

# Instruction manual

Development Kit

PIC18F microcontroller

module Professional



Kit de desenvolvimento

# PIC18F

Genios

With **USB** 2.0 and **PS / 2**  
input **ICSP** for **DEBUGGER**

supports

## MicroICD

- Gravador PIC e dsPIC via USB 2.0
- Depurador via MPLAB

## VERSION 3.0

The kit comes with the **PIC18F452** which has 32K **FLASH** and also supports

**PIC18F4550** that has several tools, including USB 2.0 channel.

Complex applications can be easily implemented and tested thanks to the excellent resources available;

**SUPPORTS** PIC16F877A / PIC18F442 / PIC18F452 /  
PIC18F458 / PIC18F4520  
/ PIC18F2550 / PIC18F2450 / PIC18F4550 /  
PIC16F873 / 876 / and  
many others.

*The KIT PICGenios is a great tool for students, professionals and teachers in order to develop microcontroller-based designs in the family **PIC18F** Microchip. Through the excellent resources available, the professional can perform all kinds of programs in assembly language, C, BASIC or Pascal, handling several such peripherals as: LCD, USB, PS / 2, RS232, RS485, A / D converters, keyboard matrix, RTC (Real Time Clock), PWM Drive, Temperature Sensor, Relays Drive, among others.*

### Basic characteristics

Control 16x4 alphanumeric LCD display (4 rows by 16 columns) in Mode 4, and 8 bits. The LCD displays are used in most major electronic design today. 4 7-segment displays driven scan.

matrix keyboard with 12 keys.

7 direct access keys to the pin, and 3 keys simulate these external interrupts INT0, INT1 and INT2 pic.

16 LEDs for visual control logic. 2 relays NO / NC for driving external loads of 10A / 220V.

RTC - real time clock with battery. By this watch the programmer can program timers, programmed drives, calendars, among other applications.

Channel Serial RS232: serial channel for communication with PC or other machines

Channel Serial RS232 Emulated: the programmer can emulate a serial software and then work with two serial RS232 in your project.

USB 2.0 channel for implementations in projects that require USB communication (necessary to use PIC18F4550 / 4450 and PIC18F2550 / 2450)

Channel PS / 2: connect to the microcontroller PC keyboard or mouse to optimize electronic design.

Heater via PWM. The student can control the PIC PWM channel simulating the board.

LM35 temperature sensor: the student can perform practical tests with this temperature sensor.

Buzzer drive. In some designs the use of an audible alarm is indispensable.

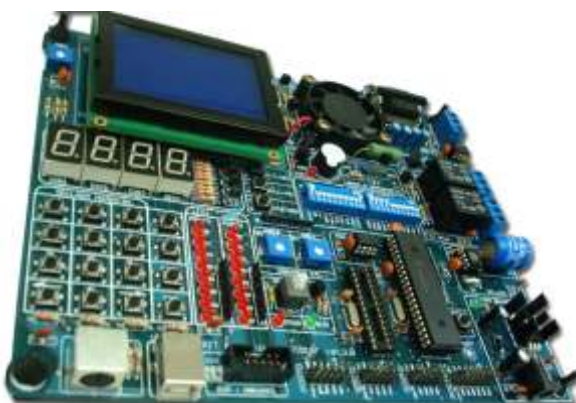
Access to all ports to expand the PIC microcontroller, which allows us to connect other external devices to the kit. Fan driven by PWM. It is important because the student can control the PWM fan rotating speed. Pulse counters. Through this circuit we know the fan rotating speed. (RPM counter). via I2C serial E2PROM memory 24C04. This type of memory is widely used in various equipment and machines. 2 trimpots simulation program and channel A / D (PIC ADC 1 and ADC 2).

RS485 communication channel: Protocol widely used in industrial networks and PLC's.

Load / Run key to ISP recording (recording on the same circuit). PIC18F452 microcontroller DIP with 32Kbyte Flash;

supports microcontroller **PIC16F877A / PIC18F442 / PIC18F452 / PIC18F458 / PIC18F4520 / PIC18F2550 / PIC18F2450 / PIC18F4550 / PIC16F873 / 876 / etc**

Recording channel ICSP: Connector mode debugger and ICD2. Voltage regulator. Dip key selector functions. Support for Graphic LCD display 128x64 with KS108 and T6963C controller.





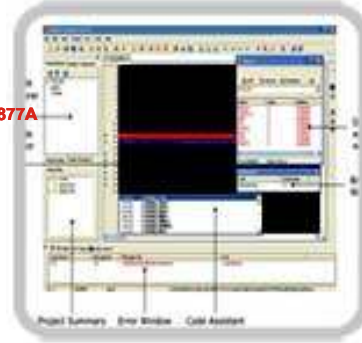
### PIC18F microcontroller



The PICGenios Kit supports various pic *Microchip* such as: **PIC16F877A** / **PIC18F442** / **PIC18F452** / **PIC18F458** / **PIC18F4520** / **PIC18F2550** / **PIC18F2450** / **PIC18F4550** / **PIC16F873** / **876** / among

others.

### Supports assembly language, C, BASIC and Pascal



The programmer can use various programming languages such as Assembly, C, BASIC and Pascal. Compatible with different compilers, such as MPLAB, MikroC, C18, CCS, etc.



It has LEDs 16 connected to the PIC PORT. Ideal for logic simulation of drive devices.

### Trimpot parasimulação A / D



The Trimmer are used to simulate the sensor input on the analog / digital converter (AN0 and AN1) Pic.

### keyboard Matrix



Today the matrix keyboards are highly used in

electronic equipment. In this kit we have 12 matrix keys and 4 keys connected directly to the PIC pins.

### source Regulated



The kit has PICGenios high quality connector P4, voltage regulator heatsink protected against polarity reversal in the input source. The kit accompanies source 12V / 500mA

### Circuit Reset



Available in kit manual reset circuit so you can start your application when you want.

### 2 Relay / NC



We offer two independent relays NO / NC drive loads that allows the engines, machines, or other types of loads.

### Channel for ICSP



ICSP connector and Debugger mode. Through this connector, you can record other PIC microcontrollers, and may connect the ICD2 Debugger the

*Microchip* to test the application in real time.

### PWM control and



Fan for simulation and testing of applications with PWM. Through the PIC CCP channel, you can control the rotating speed of the fan and infrared sensor read rotation.

### Heater and temperature sensor



Via PWM pic, you can control the heating of resistance available. We provide the LM35 temperature sensor, ideal for you to read and measure the ambient temperature or the heater.

### Expansion Ports



The KIT PICGenios offers you access to a 5 expansion ports (PORTA, PORTB, PORTC, PORTD and PORTE + VDC, + 12V and GND). Through these ports, you can connect other devices to the Kit.

### external interrupt key



Access to interrupt key INT0, INT1, INT2. It allows you to trigger the PIC external interrupts with a simple touch the touch keys. Thanks to the resources of PIC, we can also define if we want the drive for level 1 or 0.

### Channel USB 2.0



The KIT PICGenios allows you to make sophisticated programs communicating via USB 2.0 channel. (Requires PIC18F4550). Today, more and more USB communication is used in electronic equipment.

### converter Rs485



RS485 communication channel: Protocol widely used in industrial networks and PLC's.

### EEPROM



The KIT PICGenios offers you a I2C EEPROM 24C04 memory of 4 kbits for you to save your tables or data from your program.

### Input PS / 2



Through this connector PS / 2 you can connect keyboards or mice in your electronic designs. Thanks to the features of the high-level compilers, such as MikroC, you can write scripts with great ease for reading via PS / 2.

### buzzer



Concetado the Kit, we have a BUZZER (buzzer). This device is widely used in industrial, medical and household equipment.

