



# Twin Tec

## User Instructions for Mega Boot Programmer Software for TCFI II, TCFI III, and VRFI Fuel Injection Controllers

**CAUTION: CAREFULLY READ INSTRUCTIONS BEFORE PROCEEDING. THE USER IS ASSUMED TO BE FAMILIAR WITH MICROSOFT WINDOWS AND PC OPERATION.**

### INTRODUCTION

This instruction sheet covers the Mega Boot Programmer utility used to reprogram application firmware within Twin Tec TCFI II, TCFI III, and VRFI fuel injection controllers. **The term TCFI is used as a generic term to refer to these products throughout this instruction sheet.**

The Mega Boot Programmer utility runs under Microsoft Windows 98/ME/XP/Vista. This utility allows reprogramming the application firmware contained on the Atmel ATmega RISC microcontroller used within all TCFI units. The ATmega microcontroller has a special self programming function using what is commonly referred to as a 'boot loader.' The boot loader is a permanent module of firmware code that allows updating the application firmware by means of the PC link interface.

The new Twin Tec USB Interface P/N USB-INTF provides PC connectivity for all of our engine controls (ignition and fuel injection systems) and eliminates the requirement for multiple cables or a separate USB adapter if your laptop is not equipped with an RS-232 serial port (9 pin male D-sub connector). The USB Interface is compatible with Windows 98/ME/XP.

If you do not have the new USB Interface, you will require the original RS-232 PC link cable (P/N TCFI-C).

The TCFI-C cable connects to the existing four terminal Deutsch style data link connector on the H-D<sup>®</sup> wiring harness. Please note that the TCFI-C cable appears similar to our TC88-C cable used with Twin Tec TC88 ignition modules, however these cables are not interchangeable.

### PC REQUIREMENTS

If you are using the new Twin Tec USB Interface (P/N USB-INTF), refer to the supplied instructions for details. No additional hardware is required.

The original PC link cable (P/N TCFI-C) connects to an RS-232 serial port by means of a female 9 pin D-sub connector. Data transfer occurs at 56 kBaud. The high baud rate limits the maximum

cable length and the use of an extension cable is not recommended. Due to the cable length limitation and the need for portable access, a laptop PC is recommended. The PC must have a free serial port (COM1-255) with a standard 9 pin male D-sub connector. If your laptop does not include a serial port, you can use a USB adapter. However, not all USB adapters will work correctly with our PC link cables. Most of the inexpensive USB adapters are intended for interfacing Palm Pilot type devices and do not support all the signals required by our PC link cables.

We sell and recommend a low cost USB adapter (P/N USBG-232) that has been tested with a wide range of system configurations. The USBG-232 adapter comes with correct and updated driver files on CDROM. After installation the USBG-232 adapter will usually appear as COM5.

We recommend a laptop with Pentium processor and super VGA display (SVGA with 1024 x 768 pixel resolution) running Windows 98/ME/XP/Vista. A high speed Pentium processor is not required, but processors slower than 300 MHz may exhibit sluggish program loading and response. The PC must have a CDROM drive for program loading.

### SOFTWARE INSTALLATION

The software is supplied on CDROM media or in the form of a compressed file downloaded from our website. The installation process uses InstallShield. This industry standard installer is based the new Microsoft Windows Installer service that greatly reduces potential problems such as version conflicts and allows for application self-repair. Since Windows 98 systems did not originally include the Windows Installer service, the required installer software is included in the distribution media.

Before proceeding with installation, shutdown any other applications that may be running. For Windows Vista, you must disable the User Account Control (UAC) during installation. If you are not familiar with the UAC, please refer to the Vista UAC Tech Note on our website's Tech FAQ for details.

Use the Windows Explorer or the Run command from the Windows Start Menu to launch setup.exe in the Mega\_Boot\_Pro folder on the CDROM or the setup.exe file downloaded from our website. InstallShield will install the software in an appropriate folder under Program Files.

Once InstallShield has completed the installation, Mega Boot Programmer will appear on the Windows Start Menu. You can then launch it just as you would any other Windows program.

## ***RUNNING THE PROGRAM***

If you are using the new Twin Tec USB Interface (P/N USB-INTF), refer to the supplied instructions for details. No additional hardware is required.

If you are using the original RS-232 PC link cable (P/N TCFI-C), connect the cable to the H-D® data link connector and PC serial port.

Turn the ignition key and engine run/stop switches on to provide power to the TCFI unit. Do not start the engine.

