

mikroProg™ for PIC®

mikroProg™ is a fast USB programmer with mikroICD™ hardware In-Circuit Debugger support. Smart engineering allows mikroProg to support PIC10, PIC12, PIC16, PIC18, dsPIC30/33, PIC24 and PIC32 devices in a single programmer!



Introduction to mikroProg for PIC



mikroProg for PIC represents **fast** and **reliable** programmer with **ICD** support. Specially designed firmware allows programming of all Microchip® microcontrollers: **PIC**, **dsPIC** and **PIC32**. And there's no need for the firmware update each time you select a new microcontroller architecture. With mikroProg™, single firmware takes care of all supported architectures. Supporting new microcontrollers is easy. Just by downloading the latest version of **mikroProg Suite™** your programmer is ready to program new devices.

Key features

- **In-Circuit Debugging (ICD)**.
- Unique firmware for **PIC**, **dsPIC** and **PIC32** microcontrollers
- No need for firmware update
- New microcontrollers support via latest version of **mikroProg Suite for PIC** software
- Power supply for target device

- 01 Flat cable
- 02 USB MINIB connector
- 03 IDC10 connector
- 04 DATA transfer indication LED
- 05 ACTIVE indication LED
- 06 LINK indication LED
- 07 POWER indication LED



1. Driver installation

To install drivers for mikroProg for PIC go to download section on MikroElektronika website or follow link below.



http://www.mikroe.com/eng/downloads/get/1202/mikroprog_for_pic_drivers_v200.zip

After download is complete extract files and begin installation:

Folder with extracted files contains folders with drivers for different operating systems. Depending on which operating system is in use choose adequate folder and open it. Under opened folder is located setup file for driver installation. Double click on setup file and begin installation.



mikroprog_for_pic_drivers_v200
WinRAR ZIP archive
1,51 MB



Win 98
File folder



Win 2000, XP, 2003 32-bit
File folder



Win XP, 2003 64-bit
File folder



Windows 7 32 bit, Vista 32bit, Win
2008 32 bit
File folder

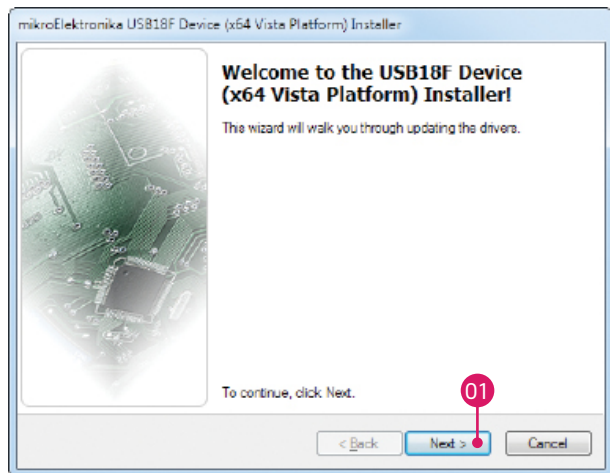


Windows 7 64 bit, Vista 64bit, Win
2008 64 bit
File folder



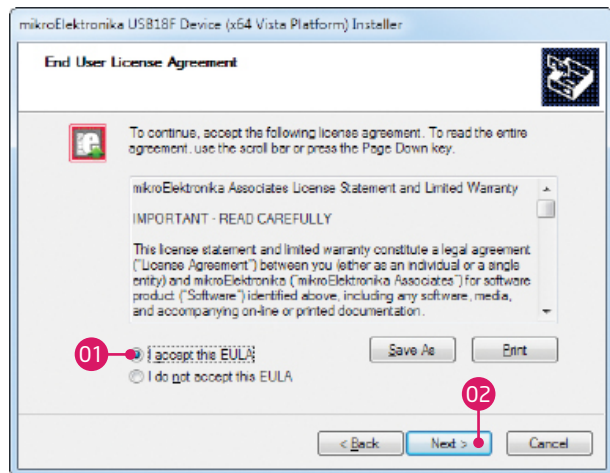
USB18PRG-Vista-x64
Win32 Cabinet Self-Extractor
Microsoft Corporation