### Key Load / Run



Key LOAD / RUN. (Programming mode / program running). Through a simple drive that button, the PIC on the recording mode will be triggered.

### Function key



The selector function keys are used to enable or desabiliar devices Kit, allowing the full use of available expansion ports.



### Rs232 serial channel and emulated



serial communication channel RS232 and serial channel Emulated via software. It allows you to use two serial RS232 in your projects

### RTC - Real Time Clock DS1307



### 4 7-segment display



min, hour, day, month and year. DS1307 and PIC18F452 allow you to display and control all data. It allows the drive four 7-segment

### Microcontroller 40 and 28 pins



Support for microcontrollers PIC 28-pin, such as PIC16F873 / 876 / PIC18F2550 or the like of the PIC16F and PIC18F family.

### Support for Graphic Display 128 x 64



Support for graphic LCD display 128 x 64 pixel. We can work with KS108 and T6963C controllers.

### features PIC18F452

O PIC18F452 accompanying the KIT PICGenios has the characteristics:

- m icrocontrolador pin 40;
- m emory of FLASH program 32Kbyte
- m emory data RAM 1536 bytes;
- m emory 256 byte EEPROM; Processing to 10MIPS (segundo million per instructions)

2-channel capture / compare / PWM - module CCP Master Synchronous

Serial Port (MSSP) module. Unhaced Usart 10-bit digital analog converter; 75 instructions;

programmable low voltage detector allows up to 100,000 cycles of writing and reading in the Flash program memory

P ermite one million read and write cycles EEPROM data retention at 40 Flash Watchdog timer with own programmable oscillator

T Res external interrupt-pin. 4 timers / counters (TIMER0, TIMER1, Timer2, TIMER3 )



Together with available kit containing a CD manuals, brochures, data sheets, programs and more than 60 examples of programs in the C language



With the kit is a CD with the presentations of Online Microgenios courses.



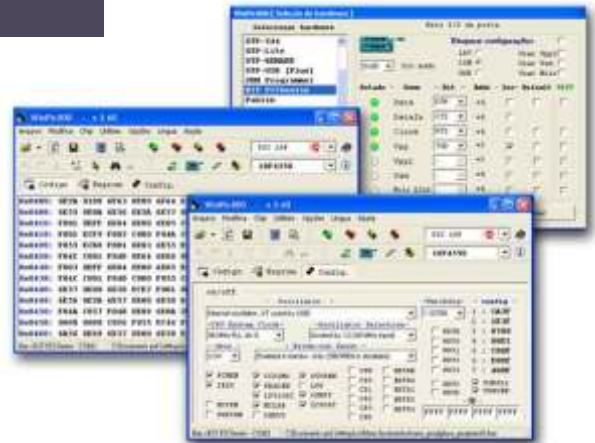
## Recording program

The PICGENIOS Kit can be written in two ways: For the COM port - SERIAL PC RS232 or by USB 2.0, with the aid of MicroICD recorder.

### Recording the door SERIAL PC

The KIT PICGenios support Windows 98 / ME / 2000 / XP. Through the RS232 serial port you can easily record our program KIT

PICGenios.O user recording program is **WinPIC800**.

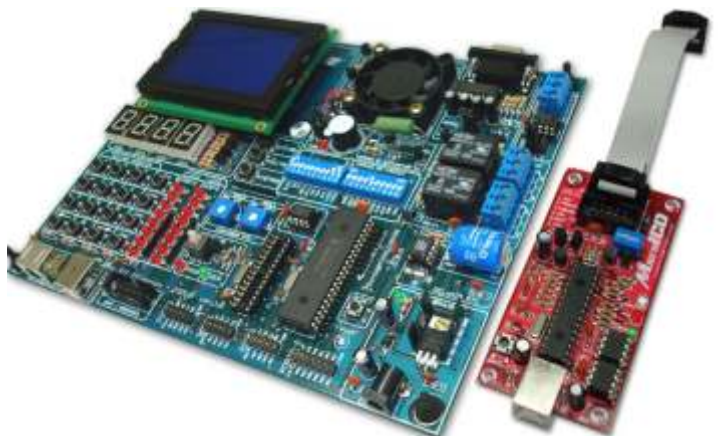


### Recording the USB 2.0 port

The KIT PICGenios supports recorder and debugger for PIC and dsPIC via USB

2.0 - MicroICD Microgenios. For more information about the MicroICD recorder, please visit our website: [www.microgenios.com.br](http://www.microgenios.com.br).

Note: MicroICD The recorder is sold separately.



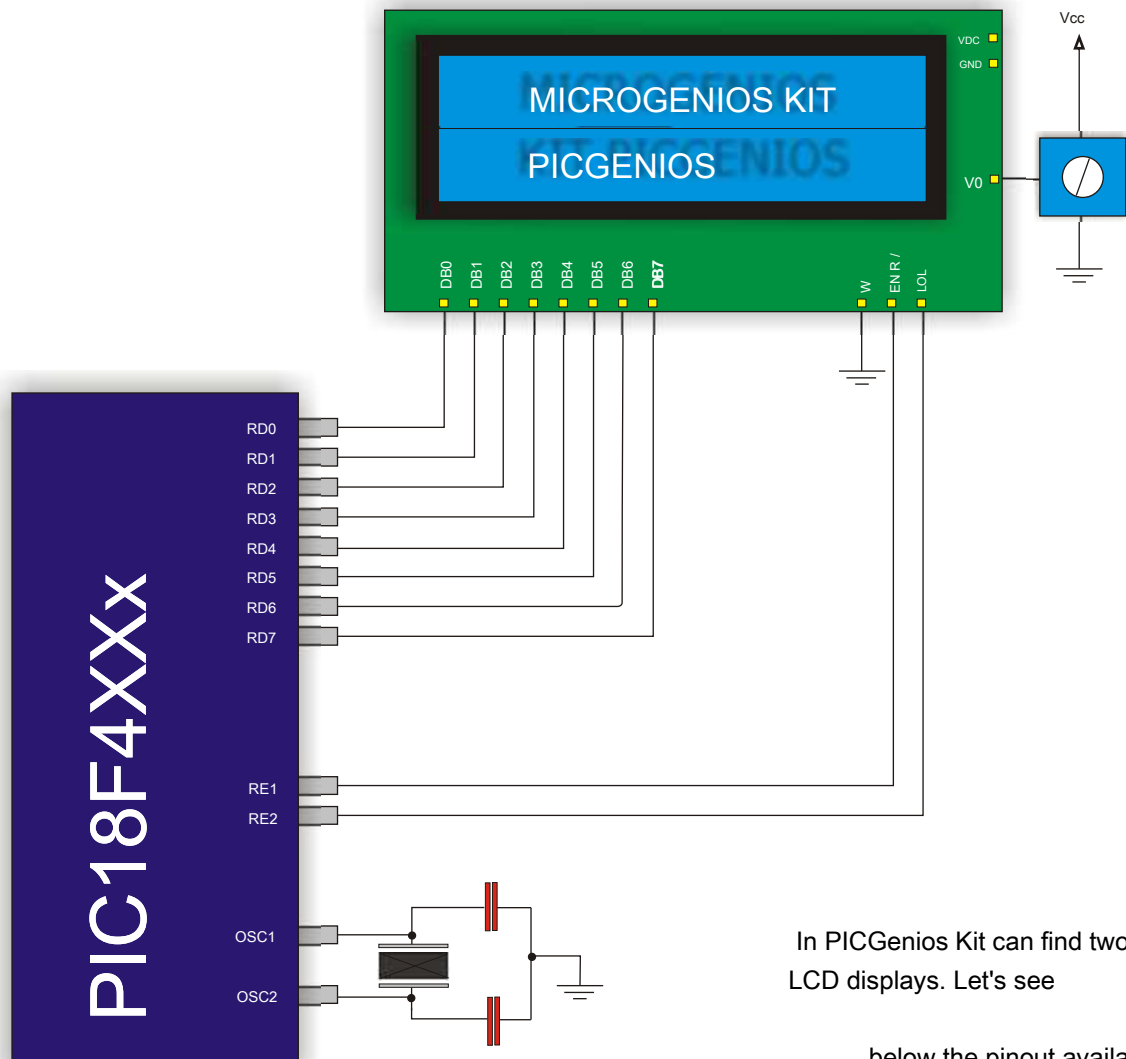
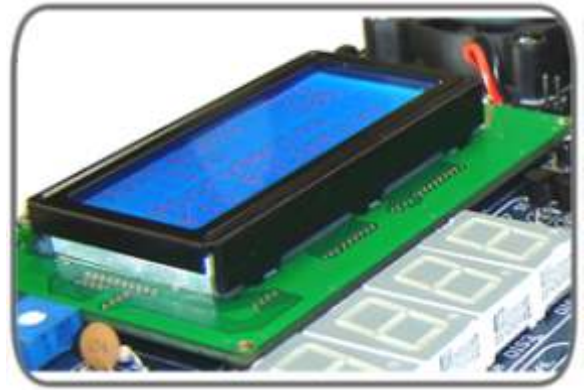
## Important informations

