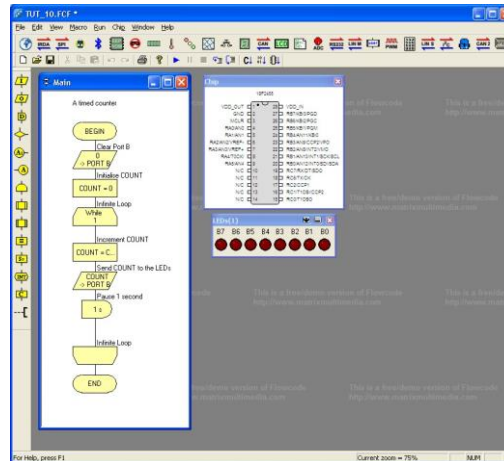


1. What you need

You will need several items before tackling the worksheets:

A. Flowcode (version 3.2.1 or later) loaded onto your computer. This is used to design your ECIO program, and then simulate it on-screen.



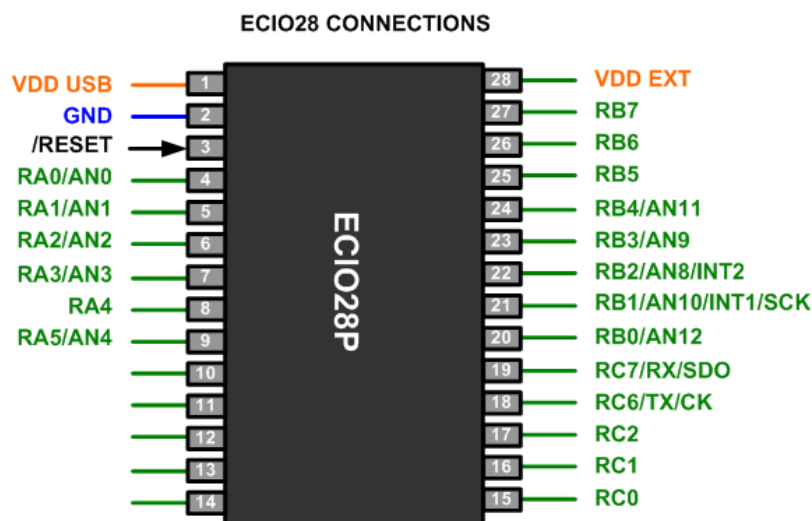
When the program does what you want, you download it to the ECIO microcontroller device, via a USB cable. ECIO devices are directly compatible with Flowcode, which converts your program into code for the microcontroller on the ECIO device. The ECIO microcontrollers are pre-programmed with software that allows you to send a new program to the microcontroller via USB.

B. The ECIO 28 pin microcontroller and a standard USB cable



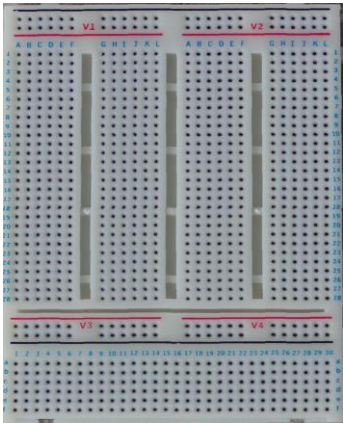
The ECIO family of USB programmable microcontrollers provides an incredibly simple way of adopting microcontroller technology into your projects. The device behaves just like a normal microcontroller - but when you plug the USB lead in and press the reset switch you can send a new program to the device.

The ECIO-28P is based on PICmicro 18 series devices - the 18F2455 respectively. Here is the pinout:



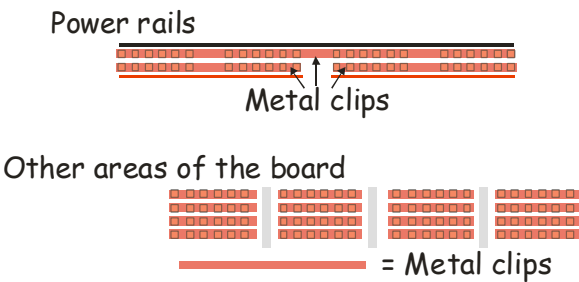
The ECIO device takes power from your computer using via the USB lead. You will need to make sure that the link on the ECIO device is in the 'USB' position. You can then use a small jumper wire to route power from the ECIO to the other parts of your circuit

C. An HPAD01 prototype board and connecting wires:



The prototype board speeds up the process of building electronic circuits. Components are connected together by plugging them into holes in the same row of the board. Metal spring clips, behind the plastic surface, grip the legs of these components and make an electrical connection between them

The next two diagrams show the arrangement of metal clips in the power rails, and in the other areas of the board. Notice that the black power rail has a clip running all the way along, whereas the red rail is divided into two sections. You will see in some of the following activities that a bridging wire is used to connect these two sections together.

