JTAG-Booster for
AMD ÉlanSC520

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Table of Contents

1. General

The program JTAGEL5 uses the JTAG port of the AMD ÉlanSC520 embedded microprocessor in conjunction with the small JTAG-BOOSTER:

- to program data into flash memory
- to verify and read the contents of a flash memory
- to make a memory dump
- to access a I2C Device
- to test CPU signals

All functions are done without any piece of software running in the target. No firmware or BIOS must be written. Bootstrap software may be downloaded to initially unprogrammed memories.

For latest documentation please refer to the file README.TXT on the distribution disk.

1.1.System Requirements

To successfully run this tool the following requirements must be met:

- MSDOS, WIN3.x, WIN9x or WinNT
  (WinNT is supported with an additional support-kit)

- Intel 80386 or higher

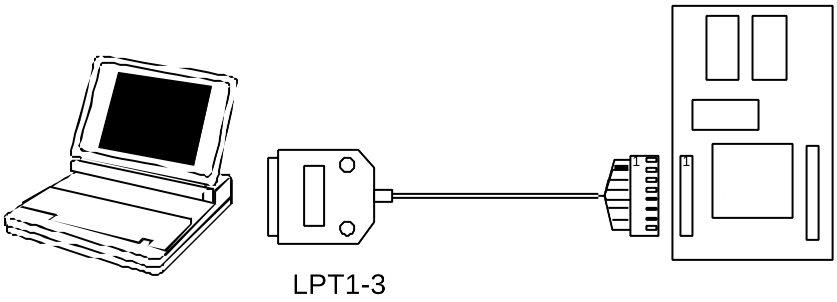
- 205 kByte of free DOS memory

- no extended memory

- Parallel Port

1.2.Connecting your PC to the target system

The JTAG-Booster can be plugged into standard parallel ports (LPT1-3) with a DB25-Connector.



The target end of the cable has the following reference:

1	2*	3	4	5	6	7	8
TCK	GND	TMS	TRST#	NC	TDI	TDO	+3.3V

*PIN 2 can be detected by the white thick cable.

To connect your design to the JTAG-BOOSTER you need a single row berg connector with a spacing of 2.54mm on your PCB. The names refer to the target: Pin 7 is the target's TDO pin and is connected to the JTAG-Booster's TDI pin.

A 3.3V version of the JTAG-Booster is delivered for the AMD ElanSC520. Do not connect the 3.3V JTAG-Booster to a 5V power supply. The JTAG-Booster may be damaged.

Before you start the program, the JTAG-BOOSTER must be plugged to a parallel interface of your PC and to the 8 pin JTAG connector on the target.

The utility is started with the general command line format:

```
JTAGEL5 /function [filename] [/option_1] ... [/option_n].
```

Note that the function must be the first argument followed (if needed) by the filename.

If you want to cancel execution of JTAGEL5, press CTRL-Break-Key.

On any error the program aborts with an MSDOS error level of one.

1.3.First Example

In the following simple example it is assumed that the JTAG-Booster is connected to LPT1 of your PC and target power is on.

Typing

```
        JTAGEL5  /P  MYAPP.BIN  /VERIFY
```

at the DOS prompt results in the following output:

```
        JTAGEL5 --- JTAG utility for AMD ÉlanSC520
        Copyright © FS FORTH-SYSTEME GmbH, Breisach
        Version 3.0 of mm/dd/yyyy

(1)     Configuration loaded from file JTAGEL5.INI
(2)     Target: FS FORTH-SYSTEME, EVA520
(3)     Using LPT at I/O-address 0378h
(4)     JTAG Adapter detected

(5)     More than 9 devices detected in JTAG chain or TDI pin stuck at low level
          Device 0: IDCODE=10EFF003   AMD ÉlanSC520, Revision 1
          Device 1: IDCODE=10EFF003   AMD ÉlanSC520, Revision 1
          Device 2: IDCODE=10EFF003   AMD ÉlanSC520, Revision 1
          Device 3: IDCODE=10EFF003   AMD ÉlanSC520, Revision 1
          Device 4: IDCODE=10EFF003   AMD ÉlanSC520, Revision 1
          Device 5: IDCODE=10EFF003   AMD ÉlanSC520, Revision 1
          Device 6: IDCODE=10EFF003   AMD ÉlanSC520, Revision 1
          Device 7: IDCODE=10EFF003   AMD ÉlanSC520, Revision 1
          Device 8: IDCODE=10EFF003   AMD ÉlanSC520, Revision 1
(6)     Sum of instruction register bits   : 4
(7)     CPU position                       : 0
(8)     Instruction register offset        : 0

(9)     AMD 29F040 detected
(10)    Erasing Flash-EPROM Block #:6 7
        Programming File MYAPP.BIN
        131072 Bytes programmed
        Programming ok
```

```
Erase Time        :     1.1 sec
Programming Time  :   121.2 sec
```

(1) The initialization file JTAGEL5.INI was found in the current directory.

(2) The target identification line of the initialization file is printed here.

(3) The resulting I/O-address of the parallel port is printed here.

(4) A JTAG-Booster is found on the parallel port

(5) The JTAG chain is analyzed. There may be several parts in the JTAG chain. The chain is analyzed and all parts except the AMD ÉlanSC520 are switched to bypass mode.
Please note: The current revision of the AMD ÉlanSC520 has a silicon bug with the JTAG identification register. As a result of that bug, the contents of the identification register is shifted out infinitely. If there are other devices in the JTAG chain, the AMD ÉlanSC520 must be the first part in the chain (nearest to TDI). Otherwise the JTAG-Booster does not work.

(6) The length of all instruction registers in the JTAG chain are added.

(7) The position of the AMD ÉlanSC520 in the JTAG chain is checked.

(8) The position of the JTAG instruction register of the AMD ÉlanSC520 is checked

(9) One Flash-EPROM AMD 29F040 selected with chip select BOOTCS# is found.

(10) In this example two blocks must be erased.

1.4.Trouble Shooting

Avoid long distances between your Host-PC and the target. If you are using standard parallel extension cable, the JTAG-BOOSTER may not work. Don't use Dongles between the parallel port and the JTAG-BOOSTER.

Switch off all special modes of your printer port (EPP, ECP, ...) in the BIOS setup. Only standard parallel port (SPP) mode is allowed.

On very fast PCs there could be verify errors. To avoid this, watch for the ´IO recovery time´-switch in the BIOS Setup which must be turned on. Otherwise try to slow down your PC by setting the turbo switch off.

When using older flash devices (nearly maximum erase cycles reached), we propose to use the /VERIFY option. This is also true for the relatively slow 3 Volt only flash devices.

Some newer fast flash devices need a setup time between address/data and the write strobe signal. If programming of this devices fails, try with the option /WRSETUP again.

If there are problems with autodetection of the flash devices use the /DEVICE= option. To speed up autodetection specify the option /16BIT or /8BIT.

Don't use hardware protected flash memories.

The used chip selects must be defined as output and inactive in the initialization file (see chapter 1.6 “Initialization file JTAGEL5.INI”). Also the address bits must be defined as output.

1.5.Error Messages

- **80386 or greater required**
  The JTAG-BOOSTER does not work on a 8088/8086 or a 80286 platform.

- **Adapter not connected or target power fail**
  The JTAG-Booster wasn't found. Please check connection to parallel port and connection to target. Check target power. Check your BIOS-Setup.

