

# **AVR Prog MKII**

# MANUAL



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ATTENTION!!

AVRISP mkII programmer is compatible with BASCOM and AVR DUDE environment. If you want to use this programmer with AVR Studio, you need to update its firmware (instruction in chapter 3: Firmware update)

## **1. Programming in BASCOM**

a) Driver installation

### **ATTENTION!!**

**Before you connect programmer to computer , install AVRJungoUSB drivers first. link:** <u>http://www.and-tech.pl/MKII/AVRJungoUSB.exe</u>

To connect programmer to computer, mini USB cable is needed (widely used with mobile devices and cameras). It is recommended to use 1.8m long cable or shorter.

To connect programmed circuit with programmer, IDC-10 cable is needed (pins order on programmer).

After you connect programmer, system should find and install appropriate drivers. If I nstallations is successful, device Jungo (with AVRISP mkII and WinDriver) should be available in device manager.





### **ATTENTION!!**

When programmer is installed successfully, green LED diode should turn on. If not, connect programmer directly to PC or laptop without HUBs or dock stations. In some cases, programmer doesn't work properly with these devices.

Please download LibUsbDotNet\_Setup.2.2.8. link: <u>http://www.and-tech.pl/MKII/LibUsbDotNet\_Setup.2.2.8.exe</u>

After you accept licence agreement and chose installation path, you should see window presented in Picture 2. Check only first position – *Runtime Files and click Next*.

elect Components		
Which components should be installe	d?	(
Select the components you want to i install. Click Next when you are read	nstall; clear the components you do not want y to continue.	to
Custom Installation		~
Runtime Files	2,	7 MB
Source and Example Code	3,	2 MB
	R	
Current selection requires at least 5,	0 MB of disk space.	

Picture 2

Check Instalall libusb-win32 with filter capabilitied? as in Picture 3 and click Next.



Picture 3



Picture 4

Start Filter Wizard. It is available in the following path: Start >Programy >LibUsbDotNet >libUsbwin32 >Filter Wizard.

	Określ dostęp do programów i ich ustawienia domyślne							
	Windows Catalog							
2	Programu		InsERT	•				
	Dokumenty	• @	Zebra Technologies Internet Explorer	•				
onal	Ustawienia	•	Paint.NET Mozilla Firefox					
SS D	Wyszukaj	•	Flip 3.4.3	+		AND INC. THE OWNER		
Profe	Pomoc i obsługa techniczna		HyperSnap 6 Gadwin Systems	+				
×	Uruchom	1	LibUsbDotNet	٠	-	libUsb-win32	Class Filter	
SMO m	Wyleanis P0E0L		MCS Electronics	*	2	LibUsbDotNet Help Test Device Notify	Filter Wizard	2
Vind Mind	Wyłącz komputer		12 220			Test Info Uninstall LibUsbDotNet	New M	
icture	art 2.5				1	USB InfWizard		

In window Install/Remove Device Filter(s) choose first option: Install a device filter- Picture 6.

nstallation.	
The libusb-win32 filter driver allo while maintaining compatibility v	ows access to usb devices using the libusb-win32 api with software which uses the original driver.
<u> </u>	
ctall/Demous Deuice Filter/c)	
scall/Remove Device Filter(s)	
Install a device filter	
Remove a device filter	
) Remove all device filters	

Picture 6

Now, please find device AVRISP mkII, as in Picture 7.

Hardware ID	Description	M
vid:203a pid:fffc rev:0100 mi:01	Urządzenie USB interfejsu HID	(S
vid:203a pid:fffc rev:0100 mi:00	Urządzenie USB interfejsu HID	(S
vid:203a pid:fffc rev:0100	Urządzenie kompozytowe USB	(S
vid:203a pid:fffb rev:0100	Urządzenie USB interfejsu HID	(5
vid:03eb pid:2104 rev:0200	AVRISP mkII	A

Picture 7

If installation is successful, the following window appears:

	(į)	libusb-win32 d	evice filter succes	sfully installed for AVRISF	SP mkII (usb\vid_03eb&pid_2104&rev_	0200)
				ОК		
1	Picture &	}				
Prog	rammer	is installed	correctly.			

#### b) Configuration 1. BASCOM

We need to configure programmer to make it work with BASCOM environment. Please, start BASCOM and find programmer settings (Options >Programmer). Now find *USBprog Programmer* / *AVRISP mkII* in the following list (Picture 9).

rigrammer	USBprog Programmer / AV	R ISP mkli
Play sound Erase warning Program after o Atmel	Auto Flash	AutoVenify Upload Code and Data
COM-port	COM1 V	Do not set ISP clock frequency
Timeout USB Timeout Serial	100 🔀	□ USB

Check USB and click OK.

