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1.0 General Description

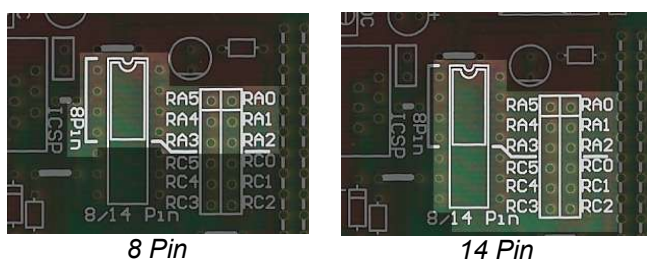
The KPIC-0818P is a general purpose prototyping board and development tool for Microchip PIC12 and PIC16 Micro-controllers with 8, 14 or 18 pins. Some PIC18, dsPIC30 and PICAXE devices may also work. There are eight sections on the board which are essential for many designs, processor sockets, oscillator, RS232 circuitry, ICD/ICSP connector, reset, power supply, stack through connector and a prototyping area.

2.0 Processor Sockets

The KPIC-0818P has two processor sockets which are capable of accepting, 8, 14 and 18 pin devices. Both sockets share the ICD/ICSP, oscillator and power supply connections. Because of this it is recommended that only one processor be used on the PCB at any one time.

2.1 The 14 Pin Socket

The 14 pin socket allows 14 and 8 pin devices to be used. If an 8 pin device is used it must be inserted in the position shown on the overlay. The pins from this socket are taken to two rows of pads that are labeled with the standard I/O port designations for PIC12 and PIC16 devices.

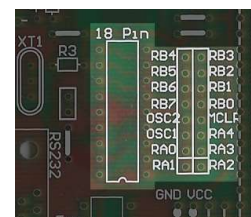


8 Pin

14 Pin

2.2 The 18 Pin Socket

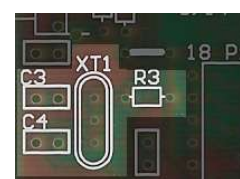
The 18 pin socket is designed for 18 pin devices only. All I/O ports are brought out two rows of holes and are labeled with the generic port labels. Some devices will have alternate functions for OSC1, OSC2 and MCLR. Please note that PIN 1 is located closest to the serial chip.



18 Pin

3.0 Oscillator

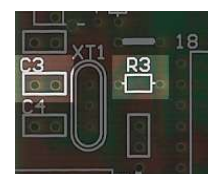
The oscillator section is capable of being configured as an RC, resonator, crystal or external clock. This allows for a wide variety of clocking options.



Oscillator Section

3.1 RC Configuration

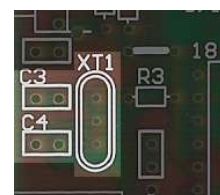
Using R3 and C3 only the RC oscillator option is created. To calculate the correct values for R3 and C3 please read the data sheet for the specific device you are using.



RC Oscillator

3.2 Resonator Configuration

Insert the two or three legged resonator into the XT1 position. Capacitors (if required) use C3 and C4 locations. For component selection please read the data sheet for the specific device you are using.



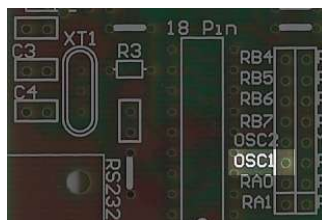
Resonator & Crystal Oscillators

3.3 Crystal Configuration

Insert the crystal into the XT1 position. Insert capacitors into C3 and C4 locations. Note that there is no series resistor, if you need to add one please cut track on underside of PCB. For correct capacitor and crystal selection please read the data sheet for the specific device you are using.

3.4 External clock

Insert clock signal into OSC1 pin.

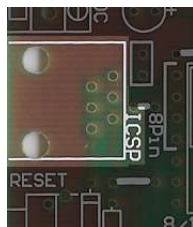


External Clock

4.0 ICD/ICSP

The In-Circuit-Debugger / In-Circuit-Serial-Programming port is pin compatible with the Microchip MPLAB-ICD2. This port allows in circuit programming and debugging of the device in the socket. The pins are shared with I/O ports, and may require external circuitry to be disconnected to work. See the data sheet for the specific device you are using for more details. Also note that adapter cables can be easily be made so that other programmers can be used.

