

DIAMEX-PROG-S

Programming adapter for AVR, STM32 and LPC controller

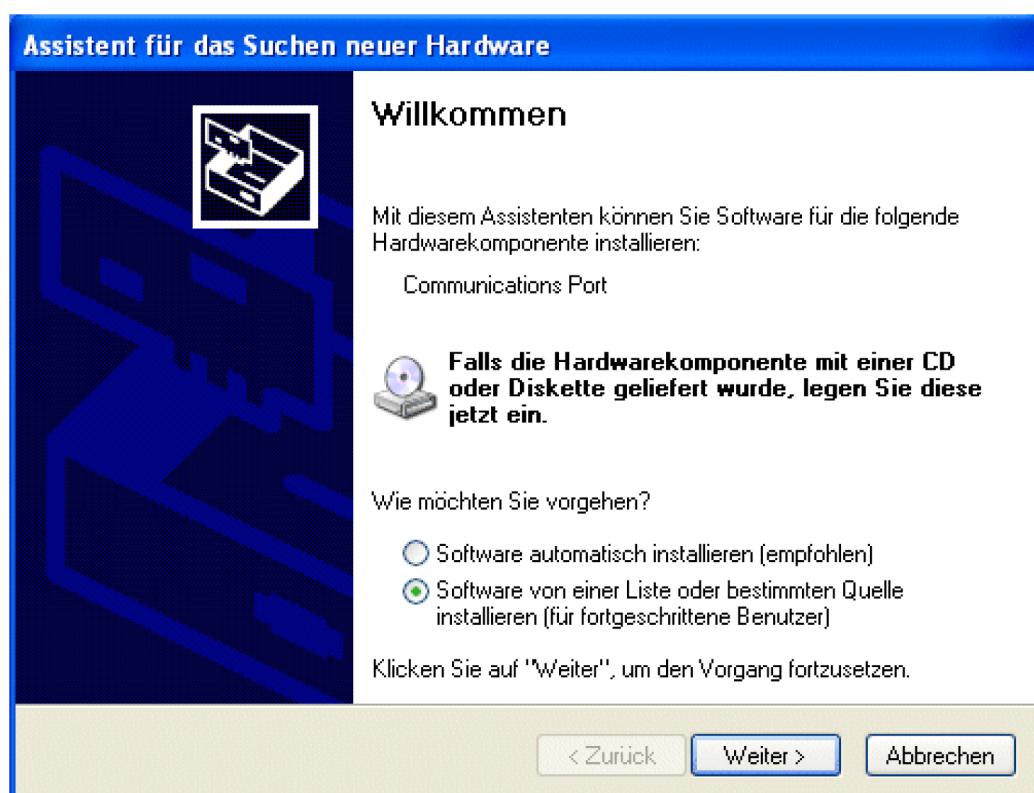
USB-ISP-programmer

Setup

Please download the *inf-file for the driver unit of the ISP-programmer:

[www.avr-programmer.com\downloads\prog-s\drivers.zip](http://www.avr-programmer.com/downloads/prog-s/drivers.zip)

Store the *inf-file on your hard drive. Connect the programmer with the USB-side to your computer, it will run automatically. While setting up Windows asks for a driver unit. The own Windows driver unit will be used the system is being told that by the special erfos-prog.inf-file. **Therefore tick the box like in the picture and press "Continue":**



In the next step, state where the *inf-file is located.

Overview of DIP-switch settings:

