

คู่มือการใช้งาน

User's Manual

CP-PIC V3/458/EXP (ICD2)

CP-PIC V3/877/EXP (ICD2)

CP-PIC V4/458 (ICD2)

CP-PIC V4/877 (ICD2)

PIC



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CP-PIC V3.0&V4.0 (ICD2)

We designed Board Microcontroller CP-PIC V3.0 & V4.0 to use with Microcontroller PIC family with No. 16F877-20P, 18F442 and 18F458 or other number that has the same structure and Pin position. Each CPU number has different specifications and we can summarize approximately about its specifications of each CPU number as in the table.

Device Support and Specification

DEVICE	Program Memory	Data Memory		CAN Module	I/O (Bit)	OSC max (MHz)	Timers	PLL
	Flash	RAM (Bytes)	EEPROM (Byte)					
PIC 16F877	8K (14-Bit Words)	368	256	NO	33	20MHz	3	NO
PIC 18F442	16 Kbyte	768	256	NO	34	40MHz	4	YES
PIC 18F458	32 Kbyte	1536	256	YES	34	40MHz	4	YES

Specification

▪ CP-PIC V3.0

- RS - 232 Driver (MAX232) 1 Channel
- ETT CON 34PIN (ET BUS I/O 34PIN)
- 5 Volt Regulator On Board
- ICD2 Port for External Programming

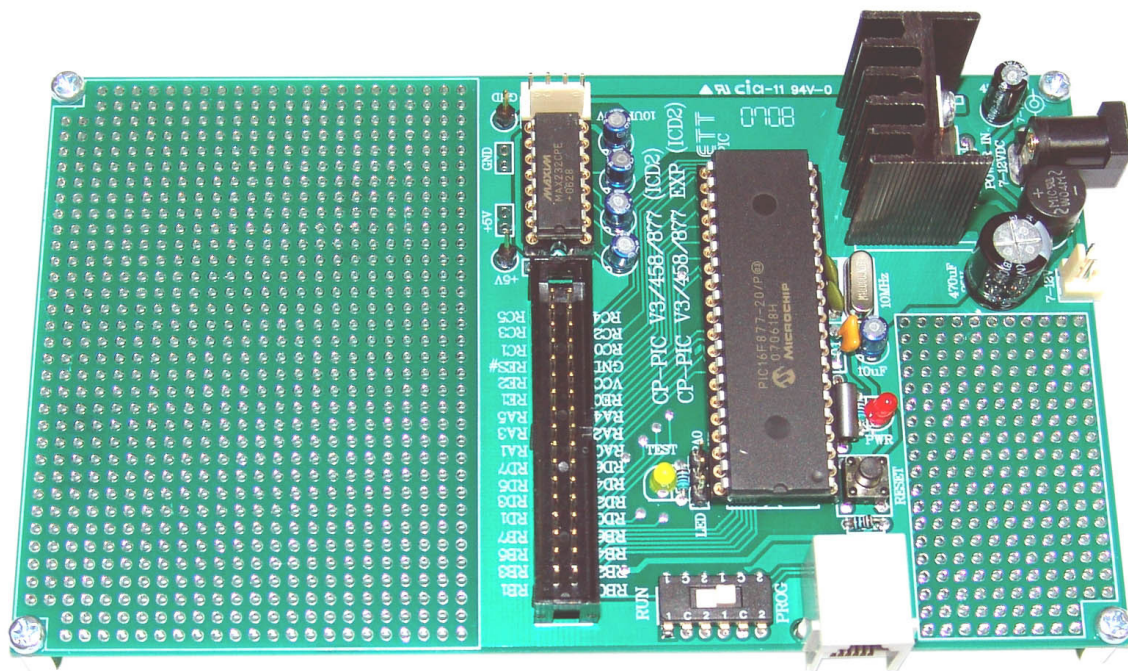
▪ CP-PIC V3.0 EXPANSION

- RS - 232 Driver (MAX232) 1 Channel
- ETT CON 34PIN (ET BUS I/O 34PIN)
- 5 Volt Regulator On Board
- ICD2 Port for External Programming
- Project Board