NOTICE: On V1.0.0 of the PCB this is wired incorrectly - see section 14.0 for details.

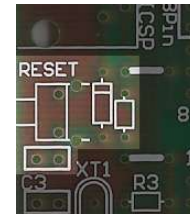


ICD/ICSP Socket

5.0 Reset

The reset circuit consists of a switch, capacitor, resistor and diode. The resistor pulls the capacitor to VCC which allows the micro-controller to run. The Switch shorts out the

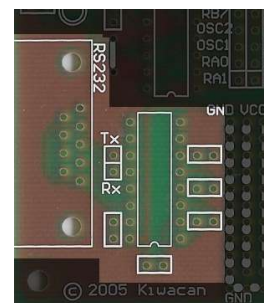
capacitor which puts the device into reset mode. The Schottky diode is in place to allow the ICD/ICSP and "alternate" port functions to be used. Some devices do not require the reset circuitry as it can be enabled internally.



Reset Section

6.0 RS232

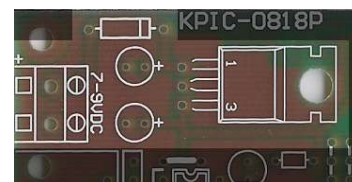
A basic RS232 interface is available using a D9 socket configured as a 3 wire NULL modem and a MAX232/202 level translator. The two holes marked as TX and RX are the logic level Transmit and Receive from the RS232 and can be linked to where ever you see fit.



RS232 Section

7.0 Power Supply

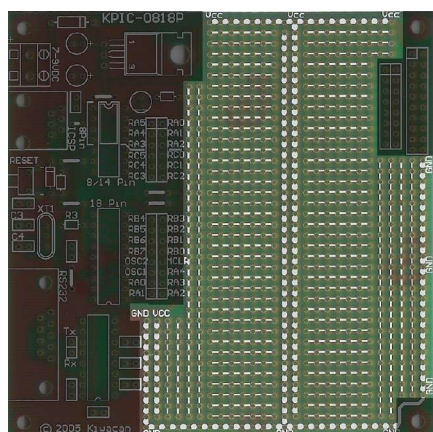
A 780x (or pin compatible) linear voltage regulator, two small filter capacitors, a polarity protection diode and screw terminal connector form a basic power supply suitable for most tasks.



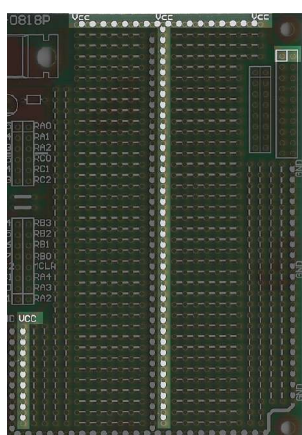
Power supply section

8.0 Prototyping area

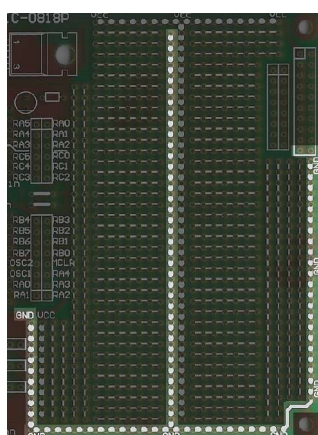
The prototyping area has been designed to be an improvement to a generic breadboard layout. The placement of power and ground rails through the centre allow for easy placement and configuration of I.C.s and the extra long run rails can be used for additional supplies, linking, common data lines etc.



Prototyping Area



VCC Connections

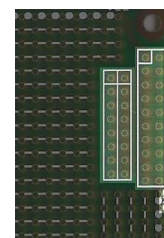


GND Connections

9.0 Stack through connector

An area for a stack through connector is provided so that other KPIC boards can be stacked and inter-connected using 16 I/O lines, power and ground. This ideal for inter-processor communication prototyping and expanding I/O and prototyping space.