step 1 - Start installation



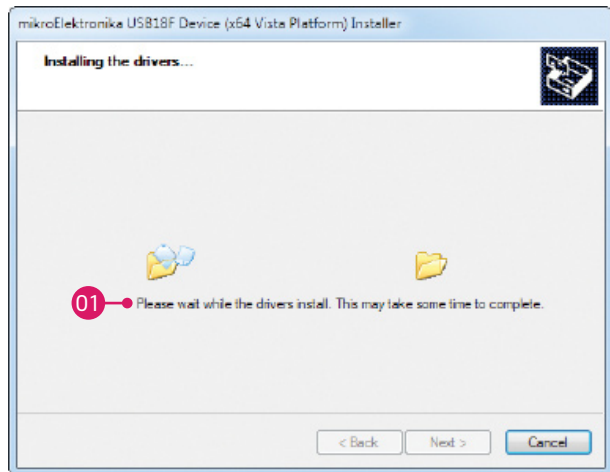
- 01 In welcome screen click on **Next>** button

step 2 - Accept EULA



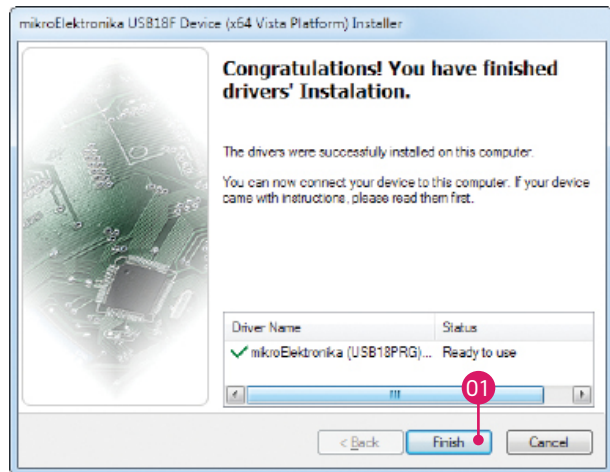
- 01 In order to proceed select: I accept the this EULA (End User License Agreement)
- 02 Click **Next>** button

step 3 - Installing the drivers



01 Drivers are installed automatically

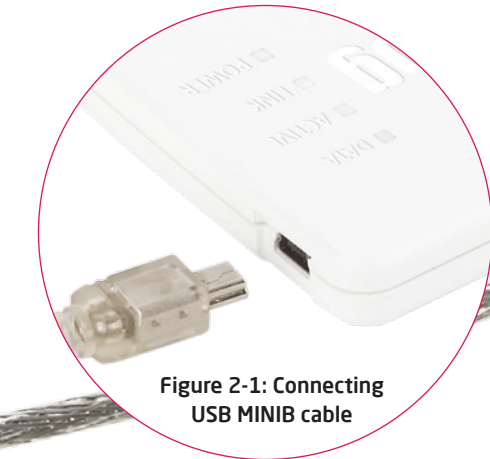
step 4 - Finish installation



01 Click on **Finish** button to end installation process

2. Connecting to a PC

In order to use mikroProg for PIC connect it with a PC via USB cable, Figure 2-1.



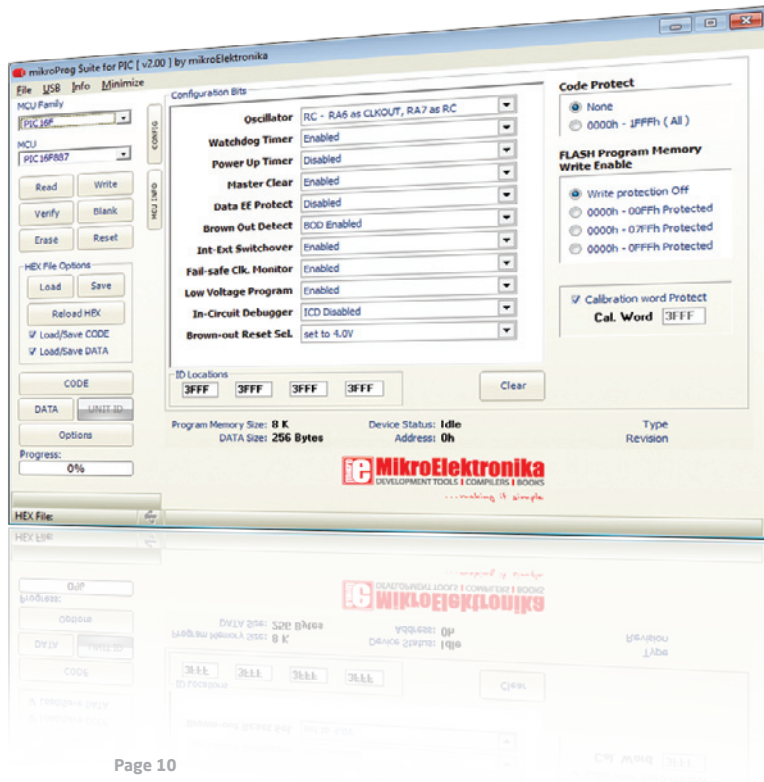
**Figure 2-1: Connecting
USB MINIB cable**