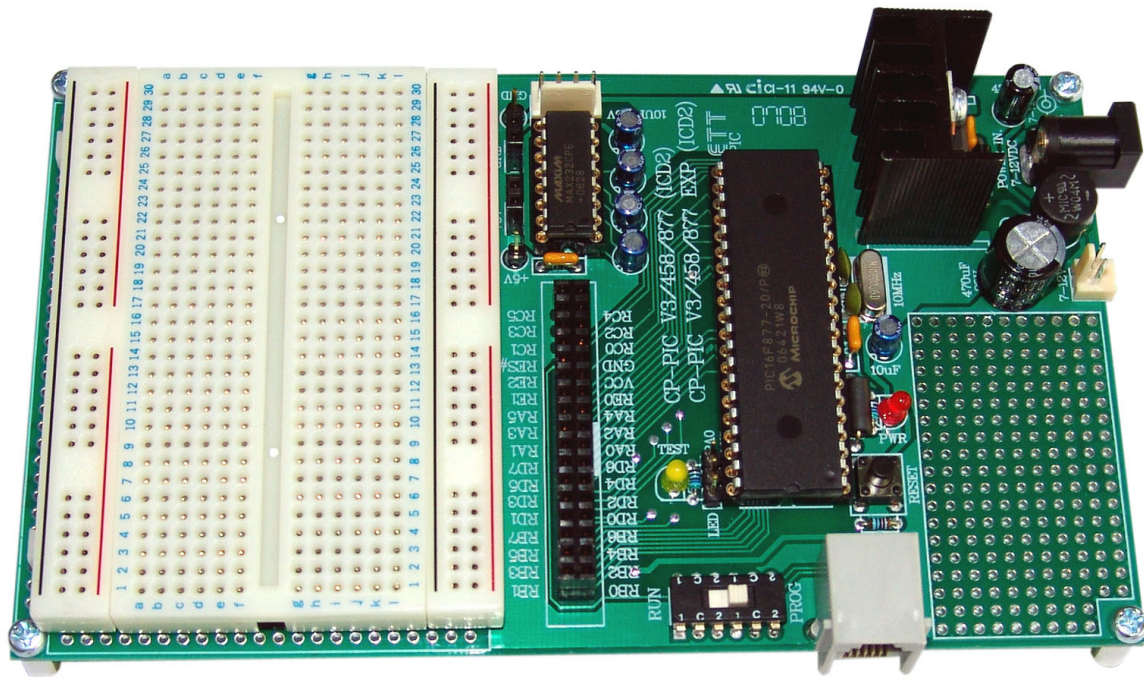
▪ CP-PIC V4.0

- RS - 232 Driver (MAX232) 1 Channel
- RS-422/458 (Option)
- ETT CON 34PIN (ET BUS I/O 34PIN)
- 5 Volt Regulator On Board
- ICD2 Port for External Programming
- RTC #PCF8583P (Option)
- ADC/IO(CPU)
- CLCD 14PIN Connector for LCD (4 Bit Data)
- EEPROM 24xx (Option)
- PCF8574AP I²C IN/OUT (Option)
- KBI/IO 10 Pin Connector
- Relay Onboard 5V (Option)
- Mini Speaker/Buzzer
- I²C BUS(EXPAND) Connector

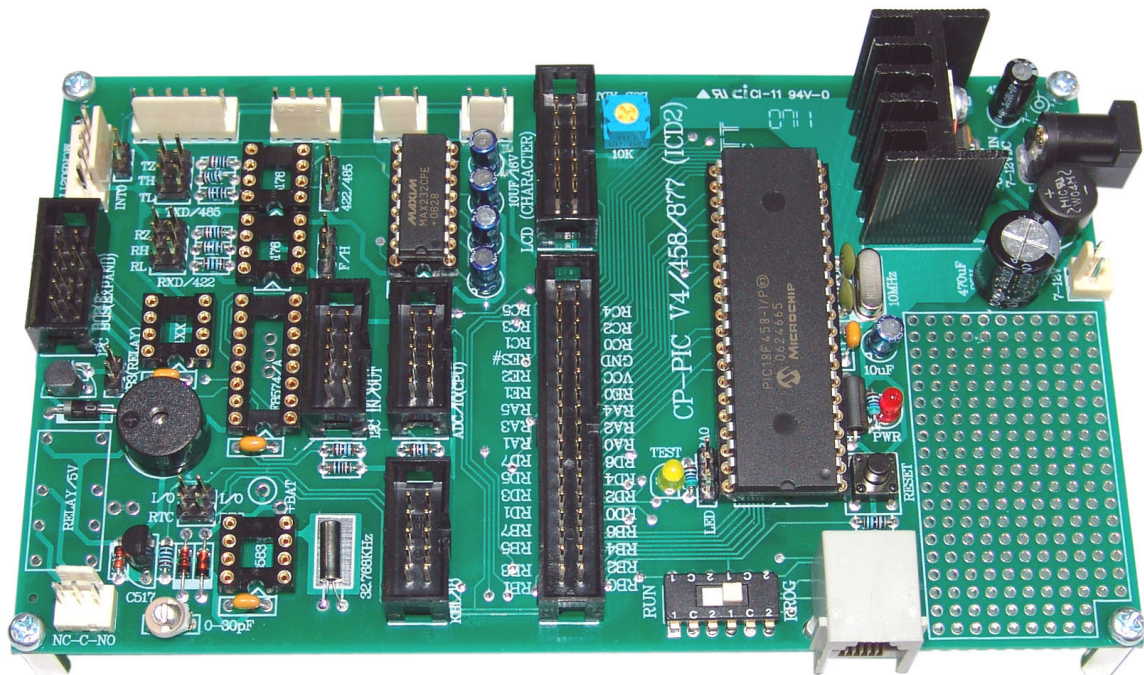
Notice Option is the part of blank Socket and if user want to use its, need to purchase additionally.