- > Unit assembled and tested, it is not a user-assembled kit.
- > 12 months warranty against manufacturing defects.
- > The kit PICGenios accompanying PIC18F452 microcontroller. To use the USB channel is necessary to use PIC18F4550 or similar.

Available in two buses PICGenios Kit for alphanumeric LCD 16x4 and 16X2 sizes. The kit comes with the 16x2 LCD with backlight (backlight)

Follow the wiring diagram of the LCD display to the PIC microcontroller:

## LCD Display Mode 2 X 16 8 bits



In PICGenios Kit can find two buses for LCD displays. Let's see

below the pinout available for communication with the display:

Pin	description
RD0	DATA0 display
RD1	DATA1 display
RD2	DATA2 display
RD3	DATA3 display
RD4	Data4 display
RD5	DATA5 display
RD6	DATA6 display
RD7	DATA7 display
RE1	Pulse ENABLE (EN)
RE2	Command pulse (RS)
GND	Pulse read / write (R / W)



The example program below has been prepared in mikroC compiler ([www.mikroe.com](http://www.mikroe.com)) and aims to write two messages on the display LCD 16x2 KIT PICGenios Microgenios.

### LCD\_16x2 program

/\* Technology center Microgenios Program example:

LCD\_mod0\_8bits.c

This program aims to write the message "Microgenios" in the first line of the LCD and the second "PICGENIOS Kit". Kitpicgenios v3.0 Crystal: 8MHz

Compiler: MikroC 8.0

\*/

// Start of program void main ()

Trisd = {0; // set all PORTD pins as output TRISE = 0; // set all sized pins as output ADCON1 = 0x06; // set all pins of A / D and I / O

Lcd8\_config general use (& postage, & PORTD, 2,1,4,7,6,5,4,3,2,1,0); // initialize mode LCD 8 bits Lcd8\_cmd (lcd\_clear);

// delete the entire display

Lcd8\_cmd (lcd\_cursor\_off);

// cursor off the LCD

Lcd8\_out (1.1 "Microgenios"); // Message write the first line of LCD Delay\_ms (10);

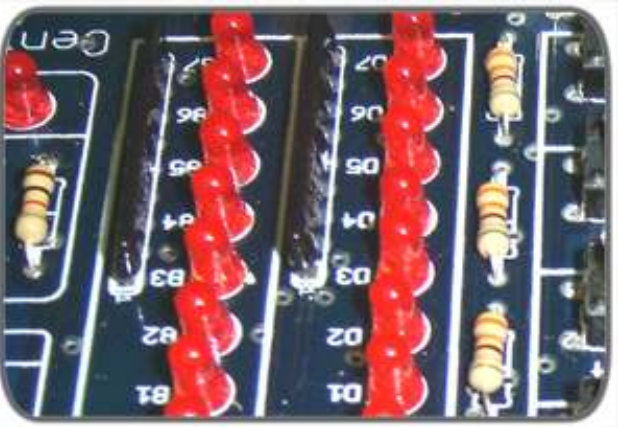
// generates delay time 10milisegundos

Lcd8\_out (2.1 "KIT PICGENIOS"); // Message write in the Second LCD Delay\_ms line (10); // generates delay time of 10

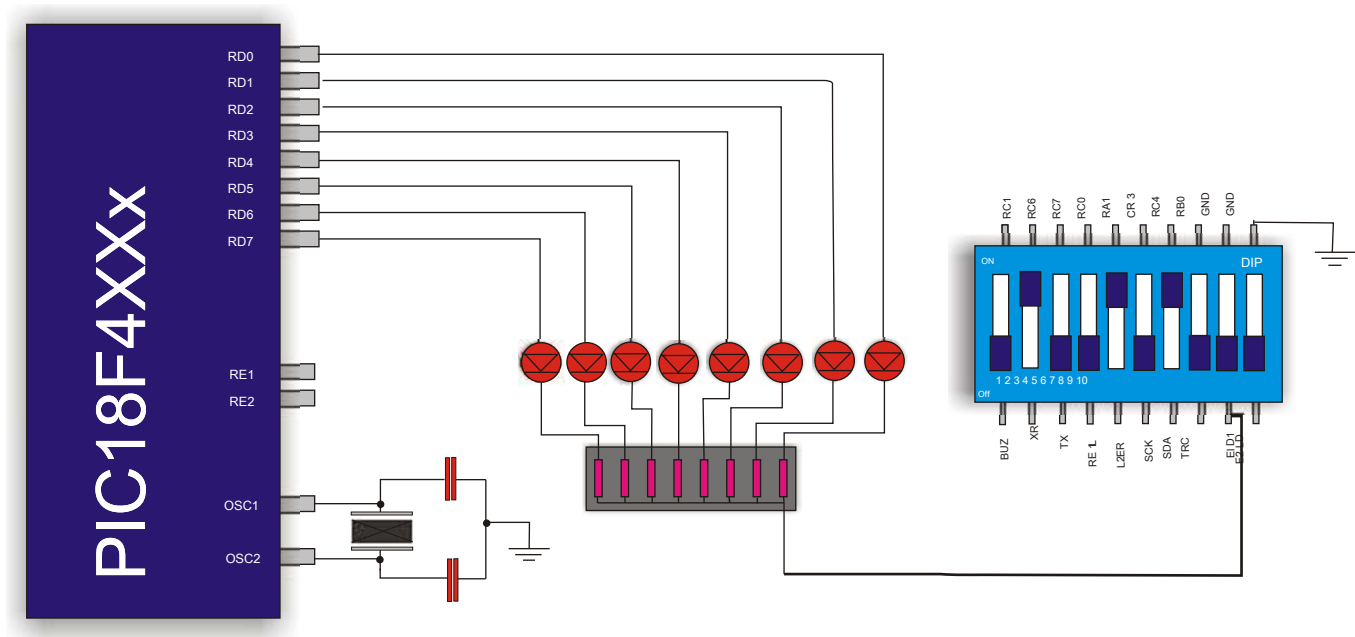
milliseconds while (1); // infinite loop. End of program}



On the PORTD We have PORTB and 16 connected LEDs (eight LEDs in each PORT). The LEDs are configured to be "ignited" in logical level 1 (one). The circuit shown below is valid for the PORTB and PORTD.