- **Can't open x:\yyy\zzz\JTAGEL5.OVL**
  The overlay file JTAGEL5.OVL must be in the same directory as JTAGEL5.EXE.

- **Configuration file XYZ not found.**
  The file specified with the option /INI= wasn't found.

- **Device offset out of range**
  The value specified with the option /OFFSET= is greater than the size of the detected flash device.

- **Disk full**
  Writing a output file was aborted as a result of missing disk space.

- **Error creating file:**
  The output file could not be opened. Please check free disk space or write protection.

- **Error: *Pin-Name* is an output only pin**
  The specified pin cannot be sampled. Check the command line. Check the initialization file.

- **Error: *Pin-Name* is an input only pin**
  The specified pin cannot be activated. Check the command line. Check the initialization file.

- **Error: *Pin-Name* may not be read back**
  The specified pin can be switched to tristate, but cannot be read back. Check the command line.

- **illegal function:**
  The first parameter of the command line must be a valid function. See chapter 2 “JTAGEL5 Parameter Description” for a list of supported functions.

- **illegal number:**
  The specified number couldn’t be interpret as a valid number. Check the relevant number base.

- **illegal option:**
  See chapter 2 “JTAGEL5 Parameter Description” for a list of supported options.

- **illegal Pin Type:**
  The name specified with the option /PIN= must be one of the list of chapter 1.6 ”Initialization file JTAGEL5.INI”

- **illegal Flash Type:**
  The name specified with the option /DEVICE= must be one of the list of chapter 1.7 ”Supported flash devices”.

- **Input file not found:**
  The specified file cannot be found

- **Input file is empty:**
  Files with zero length are not accepted

- **" " is undefined**
  Please check the syntax in your configuration file. (See chapter 1.6 “Initialization file JTAGEL5.INI”).

- **LPTx not installed**
  The LPT port specified with /LPTx cannot be found. Please check the LPT port or specify a installed LPT port. Check your BIOS setup.

- **missing filename**
  Most functions need a filename as second parameter.

- **missing option /I2CCLK=**
  Some functions need the option /I2CCLK= to be defined.

- **missing option /I2CDAT=**
  Some functions need the option /I2CDAT= or the options /I2CDATO= and /I2CDATI= to be defined.

- **missing option /LENGTH=**
  Some functions need the option /LENGTH= to be defined.

- **missing option /PIN=**
  Some functions need the option /PIN= to be defined.

- **More than 9 devices in the JTAG chain or TDI pin stuck at low level**
  The JTAG chain is limited to 9 parts. Check target power. Check the target's TDO pin.

- **No devices found in JTAG chain or TDI pin stuck at high level**
  A stream of 32 high bits was detected on the pin TDI. TDI may stuck at high level. Check the connection to your target. Check the target power. Check the target's TDO pin.

- **Option /CPUPOS= out of range**
  The number specified with the option /CPUPOS= must be less or equal to the number of parts minus 1.

- **Option /IROFFS= out of range**
  Please specify a smaller value

- **Part at specified position is not a AMD ÉlanSC520**
  The option /CPUPOS= points to a part not a AMD ÉlanSC520

- **Pins specified with /I2CCLK= and /I2CDAT= must have different control cells**
  The pin specified with the option /I2CDAT= must be able to be switched to high impedance while the pin specified with option /I2CCLK= is an active output. See chapter 1.6 "Initialization file JTAGEL5.INI".

- **Pins specified with /I2CCLK= and /I2CDATI= must have different control cells**
  The pin specified with the option /I2CDATI= must be able to be switched to high impedance while the pin specified with option /I2CCLK= is an active output. See chapter 1.6 “Initialization file JTAGEL5.INI”.

- **Pins specified with /I2CDATO= and /I2CDATI= must have different control cells**
  The pin specified with the option /I2CDATI= must be able to be switched to high impedance while the pin specified with option /I2CDATO= is an active output. See chapter 1.6 “Initialization file JTAGEL5.INI”.

- **Specify only one of that options:**
  Some options are exclusive (i.e. /8BIT and /16BIT). Don't mix them.

- **There are unknown parts in the JTAG chain. Please use the option /IROFFS= to specify the instr. reg. offset of the CPU.**
  If there are unknown parts in the JTAG chain, the program isn’t able to determine the logical position of the CPU’s instruction register.

- **There is no AMD ÉlanSC520 in the JTAG chain**
  No AMD ÉlanSC520 was found in the JTAG chain. Check the target power. Try with option /DRIVER=4 again.

- **Value of option /FILE-OFFSET out of range**
  The value of the option /FILE-OFFSET= points behind end of file.

- **wrong driver #**
  The value specified with the option /DRIVER= is out of range.

- **wrong Identifier (xxxx)**
  No valid identifier found. Check the specified chip select signal and the bus width. Try with the option /DEVICE= .

1.6.Initialization file JTAGEL5.INI

This file is used to set the CPU signals for input/output. In case of output signal an additional parameter is used to set the default level to high or low. This file can be used to adapt your own AMD ÉlanSC520 design to the JTAG-BOOSTER. The Target-Entry is used to identify your design which is displayed with most commands.

When the JTAGEL5 software is started it scans the current directory for an existing initialization file named JTAGEL5.INI. If no entry is found the default values are used. You may also specify the initialization file with the option /INI= . If the specified file isn't found, the program aborts with an error message.

The CPU pins can also be used with the functions /BLINK (chapter 2.9), /PIN? (chapter 2.10) and /SAMPLE (chapter 2.11) to test the signals on your design.