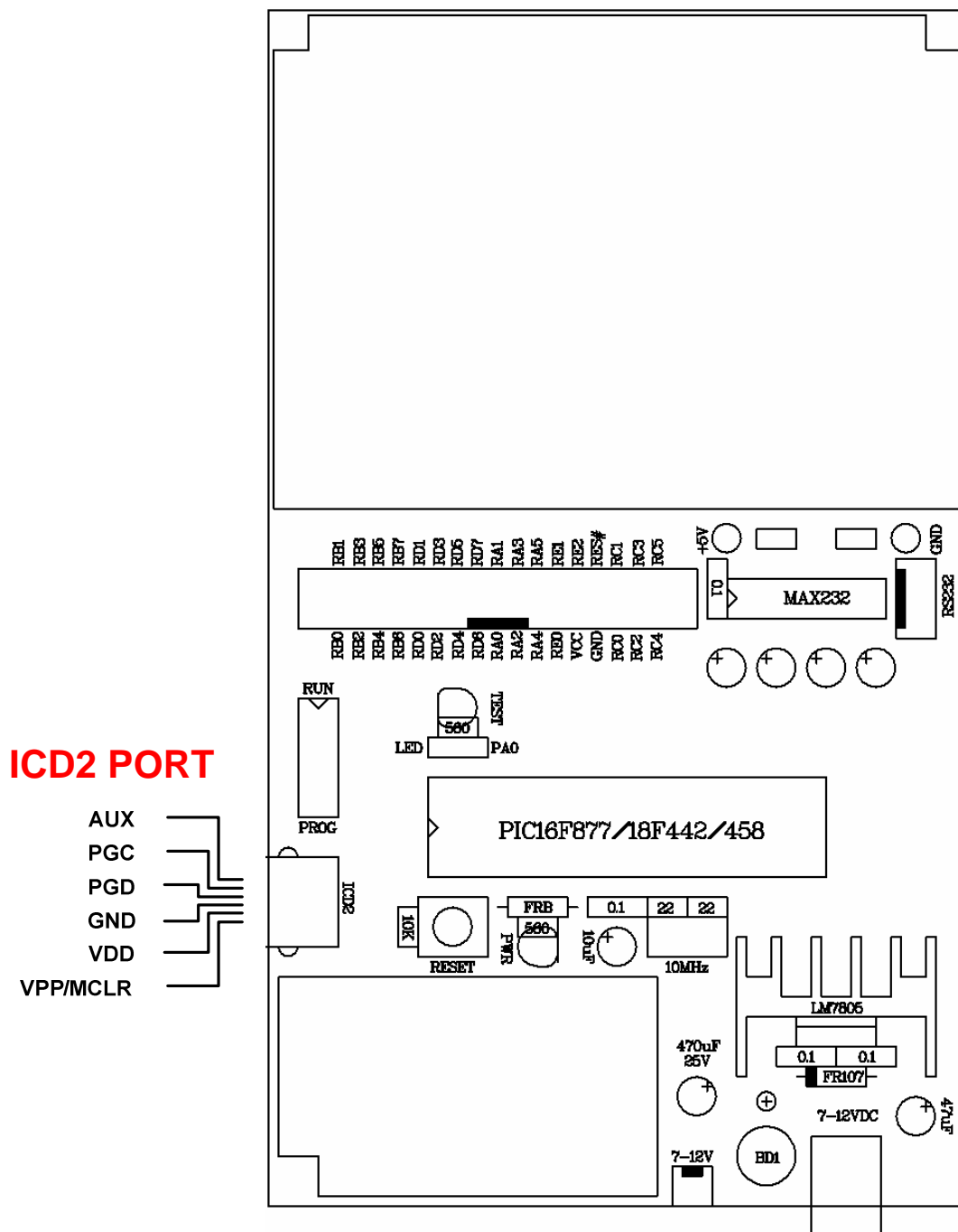
CP-PIC V3.0 (ICD2)