Compiler Communic	cation Environment Simulator Programmer Monitor Printer
Programmer	USBprog Programmer / AVR ISP mkll
Play sound	
Erase warning	Auto Flash 🗹 AutoVerily 🚺 Upload Code and Data
Program after c	compile Set focus to terminal emulator after programming
Atmel	
COM-port	CDM1 Do not set ISP clock frequency
Clock	
Timeout USB	100 🔀 🗹 USB
Timeout Serial	100

Picture 10

Click Program chip icon in order to program circuit.



<b>1</b>	lekt	or /	mk	ll co	omt	pati	ble	Pr	ogr	amı	ne	r													>
File	Bu	ffer	Chiț	)																					
0	B		Ŀ	S.			5	<u>.</u> '	5	٦	6														
Chip		???							F	lash	size	в	0	KB		EEPROM size	e 0 By	ytes	]						
Flas	h I	EEPF	юм	Lo	ock (	and	Fuse	e bit:	s																
	00 00	1 02	03	04	05	06	07	08	09	0A	OB	0C	0D	0E	0F										
00	94 0	C 00	1 2A	95	18	00	00	95	18	00	00	95	18	00	00	″ו•									
10	95 1	8 00	00	95	18	00	00	95	18	00	00	95	18	00	00	•••									
20	95 1	8 00	00	95	18	00	00	95	18	00	00	95	18	00	00	•••									
30	95 1	8 00	00	95	18	00	00	95	18	00	00	95	18	00	00	•••									
40	95 1	8 00	00	95	18	00	00	95	18	00	00	95	18	00	00	•••									
50	95 1	8 00	00	E5	8F	BF	8D	E3	C8	E2	ΕO	2E	4E	ΕO	84	<ul> <li>…叿ŤăČâŕ.Nŕ"</li> </ul>									
50	BF 8	E EC	) D4	EO	F4	2E	5F	95	Α8	Β7	84	2E	08	7F	87	źŽŕÔŕô∙`"⊭									
70	BF 8	4 E1	88	27	99	BD	81	BD	91	EF	EE	ΕO	F3	E6	AO	ż"á <b>ļ""""</b> ["'ď îŕóć									
B0	EO B	0 27	88	93	8D	97	31	F7	E9	24	66	9A	CO	ΕO	E1	ŕ°'¶″Ť−1÷é\$fšŔŕá									
90	EO F	0 94	0E	00	54	98	CO	ΕO	E1	ΕO	FO	94	0E	00	54	ŕð"T <b>l</b> Ŕŕáŕð"T									
40	94 0	C 00	46	94	F8	CF	FF	EE	88	ΕO	93	DO	0C	97	31	″F″řĎi î∥ŕ″Đ.−1									
B0	F7 D	9 95	08	97	31	F7	F1	95	08	94	68	F8	62	95	08	÷Ű∙.−1÷ń•.″hřb•.									
CO	94 E	8 F8	62	95	08	93	EF	93	FF	27	EE	2B	E8	2B	E9	″čřb∙.″ď‴` 'î+č+é									
DO	F0 3	1 E/	۱E0	EO	FF	97	31	F7	F1	97	01	F7	D1	91	FF	ð1eŕrí −1÷ŕ∺.÷Ńrí									
EO	91 E	F 95	08													′ď∙.									
Ð	D:\Do	ocum	ents	and	Set	tings	:\0p	erati	or\F	ulpit	\PR	IAK1	YKI	١ĸ	IRS	Y\RAR\kody 2\KOD3.EEP	<sup>o</sup> not found.								
Õ,	D:\Do	ocum	ents	and	Set	tings	:\0p	erati	or\F	ulpit	\PR	IAK1	YKI	\KL	IRS	Y\RAR\kody_2\KOD3.BIN	loaded 228 b	bytes into P	FLA	ASI	нь	uffer			
	Elekto Starte	or∕n ⊧d	ikll c	omp	atib	le pr	ogra	amme	er se	et '								-							
<i>ic</i>	tur	·e .	12																						

*Flash, EEPROM, Lock and Fuse bookmarks show state of* FLASH, EEPROM memory and fuse bits after sending current program to processor.

Button:

- identifies processor
 - checks if processor's memory is empty
 - erases processor's memory and sends new program

### 2. AVRDUDE

In order to use AVRDUDE environment, please download **avrdude-5.8-w32\_avrdude-**GUI\_1.0.5

link: http://www.and-tech.pl/MKII/avrdude-5.8.zip

After you extract it, turn on graphical user interface: <u>avrdude-GUI.exe</u> and then choose from list *Programmer: <u>Atmel AVR ISP mkII (avrispmkII)</u>*, from list *Port: - <u>usb</u>* and from *Device –* choose model of processor, you want to program.

