



DOMAIN TECHNOLOGIES INC.

Users Guide Version 2.1

Flash-56k

Flash Memory Programming

Flash-56k Users Guide
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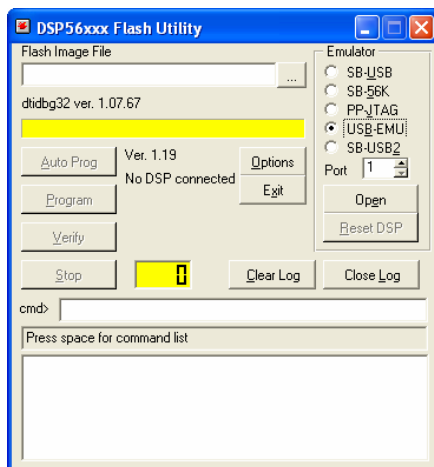
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1 Introduction

The FLASH-56K is a stand-alone desk-top utility application that can be used in combination with either the SB-USB, SB-56K or USB-EMU emulators for production programming of the internal Flash memory of Motorola DSP56F8xx family DSPs. FLASH-56K directly accepts both standard Motorola S-record and/or Code Warrior ELF format image files for programming of the DSP56F8xx DSP's internal flash memory. A special Programmer options window allows the utility to be configured by the user to generate a log file, verify programmed flash memory, select the maximum JTAG TCK clock frequency, as well as start and/or force a reset of the DSP after programming.

A Scan configuration window allows the user to add or delete up to 255 devices to the JTAG scan chain and to select which of the devices are to be programmed with the specified image file. Within the Scan configuration window the user can also specify whether a given device is a DSP56800 or a generic device. If generic, the JTAG IR register length is specified for a given device in the scan chain. Devices added to the scan chain are depicted in the Scan configuration window with the device closest to the JTAG TDO pin listed at the top, and the device closest to TDI pin listed at the bottom.

1.1 Features

The Flash-56k has the following features:

- Programs on-chip flash for DSP56F8xx devices
- Programs off-chip flash for DSP563xx devices
- Simple graphical user interface (GUI)
- Supports USB-EMU, SB-USB2, SB-USB, SB-56K emulators
- Reads Metrowerks .elf for DSP56F8xx or binary image for DSP563xx

1.2 Package Contents

The Flash56k ships with the following:

- Software CD
- Users Guide

1.3 Related Components

The following emulators are supported with your Flash-56k Utility Program:

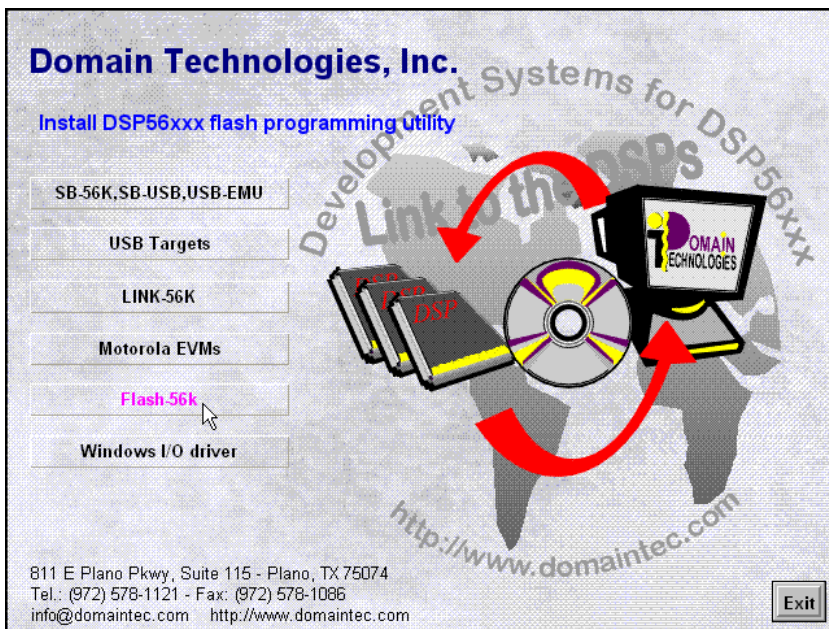
Emulator	Description
SB-USB2-DSP	FLASH programming via high performance, JTAG/OnCE emulator for Freescale/Motorola DSP 56xxxx; USB2 interface
SB-USB	FLASH memory programming via SB-USB emulator universal
USB-EMU	FLASH programming via JTAG/OnCE emulator for Freescale/Motorola DSP 56xxxx; USB interface
SB-56K	FLASH memory programming via SB-56K emulator RS-232 serial port

Additional items:

- BoxView Debugger

For more information contact Domain Technologies or review www.domaintec.com.