	<p>AVR-ISP programmer for Atmel AT90, ATMega, ATTiny</p> <p>The programming of this controller happens via the ISP-interface which is with most AVR-controller equivalent to the pins for the SOI-bus. Additionally to SCK, MISO, MOSI a reset-lead is needed. DIAMEX-PROG-S emulates an AVRISP2-programmer and is therefore compatible to AVR-studio and AVRDUDE.</p> <p>ATTENTION! Due to the special switching on the DIAMEX-PROG-S the programming voltage is solely 3,3 Volt. In most cases AVR-controller which are fed with 5 Volt can be programmed as well as the new AVR-controller are able to detect perfectly 3,3 Volt levels at the port pins too.</p>
	<p>STM32-programmer for STM32F101, STM32F102, STM32F103, STM32F105, STM32F107</p> <p>The programming of the STM32-controller happens via the integrated Bootloader through one of the serial interfaces (USART1 with STM32F101/102/103 and USART1 or USART2 with STM32F105/107). The programmer is connected to the controller by the RX and TX connections. For the automatic activation of the integrated Bootloader you need the additional connections BOOT0 and RESET, therefore no jumpers or switches at the shift are necessary.</p> <p>DIAMEX-PROG-S in association with the corresponding tools (only for Windows XP / Vista / Windows7) switches the controller automatically into the Bootloader mode, programmes the Flash-Storage and afterwards starts the just loaded application programme. Link to the programme at the end of these instructions.</p> <p>ATTENTION! Please take notice of the application note AN2662 for STM32F105 and STM32F107.</p>
	<p>NXP/LPC-programmer for LPC17xx, LPC13xx, LPC11xx, LPC21xx, LPC22xx, LPC23xx</p> <p>The programming of the LPC-controller happens via the integrated Bootloader through the serial interface UART0. The programmer is connected to the controller by the RX and TX connections. For the automatic activation of the integrated Bootloader you need the additional connections P2[10] and RESET, therefore no jumpers or switches at the shift are necessary.</p> <p>DIAMEX-PROG-S in association with the tool "Flash-Magic" switches the controller automatically into the Bootloader mode, programmes the Flash-Storage and starts the just loaded application programme.</p>
	<p>USB/Serial-converter without control mode of the handshaking line.</p> <p>This mode can be used for debugging the connected shift. The electric lines BOOT and RESET always remain in a passive state and can't accidentally relocate the programmer into the Bootloader mode. If it is sure that the handshaking lines of the terminal programme or the testing tool of the testing tools are not changed, the programmer can remain in the programming mode for STM32- or LPC-controller.</p> <p>The USB-Serial-converter allows data rates up to 125000 baud.</p>

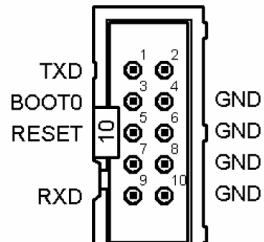
DIAMEX-PROG-S

Programming adapter for AVR, STM32 and LPC controller

Connection from DIAMEX-PROG-S to a STM32-controller:

DIP-switch: 1=on, 2=off

Connect the electric lines of the programming-connections on the DIAMEX-PROG-S directly to the pins at the controller:



10-pin Pinheader	NXP-Controller
PIN 1 (TXD)	USART0-RX (PA10)
PIN3 (BOOT)	BOOT0
PIN5 (RESET)	RESET
PIN9 (RXD)	USART0-TX (PA9)

The pin numbers of the STM32 diversify depending on the shaping of the case. Please have a look at the data sheet of the STM32 to detect the correct pin numbers for your controller.

Indications, tips!

To be able to start the Bootloader it must be secured that BOOT1 (PB2) is located on ground potential while RESET. If the pin is not used in any other way it can be located directly on GND. Otherwise locate it over a resistor 10..100kOhm on GND.

For programming the STM32 it has to be powered from the shift with 3,3 Volt. DIAMEX-PROG-S doesn't provide this voltage.

For programming you don't need to connect a quartz to the STM32, the Bootloader of the STM32 uses the internal RC-oscillator (HIS-clock) for the generation of the internal clock.

The control system of the electric lines BOOT und RESET works only with the DIAMEX-PROG-S matching programming tool "STM32Prog". You can also use the programme "STM-Flash-Loader" with the DIAMEX-PROG-S but have to deactivate the handshaking line by positioning the DIP-switch 1+2 on "ON" (USB-serial-converter mode). In this case you have to activate the STM32-Bootloader yourself (BOOT0 on "high", afterwards RESET shortly on "low").

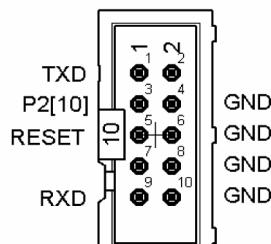
DIAMEX-PROG-S

Programming adapter for AVR, STM32 and LPC controller

Connection from DIAMEX-PROG-S to a NXP-controller

DIP-switch 1=off, 2=on

Connect the electric lines of the programming connection on the DIAMEX-PROG-S directly to the pins at the controller:



10-pin Pinheader	NXP-Controller
PIN 1 (TXD)	UART0-RXD P0[2]
PIN3 (BOOT)	P2[10]
PIN5 (RESET)	RESET
PIN9 (RXD)	UART0-TXD P0[3]

The pin numbers of the NXP-controller diversify depending on the shaping of the case. Please have a look at the data sheet to detect the correct pin numbers for your controller.