When connection is established green POWER LED will turn ON. Amber-colored LINK LED will turn ON when link between mikroProg and PC is established. Link can be established only when correct drivers are installed on your PC.

3. mikroProg Suite for PIC software

Program **mikroProg Suite for PIC™** is intended for programming **PIC®**, **dsPIC®** and **PIC32®** microcontrollers from Microchip®. The graphic interface of this program is clear and easy-to-use, which makes the use of this program faster. The program's main window includes basic options for programming microcontrollers. In addition, there are advanced programming options that enable experienced users to set configuration bits on their own. The program includes views providing basic information about the selected MCU, voltage monitoring, etc.



4. Powering device

via mikroProg

One of key benefits on mikroProg is power supply mode which can be activated from **mikroProg Suite for PIC** software. Under mikroProg Suite for PIC window (MCU INFO button) you can set power supply voltage in range from **1.8V** to **5V** with output current up to **250mA**. When you select MCU family under mikroProg Suite for PIC window, mikroProg will automatically detect which MCU is in use and it will set maximum power supply which can be used. Voltage supply value can be set by moving slider under mikroProg Suite for PIC window, Figure 4-1.

To enable power supply, first set desired voltage and then click on check box "Power board from programmer".

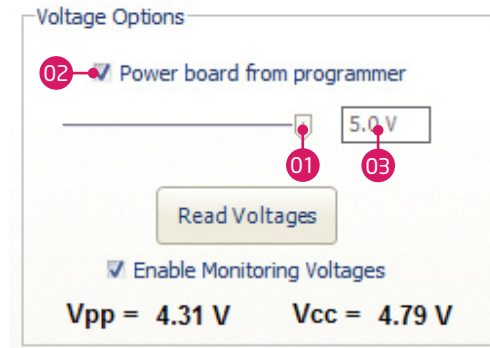


Figure 4-1: Voltage options

- 01 Setting supply voltage value from 1.8 to 5V (max 250mA)
- 02 Check box for enabling supply voltage from programmer
- 03 Box with selected supply voltage

5. Connecting with a target device

For connection with a target device mikroProg for PIC uses IDC10 connector, Figure 5-1. In order to make proper connection with the target board it is necessary to pay attention to IDC10 connector pinout. Every pin has a different purpose and for easy orientation IDC10 connector is marked with a little knob and incision, **Figure 5- 2**. First pin on IDC10 is marked with colored wire on a flat cable.

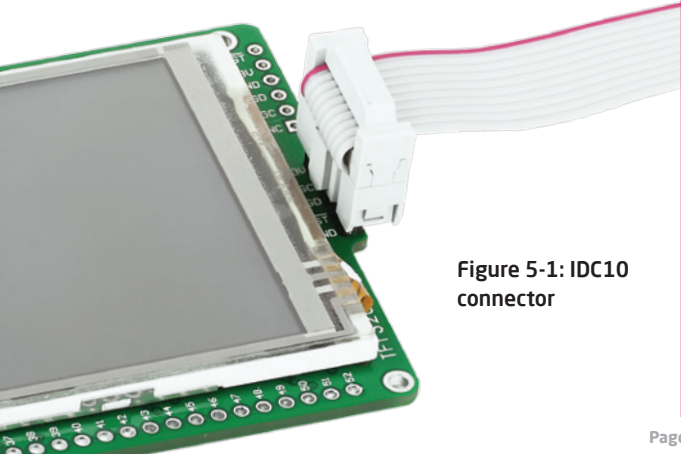
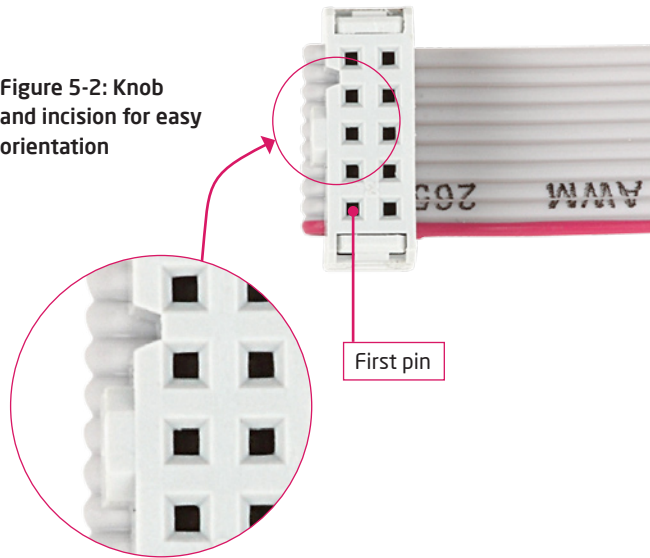