😸 avrdude-GUI [yuki-lab.	jp Version 1.0.5]	
⊂avrdude.exe File		
avrdude.exe		
Programmer	ametelly	🗌 Display Window
Port	Device	Command line Option
usb 💌	ATmega16 (m16) 🛛 👻	
Fuse hFuse h Read	Flash	
IFuse h	Read	Write
eFuse h Write	Verify	Erase - Write - Verify
CLock Bit		
h Write	Read	Write
Chip Erase	Terminal	Exit

Picture 13

### 2. Programming in AVR Studio

a) Driver installation

### **ATTENTION!!**

**Before you connect programmer to computer , install AVRJungoUSB drivers first. link:** <u>http://www.and-tech.pl/MKII/AVRJungoUSB.exe</u>

To connect programmer to computer, mini USB cable is needed (widely used with mobile devices and cameras). It is recommended to use 1.8m long cable or shorter.

To connect programmed circuit with programmer, IDC-10 cable is needed (pins order on programmer).

After you connect programmer, system should find and install appropriate drivers. If installations is successful, device Jungo (with AVRISP mkII and WinDriver) should be available in device manager.



Picture 14

### **ATTENTION!!**

When programmer is installed successfully, green LED diode should turn on. If not, connect programmer directly to PC or laptop wihout HUBs or dock stations. In some cases, programmer doesn't work properly with these devices.

### b) Configuration

To configure AVR Prog MKII, please start AVR Studio. Programmer's options are available in Tools->AVR Programming. (Picture 14).

🏶 AVR Studio		
File Edit View VAssistX Project Debug Tools	Window Help	
: 🛅 • 🖽 • 💕 🗶 🗿   X 🖬 🛍   9 🥵	AVR. Toole Firmware Opgrade	- 🛛 🖓 🖞
i 🗑 🖾 🖓 🍋 🎖 ၛ 💁 🔬 🗳 📮 🎑	AVR Programming	🚈 🛨   Hex   🖪 📲 📮 🕅 🕯
	Add STK500	
ατ	AVR QTouch Studio	
	Code Snippets Manager Ctrl+K, Ctrl+B	
	Add-in Manager	
	Extension Manager	
	External Tools	
	Import and Export Settings	
	Customize	
	Options	

Picture 15

From *Tool list choose AVRISP mkII*. List *Device* specifies model of processor, which you want to program and button *Apply saves settings*.

AVF	R Programm	ing				? 🗙
	ol <del>/RISF mkii </del>	Device ATmega16 •	Interface ISP <b></b> Apply	Device ID not read Read	Target Voltage	
OC AV	/R Simulator	ľ				
Pict	ure 16					

*Read buttons* read ID and voltage of programmed processor.

AVRISP mkll (0000A00128255) - AVR Programming						
Tool Dev AVRISP mkII 💌 AT	vice Tmega16 ▼	Interface ISP  Apply	Device ID 0x1E 0x94 0x03 Read	Target Voltage 5,0 V Read		
Interface settings Tool information Device information Memories Fuses Lock bits	The ISP Clock f	requency must be lower th	an 1/4 of frequency the device	is operating on.	125 kHz Set	

### Picture 17

To program processor, find Memory bookmark – Picture 17.

	AVRISP mkli (00	000A00128255)	- AVR Programming			? 🔀
	Tool AVRISP mkII 💌	Device ATmega16	Interface  ISP  Apply	Device ID 0x1E 0x94 0x03	Target Voltage Read 5,0 V Read	
	Interface settings Tool information Device information	Device Erase Device Verify dev	e ice after programming			
	Memories Fuses Lock bits	Flash	<b>✓</b> Erase device be	fore programming Pro	gram Verify	<b></b> Read
		EEPROM —		Pro	gram Verify	<b>•</b> Read
Pici	ure 18					

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# 3. Firmware update

*AVRISP mkII* is originally compatible with **BASCOM and AVR DUDE**. <u>If you use these</u> **programmes, please omit this chapter.** If you want to make programmer compatible with AVR Studio, you need to update its firmware according to this instruction.

To update the firmware you will need a copy of program FLIP: **link:** <u>http://www.atmel.com/dyn/resources/prod\_documents/JRE%20-%20Flip%20Installer</u> <u>%20-%203.4.3.exe</u>

and new firmware:

101116\_AVRISP\_studio.zip link: <u>http://www.and-tech.pl/MKII/101116\_AVRISP\_studio.zip</u>

Please follow step by step to get the new firmware uploaded to your target programmer using FLIP.