2 Installation



To install the **Flash-56K** utility software on Windows 2000 or XP, select the *Flash-56k* button. If the installation program shown above does not display automatically, the following can be executed

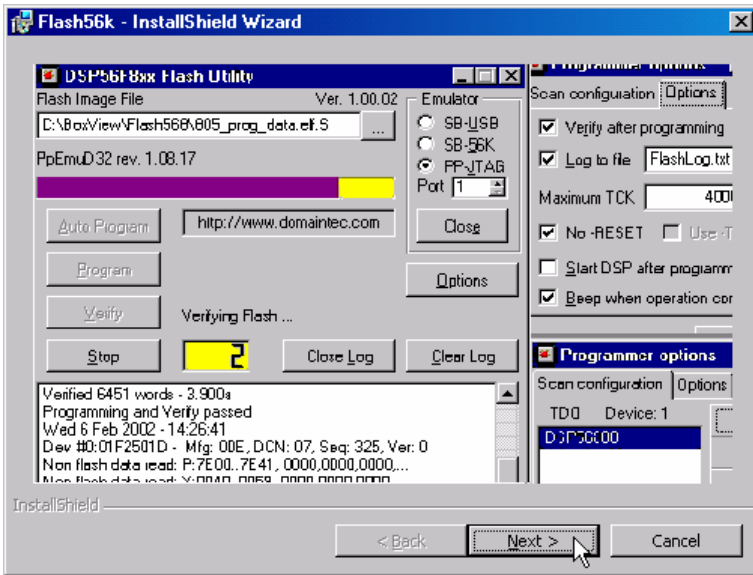
Option	Description
Flash56k:	<CD Drive:>\Flash56k\disk1\setup.exe
PP-JTAG I/O Driver	<CD Drive:>\BvNtDrv\disk1\setup.exe

The standard USB driver is provided on the CD in the Win2000 directory to support USB. For the Windows NT systems only PP-JTAG (printer port) or SB-56K (RS-232) pods can be used, since there is no USB support. The Windows I/O driver allows the Flash-56k software to access the PP-JTAG through PC's printer port. The computer's printer port must be configured with one of the following settings:

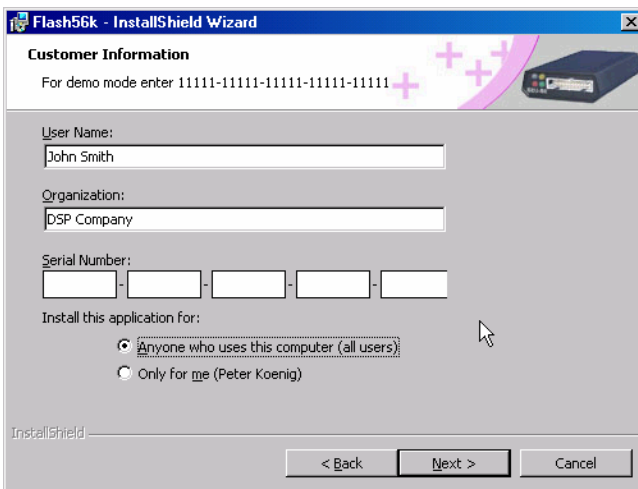
- Standard
- Bi-directional
- EPP

The ECP mode is currently not supported.

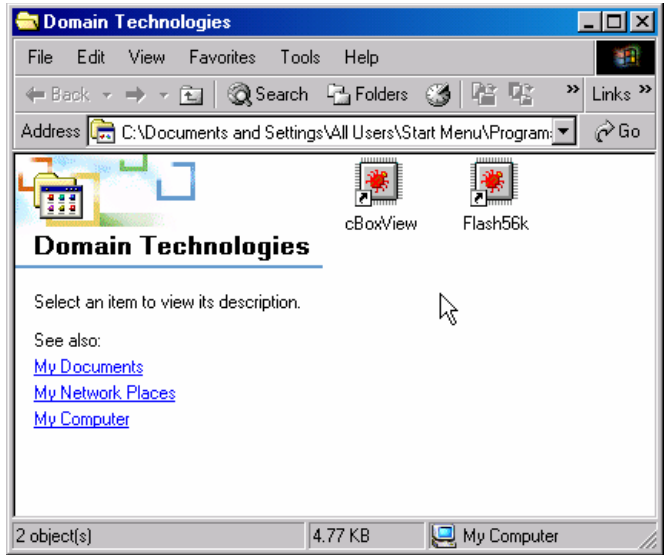
Once installation is initiated, simply follow the menu, advancing through each step by clicking on the *Next* button, until finished. The following graphic should be visible once the installation begins:



The installation requires the *User Name*, *Organization*, and *Serial Number*. Your unique serial number is located on the inside cover of the CD envelope.



