mikroProg Suite[®] for PIC[®]

programming software



mikroProg Suite[™] for PIC[®] is a free software used for programming all of Microchip[®] microcontroller families, including PIC10[®], PIC12[®], PIC16[®], PIC18[®], dsPIC30/33[®], PIC24[®] and PIC32[®]. It features a user friendly interface with simple to use options and menus.



kroProg Suite for PIC [v2.3 USB [nfo <u>Minimize</u>	a couration Bits		-		Code Protect	
anly	Oscillator	EC oscillator (high power, >16 MHz)	-		Code 00000-007FF	
SF-K • DI NOO	4 x PLL Enable bit	a null is under software condicing and	-		Code 00800-01FFF	
8	Primary Clock Enable Bit	Primary Clock is always enabled	-		Code 02000-03FFF	
AF49K22	Fail-safe CLK Monitor	Disabled	-		Code 04000-05FFF	
ead Write g	INT. / EXT. Switch over	Disabled	-	m	Code 06000-07FFF	
ead Winte of the office of the	Brown Out Voltage	2.05 V	-			Ξ
ase Reset	Brown Out Detect	HW Enabled	-		Table Write Protect	. 11
	Power Up Timer	Disabled	-		Configuration Bits	
File Options	Watchdog Postscale	1:32768	-		Data EEPROM	
.oad Save	Watchdog Timer	WDT enabled in hardware; SWDTEN bit is	-		Code 00000-007FF	
Reload HEX	MCLR Enable Bit	MCLR Enabled, RE3 Disabled	-		Code 00800-01FFF	
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TO OUR VALUED CUSTOMERS

I want to express my thanks to you for being interested in our products and for having confidence in MikroElektronika.

The primary aim of our company is to design and produce high quality electronic products and to constantly improve the performance thereof in order to better suit your needs.

Nebojsa Matic General Manager

The PIC*, dsPIC*, PIC24*, PIC32* and Windows* logos and product names are trademarks of Microchip Technology* and Microsoft* in the U.S.A. and other countries.

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Introduction to

mikroProg Suite[™] for PIC[®]

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 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.



🔋 mikroPro	og Suite 📃	x	
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MCU Family		_	
PIC18F-K	•	10	
MCU		CONFIG	
PIC18F45k	.22 -	ŭ	
Read	Write	5	
Verify	Blank	MCU INFO	
, veniy		MC	
Erase	Reset	_	
	ations		
HEX File Options			
Load	Save		
Rel	oad HEX		
✓ Load/Save CODE			
V Load/Save DATA			
	CODE		
CODE			
DATA UNIT ID			
O	ptions		
Progress:			
	0%		
HEX File:		÷	

Main window

mikroProg Suite[™] for PIC[®] window contains all the programming options. These options are graphically presented in the form of buttons, drop-down lists and check boxes.

MCU family selection list MCU type selection list

- B Read program from MCU
- Verify the loaded program
- Erase MCU memory contents
- Browse for a .hex file on your PC
- Reload previously loaded .hex file
- Preview program which is in buffer and ready for uploading in MCU FLASH memory
- Preview program which is in buffer and ready for uploading in MCU EEPROM memory

- Various settings of visual, advanced and programming options.
- Expand configuration bits menu
- Upload .hex file in to MCU memory
- 3 Expand MCU info menu
- Check whether the MCU is empty
- 5 Reset the microcontroller
- 5 Save buffer to a .HEX file
- Load/Save CODE/DATA in buffer
- 18 Used for some MCU-s ID
 - 9 Progress bar
- 20 Shows that programer is connected to USB port on a PC (red if connected)



1. Installation

mikroProg Suite" for PIC^* setup executable can be downloaded from link below:



www.mikroe.com/downloads/get/1201/ mikroprog_suite_for_pic_v230.zip

When you locate and download the setup, please extract files from the ZIP archive. Folder with extracted files contains setup executable. Double click it to start the setup wizard.



mikroprog_suite_for_pic_v230.zip WinRAR ZIP archive 4.70 MB



mikroprog_suite_for_pic_v230 File folder



mikroProg_Suite_For_PIC_v230_set up.exe Installer for mikroProg Suite For P...

step 1 - Start installation





Welcome screen. Click Next to proceede.

step 2 - Licence agreement

🗑 mikroProg Suite for PIC v2.30 Setup	x
License Agreement Please review the license terms before installing mikroProg Suite for PIC v2.30	S
Press Page Down to see the rest of the agreement.	
mikroElektronika Associates License Statement and Limited Warranty	
IMPORTANT - READ CAREFULLY	
This license statement and limited warranty constitute a legal agreement ('License Agreement') between you (either as an individual or a single entity) and mikroElektronika ('mikroElektronika Associates') for software product ('Software') identified above, including any software, media, and accompanying on-line or printed documentation.	-
ou accept the terms of the agreement, select the first option below. You must accept the eement to install mikroProg Suite for PIC v2.20. Click Next to continue.	5
© I do not accept the terms of the License Agreement	
mikroProg Suite For PIC	

step 3 - Select user





It's recommended to select **Install For All Users** option.