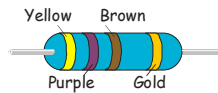


Once you have plugged the ECIO device into your prototype board you can use small link wires to connect the red and black rails on the board to the positive and negative supply lines on the ECIO. The wiring diagrams in the worksheets will show you how to do this.

D. The following electronic components which are contained in the kit HP3528

- Three LEDs:
- Three push switches:
- One Light Dependent Resistor (LDR):
- One 100kΩ potentiometer (pot):
- One 1kΩ resistor:

- Three 470Ω resistors:



- One piezoelectric sounder:

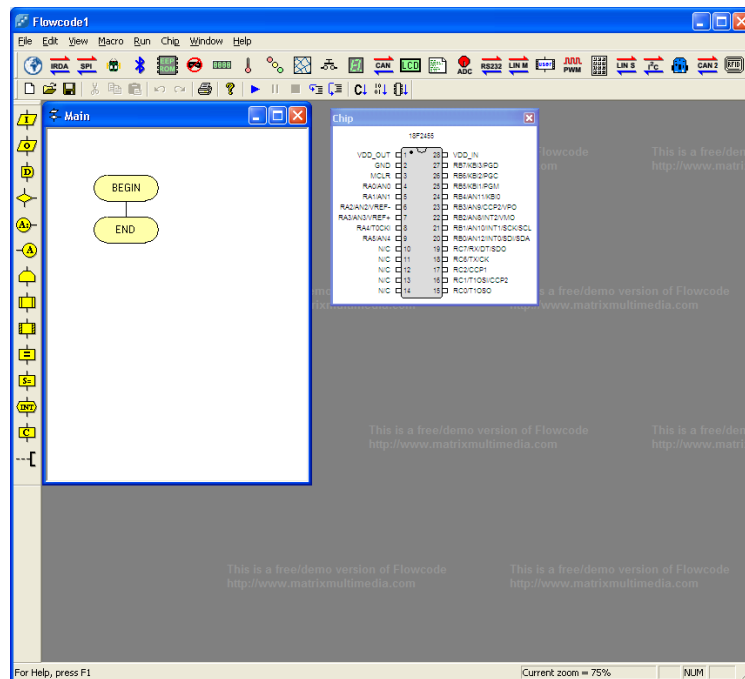


E. Connecting wires

You will also need some single core coloured connecting wires. In the kit you will find half a metre each of red, black and green wire to get you started. You will need to cut the wires into appropriate lengths and remove about 7mm of the plastic insulation from the ends of the wires before plugging them into the prototype board.

2. Getting started with Flowcode and the ECIO

You will need to install Flowcode – follow the instruction supplied for this. When you start Flowcode select the ‘Create a new Flowcode flowchart’ option and choose the ECIO28 from the list that appears. You should see a screen that looks like this:



When you first plug in the ECIO you will need to associate the ECIO drivers with the USB port you are using. This should be fairly straightforward as Flowcode includes the USB drivers for the ECIO. If you experience problems, then refer to the support section of our web site.

You are now ready to follow the worksheets.

3. Where to go for more help

There are several sources of help for Flowcode:

You can see video tutorials on using Flowcode on our YouTube page – www.youtube.com/user/MatrixMultimediaLtd

You can access the Flowcode help file by simply pressing the ‘Help’ button on the top menu.

You can see a full datasheet of the ECIO device on our website – www.matrixtsl.com/other/ecio/

You can pose questions on the Forum at – www.matrixtsl.com/mmforums/

There are also many sites of interest on the internet.

If you have any problems with the ECIO drivers then you will find a step by step explanation of how to do this at www.matrixtsl.com/other/ecio/

4. Caution

You should take care not to break your ECIO device by connecting its input or output lines directly to either 5V or to 0V. Always use a resistor in conjunction with a switch or LED to protect the ECIO.

Pin 1 (VDD) and pin 2 (GND) are the supply outputs. Make sure that you do not short these two together.

Whilst wiring the circuits up in the worksheets remove the USB lead from the ECIO device. Make sure that you carefully check the wiring of your circuit before plugging in the USB lead.

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