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# KamPROG for AVR

# ISP programmer for AVR microcontrollers

	2 - searammer		
Kamami AVH	Fuse bits Lock bits Program	er setup	
Microcontroller   1	Write Values: 0xFF 0xD1 0xFF	Auto-read	
BODLEVEL	Brown-out detection disabled		
OCDEN	E		
JTAGEN			
SPIEN	<u>ञ</u>	The second	
WDTON			
EESAVE	<b>v</b>		
BOOTSZ	Boot Flash size=4096 words start address=\$F000		
BOOTRST			
CKDIV8	D	E	
CKOUT		5 Ka	mp
CKSEL/SUT	Ext. Crystal Osc. 8.0- MHz; Start-up time: 16K	+ 65 ms	Se for ROG
intering programm hogramming mode hogramming mode	Ying mode, t enabled, ⊧ disable,		
rogress:			

Thank you for buying KamPROG for AVR. We hope that the power and quality of our tool allow you to appreciate the advantages of AVR microcontrollers.



ver. 1.0

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# Introdcution

KamPROG for AVR is development/production programmer for Atmel AVR microcontrollers. It can be controlled by KamProg application, Bascom AVR and AVR Studio. Programmer is connected to PC USB port. KamPROG works with AVR microcontrollers that can be connected through 10-pins IDC header (Atmel standard).

# **Features**

- Programmer for ISP-enabled AVR microcontrollers
- ▶ 10-pins IDC output header, Atmel standard pinout (Fig. 1)
- Power supply from USB port
- Operates with KamPROG application, Atmel AVR Studio and Bascom AVR
- Windows XP, Windows Vista compatible



Fig. 1. Output connector pin layout



# **Standard equipment**

Code	Description				
KamPROG	Cable USB A/mini B				
	KamPROG for AVR programmer				
	IDC cable (1m)				

# **Technical assistance**

For technical assistance, please contact support@kamami.com. Please provide the following data:

- Version of the operating system
- Microcontroller type used in your system and its oscillator frequency
- Detailed description of the problem



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# Installation

KamPROG for AVR does not require drivers, you only need to download and install KamPROG software (*http://www.kamami.com/?content=kamprogavr*). During installation you have to decide, whether you want to install AVR Studio Plug-in (Fig. 2).

Bascom AVR (v. 1.11.9.3 and newer) supports KamPROG for AVR.

🔂 Setup - KamPROG for AVR				
Select Components Which components should be installed?				
Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.				
Full installation	·			
Main Files 1,9 MB				
PlugIn for Atmel AVR Studio 0,1 MB				
Current selection requires at least 2,6 MB of disk space.				
< <u>B</u> ack Next > Car	icel			

Fig. 2. KamPROG for AVR installation



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On the figure 3 you can see programmer's application window.

📶 Kamami AVR pro	gramn	ner	
Microcontroller Memo	ry progr	amming Fuse bits Lock bits Programmer setup	
Supported AVR microco	ntrollers		Save settings (Ctrl+S)
ATmega128	^	Identify microcontroller	
ATmega1280 ATmega1281			Load settings (Ctrl+O)
ATmega16		Signature bytes	
Almega162 Almega168		C Auto-identify	
ATmega169P			
ATmega2560			
ATmega32			
ATmega324P			
ATmega325 ATmega3250P			
ATmega325P			
ATmega328P			
ATmega3290P			
ATmega329P			
ATmega48 ATmega64			
ATmega644P			
ATmega645			
ATmega8515			
ATmega8535			
ATmega88 ATmega88P			
ATtiny13			
ATtiny2313 ATtiny24			
ATtiny25			
ATtiny26			
			~
			_
			~
Progress:			

Fig. 3. Microcontroller tab of KamPROG for AVR application

### **Microcontroller** tab

On this tab you can find list of supported microcontrollers. You can choose programmed device on the list or identify it using its signature bytes (*Identify microcontroller* button). If you check *Auto-identify* checkbox then device will be identified everytime you open this tab.

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# Memory programming tab

To erase microcontroller's Flash memory, EEPROM memory (if EESAVE is not set), lock bits (LB, BLB0, BLB1) press *Chip erase*.

To write Flash memory enter hex file name, press *Write button* in Flash section. You can also use two additional options: *Erase chip before Flash programming* and *Verify written data*.