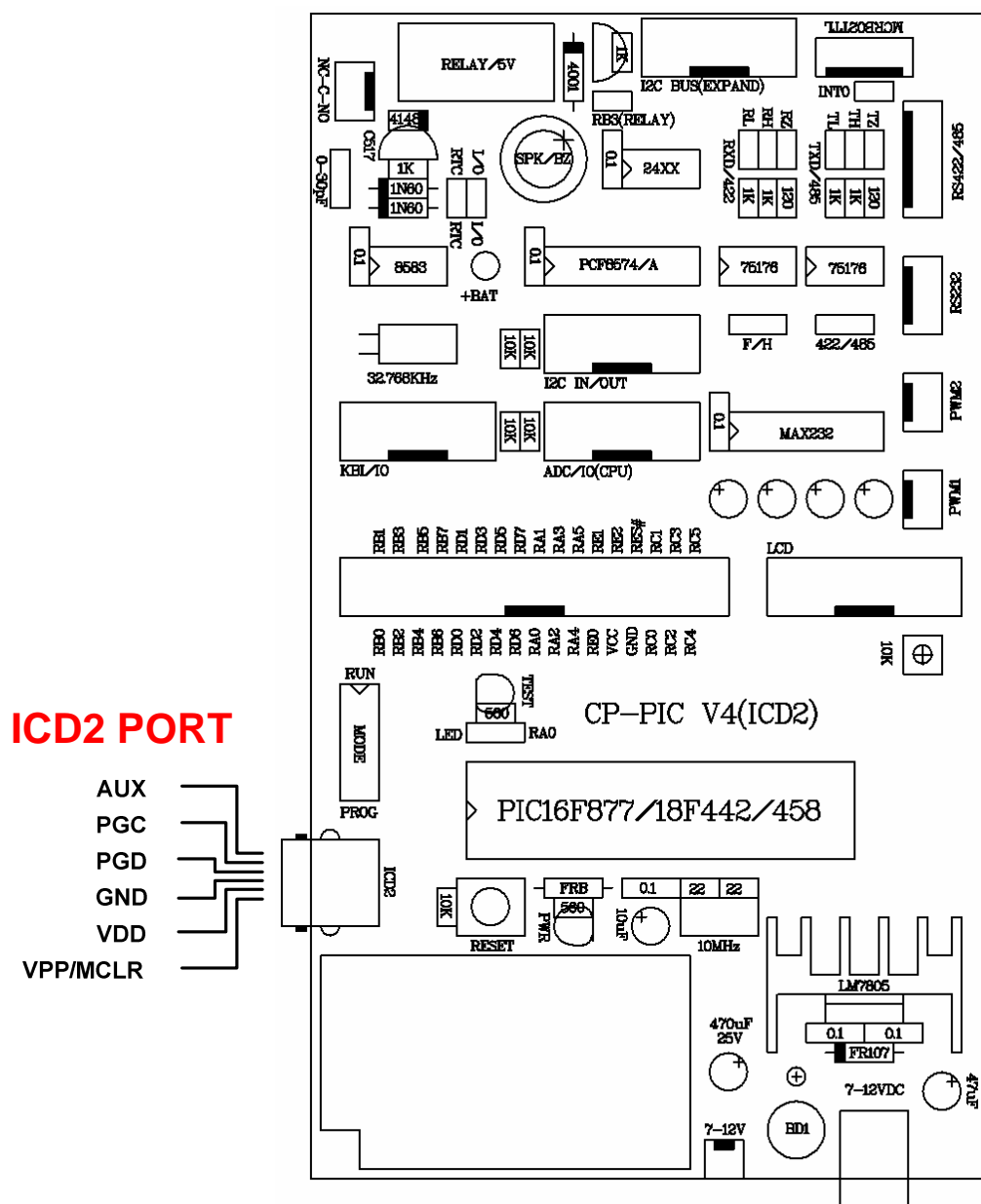
CP-PIC V3.0 (ICD2) EXPANSION



CP-PIC V4.0 (ICD2)

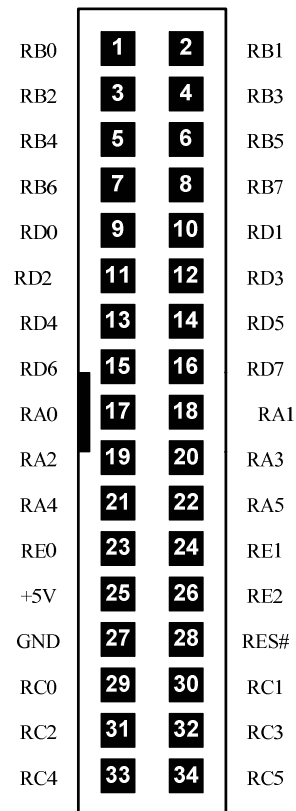


CP-PIC V3.0 and V3.0 (ICD2) EXPANSION

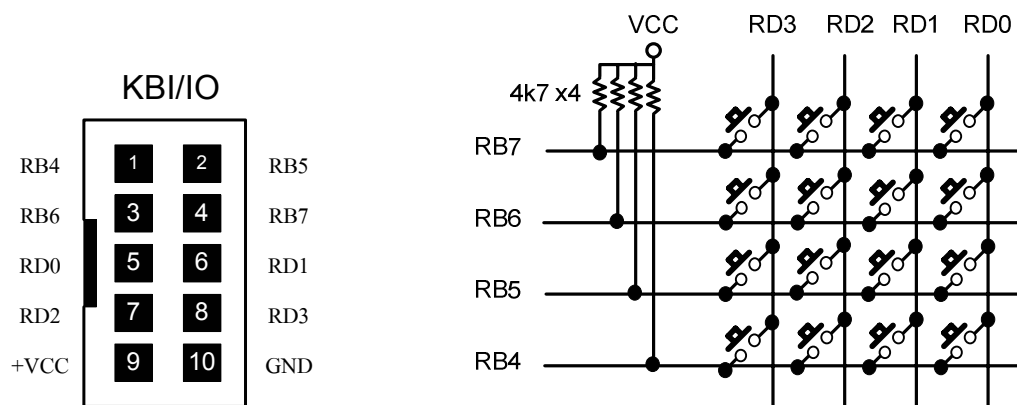


CP-PIC V4.0 (ICD2)

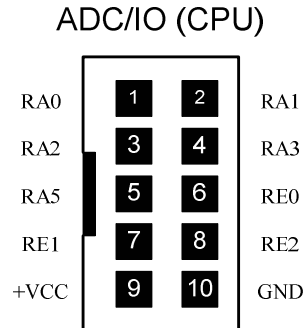
- **ET-34 Pin** Connector Layout following.



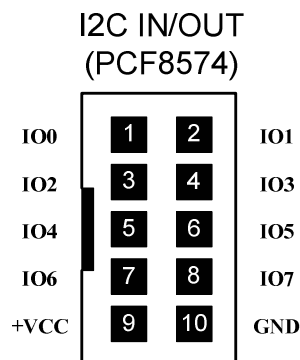
- **KBI/IO** uses to interface with Matrix Key 4x4 or 4x3 and its PIN arrangment is following.