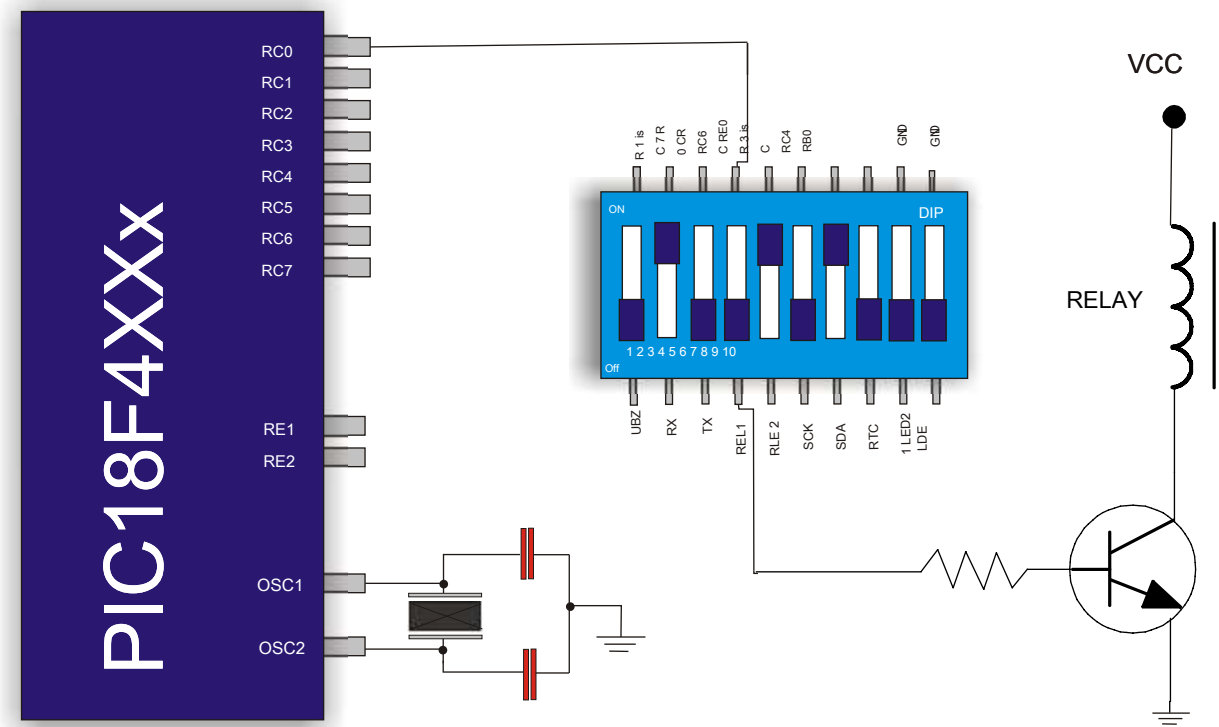
The LEDs are widely used in various electronic equipment. Its application is indispensable for  
  
in most projects



Description of the LED drive pins

Pin	description	Pin	description
RB0	LED B 0	RD0	LED D 0
RB1	LED B 1	RD1	LED D 1
RB2	LED B 2	RD2	LED D 2
RB3	LED B 3	RD3	LED D 3
RB4	LED B 4	RD4	LED D 4
RB5	LED B 5	RD5	LED D 5
RB6	LED B 6	RD6	LED D 6
RB7	LED B 7	RD7	LED D 7

In PICGenios kit temosa acionarmos option two relays NO / NC. The relays are triggered by pins RC0 and RE0 charge respectively;



We drive external loads with high currents through the relay. The relay 1 and relay 2 to be triggered should be enabled via the function key PICGenios kit. On board body we have an indication of the drive position of the relays.

RELAY

Pin assignment of drives relay



Pin	description
RC0	RELAY 1
RE0	RELAY 2

The example program below has been prepared in mikroC compiler ([www.mikroe.com](http://www.mikroe.com)) and aims to turn on and off the LEDs connected to PORTB and PORTD alternately second intervals.

## Program flasher

/\* Technology center Microgenios Program example:

FLASHER

This program aims to flash the LEDs from PORTB PORTB and alternately at 1 second intervals (on deslizado). Crystal Kitpicgenios ver.3.0 = 8Mhz

Compiler: MikroC 8.0

\*/

// Start of program

```
void main () {
    trisd = 0; TRISB = 0; of { PORTD
    = 0xff;

    PORTB = 0; Delay_ms (1000); // amounts LEDs connected in PORTD
    PORTD = 0; PORTB = 0xff; // delete the LEDs connected in PORTB // clears the LEDs
    Delay_ms (1000); // 1 second delay
    // 1 second delay connected in amounts // PORTD LEDs connected in PORTB

} While (1); }
```



The example program below was prepared in mikroC compiler ([www.mikroe.com](http://www.mikroe.com)) and is intended to engage and disengage the relay 1 and relay 2 are connected to pins RA0 and RC0 2-second intervals.

### acionamendo program relays

/ \*\*\*\*\* technology Center Microgenios Card: PICGenios Kit  
Program: Flashes Flashes

Objective: This program aims to engage and disengage relays in 1 second (on and off); Kit ver3.0 picgenios crystal = 8MHz

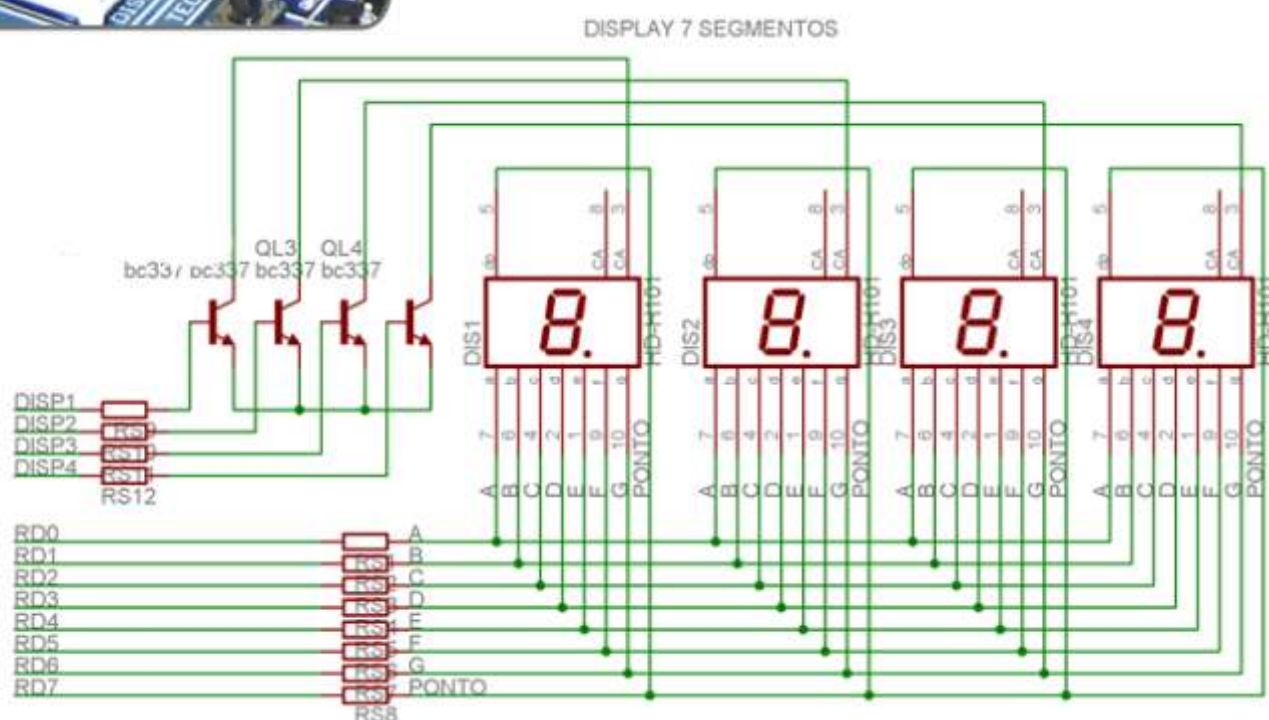
Compiler: MikroC 8.0  
\* /

```
void main () {  
  
    ADCON1 = 6; // set all pins as I / O trisc.f0 = 0; // set as output pin RC0 trise.f0 = 0;  
    // RE0 pin configured as output while (1) { // infinite loop condition  
  
        porte.f0 = 1; portc.f0 =  
        1;  
        delay_ms (1000); // delay 1000 milliseconds (1 second) porte.f0 = 0; portc.f0 = 0;  
  
        delay_ms (1000); // delay 1000 milliseconds (1 second)}}}
```

The PICGenios Kit has 4 7-segment display driven scan. Through this scanning system, we can control the displays more efficiently as we save components (converters, etc.) and optimize the number of I / O's of the microcontroller.