Figure 5-1: IDC10 connector

Figure 5-2: Knob and incision for easy orientation



Front side of IDC10 connector is marked with a knob and incision. Front side holds PGC, PGD and MCLR pins which are used for microcontroller programming.

6. IDC10 Pinout

- 01 **MCU-VCC** (colored wire) - MCU power supply
- 03 **MCU-PGC** - Serial programming clock
- 05 **MCU-PGD** - ICSP data
- 07 **MCU-MCLR** - Master clear/Programming voltage
- 09 **GND** - Ground

- 02 VCC
 - 04 PGC
 - 06 PGD
 - 08 MCLR
 - 10 GND
- These pins are used for multiplexing (see section 8.0 for more information)

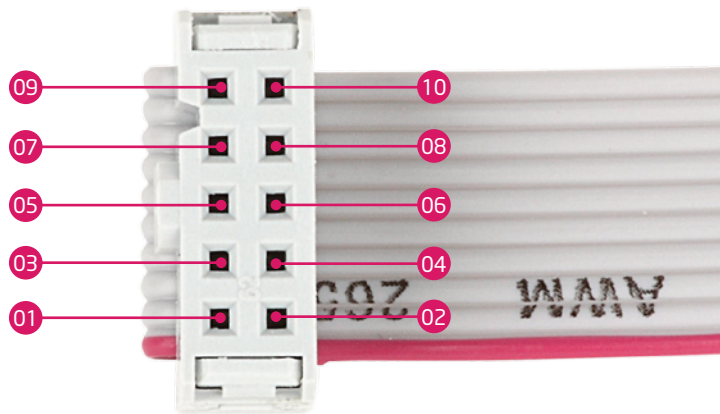


Figure 6-1: IDC10 pinout

7. Connection examples

For connecting mikroProg with your target device a best solution is to provide 1x5 or 2x5 male headers which are connected with programming pins on microcontroller.

When soldering header make sure that to use correct pinout for IDC10 connector.

Using 1x5 male headers

When connecting mikroProg with your device via 1x5 header make sure to use front side of IDC10 connector (side with a knob and incision), Figure 7-2. For example, if you use some of Mikroelektronika's products you may notice a clear markings for mikroProg IDC10 connector header, Figure 7-2.

