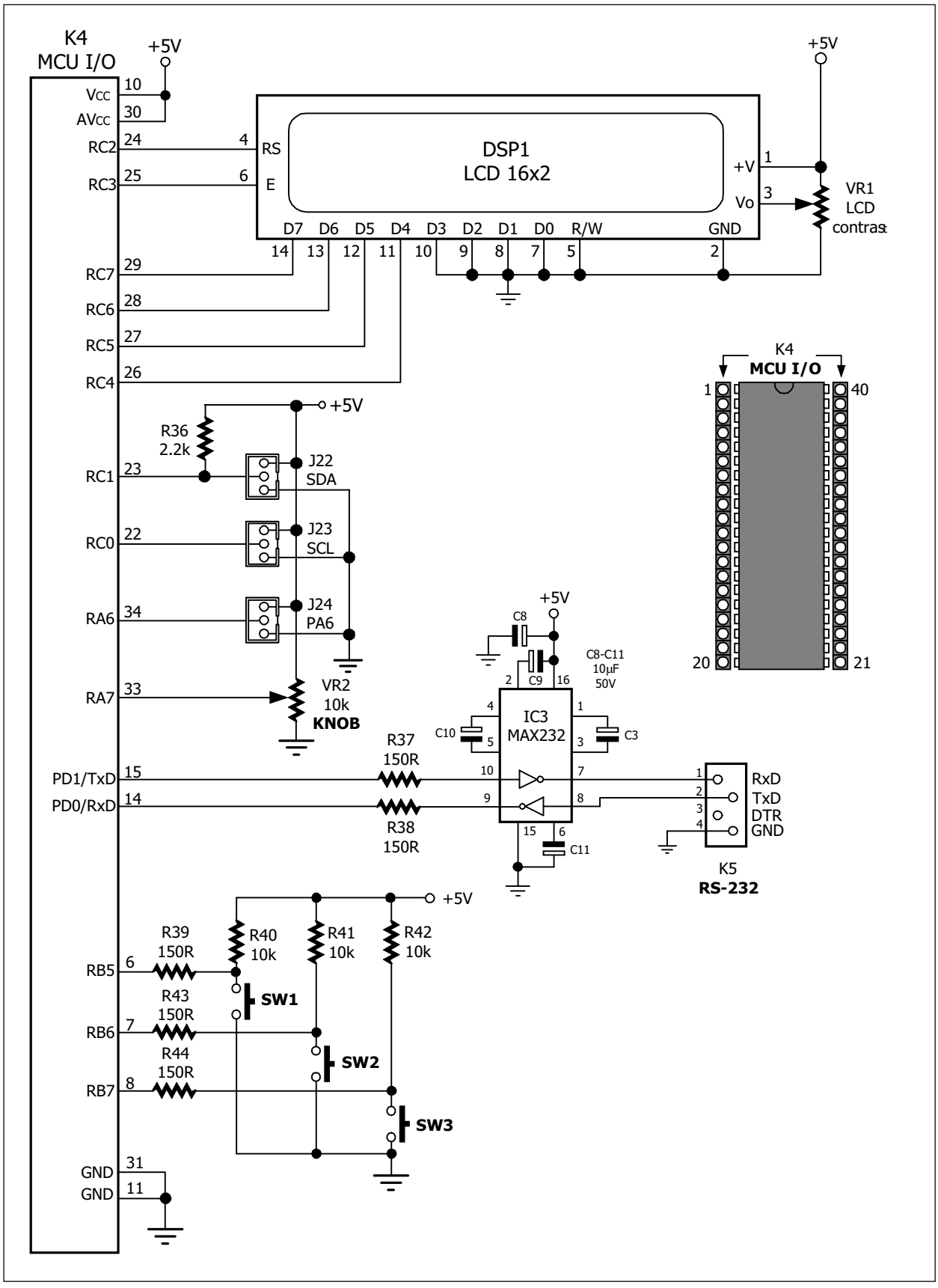


Figure 3 shows the schematic of VX-maga16 display I/O board

2. Circuit description

In Figure 2 and 3, this shows the full schematic diagram of both boards in VX-mega16 microcontroller board. The main microcontroller circuit shown in the Figure 2 and Display I/O in Figure 3.

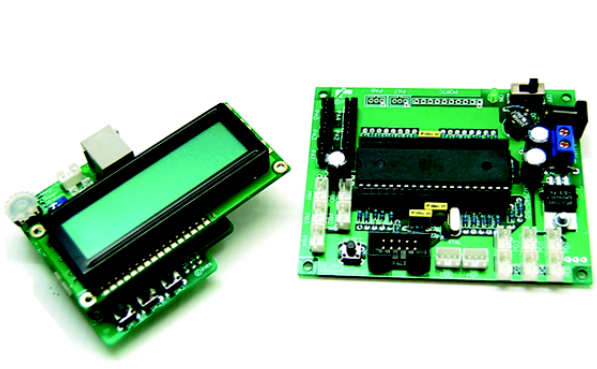
The main device is the ATmega16 microcontroller. It is the AVR microcontroller from Atmel. Operates with 16MHz clock frequency from external crystal. The main board supports all I/O pin at connector K4 and 3-pin PCB connector at J1 to J21.