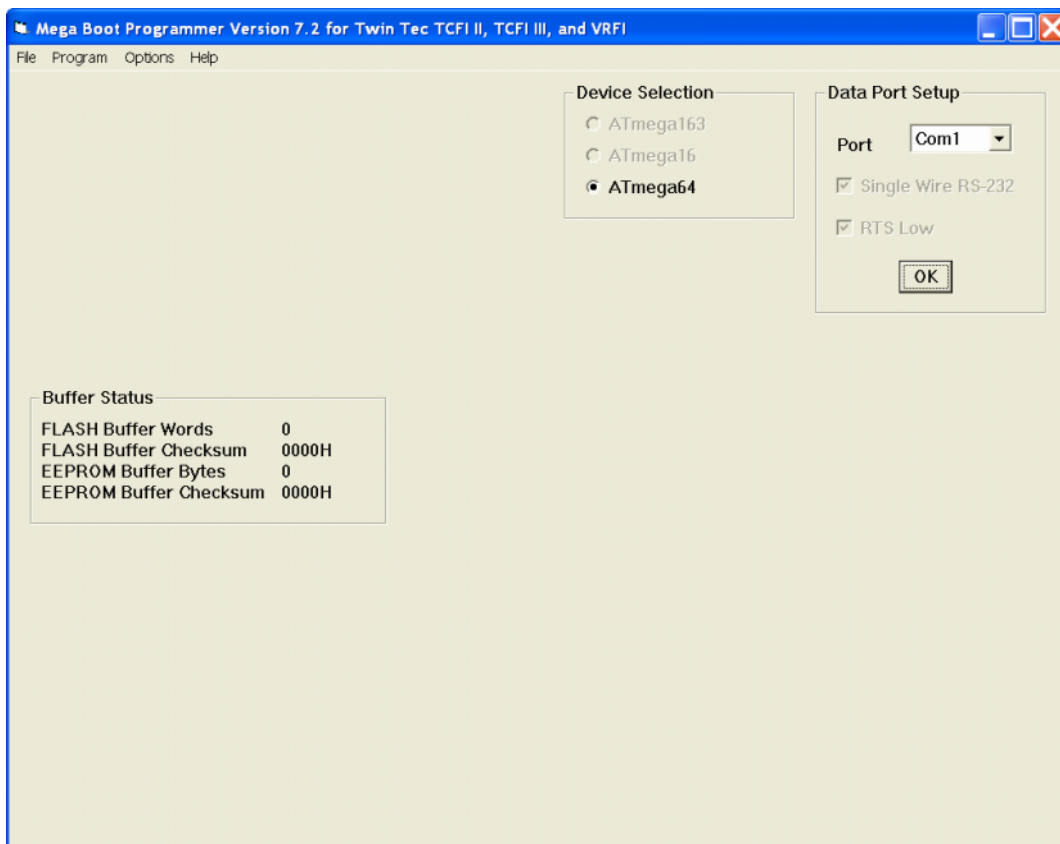
If the engine or TCFI unit has been removed from the motorcycle, you can do bench top programming by using an adapter harness P/N TCFI-ADAPT that includes a small 12 volt DC power supply.

When the program is first loaded, Buffer Status, Device Selection, and Data Port Setup options appear as shown in Figure 1. All operations are by means of a menu at the top of the screen, similar to other Windows programs. The main menu selections are File, Program, Options, and Help. Some menu selections and check boxes that are not required outside a manufacturing environment are disabled (grayed out).

Device selection: all TCFI II, TCFI III and VRFI units use the Atmel ATmega64. **This program version cannot be used for other products including the original TCFI Gen I.**

Data Port Setup allows selection of COM1-255. The default port is COM1.

Figure 1 - Mega Boot Programmer Main Screen



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The File menu has selections for opening a FLASH (firmware) or EEPROM (parameter data) file, and exiting the program. Data is loaded from a file to a buffer (a temporary storage area maintained by the utility). Separate buffers are maintained for FLASH and EEPROM. Once a buffer contains data, an on-screen status display shows the number of words (FLASH) or bytes (EEPROM) and a checksum. Mega Boot Programmer accepts standard Intel hex format FLASH (.hex) or EEPROM (.eep) files. Your firmware update will include a readme file that lists the file names for the required FLASH and EEPROM files along with the corresponding checksums.

The Program menu controls interactions with the target. Reprogramming is done by clicking on the Auto (Program FLASH and EEPROM) command. You can click on Read Firmware ID to verify that the unit has the correct firmware revision. Additional commands that are not required for field reprogramming are grayed out.

## **BASIC PROGRAMMING SEQUENCE**

1. Before reprogramming firmware, you should use the PC Link software to download and save tables and module parameters. These will all return to default values when the unit is reprogrammed and any customization or air/fuel ratio learning will be lost.
2. Start Mega Boot Programmer. Select the appropriate data port (default is COM1). Open the firmware files, i.e. Open FLASH and EEPROM from File menu). The buffer status box should show file size and checksum values matching those listed in the firmware update.
3. Make sure that the USB Interface or PC link cable is connected.
4. Turn the ignition key and engine run/stop switches on to provide power to the unit. Do not

***CAUTION: Reprogramming takes several minutes. If the process is interrupted or battery voltage drops below 12 volts, the firmware may be corrupted beyond repair. Make sure that you fully charge the battery before reprogramming. However, do not leave the battery charger connected while reprogramming.***

start the engine.

5. Click on the Auto command from the Program menu. A progress bar is displayed during the programming process. Mega Boot Programmer automatically verifies the firmware after programming. A message box appears to announce that programming has been successful or that verification has failed.
6. Click on Read Firmware ID command from the Program menu. Verify that the firmware ID matches that listed in the update bulletin.
7. End Mega Boot Programmer by using Exit from the File menu.
8. If applicable, use PC Link software to restore any customized tables and module parameters.
9. Turn off the engine run/stop switch and ignition key. Then disconnect the USB Interface or PC link cable.

## **TROUBLESHOOTING FLOWCHART**

Follow the troubleshooting flowchart shown on the next page. Experience has shown that most communication problems are user error or PC compatibility issues.

## Troubleshooting Flowchart