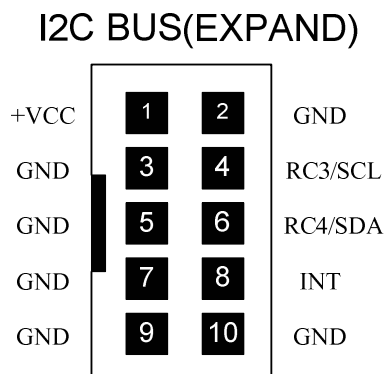
- **ADC/IO** which is Port uses to interface with connector signal of Analog to Digital Converter of PIC MCU. There's 8 channel ; AN0...AN7 and its arrangement of connector signal as following;



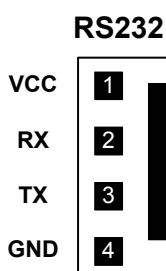
- **I2C IN/OUT** is a Port Signal to interface with I/O from IC PCF8574 which is controlled via I2C BUS. There's 8 I/O connector signal as following;



- **I2C BUS (EXPAND)** uses to expand signal of I2C BUS.

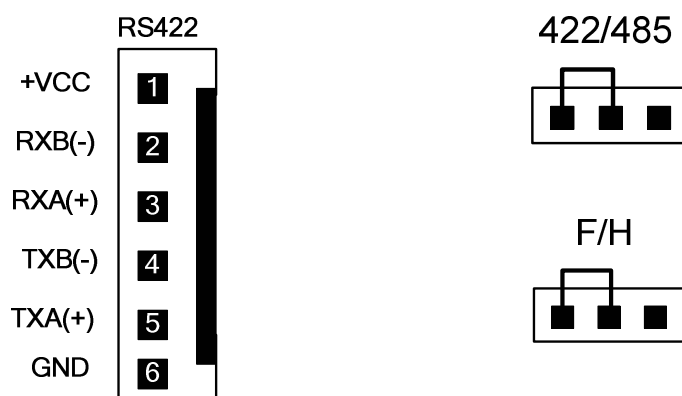


- **RS232** uses to send/receive data RS232 by
RX = PORTC.7 and TX = PORTC.6

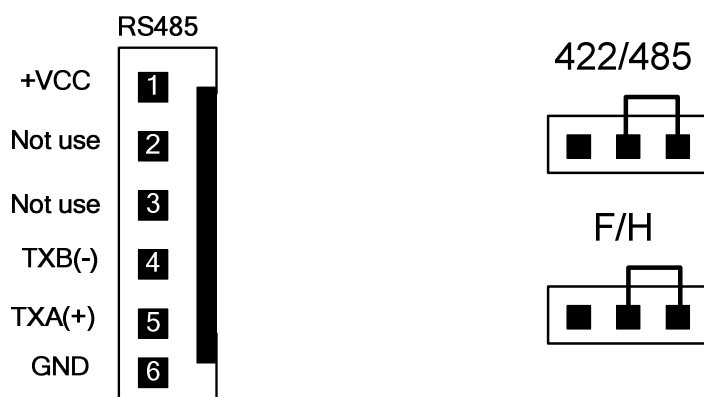


- **RS422/485** uses to communicate with basic RS422 (FULL Duplex) and RS485 (HALF Duplex). Its connections are;

- Interface all 4 of RS422; RXB, RXA, TXB and TXA and then select Jumper as following;



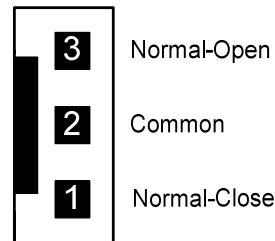
- Interface only 2 of RS485 and need to control direction of send/receive via connector signal of RC5.



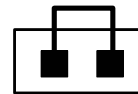
* In the part of JUMPER RL, RH, RZ, TL, TH and TZ use to be Matching Impedance in case of using a long cable.

- **RELAY** is a Port for RELAY and user can control RELAY via connector signal of RB3 that need to SET JUMPER at RB3 (RELAY) .

RELAY

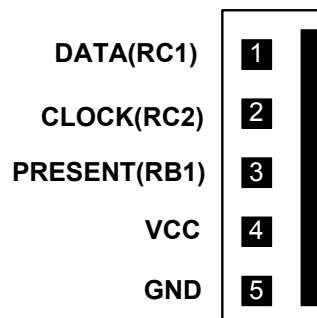


RB3(RELAY)



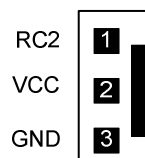
- **SPK/BZ** which is a mini speaker is controlled via connector signal of RB2.
- **MCRB02TTL** is a Port for Magnetic Card Reader MCRB02TTL.

MCRB02TTL

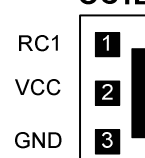


- **OC1A** and **OC1B** are Port for PWM that are connector signal PORTC.2 and PORTC.1 as following;