Example of JTAGEL5.INI:

```
// Description file for AMD ÉlanSC520
Target: FS FORTH-SYSTEME, EVA520
// All chip select signals are set to output and inactive.
// All signals should be defined. Undefined signals are set to their defaults.
// Pin names are defined in upper case.
// Low active signals are signed with a trailing #.

// Group A: All pins in this group must be set to the same direction
//         This pins are tristateable outputs and may not be read back
BA1             Out,Lo    // SDRAM, bank address
BA0             Out,Lo    // SDRAM, kank address
MA12            Out,Lo    // SDRAM, address
MA11            Out,Lo    //
MA10            Out,Lo    //
MA9             Out,Lo    //
MA8             Out,Lo    //
MA7             Out,Lo    //
MA6             Out,Lo    //
MA5             Out,Lo    //
MA4             Out,Lo    //
MA3             Out,Lo    //
MA2             Out,Lo    //
```

```
MA1             Out,Lo  //
MA0             Out,Lo  //

// Group B: All pins in this group must be set to the same direction
//       This pins are bidirectional
MD31            Inp     // SDRAM data bus
MD30            Inp     //
MD29            Inp     //
MD28            Inp     //
MD27            Inp     //
MD26            Inp     //
MD25            Inp     //
MD24            Inp     //
MD23            Inp     //
MD22            Inp     //
MD21            Inp     //
MD20            Inp     //
MD19            Inp     //
MD18            Inp     //
MD17            Inp     //
MD16            Inp     //
MD15            Inp     //
MD14            Inp     //
MD13            Inp     //
MD12            Inp     //
MD11            Inp     //
MD10            Inp     //
MD9             Inp     //
MD8             Inp     //
MD7             Inp     //
MD6             Inp     //
MD5             Inp     //
MD4             Inp     //
MD3             Inp     //
MD2             Inp     //
MD1             Inp     //
MD0             Inp     //
MECC6           Inp     // SDRAM, memory error correction code
MECC5           Inp     //
MECC4           Inp     //
MECC3           Inp     //
```

```
MECC2         Inp      //
MECC1         Inp      //
MECC0         Inp      //

// Group C: All pins in this group must be set to the same direction
//       This pins are tristateable outputs but may not be read back
SCS3#         Out,Hi   // SDRAM, chip select
SCS2#         Out,Hi   //
SCS1#         Out,Hi   //
SCS0#         Out,Hi   //

// Group D: All pins in this group must be set to the same direction
//       This pins are tristateable outputs but may not be read back
SRASB#        Out,Hi   // SDRAM, row address strobe
SRASA#        Out,Hi   //

// Group E: All pins in this group must be set to the same direction
//       This pins are tristateable outputs but may not be read back
SCASB#        Out,Hi   // SDRAM, column address strobe
SCASA#        Out,Hi   //

// Group F: All pins in this group must be set to the same direction
//       This pins are tristateable outputs but may not be read back
SWEB#         Out,Hi   // SDRAM, memory write enables
SWEA#         Out,Hi   //

// Group G: All pins in this group must be set to the same direction
//       This pins are tristateable outputs but may not be read back
SDQM3         Out,Lo   // SDRAM, data ubput/output mask
SDQM2         Out,Lo   //
SDQM1         Out,Lo   //
SDQM0         Out,Lo   //

// Group H: All pins in this group must be set to the same direction
//       This pins are bidirectional
AD31          Inp      // PCI, address/data bus
AD30          Inp      //
AD29          Inp      //
AD28          Inp      //
AD27          Inp      //
AD26          Inp      //
```

```
AD25            Inp       //
AD24            Inp       //
AD23            Inp       //
AD22            Inp       //
AD21            Inp       //
AD20            Inp       //
AD19            Inp       //
AD18            Inp       //
AD17            Inp       //
AD16            Inp       //
AD15            Inp       //
AD14            Inp       //
AD13            Inp       //
AD12            Inp       //
AD11            Inp       //
AD10            Inp       //
AD9             Inp       //
AD8             Inp       //
AD7             Inp       //
AD6             Inp       //
AD5             Inp       //
AD4             Inp       //
AD3             Inp       //
AD2             Inp       //
AD1             Inp       //
AD0             Inp       //

// Group I: All pins in this group must be set to the same direction
//       This pins are bidirectional
CBE3#           Out,Hi    // PCI, command or byte enable
CBE2#           Out,Hi    //
CBE1#           Out,Hi    //
CBE0#           Out,Hi    //

// Group J: All pins in this group must be set to the same direction
//       Pins GPA14..0 are tristateable outputs but may not be read back
//       Pins GPA25..15 are bidirectional
//       For Flash programming this pins must be set to output
GPA25           Out,Lo    // = DEBUG_ENTER config switch
GPA24           Out,Lo    // = INST_TRCE config switch
GPA23           Out,Lo    // = AMDEBUG_DIS config switch
```

```
GPA22          Out,Lo    // = RSTLD7 config switch
GPA21          Out,Lo    // = RSTLD6 config switch
GPA20          Out,Lo    // = RSTLD5 config switch
GPA19          Out,Lo    // = RSTLD4 config switch
GPA18          Out,Lo    // = RSTLD3 config switch
GPA17          Out,Lo    // = RSTLD2 config switch
GPA16          Out,Lo    // = RSTLD1 config switch
GPA15          Out,Lo    // = RSTLD0 config switch
GPA14          Out,Lo    //
GPA13          Out,Lo    //
GPA12          Out,Lo    //
GPA11          Out,Lo    //
GPA10          Out,Lo    //
GPA9           Out,Lo    //
GPA8           Out,Lo    //
GPA7           Out,Lo    //
GPA6           Out,Lo    //
GPA5           Out,Lo    //
GPA4           Out,Lo    //
GPA3           Out,Lo    //
GPA2           Out,Lo    //
GPA1           Out,Lo    //
GPA0           Out,Lo    //

// Group K: All pins in this group must be set to the same direction
//       This pins are bidirectional
GPD15          Inp       //
GPD14          Inp       //
GPD13          Inp       //
GPD12          Inp       //
GPD11          Inp       //
GPD10          Inp       //
GPD9           Inp       //
GPD8           Inp       //

// Group L: All pins in this group must be set to the same direction
//       This pins are bidirectional
GPD7           Inp       //
GPD6           Inp       //
GPD5           Inp       //
GPD4           Inp       //
```

```
GPD3          Inp       //
GPD2          Inp       //
GPD1          Inp       //
GPD0          Inp       //

// The direction of each following pin can be set independent of the others,
// but this pins can not be read back.
CLKMEMOUT    Out,Lo// SDRAM, clock output
BOOTCS#       Out,Hi//
ROMRD#        Out,Hi//
FLASHWR#      Out,Hi//
ROMBUFOE#     Out,Hi//
ROMCS1#       Out,Hi//
ROMCS2#       Out,Hi    //
CLKPCIOUT     Out,Lo    // PCI, clock input
RST#          Out,Hi    // PCI, reset
GNT4#         Out,Hi    //
GNT3#         Out,Hi    //
GNT2#         Out,H     i//
GNT1#         Out,Hi    //
GNT0#         Out,Hi    //
GPRESET       Out,Lo    // some people connect GPRESET to the Boot-Flash!!
GPIORD#       Out,Hi    //
GPIOWR#       Out,Hi    //
GPMEMRD#      Out,Hi    //
GPMEMWR#      Out,Hi    //
SOUT1         Out,Lo    //
RTS1#         Out,Lo    //
DTR1#         Out,Lo    //
SOUT2         Out,Lo    //
RTS2#         Out,Lo    //
DTR2#         Out,Lo    //
SSI_CLK       Out,Hi    //
SSI_DO        Out,Hi    //
CMDACK        Out,Lo    //
STOP/TX       Out,Lo    //
TRIG/TRACE    Out,Lo    //

// The following pins are complete bidirectional pins.
// The direction of each pin can be set independent of the other pins.
// Each pin can be used as input.
```

```
PAR          Inp       //
PERR#        Inp       //
FRAME#       Inp       //
TRDY#        Inp       //
IRDY#        Inp       //
STOP#        Inp       //
DEVSEL#      Inp       //
PIO27        Inp       // = GPCS0#
PIO26        Inp       // = PMEMCS16#
PIO25        Inp       // = GPIOCS16#
PIO24        Out,Hi    // = GPDBUFOE#
PIO23        Inp       // = GPIRQ0
PIO22        Inp       // = GPIRQ1
PIO21        Inp       // = GPIRQ2
PIO20        Inp       // = GPIRQ3
PIO19        Inp       // = GPIRQ4
PIO18        Inp       // = GPIRQ5
PIO17        Inp       // = GPIRQ6
PIO16        Inp       // = GPIRQ7
PIO15        Inp       // = GPIRQ8
PIO14        Inp       // = GPIRQ9
PIO13        Inp       // = GPIRQ10
PIO12        Out,Hi    // = GPDACK0#
PIO11        Out,Hi    // = GPDACK1#
PIO10        Out,Hi    // = GPDACK2#
PIO9         Out,Hi    // = GPDACK3#
PIO8         Inp       // = GPDRQ0
PIO7         Inp       // = GPDRQ1
PIO6         Inp       // = GPDRQ2
PIO5         Inp       // = GPDRQ3
PIO4         Out,Lo    // = GPTC
PIO3         Out,Lo    // = GPAEN
PIO2         Inp       // = GPRDY
PIO1         Out,Hi    // = GPBHE#
PIO0         Out,Lo    // = CPALE
PIO28        Inp       // = CTS2#
PIO29        Inp       // = DSR2#
PIO30        Inp       // = DCD2
PIO31        Inp       // = RIN2#
CLKTIMER     Inp       //
DC           Out,Lo    //
```

```
DATASTRB      Out,Lo   //
CPUACT        Out,Lo   //
PITOUT2       Out,Lo   //
PITGATE2      Inp      //
TMRIN1        Inp      //
TMRIN0        Inp      //
TMROUT1       Out,Lo   //
TMROUT0       Out,Lo   //

// The following pins are input only.
// Setting to output of one of these pins results in an error.
// Declaration of the direction of these pins is optional.
CLKMEMIN      Inp      //
SERR#         Inp      //
CLKPCIIN      Inp      //
INTD#         Inp      //
INTC#         Inp      //
INTB#         Inp      //
INTA#         Inp      //
REQ4#         Inp      //
REQ3#         Inp      //
REQ2#         Inp      //
REQ1#         Inp      //
REQ0#         Inp      //
SIN1          Inp      //
CTS1#         Inp      //
DSR1#         Inp      //
DCD1#         Inp      //
RIN1#         Inp      //
SIN2          Inp      //
SSI_DI        Inp      //
PWRGOOD       Inp      //
PRGRESET      Inp      //
BR/TC         Inp      //
```

