

Embedded system

Atmel Studio – Microchip Studio



Vývoj programu pre ATmega328P - Arduino Uno



Vývoj programu pre ATmega328P - Arduino Uno



- Programovanie MCU ATmega328P na vývojovej doske Arduino UNO priamo z vývojového prostredia Microchip Studio zabezpečí program Avrdude.
- Vytvor na disku počítača adresár "C:\avrdude" a nakopíruj do neho súbory "avrdude.exe" a "avrdude.conf" z <u>http://kte.fei.tuke.sk/livovsky/ZMT/avrdude</u>.
- Pripoj Arduino UNO k počítaču. V správcovi zariadení skontroluj správnosť pripojenia a číslo COM portu, cez ktorý bude počítač komunikovať s vývojovou doskou.



Nastavenie externého programátora v Mircochip Studio pre Arduino UNO

- Spusť IDE Microchip Studio
- □ V menu "Tools" zvoľ "External Tools…".
- Následne zvoľ "Add" a vyplň nasledujúce položky. Potom "OK".



Command: c:\avrdude\avrdude.exe

Arguments: -CC:\avrdude\avrdude.conf -p atmega328p -c arduino -P COM6 -b 115200 -U flash:w:"\$(ProjectDir)Debug\\$(TargetName).hex":i

External Tools		?			
Menu contents: Arduino Programmer		Add 1			
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		Move Op	-	Device Pack Manager	ri
		Move Down		Device Programming	Ctrl+Shift+P
Title:	Arduino Programmer		·***	Programming Center	
			2	Add target	
Command:	C:\avrdude\avrdude.exe	.	\sim	Data Visualizer	
Arguments:	4 -C "C:\avrdude\avrdude.conf" -p a	tmega328p - ((=)	Select profile	
Initial directory:				Code Snippets Manager	Ctrl+K, Ctrl+B
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Nastavenie externého programátora v Mircochip Studio pre Arduino UNO

Ak sú problémy s nahrávaním programu do pamäte *flash* ATmega328P Arduino Nano a vypisuje sa chyba:

avrdude.exe: stk500_recv(): programmer is not responding avrdude.exe: stk500_getsync() attempt 1 of 10: not in sync: resp=0xc5

u zmeňte parameter prenosovej rýchlosti v *Arguments* na 57600.

Title: Arduino Programmer Command: c:\avrdude\avrdude.exe Arguments: -CC:\avrdude\avrdude.conf -p atmega328p -c arduino -P COM6 -b 57600 -U flash:w:"\$(ProjectDir)Debug\\$(TargetName).hex":i

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Nový projekt "Mircochip Studio"

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Ascembler AtmelStudio Soluti	ion	GCC C Executable Project	C/C++	project
	000	GCC C Static Library Project	C/C++	
	GCC	GCC C++ Executable Project	C/C++	
	GCC	GCC C++ Static Library Project	C/C++	
		Create project from Arduino sketch	C/C++	<pre>#include <avr io.h=""> int main(void) } printf("Hello" GCC</avr></pre>
Name:	Cvicenie			
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Solution:	Create new solution		•	
Solution name:	Cvicenie		[Create <u>directory for solution</u>
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Nový projekt "Mircochip Studio"

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ATmega3209	32	4096	256		Speed:		N/A	
ATmega324A	32	2048	1024		Vcc:		N/A	
ATmega324P	32	2048	1024		Family:		ATmega	
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ATmega324PB	32	2048	1024		Device page	for ATmega328P		
ATmega325	32	2048	1024		Datasheet			
ATmega3250	32	2048	1024					
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Nový projekt "Mircochip Studio"

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Projekt "Cvicenie"-main.c nahraď súborom Blikanie_led.c



Projekt "Cvicenie"

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ASF Explorer Solution Explorer	<pre>>Int main (void) { SET_BIT(DDRB, DDB5); //DDRB = (1<<ddb5); %="" &="~(1<<PORTB5);" (200);="" (50);="" (500);="" +="1;" 100="" <="" _delay_ms="" a="" asm("nop");="" je="" led="" portb="" portb5="" pre="" vyst="" while(1)="" zapni="" zhasni="" {="" ="(1<<PORTB5);" }=""></ddb5);></pre>	upny, ostatne vstupne
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Pridanie knižnice *libprintf_flt* do *"Libraries"*



Nastavenie "linkera"