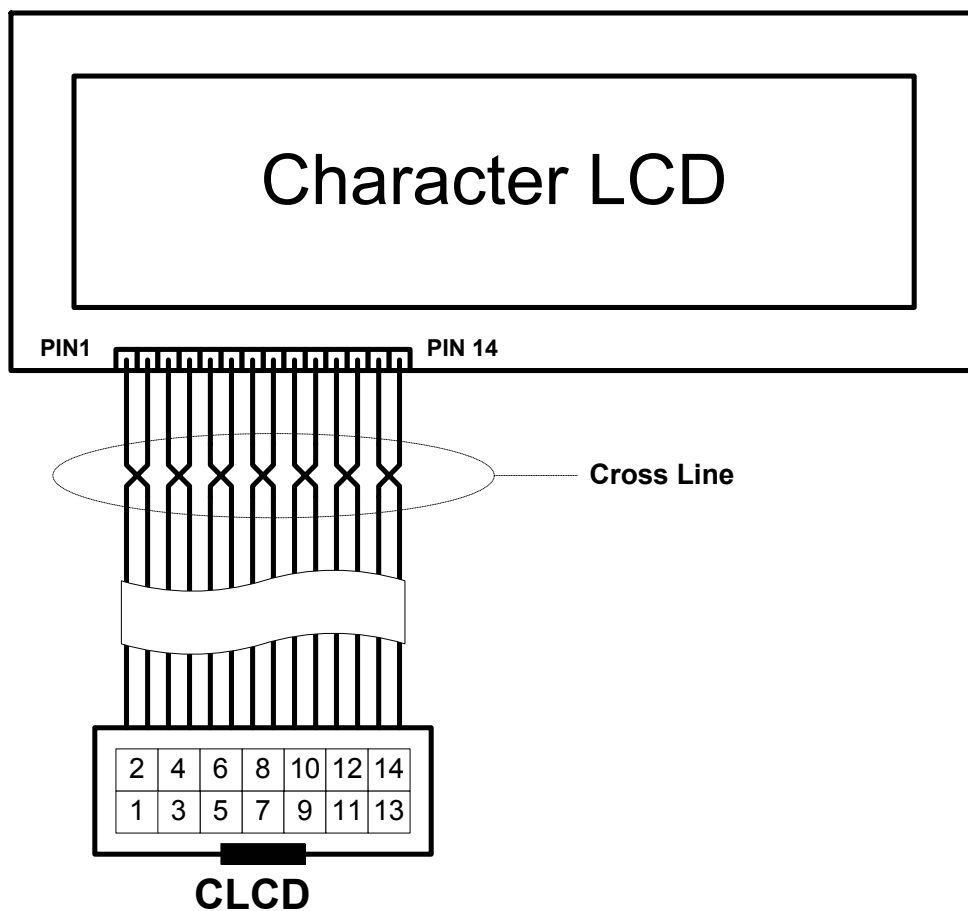
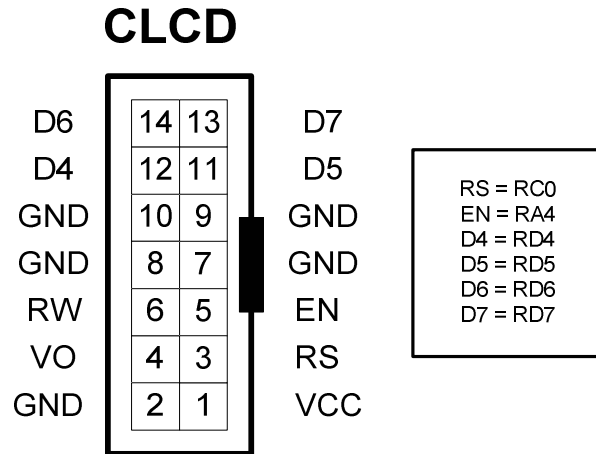
OC1A



OC1B



- **CLCD** which is a Port Connector is provided for Character LCD Display. It arranges 4 Bit Data signal and its connector signal arrangement as following;



- Using 12C BUS component inside Board by interface in the same Bus signal. Connector signal of SDA interfaces with PORTC.4 and SCL interfaces with PORTC.3. Each component has different address as in the table.

I2C Device	Control Address for General Format	Control Address for CP-PIC V4.0	
		Read Commands	Write Commands
RTC : PCF8583	[1][0][1][0][0][0][X][?]	[1][0][1][0][0][0][1][1]	[1][0][1][0][0][0][1][0]
E ² PROM:24XX	[1][0][1][0][X][X][X][?]	[1][0][1][0][1][0][0][1]	[1][0][1][0][1][0][0][0]
I/O : PCF8574	[0][1][0][0][X][X][X][?]	[0][1][0][0][0][0][0][1]	[0][1][0][0][0][0][0][0]
I/O : PCF8574A	[0][1][1][1][X][X][X][?]	[0][1][1][1][0][0][0][1]	[0][1][1][1][0][0][0][0]

- **POWER SUPPLY** Both Board CP-PIC V3.0 & V4.0 can use power supply alternating current type (AC) and direct current type (DC) because there's Rectifier circuit Bridge type with Filter circuit and Regulator +5V inside Board. Can select to interface with Connector CPA 2 PIN or Connector for Adapter, while it is running, its LED "VCC" of power supply will display its result.

Board's Operation Mode

We can configure 2 operation modes for Board CP-PIC V3.0&V4.0 (ICD2) that is **Program Mode (PROG)** and **Run Mode (RUN)**.

Program Mode (PROG)

This operation mode is used to program data into Microcontroller. Port ICD2 of Board CP-PIC V3.0&V4.0 is designed to connect signal Program (connect signal with external Programmer "ET-PGM PIC USB") and use SLIDE SWITCH to ON/OFF signal Pin for programming. If Board is used in the normal mode operation, signal pins are separated from circuit of programming, so we can use all signal pins.