This example is equal to the default initialization which is used when no initialization file could be found in the current directory and no initialization file is specified with the option /INI=.

Changes to the structure of the file could result in errors. Remarks can be added by using //.

1.7.Supported flash devices

The following types could be used with the /DEVICE= option:

	AM29F010	: AMD 29F010	
	AM29F010*2	: Dual AMD 29F010	
*	AM29LV010	: AMD 29LV010	(3.3V)
*	AM29LV010*2	: Dual AMD 29LV010	(3.3V)
*	AM29F100BW	: AMD 29F100B	(word mode)
*	AM29F100BB	: AMD 29F100B	(byte mode)
*	AM29F100TW	: AMD 29F100T	(word mode)
*	AM29F100TB	: AMD 29F100T	(byte mode)
*	AM29F200BW	: AMD 29F200B	(word mode)
*	AM29F200BB	: AMD 29F200B	(byte mode)
*	AM29F200TW	: AMD 29F200T	(word mode)
*	AM29F200TB	: AMD 29F200T	(byte mode)
*	AM29LV200BW	: AMD 29F200B	(3.3V, word mode)
*	AM29LV200BB	: AMD 29F200B	(3.3V, byte mode)
*	AM29LV200TW	: AMD 29F200T	(3.3V, word mode)
*	AM29LV200TB	: AMD 29F200T	(3.3V, byte mode)
	AM29F040	: AMD 29F040	
	AM29F040*2	: Dual AMD 29F040	
*	AM29F400BW	: AMD 29F400B	(word mode)
*	AM29F400BB	: AMD 29F400B	(byte mode)
	AM29F400TW	: AMD 29F400T	(word mode)
	AM29F400TB	: AMD 29F400T	(byte mode)
*	AM29LV400BW	: AMD 29LV400B	(3.3V, word mode)
*	AM29LV400BB	: AMD 29LV400B	(3.3V, byte mode)
*	AM29LV400TW	: AMD 29LV400T	(3.3V, word mode)
*	AM29LV400TB	: AMD 29LV400T	(3.3V, byte mode)
*	AM29LV004B	: AMD 29LV004B	(3.3V)
*	AM29LV004T	: AMD 29LV004T	(3.3V)
	AM29F080	: AMD 29F080	
*	AM29F080*2	: Dual AMD 29F080	
*	AM29LV081	: AMD 29LV081	(3.3V)
*	AM29LV081*2	: Dual 29LV081	(3.3V)
*	AM29F800BW	: AMD 29F800B	(word mode)
*	AM29F800BB	: AMD 29F800B	(byte mode)
	AM29F800TW	: AMD 29F800T	(word mode)
*	AM29F800TB	: AMD 29F800T	(byte mode)
*	AM29LV800BW	: AMD 29LV800B	(3.3V, word mode)

* AM29LV800BB	: AMD 29LV800B	(3.3V, byte mode)
AM29LV800TW	: AMD 29LV800T	(3.3V, word mode)
* AM29LV800TB	: AMD 29LV800T	(3.3V, byte mode)
* AM29LV008T	: AMD 29LV008T	(3.3V)
* AM29LV008B	: AMD 29LV008B	(3.3V)
AM29F016	: AMD 29F016	
AM29F016*2	: Dual AMD 29F016	
* AM29F017	: AMD 29F017	
AM29F017*2	: Dual AMD 29F017	
AM29LV017*2	: Dual AMD 29LV017	(3.3V)
* AM29F160BW	: AMD 29F160B	(word mode)
* AM29F160BB	: AMD 29F160B	(byte mode)
* AM29F160TW	: AMD 29F160T	(word mode)
* AM29F160TB	: AMD 29F160T	(byte mode)
* AM29F160BB*2	: Dual AMD 29F160B	(byte mode)
* AM29F160TB*2	: Dual AMD 29F160T	(byte mode)
AM29LV160BW	: AMD 29LV160B	(3.3V, word mode)
* AM29LV160BB	: AMD 29LV160B	(3.3V, byte mode)
* AM29LV160TW	: AMD 29LV160T	(3.3V, word mode)
* AM29LV160TB	: AMD 29LV160T	(3.3V, byte mode)
AM29LV160BB*2	: Dual AMD 29LV160B	(3.3V, byte mode)
* AM29LV160TB*2	: Dual AMD 29LV160T	(3.3V, byte mode)
AM29F032	: AMD 29F032	
AM29F032*2	: Dual AMD 29F032	
* AM29LV033	: AMD 29LV033	(3.3V)
* AM29LV033*2	: Dual AMD 29F033	(3.3V)
* AM29LV640	: AMD 29LV160	(3.3V, word mode)

* I28F001T	: Intel 28F001T	
* I28F001T*2	: Dual Intel 28F001T	
* I28F001B	: Intel 28F001B	
* I28F200BW	: Intel 28F200B	(word mode)
* I28F200BB	: Intel 28F200B	(byte mode)
* I28F200TW	: Intel 28F200T	(word mode)
* I28F200TB	: Intel 28F200T	(byte mode)
* I28F002B	: Intel 28F002B	
* I28F002T	: Intel 28F002T	
* I28F400BW	: Intel 28F400B	(word mode)
* I28F400BB	: Intel 28F400B	(byte mode)
I28F400TW	: Intel 28F400T	(word mode)
I28F400TB	: Intel 28F400T	(byte mode)