Figure 7-1: Use only front row for programming

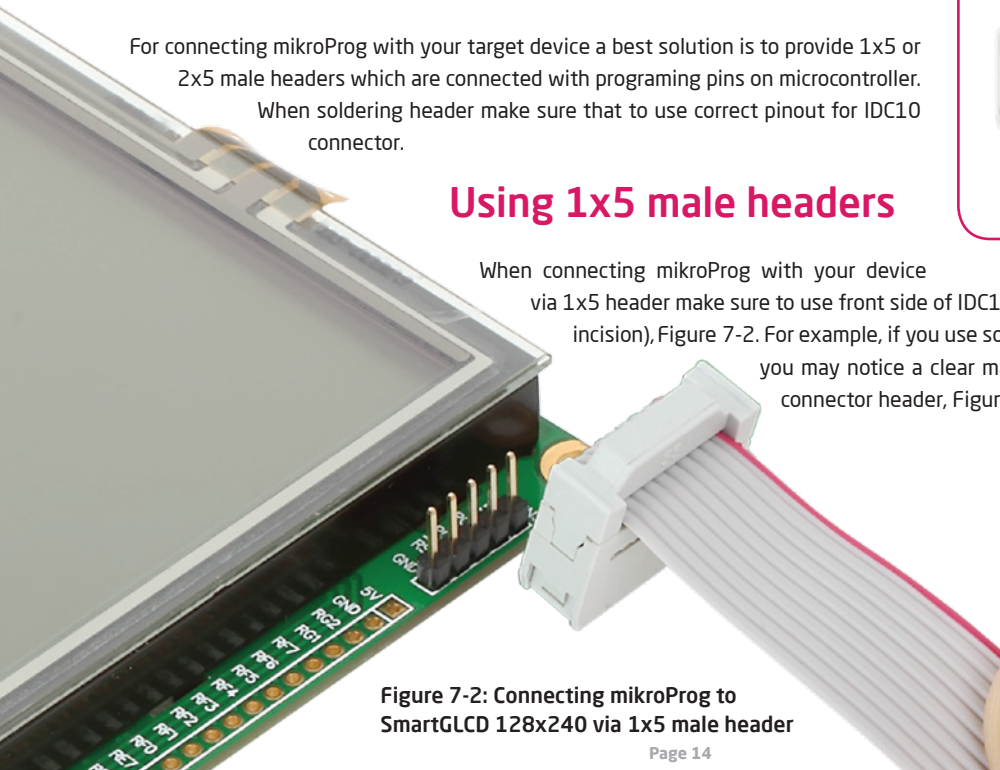
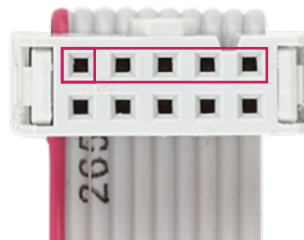


Figure 7-2: Connecting mikroProg to SmartGLCD 128x240 via 1x5 male header

Using 2x5 male headers

Instead of 1x5 male header you can use 2x5 male header. Main difference is that via 2x5 male connector you can use multiplexing feature of mikroProg for PIC (explained in section 8.0).