02 Click Next.

Carefully read the End User License Agreement.

If you agree with it, click **Next** to procede.

01

step 4 - Choose destination

🗑 mikroProg Suite for PIC v2.30 Setup
Choose Install Location Choose the folder in which to install mikroProg Suite for PIC v2.30
Setup will install mikroProg Suite for PIC v2.20 in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.
Destination Folder Lers\Public\Pocuments\Mikroelektronika\mikroProg Suite For PIC Browse
Space required: 35.0MB Space available: 5.9GB

step 5 - Progress bar

imikroProg Suite for PIC v2.30 Setup	
Installing Please wait while mikroProg Suite for PIC v2.30 is being installed.	
Create folder: C:\ProgramData\Microsoft\Windows\Start Menu\Progr	ams Wikroelektronika \mik
Showdetails	
02	
mikroProg Suite For PIC	
< Back N	ext > Cancel

- Use the suggested destination folder or select a different installation path by clicking the **Browse** button.
 - Click the **Install** button.



- Installation progress bar.
- Click the **Show details** button to monitor the installation

process more closely.

step 6 - Finish installation



Click the **Finish** button to close the Setup Wizard.

After the installation process is finished mikroProg Suite[™] for PIC[®] shortcut will appear on your desktop.



Double click it to start mikroProg Suite[™] for PIC[®] software.

2. Quick start

To program your microcontroller with a desired .HEX file just follow these few steps:

Before you begin, connect your device (programmer) with a PC via USB cable. Notice the USB icon in the bottom right corner of the **mikroProg Suite[™] for PIC*** main window: it will turn red when the device is connected.

DATA UNIT ID	
Options	
Progress:	
0%	
LIEV Eller	(L
HEX File:	~

Figure 2-1: USB icon in bottom right corner

step 1 - MCU family

🛑 mikroProg	Suite		×
<u>F</u> ile <u>U</u> SB <u>I</u>	nfo	<u>M</u> inii	mize
MCU Family			
PIC18F-K			-01
PIC10F			CONFIG
PIC12F PIC16F			0
PIC18F			
PIC18F-K PIC18F-J			
PICIOF-J	_		INFO
Verify	B	lank	MCU INFO
			ξĹ
Erase	R	leset	
HEX File Opti	ons-		-
Load	S	ave	
Loud			
Reload HEX			
✓ Load/Save CODE			
✓ Load/Save DATA			
CODE			
DATA	<u> </u>		5

From the drop down list select MCU family of your device (here PIC18F-K)

step 2 - MCU type

<u>F</u> ile <u>U</u> S	B <u>I</u> nfo	<u>M</u> inimize	
MCU Fam	ily		_
PIC18F	-К	-	
MCU			ONETG
PIC18F	45K22	•	0
PIC18F	26K20		
PIC18F	26K22		ſ
PIC18LF	-26K22		S
PIC18F	43K20		MCIT TNEO
PIC18F	43K22		10
PIC18LF	-43K22		2
PIC18F			_
PIC18F			
PIC 18LF			
PIC18F			
PIC18F			
PIC18LF			
PIC 18F			
PIC18			
PIC18F		-	
	CODE		

From the drop down list select MCU

type (in this case PIC18F-K)

Page 10

step 3 - Load .HEX



step 4 - Browse for .HEX file





* Note that you can also load the HEX file by dragging and dropping it onto the mikroProg SuiteTM for PIC[®] window.

Click the **Open** button

step 5 - Write HEX

mikroProg	Suite 🔀			
<u>F</u> ile <u>U</u> SB <u>I</u>	nfo <u>M</u> inimize			
MCU Family	_			
PIC18F-K	•			
MCU	ONFIG			
PIC18F45K2	2 🔹 🕇			
Read	Write-01 g			
Verify	Blank			
Erase	Reset			
HEX File Options				
Load	Save			
Reload HEX				
✓ Load/Save CODE				
✓ Load/Save DATA				
CODE				

Click **Write** to start programming the microcontroller.

step 6 - Progress bar

Кеао	Write				
Verify	Blank				
Erase	Reset				
HEX File Opti	ons				
Load	Save				
Reloa	d HEX				
✓ Load/Sav	✓ Load/Save CODE				
Load/Save DATA					
CO	CODE				
DATA UNIT ID					
Options					
Progress:					
28% -01					
Programming CODE Memory					
Operation: Programming					
HEX File: Load	HEX File: Loaded 🛛 😤				

01 Progress bar displays programming progress.

step 7 - Finish upload

кеао	Write
Verify	Blank
Erase	Reset
HEX File Optio	INS
Load	Save
Reload	HEX
✓ Load/Save ✓ Load/Save	
COL	DE
DATA	UNIT ID
Optio	ons
Progress:	
0%	6
Operation: Nor HEX File: Loade	

When uploading is finished your MCU is programed and ready for use

01

3. Menus

mikroProg Suite^{III} for PIC[®] comes in the form of a graphical user interface which consists of buttons, check boxes, and menus.