Nastavenie "optimalizácia kódu"

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	Memory Settings	
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Preklad projektu pomocou **"Build Solution" – F7,** vygenerované output súbory

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Cvicenie.hex	<pre>#define TOG_BIT(port, bit) (port ^= (1<<bit))< pre=""></bit))<></pre>
iii Cvicenie.lss	<pre>#define BIT(port, bit) (port & (1<<bit))< pre=""></bit))<></pre>
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"Nahranie" strojového kódu do ATmega328P na Arduino vývojovej doske

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	avrdude.exe: safemode: Fuses OK (E:00, H:00, L:00)				· · · · · · · · · · · · · · · · · · ·
	Ready		Ln 1	Col 1	Ch 1 INS

"Nahranie" strojového kódu do ATmega328P na Arduino vývojovej doske

Cvicenie - Microchip Studio Eile Edit View VAssistX ASF Project Build	Advanced Mode 🔻 Quick Launch (Ctrl+Q) 🔎 🗕 🗖 🗙 d Debug vMicro Tools Window Help
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	Hex 🔏 🗗 🗸 📮 🚛 📟 🗰 🥃 🖕 🏙 📩 🛛 🚽 🗰 ATmega328P 🦹 Simulator 🖕 vMicro 🕶
Solution Explorer 🔹 🕂 🗙	Blikanie_Led.c 🗯 🗙 👻
○ ○ ☆ ○ · 리 ⓑ / / - ○ ○ ○	▼ 🗘
Search Solution Explorer (Ctrl+ô)	#define F_CPU 16000000L #include <util delay.h=""></util>
Solution 'Cvicenie' (1 project)	
Cvicenie	<pre>#define SET_BIT(port, bit) (port = (1<<bit)) #define="" &="~(1<<bit))</pre" (port="" bit(port,="" bit)="" clr=""></bit))></pre>
Ear Output Files	<pre>#define TOG_BIT(port, bit) (port ^= (1<<bit))< pre=""></bit))<></pre>
 Libraries 	<pre>#define BIT(port, bit) (port & (1<<bit))< pre=""></bit))<></pre>
Blikanie_Led.c	char a:
	//
	<pre>SET_BIT(DDRB, DDB5); //DDRB = (1<<ddb5); je="" ostatne="" portb5="" pre="" vstupne<="" vystupny,=""></ddb5);></pre>
	asm("nop"); a = PINB:
	<pre>while(1) {</pre>
	PORTB = (1< <portb5); led<="" td="" zapni=""></portb5);>
	_delay_ms (50);
	PORTB &= ~(1< <portb5); led<="" td="" zhasni=""></portb5);>
ASF Explorer Solution Explorer	
	_delay_ms (200);
Criteria Deriest Derection	PORTB &= ~(1< <portb5); led<="" td="" zhasni=""></portb5);>
	aeLay_ms (500);
	00 % 👻 4
Output	▼ ╄ ×
Show output from Arduino Programmer	
avrdude.exe: ser_open(): can't open device	"\\.\COM3": The system cannot find the file specified.
avrdude.exe done. Thank you.	
Ready	Ln 1 Col 1 Ch 1 INS 🦼

🧸 Terminal v1.9b - 20130116ß - by Br@y++	_		×
Connect COM Port Baud rate Data bits Parity Stop bits Handsha BeScan COM7 600 14400 57600 5 © none © 1 Help COMs COMs 19200 115200 6 C odd C RTS/ About. COMs COMs 38400 256000 7 C mark C 2 C RTS/ Quit 9600 56000 c ustom 8 C space 2 C RTS/	king 'CTS /XOFF 'CTS+XO on TX	N/XOFF invert	
Settings Set font Auto Dis/Connect Time Stream log custom BR Rx Clear ASCII table Scripting AutoStart Script CR=LF Stay on Top 114000 1 Graph Remote		DCTS	CD RI
Receive CLEAR ✓ AutoScroll Reset Cnt 10 Cnt = 0 C HEX StartLog StopLog Req/Resp	☐ Dec ▼ Hex	🔲 Bin	
		< >	< >
CLEAR Send File 0 CR=CR+LF BREAK		DTR 🖸	RTS
Macros M1 M2 RESET M5 M7 M8 M9 M10 M13 M14 M15 M16 M17 M18 M19 M20 M21 M22	M11 M23	M12 M24	
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