Indications, tips!

For programming the NXP-controller it has to be powered from NXP, the Bootloader of the controller uses the internal RS-oscillator for the generation of the internal clock.

The control system of the electric lines BOOT and RESET works perfectly with the tool "Flash Magic".

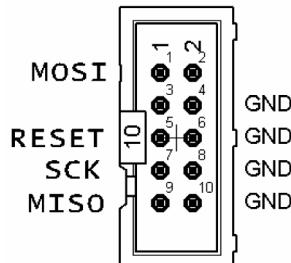
DIAMEX-PROG-S

Programming adapter for AVR, STM32 and LPC controller

Connection of the DIAMEX-PROG-S to an AVR-controller

DIP-switch: 1=off, 2=off

Connect the electric lines of the programming connection on the DIAMEX-PROG-S directly to the pins at the controller:



10-pin Pinheader	NXP-Controller
PIN1 (MOSI)	MOSI or PDI
PIN5 (RESET)	RESET
PIN7 (SCK)	SCK
PIN9 (MISO)	MISO or PDO

The pin numbers of the AVR-controller diversify depending on the shaping of the case. Please have a look at the data sheet to detect the correct pin numbers for your controller.

Indications, tips!

Some of the bigger AVR-controller (e.g. AT90CAN32/64/128, ATMega64/128) have special programming pins PDI, PDO. These can't be programmed via the standard SPI-electric lines MISO and MOSI.

The levels at the output pins MOSI, REST and SCK are 3,3 Volt. Normally there are no problems with controller who work with 5 Volt. Anyway, if the programming is not possible, try to reduce the SPI-clock rate. Many AVR-controller have the CLKDIV8-Fusebit set and can only be programmed with very low SPI-clock rates.

DIAMEX-PROG-S doesn't provide power supply for the controller over PIN2 of the connector assembly. The controller that has to be programmed has to be provided with electricity itself.

SPI-clock rates, parameter transfer with AVRDUDE respectively setting with AVR-studio 4:

AVRDUDE, Parameter -B		AVR-Studio4, ISP-Clock Setting	
-B 1	1 MBit	1,845 MHz	2 MBit
-B 2	500 kBit	460,8 kHz	1 MBit
-B 4	250 kBit	115,2 kHz	500 kBit
-B 8	125 kBit	57,6 kHz	333 kBit
-B 10	100 kBit	4 kHz	25 kBit
-B 20	50 kBit	1,21 kHz	6,3 kBit
-B 40	25 kBit		
-B 100	10 kBit		
-B 200	6,3 kBit		

Support of the following chips:

Tiny

ATtiny12, ATtiny13, ATtiny15, ATtiny2313, ATtiny24, ATtiny25, ATtiny26, ATtiny44, ATtiny45, ATtiny84, ATtiny85, ATtiny86, ATtiny261, ATtiny461, ATtiny861

Mega

Atmega88, Atmega103, Atmega128, Atmega1280, Atmega1281, Atmega16, Atmega161, Atmega162, Atmega163, Atmega164, Atmega168, Atmega169, Atmega2560, Atmega2561, Atmega32, Atmega324, Atmega325, Atmega3250, Atmega329x, Atmega48, Atmega64, Atmega640, Atmega644, Atmega645, Atmega6450, Atmega649x, Atmega8, Atmega8515, Atmega8535

Others

ATCAN128, AT90PWM2, AT90PWM2B, AT90PWM3, AT90PWM3B, AT90USB162, AT90USB646, AT90USB647, AT90USB1286, AT90USB1287

- all other ATMEGA-processors which support the ISP-application programming interface

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Indications

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Notice of liability

The manufacturer doesn't assume any liability for damages which could arise by using the DIAMEX-PROG-S.

Links

Programming tool for STM32-controller:

<http://www.er.forum.de/obd-diag-dl/index.php>

Flash-Magic for LPC-controller:

<http://www.flashmagictool.com/>