Scheme acionamendo the 7-segment display



This module is multiplexed with the data bus (PORTD). To access each display, there is a selection pin for each display. Let us see below the configuration adopted in PICGenios.

Pin	description
RD0	The segment
RD1	Segment B
RD2	segment C
RD3	segment D
RD4	segment E
RD5	segment F
RD6	segment G
RD7	segment Point
RA2	Selection Display1 (DISP1)
RA3	Selection Display2 (DISP2)
AR4	Selection Display3 (Disp3)
RA5	Selection Display4 (Disp4)

The example program below has been prepared in mikroC compiler ([www.mikroe.com](http://www.mikroe.com)) and aims to write in displays

### display scan of 7 segments

/ \*\*\*\*\* Technology Center Microgenios Program: Diplay\_7\_seg\_01  
Board: KIT PICGENIOS v3.0

Objective: This program writes the value 6057 in the 7-segment display crystal = 8MHz

Compiler: MikroC 8.0

\*\*\*\*\*  
\* \*  
\* /

```
void main () {           // main function of the program

    ADCON1 = 6; // set all pins as AD I / O GATE = 0; // resets all port pins TRISA = 0; //
    set as an output port TRISD = 0; // set PORTD = PORTD as output 255; // Sets all the
    pins PORTD {
```

// beginning of the loop routine

```
PORTA.F2 = 1;           // connects first display
= 0b11111101 PORTD;     // write digit 6
Delay_ms (1);           // delay 1ms
PORTA.F2 = 0;           // off first display
```

```
PORTA.F3 = 1;           // connects second display
= 0b00111111 PORTD;     // write digit 0
Delay_ms (1);           // delay 1ms
PORTA.F3 = 0;           // third off display
```

```
PORTA.F4 = 1;           // third display alloy
= 0b01101101 PORTD;     // write digit 5
Delay_ms (1);           // delay 1ms
PORTA.F4 = 0;           // third off display
```

```
PORTA.F5 = 1;           // League quarter display
= 0b00000111 PORTD;     // write digit 7
Delay_ms (1);           // delay 1ms
PORTA.F5 = 0;           // display off quarter
```

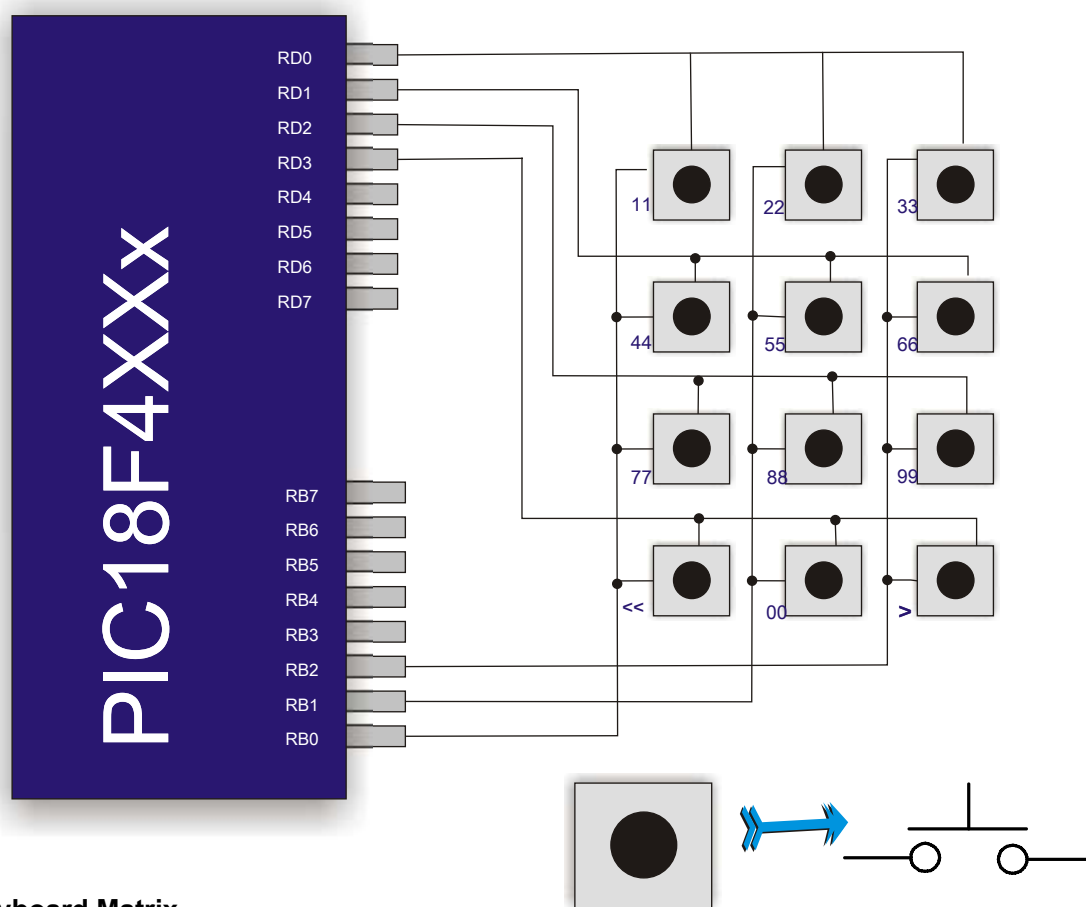
```
} While (1); }
```



The PICGenios Kit has a matrix keypad 3x4 (3 columns with 4 keys each) in which the premite acionamento for scanning. All keys are symbolized by the numbers 0 to 9 and forward and backward arrows.

Note: the keys that belong to the matrix keyboard are indicated in the symbolism of the kit PICGenios board. Do not confuse the keyboard matrix with other keys

Scheme Matrix Keyboard acionamendo



## keyboard Matrix

The matrix keyboard consists of 16 multiplexed keys on the PIC PORTD and PORTB. The theme PORTD the function to read the lines of the matrix keyboard, while the part of the PORTB has the function of enabling the columns.

Let down the pin for testing with this module:

Pin	description
RB0	column 1
RB1	column 2
RB2	column 3
RD0	line 1
RD1	line 2
RD2	line 3
RD3	line 4

The example program below has been prepared in mikroC compiler ([www.mikroe.com](http://www.mikroe.com)) and aims to read the matrix keyboard keys and send its numerical value for the LCD display 16x4.