20 Way stack through connectors can be purchased from www.kiwacan.co.nz



Stack through connector

10.0 BOM and Schematic

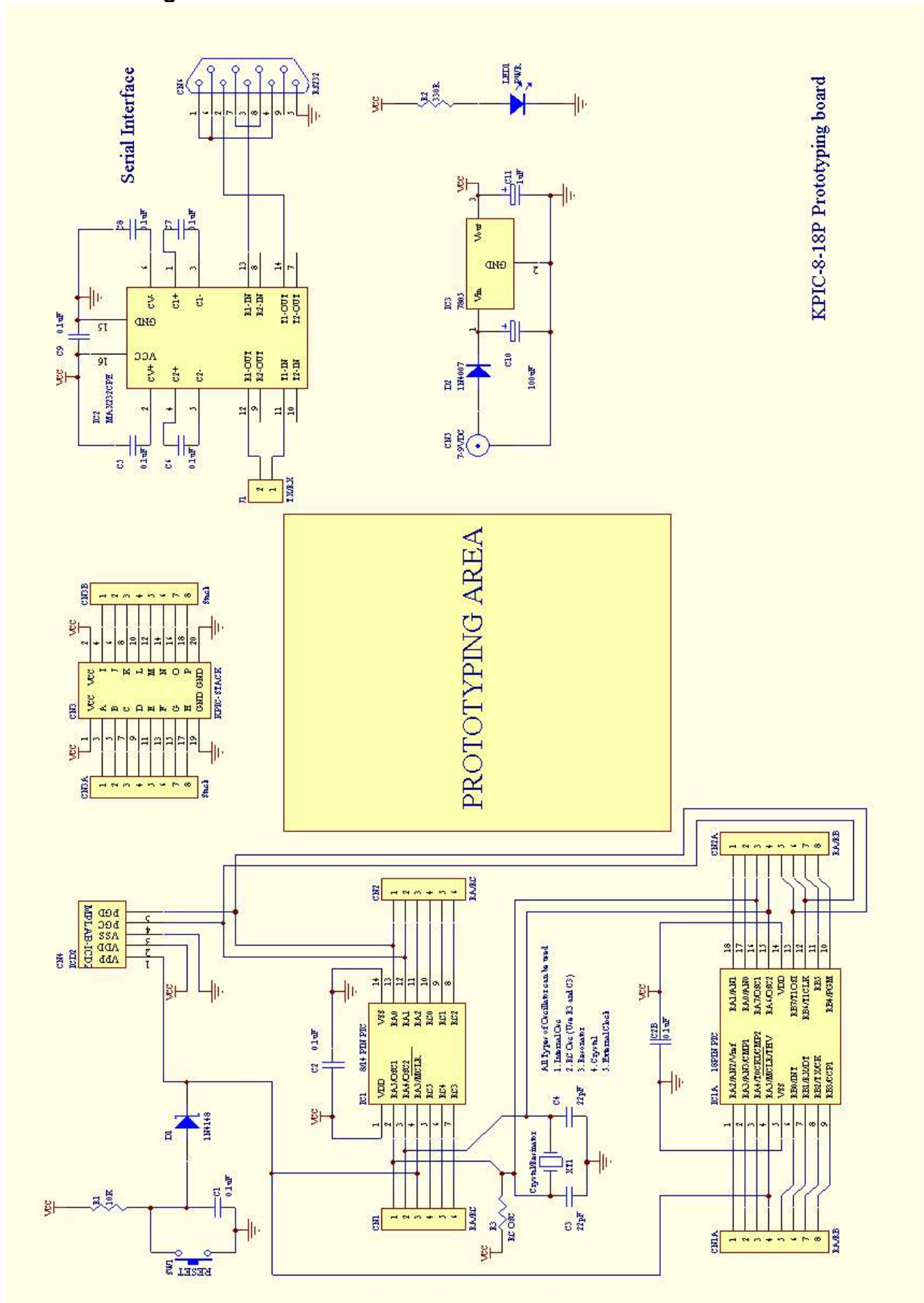
Following is the Bill of materials and schematic diagram for the KPIC-0818P.