After the installation is completed, two items will be added to the Start menu under **Domain Technologies, Inc:**

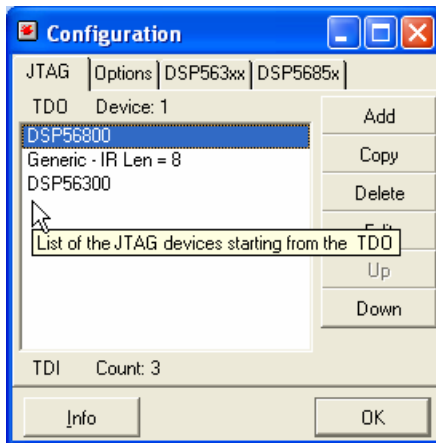


Start Menu	Description
Flash56k:	Graphical user interface for flash programming,
cBoxView	Console application for running command files which provides more control over the target DSP without use of a graphical user interface.

3 Flash-56k Configuration

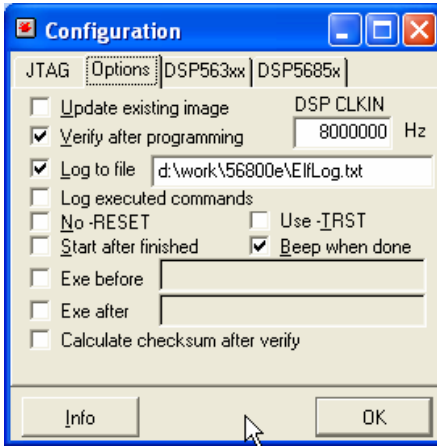
Initially, the JTAG scan-chain needs to be configured. The programming utility supports any JTAG configuration, so there can be multiple JTAG devices on the same JTAG scan-chain with the exception of the 56800E family. The 56800E programming operation limits only one device being connected to the emulator. The emulation interface relies on the data shift feature, and no other devices can be present on the JTAG scan chain during programming. For the boundary scan operations, 56800E devices can be connected with any other components.

To access the JTAG configuration dialog, select the *Options* button, then select the *JTAG* tab:



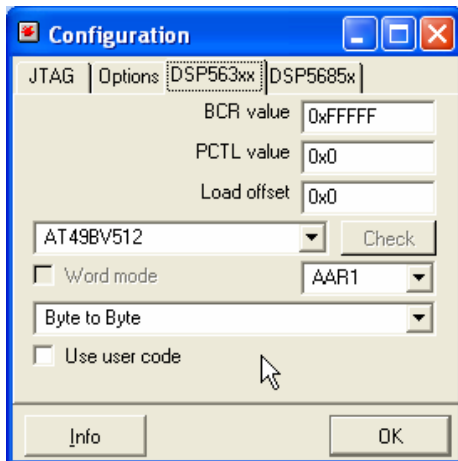
Note- the devices are listed in the order from the TDO to the TDI of the JTAG emulator. The device closest to the TDO is the first device. Highlighted device will be used for the programming operation.

The *Options* tab of the Configuration dialog lists the available programming options:



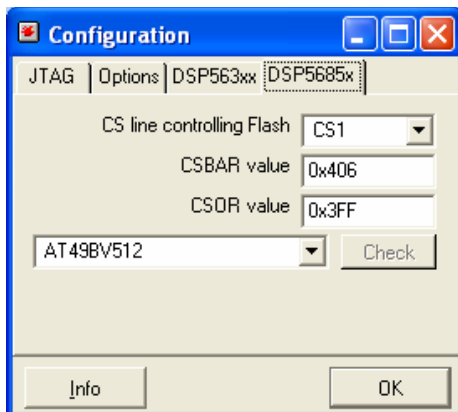
Option	Description when Enabled
Update existing image	The target device will not be erased before programming. This allows the modification of an existing flash ROM image.
Verify after Programming	Executes the full read back procedure and compares it with the original image. This increases the programming time, but will indicate any programming errors.
Log to file	Programming operations are logged into associated text file
No-RESET	Disables the use of the hardware RESET signal before programming; tries to get the device into the debug mode with the Debug Request (Halt) command.
Use-TRST	The optional JTAG signal is toggled before programming or verification
Start after finished	Starts executing the programmed code into the devices flash ROM
Beep when done	Activates the system's sound after programming operation is finished; this alerts the operator the utility is available to program other devices.
Exe before	Execute sequence of specified BoxView debugger commands
Exe after	Execute sequence of specified BoxView debugger commands
Calculate checksum after verify	Reads back whole flash contents and calculates a simple checksum