## Scan matrix keyboard

```
/ ***** Course:
programming C - PIC microcontroller Compiler: mikroC 8.0 Kit: Kit PICGenios
Crystal: 8MHz
```

Obejtivo: This program aims to read a Matrix keyboard and send the value of each key to the LCD display.

```
*****
```

```
// initialization subroutine ***** char lcd
var1;
```

```
void LCDR (char a) [5] = {0
trisd;
Lcd8_Cmd (Lcd_Clear);
LCD8_out_cp (a); trisd = 255; }
```

```
// ***** main program
*****
```

```
void main ()
{char var2; // sets the variable
ADCON1 = 0x06; // set pins as AD I / O General purpose
TRISE = 0;
```

```
trisd = 0; // set as an output port
```

```
Lcd8_Config (& Porte, & PORTD, 2,1,4,7,6,5,4,3,2,1,0); Lcd8_Cmd
(Lcd_Clear);
Lcd8_Cmd (LCD_CURSOR_OFF);
delay_ms (100);
```

```
trisd = 255;
PORTB = 255; // PORTB in FF
PORTD = 255; // PORTD in FF
trisd = 255; // set as input PORTD
TRISB = 0; // set as output PORTB
```

```
}
```

```
// ----- // start the
scanning program matrix keyboard // -----
-----
```

```
the portb.f0 = {0;
```

```
// enables first keyboard column
var2 = PORTD; if (var2.f0 == 0) LCDR (
"<-"); else if (var2.f1 == 0) LCDR ( "7");
else if (var2.f2 == 0) LCDR ( "4"); else if
(var2.f3 == 0) LCDR ( "1"); portb.f0 = 1;
```

```
// ----- // disable first keyboard column
----- portb.f1 = 0;
```

```
// second column enables the keyboard

var2 = PORTD; if (var2.f0 == 0) LCDR (
"0"); else if (var2.f1 == 0) LCDR ( "8");
else if (var2.f2 == 0) LCDR ( "5"); else if
(var2.f3 == 0) LCDR ( "2"); portb.f1 = 1;
```

```
// second column disables the keyboard

// ----- portb.f2 = 0;
```

```
// enables the third column of keypad
```

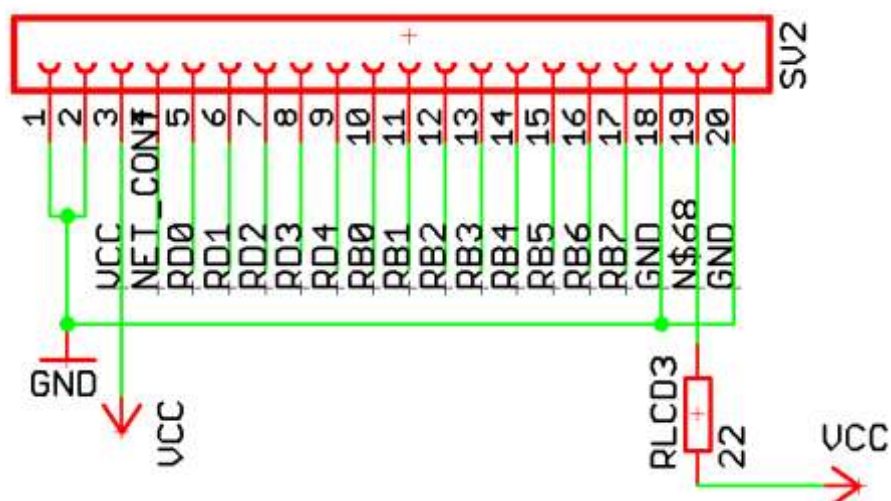
```
var2 = PORTD; if (var2.f0 == 0) LCDR (
"->"); else if (var2.f1 == 0) LCDR ( "9");
else if (var2.f2 == 0) LCDR ( "6"); else if
(var2.f3 == 0) LCDR ( "3"); portb.f2 = 1;
```

```
// disables the third column of keypad
```

```
delay_ms (100);
```

```
} While (1);
```

## GRAPHIC KS108



## LCD GRAPHIC T6963C LCD



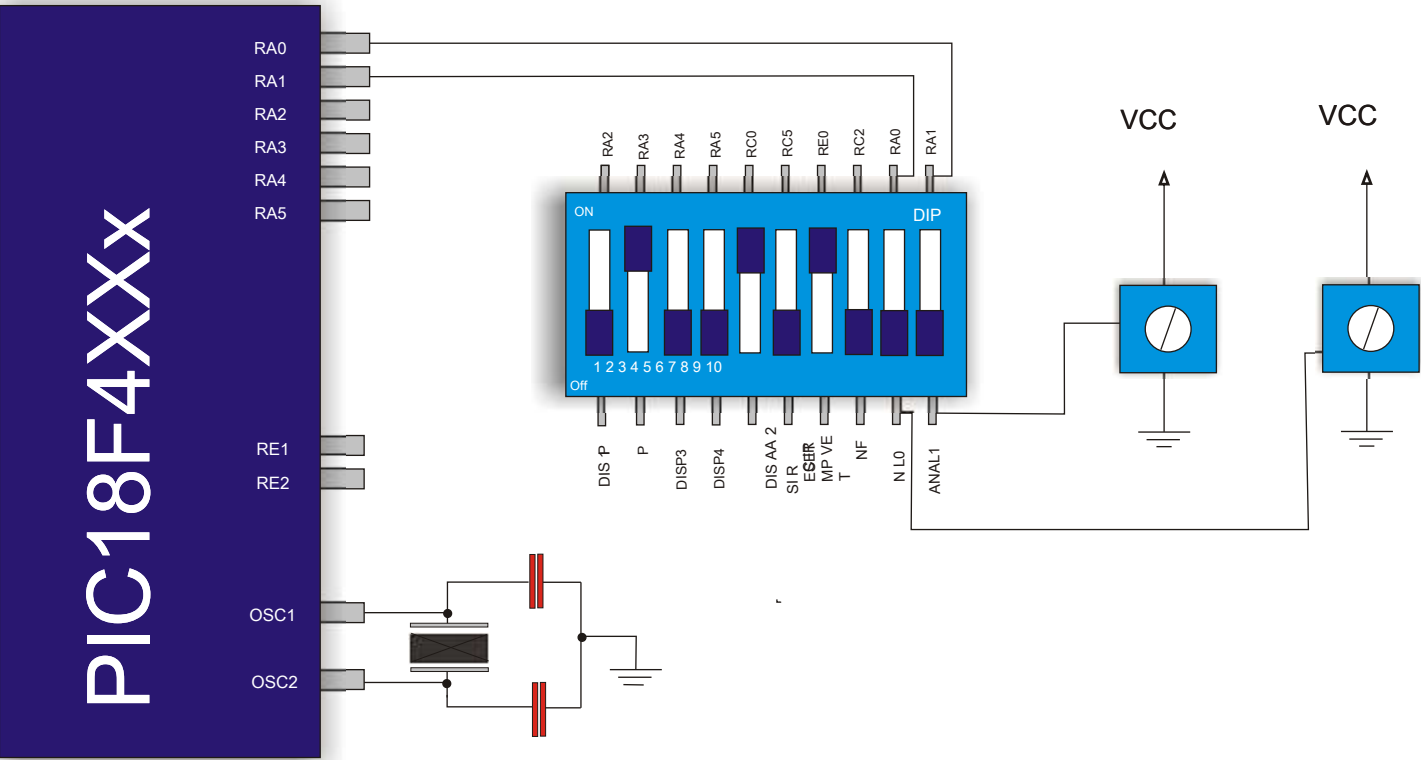


The PIC18F452 features internally 10 channels A / D converters with 10 bit resolution. To simulate the operation of A / D converters, two trimpots provide for adjustment of tension on the AN0 and AN1 channels.

To habiliarmos the Trimmers, It is necessary acionarmos the kit functions of the keys and dips ANAL0 ANAL1. (ANAL0 to acionarmos the trimpot RA0 and ANAL1 to acionarmos the trimpot RA1.