To access to Program Mode is shifting SLIDE SWITCH (PROG/RUN) to PROG position, then connect signal Download (ICD2 Port) with Programmer and can program data instantly. More detailed descriptions of programming can see from User's Manual of Programmer.

RUN



PROG

Switch to select RUN/PROG Mode.

USER MODE or RUN MODE

This operation mode configures CPU to follow commands of the designed program and the method to access to this mode operation is shifting SLIDE SWITCH (PROG/RUN) to RUN position, then SLIDE SWITCH will separate signal pins from circuit of programming, so application of I/O Port can use all signal pins.

RUN



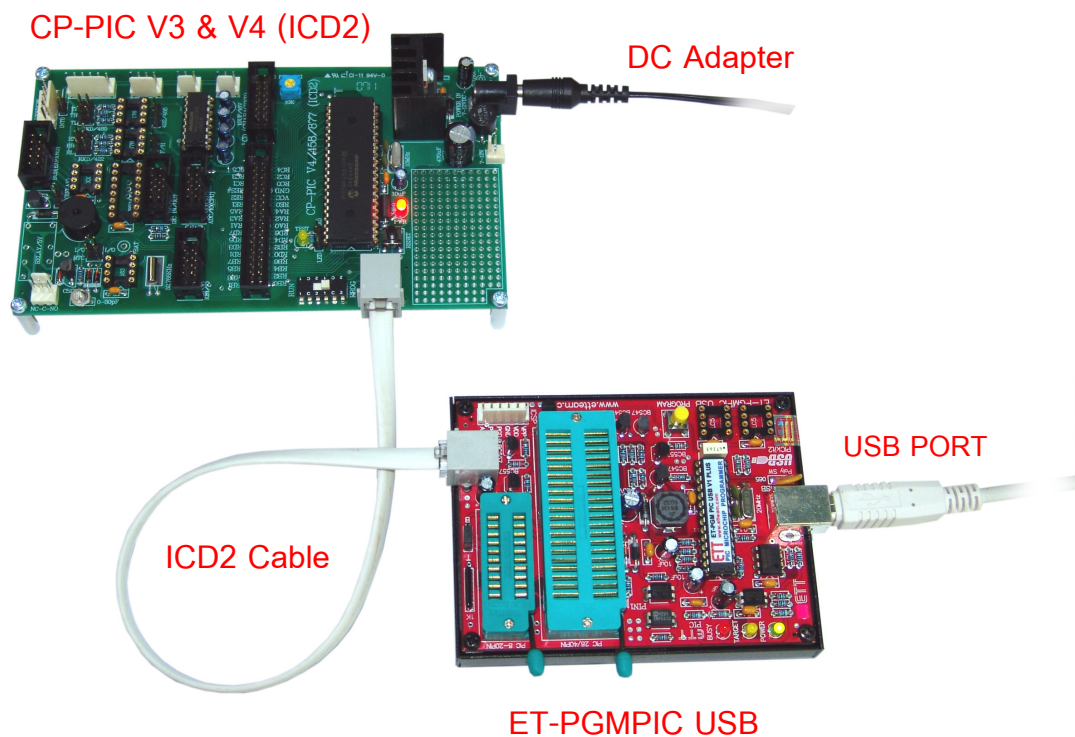
PROG

The method to develop program of Board CP-PIC V3.0&V4.0 (ICD2)

We can develop program by any language such as Assembly Language, Basic Language and C Language depend on skill of user. Although we use any language to develop program, we will get HEX FILE to program CPU. So, it is necessary to have Compiler to compile the written TEXT File into HEX FILE because Microocntroller can understand and accept this language. In this case, we will mention the method to download HEX FILE into Board only but we do not mention other detailed description about the method to write program and compile instaruction into HEX FILE, so user need to learn and study them from Configuration of Program Compiler that is used to write program by self. Board CP-PIC V3.0&V4.0 (ICD2) designs ICD2 Port to program data into CPU by connecting with external Programmer (such as Programmer "ET-PGMPIC USB").

Process to download program by Programmer "ET-PGMPIK USB"

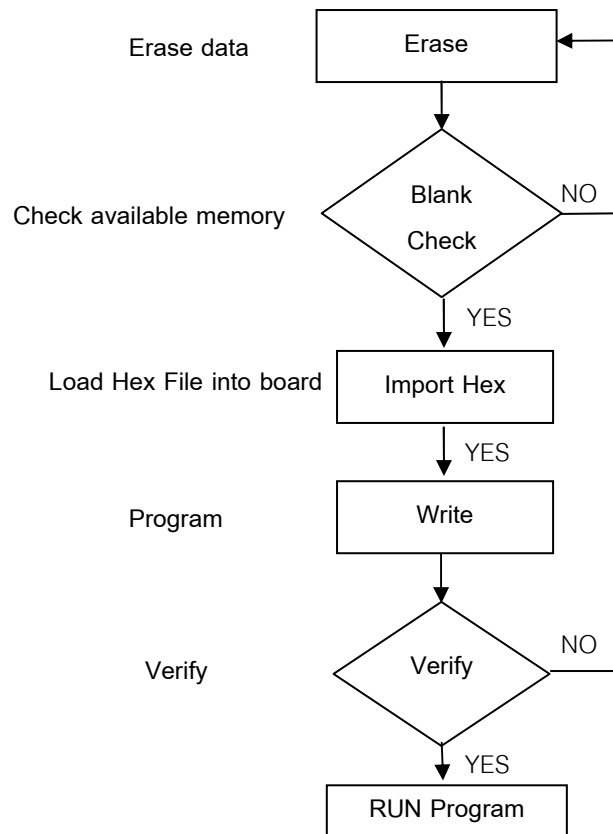
1. Connect ET-PGMPIK USB with Port USB of computer.
2. Connect Cable Program from PORT ICD2 of Programmer "ET-PGMPIK USB" with Port ICD2 of Board CP-PIC V3 & V4 (ICD2) and connect Power Supply with Board as shown in picture below.