Wide range DC power supply is +9 to 16V. It has a +5V regulator IC for converting the supply voltage to +5V for all supplying circuits.

Programming the program memory in the ATmega16 must be work via In-System Programming connector (ISP) with external ISP programmer such as INEX's PX-400 and AVRISP programmer. User must purchase separately.

At the Display I/O board, interface with main board with plugable connector K4. Port C of Atmega16 will be assign to LCD pin interfacing. The Display I/O has LCD16x2, 3 of Push button switch with pull-up resistor, one of KNOB or variable resistor for analog source, 2 connectors port for I2C bus supporting, one of PA6 connector and RS-232 serial port interface curcuit by MAX232 or ICL232 IC.

User can use only a Main board to experiment and/or plug the DisplayI/O board on top of main board for showing the data or mesaage on LCD screen, work with I2C bus device and interface computer via RS-232 serial port (or COM port). The Figure 4 shows the board connection.



(A) Show the board separated. The left is Display I/O board and Main board on the right.

(B) This is the complete VX-maga16 microcontroller board after plugging both boards together.

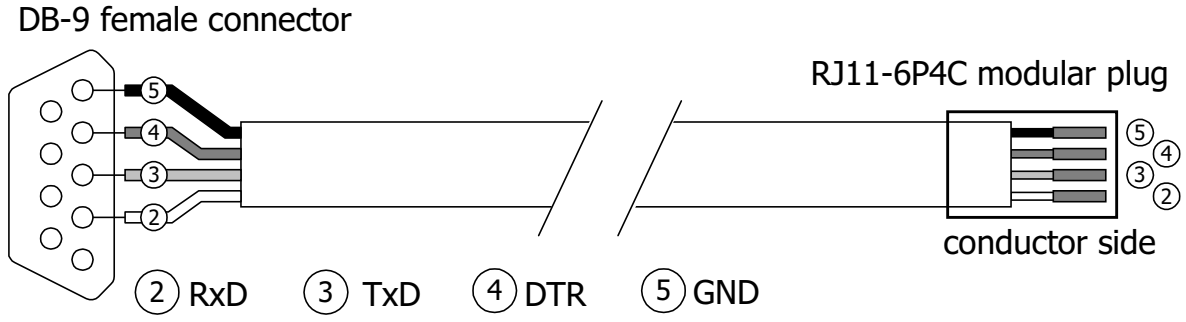
Figure 4 Shows the board connection of VX-mega16 microcontroller board.

3. VX-mega16 board's cable assignment

The VX-mega16 board includes some signal cables for the interfacing between the controller board, sensor module and computer. The VX-mega16 comes with CX-4 serial port interface cable and it need some of PCB3AA-8 cable for interconnection to the sensor module and external application board and need a In-System Programming (ISP) cable for interfacing the external programmer. However the ISP cable will supply with the programmer.

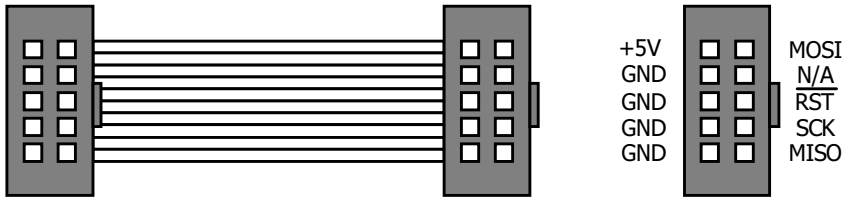
3.1 CX-4 serial port cable

This is used to connect between the computer's RS-232 serial port and the target or external device such as a Microcontroller board, eg. The VX-mega16 controller board. The connector's end uses a DB-9 female connector, and the other end uses a Modular plug RJ- 11 6P4C (6-pins form and 4-contacts) Its Length is 1.5 meters. In the kit, this cable is used to connect between the RS-232 serial port. The wire assignment is shown in the diagram below.



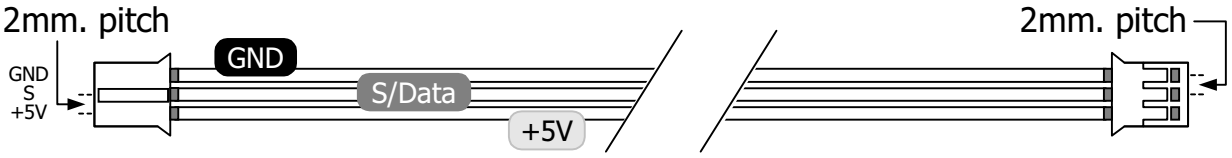
3.2 ISP cable

This is a 10-wire ribbon cable. Both ends are attached to the female 10-pin IDC header. It is used for interfacing between the ISP programmer box and Microcontroller board at ISP connector. This ISP cable's assignment is compatible with Atmel's programming tools standard. The wire assignment can be shown in the diagram below.