Scheme acionamendo converter A / D



Let down the pin for testing with this module:

Pin	description
RA0	ANAL0
RA1	ANAL1

The example program below has been prepared in mikroC compiler ([www.mikroe.com](http://www.mikroe.com)) and aims to read the A / D converters of the PIC.

### Reading the PIC AN0 and An1 channel

/ \*\*\*\*\* Microgenios Technology Center Program: Diplay\_7\_seg\_01  
Board: KIT PICGENIOS

Objective: This program has the function of reading the AD0 and AD1 channel and write the lcd conversion value = 4MHz crystal

\*\*\*\*\*

\*/

```
char text [16]; temp_res int = 0;
```

```
temp_res2 int = 0; void main ()
```

```
{
```

```
    TRISB = 0; // set PORTB as output trisd = 0; // set as output
```

```
    ADCON1 PORTD = 0x06;
```

```
                // makes all AD pins as i / general purpose
```

```
    Lcd8_Config (& Porte, & PORTD, 2,1,4,7,6,5,4,3,2,1,0); // initialize LCD Lcd8_Cmd (Lcd_Clear);
```

```
                // clears LCD
```

```
    Lcd8_Cmd (LCD_CURSOR_OFF);
```

```
                // cursor off lcd
```

```
    Lcd8_Out (1, 1, "Channel AN0:");
```

```
                // write mansagem in row 1, column 1 lcd
```

```
    delay_ms (10);
```

```
                // delay 10ms
```

```
    Lcd8_Out (2, 1, "Channel AN1:");
```

```
                // write messages in line 2, column 1 lcd
```

```
    delay_ms (10);
```

```
                // delay 10 milliseconds
```

```
    = 0b00001110 ADCON1;
```

```
                // enable channel A / D 0 and A / D1 PIC
```

```
    = 0b00001111 TRISA;
```

```
                // set as input pins
```

```
of { temp_res Adc_Read = (0);
```

```
                // le pic ad0 channel and saved in the variable value temp_res
```

```
    temp_res2 = adc_read (1); // read the PIC value d1 channel and saved in the variable temp_res2 Delay_10us;
```

```
                // delay of 10 microseconds
```

```
    wordToStr (temp_res, text);
```

```
                // convert the ad0 conversion value to string
```

```
    lcd8_out (1.11, text); // write lcd in the conversion value of ad0 delay_us (10);
```

```
                // delay of 10 us
```

```
    WordToStr (temp_res2, text); // convert the d1 conversion value for string lcd8_out (2.11, text); // write lcd in the conversion value of
```

```
d1} while (1); }
```

In KIT PICGenios we have many peripherals for testing and simulation programs. See and learn about each of these devices:

**Fan for speed control** via PWM simulation. We can control the rotating speed of the fan through the PIC CCP1 channel.

**Infrared Sensor** ( transmitter and receiver) for reading the fan rotation speed. Through the pulses generated by this sensor, we can read pulses through the pic count RC0 channel.

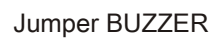
In the kit we have a **buzzer** for Audible alarm activation. To trigger the buzzer just send logic level 1 on pin RC1, but rather should enable it via the selector switch ..



**Resistance heating.** We can turn on or off the resistance in order to vary the temperature around the LM35 sensor, this way we can develop various applications of practices using the heater and the temperature sensor.

**Temperature sensor**  
LM35 connected to channel A / D NA2 PIC. Through this sensor can read the ambient temperature or the temperature of the resistance.

# PERIPHERALS



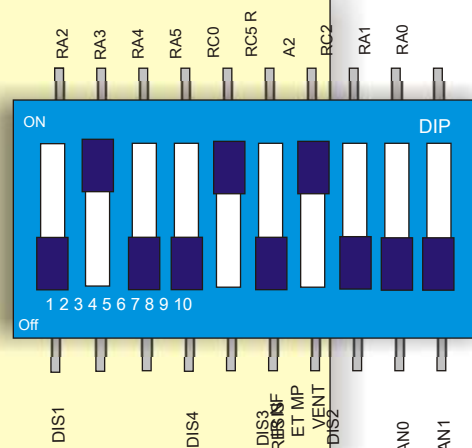
### Description of the peripheral connection pinouts

Pin	description
RE0	LM35 temperature sensor
RC2	Fan (cooler)
RC5	Heater
RC1	Buzzer - via Jumper
RC0	Infrared sensor (tachometer)

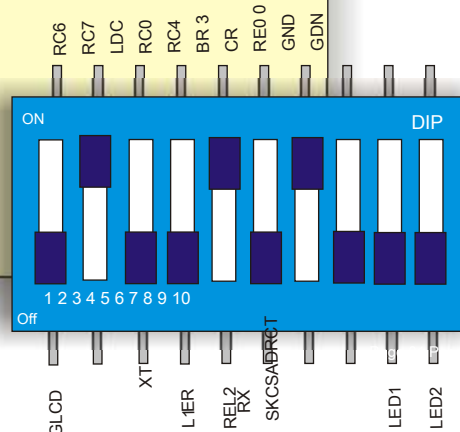


## Diagram of the functions keys

**DIS1** = 1 = enable the display  
**DIS2** enables the display enables  
**DIS3** the display 2 = 3 = 4 enables  
**DIS4** display  
**INFR** = Inflavermelho enables the heater enables  
**RESIS** the sensor =  
**VENT** = Enable = LM35 temperature sensor enables  
**TEMP** fan (cooler) = AD0 converter enables enables  
**ANO AN0** converter AD1 =



**GLCD / LCD RX** = Enables or disables LCD graphic or alphanumeric = enable  
**TX RX** = Reception of serial channel PIC = enable PIC serial channel broadcast  
**SCK** = Enable signal SCK = I2C communication enables  
**RTC** = Enable signal SDA = I2C enables RTC  
**LED1 / LED2** = Enable LEDs of the LEDs  
**PORTD / PORTB** enables PORTD PORTB =



The PiCGenios Kit allows manipulate two serial, one serial hardware via converter max232 and an emulated serial software. Both serial independently of one another.



TX Pin 3; RX. emulated serial port. Pin 1 = GND Pin 2: and 2 output connector TX and RX of the necessary to put the jumpers in positions 1 To use the RS232 serial channel kit is. and TX pins on the serial communication. software). These jumpers enable the RX programmer must create this serial an emulated serial software. (The In the kit we have the option of working with

Pin	description
RD1	Serial emulated RX pin
RD0	Pin serial emulated TX



SERIAL emulated

EXPANSION

### Program Example of sending data through the serial Rs232;

The example program below has been prepared in mikroC compiler ([www.mikroe.com](http://www.mikroe.com)) and aims to read the PIC AN0 channel and send the value of the conversion by the serial RS232 Kit ..