Figure 7-3: Use entire IDC10 connector for multiplexing feature

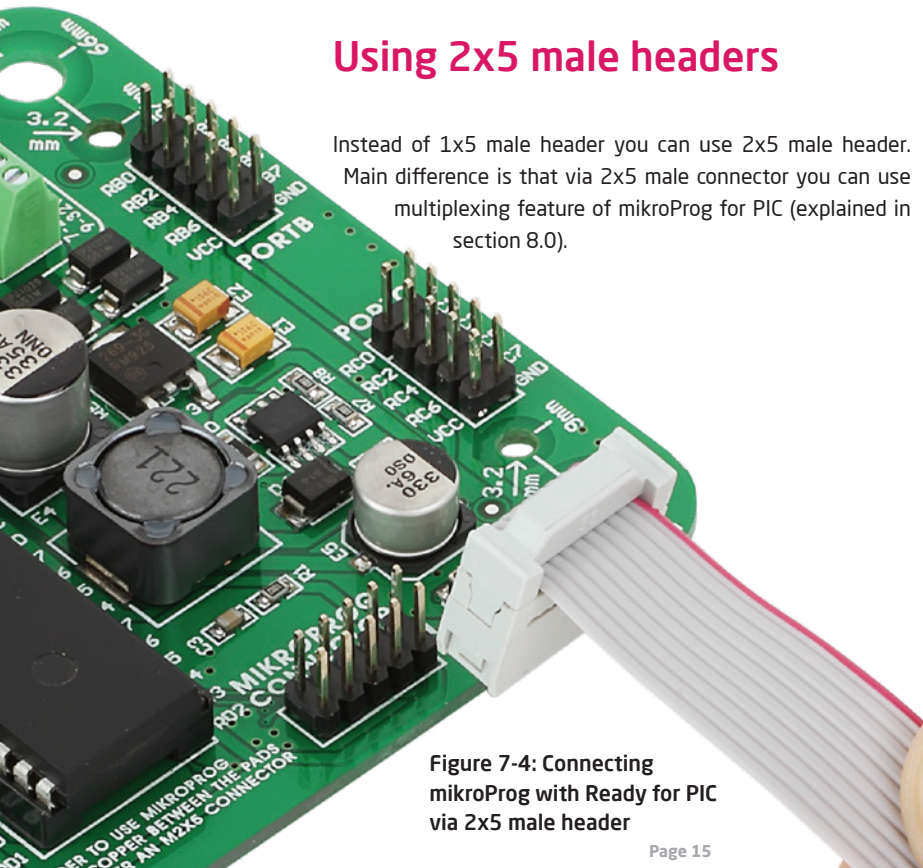


Figure 7-4: Connecting mikroProg with Ready for PIC via 2x5 male header

8. Multiplexer

Multiplexer is specially designed circuit which serves as a switch. Purpose of multiplexer is that there's no need for disconnecting mikroProg programmer from a device when programming is over. Multiplexing is always available, but can only be used with 2x5 male header on target board as shown on Figure 8-1. Multiplexer allows the usage of programmable pins as I/O, in non-programming mode.

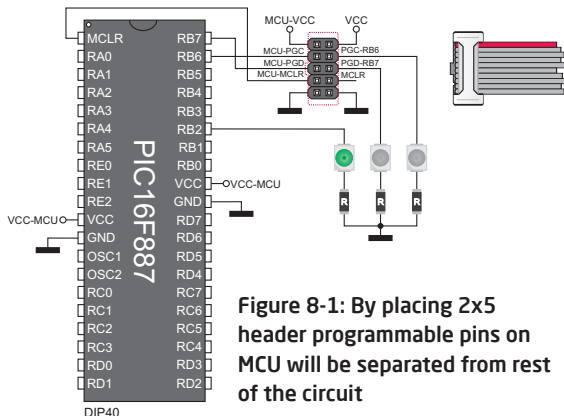


Figure 8-1: By placing 2x5 header programmable pins on MCU will be separated from rest of the circuit

While pins on MCU are separated from rest of the circuit they can not be used as I/O. By connecting mikroProg to the device programming is enabled and due to multiplexer when programming is finished programmable pins can be used as I/O without mikroProg removal, Figure 8-2.

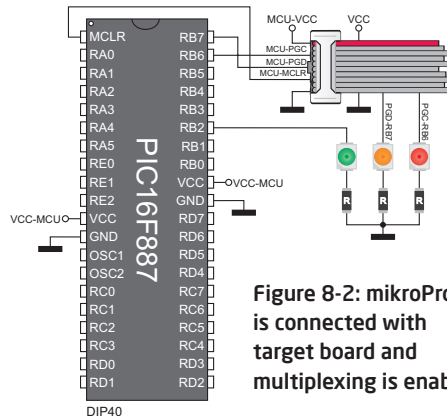


Figure 8-2: mikroProg is connected with target board and multiplexing is enabled

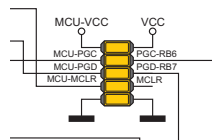


Figure 8-3: When mikroProg is removed place jumpers over 2x5 male header in order to use programmable pins as I/O

Multiplexer in programming mode

During programming, the multiplexer disconnects the microcontroller pins used for programming from the target device. This enables the programming process to be safely performed without affecting the operation of the device itself. It also prevents external signals from affecting the programming process. When the programming process has been completed, the multiplexer releases the microcontroller pins used for programming so that they can be used as I/O pins.

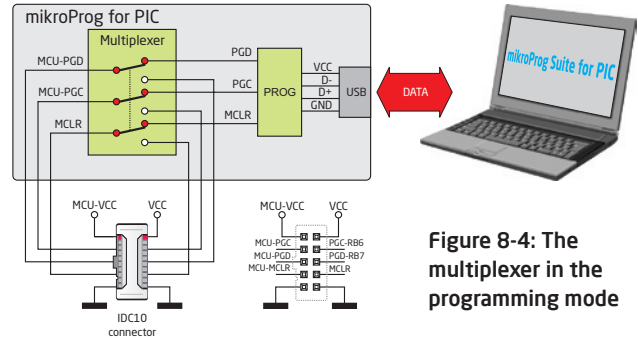


Figure 8-4: The multiplexer in the programming mode

Multiplexer in operating mode

When the programming process has been completed, the multiplexer releases the microcontroller pins used for programming, thus enabling them to be used as I/O pins. This also enables the programmer to remain connected to the target device without affecting its operation.