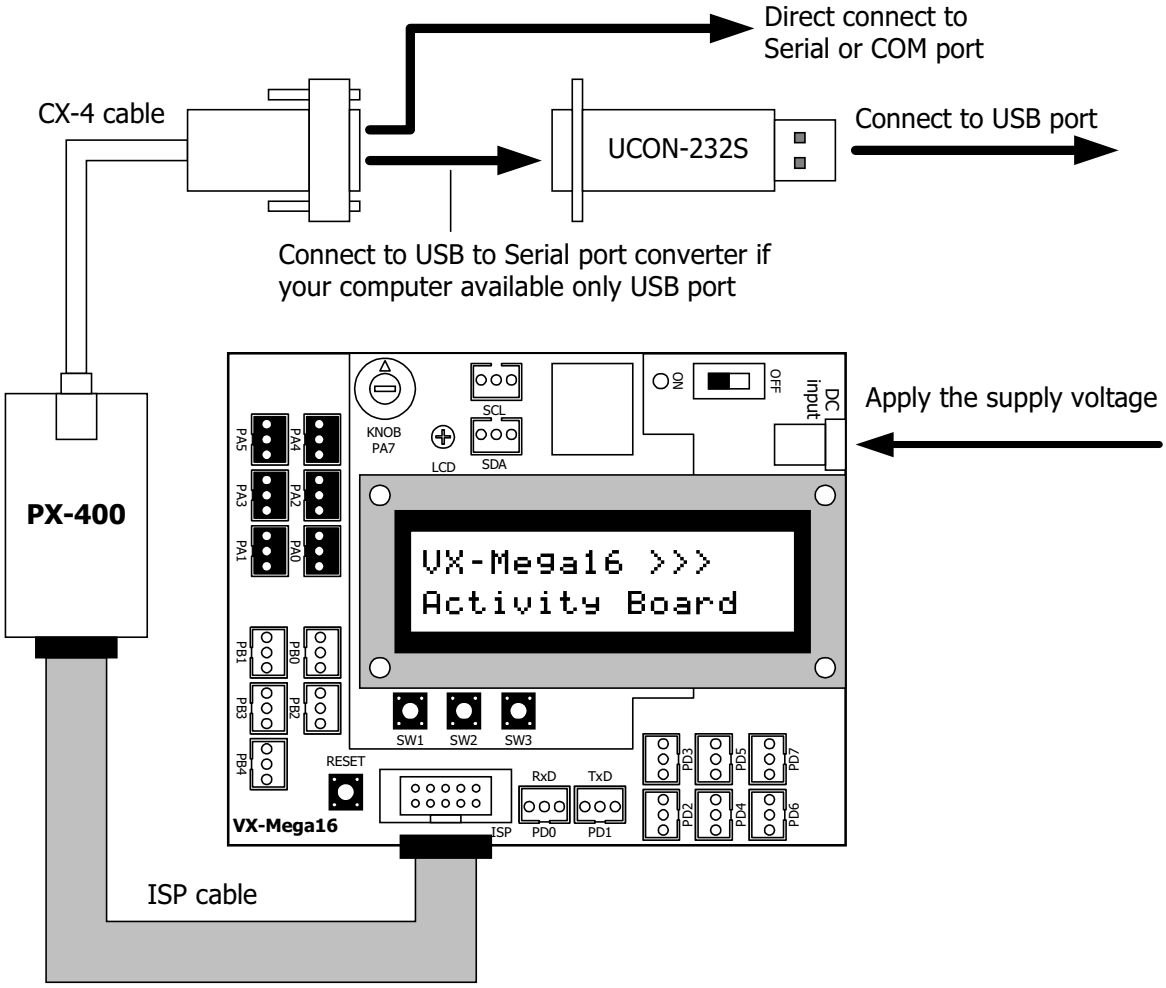
3.3 JST3AA-8 cable

This is INEX standard cable, 3-wires combined with 2mm.The JST connector is at each end. 8 inches (20cm.) in length. Used for connecting between the microcontroller board and all the sensor modules. The wire assignment can be shown in the diagram below.



4. Programming interface

In flash programming, VX-mega16 board needs the external In-system programmer; PX-400. You must connect PX-400 with the computer via Serial or COM port. If your computer has only USB ports, the USB to RS-232 converter is required to make the virtual COM port. At the other end, connect with ISP connector on the target microcontroller board. See the diagram below.



About software tools in the flash programming of microcontroller, you can use 2 Software : AvrProg and Avr-OSP III. In flash programming, you must connect the VX-mega16 board with PX-400 programmer and Serial port (or USB if using UCON-232S) and apply the supply voltage ready first. After that open the programmer software.

You can see how to use these software in the PX-400 programmer documentation.