#### Submission of the conversion value of the A / D by serial Rs232

```
/* Technology center Microgenios
Program example: drive the A / D converters ANAL0 and sending the value of the conversion by the serial Rs232.

*/

// Start the program unsigned short

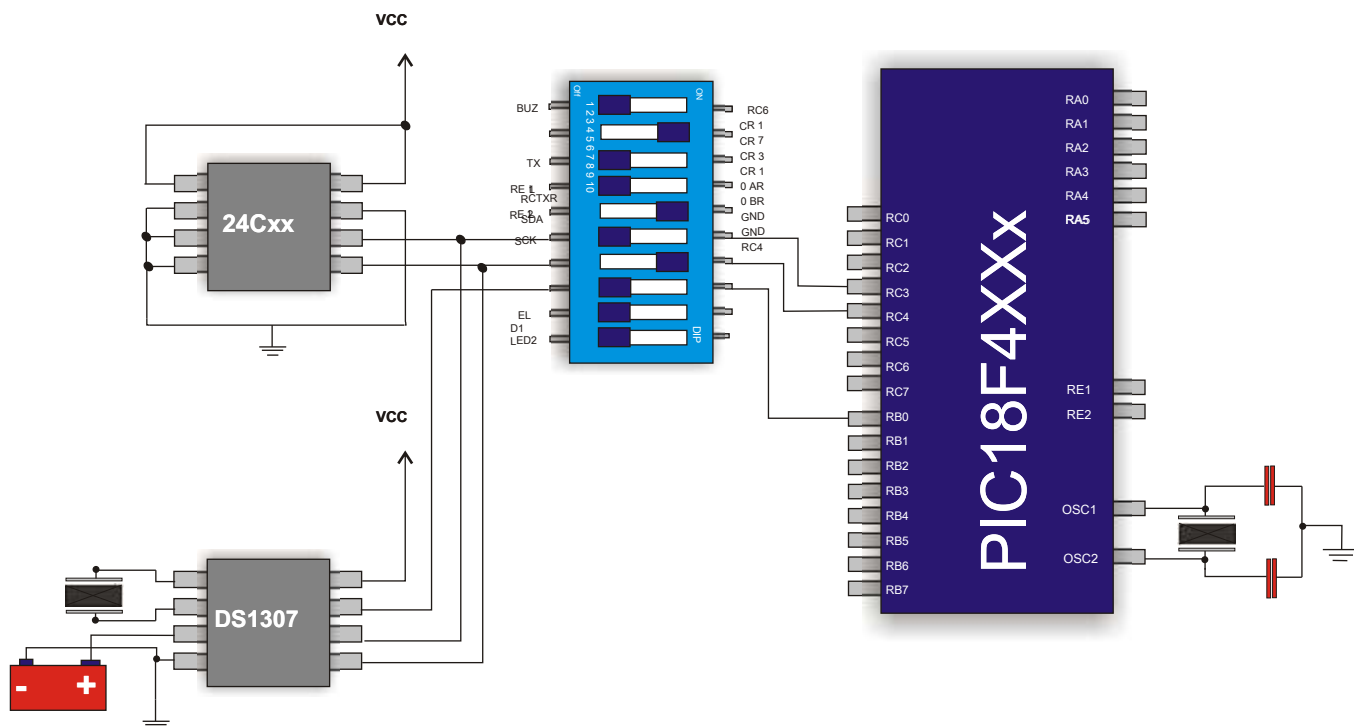
temp_res; void main () {

    USART_Init (9600); ADCON1 = 0; TRISA = 0xFF; of {

    temp_res = ADC_Read (0) >> 2;

    USART_Write (temp_res); } While (1);
}
```

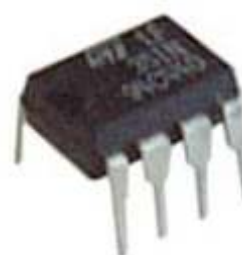
The 24c04 serial memory and real time clock DS1307 are connected in the same I2C bus (SCK and SDA). To us enable its functions is necessary to connect them through the kit functions key.



I2C BUS



MEMORY SERIAL EEPROM 24C04  
address 01h



RTC - Real-Time Clock DS1307

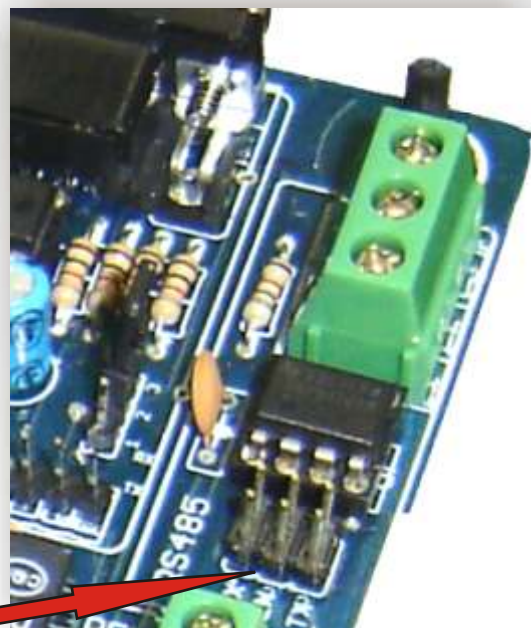
Pin	description
RC4	SDA
RC3	SCK



The 24c04 serial memory and real time clock DS1307 are connected in the same I2C bus (SCK and SDA). To enable its functions is necessary to connect them through the kit functions key.....

Pin assignment

Pin	description
RC6	TX
RE0	EN
RC7	RX

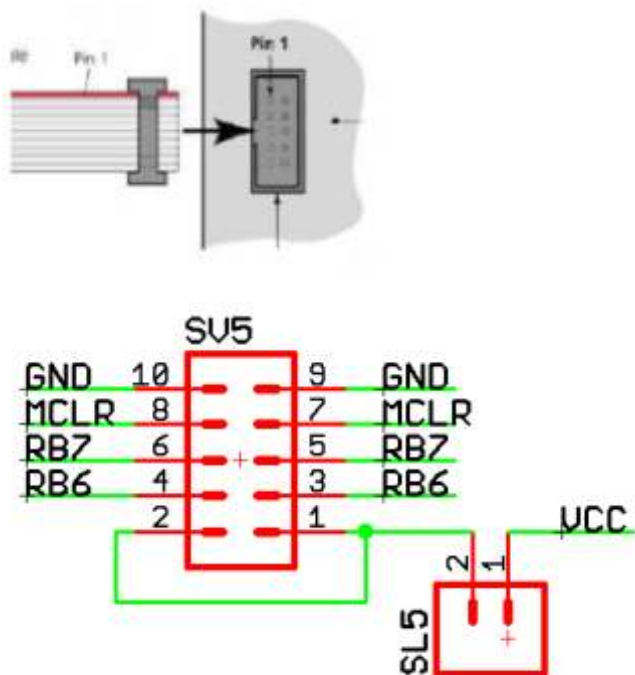


CONVERTER SERIAL Rs485 - SN75176N

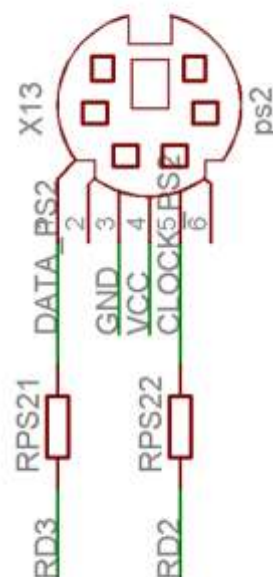
To use the RS485 serial converter is necessary to put the jumpers in the following location of the arrow next to.

In PICGenios kit we have a ICSP connector so you can connect your own debugger and test step by step your program.

Through the PS / 2 connector, we can connect keyboards or mice in our kit.



ENTRADA PS2





## More information

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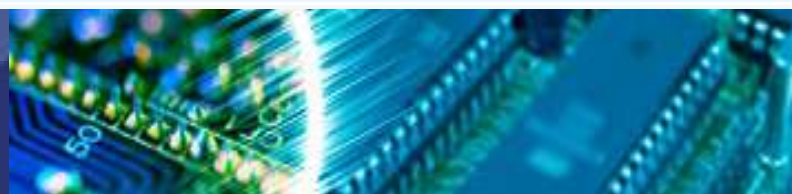
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The kits of the forming Microgenios applied and reviewed in the books "C Programming for Microcontroller 8051" and "BASIC programming for microcontrollers 8051 - Publisher Erica.

## PIC18F kit PICGenios



## KIT dsPIC30F



Kits Microchip family