10.1 Bill of Materials

The Bill of materials is as follows:

Designator(s)	Part Description	Qty	Farnell	Sicom
C1,2,2b,5,6,7,8,9	0.1uF Cap 2.54mm	8		CCM.1
R1	10K 5mm resistor	1		RA10K
R2	330ohm 5mm resistor	1		RA330R
C3,4	18-22pF Cap 2.54mm	2		CC22
D1	BAT85 Diode	1		BAT85
D2	1N4007 Diode	1		1N4007
C10	100uF 25 V Electrolytic	1		C25R100
C11	1uF 16V Tantalum	1		C35T1
LED1	5mm RED LED	1		5141RD
IC1	14 Pin DIP Socket	1		CNICS14
IC1a	18 Pin DIP Socket	1		CNICS18
IC2	MAX232CPE	1		MAX232ACWE
CN6	D9 R/A Socket	1		CNDR09S
CN4	RJ12 6/6 R/A Socket	1		CNWE7
SW1	R/A PCB Switch	1		SW0606
CN5	2 way terminal 5.08mm	1		CNTM82
R3	See PIC Datasheet	1		RA??
XT1	Crystal / Resonator 4MHz to 20Mz	1		CSX4.00 CSX20.00
IC3	7805 Regulator	1		7805

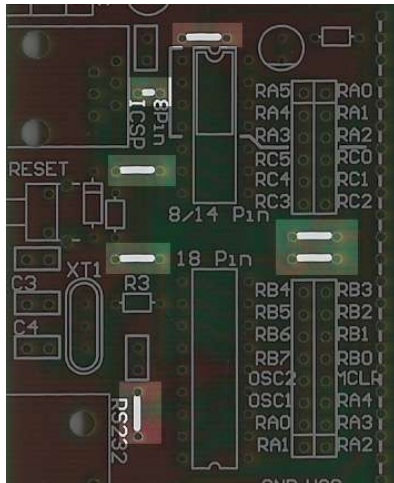
10.2 Schematic Diagram



KPIC-8-18P Prototyping board

11.0 Links

Please ensure the links are inserted otherwise the ICD and other connections will not be made.



Link Locations

12.0 Contact details

Kiwacans contact details follow:

12.1 Website

www.kiwacan.co.nz

12.2 Email

Sales: sales@kiwacan.co.nz

Information: info@kiwacan.co.nz

12.3 Phone

Mobile: +64-21-1495674

12.4 Postal Address

Kiwacan
7 Campion Place
Brookside Estates
Rolleston 8004
Canterbury
New Zealand

13.0 Acknowledgments

PIC®, PICMicro®, PICSTART®, MPLAB® are registered trademarks of Microchip Technology Inc. In the USA and other countries.

14.0 ERRATA

The following are design errors that have been found.

If you discover any other problems please email info@kiwacan.co.nz with a description of the problem and any fixes done.

14.1 ICSP/ICD Connections Incorrect

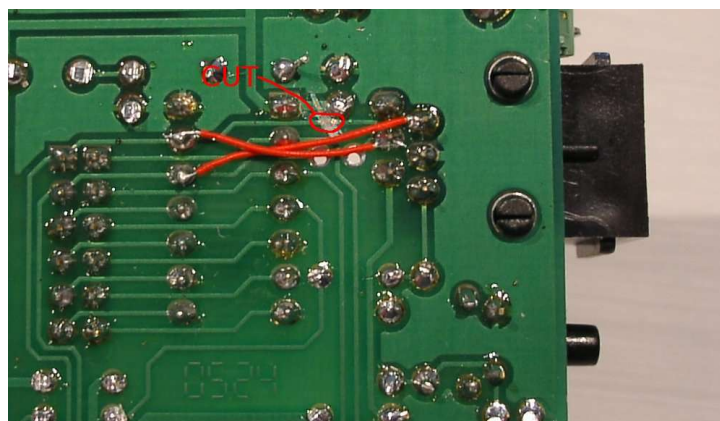
Affected version(s): PCB V1.0.0 only.

The ICSP/ICD port is wired completely wrong. Two things are required to be compatible with the MPLAB ICD-2.

1. A 6 way cross over cable need to be made to plug between the ICD-2 and the KPIC board. Kiwacan will provide this cable for cost price plus postage or make as shown below.



2. The PGC and PGD pins need to be swapped on the underside of the PCB as shown in red in the image below. One track needs to be cut, shown below.



PGC/PGD Corrections