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## AX8052 Production Programming



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### APPLICATION NOTE

#### Introduction

The standard DVK Debug Adapter not only serves development needs, it may also be used in production for in circuit programming, thanks to the scriptability of its supporting software. This application note describes this usage mode.

#### Hardware Requirements

Figure 1 shows the DVK Debug Adapter and the debug connector pinout. Customer hardware needs to make provisions to connect at least GND, PB6, PB7, DBG\_EN and RST\_N to the debug adapter. PB3 is recommended, but

not strictly required. The customer circuit may either be powered from the debug adapter (provided it requires less than 50 mA), or be powered by customer circuitry. In the latter case, customer circuitry must ensure that the device is powered during the entire programming process.



Figure 1. DVK Debug Adapter

Conn	Signal	Chip
8	VIO	22
7	PB3	15
6	GND	PAD
5	PB6 (DBG_CLK)	18
4	PB7 (DBG_DATA)	19
3	GND	PAD
2	RST_N	21
1	DBG_EN	20

#### Software Usage

Axsem provides a command line tool that makes the programming process fully scriptable. In order to run the commands described below, a command shell must be opened (Win+R cmd8 under some versions of Windows).

The basic command to program the microcontroller FLASH memory is as follows:

```
axsdb.exe --oldkeys key --newkey key --flashprog file
```

*file* is the file name (including the path) to the file containing the microcontroller code. It may either be an Intel Hex file (extension .hex), an OMF-51 file (extension .omf), or an UBROF 10 file (extension .ubr). The file is usually located in the bin\Release subdirectory of the AxCodeBlocks project. If using SDCC, either the .hex or the .omf file may be used interchangeably. If using IAR ICC, then only the .ubr file is generated.

*key* is a 64 bit hexadecimal number (format 0x0123456789abcdef). This option locks the debug interface to unauthorized access. After this command succeeds, the debug interface may no longer be accessed unless the key number is known. It is strongly recommended

that customer chooses a random number for key and keeps it secret.

The command returns success / failure status as exit code. The exit code is stored in the pseudo variable %errorlevel%. It is 0 on success and 1 on failure.

Another useful command is the following, which sends a reset pulse to the microcontroller:

```
axsdb.exe --hwreset
```

If it is desired to reset the key of a locked microcontroller, the following command can be used:

```
axsdb.exe --oldkeys key --newkey 0xffffffffffff  
--flashprog file
```

It is important that whenever the flash is programmed, --oldkeys key1,key2... is given with all possible keys the microcontroller could be locked with. Otherwise, calibration data is lost.

#### Gang Programming

In order to program multiple devices at the same time using a single PC, multiple debug adapters may be

## AND9330/D

connected (for example by using a USB hub) to the same PC. Note however that Debug Adapters shipped by Axsem all contain the same serial number (2 or 3), so they are not distinguishable out of the box.

It is, however, possible to reprogram the serial number to another number as follows. First disconnect all debug adapters, and then reconnect only the debug adapter you intend to reprogram. Then run the following command (changing the number as desired):

```
axftdieeprog.exe -p -f -s 4 -B
```

-s 4 sets the desired serial number to 4. All Debug Adapters must be programmed to different serial numbers. After this command succeeds, disconnect and reconnect the debug adapter. The debug adapter should now respond under the newly programmed serial number.

```
axsdb.exe --listserials
```

may be used to verify. This command prints out the serial numbers of all connected debug adapters.

Repeating this preparatory action for all debug adapters with different serial numbers makes the adapters individually addressable by axsdb.


In order to program the microcontroller on a specific debug adapter (say number 4), use the following command:

```
axsdb.exe --serial 00000004 --oldkeys key --newkey key --flashprog file
```

By using the multitasking capabilities of the operating system and opening as many command prompts as there are debug adapters, axsdb.exe may be run multiple times in parallel, each instance addressing a different debug adapter.

### Conclusion

This application note discussed how to use the Axsem DVK Debug Adapter in a production environment. Multiple Debug Adapters may be connected to the same PC to provide Gang programming support.

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