File menu



Figure 3-1: File menu



Close mikroProg Suite[™] for PIC[®]



Figure 3-2: Reload

Reload menu shows previously loaded .HEX files which can be reloaded with a single click. Click the **Clear History** option any time to erase the list.

Eile	<u>U</u> SB <u>I</u> nfo	<u>M</u> inimiz		
3	Load HEX	Ctrl+O		
1	Save HEX	Ctrl+S		
З	<u>R</u> eload	•		
٩	<u>I</u> nfo			
File In	formation			Х
File N GLCI	ame: D.HEX			
	cation: SERS\ANIKOLIC.M	IK\pocuments1	PROJECT\	
	ttributes: vrchive lidden tead Only system	File Size: 311331	ytes Close	

Figure 3-2: File information

USB menu



Figure 3-4: USB menu

Under the USB menu click the **Show Devices** option. A new window will appear containing information about the connected USB device and firmware version. It is also possible to connect two devices at the same time, Figure 3-5.



Figure 3-5: USB menu

When two devices are connected at the same time it is necessary to choose which one is used for programming your target device. Note that it is not possible to use multiple programmers at the same time.

Info menu

Info	<u>M</u> inimize
	<u>H</u> istory
0	<u>A</u> bout

Figure 3-6: Info menu

Info menu contains History and About options. Click **History** to get information about program changes throughout releases. The **About** option contains information about the development team.



Figure 3-7: History window

Minimize



Figure 3-8: Minimize option

Minimize option minimizes program to tray. The program stays active until explicitely closed.



Along the right side of the main window, you may notice a **CONFIG** button. Click it to expand the main window with an additional panel containing MCU configuration options. It's contents will be adjusted depending on the selected microcontrollers.

Common options for all MCU's are:

- CONFIG button opens config windowConfiguration Bits section is used to set
 - specific options for the chosen MCU.
- Protect parts of MCU memory from unauthorized reading and writing.
- 4 ID Location in MCU memory.
 - Basic information about selected MCU.

i mikroProg Suite for PIC [v2.	30] by mikroElektronika			_ = X
File USB Info Minimize	02			03
MCU Family	Configuration Bits			
PIC18F-K			*	Code Protect
MCU	Oscillator			Data FEPROM
PIC18F45K22 •		TATEE IS GIRDER SOTETICE CONTROL TELET		Code 00000-007FF
	Primary Clock Enable Bit	,,		Code 00800-01FFF
Read Write g	Fail-safe CLK Monitor			Code 02000-03FFF
Verify Blank	INT. / EXT. Switch over	Disabled 💌	Ε	Code 04000-05FFF
Verity Diank	Brown Out Voltage	2.05 V 👻		Code 06000-07FFF
Erase Reset	Brown Out Detect	HW Enabled 🔹		Table Write Protect
HEX File Options	Power Up Timer	Disabled		Configuration Bits
Load Save	Watchdog Postscale	1:32768 👻	-	Data EEPROM
LOdd Save	Watchdog Timer	WDT enabled in hardware; SWDTEN bit is		Code 00000-007FF
Reload HEX	MCLR Enable Bit	MCLR Enabled, RE3 Disabled		Code 00800-01FFF
✓ Load/Save CODE	CCP2 B Output MUX bit			Code 02000-03FFF
✓ Load/Save DATA		T3CKI is on RC0		Code 06000-03FFF
	HE Intoer fact Stellin		Ŧ	
CODE	ID Locations	FF FF FF FF Clear		Table Read Protect
DATA		FF FF FF FF		Code 00000-007FF 🔻
	Program Memory Size: 32 KE	Device Status: Idle		Туре
Options	DATA Size: 256 E	ytes Address: Oh		Revision
Progress: 0%	05	DEVELOPMENT TOOLS I COMPILERS I BO	OKS	
HEX File:	•			

Figure 4-1: Config window

5. MCU Info window



A click on the **MCU INFO** button opens a window containing basic data about the selected microcontroller as well as voltage monitoring options.



Voltage options section

The programming voltage (Vpp) is provided by the programmer during the programming procedure. Depending on the type of the microcontroller, the Vpp programming voltage can be up to 13V.