* I28F004B	: Intel 28F004B	
* I28F004T	: Intel 28F004T	
* I28F400B3B	: Intel 28F400B3B	Boot Block Smart3 Bottom
* I28F400B3T	: Intel 28F400B3T	Boot Block Smart3 Top
* I28F004S5	: Intel 28F004	FlashFile Smart3/5
* I28F800BW	: Intel 28F800B	(word mode)
* I28F800BB	: Intel 28F800B	(byte mode)
I28F800TW	: Intel 28F800T	(word mode)
* I28F800TB	: Intel 28F800T	(byte mode)
* I28F800B3B	: Intel 28F800B3B	Boot Block Smart3 Bottom
* I28F800B3T	: Intel 28F800B3T	Boot Block Smart3 Top
* I28F008B	: Intel 28F008B	
* I28F008T	: Intel 28F008T	
I28F008SA	: Intel 28F008	FlashFile 12V
I28F008SA*2	: Dual Intel 28F008	FlashFile 12V
I28F008S5	: Intel 28F008	FlashFile Smart3/5
I28F008S5*2	: Dual Intel 28F008	FlashFile Smart3/5
I28F016W	: Intel 28F016	FlashFile (word mode)
* I28F016B	: Intel 28F016	FlashFile (byte mode)
* I28F016S5	: Intel 28F016	FlashFile Smart3/5
* I28F160B3B	: Intel 28F160	Boot Block Smart3 Bottom
* I28F160B3T	: Intel 28F160	Boot Block Smart3 Top
* I28F160S5W	: Intel 28F160	FlashFile Smart5 (word mode)
* I28F160S5B	: Intel 28F160	FlashFile Smart5 (byte mode)
I28F320S5W	: Intel 28F320	FlashFile Smart3/5 (word mode)
* I28F320S5B	: Intel 28F320	FlashFile Smart3/5 (byte mode)
* I28F320J5W	: Intel 28F320	StrataFlash (word mode)
* I28F320J5B	: Intel 28F320	StrataFlash (byte mode)
* I28F320J3W	: Intel 28F320	StrataFlash (3.3V, word mode)
* I28F320J3B	: Intel 28F320	StrataFlash (3.3V, byte mode)
* I28F640J5W	: Intel 28F640	StrataFlash (word mode)
* I28F640J5B	: Intel 28F640	StrataFlash (byte mode)
* I28F640J3W	: Intel 28F640	StrataFlash (3.3V, word mode)
* I28F640J3B	: Intel 28F640	StrataFlash (3.3V, byte mode)
* I28F128J3W	: Intel 28F128	StrataFlash (3.3V, word mode)
* I28F128J3B	: Intel 28F128	StrataFlash (3.3V, byte mode)
* MBM29F200BW	: Fujitsu 29F200B	(word mode)
* MBM29F200BB	: Fujitsu 29F200B	(byte mode)
* MBM29F200TW	: Fujitsu 29F200T	(word mode)
* MBM29F200TB	: Fujitsu 29F200T	(byte mode)

* MBM29LV200BW	: Fujitsu 29LV200B	(3.3V, word mode)
* MBM29LV200BB	: Fujitsu 29LV200B	(3.3V, byte mode)
* MBM29LV200TW	: Fujitsu 29LV200T	(3.3V, word mode)
* MBM29LV200TB	: Fujitsu 29LV200T	(3.3V, byte mode)
* MBM29F002B	: Fujitsu 29F002B	
* MBM29F002SB	: Fujitsu 29F002SB	(TSOP40)
* MBM29LV002B	: Fujitsu 29LV002B	(3.3V)
* MBM29F002T	: Fujitsu 29F002T	
* MBM29F002ST	: Fujitsu 29F002ST	(TSOP40)
* MBM29LV002T	: Fujitsu 29LV002T	(3.3V)
* MBM29F040	: Fujitsu 29F040	
* MBM29F400BW	: Fujitsu 29F400B	(word mode)
* MBM29F400BB	: Fujitsu 29F400B	(byte mode)
* MBM29F400TW	: Fujitsu 29F400T	(word mode)
* MBM29F400TB	: Fujitsu 29F400T	(byte mode)
* MBM29LV400BW	: Fujitsu 29LV400B	(3.3V, word mode)
* MBM29LV400BB	: Fujitsu 29LV400B	(3.3V, byte mode)
* MBM29LV400TW	: Fujitsu 29LV400T	(3.3V, word mode)
* MBM29LV400TB	: Fujitsu 29LV400T	(3.3V, byte mode)
* MBM29LV004B	: Fujitsu 29LV004B	(3.3V)
* MBM29LV004T	: Fujitsu 29LV004T	(3.3V)
* MBM29F080	: Fujitsu 29F080	
* MBM29LV080	: Fujitsu 29LV080	(3.3V)
* MBM29F800BW	: Fujitsu 29F800B	(word mode)
* MBM29F800BB	: Fujitsu 29F800B	(byte mode)
* MBM29F800TW	: Fujitsu 29F800T	(word mode)
* MBM29F800TB	: Fujitsu 29F800T	(byte mode)
* MBM29LV800BW	: Fujitsu 29LV800B	(3.3V, word mode)
* MBM29LV800BB	: Fujitsu 29LV800B	(3.3V, byte mode)
* MBM29LV800TW	: Fujitsu 29LV800T	(3.3V, word mode)
* MBM29LV800TB	: Fujitsu 29LV800T	(3.3V, byte mode)
* MBM29LV008B	: Fujitsu 29LV008B	(3.3V)
* MBM29LV008T	: Fujitsu 29LV008T	(3.3V)
* MBM29F016	: Fujitsu 29F016	
* MBM29F016*2	: Dual Fujitsu 29F016	
* MBM29F017	: Fujitsu 29F017	
* MBM29F017*2	: Dual Fujitsu 29F017	
* MBM29F160BW	: Fujitsu 29LV160B	(word mode)
* MBM29F160BB	: Fujitsu 29LV160B	(byte mode)
* MBM29F160TW	: Fujitsu 29LV160T	(word mode)
* MBM29F160TB	: Fujitsu 29LV160T	(byte mode)

* MBM29F160BB*2	: Dual Fujitsu 29LV160B	(byte mode)
* MBM29F160TB*2	: Dual Fujitsu 29LV160T	(byte mode)
* MBM29LV160BW	: Fujitsu 29LV160B	(3.3V, word mode)
* MBM29LV160BB	: Fujitsu 29LV160B	(3.3V, byte mode)
* MBM29LV160TW	: Fujitsu 29LV160T	(3.3V, word mode)
* MBM29LV160TB	: Fujitsu 29LV160T	(3.3V, byte mode)
MBM29LV160BB*2	: Dual Fujitsu 29LV160B	(3.3V, byte mode)
* MBM29LV160TB*2	: Dual Fujitsu 29LV160T	(3.3V, byte mode)
MBM29F032	: Fujitsu 29F032	
MBM29F032*2	: Dual Fujitsu 29F032*2	

* M29F100BW	: ST 29F100B	(word mode)
* M29F100BB	: ST 29F100B	(byte mode)
* M29F100TW	: ST 29F100T	(word mode)
* M29F100TB	: ST 29F100T	(byte mode)
M29F200BW	: ST 29F200B	(word mode)
* M29F200BB	: ST 29F200B	(byte mode)
* M29F200TW	: ST 29F200T	(word mode)
* M29F200TB	: ST 29F200T	(byte mode)
* M29F040	: ST 29F040	
* M29F040*2	: Dual ST 29F040	
* M29W040	: ST 29W040	(3.3V)
* M29W040*2	: Dual ST 29W040	(3.3V)
* M29F400BW	: ST 29F400B	(word mode)
* M29F400BB	: ST 29F400B	(byte mode)
* M29F400TW	: ST 29F400T	(word mode)
* M29F400TB	: ST 29F400T	(byte mode)
* M29W400BW	: ST 29W400B	(3.3V, word mode)
* M29W400BB	: ST 29W400B	(3.3V, byte mode)
* M29W400TW	: ST 29W400T	(3.3V, word mode)
* M29W400TB	: ST 29W400T	(3.3V, byte mode)
* M29W004B	: ST 29W004B	(3.3V)
* M29W004T	: ST 29W004T	(3.3V)
* M29F800BW	: ST 29F800B	(word mode)
* M29F800BB	: ST 29F800B	(byte mode)
* M29F800TW	: ST 29F800T	(word mode)
* M29F800TB	: ST 29F800T	(byte mode)

The flash devices signed with ´*´ are not yet tested.