To put the AVRPROG MKII into DFU bootloader mode, push bootloader button. The green led should go out indicating it is in bootloader mode.

New hardware should be found.



Please choose: *Install from a list or specific location (Advanced)* and find the following path: C:/Program Files / Atmel / Flip 3.4.3 / usb. - Picture 20

Browse For Folder	? 🗙			
Select the folder that contains drivers for your hardware.				
🖃 🥯 Dysk lokalny (C:)	~			
🗉 🧰 dell				
🗉 🧰 Documents and Settings				
🗀 drvrtmp				
🖃 🧰 Program Files	=			
🗉 🧰 Adobe				
🗉 🛅 Analog Devices				
🖃 🧰 Atmel				
🖽 🧰 AVR "Jungo USB				
🗉 🧰 FLIP 2.4.6				
🖃 🧰 Flip 3.4.3				
🗄 🧰 bin				
-~	<u>×</u>			
To view any subfolders, click a plus sign above.				
ОК	Anuluj			

Picture 20

Click <u>*OK*</u> and start FLIP program.

Atmel Flip			×	
File Buffer Device Sett	ings Help			
*5 6	\$ <b>*</b> * * *	🛯 🖄 🌿 🏰 🔗		
Operations Flow	FLASH Buffer Information	AT90USB162	7	
🌑 🔽 Erase	Size 12 KB	Signature Bytes		
	Range 0x0 - 0x0	Device Boot Ids		
Blank Check	Checksum 0xFF			
	Reset Before Loading	Bootloader Ver.		
Program	HEX File:			
IVerify	AMEL,			
Run	Select EEPROM	Start Application Reset		

Picture 21

Click on the 'chip' icon or 'Device-->Select' menu option and select the device from the menu (at90usb162) – *Picture 22*.



Picture 22

Click on the 'USB cable' icon and select 'USB' from the menu and connect to the device.

Open	Close	Cancel	
------	-------	--------	--

Click <u>Open.</u>

🚮 Atmel Flip				
<u>File Buffer Device Settir</u>	ngs <u>H</u> elp			
۵۳ 🕈 🐡	🍰 <del>   ا</del>	🕨 💒 🛃		
Operations Flow	FLASH Buffer Information	AT90USB162		
Erase	Size 12 KB	Signature Bytes 58 1E 94 82		
	Range 0x0 - 0x0	Device Boot Ids 00 00		
🔘 🔲 Blank Check	Checksum 0xFF			
	Reset Before Loading	Bootloader Ver. 1.0.5		
	3 <u></u>			
💿 🔽 Program	HEX File:			
💿 🔽 Verify	AMEL,		*	
Run	Select EEPROM	Start Application Reset		
USB ON				

Picture 24

Load the new hex file from the 'LOAD hex file' icon or from the 'File-->LOAD HEX file' menu. Click on the 'RUN' button in the lower left corner.



DONE! Your programmer should be up to date now.

Picture 25

Click Start Application to restart programmer.

### **ATTENTION!!**

If you want your programmer to work again with BASCOM and AVR DUDE, follow this instruction again, but use the following firmware:

101116\_AVRISP\_avrdude.hex link: <u>http://www.and-tech.pl/MKII/101116\_AVRISP\_avrdude.zip</u>

## 4. Programmer interface

### a) ISP connector

Programmer is equipped with 10-pin ISP connector (standard KANDA). Picture 23 presents pins order.



Picture 26

### b) TPI and PDI connector

Second 10-pin ISP connector consists of TPI connector (for Attiny programming) and PDI (for Atxmega programming).



Picture 27

c) Jumpers and LED diodes



Picture 28

#### Jumpers:

USB-POWER – supply programmed circuit from programmer

5v – supply programmed circuit with 5V

3.3v – supply programmed circuit with 3,3V

### LED diodes:

READY – programmer turn on and ready BUSSY – programmer busy (working)

### d) Bootloader button

This button puts AVR Prog MKII into DFU bootloader mode – the green led goes out



Picture 29

### 5. Environment protection

The crossed-out wheeled bin means that within the European Union the product must be taken to separate collection at the product end-of-life. This applies to your device but also to any enhancements marked with this symbol. Do not dispose of

these products as unsorted municipal waste.

### NOTE

**AVRPROG MKII** is powered by **LUFA library**, which is currently released under the MIT licence (http://www.fourwalledcubicle.com/LUFA.php).