You can also verify written data by pressing *Verify* button and read microcontroller's Flash memory conent into hex file (*Read* button).

EEPROM section works similar (*Erase chip before Flash programming* and *Verify written data* options are not available for EEPROM).

🕼 Kamami AVR programmer 📃 🗖 🔀
Microcontroller Memory programming Fuse bits   Lock bits   Programmer setup
Chip erase
Flash
Erase chip before Flash programming Verify written data
Write Verity Read
EEPROM
Verify written data
write venry Read
~
Progress:

Fig. 4. Memory programming tab of KamPROG for AVR application

# Fuse bits and Lock bits tabs

Here you can set fuse bits and lock bits values.

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Be careful while changing fuse bits values. Some combinations can make microcontroller not accessible using SPI! For more informations see microcontroller's documentation.

Kamami AVI	R programmer	
Microcontroller	Memory programming   Fuse bits   Lock bits   Programmer setup	
Read	Write Values: 0xE1 0x93 0xFD 🔽 Auto-read	
M103C		
WDTON		
OCDEN		
JTAGEN	<b>v</b>	
SPIEN	<b>v</b>	
СКОРТ		
EESAVE	<b>v</b>	
BOOTSZ	Boot Flash size=2048 words start address=\$F800	•
BOOTRST		
BODLEVEL	Brown-out detection level at VCC=2.7 V	•
BODEN		
CKSEL/SUT	Int. RC Osc. 1 MHz; Start-up time: 6 CK + 64 ms	-

Fig. 5. fuse bits tab of KamPROG for AVR application

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Fig. 6. Lock bits tab of KamPROG for AVR application

# Programmer setup tab

Here you can set ISP frequency and read programmers firmware version. Make sure that ISP frequency is less than microcontroller frequency divided by 4.

KE Kamami AVR programmer	
Microcontroller Memory programming Fuse bits Lock bits Programmer setup	
ISP frequency 100 kHz 💌	
Firmware version: 1.0	Kamami Lwowska 5 05-120 Legionowo Poland www.kamami.com
Reading firmware version. Firmware version: 1.0. Reading TS fragmency succeded	^
Reading firmware version. Firmware version: 1.0.	
Reading ISP frequency succeded.	
Progress:	

Fig. 7. Programmer setup tab of KamPROG for AVR application

# **AVR Studio 4**

If you selected KamPROG for Atmel AVR Studio plug-in option during installation, then you can use KamPROG in Atmel AVR Studio 4. If there is no Kamami AVR programmer item in *Tools* menu and there is no Kamami toolbar, then open *Plug-in Manager* (*Tools>Plug-in Manager*) and check *Kamami\_AVR\_programmer* in the list, restart AVR Studio. Now you can open programmer's application (*Tools>Kamami AVR programmer>Connect*) and write Flash memory (*Tools>Kamami AVR programmer>Write Flash*), both operations can be done using toolbar.

Write Flash works only when project's output hex file has the same name as project file!



Fig. 8. KamPROG for AVR controls in Atmel AVR Studio 4

ø	AVR Studio Plug-in Manag	er			×
File	e <u>D</u> ebug Help				
	Name ✓ Atmel AVR Assembler (Project) ✓ Kamami_AVR_programmer ✓ AVR GCC (Project) ✓ STK500	Vendor Atmel Atmel Atmel	Comments AVR Assembler IDE Compiler plug-in for avr-gcc AVR Starter Kit		
				Save and Exit Quit	

Fig. 9. Atmel AVR Studio Plug-in window

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You can also use command line tool – KamPROGAVRc.exe – to work with KamPROG AVR. First you have to go to KamPROG AVR folder (default path is *C:\Program Files\KamPROGAVR*), then type in *KamPROGAVRc* and press *Enter* to display help.

### **Examples**

- Performing chip erase of autodetected device:
  - KamPROGAVRc -d -r -s 2
  - -d chip autodetection
  - -r chip erase
  - -s 2 set SPI frequency to 50kHz (omitting this parameter sets frequency to 100kHz)
- Reading ATmega8 fuse bits
  - KamPROGAVRc -c ATmega8 -B
  - -c ATmega8 connected device is ATmega8
  - -B read fuse bits
- Writing led.hex into autodetected device's Flash memory:
  - KamPROGAVRc -d -f led.hex
  - -f led.hex write led.hex into device's Flash memory

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