2. JTAGEL5 Parameter Description

When you start JTAGEL5.EXE without any parameters the following help screen with all possible functions and options is displayed:

```
JTAGEL5 --- JTAG utility for the AMD ÉlanSC520
Copyright © FS FORTH-SYSTEME GmbH, Breisach
Version 3.0 of mm/dd/yyyy

Programming of Flash-EPROMs and Debugging on targets with the
AMD ÉlanSC520.

The JTAG-Booster is needed to connect the parallel port of the PC
to the JTAG port of the AMD ÉlanSC520.

Usage: JTAGEL5 /function [filename] [/option_1] ... [/option_n]
Supported functions:
    /P          : Programming a Flash Device
    /R          : Read a Flash Device to file
    /V          : Verify a Flash Device with file
    /DUMP       : Make a target dump
    /PI2C       : Program an I2C Device with file
    /RI2C       : Read an I2C Device to file
    /VI2C       : Verify an I2C Device with file
    /DUMPI2C    : Make a dump of an I2C Device
    /BLINK      : Toggle a CPU pin
    /PIN?       : Test a CPU pin
    /SAMPLE     : Test a CPU pin while CPU is running
    /LIST       : Print a list of supported Flash devices

Supported Options:
/BOOTCS      /ROMCS1      /ROMCS2      /NOCS        /WRSETUP
/VERIFY      /TOP         /PAUSE       /P           /NODUMP
/NOERASE     /LATTICE     /ERASEALL    /LPT1        /LPT2
/LPT3        /LPT-BASE=   /16BIT       /8BIT        /NOMAN
/32H         /32L         /MBUS        /LENGTH=     /L=
/FILE-OFFSET=             /FO=         /OFFSET=     /O=
/DELAY=      /DEVICE-BASE=             /DB=         /DRIVER=
/DATA-MASK=  /DM=         /IROFFS=     /CPUPOS=     /DEVICE=
/PIN=        /I2CCLK=     /I2CDAT=     /I2CDATI=    /I2CDATO=
/WATCH=      /OUT=        /INI=
```

The following options are valid for most functions:

/DRIVER=x with x = 1,2,3,4
A driver for the interface to the JTAG-BOOSTER on the parallel port may be specified. /DRIVER=1 selects the fastest available driver, /DRIVER=4 selects the slowest one. Use a slower driver if there are problems with JTAG-BOOSTER.
Default: /DRIVER=3

/INI=file
An initialization file may be specified. By default the current directory is searched for the file JTAGEL5.INI. If this file is not found and no initialization file is specified in the command line, default initialization values are used (see also chapter 1.6 “Initialization file JTAGEL5.INI”).
Default: /INI=JTAGEL5.INI

/LATTICE
For demonstration purposes this software works with the Lattice ispLSI-Adapter, too. With the option /LATTICE you can simulate the speed achievable with the simple ispLSI-Adapter.

/LPT1 /LPT2 /LPT3
A printer port may be specified where the JTAG-Booster resides.
Default: /LPT1

/LPT-BASE
The physical I/O-Address of printer port may be specified instead of the logical printer name.

/OUT=file_or_device
All screen outputs are redirected to the specified file or device. Note that you can't redirect to the same parallel port where the JTAG-Booster resides.
Default: /OUT=CON

/PAUSE
With the option /PAUSE you can force the program to stop after each screen. Please do not use this option if you redirect the output to a file.
Abbreviation: /P

/WATCH=
With the option /WATCH= a pin can be specified, which is toggled twice per second, while the program is active. This pin may be the trigger of a watchdog. This pin must be specified as output in the initialization file.

2.1.Programming a Flash Device

Usage: JTAGEL5 /P filename [optionlist]

The specified file is programmed into the flash memory. Finally a complete verify is done, if the option /VERIFY is omitted. If the verify fails, the contents of the flash memory is written to a file with the extension DMP.

The type of the flash device is normally detected by the software. When autodetect fails you should use the /DEVICE= option to set the right flash device. The known devices are shown in chapter 1.7 “Supported flash devices”.

Options:

/DEVICE=devicename
The device is detected automatically by switching to autoselect mode. In case of trouble you should select the device by using this parameter to avoid autodetection.

/NOMAN
If you use a flash device which is identical to one of the supported parts, but is from a different manufacturer, with this option you can suppress the comparison of the manufacturer identification code. We recommend to use this option together with the /DEVICE= option to avoid failures in autodetection.

/DEVICE-BASE=hhhhhh[1]
By default a device start address of 3000000h (=48MByte) is used for accesses to the flash device.
Default: /DEVICE-BASE=3000000
Abbreviation: /DB=

/OFFSET=hhhhhh
The programming starts at an offset of hhhhhh relative to the start address of the flash device. If the offset is negative, the offset specifies an address relative to the end of the flash device. See also option /TOP
Default: /OFFSET=0
Abbreviation: /O=

[1] hhhhhh=number base is hex

/TOP
If the option /TOP is used the option /OFFSET= specifies the address where the programming ends (plus one) instead of the starting address. This option is very important for Intel CPU architectures, because target execution always starts at the top of the address space.

/FILE-OFFSET=hhhhhh
If FILE-OFFSET is specified, the first hhhhhh bytes of the file are skipped and not programmed to target.

Default:	/FILE-OFFSET=0
Abbreviation:	/FO=

/LENGTH=hhhhhh
The number of programmed bytes may be limited to LENGTH. If no LENGTH is specified the whole file is programmed.

Default:	/LENGTH=4000000 (64 MByte)
Abbreviation:	/L=

/VERIFY
If this option is specified, the result is verified on a cell by cell (cell=8bit or 16bit) basis instead of a complete verify after programming. If you want both a cell by cell verify and a complete verify after programming, please use a additional command line with the verify function. See chapter 2.3 “Verify a Flash Device with file”.

/NODUMP
In case of a verify error the contents of the flash memory is written to a file with the extension .DMP. With /NODUMP you can suppress this feature.

/ERASEALL
Erase the whole flash device. If this option isn't set, only those blocks are erased where new data should be written to.

/NOERASE
This option prevents the flash device from being erased.

/BOOTCS /ROMCS1 /ROMCS2
This options may be used to specify one or more chip select signals to the flash memory. The used chip selects must be defined as output and inactive in the initialization file. (See chapter 1.6 “Initialization file JTAGEL5.INI”.)
Default: /BOOTCS

/NOCS
Use this option to switch off all chip select signals. This may be necessary if the device's chip select is generated via a normal decoder instead of using the AMD ÉlanSC520 chip select unit.

/8BIT /16BIT
Specifies the bus interface to the target device. You can speed up autodetection, if you specify the correct bus interface width.