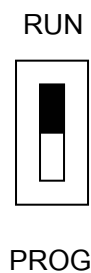
3. Shift Switch of Board CP-PIC V3 & V4 to PROG position.



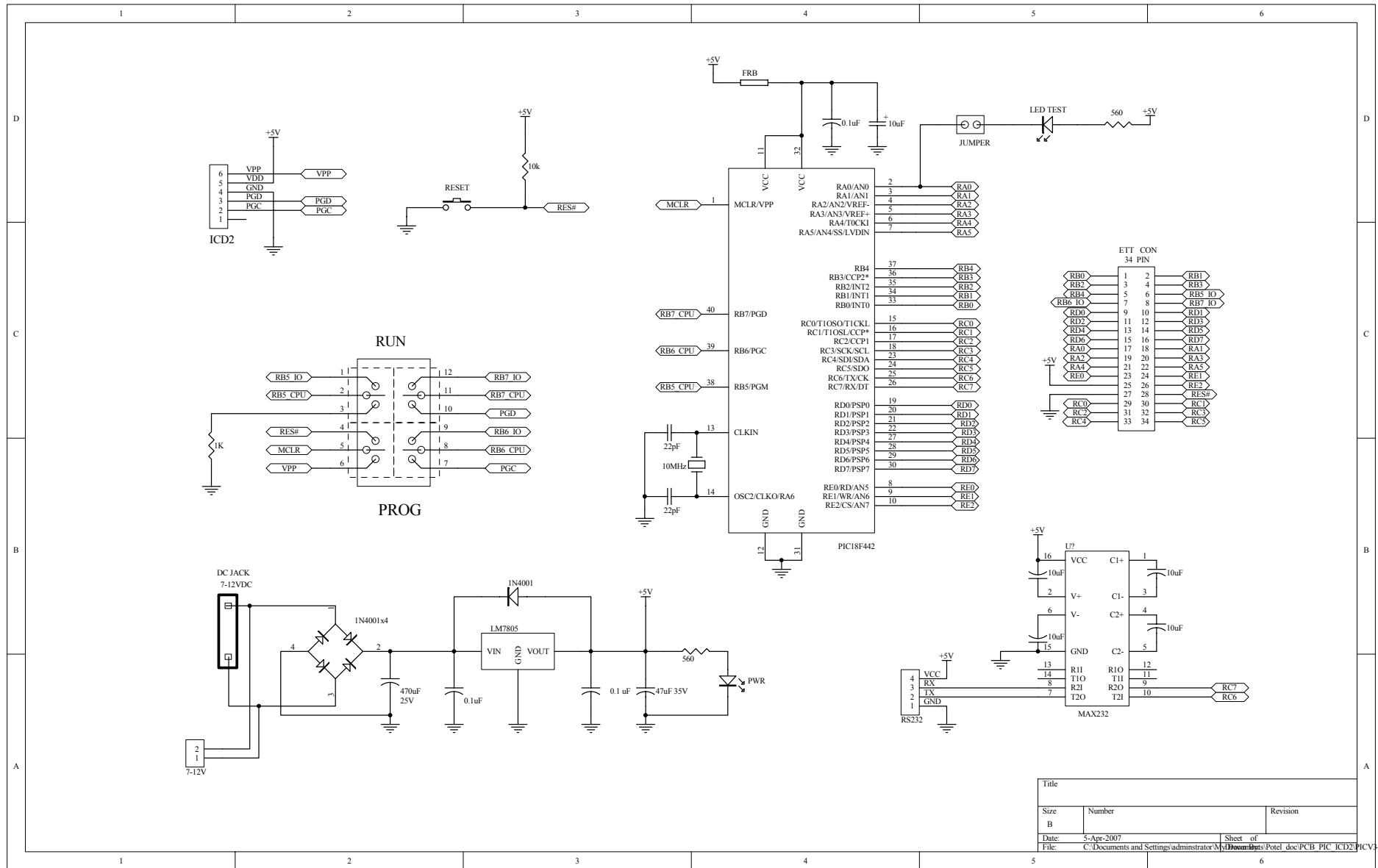
4. Open Program PicKit2, in this step we can do many processes; Erase, Blank Check, Write, Read and Verify (see more detailed information from User's Manual of Programmer "ET-PGMPIC USB"). Generally, process to program data is shown in the flow chart below.



3. If we want to go back to RUN Mode, shift Switch RUN/PROG to RUN position.



Circuit of CP-PIC V3 & V3 EXP (ICD2)



Title		
Size	Number	Revision
B		
Date:	5-Apr-2007	Sheet of
File: C:\Documents and Settings\administrator\My Documents\potel doc\PCB PIC\ICD2\PCV3-U.DDB		

Circuit of CP-PIC V4 (ICD2)