Check box for enabling supply voltage from programmer Setting supply voltage value from 2.7 to 5V (max 250mA) Manually read voltages on Vpp and Vcc MCU pins Check box for enabling automatic voltage monitoring Current Vpp value (programming voltage) Current Vcc value (power supply voltage)



After programming is finished it is possible to power up the target device via mikroProg[™] programmer. While the device is connected to the programmer set the desired voltage using the slider. Max supply voltage is determined by the MCU's power supply voltage while minimum voltage is 2.7V (max 250mA). When voltage is set just check **"Power board from programmer"** check box.



A warning window will appear. If electrical characteristics of the target device are correct click **Yes**. Otherwise click **No** and set appropriate electrical characteristics of the connected device.



Move slider to set required voltage level

- Tick "Power board from programmer" box
- Click Yes after the electrical characteristics of connected device are met.

Figure 5-2: MCU information section MCU Information Flash Memory: 32kB EEprom Data Memory: 2568 RAM: 1536 B 1/O Pins: 36 Pin Count: 40 Max. CPU Speed: 64 MHz Int. OSC: 16 MHz, 32 kHz No. of A/D Ch: 28 Dig. Comm.: 2 -A/E/USART , 2 Operating Voltage: 1.8V - 5.5V Package: 40/PDIP,40/UQFN,44/QFN,44/TQFI Recommended Dev. Tool: Click Here Recommended Compiler: Click Here Documentation: Click Here

MCU information section

Example in Figure 5-2 shows information on the PIC18F45K22 microcontroller such as: microcontroller memory size, number of integrated modules and I/O pins, operating speed, package etc. In addition, there are links to web pages where you can find the recommended development system and compiler for the selected microcontroller. There is also a link to the MCU manufacturer website where you can find a complete documentation for the selected microcontroller.

6. Advanced options

Click the **Options** button, and a window containing Program/Verify Options, Advanced Options and Visual Settings will appear.



Figure 6-1: Options button

Program/Verify Options:	Advanced Options:		
✓ CODE	Verify Chip Writes		
✓ Executive	Disable Vpp-First mode entry		
✓ DATA	Preserve DATA		
✓ ID Locations	Clear Buffers Before Load		
Configuration Word(s)			
BOOT			
Visual Settings	Theme:		
✓ Hints Disabled	👷 Default 🕞		

Figure 6-2: Options window

-Program/Verify Options:

CODE

Executive

DATA

ID Locations

Configuration Word(s)

BOOT

Within the **Program/Verify Options** section it is possible to disable programming /verification of the microcontroller memory: CODE, Executive, DATA, ID Locations, Configuration Words) and BOOT. Verification is performed by clicking on the Verify button in Main window, page 5. Advanced Options: Verify Chip Writes Disable Vpp-First mode entry Preserve DATA Clear Buffers Before Load

The Advanced Options section includes:

Verify Chip Writes: After programing is finished .hex code verification is performed automatically. By verifying .hex code you eliminate the possibility of error in program execution.

Disable Vpp-First mode entry : prevent the device from entering program mode via VPP Preserve DATA: EEPROM memory is not erased during MCU programming Clear Buffers Before Load: Clears DATA and CODE buffers



The **Visual Settings option** is used to select visual program settings as well as to disable hints.

7. Keyboard shortcuts

and command line parameters

Keyboard shortcuts

- **Alt+E** Erase the contents of the microcontroller memory
- Alt+B Program memory blank check (whether it is empty)
- Alt+W Write a hex code into microcontroller(F11 key may be optionally used)
- Alt+V Verify the loaded hex code
- Alt+R Read program memory
- Alt+D Change microcontroller type
- Alt+F Open File menu
- Alt+U Open USB menu
- Alt+I Open Info menu
- Alt+M Minimize man window
- Ctrl+S Save hex code
- Ctrl+O Open (load) file with hex code
- Ctrl+R Reload hex code

Command line

The mikroProg Suite[™] for PIC[®] programmer may also be set up from the command line, which enables you to use it from some other software, compiler, etc. Here is a list of the command line parameters:

- -w Write to MCU
- -v Verify
- -e Erase program from MCU
- -r Read program from MCU
- -p Microcontroller type
- -f .hex file name (FLASH) "[<name should be enclosed within quotation marks>]"
- -b Memory blank check (whether it is empty)
 - the mikroProg Suite™ for PIC® program after programming

-q

Example 01

mikroProg Suite for PIC.exe -w -pPIC18F45K22 -v -f"C:\somefile.hex"

This command is used for loading C:\somefile.hex into the PIC18F45K22 microcontroller. This file will be verified immediately after being loaded into the microcontroller.

Example 02

mikroProg Suite for PIC.exe -r -pPIC18F45K22

This command is used for reading the contents of the PIC18F45K22 microcontroller program memory.

Example 03

mikroProg Suite for PIC.exe -e -pPIC18F45K22

This command is used to erase program from the PIC18F45K22 microcontroller.

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