/32L /32H
The JTAG-Booster is not able to handle the interface to a dual 16bit ROM (32bit-ROM). With this two options you can select one 16 bit half of a 32bit-ROM. The option /32L selects the low word and /32H selects the high word. 32 bit flash eproms are always connected to the SDRAM data bus. It is not necessary to specify the option /MBUS if the option /32L or /32H is used. Do not specify the option /8BIT together with /32L or /32H.

/MBUS
With this option the SDRAM data bus (MDx bus) is used instead of the general purpose data bus (GPDx bus) for accesses to flash eproms.

/WRSETUP
By default write cycles to the Flash EPROM start with address, data and write strobe set at the same time. With the option /WRSETUP you can force the program to generate a setup time for address and data with respect to the write strobe.

Examples:

```
JTAGEL5  /P  ROMDOS.ROM  /VERIFY  /L=20000  /TOP
```

This example programs up to 128 Kbytes of the file ROMDOS.ROM (with i.e. 512 Kbytes) to the top of the flash memory.

```
JTAGEL5  /P  CE.EVN  /VERIFY  /32L  /ROMCS1
```

This example programs the file CE.EVN to the lower word of a 32bit-ROM connected to ROMCS1#.

2.2.Read a Flash Device to file

Usage: JTAGEL5 /R filename [optionlist]

The contents of a flash device is read and written to a file.

The type of flash device is normally detected by the software. When autodetect fails you should use the /DEVICE= option to set the right flash device. The known devices are shown in chapter 1.7 “Supported flash devices”.

Options:

/DEVICE=devicename
See function /P (Chapter 2.1)

/NOMAN
See function /P (Chapter 2.1)

/DEVICE-BASE=hhhhhh[2]
See function /P (Chapter 2.1)

/OFFSET=hhhhhh
Reading of the flash memory starts at an offset of hhhhhh relative to the start address of the flash device. If the offset is negative, the offset specifies a address relative to the end of the flash device.
See also option /TOP.

Default:	/OFFSET=0
Abbreviation:	/O=

/TOP
If the option /TOP is used the option /OFFSET= specifies the address where reading ends (plus one) instead of the starting address.

/LENGTH=hhhhhh
The number of read bytes may be limited to LENGTH. If no LENGTH is specified the whole flash device is read (if no offset is specified).

[2] hhhhhh=number base is hex

/BOOTCS /ROMCS1 /ROMCS2 /NOCS
See function /P (Chapter 2.1)

/8BIT /16BIT
See function /P (Chapter 2.1)

/32L /32H
See function /P (Chapter 2.1)

/MBUS
See function /P (Chapter 2.1)

/WRSETUP
See function /P (Chapter 2.1)
Please note: In the function /R write cycles are needed to detect the type of the flash memory.

Example: JTAGEL5 /R BIOS.ABS /L=10000 /TOP

This example may be used to read the upper most 64 Kbyte of the flash memory to the file BIOS.ABS.

2.3.Verify a Flash Device with file

Usage: JTAGEL5 /V filename [optionlist]

The contents of a flash device is compared with the specified file. If there are differences the memory is dumped to a file with the extension DMP.

The type of flash device is normally detected by the software. When autodetect fails you should use the /DEVICE= option to set the right flash device. The known devices are shown in chapter 1.7 “Supported flash devices”.

Options:

/DEVICE=devicename
See function /P (Chapter 2.1)

/NOMAN
See function /P (Chapter 2.1)

/DEVICE-BASE=hhhhhh
See function /P (Chapter 2.1)

/OFFSET=hhhhhh
See function /P (Chapter 2.1)

/TOP
See function /P (Chapter 2.1)

/FILE-OFFSET=hhhhhh
See function /P (Chapter 2.1)

/LENGTH=hhhhhh
See function /P (Chapter 2.1)

/NODUMP
See function /P (Chapter 2.1)

/BOOTCS /ROMCS1 /ROMCS2 /NOCS
See function /P (Chapter 2.1)

/8BIT /16BIT
See function /P (Chapter 2.1)

/32L /32H
See function /P (Chapter 2.1)

/MBUS
See function /P (Chapter 2.1)

/WRSETUP
See function /P (Chapter 2.1)
Please note: In the function /V write cycles are needed to detect the type of the flash memory.

Example: JTAGEL5 /V ROMDOS.ROM /L=20000 /TOP

This example may be used to verify the upper most 128 Kbytes of the flash memory with the file ROMDOS.ROM (with i.e. 512 Kbytes).

2.4.Dump target memory

Usage: JTAGEL5 /DUMP [optionlist]

A Hex-Dump of the target memory is printed on the screen, if not redirected to file or device.

Options:

/OFFSET=hhhhhh
The memory dump starts at an offset of hhhhhh.
Default: /OFFSET=0
Abbreviation: /O=

/TOP
If the option /TOP is used the option /OFFSET= specifies the address where the dump ends (plus one) instead of the starting address

/LENGTH=hhhhhh
Default: /LENGTH=100
Abbreviation: /L=

/BOOTCS /ROMCS1 /ROMCS2 /NOCS
See function /P (Chapter 2.1)
Default: /BOOTCS

/8BIT /16BIT
Default: /16BIT

/32L /32H
See function /P (Chapter 2.1)

/MBUS
See function /P (Chapter 2.1)

Example: JTAGEL5 /DUMP /BOOTCS

This example makes a memory dump of the first 256 bytes of the Boot-EPROM.

2.5.Program an I²C-Device

Usage: JTAGEL5 /PI2C filename [optionlist]

The specified file is programmed to a I²C-Device (i.e. a serial EEPROM) connected to pins of the CPU. Finally a complete verify is done. If the verify fails, the contents of the I²C-Device is written to a file with the extension DMP.

Two methods to connect the I²C-Device to the CPU are supported. The first method is to use two CPU pins, one pin for clock output (I2CCLK) and one pin for serial data input and output (I2CDAT). The second method is to use one pin for clock output (I2CCLK), one for serial data input (I2CDATI) and one for serial data output (I2CDATO).

Options:

/DEVICE-BASE=hhhhhh[3]
By default a device start address of 3000000h (=48MByte) is used for accesses to the flash device.

Default:	/DEVICE-BASE=3000000
Abbreviation:	/DB=

/OFFSET=hhhhhh
The programming starts at an offset of hhhhhh relative to the start address of the I²C-Device.

Default:	/OFFSET=0
Abbreviation:	/O=

/FILE-OFFSET=hhhhhh
If FILE-OFFSET is specified, the first hhhhhh bytes of the file are skipped and not programmed to target.

Default:	/FILE-OFFSET=0
Abbreviation:	/FO=

[3] hhhhhh=number base is hex

/LENGTH=hhhhhh
The number of programmed bytes may be limited to LENGTH. If no LENGTH is specified the whole file is programmed.
Abbreviation: /L=

/NODUMP
In case of a verify error the contents of the I²C-Device is written to a file with the extension .DMP. With option /NODUMP you can suppress this feature.

/I2CCLK=pin_name
Specifies the CPU pin used for serial clock output.

/I2CDAT=pin_name
Specifies the CPU pin used for serial data input and output. Pin_name must specify a bidirectional pin otherwise an error message occurs. Instead of one bidirectional pin one pin for serial data input and one for serial data output may be used. See option /I2CDATO= and /I2CDATI= .

