

ProtoDev – PIC PLC



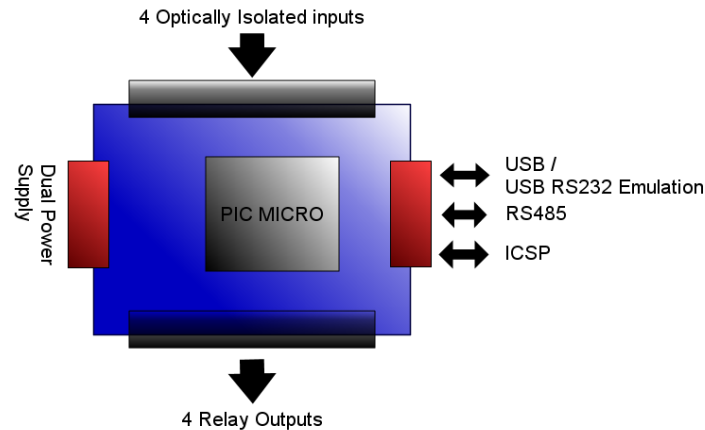
Introduction

The PICPLC is a compact and versatile product that caters to a wide variety of applications. The heart of the system is a PIC16F | PIC18F device which when chosen correctly will deliver on sufficient processing power, memory and I/O. The PICPLC is orientated towards instrumentation monitoring and control where 1 or more sensors monitor a specific application and requires a connection to high voltage equipment input or actuating high voltage outputs.

Inputs and Outputs

The PICPLC inputs are electrically isolated by four optically isolated inputs which have LEDs connected which illuminate indicating an active input. Four relay outputs are available enabling the unit to drive high voltage loads

either directly or through a smaller relay actuating a much larger relay. This robust configuration enables the system to interface with more demanding environments and allows it to be used in small scale industrial applications. The unit includes RS485 communications capability enabling interaction with a compatible network such as MODBUS. See below:



Power Supply

The system offers an onboard dual power supply configuration, which means that certain off board power requirements can be met for example push button activation which would require 12Volts to activate the optically isolated interface.

A 5Volt power supply powers the PIC and other connected circuitry.

Communications and Programming Interfaces

The system incorporates the standard ICSP header compatible with the PICKIT 2 and PICKIT 3 which is directly connected to the PIC. This enables the PIC to be reprogrammed in circuit, whilst the system is deployed in field – just the same as a



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standard industrial type PLC.

The unit supports the following communications types or interfaces:

- USB (Native – requires 18F2550 and custom code implementation)
- RS485 Driver is onboard
- RS 232
 - Requires external MAX232 / MAX 3232
 - Requires FTDI RTL232 Cable, USB to RS232 emulation
- Dallas 1 Wire devices

Sensors and Interfacing

Low current analogue sensors can be connected directly to the PIC such as an LM35 or MCP9700. Additionally, Dallas 1 wire device can also be interfaced with the unit individually or a network of 1 wire devices can be constructed.

Unit Configuration and Usage

The unit is highly configurable from the system programming level right the way through to the hardware configuration for individual inputs and outputs. Since the unit is a native PIC environment, the user creates the system software using any form of PIC compiler language such as ASM, BASIC or C. This approach offers the user the flexibility to create powerful applications limited only by their compiler license or their imaginations.

System Integration

The PCB layout is compact intended for applications where space may be at a premium. 3.0mm mounting holes are conveniently located at the four corners of the unit for easy mounting into panels and enclosures. The off board connections enable easy access for power connections, communications and input and output connections. All connections are pluggable even the I/O connections which may carry a high voltage connection. This ensures that a service technician will be able to unplug and disconnect the PICPLC from its application safely without any injury.

System Specifications

The system specifications listed below are specific to Version 1.0 of the PIC PLC and are subject to change, notice will be made when changes are made.

ProtoDev – PICPLC			
Power Supply	<=18Vdc , includes Led illumination when power is on		
	Bridge rectifier AC DC tolerant power supply		
Current	Current limiting determined by high wattage resistor R2		
PIC Microcontroller	16F882 18F2550 18F2553 *		
Programming	ICSP – PICKIT2 Compatible PICKIT 3 required for ICD support		
Communications	MAX 232 LTC 485 USB ** Dallas 1 Wire interface		
Inputs	4 x Optically Isolated inputs 12V VDC required to activate		
	PORTA accessible for analogue inputs		
	Resistor Diode configuration LED Illumination when input active		
Outputs	Reset pushbutton for software reset		
	4 Relay Outputs <i>Rated</i> : 24Vdc 120 VAC @ 1 Amp		
Primary Oscillator	Transistor drive from PIC output		
	8Mhz Crystal	Secondary	32.768 KHZ
*These are recommended devices however any 28 PIN DIP device is suitable from the 16F 18 F families			
** Exercising this option requires the implementation of a USB capable PIC			