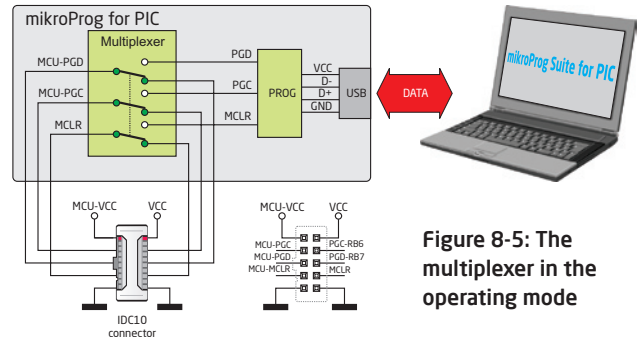
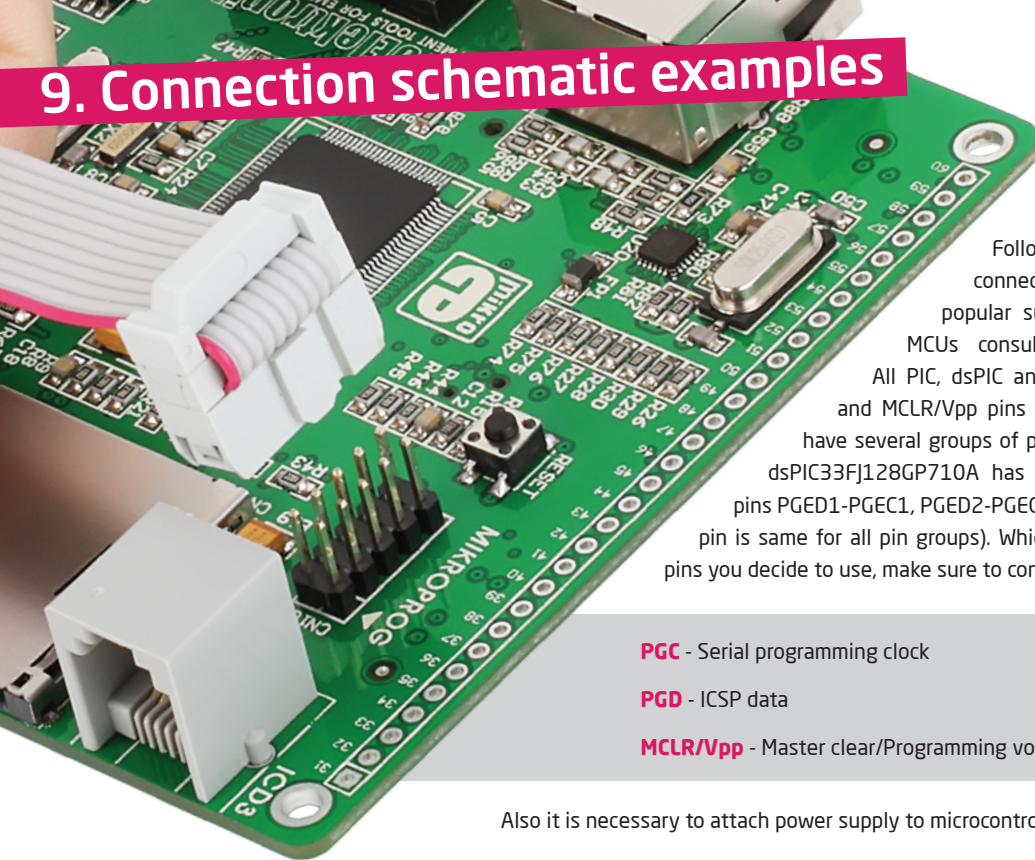


Figure 8-5: The multiplexer in the operating mode

9. Connection schematic examples



Following examples demonstrate connections with some of the most popular supported MCUs. For all other MCUs consult manufacturer's datasheet. All PIC, dsPIC and PIC32 MCUs use PGC, PGD and MCLR/Vpp pins for programming. Some MCUs have several groups of programming pins. For example dsPIC33FJ128GP710A has three pairs of programmable pins PGED1-PGEC1, PGED2-PGEC2 or PGED3-PGEC3 (MCLR/Vpp pin is same for all pin groups). Which ever group of programming pins you decide to use, make sure to connect each pin properly.

PGC - Serial programming clock

PGD - ICSP data

MCLR/Vpp - Master clear/Programming voltage

Also it is necessary to attach power supply to microcontroller VCC and GND pins.

PIC24 TQFP64

Figure 9-27: Connection schematic for 64-pin TQFP MCU via 2x5 male header