/I2CDATO=pin_name
Specifies the CPU pin used for serial data output. Pin_name must specify a output pin otherwise an error message occurs.

/I2CDATI=pin_name
Specifies the CPU pin used for serial data input. Pin_name must specify a input pin otherwise an error message occurs.

Example: JTAGEL5 /PI2C EEPROM.CFG /I2CCLK=PIO31 /I2CDAT=PIO30

This example loads the file EEPROM.CFG to a serial EEPROM connected to the pins PIO31 and PIO30 of the AMD ÉlanSC520

2.6.Read an I²C-Device to file

Usage: JTAGEL5 /RI2C filename /L=hhhhhh [optionlist]

The contents of a I²C-Device (i.e. a serial EEPROM) is read and written to a file. The option /LENGTH= must be specified.

Options:

/DEVICE-BASE=hhhhhh[4]
See function /PI2C (Chapter 2.5)

/OFFSET=hhhhhh
Reading of the I²C-Device starts at an offset of hhhhhh relative to the start address of the I²C-Device.

Default:	/OFFSET=0
Abbreviation:	/O=

/LENGTH=hhhhhh
The number of read bytes must be specified otherwise an error message occurs.
Abbreviation: /L=

/I2CCLK=pin_name
See function /PI2C (Chapter 2.5)

/I2CDAT=pin_name
See function /PI2C (Chapter 2.5)

/I2CDATO=pin_name
See function /PI2C (Chapter 2.5)

/I2CDATI=pin_name
See function /PI2C (Chapter 2.5)

[4] hhhhhh=number base is hex

Example: JTAGEL5 /RI2C EEPROM.CFG /I2CCLK=PIO31 /I2CDAT=PIO30 /L=100

This example reads 256 bytes from a serial EEPROM to the file EEPROM.CFG. The serial EEPROM is connected to the pins PIO31 and PIO30 of the AMD ÉlanSC520.

2.7.Verify an I²C-Device with file

Usage: JTAGEL5 /VI2C filename [optionlist]

The contents of a I²C-Device (i.e. a serial EEPROM) is compared with the specified file. If there are differences the contents of the I2C-Device is written to a file with the extension DMP.

Options:

/DEVICE-BASE= hhhhhh[5]
See function /PI2C (Chapter 2.5)

/OFFSET=hhhhhh
See function /PI2C (Chapter 2.5)

/FILE-OFFSET=hhhhhh
See function /PI2C (Chapter 2.5)

/LENGTH=hhhhhh
See function /PI2C (Chapter 2.5)

/NODUMP
See function /PI2C (Chapter 2.5)

/I2CCLK=pin_name
See function /PI2C (Chapter 2.5)

/I2CDAT=pin_name
See function /PI2C (Chapter 2.5)

/I2CDATO=pin_name
See function /PI2C (Chapter 2.5)

/I2CDATI=pin_name
See function /PI2C (Chapter 2.5)

[5] hhhhhh=number base is hex

Example: JTAGEL5 /VI2C EEPROM.CFG /I2CCLK=PIO31 /I2CDAT=PIO30

This example verifies 256 bytes from a serial EEPROM with the file EEPROM.CFG. The serial EEPROM is connected to the pins PIO31 and PIO30 of the AMD ÉlanSC520.

2.8.Dump an I^{2}C-Device

Usage: JTAGEL5 /DUMPI2C [optionlist]

A Hex-Dump of a I^{2}C-Device is printed on the screen, if not redirected to file or device.

Options:

/OFFSET=hhhhhh[6]
The memory dump starts at an offset of hhhhhh.
Default: /OFFSET=0
Abbreviation: /O=

/LENGTH=hhhhhh
Default: /LENGTH=100
Abbreviation: /L=

/I2CCLK=pin_name
See function /PI2C (Chapter 2.5)

/I2CDAT=pin_name
See function /PI2C (Chapter 2.5)

/I2CDATO=pin_name
See function /PI2C (Chapter 2.5)

/I2CDATI=pin_name
See function /PI2C (Chapter 2.5)

Example: JTAGEL5 /DUMPI2C /I2CCLK=PIO31 /I2CDAT=PIO30

This example makes a memory dump of the first 100h bytes of a serial EEPROM connected to the CPU.

[6] hhhhhh=number base is hex

2.9.Toggle CPU pins

Usage: JTAGEL5 /BLINK /PIN=pinname [optionlist]

This command allows to test the hardware by blinking with LEDs or toggling CPU signals. Faster signals can be generated by setting the delay option to zero. This can be a very helpful feature to watch signals on an oscilloscope.

Please Note: Not every pin of the AMD ÉlanSC520 may be specified as an output pin.

Options:

/PIN=pin_name
CPU pin to toggle. If the option /PIN= is not specified an error message occurs. Most pins of the list in chapter 1.6 “Initialization file JTAGEL5.INI” can be used. If you type /PIN= without any pin declaration a list of the CPU pins is displayed.

/DELAY=dddddd[7]
Time to wait to next change of signal. This option can be adjusted to get optimum signals for measures with the oscilloscope.
Default: /DELAY=10000

Example: JTAGEL5 /BLINK /PIN=CS0# /DELAY=0

This example toggles the CS0# pin very fast which can be followed by the use of an oscilloscope.

[7] dddddd=number base is decimal

2.10. Polling CPU pins

Usage: JTAGEL5 /PIN? /PIN=pinname [optionlist]

This command allows to test the hardware by polling CPU signals.

Please Note: Not every pin of the AMD ÉlanSC520 may be specified as an input pin.

Options:

/PIN=pin_name
CPU pin to poll. If the option /PIN= is not specified an error message occurs. Most pins of the list in chapter 1.6 “Initialization file JTAGEL5.INI” can be used. If you type /PIN= without any pin declaration a list of the CPU pins is displayed.

Example: JTAGEL5 /PIN? /PIN=PWRGOOD

This example samples the reset pin of the AMD ÉlanSC520.

2.11. Polling CPU pins while the CPU is running

Usage: JTAGEL5 /SAMPLE /PIN=pinname [optionlist]

This command is similar to the function /PIN?. But with this function any pin can be observed, independent of the pin direction. Furthermore the CPU remains in normal operation.

Options:

/PIN=pin_name
CPU pin to poll. If the option /PIN= is not specified an error message occurs. All pins of the list in chapter 1.6 "Initialization file JTAGEL5.INI" can be used. If you type /PIN= without any pin declaration a list of the CPU pins is displayed.

Example: JTAGEL5 /SAMPLE /PIN=PITOUT2

This example samples the state of the port pin PITOUT2 (=signal for the speaker) while the AMD ÉlanSC520 is running.

2.12. List of supported Flash Devices

Usage: JTAGEL5 /LIST [optionlist]

This command lists all supported flash devices to screen if not redirected to file or device. Flash devices signed with ´*´ are not yet tested.

3. Implementation Information

This chapter summarizes some information about the implementation of the JTAG-Booster and describes some restrictions.

- The JTAG-Booster currently uses the EXTEST function of the JTAG-Interface to perform Flash programming. The new debug interface of the AMD ÉlanSC520 is not used.

- The revision A0 and A1 of the AMD ÉlanSC520 have a silicon bug with the JTAG identification register. As a result of that bug, the contents of the identification register is shifted out infinitely. If there are other devices in the JTAG chain, the AMD ÉlanSC520 must be the first part in the chain (nearest to targets TDI). Otherwise the JTAG-Booster does not work.