Use the *DSP563xx* tab to program the external flash on the DSP563xx:

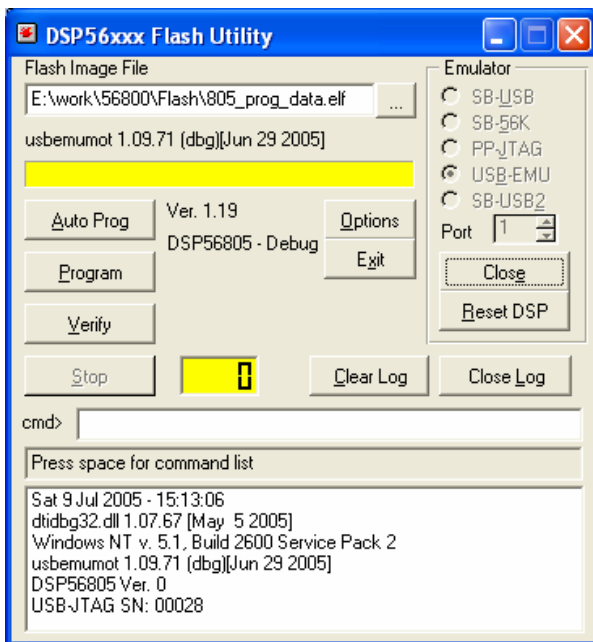


The DSP563xx tab allows setting of DSP56300 specific options; thus, allowing the programming of the external Flash devices by way of executing helper code on the DSP.

Use the *DSP5685x* tab to program the serial flash on 5685x devices:



4 Flash-56k Operation



The user interface of the Flash-56k is shown above. When the proper interface type is selected, and the “Open” button is pressed, the Flash-56K software should detect which type of DSP is attached to the 14-pin JTAG cable. For the USB devices, port number indicates which device should be used in case multiple interfaces are connected to the same PC. The above image illustrates USB-EMU interface connected to the DSP56F805 device. The flash programming image can be provided for the DSP56800 and DSP56800E devices as an ELF or SREC file. For programming of the external flash devices, a binary image is required. If needed, please contact support@domaintec.com for additional information.

The *Auto Program* option will wait for the device to disconnect and the other device to connect. This allows multiple devices to be programmed without pressing the *Program* button of the user interface. Device connect state is detected by the scanning of the JTAG’s IDCODE.

There are also basic troubleshooting commands available through the *cmd*> entry field. Memory can be displayed with the **DM** command:

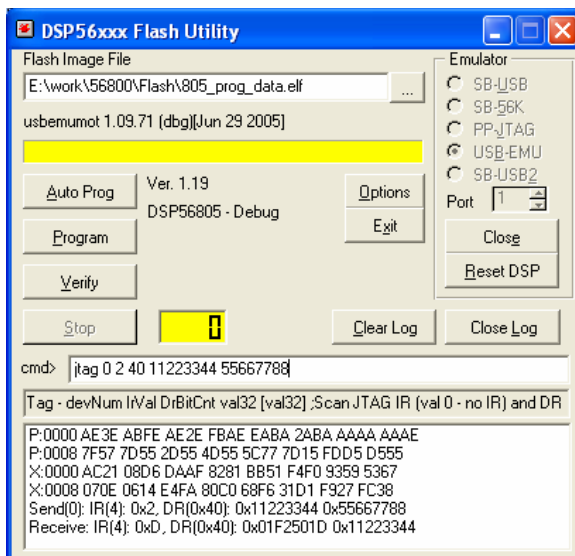
DM P:0#20

In addition, there is access to the low level JTAG commands, allowing IR and DR scans. The following example illustrates the JTAG command syntax:

JTAG devNum IRcmd DRlen DRdata1 [DRdatan]

Parameter	Description
devNum	Device number on the JTAG scan chain with number 0 closest to TDO.
IRcmd	Fixed length IR scan. A value of 0 disables the IR scan.
DRlen	Number of bit to be scanned through the DR-scan.
Drdata1- DRdatan	When DRlen is value is non-zero, this contains one or more 32-bit words with data values

All numbers are hexadecimal. The picture below shows the scan of the JTAG's IDCODE. 32-bit of the IDCODE are followed by the 32 bits shifted into the TDI during the DR scan. The captured IR scan value is shown as 0xD, indicating DSP device in the DEBUG mode.





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